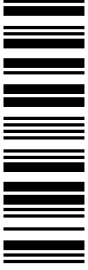


EDS84AVTCxx
13387462

L-force Drives



Software Manual

8400



E84AVTCxxxxx

Inverter Drives 8400 TopLine C

Lenze

Overview of technical documentation for Inverter Drives 8400

Project planning, selection & ordering

- 8400 hardware manual
- Catalogue

Mounting & wiring

- MA 8400 BaseLine/StateLine/HighLine/TopLine
- MA for the communication module
- MA for the extension module
- MA for the safety module
- MA for the accessories

Parameterisation

- BA keypad
- SW 8400 BaseLine
- SW 8400 StateLine
- SW 8400 HighLine
- SW 8400 TopLine
- KHB for the communication module

← This documentation

Drive commissioning

- SW 8400 BaseLine/StateLine/HighLine/TopLine
 - Chapter "Commissioning"
 - Chapter "Diagnostics & error management"
- Remote maintenance manual

Networking

- KHB for the communication medium used

Legend:

- Printed documentation
- Online documentation (PDF/Engineer online help)

Abbreviations used:

- BA Operating Instructions
- KHB Communication manual
- MA Mounting instructions
- SW Software Manual

Contents

1	About this documentation	25
1.1	Document history	25
1.2	Conventions used	26
1.3	Terminology used	27
1.4	Definition of the notes used	29
2	Introduction: Parameterising the controller	30
2.1	General notes on parameters	31
2.2	Handling the memory module	32
2.3	Handling the keypad	35
2.4	Device access protection	37
2.4.1	Password protection	38
2.4.2	Device personalisation	40
2.4.3	Unlocking the controller with a MasterPin	42
3	Commissioning	43
3.1	Selection of the right commissioning tool	44
3.2	Safety instructions with regard to commissioning	45
3.3	Notes on motor control	46
3.4	Preconditions for commissioning with the »Engineer«	47
3.5	Trouble-shooting during commissioning	48
3.6	Commissioning of the "Actuating drive speed" technology application	49
3.6.1	Prepare controller for commissioning	50
3.6.2	Creating an »Engineer« project & going online	51
3.6.3	Parameterising the motor control	52
3.6.4	Parameterising the application	53
3.6.5	Saving parameter settings safe against mains failure	55
3.6.6	Enable controller and test application	55
3.7	Commissioning of the "Table positioning" technology application	57
3.7.1	Prepare controller for commissioning	59
3.7.2	Creating an »Engineer« project & going online	60
3.7.3	Parameterising the motor control	61
3.7.4	Parameterising the application	62
3.7.4.1	Set machine parameters	63
3.7.4.2	Set the position encoder	64
3.7.4.3	Set homing	66
3.7.4.4	Enter one or more profiles	68

3.7.5	Saving parameter settings safe against mains failure	70
3.7.6	Enable controller and test application	70
3.8	Commissioning of the "Switch-off positioning" technology application	72
3.8.1	Prepare controller for commissioning	74
3.8.2	Creating an »Engineer« project & going online	75
3.8.3	Parameterising the motor control	76
3.8.4	Parameterising the application	77
3.8.5	Saving parameter settings safe against mains failure	79
3.8.6	Enable controller and test application	79
3.9	PC manual control	80
3.9.1	Activating PC manual control	80
3.9.2	Speed control	83
3.9.3	Set/reset home position	85
3.9.4	Manual jog	86
3.9.5	Positioning (relative or absolute)	87
4	Device control (DCTRL)	89
4.1	Device commands (C00002/x)	91
4.1.1	Load Lenze setting	94
4.1.2	Load all parameter sets	95
4.1.3	Save all parameter sets	96
4.1.4	Enable/Inhibit controller	97
4.1.5	Activate/Deactivate quick stop	98
4.1.6	Reset error	99
4.1.7	Delete logbook	99
4.1.8	Device search function	100
4.2	Device state machine and device statuses	101
4.2.1	FirmwareUpdate	102
4.2.2	Init	103
4.2.3	MotorIdent	104
4.2.4	SafeTorqueOff	105
4.2.5	ReadyToSwitchOn	106
4.2.6	SwitchedOn	107
4.2.7	OperationEnabled	108
4.2.8	TroubleOSP	109
4.2.9	Trouble	110
4.2.10	Fault	111
4.2.11	SystemFault	111
4.3	Automatic restart after mains connection/fault...	112
4.3.1	"Inhibit at power-on" auto-start option	112
4.3.2	Auto-start option "Inhibit at Lenze setting"	114

4.4	Internal interfaces "LS DriveInterface" system block	115
4.4.1	wCANControl/wMCIControl control words	118
4.4.2	wDeviceStatusWord status word	119
5	Motor control (MCTRL)	120
5.1	Motor selection/Motor data	121
5.1.1	Selecting a motor from the motor catalogue in the »Engineer«	124
5.1.2	Automatic motor data identification	126
5.2	Selecting the control mode	131
5.2.1	Selection help	135
5.3	Defining current and speed limits	136
5.4	Pole position identification (PPI)	139
5.4.1	Pole position identification 360°	140
5.4.2	Pole position identification without motion	144
5.5	V/f characteristic control (VFCplus)	147
5.5.1	Parameterisation dialog/signal flow	148
5.5.2	Basic settings	150
5.5.2.1	Defining the V/f characteristic shape	151
5.5.2.2	Defining current limits (Imax controller)	152
5.5.3	Optimising the control mode	153
5.5.3.1	Adapting the V/f base frequency	154
5.5.3.2	Adapting the Vmin boost	156
5.5.3.3	Optimising the Imax controller	158
5.5.3.4	Optimising the stalling behaviour	159
5.5.3.5	Torque limitation	160
5.5.3.6	Defining a user-defined V/f characteristic	162
5.5.4	Remedies for undesired drive behaviour	165
5.6	V/f characteristic control - energy-saving (VFCplusEco)	166
5.6.1	Parameterisation dialog/signal flow	167
5.6.2	Comparison of VFCplusEco - VFCplus	169
5.6.3	Basic settings	170
5.6.4	Optimising the control mode	171
5.6.4.1	Improving the behaviour at high dynamic load changes	172
5.6.4.2	Adapting the slope limitation for lowering the Eco function	173
5.6.4.3	Optimising the cos/phi controller	173
5.6.5	Remedies for undesired drive behaviour	174
5.7	V/f control (VFCplus + encoder)	176
5.7.1	Parameterisation dialog/signal flow	176
5.7.2	Basic settings	178
5.7.2.1	Parameterising the slip regulator	179

5.8	Sensorless vector control (SLVC)	182
5.8.1	Parameterisation dialog/signal flow	183
5.8.2	Types of control	185
5.8.2.1	Speed control with torque limitation	185
5.8.2.2	Torque control with speed limitation	186
5.8.3	Basic settings	187
5.8.4	Optimising the control mode	188
5.8.4.1	Optimising the starting performance after a controller enable	188
5.8.4.2	Optimise speed controller	189
5.8.4.3	Optimising dynamic performance and field weakening behaviour	191
5.8.4.4	Optimising the stalling behaviour	192
5.8.4.5	Optimise response to setpoint changes and determine mass inertia	194
5.8.4.6	Slip calculation from motor equivalent circuit diagram data	196
5.8.5	Remedies for undesired drive behaviour	197
5.9	Sensorless control for synchronous motors (SLPSM)	198
5.9.1	Parameterisation dialog/signal flow	200
5.9.2	Types of control	203
5.9.3	Basic settings	204
5.9.4	Optimising the control mode	206
5.9.4.1	Optimise current controller	207
5.9.4.2	Optimise speed controller	208
5.9.4.3	Optimise response to setpoint changes and determine mass inertia	212
5.10	Servo control (SC)	214
5.10.1	Parameterisation dialog/signal flow	215
5.10.2	Types of control	220
5.10.2.1	Speed control with torque limitation	220
5.10.2.2	Torque control with speed limitation	221
5.10.3	Basic settings	222
5.10.4	Optimising the control mode	223
5.10.4.1	Optimise current controller	224
5.10.4.2	Optimise speed controller	225
5.10.4.3	Optimise response to setpoint changes and determine mass inertia	229
5.10.4.4	Setting the current setpoint filter (band-stop filter)	231
5.10.4.5	Adapting the max. acceleration change (jerk limitation)	232
5.10.4.6	Slip calculation from motor equivalent circuit diagram data	233
5.10.4.7	Temperature compensation within the motor control	234
5.10.4.8	Optimising the behaviour of the asynchronous motor in the field weakening range	235

5.11	Parameterisable additional functions	240
5.11.1	Selection of switching frequency	240
5.11.2	Operation with increased rated power	243
5.11.3	Correction of the stator leakage inductance...	245
5.11.4	Flying restart function	247
5.11.5	DC-injection braking	250
5.11.5.1	Manual DC-injection braking (DCB)	251
5.11.5.2	Automatic DC-injection braking (Auto-DCB)	251
5.11.6	Slip compensation	255
5.11.7	Oscillation damping	256
5.11.7.1	Oscillation damping voltage range	257
5.11.7.2	Oscillation damping in the field weakening range	258
5.11.8	Phase sequence reversal for correcting misconnected UVW motor phases	259
5.11.9	Field weakening for synchronous motors	260
5.12	Position control/additive speed specification	264
5.13	Braking operation/brake energy management	265
5.13.1	Setting the voltage source for braking operation	267
5.13.2	Selecting the response to an increase of the DC-bus voltage	268
5.13.2.1	Inverter motor brake	270
5.13.3	Avoiding thermal overload of the brake resistor	273
5.14	Monitoring	274
5.14.1	Device overload monitoring (lxt)	275
5.14.2	Motor load monitoring (l2xt)	276
5.14.3	Motor temperature monitoring (PTC)	278
5.14.4	Brake resistor monitoring (l2xt)	279
5.14.5	Motor phase failure monitoring	281
5.14.6	Motor phase error monitoring before operation	281
5.14.7	Mains phase failure monitoring	283
5.14.8	Maximum current monitoring	283
5.14.9	Maximum torque monitoring	284
5.14.10	Motor speed monitoring	284
5.15	Internal interfaces system block "LS MotorInterface"	285
5.16	Internal status signals system block "LS DeviceMonitor"	291

6	Encoder/feedback system	293
6.1	Parameterisation dialog/signal flow	294
6.2	Resolver at X7	298
6.2.1	Parameterising the resolver	298
6.2.2	Optimising resolver behaviour	299
6.2.3	Internal interfaces "LS Resolver" system block	301
6.3	Multi-Encoder at X8	302
6.3.1	Parameterising Multi-Encoders	304
6.3.1.1	TTL incremental encoder	304
6.3.1.2	Sin/cos encoder	304
6.3.1.3	Absolute value encoder (sin/cos encoder with hiperface)	305
6.3.1.4	SSI encoder	307
6.3.2	Internal interfaces "LS MultiEncoder" system block	312
6.3.2.1	Recognition of invalid encoder values	313
6.3.2.2	Setting of a static position offset	313
6.4	HTL encoder at DI1/DI2 or DI6/DI7	314
6.4.1	Parameterising digital inputs as encoder inputs	314
6.4.2	Encoder evaluation method	316
6.4.3	HTL encoder at DI1/DI2	317
6.4.4	HTL encoder at DI6/DI7	319
6.5	Monitoring	320
6.5.1	Resolver/multi-encoder open-circuit monitoring	320
6.5.2	Open-circuit monitoring HTL encoder	322
6.5.3	Motor temperature monitoring (KTY)	323
6.5.4	Encoder - angular drift monitoring	326
6.5.4.1	Angular drift monitoring for encoders without absolute information	326
6.5.4.2	Angular drift monitoring for encoders with absolute information	327
7	I/O terminals	328
7.1	Digital input terminals	329
7.1.1	Change function assignment	331
7.1.1.1	Using DI1(6) and DI2(7) as digital inputs	332
7.1.1.2	Using DI1(6) and DI2(7) as frequency inputs	333
7.1.1.3	Using DI1(6) as counting input	338
7.1.2	Internal interfaces System block "LS DigitalInput"	342
7.1.2.1	Output of the encoder position of the DI1/DI2 frequency input	345
7.2	Digital output terminals	349
7.2.1	Internal interfaces System block "LS DigitalOutput"	351

7.3	Analog terminals	352
7.3.1	Parameterising analog input	355
7.3.1.1	Signal adaptation by means of characteristic	357
7.3.2	Parameterising analog output	359
7.3.3	Internal interfaces System block "LS_AnalogInput"	360
7.3.4	Internal interfaces System block "LS_AnalogOutput"	361
7.4	Touch probe detection	362
7.4.1	Parameter setting	364
7.4.2	Internal interfaces System block "LS_TouchProbe"	367
7.4.2.1	Application example: "Position measurement"	368
7.5	Configuring exception handling of the output terminals	369
7.6	User-defined terminal assignment	370
7.6.1	Source-destination principle	371
7.6.2	Changing the terminal assignment with the keypad	372
7.6.3	Changing the terminal assignment with the »Engineer«	374
8	Technology applications	377
8.1	General information	377
8.1.1	Purpose of the technology applications	377
8.1.2	Application cases for a technology application	378
8.1.3	Basic software structure	379
8.2	Overview of available technology applications	381
8.3	Selection of the technology application and the control mode	382
8.4	TA "Actuating drive speed"	383
8.4.1	Basic signal flow	384
8.4.2	Internal interfaces application block "LA_NCtrI"	386
8.4.3	Terminal assignment of the control modes	394
8.4.3.1	Terminals 0	395
8.4.3.2	Terminals 2	396
8.4.3.3	Terminals 11	397
8.4.3.4	Terminal 16	398
8.4.3.5	Keypad	399
8.4.3.6	PC	400
8.4.3.7	CAN	401
8.4.3.8	MCI	402
8.4.4	Process data assignment for fieldbus communication	403
8.4.5	Setting parameters (short overview)	405
8.4.6	Configuration parameters	407

8.5	TA "Table positioning"	410
8.5.1	Basic signal flow	411
8.5.1.1	Possibilities for the position selection	412
8.5.2	Internal interfaces Application block "LA TabPos"	414
8.5.3	Terminal assignment of the control modes	424
8.5.3.1	Terminals 0	426
8.5.3.2	Terminals 2	427
8.5.3.3	Terminals 11	428
8.5.3.4	Terminal 16	429
8.5.3.5	Keypad	430
8.5.3.6	PC	431
8.5.3.7	CAN	432
8.5.3.8	MCI	433
8.5.4	Process data assignment for fieldbus communication	434
8.5.5	Setting parameters (short overview)	436
8.5.6	Configuration parameters	436
8.6	TA "Switch-off positioning"	440
8.6.1	Basic signal flow	442
8.6.2	Internal interfaces application block "LA SwitchPos"	443
8.6.2.1	Truth table for activating the pre-switch off	450
8.6.3	Terminal assignment of the control modes	451
8.6.3.1	Terminals 0	452
8.6.3.2	Terminals 2	453
8.6.3.3	Terminals 11	454
8.6.3.4	Terminal 16	455
8.6.3.5	Keypad	456
8.6.3.6	PC	457
8.6.3.7	CAN	458
8.6.3.8	MCI	459
8.6.4	Process data assignment for fieldbus communication	460
8.6.5	Setting parameters (short overview)	462
8.6.6	Configuration parameters	464
8.7	"GeneralPurpose" functions	467
8.7.1	Analog switch	467
8.7.2	Arithmetic	468
8.7.3	Multiplication/Division	468
8.7.4	Binary delay element	469
8.7.5	Binary logic	469
8.7.6	Analog comparison	470
8.7.7	Binary signal monitor	470
8.7.8	Analog signal monitor	471

8.7.9	D-FlipFlop	471
8.7.10	Numerator	472
9	Basic drive functions (MCK)	473
9.1	Basic signal flow	474
9.2	Internal interfaces System block "LS MotionControlKernel"	475
9.2.1	MCK control word	481
9.2.2	MCK status word	483
9.2.3	MCK state machine	485
9.2.4	Interface to safety system	486
9.3	MCKInterface	487
9.3.1	Control inputs "L MckCtrlInterface" function block	489
9.3.1.1	Alternative functions for control bit "PosExecute"	494
9.3.1.2	Operating mode change with profile number	495
9.3.2	Status outputs FB "L MckStateInterface"	496
9.4	Basic settings	498
9.4.1	Machine parameters	498
9.4.1.1	Gearbox ratio	500
9.4.1.2	Feed constant	501
9.4.1.3	Activation of the modulo measuring system	502
9.4.2	Min/Max speed	505
9.4.3	Limit position monitoring	506
9.4.3.1	Software limit positions	506
9.4.3.2	Hardware limit switch	508
9.4.4	Target position monitoring (status "drive in target")	510
9.4.5	Monitoring of the maximum travel distance	512
9.4.6	Following error monitoring system	513
9.5	Speed follower	515
9.5.1	Parameter setting	515
9.5.1.1	Functional settings	515
9.5.2	Requesting the operating mode	516
9.5.3	Setpoint selection	516
9.6	Homing	517
9.6.1	Parameter setting	518
9.6.1.1	Referencing mode	519
9.6.1.2	Home position & home value offset	530
9.6.1.3	Traversing a sequence profile after completion of homing	530
9.6.2	Requesting the operating mode	530
9.6.3	Carrying out homing	531
9.6.3.1	Homing on the fly	532

9.7	Manual jog	533
9.7.1	Parameter setting	534
9.7.1.1	Functional settings	535
9.7.1.2	Smooth start and quick stop of the drive	536
9.7.1.3	Second speed	536
9.7.1.4	Time-based start of second speed	537
9.7.2	Requesting the operating mode	538
9.7.3	Executing manual jogging	538
9.7.3.1	Manual jog to limit position	539
9.7.3.2	Retracting of an operated limit switch	540
9.8	Positioning	541
9.8.1	Possible motion profiles	542
9.8.2	Parameter setting	543
9.8.2.1	Functional settings	544
9.8.2.2	Profile entry	545
9.8.2.3	Positioning modes	548
9.8.2.4	Touch probe positioning	549
9.8.2.5	S-ramp time for jerk limitation	550
9.8.3	Requesting the operating mode	552
9.8.4	Carrying out positioning	552
9.8.4.1	Stipulation of the profile to be executed	552
9.8.4.2	Starting/cancelling a traversing task	553
9.8.4.3	Override of the parameterised positioning mode	554
9.8.4.4	Position teaching	555
9.9	Stop	556
9.9.1	Parameter setting	556
9.9.2	Requesting the operating mode	556
9.10	Position follower	557
9.10.1	Parameter setting	557
9.10.1.1	Functional settings	557
9.10.2	Requesting the operating mode	558
9.10.3	Setpoint selection	558
9.11	Override	559
9.11.1	Speed override	560
9.11.2	Acceleration override	561
9.11.3	S-ramp smoothing override	562

9.12	Holding brake control	563
9.12.1	Internal interfaces	564
9.12.2	Parameter setting	565
9.12.2.1	Operating mode	567
9.12.2.2	Functional settings	569
9.12.2.3	Switching thresholds	570
9.12.2.4	Application and release time	571
9.12.2.5	Ramp time for approaching the setpoint speed	573
9.12.2.6	Motor magnetising time (only with asynchronous motor)	574
9.12.2.7	Actual value monitoring	574
9.12.3	Process when brake is released	575
9.12.4	Process when brake is closed	576
9.12.5	Behaviour in case of pulse inhibit	578
9.12.6	Feedforward control of the motor before release	579
10	Diagnostics & error management	581
10.1	Basics on error handling in the controller	581
10.2	LED status displays	582
10.2.1	LED status displays of the device status	583
10.3	Drive diagnostics with the »Engineer«	584
10.3.1	Display details of the status determining error	586
10.4	Drive diagnostics via keypad/bus system	587
10.5	Logbook	590
10.5.1	Functional description	591
10.5.2	Filtering logbook entries	591
10.5.3	Reading out logbook entries	592
10.5.4	Exporting logbook entries to a file	593
10.5.5	File logbook in project	594
10.6	Monitoring	595
10.6.1	Monitoring configuration	596
10.6.2	Setting the error response	597
10.6.3	AutoFailReset function	598
10.7	Maloperation of the drive	599
10.8	Operation without mains supply	601
10.9	Error messages of the operating system	602
10.9.1	Structure of the 32-bit error number (bit coding)	602
10.9.2	Structure of the 16-bit error number (bit coding)	605
10.9.3	Reset error messages	606
10.9.4	Export error texts	607

10.9.5	Short overview (A-Z)	608
10.9.6	Cause & possible remedies	611
10.10	System block "LS_SetError_1"	634
10.11	System block "LS_SetError_2"	636
11	System bus "CAN on board"	638
11.1	General information	639
11.1.1	General data and application conditions	640
11.1.2	Supported protocols	640
11.1.3	Communication time	641
11.2	Possible settings via DIP switch	642
11.2.1	Activating the bus terminating resistor	642
11.2.2	Setting the baud rate	643
11.2.3	Setting the node address	643
11.3	LED status displays for the system bus	644
11.4	Going online via system bus (CAN on board)	645
11.5	Reinitialising the CANopen system bus interface	645
11.6	Structure of the CAN data telegram	646
11.6.1	Identifier	646
11.6.2	User data	648
11.7	Communication phases/network management	649
11.7.1	Status transitions	650
11.7.2	Network management telegram (NMT)	651
11.7.3	Parameterising the controller as CAN master	652
11.8	Process data transfer	653
11.8.1	Available process data objects	654
11.8.1.1	RPDO1 Port block "LP_CanIn1"	655
11.8.1.2	RPDO2 Port block "LP_CanIn2"	656
11.8.1.3	RPDO3 Port block "LP_CanIn3"	657
11.8.1.4	TPDO1 Port block "LP_CanOut1"	658
11.8.1.5	TPDO2 Port block "LP_CanOut2"	659
11.8.1.6	TPDO3 Port block "LP_CanOut3"	660
11.8.2	Identifiers of the process data objects	661
11.8.3	Transmission type	662
11.8.4	PDO synchronisation via sync telegram	665
11.8.5	Monitoring of the RPDOs for data reception	666
11.8.6	Configuring exception handling of the CAN PDOs	666

11.9	Parameter data transfer	668
11.9.1	Identifiers of the parameter data objects	669
11.9.2	User data	669
11.9.2.1	Command	670
11.9.2.2	Addressing by means of index and subindex	671
11.9.2.3	Data 1 ... Data 4	672
11.9.2.4	Error messages	673
11.9.3	Parameter data telegram examples	675
11.9.3.1	Read parameters	675
11.9.3.2	Write parameters	676
11.9.3.3	Read block parameters	677
11.10	Monitoring	680
11.10.1	Integrated error detection	680
11.10.2	Heartbeat protocol	682
11.10.2.1	Telegram structure	683
11.10.2.2	Parameter setting	683
11.10.2.3	Commissioning example	685
11.10.3	Emergency telegram	686
11.11	Implemented CANopen objects	687
11.12	Internal interfaces System block "LS_CANManagement"	710
12	Fieldbus interface	711
12.1	Process data transfer	712
12.2	Control mode "MCI"	714
12.2.1	Port block "LP_MciIn"	715
12.2.2	Port block "LP_MciOut"	716
13	Axis bus	717
13.1	Data transfer axis bus	718
13.1.1	Topologies	718
13.1.2	Transfer mechanisms	718
13.1.3	Activating the bus terminating resistor	720
13.1.4	Parameter setting	720
13.1.5	Internal interfaces System block "LS_AxisBusOut"	722
13.1.6	Internal interfaces System block "LS_AxisBusIn"	723
13.1.7	Internal interfaces System block "LS_AxisBusAux"	724
13.2	IO axis bus	726
13.2.1	"Master/slave" function	727
13.2.2	"IO" function	729
13.2.3	Internal interfaces System block "LS_AxisBusIO"	730

14	Synchronisation of the internal time base	731
14.1	Internal interfaces System block "LS_SyncManagement"	733
15	Parameter change-over	734
15.1	Internal interfaces System block "LS_WriteParamList"	734
15.2	Configuring the list using the »Engineer« parameterisation dialog	735
15.3	Configuring the list by means of parameterisation	739
15.4	Selecting a value set	740
15.5	Activating the writing of the parameters	740
16	Parameter reference	742
16.1	Structure of the parameter descriptions	743
16.1.1	Data type	744
16.1.2	Parameters with read-only access	744
16.1.3	Parameters with write access	745
16.1.3.1	Parameters with setting range	745
16.1.3.2	Parameters with selection list	745
16.1.3.3	Parameters with bit-coded setting	746
16.1.3.4	Parameters with subcodes	747
16.1.4	Parameter attributes	747
16.2	Parameter list	749
16.2.1	Selection lists for connection parameters	1028
16.2.1.1	Selection list - analog signals	1028
16.2.1.2	Selection list - digital signals	1034
16.2.1.3	Selection list - angle signals	1041
16.3	Table of attributes	1043
17	Working with the FB Editor	1058
17.1	Basics	1058
17.1.1	Basic components of a drive solution	1059
17.1.1.1	What is a function block?	1060
17.1.1.2	Parameterisable function blocks	1061
17.1.1.3	What is a system block?	1061
17.1.1.4	What is a port block?	1062
17.1.1.5	What is an application block?	1062
17.1.2	Conventions used for input/output identifiers	1063
17.1.3	Scaling of physical units	1064

17.2	User interface	1065
17.2.1	Toolbar	1066
17.2.2	Search function	1067
17.2.3	Level selection	1068
17.2.4	Editor view/overview	1070
17.2.5	Context menu	1071
17.2.6	Status bar	1071
17.2.7	Overview window	1072
17.3	Using the FB Editor as "Viewer"	1074
17.3.1	Following connections of inputs and outputs	1075
17.3.2	Keyboard commands for navigation	1076
17.3.3	Change online display format	1077
17.4	Reconfiguring the predefined interconnection	1079
17.4.1	Inserting/Deleting objects	1079
17.4.1.1	Inserting a function block	1080
17.4.1.2	Inserting a system block	1082
17.4.1.3	Inserting a port block	1084
17.4.1.4	Inserting a comment	1086
17.4.1.5	Deleting objects that are no longer required	1088
17.4.2	Changing connector visibilities	1089
17.4.3	Arranging objects in the drawing area	1090
17.4.4	Creating/deleting connections	1091
17.4.4.1	Creating a connection using the connection line	1093
17.4.4.2	Creating a connection using port identifiers	1094
17.4.4.3	Creating a connection via connection dialog	1095
17.4.4.4	Deleting connections that are no longer required	1096
17.4.5	Changing the processing order	1097
17.4.6	Copying interconnection elements (across all devices)	1099
17.4.6.1	Insert options for copied elements	1101
17.4.7	Resetting changed interconnection	1102
17.5	Adjusting online and offline interconnection	1103
17.6	Printing the interconnection	1104
17.7	Comparing interconnections	1105
17.8	Copying an interconnection	1108
17.9	Exporting/Importing an interconnection	1109

18	Function library	1110
18.1	Function blocks	1110
18.1.1	L Absolute 1	1115
18.1.2	L Absolute 2	1115
18.1.3	L AddSub 1	1116
18.1.4	L AnalogSwitch 1	1117
18.1.5	L AnalogSwitch 2	1118
18.1.6	L AnalogSwitch 3	1119
18.1.7	L AnalogSwitch 4	1120
18.1.8	L AnalogSwitch 5	1121
18.1.9	L And 1	1122
18.1.10	L And 2	1123
18.1.11	L And 3	1124
18.1.12	L And5 1	1125
18.1.13	L And5 2	1126
18.1.14	L Arithmetik 1	1127
18.1.15	L Arithmetik 2	1129
18.1.16	L Arithmetik 3	1131
18.1.17	L Arithmetik 4	1133
18.1.18	L Arithmetik 5	1135
18.1.19	L ArithmetikPhi 1	1137
18.1.20	L ArithmetikPhi 2	1138
18.1.21	L ArithmetikPhi 3	1139
18.1.22	L CalcDiameter 1	1140
	18.1.22.1 Set initial value	1143
	18.1.22.2 Calculate diameter	1143
	18.1.22.3 Select change direction, web break monitoring	1143
	18.1.22.4 Holding the current value	1143
	18.1.22.5 Limit value monitoring	1144
	18.1.22.6 Converting diameter in 1/D	1144
	18.1.22.7 Physical state variables	1144
18.1.23	L Compare 1	1145
	18.1.23.1 Function 1: $nln1 = nln2$	1146
	18.1.23.2 Function 2: $nln1 > nln2$	1147
	18.1.23.3 Function 3: $nln1 < nln2$	1148
	18.1.23.4 Function 4: $nln1 = nln2$	1149
	18.1.23.5 Function 5: $nln1 > nln2$	1149
	18.1.23.6 Function 6: $nln1 < nln2$	1149
18.1.24	L Compare 2	1150
18.1.25	L Compare 3	1151
18.1.26	L Compare 4	1152

18.1.27	L Compare 5	1153
18.1.28	L ComparePhi 1	1154
18.1.28.1	Function 1: dnln1 = dnln2	1155
18.1.28.2	Function 2: dnln1 > dnln2	1156
18.1.28.3	Function 3: dnln1 < dnln2	1157
18.1.28.4	Function 4: dnln1 = dnln2 	1158
18.1.28.5	Function 5: dnln1 > dnln2 	1158
18.1.28.6	Function 6: dnln1 < dnln2 	1158
18.1.29	L ComparePhi 2	1159
18.1.30	L ComparePhi 3	1160
18.1.31	L ComparePhi 4	1161
18.1.32	L ComparePhi 5	1162
18.1.33	L ConvAP 1	1163
18.1.34	L ConvAP 2	1164
18.1.35	L ConvAP 3	1165
18.1.36	L ConvBitsToWord 1	1166
18.1.37	L ConvBitsToWord 2	1167
18.1.38	L ConvBitsToWord 3	1168
18.1.39	L ConvDIntToWords 1	1169
18.1.40	L ConvDIntToWords 2	1170
18.1.41	L ConvDIntToWords 3	1171
18.1.42	L ConvPA 1	1172
18.1.43	L ConvPA 2	1173
18.1.44	L ConvPA 3	1174
18.1.45	L ConvPP 1	1175
18.1.46	L ConvPP 2	1176
18.1.47	L ConvPP 3	1177
18.1.48	L ConvUnitsToIncr 1	1178
18.1.49	L ConvUnitsToIncr 2	1179
18.1.50	L ConvUnitsToIncr 3	1180
18.1.51	L ConvW 1	1181
18.1.52	L ConvW 2	1183
18.1.53	L ConvW 3	1184
18.1.54	L ConvW 4	1185
18.1.55	L ConvWordsToDInt 1	1186
18.1.56	L ConvWordsToDInt 2	1187
18.1.57	L ConvWordsToDInt 3	1188
18.1.58	L ConvWordToBits 1	1189
18.1.59	L ConvWordToBits 2	1190
18.1.60	L ConvWordToBits 3	1191

18.1.61	L ConvX 1	1192
18.1.62	L ConvX 2	1193
18.1.63	L ConvX 3	1194
18.1.64	L Counter 1	1195
18.1.65	L Counter 2	1197
18.1.66	L Counter 3	1199
18.1.67	L Curve 1	1201
18.1.67.1	Function 3: nOut a = f(table)	1202
18.1.68	L Curve 2	1205
18.1.69	L Curve 3	1207
18.1.70	L DFlipFlop 1	1209
18.1.71	L DFlipFlop 2	1210
18.1.72	L DFRFG 1	1211
18.1.72.1	Ramp function generator (profile generator)	1213
18.1.72.2	Quick stop	1215
18.1.72.3	Ramp function generator stop	1216
18.1.72.4	Reset angle setpoint	1216
18.1.72.5	Detecting the angular difference	1216
18.1.72.6	Offset setting	1217
18.1.73	L DFSET 1	1220
18.1.73.1	Master value rail/slave cascade	1223
18.1.73.2	Setpoint conditioning with stretch factor and gearbox factor	1224
18.1.73.3	Processing correction values	1225
18.1.73.4	Synchronising slave drive to master drive	1227
18.1.73.5	Masking out touch probe signals	1229
18.1.73.6	Process monitoring functions	1230
18.1.74	L DigitalDelay 1	1231
18.1.75	L DigitalDelay 2	1233
18.1.76	L DigitalDelay 3	1234
18.1.77	L DigitalLogic 1	1235
18.1.78	L DigitalLogic 2	1237
18.1.79	L DigitalLogic 3	1239
18.1.80	L DigitalLogic5 1	1241
18.1.81	L DigitalLogic5 2	1243
18.1.82	L DT1 1	1245
18.1.83	L FixSet a 1	1246
18.1.84	L FixSet w 1	1247
18.1.85	L FixSet w 2	1248
18.1.86	L GainOffset 1	1249
18.1.87	L GainOffset 2	1250
18.1.88	L GainOffset 3	1251

18.1.89	L GainOffsetP 1	1252
18.1.90	L GainOffsetP 2	1253
18.1.91	L GainOffsetP 3	1254
18.1.92	L GainOffsetPhiP 1	1255
18.1.93	L GainOffsetPhiP 2	1256
18.1.94	L GearComp 1	1257
18.1.95	L Interpolator 1	1259
	18.1.95.1 Signal interpolation	1260
	18.1.95.2 Signal monitoring	1261
18.1.96	L JogCtrlExtension 1	1262
18.1.97	L Limit 1	1264
18.1.98	L Limit 2	1265
18.1.99	L LimitPhi 1	1266
18.1.100	L LimitPhi 2	1267
18.1.101	L LimitPhi 3	1268
18.1.102	L MPot 1	1269
	18.1.102.1 Activate & control motor potentiometer	1271
	18.1.102.2 Deactivate motor potentiometer	1272
18.1.103	L MulDiv 1	1273
18.1.104	L MulDiv 2	1274
18.1.105	L Mux 1	1275
18.1.106	L Negation 1	1276
18.1.107	L Negation 2	1277
18.1.108	L NLim 1	1278
18.1.109	L NLim 2	1281
18.1.110	L Not 1	1283
18.1.111	L Not 2	1283
18.1.112	L Not 3	1284
18.1.113	L Not 4	1284
18.1.114	L Not 5	1285
18.1.115	L Not 6	1285
18.1.116	L Not 7	1286
18.1.117	L NSet 1	1287
	18.1.117.1 Main setpoint path	1290
	18.1.117.2 JOG setpoints	1291
	18.1.117.3 Setpoint inversion	1291
	18.1.117.4 Value range of the input signal	1291
	18.1.117.5 Skip frequency function	1292
	18.1.117.6 Ramp function generator for the main setpoint	1295
	18.1.117.7 S-shaped ramp	1297
	18.1.117.8 Additional setpoint	1297
	18.1.117.9 Application example for the additional load function	1297

18.1.118L Odometer 1	1298
18.1.119L OffsetGain 1	1300
18.1.120L OffsetGain 2	1301
18.1.121L OffsetGain 3	1302
18.1.122L OffsetGainP 1	1303
18.1.123L OffsetGainP 2	1304
18.1.124L OffsetGainP 3	1305
18.1.125L OffsetGainPhiP 1	1306
18.1.126L OffsetGainPhiP 2	1307
18.1.127L Or 1	1308
18.1.128L Or 2	1309
18.1.129L Or 3	1310
18.1.130L Or 4	1311
18.1.131L Or5 1	1312
18.1.132L Or5 2	1313
18.1.133L PhaseDiff 1	1314
18.1.134L PhaseDiff 2	1315
18.1.135L PhaseIntK 1	1316
18.1.135.1 Function at constant input value	1317
18.1.135.2 Function at input value with sign reversal	1318
18.1.135.3 Calculation of the output signal	1319
18.1.136L PhaseIntK 2	1320
18.1.137L PhiIntegrator 1	1322
18.1.137.1 Function	1324
18.1.137.2 Example	1325
18.1.138L PosCtrlLin 1	1326
18.1.139L PosCtrlLin 2	1329
18.1.140L PosiShaftCtrlInterface 1	1332
18.1.141L ProcessCtrl 1	1333
18.1.141.1 Control characteristic	1335
18.1.142L PCTRL 1	1337
18.1.142.1 Control characteristic	1341
18.1.142.2 Ramp function generator	1342
18.1.142.3 Operating range of the PID process controller	1342
18.1.142.4 Evaluation of the output signal	1343
18.1.142.5 Comparison function "Actual value = setpoint"	1343
18.1.142.6 Control functions	1344
18.1.143L PT1 1	1345
18.1.144L PT1 2	1346
18.1.145L PT1 3	1347
18.1.146L RLO 1	1348

18.1.147L	RSFlipFlop 1	1349
18.1.148L	RSFlipFlop 2	1350
18.1.149L	SampleHold 1	1351
18.1.150L	SampleHold 2	1352
18.1.151L	SignalMonitor a	1353
18.1.152L	SignalMonitor b	1354
18.1.153L	SignalSwitch 1	1355
18.1.154L	SignalSwitch 2	1356
18.1.155L	SignalSwitch 3	1357
18.1.156L	SignalSwitch 4	1358
18.1.157L	SignalSwitch32 1	1359
18.1.158L	SignalSwitch32 2	1360
18.1.159L	SignalSwitch32 3	1361
18.1.160L	SOrt 1	1362
18.1.161L	SRFG 1	1363
18.1.162L	SRFG 2	1365
18.1.163L	SwitchPoint 1	1367
	18.1.163.1 Definition of the switching range	1369
	18.1.163.2 Dead time compensation	1369
	18.1.163.3 Switching hysteresis	1370
	18.1.163.4 Position/time-based cams	1371
18.1.164L	Transient 1	1372
	18.1.164.1 Function 0: Evaluate rising signal edges	1373
	18.1.164.2 Function 1: Evaluate falling signal edges	1373
	18.1.164.3 Function 2: Evaluate rising and falling signal edges	1374
18.1.165L	Transient 2	1375
18.1.166L	Transient 3	1376
18.1.167L	Transient 4	1377
18.1.168L	Transient 5	1378
18.1.169L	Transient 6	1379
18.1.170L	Transient 7	1380
18.1.171L	Transient 8	1381
18.2	System blocks	1382
18.2.1	LS AnalogInput	1384
18.2.2	LS AnalogOutput	1384
18.2.3	LS AxisBusAux	1384
18.2.4	LS AxisBusIn	1384
18.2.5	LS AxisBusIO	1384
18.2.6	LS AxisBusOut	1385
18.2.7	LS CANManagement	1385
18.2.8	LS DataAccess	1385

18.2.9	LS DeviceMonitor	1385
18.2.10	LS DigitalInput	1385
18.2.11	LS DigitalOutput	1385
18.2.12	LS DisFree	1386
18.2.13	LS DisFree a	1387
	18.2.13.1 Display of internal process variables in application units	1388
18.2.14	LS DisFree b	1389
18.2.15	LS DisFree p	1390
18.2.16	LS DriveInterface	1390
18.2.17	LS Keypad	1391
18.2.18	LS MotionControlKernel	1392
18.2.19	LS MotorInterface	1392
18.2.20	LS MultiEncoder	1392
18.2.21	LS ParFix	1393
18.2.22	LS ParFree	1394
18.2.23	LS ParFree 2	1395
18.2.24	LS ParFree a	1396
18.2.25	LS ParFree a 2	1397
18.2.26	LS ParFree b	1398
18.2.27	LS ParFree p	1399
18.2.28	LS ParFree v	1400
18.2.29	LS ParFree v 2	1401
18.2.30	LS ParFree32	1402
18.2.31	LS ParFreeUnit	1403
18.2.32	LS ParFreeUnit 2	1404
18.2.33	LS ParReadWrite 1-6	1405
	18.2.33.1 Arithmetic function	1407
18.2.34	LS PulseGenerator	1409
18.2.35	LS Resolver	1410
18.2.36	LS RetainData	1411
18.2.37	LS SetError 1	1413
18.2.38	LS SetError 2	1413
18.2.39	LS SyncManagement	1413
18.2.40	LS TouchProbe	1413
18.2.41	LS WriteParamList	1413
19	Index	1414
	Your opinion is important to us	1438

1 About this documentation

**Danger!**

The controller is a source of danger which may lead to death or severe injury of persons.

To protect yourself and others against these dangers, observe the safety instructions before switching on the controller.

Please read the safety instructions provided in the **8400 mounting instructions** and in the **8400 hardware manual**. Both documents are supplied with the controller.

This software manual contains information on the parameterisation of the 8400 TopLine C controller by means of the L-force »Engineer« and the X400 keypad.

The information provided in this software manual applies to the 8400 TopLine C controller with the following nameplate data:

Product series	Type designation	from software version
8400 TopLine C	E84AVTCxxxxx	01.00



All screenshots provided in this documentation are application examples. Depending on the software version of the controller and the version of the installed »Engineer« software, the screenshots in this documentation may differ from the representation in the »Engineer«.

1.1 Document history

Version			Description
2.0	08/2011	TD05	Extended by new functions for 8400 TopLine C V02.00.00
1.2	02/2011	TD05	Error corrections & supplements
1.1	11/2010	TD05	First edition

1.2 Conventions used

This Software Manual uses the following conventions to distinguish between different types of information:

Type of information	Writing	Examples/notes
Spelling of numbers		
Decimal separators	Point	The decimal point is generally used. For example: 1234.56
Text		
Version info	Blue text colour	Information that is only valid for or from a certain software version of the controller is marked accordingly in this manual. Example: This function extension is available from version 02.00.00!
Program name	» «	The Lenze »Engineer« PC software ...
Window	<i>italics</i>	The <i>Message</i> window ... / The <i>Options</i> dialog box...
Variable identifier		Set <i>bEnable</i> to TRUE to...
Control element	bold	The OK button... / The Copy command... / The Properties tab... / The Name input field...
Sequence of menu commands		If the execution of a function requires several commands, the individual commands are separated by an arrow: Select File → Open to...
Shortcut	< bold >	Press < F1 > to open the online help. If a command requires a combination of keys, a "+" is placed between the key symbols: Use < Shift >+< ESC > to...
Hyperlink	<u>underlined</u>	Optically highlighted reference to another topic. In this documentation activated by mouse-click.
Icons		
Page reference	 26	Optically highlighted reference to another page. In this documentation activated by mouse-click.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

Information that is only valid for or from a certain software version of the controller is marked accordingly in this manual.

1.3 Terminology used

Term	Meaning
»Engineer«	Lenze PC software which supports you in "engineering" (parameterisation, diagnostics and configuration) throughout the whole life cycle, i.e. from planning to maintenance of the commissioned machine.
Application block	Block for a technology application (e.g. actuating drive speed) A technology application is a drive solution based on the experience and know-how of Lenze in which function blocks interconnected to a signal flow form the basis for implementing typical drive tasks.
ASM	Abbreviation for asynchronous motor
Code	Parameter used for controller parameterisation or monitoring. The term is usually called "index".
Display code	Parameter that displays the current status or value of an input/output of a system block.
Emergency brake	The emergency brake serves to shutdown rotary or translatory masses in motion in emergency situations. Emergency situations are exceptional situations that only occur sporadically.
FB Editor	Function block editor Graphical interconnection tool which is provided for FB interconnections in the »Engineer« on the FB Editor tab and by means of which the applications integrated in the 8400 HighLine controller can also be reconfigured and extended by individual functions.
Function block	General designation of a function block for free interconnection (from "HighLine" device version). A function block can be compared with an integrated circuit that contains a certain control logic and delivers one or several values when being executed. Each function block has a unique identifier (the instance name) and a processing number which defines the position at which the function block is calculated during the task cycle. Example: "L_Arithmetik1" (function block for arithmetic operations)
Holding brake	The holding brake serves to statically hold e.g. a position during the downtimes of a robot/travelling/synchronous/hoist drive.
Keypad	The keypad is an alternative to the PC for the local operation, parameterisation, and diagnostics in a simple manner. <ul style="list-style-type: none"> Detailed type designation: X400 keypad Order designation: EZAEBK1001
LA	Abbreviation for Lenze A pplication block Example: "LA_NCtrl" (block for the "Actuating drive speed" application)
Lenze setting	This setting is the default factory setting of the device.
LP	Abbreviation for Lenze P ort block Example: "LP_CanIn1" (CAN1 port block)
LS	Abbreviation for Lenze S ystem block Example: "LS_DigitalInput" (system block for digital input signals)
Port block	Block for implementing the process data transfer via a fieldbus
PSM	Abbreviation for permanently excited synchronous motor
QSP	Abbreviation for quick stop
SC	Abbreviation for S ervo C ontrol
Service brake	The service brake serves to shutdown rotary or translatory masses in motion in a controlled manner. The energy to be dissipated in this process is produced in the form of friction energy. Unlike emergency braking, this process is a regular and recurring operating mode.
SLPSM	Abbreviation for sensorless control of synchronous motors
SLVC	Abbreviation for S ensor L ess V ector C ontrol

Term	Meaning
Subcode	If a code contains several parameters, the individual parameters are stored under "subcodes". This Manual uses a slash "/" as a separator between code and subcode (e.g. "C00118/3"). The term is usually called "subindex".
System block	System blocks provide interfaces to basic functions and to the hardware of the controller in the FB Editor of the »Engineer« (e.g. to the digital inputs).
USB diagnostic adapter	The USB diagnostic adapter is used for the operation, parameterisation, and diagnostics of the controller. Data are exchanged between the PC (USB connection) and the controller (diagnostic interface on the front) via the diagnostic adapter. <ul style="list-style-type: none">• Order designation: E94AZCUS
VFCplus	Abbreviation for Voltage Frequency Control

1.4 Definition of the notes used

The following signal words and symbols are used in this Software Manual to indicate dangers and important information:

Safety instructions

Layout of the safety instructions:



Pictograph and signal word!

(characterise the type and severity of danger)

Note

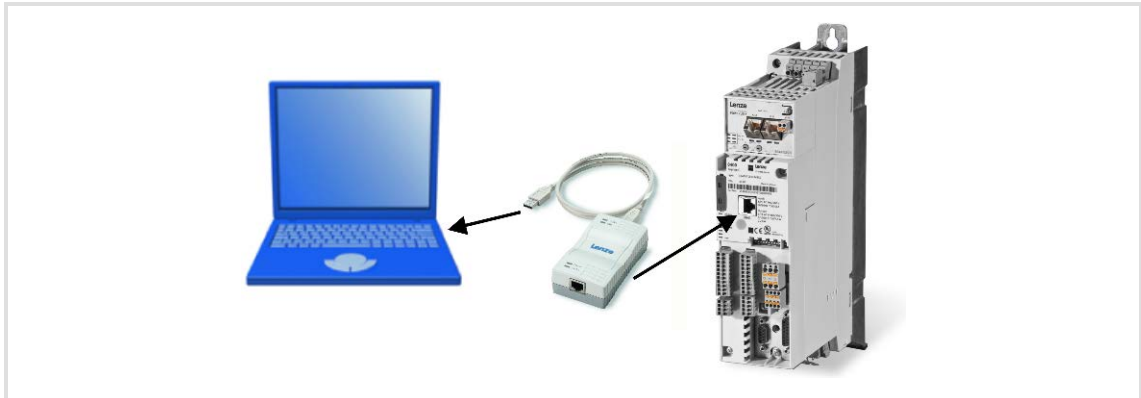
(describes the danger and informs how to prevent dangerous situations)

Pictograph	Signal word	Meaning
	Danger!	Danger of personal injury through dangerous electrical voltage Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
	Danger!	Danger of personal injury through a general source of danger Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
	Stop!	Danger of property damage Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

Application notes

Pictograph	Signal word	Meaning
	Note!	Important note to ensure trouble-free operation
	Tip!	Useful tip for easy handling

2 Introduction: Parameterising the controller



[2-1] Exemplary constellation for parameterising the controller

Being a component of a machine which includes a speed-variable drive system, the controller needs to be adjusted to its drive task. The controller is adjusted by changing parameters which are saved in the memory module. These parameters can be accessed by keypad, by the L-force »Engineer« or by a master control via fieldbus communication:

- Simply plug in the X400 keypad onto the controller if you would like to use it.
- The USB diagnostic adapter, for instance, can be used for the communication between the PC (including the L-force »Engineer« software) and the controller, see illustration. The USB diagnostic adapter is the connection between the PC (free USB port) and the controller (X6 diagnostic interface).
- The "CAN on board" CAN interface and the MCI interface are provided for fieldbus communication and can be used for a communication module (e.g. PROFIBUS).

How to obtain/update the L-force »Engineer« software:

- Download from the Internet:

The full version of the »Engineer StateLevel« is provided free of charge. Current software can be found on the Internet in the "Services & Downloads" area under Lenze website.

- **Requesting the CD**

You can also request the L-force »Engineer« separately on CD free of charge at your Lenze representative. See the "About Lenze" area on our homepage for e.g. the corresponding German address.

2.1 General notes on parameters

All parameters for controller parameterising or monitoring are saved as so-called "codes".

- ▶ The codes are numbered and indicated by the prefix "C" before the code, e.g. "C00002".
- ▶ In addition, every code has a name and specific attributes:
 - Access type (read, write)
 - Data type
 - Limit values
 - Lenze setting (factory settings)
- ▶ For the sake of clarity, some codes contain "subcodes" for saving parameters. This Manual uses a slash "/" as a separator between code and subcode, e.g. C00118/3".
- ▶ According to their functionality, the parameters are divided into three groups:

Parameter group	Examples
Setting parameters Parameters for specifying setpoints and for setting device / monitoring functions.	C00005 : Application selection C00012 : Accel. time - main setpoint C00169 : Logbook setting C00604 : Resp. to device overload (lxt)
Configuration parameters Parameters for configuring signal connections (function block interconnections) within the device, e.g. assignment of the digital input terminals to the control inputs of the technology application.	C00700 : LA_NCtrl: Analog connection list C00701 : LA_NCtrl: Digital connection list C00710 : LA_TabPos: Analog connection list C00711 : LA_TabPos: Digital connection list
Diagnostic/Display parameters Parameters for displaying device-internal process factors, current actual values, and status messages, e.g. for diagnostic purposes. These are read-only parameters.	C00052 : Motor voltage C00137 : Device status C00150 : Status word C00165 : Error information



Tip!

The terms "code" and "subcode" generally correspond to the terms "index" and "subindex" and "parameter" and "subparameter".

2.2 Handling the memory module

All parameters of the drive system are saved in the integrated memory module of the controller. These include

- ▶ the parameters of the controller
- ▶ the parameters of the communication module plugged into the MCI interface
- ▶ the parameters of the possibly existing safety module (device variant)

When handling the memory module, a distinction is drawn between the following scenarios:

Delivery

- ▶ All devices are delivered with a plugged-on memory module.
- ▶ In the delivery state, the Lenze setting of the parameters has been saved to the memory module.
- ▶ The memory module can be preconfigured with customised data.
- ▶ The memory module is available as a spare part - without any data.

During operation



Note!

Automatic saving is explicitly not supported because this significantly reduces the service life of the memory module.

- ▶ Plugging and unplugging the memory module results in a message.
- ▶ Full functionality of the memory module is even provided if the power supply has been switched off and only the electronic components of the controller are externally supplied by a 24 V DC voltage, e.g. via the X5/24E terminal.
- ▶ Parameter sets can be saved manually.
- ▶ Parameter sets can be loaded manually.

Removing the memory module

- ▶ The memory module can be plugged and unplugged during operation. The behaviour of the device remains basically unchanged because all parameters are available in the RAM after the device has been started.
- ▶ Unplugging the memory module during operation results in an error message and should therefore be avoided.
- ▶ The device can also be parameterised when the memory module is unplugged. Of course, the parameter sets cannot be saved to the memory module then (cp. [Saving the parameters to the memory module safe against mains failure](#) (□ 33)).

Replacing the controller

- ▶ In the event of a device replacement, the entire parameter data of an axis can be copied to the replacement device by "taking along" the memory module, so that additional PC or keypad operations are not required.
- ▶ When replacing the controller, the versions of the old device and the new device are of importance. Before data are actually transferred, the versions are internally checked. Basically, the following applies:
 - Parameter sets of old devices with V 1.0 can be processed on new devices \geq V 1.0 (downward compatibility).
 - Parameters of devices with higher versions are not supported on devices with lower versions. An error message will be issued if the parameter set versions of the two devices are not compatible.
 - Parameter sets of devices with versions that have less functions (e.g. 8400 StateLine) can be loaded into and executed on devices with versions that have more functions (e.g. 8400 HighLine). The reverse is not possible!

Saving the parameters to the memory module safe against mains failure

Controller parameter changes via the »Engineer«, the keypad, or a master control via fieldbus communication will be lost after mains switching of the controller unless the settings have been explicitly saved to the memory module.

- ▶ Execute the "[Save all parameter sets](#)" device command ([C00002/11](#)) to save the current parameter settings to the memory module. (□ 96)
- ▶ Using the keypad, you can also press function key **SAVE** to save the parameter settings.



Note!




When the device or the external 24 V DC voltage supply is switched on, all parameters are automatically loaded from the memory module into the main memory of the controller.

Please observe the following points during the storage process to avoid data inconsistencies which would result in an error when loading the parameters from the memory module:

- Do not switch off the supply voltage!
- Do not remove the memory module from the device!

Parameter set transfer using the »Engineer«

When an online connection to the controller has been established, the following transfer functions can directly be executed via the *Toolbar* or the **Online** menu using the L-force »Engineer«:

Symbol	Menu command	Shortcut
	Download parameter set	<F5>
	Read parameter set from device	<F7>
	Save parameter set	



Tip!

Detailed information on parameter set transfers using the »Engineer« can be found in the »Engineer« online help.

2.3 Handling the keypad

Use the keypad for quick and simple parameter setting and for displaying current actual values and device statuses via the respective display parameters. For this purpose, plug in the keypad onto the X6 diagnostic interface on the front of the standard device.



Danger!

In general, changing a parameter causes an immediate response in the controller!

- This may lead to undesirable behaviour on the motor shaft if the controller has been enabled!
- Setpoint sources, for instance, may switch over all of a sudden (e.g. when configuring the signal source for the main setpoint).

Certain device commands or settings which may cause critical states of drive behaviour constitute exceptions. Such parameter changes are only possible if the controller is inhibited. Otherwise, a corresponding error message will be issued.



Note!

Plugging and unplugging the keypad is possible during operation.



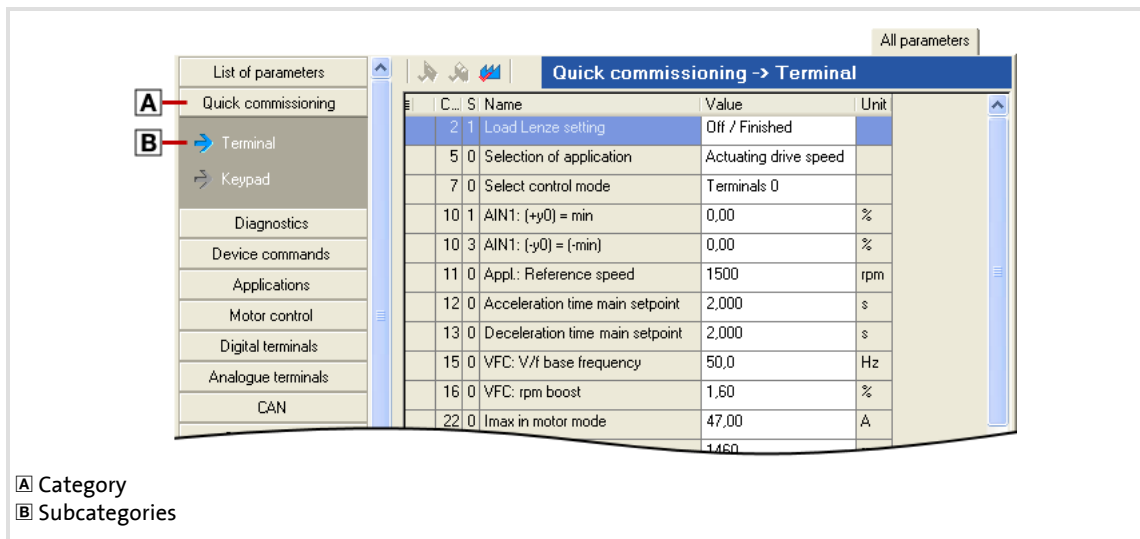
Detailed information on the keypad can be found in the operating instructions accompanying the keypad!

Menu structure

In the keypad, the parameters are classified into various menus and submenus.

- ▶ The **USER menu** includes a selection of frequently used parameters (freely configurable in [C00517](#)).
- ▶ The **Code list** contains all parameters.
- ▶ The **Go to param** function enables you to reach the corresponding parameter directly.
- ▶ The **Logbook** logs all errors and their chronological history.

- All other menus and submenus in the keypad correspond precisely to the categories and subcategories which are displayed in the form of buttons on the left hand side of the **All parameters** tab in the »Engineer«:



[2-2] All parameters tab in the »Engineer«

General operation

1. Use the \leftarrow/\rightarrow navigation keys to select the desired menu.
 - Use the \leftarrow/\rightarrow navigation keys to reach a higher/lower menu level.
 - Use the ESC function key to return to the main menu.
2. Use the \leftarrow/\rightarrow navigation keys to select the parameter to be set within a submenu.
3. Use the **EDIT** function key to switch over to the editing mode.
4. Use the navigation keys to set the desired value.
 - Use the \leftarrow/\rightarrow navigation keys to move the cursor to the left/right.
 - Use the \leftarrow/\rightarrow navigation keys to change the selected digit.
5. Use the **OK** function key to accept the change and to leave the editing mode.
 - Use the **ESC** function key to leave the editing mode without accepting the change.



Tip!

General information on setting parameters using the »Engineer« can be found in the »Engineer« online help.

2.4 Device access protection

Various tasks can be carried out via the functions of the device access protection:

▶ [Password protection](#)

- Only authorised persons (who know the password) are permitted to read/change all parameters of the controller.
- Unauthorised persons (who do not know the password) are only granted access to the max. 32 parameters of the user menu.

▶ [Device personalisation](#)

- Only controllers and memory modules which are personalised with a specific binding ID can be used for the system.



Note!

If password protection/device personalisation is used:

- Let the end customer know that Lenze can only provide limited service in case of devices with access protection.
- Lenze cannot modify e.g. a replacement device via special access to make it work with a personalised memory module.
- The keypad does not support the alpha-numeric entry of a password, thus the keypad cannot be used for entry.

2.4.1 Password protection

If password protection has been activated, only a write/read access to the parameters of the user menu is possible. Possible configurations of various protective functions, personalised for every single communication channel, are being prepared.

Short overview of the relevant parameters for password protection:

Parameter	Info	Lenze setting										
C00505/3	<p>Password</p> <ul style="list-style-type: none"> The password can have a maximum length of 16 characters. The password may contain the following characters: lower case letters (a - z), upper case letters (A - Z), digits (0 - 9) <p>Note: After the execution of one of the device commands listed below, this parameter provides the current password status:</p> <table border="1"> <tr> <td>OFF</td> <td>No password has been set, password protection is not active (Lenze delivery status).</td> </tr> <tr> <td>ON</td> <td>Password has been set, password protection is active. <ul style="list-style-type: none"> This status is also displayed after an unsuccessful check/deletion of the password due to an invalid entry. </td> </tr> <tr> <td>OK</td> <td>Password has been set, password protection is not active. <ul style="list-style-type: none"> Password protection is temporarily deactivated. </td> </tr> </table>	OFF	No password has been set, password protection is not active (Lenze delivery status).	ON	Password has been set, password protection is active. <ul style="list-style-type: none"> This status is also displayed after an unsuccessful check/deletion of the password due to an invalid entry. 	OK	Password has been set, password protection is not active. <ul style="list-style-type: none"> Password protection is temporarily deactivated. 					
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OK	Password has been set, password protection is not active. <ul style="list-style-type: none"> Password protection is temporarily deactivated. 											
Device commands												
Before the following device commands are executed, enter the corresponding password in C00505/3 .												
C00002/31	Set password ▶ Activating password protection	0: Off / ready										
C00002/32	Check password ▶ Temporary deactivation of active password protection	0: Off / ready										
C00002/33	Delete password ▶ Deactivating password protection/changing the password	0: Off / ready										
Status displays												
C00003	Status of the last device command	-										
C00507/1	<p>Password protection - all communication channels</p> <ul style="list-style-type: none"> Bit coded display of the active protective functions: <table border="1"> <tr> <td>Bit 0</td> <td>Only access to user menu</td> </tr> <tr> <td>Bit 1</td> <td>Parameter write protection</td> </tr> <tr> <td>Bit 2</td> <td>Parameter read protection</td> </tr> <tr> <td>Bit 3 ... 14</td> <td>Reserved</td> </tr> <tr> <td>Bit 16</td> <td>Memory module binding on</td> </tr> </table>	Bit 0	Only access to user menu	Bit 1	Parameter write protection	Bit 2	Parameter read protection	Bit 3 ... 14	Reserved	Bit 16	Memory module binding on	-
Bit 0	Only access to user menu											
Bit 1	Parameter write protection											
Bit 2	Parameter read protection											
Bit 3 ... 14	Reserved											
Bit 16	Memory module binding on											
Highlighted in grey = display parameter												

Activating password protection

Password protection is activated by setting a password.



How to set a password:

1. Enter the desired password in [C00505/3](#).
 - The password can have a maximum length of 16 characters.
 - The password may contain the following characters:
lower case letters (a - z), upper case letters (A - Z), digits (0 - 9)
2. Execute "Set password" device command: [C00002/31](#) = "1: On / start"
 - After successful execution, password status ON is displayed in [C00505/3](#) and password protection takes immediate effect.

Temporary deactivation of active password protection

Execute the "Check password" device command to deactivate the password protection temporarily to be able to carry out password protected functions.

- ▶ Password protection will be deactivated until
 - a valid password is entered and checked
 - or –
 - the external 24 V supply of the control electronics is switched off (< 19 V).



How to temporarily deactivate active password protection:

1. Enter the set password in [C00505/3](#).
2. Execute "Check password" device command [C00002/32](#) = "1: On / start"
 - After a successful check, password status OK is displayed in [C00505/3](#).

Deactivating password protection/changing the password

Password protection can simply be deactivated by deleting the set password. If you would like to change the set password, delete the set password first. Then set the desired new password.

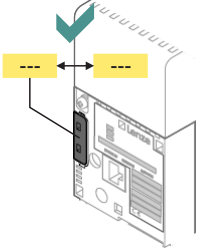
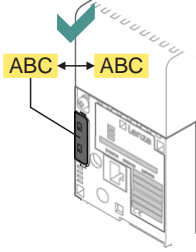
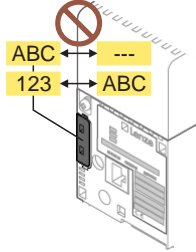


How to delete the set password:

1. Enter the set password in [C00505/3](#).
2. Execute "Delete password" device command [C00002/33](#) = "1: On / start"
 - After a successful deletion, password status OFF is displayed in [C00505/3](#).

2.4.2 Device personalisation

The device personalisation serves to connect the controller to the memory module by means of a binding ID. If the device personalisation is active, write/read actions between the controller and the memory module are only executed if both components have identical binding IDs.

Lenze delivery status:	Operation at the customer's site:	Impermissible replacement by the end user:
		
<p>No binding ID has been set.</p>	<p>Customer sets binding ID for device personalisation purposes.</p>	<p>If device personalisation is active: A replacement of the controller or the memory module results in an error message if the binding ID is incorrect or not available.</p>

If, for instance, a parameter set has been loaded from the memory module when the device personalisation was active, this parameter set cannot be saved to another memory module that has a different binding ID or no binding ID at all.

- ▶ Hence, a parameter set cannot be copied from a personalised memory module to a non-personalised memory module!

The following two types are distinguished during the check:

- ▶ If a different binding ID is detected during switch-on of the controller (during device initialisation):
 - The "Fault" error response is returned.
 - The "[PS10: Invalid memory module binding](#)" error message is entered into the logbook.
- ▶ If a different binding ID is detected during the execution of a device command for loading/saving the parameter set:
 - The loading/saving process is not carried out.
 - A corresponding status for the device command is output in [C00003](#).

Short overview of the relevant parameters for device personalisation:

Parameter	Info	Lenze setting										
C00505/2	Binding ID <ul style="list-style-type: none"> The binding ID can have a maximum length of 16 characters. The binding ID may contain the following characters: lower case letters (a - z), upper case letters (A - Z), digits (0 - 9) Note: After the execution of one of the device commands listed below, this parameter provides the current binding ID status: <table border="1"> <tr> <td>OFF</td> <td>No binding ID has been set.</td> </tr> <tr> <td>ON</td> <td>Binding ID has been set.</td> </tr> </table>	OFF	No binding ID has been set.	ON	Binding ID has been set.							
OFF	No binding ID has been set.											
ON	Binding ID has been set.											
Device commands												
Before the following device commands are executed, enter the corresponding binding ID in C00505/2 .												
C00002/29	Set binding ID ▶ Activating device personalisation	0: Off / ready										
C00002/30	Delete binding ID ▶ Deactivating the device personalisation/changing the binding ID	0: Off / ready										
Status displays												
C00003	Status of the last device command	-										
C00507/1	Password protection - all communication channels <ul style="list-style-type: none"> Bit coded display of the active protective functions: <table border="1"> <tr> <td>Bit 0</td> <td>Only access to user menu</td> </tr> <tr> <td>Bit 1</td> <td>Parameter write protection</td> </tr> <tr> <td>Bit 2</td> <td>Parameter read protection</td> </tr> <tr> <td>Bit 3 ... 14</td> <td>Reserved</td> </tr> <tr> <td>Bit 16</td> <td>Memory module binding on</td> </tr> </table>	Bit 0	Only access to user menu	Bit 1	Parameter write protection	Bit 2	Parameter read protection	Bit 3 ... 14	Reserved	Bit 16	Memory module binding on	-
Bit 0	Only access to user menu											
Bit 1	Parameter write protection											
Bit 2	Parameter read protection											
Bit 3 ... 14	Reserved											
Bit 16	Memory module binding on											
Highlighted in grey = display parameter												

Activating device personalisation

The device personalisation is activated by setting a binding ID.

**How to set a binding ID:**

- Enter the desired binding ID in [C00505/2](#).
 - The binding ID can have a maximum length of 16 characters.
 - The binding ID may contain the following characters:
lower case letters (a - z), upper case letters (A - Z), digits (0 - 9)
- Execute "Set binding ID" device command [C00002/29](#) = "1: On / start"
 - After successful execution, status ON is displayed in [C00505/2](#).

Deactivating the device personalisation/changing the binding ID

The device personalisation is simply deactivated by deleting the set binding ID. If you would like to change the set binding ID, delete the set binding ID first. Then set the desired new binding ID.



How to delete the binding ID:

1. Enter the set binding ID in [C00505/2](#).
 - If the controller and the memory module have different binding IDs, enter the binding ID of the memory module to delete the binding IDs of both components.
2. Execute "Delete binding ID" device command [C00002/30](#) = "1: On / start"
 - After a successful deletion, status OFF is displayed in [C00505/2](#).

2.4.3 Unlocking the controller with a MasterPin

Every controller has an individual master password, the MasterPin. A controller which is locked due to password mechanism can reach the delivery status again if the MasterPin is entered.



Stop!

If the MasterPin is entered, the parameter set both in the controller and in the memory module is reset to the Lenze setting!

- Customised parameterisation will be permanently lost and must be recreated!
- The reset to the Lenze setting may lead to unexpected level changes at the I/O terminals (e.g. brake control)!



How to re-establish the delivery status:

1. Inhibit the controller if it is enabled, e.g. via the [C00002/16](#) device command.
2. Enter the MasterPin in [C00505/1](#).
 - The last six digits of the serial number of the memory module represent the MasterPin.
3. Execute "Check MasterPin" device command [C00002/28](#) = "1: On / start"

3 Commissioning



Danger!

Uncontrolled motor movements can occur

Under certain conditions the motor may rotate after mains connection.

Possible consequences:

- Persons in the vicinity of the machine or plant risk getting hurt.
- Unexpected starting action may damage the machine or plant.

Protective measures:

- Commissioning with external 24 V supply and without mains voltage. In this case, the controller can only be parameterised and diagnosed during commissioning.
- Ensure that setpoints are not active.



Tip!

- Information on some of the operating statuses can quickly be obtained via the [LED status displays](#) on the front of the controller. (📖 582)
- **Check firmware:** Particularly with regard to the use of older controllers (e.g. if the customer is using one from stock) it makes sense to check the software (firmware) version. The software version of the controller can be seen on the nameplate in the "HW/SW" line and can be determined by reading out code [C00099](#).
- **Restore delivery status:** Set code [C00002/1](#) to "1: On / start" to reset all parameter settings of the device to the Lenze setting. This leaves you with a defined device configuration. ▶ [Load Lenze setting](#) (📖 94)

3.1 Selection of the right commissioning tool

There are two possibilities for commissioning the 8400 TopLine controller:

- ▶ Commissioning via keypad (diagnosis terminal)
 - If you only have a few parameters to adapt.
 - For test / demonstration purposes.
- ▶ Commissioning via PC / »Engineer«
 - In general, commissioning via the »Engineer« is suitable for every drive task, particularly for those with higher requirements or more comprehensive parameterisation.
 - Via the »Engineer« all parameters of the 8400 TopLine controller can easily be accessed which makes commissioning highly flexible.
 - Moreover, the »Engineer« provides comprehensive diagnostics options and an integrated online help which can be called via function key [F1].



The following chapters describe the commissioning of the available technology applications with the »Engineer«.

Information on the commissioning with the keypad (diagnosis terminal) is provided in the **8400 hardware manual**.

- The hardware manual has been stored in electronic form on the data carrier supplied with the 8400 drive controller.

3.2 Safety instructions with regard to commissioning

General safety instructions

To avoid injury to persons or damage to material assets,

- ▶ check before connecting the mains voltage
 - the wiring for completeness, short circuit, and earth fault
 - the "emergency stop" function of the entire system
 - that the motor circuit configuration (star/delta) is adapted to the output voltage of the controller
 - the in-phase connection of the motor
- ▶ check the setting of the most important drive parameters before enabling the controller:
 - the V/f rated frequency must be adapted to the motor circuit configuration!
 - the drive parameters relevant for your application must be set correctly!
 - the configuration of the I/O terminals must be adapted to the wiring!
- ▶ ensure that there are no active speed setpoints before enabling the controller.

Safety instructions with regard to motor operation



Danger!

- Continuous operation of self-ventilated motors at small field frequencies and rated motor currents is not permissible for thermal reasons!
 - In the Lenze setting, the [Motor temperature monitoring \(PTC\)](#) is activated. [\(☰ 278\)](#)
 - Activate the [Brake resistor monitoring \(I2xt\)](#) if necessary. [\(☰ 279\)](#)
- [C00015](#) must be used to select 87 Hz operation if a delta-connected asynchronous motor (nameplate data: 400 V ∇ / 230 V Δ) is to be operated in conjunction with a drive controller for a mains voltage of 400 V.

3.3 Notes on motor control

In the Lenze setting, the V/f characteristic control (VFCplus) as motor control is set in [C00006](#) with a linear characteristic.

- ▶ V/f characteristic control (VFCplus) is a motor control mode for classic frequency inverter applications on the basis of a simple and robust control procedure for the operation of machines with a linear or quadratic load torque characteristic (e.g. fans).
- ▶ The presettings of the parameters ensure that the controller is ready for operation right away and the motors works adequately without further parameterisation if a controller and a 50 Hz asynchronous machine with matching performances are assigned.



Note!

Check the nameplate data against the motor data set in the controller. Further information is provided in the chapter "[Motor selection/Motor data](#)". ([📖 121](#))

Recommendations for the following application cases:

- ▶ If the controller and motor differ greatly in terms of performance:
Set the I_{max} limit (in motor mode) in [C00022](#) to 2x rated motor current.
- ▶ If a high starting torque is required:
When the motor is idling, set a value for V_{min} boost in [C00016](#) which ensures that the rated motor current flows at a field frequency of f = 3 Hz (display in [C00058](#)).
- ▶ For noise optimisation:
In [C00018](#), set a switching frequency of "16 kHz var./drive-opt."
- ▶ If a high torque must be provided at small speeds without feedback:
Select "Sensorless vector control (SLVC) as motor control mode in [C00006](#).

Related topics:

- ▶ [Motor control \(MCTRL\)](#) ([📖 120](#))

3.4 Preconditions for commissioning with the »Engineer«

For commissioning, you need

- a PC that satisfies the following requirements:
 - processor with 1.4 GHz or higher
 - at least 512MB RAM and 650 MB free hard disc space
 - Microsoft® Windows® 2000 operating system (from service pack 2 onwards) or Windows® XP
- the Lenze »Engineer« PC software
- a connection to the controller, e.g. via a USB diagnostic adapter:
 - connect the USB diagnostic adapter to the X6 diagnostic interface.
 - establish a connection between the USB diagnostic adapter and the PC via a free USB port.

How to obtain/update the L-force »Engineer« software:

- **Download from the Internet:**

The full version of the »Engineer StateLevel« is provided free of charge. Current software can be found on the Internet in the "Services & Downloads" area under Lenze website.

- **Requesting the CD**

You can also request the L-force »Engineer« separately on CD free of charge at your Lenze representative. See the "About Lenze" area on our homepage for e.g. the corresponding German address.

3.5 Trouble-shooting during commissioning

With the »Engineer« trouble during commissioning can be detected and eliminated conveniently. Proceed as follows:

- ▶ Check whether error messages are displayed in the »Engineer«.
 - On the **Diagnostics** tab, relevant actual states of the controller and pending error messages are displayed in a well-arranged visualisation.
- ▶ Check the input terminals for their corresponding setpoints.
 - On the **Terminal assignment** tab, the current input and output signals are displayed.
- ▶ Check the signal flow of the application.
 - For this purpose, click the **Signal flow** button on the **Application parameter** tab. The displayed signal flow shows active setpoints and their further processing.

Related topics:

- ▶ [Diagnostics & error management](#) (📖 581)
- ▶ [LED status displays](#) (📖 582)
- ▶ [Error messages of the operating system](#) (📖 602)

3.6 Commissioning of the "Actuating drive speed" technology application

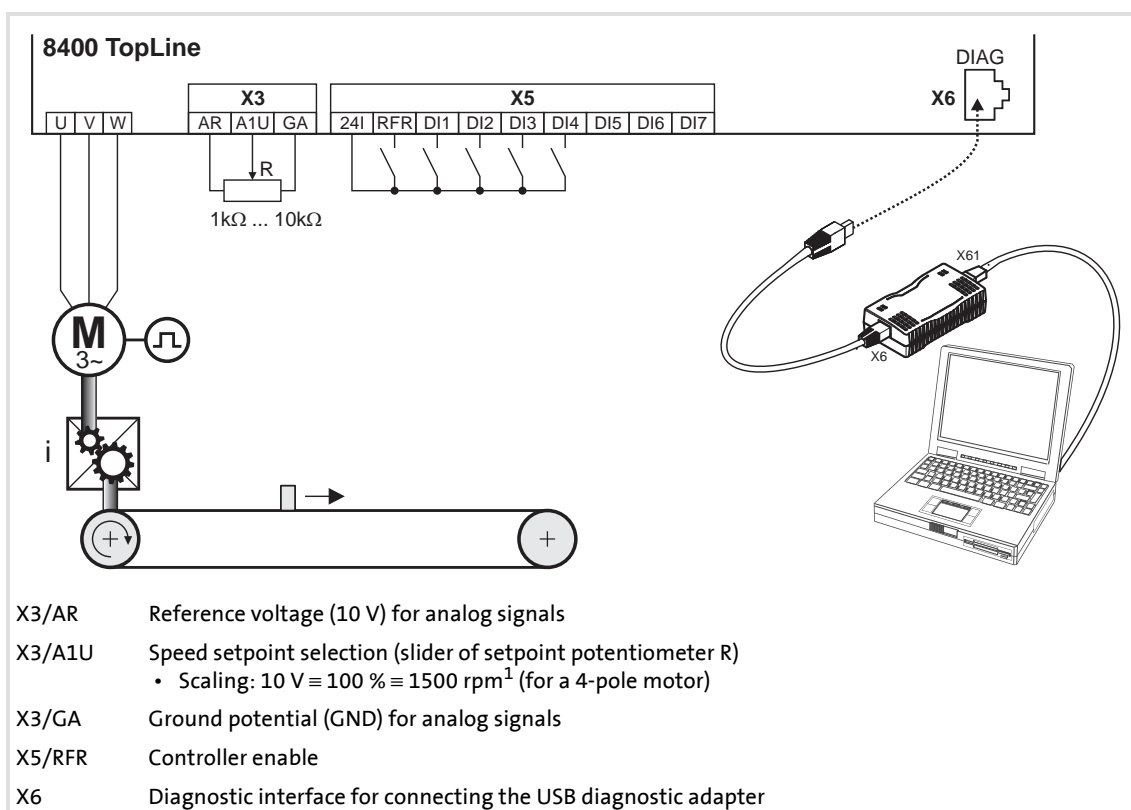


Note!

Take all the necessary safety precautions before you carry out the following commissioning steps and switch the device on!

▶ [Safety instructions with regard to commissioning](#) (45)

System constellation



[3-1] Block diagram for wiring the commissioning example for the "Actuating drive speed" application

Commissioning steps

Find a description of the commissioning steps of the "Actuating drive speed" technology application below.

Please observe the sequence of the steps in the following chapters and follow them through carefully. This will help you to commission your controller quickly and as safely as possible:

- ▶ [Prepare controller for commissioning](#) (50)
- ▶ [Creating an »Engineer« project & going online](#) (51)
- ▶ [Parameterising the motor control](#) (52)
- ▶ [Parameterising the application](#) (53)

- ▶ [Saving parameter settings safe against mains failure](#) (📖 55)
- ▶ [Enable controller and test application](#) (📖 55)

3.6.1 Prepare controller for commissioning

1. Power connection wiring

- Refer to the mounting instructions supplied with the drive controller to find help on how to correctly design the power connections to match the requirements of your device.

2. Wire the control connections

- The assignment for your digital inputs should correspond to one of the preconfigured control modes ([C00007](#)) for terminal control:

Control mode	Assignment of the digital terminals			
	DI1	DI2	DI3	DI4
Terminals 0	JOG 1/3	JOG 2/3	DCB	Cw/Ccw
Terminals 2	JOG 1/3	JOG 2/3	QSP	Cw/Ccw
Terminals 11	Cw/Ccw	DCB	MPotUp	MPotDown
Terminal 16	JOG 1/3	JOG 2/3	Cw/QSP	Ccw/QSP

Abbreviations used:

JOG	Selection of fixed setpoints 1 ... 3 parameterised in C00039/1...3
DCB	Manual DC-injection braking
Cw/Ccw	CW/CCW rotation
QSP	Quick stop
MPotUp	Motor potentiometer: Increase speed
MPotDown	Motor potentiometer: Reduce speed
Cw/QSP	Fail-safe selection of the direction of rotation in connection with quick stop
Ccw/QSP	

3. Inhibit controller: Set terminal X5/RFR to LOW level or open contact.

4. Connect USB diagnostic adapter.

5. Switch on voltage supply of the controller.

- Without motor operation: Connect external 24 V supply.
- With motor operation: Connect mains voltage.

If the green "DRV-RDY" LED is blinking and the red "DRV-ERR" LED is off, the controller is ready for operation and commissioning can proceed.

Related topics:

- ▶ [Automatic restart after mains connection/fault...](#) (📖 112)
- ▶ [LED status displays](#) (📖 582)



3.6.2 Creating an »Engineer« project & going online



You can find detailed information on the general use of the »Engineer« in the online help which you can call with **[F1]**.

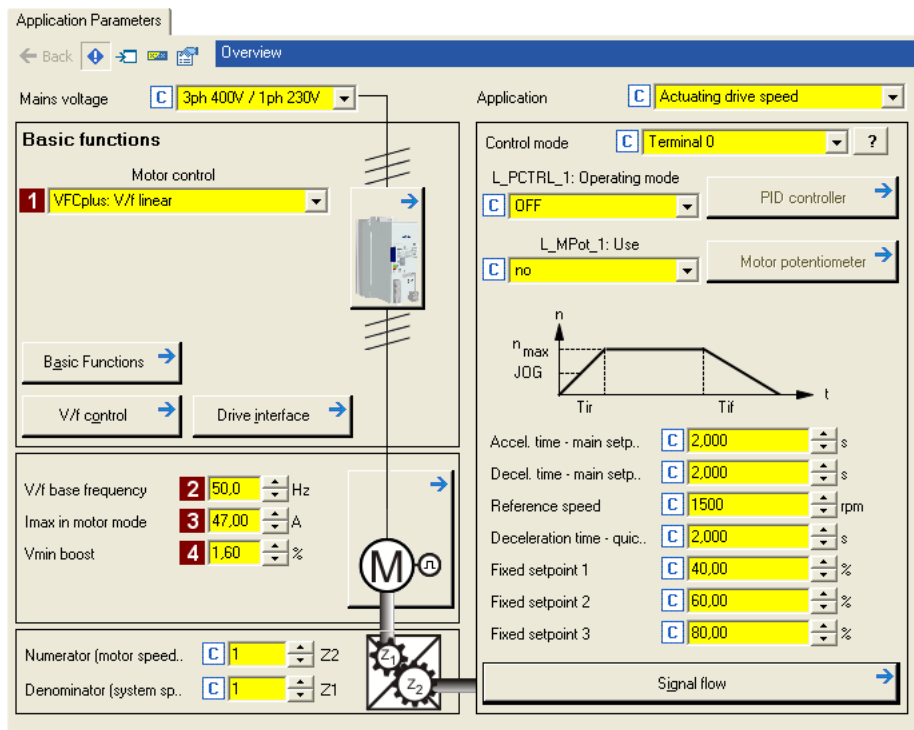
- The chapter "Working with projects" describes, among other things, all options of the *Start-up wizard* which are available to create a new »Engineer« project.

The following steps serve to describe a general method for creating a project with the **Select component from catalogue** option. For this purpose, individual components (controller, motor, etc.) are selected from selection lists.

1. Start the »Engineer«.
2. Create a new project with the *Start-up wizard* and the **Select component from catalogue** option:
 - In the **Component** step, select the 8400 TopLine controller.
 - In the **Device modules** step, select the available communication module.
 - In the **Application** step, select the "Actuating drive speed" application. (The application can also be selected any time afterwards via the **Application parameter** tab or [C00005](#).)
 - In the **Other components** step, select other components (motor / gearbox) to be added to the project.
3.  Go online.
 - After a connection to the controller has been established, the following status is displayed in the *Status line*:
4.  Transfer parameter set to the device.
 - This command serves to overwrite the current parameter settings in the controller with the parameter settings of the »Engineer« project.

3.6.3 Parameterising the motor control

1. Go to *Workspace* and change to the **Application parameters** tab.
 - The motor control parameters, among other things, can be found on the left:



2. In the **1 Motor control** list field ([C00006](#)), select the desired motor control.
3. Adapt the motor control parameters:

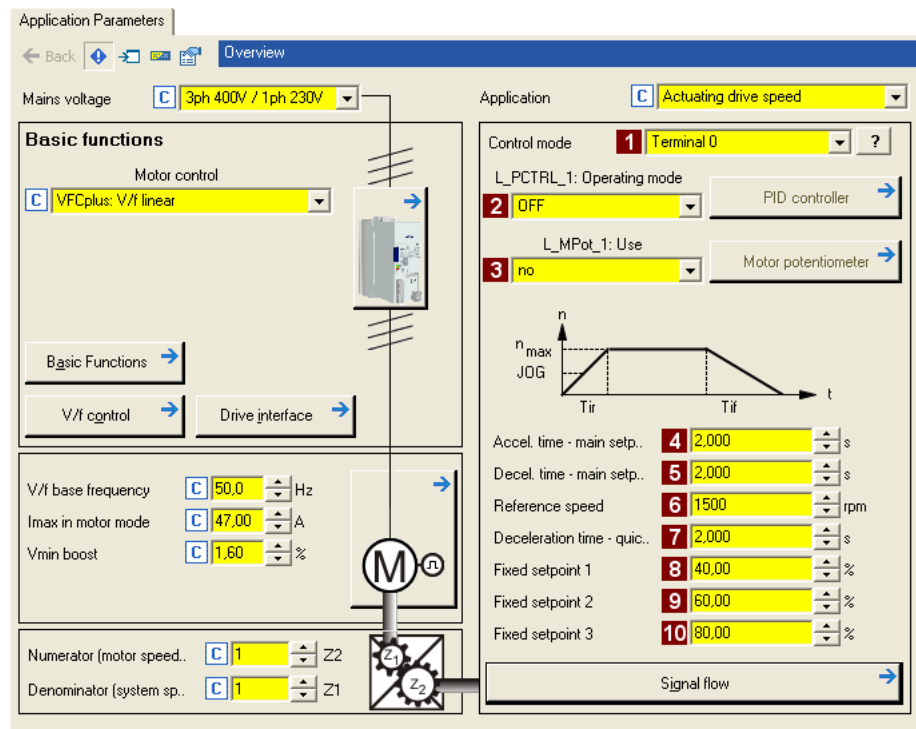
Parameter	Lenze setting		Info
	Value	Unit	
2 V/f base frequency (C00015)	50.0	Hz	▶ Adapting the V/f base frequency (📖 154)
3 Imax in motor mode (C00022)	47.00	A	▶ Optimising the Imax controller (📖 158)
4 Vmin boost (C00016)	1.60	%	▶ Adapting the Vmin boost (📖 156)

Related topics:

- ▶ [Notes on motor control](#) (📖 46)
- ▶ [Motor control \(MCTRL\)](#) (📖 120)

3.6.4 Parameterising the application

The application parameters can be found on the right side of the **Application parameter** tab:



1. In the **1** **Control mode** list field ([C00007](#)), select the control mode suitable for the wiring of the terminals.
 - The corresponding wiring diagram is displayed in a pop-up window if you click the **?** button right to the list field.
 - For a detailed description, see the chapter "[Terminal assignment of the control modes](#)". ([394](#))
2. Optional: Use a process controller.
 - For this purpose, select the desired operating mode in the **2** **L_PCTRL_1: Operating mode** list field ([C00242](#)).
 - For a detailed description see the [L_PCTRL_1](#) function block. ([1337](#))
 - Go to the parameterisation dialog of the process controller via the **Process controller** button.
3. Optional: Use a motor potentiometer.
 - For this purpose, select "1: On" in the **3** **L_MPot_1: Use** list field ([C00806](#)).
 - For a detailed description see the [L_MPot_1](#) function block. ([1269](#))
 - Go to the parameterisation dialog of the motor potentiometer via the **Motor potentiometer** button.

4. Adapt the application parameters:

Parameter	Lenze setting		Info
	Value	Unit	
4 Accel. time - main setpoint (C00012)	2.000	s	The setpoint is led via a ramp function generator with linear characteristic. The ramp function generator converts setpoint step-changes at the input into a ramp. ▶ L_NSet_1 (📖 1287)
5 Decel. time - main setpoint (C00013)	2.000	s	
6 Reference speed (C00011)	1500	rpm	All speed setpoint selections are provided in % and always refer to the reference speed set in C00011 . The motor reference speed is indicated on the motor nameplate.
7 Decel. time - quick stop (C00105)	2.000	s	If quick stop is requested, motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105 , the motor is brought to a standstill ($n_{act} = 0$). ▶ Activate/Deactivate quick stop (📖 98)
8 Fixed setpoint 1 (C00039/1)	40.00	%	A fixed setpoint for the setpoint generator can be activated instead of the main setpoint via the digital DI1 and DI2 inputs. • Fixed setpoints are selected in [%] based on the reference speed (C00011). ▶ L_NSet_1 (📖 1287)
9 Fixed setpoint 2 (C00039/2)	60.00	%	
10 Fixed setpoint 3 (C00039/3)	80.00	%	



Tip!


- Click the **Signal flow** button to go down one dialog level to the signal flow of the application with further possible parameter settings. See chapter "[Basic signal flow](#)". (📖 384)
- The preconfigured I/O connection in the selected control mode can be changed via configuration parameters. See chapter "[User-defined terminal assignment](#)". (📖 370)

More detailed information on the technology application:

- ▶ [TA "Actuating drive speed"](#) (📖 383)
- ▶ [Internal interfaces | application block "LA_NCtrl"](#) (📖 386)
- ▶ [Process data assignment for fieldbus communication](#) (📖 403)
- ▶ [Terminal assignment of the control modes](#) (📖 394)
- ▶ [Setting parameters \(short overview\)](#) (📖 405)
- ▶ [Configuration parameters](#) (📖 407)

3.6.5 Saving parameter settings safe against mains failure

The parameter set must be saved to the device safe against mains failure to prevent parameter settings becoming lost due to mains switching.

- ▶  Save parameter set.

3.6.6 Enable controller and test application



Stop!

Before stipulating a speed setpoint, check whether the brake in the form of a holding brake on the motor shaft has been released!



Note!

If the controller is enabled and the "Inhibit at power-on" auto-start option is activated in [C00142](#) (Lenze setting) when the mains is connected, the controller remains in the "[ReadyToSwitchOn](#)" state.

To be able to change to the "[SwitchedOn](#)" status, the controller enable must be deactivated first: Set terminal X5/RFR to LOW level.

If the controller is in the "[SwitchedOn](#)" status:

1. Enable controller: Set terminal X5/RFR to HIGH level or close contact.
 - If there is no other active source for the controller inhibit, the controller changes from the "[SwitchedOn](#)" status to the "[OperationEnabled](#)" status.
 - The **Diagnostics** tab and [C00158](#) display all active sources for the controller inhibit.
2. Select speed setpoint.
 - In the "Terminal 0" control mode by selecting a voltage at the analog input via the setpoint potentiometer or by selecting a fixed setpoint via the digital DI1/DI2 inputs:

DI1	DI2	Speed selection
LOW	LOW	The setpoint speed is selected via analog input 1 <ul style="list-style-type: none"> • Scaling: 10 V \equiv 100 % \equiv reference speed (C00011)
HIGH	LOW	Fixed setpoint 1 (C00039/1) is used as setpoint speed. <ul style="list-style-type: none"> • Lenze setting: 40 % of the reference speed (C00011)
LOW	HIGH	Fixed setpoint 2 (C00039/2) is used as setpoint speed. <ul style="list-style-type: none"> • Lenze setting: 60 % of the reference speed (C00011)
HIGH	HIGH	Fixed setpoint 3 (C00039/3) is used as setpoint speed. <ul style="list-style-type: none"> • Lenze setting: 80 % of the reference speed (C00011)



Note!

Observe the actual speed value (display in [C00051](#)) as well as the [LED status displays](#). ([📖 582](#))



Tip!

Other control functions in the "Terminal 0" control mode:

- DI3: HIGH level ≙ Request DC-injection braking
- DI4: HIGH level ≙ Request a change of direction of rotation

Related topics:

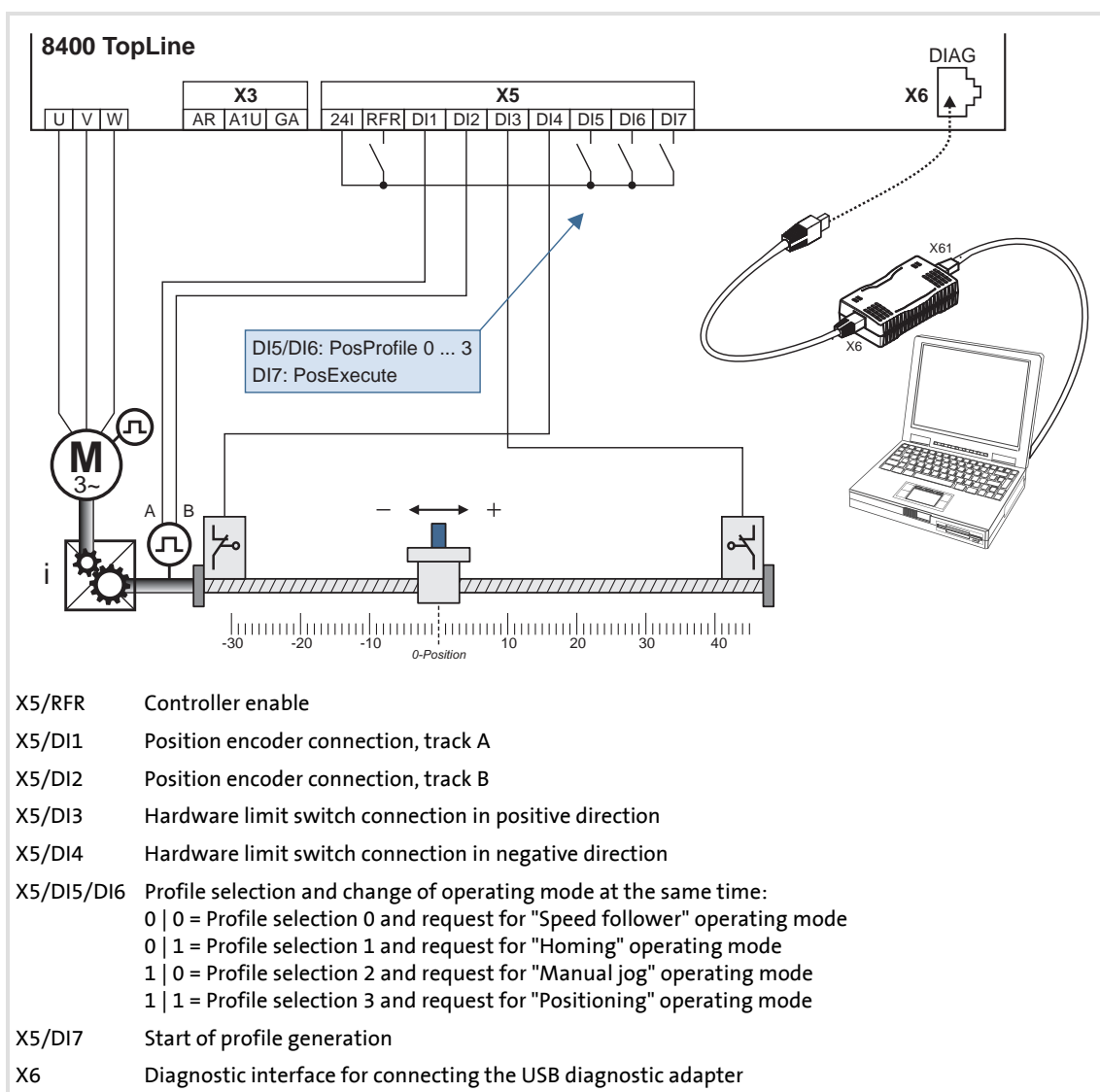
- ▶ ["Inhibit at power-on" auto-start option](#) ([📖 112](#))
- ▶ [Trouble-shooting during commissioning](#) ([📖 48](#))
- ▶ [Diagnostics & error management](#) ([📖 581](#))

3.7 Commissioning of the "Table positioning" technology application

**Note!**

Take all the necessary safety precautions before you carry out the following commissioning steps and switch the device on!

▶ [Safety instructions with regard to commissioning](#) (45)

System constellation

[3-2] Block diagram for wiring the commissioning example for the "Table positioning" application

Commissioning steps

Below find a description of the commissioning steps of the "Table positioning" application shown in illustration [\[3-2\]](#).

Please observe the sequence of the steps in the following chapters and follow them through carefully. This will help you to commission your controller quickly and as safely as possible:

- ▶ [Prepare controller for commissioning](#) (📖 59)
- ▶ [Creating an »Engineer« project & going online](#) (📖 60)
- ▶ [Parameterising the motor control](#) (📖 61)
- ▶ [Parameterising the application](#) (📖 62)
- ▶ [Saving parameter settings safe against mains failure](#) (📖 70)
- ▶ [Enable controller and test application](#) (📖 70)

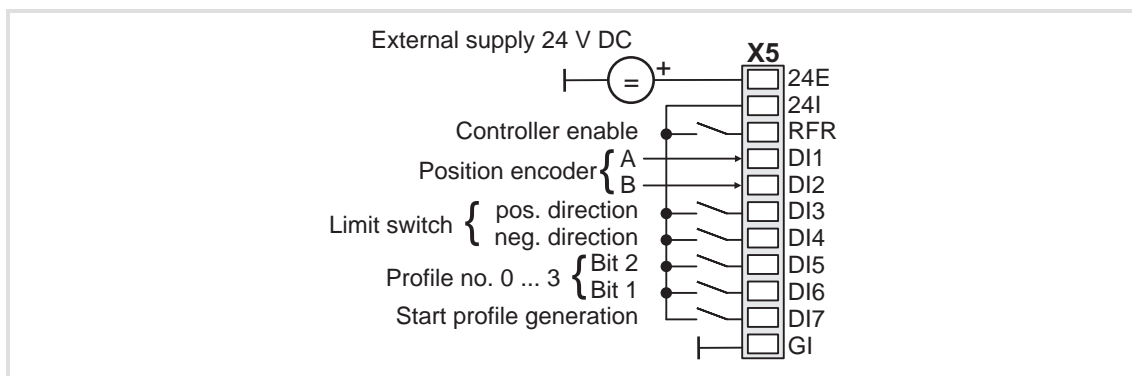
3.7.1 Prepare controller for commissioning

1. Power connection wiring

- Refer to the mounting instructions supplied with the drive controller to find help on how to correctly design the power connections to match the requirements of your device.

2. Wire the control connections

- The system constellation including position encoder and hardware limit switches shown in illustration [3-2] requires wiring according to control mode "[Terminals 0](#)":



3. Inhibit controller: Set terminal X5/RFR to LOW level or open contact.

4. Connect USB diagnostic adapter.

5. Switch on voltage supply of the controller.

- Without motor operation: Connect external 24 V supply.
- With motor operation: Connect mains voltage.

If the green "DRV-RDY" LED is blinking and the red "DRV-ERR" LED is off, the controller is ready for operation and commissioning can proceed.

Related topics:

- ▶ [Automatic restart after mains connection/fault...](#) (📖 112)
- ▶ [LED status displays](#) (📖 582)




3.7.2 Creating an »Engineer« project & going online



You can find detailed information on the general use of the »Engineer« in the online help which you can call with **[F1]**.

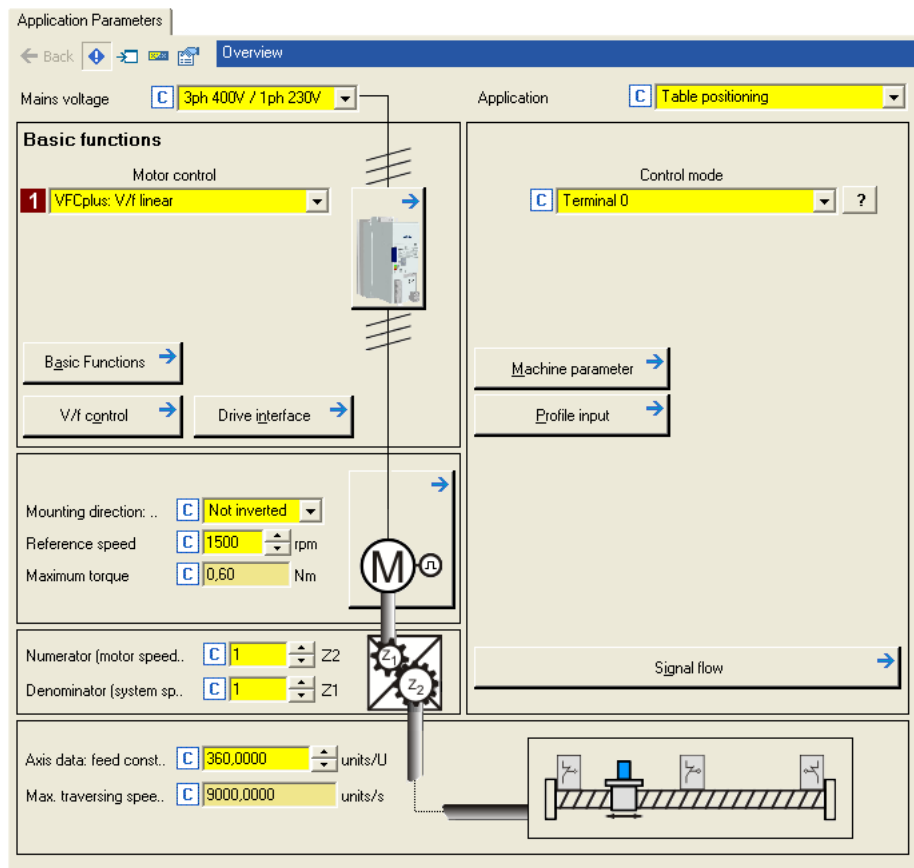
- The chapter "Working with projects" describes, among other things, all options of the *Start-up wizard* which are available to create a new »Engineer« project.

The following steps serve to describe a general method for creating a project with the **Select component from catalogue** option. For this purpose, individual components (controller, motor, etc.) are selected from selection lists.

1. Start the »Engineer«.
2. Create a new project with the *Start-up wizard* and the **Select component from catalogue** option:
 - In the **Component** step, select the 8400 TopLine controller.
 - In the **Device modules** step, select the available communication module.
 - In the **Application** step, select the "Table positioning" application. (The application can also be selected any time afterwards via the **Application parameter** tab or [C00005](#).)
 - In the **Other components** step, select other components (motor / gearbox) to be added to the project.
3.  Go online.
 - After a connection to the controller has been established, the following status is displayed in the *Status line*:

4.  Transfer parameter set to the device.
 - This command serves to overwrite the current parameter settings in the controller with the parameter settings of the »Engineer« project.

3.7.3 Parameterising the motor control

1. Go to *Workspace* and change to the **Application parameters** tab.
 - The motor control parameters, among other things, can be found on the left:



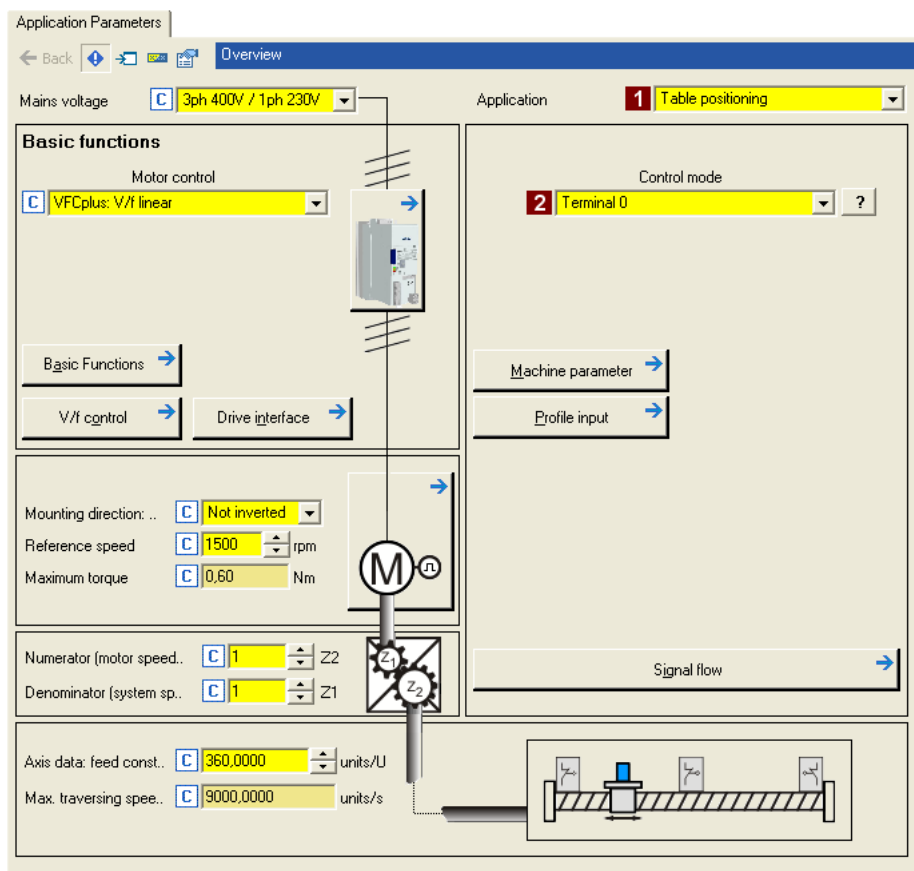
2. In the **Motor control** list field (C00006), select the desired motor control.

Related topics:

- ▶ [Notes on motor control](#) (46)
- ▶ [Motor control \(MCTRL\)](#) (120)

3.7.4 Parameterising the application

The application parameters can be found on the right side of the **Application parameter** tab:



1. Select "Table positioning" in the **1 Application** list field ([C00005](#)) (if you have not already done so while creating the project).
 - After the "Table positioning" application is selected, the contents of the tab change, e.g. the **Machine parameters** and **Profile entry** buttons are shown now.
2. In the **2 Control mode** list field ([C00007](#)), the preset "[Terminals 0](#)" control mode is already suitable for the system constellation shown in illustration [\[3-2\]](#) and need not be changed.
 - The corresponding wiring diagram is displayed in a pop-up window if you click the [?](#) button right to the list field.
 - For a detailed description, see the chapter "[Terminal assignment of the control modes](#)". ([394](#))

3.7.4.1 Set machine parameters



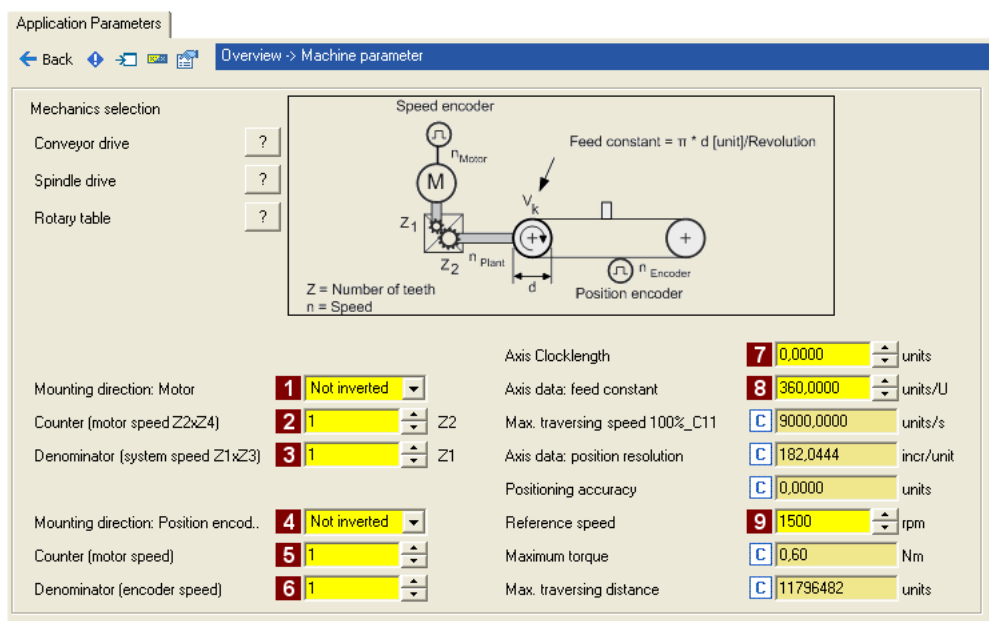
Note!

Setting the machine parameters is a basic prerequisite for the operating modes "[Homing](#)", "[Manual jog](#)" and "[Positioning](#)".

The more precisely the machine parameters are set, the better the results of positioning!

Detailed information on the machine parameters is provided in chapter "Basic drive functions" in subchapter "[Machine parameters](#)". (📖 498)

1. Go to the right side of the **Application parameter** tab and click the **Machine parameter** button to change to the *Overview → Machine parameter* dialog level:



2. Set the machine parameters according to the system constellation at hand.

Parameter	Lenze setting		Info
	Value	Unit	
1 Mounting direction: Motor (C01206/1)	not inverted		Inversion if motor mounting is mirrored.
2 Numerator (Z2) (C01202/1)	1		Gearbox factor - motor • Entry of the gearbox factor as numerator/denominator ratio (numerator = motor speed and denominator = output speed of gearbox) or from the number of teeth of the gearbox arrangement.
3 Denominator (Z1) (C01202/2)	1		
4 Mounting direction: Position encoder (C01206/2)	not inverted		Inversion if position encoder mounting is mirrored.

Parameter	Lenze setting		Info
	Value	Unit	
5 Numerator (C01203/1)	1		Gearbox factor - position encoder • Entry of the gearbox factor as numerator/denominator ratio, with numerator = motor speed and denominator = position encoder speed.
6 Denominator (C01203/2)	1		
7 Axis cycle (C01201/1)	0.0000	units	Cycle for Modulo measuring system • The Modulo system is activated by setting a cycle (C01201/1) > 0 units. • When the cycle (C01201/1) is set to 0 units (Lenze setting), the traversing range is unlimited (classical measuring system).
8 Feed constant (C01204)	360.0000	units/rev.	The feed constant corresponds to the machine movement for one revolution of the gearbox output shaft. • The value is entered in application units referred to one revolution.
9 Reference speed (C00011)	1500	rpm	All speed setpoint selections are provided in % and always refer to the reference speed set in C00011 . The motor reference speed is indicated on the motor nameplate.

3. After setting the machine parameters, click the **Back** button to change to the *Overview* dialog level.

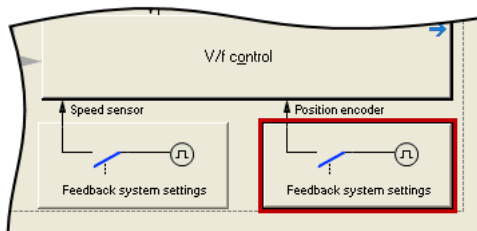
3.7.4.2 Set the position encoder

In the Lenze setting, the digital input terminals are configured as "normal" digital inputs. Since in this system constellation DI1 and DI2 are used to connect a two-track position encoder, the function assignment of these two inputs must be changed accordingly.



Detailed information on how to use a resolver/encoder as motor or position encoder can be found in the main chapter "[Encoder/feedback system](#)". (📖 293)

1. Go to the right side of the **Application parameter** tab and click the **Signal flow** button to change to the *Overview* → *Signal flow* dialog level.
2. Click the **Feedback system settings** button in the signal flow:



The *Encoder/Feedback system* parameterisation dialog will be shown:

The screenshot shows the 'Encoder/feedback system' dialog with the following settings:

- Encoder selection:** Speed sensor selection: No sensor
- Resolver:** Resolver number of pole pairs: 1; Encoder filter time resolver: 1.0 ms; Resolver pole position: -90.0
- PSM:** Switching speed closed-loop: 100.0%; Switching speed open-loop: 100.0%; SLPSM: Switching speed: 0.00%
- Multiple encoders:** MultiEncoder type: Incremental encoder; Supply voltage MultiEncoder: 5.0 V; Encoder increments MultiEncoder: 512 Inc/U; Encoder filter time TTL encoder: 1.0 ms; Pulse form TTL encoder: 4x evaluation A/B
- General:** Mounting direction: Motor: Not inverted; Mounting direction: Position enc.: Not inverted; Rotor position: 0.0; Actual speed value: 0 rpm; Actual position: 0.0000 units
- Frequency inputs:** Position encoder selection: 1 Sensor signal FreqIn12; Fct. DI 1/2 100kHz: 2 DI1(6)&DI2(7)=FreqIn; Encoder increments at FreqIn12: 3 128 Inc/U; Encoder filter time FreqIn12: 1.0 ms; Encoder scanning time FreqIn12: 10 ms; Encoder evaluation method DighIn12: comb. encoder proce
- D16 / D17:** Fct. DI 6/7 10kHz: DI1(6)=In / DI2(7)=In; Encoder increments at FreqIn67: 128 Inc/U; Encoder filter time FreqIn67: 1.0 ms; Encoder scanning time FreqIn67: 10 ms

Note: A rotary transducer (C115=2) or a two-track encoder (C115=3) can be connected via the "DI1/6 and DI2/7 function assignment" parameter (C115) when two digital inputs are used. The digital inputs are configured via the "Terminal assignment" tab.

- In the **1** Position encoder selection list field ([C00490](#)), select "Encoder signal FreqIn12".
- In the **2** Fct. DI 1/2 100kHz list field ([C00115/1](#)), select "DI1(6)&DI2(7)=FreqIn (2-track)".
 - This selection ensures that the digital DI1 and DI2 input terminals are configured as frequency inputs.
- Set the number of position encoder increments in the **3** Number of encoder increments at FreqIn12 input field ([C00420/1](#)).
- Click the **Close** button to close the parameterisation dialog again.

Related topics:

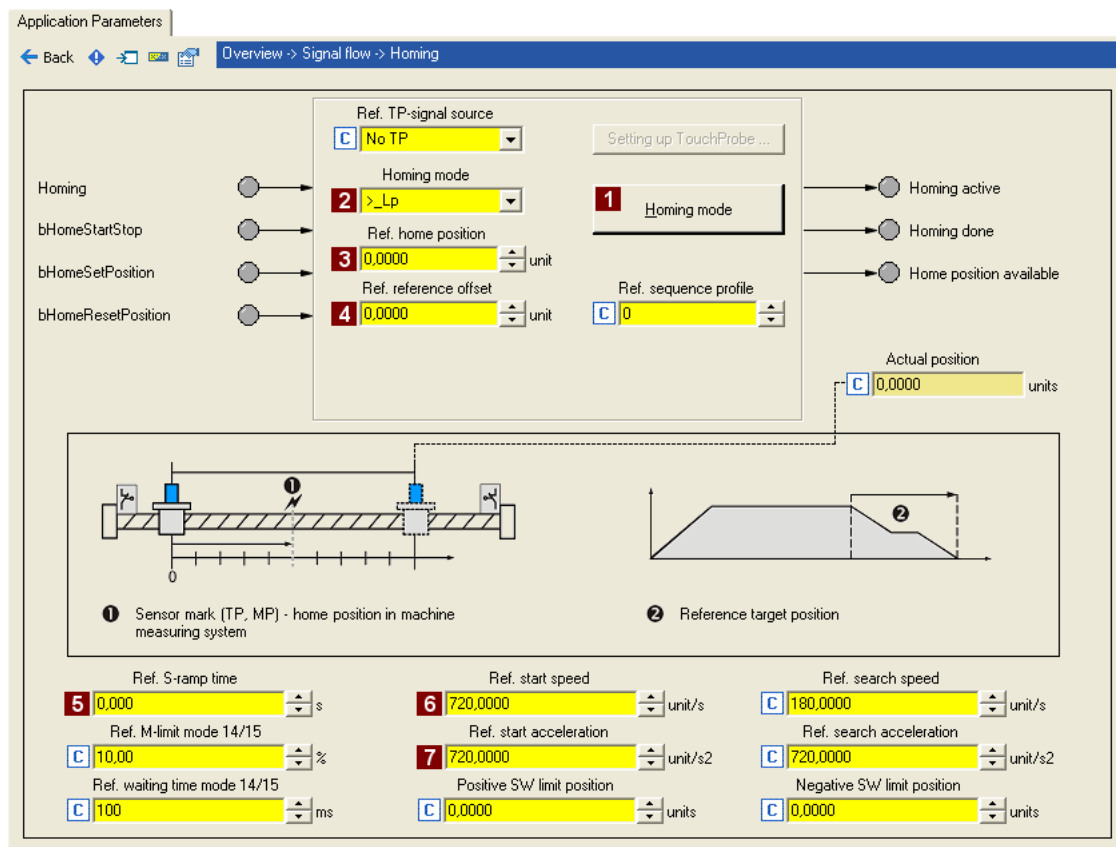
- ▶ [Digital input terminals](#) (📖 329)
- ▶ [Using DI1\(6\) and DI2\(7\) as frequency inputs](#) (📖 333)
- ▶ [Encoder/feedback system](#) (📖 293)

3.7.4.3 Set homing



Detailed information on the "Homing" operating mode is provided in chapter "Basic drive functions" in subchapter "[Homing](#)". ([517](#))

1. Click the  button (in the "MotionControlKernel" block) in the signal flow to change to the *Overview* → *Signal flow* → *Homing* dialog level:



2. Select the homing mode and hence the type of homing via the **1 Homing mode** button or directly in the **2 Homing mode** list field ([C01221](#)).
 - A graphic display of all possible homing modes can be seen via the **Homing mode** button.
 - In this system constellation without touch probe, the preset ">_Lp" mode can be used: movement in positive direction, positive edge of the limit switch sets reference.
3. Set the position to be used for loading the set position and the actual position after homing has finished in the **3 Homing home position** input field ([C01227/2](#)).

4. Recommendation: Set an offset in the **4 Homing home offset** input field ([C01227/1](#)) to prevent the machine from stopping at an activated limit switch.

- Background: The load machine can also leave the travel range limit switch. There follows a return to the home position that was set with the positive edge of the travel range limit switch.

5. Set suitable profile parameters for the homing:

Parameter	Lenze setting		Info
	Value	Unit	
5 S-ramp time (C01226/1)	0.000	s	S-ramp time for reference search/homing. • Setting "0 s" ≙ no rounding
6 Start speed (C01224/1)	720.0000	unit/s	Starting speed for approaching the pre-stop signals.
7 Start acceleration (C01225/1)	720.0000	unit/s ²	Starting acceleration for the starting speed ramps.

6. After setting the parameters for the homing, click the **Back** button to change back to the *Overview* → *Signal flow* dialog level.

3.7.4.4 Enter one or more profiles



You can find detailed information on entering profiles in the chapter entitled "Basic drive functions", subchapter "[Profile entry](#)". (545)

1. Click the **Profile entry** button (in the "MotionControlKernel" block) in the signal flow to change to the *Overview* → *Signal flow* → *Profile entry* dialog level:

The screenshot shows the 'Profile entry' dialog box. At the top, the breadcrumb is 'Overview -> Signal flow -> Profile input'. The 'Profile number' is set to 1. The 'Profile 3: Mode' is set to 'Absolute (shortest path)'. The parameters for Profile 3 are as follows:

Parameter	Value	Unit
Profile 3: Mode	2	Absolute (shortest path)
Profile 3: Position	3	360.0000
Profile 3: Speed	4	360.0000
Profile 3: Accel.	5	720.0000
Profile 3: Decel.	6	720.0000
Profile 3: S-ramp time	7	0.000
Profile 3: Final speed	8	0.0000
Profile 3: Sequence profile	9	0
Profile 3: TP-profile	10	0
Profile 3: TP-source	11	TP-Dign3

Below the parameters are two graphs showing velocity profiles. The left graph shows a standard trapezoidal profile with points A through H. The right graph shows a similar profile but with a highlighted yellow area under the curve between points G and H, indicating a TP window.



Note!

In the Lenze setting, the profiles are assigned to certain operating modes, i.e. the selection of a profile also results in a change of operating mode:

- If profile 0 is stipulated: Activation of "Speed follower" operating mode
- If profile 1 is stipulated: Activation of "Homing" operating mode
- If profile 2 is stipulated: Activation of "Manual jog" operating mode
- If profile 3 ... 15 is stipulated: Activation of "Positioning" operating mode

2. Select number 3 in the **1 Profile number** list field to enter a positioning profile which can be selected via digital inputs DI5 and DI6.

3. Set the profile parameters:

Parameter	Lenze setting		Info
	Value	Unit	
2 Profile x: Mode (C01300/x)	absolute (shortest way)t		Selection of the way in which positioning is to be carried out. ▶ Positioning modes (□ 548)
3 Profile x: Position (C01301/x)	360.0000	unit	Target position or distance to be traversed.
4 Profile x: Speed (C01302/x)	360.0000	unit/s	Maximum speed at which the target is to be approached.
5 Profile x: Acceleration (C01303/x)	720.0000	unit/s ²	Stipulation of the change in speed at which maximum acceleration is to take place.
6 Profile x: Deceleration (C01304/x)	720.0000	unit/s ²	Stipulation of the change in speed at which maximum deceleration to a standstill is to take place.
7 Profile x: S-ramp time (C01306/x)	0.000	s	Due to stipulation of an S-ramp time for a profile, the profile is executed with S-shaped ramps, i.e. acceleration and braking processes are initiated smoothly in order to reduce jerk and thus the stress on the drive components.
8 Profile x: Final speed (C01305/x)	0.0000	unit/s	This specifies the speed at which the drive is to start the next profile after reaching the target position.
9 Profile x: Sequence profile (C01307/x)	0		Optional: Sequence profile for profile linkage / following block control. After execution of the profile (target position reached), the set following (subsequent) profile is started automatically. In this way, profile chains can be stipulated without additional control processes.
10 Profile x: TP profile (C01308/x)	0		Optional: Profile number of the profile (1 ... 15) that is to be executed after a touch probe has been detected. <ul style="list-style-type: none"> • If "0" is set, there will be no profile stepping through touch probe. • Only relevant for positioning modes with touch-probe.
11 Profile x: TP source (C01308/x)	TP-DigIn3		Optional: Selection of the signal source for touch probe detection. <ul style="list-style-type: none"> • Only relevant for positioning modes with touch-probe.

4. After entering the profile, click the **Back** button to change back to the *Overview* → *Signal flow* dialog level.

Related topics:


- ▶ [Touch probe detection](#) (□ 362)
- ▶ [Operating mode change with profile number](#) (□ 495)
- ▶ [Positioning](#) (□ 541)

More detailed information on the technology application:

- ▶ [TA "Table positioning"](#) (📖 410)
- ▶ [Basic signal flow](#) (📖 411)
- ▶ [Internal interfaces | Application block "LA TabPos"](#) (📖 414)
- ▶ [Process data assignment for fieldbus communication](#) (📖 434)
- ▶ [Terminal assignment of the control modes](#) (📖 424)
- ▶ [Setting parameters \(short overview\)](#) (📖 436)
- ▶ [Configuration parameters](#) (📖 436)

3.7.5 Saving parameter settings safe against mains failure

The parameter set must be saved to the device safe against mains failure to prevent parameter settings becoming lost due to mains switching.

- ▶  Save parameter set.

3.7.6 Enable controller and test application



Stop!

Before stipulating a speed setpoint, check whether the brake in the form of a holding brake on the motor shaft has been released!



Note!

If the controller is enabled and the "Inhibit at power-on" auto-start option is activated in [C00142](#) (Lenze setting) when the mains is connected, the controller remains in the "[ReadyToSwitchOn](#)" state.

To be able to change to the "[SwitchedOn](#)" status, the controller enable must be deactivated first: Set terminal X5/RFR to LOW level.

If the controller is in the "[SwitchedOn](#)" status:

1. Enable controller: Set terminal X5/RFR to HIGH level or close contact.
 - If there is no other active source for the controller inhibit, the controller changes from the "[SwitchedOn](#)" status to the "[OperationEnabled](#)" status.
 - The **Diagnostics** tab and [C00158](#) display all active sources for the controller inhibit.
2. Select the respective control signals via the digital inputs (see sections below).

**Note!**

Observe the actual speed value (display in [C00051](#)) as well as the [LED status displays](#). ([📖 582](#))

Homing

1. Requesting the "Homing" operating mode:
 - Set digital input DI5 to LOW level and digital input DI6 to HIGH level to select profile 1 and request the "Homing" operating mode at the same time.
2. Start homing:
 - Set digital input DI7 to HIGH level ("Alternative function PosExecute").
3. Conclude homing when homing position has been reached:
 - Reset digital input DI7 to LOW level.

Positioning

1. Requesting the "Positioning" operating mode:
 - Set digital inputs DI5 and DI6 to HIGH level to select profile 3 and request the "Positioning" operating mode at the same time.
2. Start positioning:
 - Set digital input DI7 to HIGH level ("Alternative function PosExecute").
3. Conclude positioning when the target position has been reached:
 - Reset digital input DI7 to LOW level.

**Tip!**

The active operating mode ([C01243](#)) in the signal flow can also be controlled by means of the setting of the switch in the "Motion Control Kernel" block.

Related topics:

- ▶ ["Inhibit at power-on" auto-start option](#) ([📖 112](#))
- ▶ [Trouble-shooting during commissioning](#) ([📖 48](#))
- ▶ [Diagnostics & error management](#) ([📖 581](#))

3.8 Commissioning of the "Switch-off positioning" technology application

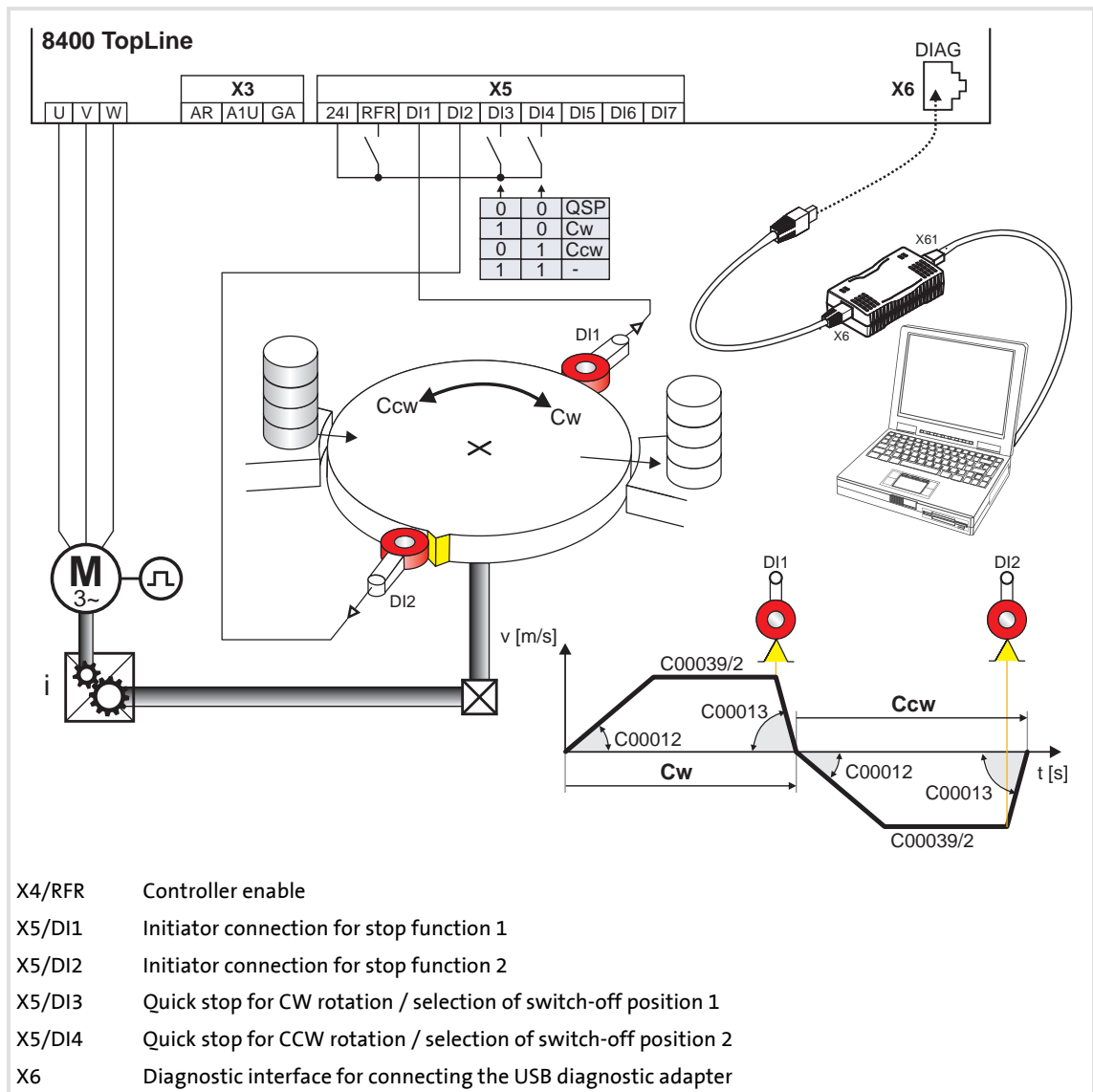


Note!

Take all the necessary safety precautions before you carry out the following commissioning steps and switch the device on!

▶ [Safety instructions with regard to commissioning](#) (45)

System constellation



[3-3] Block diagram for wiring of the commissioning example for the "Switch-off positioning" application

Functional principle of a switch-off positioning without pre-switch off

In case of the switch-off positioning without pre-switch off shown above, it makes sense to use the "[Terminals 2](#)" control mode:

1. Set DI3 to HIGH level to activate CW rotation.
2. The drive accelerates along the acceleration ramp ([C00012](#)) up to the traversing speed set in [C00039/2](#).
3. After reaching the DI1 contact, the drive comes to a stop with quick stop (QSP) in the target position.
4. Reset DI3 to LOW level and set DI4 to HIGH level to activate CCW rotation now.
5. The drive is accelerated along the acceleration ramp ([C00012](#)) up to the traversing speed set in [C00039/2](#).
6. After reaching the DI2 contact, the drive comes to a stop in the initial position with quick stop (QSP).



Tip!

- In order to avoid positioning inaccuracy due to signal propagation delays, the initiators can be directly evaluated by the drive controller. Limit switch evaluation can be configured in the drive controller. In code [C00488/x](#) you can change the method of detecting position signals from level evaluation to edge evaluation.
- In order to prevent unintended movements of the load in the target position, the use of a holding brake is recommended as an alternative to DC-injection braking (limited torque).
- The device terminals and their function assignment do not appear in the FB Editor. The assignment of (hardware) terminals to (software) functions is explained in the chapter "[Terminal assignment of the control modes](#)". (📖 451)

Commissioning steps

As shown in illustration [\[3-3\]](#), below find a description of the commissioning steps of the "Switch-off positioning" application without pre-switch off.

Please observe the sequence of the steps in the following chapters and follow them through carefully. This will help you to commission your controller quickly and as safely as possible:

- ▶ [Prepare controller for commissioning](#) (📖 74)
- ▶ [Creating an »Engineer« project & going online](#) (📖 75)
- ▶ [Parameterising the motor control](#) (📖 76)
- ▶ [Parameterising the application](#) (📖 77)
- ▶ [Saving parameter settings safe against mains failure](#) (📖 79)
- ▶ [Enable controller and test application](#) (📖 79)

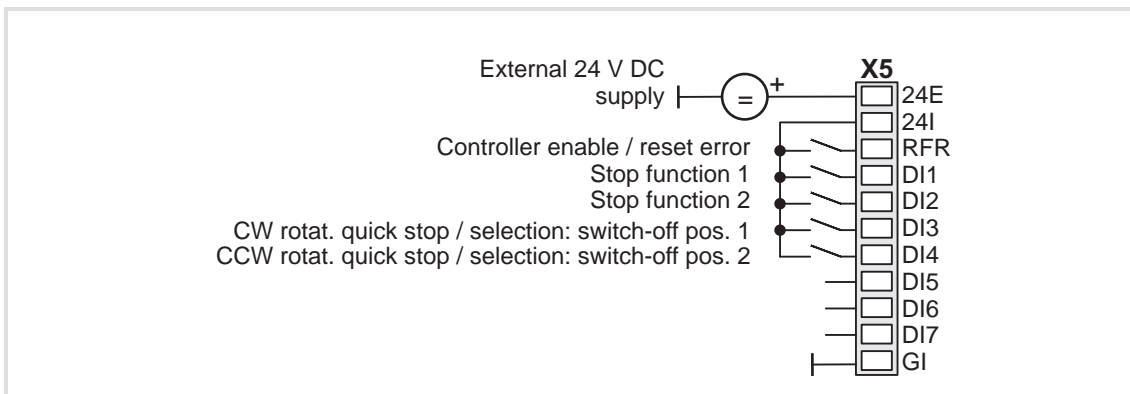
3.8.1 Prepare controller for commissioning

1. Power connection wiring

- Refer to the mounting instructions supplied with the drive controller to find help on how to correctly design the power connections to match the requirements of your device.

2. Wire the control connections

- In case of the application shown in illustration [3-3], switch-off positioning without pre-switch off, wiring according to the "[Terminals 2](#)" control mode makes sense:



3. Inhibit controller: Set terminal X5/RFR to LOW level or open contact.

4. Connect USB diagnostic adapter.

5. Switch on voltage supply of the controller.

- Without motor operation: Connect external 24 V supply.
- With motor operation: Connect mains voltage.

If the green "DRV-RDY" LED is blinking and the red "DRV-ERR" LED is off, the controller is ready for operation and commissioning can proceed.

Related topics:

- ▶ [Automatic restart after mains connection/fault...](#) (📖 112)
- ▶ [LED status displays](#) (📖 582)



3.8.2 Creating an »Engineer« project & going online



You can find detailed information on the general use of the »Engineer« in the online help which you can call with **[F1]**.

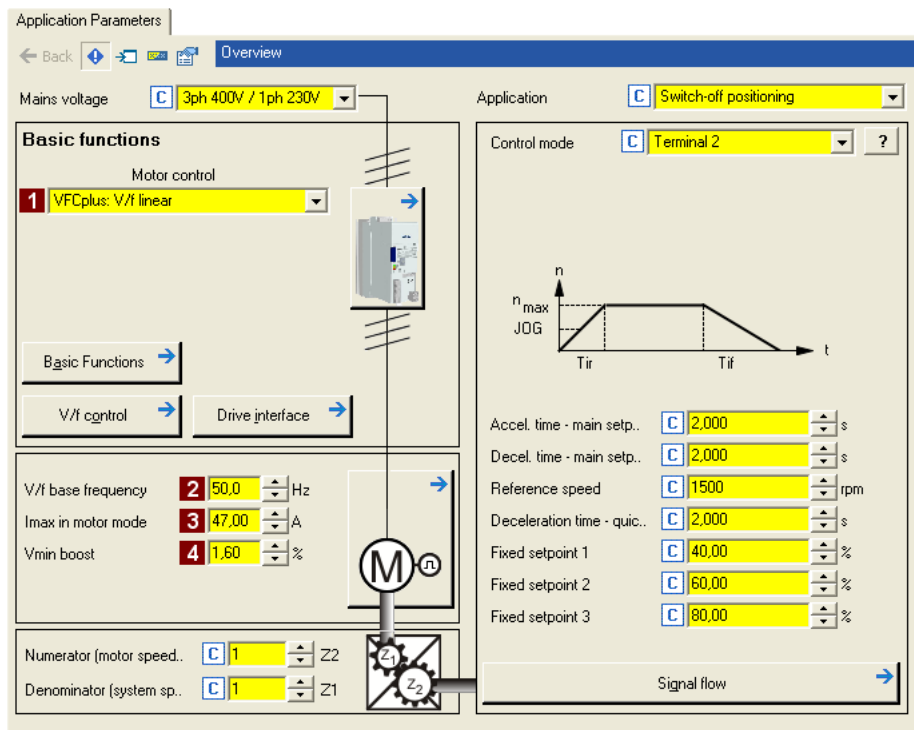
- The chapter "Working with projects" describes, among other things, all options of the *Start-up wizard* which are available to create a new »Engineer« project.

The following steps serve to describe a general method for creating a project with the **Select component from catalogue** option. For this purpose, individual components (controller, motor, etc.) are selected from selection lists.

1. Start the »Engineer«.
2. Create a new project with the *Start-up wizard* and the **Select component from catalogue** option:
 - In the **Component** step, select the 8400 TopLine controller.
 - In the **Device modules** step, select the available communication module.
 - In the **Application** step, select the "Switch-off positioning" application. (The application can also be selected any time afterwards via the **Application parameter** tab or [C00005](#).)
 - In the **Other components** step, select other components (motor / gearbox) to be added to the project.
3.  Go online.
 - After a connection to the controller has been established, the following status is displayed in the *Status line*:
4.  Transfer parameter set to the device.
 - This command serves to overwrite the current parameter settings in the controller with the parameter settings of the »Engineer« project.

3.8.3 Parameterising the motor control

1. Go to *Workspace* and change to the **Application parameters** tab.
 - The motor control parameters, among other things, can be found on the left:



2. In the **1 Motor control** list field ([C00006](#)), select the desired motor control.
3. Adapt the motor control parameters:

Parameter	Lenze setting		Info
	Value	Unit	
2 V/f base frequency (C00015)	50.0	Hz	▶ Adapting the V/f base frequency (📖 154)
3 Imax in motor mode (C00022)	47.00	A	▶ Optimising the Imax controller (📖 158)
4 Vmin boost (C00016)	1.60	%	▶ Adapting the Vmin boost (📖 156)

Related topics:

- ▶ [Notes on motor control](#) (📖 46)
- ▶ [Motor control \(MCTRL\)](#) (📖 120)

3.8.4 Parameterising the application

The application parameters can be found on the right side of the **Application parameter** tab:

- In the **1 Application** list field ([C00005](#)), select the "Switch-off positioning" application (if you have not already done so while creating the project).
 - After the "Switch-off positioning" application is selected, the contents of the tab change, e.g. the **Process controller** and **Motor potentiometer** buttons are not shown any more.
- In the **2 Control mode** list field ([C00007](#)) and in case of illustration [\[3-3\]](#), for the shown switch-off positioning without pre-switch off the "[Terminals 2](#)" control mode must be selected.
 - The corresponding wiring diagram is displayed in a pop-up window if you click the [?](#) button right to the list field.
 - For a detailed description, see the chapter "[Terminal assignment of the control modes](#)". ([394](#))

3. Adapt the application parameters:

Parameter	Lenze setting		Info
	Value	Unit	
3 Accel. time - main setpoint (C00012)	2.000	s	The setpoint is led via a ramp function generator with linear characteristic. The ramp function generator converts setpoint step-changes at the input into a ramp. Note: These settings only apply if no other ramp times have been selected at the L_NSet FB!
4 Decel. time - main setpoint (C00013)	2.000	s	
5 Reference speed (C00011)	1500	rpm	All speed setpoint selections are provided in % and always refer to the reference speed set in C00011 . The motor reference speed is indicated on the motor nameplate.
6 Decel. time - quick stop (C00105)	2.000	s	If quick stop is requested, motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105 , the motor is brought to a standstill ($n_{act} = 0$). ▶ Activate/Deactivate quick stop (□ 98)
7 Fixed setpoint 1 (C00039/1)	40.00	%	Fixed setpoints are selected in [%] based on the reference speed (C00011). Fixed setpoint 2 must be less than fixed setpoint 3! Otherwise, the drive will start at a low speed and accelerate after the pre-switch off.
8 Fixed setpoint 2 (C00039/2)	60.00	%	
9 Fixed setpoint 3 (C00039/3)	80.00	%	



Tip!


- Click the **Signal flow** button to go down one dialog level to the signal flow of the application with further possible parameter settings. See chapter "[Basic signal flow](#)". (□ 442)
- The preconfigured I/O connection in the selected control mode can be changed via configuration parameters. See chapter "[User-defined terminal assignment](#)". (□ 370)
- Low-jerk traversing profiles can be implemented by means of S-shaped ramps.
- In the case of high breakaway torques combined with horizontal motion sequences, "Sensorless vector control (SLVC)" can be used as motor control ([C00006](#)).
- For reversal of rotation direction (bidirectional motion), comprehensive configuration options are available in the drive controller (e.g. by means of the [L_DFlipFlop](#) function block).

More detailed information on the technology application:

- ▶ [TA "Switch-off positioning"](#) (□ 440)
- ▶ [Internal interfaces | application block "LA_SwitchPos"](#) (□ 443)
- ▶ [Process data assignment for fieldbus communication](#) (□ 460)
- ▶ [Terminal assignment of the control modes](#) (□ 451)
- ▶ [Setting parameters \(short overview\)](#) (□ 462)
- ▶ [Configuration parameters](#) (□ 464)

3.8.5 Saving parameter settings safe against mains failure

The parameter set must be saved to the device safe against mains failure to prevent parameter settings becoming lost due to mains switching.

- ▶  Save parameter set.

3.8.6 Enable controller and test application



Stop!

Before stipulating a speed setpoint, check whether the brake in the form of a holding brake on the motor shaft has been released!



Note!

If the controller is enabled and the "Inhibit at power-on" auto-start option is activated in [C00142](#) (Lenze setting) when the mains is connected, the controller remains in the "[ReadyToSwitchOn](#)" state.

To be able to change to the "[SwitchedOn](#)" status, the controller enable must be deactivated first: set terminal X5/RFR to LOW level.

If the controller is in the "[SwitchedOn](#)" status:

1. Enable controller: Set terminal X5/RFR to HIGH level or close contact.
 - If there is no other active source for the controller inhibit, the controller changes from the "[SwitchedOn](#)" status to the "[OperationEnabled](#)" status.
 - The **Diagnostics** tab and [C00158](#) display all active sources for the controller inhibit.
2. Select the respective control signals via the digital inputs.



Note!

Observe the actual speed value (display in [C00051](#)) as well as the [LED status displays](#). ([582](#))

Related topics:

- ▶ ["Inhibit at power-on" auto-start option](#) ([512](#))
- ▶ [Trouble-shooting during commissioning](#) ([48](#))
- ▶ [Diagnostics & error management](#) ([581](#))

3.9 PC manual control

For test and demonstration purposes, PC manual control can be used to manually control various drive functions via the »Engineer« when an online connection has been established.

Supported drive functions:

- ▶ Speed control (follow a speed setpoint)
- ▶ Activate/Deactivate quick stop
- ▶ Set/reset home position
- ▶ Manual jog
- ▶ Positioning (relative or absolute)

Other control functions:

- ▶ Reset error messages
- ▶ Set digital/analog outputs (in preparation)

Diagnostic functions:

- ▶ Display of the actual speed value and motor current (in a temporal characteristic)
- ▶ Display of the current device status
- ▶ Display of the status determining error
- ▶ Display of the status of the digital/analog inputs (in preparation)

3.9.1 Activating PC manual control



Stop!

PC manual control must be explicitly activated by the user.

If PC manual control is activated, the controller is inhibited via device command ([C00002/16](#)) first.

**Note!****For activated PC manual control:**

The online connection between the PC and the controller is monitored by the controller.

- If the online connection is interrupted for longer than the set timeout (Lenze setting: 2 s):
 - Error response "Fault" is triggered, i.e. the motor becomes torqueless and is coasting unless it already is at standstill.
 - The "[Ck16: Time overflow manual control](#)" error message is entered into the logbook.

PC manual control provides the **Motion Control Kernel** and the motor interface with all required control signals and setpoint signals.

- The existing application (function block interconnection) is now decoupled from these interfaces but will be processed as before and remains unchanged.
- It does not matter what type of motor control is set in [C00006](#).

**How to activate PC manual control:**

1. If an online connection to the controller has not been established yet:
 - Go online.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the "PC manual control" button.
 - The following safety note is displayed first:

Safety note:

When the drive controller is controlled using the PC, the drive controller must be able to be set to "controller inhibited" status via digital input terminal "RFR" at any time.

When the PC manual control is connected, connection monitoring takes place between the PC and the drive controller. If the connection is interrupted, the drive controller becomes inhibited.

monitoring timeout

C

ms

Connect PC manual control

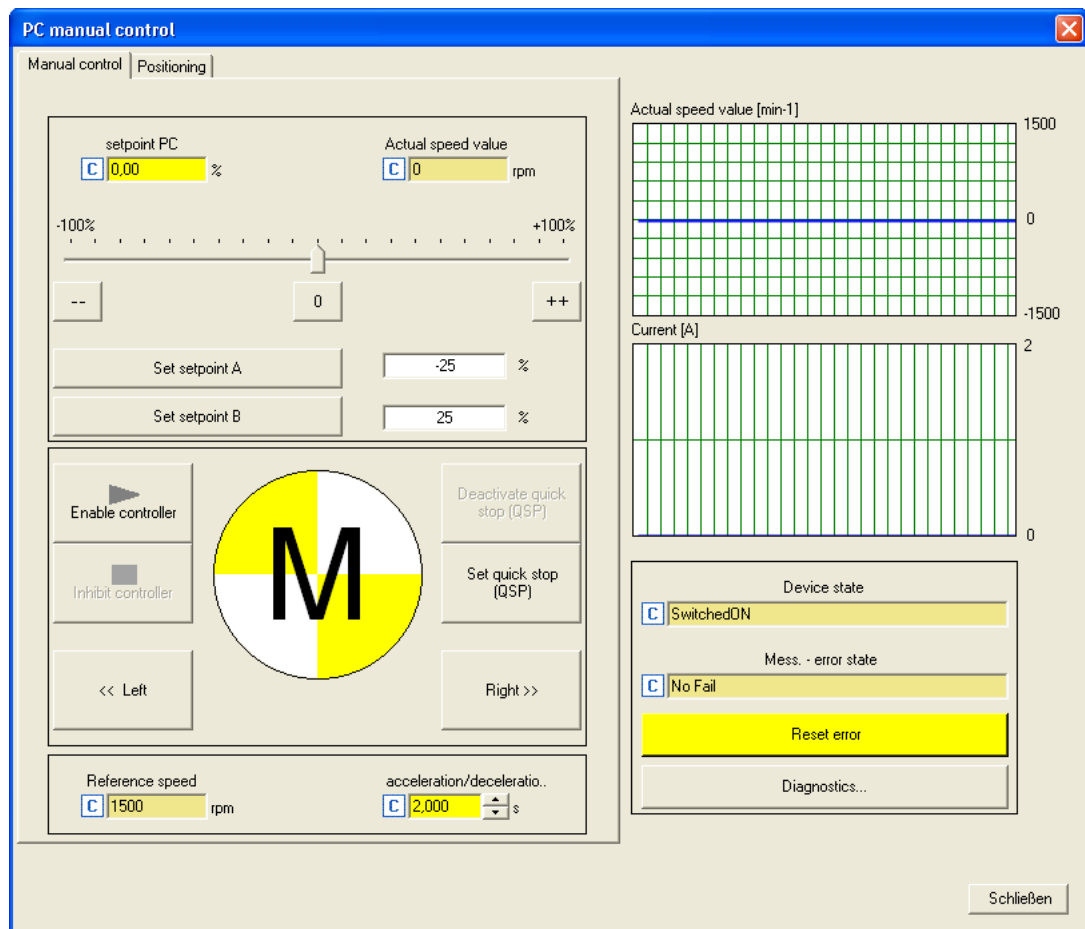
Cancel

- Click the **Cancel** button to abort the action and close the dialog box.
- The **Timeout monitoring** input field serves to adapt the timeout for monitoring the connection between the PC and the controller.

- To acknowledge the note and activate PC manual control:
Click the **Activate PC manual control** button.
 - The controller is inhibited via device command ([C00002/16](#)).
 - The *PC manual control* operator dialog is displayed.

PC manual control operator dialog

On the left-hand side, the *PC manual control* operator dialog includes several tabs which serve to select various control functions. On the right-hand side, setpoint and status displays are provided for diagnostic purposes:



Note!

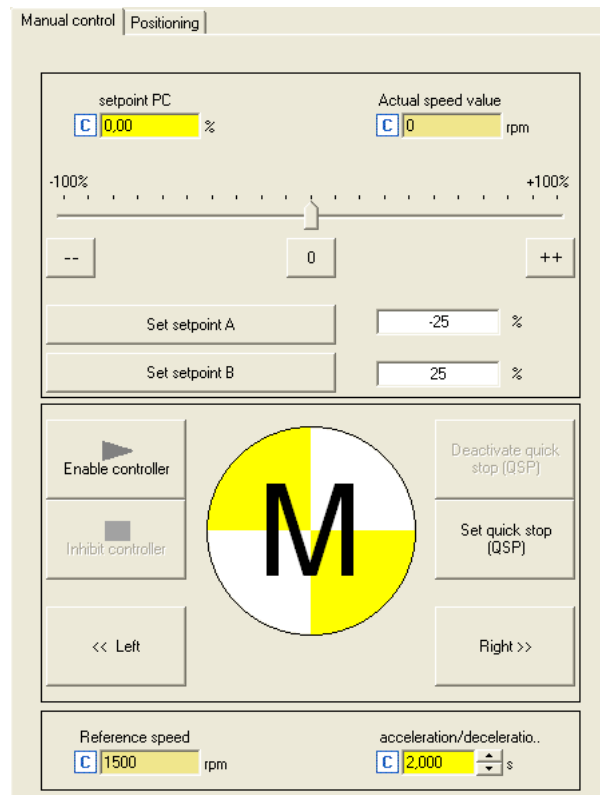
PC manual control can be exited any time by clicking the **Close** button.

If you exit PC manual control or change to another tab, the controller is inhibited via device command ([C00002/16](#)), i.e. the motor becomes torqueless and is coasting unless it already is at standstill.

The execution of the various functions is described in the following chapters.

3.9.2 Speed control

Via the **Speed control** tab, simply make the drive rotate in the "Speed follower" operating mode without the need to set control parameters or feedback systems:



How to make the motor rotate in its most basic way:

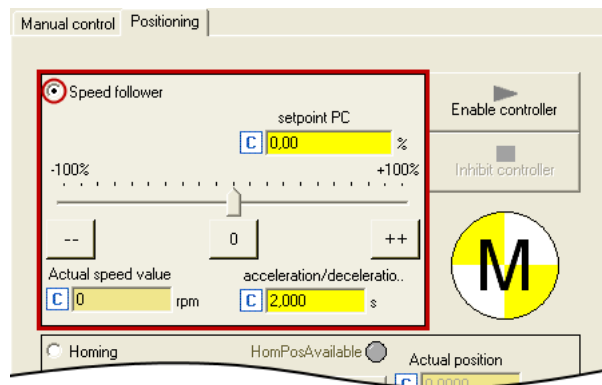
- Set the desired speed setpoint in [%] based on the reference speed, e.g. directly in the **Setpoint PC** input field or via the slider.
 - Via the **-- / 0 / ++** buttons, the currently set speed setpoint can be reduced/increased in steps of 10 percent or set to zero.
 - Via the **Set setpoint A/B** buttons, the speed setpoint can be set to a previously set constant value A/B.
- To start the speed follower:

Enable the controller via the **Enable controller** button.

 - Please observe that the controller will not be enabled if other sources of controller inhibit (e.g. terminal RFR) are active.
 - The enabled controller is now following the selected speed setpoint.
 - To avoid shocks or overload in case of great setpoint changes, the speed setpoint follows a linear ramp generator with adjustable acceleration/deceleration time.
 - Via the **Inhibit controller** button, the controller can be inhibited again, i.e. the motor becomes torqueless and is coasting unless it already is at standstill.

Further functions:

- ▶ If the **Set quick stop (QSP)** button is clicked, the motor is braked to a standstill within the deceleration time parameterised in [C00105](#).
 - Via the **Deactivate quick stop (QSP)** button, the quick stop can be deactivated.
- ▶ Via the << **CCW** and **CW** >> buttons, the direction of rotation can be changed.
- ▶ The "Speed follower" operating mode can also be activated without the functions described before via the second **Positioning** tab:



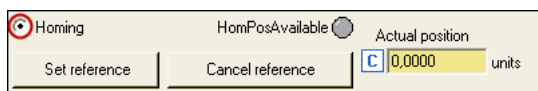
3.9.3 Set/reset home position

The measuring system in the machine is selected by means of homing and the 0 position is set within the possible physical travel range.



Detailed information on the "Homing" operating mode is provided in chapter "Basic drive functions" in subchapter "[Homing](#)". (📖 517)

The change to the "Homing" mode can be made by selecting the correspondent option on the **Positioning** tab:



How to set the reference manually with a stopped motor:

Click the **Set reference** button.

The current actual position in the machine measuring system now corresponds to the home position set in [C01227/2](#) (Lenze setting: 0.0000 units).



Stop!

If you set the reference with the PC manual control, the drive is referenced.

If another home position is required for normal operation:

Click the **Cancel reference** button and reset the status signals *HomPosAvailable* and *HomePosDone* in the MCK status word in order that no mechanical problems can occur during normal operation.

- Setpoints and actual positions remain untouched until a renewed reference setting or homing.

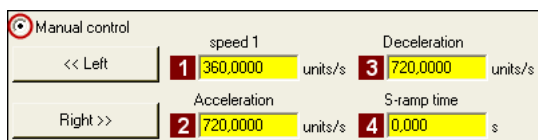
3.9.4 Manual jog

In the "Manual jog" mode, the drive can be traversed manually in a clockwise or counter-clockwise direction.



You can find detailed information on the "Manual jog" mode in the chapter entitled "Basic drive functions" in the subchapter "[Manual jog](#)". (□ 533)

The change to the "Manual jog" mode can be made by selecting the correspondent option on the **Positioning** tab:



- The profile parameters saved in the parameter set for the basic "manual control" function are used:

Parameter	Lenze setting		Info
	Value	Unit	
1 Speed 1 (C01231/1)	360.0000	units/s	Speed for manual jog
2 Acceleration (C01232/1)	720.0000	units/s ²	For accelerating and decelerating, different values can be set so that smooth starting and quick stopping of the drive can be implemented.
3 Deceleration (C01232/2)	720.0000	units/s ²	
4 S-ramp time (C01233/1)	0.000	s	In order to reduce jerking, the two ramps can be set in such a way that they are s-shaped. This is done by entering a relative S-ramp time.



How to traverse the drive manually in inching mode:

1. If the controller is still inhibited, enable the controller via the **Enable controller** button.
 - Please observe that the controller will not be enabled if other sources of controller inhibit (e.g. terminal RFR) are active.

If the controller is in the "OperationEnabled" status:

2. Click **<< Left** or **Right >>** (and keep it pressed) to traverse the drive in the corresponding direction of rotation.

3.9.5 Positioning (relative or absolute)

Positioning means that a workpiece/tool or material is moved from a starting position to a defined destination.



You can find detailed information on the "Positioning" mode in the chapter entitled "Basic drive functions" in the subchapter "[Positioning](#)". (📖 541)

The change to the "Positioning" operating mode and the simultaneous selection of the positioning mode (relative or absolute) is made by selecting the corresponding option on the **Positioning** tab:

<input checked="" type="radio"/> Relative positioning	<input type="radio"/> Absolute positioning		
Run PDS	1 360,0000 unit	2 360,0000 unit/s	
Stop PDS	3 720,0000 unit/s ²	4 720,0000 unit/s ²	
Profile number	< 01 >	5 0,000 s	

- The profile parameters saved in the parameter set for the basic "Positioning" function are used:

Parameter	Lenze setting		Info
	Value	Unit	
1 Position (C01301/1...15)	360.0000	units	Target position or distance to be traversed. <ul style="list-style-type: none"> When "Relative positioning" has been selected: Distance to starting position (current position). When "Absolute positioning" has been selected: Distance to defined zero position.
2 Speed (C01302/1...15)	360.0000	units/s	Maximum speed at which the target is to be approached.
3 Acceleration (C01303/1...15)	720.0000	units/s ²	Stipulation of the change in speed at which maximum acceleration is to take place.
4 Deceleration (C01304/1...15)	720.0000	units/s ²	Stipulation of the change in speed at which maximum deceleration to a standstill is to take place.
5 S-ramp time (C01306/1...15)	0.000	s	By defining an S-ramp time, a profile is travelled with S-shaped ramps.



Note!

In order that no complex travel motions occur, no forwarding to following profile set in the profile data takes place with PC manual control!

You can find detailed information on entering profiles in the chapter entitled "Basic drive functions", subchapter "[Profile entry](#)". (📖 545)



How to execute a positioning:

1. Select the profile to be travelled (1 ... 15) in the **Profile number** list field.
2. If the controller is still inhibited, enable the controller via the **Enable controller** button.
 - Please observe that the controller will not be enabled if other sources of controller inhibit (e.g. terminal RFR) are active.

If the controller is in the "OperationEnabled" status:

3. Click the **Run POS** button to start the positioning process.
 - Click the **Stop POS** button to stop an active positioning process anytime.

4 Device control (DCTRL)

This chapter provides information on internal device control as well as the device commands which can be executed via the subcodes of [C00002](#).

- ▶ The device control causes the controller to take defined device statuses.
- ▶ The device control provides a multitude of status information in many ways:
 - Visually via the [LED status displays](#) on the front of the controller. (📖 583)
 - As text messages in the [Logbook](#). (📖 590)
 - As process signals via the outputs of the [LS DriveInterface](#) system block. (📖 115)
 - Via diagnostic / display parameters which are included in the »Engineer« parameter list as well as in the **Diagnostics** category in the keypad.



Note!

The device statuses of the controller are based on the operating statuses of the CiA402 standard. ▶ [Device state machine and device statuses](#) (📖 101)

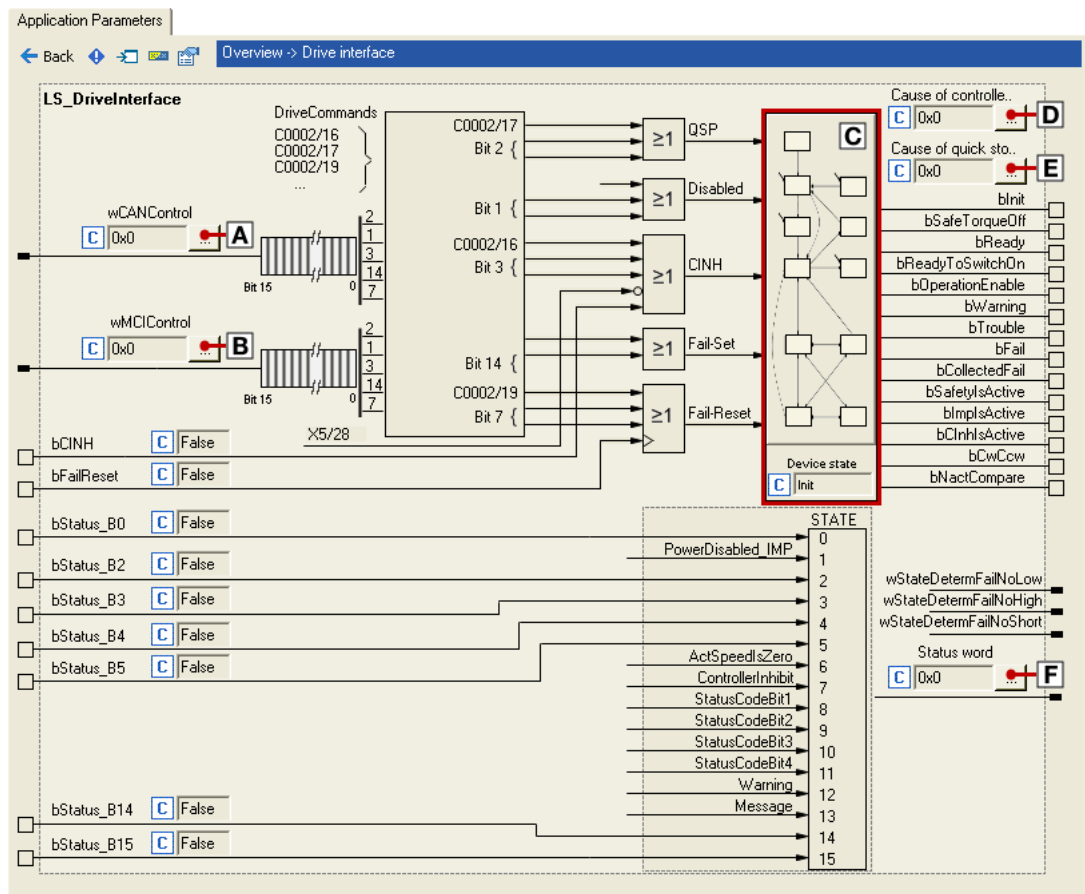


How to get to the parameterisation dialog of the device control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the **Drive interface** button.

Parameterisation dialog in the »Engineer«

The parameterisation dialog shows the input / output signals and the internal signal flow of the LS_DriveInterface system block which displays the device control in the function block editor:



Range / Meaning	Display parameter
A Display of the control word via system bus (CAN)	C00136/2
B Display of the control word via communication module (e.g. PROFIBUS)	C00136/1
C Display of the internal state machine and the current device status	C00137
D Display of all active sources of a controller inhibit	C00158
E Display of all active sources of a quick stop	C00159
F Display of the status word of the device control	C00150

4.1 Device commands (C00002/x)

This chapter describes the device commands which are provided in the subcodes of [C00002](#) and can be carried out using the keypad or, alternatively, the »Engineer« when an online connection has been established.

The device commands serve, among other things, to directly control the controller, to organise parameter sets, and to call diagnostic services.

Regarding the execution of the device commands, a distinction is drawn between:

- ▶ Device commands which have an immediate effect on control (e.g. "Activate quick stop")
 - After being called in [C00002/x](#), these device commands provide static status information ("On" or "Off").
- ▶ Device commands with longer execution duration (several seconds)
 - After being called in [C00002/x](#), these device commands provide dynamic status information ("Work in progress 20%" → "Work in progress 40%", etc.).
 - The execution of the device command has not finished successfully until the "Off / ready" status information is provided in [C00002/x](#).
 - In the event of an error, the "Action cancelled" status information is provided in [C00002/x](#). In this case, further details can be obtained from the status of the device command executed last which is displayed in [C00003](#).



Stop!

Before the supply voltage is switched off after a device command has been transmitted via [C00002/x](#), the device command must be checked for successful completion on the basis of the status information provided in [C00002/x](#)!

- This is of particular importance for device commands which save data to the memory module of the device. Incomplete storage processes may lead to data inconsistencies in the memory module.






Note!

- Before activating device commands by a master control, wait for the "Ready" signal of the controller.
- The device will reject a write process to [C00002/x](#) if the value is >1 and issue an error message.
- [C00003](#) displays the status of the device command that was executed last.

Activate device command

When an online connection has been established, simply use the »Engineer« to activate a device command by selecting the corresponding option from the **Parameters** tab in [C00002/x](#) ("0: off" or "1: On / start").

- ▶ Alternatively, the device command can also be activated via e.g. keypad or through a master control by writing to [C00002/x](#).
- ▶ Some of the frequently used device commands (such as "Save parameter set") can also be executed via the *Toolbar* icons of the »Engineer« when an online connection has been established:

Symbol	Function
	Enable controller
	Inhibit controller
	Save parameter set (for 8400: Save all parameter sets)



Note!

Device commands that can be executed via the *Toolbar* of the »Engineer« always affect the element currently selected in the *Project view* including all subelements!

- If no controller but e.g. a system module is selected in the *Project view* instead, the corresponding device command will be activated in all lower-level controllers that have an online connection to the »Engineer«.

Before the desired action is carried out, a confirmation prompt appears first, asking whether the action is really to be carried out.

Short overview of device commands

Device commands described in this chapter:

C00002 Subcode:	Device command	Controller inhibit required	Status information
1	Load Lenze setting	●	dynamic
6	Load all parameter sets	●	dynamic
11	Save all parameter sets		dynamic
16	Enable/Inhibit controller		static
17	Activate/Deactivate quick stop		static
19	Reset error		static
21	Delete logbook		static
27	Device search function		static

Device commands described in other chapters:

C00002 Subcode:	Device command	Controller inhibit required	Status information
23	Motor parameter identification ▶ Automatic motor data identification	●	dynamic
25	Identify resolver error ▶ Optimising resolver behaviour	●	dynamic
26	CAN reset node ▶ Reinitialising the CANopen system bus interface		static
28	Check MasterPin ▶ Unlocking the controller with a MasterPin	●	static
29	Set binding ID ▶ Device personalisation		static
30	Delete binding ID ▶ Device personalisation		static
31	Set password ▶ Password protection		static
32	Check password ▶ Password protection		static
33	Delete password ▶ Password protection		static
34	Identify pole position (360°) ▶ Pole position identification (PPI)	●	dynamic

4.1.1 Load Lenze setting

The [C00002/1](#) = "1: On / start" device command resets the parameters to the Lenze setting which are saved in the controller Firmware.

- ▶ Can only be executed if the controller is inhibited; otherwise, the feedback [C00002/1](#) = "6: No access - controller inhibit" will be returned.
- ▶ All parameter changes which have been carried out after the last time the parameter set was saved will be lost!
- ▶ This device command has an effect on the settings of the parameters of the operating system, application and module.



How to load the Lenze setting:

1. If the controller is enabled, it must be inhibited, e.g. by executing the "Enable/Inhibit controller" device command ([C00002/16](#) = "0: Off / ready").
2. Execute the "Load Lenze setting" device command:
[C00002/1](#) = "1: On / start"

The loading process may take a couple of seconds. After the device command has been called, [C00002/1](#) returns dynamic status information ("Work in progress 20%" → "Work in progress 40 %" → "Work in progress 60 %", etc.).

4.1.2 Load all parameter sets

The [C00002/6](#) = "1: On / start" device command reloads all parameter settings from the memory module to the controller.

- ▶ Can only be executed if the controller is inhibited; otherwise, the feedback [C00002/6](#) = "6: No access - controller inhibit" will be returned.
- ▶ All parameter changes which have been carried out after the last time the parameter set was saved will be lost!
- ▶ This device command has an effect on the settings of the parameters of the operating system, application and module.



Note!

The controller is currently provided with one data record for all parameters, i.e. every parameter has a value. Several data records per controller are in preparation.

For up to 32 freely selectable parameters, the basic function [Parameter change-over](#) provides a change-over between four sets with different parameter values. (📖 734)



How to load the parameter settings from the memory module:

1. If the controller is enabled, it must be inhibited, e.g. by executing the "Enable/Inhibit controller" device command ([C00002/16](#) = "0: Off / ready").
2. Execute the "Load all parameter sets" device command:
[C00002/6](#) = "1: On / start"

The loading process may take a couple of seconds. After the device command has been called, [C00002/6](#) returns dynamic status information ("Work in progress 20 %" → "Work in progress 40 %" → "Work in progress 60 %", etc.).

4.1.3 Save all parameter sets

If parameter settings are changed in the controller, those changes will be lost after mains switching of the controller unless the settings have been saved explicitly.

The [C00002/11](#) = "1: On / start" device command saves the current parameter settings safe against mains failure to the memory module of the controller.



Note!

When the device is switched on, all parameters are automatically loaded from the memory module to the main memory of the controller.

Observe the following to avoid data inconsistencies which cause errors when the parameters are loaded from the memory module:

During the storage process:

- Do not switch off the supply voltage!
- Do not remove the memory module from the device!

The controller is currently provided with one data record for all parameters, i.e. every parameter has a value. Several data records per controller are in preparation.



How to save the parameter settings to the memory module:


Execute the "Save all parameter sets" device command:

[C00002/11](#) = "1: On / start"

The storage process may take a couple of seconds. After the device command has been called in [C00002/11](#), dynamic status information ("Work in progress 20%" → "Work in progress 40%" → "Work in progress 60%", etc.) is returned.



Tip!

- This device command can also be activated via the  *toolbar* icon.
- The "[Load Lenze setting](#)" device command ([C00002/1](#) = "1: On / start") resets the parameter settings to the delivery status of the device.

4.1.4 Enable/Inhibit controller

The [C00002/16](#) = "1: On / start" device command enables the controller, provided that no other source of a controller inhibit is active.

The [C00002/16](#) = "0: Off / ready" device command inhibits the controller again, i.e. the power output stages in the controller are inhibited and the speed/current controllers of the motor control are reset.

- ▶ The motor becomes torqueless and coasts, if it has not yet been in standstill.
- ▶ When the controller is inhibited, the status output *bCInhActive* of the [LS DriveInterface](#) system block is set to TRUE.
- ▶ When the controller inhibit request is reset, the drive synchronises to the actual speed. For this purpose,
 - If the flying restart circuit is activated in [C00990](#), the flying restart function parameterised in [C00991](#) is used for the synchronisation to the rotary or standing drive. ▶ [Flying restart function](#) (📖 247)
 - In the case of an operation with feedback, the actual speed is read out by the encoder system.
 - In the case of a sensorless vector control (SLVC), the actual speed from the motor model of the motor control is used for the synchronisation.
- ▶ [C00158](#) provides a bit coded representation of all active sources/triggers of a controller inhibit:

Bit	Cause/Source of controller inhibit
Bit 0	Terminal controller enable
Bit 1	CAN control word
Bit 2	MCI control word
Bit 3	SwitchOn
Bit 4	Application (LS DriveInterface system block: <i>bCInh</i> input)
Bit 5	Device command (C00002/16)
Bit 6	Error with a "Fault"/"Trouble" error response or system error, respectively
Bit 7	Internal signal
Bit 8	Reserved
Bit 9	Reserved
Bit 10	AutoStartLock
Bit 11	Motor parameter identification
Bit 12	Automatic brake operation
Bit 13	DCB-IMP
Bit 14	Reserved
Bit 15	Reserved



Tip!

The controller can also be enabled or inhibited via the  and  toolbar icons.

4.1.5 Activate/Deactivate quick stop

The [C00002/17](#) = "1: On / start" device command activates the quick stop function, i.e. the motor control is separated from the setpoint selection, and within the deceleration time parameterised in [C00105](#) the motor is brought to a standstill ($n_{act} = 0$).

Parameter	Info	Lenze setting	
		Value	Unit
C00105	Decel. time - quick stop	2.000	s

- ▶ The motor is kept at a standstill during closed-loop operation.
- ▶ A pulse inhibit (CINH) is set if the auto DCB function has been activated via [C00019](#).
- ▶ In [C00104](#), the position control can be activated during ramp-down and/or at standstill.

The [C00002/17](#) = "0: Off / ready" device command deactivates the quick stop again, provided that no other source of a quick stop is active.

- ▶ [C00159](#) provides a bit coded representation of all active sources/triggers of a quick stop:

Bit	Cause/Source of controller inhibit
Bit 0	Reserved
Bit 1	CAN control word (bit 2)
Bit 2	MCI control word (bit 2)
Bit 3	Reserved
Bit 4	Application (LS_MotorInterface system block: <i>bQspOn</i> input)
Bit 5	Device command (C00002/17)
Bit 6	Device error with "TroubleQSP" error response
Bit 7	Internal signal
Bit 8	Reserved
Bit 9	Reserved
Bit 10	Operating system
Bit 11	Reserved
Bit 12	MCK (System block LS_MotionControlKernel : Input <i>bQspOn</i>)
Bit 13	Reserved
Bit 14	Reserved
Bit 15	Reserved

4.1.6 Reset error

The [C00002/19](#) = "1: On / start" device command acknowledges an existing error message if the error cause has been eliminated and thus the error is not pending anymore.

- ▶ After the reset (acknowledgement) of the current error, further errors may be pending which must also be reset.
- ▶ The status-determining error is displayed in [C00168](#).
- ▶ The current error is displayed in [C00170](#).



Tip!

An error message can also be acknowledged by activating the **Reset error** button in the **Diagnostics** tab.

Detailed information on error messages can be found in the "[Diagnostics & error management](#)" chapter. ([581](#))

4.1.7 Delete logbook

The [C00002/21](#) = "1: On / start" device command deletes all logbook entries.



Tip!

Click the **Logbook** button in the **Diagnostics** tab to display the logbook in the »Engineer«.

In the *Logbook* dialog box, it is also possible to delete all logbook entries by clicking the **Delete** button.

Detailed information on the logbook can be found in the "[Diagnostics & error management](#)" chapter. ([581](#))


4.1.8 Device search function

In some applications where controllers are installed in control cabinets or are positioned in a spacious plant, it is often difficult to locate a device connected online for e.g. maintenance work. There is an established online connection with the device but you do not know where the controller is located physically.

The [C00002/27](#) = "1: On / start" device command serves to carry out an "optical location":

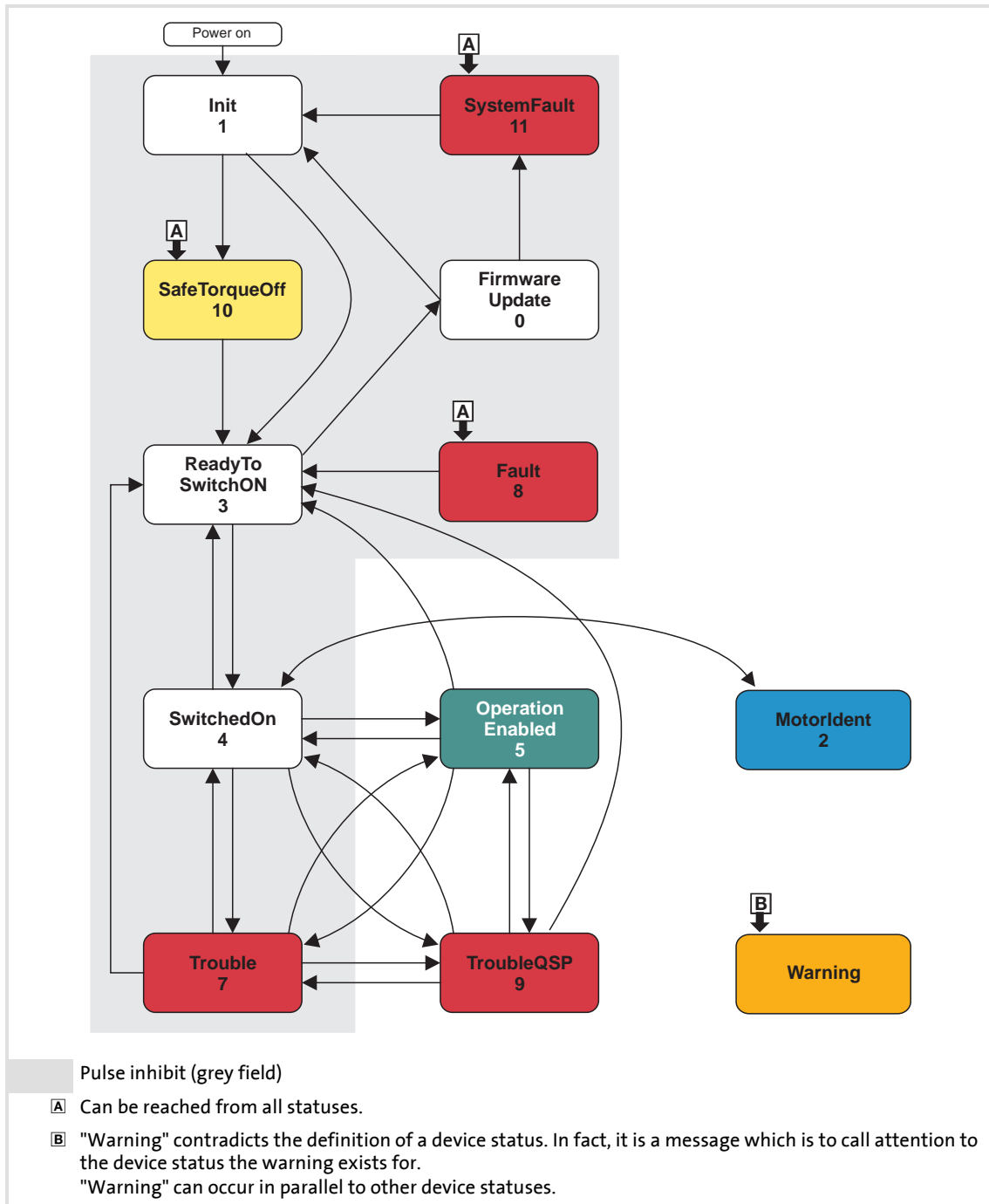
- ▶ For the time set in [C00181/1](#), all four status LEDs at the front of the controller flash. Afterwards, the function is turned off automatically.
- ▶ If the device command is executed again within the set time period, the duration is extended accordingly.
- ▶ The setting [C00002/27](#) = "0: Off / ready" serves to abort or switch off the function.
- ▶ Adjustable time period: 0 ... 6000 s (Lenze setting: 5 s)



The device search function can also be activated via the  *toolbar* icon.

4.2 Device state machine and device statuses

The behaviour of the controller is mainly determined by the current device status within the device state machine. Which device status is active and device status is next depends on certain control signals (e.g. for controller inhibit and quick stop) and status parameters.



[4-1] Device state machine

- ▶ The arrows between the device statuses mark possible status changes.
- ▶ The digits stand for the status ID (see table below).

- ▶ The change from one status to the other is carried out within a 1-ms cycle. If within this time there are several requests for status changes, the status with the higher priority is processed first (see table below).
- ▶ [C00137](#) displays the current device state.
- ▶ [C00150](#) (status word) provides a bit coded representation of the current device state via bits 8 ... 11 (see table below).

ID	Device status (Display in C00137)	Priority	Status bits (Display in C00150)				Meaning
			Bit 11	Bit 10	Bit 9	Bit 8	
0	FirmwareUpdate	-	0	0	0	0	Firmware update function is active
1	Init	-	0	0	0	1	Initialisation is active
2	MotorIdent	-	0	0	1	0	Motor parameter identification is active
3	ReadyToSwitchOn	Prio 5	0	0	1	1	Device is ready to start
4	SwitchedOn	Prio 4	0	1	0	0	Device is switched on
5	OperationEnabled	Prio 1	0	1	0	1	Operation
6	-	-	0	1	1	0	-
7	Trouble	Prio 3	0	1	1	1	Trouble is active
8	Fault	Prio 7	1	0	0	0	Fault is active
9	TroubleQSP	Prio 2	1	0	0	1	TroubleQSP is active
10	SafeTorqueOff	Prio 6	1	0	1	0	Safe torque off is active
11	SystemFault	Prio 8	1	0	1	1	System fault is active

[4-1] Device statuses, priorities, and meaning of the status bits in the status word

4.2.1 FirmwareUpdate



Note!

This function may only be executed by qualified Lenze personnel!

4.2.2 Init

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
Off	Off	Init	0	0	0	1

The controller is in this status immediately after switching on its 24 V supply voltage.

In the "Init" status, the operating system is initialised and all device components (communication module, memory module, power section, etc.) are identified. When identifying the power section, it is checked first if it is switched on or if the required voltage lies within the tolerance zone, respectively.


- ▶ The inverter is inhibited, i.e. the motor terminals (U, V, W) of the inverter are deenergised.
- ▶ The digital and analog inputs are not yet evaluated at this time.
- ▶ The bus systems (CAN, PROFIBUS etc.) do not work yet, i.e. communication is not possible.
- ▶ The application is not yet processed.
- ▶ The monitoring functions are not yet active.
- ▶ The controller cannot be parameterised yet and no device commands can be carried out yet.

**Note!**

If the 24V voltage supply is in the valid range (>19V) and the initialisation is finished, the device changes automatically to the "[ReadyToSwitchOn](#)" status.

If only the 24V voltage supply is available during the mains connection, the error message "[LU: Undervoltage in the DC bus](#)" is also entered into the logbook of the drive controller.

4.2.3 MotorIdent

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
	Off	MotorIdent	0	0	1	0

The controller has been provided with the "Motor parameter identification" function for automatic identification of the motor parameters. If the motor parameter identification is active, the controller is in the "MotorIdent" device status.

The "MotorIdent" device status can only be reached from the "[SwitchedOn](#)" device status, i.e. the controller must be inhibited first so that motor parameter identification can be started via the "Motor parameter identification" device command ([C00002/23](#)).



Stop!

While the motor parameters are being detected,

- the controller does not respond to setpoint changes or control processes (e.g. speed setpoints, quick stop, torque limitations),
- the application remains active,
- all system interfaces (IO, bus systems, etc.) remain active,
- error monitoring remains active,
- the inverter is controlled independently of the setpoint sources.

After the motor parameter identification is completed, the status changes back to "[SwitchedOn](#)".



Tip!

Detailed information on motor parameter identification can be found in the "[Automatic motor data identification](#)" subchapter on motor control. ([126](#))

4.2.4 SafeTorqueOff

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
	Off	SafeTorqueOff	1	0	1	0

**Note!**

This device status is only possible in connection with an integrated safety system and if a power section supply is available!

Integrated safety systems with Inverter Drives 8400

Drive controller of the 8400 series can be equipped with the integrated "Safe torque off (STO)" safety system.

The integrated safety system is applicable on machines for the protection of persons.

The drive function is still carried out by the drive controller. The safety system provides safe inputs. If the safety system is activated, it executes control functions according to EN 60204-1 directly in the drive controller in case of errors.

Safety status

If the drive controller is switched off by the safety system, the device changes to the "SafeTorqueOff" status.

If the safety system deactivates the "Safe torque off (STO)" request, the device changes to the "[ReadyToSwitchOn](#)" status.




Detailed information on the integrated safety system can be found in the hardware manual!

The hardware manual contains important notes on the safety system which must be observed!

- The hardware manual has been stored in electronic form on the data carrier supplied with the 8400 drive controller.

4.2.5 ReadyToSwitchOn

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
	Off	ReadyToSwitchOn	0	0	1	1

The controller is in this device status directly after the initialisation has been completed!

- ▶ The bus systems are running and the terminals and encoders are evaluated.
- ▶ The monitoring modes are active.
- ▶ The controller can be parameterised.
- ▶ The application is basically executable.



Note!

- The "ReadyToSwitchOn" status is not only activated after the mains connection, but also after the deactivation of "[Trouble](#)", "[Fault](#)" or "[SafeTorqueOff](#)".
- If [C00142](#) activates the autostart option "Inhibit at power-on" (Lenze setting), explicit deactivation of the controller inhibit after mains connection is always required for the controller to change from the "ReadyToSwitchOn" status to the "[SwitchedOn](#)" status.
- If only the 24V voltage supply is available during the mains connection, the error message "[LU: Undervoltage in the DC bus](#)" is entered into the logbook of the drive controller and the drive controller remains in the "ReadyToSwitchOn" status.




Danger!

If the "Inhibit at power-on" auto-start option has been deactivated in [C00142](#), the "ReadyToSwitchOn" status switches directly to the [SwitchedOn](#)" status after mains connection.

- ▶ [Automatic restart after mains connection/fault...](#) (□ 112)

4.2.6 SwitchedOn

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
	Off	SwitchedON	Bit 11	Bit 10	Bit 9	Bit 8
			0	1	0	0

The drive is in this device status if the DC bus voltage is applied and the controller is still inhibited by the user (controller inhibit).

- ▶ The bus systems are running and the terminals and encoders are evaluated.
- ▶ The monitoring modes are active.
- ▶ The application is basically executable.

If the controller inhibit is deactivated, the device changes to the "[OperationEnabled](#)" status and the motor follows the setpoint defined by the active application.

**Tip!**

[C00158](#) provides a bit coded representation of all active sources/triggers of a controller inhibit.


Depending on certain conditions, a status change takes place based on the "SwitchedOn" device status:

Change condition	Changeover to the device status
Control bit "EnableOperation" of all control channels = "1" AND terminal RFR = HIGH level (controller enable)	OperationEnabled
"SwitchOn" control bit of a control channel = "0".	ReadyToSwitchOn
Motor parameter identification requested.	MotorIdent
Undervoltage in the DC bus.	Trouble/Fault (depending on C00600/1)
Error with error response "Trouble" occurs.	Trouble
Error with error response "TroubleQSP" occurs.	TroubleQSP

Related topics:

- ▶ [wCANControl/wMCIControl control words](#) (📖 118)

4.2.7 OperationEnabled

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
	Off	OperationEnabled	0	1	0	1

The drive controller is in this device status if the controller inhibit is deactivated and no error ("Trouble" or "TroubleQSP") has occurred.

If the operation is enabled and the magnetisation in case of servo control (SC) and sensorless vector control (SLVC) has been completed, the motor follows the setpoint determined by the active application.


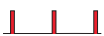
Depending on certain conditions, a status change takes place based on the "OperationEnabled" device status.

Change condition	Changeover to the device status
Control bit "EnableOperation" of a control channel = "0" OR terminal RFR = LOW level (controller inhibit).	SwitchedOn
"SwitchOn" control bit of a control channel = "0".	ReadyToSwitchOn
Undervoltage in the DC bus.	Trouble/Fault (depending on C00600/1)
Error with error response "Trouble" occurs.	Trouble
Error with error response "TroubleQSP" occurs.	TroubleQSP

Related topics:

▶ [wCANControl/wMCIControl control words](#) (📖 118)

4.2.8 TroubleQSP

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
		TroubleQSP	1	0	0	1

This device status will be active as soon as a monitoring mode responds, the error response "TroubleQSP" has been parameterised for.

- ▶ The drive is decelerated to standstill with torque within the deceleration time parameterised for quick stop independently of the defined setpoint and can be kept there.
- ▶ The device status can only be abandoned by acknowledging the error if the error cause is removed.
- ▶ When the controller is inhibited, it is possible to jump to the "[SwitchedOn](#)" status even during the error status since the controller inhibit function has a higher priority. As long as the error is pending and has not been acknowledged, the status is changed back to the "TroubleQSP" status when the controller is enabled afterwards.

Depending on certain conditions a status change takes place based on the "TroubleQSP" device status.

Change condition	Changeover to the device status
"SwitchOn" control bit of a control channel = "0".	ReadyToSwitchOn
Control bit "EnableOperation" of all control channels = "1" AND terminal RFR = HIGH level (controller enable) AND error is reset by the control bit "ResetFault" AND no more errors are pending.	OperationEnabled
Control bit "EnableOperation" of a control channel = "0" OR terminal RFR = LOW level (controller inhibit) AND error is reset by the control bit "ResetFault" AND no more errors are pending.	SwitchedOn
A message is active in the system.	Trouble

Related topics:

- ▶ [wCANControl/wMCIControl control words](#) (📖 118)
- ▶ [Basics on error handling in the controller](#) (📖 581)
- ▶ [Error messages of the operating system](#) (📖 602)

4.2.9 Trouble

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
Off		Trouble	0	1	1	1

This device status becomes active as soon as a monitoring mode responds for which the error response "Trouble" has been parameterised.

- ▶ The motor has no torque (is coasting) due to the inhibit of the inverter.
- ▶ The "Trouble" device status is automatically abandoned if the error cause has been removed.



Note!

If the "Inhibit at trouble" auto-start option has been activated in [C00142](#), explicit deactivation of the controller inhibit is required before this status can be abandoned.

Depending on certain conditions a status change takes place based on the "Trouble" device status.

Change condition	Changeover to the device status
The error cause is no longer active.	ReadyToSwitchOn
Control bit "EnableOperation" of all control channels = "1" AND terminal RFR = HIGH level (controller enable) AND the message has been cancelled.	OperationEnabled
Control bit "EnableOperation" of a control channel = "0" OR terminal RFR = LOW level (controller inhibit) AND the message has been cancelled.	SwitchedOn
In the system, there is an error configured on "TroubleQSP". AND the message has been cancelled.	TroubleQSP

Related topics:

- ▶ [wCANControl/wMCIControl control words](#) (📖 118)
- ▶ [Basics on error handling in the controller](#) (📖 581)
- ▶ [Error messages of the operating system](#) (📖 602)

4.2.10 Fault

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
Off		Fault	1	0	0	0

This device status will be active as soon as a monitoring mode responds, the error response "Fault" has been parameterised for.

- ▶ The motor has no torque (is coasting) due to the inhibit of the inverter.
- ▶ The error must explicitly be reset ("acknowledged") in order to exit the device status, e.g. by the device command "[Reset error](#)" or via the control bit "ResetFault" in the control word *wCanControl* or *wMCIControl*.

**Note!**

If an undervoltage in the DC bus of the drive controller occurs (error message "LU"), the device changes to the "[Trouble](#)" status.

An additional error of higher priority leads the device into the "[Fault](#)" status.

According to the [Device state machine](#), the device changes to the "[ReadyToSwitchOn](#)" status after acknowledging the error although the undervoltage is still available!

If the "Inhibit at fault" auto-start option has been activated in [C00142](#), explicit deactivation of the controller inhibit is required before the status can be abandoned.

Related topics:

- ▶ [wCANControl/wMCIControl control words](#) (📖 118)
- ▶ [Basics on error handling in the controller](#) (📖 581)
- ▶ [Error messages of the operating system](#) (📖 602)

4.2.11 SystemFault

LED DRIVE READY	LED DRIVE ERROR	Display in C00137	Display in status word 1 (C00150)			
			Bit 11	Bit 10	Bit 9	Bit 8
Off		SystemFault	1	0	1	1

This device status becomes active if a system fault occurs.

- ▶ The device status can only be abandoned by
 - mains switching or
 - a system restart (*in preparation*).

4.3 Automatic restart after mains connection/fault...

.../Error/undervoltage/loading of the Lenze setting

In [C00142](#), the starting performance of the controller after mains connection, undervoltage, loading of the Lenze setting as well as a "[Trouble](#)" or a "[Fault](#)" reset can be parameterised individually:

Auto-start option (C00142)		Lenze setting
Bit 0	"Inhibit at power-on" auto-start option	1 ≙ Inhibit is active
Bit 1	Inhibit at trouble	0 ≙ Inhibit is not active
Bit 2	Inhibit at fault	0 ≙ Inhibit is not active
Bit 3	Inhibit at undervoltage	1 ≙ Inhibit is active
Bit 4	Auto-start option "Inhibit at Lenze setting"	1 ≙ Inhibit is active
Bit 5	Reserved	0
Bit 6		
Bit 7		



Note!

In the Lenze setting, automatic restart after mains connection, undervoltage, and loading of the Lenze setting is inhibited.

4.3.1 "Inhibit at power-on" auto-start option

The auto-start option "Inhibit at power-on" prevents the change to the "[SwitchedOn](#)" status after mains connection if the controller is already enabled at mains connection.



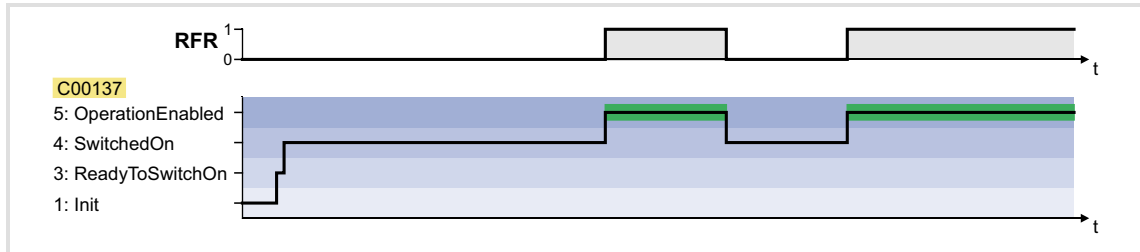
Danger!

If the "Inhibit at power-on" auto-start option has been deactivated in [C00142](#), (bit 0 = 0), the motor can directly start to run if the controller is enabled after mains connection!

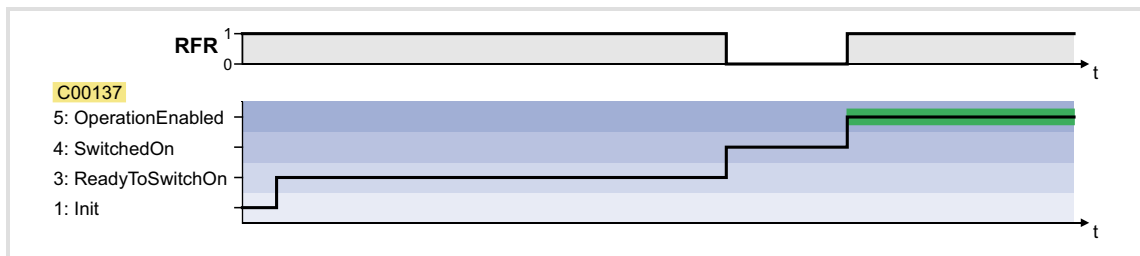
The following three cases describe the behaviour of the controller after mains connection depending on whether the controller is enabled and the set auto-start option. Here, it is assumed that after mains connection, no errors and trouble occur in the controller and the "EnableOperation" control bit in the *wDriveControl* is set to "1".

Case 1: No controller enable at mains connection

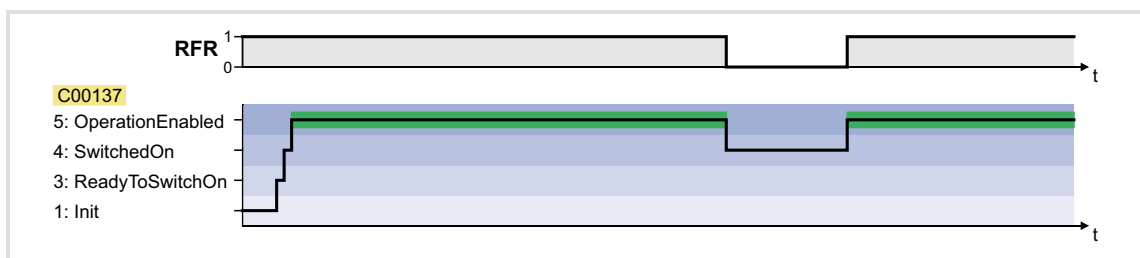
If the controller is not enabled at mains connection, the controller remains in the "[SwitchedOn](#)" status. Only with the controller enable, the status changes to the "[OperationEnabled](#)" status, independent of the set auto-start option:

**Case 2: Controller enable at mains connection and "Inhibit at power-on" activated**

If the controller is enabled at mains connection and the auto-start option "Inhibit at power-on" is activated, the controller remains in the "[ReadyToSwitchOn](#)" status. For changing to the "[SwitchedOn](#)" status, the controller enable must first be deactivated. Only when the controller is enabled again afterwards, the status changes to "[OperationEnabled](#)":

**Case 3: Controller enable at mains connection and "Inhibit at power-on" deactivated**

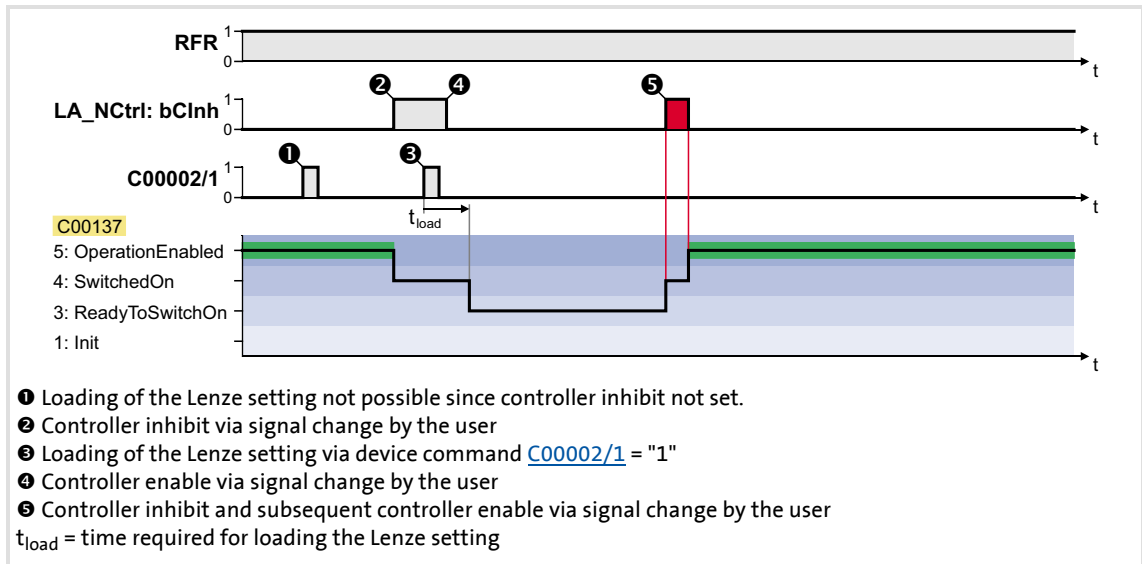
If the "Inhibit at power-on" auto-start option is deactivated in [C00142](#) (bit 0 = 0), the status first changes from "[ReadyToSwitchOn](#)" to "[SwitchedOn](#)" and then to "[OperationEnabled](#)" after mains connection with enabled controller:



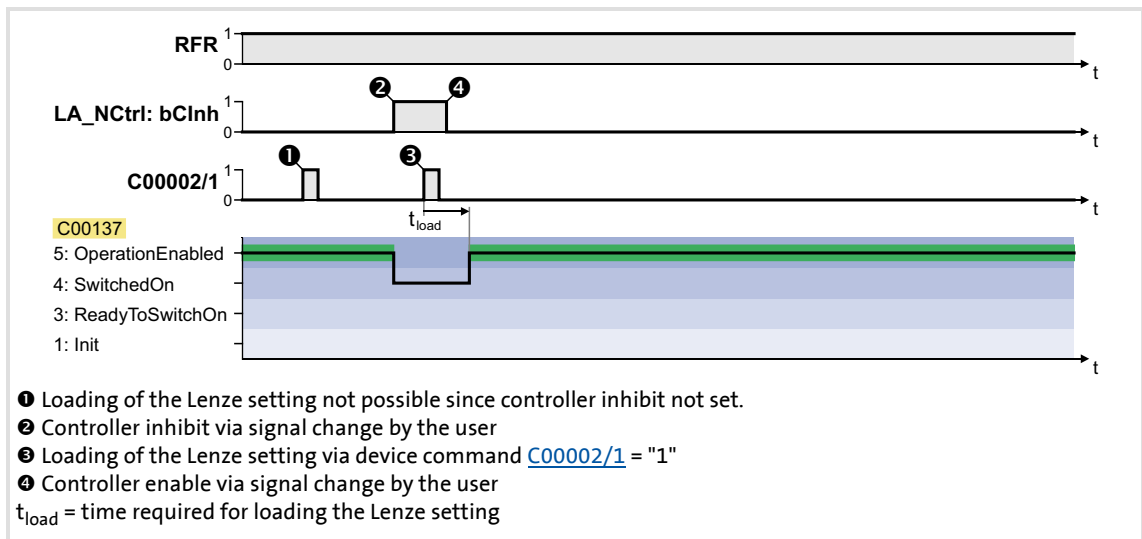
4.3.2 Auto-start option "Inhibit at Lenze setting"

The "Inhibit at Lenze setting" auto-start option configurable via bit 4 of [C00142](#) prevents the change to the "[SwitchedOn](#)" status after the Lenze setting has been loaded and the controller is enabled.

For a change to the "[SwitchedOn](#)" status, the controller enable must first be deactivated after the Lenze setting has been loaded. Only if the controller is enabled again afterwards, the status changes to "[OperationEnabled](#)":



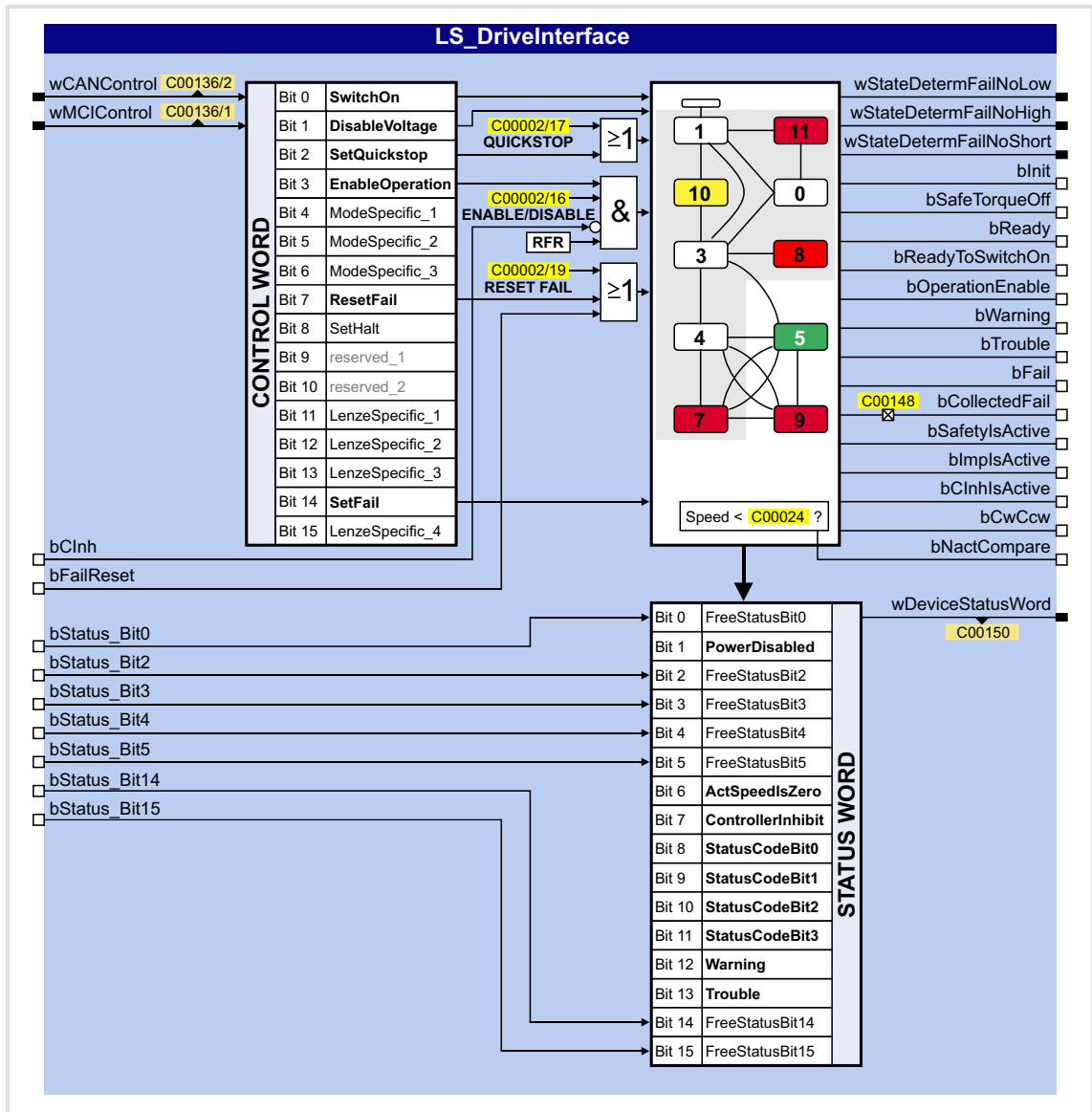
[4-2] Example 1: Behaviour with activated auto-start option "Inhibit at Lenze setting" ([C00142](#): Bit 4 = "1")



[4-3] Example 2: Behaviour with deactivated auto-start option "Inhibit at Lenze setting" ([C00142](#): Bit 4 = "0")

4.4 Internal interfaces | "LS_DriveInterface" system block

The LS_DriveInterface system block displays the device control in the FB Editor.



Inputs

Identifier <small>DIS code data type</small>	Information/possible settings				
wCANControl C00136/2 WORD	Control word via system bus (CAN) <ul style="list-style-type: none"> The controller controlled by a master control (e.g. IPC) receives its control word by the CANopen system bus interface. The process data word is provided at this input by the upstream port block LP_CanIn1. For a detailed description of the individual control bits, see chapter "wCANControl/wMCIControl control words". (□ 118) 				
wMCIControl C00136/1 WORD	Control word via communication module (e.g. PROFIBUS) <ul style="list-style-type: none"> The controller controlled by a master control (e.g. IPC) receives its control word by a plugged-in communication module. The process data word is provided at this input by the upstream port block LP_MciIn1. For a detailed description of the individual control bits, see chapter "wCANControl/wMCIControl control words". (□ 118) 				
bCInh C00833/36 BOOL	<p>▶ Enable/Inhibit controller (□ 97)</p> <table border="1"> <tr> <td>FALSE</td> <td>Enable controller: The controller switches to the "OperationEnabled" device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. </td> </tr> <tr> <td>TRUE</td> <td>Inhibit controller (controller inhibit): The controller switches to the "SwitchedOn" device status.</td> </tr> </table>	FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. 	TRUE	Inhibit controller (controller inhibit): The controller switches to the " SwitchedOn " device status.
FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. 				
TRUE	Inhibit controller (controller inhibit): The controller switches to the " SwitchedOn " device status.				
bFailReset C00833/37 BOOL	<p>▶ Reset error messages (□ 606)</p> <table border="1"> <tr> <td>FALSE</td> <td>TRUE</td> <td>The current error is reset.</td> </tr> </table>	FALSE	TRUE	The current error is reset.	
FALSE	TRUE	The current error is reset.			
bStatus_Bit0 bStatus_Bit2 bStatus_Bit3 bStatus_Bit4 bStatus_Bit5 bStatus_Bit14 bStatus_Bit15 C00833/38 ... 44 BOOL	Freely assignable bits in the status word of the controller. <ul style="list-style-type: none"> You can use these bits for returning information to the master control (e.g. IPC). 				

Outputs

Identifier <small>DIS code data type</small>	Value/meaning
wDeviceStatusWord C00150 WORD	Status word of the controller (based on DSP-402) <ul style="list-style-type: none"> The status word contains all information relevant for controlling the controller. The status word is sent as a process data word to the master control via a port block: <ul style="list-style-type: none"> –Port block LP_CanOut1 when the CANopen system bus interface is used or –Port block LP_MciOut when a plugged-in communication module is used (e.g. PROFIBUS). For a detailed description of each status bit see chapter "wDeviceStatusWord status word". (□ 119)
wStateDetermFailNoLow WORD	Display of the status determining error (32-bit error number, Low-Word) <ul style="list-style-type: none"> If the "Use 16BitFailNo" (bit 15 = "1") option is activated in C00148, the short 16-bit error number (<i>wStateDetermFailNoShort</i>) is provided via this output as well. <ul style="list-style-type: none"> –In this case, the <i>wStateDetermFailNoHigh</i> output is "0". –Advantage: The bus transfer of the error numbers is possible via a data word without changing the interconnection of the technology application.
wStateDetermFailNoHigh WORD	Display of the status determining error (32-bit error number, High-Word)
wStateDetermFailNoShort WORD	Display of the status determining error (16-bit error number)

Identifier DIS code data type	Value/meaning	
bInit BOOL	TRUE	" Init " device status is active
bSafeTorqueOff BOOL	TRUE	" SafeTorqueOff " device status is active
bReady BOOL	TRUE	" SwitchedOn " device status is active
bReadyToSwitchOn BOOL	TRUE	" ReadyToSwitchOn " device status is active
bOperationEnable BOOL	TRUE	" OperationEnabled " device status is active
bWarning BOOL	TRUE	A warning is indicated
bTrouble BOOL	TRUE	" Trouble " device state is active
bFail BOOL	TRUE	" Fault " device state is active
bCollectedFail BOOL	TRUE	Group error: A device status according to the group error configuration in C00148 has occurred, the drive is not able to follow the setpoint selection.
bSafetyIsActive BOOL	TRUE	In preparation
bImplsActive BOOL	TRUE	Pulse inhibit is active
bCInhIsActive BOOL	TRUE	Controller inhibit is active
bCwCcw BOOL	FALSE	Motor rotates in CW direction
	TRUE	Motor rotates in CCW direction
bNactCompare BOOL	TRUE	During open-loop operation: Speed setpoint < Comparison value (C00024)
		During closed-loop operation: Actual speed value < Comparison value (C00024)

Option "Lock bFail at TroubleQSP"

The [TroubleQSP](#) device status gets active as soon as a monitoring function responds that has been parameterised for the "TroubleQSP" error response. Since the *bFail* status output is not set in this case, it is not recognisable after pulse inhibit due to e.g. automatic brake operation (as well for a higher-level control), why the drive is standing und does not start when the setpoint is selected. Only after an error reset, a setpoint is accepted again.

From version 02.00.00: If the "Lock bFail at TroubleQSP" option is activated (bit 14 = "1") in [C00148](#), the *bFail* status output is also set to TRUE if the device status is [TroubleQSP](#).

4.4.1 wCANControl/wMCIControl control words

The controller is controlled by a master control (e.g. IPC) via the *wCanControl* or *wMCIControl* control word, respectively.

- ▶ *wCANControl*: Control word via system bus (CAN)
 - The process data word is provided at the *wCanControl* input via the upstream [LP CanIn1](#) port block.
 - Display parameter: [C00136/2](#)
- ▶ *wMCIControl*: Control word via a plugged-in communication module (e.g. PROFIBUS)
 - The process data word is provided at the *wMCIControl* input via the upstream [LP MciIn1](#) port block.
 - Display parameter: [C00136/1](#)
- ▶ The bit assignment for the *wCanControl/wMCIControl* control words can be seen from the table below.



Note!

The assignment of bits 11 ... 13 and bit 15 depends on the technology application selected in [C00005](#)!

- See description of the corresponding technology application.

Bit	Name	Function
Bit 0	SwitchOn	1 ≙ Change to the " SwitchedOn " device status <ul style="list-style-type: none"> • This bit must be set in the CAN AND MCI control word in order that the drive changes to the "SwitchedOn" state after main connection. In order to reach the "ReadyToSwitchOn" state, it is sufficient to set the bit to 0 in one of the two control words.
Bit 1	DisableVoltage	1 ≙ Inhibit inverter control (IMP - pulse inhibit)
Bit 2	SetQuickStop	Activate quick stop (QSP) <ul style="list-style-type: none"> ▶ Activate/Deactivate quick stop (□ 98)
Bit 3	EnableOperation	1 ≙ Enable controller (RFR) <ul style="list-style-type: none"> • This bit must be set in CAN AND in the MCI control word, otherwise the controller will be inhibited.
Bit 4	ModeSpecific_1	Reserved (currently not assigned)
Bit 5	ModeSpecific_2	
Bit 6	ModeSpecific_3	
Bit 7	ResetFault	1 ≙ Reset fault (trip reset) <ul style="list-style-type: none"> • Acknowledge fault message (if the error cause has been eliminated).
Bit 8	SetHalt	1 ≙ Activate stop function <ul style="list-style-type: none"> • Stop drive via stopping ramp (in preparation).
Bit 9	reserved_1	Reserved (currently not assigned)
Bit 10	reserved_2	
Bit 11	LenzeSpecific_1	Assignment depends on the selected technology application <ul style="list-style-type: none"> • See description of the corresponding technology application.
Bit 12	LenzeSpecific_2	
Bit 13	LenzeSpecific_3	
Bit 14	SetFail	1 ≙ Set error (trip set)
Bit 15	LenzeSpecific_4	Assignment depends on the selected technology application <ul style="list-style-type: none"> • See description of the corresponding technology application.

**Tip!**

If a bus control is not wanted (e.g. in case of control via terminals):

Connect both control word inputs with the *wDriveCtrl* output signal of the [LS ParFix](#) system block. This output signal has the fixed value "9", which corresponds to the following assignment:

- Bit 0, SwitchOn = 1
- Bit 3, EnableOperation = 1
- All others: 0

4.4.2 wDeviceStatusWord status word

The *wDeviceStatusWord* status word provided by the control system contains all information relevant for controlling the controller.

- ▶ The status word is sent as a process data word to the master control via a port block:
 - The **LP_CanOut1** port block if "CAN on board" is used or
 - the **LP_MciOut1** port block if a plugged-in communication module is used (e.g. PROFIBUS).
- ▶ Display parameter: [C00150](#)
- ▶ The bit assignment of the *wDeviceStatusWord* status word can be seen from the table below.

Bit	Name	Status
Bit 0	FreeStatusBit0	Free status bit 0
Bit 1	PowerDisabled	1 ≙ Inverter control inhibited (pulse inhibit is active)
Bit 2	FreeStatusBit2	Free status bit 2 (not assigned, freely assignable)
Bit 3	FreeStatusBit3	Free status bit 3 (not assigned, freely assignable)
Bit 4	FreeStatusBit4	Free status bit 4 (not assigned, freely assignable)
Bit 5	FreeStatusBit5	Free status bit 5 (not assigned, freely assignable)
Bit 6	ActSpeedIsZero	During open-loop operation: 1 ≙ Speed setpoint < Comparison value (C00024) During closed-loop operation: 1 ≙ Actual speed value < Comparison value (C00024)
Bit 7	ControllerInhibit	1 ≙ Controller inhibited (controller inhibit is active)
Bit 8	StatusCodeBit0	Bit coded display of the active device status ▶ Device state machine and device statuses (see table [4-1])
Bit 9	StatusCodeBit1	
Bit 10	StatusCodeBit2	
Bit 11	StatusCodeBit3	
Bit 12	Warning	1 ≙ A warning is indicated
Bit 13	Trouble	1 ≙ Controller is in the " Trouble " device status • E.g. if an overvoltage has occurred.
Bit 14	FreeStatusBit14	Free status bit 14 (not assigned, freely assignable)
Bit 15	FreeStatusBit15	Free status bit 15 (not assigned, freely assignable)

5 Motor control (MCTRL)

This chapter provides information on the parameter setting of the controller's internal motor control. The 8400 TopLine controller both supports synchronous and asynchronous motors.

Topics:

Basic settings:

- ▶ [Motor selection/Motor data](#)
- ▶ [Selecting the control mode](#)
- ▶ [Defining current and speed limits](#)
- ▶ [Pole position identification \(PPI\)](#)

Description of the motor control types:

- ▶ [V/f characteristic control \(VFCplus\)](#)
- ▶ [V/f characteristic control - energy-saving \(VFCplusEco\)](#)
- ▶ [V/f control \(VFCplus + encoder\)](#)
- ▶ [Sensorless vector control \(SLVC\)](#)
- ▶ [Sensorless control for synchronous motors \(SLPSM\)](#)
- ▶ [Servo control \(SC\)](#)

Parameterisable additional functions:

- ▶ [Selection of switching frequency](#)
- ▶ [Operation with increased rated power](#)
- ▶ [Correction of the stator leakage inductance...](#)
- ▶ [Flying restart function](#)
- ▶ [DC-injection braking](#)
- ▶ [Slip compensation](#)
- ▶ [Oscillation damping](#)
- ▶ [Phase sequence reversal for correcting misconnected UVW motor phases](#)
- ▶ [Field weakening for synchronous motors](#)

Further topics:

- ▶ [Position control/additive speed specification](#)
- ▶ [Braking operation/brake energy management](#)
- ▶ [Monitoring](#)

Internal interfaces (process signals):

- ▶ [Internal interfaces | system block "LS_MotorInterface"](#)
- ▶ [Internal status signals | system block "LS_DeviceMonitor"](#)

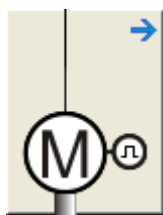
5.1 Motor selection/Motor data

The motor data term comprises all parameters that only depend on the motor and that only characterise the electrical behaviour of the machine. The motor data are independent of the application in which the controller and the motor are used.



Proceed as follows to open the dialog for parameterising the motor data:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the following button:



Parameterisation dialog in the »Engineer«

- ▶ Via the **From Motor Catalogue** button, the motor catalogue can be opened to select another motor. ▶ [Selecting a motor from the motor catalogue in the »Engineer«](#) (124)
- ▶ Via the **From drive...** button, the motor data set in the controller can be copied to the »Engineer« when an online connection has been established.
- ▶ When an online connection has been established to the controller, the **Identification in progress...** button serves to automatically identify different motor data. ▶ [Automatic motor data identification](#) (126)
- ▶ The **Encoder/feedback system...** serves to get to the settings for the encoder/feedback system, if available. ▶ [Encoder/feedback system](#) (293)



Note!

Sensorless vector control (SLVC) and sensorless control for synchronous motors (SLPSM) in particular requires the motor data parameters to be set. The motor data comprise the data of the motor nameplate and the data of the motor equivalent circuit.

If the motor has been selected via the motor catalogue of the »Engineer« or the motor data have been adapted offline using the »Engineer«, all motor data must then be copied to the controller and saved power-failure-proof to the memory module (device command: [C00002/11](#)) when an online connection has been established.

If the motor has a rated motor frequency with decimal position (e.g. motor nameplate data "23.7 Hz"), the following motor nameplate data must be increased by the factor 10:

- [C00089](#): Rated motor frequency
- [C00081](#): Rated motor power
- [C00087](#): Rated motor speed
- [C00090](#): Rated motor voltage

With a rated motor frequency of "23.7 Hz", for instance 237 Hz must be set in [C00089](#).

Motor data

In the parameterisation dialog, the data of the motor nameplate for the selected motor are displayed under "Motor data".

Parameter	Info
C00081	Rated motor power
C00087	Rated motor speed
C00088	Rated motor current
C00089	Rated motor frequency
C00090	Rated motor voltage
C00091	Motor cos φ

Actual values

When an online connection to the controller has been established, the following actual values are displayed in the parameterisation dialog under "Actual values":

Parameter	Info
C00051	Actual speed value
C00052	Motor voltage
C00053	DC-bus voltage
C00054	Motor current
C00066	Thermal motor load (I2xt)

Highlighted in grey = display parameter

Adapting motor data manually

If a third party manufacturer's motor is used, the displayed motor data can exactly be adapted to the real motor by clicking the **From project...** button and selecting the "Own motor settings" entry from the **Motor selection** dialog box afterwards. For this purpose, the data of the motor nameplate and the equivalent circuit diagram must be available.



Tip!

For a better concentricity factor, we recommend to perform motor parameter identification of the third party manufacturer's motor first. The motor parameters can be manually adapted afterwards.

Improving the concentricity factor includes

- the adjustment of the inverter error characteristic to the drive system and
- the knowledge of the motor cable resistance.

Both factors are determined in the course of motor parameter identification.

▶ [Automatic motor data identification](#) (126)

Other motor data

Click the **Other motor data...** button and go to the *Other motor data* dialog box including the motor equivalent circuit (in the following for an asynchronous motor):

The screenshot shows the 'Other motor data' dialog box with the following parameters and values:

- Motor stator resistance: 43000 mOhm
- Motor stator leakage inductance: 172.60 mH
- Motor rotor resistance: 86600 mOhm
- Motor magnetising current: 0.35 A
- Motor magnetising inductance: 879.0 mH
- VfC: V/f base frequency: 100.0 Hz
- Slip comp.: 10.00 %
- SLVC: Vp speed controller: 10.93
- SLVC: Ti speed controller: 100.0 ms
- Vp current controller: 345.20 V/A
- Ti current controller: 4.01 ms
- SC: Moment of inertia: 0.41 kg c

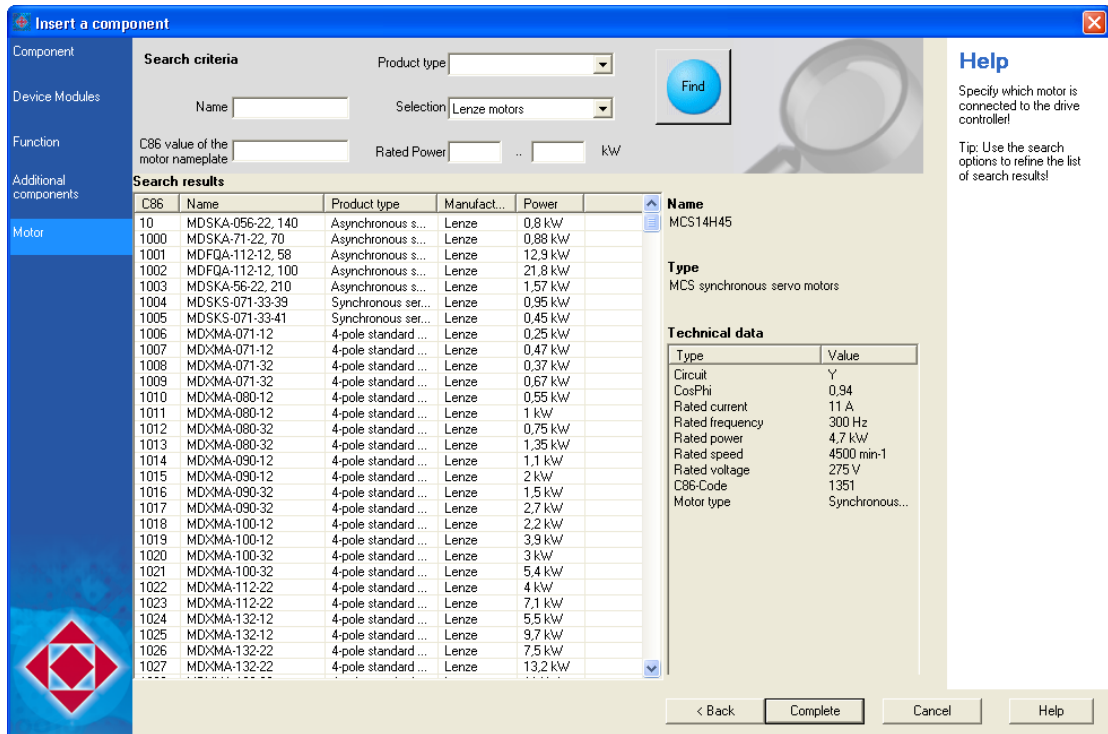
The equivalent circuit diagram shows a series combination of a resistor (stator resistance), an inductor (stator leakage inductance), a parallel combination of an inductor (magnetising inductance) and a resistor (rotor resistance), and another resistor (rotor resistance).

Parameter	Info	ASM	PSM
C00084	Motor stator resistance	●	●
C00085	Motor stator leakage inductance	●	●
C00082	Motor rotor resistance	●	
C00095	Motor magnetising current	●	
C00092	Motor magnetising inductance	●	
C00015	VfCplus: V/f base frequency	●	
C00021	Slip compensation	●	

Parameter	Info	ASM	PSM
C00070	SLVC: Vp speed controller	●	
C00071	SLVC: Ti speed controller	●	
C00075	Vp current controller	●	●
C00076	Ti current controller	●	●
C00273	Moment of inertia	●	●

5.1.1 Selecting a motor from the motor catalogue in the »Engineer«

If a checkmark is set in the **Motor** control field in the "Other components" dialog when the controller is inserted into the project, the motor for the controller can be selected from the motor catalogue in another dialog:



- ▶ Alternatively, the motor can be inserted into the project at a later time via the **Insert a component** command.
- ▶ Go to the **Application parameters** tab in the *Overview* → *Motor data* dialog level and click the **From motor catalogue...** button to also reach the motor catalogue for the selection of another motor.

Accepting the default values of the motor

If a motor is selected from the motor catalogue at a later time, the *Use motor's default values* dialog box is displayed afterwards which includes all motor data of the selected motor. Please select here which of the default values are to be copied to the controller:

Controller: 8400 HighLine C V04.00.00 [8400 HighLine C V04.00.00]
 Motor: SD5GA047-22, 100 [Y]

Motor parameter

Use selection of motor controller in C0006: No default value available for this motor

Use following values in drive controller:

Code	Subcode	Description	Value	Unit
0015	000	VFC: V/f base frequency	100	Hz
0016	000	VFC: rpm boost	4.93	%
0021	000	Slip comp.	10	%
0073	001	VFC: Vp Imax controller	1.45	
0075	000	Vp current controller	345.2	V/A
0076	000	Ti current controller	4.01	ms
0077	000	SC: Vp field controller	1.22	
0078	000	SC: Ti field controller	24.5	ms
0081	000	Rated motor power	0.08	kW
0082	000	Motor rotor resistance	86600	mOhm

Path parameters for operation with zero load

Use following values in drive controller:

Code	Subcode	Description	Value	Unit
0022	000	Imax in motor mode	0.95	A
0070	001	SLVC: Vp speed controller	10.93	
0070	002	SC: Vp speed controller	6.25	
0071	001	SLVC: Ti speed controller	100	ms
0071	002	SC: Ti speed controller	50	ms
0072	000	SC: Tdn speed controller	0	ms
0273	000	SC: Moment of inertia	0.41	kg cm ²

OK

- ▶ The listed motor parameters are already optimally preset for the selected Lenze motor. An adaptation is not required.
- ▶ The "plant parameter" term comprises all parameters that result from the combination of motor and load. These characterise the transfer behaviour of the entire controlled system.
 - The plant parameters depend on the application in which the controller and motor are used.
 - When a Lenze motor is selected in the »Engineer«, plant parameters are suggested for this motor for a load-free operation.

Tip!

If a third party manufacturer's motor is used, select a Lenze motor from the motor catalogue first which is similar in terms of current, voltage and speed rating. Adapt the preselected motor data exactly to the real motor afterwards.

5.1.2 Automatic motor data identification

Via the motor parameter identification, the inverter characteristic, the influences of the motor cable, and the motor parameters listed in the table below can be identified automatically:

Parameter	Info	ASM	PSM
C00015	V/f base frequency	●	
C00016	V _{min} boost	●	
C00021	Slip compensation	●	
C00082	Motor rotor resistance	●	
C00083	Motor rotor time constant	●	
C00084	Motor stator resistance	●	●
C00085	Motor stator leakage inductance	●	●
C00092	Motor magnetising inductance	●	
C00095	Motor magnetising current	●	

For the execution of the motor parameter identification, two modes are available in [C02867/1](#):

- ▶ "1: Basic identification"
 - Only for asynchronous motors
 - Duration approx. 30 s
- ▶ "2: extended identification"
 - Stands out due to increased accuracy of the determined motor parameters.
 - Also supports synchronous motors and asynchronous motors with a power of more than 11 kW.
 - Duration approx. 80 s



Tip!

In the Lenze setting, a setting of "0: automatic" is selected in [C02867/1](#). This setting ensures that the controller automatically selects the optimum procedure for motor parameter identification.

**Danger!**

During motor parameter identification, the motor is energised via the outputs U, V and W of the controller!

Observe the corresponding safety instructions!

**Stop!**

- If motor parameter identification is aborted, unstable drive behaviour may be the result!
- The following applies to the motor parameter identification of synchronous motors:
 - Only the extended motor parameter identification can be used.
 - During the motor parameter identification, the shaft of the synchronous motor must rotate freely (must not be locked).
 - During motor parameter identification, rotations take place.
- For asynchronous motors as of a power of 11 kW, the following applies:
 - Only the extended motor parameter identification can be used.
- When the extended motor parameter identification is started, it is decided based on the motor control selected in [C00006](#) whether an asynchronous motor or a synchronous motor is to be identified.
 - Thus, set a suitable motor control for the motor in [C00006](#) before starting the extended motor parameter identification! ▶ [Selecting the control mode](#) (131)

**Note!**

- We strongly recommend motor parameter identification before the initial commissioning of the sensorless vector control (SLVC) and the sensorless control for synchronous motors (SLPSM).
- The motor parameter identification must be carried out when the motor is cold!
- The load machine may remain connected. Holding brakes, if present, may remain in the braking position.
- With an idling motor, a small angular offset may occur at the motor shaft.
- The amplitude of the rated motor current ([C00088](#)) is injected to identify the stator resistance. If the rated motor current amounts to less than 60 % of the rated inverter current, at least 60 % of the rated inverter current will be injected to ensure sufficient motor parameter identification accuracy.

Preconditions

The motor parameters listed in the table below are excluded from automatic identification and must therefore be adapted to the used motor before motor parameter identification is carried out (see motor nameplate).

Parameter	Info
C00081	Rated motor power
C00087	Rated motor speed
C00088	Rated motor current
C00089	Rated motor frequency
C00090	Rated motor voltage
C00091	Motor $\cos \varphi$

Furthermore, the available motor cable must be specified in terms of length and cross-section:

Parameter	Info
C00915	Motor cable length
C00916	Motor cable cross-section

Sequence of the motor parameter identification

1. The motor stator resistance ([C00084](#)) is measured.
2. The inverter error characteristic is measured.
3. The motor stator leakage inductance ([C00085](#)) is measured

For asynchronous motors only:

4. The motor magnetising inductance ([C00092](#)) and the motor rotor resistance ([C00082](#)) are measured.
5. The motor magnetising current ([C00095](#)) is measured.
6. The V/f base frequency ([C00015](#)) is calculated.
7. Slip compensation ([C00021](#)) is calculated.
8. V_{\min} boost ([C00016](#)) is detected.

Optimising motor parameter identification

For the measurement of the required variables, the motor is energised via the controller terminals U, V and W during the motor parameter identification.

The corresponding current controller can be set via the following parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C00075	Vp current controller	7.00	V/A
C00076	Ti current controller	10.61	ms

In the Lenze setting, the current controller is preset in such a way that an optimum controller behaviour is obtained for an asynchronous motor with power adaptation to the controller.



Note!

The motor parameter identification can be aborted in the following cases:

- If a special motor (e.g. mid-frequency motor) or a servo motor is used.
- If there is a large deviation between inverter and motor power.

In this case we recommend (with the simple motor parameter identification):

- to reduce the P component Vp of the current controller ([C00075](#)) e.g. by halving.
- to increase the time constant Ti of the current controller ([C00076](#)) e.g. by doubling.

With the extended motor parameter identification, the current controller parameters are determined automatically. If the identification is aborted all the same, the current controller parameters set in [C00075](#) and [C00076](#) can be used by parameterising [C02866](#) to "1".

Another cause for the abort of the motor parameter identification could be the implausibility of the entered nameplate data, e.g. the entry P = 0 kW for the motor power.



How to carry out automatic motor parameter identification:

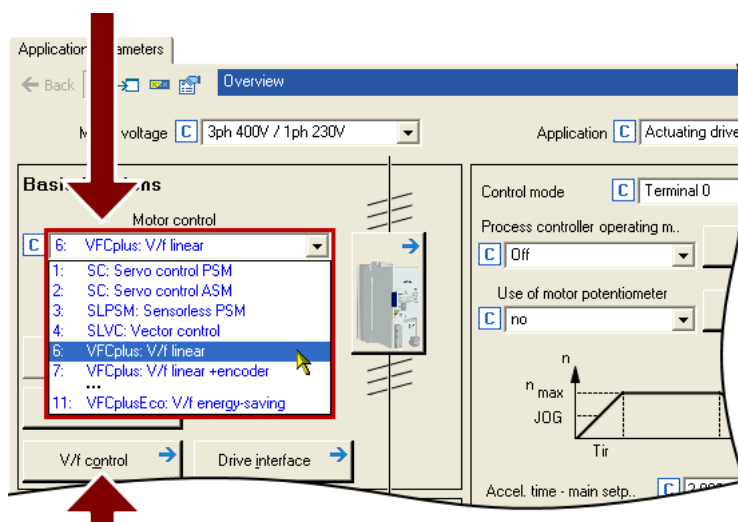
1. Inhibit the controller if it is enabled, e.g. via the [C00002/16](#) device command or a LOW signal at the X5/RFR terminal.
 - For executing the motor parameter identification, the controller must be in the "[SwitchedOn](#)" status.
2. Wait until the drive is at standstill.
3. Ensure that a motor control suitable for the motor is set in [C00006](#).
4. Transfer the nameplate data to the following codes:
 - [C00081](#): Rated motor power
 - [C00087](#): Rated motor speed
 - [C00088](#): Rated motor current (according to the connection method Υ/Δ)
 - [C00089](#): Rated motor frequency (according to the connection method Υ/Δ)
 - [C00090](#): Rated motor voltage (according to the connection method Υ/Δ)
 - [C00091](#): Motor $\cos \varphi$
5. Defining the motor cable length and motor cable cross-section:
 - [C00915](#): Motor cable length
 - [C00916](#): Motor cable cross-section

The resulting motor cable resistance is displayed in [C00917](#).
6. Activate motor parameter identification via the [C00002/23](#) = "1: On / start" device command.
7. Enable the controller again.
 - The controller changes to the "[MotorIdent](#)" device status.
 - Motor parameter identification starts.
 - The progress of the identification run can be seen in [C00002/23](#).
 - The identification is completed if the "0: Off / ready" message is displayed in [C00002/23](#).
 - After successful identification, it changes back to the "[SwitchedOn](#)" device status.
8. Inhibit controller again.

5.2 Selecting the control mode

The 8400 TopLine controller supports various modes for motor control (open loop or closed loop).

- ▶ V/f characteristic control (VFCplus) with linear characteristic for asynchronous motors is preset.
- ▶ The control mode can be selected in the »Engineer« on the **Application parameter** tab via the **Motor control (C00006)** list field:



- ▶ A click on the **Motor control...** button leads you to the parameterisation dialog of the selected motor control. (The button is labelled according to the selected motor control.)



Tip!

In order to make the selection of the motor control easier, we provide a selection help with recommendations and alternatives for standard applications in the subchapter entitled "[Selection help](#)". (135)

The following section briefly describe the control modes. A reference to more details can be found at the end of each section.

V/f characteristic control (VFCplus)

The V/f characteristic control (VFCplus) is a motor control mode for standard frequency inverter applications based on a simple and robust control process which is suitable for the operation of asynchronous motors with linear or square-law load torque characteristic (e.g. fans). Furthermore, this motor control mode is also suitable for group drives and special motors. Due to the low parameterisation effort, commissioning of such applications is fast and easy.

The V_{\min} -boost ([C00016](#)) and slip compensation ([C00021](#)) required for optimising the drive behaviour are dimensioned for asynchronous motors with power adaptations to the inverter in the Lenze setting.

▶ [V/f characteristic control \(VFCplus\)](#) (□ 147)

V/f characteristic control - energy-saving (VFCplusEco)

In contrast to the V/f characteristic control mode (VFCplus), this motor control mode uses a $\cos\phi$ control in partial load operational range to automatically reduce the power loss in the asynchronous motor (energy optimisation).

The motor data required for the $\cos\phi$ control and the V_{\min} boost ([C00016](#)) and slip compensation ([C00021](#)) required for optimising the drive behaviour are dimensioned for asynchronous motors with power adaptations to the inverter in the Lenze setting.

The required motor data (motor rotor resistance, motor stator resistance, motor stator leakage inductance and mutual motor inductance) only affect the extent of energy optimisation but not the stability.

In case of applications with dynamically very high sudden load variations from the unloaded operation, this motor control mode should not be used since a motor stalling cannot be excluded.

Energy optimisation for dynamic applications is not possible with this motor control mode.

▶ [V/f characteristic control - energy-saving \(VFCplusEco\)](#) (□ 166)

V/f control (VFCplus + encoder)

The V/f control can be selected for operating asynchronous motors with speed feedback. With this motor control, a slip regulator can be additionally parameterised which adjusts the actual speed value dynamically to the speed setpoint.

▶ [V/f control \(VFCplus + encoder\)](#) (□ 176)

Sensorless vector control (SLVC)

Sensorless (field-oriented) vector control for asynchronous motors is based on a decoupled, separate control for the torque-producing and the field-producing current component. In addition, the actual speed is reconstructed by means of a motor model so that a speed sensor is not required.

In comparison to the V/f characteristic control without feedback, the following can be achieved by means of sensorless vector control SLVC:

- ▶ A higher maximum torque throughout the entire speed range
- ▶ A higher speed accuracy
- ▶ A higher concentricity factor
- ▶ A higher level of efficiency
- ▶ The implementation of torque-actuated operation with speed limitation
- ▶ The limitation of the maximum torque in motor and generator mode for speed-actuated operation



Tip!

If a high torque without feedback is to be provided at small speeds, we recommend the "Sensorless vector control" motor control mode.

▶ [Sensorless vector control \(SLVC\)](#) (📖 182)

Sensorless control for synchronous motors (SLPSM)

This sensorless control enables an encoderless control of synchronous motors. The process is based on field-oriented control within a higher speed range (e.g. > 10 % of the rated motor speed). The actual speed value and rotor position are reconstructed via a motor model.

Standard applications for this control type are pumps and fans, horizontal materials handling and simple positioning technology.

▶ [Sensorless control for synchronous motors \(SLPSM\)](#) (📖 198)

Servo control (SC)

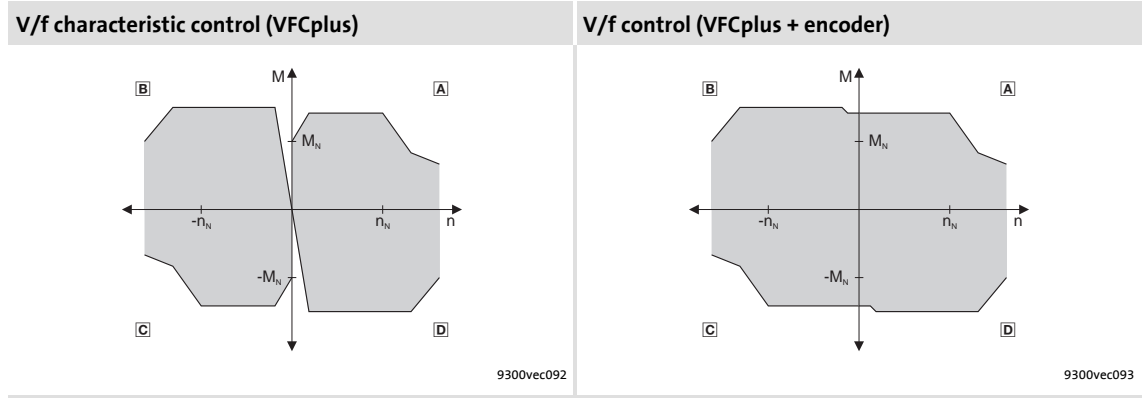
Field-oriented servo control (SC) is based on a decoupled, separate control of the torque-producing and the field-producing current component. The motor control is based on a field-oriented, cascaded controller structure with feedback function and enables dynamic and stable operation in all of the four quadrants.

The servo control can be used for synchronous motor (PSM) and asynchronous motors (ASM) and basically offers the same advantages as the sensorless vector control (SLVC).

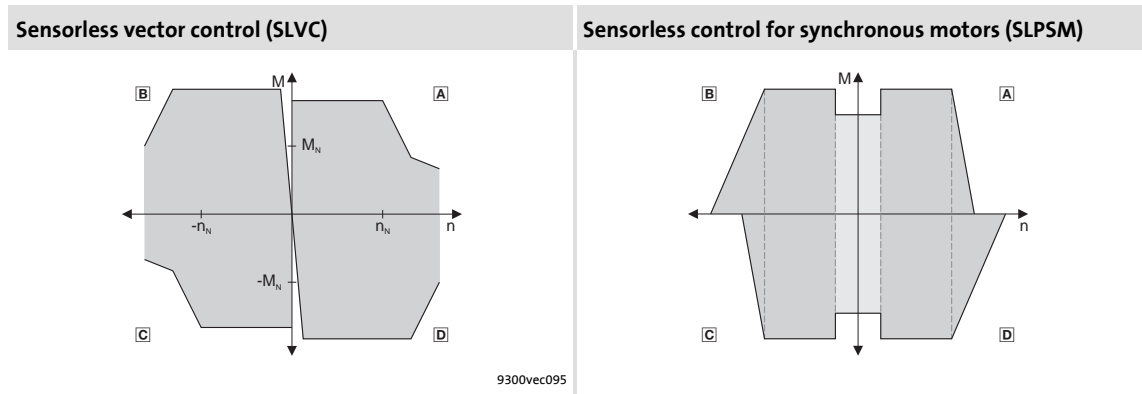
▶ [Servo control \(SC\)](#) (📖 214)

Speed feedback

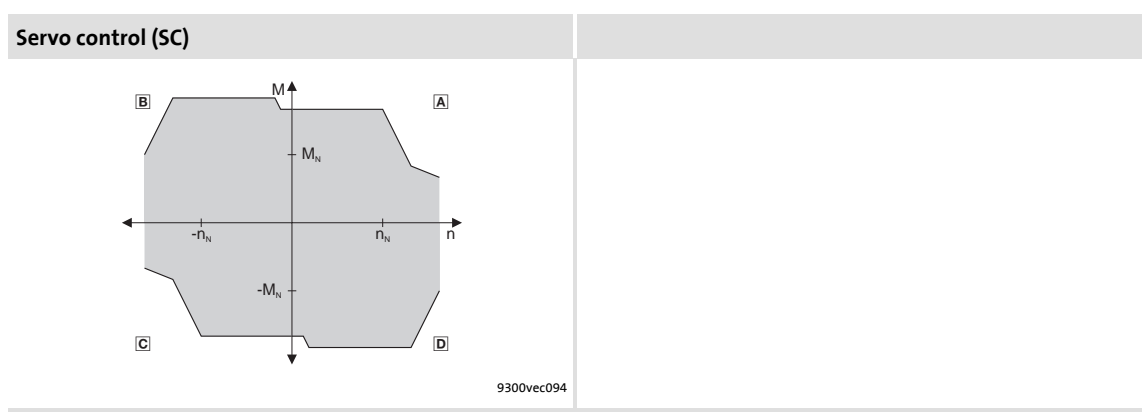
As shown in the following graphics, the drive systems with feedback have, independently of the motor control, more advantages than systems without feedback.



A Operation in motor mode (CW rotation), B Operation in generator mode (CCW rotation),
C Operation in motor mode (CCW rotation), D Operation in generator mode (CW rotation)



A Operation in motor mode (CW rotation), B Operation in generator mode (CCW rotation),
C Operation in motor mode (CCW rotation), D Operation in generator mode (CW rotation)



A Operation in motor mode (CW rotation), B Operation in generator mode (CCW rotation),
C Operation in motor mode (CCW rotation), D Operation in generator mode (CW rotation)

5.2.1 Selection help

To ease the selection of the motor control mode, the two following tables contain recommendations and alternatives to standard applications.

Application	recommended	Alternatively
Single drives		
With constant load	VFCplus: V/f linear	SLVC or SLPSM
With extremely alternating loads	VFCplus: V/f linear	SLVC
With high starting duty	SLVC	VFCplus: V/f linear
Torque limitation	SLVC	SLPSM
With torque limitation (power control)	VFCplus: V/f linear	SLPSM
Three-phase reluctance motor	VFCplus: V/f linear	-
Three-phase sliding rotor motor	VFCplus: V/f linear	-
Three-phase AC motors with permanently assigned frequency/voltage characteristic	VFCplus: V/f linear	-
Pump and fan drives with quadratic load characteristic	VFCplusEco	SLVC or SLPSM
Simple hoists	VFCplus: V/f linear	-
Group drives (several motors connected to controller)		
Identical motors and loads	VFCplus: V/f linear	-
Different motors and/or alternating loads	VFCplus: V/f linear	-

[5-1] Standard applications without speed feedback

Application	recommended	Alternatively
Single drives		
With constant load	SC	VFCplus / SLVC
With extremely alternating loads	SC	VFCplus / SLVC
With high starting duty	SC	VFCplus / SLVC
With speed control (speed feedback)	SC	VFCplus
With high dynamic performance e.g. for positioning and infeed drives	SC	-
Torque limitation	SC	SLVC
With torque limitation (power control)	-	-
Winder with dancer position control	SC	VFCplus
Unwinder with dancer position control	SC	VFCplus
Three-phase reluctance motor	-	-
Three-phase sliding rotor motor	-	-
Three-phase AC motors with permanently assigned frequency/voltage characteristic	-	-
Pump and fan drives with quadratic load characteristic	-	-
Simple hoists	VFCplus: V/f linear	-
Group drives (several motors connected to controller)		
Identical motors and loads	VFCplus	-
Different motors and/or alternating loads	-	VFCplus

[5-2] Standard applications with speed feedback

5.3 Defining current and speed limits

Limitation of the speed setpoint

Parameterising the reference speed in [C00011](#) means that the drive must rotate at the set speed if a speed setpoint of 100% is specified.

All speed setpoint selections are provided in % and always refer to the reference speed set in [C00011](#).



Tip!

For reasons of achievable resolution and the accuracy involved, the reference speed should be geared to the speed range required for the respective application.

Lenze recommendation: Reference speed ([C00011](#)) = 1500 ... 3000 rpm

Irrespective of the selected motor control, there are more limitation options:

Parameter	Info	Lenze setting	
		Value	Unit
C00909/1	Max. positive speed	120	%
C00909/2	Max. negative speed	120	%
C00910/1	Max. positive output frequency	1000	Hz
C00910/2	Max. negative output frequency	1000	Hz



Note!

In the torque-controlled operation (*bTorquemodeOn* = TRUE), the limitation of the speed setpoint does not have any effect! In this case, a permissible speed range can be defined via speed limitation (*nSpeedHighLimit* and *nSpeedLowLimit*).

Current limitation in motor and generator mode

In the various motor control modes, the controller is provided with functions which determine the dynamic behaviour under load and counteract exceedance of the maximum current in motor or generator mode.

Parameter	Info	Lenze setting	
		Value	Unit
C00022	I _{max} in motor mode	47.00	A
C00023	I _{max} in generator mode • 100 % ≙ I _{max} in motor mode (C00022)	100	%

The current limits must be selected depending on

- ▶ the permissible maximum current of the motor → recommendation: $I(\text{Mot})_N < 1.5 \dots 2.0$
- ▶ the permissible maximum current of the inverter
- ▶ the torque in motor/generator mode required for the application



Note!

Highly dynamic applications

(that have e.g. too short acceleration/deceleration times or excessively changing loads)

The overcurrent disconnection may respond (fault message OC1 or OC11) if the setting of the maximum current in motor mode in [C00022](#) approximately corresponds to the maximum permissible value of the respective inverter.

Remedies:

- Increase of the acceleration and deceleration ramp times
- Reduction of the maximum current in motor mode ([C00022](#))
- Reduction of the maximum current in generator mode ([C00023](#))
- Adaptation of the indirect peak current limitation (procedure depends on the selected motor control mode, see below)
- Reduction of the reset time of the current limiting controller ([C00074/1](#))

Influencing the torque in motor/generator mode

The torque in motor and generator mode can be limited via the *nTorqueMotLim* and *nTorqueGenLim* process signal inputs.

- If V/f characteristic control (VFCplus) is selected, limitation is indirectly performed via a so-called I_{max} controller.
- If sensorless vector control (SLVC), sensorless control for synchronous motors (SLPSM) or servo control (SC) is selected, limitation has a direct effect on the torque-producing current component.

If keypad control is selected, the *nTorqueMotLim* and *nTorqueGenLim* process signals can be parameterised via [C00728/1...2](#).



How to adapt the peak current limitation:

V/f characteristic control (VFCplus):

- Reduce the slip compensation with [C00021](#).

V/f control (VFCplus + encoder):

- Reduce the slip limitation to twice the rated motor slip with [C00971](#).
- Reduce the V_{\min} boost in [C00016](#).

Sensorless vector control (SLVC):

- Reduce the slip compensation with [C00021](#).
- Reduce the limitation of the torque in motor mode via $nTorqueMotLimit_a$ ([C00728/1](#)) and the limitation of the torque in generator mode via $nTorqueGenLimit_a$ ([C00728/2](#)).

Servo control (SC):

- Reduce the jerk limitation with [C00274](#).
- Reduce the limitation of the torque in motor mode via $nTorqueMotLimit_a$ ([C00728/1](#)) and the limitation of the torque in generator mode via $nTorqueGenLimit_a$ ([C00728/2](#)).

5.4 Pole position identification (PPI)



Note!

Only required:

- For servo control with synchronous motor of a third-party manufacturer.
- For servo control with synchronous motor and use of incremental encoders (TTL or sin/cos encoders as well as multi-pole pair resolvers).
- After changes of the motor feedback system, e.g. encoder exchange.

For the sensorless control of synchronous motors (SLPSM), a pole position identification is not required.

For the control of permanent-magnet synchronous machines, the pole position – the angle between the motor phase U and the field axis of the rotor – must be known.

- ▶ For Lenze motors with absolute value encoder or resolver, the pole position is already set correctly in [C00926/1...2](#).
- ▶ When incremental encoders (TTL or sin/cos encoders) are used, a pole position identification (PPI) is always required after mains switching, even with Lenze motors.
- ▶ The controller can also evaluate multi-pole-pair resolvers.
 - When the number of motor pole pairs is an integer multiple of the number of pole pairs of the resolver, a pole position identification must only be executed once.
 - When the number of motor pole pairs is no integer multiple of the number of pole pairs of the resolver, a pole position identification must be executed after every mains switching.
- ▶ The device command "Identify pole position (360°)" serves to detect the pole position for the motor encoder currently activated in [C00495](#) (see the following instructions).

5.4.1 Pole position identification 360°

Procedure for "pole position identification 360°"

If all conditions are met, the motor is energised with a direct current corresponding to the lower of the following two values:

$$\sqrt{2} \cdot \text{Rated device current}$$

or

$$\sqrt{2} \cdot \text{Rated motor current}$$

- ▶ The rotor is aligned through the current flow. This is absolutely necessary for the procedure.
- ▶ To ensure that the torque-neutral axis is not accidentally energised and the rotor stops, a 45° current vector is (electrically) generated for a short instant and then (electrically) switched back to 0° (≡ phase U).
 - Then a DC current of the above-mentioned value could be measured in this motor phase.
- ▶ If a resolver or an optical encoder without absolute track is used, the difference between the preselected current angle and the mechanical rotor angle is determined. After this, the current vector is (electrically) turned by another 22.5° and the difference between current angle and rotor angle is determined once again.
 - The procedure is repeated 16 times. This corresponds to one electrical revolution. The machine rotates by 360° (mech.)/pole pair number.
 - Take the average value of the 16 measurements to compensate for asymmetries.

Adjustment of the pole position identification 360°

The pole position identification can be adjusted to the respective machine and the prevailing moments of inertia by means of the parameters described below:

Parameter	Info	Lenze setting	
		Value	Unit
C00644/1	PLI 360° traversing direction	right rotating field	
C00645/2	PLI 360° max. error tolerance	0.0	°
C00646/2	PLI 360° current amplitude	100	%
C00647/2	PLI 360° ramp time	100	%

- ▶ The current amplitude can be adjusted proportionally in [C00646/2](#).
 - For large machines and high mass inertia values or for linear direct drives, the current amplitude usually has to be increased.
 - The Lenze setting "100 %" corresponds to the smaller of the two following values:

$$\sqrt{2} \cdot \text{Rated device current}$$

or

$$\sqrt{2} \cdot \text{Rated motor current}$$



Stop!

If there is no temperature monitoring in the motor and/or the I2xt motor monitoring and the maximum current monitoring are not parameterised correctly, the motor may be permanently damaged when the current amplitude is set too high (e.g. to the maximum value)!

- ▶ [Motor load monitoring \(I2xt\)](#) (📖 276)
- ▶ [Maximum current monitoring](#) (📖 283)



Note!

If the current amplitude is set to > 100 % in [C00646/2](#), the device utilisation (Ixt) monitoring and/or one of the motor monitoring functions may respond and cause the abort of the pole position identification.

- ▶ The ramp time can be adjusted proportionally in [C00647/2](#).
 - For large machines and high mass inertia values, the ramp time usually has to be increased.
 - For small machines, a reduction of the ramp time can speed up the pole position identification process.
- ▶ In some situations it may be helpful to reverse the travel direction in [C00644/2](#) for the pole position identification (e.g. for linear motor at the end stop).
- ▶ The "pole position identification 360°" procedure comprises a plausibility check. If the rotor position determined via the encoder system does not correspond to the controlled output position:
 - the pole position identification procedure is aborted.
 - the response parameterised in [C00643/1](#) (Lenze setting: "Fault") is activated.
 - the error message "[ID5: Pole position identification error](#)" is entered into the logbook.
- ▶ The preset fault tolerance for the plausibility check can be changed in [C00645/2](#).

Execute pole position identification 360°



Danger!

The machine must not be braked or blocked during the pole position identification! For this reason, the pole position identification is not permitted for hanging loads!

During the pole position identification the rotor aligns itself. The motor shaft moves by max. one electrical revolution which causes the corresponding movement of the connected mechanical components!



Stop!

Check the correct parameterisation of the max. motor current monitoring before carrying out the pole position identification to prevent the motor from being permanently damaged.

▶ [Maximum current monitoring](#) (📖 283)



Note!

By means of controller inhibit, the procedure started can be cancelled anytime, if required, without carrying out a change in [C00926](#).

If the pole position identification is aborted, the response parameterised in [C00643/1](#) is activated (Lenze setting: "Fault").

- If this behaviour is not wanted, deactivate the monitoring by selecting "0: No response" in [C00643/1](#).

Preconditions for the execution

- ▶ A synchronous motor has been selected.
- ▶ No other identification is active.
- ▶ No error has occurred.

**How to execute the pole position identification:**

1. Inhibit the controller if it is enabled, e.g. via the [C00002/16](#) device command or a LOW signal at the X5/RFR terminal.
2. Start the pole position identification with the device command [C00002/34](#) = "1: On / start".
3. Enable the controller again.
 - The pole position identification starts.
 - The progress of the identification run can be seen in [C00002/34](#).
 - The identification is completed if the "0: Off / ready" message is displayed in [C00002/34](#).
4. Inhibit controller again.

After successful completion...

...the controller is inhibited automatically and the pole position determined for the activated feedback system is set in the corresponding subcode of [C00926](#).

- ▶ For a permanent acceptance of the identified pole position, the parameter set must be saved ([C00002/11](#) = "1: On / start").
- ▶ The next controller inhibit and subsequent controller enable serve to cancel the controller inhibit automatically set by the procedure (e.g. by first executing the device command [C00002/16](#) = "0: Off / ready" and then executing the device command [C00002/16](#) = "1: On / start").

In the event of an error

If an error occurs during the procedure or the pulse inhibit gets active (e.g. due to short-time undervoltage), the procedure is terminated with controller inhibit without making a change in [C00926](#).

If the machine was braked or blocked during the procedure, this will be recognised at the end of the measurement and no change is made in [C00926](#).

- ▶ If the pole position identification is aborted:
 - the response parameterised in [C00643/1](#) (Lenze setting: "Fault") is activated.
 - the error message "[ID5: Pole position identification error](#)" is entered into the logbook.

5.4.2 Pole position identification without motion

This function extension is available from version 02.00.00!



Note!

Function only possible with:

- Servo control (SC) for synchronous motors
- Sensorless control for synchronous motors (SLPSM)

From version 02.00.00, a pole position identification without motion is also possible in case of servo control and sensorless control.

- ▶ For sensorless control of synchronous motors (SLPSM), this function is already activated in the Lenze setting, i.e. with every controller enable the rotor displacement angle is identified and thus jerks in the machine after controller enable can be avoided.
 - In order to achieve the same behaviour as before, set bit 0 to "0" in [C02874](#).
- ▶ For servo control, this function can be activated for various events in [C02874](#) via the bits 1 ... 3:
 - Bit 1: Pole position identification after mains connection
 - Bit 2: Pole position identification after controller enable
 - Bit 3: Pole position identification after error acknowledgement



Note!

- The "Pole position identification without motion" cannot completely replace the "pole position identification 360°"!
 - The electrical rotor displacement angle can only be electrically identified with an error of up to 10°. This inaccuracy can cause a worse torque accuracy and a worse energy efficiency.
- The identification takes motor-dependent 1 ... 15 ms. The setpoint enabling of the device is reduced by this time.
- In the Lenze setting, the function is preset so that in most of the cases no further settings have to be made.



Tip!

In case of servo control (SC), it is generally sufficient to activate this function only once after mains connection of the device ([C02874](#): Bit 1 = "1").

Typical application case: A speed sensor with an unknown pole position is used (e.g. encoder). The pole position identification 360°, however, cannot be used since, e.g. the motor is locked, the application does not permit it or the identification takes too long.

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C02874	PLI without motion	0x1 (bit coded)	
C02872	PLI without motion: Adaptation of time duration	0	
C02875	PLI without motion: Adaptation of ident angle	0	°
C02870	PLI without motion: Optimisation factor	-	%
C02871	PLI without motion: Running time	-	ms
C02873	PPI without motion: Identified rotor displacement angle	-	°

Highlighted in grey = display parameter

**Note!**

In case of synchronous motors with a stator time constant < 1 ms, the pole position identification is not executed since the resulting test current pulse could exceed the permissible motor current.

- This, however, only affects very few synchronous motors with very low power (e.g. Lenze motor MDSKS-020-13-300 with rated power of 40 W).
- A non-executed pole position identification can be recognised by the display [C02870](#) = 0 % and [C02871](#) = 0 ms.

► The stator time constants can be calculated based on the following formula:

$$T_s[\text{ms}] = \frac{L_{ss}[\text{mH}]}{R_s[\Omega]}$$

T_s = stator time constant

L_{ss} = Motor stator leakage inductance ([C00085](#))

R_s = Motor stator resistance ([C00084](#))

Optimising the pole position identification



Stop!

In case of a too high setting in [C02872](#), an impermissible motor current may occur during pole position identification. In this case, the "Fault" error response occurs and the "ID5: Pole position identification error" error message entered in the logbook.

In case of a considerably too high setting in [C02872](#):

- The following current monitoring functions can be triggered:
 - OC7: Motor overcurrent
 - OC11: Active clamp operation
 - OC1: Power section - short circuit
- The optimisation degree "0 %" is displayed in [C02870](#).
- The time "0 ms" is displayed in [C02871](#).



How to optimise the pole position identification without motion:

1. For optimisation, enable the controller for various rotor displacement angles.
2. After every controller enable, check the optimisation degree displayed in [C02870](#).
The pole position identification is set optimally if an optimisation degree in the range 70 ... 130 % is displayed in [C02870](#) after every controller enable.
3. When the optimisation degree is > 130 %:
Reduce the setting in [C02872](#) step by step and execute controller enable for various rotor displacement angles until an optimisation degree < 130 % is displayed.
4. When the optimisation degree is < 70 %:
Increase setting in [C02872](#) step by step and execute controller enable for various rotor displacement angles until an optimisation degree > 70 % is displayed.
5. Optional: [C02875](#) serves to increase or reduce the identified electrical rotor displacement angle. This can prevent e.g. a reversing of the motor due to the accuracy of identification if applications require it.

5.5 V/f characteristic control (VFCplus)

In case of the V/f characteristic control (VFCplus), the motor voltage of the inverter is determined by means of a linear or quadratic characteristic depending on the field frequency or motor speed to be generated. The voltage follows a preselected characteristic.



Stop!

- The V/f characteristic control is only suitable for asynchronous motors.
- The following must be observed when operating drives with quadratic V/f characteristic:
 - Please always check whether the corresponding drive is suitable for operation with a quadratic V/f characteristic!
 - If you pump or fan drive is not suitable for operation with a square-law V/f characteristic, we recommend using the energy-saving V/f characteristic control (VFCplusEco). Alternatively, you can use the V/f characteristic control with linear V/f characteristic or the sensorless vector control (SLVC) or servo control (SC).
- For adjustment, observe the thermal performance of the connected asynchronous motor at low output frequencies.
 - Usually, standard asynchronous motors with insulation class B can be operated for a short time with their rated current in the frequency range 0 Hz ... 25 Hz.
 - Contact the motor manufacturer to get the exact setting values for the max. permissible motor current of self-ventilated motors in the lower speed range.
 - If you select square-law V/f characteristics, we recommend setting a lower V_{\min} or using the energy-saving V/f characteristic control (VFCplusEco).
- The nameplate data of the motor (at least rated speed and rated frequency) must be entered if, instead of a standard motor, an asynchronous motor is used with the following values:
 - rated frequency \neq 50 Hz (star) or
 - rated frequency \neq 87 Hz (delta) or
 - number of pole pairs \neq 2



Note!

When the auto DCB threshold ([C00019](#)) is set > 0 rpm, there is no torque at the motor shaft in the lower speed range!

▶ [Automatic DC-injection braking \(Auto-DCB\)](#) (📖 251)

5.5.1 Parameterisation dialog/signal flow

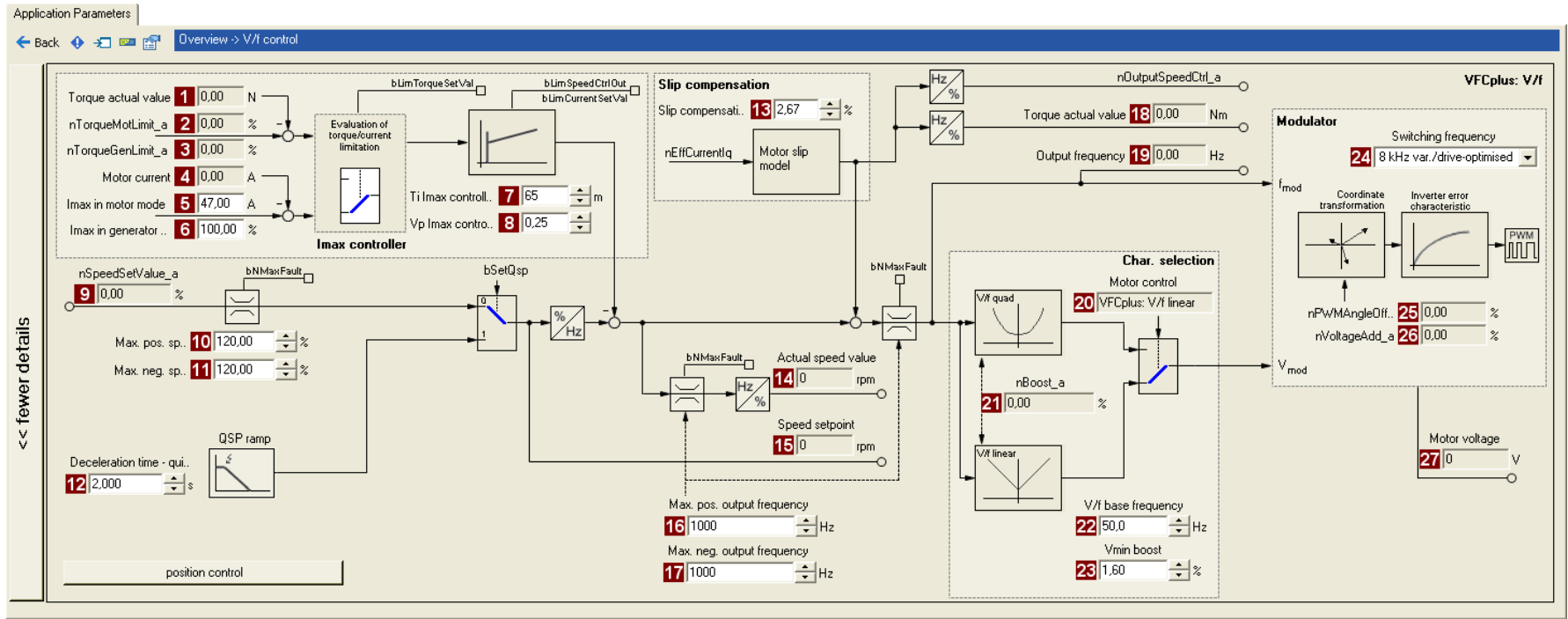


Proceed as follows to open the dialog for parameterising the motor control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Select the motor control from the *Overview* dialog level in the **Motor control** list field:
 - "6: VFCplus: V/f linear" for linear characteristic or
 - "8: VFCplus: V/f quadr" for square-law characteristic

More available V/f characteristic control modes:

- "10: VFCplus: V/f definable".
With this motor control, the V/f characteristic can be freely defined. ▶ [Defining a user-defined V/f characteristic](#) (📖 162)
 - "11: VFCplusEco: V/f energy-saving".
With this motor control, the motor is always operated in an optimal efficiency range via a $\cos\phi$ control and the resulting voltage reduction (reduced copper losses in the asynchronous motor). ▶ [V/f characteristic control - energy-saving \(VFCplusEco\)](#) (📖 166)
4. Click the **Motor control V/f** button to change to the *Overview* → *Motor control V/f* dialog box.
 - This dialog level only shows a simplified signal flow with the most important parameters.
 - When you click the >>**More details** button in the left-most position, a signal flow with more details/parameters is displayed.



Parameter	Info
1	C00056/2 Actual torque value
2	C00830/29 Limitation of torque in motor mode
3	C00830/28 Limitation of torque in generator mode
4	C00054 Motor current
5	C00022 I _{max} in motor mode
6	C00023 I _{max} in generator mode
7	C00074 T _i I _{max} controller
8	C00073 V _p I _{max} controller
9	C00830/22 Speed setpoint
10	C00909/1 Max. pos. speed
11	C00909/2 Max. neg. speed
12	C00105 Decel. time - quick stop

Parameter	Info
13	C00021 Slip compensation
14	C00051 Actual speed value
15	C00050 Speed setpoint
16	C00910/1 Max. pos. output frequency
17	C00910/2 Max. neg. output frequency

Parameter	Info
18	C00056/2 Actual torque value
19	C00058 Output frequency
20	C00006 Motor control
21	C00830/26 MCTRL: nBoost_a
22	C00015 V/f base frequency
23	C00016 V _{min} boost
24	C00018 Switching frequency
25	C00830/32 MCTRL: nPWMAngleOffset_a
26	C00830/31 MCTRL: nVoltageAdd_a
27	C00052 Motor voltage

5.5.2 Basic settings

The "Initial commissioning steps" listed in the table below are sufficient for a simple characteristic control.

- ▶ Detailed information on the individual steps can be found in the following subchapters.

Initial commissioning steps	
1.	Defining the V/f characteristic shape. (📖 151)
2.	Defining current limits (I_{max} controller). (📖 152)



Tip!

Information on the optimisation of the control mode and the adaptation to the real application is provided in the chapter "[Optimising the control mode](#)". (📖 153)

Parameterisable additional functions are described correspondingly in the chapter "[Parameterisable additional functions](#)". (📖 240)

5.5.2.1 Defining the V/f characteristic shape

In principle, four different characteristic shapes can be stipulated:

1. Linear V/f characteristic:

For drives for a constant, speed-independent load torque.

2. Quadratic V/f characteristic:

For drives with a load torque curve which is quadratic or in relation to speed. Quadratic V/f characteristics are preferred in the case of centrifugal pumps and fan drives.

3. Freely definable V/f characteristic:

For drives that require adaptation of the magnetising current by means of the output speed. The freely definable V/f characteristic can be used e.g. for operation in conjunction with special machines such as reluctance motors in order to suppress oscillations at the machine or to optimise energy consumption.



[5-3] Principle of a linear V/f characteristic (on the left) and a quadratic V/f characteristic (on the right)

4. Linear V/f characteristic with voltage reduction:

For drives which often work in partial load operation, the energy-saving V/f characteristic control (VFCplusEco) offers the opportunity to reduce the voltage at low load in order to save energy. At higher loads, the voltage reduction is cancelled and a linear characteristic is caused.

The V/f characteristic shape is defined by selecting the corresponding motor control mode in [C00006](#):

V/f characteristic shape	Motor control to be selected (C00006)
Linear V/f characteristic	6: VFCplus: V/f linear
Square-law V/f characteristic	8: VFCplus: V/f quadr
User-definable V/f characteristic	10: VFCplus: V/f definable
Linear V/f characteristic with voltage reduction	11: VFCplusEco: V/f energy-saving



Tip!

- You can find detailed information on freely definable V/f characteristics in the subchapter entitled "[Defining a user-defined V/f characteristic](#)". (162)
- You can find detailed information on the linear V/f characteristic with voltage reduction in the chapter entitled "[V/f characteristic control - energy-saving \(VFCplusEco\)](#)". (166)

5.5.2.2 Defining current limits (I_{max} controller)

The V/f characteristic control (VFCplus) and the V/f control (VFCplus + encoder) operating modes are provided with a current limitation control which is decisive for the dynamic behaviour under load and counteracts exceedance of the maximum current in motor or generator mode. This current limitation control is called I_{max} control.

- ▶ The efficiency (motor current) measured by the I_{max} control is compared with the current limit value for motor load set in [C00022](#) and the current limit value for generator load set in [C00023](#).
- ▶ If the current limit values are exceeded, the controller changes its dynamic behaviour.

Motor overload during acceleration

The controller prolongs the acceleration ramp to keep the current on or below the current limit.

Generator overload during deceleration

The controller prolongs the deceleration ramp to keep the current on or below the current limit.

Increasing load with constant speed

- ▶ If the motor current limit value is reached:
 - The controller reduces the effective speed setpoint until a stable working point is set or an effective speed setpoint of 0 rpm is reached.
 - If the load is reduced, the controller increases the effective speed setpoint until the setpoint speed is reached or the load reaches the current limit value again.
- ▶ When the generator current limit value is reached:
 - The controller increases the effective speed setpoint until a stable working point is set or the maximally permissible speed ([C00909](#)) or output frequency is reached ([C000910](#)).
 - If the load is reduced, the controller reduces the effective speed setpoint until the setpoint speed is reached or the load reaches the current limit value again.
- ▶ If a sudden load is built up at the motor shaft (e.g. drive is blocked), the overcurrent disconnection may respond (fault message OC1 or OC11).

5.5.3 Optimising the control mode

The V/f characteristic control (VFCplus) is generally ready for operation. It can be adapted subsequently by adapting the characteristic and/or the drive behaviour.

Adapting characteristic

For the linear and quadratic characteristic, it is also possible to match its curve to different load profiles or motors by adapting the V/f base frequency ([C00015](#)) and the V_{\min} boost ([C00016](#)).

▶ [Adapting the V/f base frequency](#) (📖 154)

▶ [Adapting the Vmin boost](#) (📖 156)

Freely defining the characteristic

The V/f characteristic can also be defined freely if the linear and quadratic characteristics are not suitable.

▶ [Defining a user-defined V/f characteristic](#) (📖 162)

Adapting drive behaviour

- ▶ Limitation of the maximum current by a current limitation controller (e.g. to prevent the motor from stalling or to limit to the maximally permissible motor current). ▶ [Optimising the I_{max} controller](#) (📖 158)
- ▶ Adaptation of the field frequency by a load-dependent slip compensation (improved speed accuracy for systems without feedback)
- ▶ Adaptation of the controller parameters of the slip regulator if V/f control (VFCplus + encoder) is selected. ▶ [Parameterising the slip regulator](#) (📖 179)

5.5.3.1 Adapting the V/f base frequency

The V/f base frequency ([C00015](#)) determines the slope of the V/f characteristic and has considerable influence on the current, torque, and power performance of the motor.

- ▶ The setting in [C00015](#) applies to all permitted mains voltages.
- ▶ Mains fluctuations or fluctuations of the DC-bus voltage (operation in generator mode) do not need to be considered when the V/f base frequency is set. They are automatically compensated for by the internal mains voltage compensation of the device.
- ▶ Depending on the setting in [C00015](#), it may be required to adapt the reference speed ([C00011](#)) to traverse the entire speed range of the motor.
- ▶ The V/f base frequency is automatically calculated from the stored motor nameplate data by the motor parameter identification:

$$C00015 \text{ [Hz]} = \frac{U_{FI} \text{ [V]}}{U_{Ratedmot} \text{ [V]}} \cdot f_{Rated} \text{ Hz}$$

U_{FI} : Mains voltage 400 V or 230 V
 $U_{Ratedmot}$: Rated motor voltage depending on the connection method
 f_{rated} : Rated motor frequency

[5-4] Calculation of the V/f base frequency

Typical values of the V/f base frequency

Drive controller with 400 V mains connection			
Motor voltage [V]	Motor frequency [Hz]	Motor connection	V/f base frequency (C00015)
230 / 400	50	Y	50 Hz
220 / 380	50	Y	52.6 Hz
280 / 480	60	Y	50 Hz
400 / 690	50	Δ	50 Hz
400	50		
230 / 400	50	Δ	87 Hz
280 / 480	60		
400	87		
220 / 380	50	Δ	90.9 Hz

Drive controller with 230 V mains connection			
Motor voltage [V]	Motor frequency [Hz]	Motor connection	V/f base frequency (C00015)
230	50	Δ	50 Hz
220 / 380	50	Δ	52.3 Hz



Note!

87-Hz operation

4-pole asynchronous motors which are designed for a rated frequency of $f = 50$ Hz in star connection can be operated in delta connection when being constantly excited up to $f = 87$ Hz.

- Advantages:
 - Higher speed-setting range
 - 73% higher power output in case of standard motors
- Motor current and motor power increase by the factor $\sqrt{3}$.
- The field weakening range starts above 87 Hz.
- Generally, this process can also be used with motors which have different numbers of pole pairs. In case of 2-pole asynchronous motors, the mechanical limit speed must be maintained.

5.5.3.2 Adapting the V_{min} boost

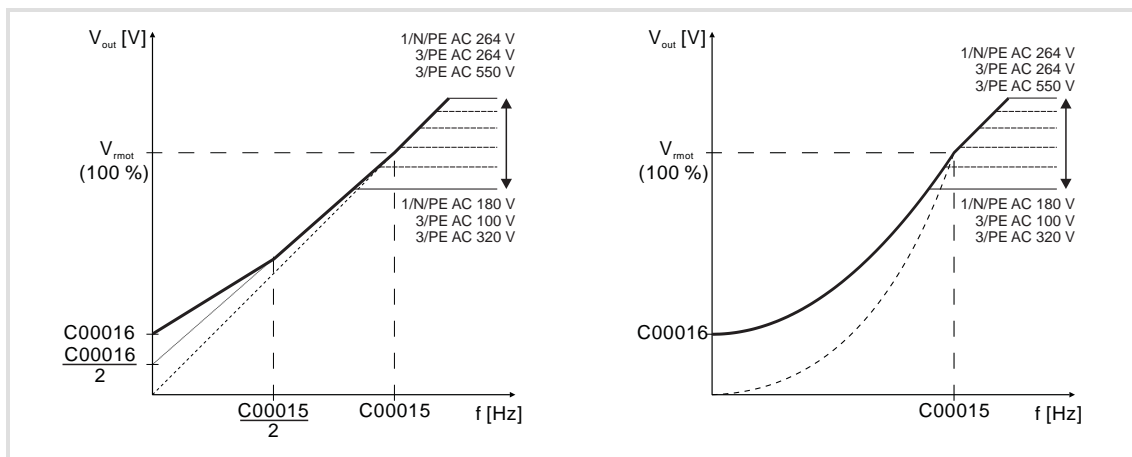
The V_{min} boost ([C00016](#)) of the motor voltage serves to select a load independent magnetising current which is required for asynchronous motors. The torque behaviour of the motor can be optimised by adapting the setting in [C00016](#).



Note!

The V_{min} boost has an effect on output frequencies below the V/f base frequency ([C00015](#)).

The general linear and quadratic V/f characteristics are shown in the illustrations below. The illustrations show the impacts of the parameters used to adapt the characteristic shape.



[5-5] Representation of the linear V/f characteristic (on the left) and quadratic V/f characteristic (on the right)



How to set the V_{min} boost:

1. Operate motor in idle state at approx. 6 % of the rated motor speed.
2. Increase V_{min} boost ([C00016](#)) until the following motor current is reached:

Motor in short-time operation up to $0.5 n_{rated}$

- for self-ventilated motors: $I_{motor} \approx I_{rated\ motor}$
- for forced ventilated motors: $I_{motor} \approx I_{rated\ motor}$

Motor in continuous operation up to $0.5 n_{rated}$

- for self-ventilated motors: $I_{motor} \approx 0.8 I_{rated\ motor}$
- for forced ventilated motors: $I_{motor} \approx I_{rated\ motor}$



Note!

V_{\min} boost is automatically calculated by the motor parameter identification using the data specified on the motor nameplate so that a no-load current of approx. $0.8 I_{\text{rated motor}}$ results at the slip frequency of the machine.

V/f control (VFCplus + encoder)

If V/f control (VFCplus + encoder) is selected, we recommend a decidedly lower V_{\min} boost:

- In this case, select a V_{\min} boost which ensures that approx. 50 % of the rated motor current flows at slip frequency when the motor is idling.

5.5.3.3 Optimising the I_{max} controller

Using the Lenze setting of the current limitation controller, the drive is stable:

Parameter	Info	Lenze setting	
		Value	Unit
C00073/1	VFC: Vp I _{max} controller	0.25	
C00074/1	VFC: Ti I _{max} controller	65	ms

Most applications do not require optimisation.

The setting of the current limitation controller must be adapted if

- ▶ power control including great moments of inertia is performed.
 - Recommendation: Increase of the reset time Ti ([C00074/1](#)) of the I_{max} controller.
- ▶ vibrations occur in the V/f control (VFCplus + encoder) mode during the intervention of the current limitation controller.
 - Recommendation: Increase of the reset time Ti ([C00074/1](#)) of the I_{max} controller.
- ▶ overcurrent errors (e.g. OC3) occur due to load impulses or too high acceleration ramps.
 - Recommendation: Reduction of the gain Vp ([C00073/1](#)) and reset time Ti ([C00074/1](#)) of the I_{max} controller.

5.5.3.4 Optimising the stalling behaviour

Motor stalling due to a torque overload in the field weakening range is prevented in all characteristic-based motor control types (VFCplus) by means of an inverter-internal stalling current monitoring. In the field weakening range, hence at frequencies above the base frequency, it reduces the maximum current to prevent the motor from stalling. The reduction depends on the current field frequency, the base frequency, the DC-bus voltage and the maximum current ([C00022](#)). Generally it applies that a higher field frequency causes a stronger limitation of the maximum current.

The behaviour in the field weakening range can be adapted via the override point of field weakening ([C00080](#)). This parameter serves to shift the frequency-dependent maximum current characteristic:

▶ [C00080](#) > 0 Hz:

- The maximum current characteristic is shifted by the entered frequency to higher field frequencies.
- The maximally permissible current and the maximum torque increase in the field weakening range.
- The risk of motor stalling increases.

▶ [C00080](#) < 0 Hz:

- The maximum current characteristic is shifted by the entered frequency to lower field frequencies.
- The maximally permissible current and the maximum torque are reduced in the field weakening range.
- The risk of motor stalling is reduced.



Note!

We recommend to keep the Lenze setting (0 Hz).

5.5.3.5 Torque limitation

The previous chapter, "[Optimising the I_{max} controller](#)", describes how the drive can be protected from overload. During commissioning, these settings are carried out once and remain unchanged afterwards. However, it is often necessary to limit the torque to a lower value for plant or process reasons.

- To avoid overload in the drive train, the torque in motor mode can be limited via the *nTorqueMotLimit_a* process input signal, and the torque in generator mode can be limited via the *nTorqueGenLimit_a* process input signal:

Identifier <small>DIS code data type</small>	Information/possible settings
nTorqueMotLimit_a C00830/29 INT	Torque limitation in motor mode <ul style="list-style-type: none"> • Scaling: 16384 ≙ 100 % M_{max} (C00057) • Setting range: 0 ... +199.99 % • If keypad control is performed: Parameterisable via C00728/1.
nTorqueGenLimit_a C00830/28 INT	Torque limitation in generator mode <ul style="list-style-type: none"> • Scaling: 16384 ≙ 100 % M_{max} (C00057) • Setting range: -199.99 ... 0 % • If keypad control is performed: Parameterisable via C00728/2.



Note!

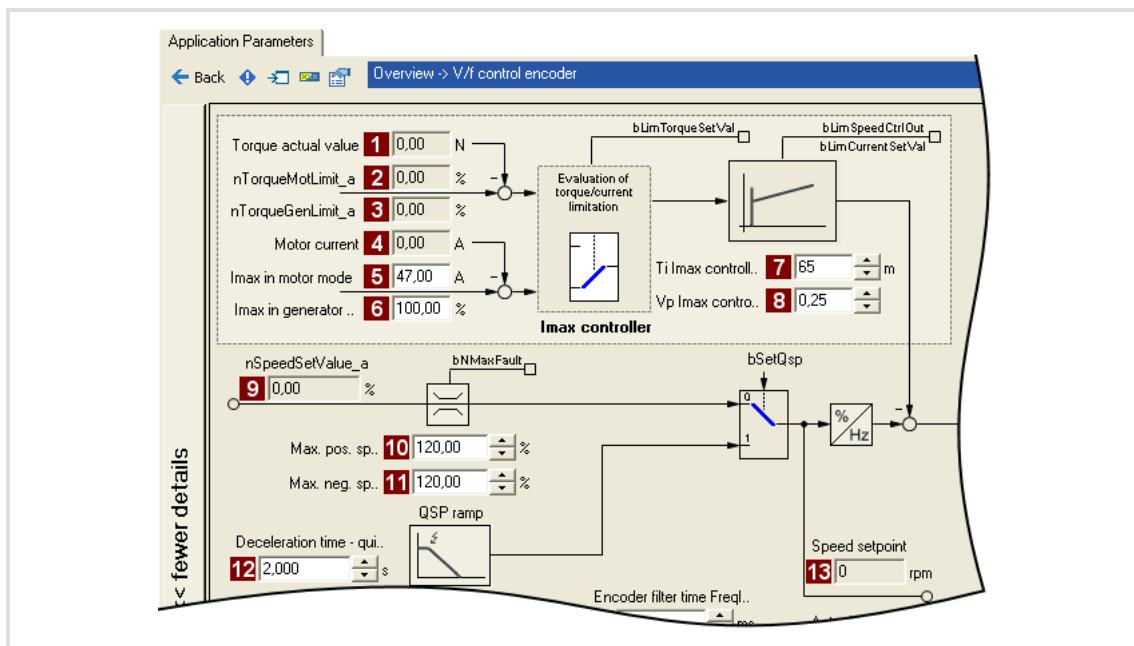
- The actual torque ([C00056/2](#)) is directly calculated from the current slip speed of the machine. This requires correct entry of the motor data. ► [Motor selection/Motor data](#) (□ 121)
- To avoid instabilities during operation with active slip compensation, the torque limit values are internally processed as absolute values.
- If slip compensation is deactivated ([C00021](#) = 0), indirect torque limitation (differential signal between the apparent motor current and *nTorqueMotLimit_a* or *nTorqueGenLimit_a*). Above the no-load current of the motor, the accuracy of the indirect torque limitation is limited.

V/f characteristic control (VFC)

The accuracy of the torque limitation is limited because the actual torque ([C00056/2](#)) is only calculated from the slip speed measured indirectly via the motor current.

V/f control (VFC + encoder)

The slip speed of the motor is available at the slip controller output. This leads to a high accuracy for the actual torque ([C00056/2](#)) and the torque limitation.



[5-6] Extract from the signal flow of the V/f control (VFC + encoder)

Parameter	Info	Parameter	Info
1	C00056/2 Actual torque value	9	C00830/22 MCTRL: nSpeedSetValue_a
2	C00830/29 Limitation of torque in motor mode	10	C00909/1 Max. pos. speed
3	C00830/28 Limitation of torque in generator mode	11	C00909/2 Max. neg. speed
4	C00054 Motor current	12	C00105 Decel. time - quick stop
5	C00022 I _{max} in motor mode	13	C00050 Speed setpoint
6	C00023 I _{max} in generator mode		
7	C00074 Ti I _{max} controller		
8	C00073 Vp I _{max} controller		

5.5.3.6 Defining a user-defined V/f characteristic

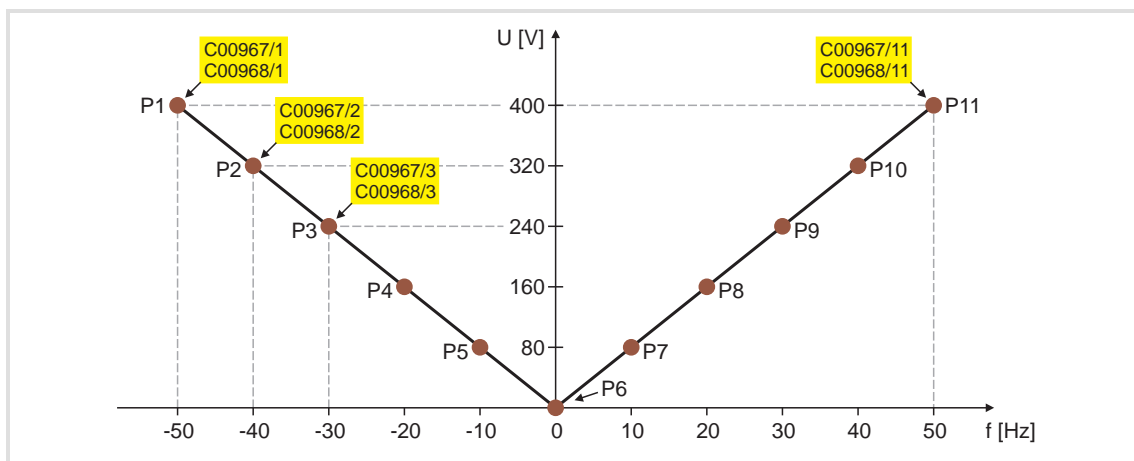
For individual adaptation of the motor magnetisation to the actual application, the motor control "10: VFCplus: V/f definable" with a freely definable characteristic can be selected in [C00006](#) as an alternative if the linear and quadratic characteristics are not suitable.



Note!

The V/f base frequency ([C00015](#)) and the V_{\min} boost ([C00016](#)) no longer exert an influence if this motor control is chosen.

- ▶ The 11 grid points (voltage/frequency values) of the characteristic are stipulated by means of the 11 subcodes of [C00967](#) and [C00968](#).
 - It is necessary to set all 11 grid points by means of corresponding subcodes.
 - If fewer grid points (voltage/frequency values) are needed, this can be achieved indirectly by ascribing the same voltage and frequency values to consecutive grid points.
Example: $C00967/3 = C00967/4$ and $C00968/3 = C00968/4$
 - The grid points can be specified in any sequence. Internally, they are automatically ordered from the minimum to the maximum frequency value.
 - Above the maximum and below the minimum frequency, the previous rise is continued until the maximum output voltage.
- ▶ In the Lenze setting, the 11 grid points represent a linear characteristic.
 - 3-phase devices: Output voltage 400 V at $f = 50$ Hz
 - 1-phase devices: Output voltage 230 V at $f = 50$ Hz



	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
V	400 V	320 V	240 V	160 V	80 V	0 V	80 V	160 V	240 V	320 V	400 V
f	-50 Hz	-40 Hz	-30 Hz	-20 Hz	-10 Hz	0 Hz	10 Hz	20 Hz	30 Hz	40 Hz	50 Hz

[5-7] Freely definable characteristic (Lenze setting for 3-phase devices)



Tip!

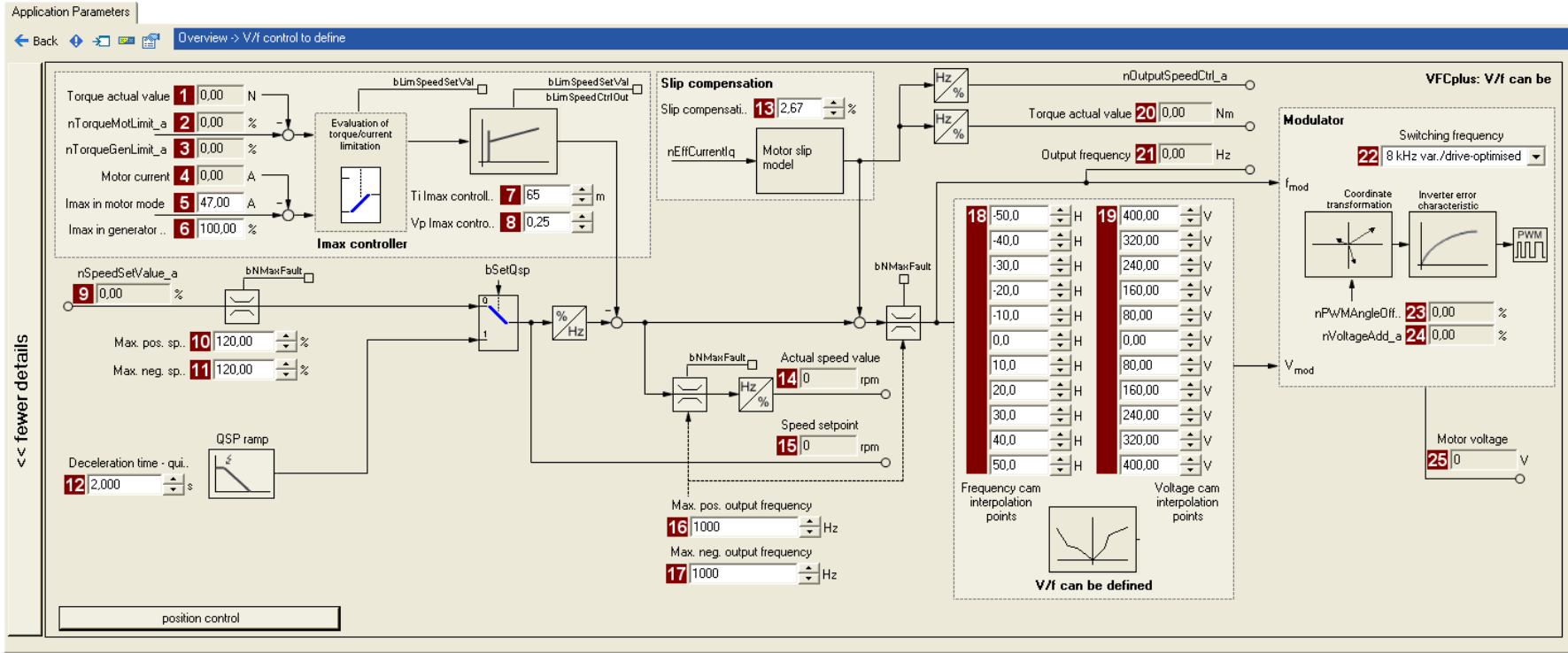
Cases of application for this function:

- Operation of reluctance motors or synchronous motors during controlled acceleration (reduction of natural frequencies caused by wrong excitation).
- Adaptation of the voltage requirement for the motor, depending on specific load conditions.



Proceed as follows to open the dialog for parameterising the motor control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Select the motor control "10: VFCplus: V/f definable" from the *Overview* dialog box in the **Motor control** list field:
4. Click the **Motor control V/f definable** button to change to the *Overview* → *Motor control V/f* dialog box.
 - This dialog level only shows a simplified signal flow with the most important parameters.
 - When you click the >>**More details** button in the left-most position, a signal flow with more details/parameters is displayed.



Parameter	Info
1	C00056/2 Actual torque value
2	C00830/29 Limitation of torque in motor mode
3	C00830/28 Limitation of torque in generator mode
4	C00054 Motor current
5	C00022 I _{max} in motor mode
6	C00023 I _{max} in generator mode
7	C00074 T _i I _{max} controller
8	C00073 V _p I _{max} controller
9	C00830/22 Speed setpoint
10	C00909/1 Max. pos. speed
11	C00909/2 Max. neg. speed
12	C00105 Decel. time - quick stop

Parameter	Info
13	C00021 Slip compensation
14	C00051 Actual speed value
15	C00050 Speed setpoint
16	C00910/1 Max. pos. output frequency
17	C00910/2 Max. neg. output frequency

Parameter	Info
18	C00967/x Frequency interpol. points
19	C00968/x Voltage interpol. points
20	C00056/2 Actual torque value
21	C00058 Output frequency
22	C00018 Switching frequency
23	C00830/32 MCTRL: nPWMAngleOffset_a
24	C00830/31 MCTRL: nVoltageAdd_a
25	C00052 Motor voltage

5.5.4 Remedies for undesired drive behaviour

Drive behaviour	Remedy
Inadequate smooth running at low speeds, especially in the case of operation with a long motor cable	▶ Automatic motor data identification (📖 126)
Problems in case of high starting duty (great mass inertia)	▶ Adapting the Vmin boost (📖 156)
Drive does not follow the speed setpoint.	<p>The current controller intervenes in the set field frequency to limit the controller output current to the maximum current (C0022, C0023). Therefore:</p> <ul style="list-style-type: none"> • Prolong acceleration/deceleration times: <ul style="list-style-type: none"> C00012: Accel. time - main setpoint C00013: Decel. time - main setpoint • Consider a sufficient magnetising time of the motor. Depending on the motor power, the magnetising time amounts to 0.1 ... 0.2 s. • Increase the maximally permissible current: <ul style="list-style-type: none"> C00022: I_{max} in motor mode C00023: I_{max} in generator mode)
For operation without speed feedback (C00006 = 6): Insufficient speed constancy at high load (setpoint and motor speed are not proportional anymore)	<ul style="list-style-type: none"> • Increase slip compensation (C00021). <p>Important: Unstable drive due to overcompensation!</p> <ul style="list-style-type: none"> • With cyclic load impulses (e. g. centrifugal pump), a smooth motor characteristic is achieved by smaller values in C00021 (possibly negative values). <p>Note: The slip compensation is only active for operation without speed feedback.</p>
"Clamp operation active" error message (OC11): Controller cannot follow dynamic processes, i.e. too short acceleration/deceleration times in terms of load ratios.	<ul style="list-style-type: none"> • Increase the gain of the I_{max} controller (C00073/1) • Reduce the reset time of the I_{max} controller (C00074/1) • Prolong the acceleration time (C00012) • Prolong the deceleration time (C00013)
Motor stalling in the field weakening range (adaptation especially required for small machines)	<ul style="list-style-type: none"> • Reduce the override point of field weakening (C00080) • If motor power < inverter power: Set C00022 to I_{max} = 2 I_{rated motor} • Reduce dynamic performance of setpoint generation

5.6 V/f characteristic control - energy-saving (VFCplusEco)

With the energy-saving V/f characteristic control mode (VFCplusEco), the motor voltage of the inverter is detected by means of a linear characteristic depending on the field frequency to be created or the motor speed. Moreover, a $\cos\phi$ control and the resulting voltage reduction causes the motor to be always operated in the optimum efficiency range (reduction of copper losses in the asynchronous motor).

- ▶ Hence, these are the advantages of this motor control mode:
 - Good robustness
 - Easy parameter setting
 - High energy efficiency (lower heating of the motor in partial load operational range)
 - Same speed accuracy and maximum torques as with VFCplus
- ▶ Predestinated application areas of this motor control mode are materials handling technology and pump and fan systems.
- ▶ This motor control mode serves to improve efficiency of standard asynchronous motors with efficiency class IE1 (standard IEC 60034-30 2008) in the range 0 ... $M_{\text{efficiency_max}}$ between 0 ... 20 % (\varnothing 5 ... 10 %).
 - For asynchronous motors with energy efficiency class IE2 the potential for efficiency improvement is reduced to approx. 0 ... 15 %.
 - Description of $M_{\text{efficiency_max}}$: Indicates the torque [%] of $M_{\text{rated_motor}}$, where the motor has the max. efficiency.)
- ▶ In case of asynchronous motors with a higher energy efficiency class (IE2 and IE3), the absolute energy saving of the motor control mode is lower due to improved efficiency of the machine. However, energy saving is still achieved in a higher load range.
- ▶ $M_{\text{efficiency_max}}$ is performance-related and listed in the following table for some power values of the energy efficiency class IE1 and IE2:

Power	$M_{\text{efficiency_max}}$ (related to $M_{\text{rated_motor}}$)	
	IE1	IE2
0.25 kW	75 %	
0.75 kW	65 %	75 %
2.2 kW	55 %	85 %
7.5 kW	30 %	45 %
22 kW	23 %	
45 kW	21 %	



Stop!

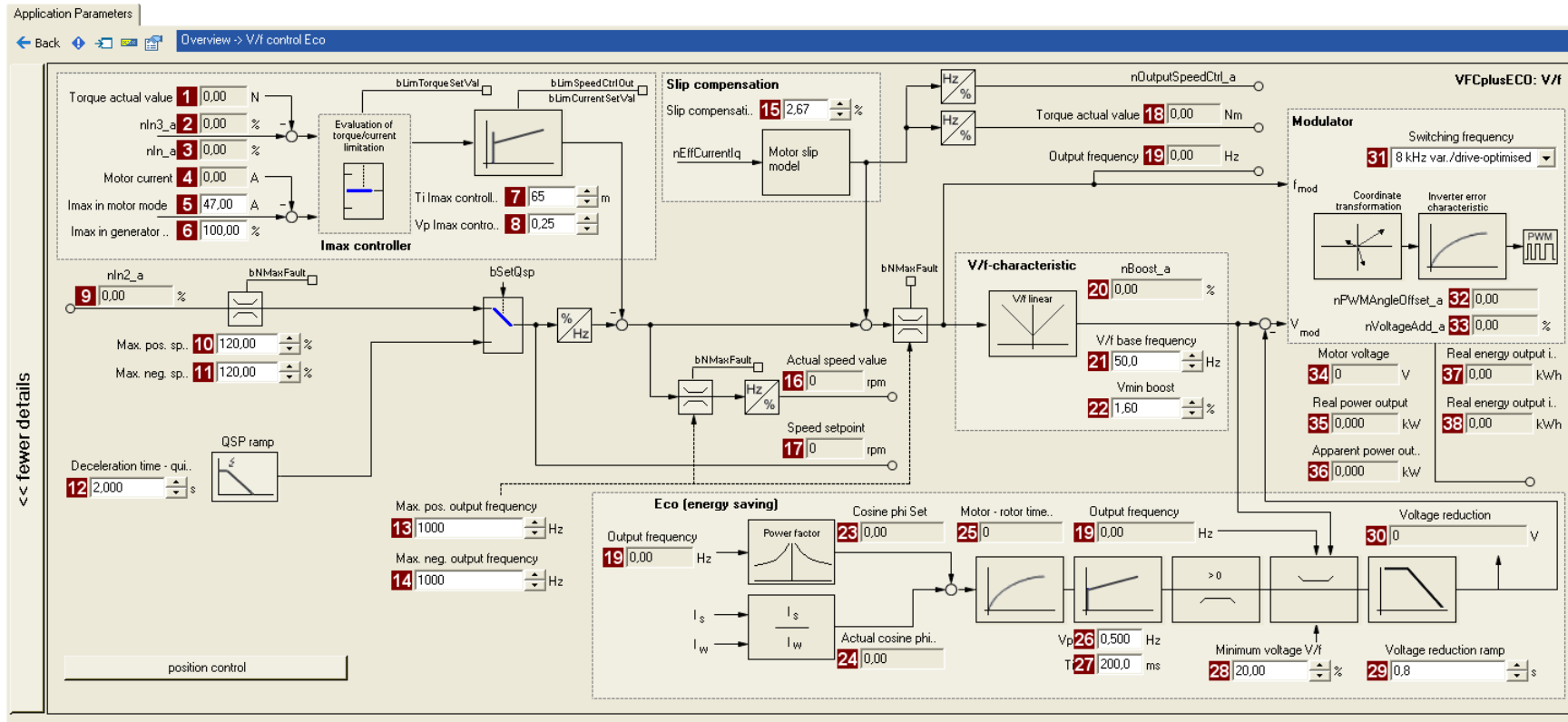
- For adjustment, observe the thermal performance of the connected asynchronous motor at low output frequencies.
 - Usually, standard asynchronous motors with insulation class B can be operated for a short time with their rated current in the frequency range 0 Hz ... 25 Hz.
 - Contact the motor manufacturer to get the exact setting values for the max. permissible motor current of self-ventilated motors in the lower speed range.
- The nameplate data of the motor (at least rated speed and rated frequency) must be entered if, instead of a standard motor, an asynchronous motor is used with the following values:
 - rated frequency \neq 50 Hz (star) or
 - rated frequency \neq 87 Hz (delta) or
 - number of pole pairs \neq 2

5.6.1 Parameterisation dialog/signal flow



Proceed as follows to open the dialog for parameterising the motor control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Select the motor control "11: VFCplusEco: V/f energy-saving" from the *Overview* dialog box in the **Motor control** 11list field:
4. Click the **Motor control V/f Eco** button to change to the *Overview* → *Motor control V/f* dialog box.
 - This dialog level only shows a simplified signal flow with the most important parameters.
 - When you click the >>**More details** button in the left-most position, a signal flow with more details/parameters is displayed.

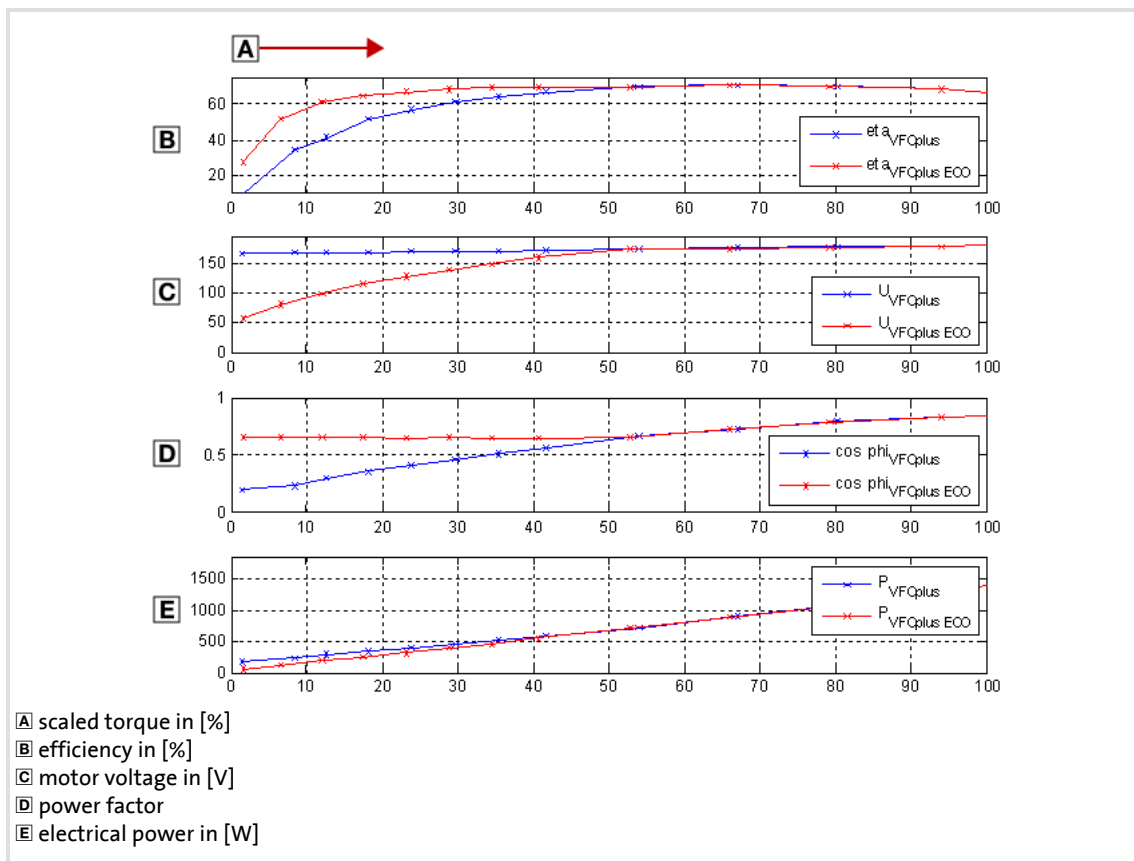


Parameter	Info	Parameter	Info	Parameter	Info
1	C00056/2 Actual torque value	13	C00910/1 Max. pos. output frequency	26	C00975 VFC-ECO: Vp
2	C00830/4 Limitation of torque in motor mode	14	C00910/2 Max. neg. output frequency	27	C00976 VFC-ECO: Ti
3	C00830/5 Limitation of torque in generator mode	15	C00021 Slip compensation	28	C00977 VFC-ECO: Minimum voltage V/f
4	C00054 Motor current	16	C00051 Actual speed value	29	C00982 VFC-ECO: Voltage reduction ramp
5	C00022 Imax in motor mode	17	C00050 Speed setpoint	30	C00978 VFC-ECO: Voltage reduction
6	C00023 Imax in generator mode	18	C00056/2 Actual torque value	31	C00018 Switching frequency
7	C00074 Ti Imax controller	19	C00058 Output frequency	32	C00830/32 MCTRL: nPWMAngleOffset_a
8	C00073 Vp Imax controller	20	C00830/26 MCTRL: nBoost_a	33	C00830/31 MCTRL: nVoltageAdd_a
9	C00830/3 Speed setpoint	21	C00015 V/f base frequency	34	C00052 Motor voltage
10	C00909/1 Max. pos. speed	22	C00016 Vmin boost	35	C00980/1 Active output power
11	C00909/2 Max. neg. speed	23	C00979/2 Cosine phi set	36	C00980/2 Apparent output power
12	C00105 Decel. time - quick stop	24	C00979/1 Cosine phi act	37	C00981/1 Output energy in motor mode
		25	C00083 Motor rotor time constant	38	C00981/2 Output energy in generator mode

5.6.2 Comparison of VFCplusEco - VFCplus

The following characteristics show the impact of the energy-saving V/f characteristic control (VFCplusEco) compared to the standard V/f characteristic control (VFCplus).

- The characteristics were recorded with a standard asynchronous motor 2.2 kW with energy efficiency class IE1 at speed = 600 rpm.



[5-8] Comparison of VFCplusEco - VFCplus

5.6.3 Basic settings

The "Initial commissioning steps" listed in the table below are sufficient for the V/f characteristic control - energy-saving (VFCplusECo).

- Detailed information on the individual steps can be found in the following subchapters.

Initial commissioning steps					
1.	Determine the motor control: C00006 = "11: VFCplusEco: V/f energy-saving"				
2.	<p>The required motor data are pre-initialised depending on the device and thus, they do not need to be entered directly. In order to achieve a high energy optimisation, these motor data can be entered (see the following section).</p> <p>Set the motor selection/motor data</p> <ul style="list-style-type: none"> When selecting and parameterising the motor, the motor nameplate data and the equivalent circuit diagram data are relevant. Detailed information can be found in the "Motor selection/Motor data" chapter. (121) <p>Depending on the motor manufacturer, proceed as follows:</p> <table border="1"> <thead> <tr> <th>Lenze motor:</th> <th>Third party manufacturer's motor:</th> </tr> </thead> <tbody> <tr> <td> Selecting a motor from the motor catalogue in the »Engineer« - or - 1. Set the motor nameplate data 2. Automatic motor data identification </td> <td> 1. Set the motor nameplate data 2. Automatic motor data identification or set known equivalent circuit diagram manually: C00084: Motor stator resistance C00085: Motor stator leakage inductance C00092: Motor magnetising inductance </td> </tr> </tbody> </table>	Lenze motor:	Third party manufacturer's motor:	Selecting a motor from the motor catalogue in the »Engineer« - or - 1. Set the motor nameplate data 2. Automatic motor data identification	1. Set the motor nameplate data 2. Automatic motor data identification or set known equivalent circuit diagram manually: C00084 : Motor stator resistance C00085 : Motor stator leakage inductance C00092 : Motor magnetising inductance
Lenze motor:	Third party manufacturer's motor:				
Selecting a motor from the motor catalogue in the »Engineer« - or - 1. Set the motor nameplate data 2. Automatic motor data identification	1. Set the motor nameplate data 2. Automatic motor data identification or set known equivalent circuit diagram manually: C00084 : Motor stator resistance C00085 : Motor stator leakage inductance C00092 : Motor magnetising inductance				
3.	Defining current limits (I_{max} controller) . (152)				



Tip!

Information on the optimisation of the control mode and the adaptation to the real application is provided in the chapter "[Optimising the control mode](#)". ([171](#))

Parameterisable additional functions are described correspondingly in the chapter "[Parameterisable additional functions](#)". ([240](#))

5.6.4 Optimising the control mode

The V/f characteristic control - energy-saving (VFCplus) is generally ready for operation. It can be adapted subsequently by adapting the characteristic and/or the drive behaviour.

Adapting characteristic

For the linear characteristic as part of the V/f characteristic control - energy-saving (VFCplusEco), it is also possible (like in case of the standard V/f characteristic control) to match its curve to different load profiles or motors by adapting the V/f base frequency ([C00015](#)) and the V_{\min} boost ([C00016](#)).



Note!

For an adaptation of the V_{\min} boost, the V/f characteristic control - energy-saving (VFCplusEco) must not be set. For this purpose, set the [V/f characteristic control \(VFCplus\)](#).

▶ [Adapting the V/f base frequency](#) (📖 154)

▶ [Adapting the Vmin boost](#) (📖 156)

Adapting drive behaviour

- ▶ Limitation of the maximum current by a current limitation controller (e.g. to prevent the motor from stalling or to limit to the maximally permissible motor current). ▶ [Optimising the I_{max} controller](#) (📖 158)
- ▶ Adaptation of the field frequency by a load-dependent slip compensation (improved speed accuracy for systems without feedback).
- ▶ [Improving the behaviour at high dynamic load changes](#). (📖 172)
- ▶ [Adapting the slope limitation for lowering the Eco function](#). (📖 173)
- ▶ [Optimising the cos/phi controller](#). (📖 173)

Torque limitation

Limit the torque to a lower value. ▶ [Torque limitation](#) (📖 160)

5.6.4.1 Improving the behaviour at high dynamic load changes

Due to the voltage reduction executed via the $\cos\phi$ control, the motor may stall in the Lenze setting at high dynamic load torque changes. This is caused by the flux reduction and the connected reduction of the stalling torque of the motor current:

$$M_{\text{Max}(t)} = M_{\text{Stalling}} \cdot \frac{U_{\text{Motor}(t)}^2}{(U_{\text{Motor}(t)} - U_{\text{Reduction}})^2} \quad \text{with } M_{\text{Stalling}} = 1.6 \dots 2.5 \cdot M_{\text{Rated_motor}}$$

V_{Motor} = display in [C00052](#)
 $V_{\text{Reduction}}$ = display in [C00978](#)

It generally applies that when the output voltage is divided in halves, the maximum torque is approx. reduced by the factor 4. A reduction by the factor 3 reduces the torque to approx. 15 %.

The minimum voltage and thus the maximum influence access of the Eco function on the output voltage can be defined in [C00977](#). With full influence of the Eco function, the following stalling torque can be ensured depending on the setting in [C00977](#):

Minimum voltage V/f (C00977)	Maximum torque
100 %	160 % ... 250 % M_{rated}
70 %	80 % ... 130 % M_{rated}
50 %	40 % ... 70 % M_{rated}
20 %	15 % ... 50 % M_{rated}

An adaptation of the minimum voltage V/f ([C00977](#)) improves the stability in case of load impulses.

- ▶ In the Lenze setting, the minimum voltage V/f is set to 20 % for the highest energy optimisation. This setting serves to respond to load torques if these amount to approx. 25 % of the rated torque or occur with low dynamics.
- ▶ An increase of the minimum voltage V/f to 70 % permits to apply a dynamic load impulse from 0 to 100 % rated motor torque without the motor stalling. This reduces the energy optimisation to be achieved by approx. 75 %.
- ▶ A further increase of the stability at still higher dynamic load impulses can be achieved by a further increase of the minimum voltage V/f, but means a further loss in energy optimisation.



Note!

The energy optimisation can be switched off by setting the minimum voltage V/f ([C00977](#)) to 100 %. Then, the behaviour corresponds to the V/f characteristic control (VFCplus) with linear characteristic.

In case of applications with very high dynamic sudden load variations from the unloaded operation, this motor control mode should not be used or the energy optimisation should be switched off, since a motor stalling cannot be excluded.

5.6.4.2 Adapting the slope limitation for lowering the Eco function

The ramp set in [C00982](#) for voltage reduction serves as slope limitation in order to prevent that voltage is suddenly applied to the motor when the Eco function is deactivated. Otherwise, the overvoltage limitation (I_{max}, Clamp) would be activated.

- ▶ This ramp is, depending on the device, pre-initialised to approx. the triple rotor time constant. An adaptation of this parameter is not required.

When the Eco function is switched off, a quick reaction (high dynamic performance) is required, but with a low current overshoot and a small torque jump. Thus, the Lenze setting of [C00982](#) is a compromise regarding the switch-off of the Eco function (voltage reduction = 0).

- ▶ To increase the dynamics when switching off the Eco function:
Reduce → setting in [C00982](#).
(Current compensation actions increase when the Eco function is switched off.)
- ▶ In order to reduce current compensation actions when switching off the Eco function:
Increase → setting in [C00982](#).
(The dynamics when switching off the eco function is reduced)

5.6.4.3 Optimising the cos/phi controller

With the Lenze setting, the cos ϕ controller is set such that usually no adaptation is required for all power ratings and application cases.

Behaviour	Remedy/recommendation
The cos ϕ actual value (C00979/1) varies greatly.	Reduce gain Vp (C00975) and reset time Ti (C00976).
The cos ϕ actual value (C00979/1) is permanently lower than the cos ϕ setpoint (C00979/2).	Increase gain Vp (C00975) and reset time Ti (C00976).

5.6.5 Remedies for undesired drive behaviour

Drive behaviour	Remedy
Inadequate smooth running at low speeds, especially in the case of operation with a long motor cable	<ul style="list-style-type: none"> ▶ Automatic motor data identification (□ 126) Reduce the influence of the Eco function by increasing the minimum voltage V/f (C00977).
Problems in case of high starting duty (great mass inertia)	<ol style="list-style-type: none"> 1. Set motor control VFCplus with linear characteristic (C00006 = 6). 2. Adapting the Vmin boost. (□ 156) 3. Again set motor control VFCplusEco (C00006 = 11).
Drive does not follow the speed setpoint	The current controller intervenes in the set field frequency to limit the controller output current to the maximum current (C0022, C0023). Therefore: <ul style="list-style-type: none"> • Prolong acceleration/deceleration times: <ul style="list-style-type: none"> C00012: Accel. time - main setpoint C00013: Decel. time - main setpoint • Consider a sufficient magnetising time of the motor. Depending on the motor power, the magnetising time amounts to 0.1 ... 0.2 s. • Increase the maximally permissible current: <ul style="list-style-type: none"> C00022: I_{max} in motor mode C00023: I_{max} in generator mode • Make adaptations for the Eco function: <ul style="list-style-type: none"> – Improving the behaviour at high dynamic load changes. (□ 172) – Adapting the slope limitation for lowering the Eco function. (□ 173) – Optimising the cos/phi controller. (□ 173)
Insufficient speed constancy at high load (setpoint and motor speed are not proportional anymore)	<ul style="list-style-type: none"> • Increase slip compensation (C00021). Important: Unstable drive due to overcompensation! • With cyclic load impulses (e. g. centrifugal pump), a smooth motor characteristic is achieved by smaller values in C00021 (possibly negative values). Note: The slip compensation is only active for operation without speed feedback.
"Clamp operation active" error message (OC11): Controller cannot follow dynamic processes, i.e. too short acceleration/deceleration times in terms of load ratios.	<ul style="list-style-type: none"> • Increase the gain of the I_{max} controller (C00073) • Reduce the reset time of the I_{max} controller (C00074) • Prolong the acceleration time (C00012) • Prolong the deceleration time (C00013) • Make adaptations for the Eco function: <ul style="list-style-type: none"> – Improving the behaviour at high dynamic load changes. (□ 172) – Adapting the slope limitation for lowering the Eco function. (□ 173)
Motor stalling in the field weakening range (adaptation especially required for small machines)	<ul style="list-style-type: none"> • If motor power < inverter power: Set C00022 to I_{max} = 2 I_{rated motor} • Reduce dynamic performance of setpoint generation • Make adaptations for the Eco function: <ul style="list-style-type: none"> – Improving the behaviour at high dynamic load changes. (□ 172) – Adapting the slope limitation for lowering the Eco function. (□ 173)
Speed variations in no-load operation for speeds > 1/3 rated speed.	Minimise speed oscillations with oscillation damping (C00234).

Drive behaviour	Remedy
Speed variations in no-load operation and with load for speeds > rated speed.	Minimise speed oscillations with increasing the oscillation damping field weakening (C00236). Caution: If C00236 is increased, the maximum output voltage of the device is reduced!
Output voltage is too low. There is a too low maximum torque in the high field weakening range.	Reduction of the oscillation damping field weakening (C00236). Caution: When C00236 = 0, oscillation damping field weakening is inactive. Thus, a maximum output voltage is available but the tendency to speed oscillations in the field weakening range at no-load operation and with load increases.

5.7 V/f control (VFCplus + encoder)

The previously described V/f characteristic control (VFCplus) can be operated with a feedback of speed. This bears the following advantages:

- ▶ Stationary accuracy of speed
- ▶ Low parameterisation effort compared to sensorless vector control (SLVC)
- ▶ Improved dynamics compared to V/f characteristic control without feedback or to sensorless vector control (SLVC).
- ▶ Suitability for group drives



The descriptions in chapter "[V/f characteristic control \(VFCplus\)](#)" also apply for the V/f control. (147)



Note!

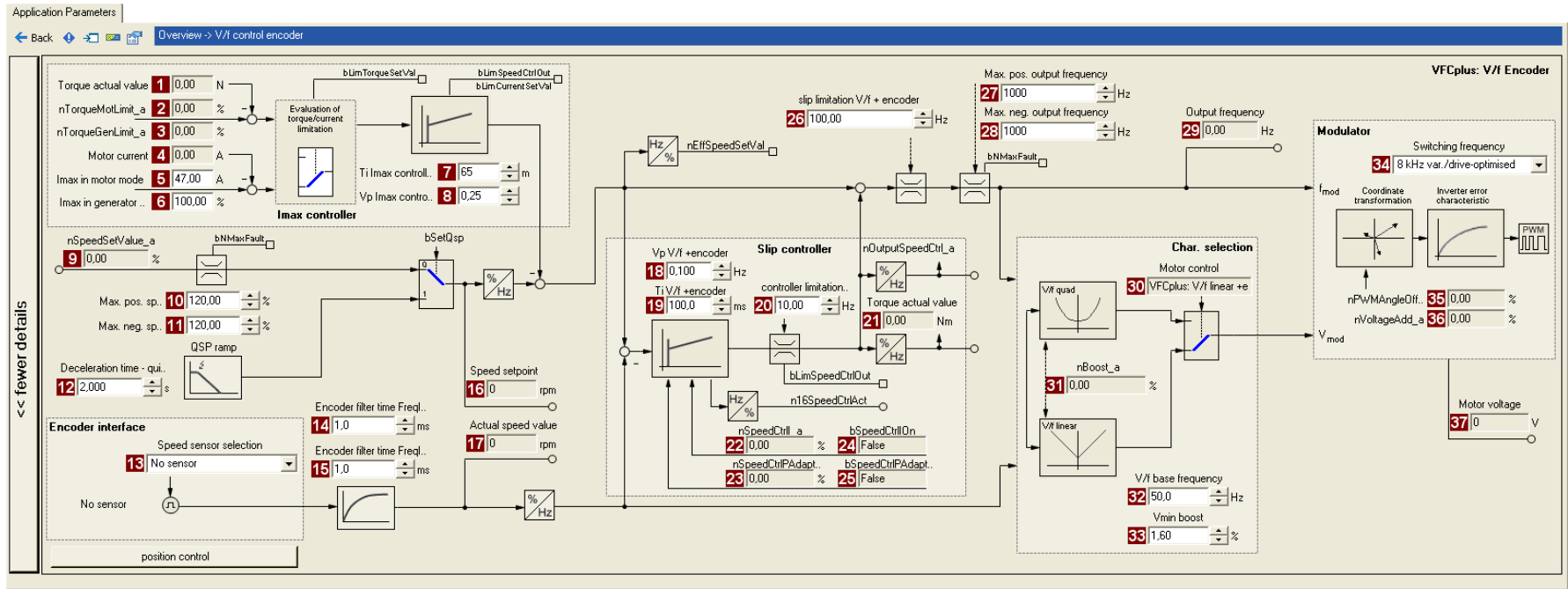
As the slip is calculated in the feedback V/f operation and injected through the slip regulator, the slip compensation ([C00021](#)) is deactivated with V/f control.

5.7.1 Parameterisation dialog/signal flow



Proceed as follows to open the dialog for parameterising the motor control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Select the motor control from the *Overview* dialog level in the **Motor control** ([C00006](#)) list field:
 - "7: VFCplus: V/f linear +encoder" for linear characteristic or
 - "9: VFCplus: V/f quadr +encoder" for square-law characteristic
4. Click the **Motor control V/f encoder** button to change to the *Overview* → *Motor control V/f* dialog box.
 - This dialog level only shows a simplified signal flow with the most important parameters.
 - When you click the >>**More details** button in the left-most position, a signal flow with more details/parameters is displayed, as shown in the following subchapter.



Parameter	Info	Parameter	Info	Parameter	Info
1	C00056/2 Actual torque value	16	C00050 Speed setpoint	29	C00058 Output frequency
2	C00830/29 Limitation of torque in motor mode	17	C00051 Actual speed value	30	C00006 Motor control
3	C00830/28 Limitation of torque in generator mode	18	C00972 Vp Vf+encoder	31	C00830/26 MCTRL: nBoost_a
4	C00054 Motor current	19	C00973 Ti Vf+encoder	32	C00015 V/f base frequency
5	C00022 Imax in motor mode	20	C00971/1 Controller limitation Vf+encoder	33	C00016 Vmin boost
6	C00023 Imax in generator mode	21	C00056/2 Actual torque value	34	C00018 Switching frequency
7	C00074 Ti Imax controller	22	C00830/24 MCTRL: nSpeedCtrlI_a	35	C00830/32 MCTRL: nPWMAngleOffset_a
8	C00073 Vp Imax controller	23	C00830/25 MCTRL: nSpeedCtrlPAadapt_a	36	C00830/31 MCTRL: nVoltageAdd_a
9	C00830/22 Speed setpoint	24	C00833/31 MCTRL: bSpeedCtrlIOn	37	C00052 Motor voltage
10	C00909/1 Max. pos. speed	25	C00833/69 MCTRL: bSpeedCtrlPAadaptOn		
11	C00909/2 Max. neg. speed	26	C00971/2 Slip limitation Vf+encoder		
12	C00105 Decel. time - quick stop	27	C00910/1 Max. pos. output frequency		
13	C00495 Speed sensor selection	28	C00910/2 Max. neg. output frequency		
14	C00497/2 Encoder filter time FreqIn67				
15	C00497/1 Encoder filter time FreqIn12				

5.7.2 Basic settings

In order to protect the drive system, carry out the commissioning of the V/f control and the slip regulator in several steps.

- Detailed information on the single steps can be found in the following subchapters or in the corresponding subchapters for V/f characteristic control.

Initial commissioning steps	
1.	Define the V/f characteristic: <ul style="list-style-type: none">• C00006 = 7: Linear characteristic• C00006 = 9: Square-law characteristic
2.	Defining current limits (I_{max} controller) . (☞ 152)
3.	Parameterise the encoder/feedback system. <ul style="list-style-type: none">▶ Encoder/feedback system (☞ 293)
4.	If special motors with a rated frequency other than 50 Hz or with a number of pole pairs $\neq 2$ are used, set the motor parameters according to the motor nameplate. <ul style="list-style-type: none">▶ Motor selection/Motor data (☞ 121)
5.	Define speed setpoint (e.g. 20 % of the rated speed) and enable controller.
6.	Check whether the actual speed value (C00051) \approx speed setpoint (C00050) and then inhibit the controller again. <ul style="list-style-type: none">• In case of a sign reversal between actual value and setpoint, check the connection or setting of the encoder.• In case the actual value differs considerably from the setpoint (factor 2), set the motor parameters according to motor nameplate. Then repeat step 5.
7.	For protecting the drive, reduce slip regulator limitation in C00971/1 . <ul style="list-style-type: none">• e.g. reduction to half the slip frequency (≈ 2 Hz)
8.	Define speed setpoint (e.g. 20 % of the rated speed) and enable controller.
9.	In case of a semi-stable operational performance, reduce the reset time (C00972) or the proportional gain (C00973) of the slip regulator until a stable operation has been achieved. <ul style="list-style-type: none">▶ Parameterising the slip regulator (☞ 179)
10.	In a final step, increase the slip regulator limitation again in C00971/1 . <ul style="list-style-type: none">• e.g. increase to twice the slip frequency



Tip!

Information on the optimisation of the control mode and the adaptation to the real application is provided in the "[Optimising the control mode](#)" chapter for the V/f characteristic control (VFCplus). (☞ 153)

Parameterisable additional functions are described correspondingly in the chapter "[Parameterisable additional functions](#)". (☞ 240)

5.7.2.1 Parameterising the slip regulator

The slip regulator is designed as a PI controller. In order to improve the response to setpoint changes, the setpoint speed or setpoint frequency is added to the output (correcting variable) of the slip regulator as feedforward control value.

- ▶ In contrast to the conventional speed controller, the slip regulator only regulates the slip.
- ▶ In the Lenze setting, the slip regulator features a configuration with a goof robustness and moderate dynamics.

Parameter	Info	Lenze setting	
		Value	Unit
C00971/1	VFC: Controller limitation V/f +encoder	10.00	Hz
C00971/2	VFC: Slip limitation V/f +encoder	100.00	Hz
C00972	VFC: Vp V/f +encoder	0.100	Hz/Hz
C00973	VFC: Ti V/f +encoder	100.0	ms

Slip regulator gain Vp

The setting range of the slip regulator gain Vp ([C00972](#)) which leads to a stable operational performance, mainly depends on the resolution of the speed sensor. There is a direct relationship between encoder resolution and gain:

- ▶ The higher the encoder resolution, the higher the gain can be set.

The following table provides maximum and recommended slip regulator gains for encoder with standard encoder increments:

Encoder increment [Increments/revolution]	Slip regulator gain Vp	
	maximum	recommended
8	0,09	0,06
64	0,52	0,31
100	0,79	0,47
120	0,94	0,57
128	1,00	0,60
256	1,29	0,77
386	1,63	0,98
512	1,97	1,18
640	2,31	1,38
768	2,65	1,59
896	2,99	1,79
1014	3,33	2,00
1536	4,69	2,81
2048	6,05	3,63
3072	8,77	5,26
4096	11,49	6,90

[5-1] Slip regulator gain Vp based on the encoder increment



How to adapt the slip regulator gain to the operating conditions:

1. Adapt the slip regulator gain ([C00972](#)) to the encoder increment according to table [\[5-1\]](#).
2. Set controller limitation ([C00971/1](#)) to half the slip frequency (≈ 2 Hz).
3. Select speed setpoint (e.g. 20 % of the rated speed).
4. Enable controller.
5. Increase slip regulator gain ([C00972](#)) until the drive becomes semi-stable.
 - This can be recognised by motor noises or "humming" of the motor or by a noise on the actual speed signal.
6. Reduce slip regulator gain ([C00972](#)) until the drive runs stable again (no motor "humming").
7. Reduce slip regulator gain ([C00972](#)) to approx. half the value.
 - For lower encoder resolutions, another reduction of the slip regulator gain for lower speeds (speed setpoint ≈ 0) may become necessary.
 - It is recommended to check as a final step the behaviour at setpoint speed = 0 and further reduce the slip regulator gain in case of irregular running.
8. Increase controller limitation ([C00971/1](#)) again (e.g. to twice the slip frequency).

Slip regulator time constant T_i



How to set the slip regulator time constant:

1. Set controller limitation ([C00971/1](#)) to half the slip frequency (≈ 2 Hz).
2. Select speed setpoint (e.g. 20 % of the rated speed).
3. Enable controller.
4. Reduce slip regulator time constant ([C00973](#)) until the drive becomes semi-stable.
 - This can be recognised by engine noises or motor "oscillating" or by oscillation on the actual speed signal.
5. Increase slip regulator time constant ([C00973](#)) until the drive runs stable again (no motor "oscillation").
6. Increase the slip regulator time constant ([C00973](#)) to approx. twice the value.
7. Increase controller limitation ([C00971/1](#)) again (e.g. to twice the slip frequency).

Controller limitation

Max. intervention of the controller is limited by the controller limitation ([C00971/1](#)).

- ▶ The controller can be limited depending on the application.
- ▶ We recommend to limit the max. intervention to twice the rated slip of the motor.
- ▶ The rated slip is calculated as follows:

$$f_{\text{Slip}_{\text{Rated}}} [\text{Hz}] = f_{\text{Rated}} [\text{Hz}] - \left(\frac{n_{\text{Motor}_{\text{Rated}}} [\text{rpm}]}{60} \cdot p_{\text{Number of pole pairs}} \right)$$

[5-9] Calculation of the rated slip



Note!

The setting [C00971/1](#) = 0 Hz deactivates the slip regulator. In this case, the structure of the V/f control corresponds to the structure of the V/f characteristic control without feedback.

Slip limitation

In addition to limiting the slip regulator, the field frequency to be injected can also be limited by another limiting element, the slip limitation ([C00971/2](#)).

- ▶ A slip limitation to, for instance, double the rated slip of the motor prevents the motor from stalling in very dynamic processes.
- ▶ Motor stalling is caused by:
 - High overcurrent at very steep speed ramps
 - very fast speed changes due to load, e.g. abrupt stopping of the drive due to an encounter with a stop or a load that is not moving.

5.8 Sensorless vector control (SLVC)

Sensorless vector control (SLVC) is based on a better motor current control according to a field-oriented control mode by Lenze.



Stop!

- The sensorless vector control (SLVC) is only suitable for asynchronous motors.
- The connected motor must not be more than two power classes smaller than the motor assigned to the controller.
- Operation of the sensorless vector control (SLVC) is only permissible for one single drive!
- Operation of the sensorless vector control (SLVC) is not permissible for hoists!
- The Lenze setting permits the operation of a power-adapted motor. Optimal operation is only possible if either:
 - the motor is selected via the Lenze motor catalogue
 - the motor nameplate data are entered and motor parameter identification is carried out afterwards
 - *or* –
 - the nameplate data and equivalent circuit data of the motor (motor leakage inductance and mutual motor inductance, slip compensation and motor stator resistance) are entered manually.
- When you enter the motor nameplate data, take into account the phase connection implemented for the motor (star or delta connection). Only enter the data applying to the selected connection type.
 - In this context, also observe the instructions in the chapter entitled "[Adapting the V/f base frequency](#)" relating to V/f characteristic control.
([154](#))



Note!

Optimal operation of the sensorless vector control (SLVC) can be achieved from a minimum speed of approx. 0.5-fold slip speed. At lower speed values below the 0.5-fold slip speed, the maximum torque is reduced.

The maximum field frequency with this motor control mode is 650 Hz.

In comparison to the V/f characteristic control without feedback, the following can be achieved by means of sensorless vector control SLVC:

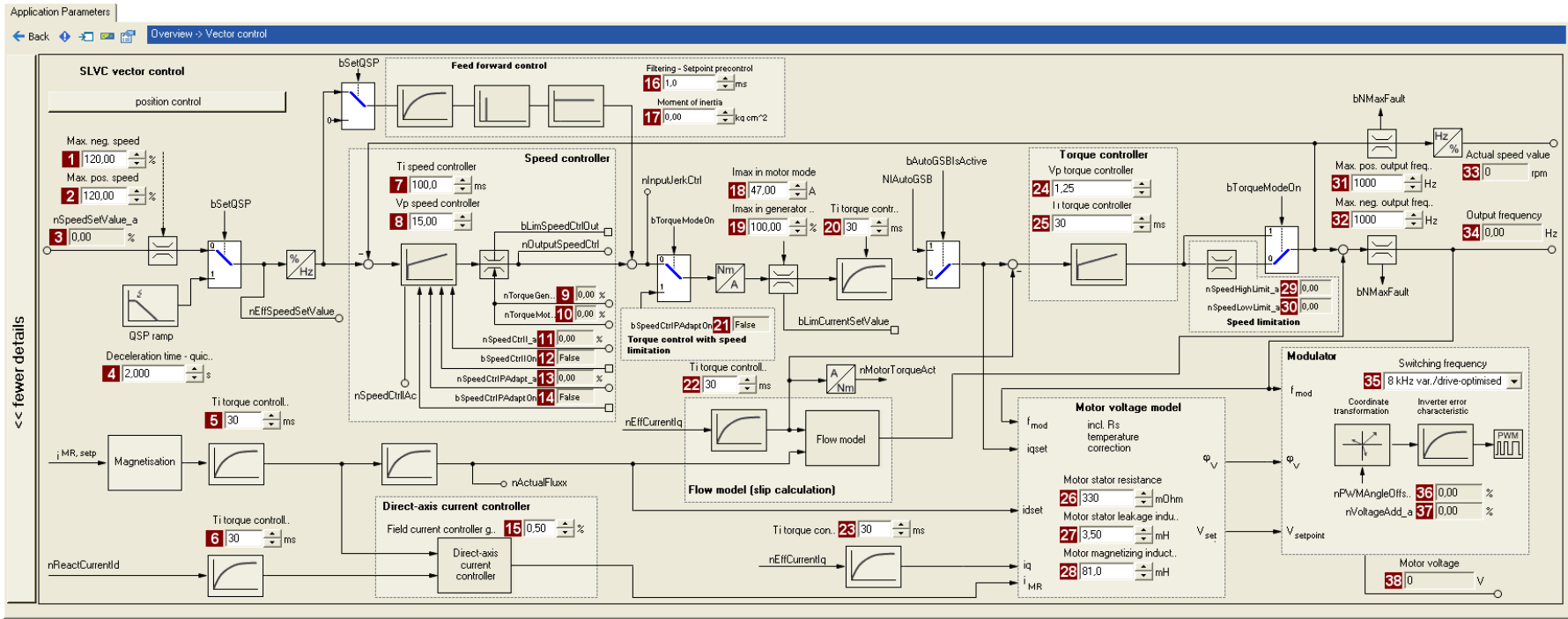
- ▶ A higher maximum torque throughout the entire speed range
- ▶ A higher speed accuracy
- ▶ A higher concentricity factor
- ▶ A higher level of efficiency
- ▶ The implementation of torque-actuated operation with speed limitation
- ▶ The limitation of the maximum torque in motor and generator mode for speed-actuated operation

5.8.1 Parameterisation dialog/signal flow



Proceed as follows to open the dialog for parameterising the motor control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Select the motor control "4: SLVC: Vector control" from the *Overview* dialog level in the **Motor control** list field ([C00006](#)):
4. Click the **Motor control vector** button to change to the *Overview → Motor control vector* dialog box.
 - This dialog level only shows a simplified signal flow with the most important parameters.
 - When you click the >>**More details** button in the left-most position, a signal flow with more details/parameters is displayed, as shown in the following subchapter.



Parameter	Info	Parameter	Info	Parameter	Info
1	C00909/2 Max. neg. speed	16	C00275 Setpoint feedforward control filtering	24	C00073/2 SLVC: Vp torque controller
2	C00909/1 Max. pos. speed	17	C00273 Moment of inertia	25	C00074/2 SLVC: Ti torque controller
3	C00830/22 Speed setpoint	18	C00022 lmax in motor mode	26	C00084 Motor stator resistance
4	C00105 Decel. time - quick stop	19	C00023 lmax in generator mode	27	C00085 Motor stator leakage inductance
5	C00074/2 SLVC: Ti torque controller	20	C00074/2 SLVC: Ti torque controller	28	C00092 Motor magnetising inductance
6	C00074/2 SLVC: Ti torque controller	21	C00833/69 MCTRL: bSpeedCtrlPAdaptOn	29	C00830/88 MCTRL: nSpeedHighLimit_a
7	C00071/1 SLVC: Ti speed controller	22	C00074/2 SLVC: Ti torque controller	30	C00830/23 MCTRL: nSpeedLowLimit_a
8	C00070/1 SLVC: Vp speed controller	23	C00074/2 SLVC: Ti torque controller	31	C00910/1 Max. pos. output frequency
9	C00830/28 Limitation of torque in generator mode			32	C00910/2 Max. neg. output frequency
10	C00830/29 Limitation of torque in motor mode			33	C00051 Actual speed value
11	C00830/24 MCTRL: nSpeedCtrlI_a			34	C00058 Output frequency
12	C00833/31 MCTRL: bSpeedCtrlIOn			35	C00018 Switching frequency
13	C00830/25 MCTRL: nSpeedCtrlPAdapt_a			36	C00830/32 MCTRL: nPWMAngleOffset_a
14	C00833/69 MCTRL: bSpeedCtrlPAdaptOn			37	C00830/31 MCTRL: nVoltageAdd_a
15	C00985 SLVC: Field current controller gain			38	C00052 Motor voltage

5.8.2 Types of control

The sensorless vector control can be operated in two different modes:

- ▶ [Speed control with torque limitation](#) (*bTorquemodeOn* = FALSE)
- ▶ [Torque control with speed limitation](#) (*bTorquemodeOn* = TRUE)

5.8.2.1 Speed control with torque limitation

A speed setpoint is selected and the drive system is operated in a speed-controlled manner.

The operational performance can be adapted in the following ways:

- ▶ Overload limitation in the drive train
 - The torque is limited via the torque setpoint.
 - The torque setpoint is identical to the value at the output of the speed controller, *nOutputSpeedCtrl*.
 - To avoid overload in the drive train, the torque in motor mode can be limited via the *nTorqueMotLimit_a* process input signal, and the torque in generator mode can be limited via the *nTorqueGenLimit_a* process input signal:

Identifier <small>DIS code data type</small>	Information/possible settings
<i>nTorqueMotLimit_a</i> C00830/29 INT	Torque limitation in motor mode <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % M_{\max} (C00057) • Setting range: 0 ... +199.99 % • If keypad control is performed: Parameterisable via C00728/1.
<i>nTorqueGenLimit_a</i> C00830/28 INT	Torque limitation in generator mode <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % M_{\max} (C00057) • Setting range: -199.99 ... 0 % • If keypad control is performed: Parameterisable via C00728/2.



Note!

To avoid instabilities during operation, the torque limit values are internally processed as absolute values.

- ▶ Motor current limitation
 - A cross current setpoint is calculated from the torque setpoint which is limited depending on the magnetising current, the max. current in motor mode ([C00022](#)), and the max. current in generator mode ([C00023](#)).
 - Here, the total current injected into the motor does not exceed the max. currents in motor and generator mode.
- ▶ [Slip compensation](#) (📖 255)
 - Using a slip model, the slip of the machine is reconstructed.
 - The slip compensation ([C00021](#)) acts as the influencing parameter.

5.8.2.2 Torque control with speed limitation

For torque-controlled operation, a torque setpoint is defined in the drive system. Unlike the [Speed control with torque limitation](#), this type of control has a deactivated speed controller and torque limitation.

- ▶ The torque setpoint is calculated directly from $nTorqueSetValue_a$.
- ▶ The speed is defined by the process.
- ▶ Due to its limitation, the speed-controlled drive can only rotate within a speed range whose positive speed is limited by $nSpeedHighLimit_a$ and whose negative speed is limited by $nSpeedLowLimit_a$.

Identifier <small>DIS code data type</small>	Information/possible settings
$nTorqueSetValue_a$ C00830/27 INT	Torque setpoint / additive torque <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % M_{max} (C00057)
$nSpeedHighLimit_a$ C00830/88 INT	Upper speed limit for speed limitation (only for torque-controlled operation) <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % rated speed (C00011)
$nSpeedLowLimit_a$ C00830/23 INT	Lower speed limit for speed limitation (only for torque-controlled operation) <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % rated speed (C00011)

5.8.3 Basic settings

The following "Initial commissioning steps" must be performed to commission the sensorless vector control:

Initial commissioning steps					
1.	Determine the motor control: C00006 = "4: SLVC: Vector control"				
2.	Set the motor selection/motor data <ul style="list-style-type: none"> When selecting and parameterising the motor, the motor nameplate data and the equivalent circuit diagram data are relevant. Detailed information can be found in the "Motor selection/Motor data" chapter. (📖 121) Depending on the motor manufacturer, proceed as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Lenze motor:</th> <th style="text-align: left;">Third party manufacturer's motor:</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> Selecting a motor from the motor catalogue in the »Engineer« - or - 1. Set the motor nameplate data 2. Automatic motor data identification </td> <td style="vertical-align: top;"> 1. Set the motor nameplate data 2. Automatic motor data identification or set known equivalent circuit diagram data manually: C00082: Motor rotor resistance C00084: Motor stator resistance C00085: Motor stator leakage inductance C00092: Motor magnetising inductance C00095: Motor magnetising current </td> </tr> </tbody> </table>	Lenze motor:	Third party manufacturer's motor:	Selecting a motor from the motor catalogue in the »Engineer« - or - 1. Set the motor nameplate data 2. Automatic motor data identification	1. Set the motor nameplate data 2. Automatic motor data identification or set known equivalent circuit diagram data manually: C00082 : Motor rotor resistance C00084 : Motor stator resistance C00085 : Motor stator leakage inductance C00092 : Motor magnetising inductance C00095 : Motor magnetising current
Lenze motor:	Third party manufacturer's motor:				
Selecting a motor from the motor catalogue in the »Engineer« - or - 1. Set the motor nameplate data 2. Automatic motor data identification	1. Set the motor nameplate data 2. Automatic motor data identification or set known equivalent circuit diagram data manually: C00082 : Motor rotor resistance C00084 : Motor stator resistance C00085 : Motor stator leakage inductance C00092 : Motor magnetising inductance C00095 : Motor magnetising current				
3.	Define the type of control: <i>bTorquemodeOn</i> = FALSE: Speed control with torque limitation <i>bTorquemodeOn</i> = TRUE: Torque control with speed limitation				
4.	Set the slip compensation (C00021). ▶ Slip compensation (📖 255)				

**Tip!**

Information on the optimisation of the control mode and the adaptation to the real application is provided in the chapter "[Optimising the control mode](#)". (📖 188)

We recommend to use the flying restart function for connecting/synchronising the inverter to an already rotating drive system. ▶ [Flying restart function](#) (📖 247)

Parameterisable additional functions are described correspondingly in the chapter "[Parameterisable additional functions](#)". (📖 240)

5.8.4 Optimising the control mode

5.8.4.1 Optimising the starting performance after a controller enable

After the controller has been enabled, the starting action of the motor is delayed due to the magnetisation of the motor. Under consideration of the motor rotor time constant ([C00083](#)), the time delay is calculated as follows:

$$\text{Magnetisation} = 1.5 * \text{motor rotor time constant}$$

If this delay cannot be tolerated for specific applications, the motor must always be operated in an energised condition. For this, select one of the following options:

Procedure without setting a controller inhibit

1. Deactivate the auto DCB function with [C00019](#) = 0.
2. Do not activate the controller inhibit. Instead, stop the drive by selecting a setpoint of 0 or by activating the quick stop function.

Procedure with setting a controller inhibit due to application requirements

1. Deactivate the auto DCB function with [C00019](#) = 0.
2. Enter a greater value for the motor rotor resistance (max. factor 2!) to reduce the magnetisation time in [C00082](#).



Note!

During the starting action, a jerk may occur in the machine due to the temporarily increased motor current!

5.8.4.2 Optimise speed controller

The speed controller is designed as a PI controller.

- In the Lenze setting, the configuration of the speed controller provides robustness and moderate dynamics.

Parameter	Info	Lenze setting	
		Value	Unit
C00070/1	SLVC: Vp speed controller	15.00	
C00071/1	SLVC: Ti speed controller	100.0	ms

Speed controller gain Vp

The gain Vp ([C00070/1](#)) of the speed controller is defined in a scaled representation which enables a comparable parameterisation almost independent of the power of the motor or inverter. Here, the speed input difference of the controller is scaled to the rated motor speed whereas the output torque refers to the rated motor torque. A gain of 10 means that a speed difference of 1 % is gained through the P component with 10 % torque.

If the rated data of the motor and the mass inertia of the drive system are known, we recommend the following setting:

$$V_p \approx 1.5 \dots 3 \cdot \frac{T_M[s]}{0.01[s]}$$

$$T_M[s] = \frac{2 \cdot \pi \cdot n_N[\text{rpm}]}{M_N[\text{Nm}] \cdot 60} \cdot J_{\text{Drive, total}}[\text{kgm}^2]$$

$$M_N[\text{Nm}] = \frac{P_N[\text{W}] \cdot 60}{2 \cdot \pi \cdot n_N[\text{rpm}]}$$

V_p = Gain of the speed controller ([C00070/1](#))
 T_M = Time constant for the acceleration of the motor
 M_N = Rated motor torque
 n_N = Rated motor speed
 $J_{\text{drive, total}}$ = Total moment of inertia of the drive

[5-10] Recommendation for the setting of the gain of the speed controller



Tip!

Values recommended by Lenze for the setting of the (proportional) gain:

- For drive systems without feedback: $V_p = 6 \dots 25$
- For drive systems with a good disturbance behaviour: $V_p > 15$
In this case, we recommend the optimisation of the dynamic performance of the torque controller.

Speed controller reset time T_i

Apart from setting the P component, [C00071/1](#) provides the possibility to take influence on the I component of the PI controller.



Tip!

Value range recommended by Lenze for the setting of the reset time:

$T_i = 20 \text{ ms} \dots 150 \text{ ms}$

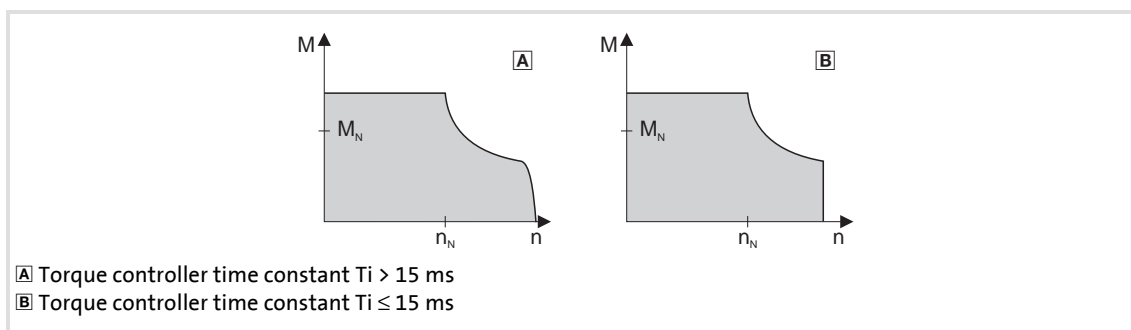
5.8.4.3 Optimising dynamic performance and field weakening behaviour

In the Lenze setting, the torque controller has been preset in such a way that robust and stable operation with a moderate dynamic response is enabled over the entire speed range. Retrospective optimisation of the controller parameters is not necessary.

Parameter	Info	Lenze setting	
		Value	Unit
C00073/2	SLVC: Vp torque controller	1.25	
C00074/2	SLVC: Ti torque controller	30	ms

A greater dynamic performance of the sensorless vector control can be achieved by reducing time constant T_i of the speed controller ([C00074/2](#)).

A greater dynamic performance of the field weakening function can be achieved by setting a time constant ≤ 15 ms. This means for actual speeds above rated speed a better torque-speed-characteristic in the field weakening range:



[5-11] Speed / torque characteristic diagram in the field weakening range

- ▶ For $T_i > 15$ ms (see **A**), the actual speed value slightly drops in the field weakening range if the load torque increases in the motor mode.
- ▶ For $T_i \leq 15$ ms (see **B**), the speed remains stable in the field weakening range if the torque is within the M/n characteristic field highlighted in grey.

Tip!

For applications with high dynamic performance and speed/torque accuracy requirements in the field weakening range, we recommend a time constant $T_i \leq 15$ ms.

In this case, the maximum torque should be limited via the $nTorqueMotLimit_a$ and $nTorqueGenLimit_a$ process input signals to $1.5 \times M_N$ to ensure stable operation in the field weakening range.

5.8.4.4 Optimising the stalling behaviour

Motor stalling due to a torque overload in the field weakening range in sensorless vector control is prevented by means of an inverter-internal stalling current monitoring. In the field weakening range, hence at frequencies above the base frequency, it reduces the maximum current to prevent the motor from stalling. The reduction depends on the current field frequency, the base frequency, the DC-bus voltage and the maximum current ([C00022](#)). Generally it applies that a higher field frequency causes a stronger limitation of the maximum current.

The field weakening behaviour of the sensorless vector control depends on the setting of the reset time T_i of the torque controller ([C00074/2](#)).

The following applies to the reset time T_i ([C00074/2](#)) > 15 ms:

The behaviour in the field weakening range can be adapted via the override point of field weakening ([C00080](#)). This parameter serves to shift the frequency-dependent maximum current characteristic:

▶ [C00080](#) > 0 Hz:

- The maximum current characteristic is shifted by the entered frequency to higher field frequencies.
- The maximally permissible current and the maximum torque increase in the field weakening range.
- The risk of motor stalling increases.

▶ [C00080](#) < 0 Hz:

- The maximum current characteristic is shifted by the entered frequency to lower field frequencies.
- The maximally permissible current and the maximum torque are reduced in the field weakening range.
- The risk of motor stalling is reduced.



Note!

We recommend to keep the Lenze setting (0 Hz).

The following applies to the reset time T_i ([C00074/2](#)) ≤ 15 ms:

The reduction of the magnetising current in the field weakening range can be adapted via the override point of field weakening ([C00080](#)):

▶ [C00080](#) > 0 Hz:

The reduction of the magnetising current is shifted to higher field frequencies. Here, there is a risk of the motor being magnetised too much and having too little voltage reserve for the torque-creating current.

▶ [C00080](#) < 0 Hz:

The reduction of the magnetising current is shifted to lower field frequencies.

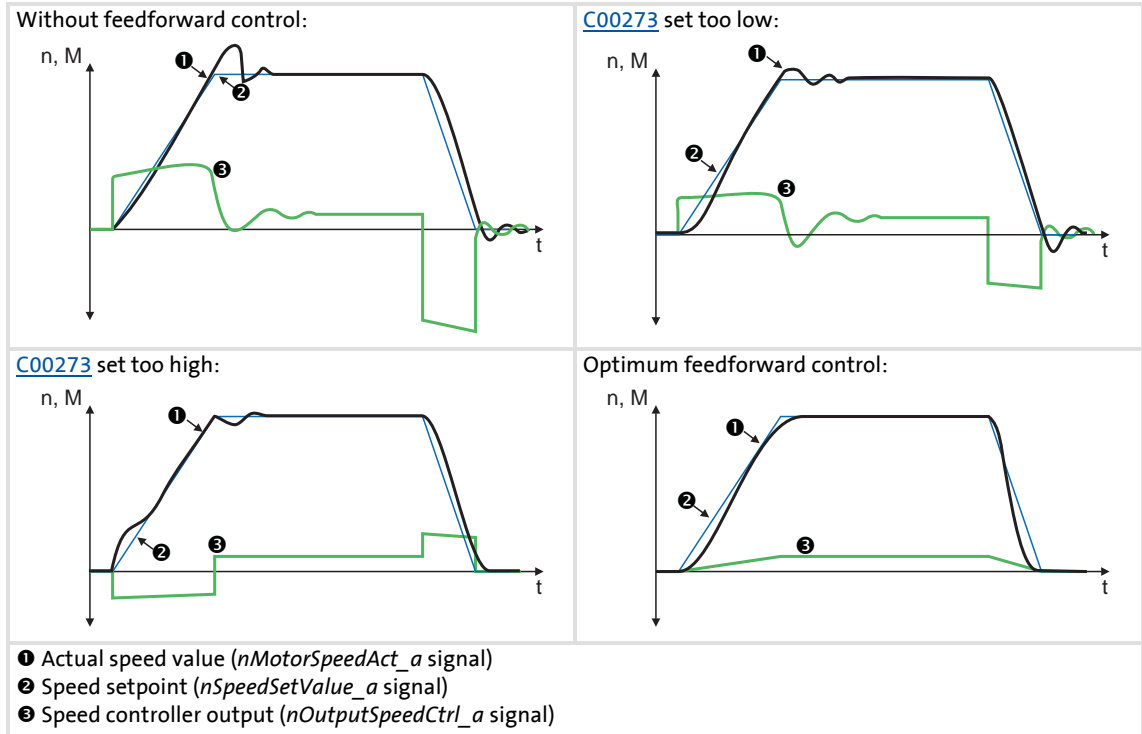


Note!

A function for enabling a stable operation can only be implemented to a limited extent with a reset time $T_i \leq 15$ ms. For applications with speeds above the 2-fold rated speed, we recommend a reset time T_i ([C00074/2](#)) > 15 ms.

5.8.4.5 Optimise response to setpoint changes and determine mass inertia

Setting the total moment of inertia under [C00273](#) provides the optimum torque feedforward control. Depending on the application, an adjustment of the setting under [C00273](#) may be necessary to optimise the response to position/speed setpoint changes by means of the torque feedforward control.



[5-12] Typical signal characteristics for different settings of the load moment of inertia

**How to optimise the torque feedforward control:**

1. Run a typical speed profile and record the inputs and outputs of the speed controller with the data logger.
 - Motor control variables to be recorded:
 - nSpeedSetValue_a* (speed setpoint)
 - nMotorSpeedAct_a* (actual speed value)
 - nOutputSpeedCtrl_a* (speed controller output)
2. Estimate the moment of inertia and set it in [C00273](#) in relation to the motor end (i.e. with account being taken of the gearbox factors).
3. Repeat the data logger recording (see step 1).

Now the data logger should show that part of the required torque is generated by the feedforward control and the speed controller output signal (*nOutputSpeedCtrl_a*) is correspondingly smaller. The resulting following error decreases.
4. Change the setting in [C00273](#) and repeat the data logger recording until the intended response to setpoint changes is reached.
 - The optimisation could aim at the speed controller being completely relieved (see signal characteristics in Fig. [\[5-12\]](#)).
5. Save the parameter set (device command: [C00002/11](#)).

5.8.4.6 Slip calculation from motor equivalent circuit diagram data

This function extension is available from version 02.00.00!

In order to achieve a better speed stability and torque accuracy, the slip calculation can be either derived from the motor nameplate data (e.g. rated motor speed) or the motor equivalent circuit diagram data (stator resistance, rotor resistance etc.).

The data to be used for sensorless vector control is selected via bit 0 in [C02879/1](#):

Setting	Info
Bit 0 SLVC	In case of sensorless vector control: <ul style="list-style-type: none">• "0" ≙ Slip calculation from motor nameplate data (Lenze setting)• "1" ≙ Slip calculation from motor equivalent circuit diagram data
Bit 1 SC_ASM	In case of servo control for asynchronous motors: <ul style="list-style-type: none">• "0" ≙ Slip calculation from motor nameplate data• "1" ≙ Slip calculation from motor equivalent circuit diagram data (Lenze setting)
Bit 2 ... 7	Reserved



Note!

In order that the slip can be calculated from the motor equivalent circuit diagram data, the equivalent circuit data (stator resistance, rotor resistance etc.) must be known as exactly as possible.

- Selecting a motor in the »Engineer« motor catalogue loads the exact motor equivalent circuit diagram data.
- When the motor nameplate data is entered manually and the motor equivalent circuit diagram data is then detected via the motor parameter identification, the "extended identification" ([C02867/1](#) = 2) must be used.
 - ▶ [Automatic motor data identification](#) (□ 126)

In the slip calculation from the motor equivalent circuit diagram data, the slip compensation ([C00021](#)) has no influence anymore.

5.8.5 Remedies for undesired drive behaviour

Drive behaviour	Remedy
Deviation between no-load current and magnetising current or bad speed or torque accuracy.	<p>Adapt the motor magnetising inductance (C00092) for no-load operation.</p> <ul style="list-style-type: none"> If the no-load current is greater than the magnetising current (C00095) at 0.5-fold rated motor speed, the magnetising inductance must be reduced until the no-load current and the magnetising current have the same values. Otherwise, the magnetising inductance must be increased. <p>Tendency of the correction of C00092:</p> <p>PN: Rated motor power</p>
Insufficient speed constancy at high load: Setpoint and motor speed are not proportional anymore. Caution: Overcompensation of the settings mentioned under "Remedy" may result in unstable behaviour!	<p>Via the slip compensation (C00021), the speed stability under high loads can be affected:</p> <ul style="list-style-type: none"> If $n_{act} > n_{slip}$, reduce the value in C00021 If $n_{act} < n_{slip}$, increase the value in C00021
Unstable control with higher speeds.	<ul style="list-style-type: none"> Check the setting of the magnetising inductance (C00092) by comparing the current consumption in no-load operation with the rated magnetising current (C00095). Optimise oscillation damping (C00234).
"Short circuit" (OC1) or "Clamp operation active" (OC11) error messages at short acceleration time (C00012) in proportion to the load (controller cannot follow the dynamic processes).	<ul style="list-style-type: none"> Increase the gain of the torque controller (C00073/2). Reduce the reset time of the torque controller (C00074/2). Increase the acceleration (C00012)/deceleration (C00013) time.
Mechanical resonance at certain speeds.	The L_NSet_1 function block masks out those speed ranges that include resonance.
Speed variations in no-load operation for speeds > 1/3 rated speed.	Minimise speed oscillations with oscillation damping (C00234).
Drive runs unstable.	Check set motor data (nameplate data and equivalent circuit diagram data).
Setpoint speed and actual speed differ strongly.	▶ Motor selection/Motor data (□ 121)
The torque required is not generated at standstill.	Increase motor magnetising current (C00095).
Current overshoots occur when heavy loads are accelerated from standstill (OC1 or OC11 error).	
The machine runs uneven.	

5.9 Sensorless control for synchronous motors (SLPSM)

The sensorless control for synchronous motors is based on a decoupled and separated control of the torque-creating and field-creating current share of synchronous motors. In contrast to the servo control, the actual speed value and the rotor position are reconstructed via a motor model.



Stop!

- The sensorless control for synchronous motors is only possible up to a maximum output frequency of 650 Hz!
 - Depending on the number of motor pole pairs, the reference speed ([C00011](#)) may only be selected that high that the output frequency displayed in [C00059](#) is lower than 650 Hz.
- We recommend to select a power-adapted combination of inverter and motor.
- The Lenze setting permits the operation of a power-adapted motor. Optimal operation is only possible if either:
 - the motor is selected via the Lenze motor catalogue
 - the motor nameplate data are entered and motor parameter identification is carried out afterwards
 - or -
 - the nameplate data and equivalent circuit data of the motor (motor leakage inductance and motor stator resistance) are entered manually.
- When you enter the motor nameplate data, take into account the phase connection implemented for the motor (star or delta connection). Only enter the data applying to the selected connection type.
- In order to protect the motor (e.g. from demagnetisation), we recommend setting the ultimate motor current in [C00939](#). This ensures motor protection even with an unstable operation. ▶ [Maximum current monitoring](#) (📖 283)
- Controller enable is only possible if the motor is at standstill.
 - When the controller is enabled, a jerk may occur due to an angle jump since the rotor displacement angle is not known after controller enable. For some applications, this jerk in the machine is not acceptable.
 - **From version 02.00.00**, the rotor displacement angle is identified with every controller enable in the Lenze setting, and thus a jerk in the machine after controller enable can be avoided. ▶ [Pole position identification without motion](#) (📖 144)
 - A flying restart circuit for synchronising to rotating motors is in preparation.

**Stop!**

- The injection of a constant current may cause an unwanted heating of the motor at controlled operation.
 - We recommend using a temperature feedback via KTY, PTC or thermal contact.
 - ▶ [Motor temperature monitoring \(KTY\)](#) (📖 323)
 - ▶ [Motor temperature monitoring \(PTC\)](#) (📖 278)

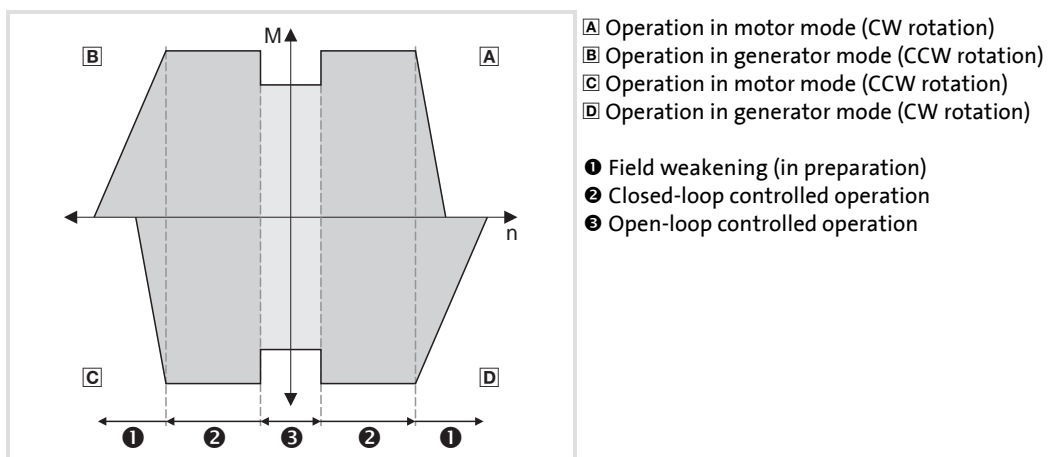
**Note!**

Currently, the sensorless control does not contain a flying restart function that enables a synchronisation of the controller to a rotating machine.

- Thus, we recommend taking measures for preventing overvoltages at operation in generator mode (e.g. brake resistor).
- By any means, the delay time for the "DC-bus overvoltage" error trigger in [C00601/1](#) must be set to 0 s.

The motor model-based speed monitoring requires a rotating machine. Thus, the operational performance of the sensorless control for synchronous motors is divided into two categories:

1. Open-loop controlled operation ($|n_{\text{setpoint}}| < n_{\text{C00996}}$)
 - In the range of low speeds, the speed of a synchronous motor is not possible. Thus, only an adjustable and constant current is injected that enables an acceleration.
2. Closed-loop controlled operation ($|n_{\text{setpoint}}| > n_{\text{C00996}}$)
 - In this range, the rotor flux position and the speed are reconstructed via an observer. The control is carried out field-oriented. Only the current is injected that is needed for the required torque.



[5-13] Operating ranges of the sensorless control for synchronous motors

The sensorless control for synchronous motors has similar advantages for the closed-loop controlled operating range and the servo control (SC) for synchronous motors. Compared to asynchronous motors, there are the following advantages:

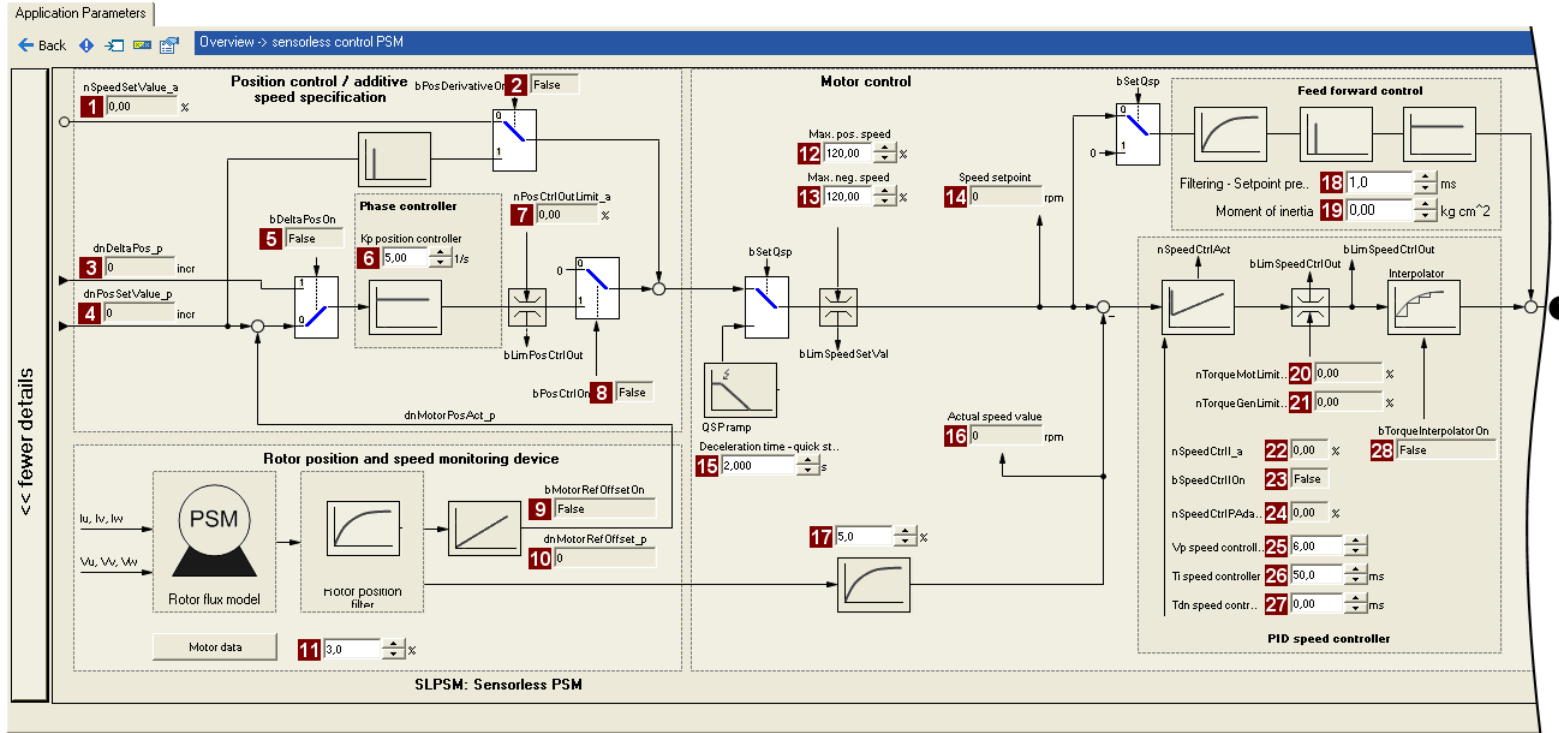
- ▶ Higher power density of the motor
- ▶ Higher efficiency
- ▶ Limitation of the maximum torque in motor mode and generator mode in closed-loop operating range
- ▶ Implementation of simple positioning

5.9.1 Parameterisation dialog/signal flow



Proceed as follows to open the dialog for parameterising the motor control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Select the motor control "3: SLPSM: Sensorless PSM" from the *Overview* dialog level in the **Motor control** list field:
4. Click the **Motor control servo SLPSM** button to change to the *Overview* → *Motor control vector* dialog box.
 - This dialog level only shows a simplified signal flow with the most important parameters.
 - When you click the >>**More details** button in the left-most position, a signal flow with more details/parameters is displayed.



Parameter	Info	Parameter	Info	Parameter	Info
1	C00830/22 Speed setpoint	12	C00909/1 Max. pos. speed	18	C00275 Setpoint feedforward control filtering
2	C00833/67 MCTRL: bPosDerivativeOn	13	C00909/2 Max. neg. speed	19	C00273 Moment of inertia
3	C00834/4 MCTRL: dnDeltaPos_p	14	C00050 Speed setpoint	20	C00830/29 Limitation of torque in motor mode
4	C00834/5 MCTRL: dnPosSetValue_p	15	C00105 Decel. time - quick stop	21	C00830/28 Limitation of torque in generator mode
5	C00833/35 MCTRL: bDeltaPosOn	16	C00051 Actual speed value	22	C00830/24 MCTRL: nSpeedCtrlI_a
6	C00254 Kp position controller	17	C00998/2 SLPSM: Filter time actual speed value	23	C00833/31 MCTRL: bSpeedCtrlIOn
7	C00830/21 MCTRL: nPosCtrlOutLimit_a			24	C00830/25 MCTRL: nSpeedCtrlIPAdapt_a
8	C00833/27 MCTRL: bPosCtrlOn			25	C00070/3 SLPSM: Vp speed controller
9	C00833/68 MCTRL: bMotorRefOffsetOn			26	C00071/3 SLPSM: Ti speed controller
10	C00834/6 MCTRL: dnMotorRefOffset_p			27	C00072 SC: Tdn speed controller
11	C00998/1 SLPSM: Filter time rotor position			28	C00833/29 MCTRL: bTorqueInterpolatorOn

5.9.2 Types of control

Sensorless control for synchronous motors can only be executed in the "Speed control with torque limitation" ($bTorquemodeOn = FALSE$) mode.

Speed control with torque limitation

A speed setpoint is selected and the drive system is operated in a speed-controlled manner. For adapting the operational performance, the overload in the drive train can be limited:

- ▶ The torque is limited via the torque setpoint.
- ▶ The torque setpoint is identical to the value at the output of the speed controller, $nOutputSpeedCtrl$.
- ▶ To avoid overload in the drive train, the torque in motor mode can be limited via the $nTorqueMotLimit_a$ process input signal, and the torque in generator mode can be limited via the $nTorqueGenLimit_a$ process input signal:

Identifier <small>DIS code data type</small>	Information/possible settings
$nTorqueMotLimit_a$ C00830/29 INT	Torque limitation in motor mode <ul style="list-style-type: none"> • Scaling: $16384 \equiv 100\% M_{max}$ (C00057) • Setting range: 0 ... +199.99 % • If keypad control is performed: Parameterisable via C00728/1.
$nTorqueGenLimit_a$ C00830/28 INT	Torque limitation in generator mode <ul style="list-style-type: none"> • Scaling: $16384 \equiv 100\% M_{max}$ (C00057) • Setting range: -199.99 ... 0 % • If keypad control is performed: Parameterisable via C00728/2.



Stop!

Torque limitation is only active in the closed-loop controlled operation ($|n_{Setpoint}| > n_{C00996}$)!

- It must be prevented that the actual speed value is braked into the non-observable area due to the torque limitation!



Note!

To avoid instabilities during operation, the torque limit values are internally processed as absolute values.

5.9.3 Basic settings

The following "Initial commissioning steps" must be performed to commission the sensorless control for synchronous motors:

Initial commissioning steps			
1.	Select motor control: C00006 = "3: SLPSM: Sensorless PSM"		
2.	<p>Set the motor selection/motor data</p> <ul style="list-style-type: none"> When selecting and parameterising the motor, the motor nameplate data and the equivalent circuit diagram data are relevant. Detailed information can be found in the "Motor selection/Motor data" chapter. (□ 121) <p>Depending on the motor manufacturer, proceed as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Lenze motor: Selecting a motor from the motor catalogue in the »Engineer«</p> <p>- or -</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification </td> <td style="width: 50%; vertical-align: top;"> <p>Third party manufacturer's motor:</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification or set known equivalent circuit diagram manually: C00084: Motor stator resistance C00085: Motor stator leakage inductance </td> </tr> </table>	<p>Lenze motor: Selecting a motor from the motor catalogue in the »Engineer«</p> <p>- or -</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification 	<p>Third party manufacturer's motor:</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification or set known equivalent circuit diagram manually: C00084: Motor stator resistance C00085: Motor stator leakage inductance
<p>Lenze motor: Selecting a motor from the motor catalogue in the »Engineer«</p> <p>- or -</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification 	<p>Third party manufacturer's motor:</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification or set known equivalent circuit diagram manually: C00084: Motor stator resistance C00085: Motor stator leakage inductance 		
3.	<p>Set speed switching thresholds between open-loop and closed-loop controlled operation:</p> <ul style="list-style-type: none"> Set transition speed from open-loop to closed-loop operation in C00996/1 in [%] with regard to the rated motor speed (C00087). Set transition speed from closed-loop to open-loop operation in C00996/2 in [%] with regard to the rated motor speed (C00087). <p>Tip!</p> <ul style="list-style-type: none"> With voltage-adjusted motors, a speed switching threshold of 10 % is recommended. As a rule of thumb, the speed switching threshold should be selected as follows: $C00996/1...2 [\%] = \frac{U_{Rated, motor} [V]}{U_{Rated, FI} [V]} \cdot 10$		
4.	<p>Set open-loop accelerating current in C00995/1 in [%] with regard to the rated motor current (C00088).</p> <ul style="list-style-type: none"> This value defines the height of the current that is injected during the acceleration process. The accelerating current must be dimensioned so that the required torque in the lower speed range can always be reached (acceleration torque + load torque): $C00995/1 [\%] = \frac{M_{Meax} [Nm]}{M_{Rated} [Nm]} \cdot I_{Rated, motor} [A] \cdot 1.3$		
5.	<p>Set open-loop steady-state current in C00995/2 in [%] with regard to the rated motor current (C00088).</p> <ul style="list-style-type: none"> This value defines the height of the current for processes without acceleration (e.g. standstill or constant setpoint speed). 		
6.	<p>For improving the operating characteristics: If required, adapt the filter time for reconstructing the rotor position and the actual speed value through the motor model in C00998/1 and C00998/2.</p> <ul style="list-style-type: none"> We recommend using the Lenze setting: Filter time rotor position (C00998/1) = 3 ms Filter time actual speed value (C00998/2) = 5 ms Deviant from this, the following value range can be used: Filter time rotor position (C00998/1) = 2 ... 5 ms Filter time actual speed value (C00998/2) = 3 ... 8 ms 		
7.	<p>For protecting the motor from demagnetisation: Set the ultimate current in C00939.</p>		



Note!

The Lenze settings of the current controller are predefined for a power-adapted motor. For an optimal drive behaviour of a synchronous motor, we recommend to adapt the controller settings.



Tip!

Information on the optimisation of the control mode and the adaptation to the real application is provided in the "[Optimising the control mode](#)" chapter.

Parameterisable additional functions are described correspondingly in the chapter "[Parameterisable additional functions](#)". (📖 240)

5.9.4 Optimising the control mode

The "optimisation steps" given in the table below serve to further optimise the control behaviour of the sensorless control for synchronous motors and adjust it to the concrete application.

- ▶ Detailed information on the individual steps can be found in the following subchapters.

Generally, the following optimisation steps are recommended:

Optimisation steps	
1.	Optimise current controller. (📖 207) <ul style="list-style-type: none">• The current controller should always be optimised if a motor of a third-party manufacturer with unknown motor data is used!
2.	Optimise speed controller. (📖 208) <ul style="list-style-type: none">• The setting of the speed controller must be adapted depending on the mechanical path.
3.	Optimise response to setpoint changes and determine mass inertia. (📖 212) <ul style="list-style-type: none">• For an optimal reference behaviour, the total moment of inertia can be used to make a feedforward control of the speed setpoint.



Note!

Current setpoint filter (band-stop filter) / jerk limitation

The use of the functions is only recommended in exceptional cases.

The functions are described in the "[Servo control \(SC\)](#)" chapter:

- ▶ [Setting the current setpoint filter \(band-stop filter\)](#) (📖 231)
- ▶ [Adapting the max. acceleration change \(jerk limitation\)](#) (📖 232)

5.9.4.1 Optimise current controller

**Note!**

An optimisation of the current controller should generally be carried out unless a power-adapted standard motor is used or the motor has been selected from the motor catalogue of the »Engineer«!

An optimisation of the current controller is sensible since the two control parameters gain ([C00075](#)) and reset time ([C00076](#)) depend on the required maximum current and the set switching frequency.

Parameter	Info	Lenze setting	
		Value	Unit
C00075	Vp current controller	7.00	V/A
C00076	Ti current controller	10.61	ms

► Gain and reset time can be calculated as per the following formulae:

$$V_p = \frac{L_{ss}[H]}{T_E[s]}$$

$$T_i = \frac{L_{ss}[H]}{R_s[\Omega]}$$

V_p = Current controller gain ([C00075](#))

T_i = Current controller reset time ([C00076](#))

L_{ss} = Motor stator leakage inductance ([C00085](#))

R_s = Motor stator resistance ([C00084](#))

T_E = Equivalent time constant (= 500 μ s)

5.9.4.2 Optimise speed controller

The speed controller is in the form of a PID controller with an additional differential speed-setpoint gain. For optimum behaviour, the PID speed controller has to be optimised and the overall mass inertia of the drive train has to be determined.

- In the Lenze setting, the configuration of the speed controller provides robustness and moderate dynamics.

Parameter	Info	Lenze setting	
		Value	Unit
C00070/3	SLPSM: Vp speed controller	3.00	
C00071/3	SLPSM: Ti speed controller	100.0	ms
C00072	SC: Tdn speed controller	0.00	ms

Speed controller gain Vp

The gain Vp ([C00070/3](#)) of the speed controller is defined in a scaled representation which enables a comparable parameterisation almost independent of the power of the motor or inverter. Here, the speed input difference of the controller is scaled to the rated motor speed whereas the output torque refers to the rated motor torque. A gain of 10 means that a speed difference of 1 % is gained through the P component with 10 % torque.

If the rated data of the motor and the mass inertia of the drive system are known, we recommend the following setting:

$$V_p \approx 0.2 \dots 0.5 \cdot \frac{T_M[s]}{0.01[s]}$$

$$T_M[s] = \frac{2 \cdot \pi \cdot n_N[\text{rpm}]}{M_N[\text{Nm}] \cdot 60} \cdot J_{\text{Drive, total}}[\text{kgm}^2]$$

$$M_N[\text{Nm}] = \frac{P_N[\text{W}] \cdot 60}{2 \cdot \pi \cdot n_N[\text{rpm}]}$$

V_p = Gain of the speed controller ([C00070/3](#))
 T_M = Time constant for the acceleration of the motor
 M_N = Rated motor torque
 n_N = Rated motor speed
 $J_{\text{drive, total}}$ = Total moment of inertia of the drive

[5-14] Recommendation for the setting of the gain of the speed controller

If the mass inertia of the drive is unknown, the optimisation can be achieved as follows:

1. Specify speed setpoint.
 - A small speed just above the switching threshold is recommended in the closed-loop controlled operation.
2. Increase V_p ([C00070/3](#)) until the drive starts to oscillate (observe engine noise).
3. Reduce V_p ([C00070/3](#)) until the drive runs stable again.
4. Reduce V_p ([C00070/3](#)) to approx. half the value.
5. Afterwards check results of the optimisation in the entire speed range (one-time passing through of the speed range).



Tip!

Values recommended by Lenze for the setting of the (proportional) gain:

- For drive systems without feedback: $V_p = 2 \dots 8$
- For drive systems with a good disturbance behaviour: $V_p > 6$

Speed controller reset time T_i

Apart from setting the P component, [C00071/3](#) provides the possibility to take influence on the I component of the PI controller.

If the mass inertia of the drive is unknown, the optimisation can be achieved as follows:

1. Specify speed setpoint.
2. Reduce T_i ([C00071/3](#)) until the drive starts to oscillate (observe engine noise).
3. Increase T_i ([C00071/3](#)) until the drive runs stable again.
4. Increase T_i ([C00071/3](#)) to approx. twice the value.



Tip!

Value range recommended by Lenze for the setting of the reset time:

$T_i = 20 \text{ ms} \dots 150 \text{ ms}$

Using the ramp response for setting the speed controller

If the mechanical components cannot be operated at the stability limit, the ramp response can also be used for setting the speed controller.



Stop!

If the controller parameters are preset unfavourably, the control can tend to heavy overshoots up to instability!

- Following and speed errors can adopt very high values.
- If the mechanics are sensitive, the corresponding monitoring functions are to be activated.



Note!

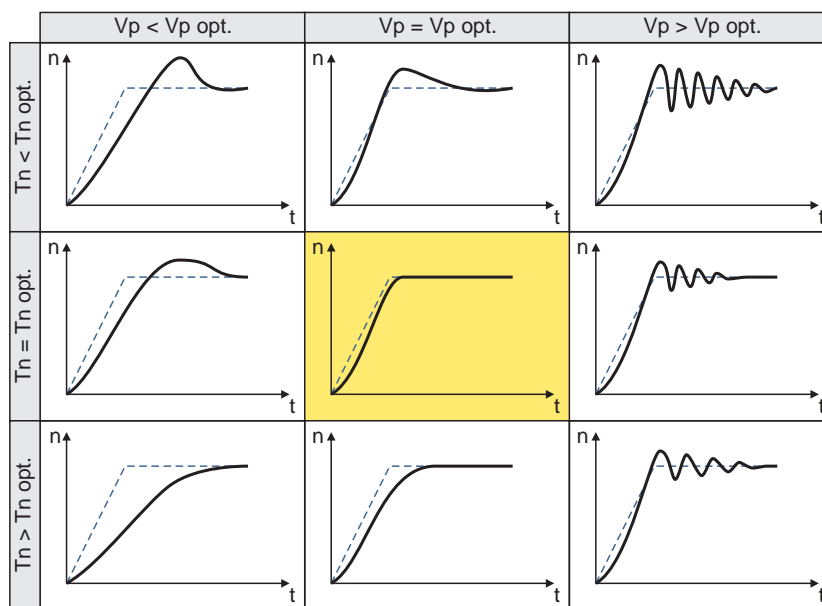
For an optimal setting, we recommend to determine the mass inertia (optimal response to setpoint changes) first.

▶ [Optimise response to setpoint changes and determine mass inertia](#)  212)



How to optimise the speed controller setting by means of the ramp response:

- Run a typical speed profile and record the ramp response of the speed using the data logger.
 - Motor control variables to be recorded:
 - nSpeedSetValue_a* (speed setpoint)
 - nMotorSpeedAct_a* (actual speed value)
- Evaluate the ramp response:

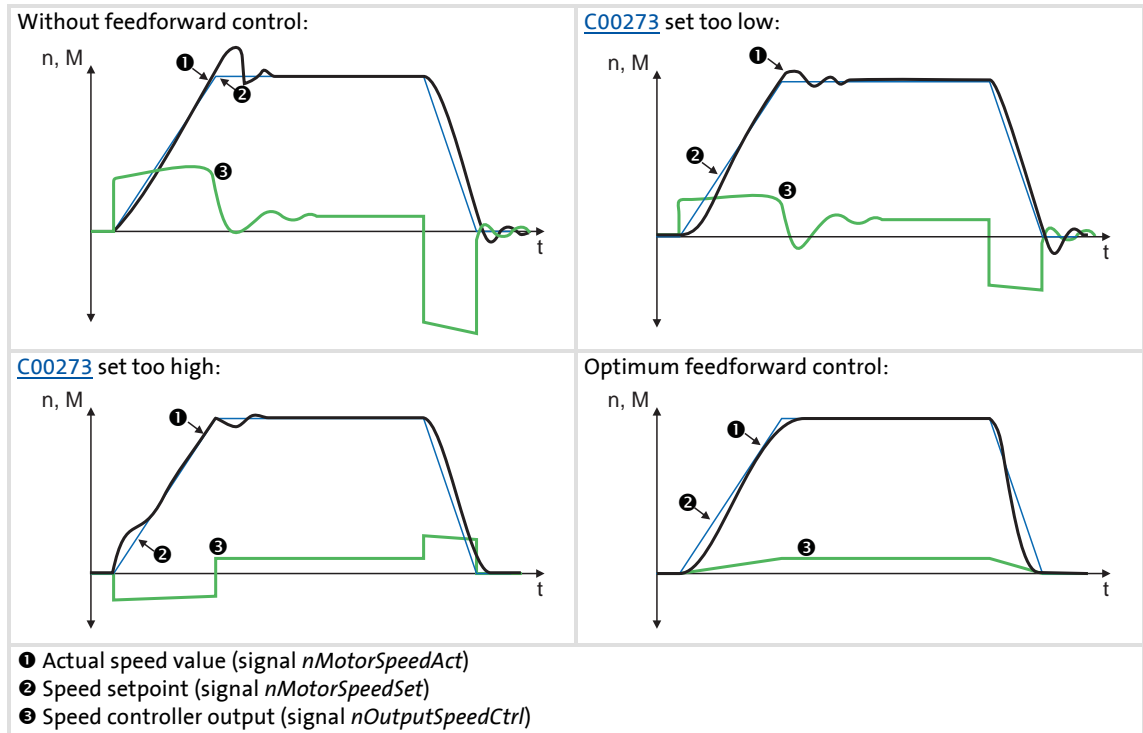


- Solid line = ramp response (actual speed value)
- Dash line = speed setpoint

- Change gain V_p in [C00070/3](#) and reset time T_n in [C00071/3](#).
- Repeat steps 1 ... 3 until the optimum ramp response is reached.

5.9.4.3 Optimise response to setpoint changes and determine mass inertia

Setting the total moment of inertia under [C00273](#) provides the optimum torque feedforward control. Depending on the application, an adjustment of the setting under [C00273](#) may be necessary to optimise the response to position/speed setpoint changes by means of the torque feedforward control.



[5-15] Typical signal characteristics for different settings of the load moment of inertia

**How to optimise the torque feedforward control:**

1. Run a typical speed profile and record the inputs and outputs of the speed controller with the data logger.
 - Motor control variables to be recorded:
 - nSpeedSetValue_a* (speed setpoint)
 - nMotorSpeedAct_a* (actual speed value)
 - nOutputSpeedCtrl_a* (speed controller output)
2. Estimate the moment of inertia and set it in [C00273](#) in relation to the motor end (i.e. with account being taken of the gearbox factors).
3. Repeat the data logger recording (see step 1).

Now the data logger should show that part of the required torque is generated by the feedforward control and the speed controller output signal (*nOutputSpeedCtrl_a*) is correspondingly smaller. The resulting following error decreases.
4. Change the setting in [C00273](#) and repeat the data logger recording until the intended response to setpoint changes is reached.
 - The optimisation could aim at the speed controller being completely relieved (see signal characteristics in Fig. [\[5-15\]](#)).
5. Save the parameter set (device command: [C00002/11](#)).

5.10 Servo control (SC)

Field-oriented servo control (SC) is based on a decoupled, separate control of the torque-producing and the field-producing current component. The motor control is based on a field-oriented, cascaded controller structure with feedback function and enables dynamic and stable operation in all of the four quadrants. It can be used for synchronous motors (PSM) and asynchronous motors (ASM).



Stop!

- We recommend to select a power-adapted combination of inverter and motor.
- The Lenze setting permits the operation of a power-adapted motor. Optimal operation is only possible if either:
 - the motor is selected via the Lenze motor catalogue
 - the motor nameplate data are entered and motor parameter identification is carried out afterwards
 - *or* –
 - the nameplate data and equivalent circuit data of the motor are entered manually.
- When you enter the motor nameplate data, take into account the phase connection implemented for the motor (star or delta connection). Only enter the data applying to the selected connection type.



Note!

- The servo control required a speed feedback!
 - See chapter entitled "[Encoder/feedback system](#)". (📖 293)
- For closed-loop control of a synchronous motor (PSM), the pole position of the motor must be known!
 - See chapter entitled "[Pole position identification \(PPI\)](#)". (📖 139)
- For closed-loop control of an asynchronous motor (ASM), the maximum current ([C00022](#)) should be higher than the magnetising current as otherwise the motor does not generate a torque.

Generally, the servo control offers the same advantages as the sensorless vector control (SLVC), i.e. compared to the V/f characteristic control, the servo control (SC) can be used to achieve

- ▶ A higher maximum torque throughout the entire speed range
- ▶ A higher speed accuracy
- ▶ A higher concentricity factor
- ▶ A higher level of efficiency
- ▶ The implementation of torque-actuated operation with speed limitation
- ▶ The limitation of the maximum torque in motor and generator mode for speed-actuated operation

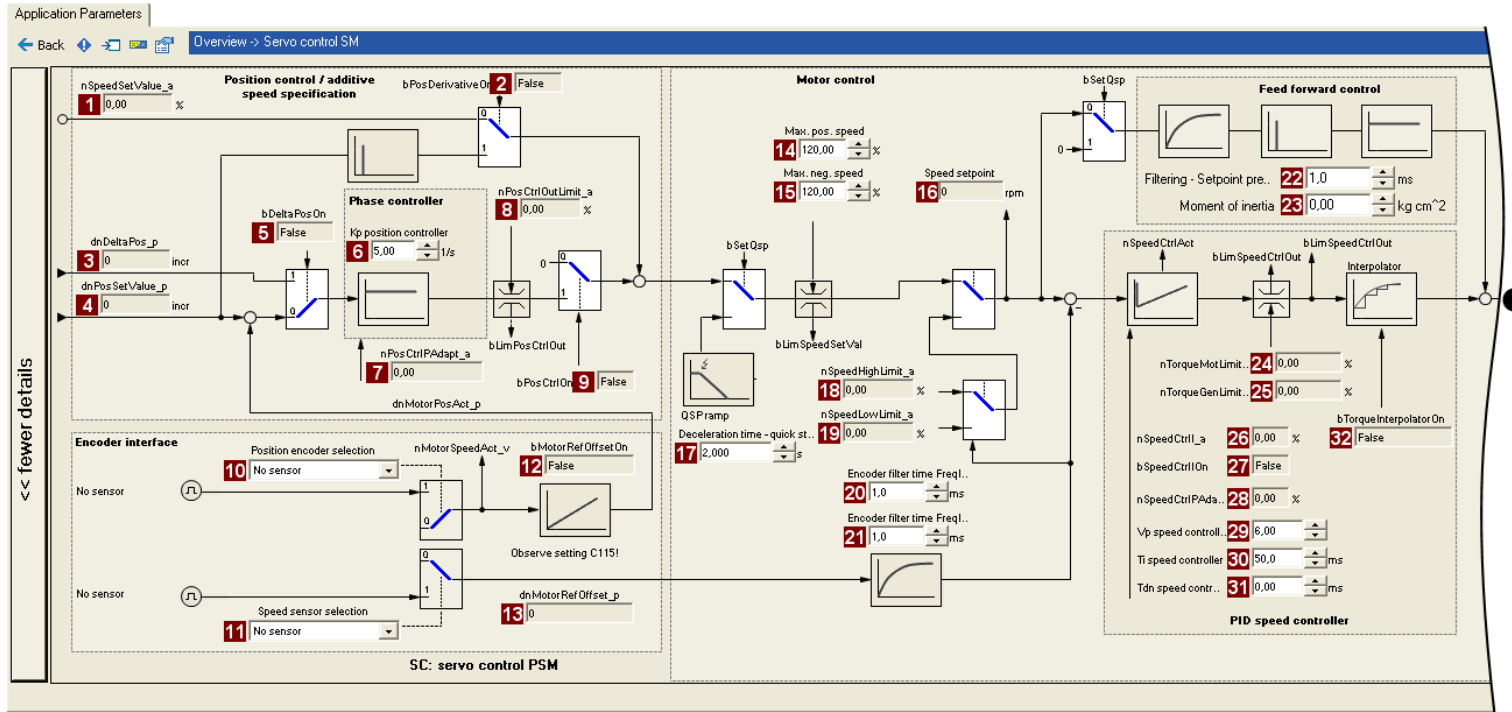
5.10.1 Parameterisation dialog/signal flow



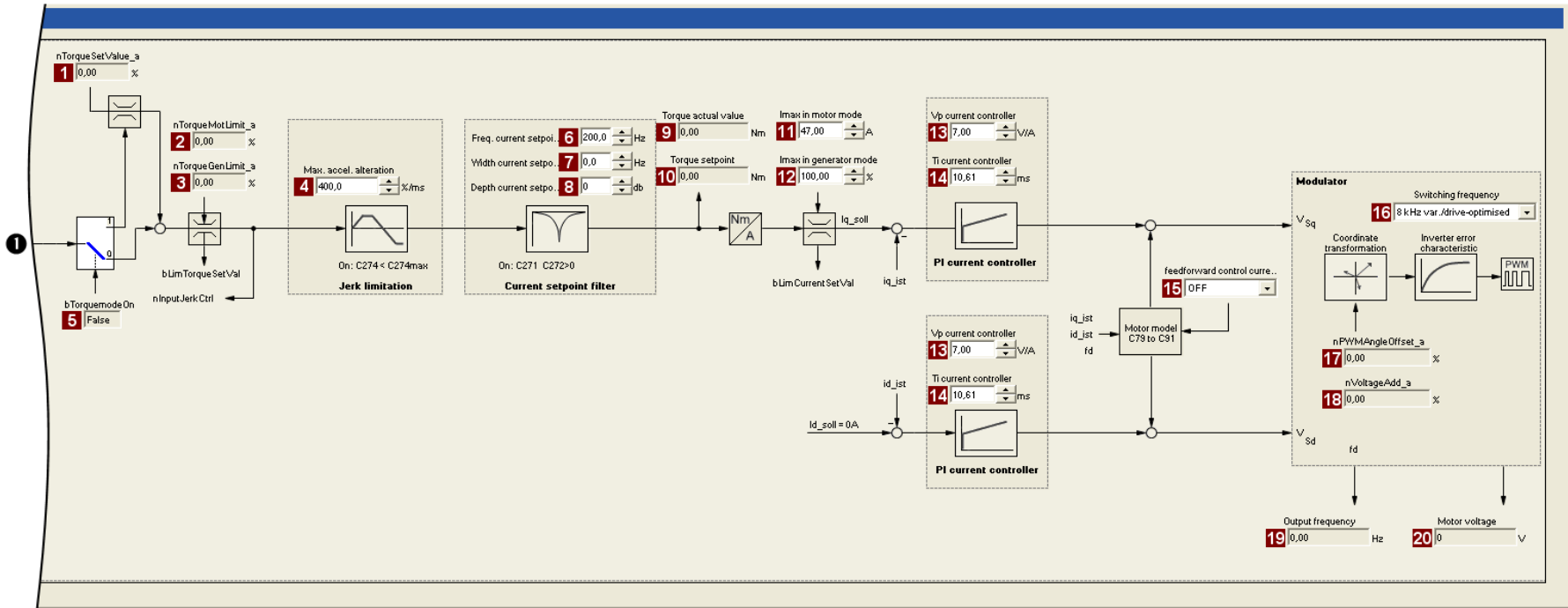
Proceed as follows to open the dialog for parameterising the motor control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Select the motor control from the *Overview* dialog level in the **Motor control** ([C00006](#)) list field:
 - "1: SC: Servo control PSM" for synchronous motor
- or -
 - "2: SC: Servo control ASM" for asynchronous motor
4. Click the **Motor control servo** button to change to the *Overview → Motor control vector* dialog box.
 - This dialog level only shows a simplified signal flow with the most important parameters.
 - When you click the >>**More details** button in the left-most position, a signal flow with more details/parameters is displayed, as shown in the following subchapter.

Signal flow for servo control for synchronous motor (PSM):

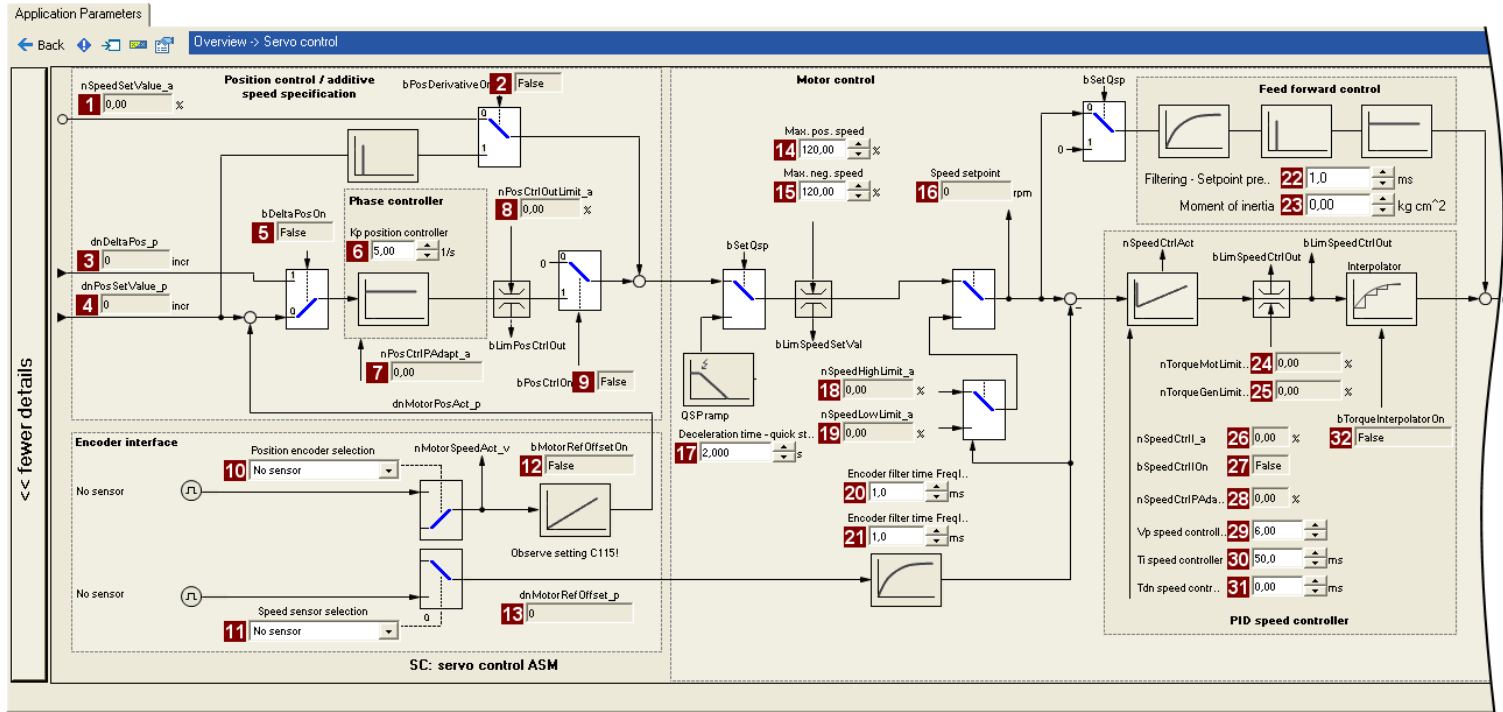


Parameter	Info	Parameter	Info	Parameter	Info
1	C00830/22 Speed setpoint	14	C00909/1 Max. pos. speed	22	C00275 Setpoint feedforward control filtering
2	C00833/67 MCTRL: bPosDerivativeOn	15	C00909/2 Max. neg. speed	23	C00273 Moment of inertia
3	C00834/4 MCTRL: dnDeltaPos_p	16	C00050 Speed setpoint	24	C00830/29 Limitation of torque in motor mode
4	C00834/5 MCTRL: dnPosSetValue_p	17	C00105 Decel. time - quick stop	25	C00830/28 Limitation of torque in generator mode
5	C00833/35 MCTRL: bDeltaPosOn	18	C00830/88 MCTRL: nSpeedHighLimit_a	26	C00830/24 MCTRL: nSpeedCtrlI_a
6	C00254 Kp position controller	19	C00830/23 MCTRL: nSpeedLowLimit_a	27	C00833/31 MCTRL: bSpeedCtrlIOn
7	C00830/20 MCTRL: nPosCtrlPAdapt_a	20	C00497/1 Encoder filter time FreqIn12	28	C00830/25 MCTRL: nSpeedCtrlPAdapt_a
8	C00830/21 MCTRL: nPosCtrlOutLimit_a	21	C00497/2 Encoder filter time FreqIn67	29	C00070/2 SC: Vp speed controller
9	C00833/27 MCTRL: bPosCtrlOn			30	C00071/2 SC: Ti speed controller
10	C00490 Position encoder selection			31	C00072 SC: Tdn speed controller
11	C00495 Speed sensor selection			32	C00833/29 MCTRL: bTorqueInterpolatorOn
12	C00833/68 MCTRL: bMotorRefOffsetOn				
13	C00834/6 MCTRL: dnMotorRefOffset_p				

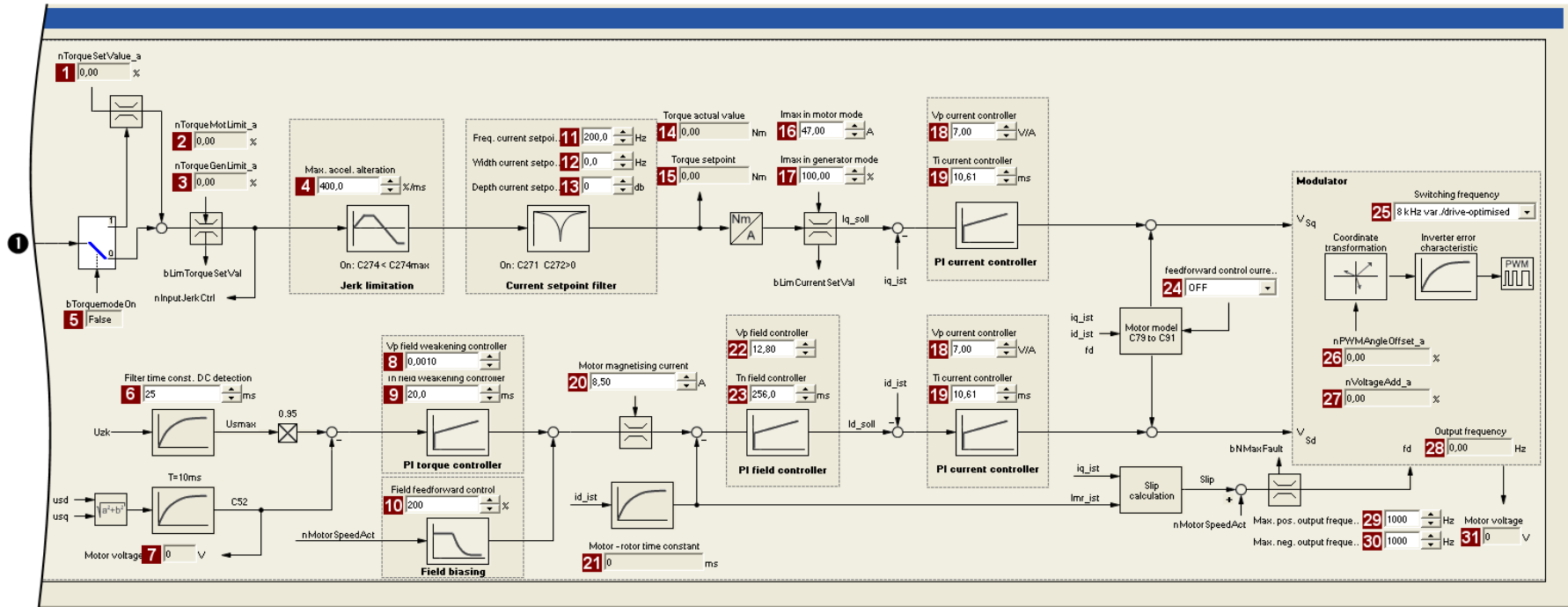


Parameter	Info	Parameter	Info	Parameter	Info
1	C00830/27 MCTRL: nTorqueSetValue_a	6	C00270 SC: Freq. current setpoint filter	15	C00079/1 SC: Current controller - feedforward control
2	C00830/29 Limitation of torque in motor mode	7	C00271 SC: Current setpoint filter width	16	C00018 Switching frequency
3	C00830/28 Limitation of torque in generator mode	8	C00272 SC: Current setpoint filter depth	17	C00830/32 MCTRL: nPWMAngleOffset_a
4	C00274 SC: Max. change in acceleration	9	C00056/2 Actual torque value	18	C00830/31 MCTRL: nVoltageAdd_a
5	C00833/30 MCTRL: bTorqueModeOn	10	C00056/1 Torque setpoint	19	C00058 Output frequency
6	C00280 SC: Filter time const. DC detection	11	C00022 I _{max} in motor mode	20	C00052 Motor voltage
7	C00052 Motor voltage	12	C00023 I _{max} in generator mode		
8	C00577 SC: V _p field weakening controller	13	C00075 V _p current controller		
9	C00578 SC: T _n field weakening controller	14	C00076 T _i current controller		
10	C00576 SC: Field feedforward control				

Signal flow for servo control for asynchronous motor (ASM):



Parameter	Info	Parameter	Info	Parameter	Info
1	C00830/22 Speed setpoint	14	C00909/1 Max. pos. speed	22	C00275 Setpoint feedforward control filtering
2	C00833/67 MCTRL: bPosDerivativeOn	15	C00909/2 Max. neg. speed	23	C00273 Moment of inertia
3	C00834/4 MCTRL: dnDeltaPos_p	16	C00050 Speed setpoint	24	C00830/29 Limitation of torque in motor mode
4	C00834/5 MCTRL: dnPosSetValue_p	17	C00105 Decel. time - quick stop	25	C00830/28 Limitation of torque in generator mode
5	C00833/35 MCTRL: bDeltaPosOn	18	C00830/88 MCTRL: nSpeedHighLimit_a	26	C00830/24 MCTRL: nSpeedCtrlI_a
6	C00254 Kp position controller	19	C00830/23 MCTRL: nSpeedLowLimit_a	27	C00833/31 MCTRL: bSpeedCtrlIOn
7	C00830/20 MCTRL: nPosCtrlPAdapt_a	20	C00497/1 Encoder filter time FreqIn12	28	C00830/25 MCTRL: nSpeedCtrlPAdapt_a
8	C00830/21 MCTRL: nPosCtrlOutLimit_a	21	C00497/2 Encoder filter time FreqIn67	29	C00070/2 SC: Vp speed controller
9	C00833/27 MCTRL: bPosCtrlOn			30	C00071/2 SC: Ti speed controller
10	C00490 Position encoder selection			31	C00072 SC: Tdn speed controller
11	C00495 Speed sensor selection			32	C00833/29 MCTRL: bTorqueInterpolatorOn
12	C00833/68 MCTRL: bMotorRefOffsetOn				
13	C00834/6 MCTRL: dnMotorRefOffset_p				



Parameter	Info	Parameter	Info	Parameter	Info
1	C00830/27 MCTRL: nTorqueSetValue_a	11	C00270 SC: Freq. current setpoint filter	24	C00079/1 SC: Current controller - feedforward control
2	C00830/29 Limitation of torque in motor mode	12	C00271 SC: Current setpoint filter width	25	C00018 Switching frequency
3	C00830/28 Limitation of torque in generator mode	13	C00272 SC: Current setpoint filter depth	26	C00830/32 MCTRL: nPWMAngleOffset_a
4	C00274 SC: Max. change in acceleration	14	C00056/2 Actual torque value	27	C00830/31 MCTRL: nVoltageAdd_a
5	C00833/30 MCTRL: bTorqueModeOn	15	C00056/1 Torque setpoint	28	C00058 Output frequency
6	C00280 SC: Filter time const. DC detection	16	C00022 Imax in motor mode	29	C00910/1 Max. pos. output frequency
7	C00052 Motor voltage	17	C00023 Imax in generator mode	30	C00910/2 Max. neg. output frequency
8	C00577 SC: Vp field weakening controller	18	C00075 Vp current controller	31	C00052 Motor voltage
9	C00578 SC: Tn field weakening controller	19	C00076 Ti current controller		
10	C00576 SC: Field feedforward control	20	C00095 Motor magnetising current		
		21	C00083 Motor rotor time constant		
		22	C00077 SC: Vp field controller		
		23	C00078 SC: Tn field controller		

5.10.2 Types of control

The servo control can be operated in two different modes:

- ▶ [Speed control with torque limitation](#) (*bTorquemodeOn* = FALSE)
- ▶ [Torque control with speed limitation](#) (*bTorquemodeOn* = TRUE)



Tip!

A position-controlled application requires a speed control with torque limitation (*bTorquemodeOn* = FALSE).

5.10.2.1 Speed control with torque limitation

A speed setpoint is selected and the drive system is operated in a speed-controlled manner.

The operational performance can be adapted in the following ways:

- ▶ Overload limitation in the drive train
 - The torque is limited via the torque setpoint.
 - The torque setpoint is identical to the value at the output of the speed controller, *nOutputSpeedCtrl*.
 - To avoid overload in the drive train, the torque in motor mode can be limited via the *nTorqueMotLimit_a* process input signal, and the torque in generator mode can be limited via the *nTorqueGenLimit_a* process input signal:

Identifier <small>DIS code data type</small>	Information/possible settings
<i>nTorqueMotLimit_a</i> C00830/29 INT	Torque limitation in motor mode <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % M_{\max} (C00057) • Setting range: 0 ... +199.99 % • If keypad control is performed: Parameterisable via C00728/1.
<i>nTorqueGenLimit_a</i> C00830/28 INT	Torque limitation in generator mode <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % M_{\max} (C00057) • Setting range: -199.99 ... 0 % • If keypad control is performed: Parameterisable via C00728/2.



Note!

To avoid instabilities during operation, the torque limit values are internally processed as absolute values.

- ▶ Motor current limitation
 - A cross current setpoint is calculated from the torque setpoint which is limited depending on the magnetising current, the max. current in motor mode ([C00022](#)), and the max. current in generator mode ([C00023](#)).
 - Here, the total current injected into the motor does not exceed the max. currents in motor and generator mode.

5.10.2.2 Torque control with speed limitation

For torque-controlled operation, a torque setpoint is defined in the drive system.

- ▶ The torque setpoint is calculated directly from *nTorqueSetValue_a*.
- ▶ The speed is defined by the process.
- ▶ Due to its limitation, the speed-controlled drive can only rotate within a speed range whose positive speed is limited by the value of *nSpeedHighLimit_a* and whose negative speed is limited by the value of *nSpeedLowLimit_a*.

Identifier <small>DIS code data type</small>	Information/possible settings
<i>nTorqueSetValue_a</i> C00830/27 INT	Torque setpoint / additive torque <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % M_{\max} (C00057)
<i>nSpeedHighLimit_a</i> C00830/88 INT	Upper speed limit for speed limitation (only for torque-controlled operation) <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % rated speed (C00011)
<i>nSpeedLowLimit_a</i> C00830/23 INT	Lower speed limit for speed limitation (only for torque-controlled operation) <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % rated speed (C00011)

5.10.3 Basic settings

The following "Initial commissioning steps" must be performed to commission the servo control:

Initial commissioning steps					
1.	<p>Determine the motor control:</p> <ul style="list-style-type: none"> For the closed-loop control of a synchronous motor (PSM): C00006 = "1: SC: Servo control PSM" For the closed-loop control of an asynchronous motor (ASM): C00006 = "2: SC: Servo control ASM" 				
2.	<p>Set the motor selection/motor data</p> <ul style="list-style-type: none"> When selecting and parameterising the motor, the motor nameplate data and the equivalent circuit diagram data are relevant. Detailed information can be found in the "Motor selection/Motor data" chapter. (📖 121) <p>Depending on the motor manufacturer, proceed as follows:</p> <table border="1"> <thead> <tr> <th>Lenze motor:</th> <th>Third party manufacturer's motor:</th> </tr> </thead> <tbody> <tr> <td> <p>Selecting a motor from the motor catalogue in the »Engineer«</p> <p>- or -</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification </td> <td> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification or set known equivalent circuit diagram data manually: C00082: Motor rotor resistance* C00084: Motor stator resistance C00085: Motor stator leakage inductance C00092: Motor magnetising inductance* C00095: Motor magnetising current* <p>* Setting only required for asynchronous motors.</p> </td> </tr> </tbody> </table>	Lenze motor:	Third party manufacturer's motor:	<p>Selecting a motor from the motor catalogue in the »Engineer«</p> <p>- or -</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification 	<ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification or set known equivalent circuit diagram data manually: C00082: Motor rotor resistance* C00084: Motor stator resistance C00085: Motor stator leakage inductance C00092: Motor magnetising inductance* C00095: Motor magnetising current* <p>* Setting only required for asynchronous motors.</p>
Lenze motor:	Third party manufacturer's motor:				
<p>Selecting a motor from the motor catalogue in the »Engineer«</p> <p>- or -</p> <ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification 	<ol style="list-style-type: none"> Set the motor nameplate data Automatic motor data identification or set known equivalent circuit diagram data manually: C00082: Motor rotor resistance* C00084: Motor stator resistance C00085: Motor stator leakage inductance C00092: Motor magnetising inductance* C00095: Motor magnetising current* <p>* Setting only required for asynchronous motors.</p>				
3.	<p>Define the type of control:</p> <p><i>bTorquemodeOn</i> = FALSE: Speed control with torque limitation</p> <p><i>bTorquemodeOn</i> = TRUE: Torque control with speed limitation</p>				
4.	<p>Parameterise the encoder/feedback system. ▶ Encoder/feedback system (📖 293)</p>				
5.	<p>Only with servo control for synchronous motors (PSM): Detect pole position of the motor. ▶ Pole position identification (PPI) (📖 139)</p>				



Note!

The Lenze settings of the controller are predefined for a power-adapted standard asynchronous motor. For an optimal drive behaviour, we recommend to adapt the controller settings.



Tip!

Information on the optimisation of the control mode and the adaptation to the real application is provided in the chapter "[Optimising the control mode](#)". ([📖 223](#))

Parameterisable additional functions are described correspondingly in the chapter "[Parameterisable additional functions](#)". ([📖 240](#))

5.10.4 Optimising the control mode

The "optimisation steps" given in the table below serve to further optimise the control behaviour of the servo control and adjust it to the concrete application.

- ▶ Detailed information on the individual steps can be found in the following subchapters.

Generally, the following optimisation steps are recommended:

Optimisation steps	
1.	Optimise current controller. (📖 224) <ul style="list-style-type: none"> • The current controller should always be optimised if a motor of a third-party manufacturer with unknown motor data is used!
2.	Optimise speed controller. (📖 225) <ul style="list-style-type: none"> • The setting of the speed controller must be adapted depending on the mechanical path.
3.	Optimise response to setpoint changes and determine mass inertia. (📖 229) <ul style="list-style-type: none"> • For an optimal reference behaviour, the total moment of inertia can be used to make a feedforward control of the speed setpoint.

Special cases may require further optimisation steps:

Optimisation steps	
1.	Setting the current setpoint filter (band-stop filter). (📖 231) <ul style="list-style-type: none"> • In order to suppress or damp (mechanical) resonant frequencies, a current setpoint filter is integrated in the speed control loop which is switched off in the default setting but can be parameterised accordingly, if required. Then readjust the speed controller: Optimise speed controller. (📖 225)
2.	Adapting the max. acceleration change (jerk limitation). (📖 232)
3.	Only with servo control for asynchronous motors (ASM): Optimising the behaviour of the asynchronous motor in the field weakening range. (📖 235) (For synchronous motors, this function is in preparation)



Tip!

In order to traverse a typical speed profile for optimisation of motor control, you can also use the basic function "[Manual jog](#)" with appropriately adapted manual jog parameters if this basic function is supported by the selected technology application. (📖 533)

5.10.4.1 Optimise current controller



Note!

An optimisation of the current controller should generally be carried out unless a power-adapted standard asynchronous motor is used or the motor has been selected from the motor catalogue of the »Engineer«!

An optimisation of the current controller is sensible since the two control parameters gain ([C00075](#)) and reset time ([C00076](#)) depend on the required maximum current and the set switching frequency.

Parameter	Info	Lenze setting	
		Value	Unit
C00075	Vp current controller	7.00	V/A
C00076	Ti current controller	10.61	ms

► Gain and reset time can be calculated as per the following formulae:

$$V_p = \frac{L_{ss}[H]}{T_E[s]}$$

$$T_i = \frac{L_{ss}[H]}{R_s[\Omega]}$$

V_p = Current controller gain ([C00075](#))

T_i = Current controller reset time ([C00076](#))

L_{ss} = Motor stator leakage inductance ([C00085](#))

R_s = Motor stator resistance ([C00084](#))

T_E = Equivalent time constant (= 500 μ s)

5.10.4.2 Optimise speed controller

The speed controller is in the form of a PID controller with an additional differential speed-setpoint gain. For optimum behaviour, the PID speed controller has to be optimised and the overall mass inertia of the drive train has to be determined.

- In the Lenze setting, the configuration of the speed controller provides robustness and moderate dynamics.

Parameter	Info	Lenze setting	
		Value	Unit
C00070/2	SC: Vp speed controller	6.00	
C00071/2	SC: Ti speed controller	50.0	ms
C00072	SC: Tdn speed controller	0.00	ms

Speed controller gain Vp

The gain Vp ([C00070/2](#)) of the speed controller is defined in a scaled representation which enables a comparable parameterisation almost independent of the power of the motor or inverter. Here, the speed input difference of the controller is scaled to the rated motor speed whereas the output torque refers to the rated motor torque. A gain of 10 means that a speed difference of 1 % is gained through the P component with 10 % torque.

If the rated data of the motor and the mass inertia of the drive system are known, we recommend the following setting:

$$V_p \approx 1.5 \dots 3 \cdot \frac{T_M[s]}{0.01[s]}$$

$$T_M[s] = \frac{2 \cdot \pi \cdot n_N[\text{rpm}]}{M_N[\text{Nm}] \cdot 60} \cdot J_{\text{Drive, total}}[\text{kgm}^2]$$

$$M_N[\text{Nm}] = \frac{P_N[\text{W}] \cdot 60}{2 \cdot \pi \cdot n_N[\text{rpm}]}$$

V_p = Gain of the speed controller ([C00070/1](#))

T_M = Time constant for the acceleration of the motor

M_N = Rated motor torque

n_N = Rated motor speed

J_{drive, total} = Total moment of inertia of the drive

[5-16] Recommendation for the setting of the gain of the speed controller

If the mass inertia of the drive is unknown, the optimisation can be achieved as follows:

1. Specify speed setpoint.
2. Increase V_p ([C00070/2](#)) until the drive is unstable (observe motor noise).
3. Reduce V_p ([C00070/2](#)) until the drive runs stable again.
4. Reduce V_p ([C00070/2](#)) to approx. half the value.



Tip!

Values recommended by Lenze for the setting of the (proportional) gain:

- For drive systems without feedback: $V_p = 6 \dots 20$
- For drive systems with a good disturbance behaviour: $V_p > 12$

Speed controller reset time T_i

Apart from setting the P component, [C00071/2](#) provides the possibility to take influence on the I component of the PI controller.

If the mass inertia of the drive is unknown, the optimisation can be achieved as follows:

1. Specify speed setpoint.
2. Reduce T_i ([C00071/2](#)) until the drive is unstable (observe motor noise).
3. Increase T_i ([C00071/2](#)) until the drive runs stable again.
4. Increase T_i ([C00071/2](#)) to approx. twice the value.



Tip!

Value range recommended by Lenze for the setting of the reset time:

$T_i = 20 \text{ ms} \dots 150 \text{ ms}$

Differential time constant T_{dn} (rate time)

The differential time constant T_{dn} of the speed controller can be set in [C00072](#).

If the mass inertia of the drive is unknown, the optimisation can be achieved as follows:

- ▶ Increase T_{dn} ([C00072](#)) during operation until optimal control mode is reached.

Using the ramp response for setting the speed controller

If the mechanical components cannot be operated at the stability limit, the ramp response can also be used for setting the speed controller.



Stop!

If the controller parameters are preset unfavourably, the control can tend to heavy overshoots up to instability!

- Following and speed errors can adopt very high values.
- If the mechanics are sensitive, the corresponding monitoring functions are to be activated.



Note!

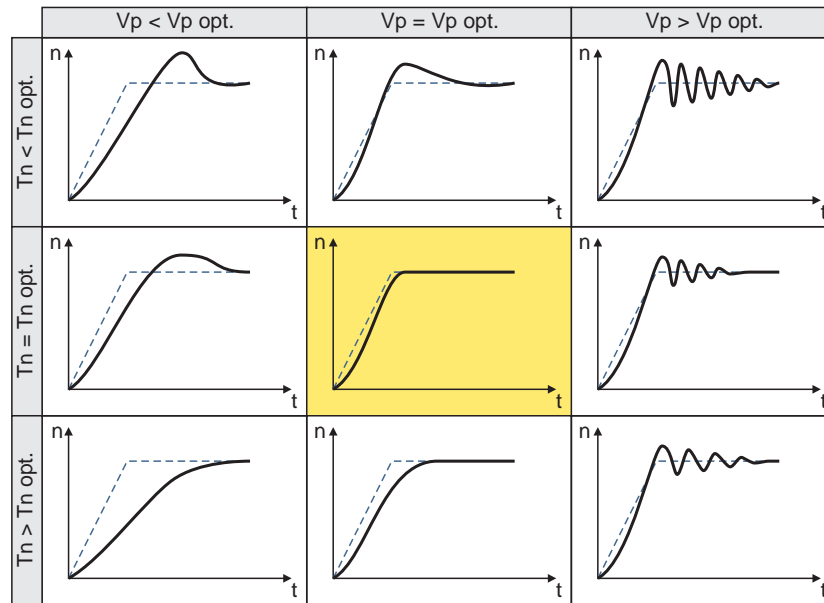
For an optimal setting, we recommend to determine the mass inertia (optimal response to setpoint changes) first.

- ▶ [Optimise response to setpoint changes and determine mass inertia](#) (📖 229)



How to optimise the speed controller setting by means of the ramp response:

1. Run a typical speed profile and record the ramp response of the speed using the data logger.
 - Motor control variables to be recorded:
 - nSpeedSetValue_a* (speed setpoint)
 - nMotorSpeedAct_a* (actual speed value)
2. Evaluate the ramp response:

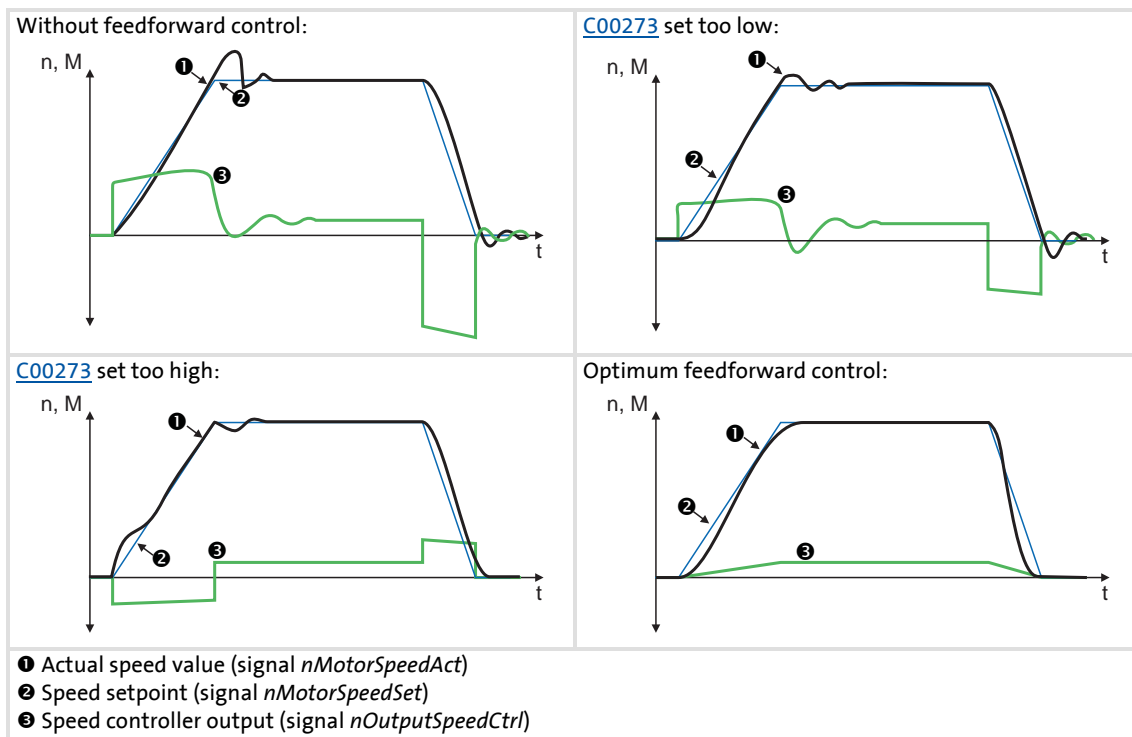


- Solid line = ramp response (actual speed value)
- Dash line = speed setpoint

3. Change gain V_p in [C00070/2](#) and reset time T_n in [C00071/2](#).
4. Repeat steps 1 ... 3 until the optimum ramp response is reached.

5.10.4.3 Optimise response to setpoint changes and determine mass inertia

Setting the total moment of inertia under [C00273](#) provides the optimum torque feedforward control. Depending on the application, an adjustment of the setting under [C00273](#) may be necessary to optimise the response to position/speed setpoint changes by means of the torque feedforward control.



[5-17] Typical signal characteristics for different settings of the load moment of inertia



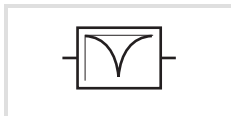
How to optimise the torque feedforward control:

1. Run a typical speed profile and record the inputs and outputs of the speed controller with the data logger.
 - Motor control variables to be recorded:
 - nSpeedSetValue_a* (speed setpoint)
 - nMotorSpeedAct_a* (actual speed value)
 - nOutputSpeedCtrl_a* (speed controller output)
2. Estimate the moment of inertia and set it in [C00273](#) in relation to the motor end (i.e. with account being taken of the gearbox factors).
3. Repeat the data logger recording (see step 1).

Now the data logger should show that part of the required torque is generated by the feedforward control and the speed controller output signal (*nOutputSpeedCtrl_a*) is correspondingly smaller. The resulting following error decreases.
4. Change the setting in [C00273](#) and repeat the data logger recording until the intended response to setpoint changes is reached.
 - The optimisation could aim at the speed controller being completely relieved (see signal characteristics in Fig. [5-17](#)).
5. Save the parameter set (device command: [C00002/11](#)).

5.10.4.4 Setting the current setpoint filter (band-stop filter)

Due to the high dynamic performance/limit frequency of the closed current control loop, mechanical natural frequencies can be activated which may lead to an unstable speed control loop.



To mask out or at least damp these resonant frequencies, a so-called current setpoint filter is integrated into the speed control loop of the controller.

Parameter	Info	Lenze setting	
		Value	Unit
C00270	SC: Freq. current setpoint filter	200.0	Hz
C00271	SC: Current setpoint filter width	0.0	Hz
C00272	SC: Current setpoint filter depth	0	dB

- ▶ In the default setting of 0 db of the filter depth ([C00272](#)), the current setpoint filter is switched off.

Setting of the current setpoint filter

Since the frequency response of the speed controlled system is only rarely known to such an extent that the current setpoint filter can be adjusted to the controlled system in the run-up, the following example describes how to set the current setpoint filter.



How to set the current setpoint filter:

1. [Optimise current controller](#) (📖 224).
2. [Optimise speed controller](#) (📖 225)
3. Measure the oscillation frequency (observe current or speed).
4. Set the measured oscillation frequency in [C00270](#) as filter frequency.
5. Set "25%" of the filter frequency in [C00271](#) as filter width.
 - Example: Filter frequency = 200 Hz → filter width = 50 Hz.
6. Set "40 dB" in [C00272](#) as filter depth.
 - If the filter depth is set to "0 dB" (default setting), the filter is not active.

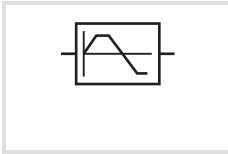


Note!

Readjust the speed controller after setting the current setpoint filter.

- ▶ [Optimise speed controller](#). (📖 225)

5.10.4.5 Adapting the max. acceleration change (jerk limitation)



Via the max. acceleration change that can be set in [C00274](#), the change of the setpoint torque can be limited for jerk limitation. Hence, sudden torque step changes can be avoided. The entire speed characteristic is smoothed.

Parameter	Info	Lenze setting	
		Value	Unit
C00274	SC: Max. change in acceleration	400.0	%/ms

In the default setting of 400 %/ms of the max. acceleration change ([C00274](#)), jerk limitation is switched off.

The setting defines the permissible maximum torque change per ms (based on the rated motor torque).



Note!

Only activate this jerk limitation for speed-controlled applications!

If table positioning or a free function block interconnection with a positioning operating mode is selected, jerk limitation must be switched off.

- Here, jerk limitation is provided for in the travel profile generator. Setting this jerk limitation in the motor control would lead to following errors!

5.10.4.6 Slip calculation from motor equivalent circuit diagram data

This function extension is available from version 02.00.00!

In order to achieve a better speed stability and torque accuracy, the slip calculation can be either derived from the motor nameplate data (e.g. rated motor speed) or the motor equivalent circuit diagram data (stator resistance, rotor resistance etc.).

The data to be used for servo control (for asynchronous motors) is selected via bit 1 in [C02879/1](#):

Setting	Info
Bit 0 SLVC	In case of sensorless vector control: <ul style="list-style-type: none"> • "0" ≙ Slip calculation from motor nameplate data (Lenze setting) • "1" ≙ Slip calculation from motor equivalent circuit diagram data
Bit 1 SC_ASM	In case of servo control for asynchronous motors: <ul style="list-style-type: none"> • "0" ≙ Slip calculation from motor nameplate data • "1" ≙ Slip calculation from motor equivalent circuit diagram data (Lenze setting)
Bit 2 ... 7	Reserved



Note!

In order that the slip can be calculated from the motor equivalent circuit diagram data, the equivalent circuit data (stator resistance, rotor resistance etc.) must be known as exactly as possible.

- Selecting a motor in the »Engineer« motor catalogue loads the exact motor equivalent circuit diagram data.
- When the motor nameplate data is entered manually and the motor equivalent circuit diagram data is then detected via the motor parameter identification, the "extended identification" ([C02867/1](#) = 2) must be used.
 - ▶ [Automatic motor data identification](#) (□ 126)

5.10.4.7 Temperature compensation within the motor control

This function extension is available from version 02.00.00!

A temperature compensation over the detected motor temperature (display in [C00063/1](#)) serves to compensate inaccuracies in the output torque within the motor control in case of temperature changes of the asynchronous or synchronous motor.



Note!

In the Lenze setting, the temperature compensation within the motor control is activated. The temperature compensation, however, is only active with speed encoder selection "3: Multi encoder" or "4: Resolver" in [C00495](#) as well as error-free KTY temperature detection (display in [C00063/1](#) \neq 255 °C).

The temperature compensation is switched on/off bit-coded in [C02878/1](#):

Setting	Info
Bit 0 SC_PSM	KTY motor temperature compensation with servo control for synchronous motors: <ul style="list-style-type: none"> • "0" \equiv Off • "1" \equiv On (Lenze setting)
Bit 1 SC_ASM	KTY motor temperature compensation with servo control for asynchronous motors: <ul style="list-style-type: none"> • "0" \equiv Off • "1" \equiv On (Lenze setting)
Bit 2 ... 7	Reserved

General information on temperature behaviour of the asynchronous and synchronous motor

In case of the **asynchronous motor**, the nameplate data always refer to rated data, i.e. on the rated load and thus on the rated temperature of the motor. For the 8400 device series, the equivalent circuit data for stator resistance ([C00084](#)) and rotor resistance ([C00082](#)) are always given for a cold asynchronous motor (20 °C) and converted to star connection. In case of a cold motor (20 °C), the real slip frequency thus corresponds to the calculated setpoint slip. In case of a warm motor, the real slip frequency is higher. This becomes especially apparent at high torques as an inaccuracy of the torque over the motor temperature.

In case of the **synchronous motor**, the field strength generated by the permanent magnet in the rotor is temperature-dependent. With a rated motor temperature, a rated field strength is generated. A negative temperature coefficient of -0.11 %/°C means that with a cold motor at the same setpoint torque a higher output torque is output than with a warm motor.

These errors must be compensated by means of the temperature compensation for asynchronous and synchronous motors in order to have a constant output torque over the motor temperature independent of the motor temperature.

5.10.4.8 Optimising the behaviour of the asynchronous motor in the field weakening range

The behaviour of the asynchronous motor in the field weakening range is influenced by:

- ▶ the field controller
- ▶ the field weakening controller
- ▶ the field feedforward control unit
- ▶ adaptive adaptation of the P component of the field and speed controllers
- ▶ An additional limitation of the I component of the controller when the voltage limit is reached



Note!

In general, these settings are pre-optimised so that further optimisation is not required.

Optimisation for special motors (e.g. mid-frequency motors) or for standard asynchronous motors whose power is not adapted can be carried out according to the algorithms shown in the following sections.

Field controller

The field controller is designed as a PI controller.

Parameter	Info	Lenze setting	
		Value	Unit
C00077	SC: Vp field controller	12.80	
C00078	SC: Tn field controller	256.0	ms

The gain Vp ([C00077](#)) of the field controller can be calculated using the motor rotor time constant and the equivalent time constant of the current-controlled motor:

$$V_{PFeld} = \frac{T_R[s]}{a^2 \cdot T_{Replacement}[ms]} \quad [%]$$

V_{PFeld} : Gain of the field controller ([C00077](#))
 T_R : Motor rotor time constant ([C00083](#))
 $T_{Equivalent}$: Motor equivalent time constant (approx. 2.5 ms)
 a : Measure for damping (z. B. $a = 2$)

If the rated data of the motor and the mass inertia of the drive system are known, we recommend the following setting:

$$V_{PFeld} \approx \frac{T_R[s]}{4 \cdot T_{Replacement}[ms]} = \frac{T_R[s]}{0.01[s]}$$

$$T_{NFeld}[ms] = T_R[ms]$$

V_{PFeld} : Gain of the field controller ([C00077](#))
 T_R : Motor rotor time constant ([C00083](#))
 T_{Equi} : Motor equivalent time constant
 T_{NFeld} : Time constant of the field controller ([C00078](#))

[5-18] Recommendation for the setting of the gain and the time constant of the field controller



Tip!

The motor rotor time constant depends on the motor rotor resistance, the magnetising inductance, and the leakage inductance.

- For an optimal calculation, we recommend to select the motor from the motor catalogue of the »Engineer« first if a Lenze motor is used. ▶ [Selecting a motor from the motor catalogue in the »Engineer«](#) (124)
- If a third party manufacturer's motor is used, motor parameter identification must be carried out previously. ▶ [Automatic motor data identification](#) (126)

Field weakening controller

The field weakening controller serves to adapt the magnetising current when the maximum control voltage has been reached so that in steady operation approximately 95 % of the maximally possible control voltage is output. Thus, there is a voltage reserve for dynamic load or speed variations.

Parameter	Info	Lenze setting	
		Value	Unit
C00577	SC: Vp field weakening controller	0.0010	
C00578	SC: Tn field weakening controller	20.0	ms

$$V_{P,FS} \approx \frac{2}{V_{Path,FS}}$$

$$V_{Path,FS} = \frac{1-\sigma}{\sigma} \cdot \frac{p \cdot 2 \cdot \pi \cdot n_N}{60} \cdot \sigma \cdot (L_h + L_{ss})^2$$

$$\sigma = 1 - \frac{(L_h)^2}{(L_h + L_{ss})^2}$$

$V_{P,FW}$: Gain of the field weakening controller ([C00577](#))
 L_m : Mutual motor inductance ([C00092](#))
 L_{sl} : Motor stator leakage inductance ([C00085](#))
 p = number of pole pairs

[5-19] Recommendation for setting the gain of the field controller (for $T_n \approx 10 \dots 30$ ms)



Tip!

If the field weakening controller is parameterised unfavourably, vibrations occur in the magnetising current, in the direct-axis current and in the cross current, in the torque and in the speed in the field weakening range. This is also audible by an increased motor noise (humming). The vibrations can be dampened by a decrease of the proportional gain of the field weakening controller.

Procedure:

- Operate the drive with max. required speed in the field weakening operation.
- Reduce V_p ([C00577](#)) of the field weakening controller until the vibration response cannot be detected anymore.

Field feedforward control

To have enough voltage reserve available for dynamic acceleration processes, a timely weakening of the field is required. The field weakening is controlled by the field feedforward control.

Parameter	Info	Lenze setting	
		Value	Unit
C00576	SC: Field feedforward control	200.0	%

The field feedforward control reciprocally reduces the magnetising current from the V/f base frequency ([C00015](#)) on. The starting point of the reduction can be shifted to low frequencies via the field feedforward control ([C00576](#)). Thus, more voltage reserve is available for acceleration processes.

The field feedforward control ([C00576](#)) must be specified in %, based on the rated slip of the machine.



Tip!

Generally, the Lenze setting is sufficient for most applications.

- We recommend to increase the field feedforward control for applications with very dynamic acceleration processes in the field weakening range.
- Reduce the field feedforward control for very slow applications if necessary.

Adaptive adaptation of the P component of the field and speed controllers

In the field weakening range, the properties of the drive change due to the reduction of the magnetisation and the voltage limitation of the inverter. To be able to continue to provide a stable, well damped drive behaviour, the servo control has an automatic adaptation of the P component of the field weakening controller and speed controller.

In the Lenze setting, this function is activated. Depending on the application, this function can be deactivated via [C00079/2](#).

Parameter	Info	Lenze setting
C00079/2	SC: Adaptive field weakening controller	1: On



Tip!

Lenze recommends to always activate the adaptation of the field weakening and speed controller.

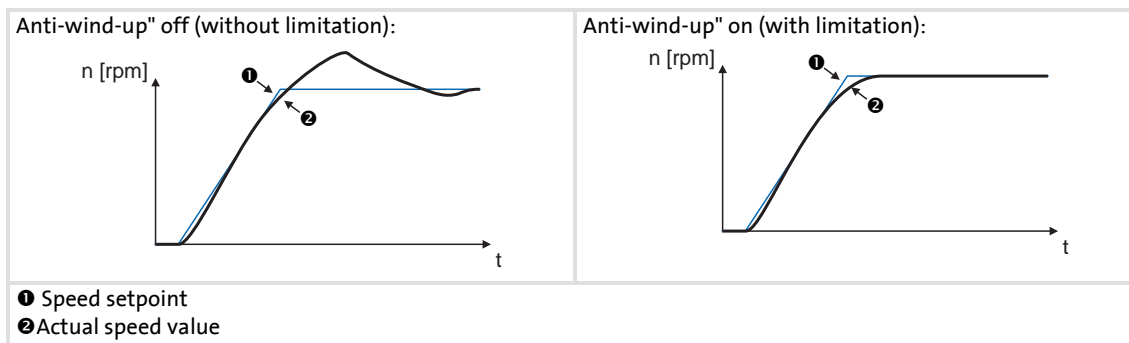
Additional limitation of the I component of the speed controller when the voltage limit is reached (anti-wind-up)

In dynamic acceleration processes in the field weakening range, the acceleration torque is limited due to the limitation of the maximum output voltage of the inverter. Acceleration ramps that are set too high ([C00012](#)) may lead to undesired charging of the integrator of the speed controller, which result in very strong overshoots of the actual speed value when the setpoint is reached.

The so-called anti-wind-up function serves to intelligently limit the integrator part in dynamic acceleration processes in the field weakening range so that an overshoot of the actual speed value can be prevented when the setpoint speed is reached.

This function is deactivated in the Lenze setting because the robustness of the drive may decrease in the field weakening range. Possible consequences are slight speed variations. If required by the application, the function can be activated via [C00079/3](#).

Parameter	Info	Lenze setting
C00079/3	SC: n-Ctrl Anti-Wind-Up	0: Off



[5-20] Typical signal characteristics for switched-on/off anti-wind-up function



Tip!

Lenze recommends to activate the additional limitation of the speed controller's I component on reaching the voltage limit ([C00079](#) = 1) if dynamic acceleration processes in the field weakening range are wanted.

The function should be deactivated again if slight speed variations occur in the field weakening range.

5.11 Parameterisable additional functions

5.11.1 Selection of switching frequency

The switching frequency of the inverter that can be selected in [C00018](#) influences the smooth running performance and the noise generation in the connected motor as well as the power losses in the controller.

The lower the switching frequency the higher the concentricity factor, the smaller the losses, and the higher the noise generation.



Stop!

If operated at a switching frequency of 16 kHz, the output current of the controller must not exceed the current limit values specified in the technical data!

▶ [Defining current and speed limits](#) (136)



Note!

- Operate mid-frequency motors only at a switching frequency of 8 kHz or 16 kHz (var./drive-opt.).
- If operated at a switching frequency of 16 kHz, the Ixt evaluation ([C00064](#)) is considered including the required derating to 67 % of the rated device current at switching frequencies of 2.4 and 8 kHz.

Settable switching frequencies

Selection in C00018	
1	4 kHz var./drive-optimised
2	8 kHz var./drive-optimised
3	16 kHz var./drive-optimised
5	2 kHz constant/drive-optimised
6	4 kHz constant/drive-optimised
7	8 kHz constant/drive-optimised
8	16 kHz constant/drive-optimised
11	4 kHz var./min. Pv
12	8 kHz var./min. Pv
13	16 kHz var./min. Pv
15	2 kHz constant/min. Pv
16	4 kHz constant/min. Pv
17	8 kHz constant/min. Pv
18	16 kHz constant/min. Pv
21	8 kHz var./drive-opt./4 kHz min
22	16 kHz var./drive-opt./4 kHz min
23	16 kHz var./drive-opt./8 kHz min
31	8 kHz var./min. Pv/4 kHz min
32	16 kHz var./min. Pv/4 kHz min
33	16 kHz var./min. Pv/8 kHz min

Abbreviations used:

- "var.": Adaptation of the switching frequency depending on the current
- "drive-opt.": drive-optimised modulation ("sine/delta modulation")
- "fixed": fixed switching frequencies
- "min. Pv": additional reduction of power loss

**Tip!**

The Lenze setting [C00018](#) = 2 (8 kHz var./drive-opt.) is the optimal value for standard applications.

Lowering the switching frequency due to high heatsink temperatures

Exceeding the maximally permissible heatsink temperature would lead to an inhibited drive due to the "Overtemperature" error and a torquelessly coasting motor. Therefore, if the Lenze setting is selected, the switching frequency is reduced to the next frequency below when the heatsink temperature has risen to 5 °C below the maximally permissible temperature. After the heatsink has cooled down, the controller automatically switches to the next frequency above until the set switching frequency is reached.

Switching frequency reduction due to high heatsink temperature can be deactivated via [C00144](#). If the switching frequency reduction is deactivated, the "OH1: Heatsink overtemperature" error message will be issued when the maximally permissible heatsink temperature is reached. An "Error" response is the result and the motor is coasting.

Parameter	Info	Lenze setting
C00144	Switching frequency reduction (temp.)	1: On

Lowering of the switching frequency depending on the output current

"Variable" switching frequencies can be selected for the controller in [C00018](#), where the controller automatically lowers the switching frequency depending on the controller output current. The modulation mode will not be changed.



The switching thresholds are given in the rated data in the **8400 hardware manual**.

- The hardware manual has been stored in electronic form on the data carrier supplied with the 8400 drive controller.

When a "fixed" switching frequency is selected, no switching frequency changeover takes place. In case of fixed frequencies, the controller output current is limited to the permissible value of the corresponding switching frequency. In case of larger load impulses, the overcurrent interruption may be activated, to which the controller responds with "Error".

Limiting the maximum output frequency



Note!

If the servo control mode (SC) is selected, the drive assumes the 'maximum current limitation' state if the maximum output frequency ([C00910](#)) has been reached.

▶ [Defining current and speed limits](#) (136)

The maximum output frequency ([C00910](#)) of the controller is not limited depending on the switching frequency. Therefore, adapt the maximum output frequency according to our recommendation:

$$\text{Maximum output frequency} \leq \frac{1}{8} \text{Switching frequency}$$

- ▶ At a switching frequency of 4 kHz, for instance, 500 Hz for the maximum output frequency should not be exceeded.

Carry out further measures:

- ▶ If required, deactivate the switching frequency changeover by the heatsink temperature via [C00144](#).
- ▶ If required, ensure that the changeover threshold of the controller output current to the next switching frequency below will not be exceeded. If required, select a constant switching frequency in [C00018](#).

Display of the current switching frequency

The current switching frequency applied in the controller is displayed in [C00725](#).

Operation at an ambient temperature of 45°C

The controller is designed so that operation at an ambient temperature of 45° C without derating is permissible at a switching frequency of 4 kHz.

5.11.2 Operation with increased rated power

Under the operating conditions described here and under continuous operation, the controller can be operated with a higher power motor (increased rated power). The remaining overload capacity of the drive system (for 60 s/3 s) is reduced accordingly to approx. 120 %/160 %.

Typical applications stand out due to low dynamic requirements, e.g. pumps and fans, general horizontal materials handling technology and line drives.



The controllers that can be operated at increased rated power are listed in the rated data in the **8400 hardware manual**.

- The hardware manual has been stored in electronic form on the data carrier supplied with the 8400 drive controller.



Stop!

Operation at increased rated power is only permitted ...

- with the controllers listed in the **8400 hardware manual** for this type of operation in the stated mains voltage range.
- at switching frequencies of 2 kHz and 4 kHz.
- at a max. ambient temperature of 40 °C.
- with the types of installation stated in the **8400 hardware manual**.
- with the fuses, cable cross-sections, mains chokes, and filters as required in the **8400 hardware manual** for this operation.
- after parameterisation according to the specifications below.

Required parameterisation

Operation at increased rated power requires the following settings to be made particularly for the V/f characteristic control (VFCplus), but also for all other types of control:

Parameter	Info	Required setting
C00016	VFC: Vmin boost	adapt to motor (reduce)
C00018	Switching frequency	1: 4 kHz var./drive-opt.
C00021	Slip compensation	adapt to motor
C00120	Setting of motor overload (I ² xt)	adapt to motor
C00123	Device utilisat. threshold (Ixt)	120 %
C00173	Mains voltage	see hardware manual → Rated data

All other types of control require the following settings in addition:

Parameter	Info	Required setting
C00022	I _{max} in motor mode	higher than rated motor current (max. 160 % rated motor current)
C00081	Rated motor power	adapt motor data (see motor nameplate), then carry out identification run ▶ Automatic motor data identification (126)
C00087	Rated motor speed	
C00088	Rated motor current	
C00089	Rated motor frequency	
C00090	Rated motor voltage	
C00091	Motor cos φ	

5.11.3 Correction of the stator leakage inductance...

...and the current controller parameters by means of the saturation characteristic



Note!

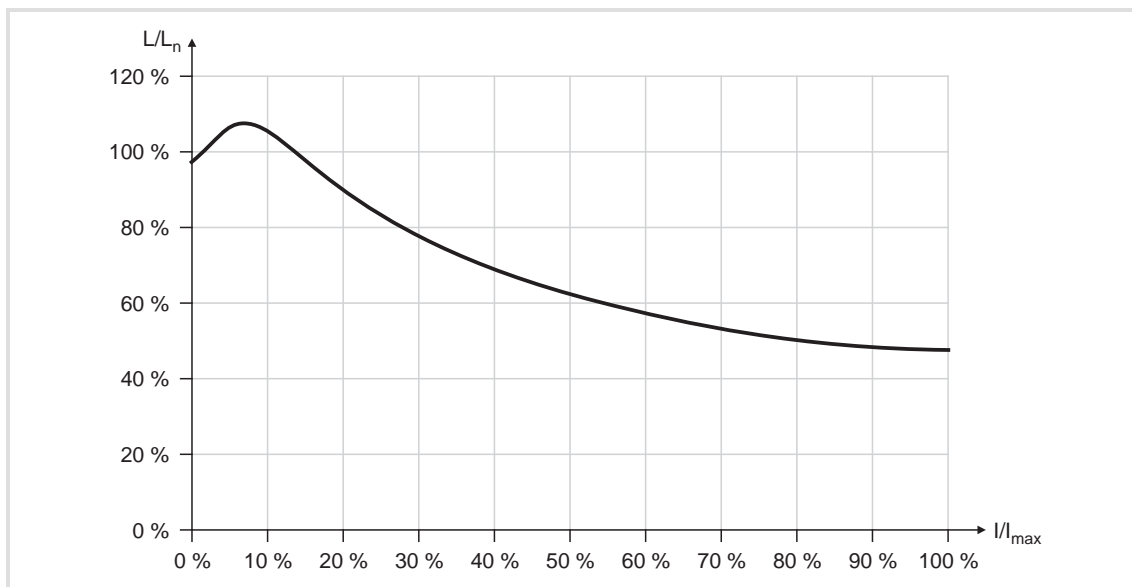
Function only possible with:

- Servo control (SC) for synchronous motors
- Sensorless control for synchronous motors (SLPSM)

The current controller must be adjusted to the electrical characteristics of the motor stator resistance ([C00084](#)) and stator leakage inductance ([C00085](#)). In case of modern motors, the stator leakage inductance changes with the height of the current so that a new current controller setting is required for each current height.

When the motor is operated with very low and very high currents (e.g. in *Pick and place* applications), it is not always possible to achieve a satisfactory current controller setting for all operating points. For this purpose, the correction of the stator leakage inductance and current controller parameters is now possible via an adjustable saturation characteristic that can be set in [C02853](#) (17 interpolation points).

The following picture shows a typical saturation characteristic of an MCS motor:



[5-21] Saturation characteristic: Inductance referring to the inductance for rated current

- ▶ When a Lenze motor is selected from the »Engineer« motor catalogue, the saturation characteristic will also be loaded and switched on if required.
- ▶ The correction by means of this saturation characteristic can be switched on/off via [C02859](#).
- ▶ If instabilities of the current controller occur when a third-party motor is used at high currents, ask the motor manufacturer whether the stator leakage inductance changes with the current height. If required, the saturation characteristic of this motor must be set and switched on.



Note!

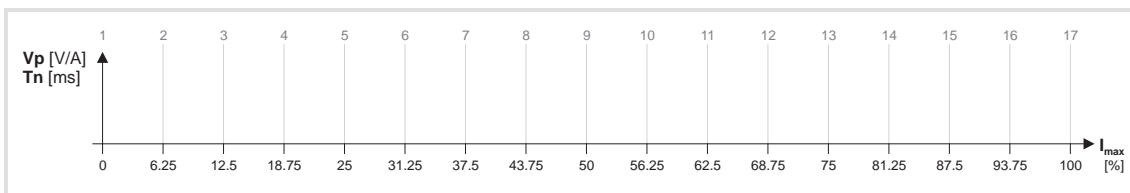
The saturation characteristic is not only used for the correction of the current controller but also influences the current controller feedforward control ([C00079/1](#)).

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C02853/1...17	Lss saturation characteristic	100	%
C02855	Imax Lss saturation characteristic	3000.0	A
C02859	Activate Lss saturation charact.	0: Off	

Distribution of the interpolation points

- ▶ The saturation characteristic is defined by 17 interpolation points which are distributed linearly on the x axis.
- ▶ Interpolation point 17 represents 100 % of the maximum motor current in the process ([C02855](#)).



[5-22] Saturation characteristic: Distribution of the interpolation points

5.11.4 Flying restart function

The flying restart circuit for asynchronous motors uses a simple motor model which requires knowledge of the motor stator resistance R_S and the rated motor current.



Note!

- Currently, the flying restart circuit is only available for asynchronous motors. (A flying restart circuit for synchronous motors is in preparation.)
- For a correct functioning of the flying restart circuit, we recommend to perform a parameter identification first. ▶ [Automatic motor data identification](#) (📖 126)
- The flying restart function works safely and reliably for drives with great centrifugal masses.
- Do not use the flying restart function if several motors with different centrifugal masses are connected to a controller.
- After the controller is enabled, the motor can start for a short time or reverse when machines with low friction and low mass inertia are used.
- The flying restart function serves to identify max. field frequencies up to ± 200 Hz.
- When power-adapted standard asynchronous motors are used (rated motor power approximately corresponds to the rated inverter power), a motor parameter identification is not required.
- On drive systems with feedback, you do not need to use the flying restart function because the synchronisation to the speed detected by the feedback is always carried out in a jerk-free manner.



Tip!

In association with the flying restart function, we recommend information provided in this documentation on the following topic:

- ▶ [Automatic DC-injection braking \(Auto-DCB\)](#) (📖 251)

General information

This function serves to activate a mode which is used to "catch" a coasting motor during operation without speed feedback. This means that the synchronicity between controller and motor is to be adjusted in such a way that a jerk-free transition to the rotating machines is achieved in the instant of connection.

The drive controller determines the synchronicity by identifying the synchronous field frequency.

Duration

The "catching" process is completed after approx. 0.5 ... 1.5 seconds. The duration is influenced by the starting value. If the field frequency is not known, we recommend a fixed starting value of 10 Hz (or -10 Hz with systems rotating in negative direction).

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C00990	Flying restart fct.: Activate	Off	
C00991	Flying restart fct.: Process	-n...+n Start: +10 Hz	
C00992	Flying restart fct.: Start frequency	5	Hz
C00993	Flying restart fct.: Int. time	300	ms
C00994	Flying restart fct.: Current	25.00	%



How to parameterise the flying restart function:

1. Activate the flying restart circuit by selecting "1: On" in [C00990](#).
 - Every time the controller is enabled, a synchronisation to the rotating or standing drive is carried out.

When the Lenze setting is used, most applications do not require additional controller settings.

If additional settings are necessary, proceed as follows:

2. Define the process and hence the speed range/rotational frequency range in [C00991](#) which is to be examined by the flying restart circuit:
 - positive speed range ($n \geq 0 \text{ rpm}^-$)
 - negative speed range ($n \leq 0 \text{ rpm}^-$)
 - total speed range
3. Define the starting frequency.

The starting frequency which defines the starting point of the flying restart function is 10 or -10 Hz for processes 0 ... 3 and has been pre-optimised for standard motors.

If process 4 is selected in [C00991](#), an arbitrary starting frequency can be defined via [C00992](#). This is especially recommended for motors with higher rated frequencies.

- We recommend to define a starting frequency of approximately 20 % of the rated motor frequency to enable a safe and fast connection to standing drive systems.
- For systems with a known search speed (e.g. torque-controlled drive systems which are to synchronise to a defined speed) the starting value can be adapted to reduce the flying restart time.

4. Set the flying restart current in [C00994](#).

We recommend setting a flying restart current of 10 % ... 25 % of the rated motor current.

- During a flying restart process, a current is injected into the motor to identify the speed.
- Reducing the current causes a reduction of the motor torque during the flying restart process. A short-time starting action or reversing of the motor is prevented with low flying restart currents.
- An increase of the current improves the robustness of the flying restart function.



Tip!

Use of motors with higher rated frequencies

For trouble-free operation, we recommend to manually enter a starting frequency of 20 % of the rated motor frequency in [C00992](#) as well as to accelerate the flying restart process (see above) and to use a lower flying restart current (10 % of the rated motor current) if motors with higher rated frequencies are used.

Optimisation of the flying restart time

The duration of the flying restart process can be influenced via the setting of the integration time ([C00993](#)). A reduction of the integration time causes an accelerated flying restart function and thus a reduced flying restart time.

- We recommend not to change the Lenze setting of the integration time.
- When special motor are used (e.g. multi-pole motors or ASM servo motors), a reduced integration time may improve the flying restart behaviour.

Optimising the current controller if the behaviour is unstable

During the execution of flying restart function, peak currents/torques are avoided by controlling the current amplitude.

Gain ([C00075](#)) and reset time ([C00076](#)) of the current controller can be adapted to improve the jerk-free/torque-free connection of the inverter to the supply of the rotating motor.

- We recommend not to change the Lenze setting of the current controller.
- If the behaviour of the current controller is unstable, gain and reset time can be calculated as per the following formulae:

$$V_p = \frac{L_{ss}[H]}{T_E[s]}$$

$$T_i = \frac{L_{ss}[H]}{R_s[\Omega]}$$

V_p = Current controller gain ([C00075](#))

T_i = Current controller reset time ([C00076](#))

L_{ss} = Motor stator leakage inductance ([C00085](#))

R_s = Motor stator resistance ([C00084](#))

T_E = Equivalent time constant (= 500 μ s)

[5-23] Formulae for the calculation of the gain and reset time of the current controller

5.11.5 DC-injection braking



Danger!

The DC-injection braking or auto DC-injection braking function cannot be used with sensorless control for synchronous motors (SLPSM) and servo control (SC) mode.

Holding braking is not possible when this braking mode is used!

- For low-wear control of a holding brake, use the basic function "[Holding brake control](#)". (□ 563)

DC-injection braking allows the drive to be quickly braked to a standstill without the need to use an external brake resistor.

- ▶ The braking current is set in [C00036](#).
- ▶ The maximum braking torque to be generated by the DC braking current is approx. 20 ... 30 % of the rated motor torque. It is lower than that for braking in generator mode with an external brake resistor.
- ▶ Automatic DC-injection braking (auto DCB) improves the starting performance of the motor when operated without speed feedback.



Tip!

DC-injection braking has the advantage that it is possible to influence the braking time by changing the motor current or the braking torque..

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C00019	Auto DCB: Threshold • Operating threshold for activating DC-injection braking	3	rpm
C00036	DC braking: Current • Braking current in [%] based on rated device current (C00098)	50	%
C00106	Auto DCB: Hold time	0.500	s
C00107	DC braking: Hold time	999.000	s
C00701/4	LA_NCtrl: bSetDCBrake • Selection of the signal source for activating DC-injection braking	Dependent on the selected control mode	

Method

DC-injection braking can be carried out in two ways with different types of activation:

- ▶ [Manual DC-injection braking \(DCB\)](#) (☰ 251)
- ▶ [Automatic DC-injection braking \(Auto-DCB\)](#) (☰ 251)

5.11.5.1 Manual DC-injection braking (DCB)

DC-injection braking can be activated manually for the two technology applications "Actuating drive speed" and "Switch-off positioning" by connecting the *bSetDCBrake* input of the **LA_NCtrl** or **LA_SwitchPos** application block to a digital signal source (e.g. via the digital signal source *bCtrl1_B3* of the port block **LP_CANIn1**).

- ▶ For HIGH-active inputs, DC-injection braking is active as long as the signal is at HIGH level.
- ▶ After the hold time ([C00107](#)) has expired, the controller sets the pulse inhibit (CINH).

5.11.5.2 Automatic DC-injection braking (Auto-DCB)

"Automatic DC-injection braking" (referred to in the following as "auto DCB") can be used if there is a requirement that the drive be isolated from the supply at $n \approx 0$.



Note!

Deactivate automatic DC-injection braking when a holding brake is used!

- For this purpose, go to [C00019](#) and set the auto DCB threshold to "0".
- Background: Controller inhibit is already activated by the [Holding brake control](#). (☰ 563)

Function

For understanding the auto DCB function, it is necessary to distinguish between three different types of operation:

- A. The drive has been enabled and, in the course of operation, the speed setpoint falls below the auto DCB threshold.
 - In case of operation without speed feedback, a braking current ([C00036](#)) is injected. After the auto DCB hold time ([C00106](#)) has expired, the motor is deenergised via the auto DCB function, i.e. a controller inhibit (CINH) is set.
 - In case of operation with speed feedback, the motor is deenergised via the auto DCB function after the auto DCB hold time ([C00106](#)) has expired, i.e. a controller inhibit (CINH) is set.

The braking current which can be parameterised in [C00036](#) does not have any effect during operation with speed feedback.
- B. When the controller is enabled, the drive is at standstill ($n = 0$).
If the enabled drive is to start, the speed setpoint passed via the acceleration ramp must exceed the auto DCB threshold ([C00019](#)). Below this threshold, the motor will not be energised.

C. When the controller is enabled, the motor (still) rotates at a speed which is above the auto DCB threshold. If the speed setpoint reached via the acceleration ramp exceeds the auto DCB threshold ([C00019](#)), the motor will be energised and the following action will take place:

- During operation without speed feedback, the drive is "caught".
 - ▶ [Flying restart function](#) (☰ 247)
- During operation with speed feedback, the drive synchronises to the current actual speed value.



Tip!

We recommend to deactivate the auto DCB function during operation with speed feedback via a setting of [C00019](#) = 0.

Auto DCB function during operation with speed feedback



Stop!

If the DC-injection braking operation is too long and the braking current or braking voltage is too high, the connected motor may overheat.

If you want to use the auto DCB function contrary to our recommendation (see above), the auto DCB threshold must not fall below the following values depending on the number of encoder increments ([C00420](#)):

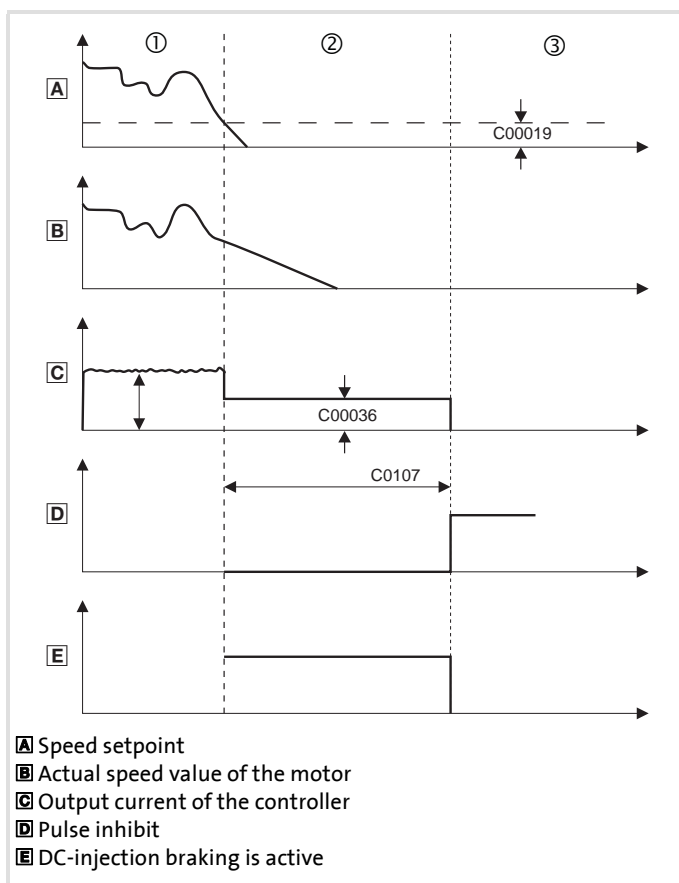
Number of encoder increments C00420	Auto DCB threshold C00019
8	16
16	8
32	4
64	2
> 128	No restrictions



How to set the automatic DC-injection braking

1. Set a hold time in [C00106](#) > 0 s.
 - Automatic DC-injection braking is active for the time set.
 - In case of operation without speed feedback, the braking current set in [C00036](#) is injected.
 - After the set hold time has expired, the controller sets a pulse inhibit.
2. Set the operating threshold in [C00019](#).
 - The operating threshold can serve to set a dead band in the setpoint. If DC-injection braking is not to be active then, [C00106](#) must be set to a value of "0".

Explanation of the automatic DC-injection braking function by means of two examples

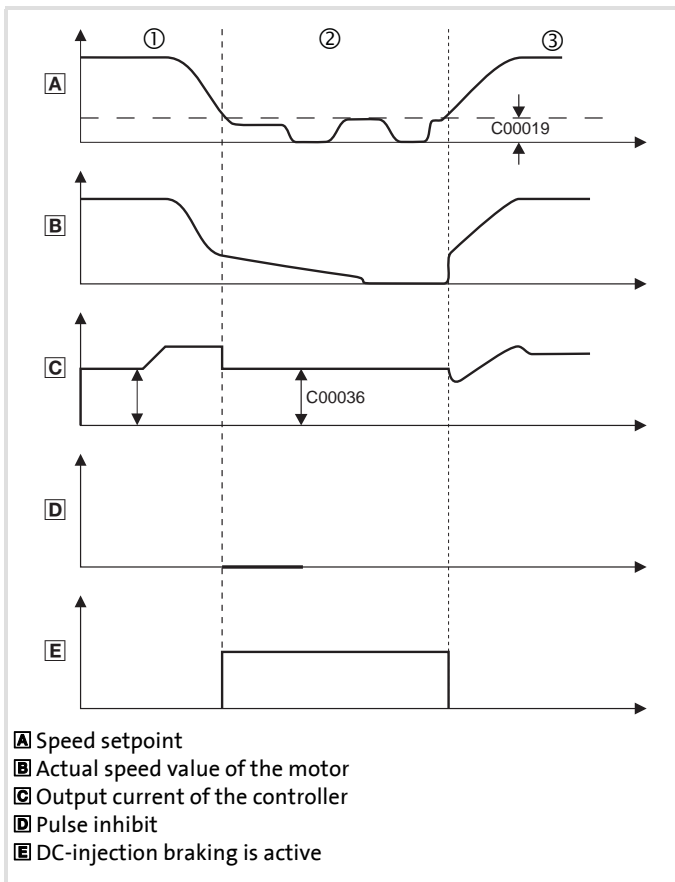


① The motor rotates at a specified speed. The current adjusts itself to the load, see [C](#).

② The DC braking current set in [C00036](#) is injected.

③ After the hold time ([C00106](#)) has expired, a pulse inhibit is set.

[5-24] Example 1: Signal characteristic for automatic DC-injection braking of a drive without speed feedback



① The motor rotates at the selected speed. The resulting current depends on the load, see **F**.

② The DC braking current set in **C00036** is injected.

③ The actual speed value of the motor follows the speed setpoint. The resulting current depends on the load.

[5-25] Example 2: Signal characteristic for automatic DC-injection braking of a drive with speed feedback

5.11.6 Slip compensation

**Note!**

Slip compensation is only active with the following motor control modes:

- [V/f characteristic control \(VFCplus\)](#) (☞ 147)
- [Sensorless vector control \(SLVC\)](#) (☞ 182)

Under load, the speed of an asynchronous motor decreases. This load-dependent speed drop is called slip. The slip can partly be compensated for by the setting in [C00021](#).

Parameter	Info	Lenze setting	
		Value	Unit
C00021	Slip compensation	2.11	%

- ▶ The setting of [C00021](#) can be done automatically in the course of motor parameter identification. ▶ [Automatic motor data identification](#) (☞ 126)
- ▶ The setting must be made manually if the motor parameter identification cannot be called up.

**How to set the slip compensation manually:**

1. Set rated motor current ([C00088](#)) and rated motor frequency ([C00089](#)).
2. Calculate the slip compensation according to motor nameplate data:

$$s = \frac{n_{rsyn} - n_r}{n_{rsyn}} \cdot 100\%$$

$$n_{rsyn} = \frac{f_r \cdot 60}{p}$$

- s Slip constant ([C00021](#)) [%]
- n_{rsyn} Synchronous motor speed [rpm]
- n_r Rated motor speed according to the motor nameplate [rpm]
- f_r Rated motor frequency according to the motor nameplate [Hz]
- p Number of motor pole pairs (1, 2, 3 ...)

3. Transfer the calculated slip constant s to [C00021](#).
4. Correct the setting in [C00021](#) while the drive is running until the load-dependent speed drop does not occur anymore between idling and maximum load of the motor in the desired speed range.



Tip!

The following guide value applies to a correctly set slip compensation:

- Deviation from the rated motor speed $\leq 1\%$ for the speed range of 10 % ... 100 % of the rated motor speed and loads \leq rated motor torque.
- Greater deviations are possible in the field weakening range.
- If [C00021](#) is set too high, the drive may get unstable.
- Negative slip ([C00021](#) < 0) with V/f characteristic control results in "smoother" drive behaviour at heavy load impulses or applications requiring a significant speed drop under load.

5.11.7 Oscillation damping

Mechanical oscillations are undesirable effects in every process and they may have an adverse effect on the single system components and/or the production output.

Mechanical oscillations in the form of speed oscillations are suppressed by the oscillation damping function.

Mechanical oscillations may occur:

- ▶ In the voltage range (output voltage is lower than max. voltage)
 - Here, the oscillations occur in no-load operation.
 - Here, speeds of 40 ... 80 % of the rated speed are typical.
 - See subchapter "[Oscillation damping voltage range](#)". (□ 257)
- ▶ In the field weakening range (output voltage has reached maximum voltage)
 - Here, the oscillations occur in no-load operation and with load.
 - Here, speeds higher than the rated speed are typical, especially when the output frequency is close to the mains frequency.
 - See subchapter "[Oscillation damping in the field weakening range](#)". (□ 258)



Note!

With servo control (SC), the [Oscillation damping voltage range](#) has no influence.

Mechanical natural frequencies can be suppressed or at least dampened in the speed control loop of the servo control by means of a current setpoint filter. ▶ [Setting the current setpoint filter \(band-stop filter\)](#) (□ 231)

Oscillation dampening, especially in the field weakening range, is also possible by activating the current controller feedforward control ([C00079/1](#)).

5.11.7.1 Oscillation damping voltage range

The oscillation damping voltage range is successfully used with

- ▶ unloaded motors (no-load oscillations)
- ▶ motors whose rated power deviates from the rated power of the controller.
 - e.g. during operation at high switching frequency including the power derating involved.
- ▶ operation with higher-pole motors
- ▶ operation with special motors
- ▶ compensation of resonance in the drive
 - At an output frequency of approx. 20 ... 40 Hz, some asynchronous motors can show resonance which causes current and speed variations and thus destabilise the running operation.

Parameter	Info	Lenze setting	
		Value	Unit
C00234	Oscillation damping influence	5.00	%
C00235	Oscillation damping filter time	32	ms



Note!

Compensate the resonance during operation with feedback (closed loop, feedback of n_{act}) via the parameters of the slip regulator.

▶ [Parameterising the slip regulator](#) (📖 179)



How to eliminate speed oscillations in no-load operation at speeds with 40 ... 80 % of the rated speed:

1. Approach the area where the speed oscillations occur.
2. Reduce the speed oscillations by changing [C00234](#) step by step (increment 1 %).
 - The filter time oscillation damping ([C00235](#)) should not be changed.
3. These can be indicators for smooth running:
 - Constant motor current characteristic
 - Reduction of the mechanical oscillations in the bearing seat

5.11.7.2 Oscillation damping in the field weakening range

When the max. possible output voltage (full modulation) has been reached, a voltage dip in the DC bus causes a voltage fluctuation in the motor. With load and during no-load operation this voltage fluctuation can cause mechanical oscillations.

The "oscillation damping field weakening" adjustable in [C00236](#) serves to limit the maximum output voltage. This can be used to always compensate voltage dips in the DC bus to the output voltage (constant output voltage). This serves to prevent mechanical oscillations due to these voltage dips.

Parameter	Info	Lenze setting	
		Value	Unit
C00236	Oscillation damping field weakening • Setting "0" ≙ 100 % output voltage can be reached	14	

- ▶ With the Lenze setting of [C00236](#) the limitation of the output voltage is set so that voltage dips in the DC bus in the output voltage for the single-phase and three-phase devices can largely be compensated so that no speed oscillations may be expected. Thus, an adaptation of [C00236](#) is not required in the majority of cases.
- ▶ Maximum output voltage to be reached with Lenze setting of [C00236](#):
 - Single-phase devices: 98.2 %
 - Three-phase devices: 99.7 %



Note!

The limitation of the output voltage via [C00236](#) in the extreme field weakening range (high speeds) causes a reduction of the max. possible output torque (stalling torque).

- If the output torque to be reached in the extreme field weakening range is not sufficient (motor is stalling too early), reduce the setting in [C00236](#).

With servo control (SC), the Lenze setting of [C00236](#) should not be reduced. Otherwise the field weakening control could not work optimally anymore (the behaviour at high speeds may get worse). When servo control (SC) has been selected, the oscillation damping in [C00236](#) should never be set to "0".



How to eliminate speed oscillations in the field weakening range:

1. Approach the area where the speed oscillations occur.
2. Reduce the speed oscillations by changing [C00236](#) step by step (increment 1).
3. These can be indicators for smooth running:
 - Constant motor current characteristic
 - Reduction of the mechanical oscillations in the bearing seat

5.11.8 Phase sequence reversal for correcting misconnected UVW motor phases

If the motor phases are misconnected at the inverter output (e.g. phase u takes the place of phase v), the motor will rotate in the wrong direction.

To correct such misconnected motor phases, the rotating field of the controller's output can be reversed by selecting "1: Inverted" in [C00905](#). In this case, a phase will be reversed at the output of the inverter.

This function does not have any effect on setpoints and actual values, i.e. the polarity of the speed setpoint/actual speed value, actual torque, output frequency, and AngleOffset do not change.



Tip!

Cases of application for this function:

- Phase sequence reversal in case of misconnected motor phases.
- Setting of the correctly signed direction of rotation for inversely mounted motors.

5.11.9 Field weakening for synchronous motors

This function extension is available from version 02.00.00!



Note!

Function only possible with:

- Servo control (SC)
- Sensorless control for synchronous motors (SLPSM) (from version 10.00.00)

The energy efficiency of a synchronous motor decreases with the field weakening operation. If a high energy efficiency is required, keep the field weakening switched off or restrict the field weakening operation via [C00938](#).



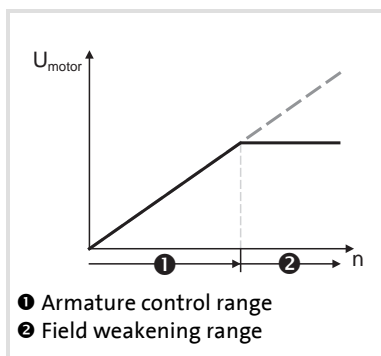
Stop!

In the field weakening operation, a current is injected into the synchronous motor even in idle state which can rise to maximum current ([C00022](#)).

Ensure that this no-load current does not cause the motor to be heated impermissibly!

- The use of a temperature feedback via KTY is recommended. ▶ [Motor temperature monitoring \(KTY\)](#) (☞ 323)

If required, field weakening for synchronous motors can be switched on in [C00079/4](#).

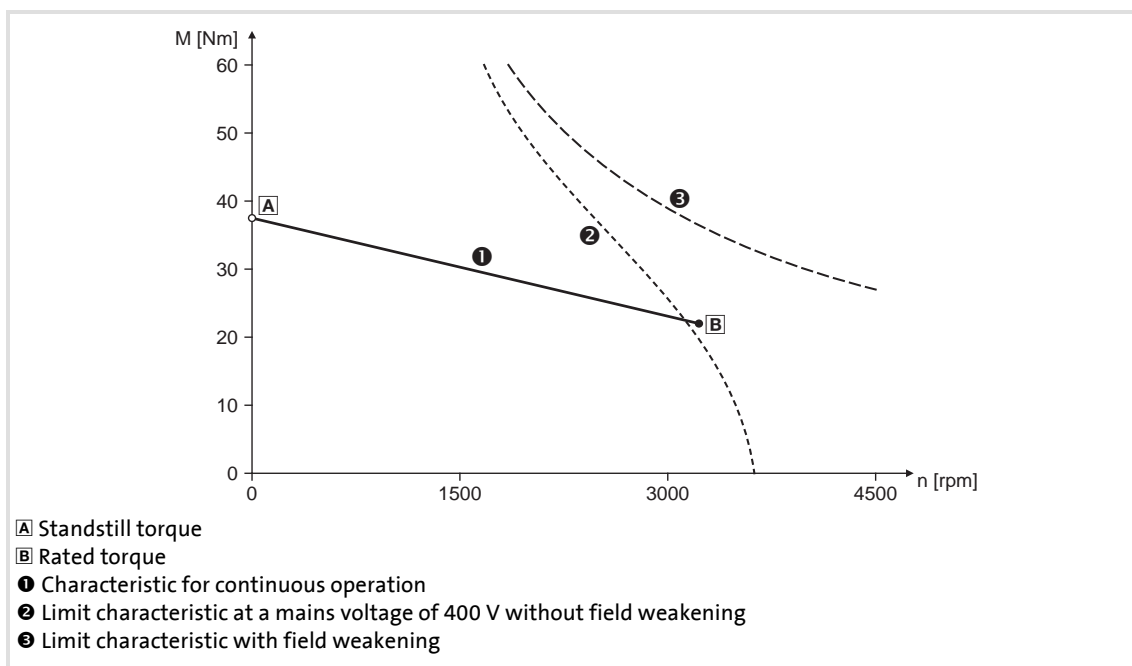


- ▶ When field weakening is switched on, the motor magnetising current is increased from 0 A to the maximally effective magnetising current via an internal control loop when the voltage limit is reached.
- ▶ As a result, a higher speed can be reached at the same motor voltage or DC-bus voltage.

[5-26] Voltage/speed characteristic with switched-on field weakening

$$n_{\text{max}} = n_{\text{nenn_mot}} \cdot \frac{800\text{V}}{\sqrt{2} \cdot U_{\text{nenn_mot}}}$$

[5-27] Calculation of the maximally reachable speed with switched-on field weakening



[5-28] Speed/torque characteristics of a synchronous servo motor with field weakening

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C00079/4	Field weakening	0	Off
C00938	Limitation of maximally effective field-producing motor current • With regard to rated motor current (C00088)	100	%
C00937/1	Maximally effective field-producing motor current	-	A

Highlighted in grey = display parameter

- ▶ The maximally effective field-producing motor current is calculated based on the motor data set in [C00085](#), [C00089](#) and [C00098](#). Then, the value is internally limited to 98 % of the set maximum current ([C00022](#) or maximally permissible current for the permanent switching frequency set in [C00018](#)).
- ▶ [C00938](#) serves to limit the maximally effective field-producing motor current as well.
 - In the Lenze setting, the field-producing motor current is limited to a rated motor current ([C00088](#)) of 100 %. Hence, the maximum speed in the field weakening operation is limited and at the same time heating of the motor in the field weakening operation and idle state is limited.
 - If a higher speed for the field weakening operation is required or the current in the field weakening operation is to be limited (e.g. since no motor temperature detection is available and/or heating in the field weakening operation is to be limited), the value must be increased or reduced accordingly in [C00938](#).

- ▶ In [C000937/1](#), the actually used maximally effective field-producing motor current is displayed.
 - With switched-on and active field weakening: 0.00 A ... -x.xx A
 - With sensorless control for synchronous motors (SLPSM), the injected current is displayed in open-loop controlled operation: 0.00 A ... +x.xx A
 - If neither field weakening nor open-loop controlled operation are active, "0.00 A" is displayed.



Note!

If a Lenze motor is used:

The controller is automatically parameterised so that field weakening operates optimally and the maximally permissible speed is monitored.



Stop!

If an OEM motor is used:

If pulse inhibit is set in the controller, the DC bus is loaded with the voltage that corresponds to the current speed of the machine.

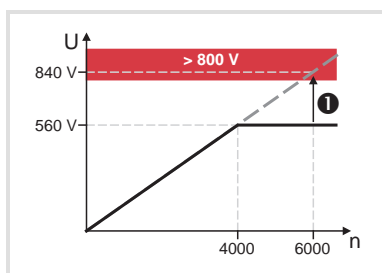
Since with switched-on field weakening higher speeds can be achieved at a correspondingly higher rotor voltage of the motor, the DC bus can be loaded to a voltage higher than the set DC-bus voltage in case of pulse inhibit and a currently high motor speed and even exceed the maximally permissible voltage of 800 V!

For device protection, either use a brake chopper or parameterise the motor speed monitoring via [C00965](#) in such a way that only a maximum speed is possible which would be also reachable without field weakening with a DC-bus voltage of = 800 V. ▶ [Motor speed monitoring](#) (📖 284)

Example: Voltage increase in the DC bus when field weakening is switched off

(For instance by an active setting of the controller inhibit or by tripping a fault or error at high motor speed.)

Field weakening	Speed n	Motor voltage peak value
Switched off	4000 rpm	560 V
	5700 rpm	800 V
	6000 rpm	840 V
Switched-on	6000 rpm	560 V



- ▶ If pulse inhibit occurs at 6000 rpm and switched-on field weakening, the DC bus is loaded to more than 800 V (❶).
- ▶ A speed limitation to 5700 rpm is required since this speed causes a DC-bus voltage of 800 V if field weakening is switched off.

[5-29] Example: Possible DC-bus voltage > 800 V if field weakening gets lost

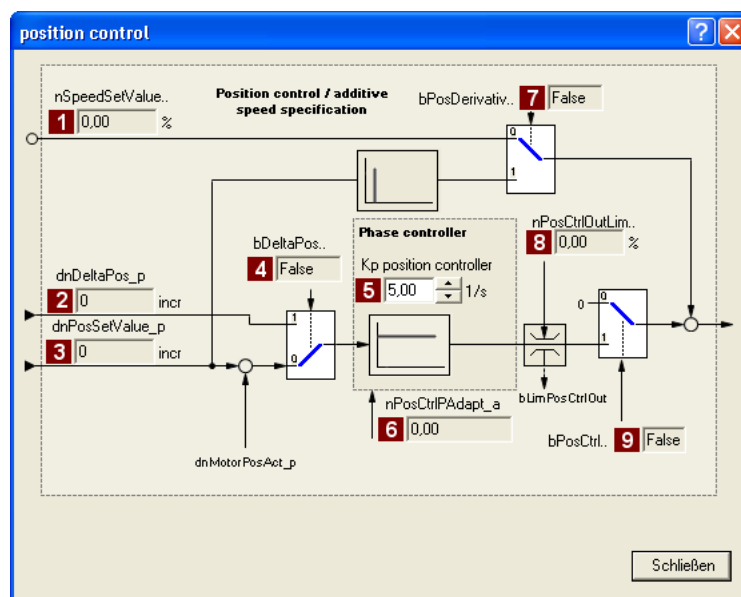
5.12 Position control/additive speed specification

In the Lenze setting, the position control is only active with [TA "Table positioning"](#).



Proceed as follows to open the dialog for parameterising the position control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the **Motor control...** button to change to the *Overview → motor control...* dialog level.
4. Click the **Position control** button in the displayed signal flow.



Parameter	Info
1 C00830/22	MCTRL: nSpeedSetValue_a Speed setpoint
2 C00834/4	MCTRL: dnDeltaPos_p Position difference (following error input)
3 C00834/5	MCTRL: dnPosSetValue_p Absolute position setpoint
4 C00833/35	MCTRL: bDeltaPosOn TRUE = Position difference is active as setpoint selection
5 C00254	Kp position controller Gain for following error compensation
6 C00830/20	MCTRL: nPosCtrlPAdapt_a Adaptation of the position controller gain
7 C00833/67	MCTRL: bPosDerivativeOn TRUE = Setpoint for the speed controller is created from the position setpoint
8 C00830/21	MCTRL: nPosCtrlOutLimit_a Limitation of the position controller output
9 C00833/27	MCTRL: bPosCtrlOn TRUE = Position/angle control active

5.13 Braking operation/brake energy management

When electric motors are braked, the kinetic energy of the drive train is fed back into the DC circuit regeneratively. This energy leads to an increase in the DC bus voltage. In order to avoid overvoltage in the DC bus, several different strategies can be used:

- ▶ Use of a brake resistor
- ▶ Stopping of the ramp function generator if brake chopper threshold exceeded (RFG_Stop)
- ▶ Use of the "Inverter motor brake" function
- ▶ Combination of the above named options

In the case of inverters with a 3-phase supply, the following is also possible:

- ▶ Coupling of the inverters in a DC-bus connection
- ▶ Recovery of regenerative energy with a regenerative module



Stop!

If the connected brake resistor is smaller than required, the brake chopper can be destroyed!

Appropriate protective measures are provided in the subchapter "[Avoiding thermal overload of the brake resistor](#)". (☰ 273)



Note!

- We recommend to use the brake chopper (brake transistor) which is integrated into the controller for the braking operation, regardless of the selected motor mode.
 - Connect the required brake resistor to the R_{B1} and R_{B2} terminals of the controller.
- For a DC-bus connection with other devices, we recommend to connect the regenerative power supply module to terminals +UG and –UG.
- If none of these measures is taken, e.g. the overvoltage deactivation ("OU") may respond in case of low deceleration times during regenerative operation.
 - ▶ [Error messages of the operating system](#) (☰ 602)



To install the regenerative module, follow the instructions in the **8400 hardware manual**.

- The hardware manual has been stored in electronic form on the data carrier supplied with the 8400 drive controller.



Tip!

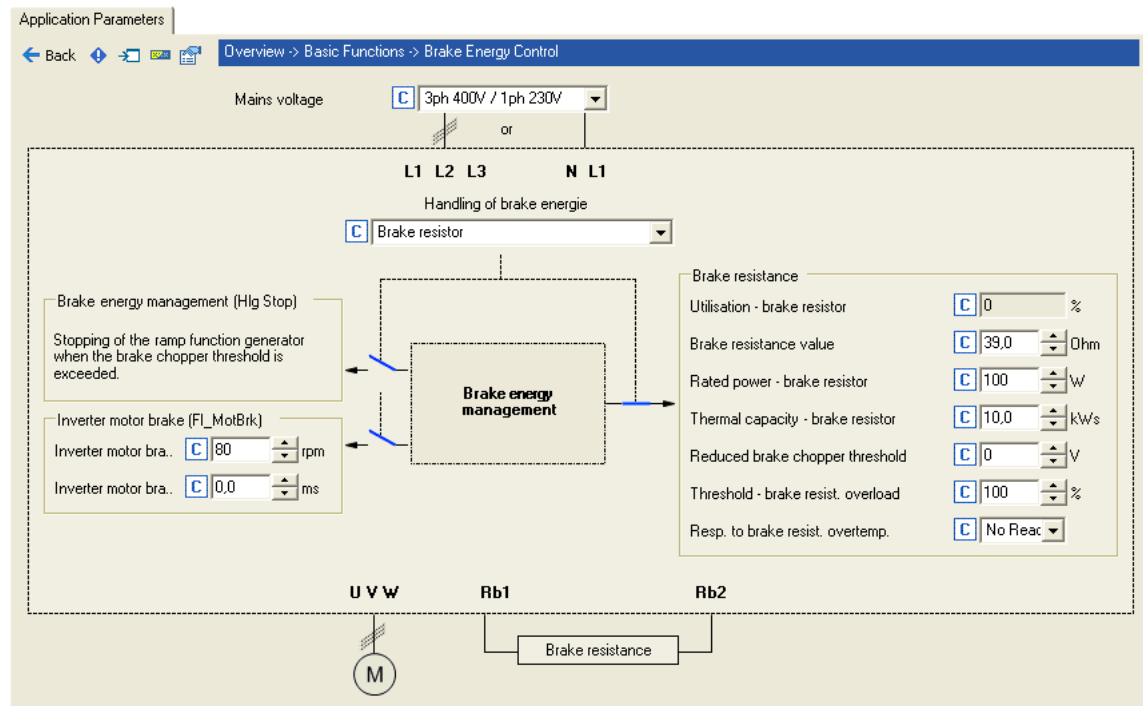
In [C00175](#), a ramp function generator stop (FB [L_NSet_1](#)) can be set for instances when the brake resistor is controlled. This prevents overvoltage deactivation in the case of short deceleration times.

▶ [Selecting the response to an increase of the DC-bus voltage](#) (268)



Proceed as follows to open the dialog for parameterising the brake energy management:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the "basic functions" button.
4. Go to the *Overview* → *basic functions* dialog box and click the **Brake energy management** button.



Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C00173	Mains voltage	3ph 400 V / 1ph 230 V	
C00175	Brake energy management	R_Brake (brake resistance)	

Highlighted in grey = display parameter

Parameter	Info	Lenze setting	
		Value	Unit
Brake resistor			
C00133	Brake resistor utilisation	-	%
C00129	Brake resistance value	39.0	Ohm
C00130	Rated brake resistor power	100	W
C00131	Thermal capacity - brake resistor	10.0	kWs
C00174	Reduced brake chopper threshold	0	V
C00572	Brake resistor overload threshold	100	%
C00574	Resp. to overtemp. brake resistor	No response	
Inverter motor brake			
C00987	Inverter motor brake: nAdd	80	rpm
C00988	Inverter motor brake: PT1 filter time	0.0	ms

Highlighted in grey = display parameter

5.13.1 Setting the voltage source for braking operation

The voltage threshold for braking operation is set via the mains voltage ([C00173](#)) and the reduced brake chopper threshold ([C00174](#)). When this "brake chopper threshold" is exceeded, the response selected in [C00175](#) takes place in the DC bus. The selected function (e.g. use of a brake resistor) serves to dissipate energy in the DC bus and reduce the DC-bus voltage.

- ▶ The "brake chopper threshold" is preset as follows so that it is higher than the specified mains voltage ([C00173](#)):

C00173	Mains voltage		Brake chopper threshold	
	1-phase	3-phase	1-phase	3-phase
0	1ph 230V	3ph 400V	DC380V	DC725V
1	1ph 230V	3ph 440V	DC380V	DC735V
2	1ph 230V	3ph 480V	DC380V	DC775V
3	1ph 230V	3ph 500V	DC380V	DC790V
4	1ph 115V	3ph 400V	DC205V	DC725V

- ▶ This brake chopper threshold can be reduced by 0 ... 150 V by means of [C00174](#).



Stop!

The brake chopper threshold resulting from [C00173](#) and [C00174](#) must not exceed the stabilised DC-bus voltage!

Example:

- ▶ A 400 V device has a maximum mains voltage of 420 V AC.
 - Maximum stationary DC-bus voltage: 420 V AC * 1.414 = 594 V DC
 - [C00173](#) has been set with the selection "0" for 400 V AC mains.
- ▶ This means that [C00174](#) can be set to a maximum of 131 V DC (725 V DC - 594 V DC).

5.13.2 Selecting the response to an increase of the DC-bus voltage

If the brake chopper threshold resulting from [C00173](#) and [C00174](#) is exceeded in the DC bus, the reaction selected in [C00175](#) takes place (use of the brake resistor and/or stop of the ramp function generator and/or inverter motor brake).

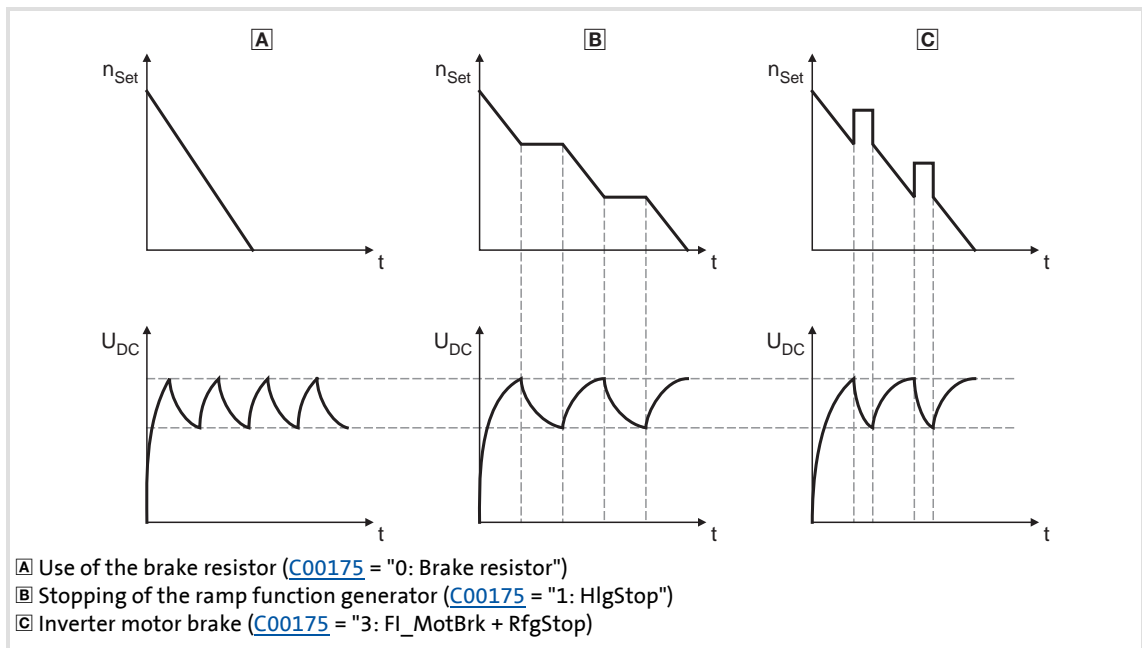
- ▶ Optimum following of the actual speed value until the speed setpoint is reached (e.g. the motor is stopped rapidly) is always achieved with the help of a brake resistor.
- ▶ Stopping the ramp function generator enables smoother deceleration with lower torque oscillation..
- ▶ The inverter-motor brake is available for selection in [C00175](#). This function enables rapid braking without a brake resistor. Torque oscillations can occur due to the traversing dynamics. ▶ [Inverter motor brake](#) (📖 270)



Stop!

- The two braking procedures "Stopping of the ramp function generator" and "Inverter motor brake" can only be used for speed-controlled applications without the influence of a position controller!
- When the "inverter motor brake" function is used, the [Motor load monitoring \(I2xt\)](#) is not adapted. If it is braked too frequently, there is a risk of the motor being thermally overloaded or the motor overload monitoring does not work properly!
- The "inverter motor brake" function must not be used with vertical conveyors (hoists) or with active loads!

The way in which the different braking procedures work is demonstrated schematically in the following illustration:



[5-30] Graph of the effective speed setpoint and the DC bus voltage during braking



Tip!

Independent of the selected motor control, all procedures given in [C00175](#) can be used.

The actual speed value can optimally follow the speed setpoint when a brake resistor is used.

If it is possible to dispense with exact adherence to the deceleration ramp in simple applications, selection of a braking method without an external brake resistor enables costs to be reduced due to the avoidance of having to use a brake resistor .

With the "inverter motor brake" function, an effective braking torque of 10 ... 20 % of the rated motor torque can be achieved.

A combination of all three braking procedures is also possible, e.g. for emergency braking if the brake resistor fails

([C00175](#) = "4: Brake resistor + FI_MotBrk + RfgStop").

5.13.2.1 Inverter motor brake

With this braking method, which can be selected as an alternative in [C00175](#), the regenerative energy in the motor is converted as a result of dynamic acceleration/deceleration with down-ramping of the ramp function generator..



Stop!

- This braking method only works without intervention of a position controller in the case of speed-controlled applications!
- When the "inverter motor brake" function is used, the [Motor load monitoring \(I2xt\)](#) is not adapted. If it is braked too frequently, there is a risk of the motor being thermally overloaded or the motor overload monitoring does not work properly!
- The "inverter motor brake" function must not be used with vertical conveyors (hoists) or with active loads!



Tip!

If no brake resistor is used, the DC injection brake can also be used for a braking process in addition to the "inverter motor brake" and "Stopping of the ramp function generator". ▶ [DC-injection braking \(p. 250\)](#)

In applications with high mass inertia and long braking times (> 2 s), we recommend the use of the DC injection brake.

- The DC injection brake provides for an oscillation-minimised braking. The braking process generally takes more time than the "inverter motor brake" function with an optimised setting. Moreover, the function is only recommended for braking to a standstill.

In the following cases we recommend the "inverter motor brake" function:

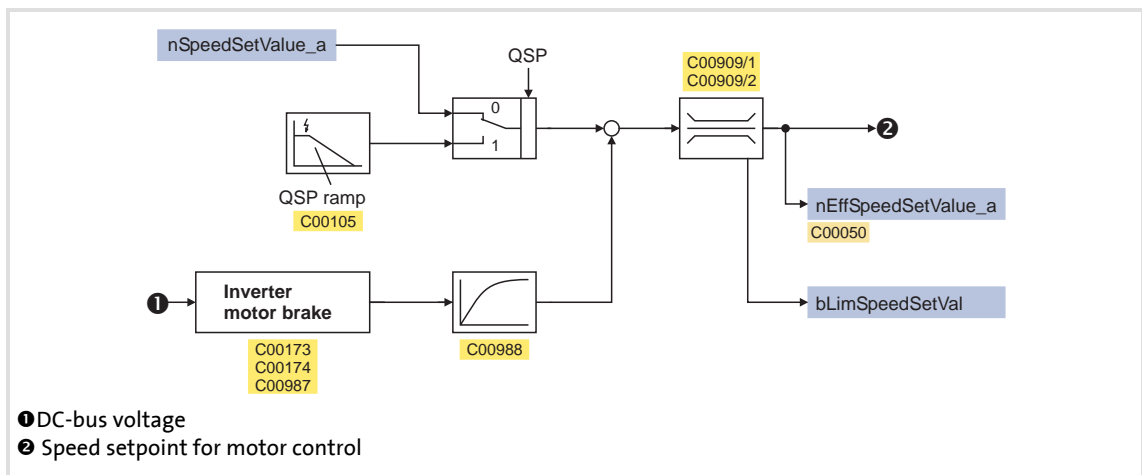
- With servo control (SC).
- For all applications that do not require braking to a standstill (e.g. braking to a lower speed setpoint) or the braking process can be interrupted by selecting a new speed setpoint.
- For applications with low mass inertias and a short braking time (< 1 s).
- For all applications where braking should be as quick as possible.

Operating mode of the inverter motor brake

The ramp function generator is stopped during acceleration. The speed set in [C00987](#) is added to the speed setpoint by means of a hysteresis-type 2-point DC bus voltage controller, whereby the sign of the current actual speed is taken into account. In addition, the ramp function generator is stopped during overvoltage.

If the DC bus voltage falls below a defined DC bus voltage potential of the hysteresis controller, the added speed is subtracted again and the ramp function generator is activated again.

The energy is converted into heat in the motor due to alternating instances of acceleration and deceleration as a result of this switching operation.



[5-31] Signal flow of the "Inverter motor brake" function

- In case of an asynchronous motor, the additive speed setpoint ([C00987](#)) should be 1 ... 4 times the slip of the machine:

$$C00987 \text{ [rpm]} = 1 \dots 4 \cdot (n_{\text{Sync}} \text{ [rpm]} - n_{\text{Rated}} \text{ [rpm]})$$

$$n_{\text{Sync}} \text{ [rpm]} = \frac{f_{\text{Rated}} \text{ Hz} \cdot 60}{p}$$

p = number of pole pairs
 n_{Rat} = Rated speed of the motor
 f_{Rat} = Rated frequency of the motor
 n_{Sync} = Synchronous speed of the motor

[5-32] Formula for calculating the additive speed setpoint for an asynchronous motor

- In case of a synchronous motor, the additive speed setpoint ([C00987](#)) should be 5 ... 20 % of the rated machine speed.

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C00173	Mains voltage	3ph 400V / 1ph 230V	
C00174	Reduc. brake chopper threshold	0	V
C00175	Resp. to brake resistor control	Brake resistor	
C00987	Inverter motor brake: nAdd <ul style="list-style-type: none"> Speed lift which is connected in pulses to the brake rampe when the motor is braked. 	80	rpm
C00988	Inverter motor brake: PT1 filter time <ul style="list-style-type: none"> PT1 filter time for smoothing the speed lift which is added in pulses. 	0.0	ms



Note!

When the "inverter motor brake" function is used, torque oscillations occur which may have a negative effect on the service life of the components of the mechanical drive train (e.g. gearbox).

- The extent of the occurring oscillations depends on the drive train (mass inertia, natural frequencies, etc.) and the function setting.
- We recommend optimising the "inverter motor brake" function for an oscillation-free operation as described in the following. Usually, this setting does not cause any torque oscillations which affect the service life of the gearbox.
- The settings of implementing a maximum acceleration ramp are only recommended if the inverter motor brake is used infrequently (e.g. in case of quick stop).



How to set the "inverter motor brake" function for an oscillation-reduced operation:

For V/f characteristic open-loop control/closed-loop control (VFCplus):

- Set reduced brake chopper threshold ([C00174](#)) to approx. 70 V.
- Set additive speed ([C00987](#)) to rated slip speed.
- Adapt the deceleration ramp so that the deceleration time is slightly below (10 ... 30 %) the deceleration time that can be realised with the inverter motor brake.

For sensorless vector control (SLVC) and servo control (SC):

- Set reduced brake chopper threshold ([C00174](#)) to approx. 50 V.
- Set additive speed ([C00987](#)) to 1 ... 2-fold rated slip speed.
- Adapt the deceleration ramp so that the deceleration time is slightly below (10 ... 30 %) the deceleration time that can be realised with the inverter motor brake.

**How to set the "inverter motor brake" function for a maximum acceleration ramp:**

For V/f characteristic open-loop control/closed-loop control (VFCplus):

- Set reduced brake chopper threshold ([C00174](#)) to approx. 70 V.
- Set additive speed ([C00987](#)) to 1,5 ... 2,5-fold rated slip speed.
- Adapt the deceleration ramp so that the deceleration time is slightly below (10 ... 30 %) the deceleration time that can be realised with the inverter motor brake.

For sensorless vector control (SLVC) and servo control (SC):

- Set reduced brake chopper threshold ([C00174](#)) to approx. 70 V.
- Set additive speed ([C00987](#)) to 2 ... 4-fold rated slip speed.
- Adapt the deceleration ramp so that the deceleration time is slightly below (10 ... 30 %) the deceleration time that can be realised with the inverter motor brake.

5.13.3 Avoiding thermal overload of the brake resistor

- ▶ Parameterisation of an error response in [C00574](#) and evaluation of the parameterised error message within the application or within the machine control system.
 - See chapter entitled "[Brake resistor monitoring \(I2xt\)](#)". ([□ 279](#))
- ▶ External interconnection using the thermal contact on the brake resistor (e.g. supply interruption via the mains contactor and activation of the mechanical brakes).

5.14 Monitoring

Many monitoring functions that are integrated into the controller can detect errors and thus protect the device/motor from damage or overload.

- ▶ Detailed information on the individual monitoring functions can be found in the following subchapters.

Monitoring	Response		Error message (with activated monitoring)
	Lenze setting	Configuration	
Device overload monitoring (lxt)	Warning	C00604	OC5
Motor load monitoring (I2xt)	Warning	C00606	OC6
Motor temperature monitoring (PTC)	Fault	C00585	OH3
Brake resistor monitoring (I2xt)	No Reaction	C00574	OC12
Motor phase failure monitoring	No Reaction	C00597	LP1
Motor phase error monitoring before operation		C02844/2	
Mains phase failure monitoring	Warning	C00565	Su02
Maximum current monitoring	No Reaction	C00609	OC7
Maximum torque monitoring	No Reaction	C00608	OT1
Motor speed monitoring	Fault	-	OS2

Parameterisable responses

If a monitoring function trips, the response set via the corresponding parameter is carried out. The following responses can be selected:

- ▶ "No response": Response/monitoring is deactivated.
- ▶ "Fault": Change of the operating status by a pulse inhibit of the power output stage.
- ▶ "Warning": Operating status of the controller remains unchanged. Only a message is entered into the logbook of the controller.

Related topics:

- ▶ [Device state machine and device statuses](#) (📖 101)
- ▶ [Diagnostics & error management](#) (📖 581)
- ▶ [Basics on error handling in the controller](#) (📖 581)
- ▶ [Error messages of the operating system](#) (📖 602)

5.14.1 Device overload monitoring (Ixt)

[C00064/1...3](#) displays the device utilisation (Ixt) in [%] in different time intervals:

Parameter	Info
C00064/1	Device utilisation (Ixt) <ul style="list-style-type: none"> • Maximum value of pulse utilisation (C00064/2) and permanent utilisation (C00064/3).
C00064/2	Device utilisation (Ixt) 15s <ul style="list-style-type: none"> • Pulse utilisation over the last 15 seconds (only for loads >160 %).
C00064/3	Device utilisation (Ixt) 3 min <ul style="list-style-type: none"> • Permanent utilisation over the last 3 minutes.

Highlighted in grey = display parameter

- ▶ If the device utilisation reaches the switch-off threshold set in [C00123](#):
 - The error response set in [C00604](#) will be carried out (Lenze setting: "Warning").
 - The "[OC5: Ixt overload](#)" error message will be entered into the logbook.
 - The *bMctrlIxtOverload* status output of the [LS DeviceMonitor](#) system block will be set to TRUE.
- ▶ A setting of [C00604](#) = "0: No Reaction" deactivates the monitoring.

5.14.2 Motor load monitoring (I2xt)

The Inverter Drives 8400 are provided with a simple, sensorless, thermal I²xt motor monitoring of self-ventilated standard motors which is based on a mathematical model.

- ▶ [C00066](#) displays the calculated motor load in [%].
- ▶ If the calculated motor load reaches the motor load setting ([C00120](#)):
 - The error response set in [C00606](#) will be carried out (Lenze setting: "Warning").
 - The "[OC6: I2xt motor overload](#)" error message will be entered into the logbook.
 - The *bMctrlI2xtOverload* status output of the [LS DeviceMonitor](#) system block will be set to TRUE.
- ▶ A setting of [C00606](#) = "0: No Reaction" deactivates the monitoring.



Stop!

The I²xt motor monitoring does not present full motor protection! As the motor utilisation calculated in the thermal motor model is lost after mains switching, for instance the following operating states cannot be measured correctly:

- Restarting (after mains switching) of a motor that is already very hot.
- Change of the cooling conditions (e.g. cooling air flow interrupted or too warm).

A full motor protection requires additional measures as e.g. the evaluation of temperature sensors that are located directly in the winding or the use of thermal contacts.

Adjustment of the motor utilisation meter

The motor utilisation meter for indicating the motor load in [C00066](#) begins to count when the apparent motor current ([C00054](#)) is greater than the motor overload setting ([C00120](#)).

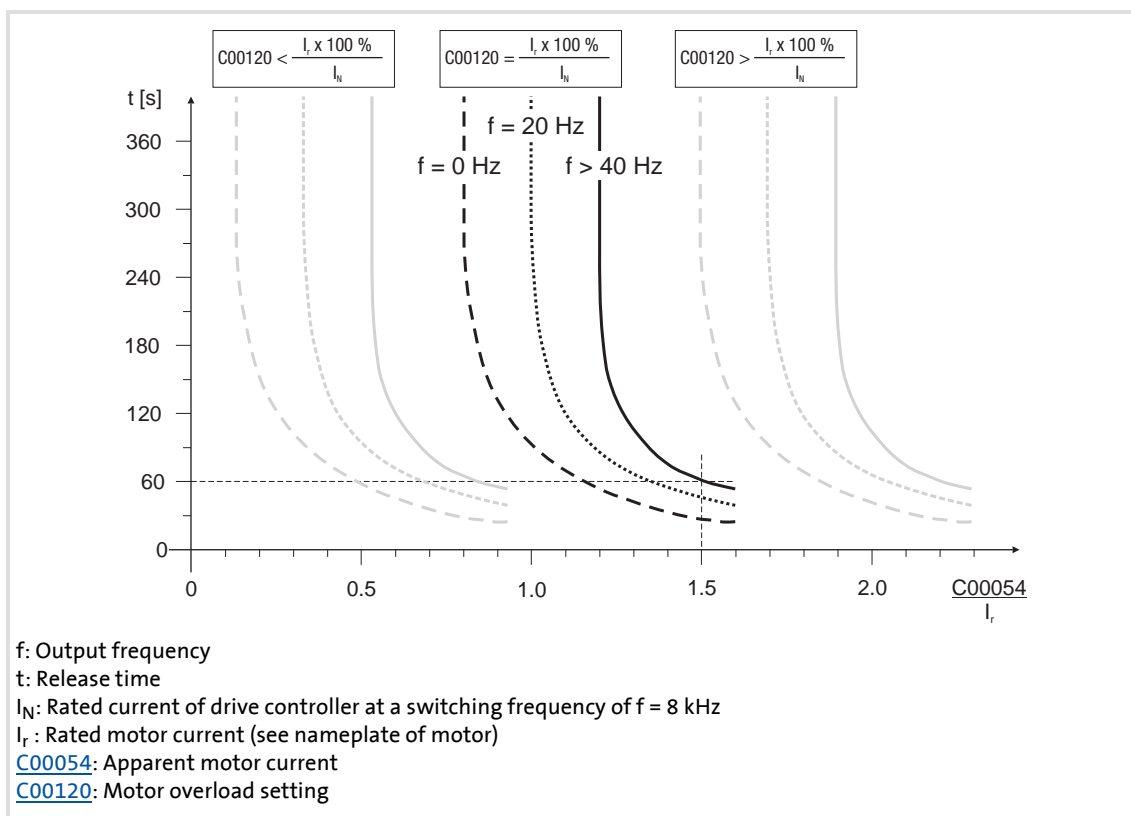
[C00120](#) is to be set as follows:

$$C00120 = \frac{I_r}{I_N} \cdot 100\%$$

I_r : Rated motor current (see nameplate of motor)

I_N : Rated controller current at a switching frequency of $f = 8$ kHz

- ▶ If you reduce [C00120](#) starting from the calculated value, the motor utilisation meter will already be counted up before the rated overload threshold is reached.
- ▶ If you increase [C00120](#) starting from the calculated value, the motor utilisation meter will not be counted up until the rated overload threshold is reached.

[5-33] Tripping characteristic of the I^2xt monitoring**Example:**

$$\text{C00120} = I_r / I_N \times 100 \%$$

$$\text{C00054} = 150 \% \text{ rated motor current}$$

- ▶ After approx. 60 seconds, [C00066](#) has reached the final value (100 %) at output frequencies $f > 40$ Hz.
- ▶ The controller outputs the "[OC6: I2xt overload motor](#)" error message and triggers the response set in [C00606](#) (default setting: "Warning").

 **Tip!**

- If forced ventilated motors are used, a premature response of the overload threshold can be avoided by deactivating this function if necessary ([C00606](#) = "0: No Reaction").
- The current limits set in [C00022](#) and [C00023](#) influence the I^2xt calculation only in an indirect way. However, the operation of the motor at maximum possible load can be averted. ▶ [Defining current and speed limits](#) (□ 136)

5.14.3 Motor temperature monitoring (PTC)

For detecting and monitoring of the motor temperature, a PTC thermistor (DIN 44081/DIN 44082) or a thermal contact (NC contact) can be connected to the terminals X106/T1 and X106/T2.



Stop!

- The controller can only evaluate one PTC thermistor!
Do not connect several PTC thermistors in series or parallel.
- If several motors are operated on one controller, use thermal contacts (NC contacts) connected in series.
- To achieve full motor protection, an additional temperature monitoring with separate evaluation must be installed.



Note!

- In the Lenze setting ([C00585](#) = "1: Fault"), motor temperature monitoring is activated!
- There is a wire jumper between the terminals X106/T1 and X106/T2 by default.
- Lenze three-phase AC motors are provided with a thermal contact on delivery.

- ▶ If $1.6 \text{ k}\Omega < R < 4 \text{ k}\Omega$ at the terminals X106/T1 and X106/T2, the monitoring will respond, see functional test below.
- ▶ If the monitoring responds:
 - The error response set in [C00585](#) is activated (Lenze setting: "Fault").
 - The "[OH3: Motor temperature \(X106\) tripped](#)" error message is entered into the Logbook.
 - The *bMctrl/MotorPtc* status output of the [LS DeviceMonitor](#) system block is set to TRUE.
- ▶ A setting of [C00585](#) = "0: No Reaction" deactivates the monitoring.



Tip!

We recommend to always activate the PTC input when using motors which are equipped with PTC thermistors or thermostats. This prevents the motor from being destroyed by overheating.

Functional test

Connect a fixed resistor to the PTC input:

- ▶ $R > 4 \text{ k}\Omega$: Fault message must be activated.
- ▶ $R < 1 \text{ k}\Omega$: Fault message must not be activated.

5.14.4 Brake resistor monitoring (I²xt)

Due to the converted braking power, the brake resistor is thermally stressed and can even be thermally destroyed by excessive braking power.

The monitoring of the I²xt utilisation of the controller serves to protect the brake resistor. It acts in proportion to the converted braking power.



Danger!

In the Lenze setting ([C00574](#) = "0: No Reaction") the response of the monitoring function does not stop the braking process!

In particular for applications such as hoists or applications with a DC-bus connection, it must be checked if a stopping of the braking process due to a setting of [C00574](#) = "1: Fault" is permissible.



Stop!

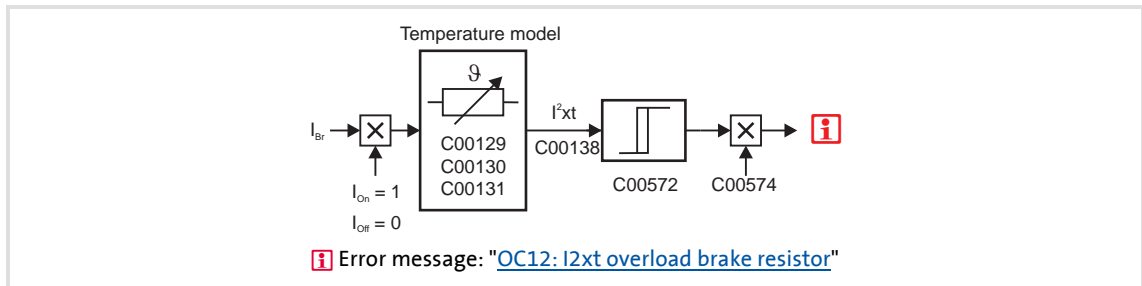
Implement appropriate protective measures against thermal overload of the brake resistor!

Examples:

- Parameterisation of an error response in [C00574](#) and evaluation of the parameterised error message within the application or the machine control system.
- Interruption of the mains supply by means of the temperature contact at the brake resistor and a simultaneous activation of the mechanical brake.

- ▶ If the I²xt utilisation reaches the switch-off threshold set in [C00572](#):
 - The error response set in [C00574](#) will take place.
 - The "[OC12: I2xt brake resistor overload](#)" error message is entered into the logbook.
 - The *bMctrlBrakeChopper* status output of the [LS DeviceMonitor](#) system block will be set to TRUE.
- ▶ If the system is dimensioned correctly, the monitoring should not be activated. If individual pieces of rated data of the actually connected brake resistor are not known, they have to be identified.
- ▶ If the DC-bus voltage exceeds the overvoltage threshold due to a braking energy that is too high, the monitoring for overvoltage in the DC bus is activated ("OU: DC-bus overvoltage" error message).
- ▶ Apart from the threshold of the I²xt utilisation that can be set in [C00572](#), there is the switching threshold of the brake transistor which results from the mains voltage ([C00173](#)) and the reduced brake chopper threshold ([C00174](#)).

Temperature model



[5-34] Signal flow for monitoring the brake resistor

The monitoring function calculates the braking current I_{Br} from the current DC-bus voltage U_{DC_act} and the brake resistance parameterised in [C00129](#):

$$I_{Br} = \frac{U_{DC_act}}{C00129}$$



Note!

The monitoring function can also be triggered due to a value entered in [C00129](#) although a brake resistor is not even connected.

- ▶ During the calculation, the thermal utilisation of the brake resistor on the basis of the following parameters is taken into consideration:
 - Resistance value ([C00129](#))
 - Continuous power ([C00130](#))
 - Thermal capacity ([C00131](#))
- ▶ In the Lenze setting these parameters are preset with the corresponding power-adapted Lenze brake resistor.
- ▶ [C00133](#) indicates the calculated utilisation of the brake resistor in [%].
 - A utilisation of 100 % corresponds to the continuous power of the brake resistor depending on the maximally permissible temperature limit.

Related topics:

- ▶ [Braking operation/brake energy management](#) (📖 265)

5.14.5 Motor phase failure monitoring



Note!

In the Lenze setting ([C00597](#) = "0: No response"), the motor phase failure monitoring is not activated!

In order to safely detect the failure of a motor phase, a certain motor current must flow for the current sensor system. Thus, the response set in [C00597](#) (Lenze setting: "No Reaction") is caused after a delay time of maximally 2 s after controller enable if a current-carrying motor phase U, V, W fails or if motor connection is missing. If the current threshold value set in [C00599](#) is already exceeded within the delay time, the motor phase failure monitoring starts from this point in time.

The monitoring mode checks the current flow for each motor phase as a function of the commutation angle. Monitoring is activated if a commutation angle of approx. 140° is covered without the current set in [C00599](#) being exceeded. Monitoring is activated at an output frequency of 0 Hz if none of the three motor phases reaches the threshold value set in [C00599](#).

- ▶ If the motor phase failure monitoring is tripped:
 - The response set in [C00597](#) will take place.
 - The error message "[LP1: Motor phase failure](#)" is entered into the logbook.
 - The *bMctrlMotorPhaseFault* status output of the [LS_DeviceMonitor](#) system block is set to TRUE.
- ▶ The motor phase failure monitoring is inactive if
 - a controller inhibit is set,
 - connection to a rotating machine is carried out (flying restart circuit or connection to actual speed value),
 - an error is pending due to a DC-bus overvoltage ("[OU](#)"),
 - motor parameter identification is carried out,
 - DC-injection braking is active.

5.14.6 Motor phase error monitoring before operation

[This function extension is available from version 02.00.00!](#)

This extended motor phase failure monitoring can both detect a phase failure on the basis of test signals and check for the existence of the motor.

- ▶ The "motor phase error monitoring before operation" is only directly active after controller enable if
 - an error response is set in [C00597](#) **AND**
 - the motor phase error monitoring is switched on ([C2866/2](#) = "1: Yes").

- ▶ The following parameters show the cause of the motor phase failure:
 - [C00561/3](#): Motor phase U
 - [C00561/4](#): Motor phase V
 - [C00561/5](#): Motor phase W



Note!

The motor phase error monitoring before operation must not be connected to a rotating or coasting machine (high compensation currents and effect of the DC injection braking).

- In case of motor control with feedback, no motor phase error monitoring is executed if the actual speed value is > 10 rpm.
- In case of motor control without feedback, the user must ensure that the motor phase error monitoring will only be executed if the speed is 0.

If the motor is at quick stop and the brake is applied, no motor phase error monitoring is executed when quick stop is deactivated (same with "0" speed and applied brake).

If the rated current of the connected motor is lower than 10 % of the rated device current, the motor phase error monitoring can be activated although no motor phase error has occurred. In this case, the motor phase error monitoring must be switched off before operation ([C2866/2](#) = "0: No").

With automatic brake control:

In case of automatic brake control, the brake will only be released if no motor phase failure exists and the magnetisation of the field-oriented control types is completed.

With manual brake control:

In case of manual brake control and forced release of the brake, the brake will be controlled directly as before.

The user himself must ensure that the brake will only be opened if all of the following conditions are met:

- Motor phase failure monitoring ([C00597](#)) and motor phase error monitoring before operation ([C2866/2](#)) are active.
- The controller is enabled (controller enable).
- The *bMctrlMotorPhaseFault* status output of the SB [LS DeviceMonitor](#) is set to FALSE.
- A delay of the pulse enable in the device after controller enable for releasing the brake has been considered (opening the brake after controller enable must be executed with a delay).

5.14.7 Mains phase failure monitoring



Stop!

Under load, the mains input of a three-phase controller can be destroyed if the device is only supplied by two phases (e.g. if a mains phase fails).

The drive controller has a simple mains-phase failure detection function with which a mains phase failure can be detected under load.

- ▶ In the case of power-adapted machines, approx. 50 % of the rated motor power must be exceeded so that a main-phase failure can be detected.
- ▶ If the mains phase failure monitoring is tripped:
 - The error response set in [C00565](#) will be carried out (Lenze setting: "Warning").
 - The "[Su02: One mains phase is missing](#)" error message will be entered into the logbook.
 - The *bMctrlMainsFault* status output of the [LS DeviceMonitor](#) system block will be set to TRUE.

5.14.8 Maximum current monitoring

The ultimate motor current to be parameterised in [C00939](#) is a limit value to protect the motor from destruction, influence of the rated data and demagnetisation.

- ▶ This limit value must not be travelled cyclically in the drive process.
- ▶ If the instantaneous value of the motor current exceeds the limit value set in [C00939](#), the error response "Fault" occurs to protect the motor and the error message "[OC7: Motor overcurrent](#)" is entered into the logbook.
- ▶ The maximum currents to be parameterised in [C00022](#) and [C00023](#) should have a sufficient distance to this limit value.



Note!

If a Lenze motor is selected from the catalogue whose plant parameters are transferred into the controller, the settings in [C00022](#) and [C00023](#) will automatically be adapted to the selected motor.

5.14.9 Maximum torque monitoring



Note!

In the Lenze setting ([C00608](#) = "0: No response"), the maximum torque monitoring is not activated!

If the maximum possible torque [C00057](#) is reached at the motor shaft, the response set in [C00608](#) will be carried out (Lenze setting: "0: No response").

If the activated monitoring is tripped:

- ▶ The "[OT1: Maximum torque reached](#)" error message is entered into the logbook.
- ▶ The *bMctrlTorqueMax* status output of the [LS DeviceMonitor](#) system block will be set to TRUE.

5.14.10 Motor speed monitoring

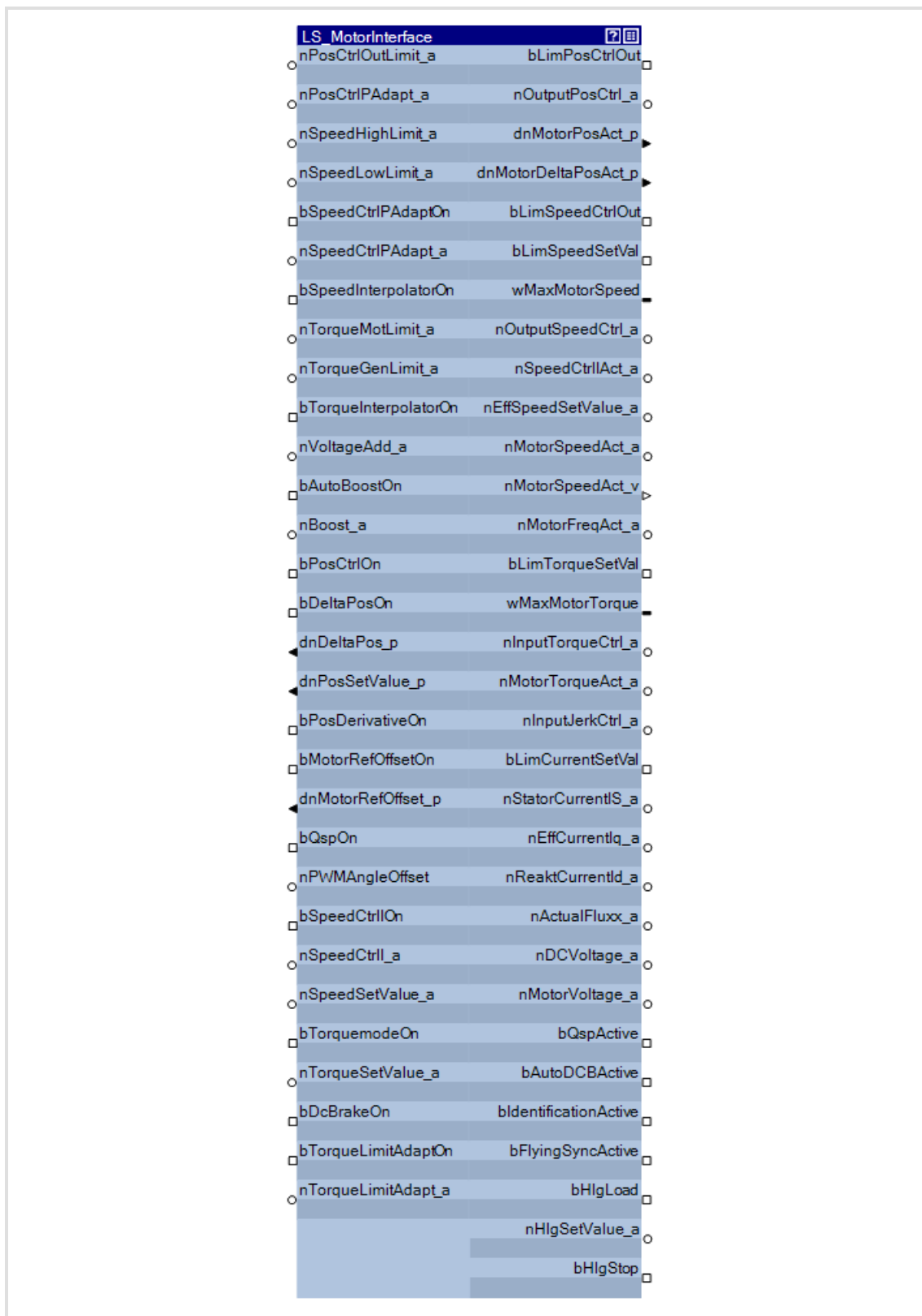
This function extension is available from version 02.00.00!

If the drive reaches the maximally permissible motor speed ([C00965](#)):

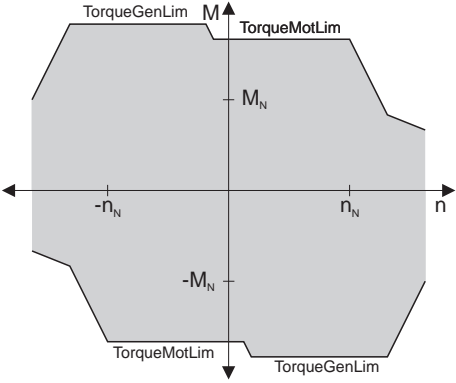
- ▶ The "Fault" error response takes place, i.e. the motor is shut down immediately.
- ▶ The error message "[OS2: Max. motor speed reached](#)" is entered into the logbook.



5.15 Internal interfaces | system block "LS_MotorInterface"

The **LS_MotorInterface** system block provides the internal interfaces to the driving machine in the function block editor.



Inputs

Identifier <small>DIS code data type</small>	Information/possible settings				
nPosCtrlOutLimit_a C00830/21 INT	Limitation of the position controller output <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % reference speed (C00011) 				
nPosCtrlPAdapt_a C00830/20 INT	Adaptation of the position controller gain <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % Vp (C00254) 				
nSpeedHighLimit_a C00830/88 INT	Upper speed limit for the speed limitation <ul style="list-style-type: none"> During torque-controlled operation only (<i>bTorquemodeOn</i> = TRUE) Scaling: 16384 \equiv 100 % reference speed (C00011) 				
nSpeedLowLimit_a C00830/23 INT	Lower speed limit for speed limitation <ul style="list-style-type: none"> During torque-controlled operation only (<i>bTorquemodeOn</i> = TRUE) Scaling: 16384 \equiv 100 % reference speed (C00011) 				
bSpeedCtrlPAdaptOn C00833/69 BOOL	Adaptive adjustment of the speed controller gain <table border="1"> <tr> <td>FALSE</td> <td>Deactivate adaptive adaptation.</td> </tr> <tr> <td>TRUE</td> <td>Activate adaptive adaptation.</td> </tr> </table>	FALSE	Deactivate adaptive adaptation.	TRUE	Activate adaptive adaptation.
FALSE	Deactivate adaptive adaptation.				
TRUE	Activate adaptive adaptation.				
nSpeedCtrlPAdapt_a C00830/25 INT	Adaptive adjustment of the speed controller gain <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % Vp (C00070) 				
bSpeedInterpolatorOn C00833/28 BOOL	Speed setpoint interpolation <table border="1"> <tr> <td>FALSE</td> <td>Deactivate interpolation</td> </tr> <tr> <td>TRUE</td> <td>Activate interpolation</td> </tr> </table>	FALSE	Deactivate interpolation	TRUE	Activate interpolation
FALSE	Deactivate interpolation				
TRUE	Activate interpolation				
nTorqueMotLimit_a C00830/29 INT nTorqueGenLimit_a C00830/28 INT	Torque limitation in motor mode and in generator mode <ul style="list-style-type: none"> The drive cannot output a higher torque in motor/generator mode than set here. The applied values (any polarity) are internally interpreted as absolute values. If V/f characteristic control (VFCplus) is selected, limitation is <u>indirectly</u> performed via a so-called I_{max} controller. If sensorless vector control (SLVC) or servo control (SC) is selected, limitation has a <u>direct</u> effect on the torque-producing current component. Scaling: 16384 \equiv 100 % M_{max} (C00057) <p>Torque limits in motor and generator mode:</p>  <p>The graph shows a shaded region representing the torque limits in motor and generator mode. The vertical axis is torque (M) and the horizontal axis is speed (n). The region is bounded by TorqueGenLim (generator torque limit) and TorqueMotLim (motor torque limit). The maximum torque in motor mode is M_N, and the maximum torque in generator mode is $-M_N$. The speed limits are $-n_N$ and n_N.</p>				
bTorqueInterpolatorOn C00833/29 BOOL	Torque setpoint interpolation <table border="1"> <tr> <td>FALSE</td> <td>Deactivate interpolation</td> </tr> <tr> <td>TRUE</td> <td>Activate interpolation</td> </tr> </table>	FALSE	Deactivate interpolation	TRUE	Activate interpolation
FALSE	Deactivate interpolation				
TRUE	Activate interpolation				

Identifier <small>DIS code data type</small>	Information/possible settings				
nVoltageAdd_a C00830/31 INT	<p>Additive voltage impression</p> <ul style="list-style-type: none"> An additional setpoint for the motor voltage can be specified via this process input. If there are, for instance, different loads at the motor output end, it is possible to apply a voltage boost at the starting time. If the value is negative, the voltage is reduced. Scaling: 16384 ≙ 1000 V <p> Stop!</p> <p>Values selected too high may cause the motor to heat up due to the resulting current!</p>				
bAutoBoostOn C00833/32 BOOL	<p>AutoBoost function</p> <ul style="list-style-type: none"> Motor voltage boost during the starting torque, controlled by process signals from the function block interconnection. <table border="1"> <tr> <td>FALSE</td> <td>Deactivate function</td> </tr> <tr> <td>TRUE</td> <td>Activate function</td> </tr> </table>	FALSE	Deactivate function	TRUE	Activate function
FALSE	Deactivate function				
TRUE	Activate function				
nBoost_a C00830/26 INT	<p>Additional setpoint for the motor voltage at speed = 0</p> <ul style="list-style-type: none"> The entire voltage-frequency characteristic is provided with an offset. Scaling: 16384 ≙ 1000 V <p> Stop!</p> <p>Values selected too high may cause the motor to heat up due to the resulting current!</p>				
bPosCtrlOn C00833/27 BOOL	<p>Position/angle control</p> <table border="1"> <tr> <td>FALSE</td> <td>Deactivate position/angle control.</td> </tr> <tr> <td>TRUE</td> <td>Activate position/angle control.</td> </tr> </table>	FALSE	Deactivate position/angle control.	TRUE	Activate position/angle control.
FALSE	Deactivate position/angle control.				
TRUE	Activate position/angle control.				
bDeltaPosOn C00833/35 BOOL	<p>Activate position difference as setpoint selection</p> <ul style="list-style-type: none"> In order to position the motor shaft, the position control function can work within the motor control function with the absolute position setpoint <i>dnPosSetValue_p</i> or alternatively with the speed setpoint <i>nSpeedSetValue_a</i> and the position difference <i>dnDeltaPos_p</i>. <table border="1"> <tr> <td>FALSE</td> <td>Positioning with position setpoint <i>dnPosSetValue_p</i>.</td> </tr> <tr> <td>TRUE</td> <td>Positioning with speed setpoint <i>nSpeedSetValue_a</i> and position difference <i>dnDeltaPos_p</i>.</td> </tr> </table>	FALSE	Positioning with position setpoint <i>dnPosSetValue_p</i> .	TRUE	Positioning with speed setpoint <i>nSpeedSetValue_a</i> and position difference <i>dnDeltaPos_p</i> .
FALSE	Positioning with position setpoint <i>dnPosSetValue_p</i> .				
TRUE	Positioning with speed setpoint <i>nSpeedSetValue_a</i> and position difference <i>dnDeltaPos_p</i> .				
dnDeltaPos_p C00834/4 DINT	<p>Position difference (following error input)</p> <ul style="list-style-type: none"> Difference between setpoint position and actual position in [increments] Is used for position control if <i>bDeltaPosOn</i> = TRUE. Scaling: 65535 ≙ 1 revolution 				
dnPosSetValue_p C00834/5 DINT	<p>Absolute position setpoint in [increments]</p> <ul style="list-style-type: none"> Is used for position control if <i>bDeltaPosOn</i> = FALSE. Scaling: 65535 ≙ 1 revolution 				
bPosDerivativeOn C00833/67 BOOL	<p>Create a setpoint for the speed controller from the position setpoint</p> <ul style="list-style-type: none"> For highly dynamic control systems, the setpoint for the speed controller can be created from the absolute position setpoint <i>dnPosSetValue_p</i> instead of the speed setpoint <i>nSpeedSetValue_a</i> ▶ Position control/additive speed specification <table border="1"> <tr> <td>TRUE</td> <td> <p>Create a speed setpoint from the position setpoint.</p> <ul style="list-style-type: none"> The absolute position setpoint <i>dnPosSetValue_p</i> is differentiated and a speed value is created which is the setpoint for the speed controller. Internal limitation of 65536 increments/ms. </td> </tr> </table>	TRUE	<p>Create a speed setpoint from the position setpoint.</p> <ul style="list-style-type: none"> The absolute position setpoint <i>dnPosSetValue_p</i> is differentiated and a speed value is created which is the setpoint for the speed controller. Internal limitation of 65536 increments/ms. 		
TRUE	<p>Create a speed setpoint from the position setpoint.</p> <ul style="list-style-type: none"> The absolute position setpoint <i>dnPosSetValue_p</i> is differentiated and a speed value is created which is the setpoint for the speed controller. Internal limitation of 65536 increments/ms. 				
bMotorRefOffsetOn C00833/68 BOOL	<p>Set home position ("referencing on the fly")</p> <table border="1"> <tr> <td>TRUE</td> <td>Set home position to value <i>dnMotorRefOffset_p</i>.</td> </tr> </table>	TRUE	Set home position to value <i>dnMotorRefOffset_p</i> .		
TRUE	Set home position to value <i>dnMotorRefOffset_p</i> .				
dnMotorRefOffset_p C00834/6 DINT	<p>Home position in [increments]</p> <ul style="list-style-type: none"> Scaling: 65535 ≙ 1 revolution 				

8400 TopLine C | Software Manual

Motor control (MCTRL)

Internal interfaces | system block "LS_MotorInterface"

Identifier <small>DIS code data type</small>	Information/possible settings
bQspOn C00833/33 BOOL	Quick stop
	FALSE Deactivate quick stop
	TRUE Activate quick stop
nPWMAngleOffset_a C00830/32 INT	Angle step change of output voltage phasor • Scaling: 65535 \equiv 1 revolution
bSpeedCtrlOn C00833/31 BOOL	Directly set the I-component of speed controller • In order to statically specify a minimum torque, e.g. when a load is being lifted.
	TRUE Set the I-component of the speed controller to the value <i>nSpeedCtrlI_a</i> .
nSpeedCtrlI_a C00830/24 INT	Value of the speed controller integrator • Scaling depends on the selected motor control: –V/f control (VFCplus + encoder): 16384 \equiv 100 % reference speed (C00011) –Servo control (SC) or vector control (SLVC): 16384 \equiv 100 % M_{max} (C00057)
nSpeedSetValue_a C00830/22 INT	Speed setpoint • Scaling: 16384 \equiv 100 % reference speed (C00011)
bTorquemodeOn C00833/30 BOOL	Selection: Speed/Torque control
	FALSE Speed control with torque limitation TRUE Torque control with speed limitation
nTorqueSetValue_a C00830/27 INT	Torque setpoint / additive torque • Scaling: 16384 \equiv 100 % M_{max} (C00057)
bDcBrakeOn C00833/34 BOOL	Activate DC injection brake
	FALSE Deactivate DC-injection braking TRUE Activate DC-injection braking
bTorqueLimitAdaptOn C00833/98 BOOL	Adaptation of torque limitation
	TRUE Activate adaptation of torque limitation.
nTorqueLimitAdapt_a C00830/70 INT	Value for adaptation of torque limitation • Scaling: 16384 \equiv 100 % <i>nTorqueMotLimit_a</i> and <i>nTorqueGenLimit_a</i>

Outputs

Identifier <small>DIS code data type</small>	Value/meaning
bLimPosCtrlOut BOOL	"Position controller output inside the limitation" status signal
	TRUE The position controller output is internally limited
nOutputPosCtrl_a INT	Position controller output • Scaling: 16384 \equiv 100 % reference speed (C00011)
dnMotorPosAct_p DINT	Current position of the motor shaft in [increments]
dnMotorDeltaPosAct_p DINT	Current following error in [increments] • Following error = Difference between set position and actual position
bLimSpeedCtrlOut BOOL	"Speed controller or manipulating variable of the slip regulator inside the limitation" status signal
	TRUE The speed controller output is internally limited
bLimSpeedSetVal BOOL	"Reduction or increase of the setpoint speed active" status signal
	TRUE Reduction or increase of the setpoint speed by the I_{max} controller is active
wMaxMotorSpeed C00011 BOOL	Reference speed (C00011)

Identifier <small>DIS code data type</small>	Value/meaning		
nOutputSpeedCtrl_a <small>INT</small>	Speed or slip controller output • Scaling: 16384 \equiv 100 % reference speed (C00011)		
nSpeedCtrlIntAct_a <small>INT</small>	Current value of speed controller integrator • Scaling depends on the selected motor control: –V/f control (VFCplus + encoder): 16384 \equiv 100 % reference speed (C00011) –Servo control (SC) or vector control (SLVC): 16384 \equiv 100 % M_{\max} (C00057)		
nEffSpeedSetValue_a <small>INT</small>	Effective speed setpoint • Scaling: 16384 \equiv 100 % reference speed (C00011)		
nMotorSpeedAct_a <small>C00051 INT</small>	Actual speed value • Scaling: 16384 \equiv 100 % reference speed (C00011)		
nMotorSpeedAct_v <small>INT</small>	Actual speed value • Scaling: 65535 \equiv 1 revolution		
nMotorFreqAct_a <small>C00058 INT</small>	Current field frequency		
bLimTorqueSetVal <small>BOOL</small>	"Setpoint torque inside the limitation" status signal <table border="1"><tr><td>TRUE</td><td>The setpoint torque is internally limited</td></tr></table>	TRUE	The setpoint torque is internally limited
TRUE	The setpoint torque is internally limited		
wMaxMotorTorque <small>C00057</small>	Maximum motor torque • $wMaxMotorTorque = 10 * M_{\max}$ (C00057)		
nInputTorqueCtrl_a <small>INT</small>	Input value of the torque control (torque setpoint) • Scaling: 16384 \equiv 100 % M_{\max} (C00057)		
nMotorTorqueAct_a <small>C00056/2 INT</small>	Actual torque • In the "VFC (+encoder)" motor control mode, this value is determined from the current motor current and only approximately corresponds to the actual torque value.. • Scaling: 16384 \equiv 100 % M_{\max} (C00057)		
nInputJerkCtrl_a <small>INT</small>	Input value of the jerk limitation • Scaling: 16384 \equiv 100 % M_{\max} (C00057)		
bLimCurrentSetVal <small>BOOL</small>	"Current setpoint inside the limitation" status signal <table border="1"><tr><td>TRUE</td><td>The current setpoint is internally limited</td></tr></table>	TRUE	The current setpoint is internally limited
TRUE	The current setpoint is internally limited		
nStatorCurrentIS_a <small>INT</small>	Current stator current/effective motor current • Scaling: 16384 \equiv 100 % I_{\max_mot} (C00022)		
nEffCurrentIq_a <small>INT</small>	Current torque-producing cross current • Scaling: 16384 \equiv 100 % I_{\max_mot} (C00022)		
nReaktCurrentId_a <small>INT</small>	Current field-producing direct-axis current • Scaling: 16384 \equiv 100 % I_{\max_mot} (C00022)		
nActualFluxx_a <small>INT</small>	Current magnetising current • Scaling: 16384 \equiv 100 % I_{\max_mot} (C00022)		
nDCVoltage_a <small>INT</small>	Actual DC-bus voltage • Scaling: 16384 \equiv 1000 V		
nMotorVoltage_a <small>INT</small>	Current motor voltage/inverter output voltage • Scaling: 16384 \equiv 1000 V		
bQspActive <small>BOOL</small>	"Quick stop active" status signal <table border="1"><tr><td>TRUE</td><td>Quick stop is active</td></tr></table>	TRUE	Quick stop is active
TRUE	Quick stop is active		
bAutoDCBActive <small>BOOL</small>	"Automatic DC-injection braking active" status signal ▶ DC-injection braking (□ 250) <table border="1"><tr><td>TRUE</td><td>Automatic DC-injection braking is active</td></tr></table>	TRUE	Automatic DC-injection braking is active
TRUE	Automatic DC-injection braking is active		
bIdentificationActive <small>BOOL</small>	"Motor parameter identification active" status signal ▶ Automatic motor data identification (□ 126) <table border="1"><tr><td>TRUE</td><td>Motor parameter identification is active</td></tr></table>	TRUE	Motor parameter identification is active
TRUE	Motor parameter identification is active		

Identifier <small>DIS code data type</small>	Value/meaning
bFlyingSyncActive <small>BOOL</small>	"Flying restart function active" status signal ▶ Flying restart function (□ 247) <hr/> TRUE Flying restart function is active
bHlgLoad <small>BOOL</small>	Control signal for an additional loading function of the ramp function generator • → L_NSet_1.bExternalCINH • To enable the ramp function generator to follow automatically when the controller is inhibited, for jerk-free setpoint connection. <hr/> TRUE Set the ramp function generator to a setpoint of <i>nHlgSetValue_a</i>
nHlgSetValue_a <small>INT</small>	Setpoint for an additional loading function of the ramp function generator • → L_NSet_1.nClnhVal_a • For speed-controlled drive tasks, the current actual speed value (e.g. in case of an active pulse inhibit, flying restart function, controller inhibit) is provided at this output. • Scaling: 16384 ≙ 100 % reference speed (C00011)
bHlgStop <small>BOOL</small>	Control signal for stopping the ramp function generator (L_NSet_1) <hr/> TRUE Stop the ramp function generator

5.16 Internal status signals | system block "LS_DeviceMonitor"

The **LS_DeviceMonitor** system block provides the status signals of the motor control in the function block editor.



Note!

The **LS_DeviceMonitor** system block can only be inserted on the application level.

If status signals of the motor control function are to be output via digital outputs or example, you can use the free *bFreeOut1 ... bFreeOut8* outputs of the application block to transfer the desired status signals from the application level to the I/O level. On the I/O level, you can then establish the logical link to the digital output terminals.

LS_DeviceMonitor	
bMctrlImpActive	<input type="checkbox"/>
bMctrlClampActive	<input type="checkbox"/>
bMctrlMotorPhaseFault	<input type="checkbox"/>
bMctrlEncoderComFault	<input type="checkbox"/>
bMctrlNmax	<input type="checkbox"/>
bMctrlTorqueMax	<input type="checkbox"/>
bMctrlFChopReduced	<input type="checkbox"/>
bMctrlIxtOverload	<input type="checkbox"/>
nMctrlIxtRate_a	<input type="checkbox"/>
bMctrlI2xtOverload	<input type="checkbox"/>
nMctrlI2xtRate_a	<input type="checkbox"/>
bMctrlMotorPtc	<input type="checkbox"/>
bMctrlMotorTemp	<input type="checkbox"/>
bMctrlHeatSinkTemp	<input type="checkbox"/>
bMctrlMainsFault	<input type="checkbox"/>
bMctrlFanFault	<input type="checkbox"/>
bMctrlNmaxForFChop	<input type="checkbox"/>
bMctrlShortCircuit	<input type="checkbox"/>
bMctrlEarthFault	<input type="checkbox"/>
bMctrlUVDetected	<input type="checkbox"/>
bMctrlIOVDetected	<input type="checkbox"/>
bMctrlBrakeChopper	<input type="checkbox"/>

Outputs

Identifier	Data type	Value/meaning	
bMctrlImpActive	BOOL	TRUE	Pulse inhibit is active
bMctrlClampActive	BOOL	TRUE	Clamp current limitation is active
bMctrlMotorPhaseFault	BOOL	TRUE	Motor phase fault has been detected
bMctrlEncoderComFault	BOOL	TRUE	Encoder error has been detected
bMctrlNmax	BOOL	TRUE	Max. speed limitation is active
bMctrlTorqueMax	BOOL	TRUE	Max. torque limitation is active
bMctrlFChopReduced	BOOL	TRUE	PWM frequency reduction is active
bMctrlIxtOverload	BOOL	TRUE	Device utilisation (I_{xt}) \geq device utilisation threshold (C00123) <ul style="list-style-type: none"> Lenze setting: C00123 = 100 %
nMctrlIxtRate_a	INT	Current device utilisation (I_{xt}) <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % 	
bMctrlI2xtOverload	BOOL	TRUE	Thermal motor overload (I^2_{xt}) \geq motor overload setting (C00120) <ul style="list-style-type: none"> Lenze setting: C00120 = 100 %.
nMctrlI2xtRate_a	INT	Current thermal motor load (I^2_{xt}) <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % 	
bMctrlMotorPTC	BOOL	TRUE	Temperature monitoring: An error has been detected
bMctrlMotorTemp	BOOL	TRUE	Thermal motor overload
bMctrlHeatSinkTemp	BOOL	TRUE	Thermal inverter overload
bMctrlMainsFault	BOOL	TRUE	Mains phase failure/Mains failure
bMctrlFanFault	BOOL	TRUE	Fan monitoring: An error has been detected
bMctrlNmaxForFChop	BOOL	TRUE	The maximum field frequency for the respective switching frequency has been exceeded.
bMctrlShortCircuit	BOOL	TRUE	Motor short circuit has been detected
bMctrlEarthFault	BOOL	TRUE	Earth fault has been detected
bMctrlUVDetected	BOOL	TRUE	An undervoltage has been detected
bMctrlOVDetected	BOOL	TRUE	An overvoltage has been detected
bMctrlBrakeChopper	BOOL	TRUE	Brake chopper error

6 Encoder/feedback system

The 8400 TopLine uses various encoder/feedback systems for the motor controls with speed feedback and the position control:

- ▶ Resolver at X7
- ▶ TTL encoder at X8
- ▶ HTL encoder at the digital DI1/DI2 or DI6/DI7 input terminals



Danger!

- If the encoder/resolver is used as motor encoder:
Safe operation of the motor is no longer ensured in the event of an error!
- If servo control (SC) or V/f control (VFCplus + encoder) are used: For safety reasons, always select "Fault" as a response for the (open-circuit) monitoring of the encoder!
 - [C00586](#): Resp. open circuit HTL encoder
 - [C00603/1](#): Resp. open circuit MultiEncoder
 - [C00603/2](#): Resp. open circuit resolver
- If an HTL encoder is used at the digital input terminals:
Observe the maximum input frequencies of the digital inputs!
 - DI1/DI2: max. 200 kHz
 - DI6/DI7: max. 10 kHz
- To avoid interference when using an encoder, only use shielded motor and encoder cables!



Note!

Speed feedback is essential for the following motor control modes with feedback:

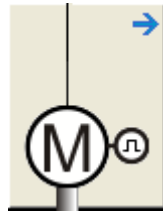
- [Servo control \(SC\)](#)
- [V/f control \(VFCplus + encoder\)](#)

6.1 Parameterisation dialog/signal flow



How to get to the parameterisation dialog of the encoder/feedback system:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the following button:



4. Go to the *Overview* → *Motor data* dialog level and click the **Encoder/Feedback system...** button.

Parameterisation dialog in the »Engineer«

Encoder/feedback system
?
✖

<p>Encoder selection [C] No sensor ▼</p> <p>Speed sensor selection [C] No sensor ▼</p> <p>Position encoder selection [C] No sensor ▼</p> <p>Resolver</p> <p>Resolver number of pole pairs [C] 1 ▼</p> <p>Encoder filter time resolver [C] 1,0 ▼ ms</p> <p>Resolver pole position [C] -90,0 ▼ °</p> <p style="text-align: center;">Identifying resolver error ...</p> <p>- [C] Error-Comp not active ▼</p> <p>PSM: Switching speed closed-loop ... [C] 100,00 ▼ %</p> <p>PSM: Switching speed open-loop c. ... [C] 100,00 ▼ %</p> <p>SLPSM: Switching speed [C] 0,00 ▼ %</p> <p>Multiple encoders</p> <p>MultiEncoder type [C] Incremental encoder ▼</p> <p>Supply voltage MultiEncoder [C] 5,0 ▼ V</p> <p>Encoder increments MultiEncoder [C] 512 ▼ Inc/U</p> <p>Encoder filter time TTL encoder [C] 1,0 ▼ ms</p> <p>Pulse form TTL encoder [C] 4x evaluation A/B ▼</p> <p style="text-align: center;">SSI configuration ...</p>	<p>Frequency inputs</p> <p>D11 / D12</p> <p>Fct. DI 1/2 100kHz [C] D11(6)=In / D12(7)=In ▼</p> <p>Encoder increments at FreqIn12 [C] 128 ▼ Inc/U</p> <p>Encoder filter time FreqIn12 [C] 1,0 ▼ ms</p> <p>Encoder scanning time FreqIn12 [C] 10 ms ▼</p> <p>Encoder evaluation method Dighn12 [C] comb. encoder proce ▼</p> <p>D16 / D17</p> <p>Fct. DI 6/7 10kHz [C] D11(6)=In / D12(7)=In ▼</p> <p>Encoder increments at FreqIn67 [C] 128 ▼ Inc/U</p> <p>Encoder filter time FreqIn67 [C] 1,0 ▼ ms</p> <p>Encoder scanning time FreqIn67 [C] 10 ms ▼</p> <p>Note: A rotary transducer (C115=2) or a two-track encoder (C115=3) can be connected via the "D11/6 and D12/7 function assignment" parameter (C115) when two digital inputs are used. The digital inputs are configured via the "Terminal assignment" tab.</p>
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<p>General</p> <p>Mounting direction: Motor [C] Not inverted ▼</p>	<p>Mounting direction: Position enc. ... [C] Not inverted ▼</p>	<p>Rotor position [C] 0,0 ▼ °</p> <p>Actual speed value [C] 0 rpm</p> <p>Actual position [C] 0,0000 units</p>
---	--	--

Monitoring...
Motor temperature monitoring (KTY) ...
Identifying pole positions ...
Schließen

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
Encoder selection / General settings			
C00495	Speed sensor selection • Source of feedback signal for speed control.	No sensor	
C00490	Position encoder selection • Source of feedback signal for position control.	No sensor	
C00254	Kp position controller	5.00	1/s
C01206/1	Mounting direction: Motor	not inverted	
C01206/2	Mounting direction: Position encoder	not inverted	
C00927	Rotor position	-	°
C00051	MCTRL: Actual speed value	-	rpm
C01210/3	MCK: Actual position	-	units
Resolver settings			
C00925	Resolver - number of pole pairs	1	
C00497/4	Encoder filter time resolver	2.0	ms
C00926/1	Resolver pole position	-90.0	°
C00002/25	Identify resolver error	0: Off / ready	
C00417	Activate resolver error comp.	0: Activate resolver error compensation	
C02862/1	Resolver: Cos gain	100.00	%
C02862/2	Resolver: Sin gain	100.00	%
C02863	Resolver: Phase error	0.00	%
C00055/4	Actual value - resolver	-	rpm
TTL Multi-Encoder settings			
C00422	Encoder type	0: Incremental encoder (TTL)	
C00421	Encoder voltage	5.0	V
C00420/3	TTL encoder	512	Incr./rev.
C00497/3	Encoder filter time TTL encoder	1.0	ms
C00424	Pulse form TTL encoder	0: 4x evaluation A/B	
C00926/2	Encoder pole position	0.0	°
C00055/3	Actual value - TTL-Multi-Encoder	-	rpm
Settings for HTL encoder at DI1/DI2			
C00115/1	Fct. DI 1/2 100kHz • Function of the digital inputs DI1 and DI2	DI1(6)=In / DI2(7)=In	
C00420/1	Encoder increments at FreqIn12 • If the digital inputs DI1 and DI2 are used as encoder inputs.	128	Incr./rev.
C00497/1	Encoder filter time FreqIn12 • If the digital inputs DI1 and DI2 are used as encoder inputs.	1.0	ms
C00425/1	Encoder scanning time FreqIn12 • If the digital inputs DI1 and DI2 are used as encoder inputs.	10	ms
C00496	► Encoder evaluation method (□ 316)	Combined encoder method	
C00055/1	Actual value - HTL encoder FreqIn12	-	rpm
Highlighted in grey = display parameter			

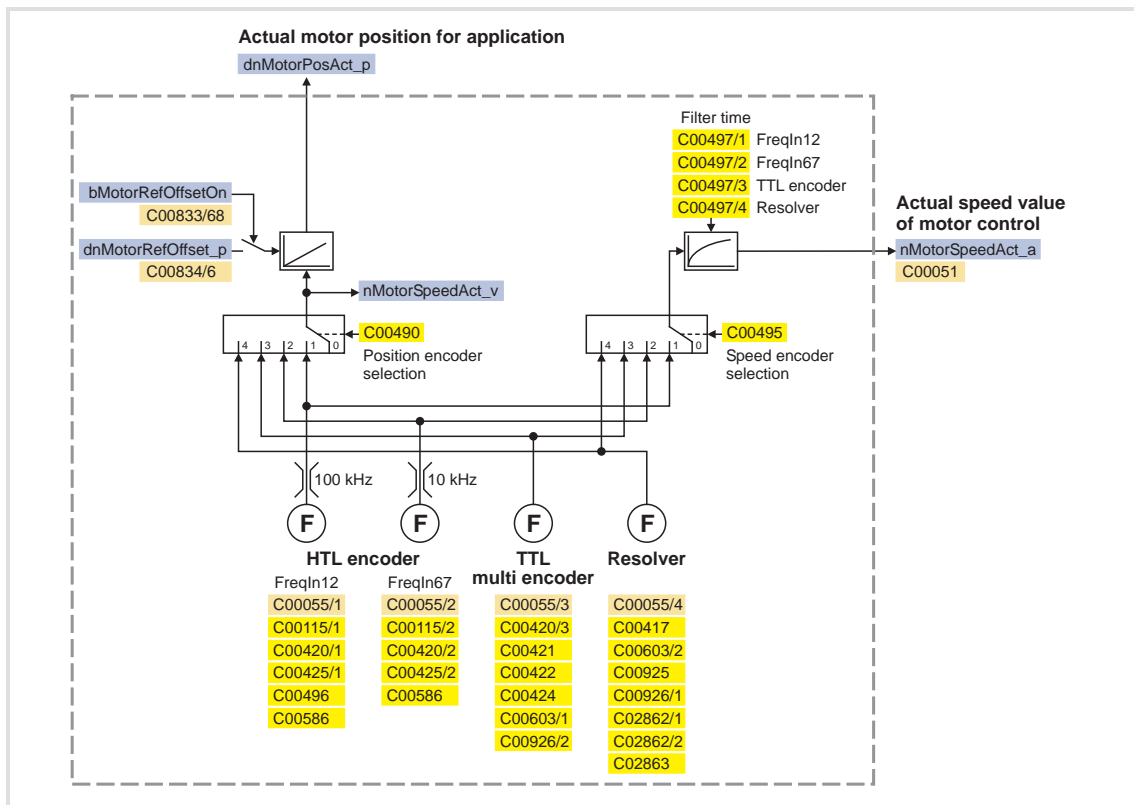
8400 TopLine C | Software Manual

Encoder/feedback system

Parameterisation dialog/signal flow

Parameter	Info	Lenze setting	
		Value	Unit
Settings for HTL encoder at DI6/DI7			
C00115/2	Fct. DI 6/7 10kHz • Function of the digital inputs DI6 and DI7	DI1(6)=In / DI2(7)=In	
C00420/2	Encoder increments at FreqIn67 • If the digital inputs DI6 and DI7 are used as encoder inputs.	128	Incr./rev.
C00497/2	Encoder filter time FreqIn67 • If the digital inputs DI6 and DI7 are used as encoder inputs.	1.0	ms
C00425/2	Encoder sample time FreqIn67 • If the digital inputs DI6 and DI7 are used as encoder inputs.	10	ms
C00055/2	Actual value - HTL encoder FreqIn67	-	rpm
Monitoring			
C00498	Open-circuit monitoring	0: Speed encoder and position encoder	
C00586	Resp. open circuit HTL encoder	1: Fault	
C00603/1	Resp. to MultiEncoder open circuit	0: No Reaction	
C00603/2	Resp. to resolver open circuit	0: No Reaction	
C00603/3	Resp. to encoder angular drift monitoring	0: No Reaction	
C00603/4	Resp. to MultiEncoder comm. error	1: Fault	
C00579	Resp. max. speed/output freq. reached	0: No Reaction	
C00607	Resp. to max. freq. feedb. DIG12/67	1: Fault	
Highlighted in grey = display parameter			

Signal flow



[6-1] Signal flow - encoder interface

Generation of the actual speed value

...depending on the encoder selection and mounting direction:

Speed sensor (C00495)	Position encoder (C00490)	Motor mounting direction (C01206/1)	Direction of rotation of motor shaft (at setpoint = Cw)	Actual speed value (nAct_v)
<input type="checkbox"/>	<input type="checkbox"/>	not inverted	Cw	Δ SetPos
		inverted	Ccw	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	not inverted	Cw	C00495
		inverted	Ccw	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	not inverted	Cw	
		inverted	Ccw	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	not inverted	Cw	C00490 → Δ ActPos
		inverted	Ccw	

no encoder Encoder set

6.2 Resolver at X7



Danger!

- If the resolver is used as motor encoder:
Safe operation of the motor is no longer ensured in the event of an error!
- If servo control (SC) or V/f control (VFCplus + encoder) are used: For safety reasons, always select "Fault" in [C00603/2](#) as a response for the (open-circuit) monitoring of the encoder!

6.2.1 Parameterising the resolver



Note!

If a Lenze motor with resolver is used, the resolver is the only item that can be selected as speed sensor in [C00495](#). Further resolver parameter setting is not required.

Moreover, Lenze synchronous machines do not require rotor position adjustment because the resolvers of the Lenze synchronous motors are pre-adjusted.

The following steps are required for commissioning a resolver:

1. If number of resolver pole pairs $\neq 1$:
Set number of pole pairs ([C00925](#)).
2. Select resolver as speed sensor ([C00495](#)) or/and as position encoder ([C00490](#)).
3. Adjust filter time of the actual speed value ([C00497/4](#)) if necessary.
 - Lenze setting: 2 ms
 - Lenze recommend a filter time between 1 ... 2 ms.
4. If the resolver is used as motor encoder and synchronous machine:
Perform rotor position adjustment.
5. For the detection and monitoring of the motor temperature via the resolver cable:
 - Select the thermal sensor of the resolver in [C01190/1](#).
 - Parameterise the monitoring:
 - ▶ [Motor temperature monitoring \(KTY\)](#) (📖 323)
6. Parameterise open-circuit monitoring.
 - ▶ [Resolver/multi-encoder open-circuit monitoring](#) (📖 320)

6.2.2 Optimising resolver behaviour

Due to mounting and production tolerances as well as resolver material property leakage, errors may occur which, among other things, result in speed-dependent vibration of the actual speed. These errors are called resolver errors. Resolver errors typically occur in the form of the 1st and 2nd harmonic. They have two different causes:

1. The inductances of the sine and cosine track of the resolver have slightly different values.
2. Sine and cosine track do not magnetise orthogonally to each other.

Resolver errors due to cause 1 can be corrected by adjusting the gains of the digital/analog converters which feed the resolver tracks. In the Lenze setting, the gains of both resolver tracks are preset with identical values.

Resolver errors due to cause 2 can be compensated for by a slight correction of the angle via which both resolver tracks are fed relative to one another.

When the "Resolver error identification" device command ([C00002/25](#)) is executed, the gain of the resolver signals and the angular drift of both resolver tracks is corrected to minimise the resolver error.


- ▶ Select a speed-controlled operating mode (e.g. servo control) for your machine while you perform a resolver error identification run. During the identification run, speed must be constant and greater than 500 rpm.
- ▶ After a successful resolver error identification run, the resolver automatically uses the following resolver error parameters which have been identified during the procedure:

Parameter	Info	Lenze setting	
		Value	Unit
C02862/1	Resolver: Cos gain	100.00	%
C02862/2	Resolver: Sin gain	100.00	%
C02863	Resolver: Phase error	0.00	%

- ▶ The detected gain can have values from 80 ... 120 %. It makes sense to adjust only one of the two gains during a resolver error compensation. The other one remains at 100 % (Lenze setting).
- ▶ Save the parameter set afterwards to accept the identified resolver error parameters permanently (device command [C00002/11](#)).
- ▶ If the resolver error compensation is deactivated ([C00417](#) = "1: Resolver error comp. deact."), the resolver will resume work with the Lenze setting. However, the identified resolver error parameters remain saved.



How to perform a resolver error identification run:

1. Select a motor control mode with speed feedback in [C00006](#) and commission it.
▶ [Selecting the control mode](#)
 - Avoid a speed controller setting that is too tight (motor humming).
 - Set the speed ramps as well as the speed setpoint (> 500 rpm).
2. Inhibit the controller, e.g. via the [C00002/16](#) device command or via a LOW signal at terminal X5/RFR.
 - The controller must be in the "[SwitchedOn](#)" status for the resolver error identification run to be performed.
3. Activate resolver error identification via the [C00002/25](#) device command = "1: On / start".
4. Enable the controller again.
 - The controller changes to the "[MotorIdent](#)" device status.
 - The resolver error identification run starts.
 - The progress of the identification run can be seen in [C00002/25](#).
 - During the resolver error identification run, the direction of rotation of the motor is not important.
 - We recommend to traverse at constant setpoint speed ($|\text{nset}| > 500 \text{ rpm}$) until resolver error identification has finished.
 - If the application offers only limited space for traversing, reversing is also possible during active resolver error identification. In this case, ensure that the controller is not inhibited and that the speed profile is traversed for at least 1 second at constant setpoint speed ($|\text{nset}| > 500 \text{ rpm}$).
 - The identification is completed if the "0: Off / ready" message is displayed in [C00002/25](#).
 - After successful identification, it changes back to the "[SwitchedOn](#)" device status.
5. After the resolver identification run has been completed successfully:
 - It is possible to inhibit the controller again.
 - Resolver error compensation is activated ([C00417](#) = "0: Resolver error comp. act.").
6. In order to accept the identified resolver error parameters:
 - ▶  Save parameter set.



Tip!

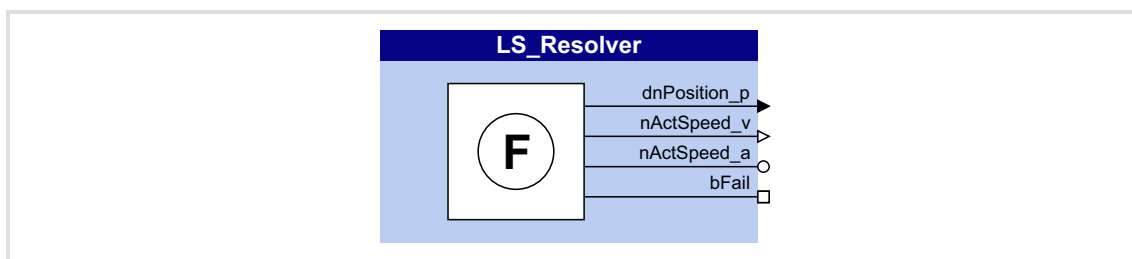
Resolver error identification can be aborted any time by setting a controller inhibit.

Possible causes for resolver error identification failure:

- ▶ A controller inhibit was set during resolver error identification.
- ▶ A time-out occurred while the algorithm was processed.
 - This error may occur if more than 60 seconds pass by between the setting of the "Resolver error identification" device command and the enable of the controller.
- ▶ The setpoint speed was too small ($|\text{nset}| < 500 \text{ rpm}$).
- ▶ The setpoint speed was not traversed for at least 1 second.

6.2.3 Internal interfaces | "LS_Resolver" system block

The **LS_Resolver** system block provides the application with speed, position and error information from the resolver in the form of process signals.

**Outputs**

Identifier	Data type	Value/meaning
dnPosition_p	DINT	Actual encoder position in [increments]
nActSpeed_v	INT	Actual speed in [increments/ms]
nActSpeed_a	INT	Actual speed in [%] • Scaling: $16384 \equiv 100\%$ reference speed (C00011)
bFail	BOOL	"Error" status
		TRUE Encoder error (e.g. open circuit)

6.3 Multi-Encoder at X8



Danger!

- If the resolver is used as motor encoder:
Safe operation of the motor is no longer ensured in the event of an error!
- If servo control (SC) or V/f control (VFCplus + encoder) are used: For safety reasons, always select "Fault" (Lenze setting) in [C00603 1](#) as a response for the (open-circuit) monitoring of the encoder!



Stop!

Before connecting an encoder, ensure that the encoder supply voltage has the correct setting in [C00421](#):

- Lenze setting: 5 V (setting range: 5 ... 12 V)

If the set supply voltage exceeds the permissible supply voltage of the connected encoder, the encoder may be destroyed!



Note!

The encoder position can be saved safe against mains failure in the controller.

- For this purpose, bit 0 must be set in [C02652](#). The actual position of the motor control is then saved in the controller (not in the memory module) and thus remains known to the drive control after mains switching.
- In case of a device replacement, this information gets lost and the home position might be approached or set again once. A device replacement can be recognised by using the SB [LS RetainData](#) and a suitable function block interconnection.

Regarding the position resolution, higher-level applications refer to the resolution of the encoder that is activated for position control.

The interface of the Multi-Encoder offers various ways in which the encoders can be used / evaluated:

- ▶ TTL incremental encoder
- ▶ Sin/cos encoder
- ▶ Absolute value encoder (sin/cos encoder with hiperface)
- ▶ SSI encoder
- ▶ Digital frequency coupling – (in preparation)

Required settings

The table below lists the required settings for the various encoder types as a function of the cable length.

- ▶ The given values apply when Lenze system cables are used under typical ambient temperatures.
- ▶ Other cables and cable cross-sections or extreme ambient temperatures may require metrologically detected adaptations.
- ▶ In case of a higher supply power of encoders, e.g. with laser-based length measuring systems, an external supply of the encoders must be provided.

Encoder type Product key	Rated voltage V_{rated}	Encoder number of increments C00420/3	Voltage setting in C00421 with a cable length of			
			0 - 30 m	30 - 70 m	70 - 100 m	100 - 150 m
TTL incremental encoder						
C00422 ="0: Incremental encoder (TTL)"						
IG2048-5V-T	5 V \pm 5 %	2048	5.0 V	5.1 V	5.2 V	5.3 V
IG4096-5V-T		4096				
IK2048-5V-T		2048				
IK4096-5V-T		4096				
Sin/cos encoder						
C00422 ="1: Sine/cosine encoder"						
IG1024-5V-V	5 V \pm 5 %	1024	5.0 V	5.1 V	5.2 V	5.3 V
IG2048-5V-S		2048				
Absolute value encoder (sin/cos encoder with hiperface)						
C00422 ="2: Absolute value encoder (hiperface)"						
AM1024-8V-H	8 V (7 ... 12 V)	1024	8.0 V			
SSI encoder						
C00422 ="4: Absolute value encoder (SSI)"						
<ul style="list-style-type: none"> • All SSI encoders which use the Stegmann SSI protocol are supported. • For configuration, see subchapter "SSI encoder". (📖 307) 						

6.3.1 Parameterising Multi-Encoders

The following steps are required for commissioning an encoder:

1. Select encoder type ([C00422](#)).
2. Set encoder voltage ([C00421](#)).
3. Set number of encoder increments ([C00420/3](#)).
4. Adjust filter time of the actual speed value ([C00497/3](#)) if necessary.
 - Lenze setting: 1 ms
 - Lenze recommend a filter time between 1 ... 2 ms.
5. If the encoder is used as motor encoder and synchronous machine:
Perform rotor position adjustment.
6. For the detection and monitoring of the motor temperature via the encoder cable:
 - Select the thermal sensor of the encoder in [C01190/2](#).
 - Parameterise the monitoring:
 - ▶ [Motor temperature monitoring \(KTY\) via encoder](#) (📖 325)
7. Parameterise open-circuit monitoring.
 - ▶ [Resolver/multi-encoder open-circuit monitoring](#) (📖 320)
8. When a TTL-incremental encoder is used:
No further settings required. The TTL incremental encoder is now ready for operation.
9. When another encoder is used:
Perform the commissioning steps specified in the subchapter for the respective encoder.

6.3.1.1 TTL incremental encoder

For operating TTL incremental encoders, only observe the information on parameter setting and commissioning in chapter [\[6.3.1\]](#).

6.3.1.2 Sin/cos encoder

The use of sin/cos encoders enables a fine interpolation of the position within one encoder increment due to the analog representation of the track signals A and B. This serves to considerably increase the resolution of the position information of a sin/cos encoder compared to a conventional TTL incremental encoder.

6.3.1.3 Absolute value encoder (sin/cos encoder with hiperface)

Absolute value encoders are especially suited for synchronous motors or positioning modes where only a one-time homing is to be executed. The analog evaluation of the sin/cos tracks enables a high resolution.

- ▶ With regard to the saving of the position information, it is distinguished between singleturn and multiturn encoders:
 - Singleturn: Saving within one revolution
 - Multiturn: Saving within a number of revolutions



Note!

The selection of an error response in [C00603/4](#) serves to optionally monitor the communication between absolute value encoder and controller.

If the monitoring is tripped:

- The error response set in [C00603/4](#) is triggered.
- The "[SD7: Encoder communication error](#)" error message is entered into the logbook.

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C00492	Hiperface: Detected TypCode	-	
C00493	Hiperface: TypCode	0	
C00494/1	Hiperface: Number of revolutions	0	
C00494/2	Hiperface: Steps per revolution	0	

Highlighted in grey = display parameter



How to parameterise the absolute value encoder:

1. As encoder type ([C00422](#)), select "2: Absolute value encoder (hiperface)".
2. Automatic detection/manual setting of encoder type:

Automatic readout of the type code

If the encoder has already been connected and read out, the type code is displayed in [C00492](#).

- Automatic readout takes place if [C00494/1..2](#) or [C00422](#) change (change to selection "2: Absolute value encoder (hiperface)") and if the device is switched on after a waiting time of approx. 1 s has expired.
- An overview of encoder types that are detected and set automatically by the controller can be found in the table below.
- If the value 0xFF is read out as type code, it is about an encoder with extended nameplate (ET). This will be set automatically as well.
- The values read out of the encoder are displayed in [C00494/1..2](#) and cannot be overwritten.

Encoders not detected automatically

If the used encoder is not included in the table (unknown type code), the value 0x00 is displayed in [C00492](#).

- In this case, the number of steps per revolution must be set in [C00494/1](#) and the number of revolutions in [C00494/2](#) for a multiturn encoder.
3. Set the number of sine/cosine periods per revolutions as "increment" of the encoder in [C00420/3](#).
 - This value can be obtained from the encoder data sheet.
 - This point must be executed last since it initiates a renewed readout of the encoder.

Encoders detected automatically

Type code	Bits Singleturn	Bits Multiturn
0x02	14	0
0x07	14	11
0x22	15	0
0x27	15	12
0x32	12	0
0x37	12	9
0x42	9	0
0x47	9	6

6.3.1.4 SSI encoder

All SSI encoders which use the Stegmann SSI protocol are supported.

- ▶ Supported bit rates for SSI communication: 100 ... 1000 kbps
- ▶ Supported data word widths: 1 ... 31 bits (effective)
- ▶ Supported output code of the SSI encoder: Gray or binary
- ▶ The SSI encoder can be used as position encoder or master encoder with a minimum cycle time of 1 ms.
- ▶ The SSI encoder can be supplied via X8 up to a maximum voltage of 12 V and a maximum current of 0.25 A.
- ▶ The received SSI data words are provided to the application via the [LS MultiEncoder](#) system block for further processing in the function block editor.



Note!

For some SSI encoder types it is common that despite a high data transfer rate an slow position detection (e.g. every 5, 10 or 20 ms) takes place. In this case, the position control, working in a 1-ms cycle, only functions with low gain and thus low dynamics since the values of the SSI encoder are only updated every x ms.

Parameterisation dialog in the »Engineer«

Confirm the **SSI configuration...** button in the *Encoder/Feedback system* dialog box to go to the parameterisation dialog for configuring the SSI encoder:

Bit	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
S	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
General			
C00428	SSI encoder: Coding	0: Binary code	
C00427	SSI encoder: Bit rate	1: 100 kbps	
C01110	LS_MultiEncoder: Solid measure	0: rotatively unipolar	
C01119/1	LS_MultiEncoder: Current position	-	units
C01119/2	LS_MultiEncoder: Maximum travel distance	-	units
Data word structure			
C00426/1	SSI encoder: Data word length	25	
C00426/2	SSI encoder: Bits SingleTurn	13	
C00426/3	SSI encoder: Start bit Singleturn	0	
C00426/4	SSI encoder: Bits Multiturn	12	
C00426/5	SSI encoder: Start bit Multiturn	13	
C00426/6	SSI encoder: Status bit	0	
C00426/7	SSI encoder: Left shift of raw value	0	
Further settings			
C01111/1	LS_MultiEncoder: Difference - traverse path	1	
C01111/2	LS_MultiEncoder: Difference - encoder path	1	
C01112/1	LS_MultiEncoder: Position offset	0.0000	
C01112/2	LS_MultiEncoder: Data area min	-214748.3647	
C01112/3	LS_MultiEncoder: Data area max	214748.3647	

Highlighted in grey = display parameter

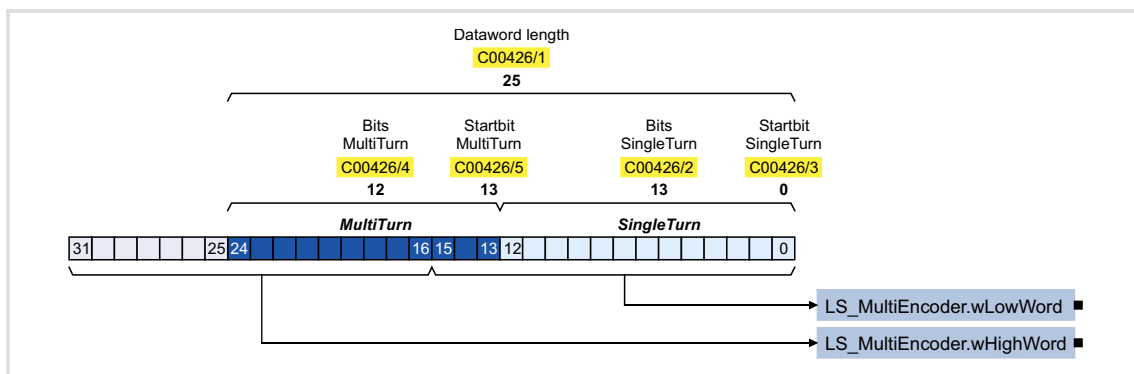


How to parameterise the SSI encoder:

1. Set the encoder voltage ([C00421](#)) of the used SSI encoder.
2. As encoder type ([C00422](#)), select "4: Absolute value encoder (SSI)".
3. Set the bit rate ([C00427](#)) for SSI communication.
 - For SSI protocols, the permissible baud rate is reduced if the cable length is increased. A safe bit rate must be set, depending on the length of the used encoder cable and the electromagnetic interference level.
4. Set the partitioning of the SSI data word according to the used SSI encoder in [C00426/1...5](#) (see example below).
5. If an SSI encoder with Gray coding is used:
 - Select "1: Gray code" in [C00428](#) to convert from Gray to binary.
 - In the Lenze setting, "0: Binary code", conversion is not performed, i.e. an SSI encoder with binary coding is expected.
6. If a linear SSI encoder is used instead of a rotative encoder or the encoder value is to be interpreted with or without sign:
 - Set the corresponding setting in [C01110](#).

Configuration example 1: Rotative encoder "BaumerIVO G0M2H Z04"

Coding: 8192x4096 Gray code

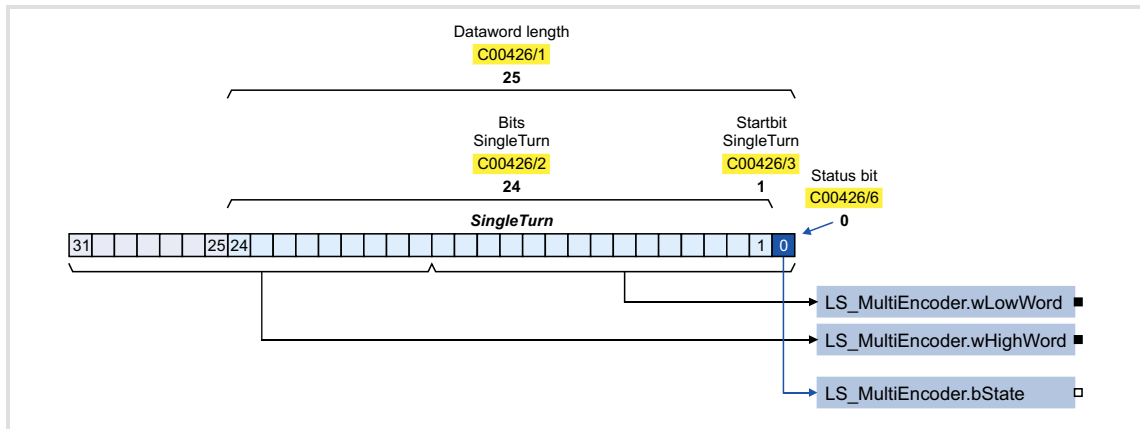


Parameter	Info	Setting for example 1
C00426/1	SSI encoder: Data word length	25
C00426/2	SSI encoder: Bits SingleTurn	13
C00426/3	SSI encoder: Start bit Singleturn	0
C00426/4	SSI encoder: Bits Multiturn	12
C00426/5	SSI encoder: Start bit Multiturn	13
C00426/6	SSI encoder: Status bit	0
C00428	SSI encoder: Coding	1: Gray code
C01110	LS_MultiEncoder: Solid measure	0: rotatively unipolar

- ▶ In "[Machine parameters](#)", the feed constant and the gearbox factors for motor and position encoder must be set correctly. ([📖 498](#))
- ▶ One encoder revolution is displayed with 65536 increments.

Configuration example 2: Linear encoder "Sick DME 5000-111"

Coding: Gray code with 25 bits of data word length
(Bit 0 = status bit, bit 1 ...24 = position, resolution 1 bit = 0.1 mm)



Parameter	Info	Setting for example 2
C00426/1	SSI encoder: Data word length	25
C00426/2	SSI encoder: Bits SingleTurn	24
C00426/3	SSI encoder: Start bit Singleturn	1
C00426/4	SSI encoder: Bits Multiturn	0
C00426/5	SSI encoder: Start bit Multiturn	0
C00426/6	SSI encoder: Status bit	0
C00428	SSI encoder: Coding	1: Gray code
C01110	LS_MultiEncoder: Solid measure	1: linearly unipolar

In "[Machine parameters](#)", the feed constant and the gearbox factors for motors and position encoders must be set as follows:

- ▶ The position encoder gearbox factor must be set to 1:1.
- ▶ When the motor gearbox factor is set to 1:1, the path covered at one motor revolution has to be entered as feed constant in [C01204](#) in [units].
- ▶ In case of a different motor gearbox factor, the path covered at one defined "drive roll" revolution has to be entered as feed constant in [C01204](#) in [units].
- ▶ The feed of the mechanics entered in [C01204](#) is displayed with 65536 increments.

Scaling of the position value

In order to scale the position change provided by the position encoder at this feed to 65536 as well, enter the traverse path in [units] in [C1111/1](#) and the corresponding difference of the raw value provided by the encoder in [C1111/2](#).

- ▶ Only the bits that contain the position data may be taken from the data word for the raw value. If e.g. the bit 0 contains status information, the raw value must be shifted to the right by this bit since only then the SLB of the position value is positioned correctly.

Scaling example:

1 [unit] = 1 mm

Feed constant ([C01204](#)) = 4 mm/revolution

Encoder resolution = 50 µm → raw value difference = 20 [digit]/1 [unit]

→ Difference - traverse path ([C1111/1](#)) = 1 [unit]

→ Difference - encoder value ([C1111/2](#)) = 20 [digit]

Thus, at a feed of the mechanics of 4 mm, the encoder provides a position difference of 65536 increments.

$$\text{Position} = \text{Raw value} \cdot \frac{\text{Encoder feed constant}}{65536}$$

$$\text{with encoder feed constant} = \frac{C01111/1 \cdot 65536^2}{C01111/2 \cdot C01204}$$

$$\text{Position} = \text{Raw value} \cdot \frac{C01111/1 \cdot 65536}{C01111/2 \cdot C01204}$$

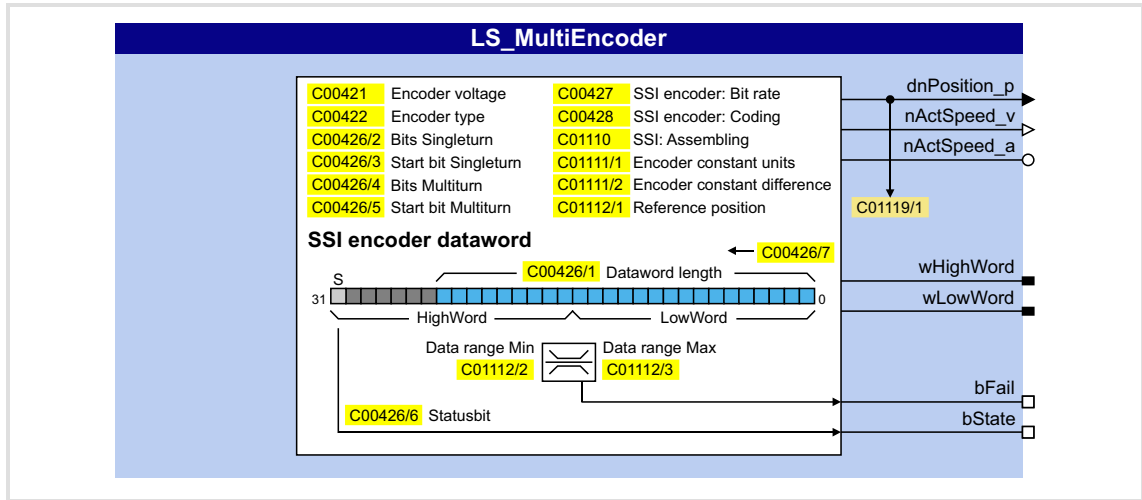
Left shift of raw value

The data read-in by the encoder is processed via the settings of the start bits for singleturn and multiturn and the number of bits in such a way that a position signal suitable for the controller is created that can be fed into the function block interconnection.

For evaluating status information that is transmitted by the encoders as well, it is sometimes required to adjust the output at the "raw value" outputs (*wHighWord* and *wLowWord*). For this purpose, a left shift can be set in [C00426/7](#).

6.3.2 Internal interfaces | "LS_MultiEncoder" system block

The LS_MultiEncoder system block provides the application with speed, position and error information from the encoder in the form of process signals.



Outputs

Identifier	Data type	Value/meaning
dnPosition_p	DINT	Actual position value of the encoder in [increments]
nActSpeed_v	INT	Actual speed of the encoder in [increments/ms]
nActSpeed_a	INT	Actual speed of the encoder in [%] • 100 % = reference speed (C00011)
wHighWord wLowWord	WORD	32-Bit data telegram of the encoder (raw data) ▶ SSI encoder (307)
bFail	BOOL	Configurable status signal "invalid encoder value" TRUE The encoder value is outside the value range set in C01112/2 and C01112/3 . ▶ Recognition of invalid encoder values
bState <small>(from version 02.00.00)</small>	BOOL	Status bit of the encoder • The bit position of the status bit within the 32-bit data telegram can be set in C00426/6 .

6.3.2.1 Recognition of invalid encoder values

For detecting invalid encoder values, a value range can be defined via the parameters [C01112/2](#) and [C01112/3](#). When the encoder signal leaves the set value range, the *bFail* status signal is set to TRUE. Monitoring is only active if the *bSetRef* input is set to TRUE.

► **Example 1: SSI laser distance meter**

The *bFail* status signal can be used to detect an interruption of the laser beam or a dirty mirror.

► **Example 2: SSI bar code scanner**

In an application, an SSI bar code scanner is used to detect the workpiece ID and the workpiece position. A setting of sensible limit values serves to use the *bFail* status signal to determine whether the ID or the position of the SSI bar code scanner has been detected.

6.3.2.2 Setting of a static position offset

If, for example, the encoder cannot be mounted mechanically in order that the supplied position matches the mechanics or if for other reasons, a static position offset is required, this value can be set in [C01112/1](#).

6.4 HTL encoder at DI1/DI2 or DI6/DI7

6.4.1 Parameterising digital inputs as encoder inputs

The function of the digital inputs DI1/DI2 and DI6/DI7 is defined via [C00115/1...2](#).

To be able to use the digital inputs as encoder inputs, select 2, 3, or 4 (Lenze recommendation: 2) in [C00115/1](#) or [C00115/2](#), depending on the input terminals used.

Selection in C00115/1...2	Function
2: DI1(6)&DI2(7)=FreqIn (2-track)	DI1/6 and DI2/7 = 2-track frequency input <ul style="list-style-type: none">Permits a two-track evaluation of the encoder including correct detection of the direction of rotation.
3: DI1(6)=FreqIn / DI2(7)=Direction	DI1/6 = 1-track frequency input DI2/7 = specification of direction
4: DI1(6)=CountIn / DI2(7)=In	DI1/6 = counter input DI2/7 = digital input



Danger!

- For single-track evaluation, make sure that the sign is correctly specified. Otherwise, the motor may overspeed.
- If an HTL encoder is used at the digital input terminals:
Observe the maximum input frequencies of the digital inputs!
 - DI1/DI2: max. 200 kHz
 - DI6/DI7: max. 10 kHz



Note!

If the digital inputs are parameterised as encoder inputs, the corresponding output signals (*bln1/bln2* and *bln6/bln7*) at the [LS DigitalInput](#) system block are automatically set to FALSE.



Wiring diagram, assignment and electrical data of the digital input terminals can be found in the **8400 hardware manual** in the chapter "Technical data".

- The hardware manual has been stored in electronic form on the data carrier supplied with the 8400 drive controller.

General procedure

(if the encoder is connected to the digital inputs DI1 and DI2)

1. Define the function of the digital inputs DI1 and DI2 in [C00115/1](#).
2. Set the encoder increments in [C00420/1](#).
3. Select "1: Encoder signal FreqIn12" in [C00495/1](#).
4. Adapt the filter time of the speed measurement in [C00497/1](#).
5. In the case of encoders with a very low resolution (number of increments < 120 increments):
Change the encoder evaluation procedure in [C00496](#) if necessary.

Related topics:

- ▶ [Digital input terminals](#) (📖 329)
- ▶ [Using DI1\(6\) and DI2\(7\) as frequency inputs](#) (📖 333)

6.4.2 Encoder evaluation method

Depending on the encoder used, the following table specifies which evaluation method should be selected in [C00496](#):

Selection in C00496	Encoder evaluation method
0: High-resolution encoder	<p>High-precision procedure for high-resolution encoders (≥ 512 increments)</p> <ul style="list-style-type: none"> • Method for speed measurement with automatic scan time setting (0.5 ... 500 ms). • Evaluation with automatic scan time minimisation for an optimum dynamic performance. • Particularly suited for high-resolution encoders (≥ 1024 inc) with good signal quality, i.e. <ul style="list-style-type: none"> – good scanning ratio 1:1 – exactly 90°-phase offset between track A and B (error $\leq \pm 10^\circ$) • Not suited for encoders with poor signal quality. • Wiring according to EMC (e.g. motor and encoder cable shielding) is required!
1: Low-resolution encoder (StateLine)	<p>High-precision procedure for low-resolution encoders (≤ 128 increments)</p> <ul style="list-style-type: none"> • Exact method for speed measurement with automatic scan time setting (0.5 ... 500 ms) for low-resolution encoders in the range of 4 ... 128 increments. • Evaluation with automatic scan time minimisation for an optimum dynamic performance. • Method is also suited for encoders with poor signal quality, e.g. for encoders with high error rate in scanning ratio and phase offset. • This method requires an equidistant period length per encoder increment. • Wiring according to EMC (e.g. motor and encoder cable shielding) is required!
2: Comb. encoder method (Lenze setting)	<p>Combination of the first two procedures as a function of the speed (recommended procedure)</p> <ul style="list-style-type: none"> • For a high-precision speed measurement suited for encoders with an arbitrary number of increments (4 ... 1024 increments). • Low input frequencies at the encoder inputs: The method is used for low-resolution encoders. • High input frequencies at the encoder inputs: The method is used for high-resolution encoders. • This method is suited for encoders with average to good signal quality. • Evaluation with automatic scan time minimisation for an optimum dynamic performance. • This method requires an equidistant period length per encoder increment. • Wiring according to EMC (e.g. motor and encoder cable shielding) is required!
3: Edge-counting procedure	<p>Simple edge counting procedure with adjustable scanning time (C00425)</p> <ul style="list-style-type: none"> • Speed measurement by means of the edges of tracks A and B measured per scanning interval. • Integrated correction algorithm for EMC interference. • Limited suitability for systems with unshielded encoder and/or motor cable. • Limited suitability for encoders with poor signal quality, i.e. high error rate in scanning ratio and phase offset.



Tip!

- We recommend to use the preset combined encoder method ([C00496](#) = 2).
- Use one of the first three procedures ([C00496](#) = 0, 1, or 2) for dynamic applications (e.g. operating mode: servo control).
- For dynamic speed control or positioning processes, use an HTL encoder with 1024 increments.

6.4.3 HTL encoder at DI1/DI2

**Note!**

At the digital terminals DI1 and DI2, only encoders with HTL level can be used. In spite of the selected operating mode without encoder feedback, the actual speed value ([C00051](#)) is calculated if an encoder is connected and "1: Encoder signal FrqIn12" is selected in [C00495](#).

Low speeds (except for edge counting)

For the first three methods ([C00496](#) = 0, 1, or 2), the minimum speed that can be measured depends on the encoder resolution.

The quantisation error

- ▶ is independent of the encoder resolution,
- ▶ exclusively depends on the encoder quality (encoder errors).
- ▶ at least amounts to 0.5 rpm.

Internal arithmetic operations automatically maintain the minimally required value of the scanning time in order to achieve maximum dynamics.

Encoder resolution (Number of increments)	Min. measurable speed in [rpm]
8	16
16	8
32	4
64	2
128	1
256	0.5
≥ 512	0.25

Low speeds with edge counting

The minimum speed that can be measured and the quantisation error of speed measurement in the edge-counting procedure ([C00496](#) = 3) depend on the scanning time that can be set in [C00425/1](#) and the encoder resolution.

Depending on accuracy and the requirements with regard to the dynamic performance, the respective scanning time must be selected and set in [C00425/1](#):

Encoder resolution (Number of increments)	Scanning time [ms]									
	1	2	5	10	20	50	100	200	500	1000
	Min. measurable speed in [rpm]									
8	1875	938	375	188	93.8	37.5	18.8	9.4	3.8	1.9
16	938	469	188	94	46.9	18.8	9.4	4.7	1.9	0.9
32	469	234	94	46.9	23.4	9.4	4.7	2.3	0.9	0.5
64	234	117	46.9	23.4	11.7	4.7	2.3	1.2	0.5	0.2
128	117	58.6	23.4	11.7	5.9	2.3	1.2	0.6	0.2	0.12
256	58.6	29.3	11.7	5.9	2.9	1.2	0.6	0.3	0.12	0.06
512	29.3	14.6	5.9	2.9	1.5	0.6	0.3	0.15	0.06	0.03
1024	14.6	7.3	2.9	1.5	0.7	0.3	0.15	0.07	0.03	0.01

6.4.4 HTL encoder at DI6/DI7

**Note!**

Single-track evaluation of the digital DI6/DI7 terminals as speed feedback ($C0115/2 = 1$ or 3) is not possible. Hence, a single-track encoder cannot be used for speed control at the digital DI6 terminal!

Low speeds with edge counting

The speed measurement is evaluated at the digital terminals DI6/DI7 with the edge-counting procedure and a fixed scanning time that can be set in [C00425/2](#).

The minimum speed that can be measured and the quantisation error of speed measurement in the edge-counting procedure depend on the scanning time that can be set in [C00425/2](#) and the encoder resolution.

Depending on accuracy and the requirements with regard to the dynamic performance, the respective scanning time must be selected and set in [C00425/2](#):

Encoder resolution (Number of increments)	Scanning time [ms]									
	1	2	5	10	20	50	100	200	500	1000
	Min. measurable speed in [rpm]									
8	1875	938	375	188	93.8	37.5	18.8	9.4	3.8	1.9
16	938	469	188	94	46.9	18.8	9.4	4.7	1.9	0.9
32	469	234	94	46.9	23.4	9.4	4.7	2.3	0.9	0.5
64	234	117	46.9	23.4	11.7	4.7	2.3	1.2	0.5	0.2
128	117	58.6	23.4	11.7	5.9	2.3	1.2	0.6	0.2	0.12
256	58.6	29.3	11.7	5.9	2.9	1.2	0.6	0.3	0.12	0.06
512	29.3	14.6	5.9	2.9	1.5	0.6	0.3	0.15	0.06	0.03
1024	14.6	7.3	2.9	1.5	0.7	0.3	0.15	0.07	0.03	0.01

Maximum speeds with edge counting

Due to the lower input frequency (max. 10 kHz) compared to the terminals DI1/DI2, operation with maximum speed at the terminals DI6/DI7 is limited. ▶ [Digital input terminals](#) (📖 329)

Encoder resolution (Number of increments)	Max. measurable speed in [rpm]
8	No restrictions
16	37500
32	18750
64	9375
128	4688
256	2344
512	1172
1024	586

6.5 Monitoring

6.5.1 Resolver/multi-encoder open-circuit monitoring

Open-circuit monitoring is available for the resolver cable and the encoder cable.



Danger!

- For safety reasons, always select "Fault" as a response for the (open-circuit) monitoring of the resolver/encoder!
- To avoid interference when using an encoder, only use shielded motor and encoder cables!

The encoders to be monitored are selected in [C00498](#):

Selection	Function
0: Speed encoder and position encoder	Open-circuit monitoring is active for the speed encoder selected in C00495 and the position encoder selected in C00490 . <ul style="list-style-type: none">• Depending on whether a speed encoder or position encoder has been selected, the monitoring mode for the resolver and/or encoder is activated.• If no speed encoder and position encoder have been selected, open-circuit monitoring is deactivated.
1: Resolver only	Open-circuit monitoring is only active for the resolver, independent on the selection of the speed encoder and position encoder. <ul style="list-style-type: none">• Open-circuit monitoring for the encoder is deactivated.
2: Encoder only	Open-circuit monitoring is only active for the encoder, independent on the selection of the speed encoder and position encoder. <ul style="list-style-type: none">• Open-circuit monitoring for the resolver is deactivated.
3: Resolver and encoder	Open-circuit monitoring is active for the resolver and encoder, independent on the selection of the speed encoder and position encoder.



Tip!

We recommend the Lenze setting, "0: Speed sensor and position encoder". Further possible settings make sense if the respective encoder is not used as speed sensor or position encoder but for other tasks in the application. Moreover, a selective switch-off of the monitoring is possible if other settings are made.

When does the open-circuit monitoring system respond?

Resolver	Multi encoder
<ul style="list-style-type: none"> • In case of open circuit in the encoder cable. • If the resolver impedance is too high. • In case of EMC interferences. 	<ul style="list-style-type: none"> • In case of open circuit in the encoder cable.

Response to open circuit

Resolver	Multi encoder
<p>The error response set in C00603/2 is triggered (Lenze setting: "0: No Reaction").</p> <p>Logbook entry: "SD2: Open circuit - resolver"</p>	<p>The error response set in C00603/1 is triggered (Lenze setting: "0: No Reaction").</p> <p>Logbook entry: "SD4: Open circuit - MultiEncoder"</p>

6.5.2 Open-circuit monitoring HTL encoder

Open-circuit monitoring is available for the HTL encoder cable.



Danger!

For safety reasons, always select "Fault" (Lenze setting) as a response for the (open-circuit) monitoring of the HTL encoder!



Note!

If you do not use an HTL encoder, deactivate the monitoring ([C00586](#) = "0: No Reaction").

When does the open-circuit monitoring system respond?

The open-circuit monitoring will trigger if

- ▶ an open circuit occurs in the encoder cable.
- ▶ extreme overload (e.g. a blocked motor shaft) occurs in the starting phase of the motor.
- ▶ highly dynamic reversion of the motor occurs.

Which measured values lead to an actuation of the open-circuit monitoring system?

The following measured values checked for plausibility lead to an actuation of the open-circuit monitoring system:

1. If the total deviation between actual speed and setpoint speed is higher than $f = 40$ Hz for a time > 0.1 s.
2. If the actual speed detected is $f = 0$ Hz or $n = 0$ rpm and the I_{\max} controller or the torque limitation for servo control (SC) is active for $t \geq 0.1$ s.
3. If the sign of the injected frequency and the actual speed is not the same, the I_{\max} controller is active and this status is active for 0.1 s. Usually this is the case when A/B tracks are reversed.

Response to open circuit

- ▶ If the open-circuit monitoring is tripped:
 - The error response set in [C00586](#) is activated (Lenze setting: "Fault").
 - The "[SD3: Open circuit - feedback system](#)" is entered into the Logbook.
 - The `bMctrlEncoderComFault` status output of the [LS DeviceMonitor](#) SB is set to TRUE.
- ▶ A setting of [C00586](#) = "0: No Reaction" deactivates the monitoring.

6.5.3 Motor temperature monitoring (KTY)

The motor temperature can also be detected and monitored via the resolver cable and/or the encoder cable.

- ▶ The feedback system to be used for the motor temperature is selected in [C01193](#).
- ▶ The respective motor temperature monitoring includes an early warning stage as well as an open-circuit monitoring for the thermal sensor.



Note!

In the Lenze setting of [C00583/1...6](#), the motor temperature monitoring functions are switched on! These monitoring functions are only active with speed encoder selection "3: Multi encoder" or "4: Resolver" in [C00495](#).

From version [V11.00.00](#), the servo control (SC) the temperature compensation within the motor control is activated in the Lenze setting of [C02878/1](#). However, temperature compensation is only active with speed sensor selection "3: Multi encoder" or "4: Resolver" in [C00495](#) as well as error-free KTY temperature detection (display in [C00063/1](#) $\neq 255$ °C).

Parameterisation dialog in the »Engineer«

Click the **Motor temperature monitoring (KTY) ...** button in the *Encoder/feedback system* dialog box to access the parameterisation dialog:

Motor temperature monitoring (KTY) ...

Drehzahlrückführung

Motortemperatur: 25 °C

Resolver

- Motortemperatur über Resolver: 25
- Warnschwelle Motortemperatur Resolver: 120
- Reakt. Motor-Übertemp. KTY Resolver: No Reaction
- Reakt. Motortemp. > C00121 Resolver: No Reaction
- Reakt. Temp.-sensorfehler KTY Resolver: No Reaction
- Typ Motortemperatursensor Resolver: KTY83-110

Encoder

- Motortemperatur über MultiEncoder: 25
- Warnschwelle Motortemperatur MultiEnco.: 120
- Reakt. Motor-Übertemp. KTY MultiEncoder: No Reaction
- Reakt. Motortemp. > C00121 Encoder: No Reaction
- Reakt. Temp.-sensorfehler KTY MultiEnco.: No Reaction
- Typ Motortemperatursensor MultiEncoder: KTY83-110

User characteristic (sensor type selection)

1 Grid point: 100, 1070

2 Grid point: 150, 2225

Graph: Ω vs $^{\circ}\text{C}$. Points: (25, 1000), (150, 2225).

Schließen

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C01193	Feedback system motor temperature	0: Speed feedback	
C00063/1	Motor temperature	-	°C
Resolver			
C00063/2	Motor temperature via resolver	-	°C
C00121/1	Warning threshold motor temp. to resolver	120	°C
C00583/1	Motor overtemperature KTY resolver	1: Fault	
C00583/3	Motor temp. > C00121 resolver	5: Warning	
C00583/5	Thermal sensor motor KTY resolver	1: Fault	
C01190/1	Thermal motor sensor to resolver	0: KTY83-110	°C
Encoder			
C00063/2	Motor temperature via encoder	-	°C
C00121/2	Warning threshold motor temp. to encoder	120	°C
C00583/2	Motor overtemperature KTY encoder	1: Fault	
C00583/4	Motor temp. > C00121 encoder	5: Warning	
C00583/6	Thermal sensor motor KTY encoder	1: Fault	
C01190/2	Thermal motor sensor to encoder	0: KTY83-110	°C
User characteristic			
C01191/1	PTC characteristic: Temperature 1	100	°C
C01191/2	PTC characteristic: Temperature 2	150	°C
C01192/1	PTC characteristic: Resistance 1	1070	Ohm
C01192/2	PTC characteristic: Resistance 2	2225	Ohm

Highlighted in grey = display parameter

Motor temperature monitoring (KTY) via resolver

- ▶ If the winding temperature detected via the motor temperature sensor exceeds the limit value set in [C00121/1](#) (Lenze setting: 120 °):
 - An advance warning in the form of the error response set in [C00583/3](#) is issued.
 - The "[OH7: Motor temperature - resolver > C121](#)" error message is entered into the logbook.
- ▶ If the fixed limit value of 150 °C is exceeded:
 - The error response set in [C00583/1](#) is triggered.
 - The "[OH9: Motor temperature - resolver](#)" error message is entered into the logbook.
 - The *bFail* status output of the [LS Resolver](#) SB is set to TRUE.
- ▶ If open circuit is detected for the motor temperature sensor:
 - The error response set in [C00583/5](#) is triggered.
 - The "[SD6: Thermal detector error - resolver](#)" error message is entered into the logbook.
 - The *bFail* status output of the [LS Resolver](#) SB is set to TRUE.

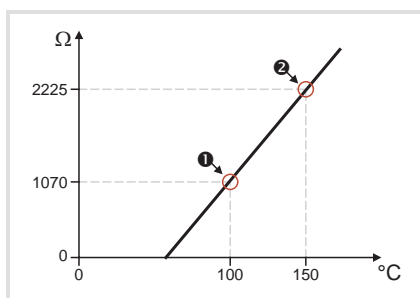
Motor temperature monitoring (KTY) via encoder

- ▶ If the winding temperature detected via the motor temperature sensor exceeds the limit value set in [C00121/2](#) (Lenze setting: 120 °):
 - An advance warning in the form of the error response set in [C00583/4](#) is issued.
 - The "[OH6: Motor temperature - MultiEncoder > C121](#)" error message is entered into the logbook.
- ▶ If the fixed limit value of 150 °C is exceeded:
 - The error response set in [C00583/2](#) is triggered.
 - The "[OH12: Motor overtemperature - MultiEncoder](#)" error message is entered into the logbook.
 - The *bFail* status output of the [LS MultiEncoder](#) SB is set to TRUE.
- ▶ If open circuit is detected for the motor temperature sensor:
 - The error response set in [C00583/6](#) is triggered.
 - The "[SD12: Thermal detector error - MultiEncoder](#)" error message is entered into the logbook.
 - The *bFail* status output of the [LS MultiEncoder](#) SB is set to TRUE.

Specific characteristic for the motor temperature sensor

A specific characteristic can be defined and activated for the motor temperature sensor if required.

- ▶ The specific characteristic is defined on the basis of two grid points which must be set in [C01191](#) and [C01192](#). Those two points define a line which is extrapolated to the right and to the left.
- ▶ The specific characteristic can be activated by selecting "1: Spec. characteristic" in [C01190/1](#) for the resolver and in [C01190/2](#) for the encoder.
- ▶ In the Lenze setting, the specific characteristic is defined as follows:



- ▶ Grid point ①
 - [C01191/1](#) = 100 °C
 - [C01192/1](#) = 1070 Ω
- ▶ Grid point ②
 - [C01191/2](#) = 150 °C
 - [C01192/2](#) = 2225 Ω

[6-2] Lenze setting of the specific characteristic



Note!

If a motor is selected from the motor catalogue, parameters [C01190](#), [C01191](#), and [C01192](#) are overwritten!

6.5.4 Encoder - angular drift monitoring

This function extension is available from version 02.00.00!



Note!

In the Lenze setting ([C00603/3](#) = "0: No response"), the angular drift monitoring of the encoder is not activated!

The encoder angular drift monitoring monitors a possible deviation of the real encoder angle from the angle calculated by counting increments in the encoder evaluation.

- ▶ If a deviation higher than 45° (electrical) is recognised when monitoring is activated:
 - The error response set in [C00603/3](#) is triggered.
 - The "[SD8: Encoder angular drift monit.](#)" error message is entered into the logbook.
 - The "Reference known" status of the "Homing" basic drive function is reset (if this status was set before)



Tip!

A deviation may occur, for instance, by incorrect parameter setting of the encoder increments, by lines in the form of interferences caused by EMC or loss of lines caused by EMC.

The encoder angular drift monitoring for encoders with and without absolute information is implemented by two different principles which are explained in detail in the following subchapters.

6.5.4.1 Angular drift monitoring for encoders without absolute information

For an encoder without absolute information, the number of incoming encoder lines between two zero pulses (one revolution) is monitored. This value must equal the encoder increments set in [C00420](#).



Note!

After mains switching, monitoring is only active after second incoming zero pulse since the first line difference to be used can only be calculated with the second and first zero pulse.

When the motor (and thus the encoder) is replaced, it is very likely that a angular drift error occurs within the first revolution after acknowledging the encoder error since the monitoring function cannot recognise that the encoder has been replaced.

6.5.4.2 Angular drift monitoring for encoders with absolute information

For an encoder with absolute information, cyclical communication with the encoder takes place and the angle is read out digitally. This angle is compared to the angle from the encoder evaluation.



Note!

If monitoring is deactivated ([C00603/3](#) = "0: No Reaction"), no cyclical communication with the encoder takes place and thus no communication errors with the encoder can occur.

If monitoring is activated, it is only executed for speeds lower than 100 rpm due to runtimes for communication.

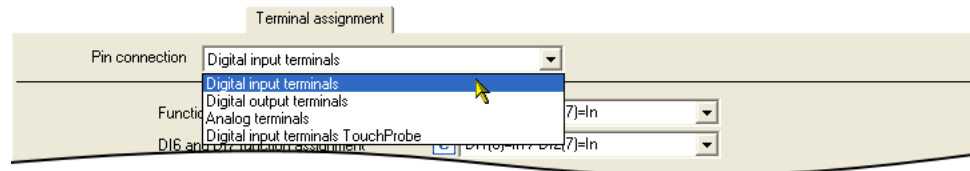
- If increments get lost at higher speeds, this deviation can only be recognised when the speed falls below 100 rpm for at least 80 ms.

After each detected encoder angular drift error, a renewed read-out of the position is tripped automatically and this angle is written into the encoder evaluation. This makes it possible to acknowledge the error. In case of synchronous machines, the pole position is corrected simultaneously.

7 I/O terminals

This chapter provides information on the function, possible parameter settings, and technical data of the input/output terminals of the controller.

In the »Engineer«, the input and output terminals are parameterised on the **Terminal assignment** tab. To do this, go to the **Control terminals** list field and select the terminals that you wish to parameterise:



You can find further information in the respective subchapter:

- ▶ [Digital input terminals](#) (📖 329)
- ▶ [Digital output terminals](#) (📖 349)
- ▶ [Analog terminals](#) (📖 352)
- ▶ [Touch probe detection](#) (📖 362)



Note!

The input and output terminals of the drive controller have already been functionally assigned in the default setting ("Lenze setting"). The preconfigured assignment depends on the technology application selected in [C00005](#) and the control mode selected in [C00007](#):

- TA "Actuating drive speed": [Terminal assignment of the control modes](#) (📖 394)
- TA "Table positioning": [Terminal assignment of the control modes](#) (📖 424)
- TA "Switch-off positioning": [Terminal assignment of the control modes](#) (📖 451)



Wiring diagram, assignment and electrical data of the input and output terminals can be found in the **8400 hardware manual** in the chapter "Technical data".

- The hardware manual has been stored in electronic form on the data carrier supplied with the 8400 drive controller.



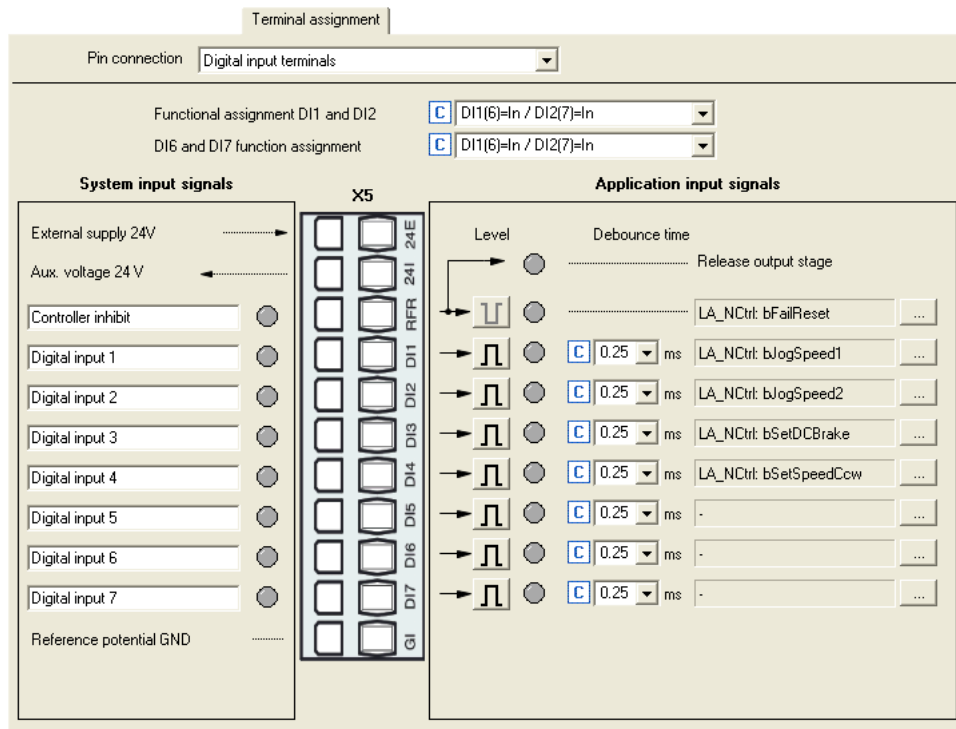
Tip!




How you can alter the preconfigured assignment of the input and output terminals is described in the chapter entitled "[User-defined terminal assignment](#)". (📖 370)

7.1 Digital input terminals

The drive controller has 7 parameterisable input terminals (DI1 ... DI7) for detecting digital signals. The RFR control input for enabling the controller is permanently connected to the device control unit.

Parameterisation dialog in the »Engineer«:



Button	Function
	Indicates the polarity of the input is HIGH active. The polarity can be changed from HIGH active to LOW active by clicking this button.
	Indicates that the polarity of the input is LOW active. The polarity can be changed from LOW active to HIGH active by clicking this button.
	Open the parameterising dialog for assigning application inputs to the digital input. ▶ Changing the terminal assignment with the »Engineer« (□ 374)

Short overview of parameters for the digital input terminals:

Parameter	Info	Lenze setting	
		Value	Unit
C00115/1	Fct. DI 1/2 200kHz ▶ Change function assignment (📖 331)	0: DI1(6)=In / DI2(7)=In	
C00115/2	Fct. DI 6/7 10kHz ▶ Change function assignment (📖 331)	0: DI1(6)=In / DI2(7)=In	
Digital inputs DI1 ... DI7			
C00114	DigInX: Inversion	Bit coded	
C02830/1...7	DI1...DI7: Debounce time	1: 0.25	
C00443/1	Dlx: Terminal level	-	
C00443/2	Dlx: Output level	-	

Highlighted in grey = display parameter

Related topics:

- ▶ [Touch probe detection](#) (📖 362)
- ▶ [User-defined terminal assignment](#) (📖 370)

7.1.1 Change function assignment

The internal processing function of the digital input terminals DI1/DI2 und DI6/DI7 can be reconfigured in [C00115](#) if necessary. In this way, these input terminals can alternatively be used as frequency or counting inputs in order to implement the following functions:

- ▶ Detection of the input frequency
- ▶ Detection and processing of two unipolar input frequencies to one bipolar frequency
- ▶ Counting of input pulses
- ▶ Evaluation of the speed feedback (HTL encoder) for the motor control (speed-controlled operation)

	C00115/1: Function assignment of DI1 and DI2 C00115/2: Function assignment of DI6 and DI7	Function assignment	
		DI1 / DI6	DI2 / DI7
0	DI1(6)=In / DI2(7)=In	Digital input	Digital input
1	DI1(6)=FreqIn / DI2(7)=In	Frequency input	Digital input
2	DI1(6)&DI2(7)=FreqIn (2-track)	Frequency input (2-track)	
3	DI1(6)=FreqIn / DI2(7)=direction	Frequency input (speed)	Frequency input (direction)
4	DI1(6)=CountIn / DI2(7)=In	Count input	Digital input



Note!

- In the Lenze setting of [C00115](#), the digital input terminals DI1/DI2 and DI6/DI7 have been configured as "normal" digital inputs.
- The digital input terminals DI3 ... DI5 are basically designed as "normal" digital inputs.
- Very high pulse frequencies can be measured at the DI1/DI2 and DI6/DI7 input terminals if the latter have been configured as frequency or counting inputs in [C00115](#). Scanning is then carried out within less than μs instead of the otherwise usual scanning rate of 1 kHz (1 ms).

You can find detailed information on the respective function assignment in the following subchapters:

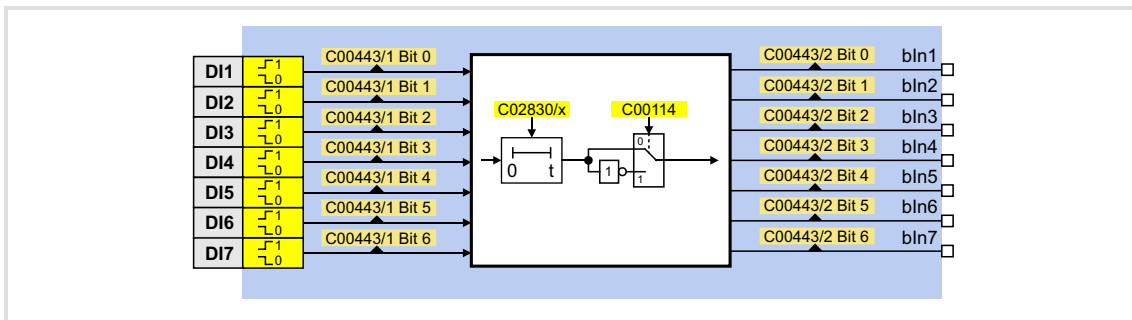
- ▶ [Using DI1\(6\) and DI2\(7\) as digital inputs](#) (📖 332)
- ▶ [Using DI1\(6\) and DI2\(7\) as frequency inputs](#) (📖 333)
- ▶ [Using DI1\(6\) as counting input](#) (📖 338)

7.1.1.1 Using DI1(6) and DI2(7) as digital inputs

Function assignment 0: DI1(6)=In / DI2(7)=In

With this setting in [C00115](#), the digital input terminals have been configured as "normal" digital inputs.

- ▶ For each digital input, the debounce time ([C02830/1...7](#)) and the terminal polarity ([C00114](#)) can be set individually.
- ▶ The current terminal level at the input of the internal processing function is shown in [C00443/1](#) in bit-coded form.
- ▶ The output level for the application is shown in [C00443/2](#) in bit-coded form.



Internal interfaces to the application

- ▶ Relevant outputs at the [LS_DigitalInput](#) system block:

Output	Value/meaning
DIS code data type bIn1 ... bIn7 C00443/2 BOOL	Digital input DI1 ... DI7

Related topics:

- ▶ [Using DI1\(6\) and DI2\(7\) as frequency inputs](#) (□ 333)
- ▶ [Using DI1\(6\) as counting input](#) (□ 338)
- ▶ [Internal interfaces | System block "LS_DigitalInput"](#) (□ 342)

7.1.1.2 Using DI1(6) and DI2(7) as frequency inputs

General information on using the input terminals as frequency inputs

The frequency inputs serve to detect HTL encoders with any number of increments and single-track and two-track signals. Single-track signals can be evaluated with or without rotation signal.

**Note!**

- Make sure that, when motor control with speed feedback is in use, the maximum input frequency of the respective input terminal is not exceeded.
 - DI1/DI2: $f_{\max} = 100 \text{ kHz}$ (from version 02.00.00: $f_{\max} = 200 \text{ kHz}$)
 - DI6/DI7: $f_{\max} = 10 \text{ kHz}$
- If the encoder signal is used as an actual speed value:
Number of encoder pulses / revolution $\leq 8192!$

Example of DI6/DI7 (in accordance with the preceding note):

- ▶ Number of encoder increments: 512 pulses / motor revolution
- ▶ Reference speed (C00011): 1500 rpm
- ▶ Speed setpoint: 100 %

$$\text{Input frequency} = \frac{1500 \text{ rpm}}{60 \text{ s}} \times 512 \text{ pulse} = 12800 \text{ pulse/s} = 12.8 \text{ kHz}$$

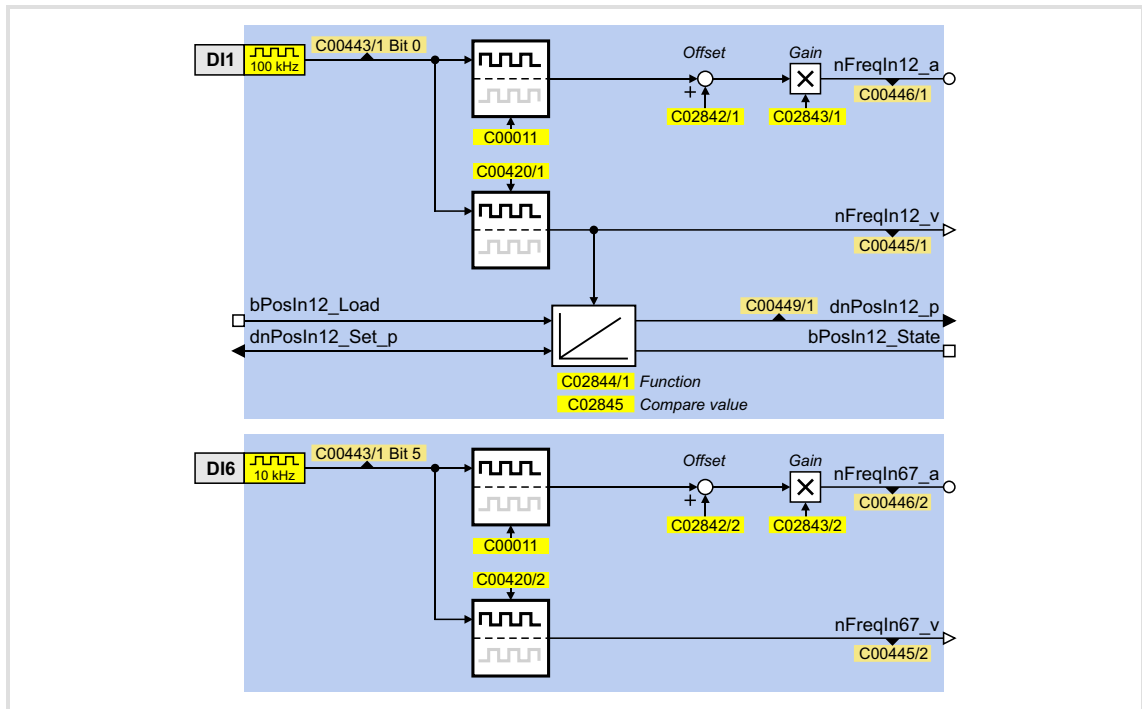
- ▶ Result: The speed or the number of increments is too high!

**Tip!**

The [LS DigitalInput](#) system block can also provide the encoder position. Detailed information on this topic is provided in chapter "[Output of the encoder position of the DI1/DI2 frequency input](#)". (📖 345)

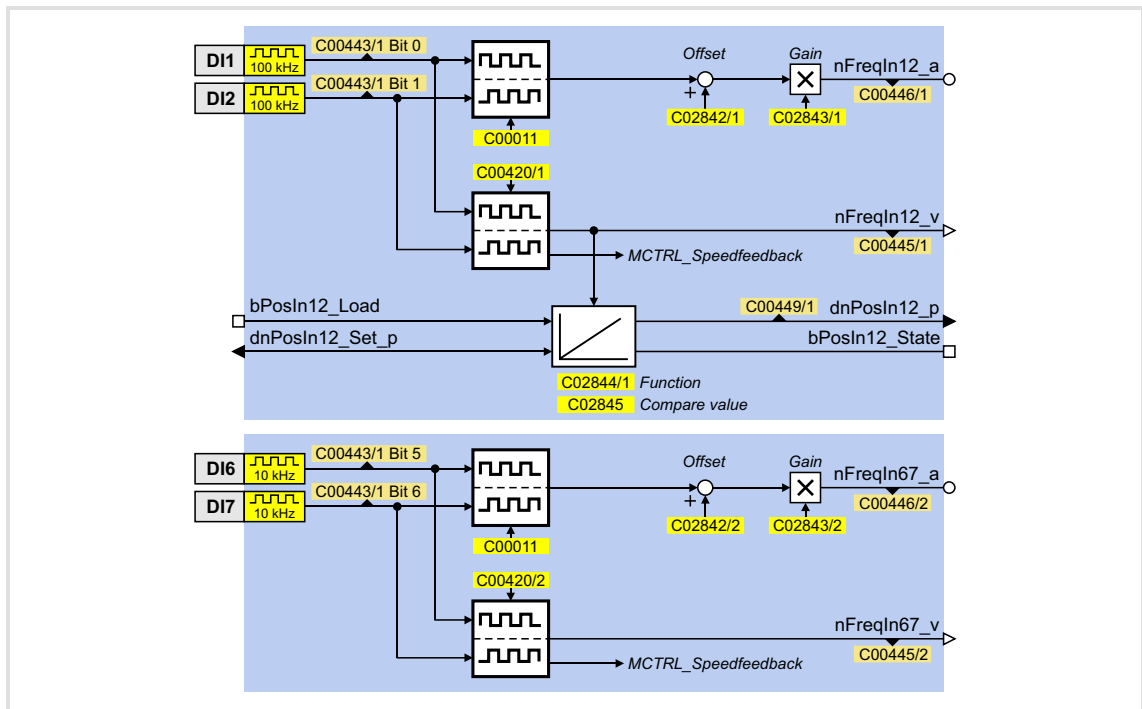
Function assignment 1: DI1(6)=FreqIn / DI2(7)=In

This setting in [C00115](#) configures the input terminal DI1 or DI6 as frequency input. The input terminal DI2 or DI7 remains configured as "normal" digital input..



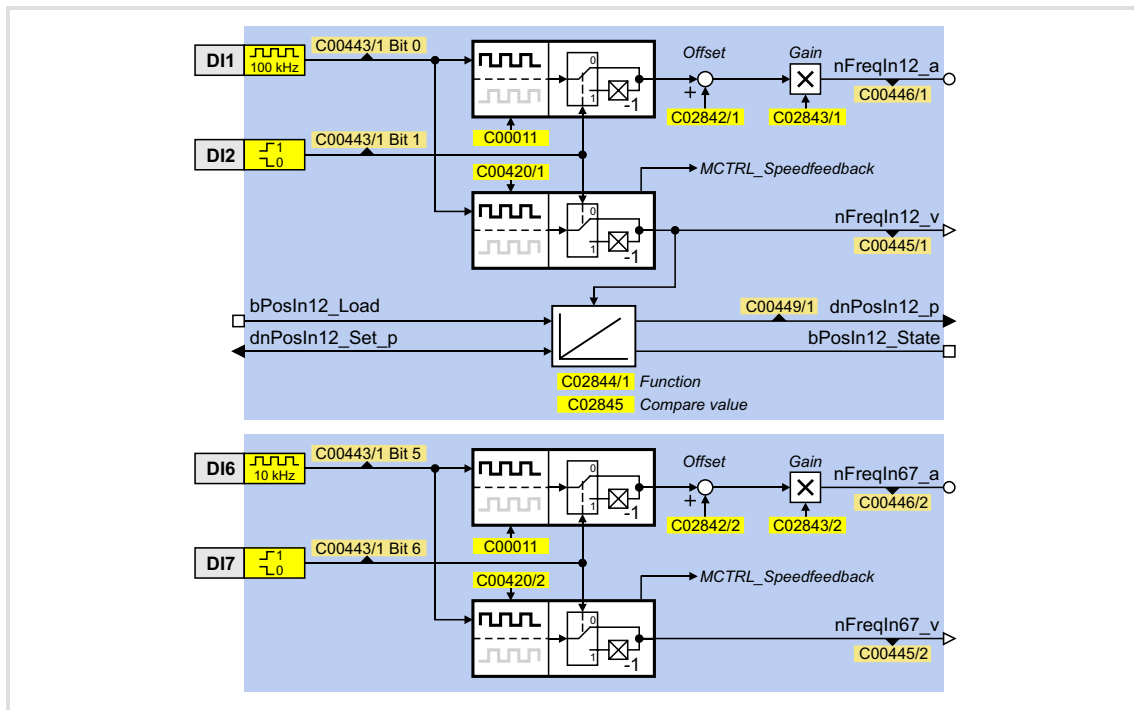
Function assignment 2: DI1(6)&DI2(7)=FreqIn (2-track)

This setting in [C00115](#) can be used to connect a two-track encoder to the DI1/DI2 or DI6/DI7 terminals.



Function assignment 3: DI1(6)=FreqIn / DI2(7)=Direction

This setting in [C00115](#) can be used to connect a single-track encoder to terminals DI1/DI2 or DI6/DI7. For this purpose, the rotation speed is evaluated via terminal DI1(6) and the direction of rotation of the encoder (LOW level \equiv CW direction of rotation) is evaluated via the DI(7) terminal.



Short overview of the parameters for the frequency inputs:

Parameter	Info	Lenze setting	
		Value	Unit
C00011	Appl.: Reference speed	1500	rpm
Frequency input DI1/DI2			
C00115/1	Fct. DI 1/2 200kHz	0: DI1(6)=In / DI2(7)=In	
C00420/1	Encoder increments at FreqIn12	128	Incr./rev.
C02842/1	FreqIn12: Offset	0.00	%
C02843/1	FreqIn12: Gain	100.00	%
C02844/1	PosIn12: Function	Loading with level	
C02845	PosIn12: Comparison value	0	
C00443/1	Dlx: Terminal level	-	
C00445/1	FreqIn12_nOut_v	-	Incr/ms
C00446/1	FreqIn12_nOut_a	-	%
C00449/1	FreqIn12_dnOut_p	-	Incr
Frequency input DI6/DI7			
C00115/2	Fct. DI 6/7 10kHz	0: DI1(6)=In / DI2(7)=In	
C00420/2	Encoder increments at FreqIn67	128	Incr./rev.
C02842/2	FreqIn67: Offset	0.00	%
C02843/2	FreqIn67: Gain	100.00	%
C00443/1	Dlx: Terminal level	-	
C00445/2	FreqIn67_nOut_v	-	Incr/ms
C00446/2	FreqIn67_nOut_a	-	%
Highlighted in grey = display parameter			

Internal interfaces to the application

► Relevant inputs at [LS DigitalInput](#) system block:

Input	Data type	Information/possible settings
Frequency input DI1/DI2		
bPosIn12_Load	BOOL	Load angle integrator with starting value and reset status signal
		TRUE Angle integrator is loaded with the value at <i>dnPosIn12_Set_p</i> and <i>bPosIn12_State</i> is reset to FALSE.
dnPosIn12_Set_p	DINT	Starting value for angle integrator

► Relevant outputs at the [LS DigitalInput](#) system block:

Output	Data type	Value/meaning
Frequency input DI1/DI2		
nFreqIn12_a	C00446/1 INT	Output frequency as scaled analog signal in [%]
nFreqIn12_v	C00445/1 INT	Output frequency as speed signal in [inc/ms]
dnPosIn12_p	DINT	Angle output signal <ul style="list-style-type: none"> • 65536 [incr.] ≙ 1 encoder revolution • Overflow is possible (display via <i>bPosIn12_State</i>)
bPosIn12_State	BOOL	Status signal "Overflow occurred/distance processed" <ul style="list-style-type: none"> • Status signal can be reset via <i>bPosIn12_Load</i>.
		TRUE Overflow has occurred or distance is processed.
Frequency input DI6/DI7		
nFreqIn67_a	C00446/2 INT	Output frequency as scaled analog signal in [%]
nFreqIn67_v	C00445/2 INT	Output frequency as speed signal in [inc/ms]

Related topics:

- [Output of the encoder position of the DI1/DI2 frequency input](#) (📖 345)
- [Using DI1\(6\) and DI2\(7\) as digital inputs](#) (📖 332)
- [Using DI1\(6\) as counting input](#) (📖 338)
- [Internal interfaces | System block "LS DigitalInput"](#) (📖 342)

7.1.1.3 Using DI1(6) as counting input

General information on use as a counting input

The counting input is used for counting fast edges. A 32-bit counter counts from a parameterisable starting value up to a parameterisable comparison value and then outputs a corresponding status signal.

► Possible counting range: $0 \dots 2^{31} - 1$ (0 ... 2147483647)

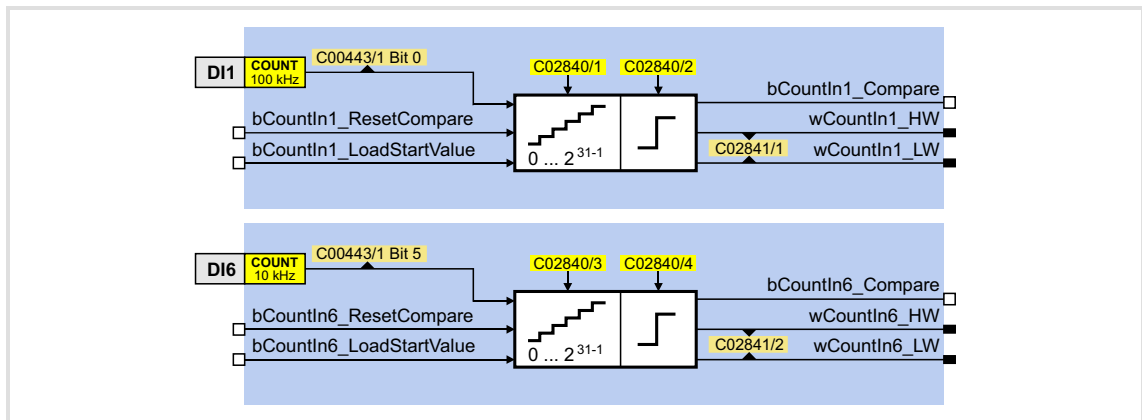


Note!

- The starting value must have been set so that it is smaller than the comparison value. Otherwise, the counter will be kept at the starting value because the condition "Count value \geq Comparison value" has been satisfied.
- Note the maximum input frequency of the respective input terminal:
 - DI1: $f_{\max} = 200$ kHz
 - DI6: $f_{\max} = 10$ kHz

Function assignment 4: DI1(6)=CountIn / DI2(7)=In

This setting in [C00115](#) configures the input terminal DI1 or DI6 as counting input. The input terminal DI2 or DI7 remains configured as "normal" digital input..



Short overview of parameters for the counting inputs:

Parameter	Info	Lenze setting	
		Value	Unit
Counting input DI1			
C00115/1	Fct. DI 1/2 200kHz	0: DI1(6)=In / DI2(7)=In	
C00621/3	LS_DigitalInput: bCountIn1_Reset	0: Not connected	
C00621/4	LS_DigitalInput: bCountIn1_LoadStartValue	0: Not connected	
C02840/1	CountIn1: Starting value	0	incr
C02840/2	CountIn1: Comparison value	65535	incr
C02841/1	CountIn1: Counter content	-	incr
C00443/1	Dlx: Terminal level	-	
Counting input DI6			
C00115/2	Fct. DI 6/7 10kHz	0: DI1(6)=In / DI2(7)=In	
C00621/97	LS_DigitalInput: bCountIn6_Reset	0: Not connected	
C00621/98	LS_DigitalInput: bCountIn6_LoadStartValue	0: Not connected	
C02840/3	CountIn6: Starting value	0	incr
C02840/4	CountIn6: Comparison value	65535	incr
C02841/2	CountIn6: Counter content	-	incr
C00443/1	Dlx: Terminal level	-	

Highlighted in grey = display parameter

Internal interfaces to the application

► Relevant inputs at the [LS DigitalInput](#) system block:

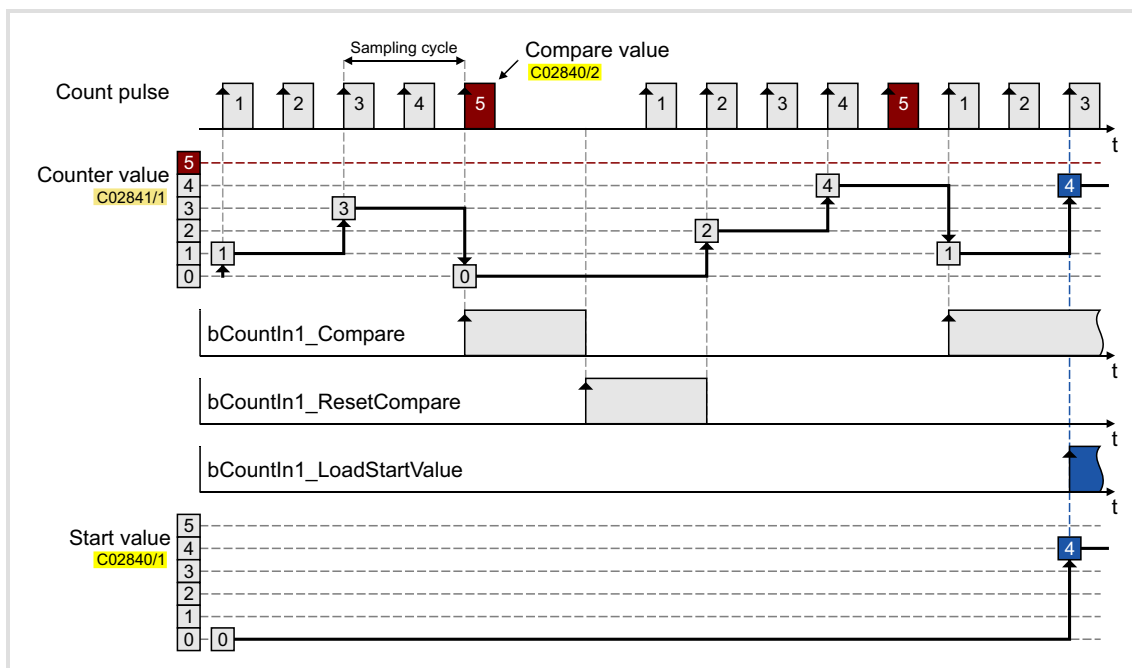
Identifier <small>DIS code data type</small>	Information/possible settings
Counting input DI1	
bCountIn1_ResetCompare <small>BOOL</small>	Reset status signal "Comparison value reached"
	FALSE↗TRUE The output <i>bCountIn1_Compare</i> is reset to FALSE.
bCountIn1_LoadStartValue <small>BOOL</small>	Load starting value into counter
	FALSE↗TRUE The starting value set in C02840/1 is accepted as the current count value.
Counting input DI6	
bCountIn6_ResetCompare <small>BOOL</small>	Reset status signal "Comparison value reached"
	FALSE↗TRUE The output <i>bCountIn6_Compare</i> is reset to FALSE.
bCountIn6_LoadStartValue <small>BOOL</small>	Load starting value into counter
	FALSE↗TRUE The starting value set in C02840/3 is accepted as the current count value.

► Relevant outputs at the [LS DigitalInput](#) system block:

Identifier <small>DIS code data type</small>	Value/meaning
Counting input DI1	
bCountIn1_Compare <small>BOOL</small>	Status signal "Comparison value reached"
	FALSE Current count value < comparison value (C02840/2)
	TRUE Current count value ≥ comparison value (C02840/2)
wCountIn1_HW wCountIn1_LW C02841/1 WORD	Current count value <ul style="list-style-type: none"> • Output as High and Low word (without sign) • Possible counting range: 0 ... $2^{31} - 1$
Counting input DI6	
bCountIn6_Compare <small>BOOL</small>	Status signal "Comparison value reached"
	FALSE Current count value < comparison value (C02840/4)
	TRUE Current count value ≥ comparison value (C02840/4)
wCountIn6_HW wCountIn6_LW C02841/2 WORD	Current count value <ul style="list-style-type: none"> • Output as High and Low word (without sign) • Possible counting range: 0 ... $2^{31} - 1$

Counting behaviour

The following temporal characteristic shows the counting process depending on the signals of the interfaces described before:



[7-1] Transient characteristic of a quick counter block, sampling cycle = 1 ms

- ▶ The counter starts with the parameterised starting value.
- ▶ If the comparison value is reached or exceeded:
 - The counter jumps back to its starting value.
 - The output *bCount1(6)_Compare* is set to TRUE.
- ▶ If there is a FALSE-TRUE edge at the input *bCountIn1(6)_ResetCompare*, the output *bCountIn1(6)_Compare* can be reset to FALSE.
- ▶ If there is a FALSE-TRUE edge at the input *bCountIn1(6)_LoadStartValue*, the current counter content can be reset to the parameterised starting value.

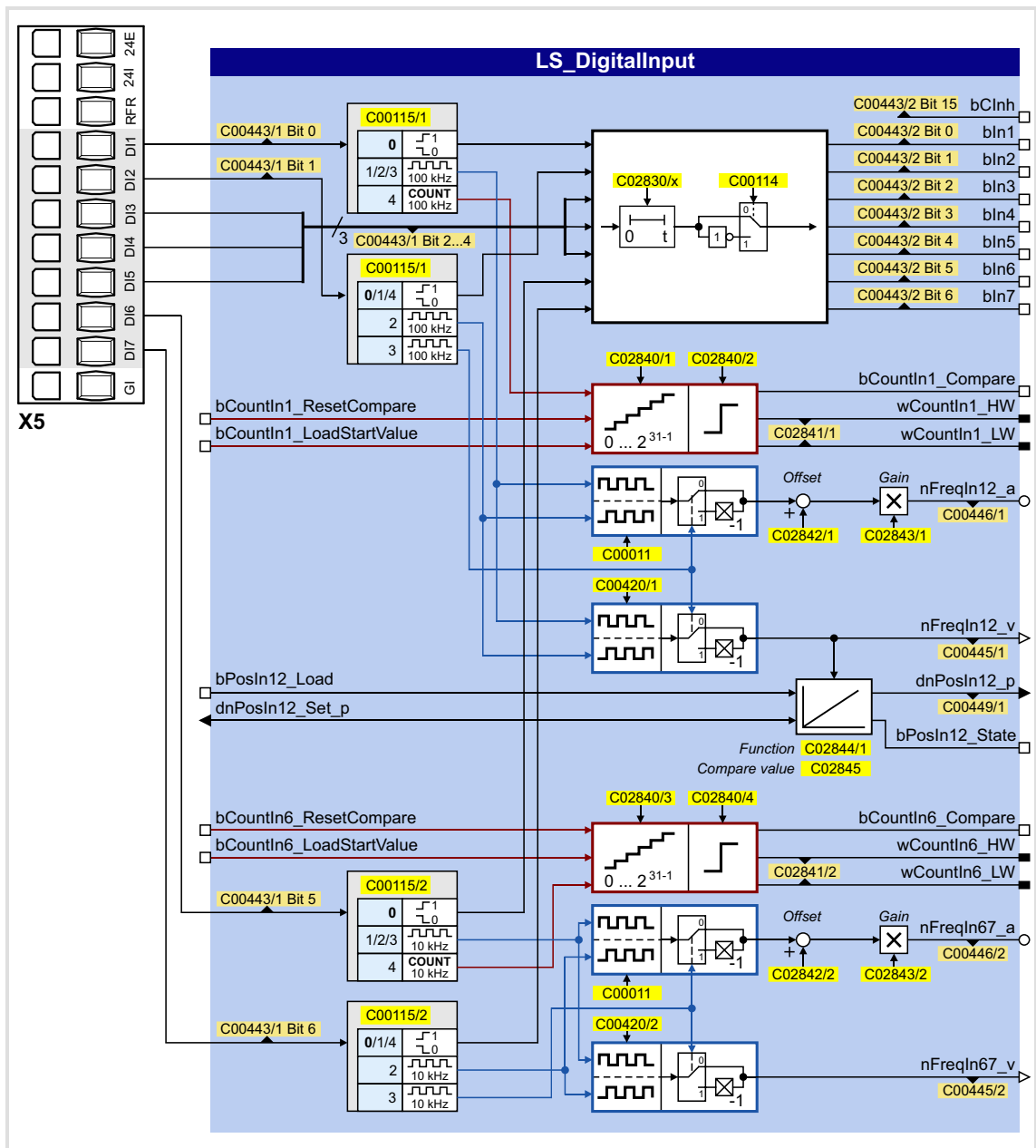
Related topics:

- ▶ [Using DI1\(6\) and DI2\(7\) as digital inputs](#) (☐ 332)
- ▶ [Using DI1\(6\) and DI2\(7\) as frequency inputs](#) (☐ 333)
- ▶ [Internal interfaces | System block "LS_DigitalInput"](#) (☐ 342)

7.1.2 Internal interfaces | System block "LS_DigitalInput"

The system block **LS_DigitalInput** maps the digital input terminals in the FB editor.

- ▶ The internal processing function of the digital DI1/2 and DI6/7 input terminals can be reconfigured in [C00115](#) if necessary. These input terminals can then be alternatively used as frequency inputs or counting inputs.
- ▶ The DI3 ... DI5 input terminals are basically designed as "normal" digital inputs.



Inputs

Identifier DIS code data type	Information/possible settings
Counting input DI1	▶ Using DI1(6) as counting input
bCountIn1_ResetCompare BOOL	Reset status signal "Comparison value reached" FALSE↗TRUE The output <i>bCountIn1_Compare</i> is reset to FALSE.
bCountIn1_LoadStartValue BOOL	Load starting value into counter FALSE↗TRUE The starting value set in C02840/1 is accepted as the current count value.
Frequency input DI1/DI2	▶ Output of the encoder position of the DI1/DI2 frequency input
bPosIn12_Load BOOL	Load angle integrator with starting value and reset status signal TRUE Angle integrator is loaded with the value at <i>dnPosIn12_Set_p</i> and <i>bPosIn12_State</i> is reset to FALSE.
dnPosIn12_Set_p DINT	Starting value for angle integrator
Counting input DI6	▶ Using DI1(6) as counting input
bCountIn6_ResetCompare BOOL	Reset status signal "Comparison value reached" FALSE↗TRUE The output <i>bCountIn6_Compare</i> is reset to FALSE.
bCountIn6_LoadStartValue BOOL	Load starting value into counter FALSE↗TRUE The starting value set in C02840/3 is accepted as the current count value.

Outputs

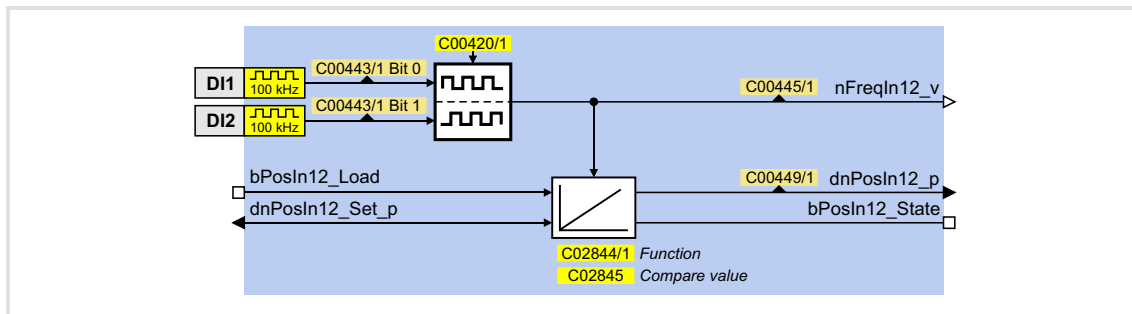
Identifier DIS code data type	Value/meaning
bCInh C00443/2 BOOL	RFR digital input (controller enable)
Digital inputs DI1 ... DI7	▶ Using DI1(6) and DI2(7) as digital inputs
bln1 ... bln7 C00443/2 BOOL	Digital input DI1 ... DI7
Counting input DI1	▶ Using DI1(6) as counting input
bCountIn1_Compare BOOL	Status signal "Comparison value reached" FALSE Current count value < comparison value (C02840/2) TRUE Current count value ≥ comparison value (C02840/2)
wCountIn1_HW wCountIn1_LW C02841/1 WORD	Current count value • Output as High and Low word (without sign) • Possible counting range: 0 ... 2 ³¹ - 1
Frequency input DI1/DI2	▶ Using DI1(6) and DI2(7) as frequency inputs
nFreqIn12_a C00446/1 INT	Output frequency as scaled analog signal in [%]
nFreqIn12_v C00445/1 INT	Output frequency as speed signal in [inc/ms]
dnPosIn12_p DINT	Angle output signal • 65536 [incr.] ≙ 1 encoder revolution • Overflow is possible (display via <i>bPosIn12_State</i>)
bPosIn12_State BOOL	Status signal "Overflow occurred/distance processed" • Status signal can be reset via <i>bPosIn12_Load</i> . TRUE Overflow has occurred or distance is processed.

Identifier <small>DIS code data type</small>	Value/meaning
Counting input DI6	▶ Using DI1(6) as counting input
bCountIn1_Compare <small>BOOL</small>	Status signal "Comparison value reached"
	FALSE Current count value < comparison value (C02840/4)
	TRUE Current count value ≥ comparison value (C02840/4)
wCountIn6_HW wCountIn6_LW <small>C02841/2 WORD</small>	Current count value <ul style="list-style-type: none"> • Output as High and Low word (without sign) • Possible counting range: 0 ... $2^{31} - 1$
Frequency input DI6/DI7	▶ Using DI1(6) and DI2(7) as frequency inputs
nFreqIn67_a <small>C00446/2 INT</small>	Output frequency as scaled analog signal in [%]
nFreqIn67_v <small>C00445/2 INT</small>	Output frequency as speed signal in [inc/ms]

7.1.2.1 Output of the encoder position of the DI1/DI2 frequency input

The [LS DigitalInput](#) system block includes an integrator for providing the encoder position.

- ▶ The integrator can take max. ± 32000 encoder revolutions.
- ▶ The starting position can be loaded via inputs.
- ▶ The internal function can be set via parameters.
- ▶ In addition to the encoder position, the "Overflow occurred/distance processed" status signal is provided.



Inputs

Identifier DIS code data type	Information/possible settings
bPosIn12_Load BOOL	Load angle integrator with starting value and reset status signal TRUE Angle integrator is loaded with the value at <i>dnPosIn12_Set_p</i> and <i>bPosIn12_State</i> is reset to FALSE.
dnPosIn12_Set_p DINT	Starting value for angle integrator

Outputs

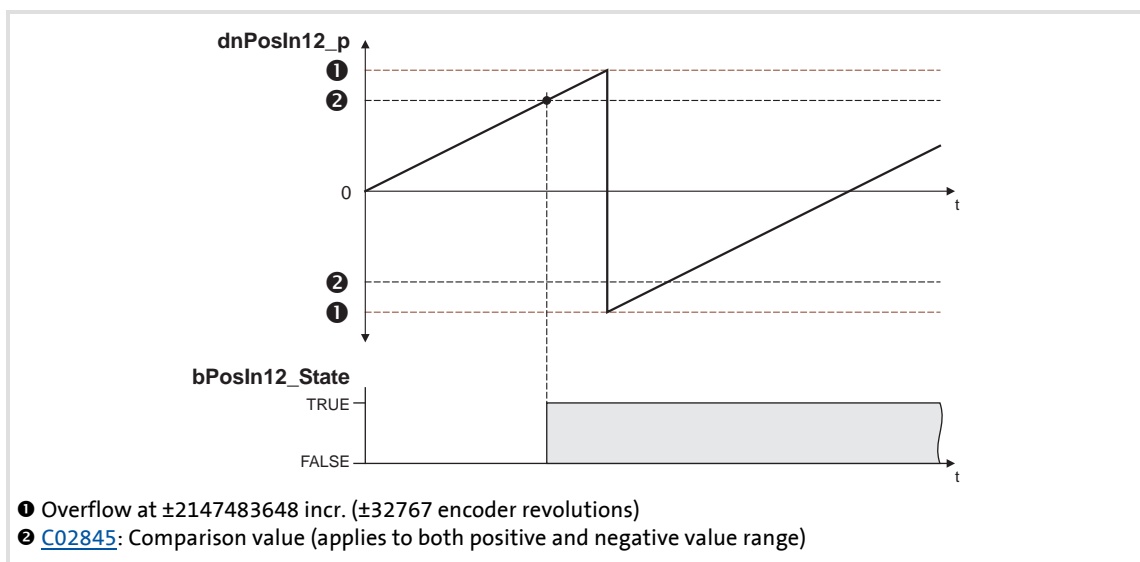
Identifier DIS code data type	Value/meaning
dnPosIn12_p DINT	Angle output signal <ul style="list-style-type: none"> • 65536 [incr.] \equiv 1 encoder revolution • Overflow is possible (display via <i>bPosIn12_State</i>)
bPosIn12_State BOOL	Status signal "Overflow occurred/distance processed" <ul style="list-style-type: none"> • Status signal can be reset via <i>bPosIn12_Load</i>.
	TRUE Overflow has occurred or distance is processed.

Parameter

Parameter	Possible settings	Info
C02844/1	0 Loading with level	Function
	1 Loading with edge	Load integrator with TRUE/TRUE edge at the <i>bPosIn12_Load</i> input.
	2 Loading with level + reset	Load integrator when reaching the comparison value or with TRUE level at the <i>bPosIn12_Load</i> input.
C02845	0	2000000000
		Comparison value <ul style="list-style-type: none"> • Is valid for both the positive and the negative value range. • Lenze setting: 0

Function at constant input value

Selection: [C02844/1](#) = "0: Loading with level" or "1: Loading with edge"



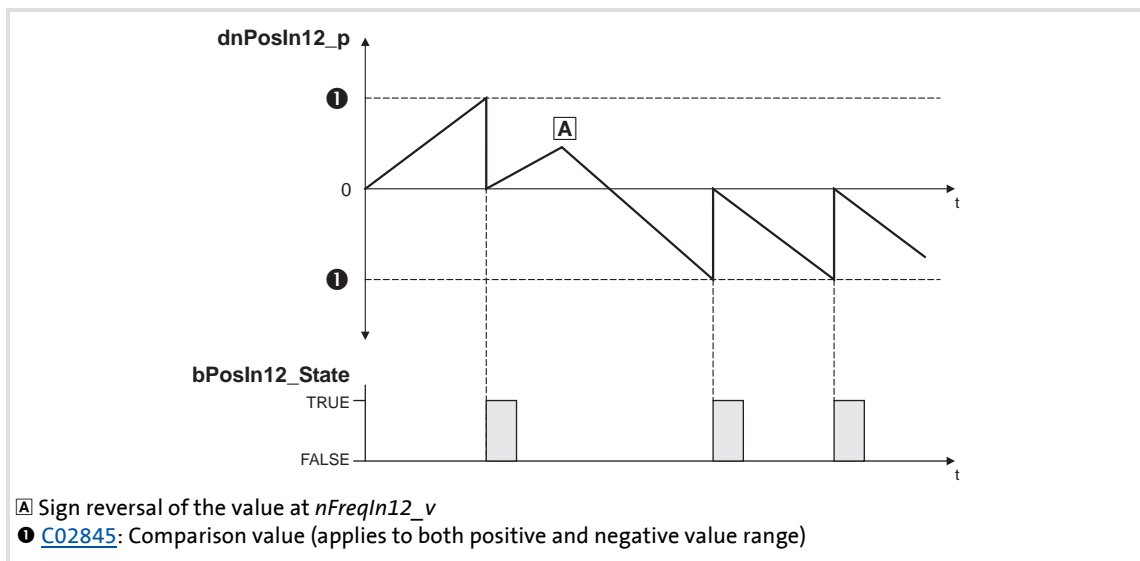
[7-2] Switching performance if the overflow is in the positive direction

- ▶ If "0: Loading with level" is selected in [C02844/1](#), the *bPosIn12_Load* input is status-controlled: In case of a TRUE signal, the integrator is loaded with the value at *dnPosIn12_Set_p* and the *bPosIn12_State* output is set to FALSE.
- ▶ If "1: Loading with edge" is selected in [C02844/1](#), the *bPosIn12_Load* input is edge-controlled: In case of a FALSE/TRUE edge, the integrator is loaded with the value at *dnPosIn12_Set_p* and then immediately continues to integrate, the *bPosIn12_State* output is set to FALSE.
- ▶ A positive *nFreqIn12_v* signal is incremented (the counter content is increased with every cycle).
- ▶ A negative *nFreqIn12_v* signal is decremented (the counter content is reduced with every cycle).

- ▶ *dnPosIn12_p* provides the counter content of the bipolar integrator.
 - If the counter content exceeds a value of +32767 encoder revolutions (corresponds to +2147483647 incr.), an overflow occurs and the counting process continues at a value of -32768 encoder revolutions.
 - If the counter content falls below a value of -32768 encoder revolutions (corresponds to -2147483648 incr.), an overflow occurs and the counting process starts at a value of +32767 encoder revolutions.
- ▶ *bPosIn12_State* is set to TRUE if the comparison value set in [C02845](#) has been reached.

Function at input value with sign reversal

Selection: [C02844/1](#) = "2: Loading with level + reset"



[7-3] Switching performance if the input signal changes signs

- ▶ If "2: Loading with level + reset" is selected in [C02844/1](#), the *bPosIn12_Load* input is status-controlled: In case of a TRUE signal, the integrator is loaded with the value at *dnPosIn12_Set_p* and the *bPosIn12_State* output is set to FALSE.
- ▶ A positive *nFreqIn12_v* signal is incremented (the counter content is increased with every cycle).
- ▶ A negative *nFreqIn12_v* signal is decremented (the counter content is reduced with every cycle).
- ▶ *dnPosIn12_p* provides the counter content of the bipolar integrator.
 - If the positive counter content is higher than the comparison value set in [C02845](#), the comparison value will be subtracted from the counter content, and *bPosIn12_State* will be set to TRUE for one task cycle.
 - If the negative counter content is lower than the comparison value set in [C02845](#), the comparison value will be added to the counter content, and *bPosIn12_State* will be set to TRUE for one task cycle.

Calculation of the output signal

The output value at $dnPosIn12_p$ is calculated as per the formula below:

$$dnPosIn12_p \text{ [incr.]} = nFreqIn12_v \text{ [rpm]} \cdot t \text{ [s]} \cdot 65535 \text{ [incr./rev.]}$$

t = integration time
16384 \approx 15000 rpm
1 \approx 1 incr.

Example

You want to determine the counter content of the integrator at a certain speed at the input and a certain integration time t .

Given values:

- ▶ $nFreqIn12_v = 1000 \text{ rpm} \approx \text{integer value } 1092$
- ▶ Integration time $t = 10 \text{ s}$
- ▶ Starting value of the integrator = 0

Solution:

- ▶ Conversion of the $nFreqIn12_v$ input signal:

$$1000 \text{ rpm} = \frac{1000 \text{ rev.}}{60 \text{ s}}$$

- ▶ Calculation of the output value:

$$dnPosIn12_p = \frac{1000 \text{ rev.}}{60 \text{ s}} \cdot 10 \text{ s} \cdot \frac{65535 \text{ incr.}}{\text{Rev.}} = 10922666 \text{ incr.}$$

7.2 Digital output terminals

The drive controller has

- ▶ three parameterisable output terminals (DO1 ... DO3) for outputting digital signals
- ▶ a relay output (terminal strip X101),
- ▶ a (high-current) output for controlling a brake (terminal strip X107).



Note!

Initialisation behaviour:

- After mains switching up to the start of the application, the digital outputs remain set to FALSE.

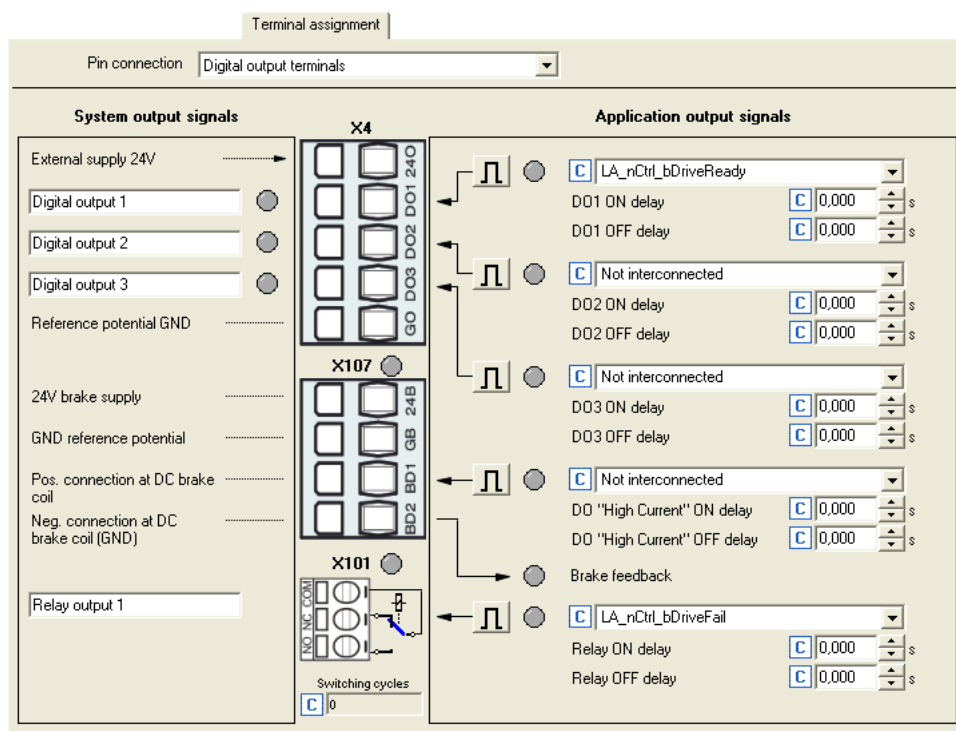
Exception handling:



- In case of a critical exception in the application (e.g. reset), the digital outputs are set to FALSE considering the terminal polarity parameterised in [C00118](#).

Switching cycle diagnostics of the relay:

- A reference for evaluating the wear limit can be obtained via the number of switching cycles of the relay displayed in [C00177/2](#).

Parameterisation dialog in the »Engineer«:



Button	Function
	Indicates that the polarity of the output is HIGH active. The polarity can be changed from HIGH active to LOW active by clicking this button.
	Indicates that the polarity of the output is LOW active. The polarity can be changed from LOW active to HIGH active by clicking this button.

Short overview of parameters for the digital output terminals:

Parameter	Info	Lenze setting	
		Value	Unit
Digital outputs DO1/DO2			
C00118	DigOutX: Inversion	Bit coded	
C00423/3	DO1 ON delay	0.000	s
C00423/4	DO1 OFF delay	0.000	s
C00423/5	DO2 ON delay	0.000	s
C00423/6	DO2 OFF delay	0.000	s
C00423/7	DO3 ON delay	0.000	s
C00423/8	DO3 OFF delay	0.000	s
C00444/1	DOx: Input level	-	
C00444/2	DOx: Terminal level	-	
High current output			
C00423/9	DO "High Current" ON delay	0.000	s
C00423/10	DO "High Current" OFF delay	0.000	s
C00117	Status of brake output BD	-	
Relay output			
C00423/1	Relay ON delay	0.000	s
C00423/2	Relay OFF delay	0.000	s
Digital outputs - terminal configuration			
C00621/1	LS_DigitalOutput:bRelay	1001: LA_nCtrl_bDriveFail	
C00621/2	LS_DigitalOutput:bOut1	1000: LA_nCtrl_bDriveReady	
C00621/99	LS_DigitalOutput: bOut2	0: Not connected	
C00621/100	LS_DigitalOutput: bOut3	0: Not connected	
C00621/101	LS_DigitalOutput: bOut HighCurrent	0: Not connected	

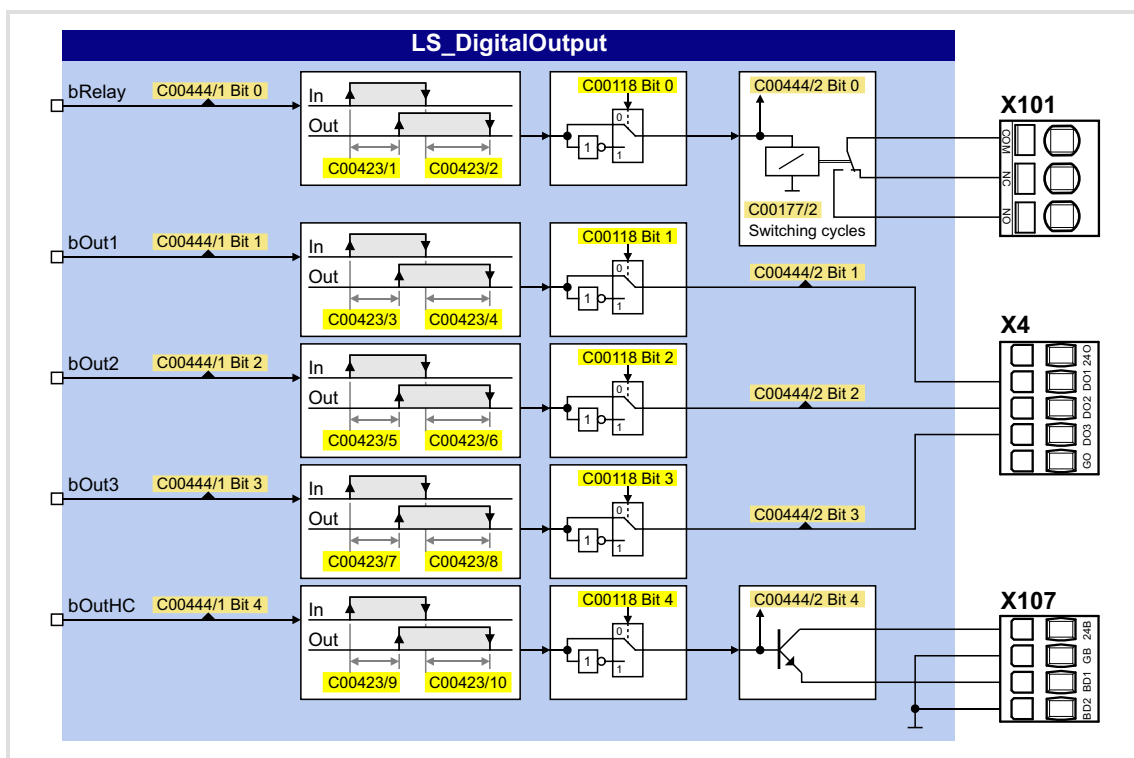
Highlighted in grey = display parameter

Related topics:

- ▶ [Configuring exception handling of the output terminals](#) (📄 369)
- ▶ [User-defined terminal assignment](#) (📄 370)

7.2.1 Internal interfaces | System block "LS_DigitalOutput"

The LS_DigitalOutput system block maps the digital output terminals in the FB editor.



Input	Information/possible settings
bRelay DIS code data type C00444/1 BOOL	Relay output, potential-free two-way switch
bOut1 ... bOut3 C00444/1 BOOL	Digital output DO1 ... DO3
bOutHC C00444/1 BOOL	Output for brake control

7.3 Analog terminals

The analog input terminals together with the analog output terminals are located on the X3 plug connector.

Analog input terminals

The drive controller has four analog input terminals for detecting two current signals and two voltage signals:

- ▶ Voltage signals in the ± 10 V range
The voltage signal can be e.g. an analog speed setpoint or the signal of an external sensor (temperature, pressure, etc.).
- ▶ Current signals in the 0/+ 4 ... + 20 mA range
For open-circuit monitoring, the current signal can be evaluated with regard to "Life Zero" or "Dead Zero":
 - 0 ... 20 mA, without open-circuit monitoring
 - 4 ... 20 mA, with open-circuit monitoring



Note!

To avoid undefined states, free input terminals of the controller must be assigned as well, e.g. by applying 0 V to the terminal.

Analog output terminals

The drive controller has four analog output terminals.

- ▶ Two output terminals output an analog current signal (O1I, O2I)
- ▶ Two output terminals output an analog voltage signal (O1U, O2U)



Note!

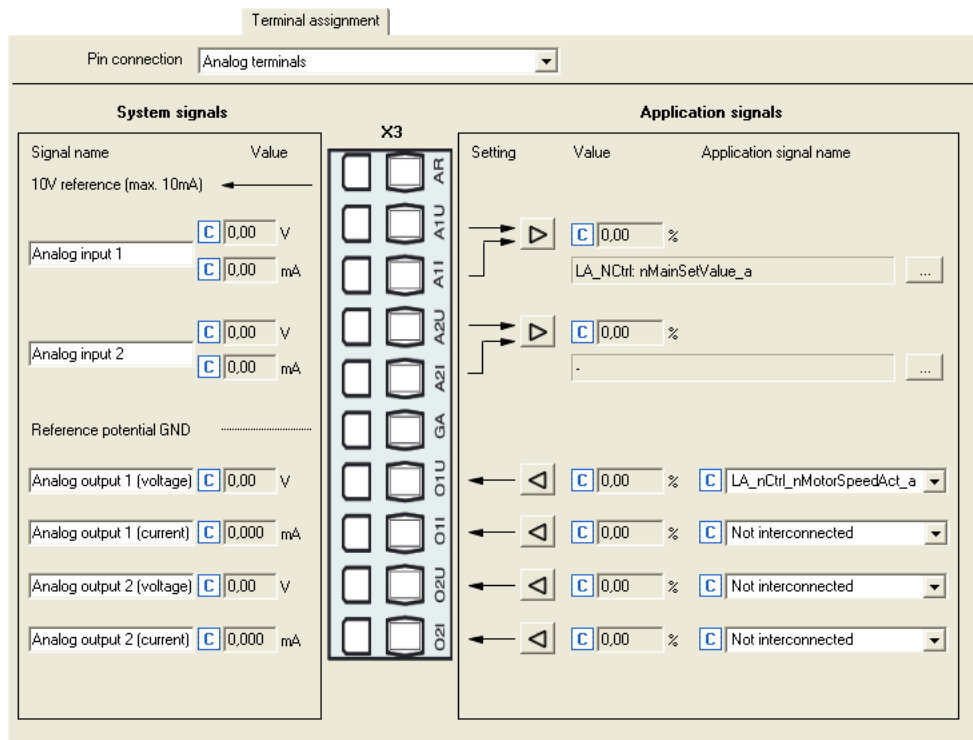
Initialisation behaviour:

- After mains switching up to the start of the application, the analog outputs remain set to 0 V.

Exception handling:

- In case of a critical exception in the application (e.g. reset), the analog outputs are set to 0 V.

Parameterisation dialog in the »Engineer«:



Button	Function
	Parameterising analog input (📖 355)
	Parameterising analog output (📖 359)
	Open the parameterising dialog for assigning application inputs to the analog input. ▶ Changing the terminal assignment with the »Engineer« (📖 374)

Short overview of parameters for the analog terminals:

Parameter	Info	Lenze setting	
		Value	Unit
Analog input 1			
C00028/1	AIN1: Input voltage	-	V
C00029/1	AIN1: Input current	-	mA
C00033/1	AIN1: Output value (to application)	-	%
Analog input 2			
C00028/2	AIN2: Input voltage	-	V
C00029/2	AIN2: Input current	-	mA
C00033/2	AIN2: Output value (to application)	-	%

Highlighted in grey = display parameter


Parameter	Info	Lenze setting	
		Value	Unit
Analog output 1			
C00439/1	O1U: Input value (from application)	-	%
C00439/3	O1I: Input value (from application)	-	%
C00436/1	O1U: Voltage	-	V
C00437/1	O1I: Current	-	mA
Analog output 2			
C00439/2	O2U: Input value (from application)	-	%
C00439/4	O2I: Input value (from application)	-	%
C00436/2	O2U: Voltage	-	V
C00437/2	O2I: Current	-	mA
Analog outputs - terminal assignment			
C00620/1	LS_AnalogOutput: nOut1_a (V)	1003: LA_nCtrl_nMotorSpeedAct_a	
C00620/39	LS_AnalogOutput: nOut1_a (I)	0: Not connected	
C00620/38	LS_AnalogOutput: nOut2_a (V)	0: Not connected	
C00620/40	LS_AnalogOutput: nOut2_a (I)	0: Not connected	

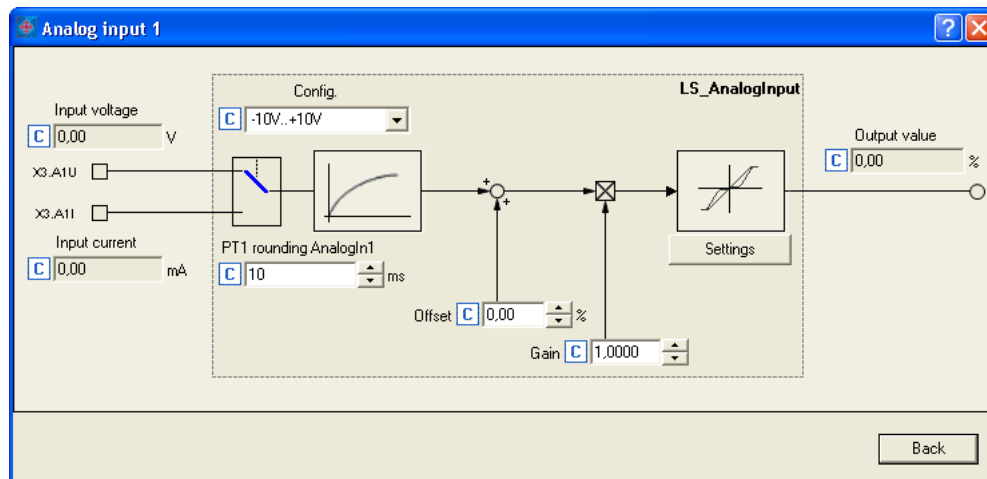
Highlighted in grey = display parameter

Related topics:

- ▶ [Configuring exception handling of the output terminals](#) (□ 369)
- ▶ [User-defined terminal assignment](#) (□ 370)

7.3.1 Parameterising analog input

By clicking on the  button on the **Terminal assignment** tab, you reach the parameterising dialog for the corresponding analog input:



Short overview of parameters for the analog inputs:

Parameter	Info	Lenze setting	
		Value	Unit
Analog input 1			
C00034/1	AIN1: Config.	0: -10V..+10V	
C00026/1	AIN1: Offset	0.00	%
C00027/1	AIN1: Gain	1.0000	
C00028/1	AIN1: Input voltage	-	V
C00029/1	AIN1: Input current	-	mA
C00033/1	AIN1: Output value (to application)	-	%
C00440/1	PT1 rounding AnalogIn1	10	ms
C00598/1	Resp. to open circuit AIN1	3: TroubleQuickStop	
Analog input 2			
C00034/2	AIN2: Config.	0: -10V..+10V	
C00026/2	AIN2: Offset	0.00	%
C00027/2	AIN2: Gain	1.0000	
C00028/2	AIN2: Input voltage	-	V
C00029/2	AIN2: Input current	-	mA
C00033/2	AIN2: Output value (to application)	-	%
C00440/2	PT1 rounding AnalogIn2	10	ms
C00598/2	Resp. to open circuit AIN2	3: TroubleQuickStop	

Highlighted in grey = display parameter

Using current input A1I/A2I

In the Lenze setting, voltage signals in the range of ± 10 V are evaluated via the A1U and A2U input terminals. If current signals are detected via the A1I or A2I input terminals instead, the selection "1: 0...20mA" or "2: 4...20mA" is to be set in [C00034](#).



Tip!

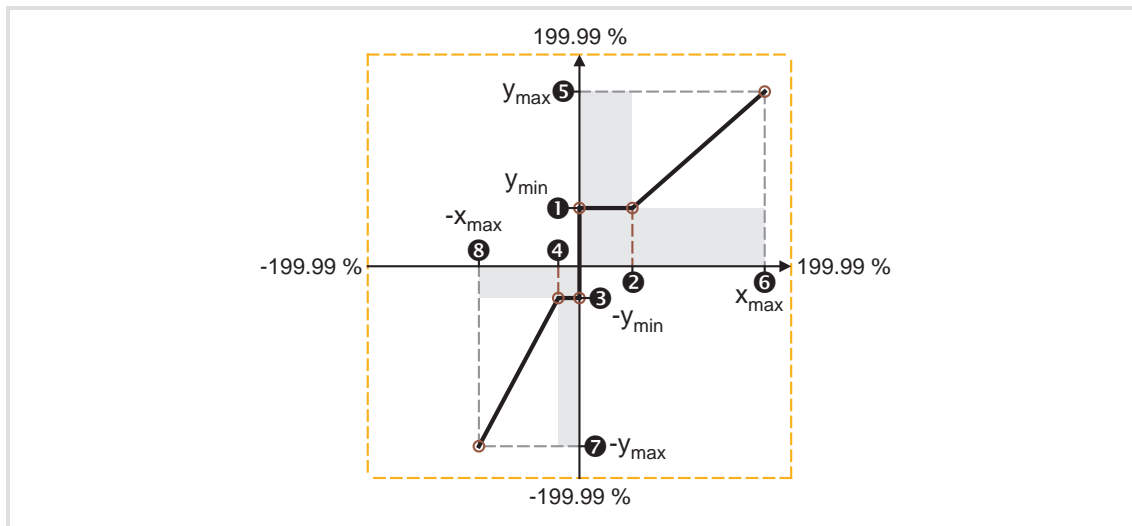
By selecting "2: 4...20mA", you can implement a 4 ...20 mA current loop, e.g. for stipulation of the speed setpoint.

Open-circuit monitoring

In the case of configuration as a 4 ... 20 mA current loop, the fault response set in [C00598](#) takes place in the event of a wire breakage (Lenze setting: "TroubleQuickStop").

7.3.1.1 Signal adaptation by means of characteristic

According to the illustration below, an individual characteristic can be parameterised for the analog inputs via the subcodes of [C00010](#) and [C00020](#) to provide different slopes and a dead band. Here, the input signal corresponds to the X axis and the output signal corresponds to the Y axis:




[7-4] Characteristic for analog inputs

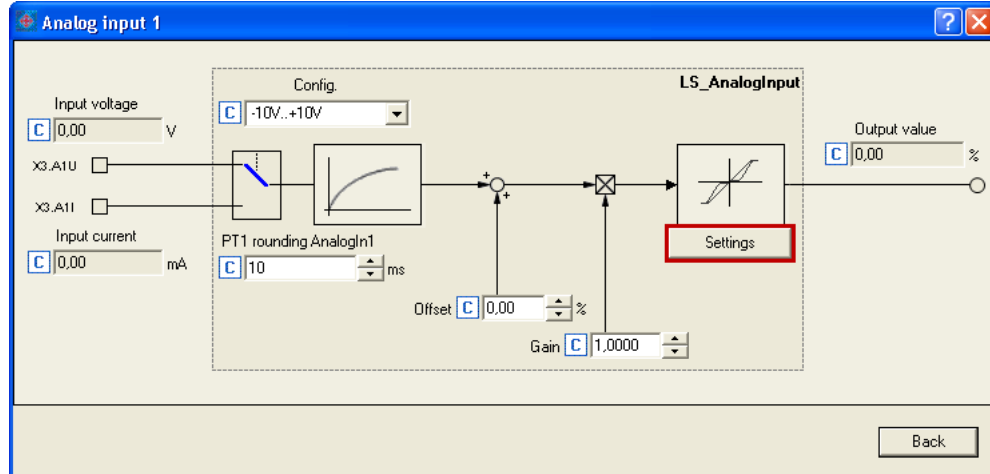
Parameter	Info	Lenze setting	
		Value	Unit
C00010/1	➊ AIN1: (+y0) = min	0.00	%
C00010/2	➋ AIN1: (+x0) = Dead band	1.00	%
C00010/3	➌ AIN1: (-y0) = (-min)	0.00	%
C00010/4	➍ AIN1: (-x0) = (-Dead band)	1.00	%
C00010/5	➎ AIN1: (+ymax)	199.99	%
C00010/6	➏ AIN1: (+xmax)	199.99	%
C00010/7	➐ AIN1: (-ymax)	199.99	%
C00010/8	➑ AIN1: (-xmax)	199.99	%
C00020/1	➊ AIN2: (+y0) = min	0.00	%
C00020/2	➋ AIN2: (+x0) = Dead band	1.00	%
C00020/3	➌ AIN2: (-y0) = (-min)	0.00	%
C00020/4	➍ AIN2: (-x0) = (-Dead band)	1.00	%
C00020/5	➎ AIN2: (+ymax)	199.99	%
C00020/6	➏ AIN2: (+xmax)	199.99	%
C00020/7	➐ AIN2: (-ymax)	199.99	%
C00020/8	➑ AIN2: (-xmax)	199.99	%

In the »Engineer«, there is a parameterising dialog for entering the characteristic. This dialog also displays the set characteristic graphically.

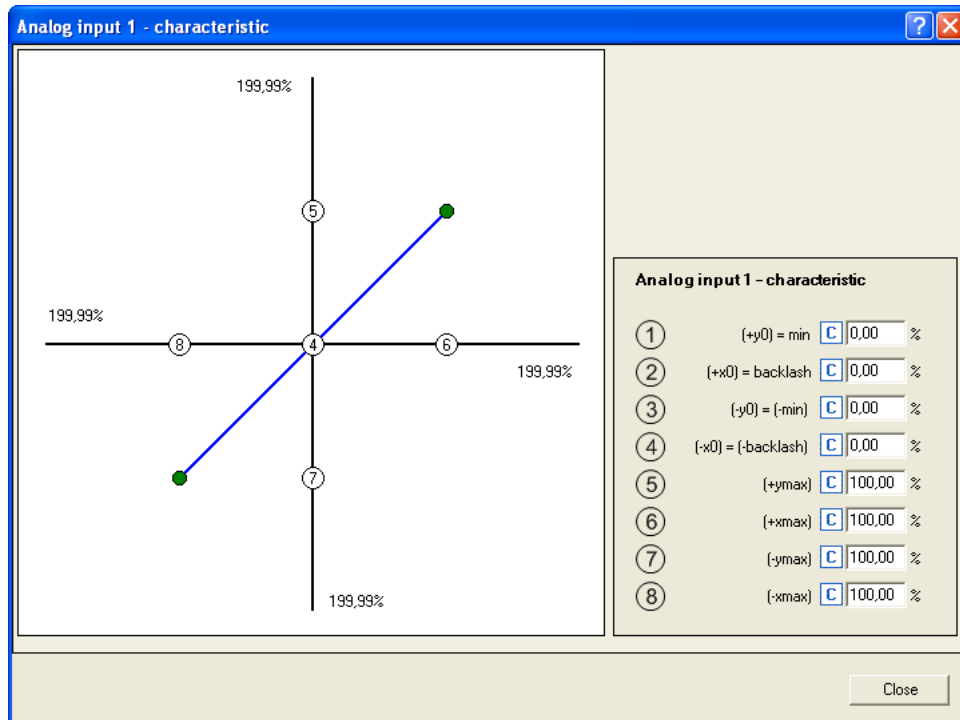


Proceed as follows to open the dialog for parameterising the characteristic:


1. Go to the **Terminal assignment** tab and select the "Analog terminals" entry in the **Control connections** list field.
2. Click on the  button for the analog input in order to open the *Analog input* dialog.

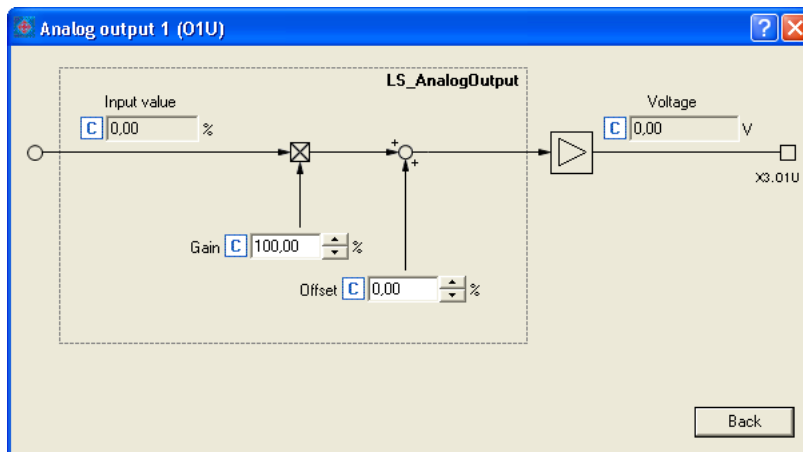


3. Click on the **Settings** button in order to open the *Analog input - Characteristic* dialog box:



7.3.2 Parameterising analog output

By clicking on the  button on the **Terminal assignment** tab, you can open the parameterising dialog for the corresponding analog output (here: O1U):



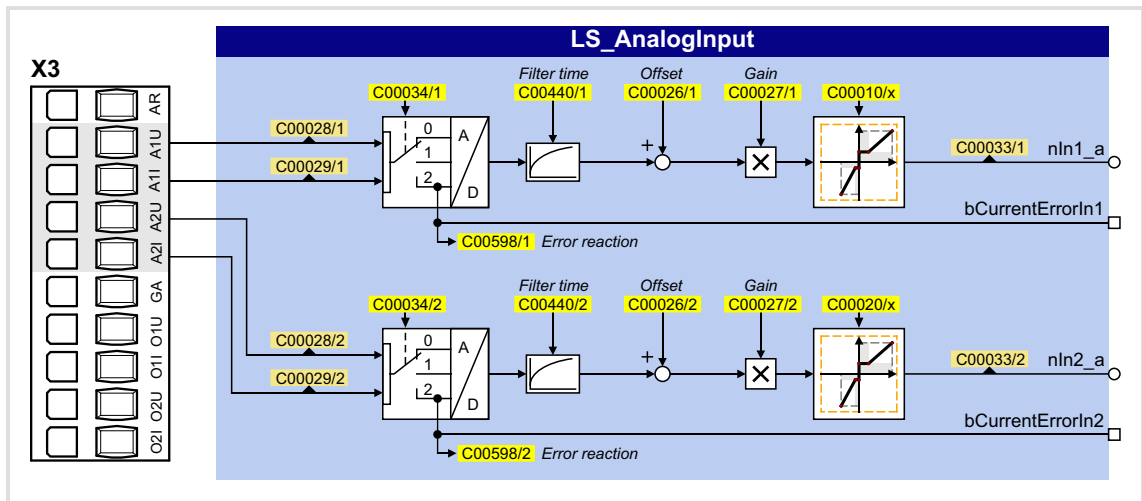
Short overview of parameters for the analog outputs:

Parameter	Info	Lenze setting	
		Value	Unit
Analog output 1			
C00434/1	O1U: Gain	100.00	%
C00435/1	O1U: Offset	0.00	%
C00439/1	O1U: Input value (from application)	-	%
C00439/3	O1I: Input value (from application)	-	%
C00436/1	O1U: Voltage	-	V
C00437/1	O1I: Current	-	mA
Analog output 2			
C00434/2	O2U: Gain	100.00	%
C00435/2	O2U: Offset	0.00	%
C00439/2	O2U: Input value (from application)	-	%
C00439/4	O2I: Input value (from application)	-	%
C00436/2	O2U: Voltage	-	V
C00437/2	O2I: Current	-	mA

Highlighted in grey = display parameter

7.3.3 Internal interfaces | System block "LS_AnalogInput"

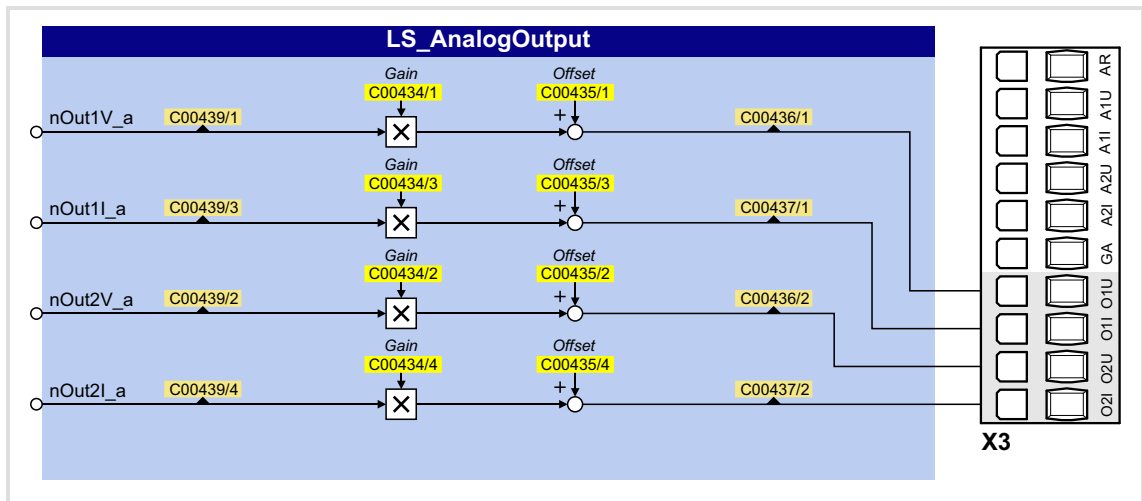
The LS_AnalogInput system block maps the analog inputs in the FB editor.



Output	Value/meaning
DIS code data type nIn1_a C00033/1 INT	Analog input 1 • Scaling: $\pm 2^{14} \equiv \pm 10 \text{ V}$ for use as voltage input $+2^{14} \equiv +20 \text{ mA}$ for use as current input
bCurrentErrorIn1 BOOL	Status signal "Current input error" • Only when analog input 1 is used as current input. • Application: Cable-breakage monitoring of the 4 ...20 mA circuit. TRUE $ I_{AIN1} < 4 \text{ mA}$
nIn2_a C00033/2 INT	Analog input 2 • Scaling: $\pm 2^{14} \equiv \pm 10 \text{ V}$ for use as voltage input $+2^{14} \equiv +20 \text{ mA}$ for use as current input
bCurrentErrorIn2 BOOL	Status signal "Current input error" • Only when analog input 2 is used as current input. • Application: Cable-breakage monitoring of the 4 ...20 mA circuit. TRUE $ I_{AIN2} < 4 \text{ mA}$

7.3.4 Internal interfaces | System block "LS_AnalogOutput"

The LS_AnalogInput system block maps the analog outputs in the FB editor.



Input	DIS code data type	Information/possible settings
nOut1V_a	C00439/1 INT	Analog output 1 (voltage) • Scaling: $2^{14} \equiv 16384 \equiv 10 \text{ V}$
nOut1I_a	C00439/3 INT	Analog output 1 (current) • Scaling: $2^{14} \equiv 16384 \equiv 20 \text{ mA}$
nOut2V_a	C00439/2 INT	Analog output 2 (voltage) • Scaling: $2^{14} \equiv 16384 \equiv 10 \text{ V}$
nOut2I_a	C00439/4 INT	Analog output 2 (current) • Scaling: $2^{14} \equiv 16384 \equiv 20 \text{ mA}$

7.4 Touch probe detection

"Touch probe" (TP) in general means quick detection of a position by a quick sensor if the pulse duration of the sensor signal is too short to be detected by a "normal" digital input (scanning time: 1 ms).

Moreover, touch probe requires exact detection of the position. Here, the difference in position between the 1 ms position detection and the touch probe signal is considered as correction value.

Applications:

- ▶ Precise approach of a position at a previously detected signal mark
- ▶ High-precision traversing of a section starting at a previously detected signal mark
- ▶ Safe detection of signal marks with very short signal edges
- ▶ Measurement of a high-precision position at a previously detected signal mark
- ▶ Homing to touch probe (homing signal)
- ▶ Relative residual path positioning (traversing of a section starting at signal mark)
- ▶ Absolute positioning to target position, activated by a safely detected signal mark
- ▶ Position measurement of a distance between 2 signal marks

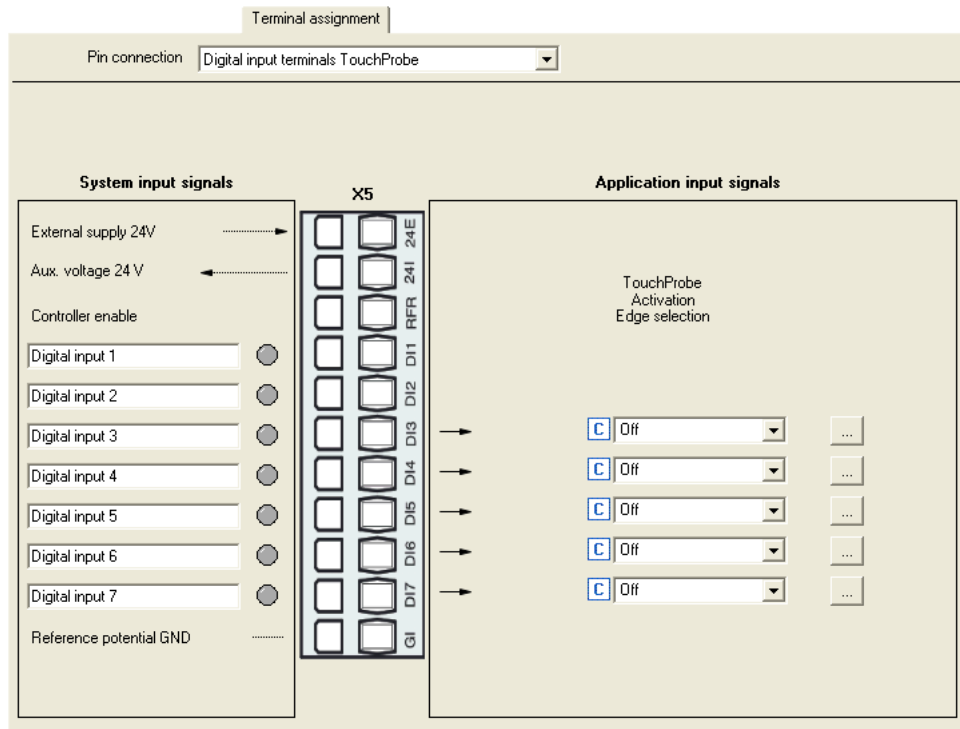
Overview of touch probe signal sources

The 8400 TopLine provides the following signal sources for touch probe detection which can be configured independently:

Signal source	Edge sensitivity	Applications
Digital input DI3 ... Digital input DI7	Rising edge, falling edge, rising and falling edge (parameterisable)	Homing Residual path positioning Position measurement Freely interconnectable
Zero pulse - resolver*	Rising edge	Homing
Zero pulse - Multi-Encoder*	Rising edge	Homing

* in preparation

Parameterisation dialog in the »Engineer«:



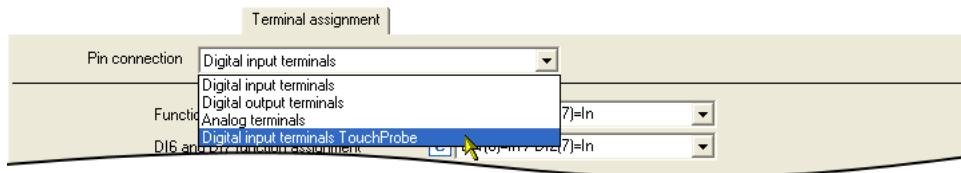
Button	Function
	Open the parameterisation dialog for the selected TP source. ▶ Parameter setting (□ 364)

Parameter	Info	Lenze setting	
		Value	Unit
C02810/3...7	TPDigIn3 ... TPDigIn7: Edge selection	0:	Off

7.4.1 Parameter setting

Proceed as follows to open the parameterisation dialog for setting a TP signal source:

1. Go to the **Terminal Assignment** tab and select "Digital input terminals TouchProbe" in the **Control connections** list field:

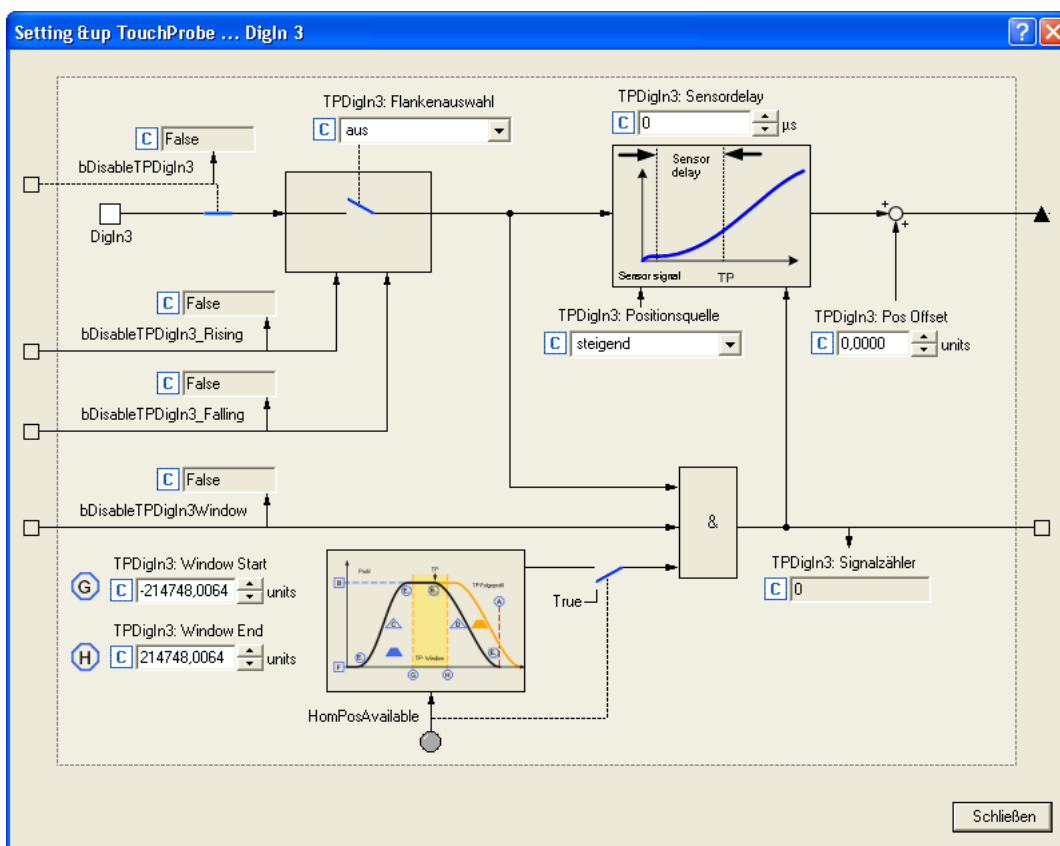


2. Click the **...** button for the digital input that is to be set for the touch probe detection.



Tip!

If the "Table positioning" technology application is used, the following parameterisation dialog can be opened for the selected TP source in the parameterisation dialogs for the [Profile entry](#) and the basic "[Homing](#)" function via the **Set up touch probe...** button:



Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C02810/3...7	TPDigIn3 ... TPDigIn7: Edge selection	0: Off	
C02811/3...7	TPDigIn3 ... TPDigIn7: Sensor delay	0	µs
C02812/3...7	TPDigIn3 ... TPDigIn7: Pos Offset	0.0000	units
C02813/1...3	TPDigIn3 ... TPDigIn5: Window start	0.0000	units
C02814/1...3	TPDigIn3 ... TPDigIn5: Window end	0.0000	units
C02815/3...7	TPDigIn3 ... TPDigIn7: Position source	0: Position encoder actual value	
C02816/3...7	TPDigIn3 ... TPDigIn7: Signal counter	-	

Highlighted in grey = display parameter

Edge selection

Select which edge the corresponding input is to respond to.

- ▶ In the case of signal sources DI3 ... DI5, the edge sensitivity can also be dynamically changed via inputs at the [LS TouchProbe SB](#).

Sensor delay

This setting serves to compensate for a sensor delay of the touch probe sensor, if any.

- ▶ Typical values for laser photoelectric barriers are e.g. 300 µs.
- ▶ Delay of the digital inputs for the 8400 device series:
 - 5 µs for a rising edge
 - 25 µs for a falling edge
- ▶ Internal automatic compensation for device-internal signal delay due to encoder zero pulse.

Pos Offset

Use this setting to add an offset to the position value measured by touch probe. This may be required if the touch probe sensor has assumed a disadvantageous position on the machine. By adding an offset the touch probe sensor can be moved to a position which is more convenient to the application.

Window start / end

Via the two parameters Window start ([C02813/x](#)) and Window end ([C02814/x](#)), acceptance windows can be set for the DI3 ... DI5 signal sources in which the touch probe signal is accepted.

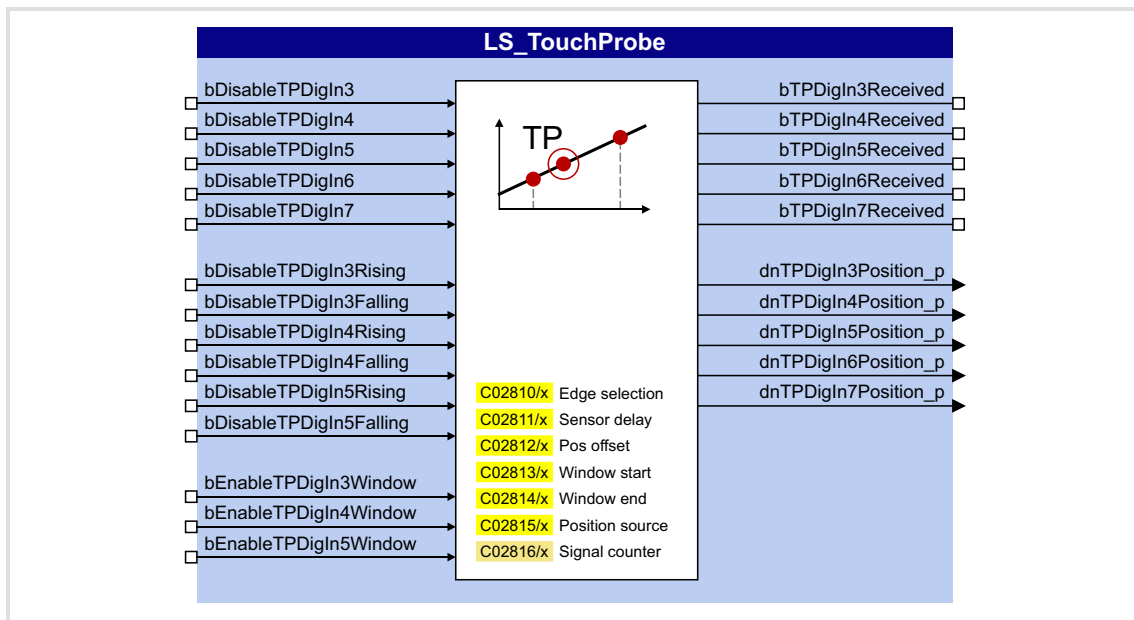
- ▶ The acceptance windows can be dynamically activated via the inputs at the [LS TouchProbe](#) SB.
- ▶ If the actual position is outside the acceptance window, touch probe is automatically deactivated.
- ▶ If both window limits are set to "0", the acceptance window does not have any effect.
- ▶ To properly use this function, the drive needs to know the home position (zero position).

Position source

Selection of the position signal source to be measured with touch probe. This usually is the actual position of the motor / encoder position encoder.

7.4.2 Internal interfaces | System block "LS_TouchProbe"

The LS_TouchProbe system block provides the internal interfaces for touch probe detection in the function block editor:



Inputs

Input	Data type	Information/possible settings
bDisableTPDigIn3...7	BOOL	DI3 ... DI7: Dynamically deactivate TP function TRUE TP function is deactivated.
bDisableTPDigIn3...5Rising	BOOL	DI3 ... DI5: Dynamically deactivate detection of rising edges TRUE Detection of rising edges is deactivated.
bDisableTPDigIn3...5Falling	BOOL	DI3 ... DI5: Dynamically deactivate detection of falling edges TRUE Detection of falling edges is deactivated.
bEnableTPDigIn3...5Window	BOOL	DI3 ... DI5: Activate acceptance window TRUE Acceptance window function is active: • If the actual position is outside the acceptance window, whose starting position is set in C02813/x and whose end position is set in C02814/x , touch probe is automatically deactivated.

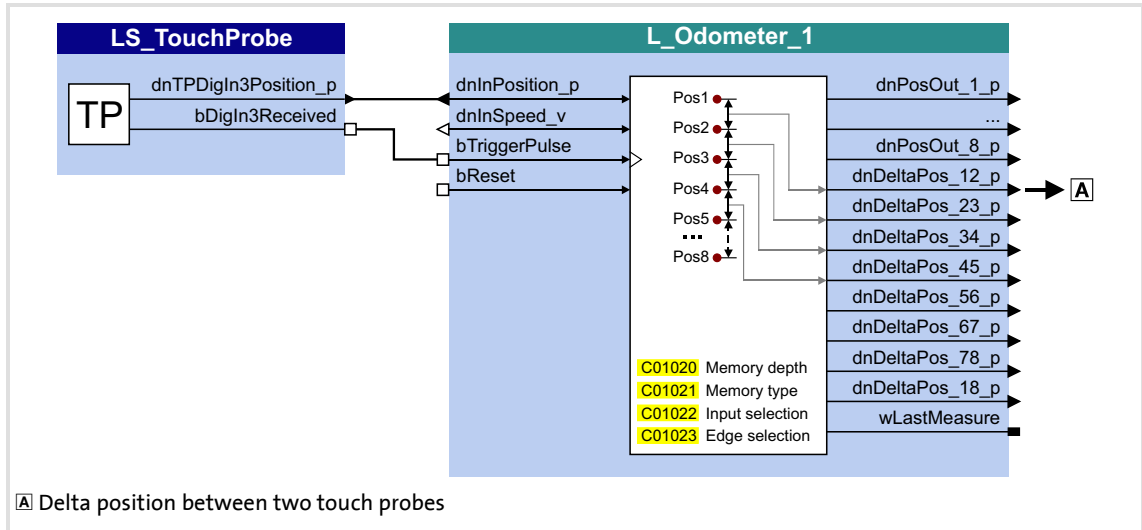
Outputs

Output	Data type	Value/meaning
bTPDigIn3...7Received	BOOL	TRUE DI3 ... DI7: Touch probe received. • The signal is only pending for one task cycle (1 ms).
dnTPDigIn3...7Position_p	DINT	DI3 ... DI7: Position measured by touch probe in [units]

7.4.2.1 Application example: "Position measurement"

The touch probe function can be combined with the [L Odometer](#) FB for a position measurement. This FB is able to save position signals to a ring buffer and detect differences between two position signals.

In the wiring below, digital input DI3 is used to connect the touch probe sensor. For the sake of clarity, irrelevant inputs and outputs of the [LS TouchProbe](#) SB are masked out.



[7-5] Wiring for position measurement

7.5 Configuring exception handling of the output terminals

Exception handling for the analog and digital output terminals in the event of an error can be set via decoupling configuration and decoupling values.

- ▶ Bit coded selection is carried out in [C00441](#) for the analog output terminals, defining the events that will trigger decoupling.
- ▶ Bit coded selection is carried out in [C00447](#) for the digital output terminals, defining the events that will trigger decoupling.

Bit	Event
Bit 0 <input type="checkbox"/>	SafeTorqueOff
Bit 1 <input type="checkbox"/>	ReadyToSwitchOn
Bit 2 <input type="checkbox"/>	SwitchedOn
Bit 3 <input type="checkbox"/>	Reserved
Bit 4 <input type="checkbox"/>	Trouble
Bit 5 <input type="checkbox"/>	Fault
Bit 6 <input type="checkbox"/>	Reserved
Bit 7 <input type="checkbox"/>	Reserved
Bit 8 <input type="checkbox"/>	Reserved
Bit 9 <input type="checkbox"/>	Fail CAN_Management
Bit 10 <input type="checkbox"/>	Reserved
Bit 11 <input type="checkbox"/>	Reserved
Bit 12 <input type="checkbox"/>	Reserved
Bit 13 <input type="checkbox"/>	Reserved
Bit 14 <input type="checkbox"/>	Reserved
Bit 15 <input type="checkbox"/>	Reserved

Finally, the following parameters define the value/status that the output terminals are to have when they are decoupled:

Parameter	Info	Lenze setting	
		Value	Unit
C00442/1	AOut1_U: Decoupling value	0.00	%
C00442/2	AOut2_U: Decoupling value	0.00	%
C00442/3	AOut1_I: Decoupling value	0.00	%
C00442/4	AOut2_I: Decoupling value	0.00	%
C00448	DigOut decoupling value	Bit coded	

Related topics:

- ▶ [Configuring exception handling of the CAN PDOs](#) (666)

7.6 User-defined terminal assignment

In order to individually adapt the preconfigured assignment of the input/output terminals to your application, you can choose one of the following procedures:

A. In the »Engineer«:

- Change the terminal assignment on the **Terminal assignment** tab.
- Change the signal assignment on the **Application Parameters** tab, on the dialog level *Overview* → *Signal flow*.
- Change the interconnections in the FB editor (on the I/O level).

B. In the »Engineer« or with the keypad:

- Change the parameters for signal configuration in the parameters list.



Note!

If you change the preconfigured assignment of the input/output terminals, the terminal assignment will be a user-defined one. In [C00007](#), control mode "0: Interconnection changed" will be shown.



Tip!

First of all, select a Lenze configuration useful for the purpose at hand by going to [C00005](#) and selecting a technology application that matches your drive task and then going to [C00007](#) and selecting an appropriate control mode. You will then have an application for which there is a signal flow, logical block links and terminal assignment.

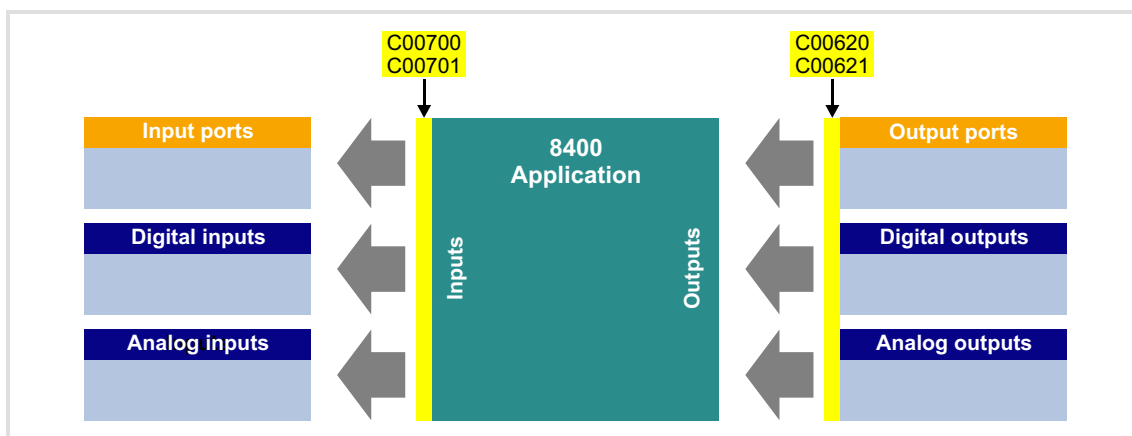
We recommend using the »Engineer« for the implementation of comprehensive user-defined drive solutions.

7.6.1 Source-destination principle

The I/O configuration of the input and output signals is carried out according to the source/destination principle:

- ▶ A connection always has a direction and therefore always has a source and a target.
- ▶ The inputs signals of the technology application are logically linked to the outputs of system blocks which represent the device input terminals.
- ▶ The inputs of system blocks that represent the device output terminals are logically linked to output signals of the technology application.

The following graphic illustrates the source/destination principle:



[7-6] Source-destination principle

Note the following:

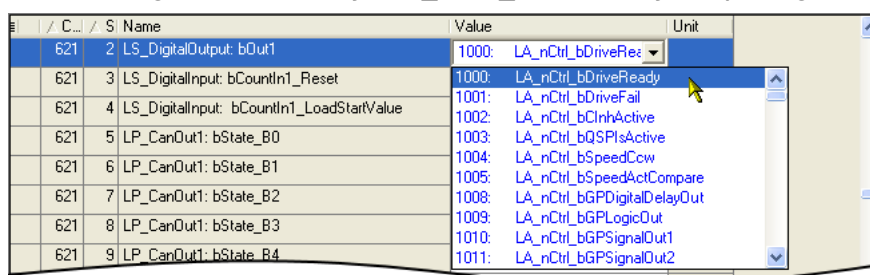
- ▶ An equipment input terminal can be logically linked to several inputs of the application block.
- ▶ Every input of the application block can only be logically linked to one input signal.
- ▶ An output of the application block can be logically linked to several device output terminals.

7.6.2 Changing the terminal assignment with the keypad

You can reconfigure the preconfigured terminal assignment with the keypad (and with the »Engineer«) by means of so-called configuration parameters.

- ▶ Each configuration parameter represents a signal input of a system block or application block.
- ▶ Each configuration parameter contains a selection list with output signals of the same type of data.
- ▶ Logical linking is thus carried out by selecting the output signal for the corresponding signal input.

In the following example, digital output 1 (**LS_DigitalOutput.bOut1** input) is logically linked to the status signal "Drive ready" (**LA_nCtrl_bDriveReady** output signal):



Configuration parameters for the analog and digital output terminals

The preconfigured assignment of the analog and digital output terminals can be altered by means of the subcodes of [C00620](#) and [C00621](#):

Parameter	Info	Lenze setting	
		Value	Unit
Analog outputs - terminal assignment			
C00620/1	LS_AnalogOutput: nOut1_a (V)	1003: LA_nCtrl_nMotorSpeedAct_a	
C00620/39	LS_AnalogOutput: nOut1_a (I)	0: Not connected	
C00620/38	LS_AnalogOutput: nOut2_a (V)	0: Not connected	
C00620/40	LS_AnalogOutput: nOut2_a (I)	0: Not connected	
Digital outputs - terminal assignment			
C00621/1	LS_DigitalOutput:bRelay	1001: LA_nCtrl_bDriveFail	
C00621/2	LS_DigitalOutput:bOut1	1000: LA_nCtrl_bDriveReady	
C00621/99	LS_DigitalOutput: bOut2	0: Not connected	
C00621/100	LS_DigitalOutput: bOut3	0: Not connected	
C00621/101	LS_DigitalOutput: bOut HighCurrent	0: Not connected	

Other subcodes (not shown here) allow the configuration of input signals of different system blocks and port blocks.

Configuration parameters for the inputs of the technology application

The following parameters can be used to change the preconfigured assignment of the application inputs:

Parameter	Info
TA "Actuating drive speed": Configuration parameters (407)	
C00700/x	Analog connection list
C00701/x	Digital connection list
TA "Table positioning": Configuration parameters (436)	
C00710/x	Analog connection list
C00711/x	Digital connection list
TA "Switch-off positioning": Configuration parameters (464)	
C00760/x	Analog connection list
C00761/x	Digital connection list

Example

Task: Starting from the preset technology application "Actuating drive speed" and the "Terminals 0" control mode, the DI2 digital input is to be used for choosing an alternative acceleration/deceleration time for the main setpoint instead of for choosing the fixed setpoint 2/3. To do this, the DI2 digital input is not to be linked to the *bJogSpeed2* input but to the *bJogRamp1* input of the application module.

Procedure:

1. Use the keypad to go to the menu level **Applications → Actuating drive speed (conf.)**. This menu level contains all the configuration parameters of the "Actuating drive speed" technology application". [Configuration parameters \(407\)](#)
2. Navigate to the configuration parameter LA_NCtrl: *bJogSpeed2* ([C00701/10](#)) which represents the logical signal link of the application input *bJogSpeed2*.
3. Change the setting of [C00701/10](#):
Change selection "16001: DigIn_bIn2" in selection "0: Not interconnected".
4. Navigate to the configuration parameter LA_NCtrl: *bJogRamp1* ([C00701/13](#)) which represents the logical signal link of the application input *bJogRamp1*.
5. Change the setting of [C00701/13](#):
Change selection "0: Not interconnected" in selection "16001: DigIn_bIn2".



Tip!

The example shows that, for each input of the application block, the associated configuration parameter ([C00700/x](#) or [C00701/x](#)) is only allowed to contain one source that you enter.

7.6.3 Changing the terminal assignment with the »Engineer«

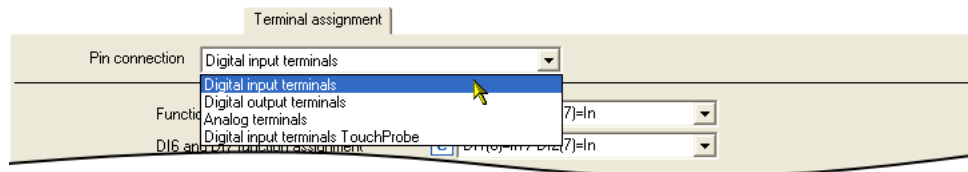
Whereas the configuration parameters referred to have to be parameterised with the keypad, implementation in the »Engineer« is much easier due to the availability of the corresponding dialogs. The following task illustrates the respective procedure.

Task: Starting from the preset technology application "Actuating drive speed" and the "Terminals 0" control mode, the DI2 digital input is to be used for choosing an alternative acceleration/deceleration time for the main setpoint instead of for choosing the fixed setpoint 2/3. To do this, the DI2 digital input is not to be linked to the *bJogSpeed2* input but to the *bJogRamp1* input of the application module.

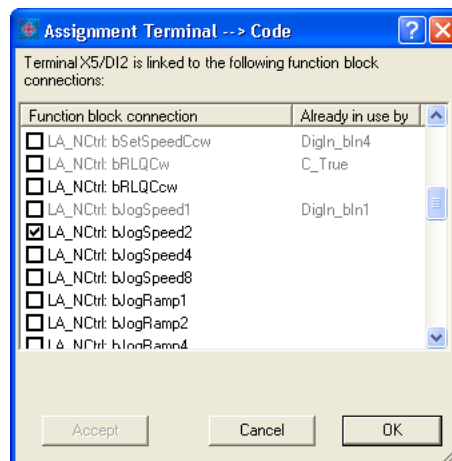
Possibility 1: Change terminal assignment by means of the Terminal Assignment tab

Procedure:

1. Go to the **Terminal Assignment** tab and select "Digital input terminals" in the **Control connections** list field:



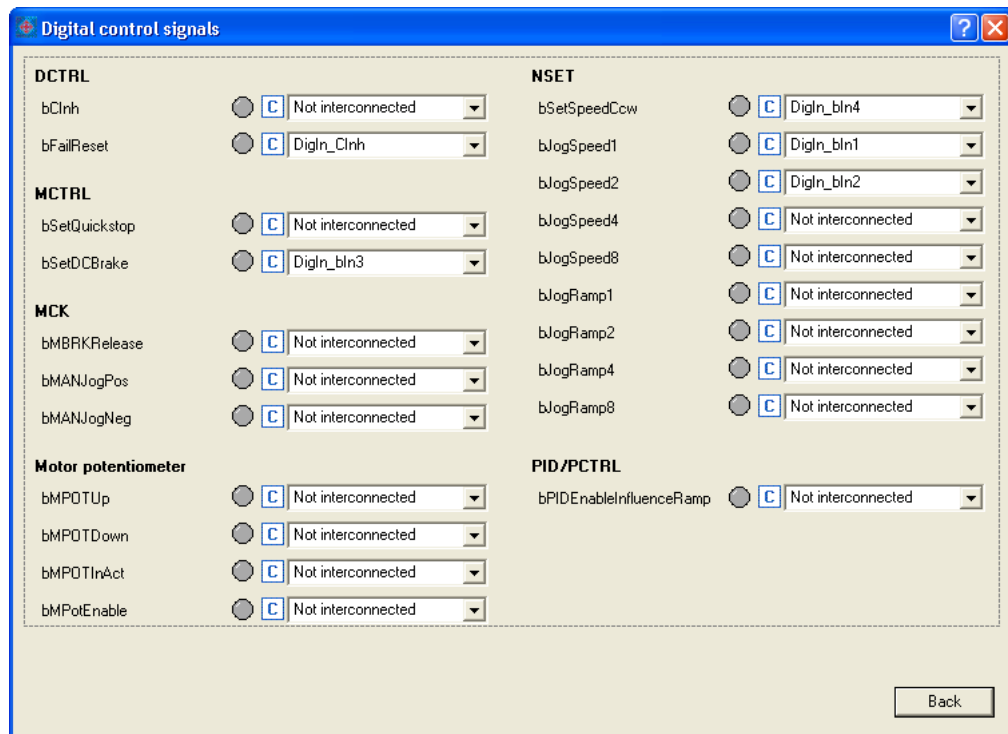
2. Click on the **...** button for the DI2 terminal in order to open the dialog box *Assignment Terminal --> Function block*.
 - In the list field, all block inputs that are currently logically linked to digital input DI2 are marked with a checkmark:



3. Remove checkmark for the connection **LA_NCtrl: bJogSpeed2** in order to cancel the existing logical link.
4. Set checkmark for connection **LA_NCtrl: bJogRamp1** in order to logically link this application input to digital input DI2.

Possibility 2: Change terminal assignment by means of the signal flow shownProcedure:

1. Go to the **Application parameters** tab.
2. Go to the **Application Parameters** tab and click on the **Signal flow** button in order to change to the dialog level *Overview* → *Signal flow*.
3. On the dialog level *Overview* → *Signal flow*, click on the **Digital control signals** button in order to open the *Digital control signals* dialog box:

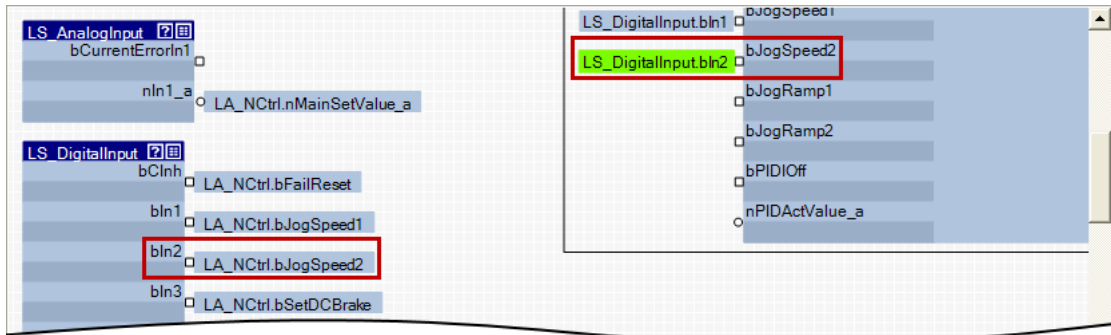


4. In the **bJogSpeed2** list field, set the selection "0: Not interconnected".
5. In the **bJogRamp1** list field, set the selection "16001: DigIn_bln2".
6. Click on the **Back** button in order to close the dialog box again.

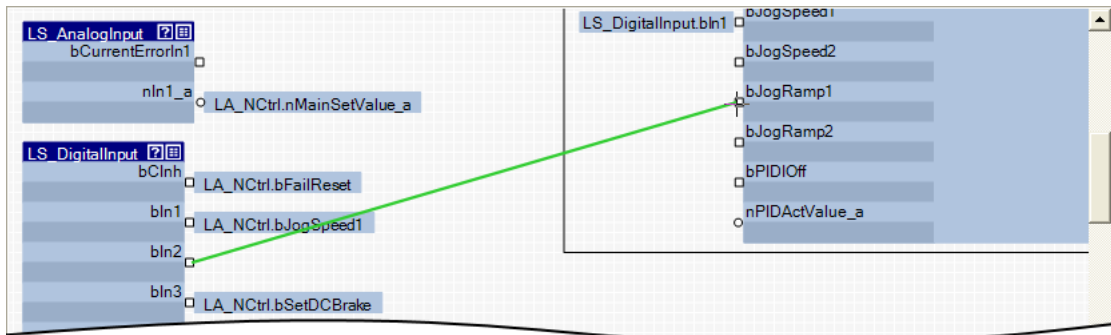
Possibility 3: Change terminal assignment with the FB editor

Procedure:

1. Go to the **FB Editor** tab.
2. Delete the existing interconnection from **LS_DigitalInput.bIn2** to **LA_NCtrl.bJogSpeed2**:



3. Establish a new interconnection from **LS_DigitalInput.bIn2** to **LA_NCtrl.bJogRamp1**:



Tip!

You can find detailed information on how to use the FB editor of the »Engineer« in the main chapter entitled "[Working with the FB Editor](#)". (📖 1058)

8 Technology applications

A technology application is a drive solution equipped with Lenze's experience and know-how in which function and system blocks interconnected to a signal flow clearly show the basis for implementing typical drive tasks.

This chapter describes the handling and the functional range of the technology applications available for the 8400 HighLine drive controller.



Note!

Please note that the StateLine and HighLine device types differ with regard to the number, functional range, and flexibility of the technology applications offered.

8.1 General information

8.1.1 Purpose of the technology applications

The stepped Inverter Drives 8400 series provides solutions for simple to complex applications – depending on the user's experience and knowledge about the handling of drives and drive tasks.

Some drive tasks are similar in practice so that a few modifications of the corresponding technology applications can provide the required result very quickly.

On the one hand a great scope of standard drive tasks for frequency inverters is covered by the technology applications offered by Lenze, and on the other hand, the user is relieved from time-consuming programming activities.

Other important features of technology applications are:

- ▶ Direct implementation of drive tasks without recreating a function block interconnection inside the device
- ▶ Operation via keypad and/or operation via convenient operator dialogs in the «Engineer»
- ▶ Commissioning via few operating and diagnosing parameters (local keypad operation)
- ▶ Achieving a transparency as high as possible via the integrated functionality of the device by representing signal flow diagrams
- ▶ Provision of a basic functionality suitable and often sufficient for many applications

8.1.2 Application cases for a technology application

You should use a technology application if

- ▶ the task can be solved completely or to a great extent by the basic functionality of the technology application.
- ▶ the end customer does not want to create the comprehensive core functions of the corresponding technology on his own.
- ▶ the creation time for a project is to be reduced by using the ready-made technology application
- ▶ the end customer wants to build upon the know-how of Lenze.

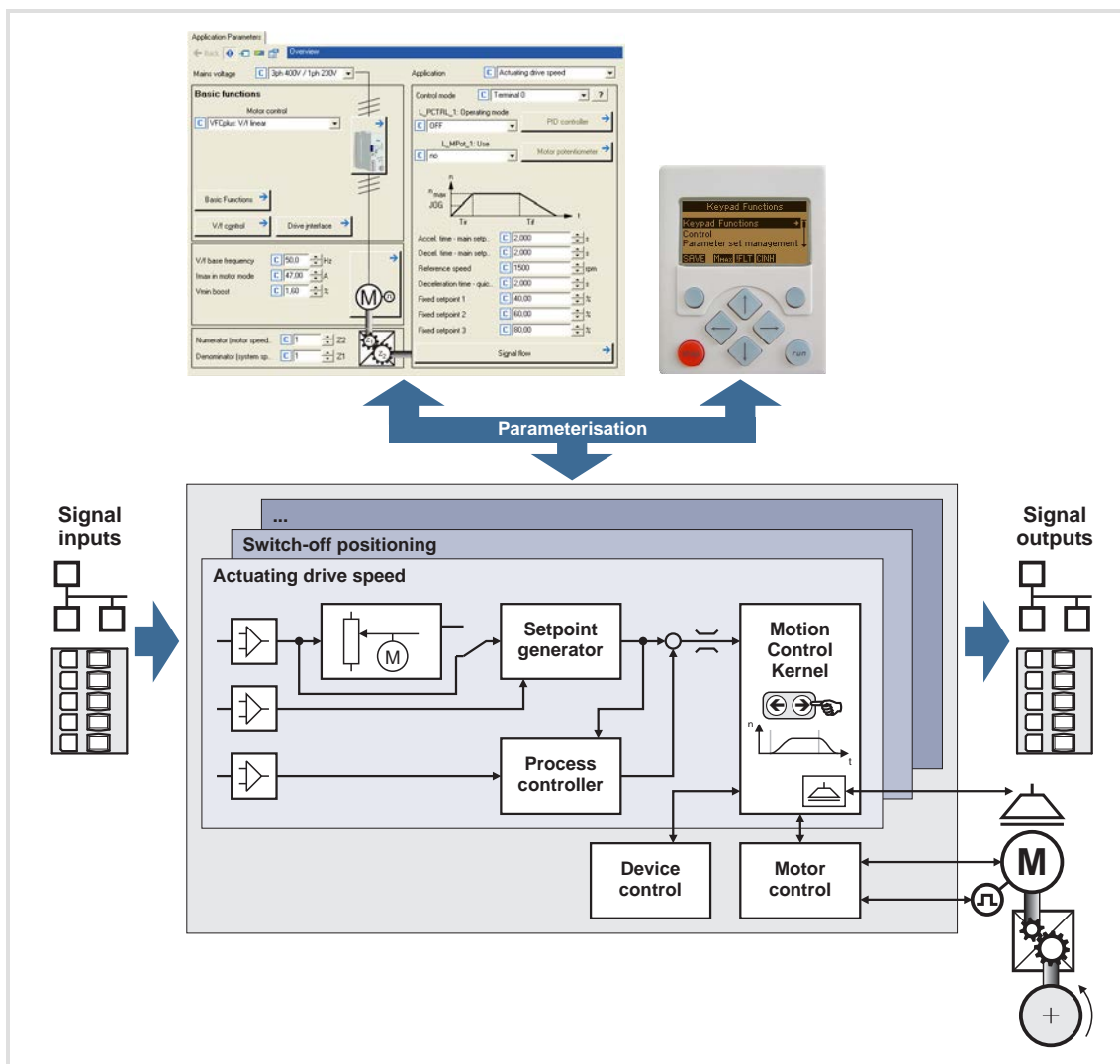


Tip!

If the end customer of the machine does not want to use ready-made Lenze functions, it is also possible to implement individual drive solutions with the HighLine version in the form of "free interconnections". In this case, the technology applications integrated in the device can be used as a basis to be adapted to the requirements by changes or extensions by means of the function block editor.

Detailed information on the creation or change of interconnections by means of the function block editor can be found in the main chapter "[Working with the FB Editor](#)". ([📖 1058](#))

8.1.3 Basic software structure



[8-1] Software structure of the application function

The technology applications integrated in the drive controller provide the main signal flow for the implementation of a general or a special drive task.

Every technology application features an input interface for the connection of the signal sources (e.g. main setpoint) as well as an output interface for the control of output terminals and output ports.

I/O level & application level

The interconnection of the interfaces is shown in the I/O level of the function block editor according to the control mode set in [C00007](#). In the "deeper" application level, the main signal flow is realised in the form of an interconnection of various function and system blocks.



Tip!

Every application block features so-called "free inputs and outputs" which you can use to transfer signals from the I/O level to the application level and vice versa.

- In the Lenze setting, these connectors are hidden in the function block editor.
- These connections can be shown via the **Connector visibilities** command in the *Context menu* of the application block.

Motion Control Kernel

Important basic (drive) functions as well as further basic functionalities are implemented in the firmware of the drive controller in the so-called **Motion Control Kernel (MCK)** which can be accessed by the active technology application via defined internal interfaces. By this means the expensive creation of single function block interconnections is omitted so that the expenditure and the complexity for the realisation of standard functions is minimised.

The **Motion Control Kernel** is integrated in the main setpoint path and, depending on the set operating mode, it creates the required control and setpoint signals for the motor control and the drive interface.



Tip!

A detailed description of the basic functions implemented in the **Motion Control Kernel** can be found in the main chapter "[Basic drive functions \(MCK\)](#)". (☰ 473)

Parameter

The setting/parameterisation of internal functions, the selection of setpoints and the display of actual values is executed via parameters. A re-configuration of the TA interfaces is also possible via the corresponding configuration parameters.

The access to parameters can either be executed with the keypad, the L-force »Engineer« or a master control per field bus communication.

8.2 Overview of available technology applications



Technology application "Actuating drive speed"

This technology application serves to solve speed-controlled drive tasks, e.g. conveyor drives (interconnected), extruders, test benches, vibrators, travelling drives, presses, machining systems, metering units.

▶ [TA "Actuating drive speed"](#) (☒ 383)



Technology application "Table positioning"

This technology application serves to solve position-controlled drive tasks which are normally controlled by a higher-level control via a fieldbus, e.g. transport facilities, rotary tables, storage and retrieval units, feed drives, metering units, hoists.

Note: An external sequence control is required for this TA!

▶ [TA "Table positioning"](#) (☒ 410)



"Switch-off positioning" technology application

This technology application is used to solve speed-controlled drive tasks which require a pre-switch off or stopping at certain positions, e.g. roller conveyors and conveying belts. The pre-switch off is implemented by connecting switch-off sensors.

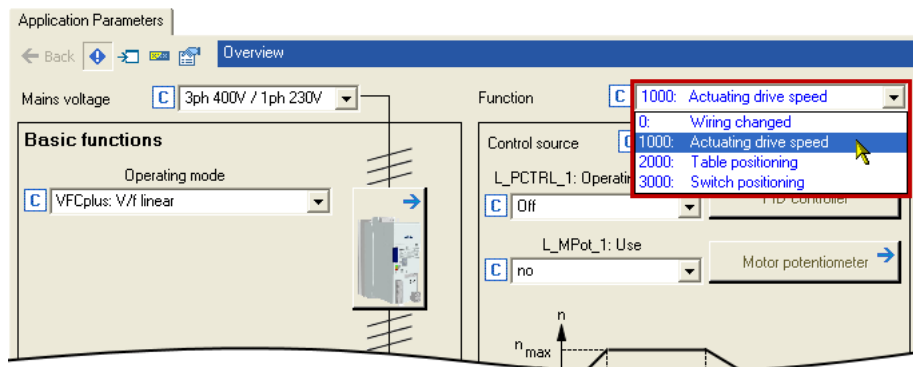
▶ [TA "Switch-off positioning"](#) (☒ 440)

Further technology applications are in preparation.

8.3 Selection of the technology application and the control mode

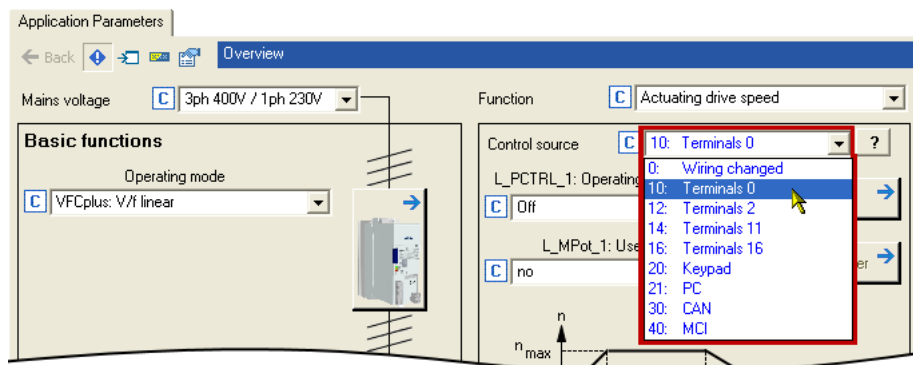
The technology application to be used is selected in [C00005](#).

- ▶ You can select the technology application in the »Engineer« on the **Application parameter** tab via the **Application** list field:



Different control modes can be selected for every application in [C00007](#). By selecting the control mode you set the way by which the technology application should be controlled, e.g. via terminals or via a fieldbus. The interconnection of the input/output terminals and ports shown in the FB editor in the I/O level changes accordingly.

- ▶ You can select the control mode in the »Engineer« on the **Application parameter** tab via the **Control mode** list field:



Tip!

You can infer the pre-configured assignment of the input/output terminals and ports for each control mode from the description of the corresponding technology application:

TA "Actuating drive speed": [Terminal assignment of the control modes](#) (📖 394)

TA "Table positioning": [Terminal assignment of the control modes](#) (📖 424)

TA "Switch-off positioning": [Terminal assignment of the control modes](#) (📖 451)

Detailed information on the individual configuration of the input/output terminals can be found in the description of the I/O terminals in the subchapter "[User-defined terminal assignment](#)". (📖 370)

8.4 TA "Actuating drive speed"

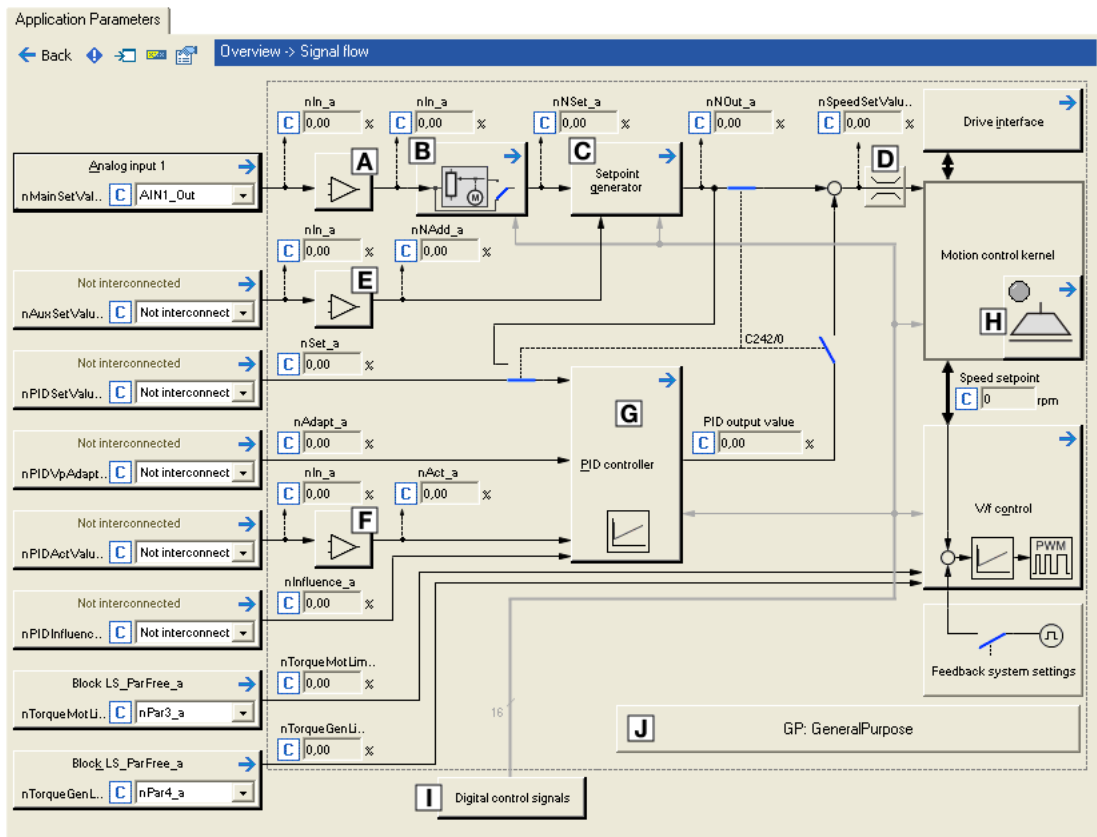
Features

- ▶ Pre-configured control modes for terminals and bus control (with predefined process data connection to the fieldbus)
- ▶ Free configuration of input and output signals
- ▶ Offset, gain, and negation of main setpoint, additional setpoint, actual process controller value
- ▶ Up to 15 fixed setpoints for speed and ramp time
- ▶ Adjustable setpoint ramp times
- ▶ Freely selectable, variable ramp shape
- ▶ Automatic holding brake control
- ▶ Quick stop (QSP) with adjustable ramp time
- ▶ Motor potentiometer function
- ▶ Process controller
- ▶ Load monitoring (*in preparation*)
- ▶ Integrated disposable "GeneralPurpose" functions:
Analog switch, arithmetic, multiplication/division, binary delay element, binary logic, analog comparison, D-flipflop
- ▶ Interface to the safety module (optional)
- ▶ Integration of encoder feedback

Related topics:

- ▶ [Commissioning of the "Actuating drive speed" technology application](#) (49)

8.4.1 Basic signal flow



[8-2] Signal flow of the technology application "Actuating drive speed"

- Ⓐ Main speed setpoint offset and gain ([L_OffsetGainP_1](#))
- Ⓑ Motor potentiometer function ([L_MPot_1](#))
- Ⓒ Setpoint generator ([L_NSet_1](#))
- Ⓓ Speed setpoint input limitation
- Ⓔ Additional speed setpoint offset and gain ([L_OffsetGainP_2](#))
- Ⓕ Actual speed/sensor value offset and gain ([L_OffsetGainP_3](#))
- Ⓖ Process controller ([L_PCTRL_1](#))
- Ⓗ [Holding brake control](#)
- Ⓘ Terminal assignment & display of digital control signals
- Ⓣ Integrated disposable "[GeneralPurpose](#)" functions:
Analog switch, arithmetic, multiplication/division, binary delay element, binary logic, analog comparison, D-flipflop

Selection of the main speed setpoint

The main speed setpoint is selected in the Lenze setting via the analog input 1.

- ▶ Offset and gain of this input signal can be adjusted in [C00696](#) and [C00670](#) for a simple adjustment of a setpoint encoder.
- ▶ Scaling: $16384 \equiv 100\%$ reference speed ([C00011](#))
- ▶ The main setpoint is transformed to a speed setpoint in the setpoint encoder via a ramp function generator with linear or S-shaped ramps.
- ▶ Upstream to the ramp function generator, a blocking speed masking function and a setpoint MinMax limitation are effective.
- ▶ For a detailed functional description see FB [L_NSet](#).

Motor potentiometer function

Alternatively, the main speed setpoint can be generated via a motor potentiometer function.

- ▶ In the Lenze setting, the motor potentiometer function is deactivated.
- ▶ Activation is possible via [C00806](#) or via the *bMPotEnable* input.
- ▶ The behaviour of the motor potentiometer during switch-on of the drive system can be selected in [C00805](#).
- ▶ For a detailed functional description see FB [L_MPot](#).

Optional selection of an additional speed setpoint

You can optionally select an additional speed setpoint (e.g. as a correcting signal).

- ▶ The additional speed setpoint can be linked arithmetically with the main speed setpoint behind the ramp function generator.
- ▶ You must set the setpoint arithmetic to "1: NOut = NSet + NAdd" in [C00190](#) in order to activate the additional speed setpoint.
- ▶ Offset and gain of this input signal can be set in [C00697](#) and [C00671](#) for a simple signal adjustment of a setpoint encoder.
- ▶ Scaling: $16384 \equiv 100\%$ reference speed ([C00011](#))
- ▶ The acceleration and deceleration time for the additional speed setpoint can be set in [C00220](#) and [C00221](#).
- ▶ For a detailed functional description see FB [L_NSet](#).

Tip!

In the case of a grinding machine, the additional speed setpoint can, for instance, be used to control a constant circumferential speed while the grinding disk diameter is reduced.

8.4.2 Internal interfaces | application block "LA_NCtrl"






Note!

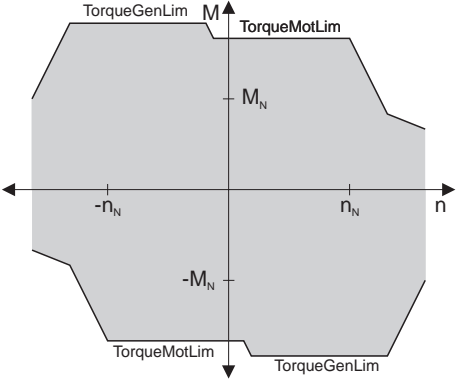
The connectors grayed out in the following table are hidden in the function block editor in the Lenze setting.

- These connections can be shown via the **Connector visibilities** command in the *Context menu* of the application block.

Inputs

Identifier	Data type	Information/possible settings		
wCANDriveControl	WORD	Control word via system bus (CAN) to device control <ul style="list-style-type: none"> • See the "wCANControl/wMCIControl control words" subchapter of the chapter on device control for a detailed description of the individual control bits. 		
wMCIControl	WORD	Control word via communication module (e.g. PROFIBUS) to device control <ul style="list-style-type: none"> • See the "wCANControl/wMCIControl control words" subchapter of the chapter on device control for a detailed description of the individual control bits. 		
wSMControl	WORD	Interface to the optional safety system. <ul style="list-style-type: none"> • Setting control bit 0 ("SafeStop1") in this control word causes e.g. the automatic deceleration of the drive to standstill within this application (in the Motion Control Kernel). • See the "Interface to safety system" subchapter of the chapter on basic drive functions for a detailed description of the control bits. 		
bCInh	BOOL	Enable/Inhibit controller		
		<table border="0"> <tr> <td style="padding-right: 10px;">FALSE</td> <td>Enable controller: The controller switches to the "OperationEnabled" device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. </td> </tr> <tr> <td>TRUE</td> <td>Inhibit controller (controller inhibit): The controller switches to the "SwitchedOn" device status.</td> </tr> </table>	FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit.
FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. 			
TRUE	Inhibit controller (controller inhibit): The controller switches to the " SwitchedOn " device status.			
bFailReset	BOOL	Reset error messages In the Lenze setting this input is connected to the digital input controller enable so that a possibly existing error message is reset together with the controller enable (if the cause for the fault is eliminated).		
		<table border="0"> <tr> <td style="padding-right: 10px;">TRUE</td> <td>The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged. </td> </tr> </table>	TRUE	The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged.
TRUE	The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged. 			
bSetQuickstop	BOOL	Enable quick stop (QSP) <ul style="list-style-type: none"> • Also see device command "Activate/Deactivate quick stop". 		
		<table border="0"> <tr> <td style="padding-right: 10px;">TRUE</td> <td>Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019. </td> </tr> <tr> <td>FALSE</td> <td>Deactivate quick stop <ul style="list-style-type: none"> • The quick stop is deactivated if no other source for the quick stop is active. • C00159 provides a bit-coded representation of active sources/causes for the quick stop. </td> </tr> </table>	TRUE	Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019.
TRUE	Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019. 			
FALSE	Deactivate quick stop <ul style="list-style-type: none"> • The quick stop is deactivated if no other source for the quick stop is active. • C00159 provides a bit-coded representation of active sources/causes for the quick stop. 			

Identifier	Data type	Information/possible settings		
bSetDCBrake	BOOL	Manual DC-injection braking (DCB) <ul style="list-style-type: none"> Detailed information on DC-injection braking is provided in the motor control chapter, subchapter "DC-injection braking". 		
		 Note! Holding braking is not possible when this braking mode is used! For controlling a holding brake with low rate of wear, use the basic function " Holding brake control ".		
		<table border="1"> <tr> <td>FALSE</td> <td>Deactivate DC-injection braking.</td> </tr> <tr> <td>TRUE</td> <td>Activate DC-injection braking, i.e. the drive is brought to a standstill by means of DC-injection braking. <ul style="list-style-type: none"> The braking effect stops when the rotor is at standstill. After the hold time (C00107) has expired, the controller sets the pulse inhibit (CINH). </td> </tr> </table>	FALSE	Deactivate DC-injection braking.
FALSE	Deactivate DC-injection braking.			
TRUE	Activate DC-injection braking, i.e. the drive is brought to a standstill by means of DC-injection braking. <ul style="list-style-type: none"> The braking effect stops when the rotor is at standstill. After the hold time (C00107) has expired, the controller sets the pulse inhibit (CINH). 			
bRFG_Stop	BOOL	Ramp function generator: Maintain the current value of the main setpoint integrator <ul style="list-style-type: none"> The speed, for instance, of a running ramp process is immediately kept constant when <i>bRFG_Stop</i> is activated. At the same time, the acceleration/deceleration jumps to the value "0". For a detailed functional description see the L_NSet FB. 		
		<table border="1"> <tr> <td>TRUE</td> <td>The current value of the main setpoint integrator is held.</td> </tr> </table>	TRUE	The current value of the main setpoint integrator is held.
TRUE	The current value of the main setpoint integrator is held.			
bRFG_0	BOOL	Ramp function generator: Lead the main setpoint integrator to "0" within the current Ti times <ul style="list-style-type: none"> For a detailed functional description see the L_NSet FB. 		
		<table border="1"> <tr> <td>TRUE</td> <td>The current value of the main setpoint integrator is led to "0" within the Ti time set.</td> </tr> </table>	TRUE	The current value of the main setpoint integrator is led to "0" within the Ti time set.
TRUE	The current value of the main setpoint integrator is led to "0" within the Ti time set.			
nVoltageAdd_a	INT	Additive voltage impression <ul style="list-style-type: none"> An additional setpoint for the motor voltage can be specified via this process input. If there are, for instance, different loads at the motor output end, it is possible to apply a voltage boost at the starting time. If the value is negative, the voltage is reduced. Scaling: 16384 \equiv 1000 V 		
		 Stop! Values selected too high may cause the motor to heat up due to the resulting current!		
nBoost_a	INT	Additional setpoint for the motor voltage at speed = 0 <ul style="list-style-type: none"> The entire voltage-frequency characteristic is provided with an offset. Scaling: 16384 \equiv 1000 V 		
		 Stop! Values selected too high may cause the motor to heat up due to the resulting current!		
nPWMAngleOffset	INT	Additional offset for the electrical angle of rotation <ul style="list-style-type: none"> If a torque is connected, e.g. dynamic acceleration processes can be generated. Scaling: $\pm 32767 \equiv \pm 180^\circ$ angle of rotation 		

Identifier	Data type	Information/possible settings				
nTorqueMotLim_a nTorqueGenLim_a	INT	<p>Torque limitation in motor mode and in generator mode</p> <ul style="list-style-type: none"> • These input signals are directly transferred to the motor control to limit the controller's maximum torque in motor and generator mode. • The drive cannot output a higher torque in motor/generator mode than set here. • The applied values (any polarity) are internally interpreted as absolute values. • If V/f characteristic control (VFCplus) is selected, limitation is <u>indirectly</u> performed via a so-called I_{max} controller. • If sensorless vector control (SLVC) or servo control (SC) is selected, limitation has a <u>direct</u> effect on the torque-producing current component. • Scaling: $16384 \equiv 100\% M_{max}$ (C00057) <p>Torque limits in motor and generator mode:</p> 				
bSetSpeedCcw	BOOL	<p>Change of direction of rotation</p> <ul style="list-style-type: none"> • For instance if a motor or gearbox is fixed laterally reversed to a machine part, but the setpoint selection should still be executed for the positive direction of rotation. <table border="1"> <tr> <td>FALSE</td> <td>Direction of rotation to the right (Cw)</td> </tr> <tr> <td>TRUE</td> <td>Direction of rotation to the left (Ccw)</td> </tr> </table>	FALSE	Direction of rotation to the right (Cw)	TRUE	Direction of rotation to the left (Ccw)
FALSE	Direction of rotation to the right (Cw)					
TRUE	Direction of rotation to the left (Ccw)					
bRLQCw	BOOL	<p>Activate clockwise rotation (fail-safe)</p> <ul style="list-style-type: none"> • For a detailed functional description see FB L_RLO. <table border="1"> <tr> <td>FALSE</td> <td>Quick stop</td> </tr> <tr> <td>TRUE</td> <td>Clockwise rotation</td> </tr> </table>	FALSE	Quick stop	TRUE	Clockwise rotation
FALSE	Quick stop					
TRUE	Clockwise rotation					
bRLQCcw	BOOL	<p>Activate counter-clockwise rotation (fail-safe)</p> <ul style="list-style-type: none"> • For a detailed functional description see the L_RLO FB. <table border="1"> <tr> <td>FALSE</td> <td>Quick stop</td> </tr> <tr> <td>TRUE</td> <td>Counter-clockwise rotation</td> </tr> </table>	FALSE	Quick stop	TRUE	Counter-clockwise rotation
FALSE	Quick stop					
TRUE	Counter-clockwise rotation					
nMainSetValue_a	INT	<p>Main speed setpoint</p> <ul style="list-style-type: none"> • Offset and gain of this input signal can be set in C00696 and C00670 for a simple signal adjustment of a setpoint encoder. • Scaling: $16384 \equiv 100\%$ reference speed (C00011) • The main setpoint is transformed to a speed setpoint in the setpoint encoder via a ramp function generator with linear or S-shaped ramps. • Upstream to the ramp function generator, a blocking speed masking function and a setpoint MinMax limitation are effective. • For a detailed functional description see the L_NSet FB. 				

Identifier	Data type	Information/possible settings
nAuxSetValue_a	INT	<p>Additional speed setpoint</p> <ul style="list-style-type: none"> The additional speed setpoint can be linked arithmetically with the main speed setpoint behind the ramp function generator. You must set the setpoint arithmetic to "1: NOut = NSet + NAdd" in C00190 in order to activate the additional speed setpoint. Offset and gain of this input signal can be set in C00697 and C00671 for a simple signal adjustment of a setpoint encoder. Scaling: 16384 ≡ 100 % reference speed (C00011) The acceleration and deceleration time for the additional speed setpoint can be set in C00220 and C00221. For a detailed functional description see the L_NSet FB.
bJogSpeed1 bJogSpeed2	BOOL	<p>Selection inputs for fixed changeover setpoints (JOG setpoints) for the main setpoint</p> <ul style="list-style-type: none"> A fixed setpoint for the setpoint generator can be activated instead of the main setpoint via these selection inputs. The four selection inputs are binary coded, therefore 15 fixed setpoints can be selected. In the case of binary coded selection "0" (all inputs = FALSE or not assigned), main setpoint <i>nMainSetValue_a</i> is active. The selection of the fixed setpoints is carried out in C00039/1...15 in [%] based on the reference speed (C00011). For a detailed functional description see the L_NSet FB.
bJogSpeed4 bJogSpeed8	BOOL	
bJogRamp1 bJogRamp2	BOOL	<p>Selection inputs for alternative acceleration/deceleration times for the main setpoint</p> <ul style="list-style-type: none"> The four selection inputs are binary coded, therefore 15 alternative acceleration/deceleration times can be selected. For main setpoint <i>nMainSetValue_a</i>, the set acceleration time (C00012) and deceleration time (C00013) are active in the case of the binary coded selection "0" (all inputs = FALSE or not assigned). Alternative acceleration times are selected in C00101/1...15. The selection of the alternative deceleration times is carried out in C00103/1...15. For a detailed functional description see the L_NSet FB.
bJogRamp4 bJogRamp8	BOOL	
<p>Motor potentiometer</p> <p>Alternatively to the input signal <i>nMainSetValue_a</i>, the main setpoint can also be generated by a motor potentiometer function.</p> <ul style="list-style-type: none"> In the Lenze setting, the motor potentiometer function is deactivated. Activation is possible via C00806 or via the <i>bMPotEnable</i> input. The behaviour of the motor potentiometer during switch-on of the drive system can be selected in C00805. For a detailed functional description see the L_MPot FB. 		
bMPotEnable	BOOL	Activating the motor potentiometer function
		<ul style="list-style-type: none"> This input and C00806 are OR'd.
bMPotUp	BOOL	Increasing the speed setpoint
		<ul style="list-style-type: none"> TRUE Approach the upper speed limit value set in C00800 with the acceleration time set in C00802.
bMPotInAct	BOOL	Activating the inactive function
		<ul style="list-style-type: none"> TRUE The speed setpoint behaves according to the inactive function set in C00804. In the Lenze setting, the speed setpoint is maintained.
bMPotDown	BOOL	Decreasing the speed setpoint
		<ul style="list-style-type: none"> TRUE Approach the lower speed limit value set in C00801 with the deceleration time set in C00803.

Identifier	Data type	Information/possible settings		
Process controller				
<ul style="list-style-type: none"> In the Lenze setting, the process controller is deactivated. The activation is executed by selecting the operating mode in C00242. For a detailed functional description see FB L_PCTRL. 				
bPIDEnableInfluenceRamp	BOOL	Activate ramp for influencing factor		
		<table border="1"> <tr> <td>FALSE</td> <td>Influencing factor of the PID controller is ramped down to "0".</td> </tr> <tr> <td>TRUE</td> <td>Influencing factor of the PID controller is ramped up to the value <i>nPIDInfluence_a</i>.</td> </tr> </table>	FALSE	Influencing factor of the PID controller is ramped down to "0".
FALSE	Influencing factor of the PID controller is ramped down to "0".			
TRUE	Influencing factor of the PID controller is ramped up to the value <i>nPIDInfluence_a</i> .			
bPIDIOff	BOOL	Switch off I-component of process controller		
		<ul style="list-style-type: none"> In conjunction with the operating mode set in C00242 (Lenze setting: "Off"). <table border="1"> <tr> <td>TRUE</td> <td>I-component of the process controller is switched off.</td> </tr> </table>	TRUE	I-component of the process controller is switched off.
TRUE	I-component of the process controller is switched off.			
nPIDVpAdapt_a	INT	Adaptation of gain Vp set in C00222 in percent <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % Internal limitation to \pm 199.99 % Changes can be done online. 		
nPIDSetValue_a	INT	Sensor and process setpoint for operating modes 2, 4 and 5 <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % Internal limitation to \pm 199.99 % 		
nPIDActValue_a	INT	Speed or actual sensor value (actual process value) <ul style="list-style-type: none"> Offset and gain for this input signal can be set in C00698 and C00672. Scaling: 16384 \equiv 100 % Internal limitation to \pm 199.99 % 		
nPIDInfluence_a	INT	Limitation of the influencing factor in percent <ul style="list-style-type: none"> The influence factor of the PID controller can be limited to a certain value (- 199.99% ... + 199.99%) via <i>nPIDInfluence_a</i>. Scaling: 16384 \equiv 100 % Internal limitation to \pm 199.99 % 		
MCK basic functions				
bMBRKRelease	BOOL	Holding brake control : Release/apply brake		
		<ul style="list-style-type: none"> In conjunction with the operating mode selected in C02580 (Lenze setting: "Brake control off"). 		
		<table border="1"> <tr> <td>FALSE</td> <td>Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake. </td> </tr> <tr> <td>TRUE</td> <td>Release brake manually (forced release). <ul style="list-style-type: none"> Note! The brake can also be released when the controller is inhibited! During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. In semi-automatic operation, the brake is released including feedforward control. </td> </tr> </table>	FALSE	Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake.
FALSE	Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake. 			
TRUE	Release brake manually (forced release). <ul style="list-style-type: none"> Note! The brake can also be released when the controller is inhibited! During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. In semi-automatic operation, the brake is released including feedforward control. 			
bManJogPos bManJogNeg	BOOL	reserved (inputs are not interconnected on the application level)		
GP: GeneralPurpose				
<p>The following inputs are interconnected with logic/arithmetic functions on application level for free usage.</p> <p>► "GeneralPurpose" functions</p>				
nGPAnalogSwitchIn1_a nGPAnalogSwitchIn2_a	INT	Analog switch : Input signals <ul style="list-style-type: none"> The input signal selected via the selection input <i>bGPAnalogSwitchSet</i> is output at output <i>nGPAnalogSwitchOut_a</i>. 		

Identifier	Data type	Information/possible settings
bGPAnalogSwitchSet	BOOL	Analog switch: Selection input
		FALSE <i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn1_a</i>
		TRUE <i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn2_a</i>
nGPArithmetikIn1_a nGPArithmetikIn2_a	INT	Arithmetic: Input signals <ul style="list-style-type: none"> The arithmetic function is selected in C00338. The result is output at output <i>nGPArithmetikOut_a</i>.
nGPMulDivIn_a	INT	Multiplication/Division: Input signal <ul style="list-style-type: none"> The factor for the multiplication can be set in C00699/1 (numerator) and C00699/2 (denominator). The result is output at output <i>nGPMulDivOut_a</i>.
bGPDigitalDelayIn	BOOL	Binary delay element: Input signal <ul style="list-style-type: none"> The on-delay can be set in C00720/1. The off-delay can be set in C00720/2. The time-delayed input signal is output at output <i>bGPDigitalDelayOut</i>.
bGPLogicIn1 bGPLogicIn2 bGPLogicIn3	BOOL	Binary logic: Input signals <ul style="list-style-type: none"> The logic operation is selected in C00820. The result is output at output <i>bGPLogicOut</i>.
nGPCompareIn1_a nGPCompareIn2_a	INT	Analog comparison: Input signals <ul style="list-style-type: none"> The comparison operation is selected in C00680. Hysteresis and window size can be set in C00680 and C00682. If the comparison statement is true, the output <i>bGPCompareOut</i> will be set to TRUE.
bGPDFlipFlop_InD bGPDFlipFlop_InClk bGPDFlipFlop_InClr	BOOL	D-FlipFlop: Input signals <ul style="list-style-type: none"> Data, clock and reset input
Free inputs		
The following inputs can freely be interconnected on the application level. The signals can be transferred from the I/O level to the application level via these inputs.		
bFreeIn1 ... bFreeIn8	BOOL	Free inputs for digital signals
wFreeIn1 ... wFreeIn4	WORD	Free inputs for 16-bit signals

Outputs

Identifier	Data type	Value/meaning
wDriveControlStatus	WORD	Status word of the controller (based on DSP-402) <ul style="list-style-type: none"> The status word contains information on the currents status of the drive controller. See the "wDeviceStatusWord status word" subchapter of the chapter on device control for a detailed description of the bit assignment.
wStateDetermFailNoLow	WORD	Display of the status determining error (LOW word)
wStateDetermFailNoHigh	WORD	Display of the status determining error (HIGH word)
bDriveFail	BOOL	TRUE Drive controller in error status. <ul style="list-style-type: none"> "Fault" device status is active.
bDriveReady	BOOL	TRUE Controller is ready for operation. <ul style="list-style-type: none"> "SwitchedOn" device status is active. The drive is in this device status if the DC bus voltage is applied and the controller is still inhibited by the user (controller inhibit).

Identifier	Data type	Value/meaning	
bClnhActive	BOOL	TRUE	Controller inhibit is active.
bQSPlsActive	BOOL	TRUE	Quick stop is active.
bSpeedCcw	BOOL	Current direction of rotation	
		FALSE	Direction of rotation to the right (Cw)
		TRUE	Direction of rotation to the left (Ccw)
bSpeedActCompare	BOOL	Result of the speed comparison	
		TRUE	During open-loop operation: Speed setpoint < Comparison value (C00024) During closed-loop operation: Actual speed value < Comparison value (C00024)
bOverLoadActive	BOOL	In preparation (output is not interconnected on the application level)	
bUnderLoadActive	BOOL	In preparation (output is not interconnected on the application level)	
blmaxActive	BOOL	"Current setpoint inside the limitation" status signal	
		TRUE	The current setpoint is internally limited (the drive controller operates at the maximum current limit).
bSpeedSetReached	BOOL	Status signal "setpoint = 0"	
		TRUE	Speed setpoint from the ramp function generator = 0
bSpeedActEqSet	BOOL	TRUE	Actual speed value = speed setpoint
nMotorCurrent_a	INT	Current stator current/effective motor current • Scaling: 16384 \equiv 100 % I_{\max_mot} (C00022)	
nMotorSpeedSet_a	INT	Speed setpoint • Scaling: 16384 \equiv 100 % reference speed (C00011)	
nMotorSpeedAct_a	INT	Actual speed value • Scaling: 16384 \equiv 100 % reference speed (C00011)	
nMotorTorqueAct_a	INT	Actual torque • In the "VFC (+encoder)" operating mode of the motor control, this value is determined from the current motor current and corresponds to the actual torque only by approximation. • Scaling: 16384 \equiv 100 % M_{\max} (C00057)	
nDCVoltage_a	INT	Actual DC-bus voltage • Scaling: 16384 \equiv 1000 V	
nMotorVoltage_a	INT	Current motor voltage/inverter output voltage • Scaling: 16384 \equiv 1000 V	
MCK basic functions			
bBrakeReleaseOut	BOOL	Holding brake control : Trigger signal for the holding brake control switching element via a digital output • Use bit 0 in C02582 to activate inverted switching element triggering.	
		FALSE	Apply brake.
		TRUE	Release brake.
bBrakeReleased	BOOL	Holding brake control : "Brake released" considering the brake release time • When the holding brake is triggered to close, <i>bBrakeReleased</i> is immediately set to FALSE even if the brake closing time has not yet elapsed!	
		TRUE	Brake released (when the brake release time has elapsed).
GP: GeneralPurpose The following outputs are interconnected with logic/arithmetic functions on application level for free usage. ▶ "GeneralPurpose" functions			

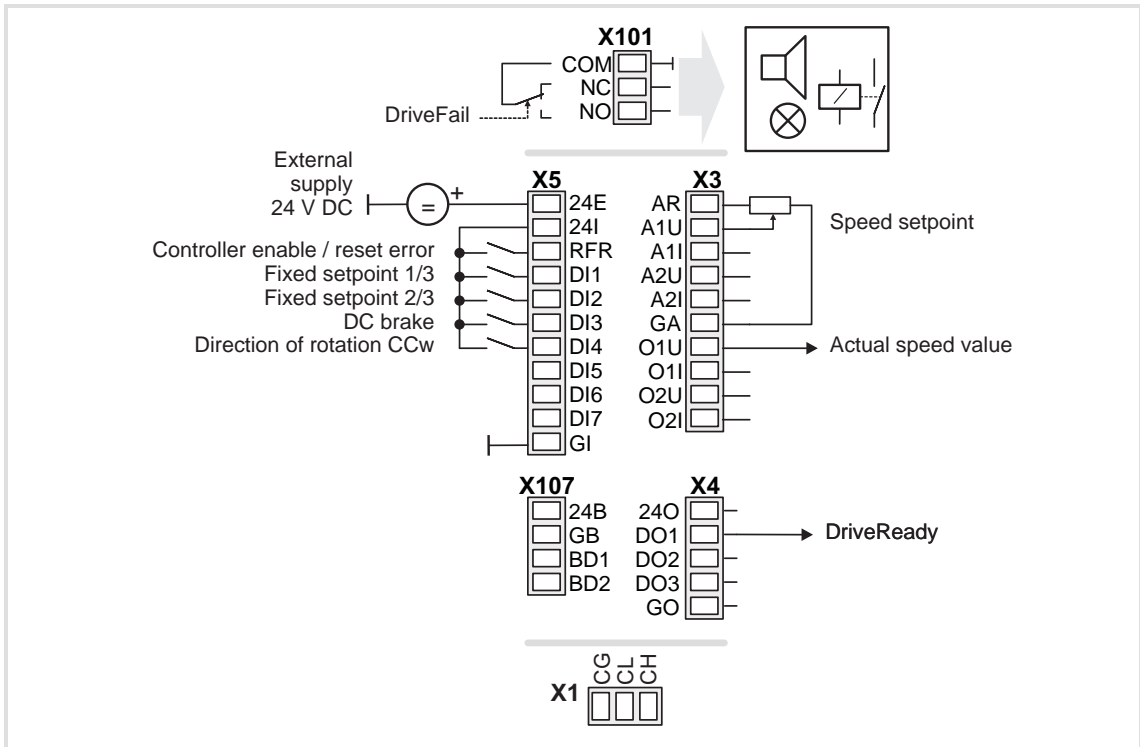
Identifier	Data type	Value/meaning
nGPAAnalogSwitchInOut_a	INT	Analog switch : Output signal
nGPArithmetikOut_a	INT	Arithmetic : Output signal
nGPMulDivOut_a	INT	Multiplication/Division : Output signal
bGPDigitalDelayOut	BOOL	Binary delay element : Output signal
bGPLogicOut	BOOL	Binary logic : Output signal
bGPCompareOut	BOOL	Analog comparison : Output signal
bGPSignalOut1 ... bGPSignalOut4	BOOL	Binary signal monitor : Output signals <ul style="list-style-type: none"> The signal sources to be output are selected in C00411/1...4. A bit coded inversion of the output signals can be parameterised in C00412.
nGPSignalOut1_a ... nGPSignalOut4_a	BOOL	Analog signal monitor : Output signals <ul style="list-style-type: none"> The signal sources to be output are selected in C00410/1...4. Gain and offset for each output signal can be parameterised in C00413/1...8.
bGPDFlipFlop_Out	BOOL	D-FlipFlop : Output signal
bGPDFlipFlop_NegOut	BOOL	D-FlipFlop : Negated output signal
Free outputs		
The following outputs can freely be interconnected on the application level. The signals from the application level can be transferred to the I/O level via these outputs.		
bFreeOut1 ... bFreeOut8	BOOL	Free outputs for digital signals
wFreeOut1 ... wFreeOut4	WORD	Free outputs for 16-bit signals

8.4.3 Terminal assignment of the control modes

The following comparison provides information about which inputs/outputs of the application block LA_NCtrl are interconnected to the digital and analog input/output terminals of the drive controller in the different control modes.

	Control mode (C00007)							
	10: Terminals 0	12: Terminals 2	14: Terminals 11	16: Terminal 16	20: Keypad	21: PC	30: CAN	40: MCI
Digital input terminals								
X5/RFR	Controller enable / Reset of error message bFailReset							
X5/DI1	Fixed setpoint 1/3 bJogSpeed1		Change of direction of rotation bSetSpeedCcw	Fixed setpoint 1/3 bJogSpeed1	-	-	Quick stop bSetQuickstop	
X5/DI2	Fixed setpoint 2/3 bJogSpeed2		Activate manual DC-injection braking (DCB) bSetDCBrake	Fixed setpoint 2/3 bJogSpeed2	-	-	-	-
X5/DI3	Activate manual DC-injection braking (DCB) bSetDCBrake	Quick stop bSetQuickstop	Motor potentiometer: Increase speed bMPotUp	CW rotation quick stop bRLQCw	-	-	-	-
X5/DI4	Change of direction of rotation bSetSpeedCcw		Motor potentiometer: Decrease speed bMPotDown	CCW rotation quick stop bRLQCcw	-	-	-	-
X5/DI5 ... DI7	-	-	-	-	-	-	-	-
Analog input terminals								
X3/A1U, A1I	Main speed setpoint nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)				-	-	Additional speed setpoint nAuxSetValue_a 10 V ≙ 100 % reference speed (C00011)	
X3/A2U, A2I	-	-	-	-	-	-	-	-
Digital output terminals								
X4/DO1	Status "Drive is ready" bDriveReady							
X4/DO2 ... DO3	-	-	-	-	-	-	-	-
X107/BD1, BD2	-	-	-	-	-	-	-	-
X101/COM, NO	Status "Error is pending" bDriveFail							
Analog output terminals								
X3/O1U	Actual speed value nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)							
X3/O1I	-	-	-	-	-	-	-	-
X3/O2U	-	-	-	-	-	-	-	-
X3/O2I	-	-	-	-	-	-	-	-

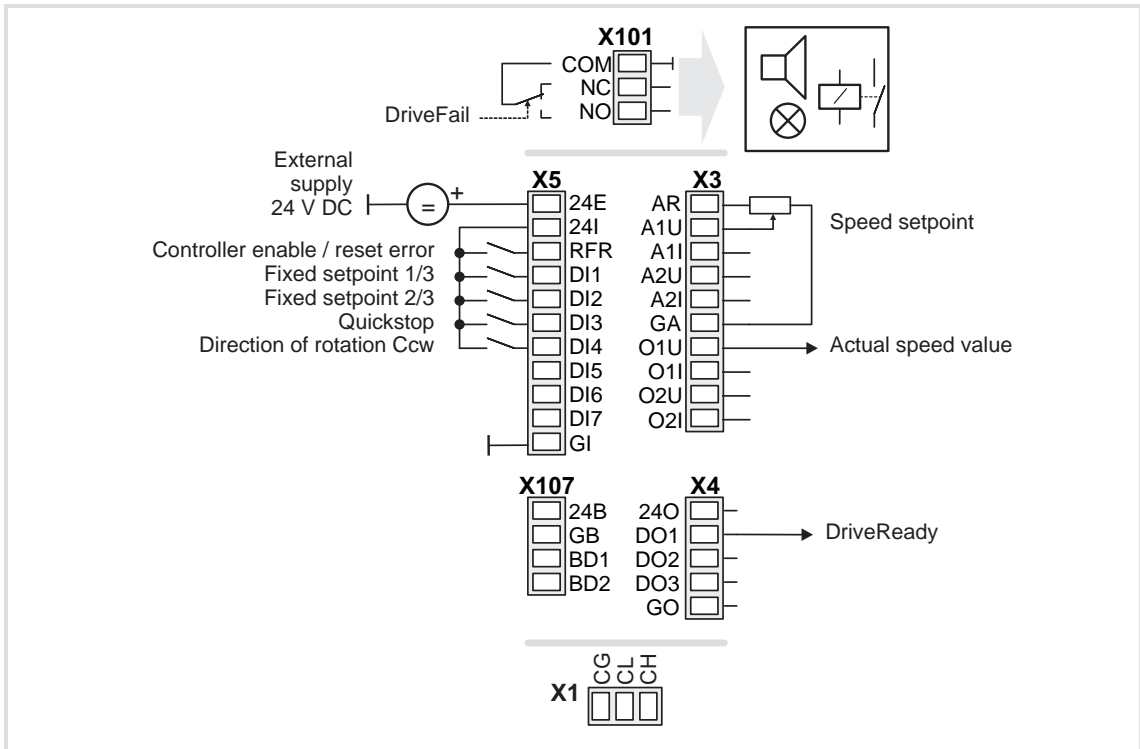
8.4.3.1 Terminals 0



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	LA_NCtrl.bJogSpeed1
X5/DI2	LA_NCtrl.bJogSpeed2
X5/DI3	LA_NCtrl.bSetDCBrake
X5/DI4	LA_NCtrl.bSetSpeedCcw
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	LA_NCtrl.nMainSetValue_a *
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a *
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V = 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

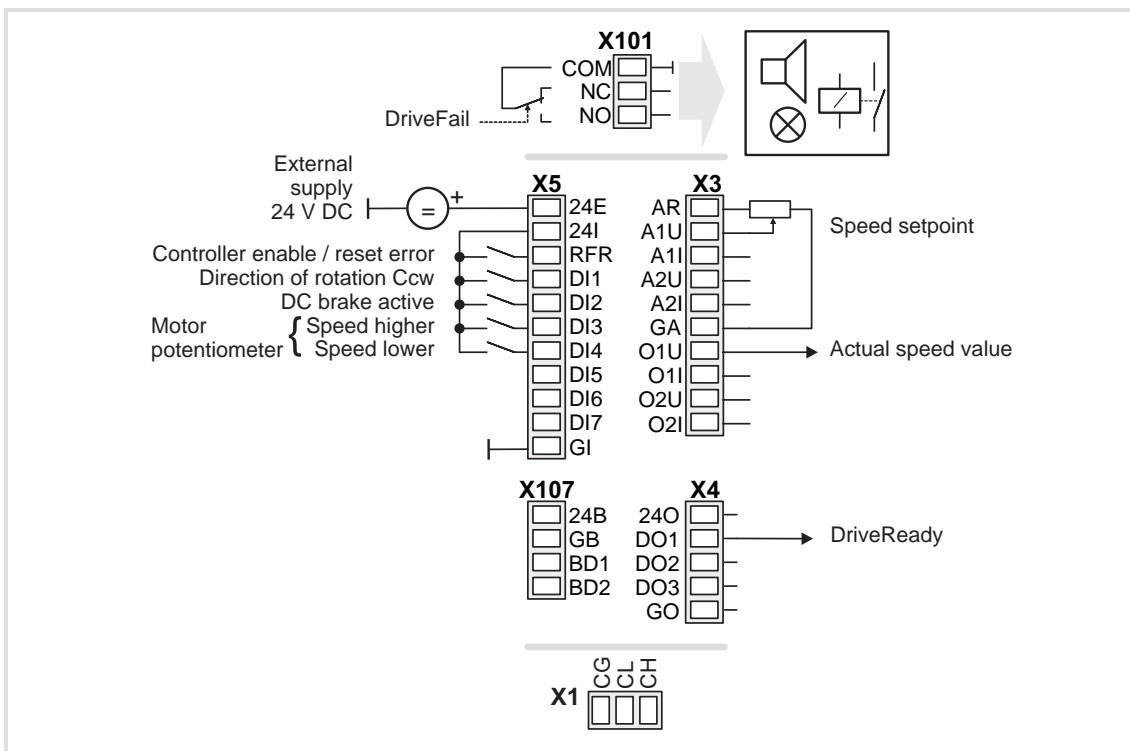
8.4.3.2 Terminals 2



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	LA_NCtrl.bJogSpeed1
X5/DI2	LA_NCtrl.bJogSpeed2
X5/DI3	LA_NCtrl.bSetQuickstop
X5/DI4	LA_NCtrl.bSetSpeedCcw
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	LA_NCtrl.nMainSetValue_a *
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a *
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V = 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

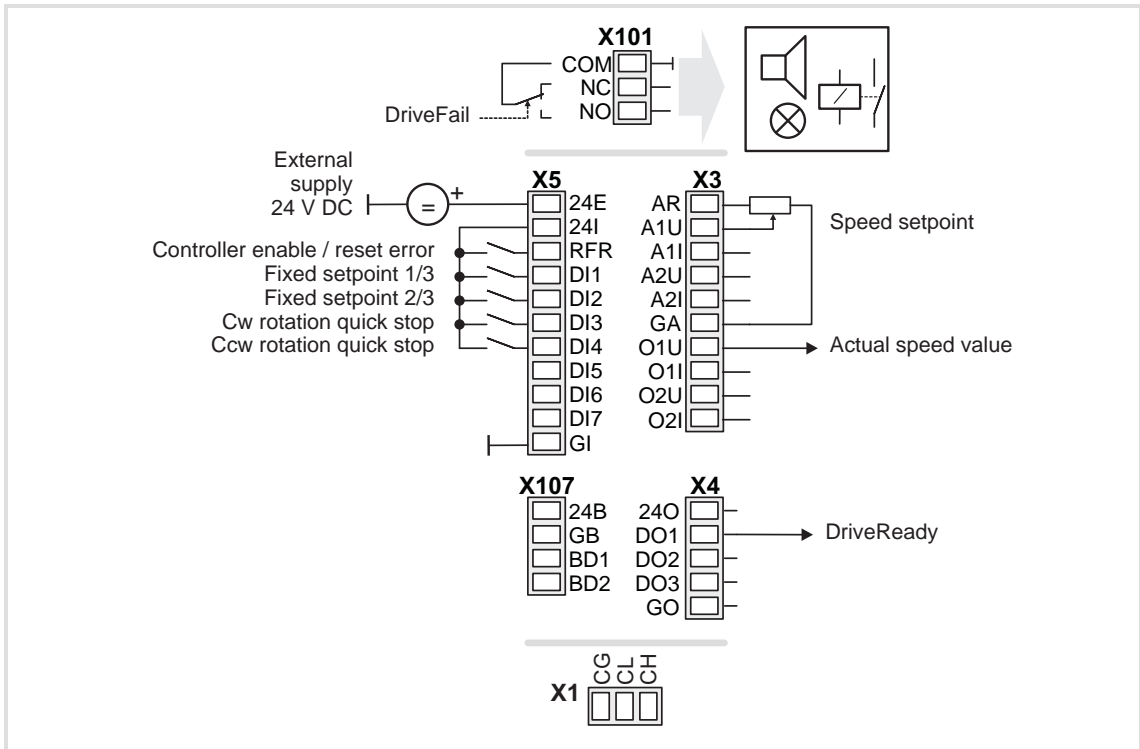
8.4.3.3 Terminals 11



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	LA_NCtrl.bSetSpeedCcw
X5/DI2	LA_NCtrl.bSetDCBrake
X5/DI3	LA_NCtrl.bMPotUp
X5/DI4	LA_NCtrl.bMPotDown
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	LA_NCtrl.nMainSetValue_a*
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a*
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V = 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

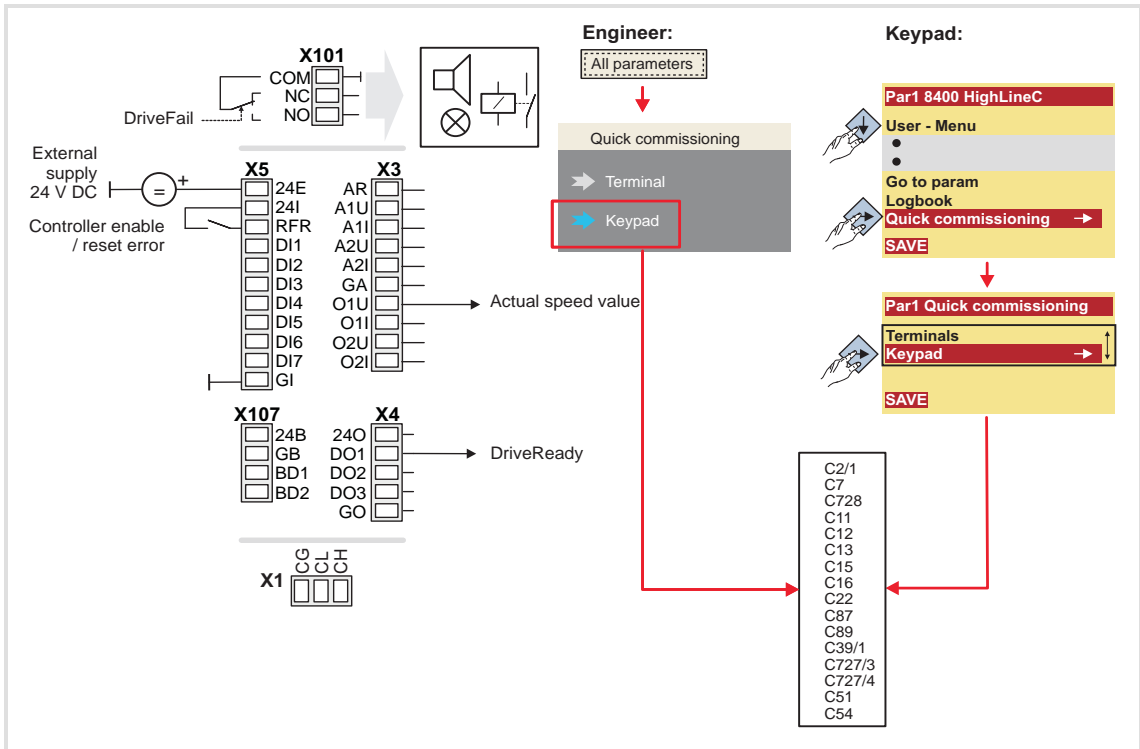
8.4.3.4 Terminal 16



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	LA_NCtrl.bJogSpeed1
X5/DI2	LA_NCtrl.bJogSpeed2
X5/DI3	LA_NCtrl.bRLQCw
X5/DI4	LA_NCtrl.bRLQCcw
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	LA_NCtrl.nMainSetValue_a*
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a*
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V = 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

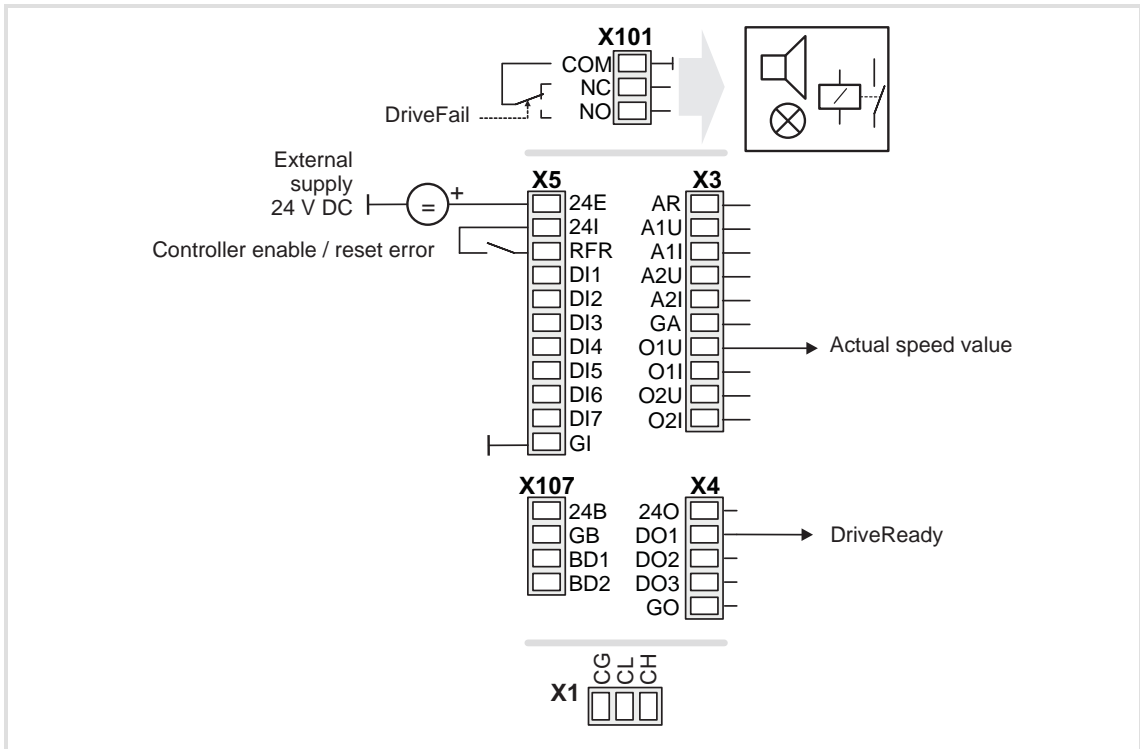
8.4.3.5 Keypad



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	LA_NCtrl.nMainSetValue_a *
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a *
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V ≙ 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

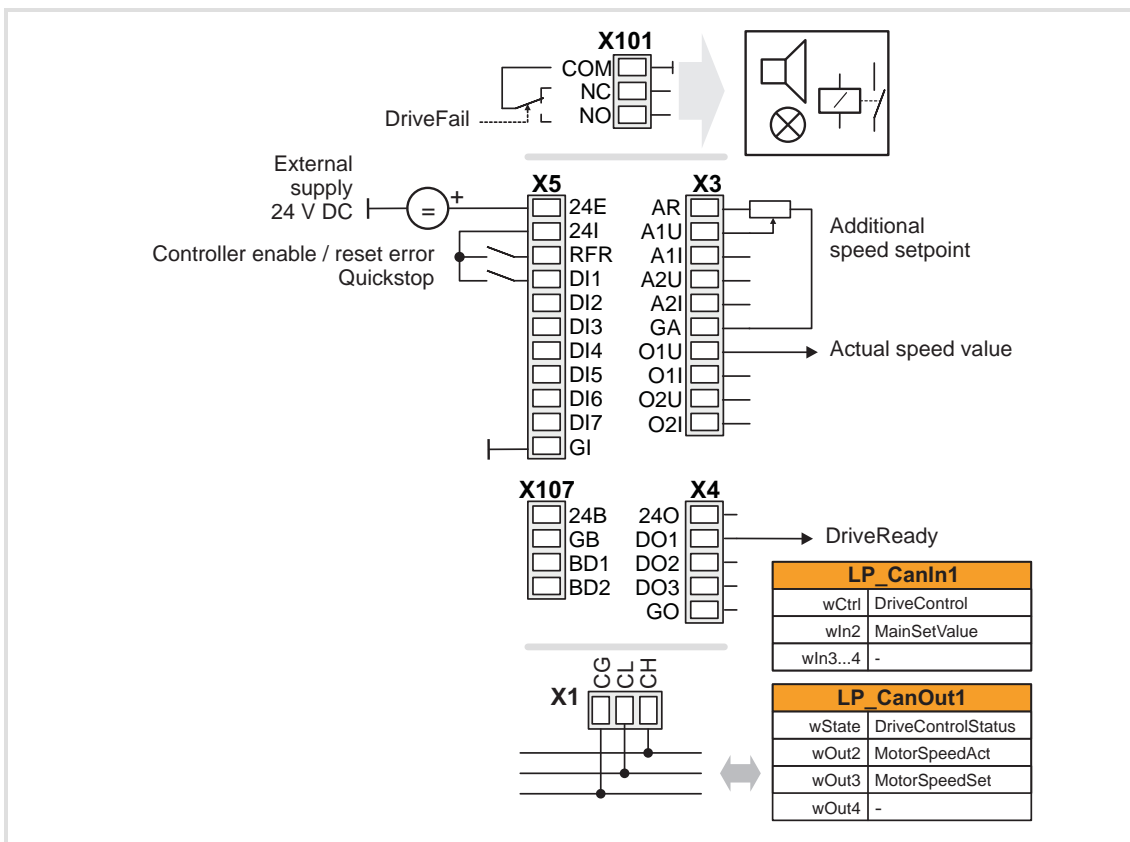
8.4.3.6 PC



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	-
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a *
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V = 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

8.4.3.7 CAN



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	LA_NCtrl.bSetQuickStop
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	LA_NCtrl.nAuxSetValue_a *
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a *
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V ≙ 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

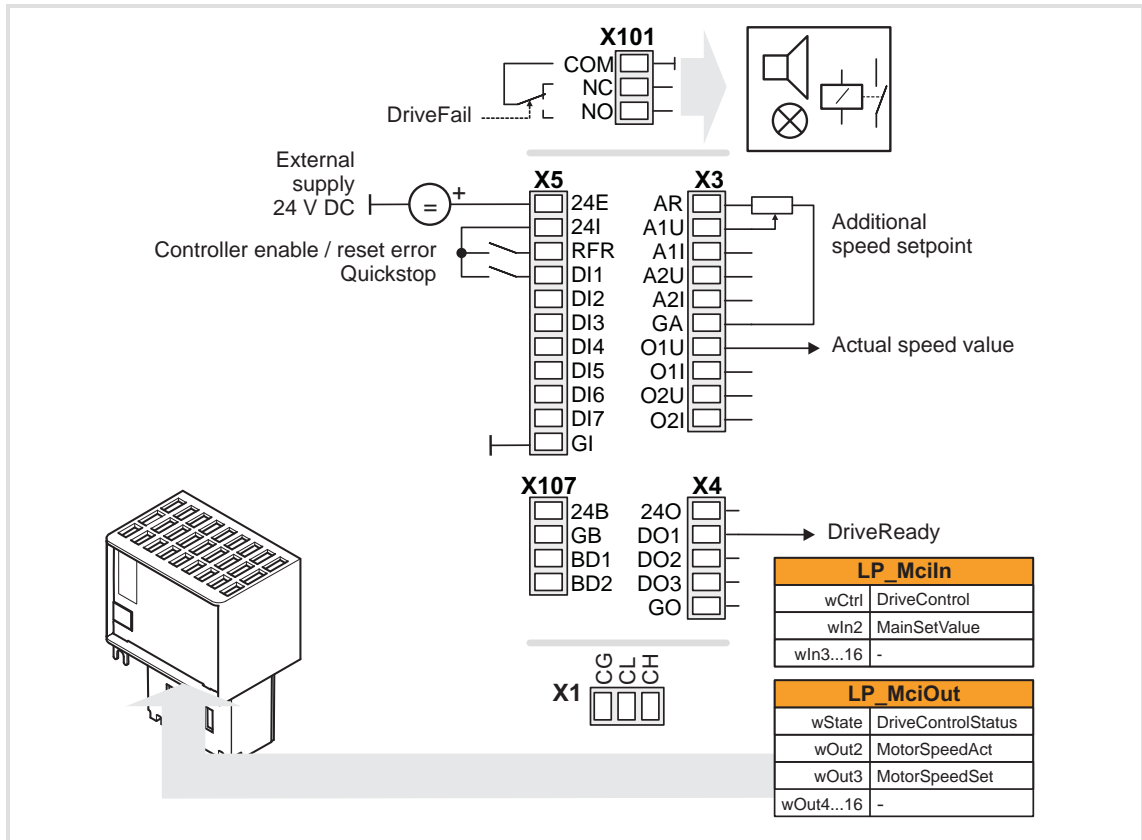
▶ [Process data assignment for fieldbus communication](#) (403)



Note!

- You must set the setpoint arithmetic in [C00190](#) to "1: NOut = NSet + NAdd" so that the additional speed setpoint selected via the analog input A1U has an additive effect.
- The "manual jog" function via digital terminals is being prepared!

8.4.3.8 MCI



Connection	Assignment
X101/NC-NO	LA_NCtrl.bDriveFail
X5/RFR	LA_NCtrl.bFailReset
X5/DI1	LA_NCtrl.bSetQuickStop
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	-
X107/BD2	-

Connection	Assignment
X3/A1U	LA_NCtrl.nAuxSetValue_a *
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_NCtrl.nMotorSpeedAct_a *
X3/O1I	-
X3/O2U	-
X3/O2I	-
* 10 V ≙ 100 % reference speed (C00011)	
X4/DO1	LA_NCtrl.bDriveReady
X4/DO2	-
X4/DO3	-

▶ [Process data assignment for fieldbus communication](#) (403)



Note!

- You must set the setpoint arithmetic in [C00190](#) to "1: NOut = NSet + NAdd" so that the additional speed setpoint selected via the analog input A1U has an additive effect.
- The "manual jog" function via digital terminals is being prepared!

8.4.4 Process data assignment for fieldbus communication

The fieldbus communication is connected (preconfigured) to the previously selected technology application by selecting the corresponding control mode in [C00007](#):

- ▶ "30: [CAN](#)" for the connection to the system bus (CAN)
- ▶ "40: [MCI](#)" for the connection to a plugged-on communication module (e.g. PROFIBUS)

The assignment of the process data words does not depend on the applied bus system but exclusively on the application:

Input words	Name	Assignment
Word 1	DriveControl	Control word <ul style="list-style-type: none"> • See table below for bit assignment.
Word 2	MainSetValue	Speed setpoint <ul style="list-style-type: none"> • Scaling: 16384 ≙ 100 % reference speed (C00011)
Word 3	-	Not preconfigured
Word 4	-	Not preconfigured
Word 5 ... 16	-	Not preconfigured <ul style="list-style-type: none"> • Only available for control mode "40: MCI".

Control word	Name	Function
Bit 0	SwitchOn	1 ≙ Change to the " SwitchedOn " device status <ul style="list-style-type: none"> • This bit must be set in the CAN/MCI control word to ensure that the device changes to the "SwitchedOn" device status after mains connection without the need for a master control specifying this bit via fieldbus. • If control via a bus system is not wanted (e.g. in the case of control via terminals), the <i>wDriveCtrl</i> output signal of the LS_ParFix system block can be connected to the control word inputs.
Bit 1	DisableVoltage	1 ≙ Inhibit inverter control (IMP - pulse inhibit)
Bit 2	SetQuickStop	1 ≙ Activate quick stop (QSP). ▶ Activate/Deactivate quick stop (□ 98)
Bit 3	EnableOperation	1 ≙ Enable controller (RFR) <ul style="list-style-type: none"> • If control via terminals is performed, this bit must be set both in the CAN control word and in the MCI control word. Otherwise, the controller is inhibited. ▶ Enable/Inhibit controller (□ 97)
Bit 4	ModeSpecific_1	Reserved (currently not assigned)
Bit 5	ModeSpecific_2	
Bit 6	ModeSpecific_3	
Bit 7	ResetFault	1 ≙ Reset fault (trip reset) <ul style="list-style-type: none"> • Acknowledge fault message (if the error cause has been eliminated). ▶ Reset error (□ 99)
Bit 8	SetHalt	1 ≙ Activate stop function <ul style="list-style-type: none"> • Stop drive via stopping ramp (in preparation).
Bit 9	reserved_1	Reserved (currently not assigned)
Bit 10	reserved_2	
Bit 11	SetDCBrake	1 ≙ Activate DC-injection braking ▶ Manual DC-injection braking (DCB) (□ 251)
Bit 12	JogSpeed1	Activation of fixed speed 1 ... 3
Bit 13	JogSpeed2	

Control word	Name	Function
Bit 14	SetFail	1 ≙ Set error (trip set)
Bit 15	SetSpeedCcw	0 ≙ Direction of rotation to the right (Cw) 1 ≙ Direction of rotation to the left (Ccw)

Output words	Name	Assignment
Word 1	DriveControlStatus	Status word • See table below for bit assignment.
Word 2	MotorSpeedAct	Actual speed value • Scaling: 16384 ≙ 100 % reference speed (C00011)
Word 3	MotorSpeedSet	Resulting overall setpoint • Scaling: 16384 ≙ 100 % reference speed (C00011)
Word 4	-	Not preconfigured
Word 5 ... 16	-	Not preconfigured • Only available for control mode "40: MCI".

Status word	Name	Status
Bit 0	FreeStatusBit0	Free status bit 0 (not assigned, freely assignable)
Bit 1	PowerDisabled	1 ≙ Inverter control inhibited (pulse inhibit is active)
Bit 2	FreeStatusBit2	Free status bit 2 (not assigned, freely assignable)
Bit 3	FreeStatusBit3	Free status bit 3 (not assigned, freely assignable)
Bit 4	FreeStatusBit4	Free status bit 4 (not assigned, freely assignable)
Bit 5	FreeStatusBit5	Free status bit 5 (not assigned, freely assignable)
Bit 6	ActSpeedIsZero	During open-loop operation: 1 ≙ Speed setpoint < Comparison value (C00024) During closed-loop operation: 1 ≙ Actual speed value < Comparison value (C00024)
Bit 7	ControllerInhibit	1 ≙ Controller inhibited (controller inhibit is active)
Bit 8	StatusCodeBit0	Bit coded display of the active device status ▶ Device state machine and device statuses (see table [4-1])
Bit 9	StatusCodeBit1	
Bit 10	StatusCodeBit2	
Bit 11	StatusCodeBit3	
Bit 12	Warning	1 ≙ A warning is indicated
Bit 13	Trouble	1 ≙ Controller is in the " Trouble " device status • E.g. if an overvoltage has occurred.
Bit 14	FreeStatusBit14	Free status bit 14 (not assigned, freely assignable)
Bit 15	FreeStatusBit15	Free status bit 15 (not assigned, freely assignable)

8.4.5 Setting parameters (short overview)

Parameter	Info	Lenze setting	
		Value	Unit
C00012	Accel. time - main setpoint	2.000	s
C00013	Decel. time - main setpoint	2.000	s
C00019	Auto DCB: Threshold	3	rpm
C00024	Comparison value N_Act	0.00	%
C00036	DCB: Current	50.00	%
C00039/1	Fixed setpoint 1	40.00	%
C00039/2	Fixed setpoint 2	60.00	%
C00039/3	Fixed setpoint 3	80.00	%
C00039/4...15	Fixed setpoint 4 ... 15	0.00	%
C00101/1...15	Add. accel. time 1 ... 15	0.000	s
C00103/1...15	Add. decel. time 1 ... 15	0.000	s
C00105	Decel. time - quick stop	2.000	s
C00106	Auto DCB: Hold time	0.500	s
C00107	DCB: Hold time	999.000	s
C00134	Ramp rounding - main setpoint	0: Off	
C00182	S-ramp time PT1	20.00	s
C00190	Setpoint arithmetic	0: NOut = NSet	
C00220	Accel. time - add. setpoint	0.000	s
C00221	Decel. time - add. setpoint	0.000	s
C00222	L_PCTRL_1: Vp	1.0	
C00223	L_PCTRL_1: Tn	400	ms
C00224	L_PCTRL_1: Kd	0.0	
C00225	L_PCTRL_1: MaxLimit	199.99	%
C00226	L_PCTRL_1: MinLimit	-199.99	%
C00227	L_PCTRL_1: Accel. time	0.010	s
C00228	L_PCTRL_1: Decel. time	0.010	s
C00233	L_PCTRL_1: Root function	0: Off	
C00241	L_NSet_1: Hyst. NSet reached	0.50	%
C00242	L_PCTRL_1: Operating mode	0: Off	
C00243	L_PCTRL_1: Accel. time influence	5.000	s
C00244	L_PCTRL_1: Decel. time influence	5.000	s
C00632/1	L_NSet_1: Blocking speed 1 max	0.00	%
C00632/2	L_NSet_1: Blocking speed 2 max	0.00	%
C00632/3	L_NSet_1: Blocking speed 3 max	0.00	%
C00633/1	L_NSet_1: Blocking speed 1 min	0.00	%
C00633/2	L_NSet_1: Blocking speed 2 min	0.00	%
C00633/3	L_NSet_1: Blocking speed 3 min	0.00	%
C00635	L_NSet_1: nMaxLimit	199.99	%
C00636	L_NSet_1: nMinLimit	-199.99	%
C00670	L_OffsetGainP_1: Gain	1.0000	
C00671	L_OffsetGainP_2: Gain	1.0000	
C00672	L_OffsetGainP_3: Gain	1.0000	

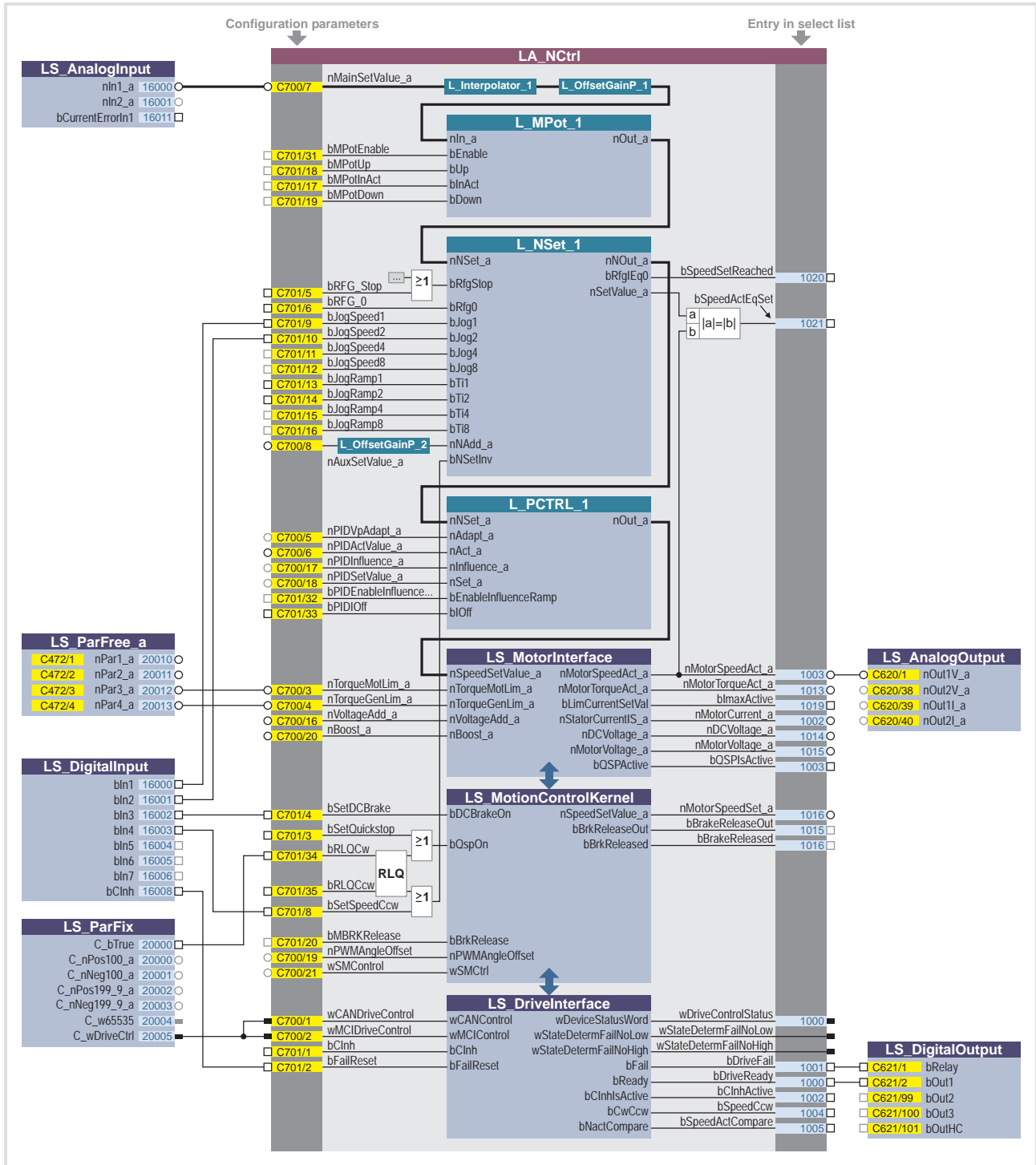
Parameter	Info	Lenze setting	
		Value	Unit
C00696	L_OffsetGainP_1: Offset	0.00	%
C00697	L_OffsetGainP_2: Offset	0.00	%
C00698	L_OffsetGainP_3: Offset	0.00	%
C00800	L_MPot_1: Upper limit	100.00	%
C00801	L_MPot_1: Lower limit	-100.00	%
C00802	L_MPot_1: Accel. time	10.0	s
C00803	L_MPot_1: Decel. time	10.0	s
C00804	L_MPot_1: Inactive fct.	0: Retain value	
C00805	L_MPot_1: Init fct.	0: Load last value	
C00806	L_MPot_1: Use	0: No	

Related topics:

- ▶ ["GeneralPurpose" functions](#) (467)

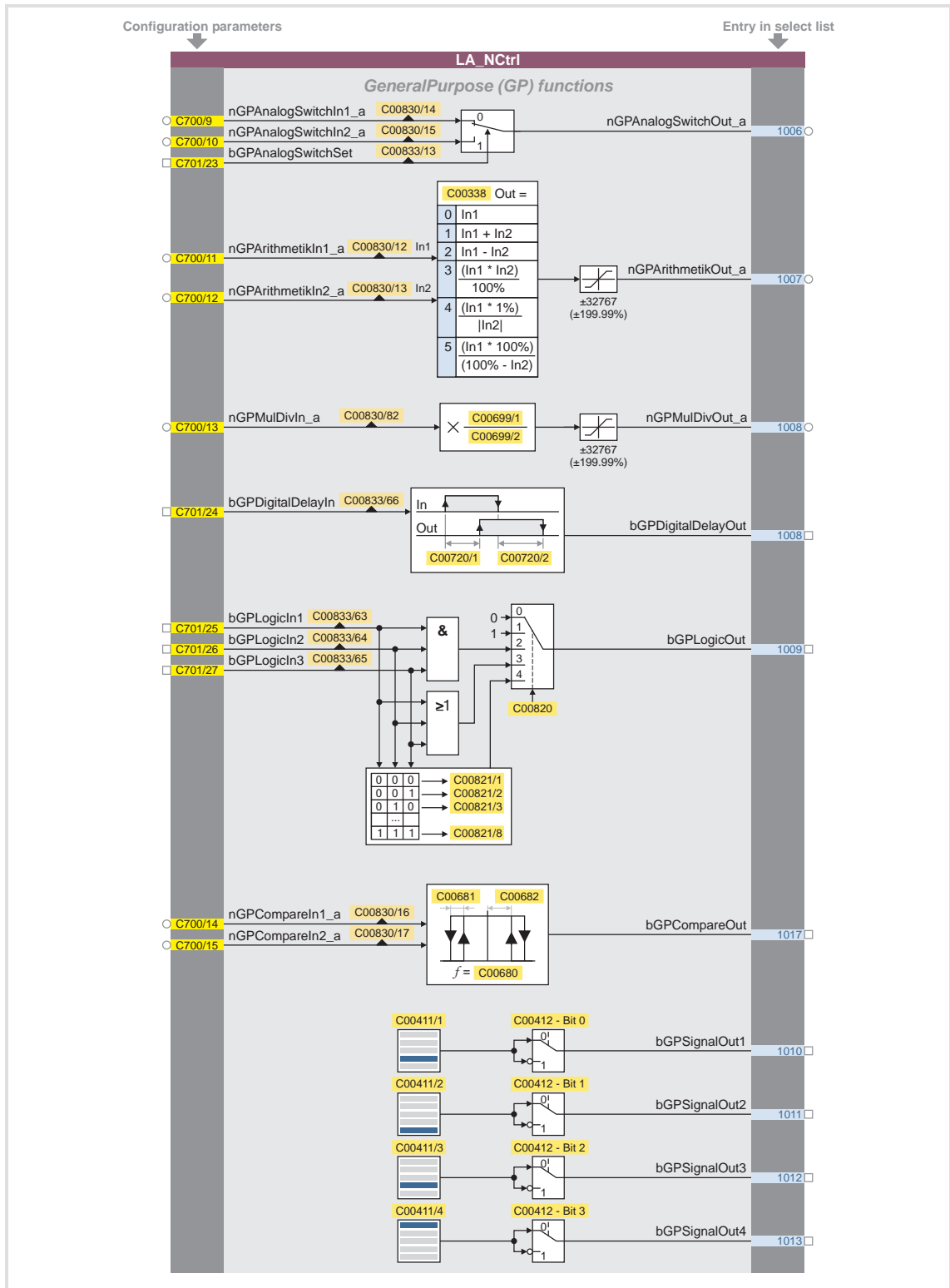
8.4.6 Configuration parameters

If required, the subcodes of [C00700](#) and [C00701](#) serve to change the pre-configured assignment of the application inputs:

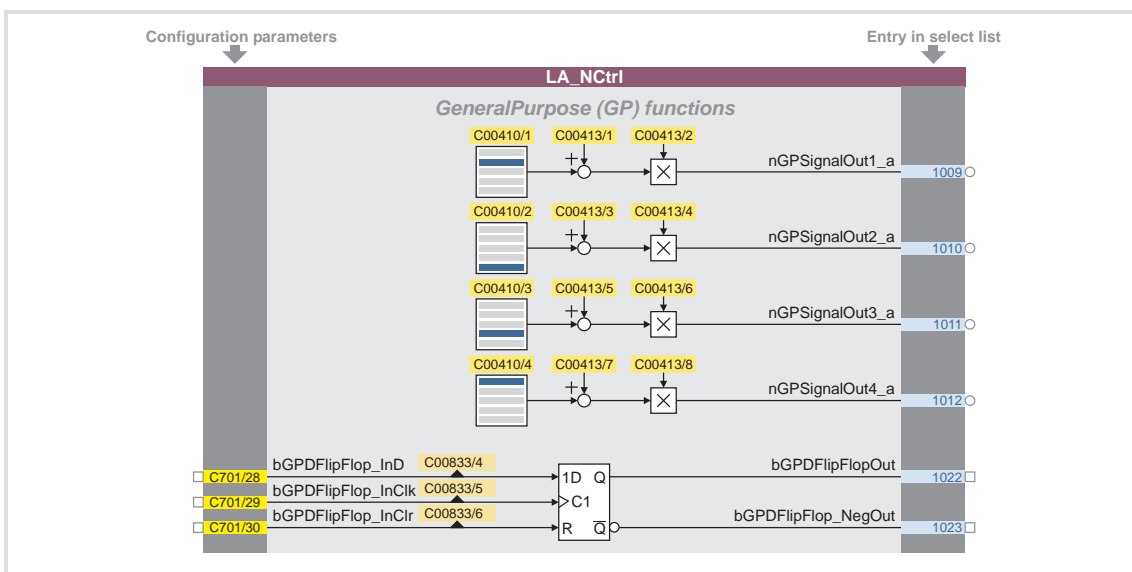


[8-1] Pre-assignment of the "Actuating drive speed" application in the "Terminals 0" control mode

Configuration parameters for "GeneralPurpose" functions



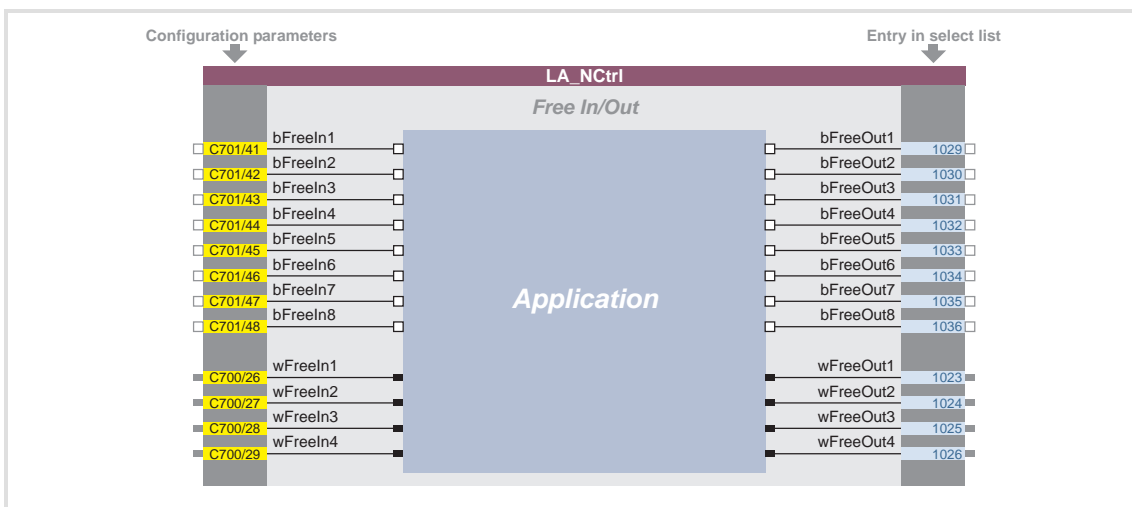
[8-2] "GeneralPurpose" functions



[8-3] "GeneralPurpose" functions (continuation)

Free inputs and outputs

These inputs can be freely interconnected in the application level. They can be used to transfer signals from the I/O level to the application level and vice versa.



[8-4] Free inputs/outputs

Related topics:

- ▶ [User-defined terminal assignment](#) (📖 370)
- ▶ ["GeneralPurpose" functions](#) (📖 467)

8.5 TA "Table positioning"

Numerous functions for the motion control of a single axis can be executed with the "Table positioning" technology application. For this, the technology application accesses the basic functions implemented in the **Motion Control Kernel** which are described in detail in the main chapter "[Basic drive functions \(MCK\)](#)". (📖 473)

- ▶ Manual jog
- ▶ Retracting from limit switches
- ▶ Reference setting/homing in 18 different modes (*in preparation*)
- ▶ Positioning (absolute, relative)
- ▶ Continuous travel (speed mode)
- ▶ Speed override
- ▶ Acceleration override
- ▶ Profile sequence block control
- ▶ Travel block restart within the profile (online profile start)
- ▶ Specification of target position via process signal interface (e.g. via fieldbus)

Further functions

- ▶ Up to 15 travel sets can be set via parameters
- ▶ Parameterisation of the profile data in physical units or relative values
- ▶ Adjustable torque limitation
- ▶ Freely selectable, variable ramp shape
- ▶ Motor potentiometer function
- ▶ Software limit position monitoring
- ▶ Following error monitoring (with static limits)
- ▶ Automatic holding brake control
- ▶ Quick stop (QSP) with adjustable ramp time
- ▶ Enable of individual functions via control word
- ▶ Status and diagnostic displays
- ▶ Operating mode changeover (manual jog, homing, speed follower, positioning)
- ▶ Integrated disposable "GeneralPurpose" functions:
Analog switch , arithmetic, multiplication/division, binary delay element, binary logic, analog comparison, D-FlipFlop, counter

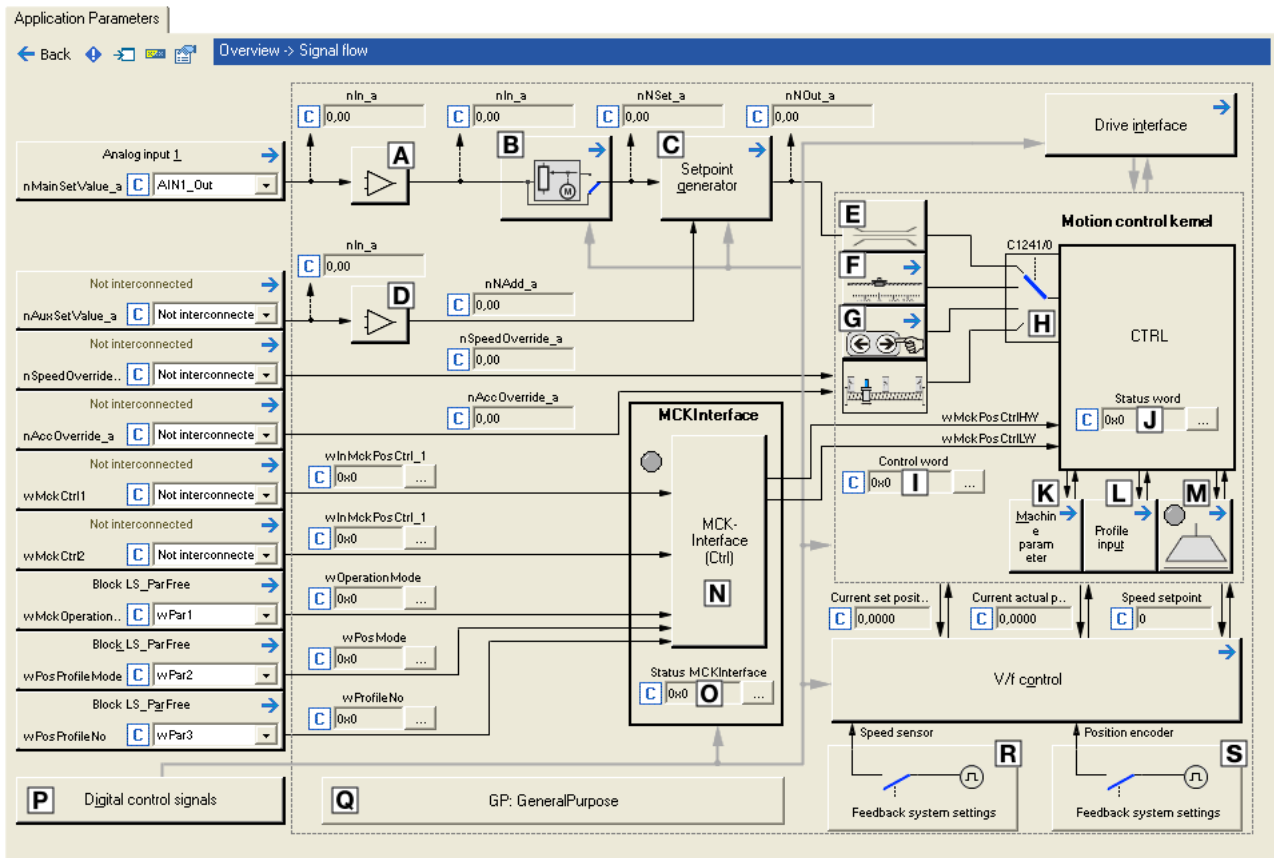
Related topics:

- ▶ [Commissioning of the "Table positioning" technology application](#) (📖 57)

8.5.1 Basic signal flow

The main element of the technology application is the **Motion Control Kernel**.

- ▶ The **Motion Control Kernel** is controlled via a 32-bit double control word. All motion profiles in the different operating modes can be controlled with this interface.
- ▶ Upstream to the **Motion Control Kernel** there is a so-called **MCKInterface** called which provides additional process inputs for the application in order to control the **Motion Control Kernel**.



[8-5] Signal flow of the table positioning

- | | |
|---|---|
| <ul style="list-style-type: none"> Ⓐ Offset and gain (L_OffsetGainP_1) Ⓑ Motor potentiometer function (L_MPot_1) Ⓒ Setpoint generator (L_NSet_1) Ⓓ Offset and gain (L_OffsetGainP_2) Ⓔ Speed setpoint input limitation Ⓕ Basic function "Homing" Ⓖ Basic function "Manual jog" Ⓗ Operating mode changeover (is executed by the MCKInterface) Ⓙ Integrated disposable "GeneralPurpose" functions: Analog switch, arithmetic, multiplication/division, binary delay element, binary logic, analog comparison, D-flipflop | <ul style="list-style-type: none"> Ⓛ MCK control word Ⓜ MCK status word Ⓨ Selection of the machine parameters Ⓩ Profile entry for the "Positioning" basic function. ⓐ Holding brake control ⓑ MCKInterface ⓓ Status word of the MCKInterface ⓔ Terminal assignment & display of digital control signals |
|---|---|

8.5.1.1 Possibilities for the position selection

The following options are available for the selection of different positions:

1. Changeover of profiles
2. Changing the profile position via parameter data (SDO)
3. Changing the profile position via process data (PDO)
 - The profile position is defined in [increments] or in the application unit [units].

	Changeover of profiles	Changing the profile position via SDO	Changing the profile position via PDO	
Number of positions	max. 15	n > 15	n > 15	
Position selection	Parameterisation in the profile	Selection via SDO	Selection via PDO	
Unit	units	units	Increments	units
Remainder allowance	in the drive	in the drive	in the PLC	in the drive



Note!

Setting the machine parameters is a basic prerequisite for the operating modes "[Homing](#)", "[Manual jog](#)" and "[Positioning](#)".

The more precisely the machine parameters are set, the better the results of positioning!

▶ [Machine parameters](#) (📖 498)

Possibility 1: Changeover of profiles

A total of 15 profiles is available in the 8400 TopLine.

- ▶ A profile describes a motion task that can be converted into a rotary motion by the **Motion Control Kernel** in the "Positioning" operating mode.
- ▶ A detailed explanation of all profile parameters can be found in the subchapter "[Profile entry](#)". (📖 545) of the description of the "Positioning" basic drive function.
- ▶ The selection of the profile to be executed can either be executed as a data word via the input *wPosProfileNo* or binary coded via the inputs *bPosProfileNo_1* ... *bPosProfileNo_4*.
- ▶ The chosen profile is started via the process input *bPosExecute* of the FB [L_MckCtrlInterface](#) or the control bit "PosExecute" in the [MCK control word](#).

Possibility 2: Changing the profile position via parameter data (SDO)

The parameter data channel of a fieldbus can also be used to change the position in a profile.

- ▶ The position of the profiles 1 ... 15 are stored in the subcodes 1 ... 15 of the code [C01301](#).
- ▶ More than 15 positions are available via the profile changeover (as described under possibility 1).

Possibility 3: Changing the profile position via process data (PDO)

For selecting the position in [increments], the *dnPosProfilePosition_p* input at the application block is available.

**Note!**

For selecting the position in [units], the two inputs *wPosProfileUnitsLW* and *wPosProfileUnitsHW* at the application block are available.

- In the application level, the position in the FB [L_MckCtrlInterface](#) is converted from [units] to [increments] again and output to *dnPosSetOut_p*. For this purpose, the respective mode for position calculation must be selected in [C01296/1](#).
- Since the conversion is not executed within one controller cycle, the data at the *dnPosSetOut_p* output can be out-of-date. The *bPosSetDataValid* output is set to TRUE when the conversion is completed and the position in increments is valid. Then, the position can be transmitted to the profile (see the following section).

The acceptance of the position into the currently selected profile is executed with a FALSE-TRUE edge at the *bPosSetProfilePosition* input.

- ▶ If bit 2 is set in [C01297](#), the applied setpoint position is accepted into the currently selected profile and the profile is started directly when setting the process input *bPosExecute* to TRUE or setting the control bit "PosExecute" in the [MCK control word](#).
- ▶ If bit 3 is set in [C01297](#), the setpoint positions at the MCKInterface are automatically accepted into the profile with the applied profile number if a change of data is detected at the corresponding input for the setpoint position.
- ▶ The accepted position is stored in the code [C01301/x](#) in the application unit [units]. By reading out the code, you can check if the position was correctly accepted into the profile.

**Note!**

How to store changed profile parameters safely against mains failure in the memory module: Set [C00002/11](#) = "1: On / Start".

8.5.2 Internal interfaces | Application block "LA_TabPos"



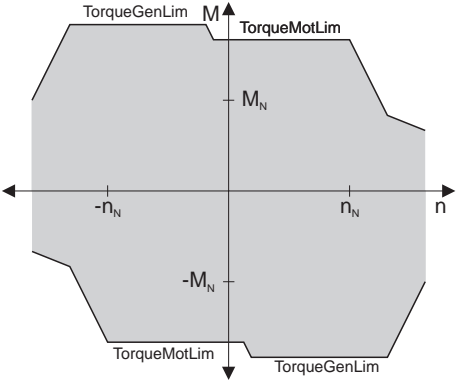
Note!

The connectors grayed out in the following table are hidden in the function block editor in the Lenze setting.

- These connections can be shown via the **Connector visibilities** command in the *Context menu* of the application block.

Inputs

Identifier	Data type	Information/possible settings		
wCANDriveControl	WORD	Control word via system bus (CAN) to device control <ul style="list-style-type: none"> • See the "wCANControl/wMCIControl control words" subchapter of the chapter on device control for a detailed description of the individual control bits. 		
wMCIControl	WORD	Control word via communication module (e.g. PROFIBUS) to device control <ul style="list-style-type: none"> • See the "wCANControl/wMCIControl control words" subchapter of the chapter on device control for a detailed description of the individual control bits. 		
wSMControl	WORD	Interface to the optional safety system. <ul style="list-style-type: none"> • Setting control bit 0 ("SafeStop1") in this control word causes e.g. the automatic deceleration of the drive to standstill within this application (in the Motion Control Kernel). • See the "Interface to safety system" subchapter of the chapter on basic drive functions for a detailed description of the control bits. 		
bCInh	BOOL	Enable/Inhibit controller		
		<table border="0"> <tr> <td style="padding-right: 10px;">FALSE</td> <td>Enable controller: The controller switches to the "OperationEnabled" device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. </td> </tr> <tr> <td>TRUE</td> <td>Inhibit controller (controller inhibit): The controller switches to the "SwitchedOn" device status.</td> </tr> </table>	FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit.
FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. 			
TRUE	Inhibit controller (controller inhibit): The controller switches to the " SwitchedOn " device status.			
bFailReset	BOOL	Reset error messages		
		<p>In the Lenze setting this input is connected to the digital input controller enable so that a possibly existing error message is reset together with the controller enable (if the cause for the fault is eliminated).</p> <table border="0"> <tr> <td style="padding-right: 10px;">TRUE</td> <td>The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged. </td> </tr> </table>	TRUE	The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged.
TRUE	The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged. 			
bSetQuickstop	BOOL	Enable quick stop (QSP) <ul style="list-style-type: none"> • Also see device command "Activate/Deactivate quick stop". 		
		<table border="0"> <tr> <td style="padding-right: 10px;">TRUE</td> <td>Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019. </td> </tr> <tr> <td>FALSE</td> <td>Deactivate quick stop <ul style="list-style-type: none"> • The quick stop is deactivated if no other source for the quick stop is active. • C00159 provides a bit-coded representation of active sources/causes for the quick stop. </td> </tr> </table>	TRUE	Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019.
TRUE	Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019. 			
FALSE	Deactivate quick stop <ul style="list-style-type: none"> • The quick stop is deactivated if no other source for the quick stop is active. • C00159 provides a bit-coded representation of active sources/causes for the quick stop. 			

Identifier	Information/possible settings				
<p>nTorqueMotLim_a nTorqueGenLim_a</p> <p style="text-align: right;">Data type INT</p>	<p>Torque limitation in motor mode and in generator mode</p> <ul style="list-style-type: none"> • These input signals are directly transferred to the motor control to limit the controller's maximum torque in motor and generator mode. • The drive cannot output a higher torque in motor/generator mode than set here. • The applied values (any polarity) are internally interpreted as absolute values. • If V/f characteristic control (VFCplus) is selected, limitation is <u>indirectly</u> performed via a so-called I_{max} controller. • If sensorless vector control (SLVC) or servo control (SC) is selected, limitation has a <u>direct</u> effect on the torque-producing current component. • Scaling: 16384 \equiv 100 % M_{max} (C00057) <p>Note: Setting this input is ineffective in the reference modes 14 and 15 ("Homing to positive stop").</p> <p>Torque limits in motor and generator mode:</p> 				
<p>bSetSpeedCcw</p> <p style="text-align: right;">Data type BOOL</p>	<p>Change of direction of rotation</p> <ul style="list-style-type: none"> • For instance if a motor or gearbox is fixed laterally reversed to a machine part, but the setpoint selection should still be executed for the positive direction of rotation. <table border="1"> <tr> <td>FALSE</td> <td>Direction of rotation to the right (Cw)</td> </tr> <tr> <td>TRUE</td> <td>Direction of rotation to the left (Ccw)</td> </tr> </table>	FALSE	Direction of rotation to the right (Cw)	TRUE	Direction of rotation to the left (Ccw)
FALSE	Direction of rotation to the right (Cw)				
TRUE	Direction of rotation to the left (Ccw)				
<p>nMainSetValue_a</p> <p style="text-align: right;">Data type INT</p>	<p>Main speed setpoint</p> <ul style="list-style-type: none"> • Offset and gain of this input signal can be set in C00696 and C00670 for a simple signal adjustment of a setpoint encoder. • Scaling: 16384 \equiv 100 % reference speed (C00011) • The main setpoint is transformed to a speed setpoint in the setpoint encoder via a ramp function generator with linear or S-shaped ramps. • Upstream to the ramp function generator, a blocking speed masking function and a setpoint MinMax limitation are effective. • For a detailed functional description see the L_NSet FB. 				
<p>nAuxSetValue_a</p> <p style="text-align: right;">Data type INT</p>	<p>Additional speed setpoint</p> <ul style="list-style-type: none"> • Offset and gain of this input signal can be set in C00697 and C00671 for a simple signal adjustment of a setpoint encoder. • Scaling: 16384 \equiv 100 % reference speed (C00011) • The additional speed setpoint can be linked arithmetically with the main speed setpoint behind the ramp function generator. • The additional speed setpoint can be shown via ramp times of a second ramp function generator. • For a detailed functional description see the L_NSet FB. 				
<p>bJogSpeed1 bJogSpeed2</p> <p style="text-align: right;">Data type BOOL</p>	<p>Selection inputs for fixed changeover setpoints (JOG setpoints) for the main setpoint</p> <ul style="list-style-type: none"> • Selection inputs are binary coded. 				

Identifier	Data type	Information/possible settings
bJogSpeed1 bJogSpeed2	BOOL	<p>Selection inputs for fixed changeover setpoints (JOG setpoints) for the main setpoint</p> <ul style="list-style-type: none"> • A fixed setpoint for the setpoint generator can be activated instead of the main setpoint via these selection inputs. • The two selection inputs are binary coded, therefore you can select 3 fixed setpoints. • In the case of binary coded selection "0" (all inputs = FALSE or not assigned), main setpoint <i>nMainSetValue_a</i> is active. • The selection of the fixed setpoints is carried out in C00039/1...3 in [%] based on the reference speed (C00011). • For a detailed functional description see the L_NSet FB.
<p>Motor potentiometer</p> <p>Alternatively to the input signal <i>nMainSetValue_a</i>, the main setpoint can also be generated by a motor potentiometer function.</p> <ul style="list-style-type: none"> • In the Lenze setting, the motor potentiometer function is deactivated. • Activation is possible via C00806 or via the <i>bMPotEnable</i> input. • The behaviour of the motor potentiometer during switch-on of the drive system can be selected in C00805. • For a detailed functional description see the L_MPot FB. 		
bMPotEnable	BOOL	<p>Activating the motor potentiometer function</p> <ul style="list-style-type: none"> • This input and C00806 are OR'd.
		<p>TRUE</p> <p>The motor potentiometer function is active; the speed setpoint can be changed via the <i>bMPotUp</i> and <i>bMPotDown</i> control inputs.</p>
bMPotUp	BOOL	<p>Increasing the speed setpoint</p>
		<p>TRUE</p> <p>Approach the upper speed limit value set in C00800 with the acceleration time set in C00802.</p>
bMPotDown	BOOL	<p>Decreasing the speed setpoint</p>
		<p>TRUE</p> <p>Approach the lower speed limit value set in C00801 with the deceleration time set in C00803.</p>
<p>MCK basic functions</p>		
bMBrakeRelease	BOOL	<p>Holding brake control: Release/apply brake</p> <ul style="list-style-type: none"> • In conjunction with the operating mode selected in C02580 (Lenze setting: "Brake control off").
		<p>FALSE</p> <p>Apply brake.</p> <ul style="list-style-type: none"> • During automatic operation, the internal brake logic controls of the brake.
		<p>TRUE</p> <p>Release brake manually (forced release).</p> <ul style="list-style-type: none"> • Note! The brake can also be released when the controller is inhibited! • During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. • In semi-automatic operation, the brake is released including feedforward control.
wMckCtrl1 wMckCtrl2	WORD	<p><u>Direct</u> selection of MCK control words</p> <ul style="list-style-type: none"> • E.g. via a master control which has been connected to the fieldbus, too. For this purpose, the control word inputs can directly be connected to the LP_McIn or LP_CanIn fieldbus interface. • See the "MCK control word" chapter for a detailed description of the individual control bits.

Identifier	Data type	Information/possible settings														
wMckOperationMode	WORD	<p>Selection of the operating mode of the Motion Control Kernel</p> <ul style="list-style-type: none"> Only bit 0 ... bit 3 of <i>wMckOperationMode</i> is evaluated. If an invalid operating mode is selected, the response set in C00595/11 is activated (Lenze setting: "Warning"). The current operating mode is displayed in C01243. <table border="1"> <tr><td>0</td><td>Speed follower</td></tr> <tr><td>1</td><td>Homing</td></tr> <tr><td>2</td><td>Manual jog</td></tr> <tr><td>3</td><td>Positioning</td></tr> <tr><td>4</td><td>Stop</td></tr> <tr><td>5</td><td>Position follower</td></tr> <tr><td>6 ... 15</td><td>Reserved for future extensions</td></tr> </table>	0	Speed follower	1	Homing	2	Manual jog	3	Positioning	4	Stop	5	Position follower	6 ... 15	Reserved for future extensions
0	Speed follower															
1	Homing															
2	Manual jog															
3	Positioning															
4	Stop															
5	Position follower															
6 ... 15	Reserved for future extensions															
bMckOperationMode_1 ... bMckOperationMode_8	BOOL/BOOL	<p>Binary-coded selection of the operating mode of the Motion Control Kernel</p> <ul style="list-style-type: none"> See the "MCK control word" chapter for a detailed description of the individual control bits. If an invalid operating mode is selected, the response set in C00595/11 is activated (Lenze setting: "Warning"). The current operating mode is displayed in C01243. 														
bPosCtrlOn	BOOL	<p>Position control/Angle control</p> <ul style="list-style-type: none"> Pre-configured assignment: TRUE (position control active) <table border="1"> <tr><td>FALSE</td><td>Deactivate position control/angle control</td></tr> <tr><td>TRUE</td><td>Activate position control/angle control</td></tr> </table>	FALSE	Deactivate position control/angle control	TRUE	Activate position control/angle control										
FALSE	Deactivate position control/angle control															
TRUE	Activate position control/angle control															
nPosCtrlOutLimit_a	INT	<p>Limitation of the position controller output</p> <ul style="list-style-type: none"> Scaling: 16384 ≙ 100 % reference speed (C00011) Pre-configured assignment: 100 % 														
nPosCtrlPAadapt_a	INT	<p>Adaptation of the position controller gain</p> <ul style="list-style-type: none"> Scaling: 16384 ≙ 100 % Vp (C00254) Pre-configured assignment: 100 % 														
bLimitSwitchPos bLimitSwitchNeg	BOOL	<p>Limit position monitoring: Inputs for positive/negative limit switch</p>														
bReleaseLimitSwitch	BOOL	<p>Manual jog: Retract operated limit switch</p> <table border="1"> <tr><td>TRUE</td><td>Retract operated limit switch (in opposite direction)</td></tr> </table>	TRUE	Retract operated limit switch (in opposite direction)												
TRUE	Retract operated limit switch (in opposite direction)															
bManJogPos bManJogNeg	BOOL	<p>Manual jog:</p> <p><i>bManJogPos</i> = TRUE: Manual jog right <i>bManJogNeg</i> = TRUE: Manual jog left Both inputs = TRUE: No change compared to previous state Both inputs = FALSE: Stop manual jog</p>														
bManJogExecute2ndVel	BOOL	<p>Manual jog: Changeover to speed 2</p> <table border="1"> <tr><td>FALSE</td><td>Speed 1 (C01231/1) active</td></tr> <tr><td>TRUE</td><td>Speed 2 (C01231/2) active</td></tr> </table>	FALSE	Speed 1 (C01231/1) active	TRUE	Speed 2 (C01231/2) active										
FALSE	Speed 1 (C01231/1) active															
TRUE	Speed 2 (C01231/2) active															
bEnableSpeedOverride	BOOL	<p>Speed override</p> <table border="1"> <tr><td>TRUE</td><td>Activate speed override</td></tr> </table>	TRUE	Activate speed override												
TRUE	Activate speed override															
nSpeedOverride_a	INT	<p>Value for Speed override</p> <ul style="list-style-type: none"> Percentage multiplier for the currently active speed. 16384 ≙ 100 % of the maximum traversing speed (display in C01211/1). Values > 16384 are ignored. If the override value is 0 %, the drive is brought to a standstill. 														
bEnableAccOverride	BOOL	<p>Acceleration override</p> <table border="1"> <tr><td>TRUE</td><td>Activate acceleration override</td></tr> </table>	TRUE	Activate acceleration override												
TRUE	Activate acceleration override															

Identifier	Data type	Information/possible settings
nAccOverride_a	INT	Value for Acceleration override <ul style="list-style-type: none"> Percentage multiplier for the currently active acceleration. 16384 ≙ 100 % of the parameterised acceleration of the corresponding operating mode. Values > 16384 are ignored. If the override value is 0 %, acceleration ceases.
bHomeStartStop	BOOL	Homing : Start/stop homing
		TRUE Start homing
bHomeSetPosition	BOOL	Homing : Set home position
		TRUE↘FALSE Stop homing
bHomeResetPosition	BOOL	Homing : Reset home position
		TRUE Reset the "Reference known" status
bHomeMark	BOOL	Homing : Input for reference switch (pre-switch off mark) <ul style="list-style-type: none"> This input responds to the FALSE status (fail-safe) and is to be connected to the corresponding digital input to which the reference switch is connected.
bPosSetProfilePosition	BOOL	Position teaching : MCK setpoint position
		TRUE Teach MCK setpoint position into the selected profile.
bPosSetActualPosition	BOOL	Position teaching : Current position
		TRUE Teach current position into the selected profile.
bPosExecute	BOOL	Positioning : Start travelling
		FALSE↗TRUE Execute selected profile
bPosFinishTarget	BOOL	Positioning : Complete cancelled profile
		FALSE↗TRUE A positioning process previously cancelled, e.g. by <i>bPosStop</i> or due to a device error, is resumed by travelling to the original target.
bPosDisableFollowProfile	BOOL	Positioning : Do not execute sequence profile (switch-off profile linkage)
		TRUE Evaluation of the sequence profile number parameterised in C01307/1...15 for the selected profile is suppressed.
bPosStop	BOOL	Positioning : Cancel travelling
		TRUE Stop positioning From version 02.00.00, more travel requests will be inhibited ("PosExecute" will be blocked).

Identifier	Data type	Information/possible settings																						
wPosProfileMode	WORD	<p>Override of the positioning mode set in the profile data</p> <ul style="list-style-type: none"> Via this input, an override of the positioning mode parameterised in C01300/1...15 for the selected profile is possible. The value set in C01300/1...15 is not overwritten in this case. Only bit 0 ... bit 3 of <i>wPosMode</i> are evaluated. If <i>wPosMode</i> = 0 is selected, the positioning mode set in C01300/1...15 is used. <table border="1"> <tr><td>0</td><td>Positioning mode = setting in C01300/1...15</td></tr> <tr><td>1</td><td>Absolute (shortest path)</td></tr> <tr><td>2</td><td>Continuous</td></tr> <tr><td>3</td><td>Relative</td></tr> <tr><td>4</td><td>Absolute (Cw)</td></tr> <tr><td>5</td><td>Absolute (Ccw)</td></tr> <tr><td>8</td><td>Absolute (shortest path) to TP</td></tr> <tr><td>9</td><td>Continuous to TP</td></tr> <tr><td>10</td><td>Relative to TP</td></tr> <tr><td>11</td><td>Absolute (Cw) on TP</td></tr> <tr><td>12</td><td>Absolute (Ccw) on TP</td></tr> </table> <p>All other possible settings are reserved for future extensions!</p>	0	Positioning mode = setting in C01300/1...15	1	Absolute (shortest path)	2	Continuous	3	Relative	4	Absolute (Cw)	5	Absolute (Ccw)	8	Absolute (shortest path) to TP	9	Continuous to TP	10	Relative to TP	11	Absolute (Cw) on TP	12	Absolute (Ccw) on TP
0	Positioning mode = setting in C01300/1...15																							
1	Absolute (shortest path)																							
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9	Continuous to TP																							
10	Relative to TP																							
11	Absolute (Cw) on TP																							
12	Absolute (Ccw) on TP																							
wPosProfileNo	WORD	<p>Stipulation of the profile to be executed</p> <ul style="list-style-type: none"> Optionally as a data word or binary coded. 																						
bPosProfileNo_1 ... bPosProfileNo_8	BOOL																							
dnPosProfilePosition_p	DINT	<p>Selection of the target position in [increments]</p> <ul style="list-style-type: none"> The mode for calculating the position is selected in C01296/1. 																						
wPosProfileUnitsLW wPosProfileUnitsHW	WORD	<p>Selection of the target position in [units]</p> <ul style="list-style-type: none"> <i>wPosProfileUnitsLW</i> = Low word, <i>wPosProfileUnitsHW</i> = High word The mode for calculating the position is selected in C01296/1. 																						
GP: GeneralPurpose																								
The following inputs are interconnected with logic/arithmetic functions on application level for free usage. ▶ "GeneralPurpose" functions																								
nGPAnalogSwitchIn1_a nGPAnalogSwitchIn2_a	INT	<p>Analog switch: Input signals</p> <ul style="list-style-type: none"> The input signal selected via the selection input <i>bGPAnalogSwitchSet</i> is output at output <i>nGPAnalogSwitchOut_a</i>. 																						
bGPAnalogSwitchSet	BOOL	<p>Analog switch: Selection input</p> <table border="1"> <tr><td>FALSE</td><td><i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn1_a</i></td></tr> <tr><td>TRUE</td><td><i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn2_a</i></td></tr> </table>	FALSE	<i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn1_a</i>	TRUE	<i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn2_a</i>																		
FALSE	<i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn1_a</i>																							
TRUE	<i>nGPAnalogSwitchOut_a</i> = <i>nGPAnalogSwitchIn2_a</i>																							
nGPArithmetikIn1_a nGPArithmetikIn2_a	INT	<p>Arithmetic: Input signals</p> <ul style="list-style-type: none"> The arithmetic function is selected in C00338. The result is output at output <i>nGPArithmetikOut_a</i>. 																						
nGPMulDivIn_a	INT	<p>Multiplication/Division: Input signal</p> <ul style="list-style-type: none"> The factor for the multiplication can be set in C00699/1 (numerator) and C00699/2 (denominator). The result is output at output <i>nGPMulDivOut_a</i>. 																						
bGPDigitalDelayIn	BOOL	<p>Binary delay element: Input signal</p> <ul style="list-style-type: none"> The on-delay can be set in C00720/1. The off-delay can be set in C00720/2. The time-delayed input signal is output at output <i>bGPDigitalDelayOut</i>. 																						

Identifier	Data type	Information/possible settings
bGLogicIn1 bGLogicIn2 bGLogicIn3	BOOL	Binary logic: Input signals <ul style="list-style-type: none"> The logic operation is selected in C00820. The result is output at output <i>bGLogicOut</i>.
nGCompareIn1_a nGCompareIn2_a	INT	Analog comparison: Input signals <ul style="list-style-type: none"> The comparison operation is selected in C00680. Hysteresis and window size can be set in C00680 and C00682. If the comparison statement is true, the output <i>bGCompareOut</i> will be set to TRUE.
bGPDFlipFlop_InD bGPDFlipFlop_InClk bGPDFlipFlop_InClr	BOOL	D-FlipFlop: Input signals <ul style="list-style-type: none"> Data, clock and reset input
bGPCounter1ClkUp	BOOL	Numerator: Clock input <ul style="list-style-type: none"> With each edge, the module counts up by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bGPCounter1ClkDown	BOOL	Numerator: Clock input <ul style="list-style-type: none"> With each edge, the module counts down by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bGPCounter1Load	BOOL	Numerator: Loading input <ul style="list-style-type: none"> The input has the highest priority.
wGPCounter1LdVal	WORD	Numerator: Starting value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.
wGPCounter1CmpVal	WORD	Numerator: Comparison value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.
Free inputs The following inputs can freely be interconnected on the application level. The signals can be transferred from the I/O level to the application level via these inputs.		
bFreeIn1 ... bFreeIn8	BOOL	Free inputs for digital signals
wFreeIn1 ... wFreeIn4	WORD	Free inputs for 16-bit signals
dnFreeIn1_p ... dnFreeIn2_p	DINT	Free inputs for 32-bit signals

Outputs

Identifier	Data type	Value/meaning
wDriveControlStatus	WORD	Status word of the controller (based on DSP-402) <ul style="list-style-type: none"> The status word contains information on the current status of the drive controller. See the "wDeviceStatusWord status word" subchapter of the chapter on device control for a detailed description of the bit assignment.
wStateDetermFailNoLow	WORD	Display of the status determining error (LOW word)
wStateDetermFailNoHigh	WORD	Display of the status determining error (HIGH word)
bDriveFail	BOOL	TRUE Drive controller in error status. <ul style="list-style-type: none"> "Fault" device status is active.

Identifier	Data type	Value/meaning	
bDriveReady	BOOL	TRUE	Controller is ready for operation. <ul style="list-style-type: none"> "SwitchedOn" device status is active. The drive is in this device status if the DC bus voltage is applied and the controller is still inhibited by the user (controller inhibit).
bCInhActive	BOOL	TRUE	Controller inhibit is active.
bQSPisActive	BOOL	TRUE	Quick stop is active.
bSpeedCcw	BOOL	Current direction of rotation	
		FALSE	Direction of rotation to the right (Cw)
		TRUE	Direction of rotation to the left (Ccw)
bSpeedActCompare	BOOL	Result of the speed comparison	
		TRUE	During open-loop operation: Speed setpoint < Comparison value (C00024) During closed-loop operation: Actual speed value < Comparison value (C00024)
blmaxActive	BOOL	"Current setpoint inside the limitation" status signal	
		TRUE	The current setpoint is internally limited (the drive controller operates at the maximum current limit).
bSpeedSetReached	BOOL	Status signal "setpoint = 0"	
		TRUE	Speed setpoint from the ramp function generator = 0
nMotorCurrent_a	INT	Current stator current/effective motor current <ul style="list-style-type: none"> Scaling: $16384 \equiv 100\% I_{\max_mot}$ (C00022) 	
nMotorSpeedSet_a	INT	Speed setpoint <ul style="list-style-type: none"> Scaling: $16384 \equiv 100\%$ reference speed (C00011) 	
nMotorSpeedAct_a	INT	Actual speed value <ul style="list-style-type: none"> Scaling: $16384 \equiv 100\%$ reference speed (C00011) 	
nMotorTorqueAct_a	INT	Actual torque <ul style="list-style-type: none"> In the "VFC (+encoder)" operating mode of the motor control, this value is determined from the current motor current and corresponds to the actual torque only by approximation. Scaling: $16384 \equiv 100\% M_{\max}$ (C00057) 	
nDCVoltage_a	INT	Actual DC-bus voltage <ul style="list-style-type: none"> Scaling: $16384 \equiv 1000\text{ V}$ 	
nMotorVoltage_a	INT	Current motor voltage/inverter output voltage <ul style="list-style-type: none"> Scaling: $16384 \equiv 1000\text{ V}$ 	
MCK basic functions			
bMBrakeReleaseOut	BOOL	Holding brake control : Trigger signal for the holding brake control switching element via a digital output <ul style="list-style-type: none"> Use bit 0 in C02582 to activate inverted switching element triggering. 	
		FALSE	Apply brake.
		TRUE	Release brake.
bMBrakeReleased	BOOL	Holding brake control : "Brake released" considering the brake release time <ul style="list-style-type: none"> When the holding brake is triggered to close, <i>bMBrakeReleased</i> is immediately set to FALSE even if the brake closing time has not yet elapsed! 	
		TRUE	Brake released (when the brake release time has elapsed).
wMckState1 wMckState2	WORD	Output of the MCK status words <ul style="list-style-type: none"> For a detailed description of each status bit see chapter "MCK status word". 	
wMckActOperationMode	WORD	Active setpoint-generating state of the MCK. <ul style="list-style-type: none"> Bit B0 ... B3 contain the information of the MCK status word. Bits B4 ... B15 are fixed at "0". 	

Identifier	Data type	Value/meaning
bHomeDone	BOOL	TRUE Homing has been executed.
bHomePosAvailable	BOOL	TRUE Home position is known.
bProfileDone	BOOL	TRUE Target position from the profile has been approached.
bProfileBusy	BOOL	TRUE Profile positioning is active.
bAccelerating	BOOL	TRUE Acceleration phase active.
bConstantDuty	BOOL	TRUE Constant phase active.
bDecelerating	BOOL	TRUE Braking phase active.
bDwellTime	BOOL	TRUE Settling in target position is active
bInTarget	BOOL	TRUE Target position (actual value) is in the target window.
wActProfileNo	WORD	Current profile number <ul style="list-style-type: none"> • Bit B0 ... B7 contain the information of the MCK status word. • Bits B8 ... B15 are fixed at "0".
wActPosMode	WORD	Current positioning mode <ul style="list-style-type: none"> • Bit B0 ... B3 contain the information of the MCK status word. • Bits B4 ... B15 are fixed at "0".
dnTargetPos_p	DINT	Target position in [increments] <ul style="list-style-type: none"> • 65535 = 1 revolution of the motor shaft
dnSetPos_p	DINT	Absolute position setpoint
dnPosAct_p	DINT	Current position of the motor shaft in [increments]
dnDeltaPosAct_p	DINT	Current following error in [increments] <ul style="list-style-type: none"> • Following error = Difference between set position and actual position
wPosOutUnitsLW wPosOutUnitsHW	WORD	Output of the target position in [units] <ul style="list-style-type: none"> • <i>wPosOutUnitsLW</i> = Low-Word, <i>wPosOutUnitsHW</i> = High-Word • The mode for calculating the position is selected in C01296/2.
GP: GeneralPurpose The following outputs are interconnected with logic/arithmetic functions on application level for free usage. ▶ "GeneralPurpose" functions		
nGPAAnalogSwitchInOut_a	INT	Analog switch : Output signal
nGPArithmetikOut_a	INT	Arithmetic : Output signal
nGPMulDivOut_a	INT	Multiplication/Division : Output signal
bGPDigitalDelayOut	BOOL	Binary delay element : Output signal
bGPLogicOut	BOOL	Binary logic : Output signal
bGPCompareOut	BOOL	Analog comparison : Output signal
bGPSignalOut1 ... bGPSignalOut4	BOOL	Binary signal monitor : Output signals <ul style="list-style-type: none"> • The signal sources to be output are selected in C00411/1...4. • A bit coded inversion of the output signals can be parameterised in C00412.

Identifier	Data type	Value/meaning
nGPSignalOut1_a ... nGPSignalOut4_a	BOOL	Analog signal monitor : Output signals <ul style="list-style-type: none"> The signal sources to be output are selected in C00410/1...4. Gain and offset for each output signal can be parameterised in C00413/1...8.
bGPDFlipFlop_Out	BOOL	D-FlipFlop : Output signal
bGPDFlipFlop_NegOut	BOOL	D-FlipFlop : Negated output signal
bGPCounter1Equal	BOOL	Numerator : Status signal "Comparison value reached" TRUE Comparison value <i>wGPCounter1CmpVal</i> reached.
wGPCounter1Out	WORD	Numerator : Counter content <ul style="list-style-type: none"> Internal limitation to ± 32767 The most significant bit determines the sign!
Free outputs		
The following outputs can freely be interconnected on the application level. The signals from the application level can be transferred to the I/O level via these outputs.		
bFreeOut1 ... bFreeOut8	BOOL	Free outputs for digital signals
wFreeOut1 ... wFreeOut4	WORD	Free outputs for 16-bit signals
dnFreeOut1_p dnFreeOut2_p	WORD	Free outputs for 32-bit signals

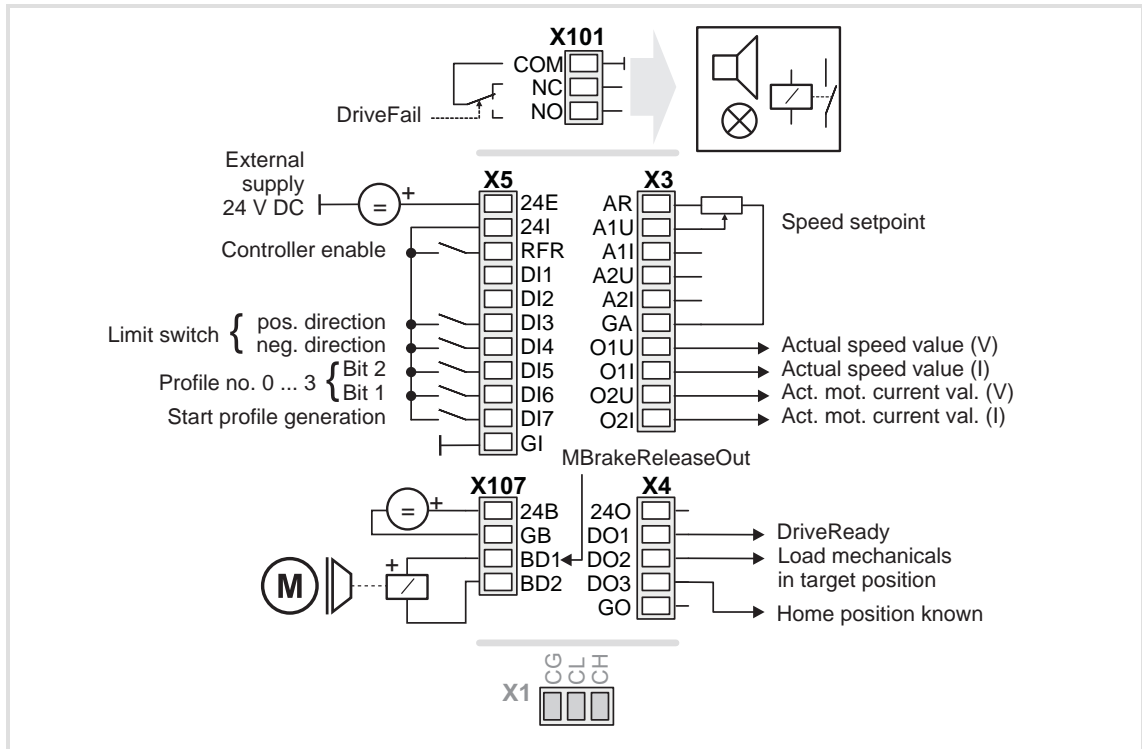
8.5.3 Terminal assignment of the control modes

The following comparison provides information about which inputs/outputs of the application block **LA_TabPos** are interconnected to the digital and analog input/output terminals of the drive controller in the different control modes.

	Control mode (C00007)							
	10: Terminals 0	12: Terminals 2	14: Terminals 11	16: Terminal 16	20: Keypad	21: PC	30: CAN	40: MCI
Digital input terminals								
X5/RFR	Controller enable / Reset of error message bFailReset							
X5/DI1	-	-	Positive limit switch bLimitSwitchPos	-	-	-	-	-
X5/DI2	-	-	Negative limit switch bLimitSwitchNeg	-	-	-	-	-
X5/DI3	Positive limit switch bLimitSwitchPos	-	-	Manual jog in positive direction bManJogPos	-	-	Positive limit switch bLimitSwitchPos	
X5/DI4	Negative limit switch bLimitSwitchNeg	Positioning profile, array bit (valency 4) bPosProfileNo_4		Manual jog in negative direction bManJogNeg	-	-	Negative limit switch bLimitSwitchNeg	
X5/DI5	Positioning profile, array bit (valency 2) bPosProfileNo_2				-	-	Home position bHomeMark	
X5/DI6	Positioning profile, array bit (valency 1) bPosProfileNo_1				-	-	Quick stop bSetQuickstop	
X5/DI7	Start of profile generation bPosExecute				-	-	Status word - bit 7 LP_CanOut1: bState_B7	Status word - bit 7 LP_MciOut: bState_B7
Analog input terminals								
X3/A1U	Main speed setpoint nMainSetValue_a				-	-	Main speed setpoint nMainSetValue_a	
X3/A1I	10 V ≙ 100 % reference speed (C00011)				-	-	10 V ≙ 100 % reference speed (C00011)	
X3/A2U	-	-	-	-	-	-	-	-
X3/A2I	-	-	-	-	-	-	-	-
Digital output terminals								
X4/DO1	Status "Drive is ready" bDriveReady							
X4/DO2	Status "Target position (actual value) is in the target window" bInTarget							
X4/DO3	Status "Home position known" bHomePosAvailable						Status "Maximum current limit" blmaxActive	
X107/BD1, BD2	Control of the holding brake bBrakeReleaseOut							
X101/COM, NO	Status "Error is pending" bDriveFail							

		Control mode (C00007)							
		10: Terminals 0	12: Terminals 2	14: Terminals 11	16: Terminal 16	20: Keypad	21: PC	30: CAN	40: MCI
Analog output terminals									
X3/O1U		Actual speed value nMotorSpeedAct_a 10 V \equiv 100 % reference speed (C00011)							
X3/O1I									
X3/O2U		Current motor current nMotorCurrent_a 10V \equiv 100% of I_{\max_mot} (C00022)							
X3/O2I									

8.5.3.1 Terminals 0



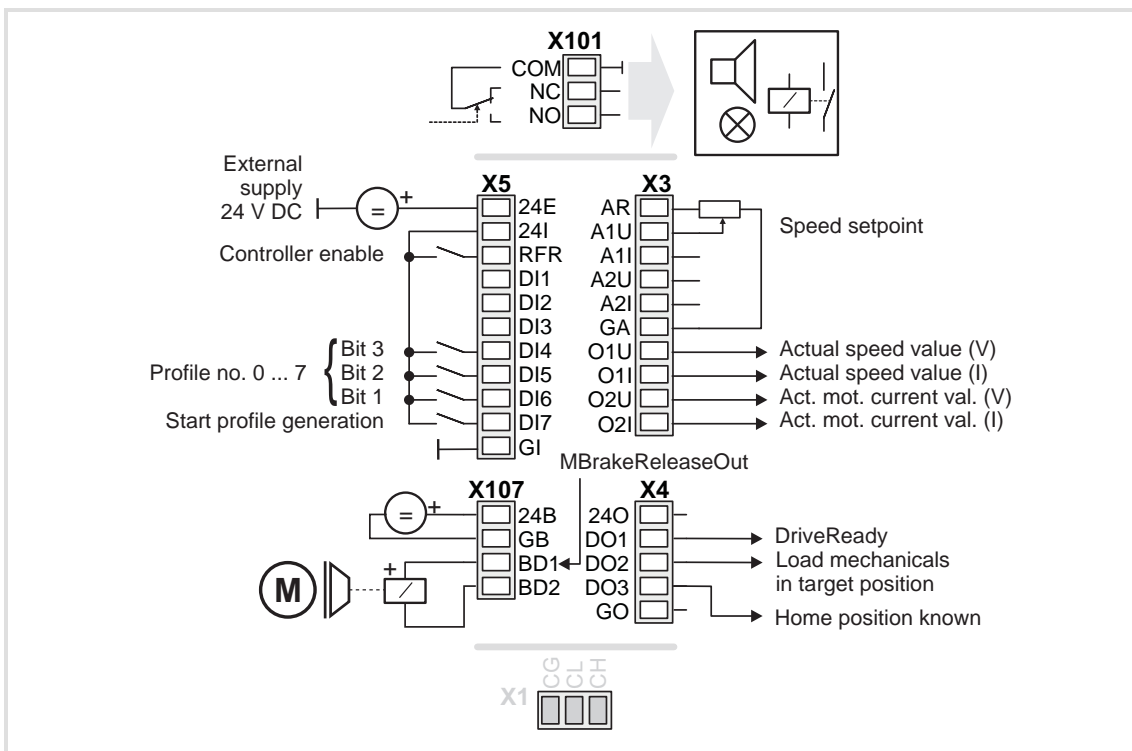
Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	LA_TabPos.bLimitSwitchPos
X5/DI4	LA_TabPos.bLimitSwitchNeg
X5/DI5	LA_TabPos.bPosProfileNo_2
X5/DI6	LA_TabPos.bPosProfileNo_1
X5/DI7	LA_TabPos.bPosExecute
X107/BD1	LA_TabPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_TabPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bHomePosAvailable

When the profile is defined, the operating mode in the Lenze setting is changed simultaneously:

bPosProfileNo_2 (DI5)	bPosProfileNo_1 (DI6)	Selected profile	Activation of operating mode
FALSE	FALSE	0	Speed follower
FALSE	TRUE	1	Homing
TRUE	FALSE	2	Manual jog
TRUE	TRUE	3	Positioning

8.5.3.2 Terminals 2



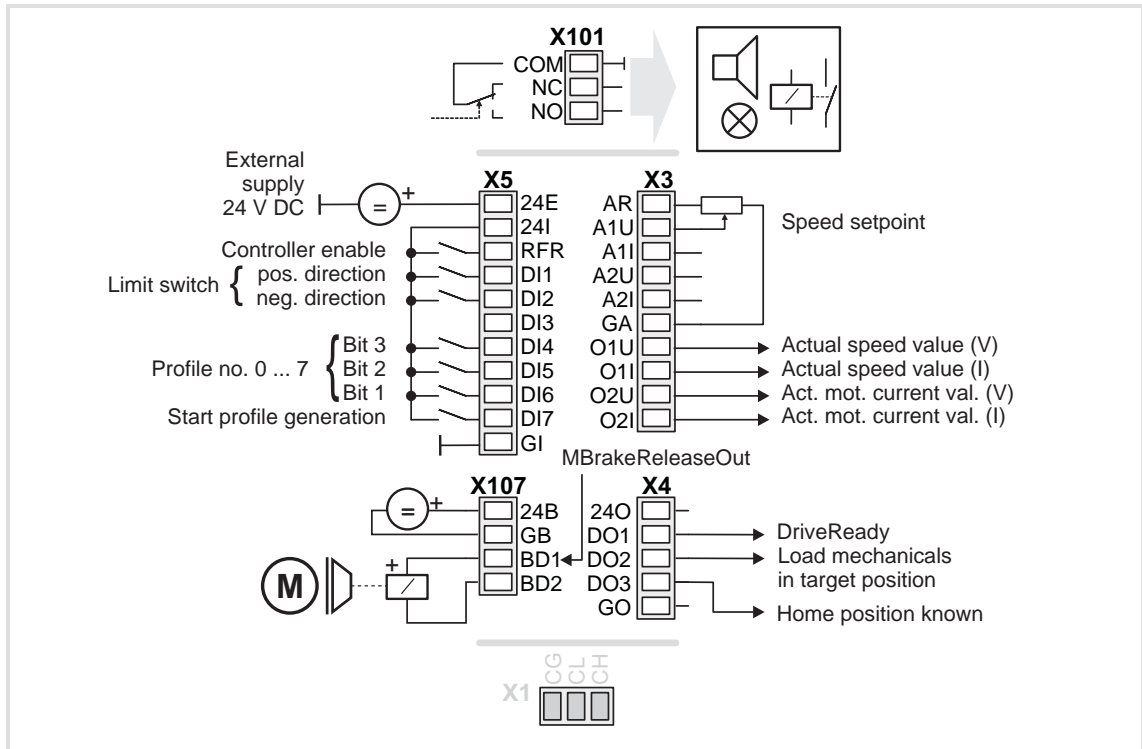
Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	-
X5/DI4	LA_TabPos.bPosProfileNo_4
X5/DI5	LA_TabPos.bPosProfileNo_2
X5/DI6	LA_TabPos.bPosProfileNo_1
X5/DI7	LA_TabPos.bPosExecute
X107/BD1	LA_TabPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_TabPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bHomePosAvailable

When the profile is defined, the operating mode in the Lenze setting is changed simultaneously:

bPosProfileNo_4 (DI4)	bPosProfileNo_2 (DI5)	bPosProfileNo_1 (DI6)	Selected profile	Activation of operating mode
FALSE	FALSE	FALSE	0	Speed follower
FALSE	FALSE	TRUE	1	Homing
FALSE	TRUE	FALSE	2	Manual jog
FALSE	TRUE	TRUE	3	Positioning
...
TRUE	TRUE	TRUE	7	...

8.5.3.3 Terminals 11



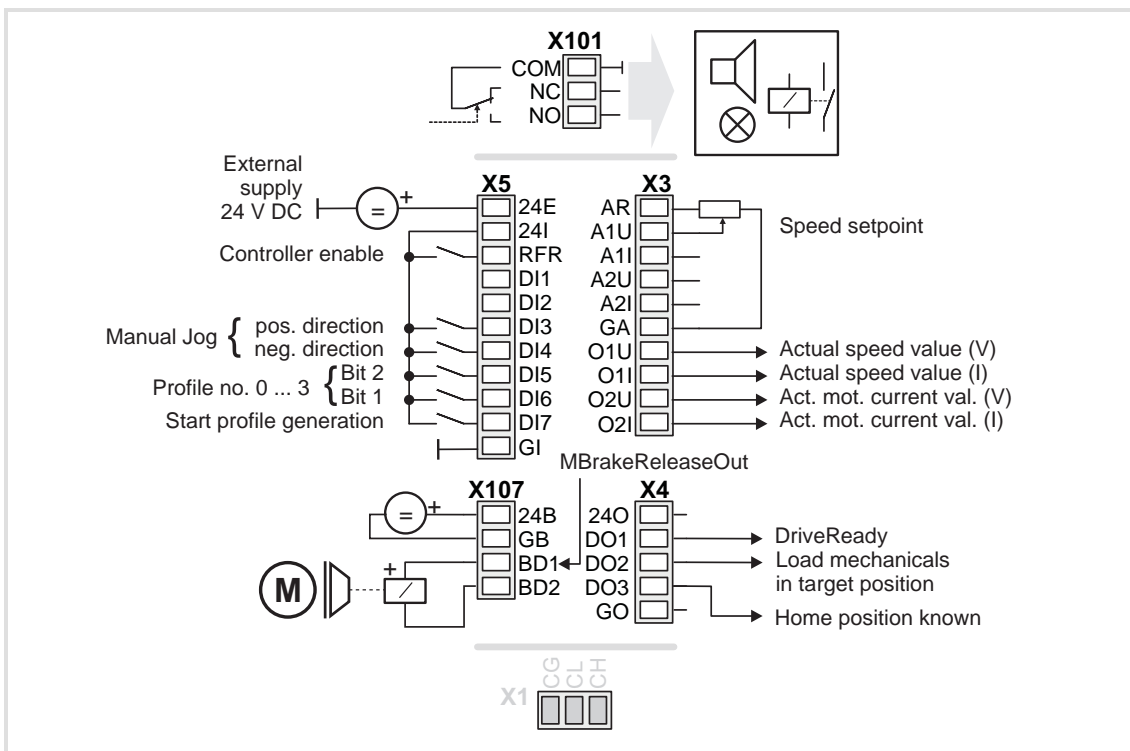
Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	LA_TabPos.bLimitSwitchPos
X5/DI2	LA_TabPos.bLimitSwitchNeg
X5/DI3	-
X5/DI4	LA_TabPos.bPosProfileNo_4
X5/DI5	LA_TabPos.bPosProfileNo_2
X5/DI6	LA_TabPos.bPosProfileNo_1
X5/DI7	LA_TabPos.bPosExecute
X107/BD1	LA_TabPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_TabPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bHomePosAvailable

When the profile is defined, the operating mode in the Lenze setting is changed simultaneously:

bPosProfileNo_4 (DI4)	bPosProfileNo_2 (DI5)	bPosProfileNo_1 (DI6)	Selected profile	Activation of operating mode
FALSE	FALSE	FALSE	0	Speed follower
FALSE	FALSE	TRUE	1	Homing
FALSE	TRUE	FALSE	2	Manual jog
FALSE	TRUE	TRUE	3	Positioning
...
TRUE	TRUE	TRUE	7	...

8.5.3.4 Terminal 16



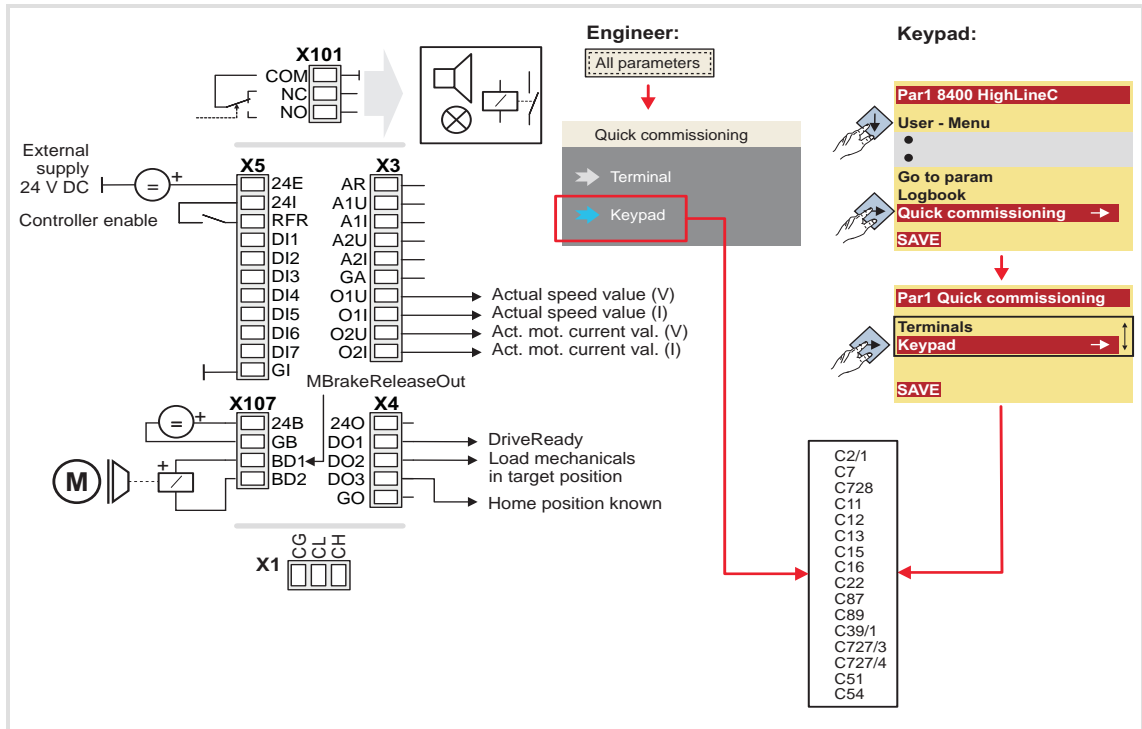
Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	LA_TabPos.bManJogPos
X5/DI4	LA_TabPos.bManJogNeg
X5/DI5	LA_TabPos.bPosProfileNo_2
X5/DI6	LA_TabPos.bPosProfileNo_1
X5/DI7	LA_TabPos.bPosExecute
X107/BD1	LA_TabPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_TabPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bHomePosAvailable

When the profile is defined, the operating mode in the Lenze setting is changed simultaneously:

bPosProfileNo_2 (DI5)	bPosProfileNo_1 (DI6)	Selected profile	Activation of operating mode
FALSE	FALSE	0	Speed follower
FALSE	TRUE	1	Homing
TRUE	FALSE	2	Manual jog
TRUE	TRUE	3	Positioning

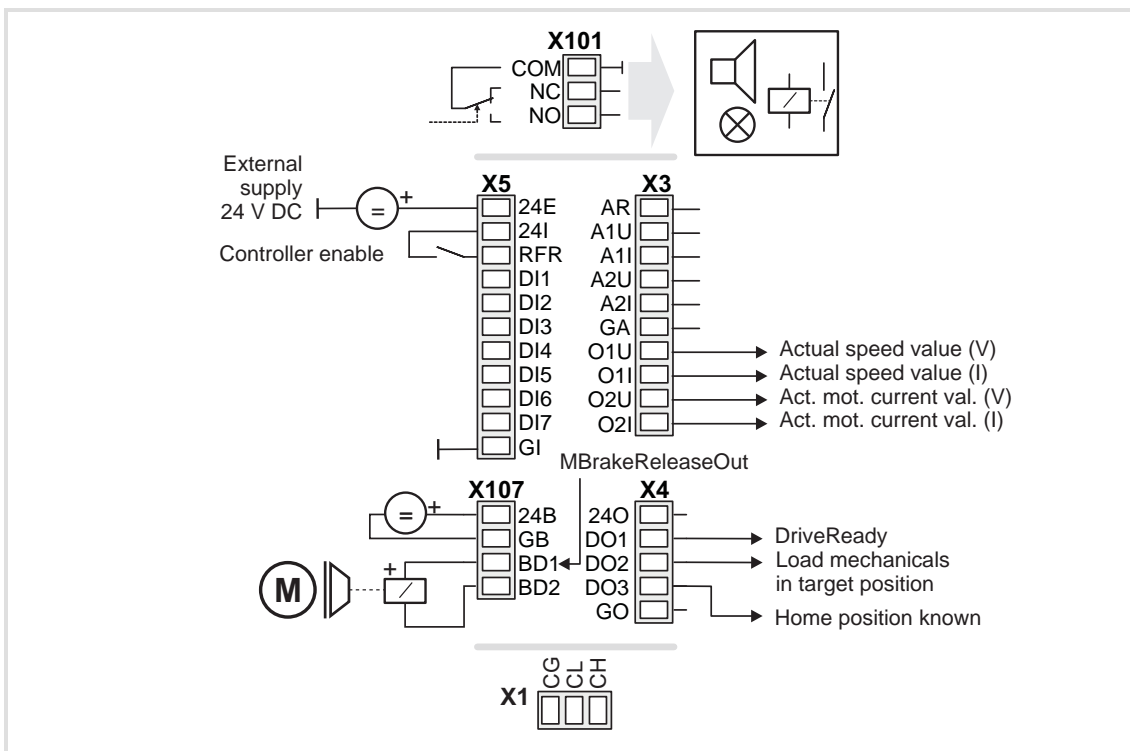
8.5.3.5 Keypad



Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	LA_TabPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_TabPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bHomePosAvailable

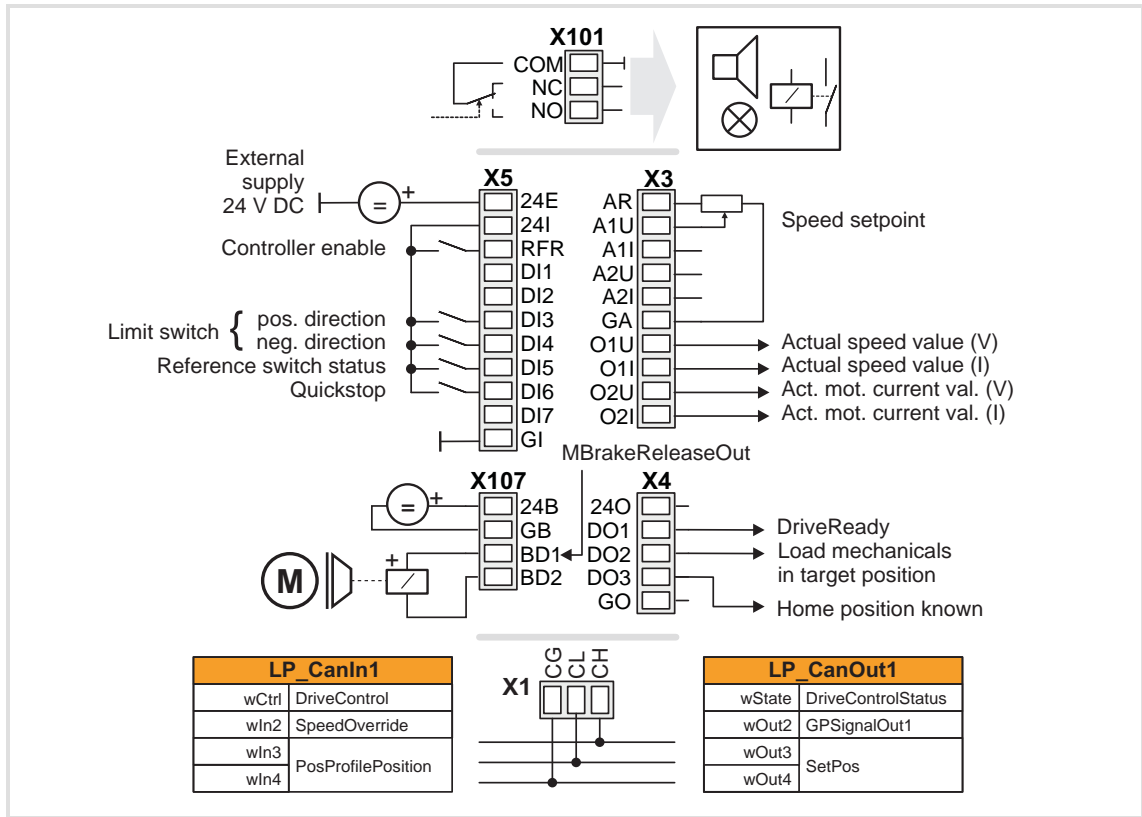
8.5.3.6 PC



Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	LA_TabPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	-
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bHomePosAvailable

8.5.3.7 CAN

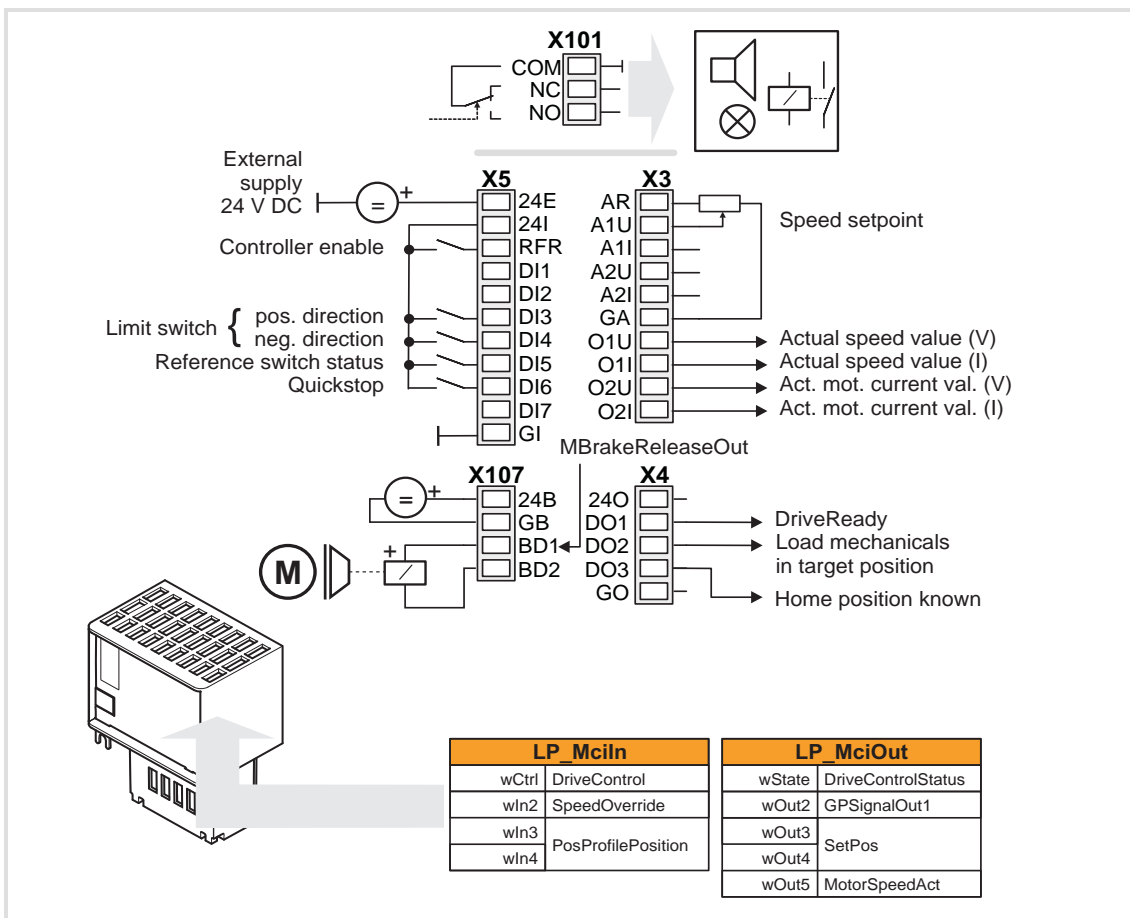


Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	LA_TabPos.bLimitSwitchPos
X5/DI4	LA_TabPos.bLimitSwitchNeg
X5/DI5	LA_TabPos.bHomeMark
X5/DI6	LA_TabPos.bSetQuickstop
X5/DI7	LP_CanOut1: bState_B7
X107/BD1	LA_TabPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_TabPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bI _{max} Active

▶ [Process data assignment for fieldbus communication](#) (434)

8.5.3.8 MCI



Connection	Assignment
X101/NC-NO	LA_TabPos.bDriveFail
X5/RFR	LA_TabPos.bFailReset
X5/DI1	-
X5/DI2	-
X5/DI3	LA_TabPos.bLimitSwitchPos
X5/DI4	LA_TabPos.bLimitSwitchNeg
X5/DI5	LA_TabPos.bHomeMark
X5/DI6	LA_TabPos.bSetQuickstop
X5/DI7	LP_MciOut: bState_B7
X107/BD1	LA_TabPos.bBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_TabPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	LA_TabPos.nMotorSpeedAct_a 10 V ≙ 100 % reference speed (C00011)
X3/O1I	-
X3/O2U	LA_TabPos.nMotorCurrent_a 10V ≙ 100% of I _{max_mot} (C00022)
X3/O2I	-
X4/DO1	LA_TabPos.bDriveReady
X4/DO2	LA_TabPos.bInTarget
X4/DO3	LA_TabPos.bI _{max} Active

► [Process data assignment for fieldbus communication](#) (434)

8.5.4 Process data assignment for fieldbus communication

The fieldbus communication is connected (preconfigured) to the previously selected technology application by selecting the corresponding control mode in [C00007](#):

- ▶ "30: [CAN](#)" for the connection to the system bus (CAN)
- ▶ "40: [MCI](#)" for the connection to a plugged-on communication module (e.g. PROFIBUS)

The assignment of the process data words does not depend on the applied bus system but exclusively on the application:

Input words	Name	Assignment
Word 1	DriveControl	Control word <ul style="list-style-type: none"> • See table below for bit assignment.
Word 2	SpeedOverride	Value for speed override <ul style="list-style-type: none"> • Percentage multiplier for the currently active speed. • 16384 ≙ 100 % of the maximum traversing speed (display in C01211/1). • Values > 16384 are ignored. • If the override value is 0 %, the drive is brought to a standstill. ▶ Speed override (☒ 560)
Word 3 and 4	PosProfilePosition	Selection of the target position in [increments] <ul style="list-style-type: none"> • The mode for calculating the position is selected in C01296/1. • 65535 [Increments] ≙ 1 motor revolution • The position resolution, i.e. how many increments form one unit, is displayed in C01205.
Word 5 ... 16	-	Not preconfigured <ul style="list-style-type: none"> • Only available for control mode "40: MCI".

Control word	Name	Function
Bit 0	MckOperationMode_1	Binary-coded selection of the operating mode of the Motion Control Kernel <ul style="list-style-type: none"> • For a detailed description of the individual control bits, see chapter "MCK control word". (☒ 481)
Bit 1	MckOperationMode_2	
Bit 2	MckOperationMode_4	
Bit 3	CINH	1 ≙ Inhibit drive controller (controller inhibit): The drive controller changes to the device state " SwitchedOn ". ▶ Enable/Inhibit controller (☒ 97)
Bit 4	PosProfileNo_1	Selection of the profile number ▶ Stipulation of the profile to be executed (☒ 552)
Bit 5	PosProfileNo_2	
Bit 6	PosProfileNo_4	
Bit 7	PosProfileNo_8	
Bit 8	PosExecute	1 ≙ Start travel job ▶ Positioning (☒ 541)
Bit 9	EnableSpeedOverride	1 ≙ Activate speed override ▶ Speed override (☒ 560)
Bit 10	HomeSetPosition	1 ≙ Set home position ▶ Homing (☒ 517)
Bit 11	FailReset	1 ≙ Reset error message ▶ Reset error messages (☒ 606)
Bit 12	ManJogNeg	Manual jog in positive/negative direction ▶ Manual jog (☒ 533)
Bit 13	ManJogPos	
Bit 14	-	Free control bit 14 (not assigned, freely assignable)
Bit 15	-	Free control bit 15 (not assigned, freely assignable)

Output words	Name	Assignment
Word 1	DriveControlStatus	Status word <ul style="list-style-type: none"> See table below for bit assignment.
Word 2	GPSignalOut1	Analog signal monitor: Output signal 1 <ul style="list-style-type: none"> The selection of the signal source to output is executed in C00410/1. Gain and offset for the output signal can be parameterised in C00413/1 and C00413/2. For a detailed functional description see the L_SignalMonitor_a FB.
Word 3 and 4	SetPos	Absolute position setpoint in [increments] <ul style="list-style-type: none"> 65535 [Increments] \equiv 1 motor revolution The position resolution, i.e. how many increments form one unit, is displayed in C01205.
Word 5	MotorSpeedAct	Actual speed value <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % reference speed (C00011) Only available for control mode "40: MCI".
Word 6 ... 16	-	Not preconfigured <ul style="list-style-type: none"> Only available for control mode "40: MCI".

Status word	Name	Status
Bit 0	DriveFail	1 \equiv Drive controller in error status <ul style="list-style-type: none"> "Fault" device status is active.
Bit 1	GPSignalOut1	Binary signal monitor: Output signals 1 & 2 <ul style="list-style-type: none"> The signal sources to be output are selected in C00411/1...2. A bit coded inversion of the output signals can be parameterised in C00412. For a detailed functional description see FB L_SignalMonitor_b.
Bit 2	GPSignalOut2	
Bit 3	ClnhActive	1 \equiv Controller inhibit is active
Bit 4	DriveReady	1 \equiv Drive controller is ready for operation <ul style="list-style-type: none"> "SwitchedOn" device status is active. The drive is in this device status if the DC bus voltage is applied and the controller is still inhibited by the user (controller inhibit).
Bit 5	DigitalInput5	Signal from the digital input DI5
Bit 6	DigitalInput6	Signal from the digital input DI6
Bit 7	DigitalInput7	Signal from the digital input DI7
Bit 8	InTarget	1 \equiv Target position (actual value) is in the target window
Bit 9	ProfileBusy	1 \equiv Profile positioning is active
Bit 10	HomePosAvailable	1 \equiv Home position is known
Bit 11	SpeedActCompare	Result of the speed comparison <ul style="list-style-type: none"> In case of the "Open loop" operation: <ul style="list-style-type: none"> 1 \equiv Speed setpoint < comparison value (C00024) For "Closed loop" operation: <ul style="list-style-type: none"> 1 \equiv actual speed value < comparison value (C00024)
Bit 12	DigitalInput4	Signal from the digital input DI4
Bit 13	DigitalInput3	Signal from the digital input DI3
Bit 14	QsplsActive	1 \equiv Quick stop is active
Bit 15	-	Free status bit 15 (not assigned, freely assignable)

8.5.5 Setting parameters (short overview)

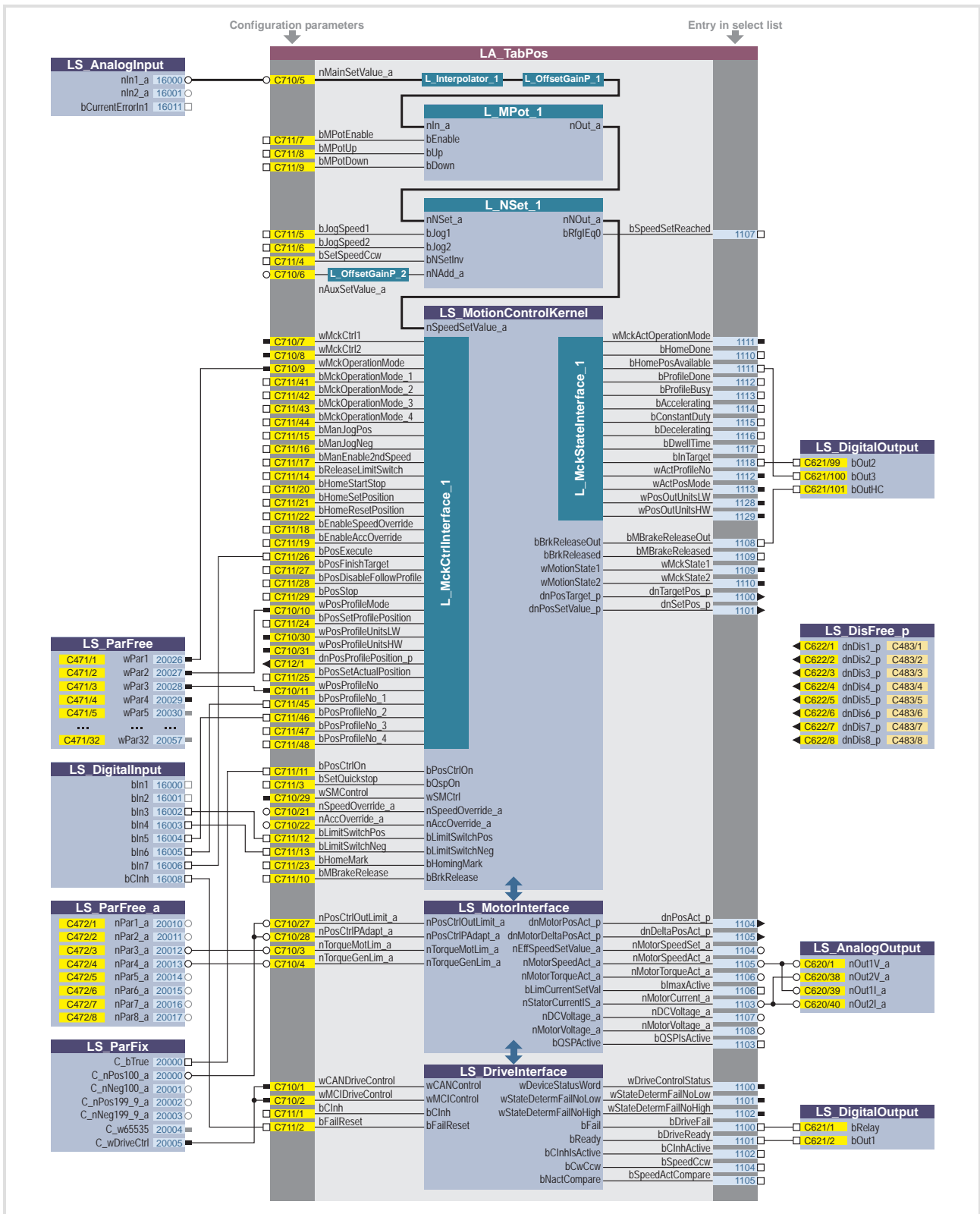
Parameter	Info	Lenze setting	
		Value	Unit
C00012	Accel. time - main setpoint	2.000	s
C00013	Decel. time - main setpoint	2.000	s
C00024	Comparison value N_Act	0.00	%
C00039/1	Fixed setpoint 1	40.00	%
C00039/2	Fixed setpoint 2	60.00	%
C00182	S-ramp time PT1	20.00	s
C00190	Setpoint arithmetic	0: NOut = NSet	
C00220	Accel. time - add. setpoint	0.000	s
C00221	Decel. time - add. setpoint	0.000	s
C00632/1	L_NSet_1: Blocking speed 1 max	0.00	%
C00632/2	L_NSet_1: Blocking speed 2 max	0.00	%
C00632/3	L_NSet_1: Blocking speed 3 max	0.00	%
C00633/1	L_NSet_1: Blocking speed 1 min	0.00	%
C00633/2	L_NSet_1: Blocking speed 2 min	0.00	%
C00633/3	L_NSet_1: Blocking speed 3 min	0.00	%
C00635	L_NSet_1: nMaxLimit	199.99	%
C00636	L_NSet_1: nMinLimit	-199.99	%
C00670	L_OffsetGainP_1: Gain	1.0000	
C00671	L_OffsetGainP_2: Gain	1.0000	
C00696	L_OffsetGainP_1: Offset	0.00	%
C00697	L_OffsetGainP_2: Offset	0.00	%
C00800	L_MPot_1: Upper limit	100.00	%
C00801	L_MPot_1: Lower limit	-100.00	%
C00802	L_MPot_1: Accel. time	10.0	s
C00803	L_MPot_1: Decel. time	10.0	s
C00804	L_MPot_1: Inactive fct.	0: Retain value	
C00805	L_MPot_1: Init fct.	0: Load last value	
C00806	L_MPot_1: Use	0: No	
C01297	Alternative function	Bit coded	
C01298/1	MCK operating mode at profile no. 0	1: Follower	
C01298/2	MCK operating mode at profile no. 1	2: Homing	
C01298/3	MCK operating mode at profile no. 2	3: ManualJog	
C01298/4	MCK operating mode at profile no. 3...15	4: Positioning	
C01299	MCKI: Status MCKInterface	-	

Related topics:

▶ ["GeneralPurpose" functions](#) (467)

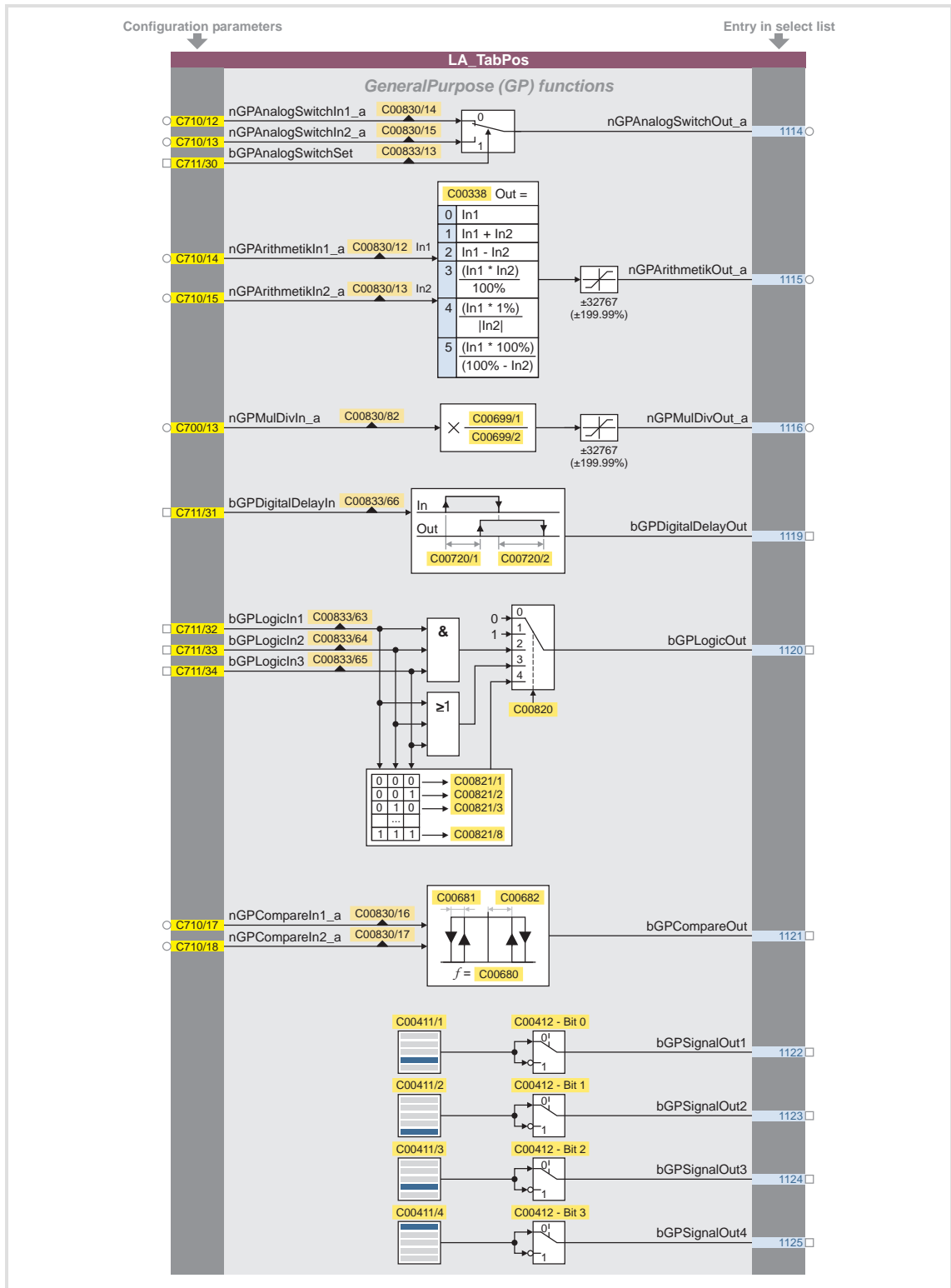
8.5.6 Configuration parameters

If required, the subcodes of [C00710](#), [C00711](#) and [C00712](#) serve to change the pre-configured assignment of the application inputs:

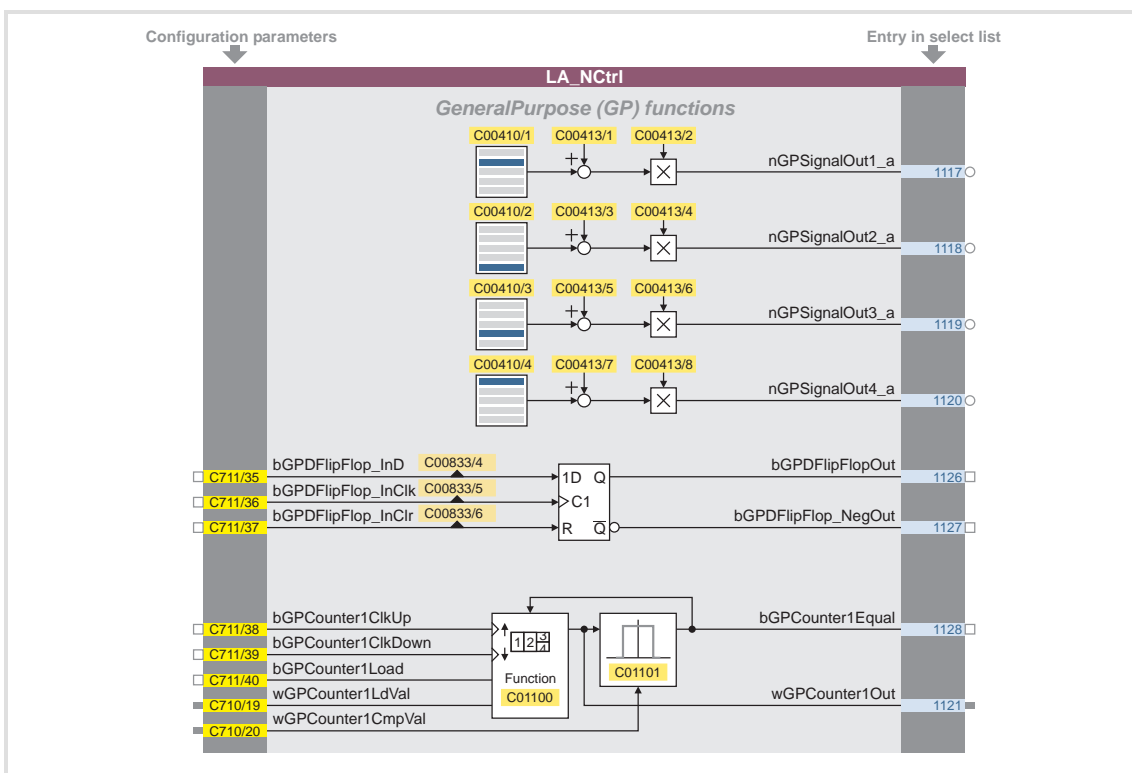


[8-1] Pre-assignment of the "Table positioning" application in the "Terminals 0" control mode

Configuration parameters for "GeneralPurpose" functions



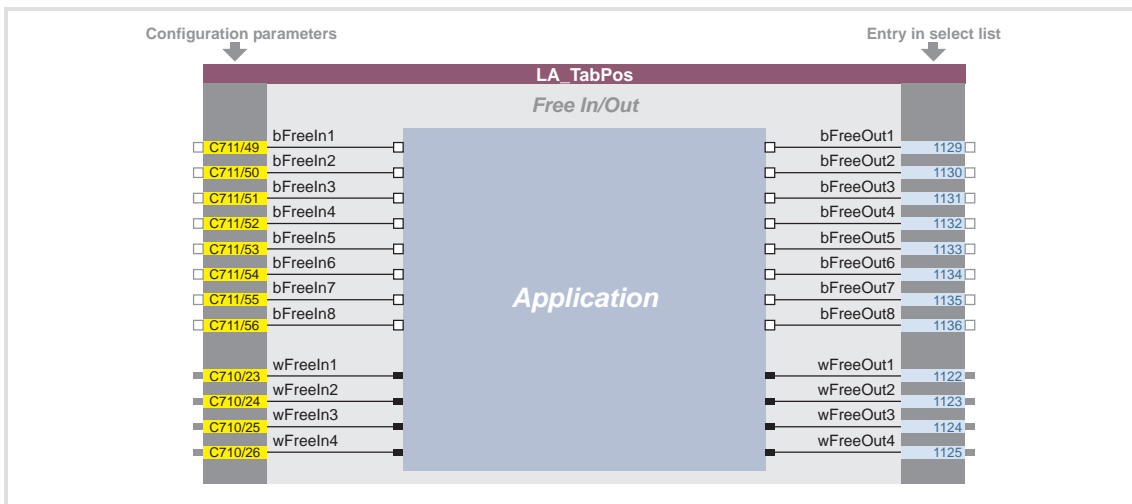
[8-2] "GeneralPurpose" functions



[8-3] "GeneralPurpose" functions (continuation)

Free inputs and outputs

These inputs can be freely interconnected in the application level. They can be used to transfer signals from the I/O level to the application level and vice versa.



[8-4] Free inputs/outputs

Related topics:

- ▶ [User-defined terminal assignment](#) (437)
- ▶ ["GeneralPurpose" functions](#) (467)

8.6 TA "Switch-off positioning"

The basic principle of this technology application is to travel to a switch-off sensor (e.g. a limit switch) in a speed-controlled manner and to stop as close as possible at this position. Unlike other positioning controls, the switch-off positioning neither has a position feedback nor calculates the path in advance. Thus, the accuracy that can be achieved depends on various factors such as the speed at which the switch-off sensor is advanced.

In addition, a pre-switch off can be implemented which requires a sufficient number of unassigned digital inputs on the controller which can be used to connect other sensors for the additional stop positions. These sensors effect a reduction in speed before the last switch-off sensor is reached.

Features

- ▶ Pre-configured control modes for terminals and bus control (with predefined process data connection to the fieldbus)
- ▶ Free configuration of input and output signals
- ▶ Offset, gain, and negation of main setpoint & additional setpoint
- ▶ Up to 15 fixed setpoints for speed and ramp time
- ▶ Adjustable setpoint ramp times
- ▶ Freely selectable, variable ramp shape
- ▶ Automatic holding brake control
- ▶ Quick stop (QSP) with adjustable ramp time
- ▶ Integrated disposable "GeneralPurpose" functions:
Analog switch, arithmetic, multiplication/division, binary delay element, binary logic, analog comparison, D-flipflop
- ▶ Interface to the safety module (optional)
- ▶ Integration of encoder feedback
- ▶ Switch-off sensor management for the implementation of a pre-switch off

Decision criteria

Criteria	Switch-off positioning with constant load	Switch-off positioning with variable load
Operating mode	V/f characteristic without speed sensor. Alternatively for large breakaway torques: Use of a sensorless vector control (only applicable for horizontal movements).	
Limit switch evaluation	One limit switch is required per direction of movement. When the limit switch is reached, the drive is brought to a standstill led by the deceleration ramp or the QSP ramp.	Per direction of movement, one limit switch and one initiator is required for fast/slow changeover. When this initiator is reached, the speed of the drive is reduced to a creeping speed (selected jog value). When the limit switch is reached, the drive is brought to a standstill led by the deceleration ramp or the QSP ramp.

Criteria	Switch-off positioning with constant load	Switch-off positioning with variable load
Positioning accuracy at the motor shaft The positioning accuracy of the load depends e.g. on the selected mechanics by clearance and friction and must be determined individually.	The ideal case is 5-10° at the motor shaft. Consider the influence of the motor temperature. In the case of a constant load, you can assume a good repeat accuracy during positioning. In the case of variable loads, you must take significant deviations into account.	5-10° at the motor shaft. As the positioning is executed in a creeping speed, a good repeat accuracy is reached even for variable loads.
Speed setting range	1 : 50, based on 50Hz and M_n	1 : 50, based on 50Hz and M_n
Typical applications	Switch-off positioning with constant load, e.g. travelling drive, roll-up door.	Switch-off positioning with variable load, e.g. travelling drive, conveying belt, hoists approaching a stop position

System limits and exclusion criteria

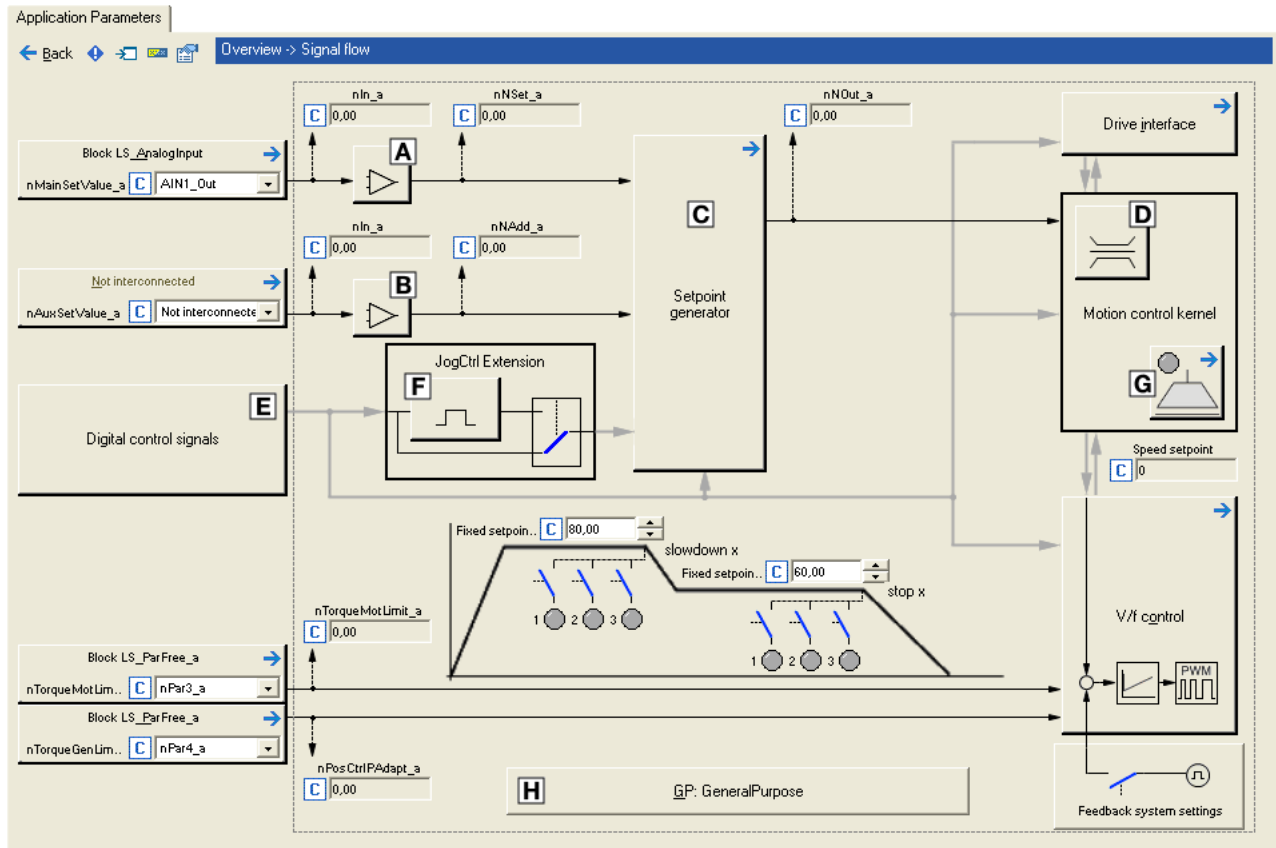
They result from the non-compliance with the decision criteria.

- ▶ Compared to systems with speed feedback, the positioning and repeat accuracy is reduced.
- ▶ Due to the mechanical hardware limit switches, this concept is only applicable for systems with only a few fixed positions. Changing the target position during the operation or the teaching is not possible.
- ▶ If necessary, additional functions like manual jog or homing must be realised externally, e.g. via a control.
- ▶ As the 8400 TopLine controller does not meet safety-related functions except STO (Safe Torque Off), you must observe that all safety-related aspects are realised by the plant instructor.
- ▶ Especially in the case of an outdoor use or in wet areas, you must consider the corresponding discharge currents when operated with a fault current circuit breaker.
- ▶ A table positioning or sequential positioning control is required for highly dynamic applications and jerk-free traversing profiles which is available with the "HighLine" device version.

Related topics:

- ▶ [Commissioning of the "Switch-off positioning" technology application](#) (📖 72)

8.6.1 Basic signal flow



[8-5] Signal flow of the switch-off positioning

- Ⓐ Main speed setpoint offset and gain ([L_OffsetGainP_1](#))
- Ⓑ Additional speed setpoint offset and gain ([L_OffsetGainP_2](#))
- Ⓒ Setpoint generator ([L_NSet_1](#))
- Ⓓ Speed setpoint input limitation
- Ⓔ Terminal assignment & display of digital control signals
- Ⓕ Selection of edge/level for tripping the ramp down and stop functions ([L_JogCtrlExtension_1](#))
- Ⓖ [Holding brake control](#)
- Ⓗ Integrated disposable "GeneralPurpose" functions:
Analog switch, arithmetic, multiplication/division, binary delay element, binary logic, analog comparison, D-flipflop

8.6.2 Internal interfaces | application block "LA_SwitchPos"




**Note!**

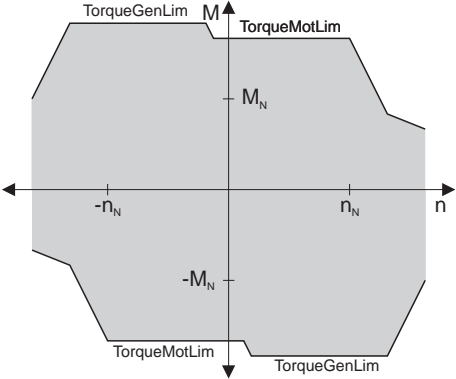
The connectors grayed out in the following table are hidden in the function block editor in the Lenze setting.

- These connections can be shown via the **Connector visibilities** command in the *Context menu* of the application block.

Inputs

Identifier	Data type	Information/possible settings				
wCANDriveControl	WORD	Control word via system bus (CAN) to device control <ul style="list-style-type: none"> • See the "wCANControl/wMCIControl control words" subchapter of the chapter on device control for a detailed description of the individual control bits. 				
wMCIControl	WORD	Control word via communication module (e.g. PROFIBUS) to device control <ul style="list-style-type: none"> • See the "wCANControl/wMCIControl control words" subchapter of the chapter on device control for a detailed description of the individual control bits. 				
wSMControl	WORD	Interface to the optional safety system. <ul style="list-style-type: none"> • Setting control bit 0 ("SafeStop1") in this control word causes e.g. the automatic deceleration of the drive to standstill within this application (in the Motion Control Kernel). • See the "Interface to safety system" subchapter of the chapter on basic drive functions for a detailed description of the control bits. 				
bCInh	BOOL	Enable/Inhibit controller <table border="1"> <tr> <td>FALSE</td> <td>Enable controller: The controller switches to the "OperationEnabled" device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. </td> </tr> <tr> <td>TRUE</td> <td>Inhibit controller (controller inhibit): The controller switches to the "SwitchedOn" device status.</td> </tr> </table>	FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. 	TRUE	Inhibit controller (controller inhibit): The controller switches to the " SwitchedOn " device status.
FALSE	Enable controller: The controller switches to the " OperationEnabled " device status if no other source of a controller inhibit is active. <ul style="list-style-type: none"> • C00158 provides a bit coded representation of all active sources/triggers of a controller inhibit. 					
TRUE	Inhibit controller (controller inhibit): The controller switches to the " SwitchedOn " device status.					
bFailReset	BOOL	Reset error messages In the Lenze setting this input is connected to the digital input controller enable so that a possibly existing error message is reset together with the controller enable (if the cause for the fault is eliminated). <table border="1"> <tr> <td>TRUE</td> <td>The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged. </td> </tr> </table>	TRUE	The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged. 		
TRUE	The current fault is reset, if the cause for the fault is eliminated. <ul style="list-style-type: none"> • If the fault still exists, the error status remains unchanged. 					
bSetQuickstop	BOOL	Enable quick stop (QSP) <ul style="list-style-type: none"> • Also see device command "Activate/Deactivate quick stop". <table border="1"> <tr> <td>TRUE</td> <td>Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019. </td> </tr> <tr> <td>FALSE</td> <td>Deactivate quick stop <ul style="list-style-type: none"> • The quick stop is deactivated if no other source for the quick stop is active. • C00159 provides a bit-coded representation of active sources/causes for the quick stop. </td> </tr> </table>	TRUE	Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019. 	FALSE	Deactivate quick stop <ul style="list-style-type: none"> • The quick stop is deactivated if no other source for the quick stop is active. • C00159 provides a bit-coded representation of active sources/causes for the quick stop.
TRUE	Activate quick stop <ul style="list-style-type: none"> • Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). • The motor is kept at a standstill during closed-loop operation. • A pulse inhibit (CINH) is set if the auto DCB function has been activated via C00019. 					
FALSE	Deactivate quick stop <ul style="list-style-type: none"> • The quick stop is deactivated if no other source for the quick stop is active. • C00159 provides a bit-coded representation of active sources/causes for the quick stop. 					

Identifier	Data type	Information/possible settings		
bSetDCBrake	BOOL	Manual DC-injection braking (DCB) <ul style="list-style-type: none"> Detailed information on DC-injection braking is provided in the motor control chapter, subchapter "DC-injection braking". 		
		 Note! Holding braking is not possible when this braking mode is used! For controlling a holding brake with low rate of wear, use the basic function " Holding brake control ".		
		<table border="1"> <tr> <td>FALSE</td> <td>Deactivate DC-injection braking.</td> </tr> <tr> <td>TRUE</td> <td> Activate DC-injection braking, i.e. the drive is brought to a standstill by means of DC-injection braking. <ul style="list-style-type: none"> The braking effect stops when the rotor is at standstill. After the hold time (C00107) has expired, the controller sets the pulse inhibit (CINH). </td> </tr> </table>	FALSE	Deactivate DC-injection braking.
FALSE	Deactivate DC-injection braking.			
TRUE	Activate DC-injection braking, i.e. the drive is brought to a standstill by means of DC-injection braking. <ul style="list-style-type: none"> The braking effect stops when the rotor is at standstill. After the hold time (C00107) has expired, the controller sets the pulse inhibit (CINH). 			
bRFG_Stop	BOOL	Ramp function generator: Maintain the current value of the main setpoint integrator <ul style="list-style-type: none"> The speed, for instance, of a running ramp process is immediately kept constant when <i>bRFG_Stop</i> is activated. At the same time, the acceleration/deceleration jumps to the value "0". For a detailed functional description see the L_NSet FB. 		
		<table border="1"> <tr> <td>TRUE</td> <td>The current value of the main setpoint integrator is held.</td> </tr> </table>	TRUE	The current value of the main setpoint integrator is held.
TRUE	The current value of the main setpoint integrator is held.			
nVoltageAdd_a	INT	Additive voltage impression <ul style="list-style-type: none"> An additional setpoint for the motor voltage can be specified via this process input. If there are, for instance, different loads at the motor output end, it is possible to apply a voltage boost at the starting time. If the value is negative, the voltage is reduced. Scaling: 16384 \equiv 1000 V 		
		 Stop! Values selected too high may cause the motor to heat up due to the resulting current!		
nBoost_a	INT	Additional setpoint for the motor voltage at speed = 0 <ul style="list-style-type: none"> The entire voltage-frequency characteristic is provided with an offset. Scaling: 16384 \equiv 1000 V 		
		 Stop! Values selected too high may cause the motor to heat up due to the resulting current!		
nPWMAngleOffset	INT	Additional offset for the electrical angle of rotation <ul style="list-style-type: none"> If a torque is connected, e.g. dynamic acceleration processes can be generated. Scaling: $\pm 32767 \equiv \pm 180^\circ$ angle of rotation 		

Identifier	Data type	Information/possible settings				
nTorqueMotLim_a nTorqueGenLim_a	INT	<p>Torque limitation in motor mode and in generator mode</p> <ul style="list-style-type: none"> • These input signals are directly transferred to the motor control to limit the controller's maximum torque in motor and generator mode. • The drive cannot output a higher torque in motor/generator mode than set here. • The applied values (any polarity) are internally interpreted as absolute values. • If V/f characteristic control (VFCplus) is selected, limitation is <u>indirectly</u> performed via a so-called I_{max} controller. • If sensorless vector control (SLVC) or servo control (SC) is selected, limitation has a <u>direct</u> effect on the torque-producing current component. • Scaling: 16384 \equiv 100 % M_{max} (C00057) <p>Torque limits in motor and generator mode:</p> 				
bSetSpeedCcw	BOOL	<p>Change of direction of rotation</p> <ul style="list-style-type: none"> • For instance if a motor or gearbox is fixed laterally reversed to a machine part, but the setpoint selection should still be executed for the positive direction of rotation. <table border="1"> <tr> <td>FALSE</td> <td>Direction of rotation to the right (Cw)</td> </tr> <tr> <td>TRUE</td> <td>Direction of rotation to the left (Ccw)</td> </tr> </table>	FALSE	Direction of rotation to the right (Cw)	TRUE	Direction of rotation to the left (Ccw)
FALSE	Direction of rotation to the right (Cw)					
TRUE	Direction of rotation to the left (Ccw)					
bRLQCw	BOOL	<p>Activate clockwise rotation (fail-safe)</p> <ul style="list-style-type: none"> • For a detailed functional description see the L_RLO FB. <table border="1"> <tr> <td>FALSE</td> <td>Quick stop</td> </tr> <tr> <td>TRUE</td> <td>Clockwise rotation</td> </tr> </table>	FALSE	Quick stop	TRUE	Clockwise rotation
FALSE	Quick stop					
TRUE	Clockwise rotation					
bRLQCcw	BOOL	<p>Activate counter-clockwise rotation (fail-safe)</p> <ul style="list-style-type: none"> • For a detailed functional description see the L_RLO FB. <table border="1"> <tr> <td>FALSE</td> <td>Quick stop</td> </tr> <tr> <td>TRUE</td> <td>Counter-clockwise rotation</td> </tr> </table>	FALSE	Quick stop	TRUE	Counter-clockwise rotation
FALSE	Quick stop					
TRUE	Counter-clockwise rotation					
nMainSetValue_a	INT	<p>Main speed setpoint</p> <ul style="list-style-type: none"> • Offset and gain of this input signal can be set in C00696 and C00670 for a simple signal adjustment of a setpoint encoder. • Scaling: 16384 \equiv 100 % reference speed (C00011) • The main setpoint is transformed to a speed setpoint in the setpoint encoder via a ramp function generator with linear or S-shaped ramps. • Upstream to the ramp function generator, a blocking speed masking function and a setpoint MinMax limitation are effective. • For a detailed functional description see the L_NSet FB. 				
nAuxSetValue_a	INT	<p>Additional speed setpoint</p> <ul style="list-style-type: none"> • Offset and gain of this input signal can be set in C00697 and C00671 for a simple signal adjustment of a setpoint encoder. • Scaling: 16384 \equiv 100 % reference speed (C00011) • The additional speed setpoint can be linked arithmetically with the main speed setpoint behind the ramp function generator. • The additional speed setpoint can be shown via ramp times of a second ramp function generator. • For a detailed functional description see the L_NSet FB. 				

Identifier	Data type	Information/possible settings	
Switch-off positioning			
bJogCtrlInputSel1 bJogCtrlInputSel2	BOOL	Selection inputs for a binary coded selection of the switch-off position 1 ... 3 <ul style="list-style-type: none"> Activation of the signal pairs <i>bJogCtrlSlowDown1/bJogCtrlStop1</i>, <i>bJogCtrlSlowDown2/bJogCtrlStop2</i> or <i>bJogCtrlSlowDown3/bJogCtrlStop3</i> according to the Truth table for activating the pre-switch off. 	
bJogCtrlRfglN	BOOL	Ramping down of the setpoint generator in the downstream L_NSet FB according to the Truth table for activating the pre-switch off	
bJogCtrlJog1 bJogCtrlJog2	BOOL	Selection inputs for fixed changeover setpoints (JOG setpoints) for the main setpoint <ul style="list-style-type: none"> If the pre-switch off is inactive (<i>bJogCtrlInputSel1</i> and <i>bJogCtrlInputSel2</i> are both set to FALSE), the two control signals are passed through 1:1 to the downstream FB L_NSet. To achieve the desired behaviour (starting at high speed, pre-switch off at low speed), both inputs must be set to TRUE. Fixed setpoint 2 must be less than fixed setpoint 3! Otherwise, the drive will start at a low speed and accelerate after the pre-switch off. If in addition to the inputs <i>bJogCtrlJog1</i> and <i>bJogCtrlJog2</i> the selection inputs <i>bJogSpeed4</i> and <i>bJogSpeed8</i> are assigned, different fixed setpoints can result from this and the drive may travel with different speeds than selected via <i>bJogCtrlJog1</i> and <i>bJogCtrlJog2</i>. 	
bJogCtrlSlowDown1 bJogCtrlSlowDown2 bJogCtrlSlowDown3	BOOL	Activation of fixed setpoint 2 in the downstream L_NSet FB <ul style="list-style-type: none"> These inputs do only have a function if they were previously activated via <i>bJogCtrlInputSel1</i> and <i>bJogCtrlInputSel2</i> (see Truth table for activating the pre-switch off). 	
bJogCtrlStop1 bJogCtrlStop2 bJogCtrlStop3	BOOL	Ramping down of the ramp function generator in the downstream L_NSet FB <ul style="list-style-type: none"> These inputs do only have a function if they were previously activated via <i>bJogCtrlInputSel1</i> and <i>bJogCtrlInputSel2</i> (see Truth table for activating the pre-switch off). 	
bJogSpeed4 bJogSpeed8	BOOL	Selection inputs for fixed changeover setpoints (JOG setpoints) for the main setpoint <ul style="list-style-type: none"> A fixed setpoint for the setpoint generator can be activated instead of the main setpoint via these selection inputs. The selection inputs are binary coded. For a detailed functional description see the L_NSet FB. 	
bJogRamp1 ... bJogRamp8	BOOL	Selection inputs for alternative acceleration/deceleration times for the main setpoint <ul style="list-style-type: none"> The four selection inputs are binary coded, therefore 15 alternative acceleration/deceleration times can be selected. For main setpoint <i>nMainSetValue_a</i>, the set acceleration time (C00012) and deceleration time (C00013) are active in the case of the binary coded selection "0" (all inputs = FALSE or not assigned). Alternative acceleration times are selected in C00101/1...15. The selection of the alternative deceleration times is carried out in C00103/1...15. For a detailed functional description see the L_NSet FB. 	
MCK basic functions			
bMBRKRelease	BOOL	Holding brake control : Release/apply brake <ul style="list-style-type: none"> In conjunction with the operating mode selected in C02580 (Lenze setting: "Brake control off"). 	
		FALSE	Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake.
		TRUE	Release brake manually (forced release). <ul style="list-style-type: none"> Note! The brake can also be released when the controller is inhibited! During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. In semi-automatic operation, the brake is released including feedforward control.

Identifier Data type	Information/possible settings				
GP: GeneralPurpose					
The following inputs are interconnected with logic/arithmetic functions on application level for free usage. ▶ "GeneralPurpose" functions					
nGPAAnalogSwitchIn1_a nGPAAnalogSwitchIn2_a INT	Analog switch: Input signals <ul style="list-style-type: none"> The input signal selected via the selection input <i>bGPAAnalogSwitchSet</i> is output at output <i>nGPAAnalogSwitchOut_a</i>. 				
bGPAAnalogSwitchSet BOOL	Analog switch: Selection input <table border="1"> <tr> <td>FALSE</td> <td><i>nGPAAnalogSwitchOut_a</i> = <i>nGPAAnalogSwitchIn1_a</i></td> </tr> <tr> <td>TRUE</td> <td><i>nGPAAnalogSwitchOut_a</i> = <i>nGPAAnalogSwitchIn2_a</i></td> </tr> </table>	FALSE	<i>nGPAAnalogSwitchOut_a</i> = <i>nGPAAnalogSwitchIn1_a</i>	TRUE	<i>nGPAAnalogSwitchOut_a</i> = <i>nGPAAnalogSwitchIn2_a</i>
FALSE	<i>nGPAAnalogSwitchOut_a</i> = <i>nGPAAnalogSwitchIn1_a</i>				
TRUE	<i>nGPAAnalogSwitchOut_a</i> = <i>nGPAAnalogSwitchIn2_a</i>				
nGPArithmetikIn1_a nGPArithmetikIn2_a INT	Arithmetic: Input signals <ul style="list-style-type: none"> The arithmetic function is selected in C00338. The result is output at output <i>nGPArithmetikOut_a</i>. 				
nGPMulDivIn_a INT	Multiplication/Division: Input signal <ul style="list-style-type: none"> The factor for the multiplication can be set in C00699/1 (numerator) and C00699/2 (denominator). The result is output at output <i>nGPMulDivOut_a</i>. 				
bGPDigitalDelayIn BOOL	Binary delay element: Input signal <ul style="list-style-type: none"> The on-delay can be set in C00720/1. The off-delay can be set in C00720/2. The time-delayed input signal is output at output <i>bGPDigitalDelayOut</i>. 				
bGPLogicIn1 bGPLogicIn2 bGPLogicIn3 BOOL	Binary logic: Input signals <ul style="list-style-type: none"> The logic operation is selected in C00820. The result is output at output <i>bGPLogicOut</i>. 				
nGPCompareIn1_a nGPCompareIn2_a INT	Analog comparison: Input signals <ul style="list-style-type: none"> The comparison operation is selected in C00680. Hysteresis and window size can be set in C00680 and C00682. If the comparison statement is true, the output <i>bGPCompareOut</i> will be set to TRUE. 				
bGPDFlipFlop_InD bGPDFlipFlop_InClk bGPDFlipFlop_InClr BOOL	D-FlipFlop: Input signals <ul style="list-style-type: none"> Data, clock and reset input 				
Free inputs					
The following inputs can freely be interconnected on the application level. The signals can be transferred from the I/O level to the application level via these inputs.					
bFreeIn1 ... bFreeIn8 BOOL	Free inputs for digital signals				
wFreeIn1 ... wFreeIn4 WORD	Free inputs for 16-bit signals				
dnFreeIn1_p ... dnFreeIn2_p DINT	Free inputs for 32-bit signals				

Outputs

Identifier Data type	Value/meaning
wDriveControlStatus WORD	Status word of the controller (based on DSP-402) <ul style="list-style-type: none"> The status word contains information on the current status of the drive controller. See the "wDeviceStatusWord status word" subchapter of the chapter on device control for a detailed description of the bit assignment.
wStateDetermFailNoLow WORD	Display of the status determining error (LOW word)

Identifier	Data type	Value/meaning	
wStateDetermFailNoHigh	WORD	Display of the status determining error (HIGH word)	
bDriveFail	BOOL	TRUE	Drive controller in error status. • "Fault" device status is active.
bWarningActive	BOOL	TRUE	A monitoring in the drive controller, for which the error response "Warning" or "WarningLocked" has been parameterised, responded.
bSafeTorqueOff	BOOL	TRUE	Safe torque off. • "SafeTorqueOff" device status is active.
bDriveReady	BOOL	TRUE	Controller is ready for operation. • "SwitchedOn" device status is active. • The drive is in this device status if the DC bus voltage is applied and the controller is still inhibited by the user (controller inhibit).
bCInhActive	BOOL	TRUE	Controller inhibit is active.
bImplsActive	BOOL	TRUE	Pulse inhibit is active.
bQSPisActive	BOOL	TRUE	Quick stop is active.
bSpeedCcw	BOOL	Current direction of rotation	
		FALSE	Direction of rotation to the right (Cw)
		TRUE	Direction of rotation to the left (Ccw)
bSpeedActCompare	BOOL	Result of the speed comparison	
		TRUE	During open-loop operation: Speed setpoint < Comparison value (C00024) During closed-loop operation: Actual speed value < Comparison value (C00024)
bImaxActive	BOOL	"Current setpoint inside the limitation" status signal	
		TRUE	The current setpoint is internally limited (the drive controller operates at the maximum current limit).
bSpeedSetReached	BOOL	Status signal "setpoint = 0"	
		TRUE	Speed setpoint from the ramp function generator = 0
bSpeedActEqSet	BOOL	TRUE	Actual speed value = speed setpoint
nMotorCurrent_a	INT	Current stator current/effective motor current • Scaling: 16384 \equiv 100 % I_{\max_mot} (C00022)	
nMotorSpeedSet_a	INT	Speed setpoint • Scaling: 16384 \equiv 100 % reference speed (C00011)	
nMotorSpeedAct_a	INT	Actual speed value • Scaling: 16384 \equiv 100 % reference speed (C00011)	
nMotorTorqueAct_a	INT	Actual torque • In the "VFC (+encoder)" operating mode of the motor control, this value is determined from the current motor current and corresponds to the actual torque only by approximation. • Scaling: 16384 \equiv 100 % M_{\max} (C00057)	
nDCVoltage_a	INT	Actual DC-bus voltage • Scaling: 16384 \equiv 1000 V	
nMotorVoltage_a	INT	Current motor voltage/inverter output voltage • Scaling: 16384 \equiv 1000 V	

Identifier	Data type	Value/meaning
MCK basic functions		
bBrakeReleaseOut	BOOL	Holding brake control : Trigger signal for the holding brake control switching element via a digital output <ul style="list-style-type: none"> Use bit 0 in C02582 to activate inverted switching element triggering.
		FALSE Apply brake.
		TRUE Release brake.
bBrakeReleased	BOOL	Holding brake control : "Brake released" considering the brake release time <ul style="list-style-type: none"> When the holding brake is triggered to close, <i>bBrakeReleased</i> is immediately set to FALSE even if the brake closing time has not yet elapsed!
		TRUE Brake released (when the brake release time has elapsed).
GP: GeneralPurpose		
The following outputs are interconnected with logic/arithmetic functions on application level for free usage.		
▶ "GeneralPurpose" functions		
nGPAAnalogSwitchInOut_a	INT	Analog switch : Output signal
nGPArithmeticOut_a	INT	Arithmetic : Output signal
nGPMulDivOut_a	INT	Multiplication/Division : Output signal
bGPDigitalDelayOut	BOOL	Binary delay element : Output signal
bGPLogicOut	BOOL	Binary logic : Output signal
bGPCompareOut	BOOL	Analog comparison : Output signal
bGPSignalOut1 ... bGPSignalOut4	BOOL	Binary signal monitor : Output signals <ul style="list-style-type: none"> The signal sources to be output are selected in C00411/1...4. A bit coded inversion of the output signals can be parameterised in C00412.
nGPSignalOut1_a ... nGPSignalOut4_a	BOOL	Analog signal monitor : Output signals <ul style="list-style-type: none"> The signal sources to be output are selected in C00410/1...4. Gain and offset for each output signal can be parameterised in C00413/1...8.
bGPDFlipFlop_Out	BOOL	D-FlipFlop : Output signal
bGPDFlipFlop_NegOut	BOOL	D-FlipFlop : Negated output signal
Free outputs		
The following outputs can freely be interconnected on the application level.		
The signals from the application level can be transferred to the I/O level via these outputs.		
bFreeOut1 ... bFreeOut8	BOOL	Free outputs for digital signals
wFreeOut1 ... wFreeOut4	WORD	Free outputs for 16-bit signals
dnFreeOut1_p dnFreeOut2_p	WORD	Free outputs for 32-bit signals

8.6.2.1 Truth table for activating the pre-switch off

Input		Function	Response in the setpoint generator (FB L_NSet)
bJogCtrl InputSel1	bJogCtrl InputSel2		
FALSE	FALSE	Pre-switch off inactive	No response <ul style="list-style-type: none"> The input signal <i>bJogCtrlRfgIn</i> is output directly at output <i>bRfgOut</i>. The input signals <i>bJogCtrlJog1</i> and <i>bJogCtrlJog2</i> are passed through 1:1 to the downstream FB L_NSet for the selection of fixed setpoints.
TRUE	FALSE	The <i>bJogCtrlSlowDown1</i> and <i>bJogCtrlStop1</i> inputs are evaluated.	Pre-switch off can be activated <ul style="list-style-type: none"> If the slowdown function is activated via the selected <i>bJogCtrlSlowDown</i> input, fixed setpoint 2 is activated in the setpoint generator. If the stop function is activated via the selected <i>bJogCtrlStop</i> input, the setpoint generator is deactivated.
FALSE	TRUE	The <i>bJogCtrlSlowDown2</i> and <i>bJogCtrlStop2</i> inputs are evaluated.	
TRUE	TRUE	The inputs <i>bJogCtrlSlowDown3</i> and <i>bJogCtrlStop3</i> are evaluated.	

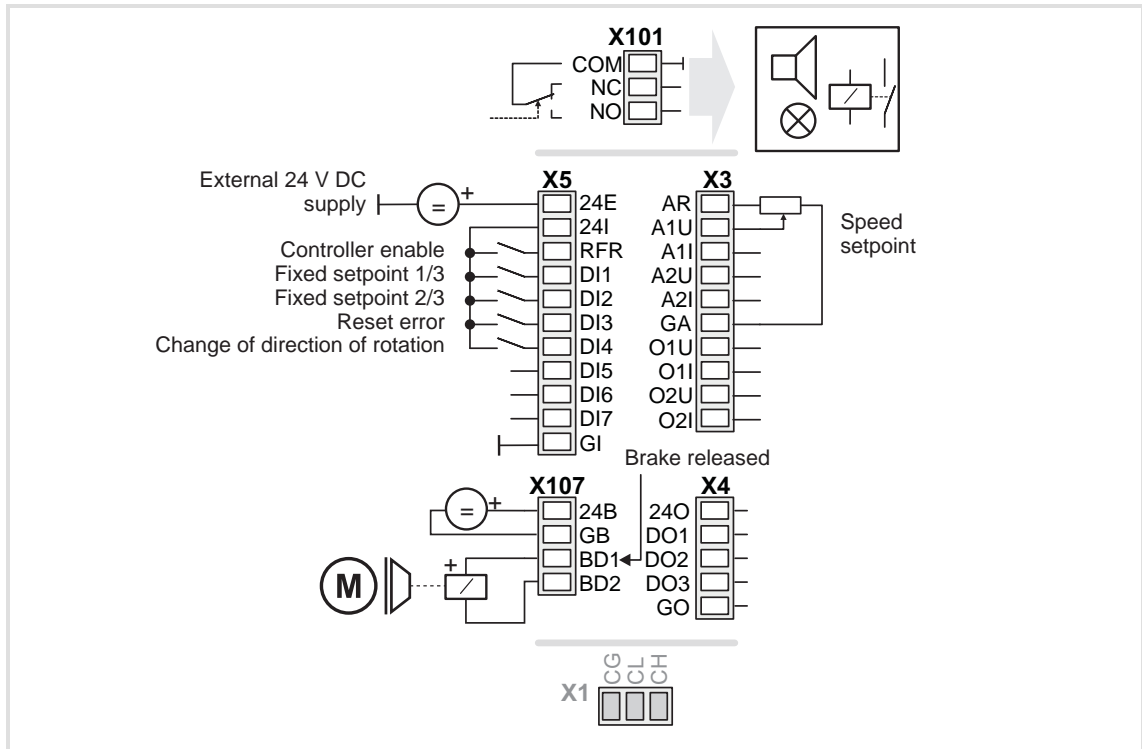
[8-1] Truth table for activating the pre-switch off

8.6.3 Terminal assignment of the control modes

The following comparison provides information about which inputs/outputs of the application block **LA_SwitchPos** are interconnected to the digital and analog input/output terminals of the drive controller in the different control modes.

	Control mode (C00007)							
	10: Terminals 0	12: Terminals 2	14: Terminals 11	16: Terminal 16	20: Keypad	21: PC	30: CAN	40: MCI
Digital input terminals								
X5/RFR	Controller enable	Controller enable / Reset of error message bFailReset						
X5/DI1	Fixed setpoint 1/3 bJogCtrlJog1	Stop function 1 bJogCtrlStop1		Fixed setpoint 1/3 bJogCtrlJog1	-	-	Stop function 1 bJogCtrlStop1	
X5/DI2	Fixed setpoint 2/3 bJogCtrlJog2	Stop function 2 bJogCtrlStop2	Selection: Pre-switch off 1 bJogCtrlSlowDown 1	Fixed setpoint 2/3 bJogCtrlJog2	-	-	Selection: Pre-switch off 1 bJogCtrlSlowDown 1	
X5/DI3	Reset error messages bFailReset	CW rotation quick stop bRLQCw Selection: Switch-off position 1 bJogCtrlInputSel1		CW rotation quick stop bRLQCw	-	-	Stop function 2 bJogCtrlStop2	
X5/DI4	Change of direction of rotation bSetSpeedCcw	CCW rotation quick stop bRLQCcw Selection: Switch-off position 2 bJogCtrlInputSel2		CCW rotation quick stop bRLQCcw	-	-	Selection: Pre-switch off 2 bJogCtrlSlowDown 2	
X5/DI5	-	-	Stop function 2 bJogCtrlStop2	-	-	-	Stop function 3 bJogCtrlStop3	
X5/DI6	-	-	Selection: Pre-switch off 2 bJogCtrlSlowDown 2	-	-	-	Selection: Pre-switch off 3 bJogCtrlSlowDown 3	
X5/DI7	-	-	-	-	-	-	-	-
Analog input terminals								
X3/A1U, A1I	Main speed setpoint nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)				-	-	Additional speed setpoint nAuxSetValue_a 10 V ≙ 100 % reference speed (C00011)	
X3/A2U, A2I	-	-	-	-	-	-	-	-
Digital output terminals								
X4/DO1 ... DO3	-	-	-	-	-	-	-	-
X107/BD1, BD2	Control of the holding brake bMBrakeReleaseOut							
X101/COM, NO	-	-	-	-	-	-	-	-
Analog output terminals								
X3/O1U, O1I	-	-	-	-	-	-	-	-
X3/O2U, O2I	-	-	-	-	-	-	-	-

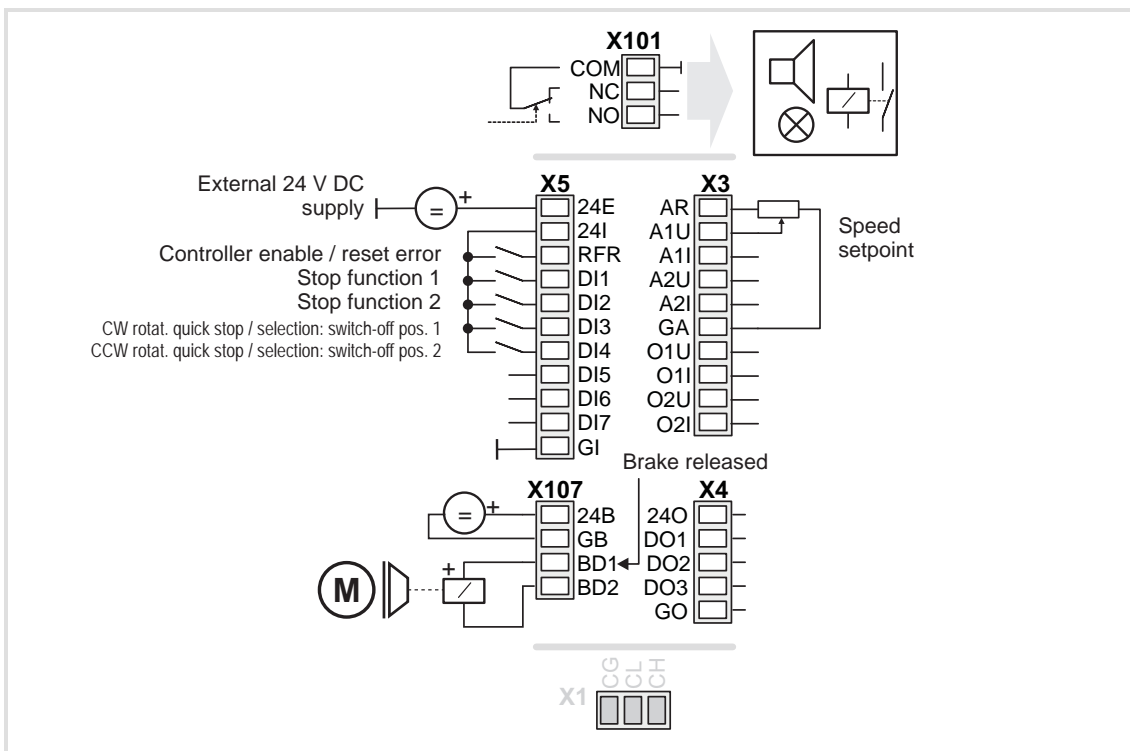
8.6.3.1 Terminals 0



Connection	Assignment
X101/NC-NO	-
X5/RFR	-
X5/DI1	LA_SwitchPos.bJogCtrlJog1
X5/DI2	LA_SwitchPos.bJogCtrlJog2
X5/DI3	LA_SwitchPos.bFailReset
X5/DI4	LA_SwitchPos.bSetSpeedCcw
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	LA_SwitchPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_SwitchPos.nMainSetValue_a
X3/A1I	10 V ≙ 100 % reference speed (C00011)
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X3/O2I	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

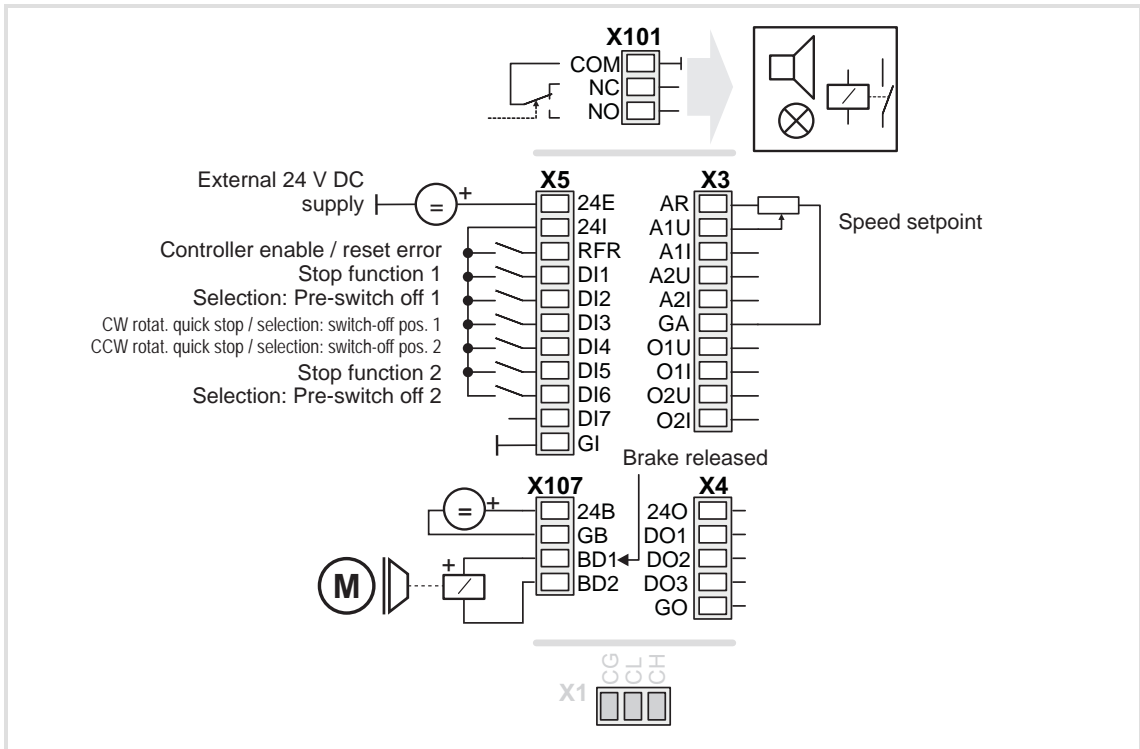
8.6.3.2 Terminals 2



Connection	Assignment
X101/NC-NO	-
X5/RFR	LA_SwitchPos: bFailReset
X5/DI1	LA_SwitchPos: bJogCtrlStop1
X5/DI2	LA_SwitchPos: bJogCtrlStop2
X5/DI3	LA_SwitchPos: bRLQCw LA_SwitchPos: bJogCtrlInputSel1
X5/DI4	LA_SwitchPos: bRLQCw LA_SwitchPos: bJogCtrlInputSel2
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	LA_SwitchPos: bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_SwitchPos.nMainSetValue_a
X3/A1I	10 V ≙ 100 % reference speed (C00011)
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

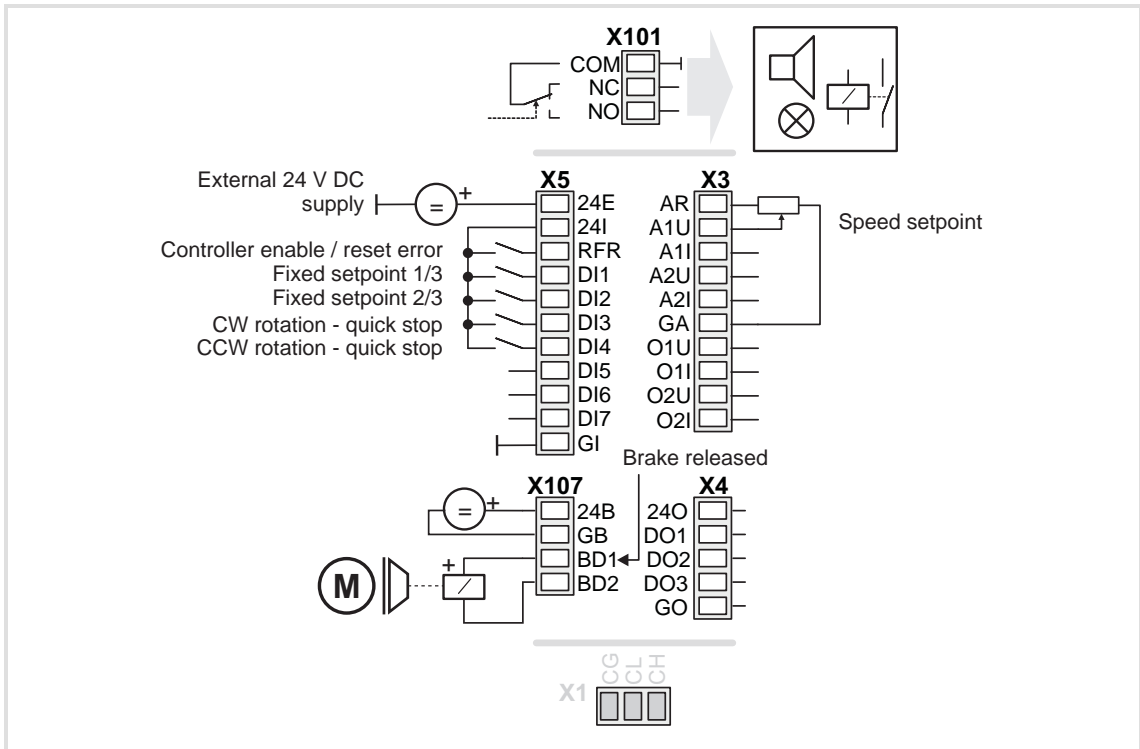
8.6.3.3 Terminals 11



Connection	Assignment
X101/NC-NO	-
X5/RFR	LA_SwitchPos: bFailReset
X5/DI1	LA_SwitchPos: bJogCtrlStop1
X5/DI2	LA_SwitchPos: bJogCtrlSlowDown1
X5/DI3	LA_SwitchPos: bRLQCcw LA_SwitchPos: bJogCtrlInputSel1
X5/DI4	LA_SwitchPos: bRLQCcw LA_SwitchPos: bJogCtrlInputSel2
X5/DI5	LA_SwitchPos: bJogCtrlStop2
X5/DI6	LA_SwitchPos: bJogCtrlSlowDown2
X5/DI7	-
X107/BD1	LA_SwitchPos: bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_SwitchPos.nMainSetValue_a 10 V ≙ 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

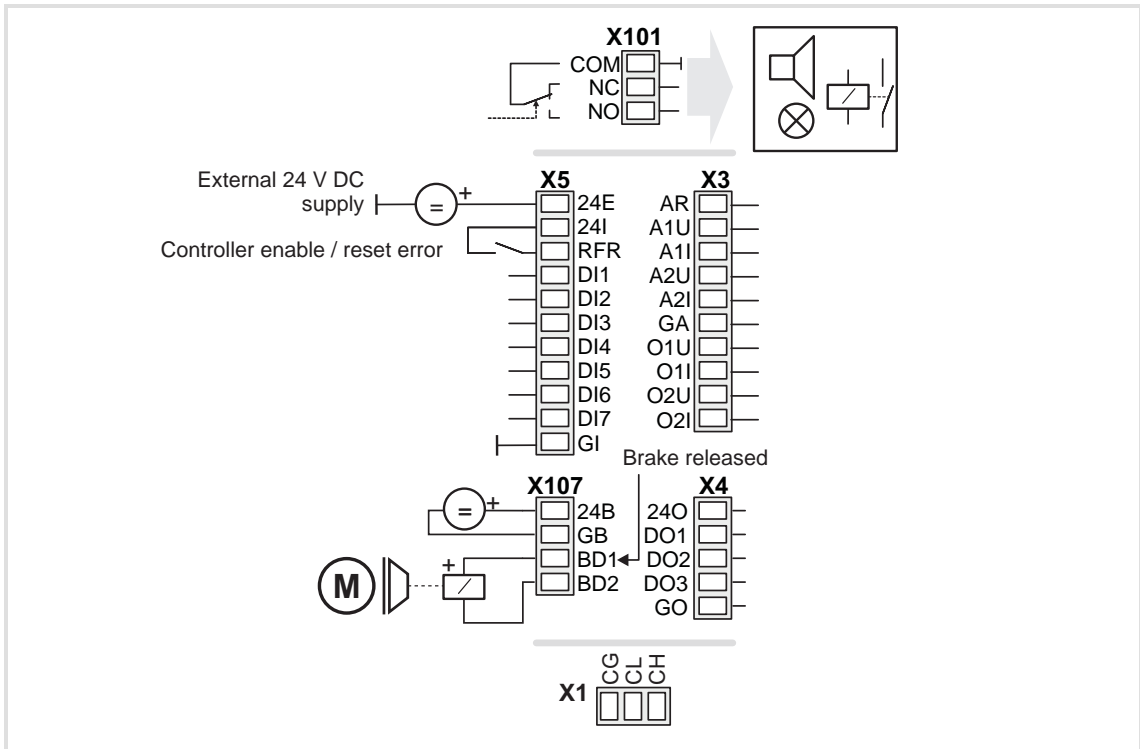
8.6.3.4 Terminal 16



Connection	Assignment
X101/NC-NO	-
X5/RFR	LA_SwitchPos: bFailReset
X5/DI1	LA_SwitchPos: bJogCtrlJog1
X5/DI2	LA_SwitchPos: bJogCtrlJog2
X5/DI3	LA_SwitchPos: bRLQCw
X5/DI4	LA_SwitchPos: bRLQCcw
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	LA_SwitchPos: bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_SwitchPos.nMainSetValue_a
X3/A1I	10 V ≙ 100 % reference speed (C00011)
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X3/O2I	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

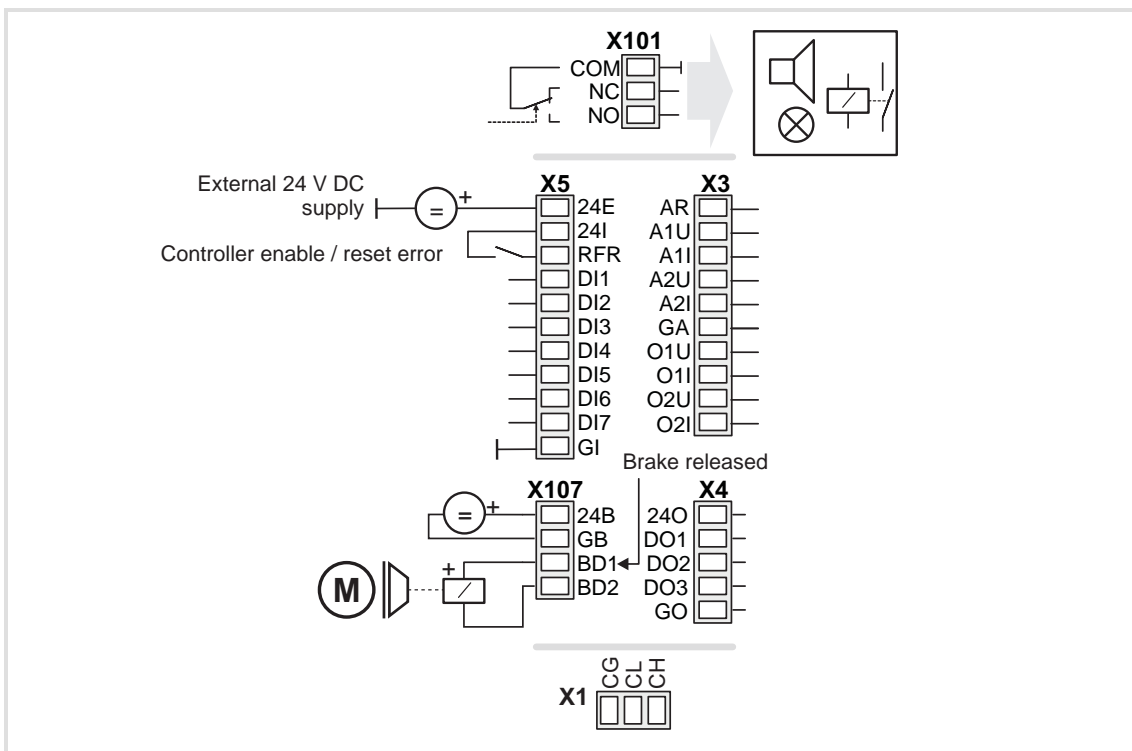
8.6.3.5 Keypad



Connection	Assignment
X101/NC-NO	-
X5/RFR	-
X5/DI1	-
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	LA_SwitchPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	-
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X3/O2I	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

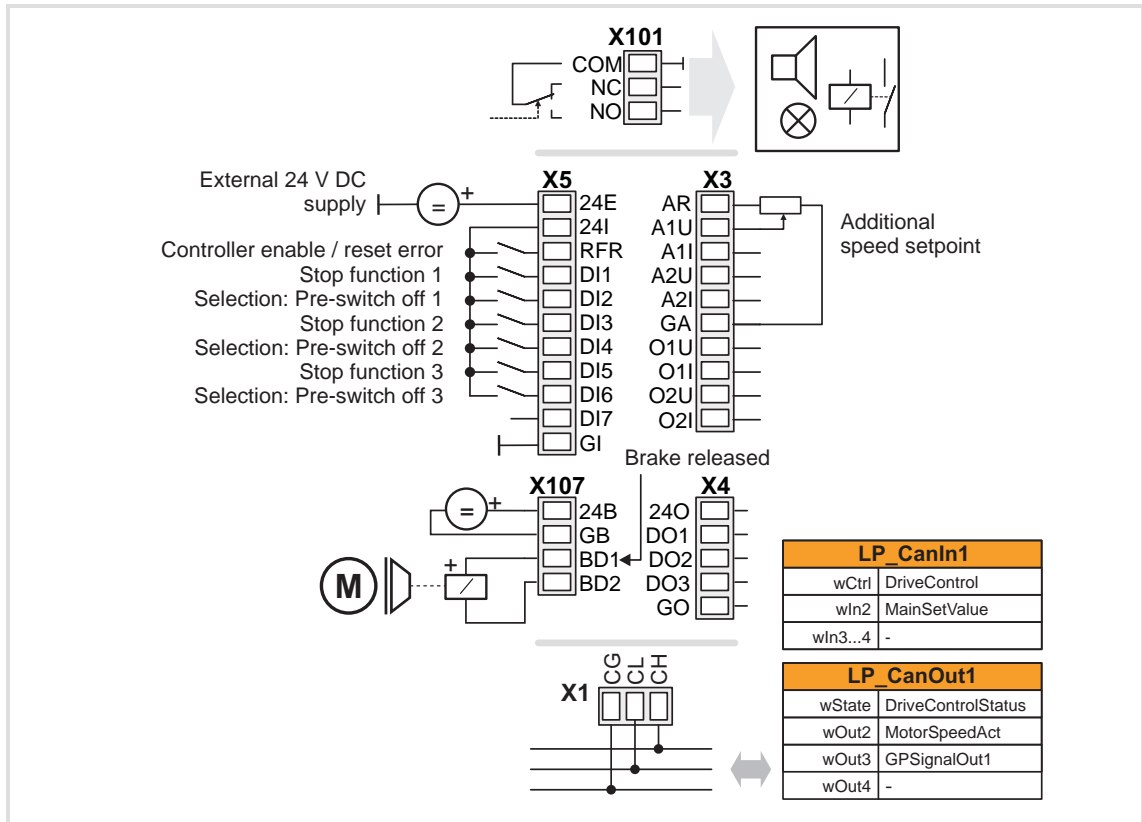
8.6.3.6 PC



Connection	Assignment
X101/NC-NO	-
X5/RFR	-
X5/DI1	-
X5/DI2	-
X5/DI3	-
X5/DI4	-
X5/DI5	-
X5/DI6	-
X5/DI7	-
X107/BD1	LA_SwitchPos.bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	-
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X3/O2I	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

8.6.3.7 CAN



Connection	Assignment
X101/NC-NO	-
X5/RFR	LA_SwitchPos: bFailReset
X5/DI1	LA_SwitchPos: bJogCtrlStop1
X5/DI2	LA_SwitchPos: bJogCtrlSlowDown1
X5/DI3	LA_SwitchPos: bJogCtrlStop2
X5/DI4	LA_SwitchPos: bJogCtrlSlowDown2
X5/DI5	LA_SwitchPos: bJogCtrlStop3
X5/DI6	LA_SwitchPos: bJogCtrlSlowDown3
X5/DI7	-
X107/BD1	LA_SwitchPos: bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_SwitchPos.nAuxSetValue_a 10 V = 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X3/O2I	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

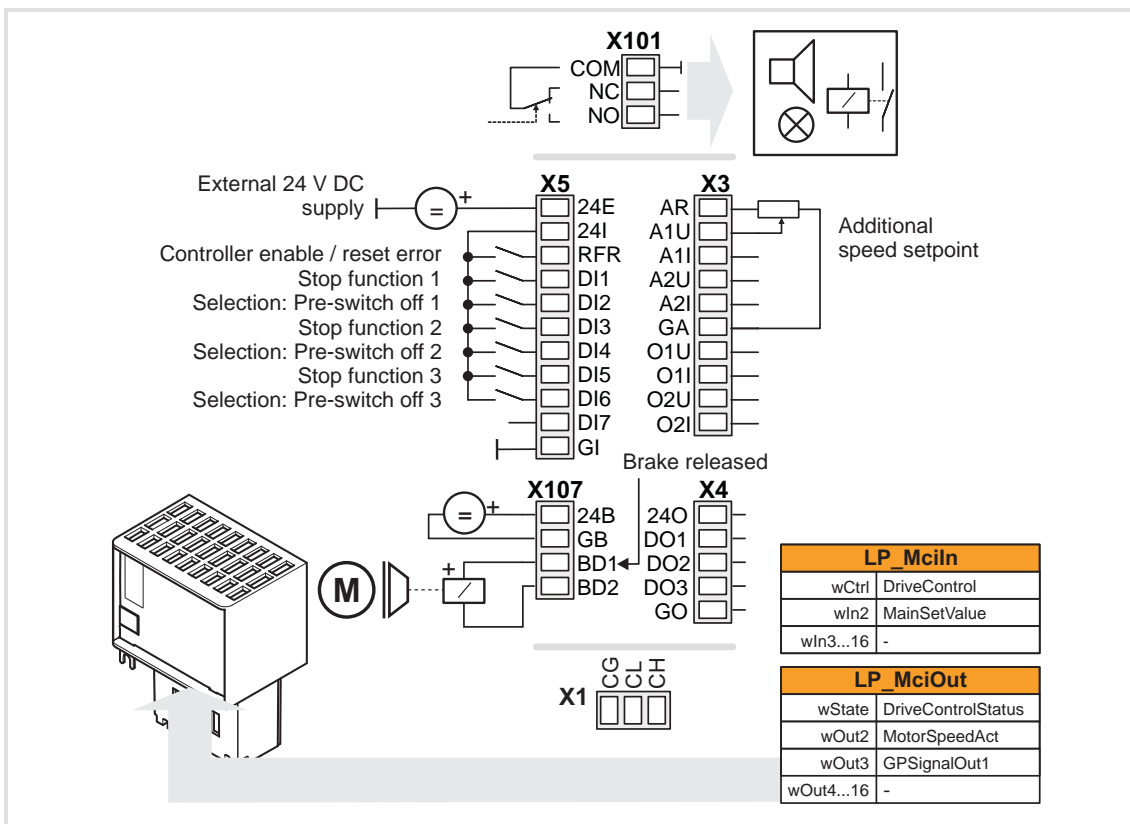
▶ [Process data assignment for fieldbus communication](#) (460)



Note!

You must set the setpoint arithmetic in [C00190](#) to "1: NOut = NSet + NAdd" so that the additional speed setpoint selected via the analog input A1U has an additive effect.

8.6.3.8 MCI



Connection	Assignment
X101/NC-NO	-
X5/RFR	LA_SwitchPos: bFailReset
X5/DI1	LA_SwitchPos: bJogCtrlStop1
X5/DI2	LA_SwitchPos: bJogCtrlSlowDown1
X5/DI3	LA_SwitchPos: bJogCtrlStop2
X5/DI4	LA_SwitchPos: bJogCtrlSlowDown2
X5/DI5	LA_SwitchPos: bJogCtrlStop3
X5/DI6	LA_SwitchPos: bJogCtrlSlowDown3
X5/DI7	-
X107/BD1	LA_SwitchPos: bMBrakeReleaseOut
X107/BD2	-

Connection	Assignment
X3/A1U	LA_SwitchPos.nAuxSetValue_a 10 V = 100 % reference speed (C00011)
X3/A1I	-
X3/A2U	-
X3/A2I	-
X3/O1U	-
X3/O1I	-
X3/O2U	-
X3/O2I	-
X4/DO1	-
X4/DO2	-
X4/DO3	-

▶ [Process data assignment for fieldbus communication](#) (460)



Note!

You must set the setpoint arithmetic in [C00190](#) to "1: NOut = NSet + NAdd" so that the additional speed setpoint selected via the analog input A1U has an additive effect.

8.6.4 Process data assignment for fieldbus communication

The fieldbus communication is connected (preconfigured) to the previously selected technology application by selecting the corresponding control mode in [C00007](#):

- ▶ "30: [CAN](#)" for the connection to the system bus (CAN)
- ▶ "40: [MCI](#)" for the connection to a plugged-on communication module (e.g. PROFIBUS)

The assignment of the process data words does not depend on the applied bus system but exclusively on the application:

Input words	Name	Assignment
Word 1	DriveControl	Control word <ul style="list-style-type: none"> • See table below for bit assignment.
Word 2	MainSetValue	Speed setpoint <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % reference speed (C00011)
Word 3	-	Not preconfigured
Word 4	-	Not preconfigured
Word 5 ... 16	-	Not preconfigured <ul style="list-style-type: none"> • Only available for control mode "40: MCI".

Control word	Name	Function
Bit 0	SwitchOn	1 \equiv Change to the " SwitchedOn " device status <ul style="list-style-type: none"> • This bit must be set in the CAN/MCI control word to ensure that the device changes to the "SwitchedOn" device status after mains connection without the need for a master control specifying this bit via fieldbus. • If control via a bus system is not wanted (e.g. in the case of control via terminals), the <i>wDriveCtrl</i> output signal of the LS_ParFix system block can be connected to the control word inputs.
Bit 1	DisableVoltage	1 \equiv Inhibit inverter control (IMP - pulse inhibit)
Bit 2	SetQuickStop	1 \equiv Activate quick stop (QSP). ▶ Activate/Deactivate quick stop (📖 98)
Bit 3	EnableOperation	1 \equiv Enable controller (RFR) <ul style="list-style-type: none"> • If control via terminals is performed, this bit must be set both in the CAN control word and in the MCI control word. Otherwise, the controller is inhibited. ▶ Enable/Inhibit controller (📖 97)
Bit 4	ModeSpecific_1	Reserved (currently not assigned)
Bit 5	JogCtrlInputSel1	Binary coded selection of the switch-off position 1 ... 3 <ul style="list-style-type: none"> • Activation of the signal pairs <i>bJogCtrlSlowDown1/bJogCtrlStop1</i>, <i>bJogCtrlSlowDown2/bJogCtrlStop2</i> or <i>bJogCtrlSlowDown3/bJogCtrlStop3</i> according to the Truth table for activating the pre-switch off.
Bit 6	JogCtrlInputSel2	
Bit 7	ResetFault	1 \equiv Reset fault (trip reset) <ul style="list-style-type: none"> • Acknowledge fault message (if the error cause has been eliminated). ▶ Reset error (📖 99)
Bit 8	bJogCtrlRfGln	Ramping down of the setpoint generator in the downstream L_NSet FB according to the Truth table for activating the pre-switch off
Bit 9	reserved_1	Reserved (currently not assigned)
Bit 10	reserved_2	

Control word	Name	Function
Bit 11	MBrkRelease	<u>Holding brake control</u> : 0 ≡ Apply brake 1 ≡ Release brake • In conjunction with the operating mode selected in C02580 (Lenze setting: "Brake control off").
Bit 12	JogCtrlJog1	Binary coded selection of the fixed setpoints (JOG setpoints)
Bit 13	JogCtrlJog2	
Bit 14	SetFail	1 ≡ Set error (trip set)
Bit 15	SetSpeedCcw	0 ≡ Direction of rotation to the right (Cw) 1 ≡ Direction of rotation to the left (Ccw)

Output words	Name	Assignment
Word 1	DriveControlStatus	Status word • See table below for bit assignment.
Word 2	MotorSpeedAct	Actual speed value • Scaling: 16384 ≡ 100 % reference speed (C00011)
Word 3	GPSignalOut1	Analog signal monitor: Output signal 1 • The selection of the signal source to output is executed in C00410/1 . • Gain and offset for the output signal can be parameterised in C00413/1 and C00413/2 . • For a detailed functional description see the L_SignalMonitor_a FB.
Word 4	-	Not preconfigured
Word 5 ... 16	-	Not preconfigured • Only available for control mode "40: MCI".

Status word	Name	Status
Bit 0	DriveFail	1 ≡ Drive controller in error status • " Fault " device status is active.
Bit 1	PowerDisabled	1 ≡ Inverter control inhibited (pulse inhibit is active)
Bit 2	DriveReady	1 ≡ Drive controller is ready for operation • " SwitchedOn " device status is active. • The drive is in this device status if the DC bus voltage is applied and the controller is still inhibited by the user (controller inhibit).
Bit 3	SpeedCcw	0 ≡ Direction of rotation to the right (Cw) 1 ≡ Direction of rotation to the left (Ccw)
Bit 4	QsplsActive	1 ≡ Quick stop is active
Bit 5	BrakeReleased	1 ≡ Brake released (after the brake opening time has elapsed)
Bit 6	ActSpeedIsZero	During open-loop operation: 1 ≡ Speed setpoint < Comparison value (C00024) During closed-loop operation: 1 ≡ Actual speed value < Comparison value (C00024)
Bit 7	ControllerInhibit	1 ≡ Controller inhibited (controller inhibit is active)
Bit 8	StatusCodeBit0	Bit coded display of the active device status ▶ Device state machine and device statuses (see table [4-1])
Bit 9	StatusCodeBit1	
Bit 10	StatusCodeBit2	
Bit 11	StatusCodeBit3	
Bit 12	Warning	

Status word	Name	Status
Bit 13	Trouble	1 ≙ Controller is in the "Trouble" device status • E.g. if an overvoltage has occurred.
Bit 14	JogCtrlInputSel1	Binary coded selection of the switch-off position 1 ... 3 • Bits 5 and 6 of the control word.
Bit 15	JogCtrlInputSel2	

8.6.5 Setting parameters (short overview)

Parameter	Info	Lenze setting	
		Value	Unit
C00011	Appl.: Reference speed	1500	rpm
C00012	Accel. time - main setpoint	2.000	s
C00013	Decel. time - main setpoint	2.000	s
C00105	Decel. time - quick stop	2.000	s
C00039/1	Fixed setpoint 1	40.00	%
C00039/2	Fixed setpoint 2	60.00	%
C00039/3	Fixed setpoint 3	80.00	%
C00039/4...15	Fixed setpoint 4 ... 15	0.00	%
C00101/1...15	Add. accel. time 1 ... 15	0.000	s
C00103/1...15	Add. decel. time 1 ... 15	0.000	s
C00105	Decel. time - quick stop	2.000	s
C00106	Auto DCB: Hold time	0.500	s
C00107	DCB: Hold time	999.000	s
C00134	Ramp rounding - main setpoint	0: Off	
C00182	S-ramp time PT1	20.00	s
C00190	Setpoint arithmetic	0: NOut = NSet	
C00220	Accel. time - add. setpoint	0.000	s
C00221	Decel. time - add. setpoint	0.000	s
C00241	L_NSet_1: Hyst. NSet reached	0.50	%
C00488/1	InputSens.SlowDown1	0: Level	
C00488/2	InputSens.Stop1	0: Level	
C00488/3	InputSens.SlowDown2	0: Level	
C00488/4	InputSens.Stop2	0: Level	
C00488/5	InputSens.SlowDown3	0: Level	
C00488/6	InputSens.Stop3	0: Level	
C00632/1	L_NSet_1: Blocking speed 1 max	0.00	%
C00632/2	L_NSet_1: Blocking speed 2 max	0.00	%
C00632/3	L_NSet_1: Blocking speed 3 max	0.00	%
C00633/1	L_NSet_1: Blocking speed 1 min	0.00	%
C00633/2	L_NSet_1: Blocking speed 2 min	0.00	%
C00633/3	L_NSet_1: Blocking speed 3 min	0.00	%
C00635	L_NSet_1: nMaxLimit	199.99	%
C00636	L_NSet_1: nMinLimit	-199.99	%
C00670	L_OffsetGainP_1: Gain	1.0000	
C00671	L_OffsetGainP_2: Gain	1.0000	

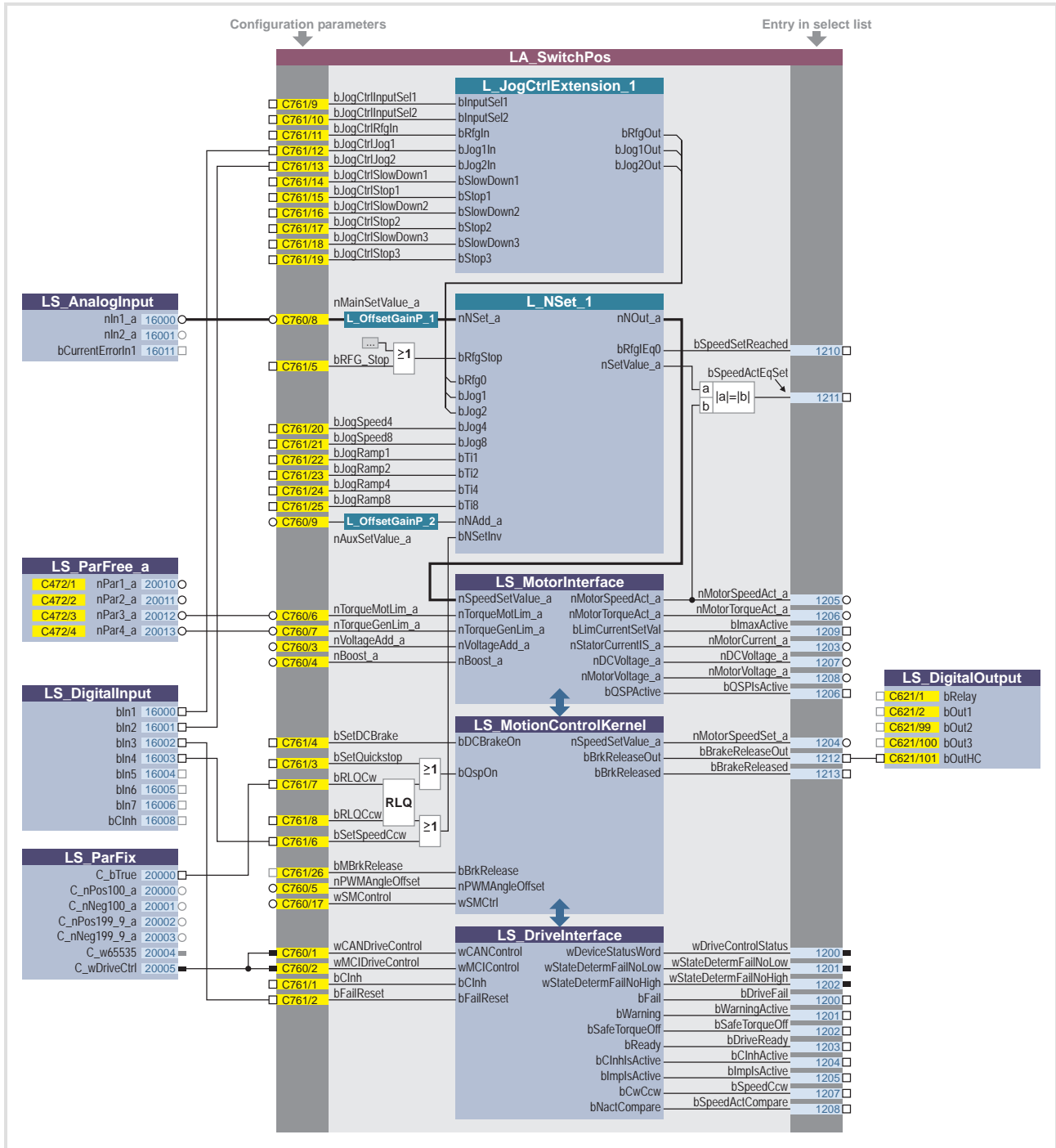
Parameter	Info	Lenze setting	
		Value	Unit
C00672	L_OffsetGainP_3: Gain	1.0000	
C00696	L_OffsetGainP_1: Offset	0.00	%
C00697	L_OffsetGainP_2: Offset	0.00	%
C00698	L_OffsetGainP_3: Offset	0.00	%
C00800	L_MPot_1: Upper limit	100.00	%
C00801	L_MPot_1: Lower limit	-100.00	%
C00802	L_MPot_1: Accel. time	10.0	s
C00803	L_MPot_1: Decel. time	10.0	s
C00804	L_MPot_1: Inactive fct.	0: Retain value	
C00805	L_MPot_1: Init fct.	0: Load last value	
C00806	L_MPot_1: Use	0: No	
C02610/2	MCK: Ramp time synchr. setpoint	2.000	s
C02611/1	MCK: Pos. max. speed	199.99	%
C02611/2	MCK: Pos. min. speed	0.00	%
C02611/3	MCK: Neg. min. speed	0.00	%
C02611/4	MCK: Neg. max. speed	199.99	%

Related topics:

▶ ["GeneralPurpose" functions](#) (📖 467)

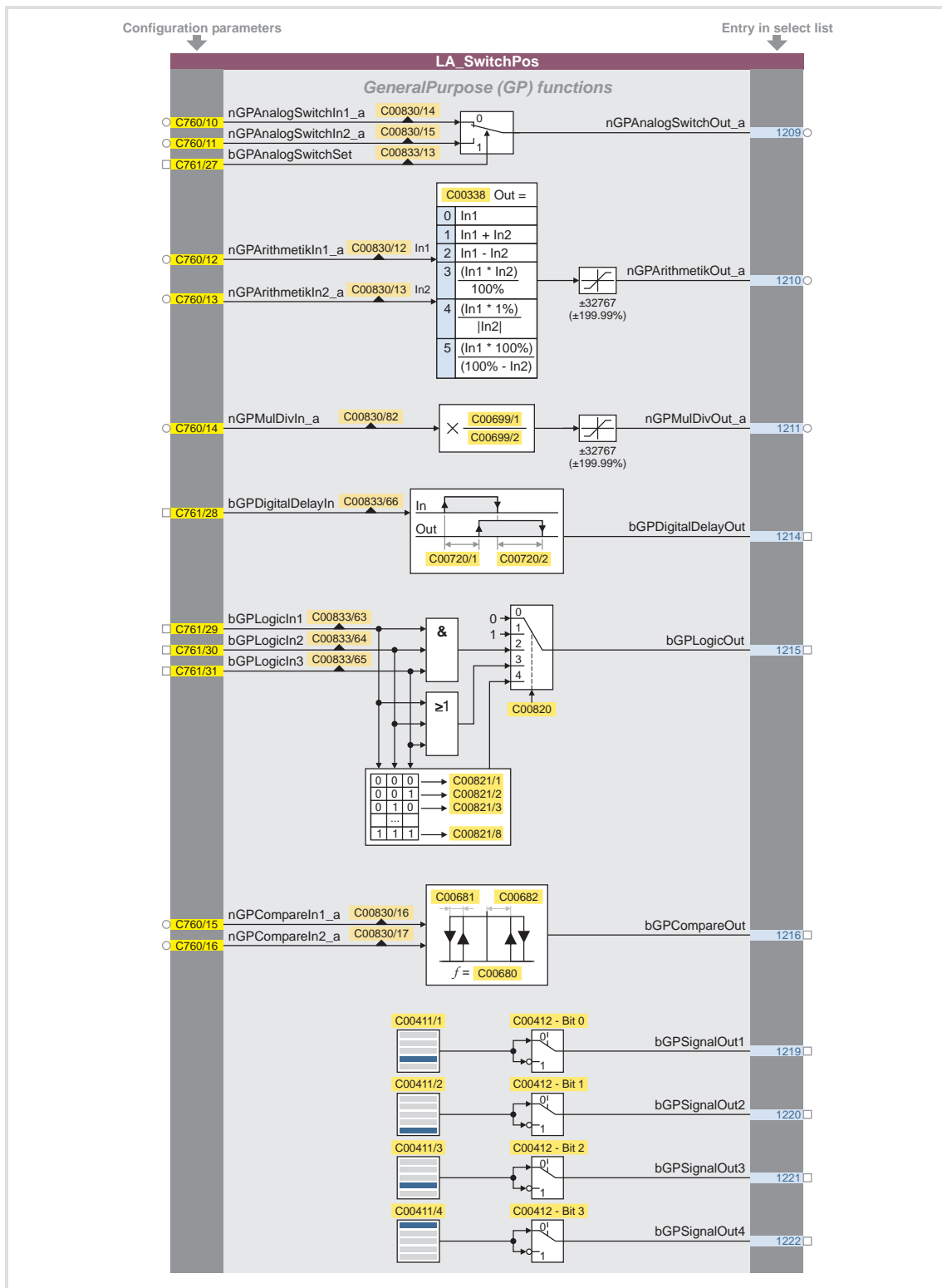
8.6.6 Configuration parameters

If required, the subcodes of [C00760](#) and [C00761](#) serve to change the pre-configured assignment of the application inputs:

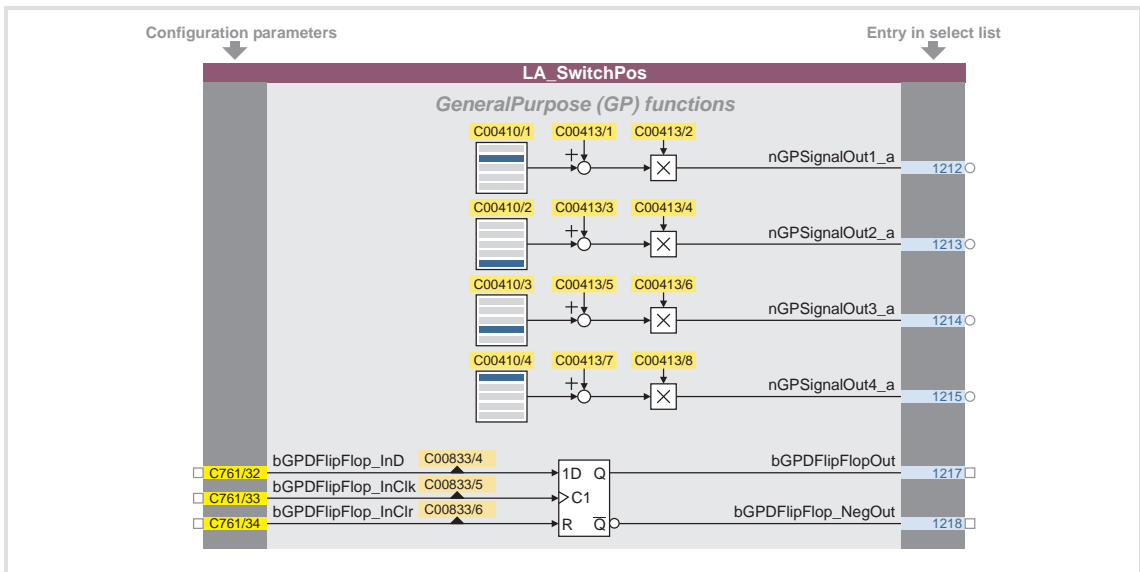


[8-1] Pre-assignment of the "Switch-off positioning" application in the "Terminals 0" control mode

Configuration parameters for "GeneralPurpose" functions



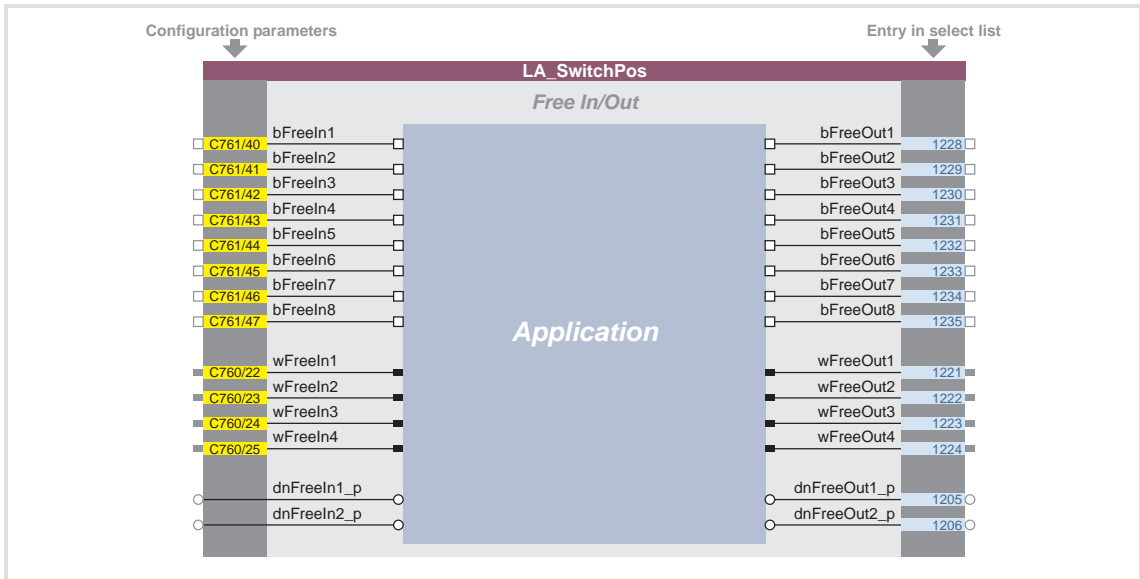
[8-2] "GeneralPurpose" functions



[8-3] "GeneralPurpose" functions (continuation)

Free inputs and outputs

These inputs can be freely interconnected in the application level. They can be used to transfer signals from the I/O level to the application level and vice versa.



[8-4] Free inputs/outputs

Related topics:

- ▶ [User-defined terminal assignment](#) (370)
- ▶ ["GeneralPurpose" functions](#) (467)

8.7 "GeneralPurpose" functions

Each technology application provides different free logic and arithmetic functions, so-called "GeneralPurpose" functions.

For the interconnection of these functions, the application block features inputs and outputs on the I/O level, which are linked to the logic/arithmetic function.



Note!

In the Lenze setting, the connectors for the "GeneralPurpose" functions are hidden in the function block editor.

- These connections can be shown via the **Connector visibilities** command in the *Context menu* of the application block.



Tip!

The inputs of the "GeneralPurpose" functions can also be linked to other output signals via the configuration parameters of the technology application.

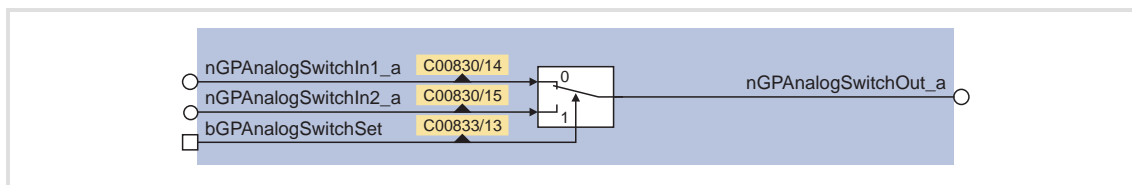
On the other hand, the outputs of the "GeneralPurpose" functions can be selected in the configuration parameters of other inputs.

Related topics:

- ▶ [User-defined terminal assignment](#) (📖 370)
- ▶ [TA "Actuating drive speed": Configuration parameters](#) (📖 407)
- ▶ [TA "Table positioning": Configuration parameters](#) (📖 436)
- ▶ [TA "Switch-off positioning": Configuration parameters](#) (📖 464)

8.7.1 Analog switch

This function switches between two analog input signals. The switch-over is controlled by a boolean input signal.

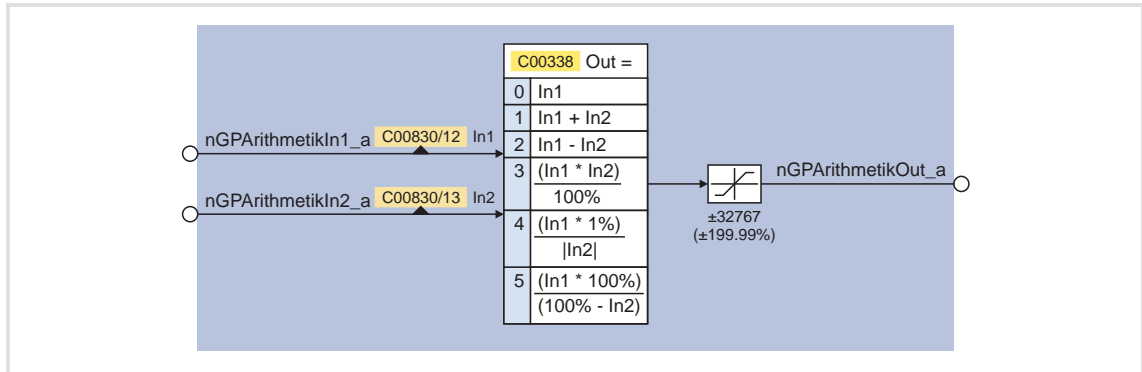


[8-5] GeneralPurpose function "Analog switch"

- ▶ For a detailed functional description see FB [L_AnalogSwitch](#).

8.7.2 Arithmetic

This function links two analog signals arithmetically. The arithmetic function can be parameterised.



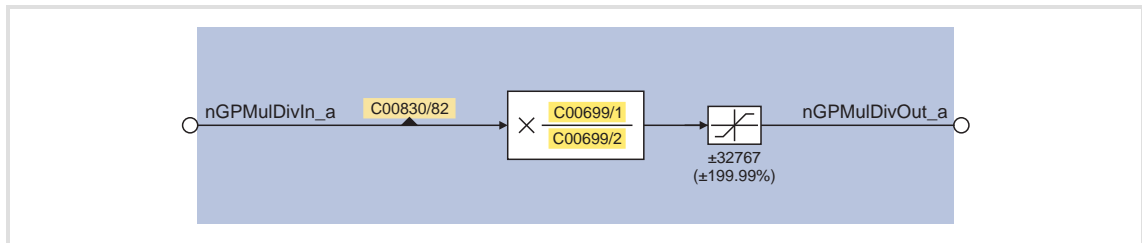
[8-6] GeneralPurpose function "Arithmetic"

Parameter	Info	Lenze setting	
		Value	Unit
C00338	L_Arithmetik_1: Function	0:	nOut_a = nIn1_a

► For a detailed functional description see the [L_Arithmetik](#) FB.

8.7.3 Multiplication/Division

This function multiplies an analog input signal with a parameterisable factor. The factor must be selected in the form of a quotient (numerator and denominator).



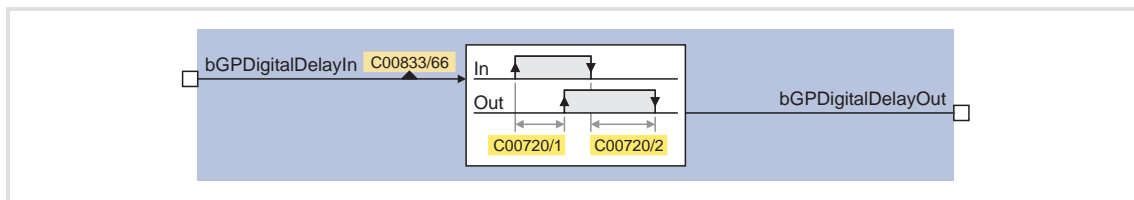
[8-7] GeneralPurpose function "Multiplication/division"

Parameter	Info	Lenze setting	
		Value	Unit
C00699/1	L_MulDiv_1: Numerator	0	
C00699/2	L_MulDiv_1: Denominator	10000	

► For a detailed functional description see FB [L_MulDiv](#).

8.7.4 Binary delay element

This function timely delays binary signals. On-delay and off-delay can be parameterised separately.



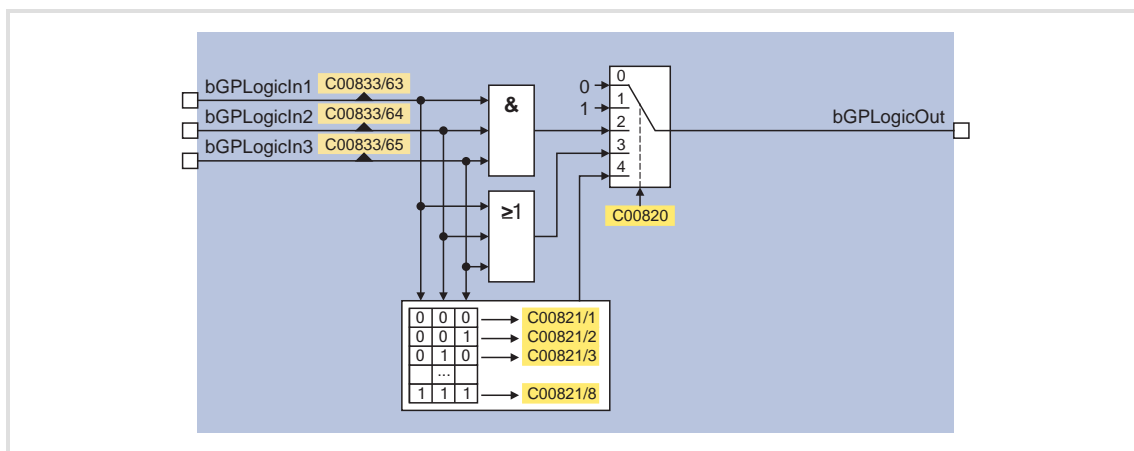
[8-8] GeneralPurpose function "Binary delay element"

Parameter	Info	Lenze setting	
		Value	Unit
C00720/1	L_DigitalDelay_1: On delay	0.000	s
C00720/2	L_DigitalDelay_1: Off delay	0.000	s

► For a detailed functional description see FB [L_DigitalDelay](#).

8.7.5 Binary logic

This function provides a binary output signal which is formed by a logic operation of the input signals. Alternatively, you can also select a fixed binary value which is independent of the input signals.



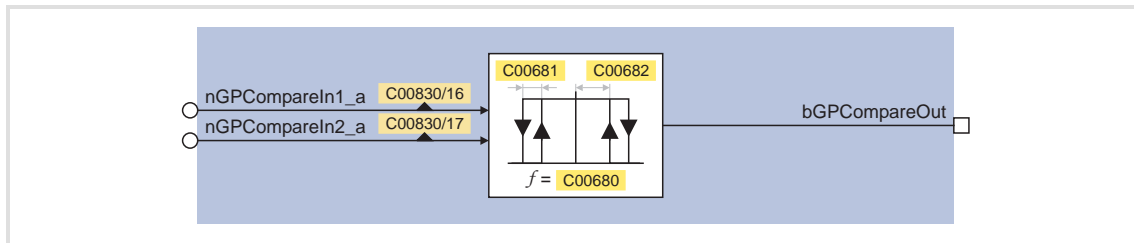
[8-9] GeneralPurpose function "Binary logic"

Parameter	Info	Lenze setting	
		Value	Unit
C00820	L_DigitalLogic_1: Function	0: bOut = 0	
C00821/1	bIn1=0/bIn2=0/bIn3=0	0: FALSE	
C00821/...	
C00821/8	bIn1=1/bIn2=1/bIn3=1	0: FALSE	

► For a detailed functional description see FB [L_DigitalLogic](#).

8.7.6 Analog comparison

This function compares two analog signals and can be used e.g. to realise a trigger. The comparison operation, hysteresis and window size can be parameterised.



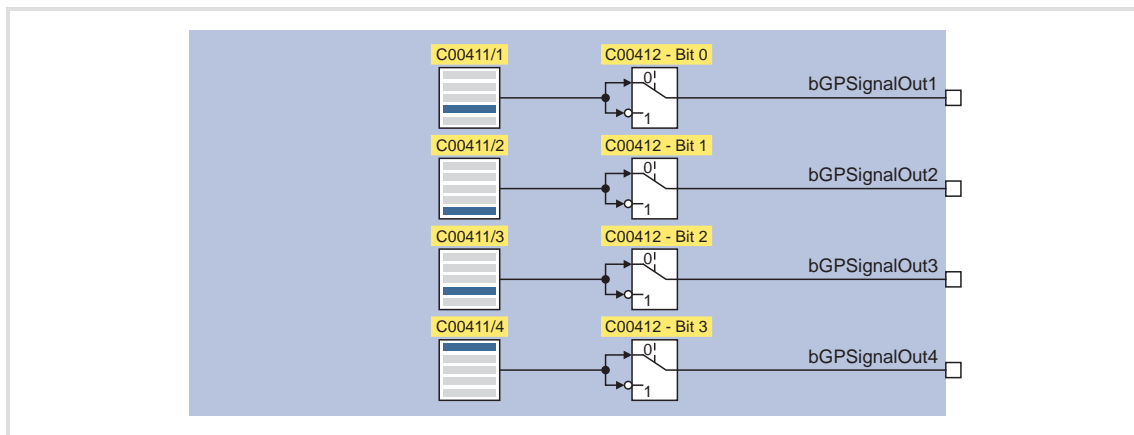
[8-10] GeneralPurpose function "Analog comparison"

Parameter	Info	Lenze setting	
		Value	Unit
C00680	L_Compare_1: Fct.	6: In1 < In2	
C00681	L_Compare_1: Hysteresis	0.50	%
C00682	L_Compare_1: Window	2.00	%

► For a detailed functional description see FB [L_Compare](#).

8.7.7 Binary signal monitor

This function serves to output four binary signals selected from a list of all binary output signals available in the drive controller. You can set an inversion of the output signals.



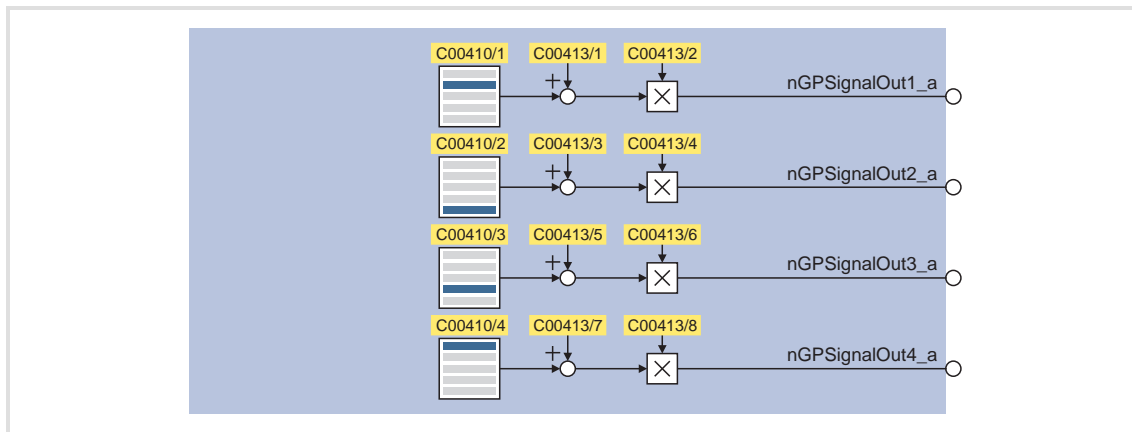
[8-11] GeneralPurpose function "Binary signal monitor"

Parameter	Info	Lenze setting	
		Value	Unit
C00411/1...4	L_SignalMonitor_b: Signal 1 ... 4	0: Not connected	
C00412	L_SignalMonitor_b: Inversion	Bit coded	

► For a detailed functional description see FB [L_SignalMonitor b](#).

8.7.8 Analog signal monitor

This function serves to output four analog signals selected from a list of all analog output signals available in the drive controller. Offset and gain of the source signals can be adjusted.



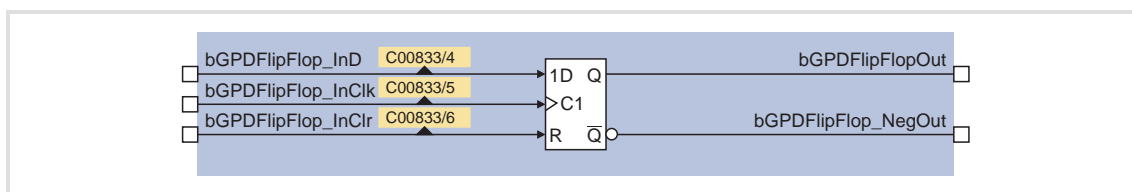
[8-12] GeneralPurpose function "Analog signal monitor"

Parameter	Info	Lenze setting	
		Value	Unit
C00410/1...4	L_SignalMonitor_a: Signal 1 ... 4	0: Not connected	
C00413/1	L_SignalMonitor_a: Signal 1 offset	0.00	%
C00413/2	L_SignalMonitor_a: Signal 1 gain	100.00	%
C00413/3	L_SignalMonitor_a: Signal 2 offset	0.00	%
C00413/4	L_SignalMonitor_a: Signal 2 gain	100.00	%
C00413/5	L_SignalMonitor_a: Signal 3 offset	0.00	%
C00413/6	L_SignalMonitor_a: Signal 3 gain	100.00	%
C00413/7	L_SignalMonitor_a: Signal 4 offset	0.00	%
C00413/8	L_SignalMonitor_a: Signal 4 gain	100.00	%

► For a detailed functional description see the [L_SignalMonitor_a](#) FB.

8.7.9 D-FlipFlop

This function saves the logic status of the data input (1D) in case of an active clock edge at the clock input (C1) and puts out its value in sequence at the output Q. If there is no active clock edge, the input value is not accepted.

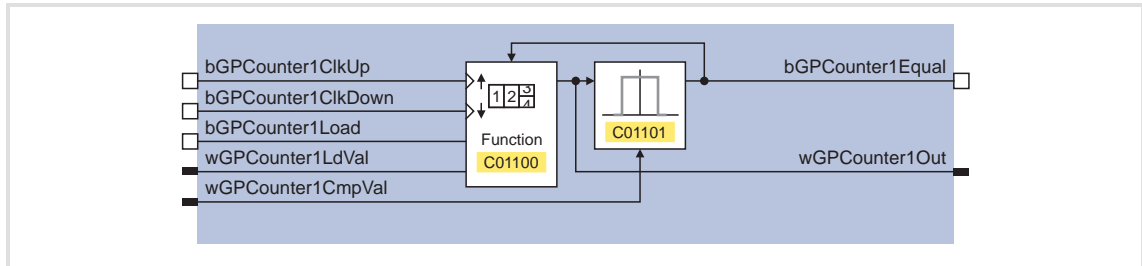


[8-13] GeneralPurpose function "D-FlipFlop" (clock-edge controlled)

► For a detailed functional description see FB [L_DFliPflOp](#).

8.7.10 Numerator

This function is a digital upcounter and downcounter with a comparison operation.



[8-14] GeneralPurpose function "Counter"

Parameter	Info	Lenze setting	
		Value	Unit
C01100/1	L_Counter_1: Function	0	Normal counting
C01101/1	L_Counter_1: Comparison	0	Greater than or equal to

- ▶ Only available with [TA "Table positioning"](#).
- ▶ For a detailed functional description see FB [L_Counter](#).

9 Basic drive functions (MCK)

In this chapter, the standard and basic drive functions integrated in the **Motion Control Kernel (MCK)** of the 8400 TopLine are described to which the active technology application can gain access via defined internal interfaces. As a result, the time-consuming creation of individual FB interconnections is avoided and the amount of work and complexity involved in the implementation of standard functions is minimised.

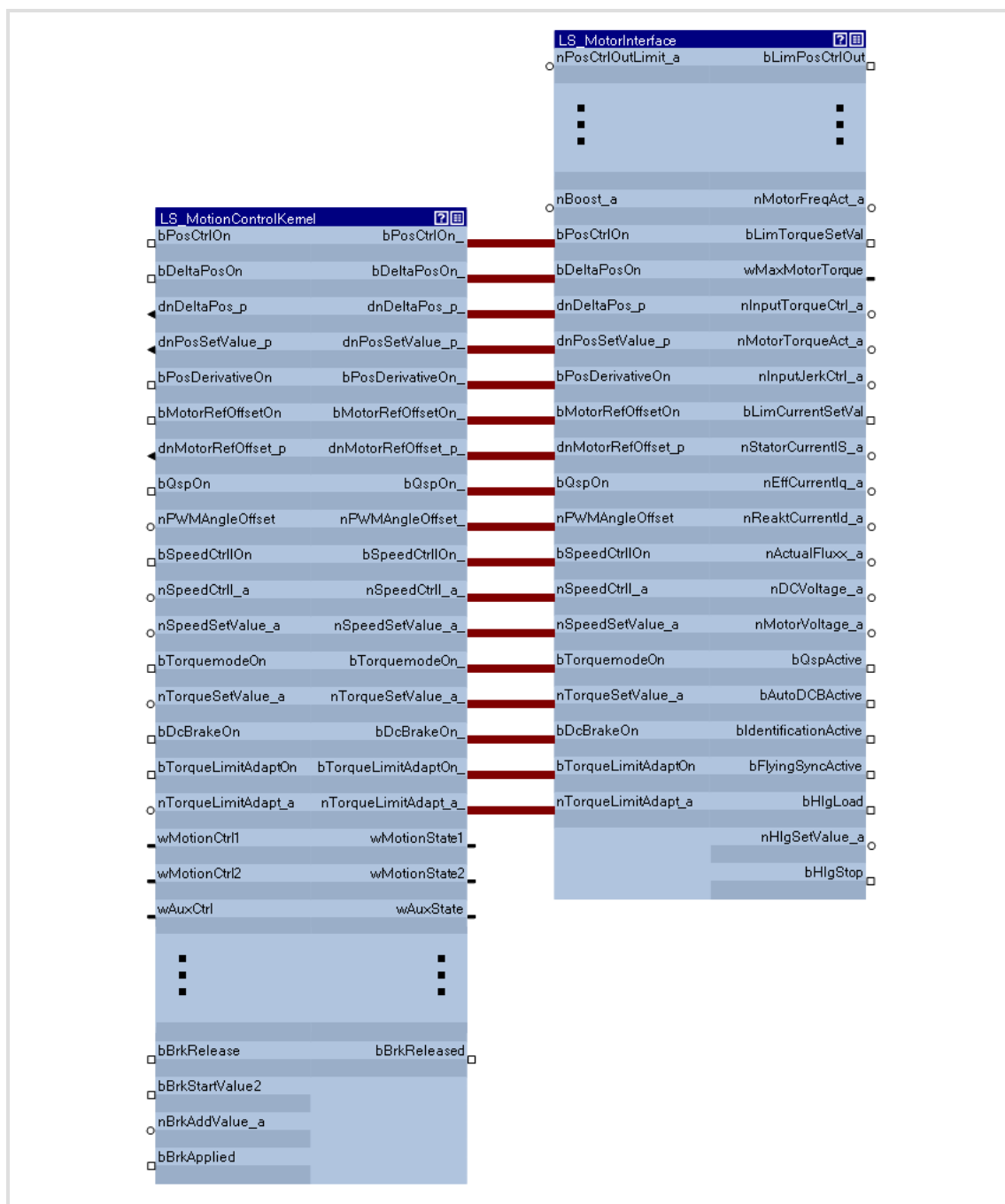
In the **Motion Control Kernel**, for example, an automatic holding brake control function is integrated which controls the holding brake in relation to the speed setpoint and various other internal control signals. Due to integrated automatic brake operation, the user is relieved of the task of managing these control signals.

Other standard functions integrated in the **Motion Control Kernel** in the case of the 8400 TopLine controller are, for example:

- ▶ Manual jog, e.g. for manual setting-up operation
- ▶ Homing for positioning functions of the drive
- ▶ Position profile generator for positioning functions of the drive

9.1 Basic signal flow

The **Motion Control Kernel** is connected between setpoint generator (e.g. ramp generator, PID process controller, etc.) and the motor control function in the case of the available technology applications. For problem-free interaction of the **Motion Control Kernel** and motor control function, the two associated system blocks [LS_MotionControlKernel](#) and [LS_MotorInterface](#) have interfaces with corresponding inputs/outputs. These are visible in the FB Editor for monitoring purposes and must be connected to each other:



[9-1] Interconnection of Motion Control Kernel and motor control function


In the interconnection previously shown, the **Motion Control Kernel** monitors every interface. Some of the signals such as a quick stop request or a DC-injection braking request are directly passed through to the motor control. However, other signals are passed through or modified depending on the operating mode (e.g. synchronising a setpoint selection via ramp function).

9.2 Internal interfaces | System block "LS_MotionControlKernel"

In the Function Block editor, the system block **LS_MotionControlKernel** provides the interfaces to the **Motion Control Kernel**.

Inputs

Identifier	Data type	Information/possible settings				
Control and setpoint signals for motor control						
The purpose of the following inputs is to transfer control signals and setpoints to the internal motor control function (LS_MotorInterface).						
bPosCtrlOn	BOOL	Activation of position/angle control <table border="1"> <tr> <td>FALSE</td> <td>Position/angle control deactivated.</td> </tr> <tr> <td>TRUE</td> <td>Position/angle control activated.</td> </tr> </table>	FALSE	Position/angle control deactivated.	TRUE	Position/angle control activated.
FALSE	Position/angle control deactivated.					
TRUE	Position/angle control activated.					
bDeltaPosOn	BOOL	Activate position difference as setpoint selection <ul style="list-style-type: none"> In order to position the motor shaft, the position control function can work within the motor control function with the absolute position setpoint <i>dnPosSetValue_p</i> or alternatively with the speed setpoint <i>nSpeedSetValue_a</i> and the position difference <i>dnDeltaPos_p</i>. <table border="1"> <tr> <td>FALSE</td> <td>Positioning with position setpoint <i>dnPosSetValue_p</i>.</td> </tr> <tr> <td>TRUE</td> <td>Positioning with speed setpoint <i>nSpeedSetValue_a</i> and position difference <i>dnDeltaPos_p</i>.</td> </tr> </table>	FALSE	Positioning with position setpoint <i>dnPosSetValue_p</i> .	TRUE	Positioning with speed setpoint <i>nSpeedSetValue_a</i> and position difference <i>dnDeltaPos_p</i> .
FALSE	Positioning with position setpoint <i>dnPosSetValue_p</i> .					
TRUE	Positioning with speed setpoint <i>nSpeedSetValue_a</i> and position difference <i>dnDeltaPos_p</i> .					
dnDeltaPos_p	DINT	Position difference (following error input) <ul style="list-style-type: none"> Difference between setpoint position and actual position in [increments] Is used for position control if <i>bDeltaPosOn</i> = TRUE. Scaling: a revolution is displayed with 65536 increments or steps. 				
dnPosSetValue_p	DINT	Absolute position setpoint in [increments] <ul style="list-style-type: none"> Is used for position control if <i>bDeltaPosOn</i> = FALSE. Scaling: a revolution is displayed with 65536 increments or steps. 				
bPosDerivativeOn	BOOL	Create a setpoint for the speed controller from the position setpoint <ul style="list-style-type: none"> For highly dynamic control systems, the setpoint for the speed controller can be created from the absolute position setpoint <i>dnPosSetValue_p</i> instead of the speed setpoint <i>nSpeedSetValue_a</i>. Position control/additive speed specification <table border="1"> <tr> <td>TRUE</td> <td>Create a speed setpoint from the position setpoint. <ul style="list-style-type: none"> The absolute position setpoint <i>dnPosSetValue_p</i> is differentiated and a speed value is created which is the setpoint for the speed controller. Internal limitation of 65536 increments/ms. </td> </tr> </table>	TRUE	Create a speed setpoint from the position setpoint. <ul style="list-style-type: none"> The absolute position setpoint <i>dnPosSetValue_p</i> is differentiated and a speed value is created which is the setpoint for the speed controller. Internal limitation of 65536 increments/ms. 		
TRUE	Create a speed setpoint from the position setpoint. <ul style="list-style-type: none"> The absolute position setpoint <i>dnPosSetValue_p</i> is differentiated and a speed value is created which is the setpoint for the speed controller. Internal limitation of 65536 increments/ms. 					
bMotorRefOffsetOn	BOOL	In preparation - Input has no function at present time! Adopt home position ("Homing on the fly") <table border="1"> <tr> <td>FALSE → TRUE</td> <td>Adopt home position <i>dnMotorRefOffset_p</i>.</td> </tr> </table>	FALSE → TRUE	Adopt home position <i>dnMotorRefOffset_p</i> .		
FALSE → TRUE	Adopt home position <i>dnMotorRefOffset_p</i> .					

Identifier	Data type	Information/possible settings
dnMotorRefOffset_p	DINT	<p>Home position in [increments]</p> <ul style="list-style-type: none"> Value is adopted when control bit 9 ("HomeSetPos") is set from "0" to "1" in the MCK control word and is sent to the motor control function via the <i>dnMotorRefOffset_p</i> output. Transfer is possible in any operating mode ("Homing on the fly"). For this function, the two outputs <i>bMotorRefOffsetOn_</i> and <i>dnMotorRefOffset_p</i> must be connected to the inputs of the same name of the LS_MotorInterface system block.
bQspOn	BOOL	<p>Trigger quick stop (QSP) via the MCK</p> <ul style="list-style-type: none"> Also see device command "Activate/Deactivate quick stop".
		<p>TRUE</p> <p>Activate quick stop</p> <ul style="list-style-type: none"> Motor control is decoupled from the setpoint selection and, within the deceleration time parameterised in C00105, the motor is brought to a standstill ($n_{act} = 0$). A pulse inhibit (CINH) is set if the auto-DCB function has been activated via C00019. The motor is kept at a standstill during closed-loop operation (function in preparation).
		<p>FALSE</p> <p>Deactivate quick stop</p> <ul style="list-style-type: none"> The quick stop is deactivated if no other source for the quick stop is active. C00159 displays a bit code of active sources/causes for the quick stop.
nPWMAngleOffset	INT	<p>Angular offset input</p> <ul style="list-style-type: none"> Scaling: $16384 \equiv 100\%$ Setting range: 0 ... 199.99 %
bSpeedCtrlIOn	BOOL	<p>Directly set the I-component of speed controller</p> <ul style="list-style-type: none"> In order to statically specify a minimum torque, e.g. when a load is being lifted.
		<p>TRUE</p> <p>Set the I-component of the speed controller to the value <i>nSpeedCtrlI_a</i>.</p>
nSpeedCtrlI_a	INT	<p>I-component of the speed controller</p> <ul style="list-style-type: none"> Value is adopted in the case of a FALSE-TRUE edge at the input <i>bSpeedCtrlIOn</i>.
nSpeedSetValue_a	INT	<p>Rotation speed/velocity setpoint</p>
bTorquemodeOn	BOOL	<p>TRUE</p> <p>Switch on torque-controlled operation</p>
nTorqueSetValue_a	INT	<p>Torque setpoint</p>
bDcBrakeOn	BOOL	<p>Manual DC-injection braking (DCB)</p> <ul style="list-style-type: none"> For this function, the <i>bDcBrakeOn_</i> output signal must be connected to the <i>bDcBrakeOn</i> input of the same name of the LS_MotorInterface system block. Detailed information on DC-injection braking is provided in the motor control chapter, subchapter "DC-injection braking".
		<p> Note!</p> <p>Holding braking is not possible when this braking mode is used! Use the basic "Holding brake control" function for controlling the holding brake with a low rate of wear.</p>
		<p>FALSE</p> <p>Deactivate DC-injection braking.</p>
		<p>TRUE</p> <p>Activate DC-injection braking, i.e. the drive is brought to a standstill by means of DC-injection braking.</p> <ul style="list-style-type: none"> The braking effect stops when the rotor is at standstill. After the hold time (C00107) has expired, the controller sets the pulse inhibit (CINH).

Identifier	Data type	Information/possible settings
bTorqueLimitAdaptOn	BOOL	Adaptation of torque limitation TRUE Activate adaptation of torque limitation.
nTorqueLimitAdapt_a	INT	Value for adaptation of torque limitation • Scaling: 16384 ≙ 100 % of the torque limit specified at the LS_MotorInterface system block via the <i>nTorqueMotLimit_a</i> and <i>nTorqueGenLimit_a</i> inputs.
Control words		
MCK: wMotionCtrl1 wMotionCtrl2	WORD	MCK control word 1 & 2 • The two control words together form a 32-bit double control word with which the entire Motion Control Kernel is controlled. • All motion profiles in the different operating modes can be operated via this interface. • See the " MCK control word " subchapter for a detailed description of the individual control bits. • Display parameter: C01240
wAuxCtrl	WORD	For future extensions - Input has not function at present time! Additional control word
wSMCtrl	WORD	Interface to the optional safety system. • Setting control bit 0 ("SafeStop1") in this control word causes e.g. the automatic deceleration of the drive to standstill within this application (in the Motion Control Kernel). • See the " Interface to safety system " subchapter for a detailed description of the individual control bits.
Control and setpoint signals for Motion Control Kernel function		
dnProfilePosition_p	DINT	Profile position in [increments] • Position which is to be entered into a profile data set selected via the MCK control word . • In the "absolute" mode, this position is a target position. However, in the "relative" mode it is a relative traverse path.
nSpeedAddValue_v	INT	Additive speed setpoint in [inc/ms]
nSpeedOverride_a	INT	Value for Speed override • Percentage multiplier (0 ... 199.99 %) for the currently active speed. • 16384 ≙ 100 % of the maximum traversing speed (display in C01211/1). • If the override value is 0 %, the drive is brought to a standstill.
nAccOverride_a	INT	Value for Acceleration override • Percentage multiplier (0 ... 199.99 %) for the currently active acceleration. • 16384 ≙ 100 % of the parameterised acceleration of the corresponding operating mode. • If the override value is 0 %, acceleration ceases.
nSRampOverride_a	INT	Value for S-ramp smoothing override • Percentage multiplier (0 ... 100 %) for the currently active acceleration. • 16384 ≙ 100 % of the parameterised S-ramp time (C01306/1...15). • Values > 16384 are ignored.
 Note! If the <i>nSRampOverride_a</i> input remains unconnected or if an override value of "0 %" is selected, activation of the S-ramp override causes deactivation of the S-ramp time. <ul style="list-style-type: none"> • Deactivation of the S-ramp time before the start of a profile with S-ramp time causes linear ramp generation. • Deactivation of the S-ramp time during a traversing process, however, is not accepted immediately in the profile generator, but the profile generator checks automatically when an online change of the ramp form can be carried out and then initiates it automatically. 		
bLimitSwitchPos	BOOL	Input for Hardware limit switch (positive)
bLimitSwitchNeg	BOOL	Input for Hardware limit switch (negative)

Identifier	Data type	Information/possible settings				
bHomingMark	BOOL	Input for pre-stop mark/pre-stop signal for homing				
bBrkRelease	BOOL	<p>Holding brake control: Releasing/applying the brake in connection with the selected operating mode</p> <table border="1"> <tr> <td>FALSE</td> <td>Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake. </td> </tr> <tr> <td>TRUE</td> <td>Release brake manually (forced release). <ul style="list-style-type: none"> Note! The brake can also be released when the controller is inhibited! During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. In semi-automatic operation, the brake is released including feedforward control. </td> </tr> </table>	FALSE	Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake. 	TRUE	Release brake manually (forced release). <ul style="list-style-type: none"> Note! The brake can also be released when the controller is inhibited! During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. In semi-automatic operation, the brake is released including feedforward control.
FALSE	Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake. 					
TRUE	Release brake manually (forced release). <ul style="list-style-type: none"> Note! The brake can also be released when the controller is inhibited! During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. In semi-automatic operation, the brake is released including feedforward control. 					
bBrkStartValue2	BOOL	<p>Holding brake control: Selection of the torque feedforward control value for manual specification of the feedforward control value</p> <ul style="list-style-type: none"> Only effective if bit 4 in C02582 is set to "1". ▶ Feedforward control of the motor before release <table border="1"> <tr> <td>FALSE</td> <td>Starting value 1 (C02581/4) active.</td> </tr> <tr> <td>TRUE</td> <td>Starting value 2 (C02581/5) active.</td> </tr> </table>	FALSE	Starting value 1 (C02581/4) active.	TRUE	Starting value 2 (C02581/5) active.
FALSE	Starting value 1 (C02581/4) active.					
TRUE	Starting value 2 (C02581/5) active.					
nBrkAddValue_a	INT	<p>Holding brake control: Additive feedforward control value (speed or torque) in [%] for torque feedforward control when the respective control mode is started</p> <ul style="list-style-type: none"> For speed control: 100 % ≡ reference speed (C00011) For torque control: 100 % ≡ maximum torque (C00057) ▶ Feedforward control of the motor before release 				
bBrkApplied	BOOL	<p>Holding brake control: Input for status detection via switching contacts at the brake</p> <ul style="list-style-type: none"> Only effective if bit 5 in C02582 is set to "1". <table border="1"> <tr> <td>FALSE</td> <td>Brake is released.</td> </tr> <tr> <td>TRUE</td> <td>Brake is applied.</td> </tr> </table>	FALSE	Brake is released.	TRUE	Brake is applied.
FALSE	Brake is released.					
TRUE	Brake is applied.					

Outputs

Identifier	Data type	Value/meaning	
Control and setpoint signals for motor control			
The following outputs are used to transfer control signals and setpoints to the internal motor control function (LS_MotorInterface).			
bPosCtrlOn_	BOOL	TRUE	Activate position control.
bDeltaPosOn_	BOOL	TRUE	Control to adjust for following errors.
dnDeltaPos_p_	DINT	Following error input	
dnPosSetValue_p_	DINT	Absolute position setpoint	
bPosDerivativeOn_	BOOL	TRUE	Activate precontrol function of speed controller.
bMotorRefOffsetOn_	BOOL	FALSE↗TRUE	Accept home position.
dnMotorRefOffset_p_	DINT	Home position	
bQspOn_	BOOL	TRUE	Activate quick stop
nPWMAngleOffset_a_	INT	Angular offset input	
bSpeedCtrlIOn_	BOOL	TRUE	Set I-component of speed controller.
nSpeedCtrlI_a_	INT	I-component of the speed controller	
nSpeedSetValue_a_	INT	Main setpoint of speed	
bTorqueModeOn_	BOOL	TRUE	Switch on torque-guided operation.
nTorqueSetValue_a_	INT	Torque setpoint	
bDcBrakeOn_	BOOL	TRUE	Activate DC-injection braking.
bTorqueLimitAdaptOn_	BOOL	TRUE	Activate adaptation of torque limitation.
nTorqueLimitAdapt_a_	INT	Value for adaptation of torque limitation	
Status words			
wMotionState1 wMotionState2	WORD	MCK status word 1 & 2 <ul style="list-style-type: none"> For a detailed description of the individual status bits, see subchapter entitled "MCK status word." Display parameter: C01241 	
wAuxState	WORD	For future extensions - Output has no function at present time! Additional status word	

Identifier	Data type	Value/meaning
Status signal and actual-value signals from Motion Control Kernel functions		
nSpeedSet_v	INT	Speed setpoint selection in [increments/ms] • 16384 ≙ 15000 rpm
dnPosTarget_p	DINT	Target position in [increments] • 65535 ≙ 1 revolution of the motor shaft
dnPosSet_p	DINT	Module position in [increments] • 65535 ≙ 1 revolution of the motor shaft ▶ Activation of the modulo measuring system
dnPosSetRelative_p <small>(from version 02.00.00)</small>	DINT	Relative feed in positioning processes in [increments] • 65535 ≙ 1 revolution of the motor shaft
wActProfileNo	WORD	Number of current profile
wFollowProfileNo	WORD	Number of sequence profile
bPosBusy	BOOL	TRUE Setpoint profile generation is active.
bPosDone	BOOL	TRUE Setpoint profile generation is completed (set position = target position).
bHomingDone	BOOL	TRUE Homing has been carried out. • The <i>bHomingDone</i> output, in contract to the <i>bHomePosAvailable</i> output, remains set to TRUE even if a travel command that resulted in a reset of the home position has been carried out.
bHomePosAvailable	BOOL	TRUE Home position is known.
bBrkReleaseOut	BOOL	Trigger signal for switching element holding brake control via a digital output • Use bit 0 under C02582 to activate inverted switching element triggering. ▶ Holding brake control
		FALSE Apply brake.
		TRUE Release brake.
bBrkReleased	BOOL	"Brake released" status signal considering the brake release time • If the holding brake is triggered to be applied, <i>bBrkReleased</i> is immediately reset to FALSE even if the brake application time has not elapsed yet! ▶ Holding brake control
		TRUE Brake released (when the brake release time has elapsed).
wGearNum wGearDenom <small>(from version 02.00.00)</small>	WORD	Output of the gearbox factor set in C01202/1 and C01202/2 • These outputs can be connected to the <i>GearNum-/GearDenom</i> inputs of the FBs which process a gearbox factor (FB L_PhilIntegrator_1 , FB L_DFSET_1 , FB L_CalcDiameter_1). • C01067/1...3 can be used to inform these FBs that the gearbox direction of rotation is inverted is mostly done by selecting "motor mounting position inverted").

Related topics:

- ▶ [MCKInterface](#)
- ▶ [Control inputs | "L_MckCtrlInterface" function block](#)
- ▶ [Status outputs | FB "L_MckStateInterface"](#)

9.2.1 MCK control word

The motion control function implemented in the [LS_MotionControlKernel](#) system block can be controlled via the *wMotionCtrl1* and *wMotionCtrl2* control words. Together, both control words form a 32-bit control double word which serves to control the entire MotionControlKernel. All motion profiles in the various operating modes can be operated via this interface.

For direct control via a fieldbus system, the two control words can be triggered by the field bus via a port block. In addition to a few other signals (e.g. limit switch, speed override) that are connected to the digital inputs of the drive controller, all control signals can therefore be activated/deactivated via the fieldbus used (CAN, PROFIBUS, etc.).

As an alternative to this, changes to the individual control bits or bit fields (e.g. for specifying the profile number) can also be carried out via separate process inputs provided by the [L_MckCtrlInterface](#) function block. The control words *wOutMckPosCtrl_1* and *wOutMckPosCtrl_2* output by this function block constitute the input information for the [LS_MotionControlKernel](#) system block in this case.

MCK control word 1 (wMotionCtrl1)

Bit	Designation	Description	Bit 3	Bit 2	Bit 1	Bit 0
0	OpMode_Bit0	Operating mode				
...	...	Speed follower	0	0	0	0
3	OpMode_Bit3	Homing	0	0	0	1
		Manual jog	0	0	1	0
		Positioning	0	0	1	1
		Stop	0	1	0	0
		Position follower	0	1	0	1
All other possible settings are reserved for future extensions!						
4	ManJogPos	Manual jog			Bit 5	Bit 4
5	ManJogNeg	Stop manual jogging			0	0
		Manual jog, right			0	1
		Manual jog, left			1	0
		No change from previous status			1	1
6	ManExecute 2ndSpeed	"1" ≡ Change over to manual speed 2				
7	ReleaseLimitSwitch	"1" ≡ Retract operated hardware limit switch				
8	HomStartStop	"1" ≡ Start/stop homing process				
9	HomSetPos	"1" ≡ Set homing position				
10	HomResetPos	"1" ≡ Reset the "Reference known" status • <i>bHomePosDone</i> and <i>bHomePosAvailable</i> are reset to FALSE. • The positions remain unaffected.				
11	EnableSpeedOverride	"1" ≡ Activate speed override				
12	EnableAccOverride	"1" ≡ Activate acceleration override				
13	Enable SRampOverride	"1" ≡ Activate S-ramp override				
14	PosTeachSetPos	"1" ≡ Teach MCK set position into the selected profile				
15	PosTeachActPos	"1" ≡ Teach current position into the selected profile				

MCK control word 2 (wMotionCtrl2)

Bit	Designation	Description									
16	PosExecute	"071" ≡ Start travelling									
17	PosFinishTarget	"071" ≡ Complete cancelled profile									
18	PosDisable FollowProfile	"1" ≡ Do not travel sequence profile									
19	PosStop	"1" ≡ Cancel travelling From version 02.00.00, more travel requests will be inhibited ("PosExecute" will be blocked).									
20	PosModeBit0	Positioning mode Positioning mode = setting in C01300/1...15 Absolute (shortest path) Continuous Relative absolute (Cw) absolute (Ccw) Absolute (shortest path) to TP Continuous to TP Relative to TP Absolute (Cw) on TP Absolute (Ccw) on TP All other possible settings are reserved for future extensions!	Bit 3	Bit 2	Bit 1	Bit 0					
...	...		0	0	0	0					
23	PosModeBit3		0	0	0	1					
			0	0	1	0					
			0	0	1	1					
			0	1	0	0					
			0	1	0	1					
			1	0	0	0					
			1	0	0	1					
			1	0	1	0					
			1	0	1	1					
			1	1	0	0					
24	ProfileNo_Bit0		Profile Profile 0 Profile 1 Profile 2 ... Profile 15 All other possible settings are reserved for future extensions!	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
...	...	0		0	0	0	0	0	0	0	
31	ProfileNo_Bit7	0		0	0	0	0	0	0	1	
		0		0	0	0	0	0	1	0	
		...									
		0		0	0	0	1	1	1	1	
		All other possible settings are reserved for future extensions!									



Note!

The profile 0 is no valid profile for the "[Positioning](#)" operating mode.

If a driving request with an invalid profile number is started, the response set in [C00595/12](#) occurs (Lenze setting: "WarningLocked").



Tip!

Travel requests/profiles can also be started while the drive is running. The drive does not need to be at standstill.

9.2.2 MCK status word

MCK status word 1 (wMotionState1)

Bit	Designation	Description	Bit 3	Bit 2	Bit 1	Bit 0
0	ActOpModeBit00	Active operating mode				
...	...	Speed follower	0	0	0	0
3	ActOpModeBit03	Homing	0	0	0	1
		Manual jog	0	0	1	0
		Positioning	0	0	1	1
		Stop or Safe stop 1 (SS1)	0	1	0	0
		Position follower	0	1	0	1
		StandBy (internal operating mode in the event of quick stop, pulse inhibit, and DC-injection braking)	1	1	1	1
4	Busy	"1" ≙ Internal profile generation is active. A speed profile is being generated.				
5	Done	"1" ≙ Generation of a speed profile with the selected position has been completed.				
6	AcceleratingActive	"1" ≙ Profile generation phase is in the acceleration process.				
7	ConstSpeedDuty	"1" ≙ Profile generation phase at constant speed active.				
8	DeceleratingActive	"1" ≙ Profile generation phase is in the deceleration process.				
9	S_ShapingActive	In preparation - status bit without function at the moment! "1" ≙ Rounding during acceleration/deceleration active.				
10	Pos. HW-Limit Detected	"1" ≙ Positive limit switch has triggered. • Reset only possible via "Manual jog" mode!				
11	Neg. HW-Limit Detected	"1" ≙ Negative limit switch has triggered. • Reset only possible via "Manual jog" mode!				
12	HomPosDone	"1" ≙ Homing has been completed.				
13	HomPosAvailable	"1" ≙ The home position has been detected and is known in the drive.				
14	Reserved	-				
15	Reserved	-				

**Note!**

The internal "StandBy" operating mode is assumed if pulse inhibit, quick stop and/or DC-injection braking are activated.

- No setpoint generation via the **Motion Control Kernel** in this operating mode.
- If the holding brake control sets a controller inhibit when the holding brake is closed, the internal "StandBy" operating mode is not assumed.

MCK status word 2 (wMotionState2)

Bit	Designation	Description																																																																		
16	DwellTime	"1" ≙ Dwell time after reaching the setpoint position is active. ▶ Target position monitoring (status "drive in target")																																																																		
17	InTarget	"1" ≙ Dwell time has expired and current actual position is in the set target window. ▶ Target position monitoring (status "drive in target")																																																																		
18	PosDone	"1" ≙ Positioning profile has been completed in the "Positioning" or "Homing" mode. Setpoint position of a profile data set is in target.																																																																		
19	Reserved	-																																																																		
20	ActPosMode_Bit00	<table border="1"> <thead> <tr> <th colspan="2">Active positioning mode</th> <th>Bit 3</th> <th>Bit 2</th> <th>Bit 1</th> <th>Bit 0</th> </tr> </thead> <tbody> <tr> <td>Absolute (shortest path)</td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Continuous</td> <td></td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Relative</td> <td></td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>absolute (Cw)</td> <td></td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>absolute (Ccw)</td> <td></td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>Absolute (shortest path) to TP</td> <td></td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Continuous to TP</td> <td></td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Relative to TP</td> <td></td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Absolute (Cw) on TP</td> <td></td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>Absolute (Ccw) on TP</td> <td></td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>Note: The display of the active positioning mode depends on further factors. See subchapter "Override of the parameterised positioning mode".</p>	Active positioning mode		Bit 3	Bit 2	Bit 1	Bit 0	Absolute (shortest path)		0	0	0	1	Continuous		0	0	1	0	Relative		0	0	1	1	absolute (Cw)		0	1	0	0	absolute (Ccw)		0	1	0	1	Absolute (shortest path) to TP		1	0	0	0	Continuous to TP		1	0	0	1	Relative to TP		1	0	1	0	Absolute (Cw) on TP		1	0	1	1	Absolute (Ccw) on TP		1	1	0	0
Active positioning mode			Bit 3	Bit 2	Bit 1	Bit 0																																																														
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Relative to TP			1	0	1	0																																																														
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Absolute (Ccw) on TP			1	1	0	0																																																														
...	...																																																																			
23	ActPosMode_Bit03																																																																			
24	ActProfileNo_Bit00	<table border="1"> <thead> <tr> <th colspan="2">Active profile</th> <th>Bit 7</th> <th>Bit 6</th> <th>Bit 5</th> <th>Bit 4</th> <th>Bit 3</th> <th>Bit 2</th> <th>Bit 1</th> <th>Bit 0</th> </tr> </thead> <tbody> <tr> <td>Profile 0</td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Profile 1</td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Profile 2</td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>...</td> <td></td> <td colspan="8">...</td> </tr> <tr> <td>Profile 15</td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Active profile		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Profile 0		0	0	0	0	0	0	0	0	Profile 1		0	0	0	0	0	0	0	1	Profile 2		0	0	0	0	0	0	1	0								Profile 15		0	0	0	0	1	1	1	1						
Active profile			Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0																																																										
Profile 0			0	0	0	0	0	0	0	0																																																										
Profile 1			0	0	0	0	0	0	0	1																																																										
Profile 2			0	0	0	0	0	0	1	0																																																										
...			...																																																																	
Profile 15			0	0	0	0	1	1	1	1																																																										
...	...																																																																			
31	ActProfileNo_Bit07																																																																			



Note!

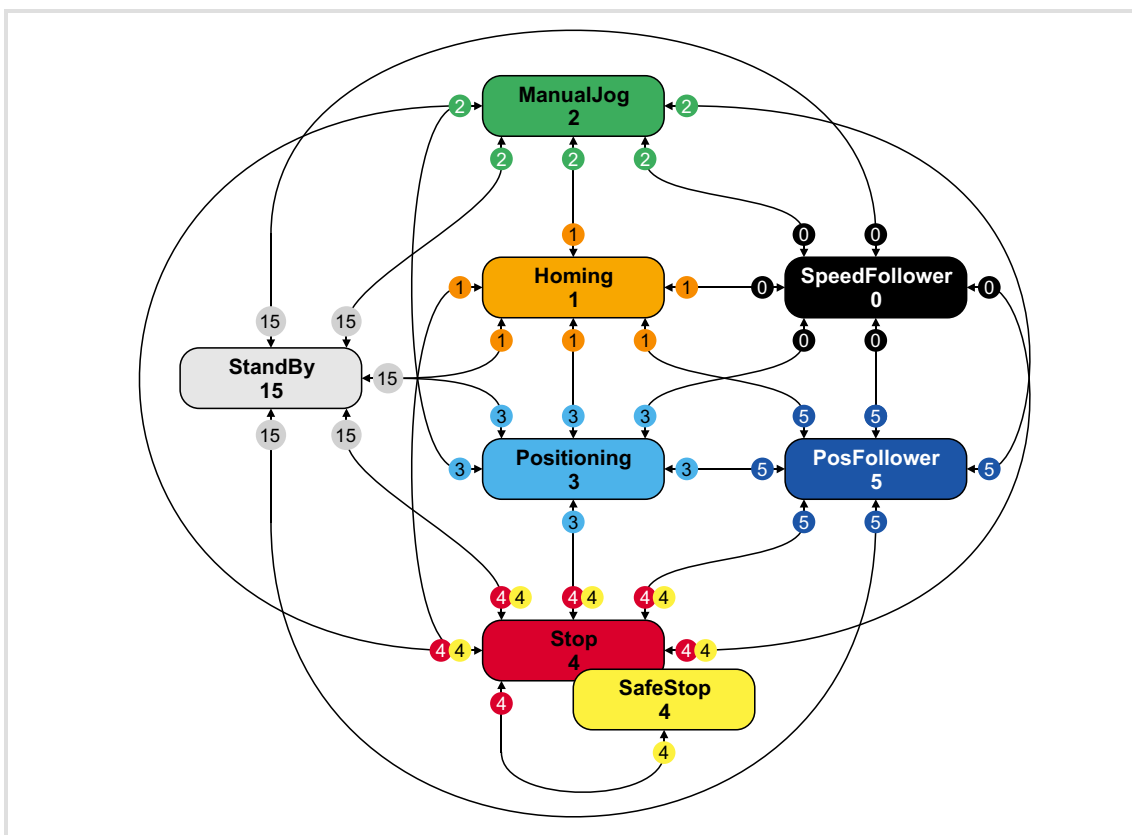
The effective positioning mode is generated via the MCK control word (bit 20 ... 23) and/or the parameters [C01300/1...15](#) for defining the positioning mode in the profile data. Here, the setting in the MCK control word superimposes the mode selection via the corresponding parameter. This means that the mode selection and the touch probe enable are possible via process data.

For generating the effective positioning mode, the following applies:

- Valid PosMode in the MCK control word:
→ Use positioning mode of the MCK control word
- PosMode in the MCK control word = 0:
→ Use positioning mode set in [C01300/x](#)
- Invalid PosMode in the MCK control word:
→ Error message "Ck09: Positioning mode invalid"

9.2.3 MCK state machine

Prio	Condition																													
Global conditions:																														
1	15 Setpoint generation through Motor control (MCTRL) : <ul style="list-style-type: none"> • DCB = DC-injection braking • QSP = quick stop • CINH = controller inhibit 																													
2	4 "Safe stop 1" (SS1) requested Interface to safety system																													
Conditions requested by MCK control word:																														
		<table border="1"> <thead> <tr> <th>Bit 3</th> <th>Bit 2</th> <th>Bit 1</th> <th>Bit 0</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Bit 3	Bit 2	Bit 1	Bit 0	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	1	0	1	0	0
Bit 3	Bit 2	Bit 1	Bit 0																											
0	0	1	0																											
0	0	0	1																											
0	0	1	1																											
0	0	0	0																											
0	1	0	1																											
0	1	0	0																											
3	2 Manual jog requested																													
4	1 Homing requested																													
5	3 Positioning requested																													
6	0 Speed follower requested																													
7	5 Position follower requested																													
8	4 Stop requested																													



[9-2] MCK state machine

9.2.4 Interface to safety system

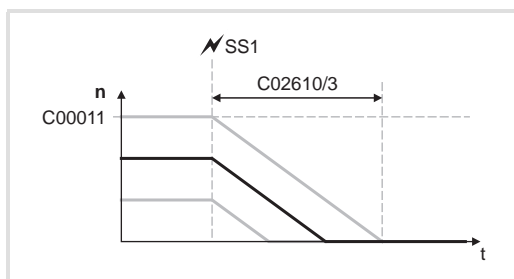
For operation with optional safety system, the [LS_MotionControlKernel](#) system block has the *wSMCtrl* input. This interface is used to transfer a control word by means of which the **Motion Control Kernel** can be supplied with information on requested or active safety functions. The **Motion Control Kernel** then initiates the necessary motion sequence (e.g. braking).

At the moment, only bit 0 in the *wSMCtrl* control word has a function. Additional functions are in preparation:

Bit	Designation	Description
0	SafeStop1	"1" ≙ Request for "Safe Stop 1" (SS1).
1	Reserved	In preparation - Still without function!
...		
15		

Behaviour in case of request for "Safe Stop 1" (SS1)

The drive is brought to a standstill with the stopping ramp set in [C02610/3](#).



- ▶ The time set in [C02610/3](#) refers to the down-ramping of the reference speed set in [C00011](#).
- ▶ If the current speed is lower, the time to standstill is accordingly lower as well.

[9-3] Ramping down to standstill

If the request is reset during the down-ramping process (bit 0 = "1↘0"), the behaviour depends on the active operating mode:

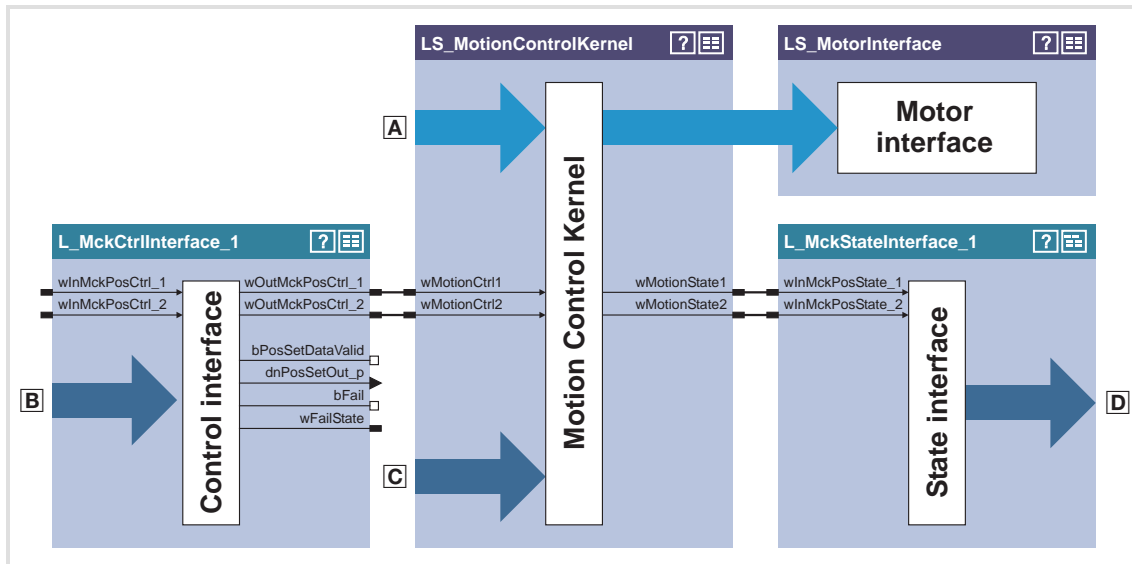
- ▶ In the "[Speed follower](#)" operating mode, direct synchronisation with the target speed takes place with the ramp time set in [C02610/2](#).
- ▶ In the "[Homing](#)" operating mode, the ramp-down is continued with the deceleration for stop set in [C01251](#) if the bit 8 ("HomStartStop") in the MCK control word = "0". If bit 8 is set, the homing process starts immediately in the selected homing mode.
- ▶ In the "[Manual jog](#)" operating mode, the behaviour depends on whether the manual jog initiator (*bManJogPos* or *bManJogNeg*) is still set:

Bit 0 (SafeStop1)	bManJogPos bManJogNeg	Behaviour
1	TRUE	Ramping down to standstill
0	TRUE	Accelerating to manual speed
0	FALSE	Ramping down to standstill

- ▶ In the "[Positioning](#)" operating mode, the behaviour depends on the setting in [C01216](#).
- ▶ In the "[Position follower](#)" operating mode, (forward) positioning to the signalled absolute position always takes place if this position differs from the internal position.

9.3 MCKInterface

The so-called "MCK interface" described in this chapter consists of the two function blocks [L_MckCtrlInterface](#) and [L_MckStateInterface](#), which are connected upstream respectively downstream of the [LS_MotionControlKernel](#) system block:



[9-4] Detail of the interconnection architecture for the "table positioning" technology application

- A** Control and setpoint signals for motor control
- B** Additional process inputs for controlling the **Motion Control Kernel**, e.g.:
 - Selection of the operating mode
 - Selection of the profile number
 - Override of the positioning mode
 - Control inputs for manual jogging, homing, positioning
 - Control inputs for speed/acceleration/S-ramp override
- C** Control and setpoint signals for the **Motion Control Kernel** such as
 - Selection of speed setpoint for speed follower
 - Selection of positioning setpoint for position follower
 - Selection of override values
 - Connection for limit switch & pre-stop mark for homing
 - Holding brake control
- D** Output of status signals of the **Motion Control Kernel**

Control of the Motion Control Kernel

Control of the basic drive functions implemented in the Motion Control Kernel is carried out by means of

- ▶ direct specification of the control words, for example via a master control unit also connected to the fieldbus.
 - For this purpose, the control word inputs can be directly connected to the field bus interface **LP_McIn** respectively **LP_CanIn**.
 - See the "[MCK control word](#)" chapter for a detailed description of the individual control bits.
- ▶ the specification of individual process signals at the [L_MckCtrlInterface](#) FB which are then ORed with the control word.

Plausibility check

The process signals applied to the [L_MckCtrlInterface](#) FB are logically linked by means of an OR logic operation to the specified control word via the two control word inputs *wInMckPosCtrl_1* and *wInMckPosCtrl_2* and, after a plausibility check, are output via the two control word outputs *wOutMckPosCtrl_1* and *wOutMckPosCtrl_2*.

- ▶ The profile number, the operating mode, and the positioning mode are checked for plausibility.
- ▶ If implausibility is detected, only control bit information is output and the *bFail* output is set to TRUE.
- ▶ The result of the plausibility check is provided as the *wFailState* output word and displayed in [C01299](#).

The control words that are output, namely *wOutMckPosCtrl_1* and *wOutMckPosCtrl_2*, constitute the input information for the [LS_MotionControlKernel](#) system block.

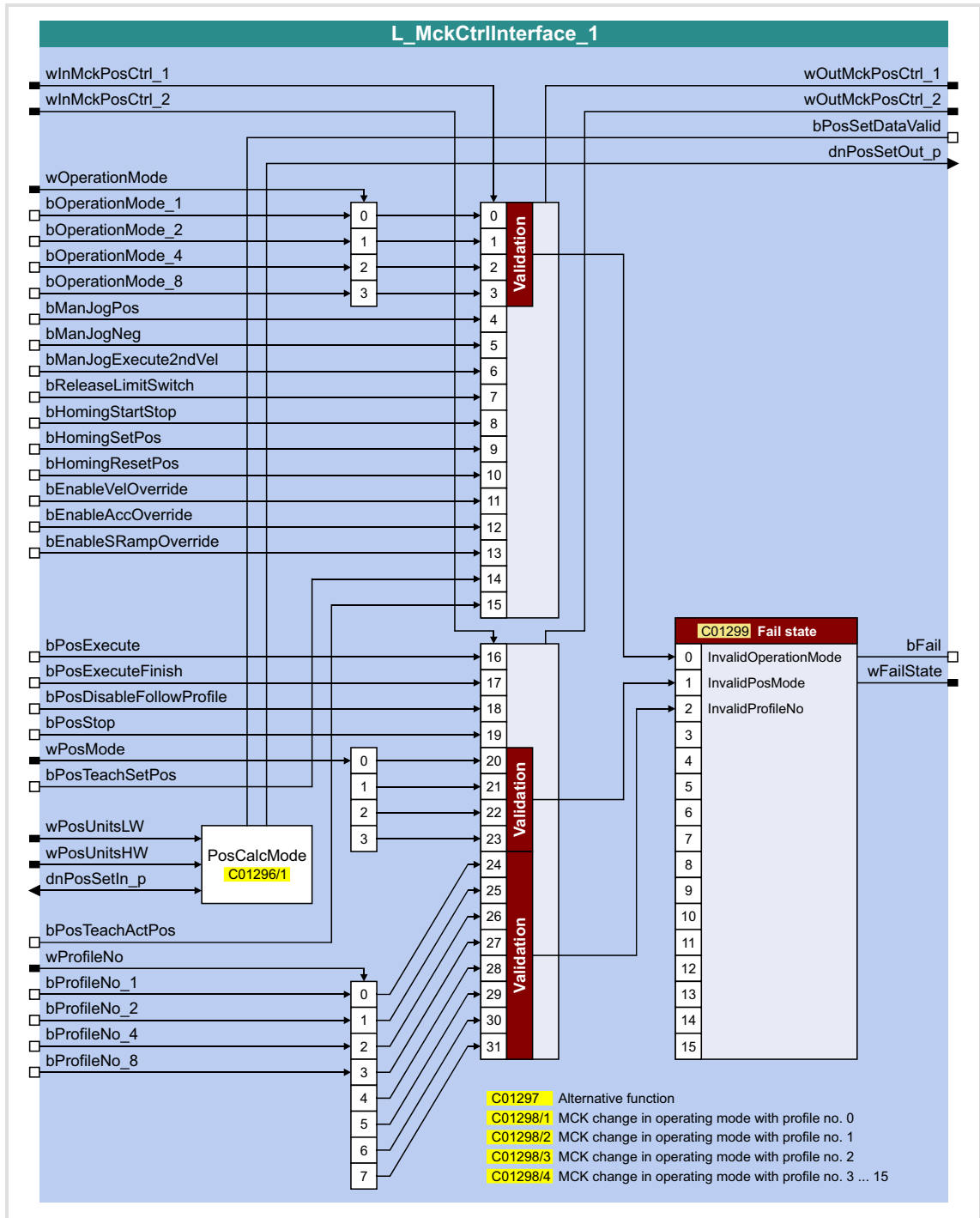
Status information of the Motion Control Kernel

Output by the [LS_MotionControlKernel](#), the status words *wMotionState1* and *wMotionState2* also constitute input information for the downstream [L_MckStateInterface](#) FB, which provides this information to the application in the form of process signals.

9.3.1 Control inputs | "L_MckCtrlInterface" function block


This FB provides process inputs for controlling different basic functions of the **Motion Control Kernel**.

In addition to the ORing of discrete input signals with the control word inputs, the FB has further functions that are described in the following subchapters.



Inputs

Identifier	Data type	Information/possible settings														
wInMckPosCtrl_1 wInMckPosCtrl_2	WORD	<p><u>Direct</u> specification of the MCK control word 1 & 2</p> <ul style="list-style-type: none"> For example, via a master control unit that is also connected to the fieldbus. For this purpose, the control word inputs can be directly connected to the LP_McIn respectively LP_CanIn1 fieldbus interface. The two control words together form a 32-bit double control word with which the entire Motion Control Kernel is controlled. All motion profiles in the different operating modes can be operated via this interface. See the "MCK control word" chapter for a detailed description of the individual control bits. 														
wOperationMode	WORD	<p>Selection of the operating mode of the Motion Control Kernel</p> <ul style="list-style-type: none"> Only bit 0 ... bit 3 of <i>wOperationMode</i> are evaluated. If an invalid operating mode is selected, the response set in C00595/11 occurs (Lenze setting: "Warning"). The current operating mode is displayed in C01243. <table border="1"> <tr><td>0</td><td>Speed follower</td></tr> <tr><td>1</td><td>Homing</td></tr> <tr><td>2</td><td>Manual jog</td></tr> <tr><td>3</td><td>Positioning</td></tr> <tr><td>4</td><td>Stop</td></tr> <tr><td>5</td><td>Position follower</td></tr> <tr><td>6 ... 15</td><td>Reserved for future extensions</td></tr> </table>	0	Speed follower	1	Homing	2	Manual jog	3	Positioning	4	Stop	5	Position follower	6 ... 15	Reserved for future extensions
0	Speed follower															
1	Homing															
2	Manual jog															
3	Positioning															
4	Stop															
5	Position follower															
6 ... 15	Reserved for future extensions															
bOperationMode_1 ... bOperationMode_8	BOOL	<p>Binary-coded selection of the operating mode of the Motion Control Kernel</p> <ul style="list-style-type: none"> See the "MCK control word" chapter for a detailed description of the individual control bits. If an invalid operating mode is selected, the response set in C00595/11 is activated (Lenze setting: "Warning"). The current operating mode is displayed in C01243. 														
bManJogPos bManJogNeg	BOOL	<p>Manual jog:</p> <p><i>bManJogPos</i> = TRUE: Manual jog right <i>bManJogNeg</i> = TRUE: Manual jog left Both inputs = TRUE: No change compared to previous state Both inputs = FALSE: Stop manual jog</p>														
bManJogExecute2ndVel	BOOL	<p>Manual jog: Changeover to speed 2</p> <table border="1"> <tr><td>FALSE</td><td>Speed 1 (C01231/1) active</td></tr> <tr><td>TRUE</td><td>Speed 2 (C01231/2) active</td></tr> </table>	FALSE	Speed 1 (C01231/1) active	TRUE	Speed 2 (C01231/2) active										
FALSE	Speed 1 (C01231/1) active															
TRUE	Speed 2 (C01231/2) active															
bReleaseLimitSwitch	BOOL	<p>Manual jog: Retract operated limit switch</p> <table border="1"> <tr><td>TRUE</td><td>Retract operated limit switch (in opposite direction)</td></tr> </table>	TRUE	Retract operated limit switch (in opposite direction)												
TRUE	Retract operated limit switch (in opposite direction)															

Identifier	Data type	Information/possible settings
bHomingStartStop	BOOL	Homing: Start/stop homing <ul style="list-style-type: none"> Only possible in the "referencing" operating mode.
		TRUE <p>If one of referencing modes "0" ... "15" in C01221 is selected:</p> <p>Start reference search</p> <ul style="list-style-type: none"> The current status of the reference search is indicated via the status outputs <i>bHomingDone</i> and <i>bHomePosAvailable</i>. If the 100_Set_Ref_directly" referencing mode has been selected in C01221, the home position can be set manually via the <i>bHomeStartStop</i> input with the drive at a standstill. The current actual position is set as the home position (C01227/2) <p>If referencing mode "100: SetRef" is selected:</p> <p>Setting the home position manually</p> <ul style="list-style-type: none"> The home position is set manually with the drive at a standstill. The current actual position now corresponds to the reference position set in C01227/2 in the machine measuring system.
		TRUE⇒FALSE <ul style="list-style-type: none"> Stop homing. If the <i>bHomingStartStop</i> input is reset to FALSE during active referencing, homing is cancelled and the drive is brought to a standstill.
bHomingSetPos	BOOL	Homing: Set home position ("on the fly" homing) <ul style="list-style-type: none"> With referencing "on the fly", the home position of a machine can be set during ongoing movement. Jerking and compensating movements do not occur.
		FALSE⇌TRUE <p>The position at the <i>dnMotorRefOffset_p</i> input of the LS MotionControlKernel SB at the instant of activation is the set home position.</p>
bHomingResetPos	BOOL	Homing: Delete home position <p>Note: With this function, positions are not deleted but only the status signals <i>bHomePosAvailable</i> and <i>bHomePosDone</i> are reset. Setpoints and actual positions remain untouched until a renewed reference setting or homing.</p>
		FALSE⇌TRUE <ul style="list-style-type: none"> The internal status "reference known" is reset. The controller is no longer referenced. The process outputs <i>bHomePosAvailable</i> and <i>bHomingDone</i> are reset to FALSE.
bEnableVelOverride	BOOL	Speed override
		TRUE <p>Activate speed override</p>
bEnableAccOverride	BOOL	Acceleration override
		TRUE <p>Activate acceleration override</p>
bEnableSRampOverride	BOOL	S-ramp smoothing override
		 Note! <p>If the <i>nSRampOverride_a</i> input on the LS MotionControlKernel remains unconnected or if "0 %" is specified as the override value, activation of the S-ramp override results in deactivation of the S-ramp time.</p> <ul style="list-style-type: none"> Deactivation of the S-ramp time before the start of a profile with S-ramp time causes linear ramp generation. Deactivation of the S-ramp time during a traversing process, however, is not accepted immediately in the profile generator, but the profile generator checks automatically when an online change of the ramp form can be carried out and then initiates it automatically.
bPosExecute	BOOL	Positioning: Start travelling
		FALSE⇌TRUE <p>Execute selected profile</p>
bPosExecuteFinish	BOOL	Positioning: Complete cancelled profile
		FALSE⇌TRUE <p>A positioning process previously cancelled, e.g. by <i>bPosStop</i> or due to a device error, is resumed by travelling to the original target.</p>

Identifier	Data type	Information/possible settings																						
bPosDisableFollowProfile	BOOL	<p>Positioning: Do not execute sequence profile (switch-off profile linkage)</p> <p>TRUE Evaluation of the sequence profile number parameterised in C01307/1...15 for the selected profile is suppressed.</p>																						
bPosStop	BOOL	<p>Positioning: Cancel travelling</p> <p>TRUE Stop positioning From version 02.00.00, more travel requests will be inhibited ("PosExecute" will be blocked).</p>																						
wPosMode	WORD	<p>Override of the positioning mode set in the profile data</p> <ul style="list-style-type: none"> Via this input, an override of the positioning mode parameterised in C01300/1...15 for the selected profile is possible. The value set in C01300/1...15 is not overwritten in this case. Only bit 0 ... bit 3 of <i>wPosMode</i> are evaluated. If <i>wPosMode</i> = 0 is selected, the positioning mode set in C01300/1...15 is used. <table border="1"> <tr><td>0</td><td>Positioning mode = setting in C01300/1...15</td></tr> <tr><td>1</td><td>Absolute (shortest path)</td></tr> <tr><td>2</td><td>Continuous</td></tr> <tr><td>3</td><td>Relative</td></tr> <tr><td>4</td><td>absolute (Cw)</td></tr> <tr><td>5</td><td>absolute (Ccw)</td></tr> <tr><td>8</td><td>Absolute (shortest path) to TP</td></tr> <tr><td>9</td><td>Continuous to TP</td></tr> <tr><td>10</td><td>Relative to TP</td></tr> <tr><td>11</td><td>Absolute (Cw) on TP</td></tr> <tr><td>12</td><td>Absolute (Ccw) on TP</td></tr> </table> <p>All other possible settings are reserved for future extensions!</p>	0	Positioning mode = setting in C01300/1...15	1	Absolute (shortest path)	2	Continuous	3	Relative	4	absolute (Cw)	5	absolute (Ccw)	8	Absolute (shortest path) to TP	9	Continuous to TP	10	Relative to TP	11	Absolute (Cw) on TP	12	Absolute (Ccw) on TP
0	Positioning mode = setting in C01300/1...15																							
1	Absolute (shortest path)																							
2	Continuous																							
3	Relative																							
4	absolute (Cw)																							
5	absolute (Ccw)																							
8	Absolute (shortest path) to TP																							
9	Continuous to TP																							
10	Relative to TP																							
11	Absolute (Cw) on TP																							
12	Absolute (Ccw) on TP																							
bPosTeachSetPos	BOOL	<p>Position teaching: MCK setpoint position</p> <p>FALSE↗TRUE Teach MCK setpoint position into the selected profile.</p>																						
wPosUnitsLW wPosUnitsHW	WORD	<p>Selection of the target position in [units]</p> <ul style="list-style-type: none"> <i>wPosUnitsLW</i> = LOW word, <i>wPosUnitsHW</i> = HIGH word The mode for calculating the position is selected in C01296/1. 																						
dnPosSetIn_p	DINT	<p>Selection of the target position in [increments]</p> <ul style="list-style-type: none"> The mode for calculating the position is selected in C01296/1. 																						
bPosTeachActPos	BOOL	<p>Position teaching: Current position</p> <p>FALSE↗TRUE Teach current position into the selected profile.</p>																						
wProfileNo	WORD	<p>Stipulation of the profile to be executed</p> <ul style="list-style-type: none"> Optionally as a data word or binary coded. When the profile is stipulated, this FB carries out a mode change in the Lenze setting at the same time: <ul style="list-style-type: none"> -If profile 0 is stipulated: Activation of "Speed follower" operating mode -If profile 1 is stipulated: Activation of "Homing" operating mode -If profile 2 is stipulated: Activation of "Manual jog" operating mode -If profile 3 ... 15 is stipulated: Activation of "Positioning" operating mode 																						
bProfileNo_1 ... bProfileNo_8	BOOL																							

Outputs

Identifier	Data type	Value/meaning
wOutMckPosCtrl_1 wOutMckPosCtrl_2	WORD	Output of the MCK control word 1 & 2 <ul style="list-style-type: none"> For transfer to the LS MotionControlKernel system block. For a detailed description of the individual control bits, see chapter "MCK control word". (□ 481)
bPosSetDataValid	BOOL	Status signal "Position conversion completed, data consistent" <ul style="list-style-type: none"> This output is permanently TRUE if the "0: dnPosOut_p=dnPosIn_p" mode has been set for calculating the position in C01296/1 since this is just a copy process and not a complex conversion.
		TRUE Conversion of the target position from [units] into [increments] has been completed. <ul style="list-style-type: none"> The travel profile data are valid and the profile is ready to start.
dnPosSetOut_p	DINT	Output of the target position in [increments] <ul style="list-style-type: none"> Observe the <i>bPosSetDataValid</i> status output!
wFailState	WORD	Result of the plausibility check <ul style="list-style-type: none"> Display parameter: C01299 Result is bit coded:
		Bit 0 Invalid operating mode selection <ul style="list-style-type: none"> "1" ≡ The selected operating mode is not defined/invalid.
		Bit 1 Invalid positioning mode selection <ul style="list-style-type: none"> "1" ≡ The selected positioning mode is not defined/invalid.
		Bit 2 Invalid profile number selection <ul style="list-style-type: none"> "1" ≡ The selected profile number refers to a profile data set that does not exist.
		Bit 3 Reserved
		...
Bit 15		
bFail	BOOL	FALSE Okay, no error
		TRUE <ul style="list-style-type: none"> Plausibility check error or control information error (in this case after ORing the individual signals with the control words)

9.3.1.1 Alternative functions for control bit "PosExecute"

In [C01297](#), alternative functions for bit 16 (PosExecute) in the MCK control word can be selected with bit-coding.

PosStop with PosExecute = FALSE

If bit 0 has been set in [C01297](#), positioning can only be started/cancelled with the "PosExecute" control bit.

- If the "Positioning" operating mode has been set on the MCK, the "Pos-Execute" control bit has the following effects when being activated:

Signals at the input	Signals in the control word to the MCK
bPosExecute = TRUE	bPosExecute = TRUE bPosStop = FALSE bHomingStartStop remains unchanged
bPosExecute = FALSE	bPosExecute = FALSE bPosStop = TRUE bHomingStartStop remains unchanged

HomingStartStop with PosExecute

If bit 1 has been set in [C01297](#), homing can only be started/stopped with the "PosExecute" control bit.

- If the "Homing" operating mode has been set on the MCK, the "PosExecute" control bit has the following effect when activated:

Signals at the input	Signals in the control word to the MCK
bPosExecute = TRUE	bPosExecute = TRUE bPosStop = FALSE bHomingStartStop = TRUE
bPosExecute = FALSE	bPosExecute = FALSE bPosStop remains unchanged bHomingStartStop = FALSE

SetProfilPosition with PosExecute

If bit 2 has been set in [C01297](#) and control bit ("PosExecute") is being set, the setpoint position being applied is incorporated in the currently selected profile and then the profile is started immediately.

- If the "Positioning" operating mode has been set on the MCK, the "PosExecute" control bit has the following effect when activated:

Signals at the input	Signals in the control word to the MCK
bPosExecute = TRUE	bPosExecute = TRUE bPosStop = FALSE bHomingStartStop remains unchanged bPosTeachSetPos = TRUE (edge)
bPosExecute = FALSE	bPosExecute = FALSE bPosStop remains unchanged bHomingStartStop remains unchanged bPosTeachSetPos = FALSE

SetProfilPosition at position change

If bit 3 is set in [C01297](#), the setpoint positions at the MCKInterface are automatically accepted into the profile with the applied profile number if a change of data is detected at the corresponding input for the setpoint position.

- ▶ If the "0: dnPosOut_p=dnPosIn_p" mode has been set in [C01296/1](#) for converting the position, automatic acceptance is executed if the incremental position selection at the *dnPosIn_p* input was changed.
- ▶ If another mode (>0) has been set in [C01296/1](#), automatic acceptance is executed if the incremental position selection at the *wPosUnitsLW* and *wPosUnitsHW* inputs was changed.
- ▶ From version 02.00.00 a hysteresis can be set in [C01245/3](#) for the position change.

PosExecute at position change

(from version 02.00.00)

If bit 4 is set in [C01297](#), an automatic "PosExecute" takes place if the incremental position selection changes and this change is higher than set in the hysteresis for position change ([C01245/3](#)).

If the selection is made in units, so that in a first step it has to be converted into increments, and if this automatic function is then activated, the "PosExecute" will only be created automatically when the internal conversion is completed (*bPosSetDataValid*).



Tip!

This option serves to start travel requests very easily by simply defining the new target position.

9.3.1.2 Operating mode change with profile number

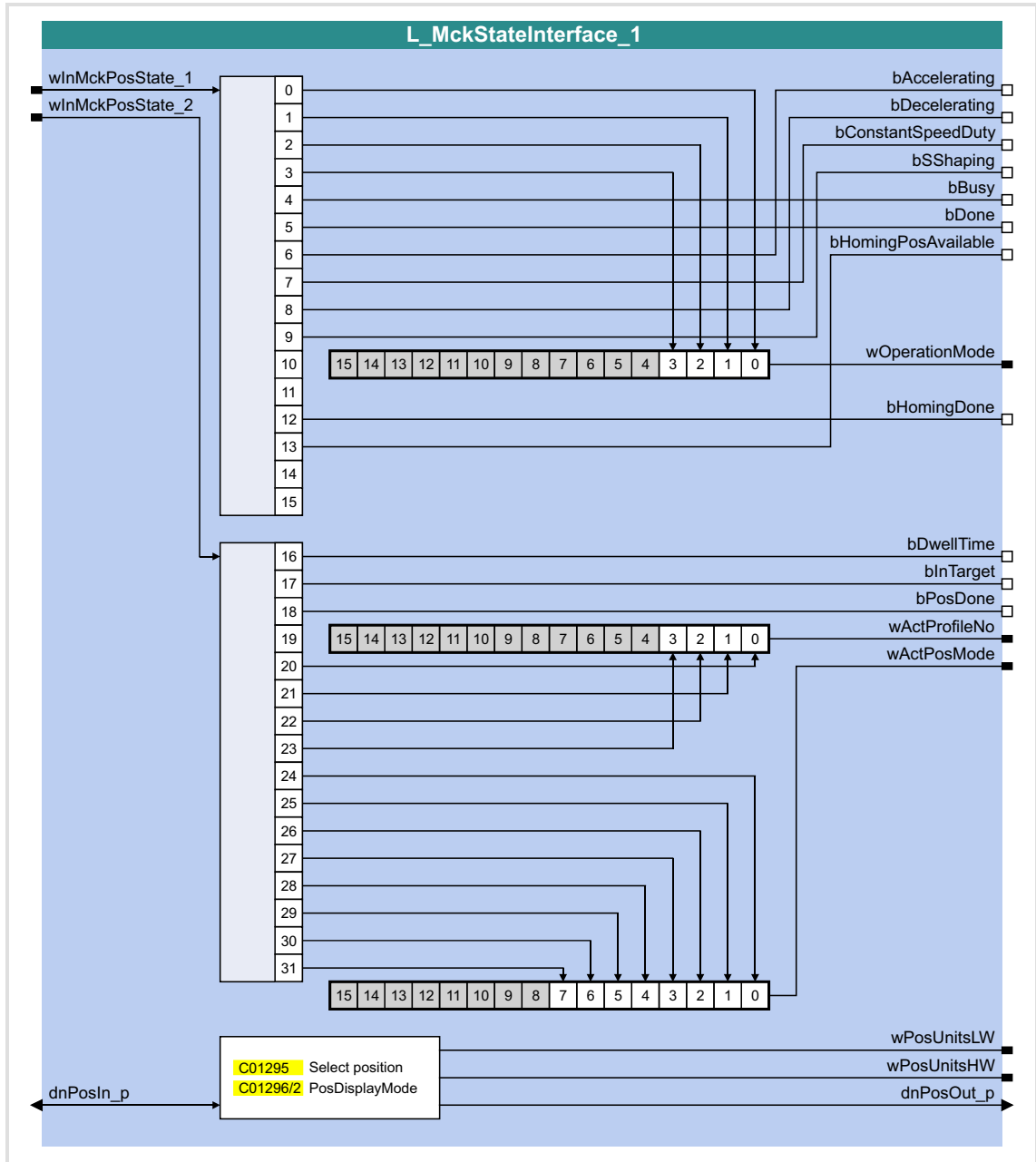
One of the operating modes of the **LS_MotionControlKernel** system block can be assigned to the positioning profiles via the four subcodes of [C01298](#):

Parameter	Info	Lenze setting
C01298/1	Operating mode if profile 0 is selected	Speed follower
C01298/2	Operating mode if profile 1 is selected	Homing
C01298/3	Operating mode if profile 2 is selected	Manual jog
C01298/4	Operating mode if profile 3 ... 15 is selected	Positioning

- ▶ When a changeover to the corresponding profile is carried out, the set operating module is requested at the same time.
- ▶ In the case of the setting "0: No change", the operating mode is not changed when the profile changeover occurs. Instead, the operating mode requested "from outside" via the [MCK control word](#) is applicable.

9.3.2 Status outputs | FB "L_MckStateInterface"

This FB provides the application with different status information of the **Motion Control Kernel** via process outputs.



Inputs

Identifier	Data type	Information/possible settings
wInMckPosState_1 wInMckPosState_2	WORD	Inputs for accepting the status words from the LS_MotionControlKernel system block.
dnPosIn_p	DINT	Position in [increments] <ul style="list-style-type: none"> Is converted into [units] if C01295 = "0: dnPosIn_p" and output at the <i>wPosUnitsLW</i> and <i>wPosUnitsHW</i> outputs. The mode for calculating the position is selected in C01296/2.

Outputs

Identifier	Data type	Value/meaning
bAccelerating	BOOL	TRUE Acceleration phase active.
bDecelerating	BOOL	TRUE Braking phase active.
bConstantSpeedDuty	BOOL	TRUE Constant phase active.
bSShaping	BOOL	In preparation - output without function at the moment!
bBusy	BOOL	TRUE Profile rounding active.
bDone	BOOL	TRUE Setpoint generation active.
bHomingPosAvailable	BOOL	TRUE Target position (setpoint) has been approached.
bHomingDone	BOOL	TRUE Home position is known.
wOperationMode	WORD	Active setpoint-generating state of the Motion Control Kernel . <ul style="list-style-type: none"> Bit B0 ... B3 contain the information of the MCK status word. Bits B4 ... B15 are fixed at "0".
bHomingDone	BOOL	TRUE Homing has been executed.
bDwellTime	BOOL	TRUE Settling in target position is active
bInTarget	BOOL	TRUE Target position (actual value) is in the target window.
bPosDone	BOOL	TRUE Target position from the profile has been approached.
wActProfileNo	WORD	Current traversing profile number <ul style="list-style-type: none"> Bit B0 ... B7 contain the information of the MCK status word. Bits B8 ... B15 are fixed at "0".
wActPosMode	WORD	Current positioning mode <ul style="list-style-type: none"> Bit B0 ... B3 contain the information of the MCK status word. Bits B4 ... B15 are fixed at "0".
wPosUnitsLW wPosUnitsHW	WORD	Output of the position selected in C01295 in [units] <ul style="list-style-type: none"> <i>wPosUnitsLW</i> = LOW word, <i>wPosUnitsHW</i> = HIGH word The mode for calculating the position is selected in C01296/2.
dnPosOut_p	DINT	Output of the position selected in C01295 in [increments] <ul style="list-style-type: none"> The mode for calculating the position is selected in C01296/2.

9.4 Basic settings

9.4.1 Machine parameters

The motor end, among other things, is described by the machine parameters indicated below in respect of the mechanics used.



Note!

Setting the machine parameters is a basic prerequisite for the operating modes "[Homing](#)", "[Manual jog](#)" and "[Positioning](#)".

The more precisely the machine parameters are set, the better the results of positioning!

For [TA "Table positioning"](#), you can set the machine parameters in the »Engineer« on the tab headed **Application Parameters** on the dialog level *Overview* → *Machine parameters*:

The screenshot shows the 'Application Parameters' dialog box with the 'Machine parameter' tab selected. The interface includes a 'Mechanics selection' section with radio buttons for 'Conveyor drive', 'Spindle drive', and 'Rotary table'. A schematic diagram illustrates a motor (M) connected to a gear system with gears Z1 and Z2, a plant (n Plant), and a position encoder (n Encoder). The diagram labels include 'Speed encoder', 'Feed constant = π * d [unit]/Revolution', and 'Position encoder'. Below the diagram, there are several parameter fields:

- Mounting direction: Motor: [C] Not inverted
- Counter (motor speed Z2xZ4): [C] 1
- Denominator (system speed Z1xZ3): [C] 1
- Mounting direction: Position encod.: [C] Not inverted
- Counter (motor speed): [C] 1
- Denominator (encoder speed): [C] 1
- Axis Clocklength: [C] 0,0000 units
- Axis data: feed constant: [C] 360,0000 units/rev.
- Max. traversing speed 100%_C11: [C] 0,0000 units/s
- Axis data: position resolution: [C] 0,0000 incr/unit
- Positioning accuracy: [C] 0,0000 units
- Reference speed: [C] 1500 rpm
- Maximum torque: [C] 0,00 Nm
- Max. traversing distance: [C] 0 units



Tip!

You are provided with more detailed information on the machine parameters "[Gearbox ratio](#)" and "[Feed constant](#)" in the following subchapters.

Short overview of machine parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C01206/1	Mounting direction: Motor	0: Not inverted	
C01202/1	iM: Nominator of gearbox factor Z2	1	
C01202/2	iM: Denominator of gearbox factor Z1	1	
C01206/2	Mounting direction: Position encoder	0: Not inverted	
C01203/1	iG: Nominator (motor speed)	1	
C01203/2	iG: Denominator (encoder speed)	1	
C01201/1	Axis data: Axis cycle ▶ Activation of the modulo measuring system	0.0000	units
C01204	Axis data: Feed constant	360.0000	units/rev.
C00011	Appl.: Reference speed	1500	rpm

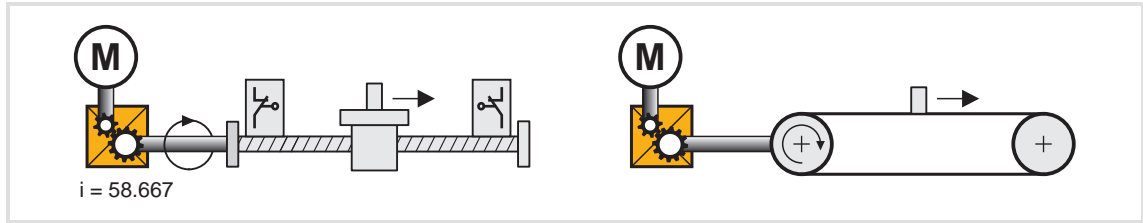
After the machine parameters have been entered, the drive controller sends back application-relevant data via the following display parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C01211/1	Max. traversing speed 100%_C11 • Is used for orientation when the velocity is being set in the profile sets.	-	units/s
C01205	Axis data: Position resolution • Is needed for the incremental specification of positions.	-	incr/unit
C01210/5	MCK: Positioning accuracy • Theoretical accuracy during positioning with account being taken of the machine data and encoder data.	-	units
C00057	Maximum torque	-	Nm
C01213/1	MCK: Max. traversing distance	-	units

Highlighted in grey = display parameter

9.4.1.1 Gearbox ratio

The gearbox ratio indicates the number of rotations of the motor axis it takes for exactly one rotation of the load axis (e.g. spindle or drive roll) to take place.

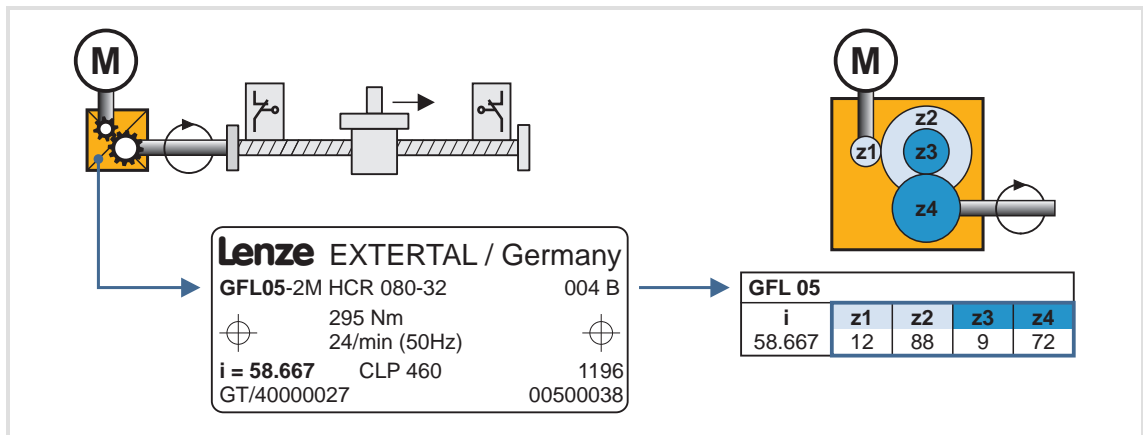


[9-5] Schematic diagram of gearbox ratio

- ▶ In the example shown in the illustration [9-5], the spindle rotates exactly once for every 58,667 rotations of the motor axis.

Specification of the gearbox ratio

- ▶ The gearbox ratio is to be specified in the form of a quotient (numerator/denominator). You can find the necessary data in the technical data for the gearbox:



[9-6] Example: Technical data relating to the gearbox (from gearbox catalogue)



Tip!

In order to specify the gearbox ratio exactly, use the number of teeth indicated on the data sheet or in the catalogue, if possible, instead of the information on the nameplate (see following calculation).

Calculation as an example based on the technical data relating to the gearbox:

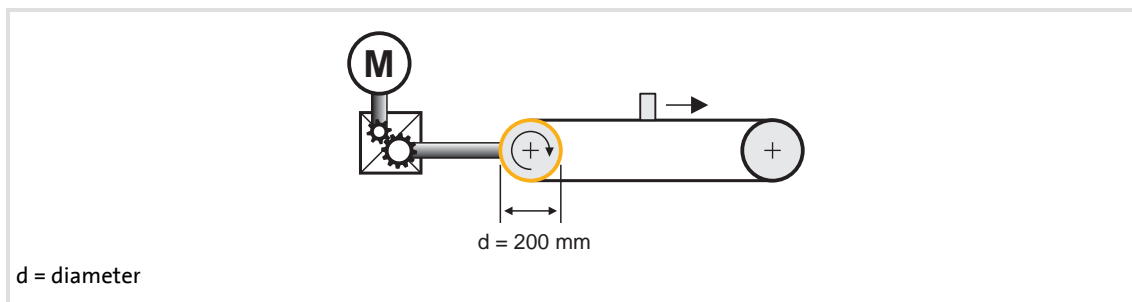
$$\begin{aligned} \text{Gearbox factor numerator (C01202/1)} &= z2 \times z4 = 88 \times 72 = 6336 \\ \text{Gearbox factor denominator (C01202/2)} &= z1 \times z3 = 12 \times 9 = 108 \end{aligned}$$

[9-7] Calculation example (for 2-stage gearbox)

9.4.1.2 Feed constant

The feed constant corresponds to the machine movement for one revolution of the gearbox output shaft.

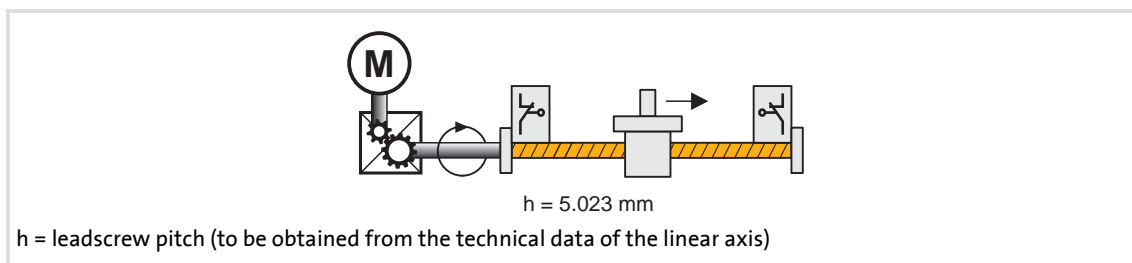
- ▶ The entry in the **Feed constant** ([C01204](#)) field is made in the user unit [units] in respect of the revolution.
- ▶ In the case of a conveyor drive, the feed constant is obtained from the drive roll's circumference, which, in the following example, is calculated on the basis of the indicated diameter:



$$\text{Feed constant} = \pi \cdot d \frac{[\text{unit}]}{\text{Revolution}} = \pi \cdot 200 \frac{\text{mm}}{\text{Revolution}} = 628.3185 \frac{\text{mm}}{\text{Revolution}}$$

[9-8] Schematic diagram: Feed constant for a conveyor driver

- ▶ In the case of a spindle drive (linear axis), the feed constant is derived from the leadscrew pitch. The feed constant indicates the distance the slide travels during one revolution of the spindle (in the following example: 5.023 mm).

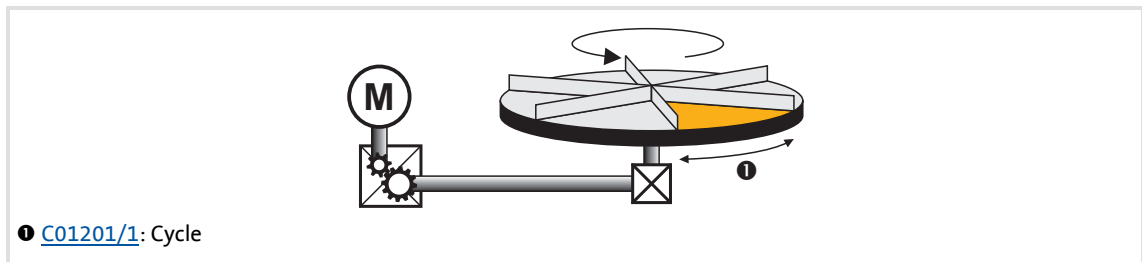


[9-9] Schematic diagram: Feed constant for a spindle drive

- ▶ In the case of a rotary table and its specification as an angle, the feed constant is = 360°/revolution.

9.4.1.3 Activation of the modulo measuring system

The Modulo measuring system is also called "rotary table application".



[9-10] Example: Rotary table application

- ▶ The measuring system is repeated.
- ▶ If the set cycle is exceeded, a defined overflow occurs.
 - In a rotative system, the cycle usually corresponds to one revolution or tool distance.
- ▶ The home position must be known for positioning.
 - Exception: Positioning mode relative (TP) and continuous (TP)
- ▶ Software limit positions are not effective.
- ▶ Absolute targets can be approached by exceeding the measuring system limit, e.g. from 10° via 0° to 350°.

Activating the Modulo measuring system

The Modulo system is activated by setting a cycle ([C01201/1](#)) > 0 units.

- ▶ The cycle can be set if the controller is enabled.
- ▶ When the cycle ([C01201/1](#)) is set to 0 units (Lenze setting), the traversing range is unlimited (classical measuring system).

Generation of the Modulo measuring system

When the Modulo measuring system is active, it is displayed internally via an integrator. The Modulo position is provided at the *dnPosSet_p* process output of the SB [LS_MotionControlKernel](#) and displayed in [C01210/7](#). When the Modulo measuring system is not active, the continuous (*dnPosSetValue_p*) setpoint position is output instead.

Blocking zone for "absolute (Cw)" and "absolute (Ccw)" positioning modes

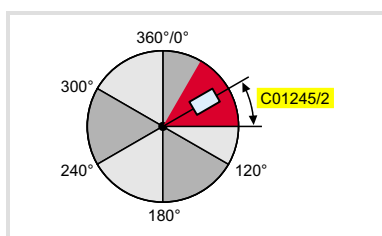
Set a blocking zone in [C01245/2](#) for the "absolute (Cw)" and "absolute (Ccw)" positioning modes in which no target positions are approached. This blocking zone around the current setpoint position serves to consider drift motions of the shaft in case of controller inhibit/enable cycles in order to prevent e.g. an unwanted motion by one cycle.



Stop!

Target positions in the set blocking zone are always approached with the shortest possible distance in the "absolute (Cw)" and "absolute (Ccw)" positioning modes!

If the blocking zone is too large, the drive may travel to the opposite direction!



- ▶ Target positions outside the blocking zone are approached with the selected positioning mode.
- ▶ The blocking zone is limited internally to half the cycle.

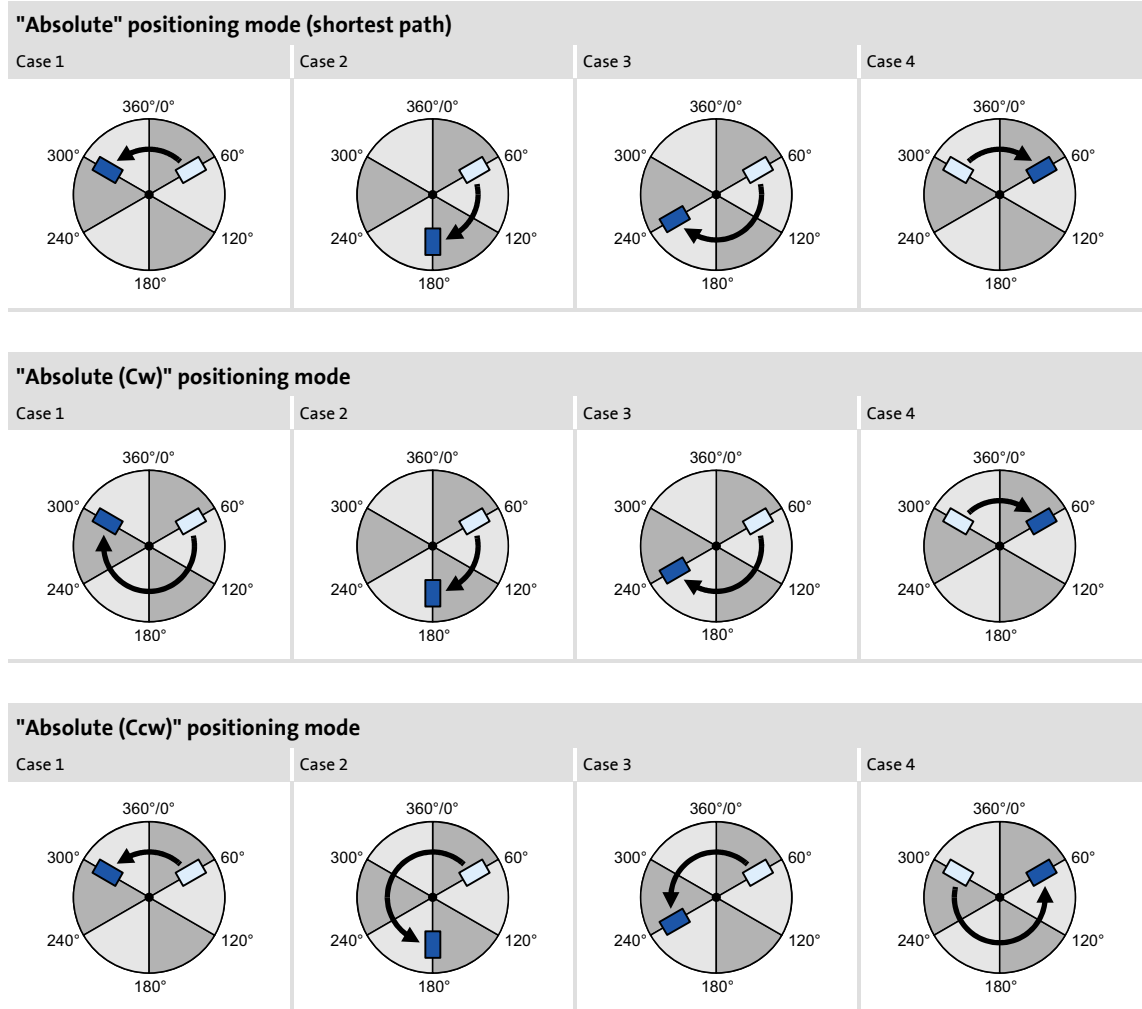
[9-11] Definition of the blocking zone

Display of the target position in the "Positioning" mode

Positioning mode	Target position displayed in C01210/6 in [units]
Absolute (shortest path)	Defined position
absolute (Cw)	Defined position
absolute (Ccw)	Defined position
Continuous	214748.3647
Relative	Modulo position + defined position

Case studies for Modulo positioning

In the following, some case studies are shown in the various positioning modes. The target positions are defined by the user.



9.4.2 Min/Max speed

For the "[Speed follower](#)" operating mode, you can initially limit the speed setpoint by means of the following parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C02610/2	MCK: Ramp time synchr. setpoint	2.000	s
C02611/1	MCK: Pos. max. speed	199.99	%
C02611/2	MCK: Pos. min. speed	0.00	%
C02611/3	MCK: Neg. min. speed	0.00	%
C02611/4	MCK: Neg. max. speed	199.99	%

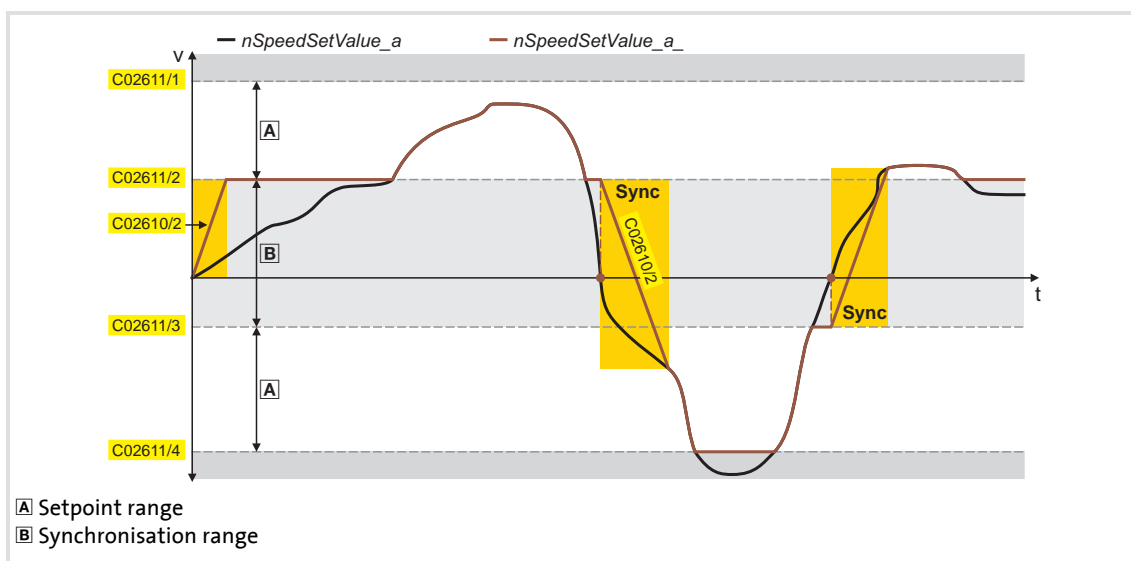
In the »Engineer«, you can set the initial limit by means of the dialog box *Min/Max speed*.

- Open the *Min/max speed* dialog box by opening the **Application Parameters** tab and clicking on the following button on the dialog level *Overview* → *Signal flow*:



Speed setpoint generation

When the speed limit values are set, the **Motion Control Kernel** influences the setpoint generation with a synchronisation mode. The synchronisation mode serves to travel the synchronisation range dynamically with the synchronisation ramp set in [C02610/2](#). Synchronisation always starts in the zero crossing of the defined speed.



[9-12] Example: Speed setpoint generation in the "Speed follower" operating mode (with nSpeedAddValue_v = 0)

9.4.3 Limit position monitoring

9.4.3.1 Software limit positions

The parameterisable limit positions are used by the software to limit the traversing range.

- ▶ The positive software limit position is set in [C01229/1](#) and the negative software limit position is set in [C01229/2](#).



Stop!

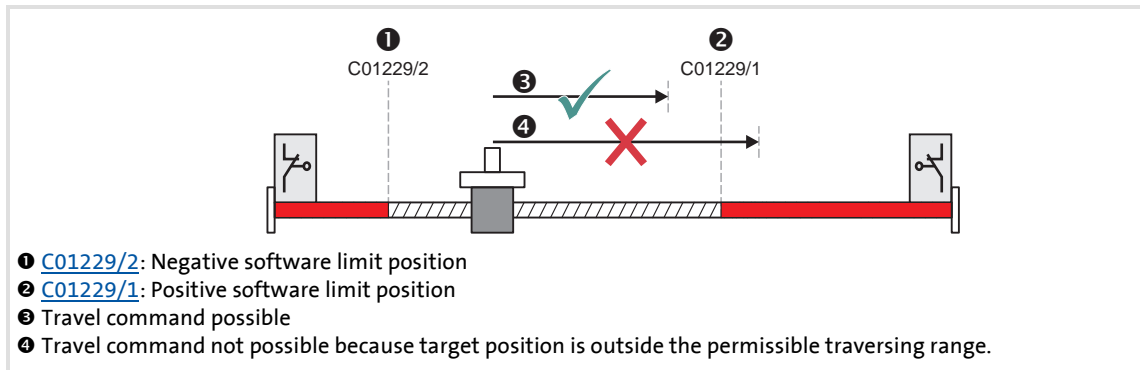
The software limit positions are only evaluated and monitoring if the drive knows the home position and the software limit positions for the respective operating mode have been activated.

- For the "manual jogging" operating mode, travel range monitoring is switched off by means of parameterisable software limit positions in the Lenze setting of [C01230](#).
- In the "[Homing](#)" and "[Positioning](#)" operating modes, the travel range monitoring is generally switched-on.

Parameter	Info	Lenze setting
C01218 - Bit 3	SW limit positions for position follower on/off	On
C01219 - bit 3	SW limit positions for speed follower on/off	On
C01230 - bit 3	SW limit position for manual jogging on/off	Off

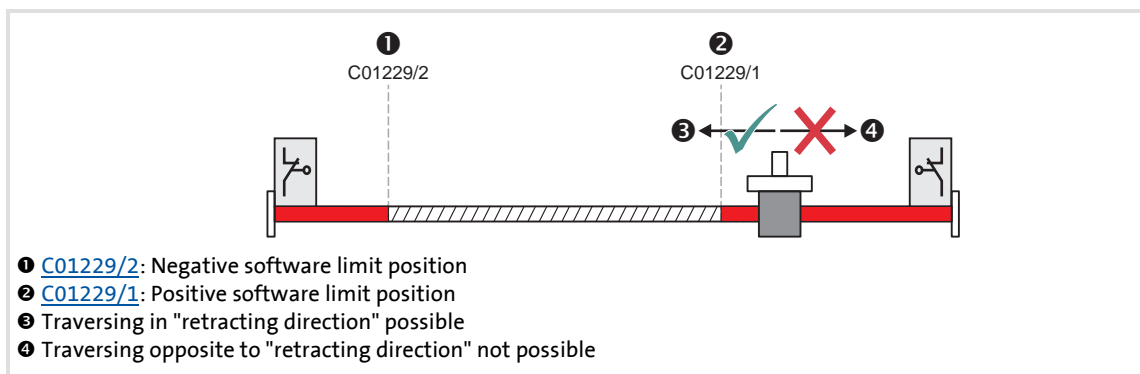
Behaviour in the case of active software limit positions

- ▶ If the software limit positions are active, travelling commands that would result in exiting from the permissible travel range can no longer be executed:



[9-13] Example: Traversing range limitation by means of software limit positions

- ▶ If the drive is already outside the permissible travel range and the software limit positions have been activated, only travel commands that result in the drive moving back into the permissible travel range can be executed:



[9-14] Example: Permissible traversing direction if software limit positions active

- ▶ If the software limit positions are active and a software limit position is passed ("overtravel"):
 - The error response "TroubleQuickStop" takes place in the Lenze setting, i.e. the drive is brought to a standstill in the deceleration time set for the quick stop function and does so irrespective of the setpoint selection. The error response can be parameterised in [C00595/3](#) and [C00595/4](#).
 - The error message "Ck03: Pos. SW limit position" or "Ck04: Neg. SW limit position" is entered in the logbook of the drive controller.
 - Depending on the parameterised error response, the drive cannot traverse until the error has been acknowledged.

9.4.3.2 Hardware limit switch

The travel range limits are monitored by means of limit switches via the inputs *bLimitSwitchPos* and *bLimitSwitchNeg* of the [LS MotionControlKernel](#) system block.

- ▶ The two inputs react to the TRUE state.
- ▶ In [TA "Table positioning"](#), the two inputs are connected to the digital inputs provided for connection of the limit switches.



Stop!

The limit switches are only evaluated if the limit switches for the respective operating mode have been activated (see the following table)!

Operating mode	Hardware limit switch effective
Speed follower	Yes (adjustable in C01219 - bit 2)
Homing	Depending on the selected homing mode (see description of the homing modes)
Manual jog	No (adjustable in C01230 - bit 2)
Positioning	Yes
Stop	Yes
Position follower	Yes (adjustable in C01218 - bit 2)



Note!

If the digital inputs used for connecting the limit switches are fail-safe inputs (tripping at LOW level), you simply change the terminal polarity of the corresponding digital inputs in [C00114](#).

Behaviour when hardware limit switches are active

- ▶ If one of the two monitoring inputs is set to TRUE:
 - The error response "TroubleQuickStop" takes place in the Lenze setting, i.e. the drive is brought to a standstill in the deceleration time set for the quick stop function and does so irrespective of the setpoint selection. The error response can be parameterised in [C00595/1](#) and [C00595/2](#).
 - The error message "Ck01: Pos. HW limit switch" or "Ck02: Neg. HW limit switch" is entered in the logbook.
 - Bit 10 ("Pos. HW-Limit Detected") or bit 11 ("Neg. HW-Limit Detected") is set in the [MCK status word](#).
 - Depending on the parameterised error response, the drive cannot traverse until the error has been acknowledged.

**Note!**

An activated limit switch can be retracted again by manual jog in the opposed direction or with the "Retract limit switch" function. ▶ [Retracting of an operated limit switch](#) (📖 540)

Only in the "[Manual jog](#)" operating mode, retracting of the limit switch resets bit 10 ("Pos. HW-Limit Detected") or bit 11 ("Neg. HW-Limit Detected") in the [MCK status word](#).

Re-activation after acknowledging the error

When the error has been acknowledged and the limit switch is still active, the following action is required for a renewed activation of the monitoring depending on the operating mode:

Operating mode	Action for (re) activation
Speed follower	Limit switch is activated and setpoint in direction of the activated limit switch is pending
Homing	Limit switch is activated and <i>bHomStartStop</i> = TRUE
Manual jog	Limit switch is activated and manual jog in direction of the activated limit switch
Positioning	Limit switch is activated and setpoint command has been transmitted.
Stop	Setting of the operating mode
Position follower	Limit switch is activated and setpoint in direction of the activated limit switch is pending

9.4.4 Target position monitoring (status "drive in target")

The target position monitoring detects whether the drive has reached the target.



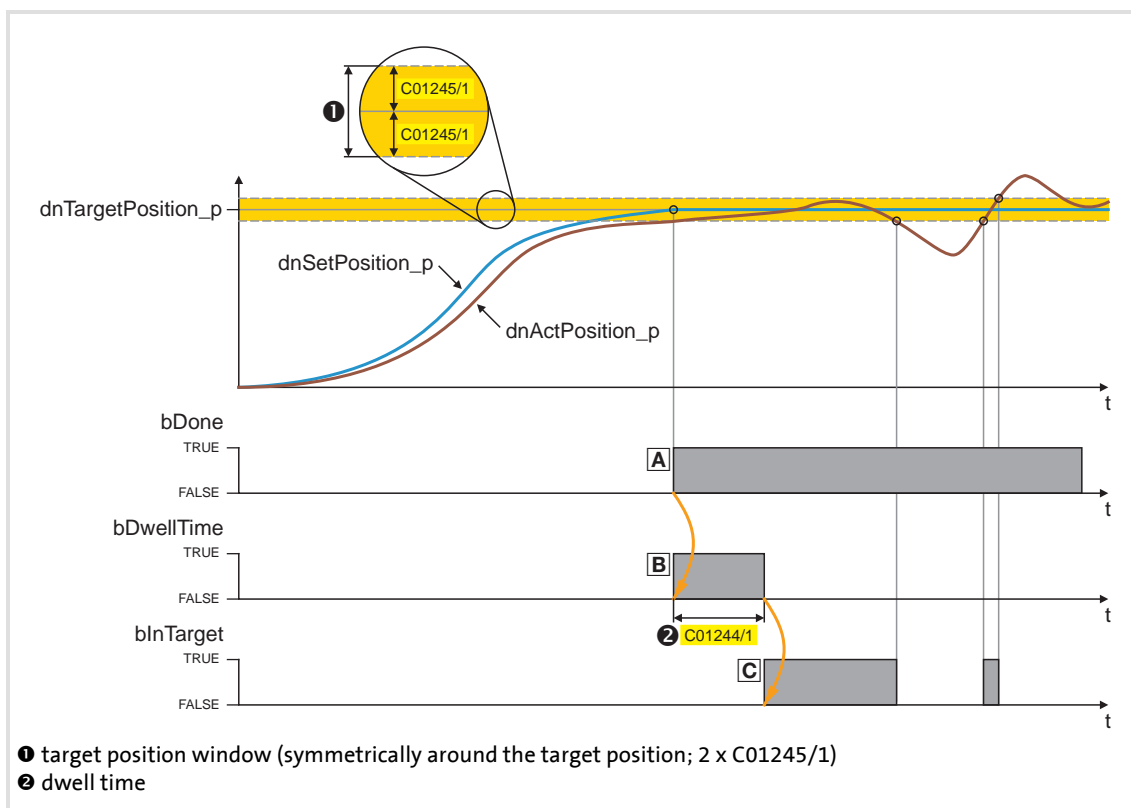
Note!

- The target position detection is active with the following operating modes/functions:
 - Operating mode "[Positioning](#)": Absolute and relative positioning mode
 - Operating mode "[Homing](#)": After approaching the starting position via start profile (if start profile has been selected)
 - Operating mode "[Manual jog](#)": When the breakpoints and the software limit positions are approached
- The target position monitoring is active until the operating mode changes or a new travel command influences the setpoint.

Short overview of the parameters for target position monitoring:

Parameter	Info	Lenze setting	
		Value	Unit
C01244/1	MCK: Dwell time - target position <ul style="list-style-type: none">• For considering mechanical transient phenomenons of the tool when the target position is reached.	100	ms
C01245/1	MCK: Window target position <ul style="list-style-type: none">• Symmetrical window around the target position.	1.0000	units

Principal procedure of the position detection



[9-15] Signal characteristics

Status "Done" (A)

- The position setpoint has reached the target position.

Status "DwellTime" (B)

- Bit 16 in the [MCK status word](#) or the *bDwellTime* output of the [L_MckStateInterface](#) FB is set when the setpoint position has been reached after the dwell time set in [C01244/1](#) has expired.
- The status detects the time after the *bDone* signal when settling to target position is executed and actual position detection is not active yet.

Status "InTarget" (C)

- If the actual position is within the symmetrical target position window after the dwell time has expired, bit 17 is set to "1" in the [MCK status word](#) or the *blnTarget* output of the [L_MckStateInterface](#) FB is set to TRUE.



Note!

- The target position including the target position window has to be within the maximum traversing range.
- Please observe the following if you use *blnTarget* as stepping condition in a step sequence:
The *blnTarget* signal needs the set position to be located in the target. A profile restart immediately deletes the setpoint position in the first cycle and thus also resets *blnTarget*.

- ▶ The "InTarget" status is reset if:
 - The motor shaft leaves the target position window,
 - a new profile or a new motion process is started,
 - *blnTarget* has been set via manual jog (intermediate stops) and the "[Manual jog](#)" mode is left,
 - the target position window has been left in the "[Speed follower](#)" mode and a speed setpoint not equal to "0" is injected into the process,
 - a new homing process is started,
 - the reference is set,
 - the device is switched off/on.

9.4.5 Monitoring of the maximum travel distance

Continuous travel requests in the "[Positioning](#)" operating mode (or relative positioning with feed in the same direction) cause an overflow of the position integrators when the max. display area of the position is reached and the reference is set. The same behaviour takes place in the "[Speed follower](#)" and "[Manual jog](#)" operating modes. For this reason, a monitoring mode of the maximum travel distance is implemented in the **Motion Control Kernel**.

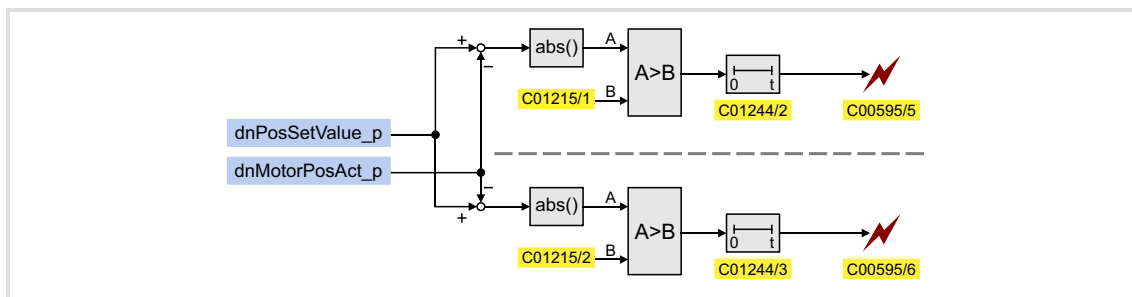
- ▶ If the maximum travel distance ([C01213/1](#)) is exceeded:
 - The error response set in [C00595/7](#) will be carried out (Lenze setting: "TroubleQuickStop").
 - The "[Ck07: Travel range limit exceeded](#)" error message is entered into the logbook.
 - The internal status "reference known" is reset (the controller is no longer referenced).
- ▶ A setting of [C00595/7](#) = "0: No Reaction" deactivates the monitoring.

9.4.6 Following error monitoring system

The difference between set position and actual position is called the following error. Ideally, the following error should be "0". The set position is created by the internal definition of the traversing profiles of the **Motion Control Kernel**. The actual position is created by the integration of the speed supplied by the position encoder. If the position control is adjusted optimally, only a minimum following error arises which is always compensated dynamically and not increases continuously.

Certain processes, however, require that a defined limit as a difference between set position and actual position is not exceeded. If it is exceeded, it may have been caused by a mechanical blocking in the machine and the system part is not situated at the position defined at that time. In such a case, it makes sense to activate the "Fault" error response to make the motor torqueless.

In the 8400 TopLine controller, two independent following error monitoring systems can be parameterised:



[9-16] Two-channel following error monitoring system

Parameter	Info	Lenze setting	
		Value	Unit
C01215/1	MCK: Following error limit 1	0.0000	units
C01215/2	MCK: Following error limit 2	0.0000	units
C01244/2	MCK: Following error deceleration 1	0.000	s
C01244/3	MCK: Following error deceleration 2	0.000	s
C00595/5	MCK: Resp. to following error 1	Warning	
C00595/6	MCK: Resp. to following error 2	Warning	



Note!

If the limit for the following error is set to "0.0000 units" (Lenze setting, the following error monitoring system is not active.



Tip!

In certain situations (e.g. dynamic acceleration of the load), higher system-dependent following errors occur than while approaching the target position.

In order that no error is triggered during acceleration and a close tolerance limit can be monitored all the same at standstill in the target, the addressing of the following error monitoring system can be decelerated. Thus, dynamic processes or torque impulses occurring for short periods can be "masked out".

Operating mode

If the limit for the following error in [C01215/x](#) is set higher than "0.0000 units" and if the current following error exceeds this limit over the time set in [C01244/x](#):

- ▶ The error response set in [C00595/5](#) or [C00595/6](#) will be carried out (Lenze setting: "Warning").
- ▶ The error message "[Ck05: Error, following error 1](#)" or "[Ck06: Error, following error 2](#)" will be entered into the logbook.

9.5 Speed follower

In the "speed follower" operating mode, the drive follows a speed setpoint.

9.5.1 Parameter setting

Short overview of parameters for the "speed follower" operating mode:

Parameter	Info	Lenze setting	
		Value	Unit
C01219	MCK: Speed follower setting	Bit coded	
C02610/2	MCK: Ramp time synchr. setpoint	2.000	s
C02611/1	MCK: Pos. max. speed	199.99	%
C02611/2	MCK: Pos. min. speed	0.00	%
C02611/3	MCK: Neg. min. speed	0.00	%
C02611/4	MCK: Neg. max. speed	199.99	%

9.5.1.1 Functional settings

In [C01219](#), various functional settings for the speed follower can be made in bit-coded form.

Function		Lenze setting
Bit 0	Reserved	Off
Bit 1	Reserved	Off
Bit 2	HW limit switch on In the "speed follower" operating mode, a travel range monitoring mode via hardware limit switch is active. ▶ Limit position monitoring (□ 506)	On
Bit 3	SW limit switch on In the "speed follower" operating mode, a travel range monitoring mode via parameterised software limit positions. ▶ Limit position monitoring (□ 506)	On
Bit 4	Reserved	Off
Bit 5	Reserved	Off
Bit 6	Reserved	Off
Bit 7	Position controller off In the "Speed follower" operating mode, the position controller is deactivated. Thus, the compensation of the following error is switched off.	Off

9.5.2 Requesting the operating mode

Request for "speed follower" operating mode by means of the [MCK control word](#):

MCK control word						
Bit 31	...	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			OpMode_Bit3	OpMode_Bit2	OpMode_Bit1	OpMode_Bit0
X	...	X	0	0	0	0

X = Status not significant

If the **MCKInterface** is connected upstream to the **Motion Control Kernel** and if the operating mode is requested at the [L MckCtrlInterface](#) FB, the *wOperationMode* and *bOperationMode_1...8* process inputs are available.

9.5.3 Setpoint selection

The speed setpoint is selected via the *nSpeedSetValue_a* process input and additively via the *nSpeedAddValue_v* process input.

- ▶ Usually, the ramp generator [L NSet](#) and, optionally, the process controller [L PCTRL](#) are upstream of the *nSpeedSetValue_a* process input.
- ▶ The speed setpoint is limited internally to the speed limits set in [C02611/1...4](#).



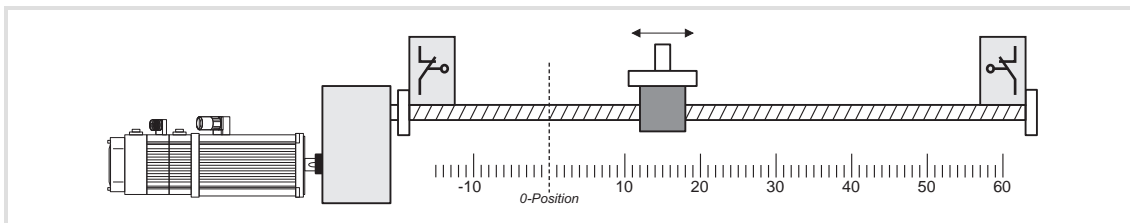
Note!

When the speed limit values are set, the **Motion Control Kernel** influences the setpoint generation with a synchronisation mode. The synchronisation mode serves to travel the synchronisation range dynamically with the synchronisation ramp set in [C02610/2](#).

- ▶ [Min/Max speed](#) (📖 505)

9.6 Homing

The measuring system in the machine is selected by means of homing and the 0 position is set within the possible physical travel range:



[9-17] Homing (selection of 0 position)

The zero position (home) can be defined by a reference run or by setting a home position:

- ▶ If a reference run is carried out, the drive follows a previously selected path to find the home position.
- ▶ When the reference is set, it is selected manually when the drive stands still.



Danger!

During homing, specially assigned profile parameters are active. If they have not been set correctly, the drive can engage in uncontrolled movement!



Tip!

A reference run is mainly used for systems with feedback via encoders, resolvers, or single-turn absolute value encoders, as in the case of these systems the home position is lost when the supply voltage is switched off.

Usually the reference is set only once during commissioning or in the event of service (e. g. if drive components are replaced), and it is mostly used for systems with feedback via absolute value encoders.

9.6.1 Parameter setting

Parameterisation dialog in the »Engineer«

The screenshot shows the 'Application Parameters' dialog for Homing. The parameters are as follows:

- Ref. TP-signal source: No TP
- Homing mode: >_Lp
- Ref. home position: 0,0000 unit
- Ref. reference offset: 0,0000 unit
- Ref. sequence profile: 0
- Actual position: 0,0000 units
- Ref. S-ramp time: 0,000 s
- Ref. start speed: 720,0000 unit/s
- Ref. search speed: 180,0000 unit/s
- Ref. M-limit mode 14/15: 10,00 %
- Ref. start acceleration: 720,0000 unit/s²
- Ref. search acceleration: 720,0000 unit/s²
- Ref. waiting time mode 14/15: 100 ms
- Positive SW limit position: 0,0000 units
- Negative SW limit position: 0,0000 units

The diagram shows a machine with a sensor (1) and a graph of the homing sequence profile (2). The graph shows a ramp up to a constant speed, followed by a ramp down to a stop at the reference target position.

Short overview of parameters for "Referencing" operating mode:

Parameter	Info	Lenze setting	
		Value	Unit
C01221	MCK: Ref. mode	12: >_Lp	
C01224/1	MCK: Ref. initial speed	720.0000	unit/s
C01225/1	MCK: Ref. initial acceleration	720.0000	unit/s ²
C01224/2	MCK: Ref. search speed	180.0000	unit/s
C01225/2	MCK: Ref. search acceleration	720.0000	unit/s ²
C01226/1	MCK: Ref. S-ramp time	0.000	s
C01222	MCK: Ref. M limit mode 14/15	10.00	%
C01223	MCK: Ref. waiting time mode 14/15	100	ms
C01227/1	MCK: Ref. offset reference degree	0.0000	unit
C01227/2	MCK: Ref. home position	0.0000	unit
C01228	MCK: Ref. sequence profile	0	
C01229/1	MCK: Positive SW limit position	0.0000	units
C01229/2	MCK: Negative SW limit position	0.0000	units
C01246/1	MCK: Ref. TP signal source	0: No TP	
C01246/2	MCK: Set.Ref. signal source	0: No TP	

9.6.1.1 Referencing mode

Specify the referencing mode in [C01221](#), i.e. the way in which referencing is to take place.

- ▶ For reference setting, the referencing mode "100" is to be selected in [C01221](#).
- ▶ For a reference search, [C01221](#) contains referencing modes "6"..."15" which can be selected from.

Referencing mode C01221	Evaluated signals/sensors			Pre-stop mark at <i>bHomingMark</i>
	Sensor reference signal	Travel range limit switch		
		Negative limit switch	Positive limit switch	
6	☑			☑
7	☑			☑
8	☑			
9	☑			
10	☑		☑	
11	☑	☑		
12			☑	
13		☑		
14	Positive direction of rotation to torque limit.			
15	Negative direction of rotation to torque limit.			
100	Set reference directly.			

Internal interfaces

The switches/sensors are evaluated via the following internal interfaces:

Switch/sensor	Internal interface for digital input signal
Touch probe sensor (Sensor reference signal)	<ul style="list-style-type: none"> • In the Lenze setting, a signal pending at the digital input DI3 is interpreted level-sensitive as TP sensor signal. <ul style="list-style-type: none"> – In this case, the search speed must be selected in order that the signal at DI3 will be detected. • Moreover, the high-precision homing with touch probe is supported. <ul style="list-style-type: none"> – The touch probe signal source can be selected in C01246/1. – If the reference signal is to follow a real touch probe, configure the touch probe signal accordingly. ▶ Touch probe detection (□ 362)
Positive travel range limit switch	<i>bLimitSwitchPos</i>
Negative travel range limit switch	<i>bLimitSwitchNeg</i>
Pre-stop mark/pre-stop signal	<i>bHomingMark</i> <ul style="list-style-type: none"> • This input responds to the FALSE status and is to be connected to the corresponding digital input to which the reference switch is connected. • The response to the pre-switch off signal depends on the referencing mode selected.



Note!

For a reference search with touch probe detection:

- The touch probe signal source can be selected in [C01246/1](#).
- Go to [C02810/x](#) and select the edge, the digital input used for the connection of the touch-probe sensor is to respond. In the Lenze setting of [C02810/x](#), no touch probe is detected!
- Moreover, no "acceptance window" must be set in [C2813/x](#) and [C02814/x](#) for accepting the touch probe signal in order that a touch probe will always be detected independent of the position.

▶ [Touch probe detection](#) (📖 362)

Start and search profile data set

Certain referencing modes use two different profile data sets for homing in order to shorten the homing time and, at the same time, increase accuracy.

- ▶ At first, a quick approach of the limit switch/pre-stop mark (depending on the selected mode) is carried out using the start profile data set.
- ▶ After reversing at the limit switch/pre-stop mark, the search profile data set results in slower – but more accurate – approaching of the touch probe sensor.

Start profile data set		Search profile data set	
C01224/1	Start speed	C01224/2	Search speed
C01225/1	Start acceleration (deceleration as well)	C01225/2	Search acceleration (deceleration as well)
C01226/1	S-ramp time (identical in the two profile data sets)	C01226/1	S-ramp time (identical in the two profile data sets)



Note!

A changeover to the search profile data set is only carried out if the search speed has been set to ([C01224/2](#)) > "0"!

The exact time of the changeover to search profile data set occurs in the respective referencing mode is indicated in the process descriptions of the referencing modes.

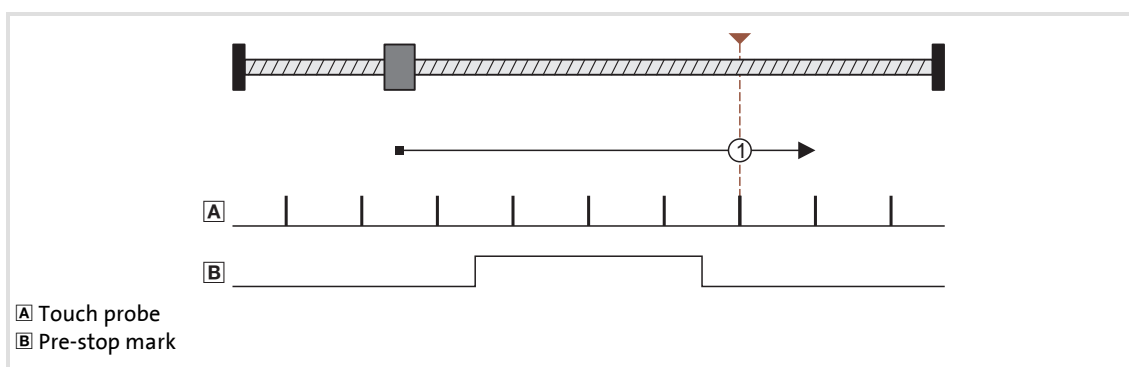


Tip!

The result of setting a lower search speed in [C01224/2](#) and a high search acceleration in [C01225/2](#) is that deceleration to search speed takes place quickly and position detection is exact (at slower search speed).

Abbreviations used for the referencing modes:

Abbreviation	Meaning
>	Movement in positive direction
<	Movement in negative direction
Ln	Negative travel range limit switch
Lp	Positive travel range limit switch
Rn	Negative edge - pre-stop mark/pre-stop signal
TP	Touch probe or sensor reference signal/reference switch detected
Mlim	Torque limit value reached

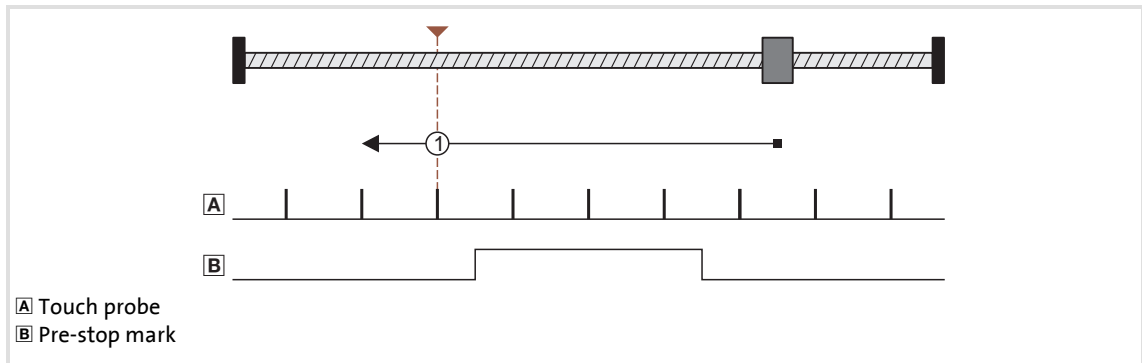
Mode 6: >_Rn_>_TP

Mode 6	>	Rn	>	TP	Offset path	Sequence profile (optional)
	Start speed		Search speed			Profile speed
Lp	Active	Active	Active	Active	Active	Active
Ln	Inactive	Inactive	Inactive	Inactive	Active	Active

Functional sequence:

1. Movement in positive direction with start profile data set.
2. Positive edge at *bHomingMark* activates search profile data set for further reference search.
3. Negative edge at *bHomingMark* enables home position detection.
4. Following edge of the touch probe sensor sets home position.

Mode 7: <_Rn_<_TP

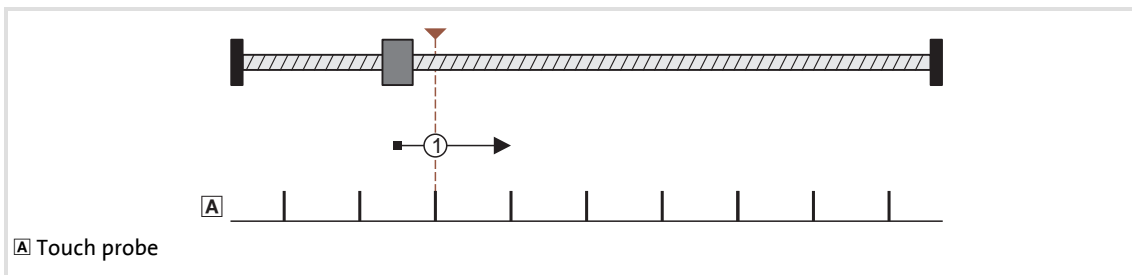


Mode 7	<	Rn	<	TP	Offset path	Sequence profile (optional)
	Start speed		Search speed			Profile speed
Lp	Inactive	Inactive	Inactive	Inactive	Active	Active
Ln	Active	Active	Active	Active	Active	Active

Functional sequence:

1. Movement in negative direction with start profile data set.
2. Positive edge at *bHomingMark* activates search profile data set for further reference search.
3. Negative edge at *bHomingMark* enables home position detection.
4. Following edge of the touch probe sensor sets home position.

Mode 8: >_TP

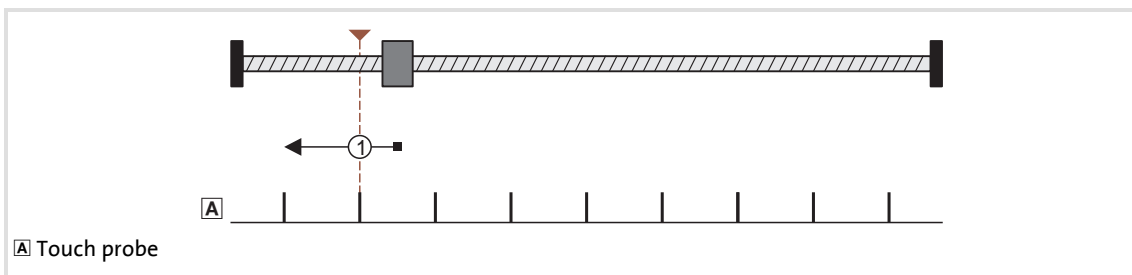


Mode 8	>	TP	Offset path	Sequence profile (optional)
	Start speed			Profile speed
Lp	Active	Active	Active	Active
Ln	Inactive	Inactive	Active	Active

Functional sequence:

1. Movement in positive direction with start profile data set.
2. Following edge of the touch probe sensor sets home position.

Mode 9: <_TP

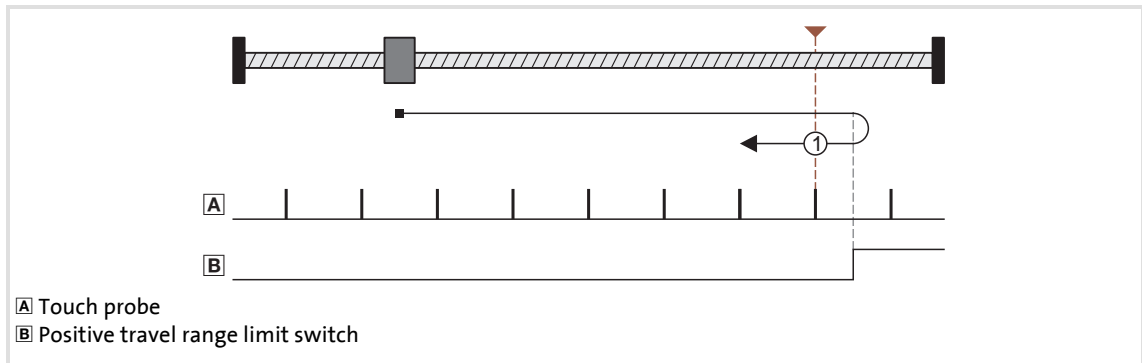


Mode 9	<	TP	Offset path	Sequence profile (optional)
	Start speed			Profile speed
Lp	Inactive	Inactive	Active	Active
Ln	Active	Active	Active	Active

Functional sequence:

1. Movement in negative direction with start profile data set.
2. Following edge of the touch probe sensor sets home position.

Mode 10: >_Lp_<_TP

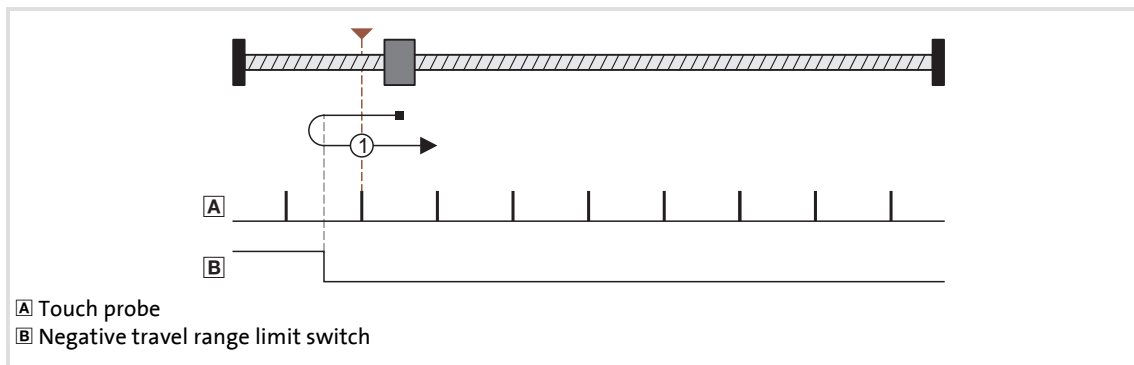


Mode 10	>	Lp	<	TP	Offset path	Sequence profile (optional)
	Start speed		Search speed			Profile speed
Lp	Inactive	Inactive	Inactive	Inactive	Inactive	Active
Ln	Inactive	Inactive	Active	Active	Active	Active

Functional sequence:

1. Movement in positive direction with start profile data set.
2. Reversing when the edge of the positive travel range limit switch is positive and, at the same time, activation of search profile data set for continued reference searching.
3. Negative edge of the travel range limit switch enables home position detection.
4. Following edge of the touch probe sensor sets home position.

Mode 11: <_Ln_>_TP

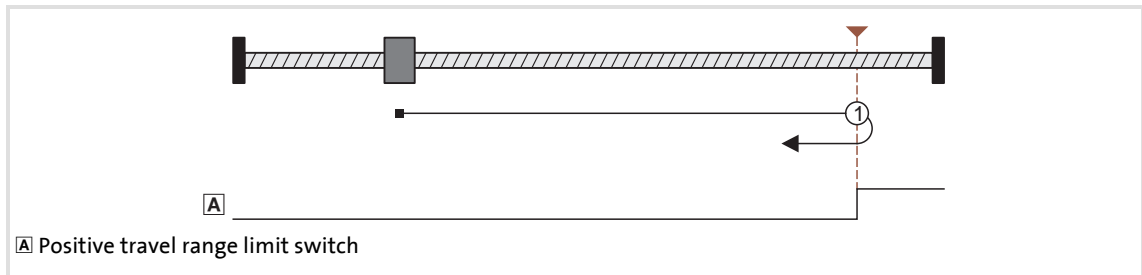


Mode 11	<	Ln	>	TP	Offset path	Sequence profile (optional)
	Start speed		Search speed			Profile speed
Lp	Inactive	Inactive	Active	Active	Active	Active
Ln	Inactive	Inactive	Inactive	Inactive	Inactive	Active

Functional sequence:

1. Movement in negative direction with start profile data set.
2. Reversing when the edge of the negative travel range limit switch is positive and, at the same time, activation of search profile data set for continued reference searching.
3. Negative edge of the travel range limit switch enables home position detection.
4. Following edge of the touch probe sensor sets home position.

Mode 12: >_Lp



Mode 12	>	Lp	Offset path	Sequence profile (optional)
	Start speed			Profile speed
Lp	Inactive	Inactive	Inactive	Active
Ln	Inactive	Inactive	Active	Active

Functional sequence:

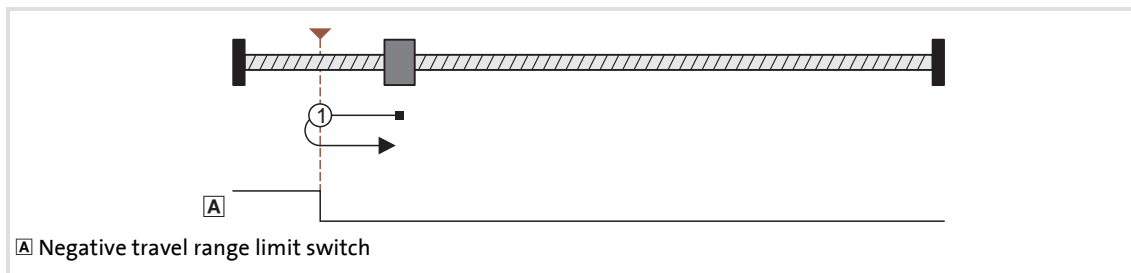
1. Movement in positive direction with start profile data set.
2. Positive edge of the travel range limit switch sets reference.



Note!

The load machine can also leave the travel range limit switch. There follows a return to the home position that was set with the positive edge of the travel range limit switch.

- It is possible that, as a result, the machine will remain on an operated limit switch.
- It is therefore recommended that a home value offset be set in [C01227/1](#) in order to release the operated limit switch.

Mode 13: <_Ln

Mode 13	<	Ln	Offset path	Sequence profile (optional)
	Start speed			Profile speed
Lp	Inactive	Inactive	Active	Active
Ln	Inactive	Inactive	Inactive	Active

Functional sequence:

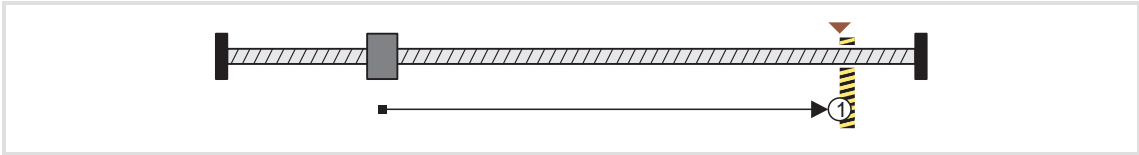
1. Movement in negative direction with start profile data set.
2. Positive edge of the travel range limit switch sets reference.

**Note!**

The load machine can also leave the travel range limit switch. There follows a return to the home position that was set with the positive edge of the travel range limit switch.

- It is possible that, as a result, the machine will remain on an operated limit switch.
- It is therefore recommended that a home value offset be set in [C01227/1](#) in order to release the operated limit switch.

Mode 14: >_Mlim



Mode 14	>	Mlim	Offset path	Sequence profile (optional)
		Start speed		Profile speed
Lp	Active	Active	Active	Active
Ln	Inactive	Inactive	Active	Active

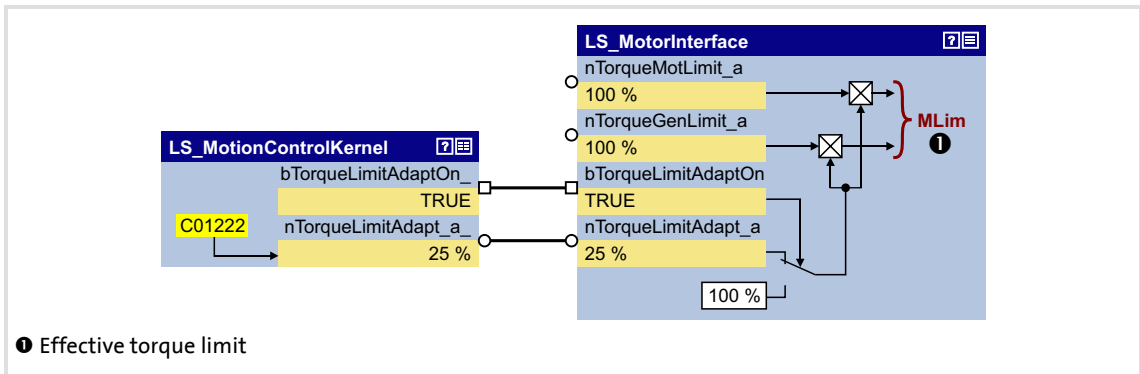
Functional sequence:

1. Movement in a positive direction with reduced torque and start profile data set.
2. The reference is set if it is detected that the torque limit set in [C01222](#) is exceeded beyond the time set in [C01223](#) ("Homing to positive stop").
 - If a home value offset has not been set, this position is the home position.
 - If a home value offset has been set, correctly signed traversing by this offset takes place and the home position is set at the end of this travel distance.

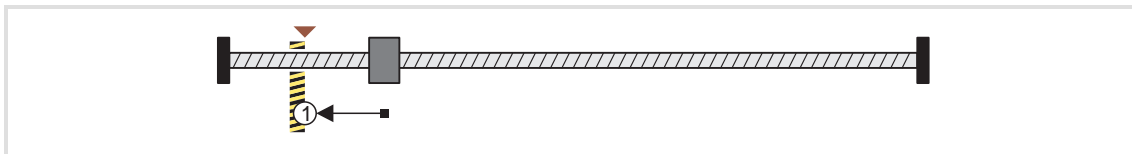


Tip!

Set a home value offset in [C01227/1](#) to avoid stopping at the positive stop.



[9-18] Wiring for torque limit when homing to "Positive stop" (homing modes 14/15)

Mode 15: <_Mlim

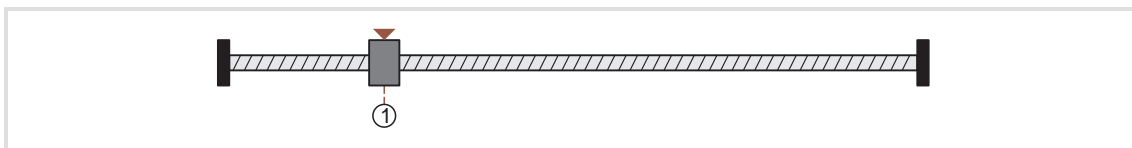
Mode 15	<	Mlim	Offset path	Sequence profile (optional)
	Start speed			Profile speed
Lp	Inactive	Inactive	Active	Active
Ln	Active	Active	Active	Active

Functional sequence:

1. Movement in a negative direction with reduced torque and start profile data set.
2. The reference is set if it is detected that the torque limit set in [C01222](#) is exceeded beyond the time set in [C01223](#) ("Homing to positive stop").
 - If a home value offset has not been set, this position is the home position.
 - If a home value offset has been set, correctly signed traversing by this offset takes place and the home position is set at the end of this travel distance.

**Tip!**

Set a home value offset in [C01227/1](#) to avoid stopping at the positive stop.

Mode 100: SetRef

Mode 15	SetRef	Offset path	Sequence profile (optional)
	-	Start speed	Profile speed
Lp	Active	Active	Active
Ln	Active	Active	Active

When the drive is at standstill, the measuring system is set via the bit 9 ("HomSetPos") in [MCK control word](#). The current actual position now corresponds to the home position set in [C01227/2](#) in the machine measuring system.

9.6.1.2 Home position & home value offset

If the home position is set in the course of the reference search, this determined position in the machine measuring system now corresponds to the home position set in [C01227/2](#).

If a home value offset has been set in [C01227/1](#), the drive continues correctly signed traversing by this offset at search speed after the home position has been found. The home position is not set until after this movement.

9.6.1.3 Traversing a sequence profile after completion of homing

If necessary, a sequence (following or subsequent) profile can be entered in [C01228](#) in order to arrange for a positioning movement to be carried out immediately after completion of homing.



Note!

The positioning movement for the sequence profile set in [C01228](#) is also carried out in the "referencing" mode. If a second sequence (following or subsequent) profile has been defined in the sequence profile, it is not automatically started!

9.6.2 Requesting the operating mode

Request for the "referencing" operating mode by means of the [MCK control word](#):

MCK control word						
Bit 31	...	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			OpMode_Bit3	OpMode_Bit2	OpMode_Bit1	OpMode_Bit0
X	...	X	0	0	0	1

X = Status not significant

If the **MCKInterface** is connected upstream to the **Motion Control Kernel** and if the operating mode is requested at the [L_MckCtrlInterface](#) FB, the *wOperationMode* and *bOperationMode_1...8* process inputs are available.

9.6.3 Carrying out homing

Control is exercised by means of bits 8 ... 10 in the [MCK control word](#):

Homing	MCK control word		
	Bit 10	Bit 9	Bit 8
	HomResetPos	HomSetPos	HomStartStop
Stop homing	0	0	0
Start homing	0	0	1
Set home position	0	1	X
Delete home position	1	0	X

X = Status not significant

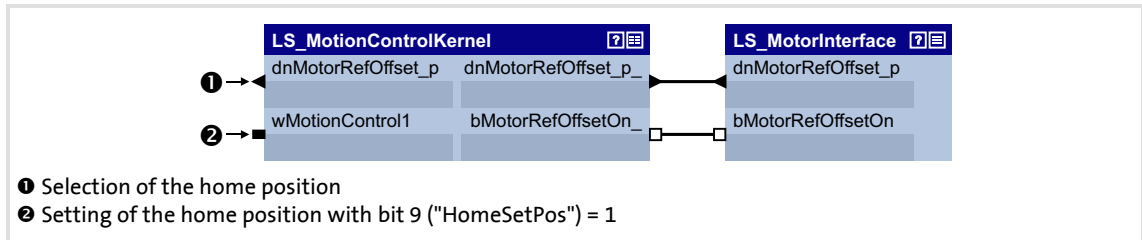
If the **Motion Control Kernel** is downstream from the **MCKInterface** in the circuit, the [L_MckCtrlInterface](#) FB provides the following process inputs for controlling the operating mode:

Identifier	Data type	Information/possible settings
bHomingStartStop	BOOL	Start/stop homing <ul style="list-style-type: none"> Only possible in the "referencing" operating mode.
		TRUE <ul style="list-style-type: none"> If one of referencing modes "0" ... "15" in C01221 is selected: <p>Start reference search</p> <ul style="list-style-type: none"> The current status of the reference search is indicated via the status outputs <i>bHomingDone</i> and <i>bHomePosAvailable</i>. If the "100_Set_Ref_directly" referencing mode has been selected in C01221, the home position can be set manually via the <i>bHomeStartStop</i> input with the drive at a standstill. The current actual position is set as the home position (C01227/2) If referencing mode "100: SetRef" is selected: <p>Setting the home position manually</p> <ul style="list-style-type: none"> The home position is set manually with the drive at a standstill. The current actual position now corresponds to the reference position set in C01227/2 in the machine measuring system.
		TRUE↔FALSE <ul style="list-style-type: none"> Stop homing. <ul style="list-style-type: none"> If the <i>bHomingStartStop</i> input is reset to FALSE during active referencing, homing is cancelled and the drive is brought to a standstill.
bHomingSetPos	BOOL	Set home position (Homing on the fly) <ul style="list-style-type: none"> With referencing "on the fly", the home position of a machine can be set during ongoing movement. Jerking and compensating movements do not occur.
		FALSE↔TRUE <ul style="list-style-type: none"> The position applied at the <i>dnMotorRefOffset_p</i> input of the SB LS_MotionControlKernel at the time of activation is set as home position if C01246/2 = "0: No TP" is set.
bHomingResetPos	BOOL	Delete home position <p>Note: With this function, positions are not deleted but only the status signals <i>bHomePosAvailable</i> and <i>bHomePosDone</i> are reset. Setpoints and actual positions remain untouched until a renewed reference setting or homing.</p>
		FALSE↔TRUE <ul style="list-style-type: none"> The internal status "reference known" is reset. <ul style="list-style-type: none"> The controller is no longer referenced. The process outputs <i>bHomePosAvailable</i> and <i>bHomingDone</i> are reset to FALSE.

9.6.3.1 Homing on the fly

With referencing "on the fly", the home position of a machine can be set during ongoing movement. Jerking and compensating movements do not occur.

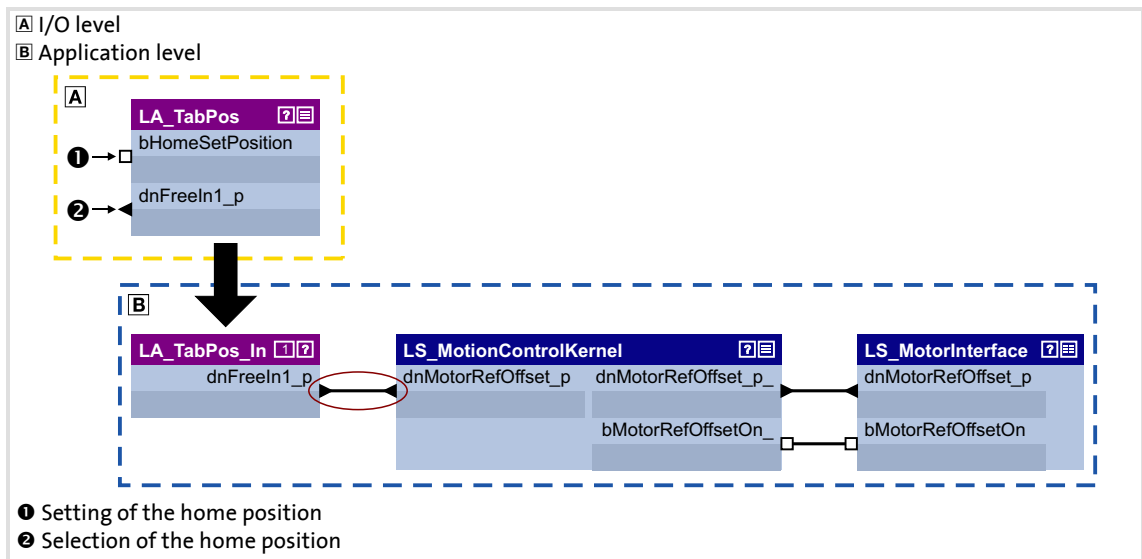
The following illustration shows the relevant interfaces for selecting the home position at the SB [LS_MotionControlKernel](#) and SB [LS_MotorInterface](#):



[9-19] Interface for selecting the home position

In order that position selections can be accepted while homing on the fly, an additional connection is required in the application level.

- ▶ The following illustration shows the required modification using the example of the "table positioning" technology application.
- ▶ For transmitting the home position from the I/O level to the application level, the "free" input *dnFreeIn1_p* is used here:



[9-20] Modified interconnection for selecting the home position

9.7 Manual jog

In this operating mode, the drive can be traversed manually in a clockwise or anticlockwise direction ("jogging mode").

- ▶ As an option, it is possible to change over to a second speed during traversing.
- ▶ "Retraction" of operated (travel range) limit switches is also supported. Only traversing in the corresponding retracting direction is then possible.



Danger!

During manual jogging, specially assigned profile parameters are active. If they have not been set correctly, the drive can engage in uncontrolled movement!



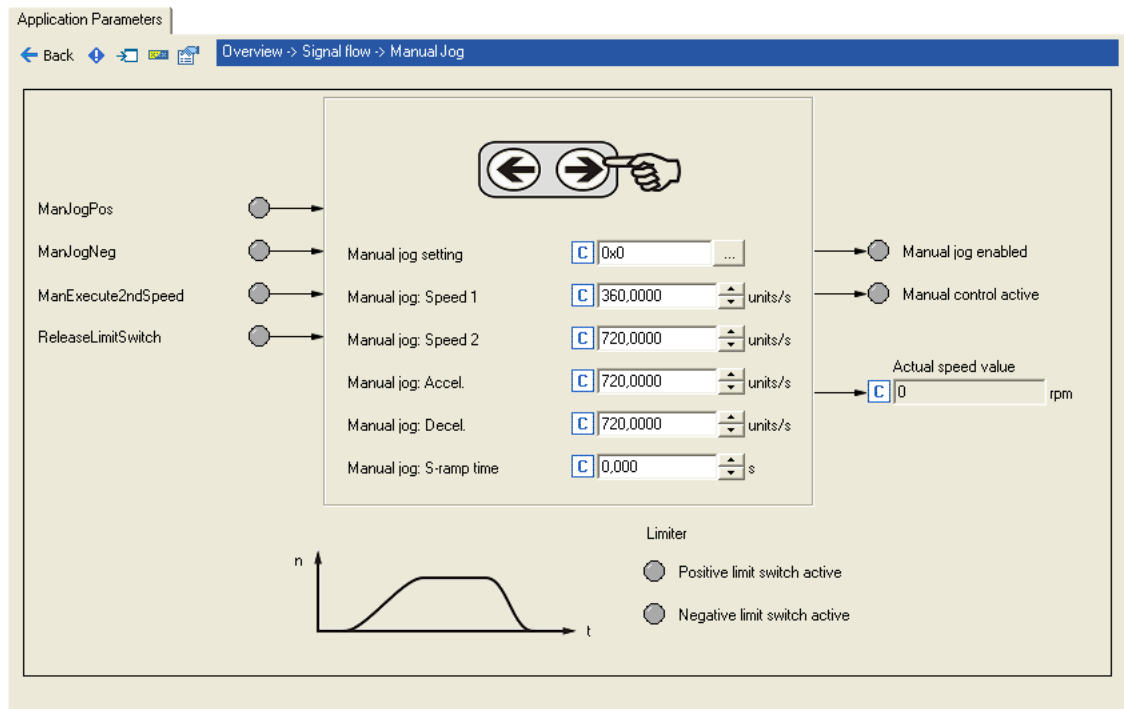
Stop!

In the Lenze setting, travel range monitoring is switched-off in [C01230](#) by means of hardware limit switches and software limit positions for the "Manual jog" operating mode!

If travel range monitoring has been deactivated, the drive can travel into a mechanical limit during manual jogging and machine parts can be destroyed or damaged!

9.7.1 Parameter setting

Parameterisation dialog in the »Engineer«



Short overview of parameters for "manual jogging" mode":

Parameter	Info	Lenze setting	
		Value	Unit
C01230	MCK: Manual jog setting	Bit coded	
C01231/1	Manual jog: speed 1	360.0000	units/s
C01231/2	Manual jog: Speed 2	720.0000	units/s
C01232/1	Manual jog: Acceleration	720.0000	units/s ²
C01232/2	Manual jog: Deceleration	720.0000	units/s ²
C01233/1	Manual jog: S-ramp time	0.000	s
C01235/1	Waiting time 2nd speed	5.000	s
C01234/1	Manual jog: Breakpoint 1	0.0000	unit
C01234/2	Manual jog: Breakpoint 2	0.0000	unit
C01234/3	Manual jog: Breakpoint 3	0.0000	unit
C01234/4	Manual jog: Breakpoint 4	0.0000	unit



Note!

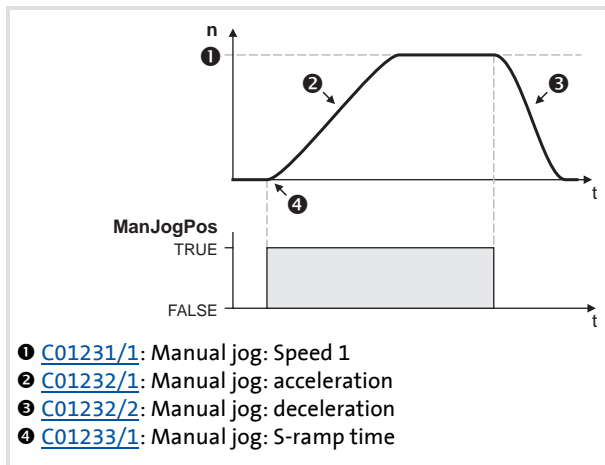
For trouble-free operation, the [Machine parameters](#) (at least gearbox factor and feed constant) must also be set correctly!

9.7.1.1 Functional settings

In [C01230](#), various functional settings for manual jogging can be carried out in bit-coded form.

Function	Lenze setting
Bit 0 Manual jog with breakpoint During manual jog, a stop is automatically made at the breakpoint positions set in C01234/1...4 . <ul style="list-style-type: none"> • The home position must be known for this function. • Travelling is continued when the pushbutton is "released" and pressed again. This button has been assigned the <i>ManJogPos</i> and/or <i>ManJogNeg</i> control function. 	Off
Bit 1 Time-based start of second speed In manual jog mode, an automatic changeover to manual speed 2 takes place after a parameterisable waiting time. ▶ Time-based start of second speed (☞ 537)	Off
Bit 2 HW limit switch on In the "manual jog" operating mode, a travel range monitoring mode via hardware limit switch is active. ▶ Limit position monitoring (☞ 506)	Off
Bit 3 SW limit switch on In the "manual jog" operating mode, a travel range monitoring mode via parameterised software limit positions. ▶ Limit position monitoring (☞ 506)	Off
Bit 4 Reserved	Off
Bit 5 Reserved	Off
Bit 6 Reserved	Off
Bit 7 Position controller off In the "manual jog" operating mode, the position controller is deactivated. Thus, the compensation of the following error is switched off.	Off

9.7.1.2 Smooth start and quick stop of the drive



[9-21] Example: Smooth start and quick stop

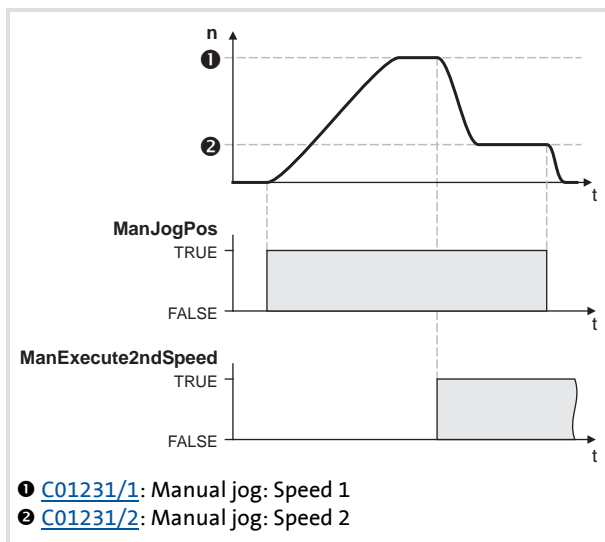


Tip!

Rapid deceleration ([C01232/2](#)) reduces the time from releasing of the "jog button" to actual stopping of the drive, with the result that it is easier to position the drive "by sight" and the desired stop position is not passed.

- For accelerating and decelerating, different values can be set in [C01232/1...2](#) so that smooth starting and quick stopping of the drive can be implemented.
- In order to reduce jerking, the two ramps can be set in such a way that they are s-shaped. This is done by entering a relative S-ramp time in [C01233/1](#).

9.7.1.3 Second speed



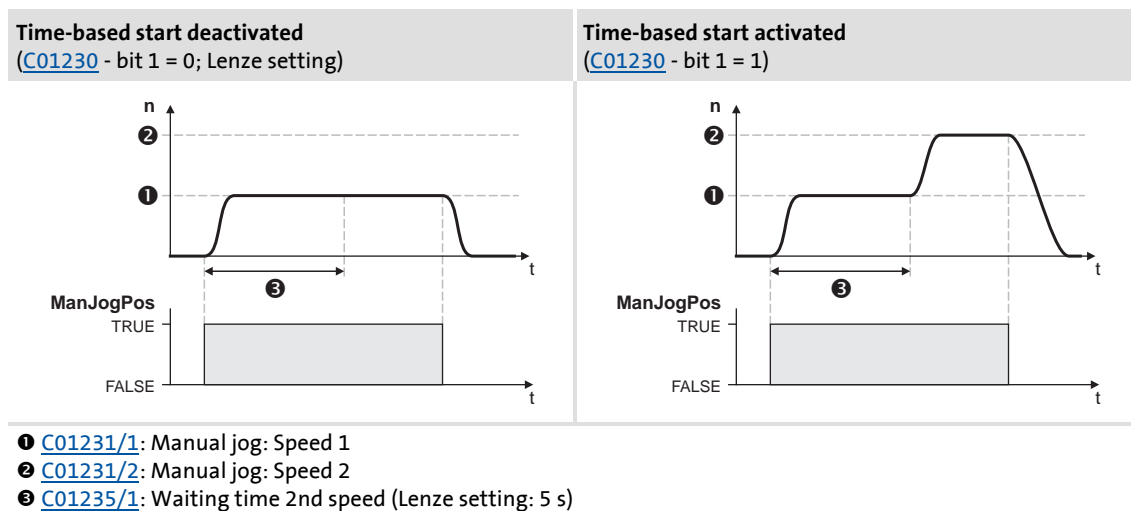
[9-22] Example: Changing over to second speed

- By setting control bit 6 (*ManExecute2ndSpeed*) in the [MCK control word](#), you can changeover to a second speed ([C01231/2](#)) during traversing.

9.7.1.4 Time-based start of second speed

If this function has been activated by means of bit 1 in [C01230](#) and a waiting time > "0 s" has been set in [C01235/1](#), an automatic change-over to manual jog speed 2 takes place when the manual jog function is activated and after the waiting time has expired.

► When the waiting time is set = 0 s, the automatic change-over is deactivated.



[9-23] Time-based start of second speed



Tip!

By leaving the corresponding button for manual jog pressed down for longer than the waiting time and parameterising manual jog speed 2 so that it is higher than manual jog speed 1, you can enable longer distances to be travelled by means of manual jogging with this function.

9.7.2 Requesting the operating mode

Request for "manual jog" mode via the [MCK control word](#):

MCK control word						
Bit 31	...	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			OpMode_Bit3	OpMode_Bit2	OpMode_Bit1	OpMode_Bit0
X	...	X	0	0	1	0

X = Status not significant

If the **MCKInterface** is connected upstream to the **Motion Control Kernel** and if the operating mode is requested at the [L_MckCtrlInterface](#) FB, the *wOperationMode* and *bOperationMode_1...8* process inputs are available.

9.7.3 Executing manual jogging

Control is exercised by means of bits 4 ... 7 in the [MCK control word](#):

Manual jog	MCK control word			
	Bit 7	Bit 6	Bit 5	Bit 4
	Release LimitSwitch	ManExecute 2ndSpeed	ManJogNeg	ManJogPos
Stop manual jogging	0	X	0	0
Manual jog, right • With speed 1 (C01231/1)		0	0	1
Manual jog, right • With speed 2 (C01231/2)		1		
Manual jog, left • With speed 1 (C01231/1)		0	1	0
Manual jog, left • With speed 2 (C01231/2)		1		
No change in relation to previous state		X	1	1
Retract operated limit switch	1	0	0	0

X = Status not significant

If the **Motion Control Kernel** is downstream from the **MCKInterface** in the circuit, the [L_MckCtrlInterface](#) FB provides the following process inputs for controlling the operating mode:

Identifier	Data type	Information/possible settings
bManJogPos bManJogNeg	BOOL	bManJogPos = TRUE: Manual jog right bManJogNeg = TRUE: Manual jog left Both inputs = TRUE: No change compared to previous state Both inputs = FALSE: Stop manual jog
bManJogExecute2ndVel	BOOL	Change over to speed 2 for manual jog FALSE Speed 1 (C01231/1) active. TRUE Speed 2 (C01231/2) active.
bReleaseLimitSwitch	BOOL	Retract operated limit switch TRUE Retract operated limit switch (in opposite direction)

Case 1: Reference known

If the reference is known and the software limit positions have been set, i.e. at least one software limit position is > 0 , manual jogging is carried out until a position at the corresponding software limit position is reached unless manual jogging is aborted first. Overtravelling the set software limit positions is not possible.

Case 2: Reference not known

If the reference is not known, the travel range limits are only monitored via the limit switches (if connected).

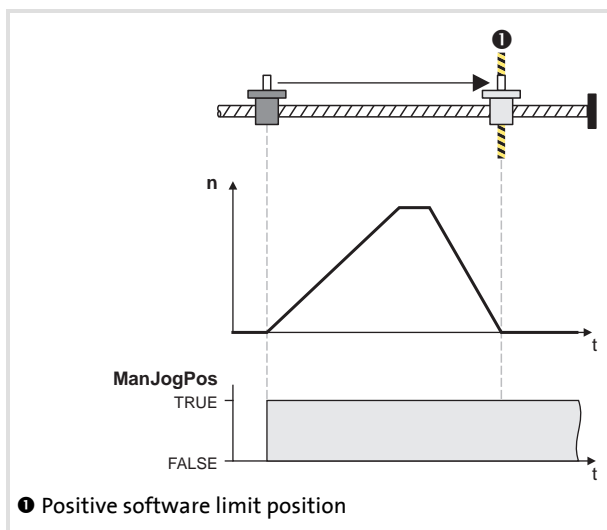
If you end manual jogging manually by resetting *bManJogNeg* or *bManJogPos*, the drive is brought to a standstill at the rate of deceleration set for manual jogging.

9.7.3.1 Manual jog to limit position**Stop!**

In the Lenze setting, travel range monitoring is switched-off in [C01230](#) by means of hardware limit switches and software limit positions for the "Manual jog" operating mode!

If travel range monitoring has been deactivated, the drive can travel into a mechanical limit during manual jogging and machine parts can be destroyed or damaged!

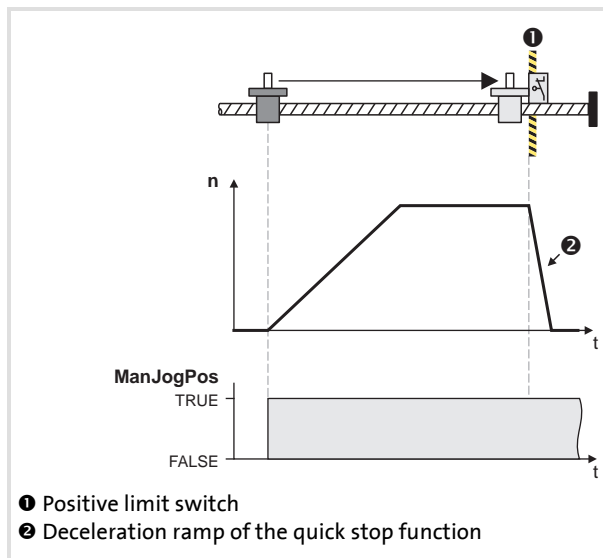
► [Limit position monitoring](#) (□ 506)

Manual jog to software limit position

[9-24] Example: Manual jogging to positive software limit position

- If the reference is known and the software limit positions have been set and are active, positioning to the corresponding software limit position is carried out unless you manually stop manual jogging first by resetting control bit 4/5 (*ManJogPos/ManJogNeg*) in the [MCK control word](#).
- The drive decelerates at the set rate of deceleration ([C01232/2](#)) to the position of the corresponding software limit position.

Manual jogging to hardware limit position (limit switch)



- ▶ When monitoring of the limit switches is switched on and a limit switch is approached during manual jog, the drive is braked within the deceleration time set for the quick stop function if the "TroubleQuickStop" error response is set in [C00595/1](#) or [C00595/2](#).

[9-25] Example: Manual jogging to positive limit switch

9.7.3.2 Retracting of an operated limit switch

If control bit 7 (*ReleaseLimitSwitch*) in the [MCK control word](#) is set, retracting from an operated limit switch is possible. Traversing is carried out in the corresponding retracting direction until the limit switch is no longer operated.

- ▶ If a direction preselection is made for retracting by means of control bit 4/5 (*ManJogPos/ManJogNeg*) in the retracting direction, travelling is continued, even after the limit switch has been left, until the corresponding control bit is reset.
- ▶ If, instead, a direction preselection is made against the retracting direction, the drive remains at a standstill.



Note!

Retracting from a limit switch is only possible if this switch is still in the operated state, i.e. the corresponding limit switch input is still active. You must therefore make sure that, when travelling to a limit switch, its tripping mechanism is not "driven over" due to e.g. an excessively high mass or too much momentum so that the limit switch is no longer in the operated state as a result.

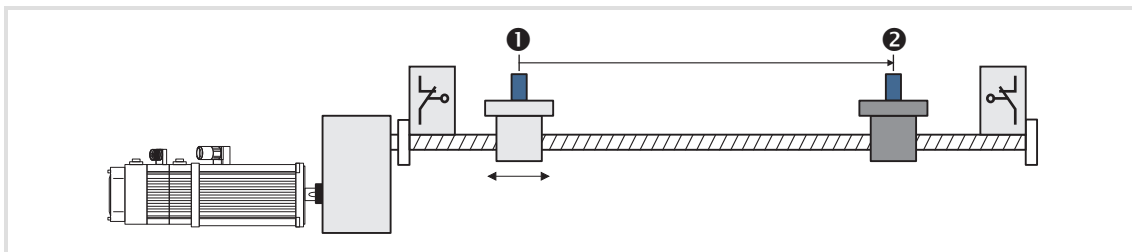


Tip!

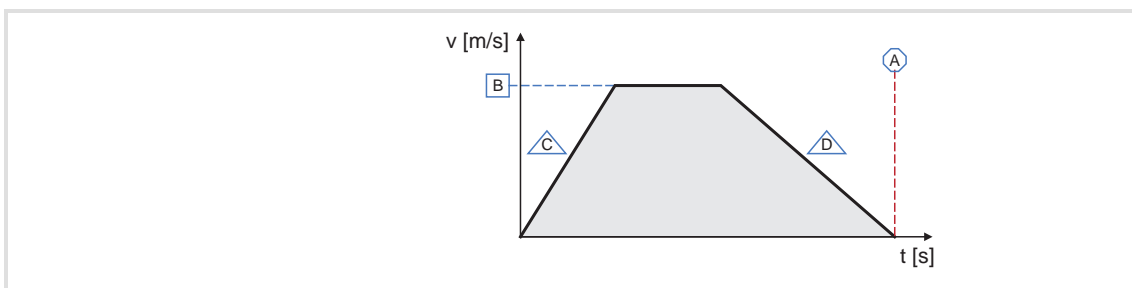
A limit switch that is in the operated state can also be moved away from again through manual jogging in the retracting direction by means of control bits 4/5 (*ManJogPos/ManJogNeg*).

9.8 Positioning

Positioning means that a workpiece/tool or material is moved from a starting position ❶ to a defined destination ❷:



To carry out positioning, a travel profile has to be stored in the drive controller for at least the following profile parameter:

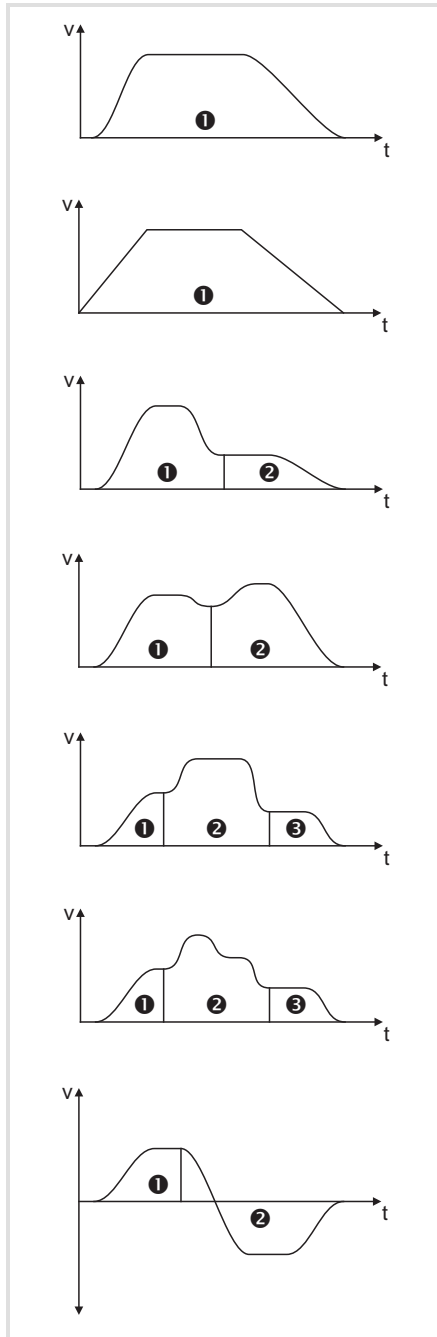


Symbol	Profile parameter
Ⓐ	Position Target position or distance to be traversed.
Ⓑ	Speed Maximum speed at which the target is to be approached.
Ⓒ	Acceleration Stipulation of the change in speed at which maximum acceleration is to take place.
Ⓓ	Deceleration Stipulation of the change in speed at which maximum deceleration to a standstill is to take place.

- ▶ A profile describes a motion task that can be converted into a rotary motion by the **Motion Control Kernel** in the "Positioning" operating mode.
- ▶ A positioning process can be composed of a large number of profiles that are executed in a fixed manner.
- ▶ You can find a detailed explanation of all profile parameters in the subchapter entitled "[Profile entry](#)". (□ 545)

9.8.1 Possible motion profiles

The following illustration shows different movement profiles that can be travelled in the "positioning" mode:



Asymmetrical trapezoidal profile

- with S-shaped ramps

Asymmetrical trapezoidal profile

- with linear ramps

Velocity changeover for profile with S-shaped ramps

- here: $v_{Profile\ 1} > v_{Profile\ 2}$ OR $v_{End1} = v_{Profile\ 2}$

Velocity changeover for profile with S-shaped ramps

- here: $v_{Profile\ 1} < v_{Profile\ 2}$

Profile linkage

Profile linkage

- with speed override in profile 2

Profile linkage

- here: forwards/backwards profile

[9-26] Examples of possible motion profiles

9.8.2 Parameter setting

Short overview of parameters for "positioning" mode:

Parameter	Info	Lenze setting	
		Value	Unit
C01216	MCK: Positioning setting	Bit coded	
C01300/1...15	Profile 1 ... 15: Mode	1: absolute (beeline)	
C01301/1...15	Profiles 1 ... 15: Position	360.0000	unit
C01302/1...15	Profile 1 ... 15: Speed	360.0000	unit/s
C01303/1...15	Profile 1 ... 15: Accel.	720.0000	unit/s ²
C01304/1...15	Profile 1 ... 15: Decel.	720.0000	unit/s ²
C01305/1...15	Profile 1 ... 15: Final speed	0.0000	unit/s
C01306/1...15	Profiles 1 ... 15: S-ramp time	0.000	s
C01307/1...15	Profiles 1 ... 15: Sequence profile	0	
C01308/1...15	Profile 1 ... 15: TP profile	0	
C01309/1...15	Profile 1 ... 15: TP source	3: TP-DigIn3	
C00595/9	MCK: Resp. to invalid pos.mode	4: WarningLocked	
C00595/10	MCK: Resp. to invalid profile data	4: WarningLocked	
C00595/12	MCK: Resp. to invalid profile no.	4: WarningLocked	
C00595/14	MCK: React target out of travel range	4: WarningLocked	
C01210/1	MCK: Curr. feed	-	units
C01210/2	MCK: Akt. Set position	-	units
C01210/3	MCK: Akt. Actual position	-	units
C01210/4	MCK: Curr. following error	-	units
C01210/5	MCK: Positioning accuracy	-	units
C01210/6	MCK: Target position	-	units
C01211/1	Max. traversing speed 100%_C11	-	units/s
C01213/1	MCK: Max. traversing distance	-	units
C01242	MCK: Current pos profile number	-	

Highlighted in grey = display parameter

**Note!**

For trouble-free operation, the [Machine parameters](#) (at least gearbox factor and feed constant) must also be set correctly!

9.8.2.1 Functional settings

In [C01216](#), various functional settings regarding behaviour in the case of a changeover to the "positioning" mode can be made in bit-coded form.

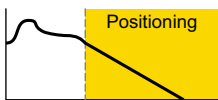
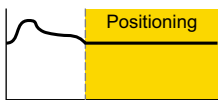
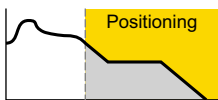
- ▶ When this is being done, any mode change must be taken into account.
- ▶ Positioning with controller inhibit/enable is also possible if the corresponding setting is made.

Function	
Bit 0	PosAbort at PosInit When a changeover to "positioning" mode is made, ramping down at the rate of deceleration set in C01251 for normal stopping is carried out.
Bit 1	PosExecute active at PosInit When a changeover is made to the "positioning" mode, the specified profile is immediately executed if the "MCK PosExecute" control bit has also been set. If the MCK "PosExecute" control bit has not been set, the setpoint is continued.
Bit 2	Reserved
Bit 3	Reserved
Bit 4	ProfilStart at PosInit When it is changed to the "Positioning" operating mode, the defined profile is executed immediately.
Bit 5	Reserved
Bit 6	Reserved
Bit 7	Reserved



Note!

In the case of multiple selection, the "PosAbort at PosInit" function, which can be activated by means of bit 0, has priority over the other functions (see the following truth table).

Bit 4 ProfilStart	Bit 1 PosExecute active	Bit 0 PosAbort	MCK control bit "PosExecute"	Behaviour when it is changed to "Positioning" operating mode
X	X	1	X	 Ramping down the setpoint
0	0	0	X	 Continuing the setpoint
0	1	0	0	
0	1	0	1	 Positioning from the setpoint
1	X	0	X	

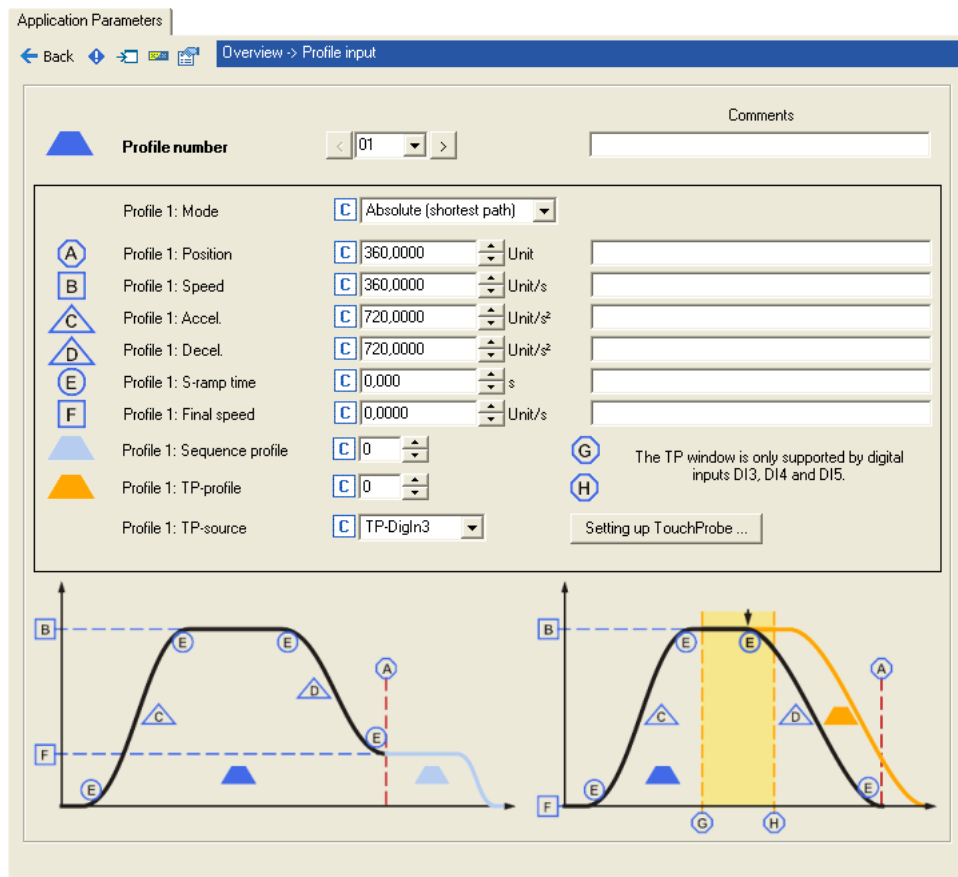
printed in bold = Lenze setting; x = any state

Related topics:

- ▶ [Stipulation of the profile to be executed](#) (📖 552)
- ▶ [Starting/cancelling a traversing task](#) (📖 553)

9.8.2.2 Profile entry

In the »Engineer«, the following parameterisation dialog is available for setting the profile parameters:



A profile is described by the following profile parameters:

Symbol	Profile parameter
	<p>(Standard) profile Profile data set (profile numbers 1 ... 15), in which the profile data are stored.</p>
	<p>Mode (C01300/1...15) Selection of the way in which positioning is to be carried out. Positioning modes (548)</p>
	<p>Position (C01301/1...15) Target position or distance to be traversed. When the position is indicated, a distinction is made between absolute position and relative position:</p> <ul style="list-style-type: none"> An absolute position always indicates the distance to the defined zero position: Absolute position = Target position <ul style="list-style-type: none"> A relative position indicates the distance to the starting position (current position): Relative position = Target position - Starting position

Symbol	Profile parameter
B	<p>Speed (C01302/1...15)</p> <p>Maximum speed at which the target is to be approached.</p> <ul style="list-style-type: none"> Depending on the profile parameters of position, acceleration and deceleration, it is possible that the drive will not even reach the maximum speed. In this case, the graphic representation will be a trapezium instead of a triangle:
	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> </div> <div style="flex: 1; padding-left: 10px;"> <ul style="list-style-type: none"> 1 Acceleration 2 Travelling speed (is not reached in this case) 3 Deceleration 4 Target position (or traversing distance) </div> </div>
C	<p>Acceleration (C01303/1...15)</p> <p>Stipulation of the change in speed at which maximum acceleration is to take place.</p> <ul style="list-style-type: none"> Two types of acceleration are distinguished: <ul style="list-style-type: none"> –Constant acceleration: the speed increases linearly. –Linearly increasing acceleration: Speed increases in S-shape. A linearly increasing acceleration (S-profile) results from the setting of an S-ramp time (see more below).
	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> </div> <div style="flex: 1; padding-left: 10px;"> <ul style="list-style-type: none"> 1 Constant acceleration (L-profile) 2 Linearly increasing acceleration (S-profile) </div> </div>
D	<p>Deceleration (C01304/1...15)</p> <p>Stipulation of the change in speed at which maximum deceleration to a standstill is to take place.</p>
E	<p>S-ramp time (C01305/1...15)</p> <p>Due to stipulation of an S-ramp time for a profile, the profile is executed with S-shaped ramps, i.e. acceleration and braking processes are initiated smoothly in order to reduce jerk and thus the stress on the drive components.</p> <ul style="list-style-type: none"> The acceleration/deceleration stipulated in the profile is not achieved until after the specified S-ramp time. This kind of acceleration/deceleration is needed for sensitive machine parts with a certain amount of play. The unavoidable consequence of the slower increase in acceleration in the case of the S profile is that the positioning time is longer compared to the L profile, which is more efficient in terms of time. <p>► S-ramp time for jerk limitation (550)</p>
	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> </div> <div style="flex: 1; padding-left: 10px;"> <ul style="list-style-type: none"> 1 Without jerk limitation (L profile) 2 With jerk limitation (S profile) </div> </div>

Symbol	Profile parameter
F	<p>Final speed (C01305/1...15)</p> <p>This specifies the speed at which the drive is to start the next profile after reaching the target position. With a final speed not equal to "0", "velocity changeover" or "overchange" is possible, i.e. when the target position is reached, a second positioning process is started immediately without the drive coming to a standstill at the first target position.</p> <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p style="font-size: small;">v [m/s]</p> <p style="font-size: small;">v_{pos}</p> <p style="font-size: small;">v_{end}</p> <p style="font-size: small;">t [s]</p> </div> <div style="flex: 0.5; padding-left: 10px;"> <p>❶ Target position</p> <p>❷ Final speed (in this case, not equal to "0")</p> </div> </div>
▲	<p>Sequence profile (C01307/1...15) for profile linkage/following block control</p> <p>A special feature is automatic advancing to subsequent profiles with and without velocity changeover. For this purpose, the profile number of the desired subsequent profile (1 to 15) is simply set in the parameter "Sequence profile" (C01307/1...15) of a profile.</p> <p>After execution of the profile (target position reached), the set following (subsequent) profile is started automatically. In this way, profile chains can be stipulated without additional control processes.</p> <ul style="list-style-type: none"> • If the profile parameter "Final speed" (C01305/1...15) is set to \neq "0", there is a velocity changeover leading into the following (subsequent) profile at the set final speed. • If "0" is set for the following (i.e. subsequent) profile, profile linkage does not take place. • This function can be performed in all positioning modes.
▲	<p>TP profile (C01308/1...15)</p> <p>Profile number of the profile (1 ... 15) that is to be executed after a touch probe has been detected.</p> <ul style="list-style-type: none"> • If "0" is set, there will be no profile stepping through touch probe. • Only relevant for positioning modes with touch-probe. <p>▶ Touch probe positioning (📖 549)</p>
	<p>TP source (C01309/1...15)</p> <p>Selection of the signal source for touch probe detection.</p> <ul style="list-style-type: none"> • Only relevant for positioning modes with touch-probe. <p>▶ Touch probe positioning (📖 549)</p>

9.8.2.3 Positioning modes

For positioning, it is possible to select from different positioning modes in relation to the type of axis/application. These modes are described in the following table.



Stop!

In the positioning modes "continuous" and "relative", the "TroubleQuickStop" error response occurs in the Lenze setting when the maximum travel distance is exceeded ([C01213/1](#)). ▶ [Monitoring of the maximum travel distance](#) (📖 512)



Note!

For absolute positioning, the home (reference) position must be known!

- If absolute positioning (positioning modes 1, 4, 5, 8, 11, 12) is started although the home position is not known:
 - The error message set in [C00595/8](#) is displayed (Lenze setting: "WarningLocked").
 - The error message "[Ck08: Home position unknown](#)" is entered into the logbook.

Positioning mode	Info
1 Absolute (shortest path)	Travelling along the axis takes place until an absolute position is reached via the shortest path. <ul style="list-style-type: none"> • Reference for the absolute position is the zero position.
8 Absolute (shortest path) to TP	
2 Continuous	In these two modes, no particular position is approached but travelling takes place at the traversing speed stipulated by means of the profile. <ul style="list-style-type: none"> • The values of the profile are used for accelerating and decelerating. • The direction of travel is determined by the sign of the traversing speed.
9 Continuous to TP	
3 Relative	The axis is traversed by a distance. <ul style="list-style-type: none"> • Reference for the distance is the target position of the previously executed profile.
10 Relative to TP	
Positioning modes for Modulo measuring system (rotary table application)	
▶ Activation of the modulo measuring system (📖 502)	
4 absolute (Cw)	<u>Clockwise</u> travelling along the axis takes place until an absolute position is reached. <ul style="list-style-type: none"> • Reference for the absolute position is the zero position. • The zero position of the axis can be exceeded in this direction.
11 Absolute (Cw) on TP	
5 absolute (Ccw)	<u>Counter-clockwise</u> travelling along the axis takes place until an absolute position is reached. <ul style="list-style-type: none"> • Reference for the absolute position is the zero position. • The zero position of the axis can be exceeded in this direction.
12 Absolute (Ccw) on TP	

9.8.2.4 Touch probe positioning

In case of a touch probe positioning, first the profile is executed according to the set profile parameters. If a touch probe is detected during the process, it is automatically changed to the profile defined in the "TP profile" profile parameter. This profile mode is also defined via the mode selection like in the following profile start processes.

If no valid TP profile is set, the travel request is aborted ("PosStop").

Preconditions for touch probe positioning

- ▶ The mode of the current profile data set contains the setting "to TP".
- ▶ For absolute positioning, the home (reference) position must be known.
- ▶ In the corresponding profile data set, the following profile parameters must be set in addition:
 - TP profile ([C1308/x](#))
 - TP source ([C1309/x](#))
- ▶ The touch probe interface is configured such that the selected TP source is enabled.
 - See chapter entitled "[Touch probe detection](#)". ([362](#))



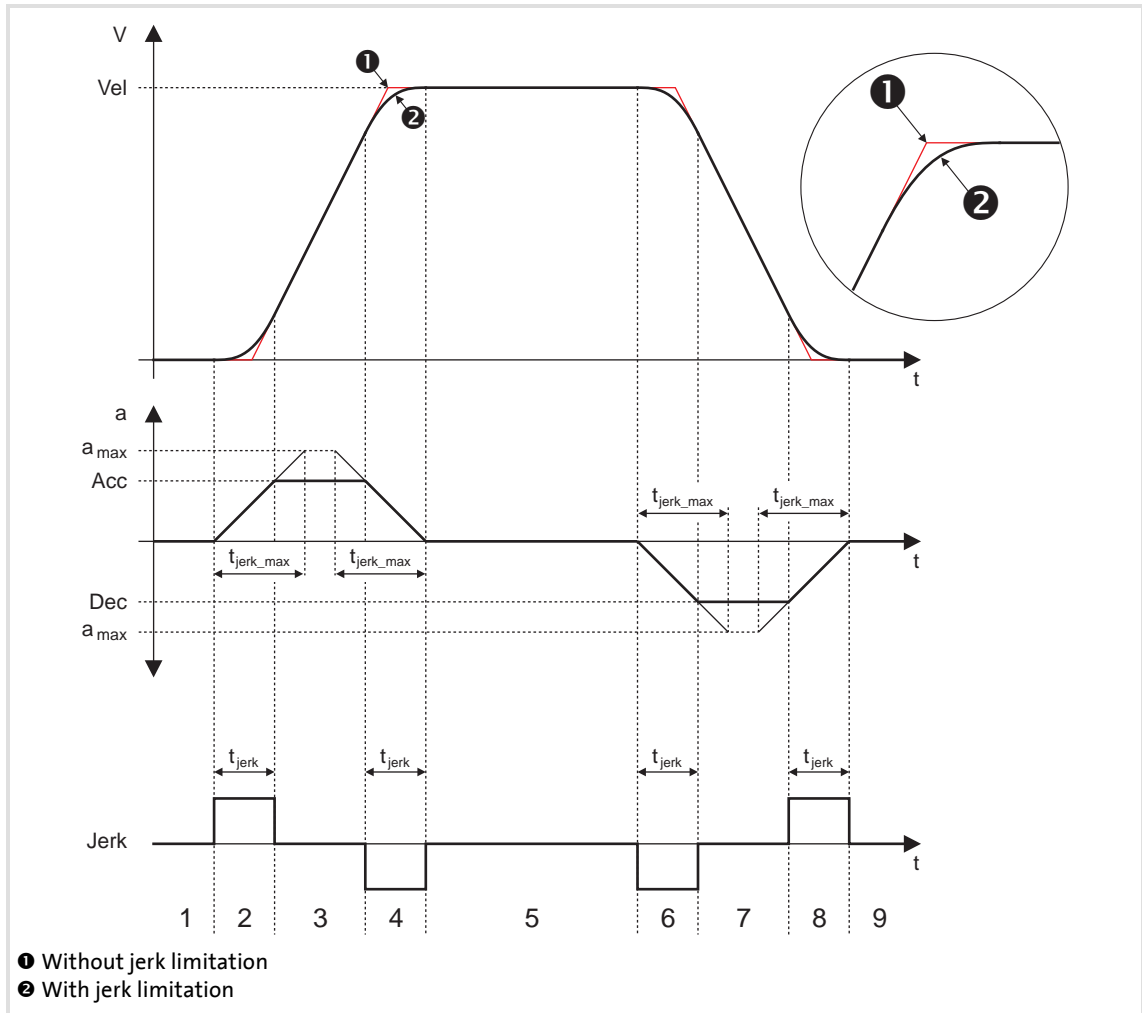
Note!

Go to [C02810/x](#) and select the edge, the digital input used for the connection of the touch-probe sensor is to respond. In the Lenze setting of [C02810/x](#), no touch probe is detected!

9.8.2.5 S-ramp time for jerk limitation

The maximum jerk is defined by the selection of an S-ramp time t_{jerk_max} , after which the max. acceleration (a_{max}) only is reached.

► The actual jerk time t_{jerk} is reduced according to the actual acceleration Acc:



- | | |
|---|---|
| 1. Standstill | 6. Deceleration with set jerk limitation |
| 2. Acceleration with set jerk limitation | 7. Deceleration according to deceleration profile (Dec) |
| 3. Acceleration according to acceleration profile (Acc) | 8. Reduce deceleration (jerk limitation) |
| 4. Reduce acceleration (jerk limitation) | 9. Standstill (position target reached) |
| 5. Traversing with Vel according to speed profile | |

**Note!**

If disproportionately high S-ramp times are set for low acceleration times, this may result in an incorrect profile generation.

Example: $v = 100 \text{ mm/s}$, $a = 1000 \text{ mm/s}^2$

→ $t_{\text{acc}} = 0.1 \text{ s}$

→ $t_{\text{jerk_max}} = 1 \text{ s}$

For this reason, you must only set plausible S-ramp times (this should not exceed half the value of t_{acc}).

9.8.3 Requesting the operating mode

Request for "positioning" mode by means of the [MCK control word](#):

MCK control word								
Bit 31	...			Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
					OpMode_Bit3	OpMode_Bit2	OpMode_Bit1	OpMode_Bit0
X	...	X	X	0	0	1	1	

X = Status not significant

If the **MCKInterface** is connected upstream to the **Motion Control Kernel** and if the operating mode is requested at the [L_MckCtrlInterface](#) FB, the *wOperationMode* and *bOperationMode_1...8* process inputs are available.

9.8.4 Carrying out positioning

9.8.4.1 Stipulation of the profile to be executed

The profile to be executed is stipulated by means of the [MCK control word](#) in bit-coded form:

Bit	Designation	Description	Profile							
			Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
24	ProfileNo_Bit0	Profile 0	0	0	0	0	0	0	0	0
...	...	Profile 1	0	0	0	0	0	0	0	1
31	ProfileNo_Bit7	Profile 2	0	0	0	0	0	0	1	0
								
		Profile 15	0	0	0	0	1	1	1	1

All other possible settings are reserved for future extensions!

If the **Motion Control Kernel** is downstream from the **MCKInterface**, the [L_MckCtrlInterface](#) FB provides the following processing inputs for stipulating the profile to be executed:

Identifier	Data type	Information/possible settings
wProfileNo	WORD	Selection of the profile number <ul style="list-style-type: none"> Optionally as a data word or binary coded.
bProfileNo_1	BOOL	<ul style="list-style-type: none"> In the Lenze setting, an operating mode change is carried out by the L_MckCtrlInterface FB at the same time as the profile is stipulated: <ul style="list-style-type: none"> -If profile 0 is stipulated: Activation of "Speed follower" operating mode -If profile 1 is stipulated: Activation of "Homing" operating mode -If profile 2 is stipulated: Activation of "Manual jog" operating mode -If profile 3 ... 15 is stipulated: Activation of "Positioning" operating mode The operating mode change with profile number can be set in C01298/1...4.
...		
bProfileNo_8		



Note!

The profile 0 is no valid profile for the "positioning" operating mode.

If a driving request with an invalid profile number is started, the response set in [C00595/12](#) occurs (Lenze setting: "WarningLocked").

9.8.4.2 Starting/cancelling a traversing task

Control is exercised by means of bits 16 ... 19 in the [MCK control word](#):

Homing	MCK control word			
	Bit 19	Bit 18	Bit 17	Bit 16
	PosStop	Pos DisableFollowProfile	PosFinishTarget	PosExecute
Start travelling	0	0	0	01
Complete interrupted profile	0	0	01	0
Do not travel sequence profile	0	1	X	X
Cancel travelling*	1	X	X	X

*From version 02.00.00, more travel requests will be inhibited ("PosExecute" will be blocked).

X = Status not significant

If the **Motion Control Kernel** is downstream from the **MCKInterface** in the circuit, the [L_MckCtrlInterface](#) FB provides the following process inputs for controlling the operating mode:

Identifier	Data type	Information/possible settings
bPosExecute	BOOL	Start travelling
		FALSE↗TRUE Execute selected profile
bPosExecuteFinish	BOOL	Complete interrupted profile
		FALSE↗TRUE A positioning process previously cancelled, e.g. by <i>bPosStop</i> or due to a device error, is resumed by travelling to the original target.
bPosDisableFollowProfile	BOOL	Do not execute following profile (switch off profile linkage)
		TRUE Evaluation of the sequence profile number parameterised in C01307/1...15 for the selected profile is suppressed.
bPosStop	BOOL	Cancel travelling
		TRUE Stop positioning From version 02.00.00, more travel requests will be inhibited ("PosExecute" will be blocked).



Tip!

Travel requests/profiles can also be started while the drive is running. The drive does not need to be at standstill.

Related topics:

- ▶ [Target position monitoring \(status "drive in target"\)](#) (📖 510)
- ▶ [Monitoring of the maximum travel distance](#) (📖 512)
- ▶ [Following error monitoring system](#) (📖 513)

9.8.4.3 Override of the parameterised positioning mode

The setting of the positioning mode in [MCK control word](#) superimposes the mode selection via the "Mode" profile parameter ([C1300/1...15](#)). This means that for selected profiles the mode selection and the request of a touch probe positioning via process data are possible. The value set in [C01300/1...15](#) is not overwritten. The following applies to the override:

- A. Valid positioning mode in the MCK control word:
The positioning mode set in the MCK control word is used.
- B. Positioning mode in the MCK control word = 0:
The positioning mode set in "mode" profile parameter ([C1300/1...15](#)) is used.
- C. Invalid positioning mode in the MCK control word:
Ck09Error message "Ck09: Invalid positioning mode". The response set in [C00595/9](#) occurs (Lenze setting: "WarningLocked").

Bit	Designation	Description	Bit 3	Bit 2	Bit 1	Bit 0
20	PosModeBit0	Positioning mode				
...	...	Positioning mode = setting in C01300/1...15	0	0	0	0
23	PosModeBit3	Absolute (shortest path)	0	0	0	1
		Continuous	0	0	1	0
		Relative	0	0	1	1
		absolute (Cw)	0	1	0	0
		absolute (Ccw)	0	1	0	1
		Absolute (shortest path) to TP	1	0	0	0
		Continuous to TP	1	0	0	1
		Relative to TP	1	0	1	0
		Absolute (Cw) on TP	1	0	1	1
		Absolute (Ccw) on TP	1	1	0	0
		All other possible settings are reserved for future extensions!				

If the **Motion Control Kernel** is downstream from the **MCKInterface** in the circuit, the [L_MckCtrlInterface](#) FB provides the following process input for stipulating an override of the positioning mode:

Identifier	Data type	Information/possible settings
wPosMode	WORD	Override of the positioning mode set in the profile data <ul style="list-style-type: none"> Only bit 0 ... bit 3 of wPosMode are evaluated.
		0 Positioning mode = setting in C01300/1...15
		1 Absolute (shortest path)
		2 Continuous
		3 Relative
		4 absolute (Cw)
		5 absolute (Ccw)
		8 Absolute (shortest path) to TP
		9 Continuous to TP
		10 Relative to TP
		11 Absolute (Cw) on TP
		12 Absolute (Ccw) on TP
All other possible settings are reserved for future extensions!		

9.8.4.4 Position teaching

The [MCK control word](#) can be used to initiate "teaching" or "latching" of the MCK setpoint position or the current position into the currently selected profile.

Bit	Designation	Description
14	PosTeachSetPos	"1" ≡ Teach MCK set position into the selected profile
15	PosTeachActPos	"1" ≡ Teach current position into the selected profile

If the **Motion Control Kernel** is downstream from the **MCKInterface**, the [L_MckCtrlInterface](#) FB provides the following process inputs for teaching:

Identifier	Data type	Information/possible settings
bPosTeachSetPos	BOOL	Teach MCK setpoint position
		TRUE Teach MCK setpoint position into the selected profile.
bPosTeachActPos	BOOL	Teach current position
		TRUE Teach current position into the selected profile.



Note!

If request is made at the same time, the current position is taught.

9.9 Stop

If the "normal stop" operating mode is active, the drive is brought to a standstill with a parameterisable deceleration ramp.

9.9.1 Parameter setting

Short overview of parameters for "Normal stop" operating mode:

Parameter	Info	Lenze setting	
		Value	Unit
C01251/1	Normal stop: Deceleration	720.0000	units/s ²
C01252/1	Stop: S-ramp time	0.000	s

9.9.2 Requesting the operating mode

Request for "Normal stop" operating mode by means of the [MCK control word](#):

MCK control word						
Bit 31	...	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			OpMode_Bit3	OpMode_Bit2	OpMode_Bit1	OpMode_Bit0
X	...	X	0	1	0	0

X = Status not significant

If the **MCKInterface** is connected upstream to the **Motion Control Kernel** and if the operating mode is requested at the [L_MckCtrlInterface](#) FB, the *wOperationMode* and *bOperationMode_1...8* process inputs are available.

9.10 Position follower

In the "position follower" operating mode, the drive follows a position setpoint.

9.10.1 Parameter setting

Short overview of parameters for "position follower" operating mode:

Parameter	Info	Lenze setting	
		Value	Unit
C01218	MCK: Pos follower setting	Bit coded	
C01236/1	PosFollower: Sync. speed	360.0000	units/s
C01237/1	Pos follower: Sync. accel.	720.0000	units/s ²
C01237/2	Pos follower: Sync. decel.	720.0000	units/s ²
C01238/1	Pos follower: Sync. S-ramp time	0.000	s
C01239	MCK: Interpolator cycle pos. follower	0.000	ms

9.10.1.1 Functional settings

In [C01218](#), various functional settings for the position follower can be made in bit-coded form.

Function	Lenze setting
Bit 0 Speed FF control.: <code>nSpeedSetValue_a</code>	Off
Bit 1 Speed FF control: <code>nSpeedAddValue_v</code>	Off
Bit 2 HW limit switch on	On
Bit 3 SW limit switch on	On
Bit 4 Reserved	Off
Bit 5 Reserved	Off
Bit 6 Reserved	Off
Bit 7 Position controller off	Off

Speed feedforward control by means of `nSpeedSetValue_a`

If this function has been activated by means of bit 0 in [C01218](#), the main setpoint `nSpeedSetValue_a` is used as the speed feedforward control value.

Speed feedforward control by means of `nSpeedAddValue_v`

If this function has been activated by means of bit 1 in [C01218](#), the additive speed value `nSpeedAddValue_v` is used as the speed feedforward control value.

HW limit switch on

If this function has been activated by means of bit 2 in [C01218](#), travel range monitoring by means of hardware limit switches is active in this mode.

▶ [Limit position monitoring](#) (□ 506)

SW limit switch on

If this function has been activated by means of bit 3 in [C01218](#), travel range monitoring by means of parameterised software limit positions is active in this mode.

▶ [Limit position monitoring](#) (📖 506)

Position controller off

If this function is activated via bit 7 in [C01218](#), the position controller is deactivated in this operating mode. Hence, following error control is switched-off.

9.10.2 Requesting the operating mode

Requesting the "position follower" operating mode by means of the [MCK control word](#):

MCK control word						
Bit 31	...	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
			OpMode_Bit3	OpMode_Bit2	OpMode_Bit1	OpMode_Bit0
X	...	X	0	1	0	1

X = Status not significant

If the **MCKInterface** is connected upstream to the **Motion Control Kernel** and if the operating mode is requested at the [L_MckCtrlInterface](#) FB, the *wOperationMode* and *bOperationMode_1...8* process inputs are available.

9.10.3 Setpoint selection

The absolute position setpoint is stipulated via the *dnPosSetValue_p* process input.



Note!

The *bPosCtrlOn* process input must be set to TRUE so that position/angle control is active within motor control.

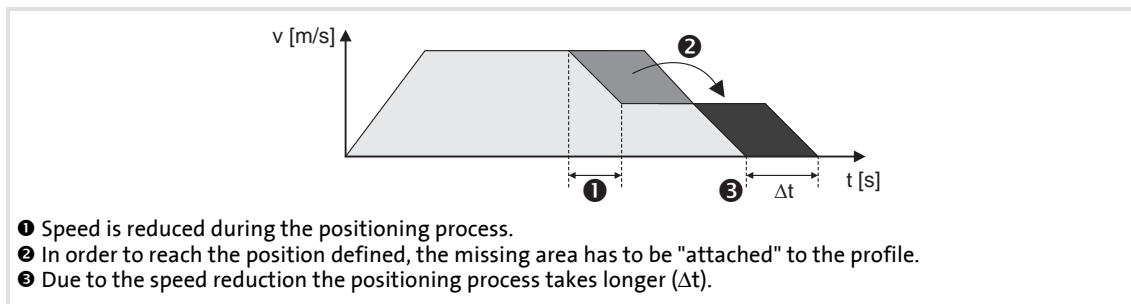
Compensating following errors

If the *bDeltaPosOn* process input is set to TRUE, a position difference (following error) is compensated for which is not internally generated from setpoint/actual positions but must be defined via the *dnDeltaPos_p* process input instead.

9.11 Override

An "Override" is the change of profile parameters and their acceptance during the positioning process.

- In this case the traversing profile has to be adapted accordingly, so that positioning is carried out exactly to the target position defined, even if for example a change in speed occurs during the positioning process ("Speed override"):



[9-27] Override (here: speed override)

- The override for speed, acceleration, and S-ramp time affects all motion profiles that are controlled by the internal profile generator:
 - Manual jog
 - Retracting from limit switches
 - Homing
 - Point-to-point positioning



Note!

The online change of speed and acceleration is in effect from the start of the profile until the deceleration phase begins. Changing the deceleration phase by means of an override is therefore not possible!

- In the case of an override value of 0 % for the speed, the drive is brought to a standstill.
- In the case of an override value of 0 % for the acceleration, acceleration does not take place any longer.

The acceleration override also has the same effect on the deceleration ramp to the same extent specified, but only until the deceleration phase is initiated.

The override has no impact on:

- The "speed follower" operating mode
- Synchronising processes
- Setpoint controls via external setpoints
- Abort via input *bPosStop*
- Speed setpoint selection in case of error (e. g. "Fail-QSP")

9.11.1 Speed override

Activating override

If control bit 11 (*EnableSpeedOverride*) has been set to "1" in the [MCK control word](#), a speed override is carried out in accordance with the stipulated override value.

If the **Motion Control Kernel** is downstream from the **MCKInterface** in the circuit, the [L MckCtrlInterface](#) provides the following process input for activating the speed override:

Identifier	Data type	Information/possible settings
bEnableVelOverride	BOOL	Speed override
		TRUE Activate speed override

Stipulate override value

The override value is selected via the *nSpeedOverride_a* input at the [SB LS MotionControlKernel](#). The override value is a percentage of the speed of the current profile.

Identifier	Data type	Information/possible settings
nSpeedOverride_a	INT	Value for speed override
		<ul style="list-style-type: none"> Percentage multiplier (0 ... 199.99 %) for the currently active speed. 16384 ≙ 100 % of the maximum traversing speed (display in C01211/1). If the override value is 0 %, the drive is brought to a standstill.

Deactivate override

If control bit 11 (*EnableSpeedOverride*) is reset to "0", travelling takes place at the speeds that have been specified by means of the profile parameters. Acceleration/deceleration from the speed defined with override to the speed set in the profile takes places immediately in this case.

Deactivating the override within the braking/deceleration ramp does not have any effect.

9.11.2 Acceleration override

Activating override

If control bit 12 (*EnableAccOverride*) in the [MCK control word](#) has been set to "1", an acceleration override takes place in accordance with the stipulated override value.

If the **Motion Control Kernel** is downstream from the **MCKInterface** in the circuit, the [L MckCtrlInterface](#) FB provides the following process input for activating the acceleration override:

Identifier	Data type	Information/possible settings
bEnableAccOverride	BOOL	Acceleration override
		TRUE Activate acceleration override

Stipulate override value

The override value is stipulated via the *nAccOverride_a* input at the [LS MotionControlKernel](#) SB. The override value is a percentage of the maximum acceleration that has been set for the respective operating mode (referencing, manual jog, positioning etc.) in the corresponding profile parameter.

The acceleration override results in a deceleration override. Both ramps are evaluated by multiplication by the acceleration override until the deceleration process sets in.

Identifier	Data type	Information/possible settings
nAccOverride_a	INT	Value for acceleration override <ul style="list-style-type: none"> Percentage multiplier (0 ... 199.99 %) for the currently active acceleration. 16384 \equiv 100 % of the parameterised acceleration of the corresponding operating mode. If the override value is 0 %, acceleration ceases.

Deactivate override

If control bit 12 (*EnableAccOverride*) is reset to "0", travelling takes place at the acceleration rates specified by means of the profile parameters. "Ramping up" from the acceleration defined with override to the acceleration set in the profile takes place immediately in this case.

9.11.3 S-ramp smoothing override

Activating override

If control bit 13 (*EnableSRampOverride*) in the [MCK control word](#) is set to "1", S-ramp smoothing override is executed according to the selected override value.

If the **Motion Control Kernel** is downstream from the **MCKInterface** in the circuit, the [L MckCtrlInterface](#) FB provides the following process input for activating the S-ramp smoothing override:

Identifier	Data type	Information/possible settings
bEnableSRampOverride	BOOL	S-ramp smoothing override
		TRUE Activate S-ramp smoothing override

Stipulate override value

Optional stipulation of the override value is carried out via the *nSRampOverride_a* input at the [LS MotionControlKernel](#) SB. The override value is a percentage of the S-ramp time set in the profile data.



Note!

If the *nSRampOverride_a* input remains unconnected or if an override value of "0 %" is selected, activation of the S-ramp override causes deactivation of the S-ramp time.

- Deactivation of the S-ramp time before the start of a profile with S-ramp time causes linear ramp generation.
- Deactivation of the S-ramp time during a traversing process, however, is not accepted immediately in the profile generator, but the profile generator checks automatically when an online change of the ramp form can be carried out and then initiates it automatically.



Tip!

Thus it is possible to start a travel profile with S-ramp time and then deactivate the S-ramp time, e.g. to traverse with a linear characteristic after reaching the profile speed.

Identifier	Data type	Information/possible settings
nSRampOverride_a	INT	Value for S-ramp smoothing override <ul style="list-style-type: none"> • Percentage multiplier (0 ... 100 %) for the currently active acceleration. • 16384 ≙ 100 % of the parameterised S-ramp time (C01306/1...15). • Values > 16384 are ignored.

Deactivate override

If control bit 13 (*EnableSRampOverride*) is reset to "0", the S-ramp time specified by means of the profile parameters is used for profile generation.

9.12 Holding brake control

This basic function is used for low-wear control of a holding brake.



Danger!

Please note that the holding brake is an important element of the safety concept of the entire machine.

Thus, proceed very carefully when commissioning this system part!



Stop!

Holding brakes on Lenze motors are not intended for braking during operation. The increased wear caused by braking during operation can destroy the motor holding brake!



Note!

- **Deactivate automatic DC-injection braking when a holding brake is used!**
 - For this purpose, go to [C00019](#) and set the [Auto DCB](#) threshold to "0".
 - Background: Controller inhibit is already activated by the holding brake control.
- If an electrically holding (self-releasing) brake is to be controlled instead of an electrically released (self-holding) brake, the trigger signal must be inverted!
 - ▶ [Functional settings](#) (p. 569)
- Detailed information on mounting and electrical installation of the motor holding brake can be found in the documentation on the motor holding brake.

Intended use

Motor holding brakes are used to lock axes if the controller is inhibited or in case of "mains off" system status. This is not only important for vertical axes but also for e.g. horizontal axes which may cause various problems if the motion is not controlled.

Examples:

- ▶ Loss of the reference information after mains OFF and further spinning of the drive.
- ▶ Collision with other moving machine parts.

9.12.1 Internal interfaces

In the function block editor, the [LS MotionControlKernel](#) system block provides the following internal interfaces for the basic function "holding brake control":

Inputs

Identifier	Data type	Information/possible settings
bBrkRelease	BOOL	Releasing/applying the brake in connection with the selected operating mode
		FALSE Apply brake. <ul style="list-style-type: none"> During automatic operation, the internal brake logic controls of the brake.
		TRUE Release brake manually (forced release). <ul style="list-style-type: none"> Note! The brake can also be released when the controller is inhibited! During automatic operation, the internal brake logic is deactivated and the brake is released (supervisor operation). If the brake control has inhibited the controller, this inhibit is deactivated again. In semi-automatic operation, the brake is released including feedforward control.
bBrkStartValue2	BOOL	Selection of the torque feedforward control value for manual specification of the feedforward control value <ul style="list-style-type: none"> Only effective if bit 4 in C02582 is set to "1". ▶ Feedforward control of the motor before release
		FALSE Starting value 1 (C02581/4) active.
		TRUE Starting value 2 (C02581/5) active.
nBrkAddValue_a	INT	Additive feedforward control value (speed or torque) in [%] for torque feedforward control when the respective control mode is started <ul style="list-style-type: none"> For speed control: 100 % ≙ reference speed (C00011) For torque control: 100 % ≙ maximum torque (C00057) ▶ Feedforward control of the motor before release
bBrkApplied	BOOL	Input for status detection via switching contacts at the brake <ul style="list-style-type: none"> Only effective if bit 5 in C02582 is set to "1".
		FALSE Brake is released.
		TRUE Brake is applied.

Outputs

Identifier	Data type	Value/meaning
bBrkReleaseOut	BOOL	Trigger signal for switching element holding brake control via a digital output <ul style="list-style-type: none"> Use bit 0 under C02582 to activate inverted switching element triggering. ▶ Functional settings
		FALSE Apply brake.
		TRUE Release brake.
bBrkReleased	BOOL	"Brake released" status signal considering the brake release time <ul style="list-style-type: none"> If the holding brake is triggered to be applied, <i>bBrkReleased</i> is immediately reset to FALSE even if the brake application time has not elapsed yet!
		TRUE Brake released (when the brake release time has elapsed).



Stop!

The digital outputs are not suitable for the "direct" control of a holding brake!

- Connect the digital output connected to the trigger signal *bBrkReleaseOut* with a relay or power contactor which switches the brake supply.
- When a power contactor is used, the response and release time of the earth contact is added to the response and release time of the brake. Both times must also be considered for parameterising the closing and opening time of the holding brake



Tip!

For direct triggering of a holding brake, the high current output of the 8400 TopLine controller can be used that can switch max. 2.5 A. For this purpose, connect the *bBrkReleaseOut* trigger signal to the *bOutHC* input of the SB [LS DigitalOutput](#).

9.12.2 Parameter setting



Danger!

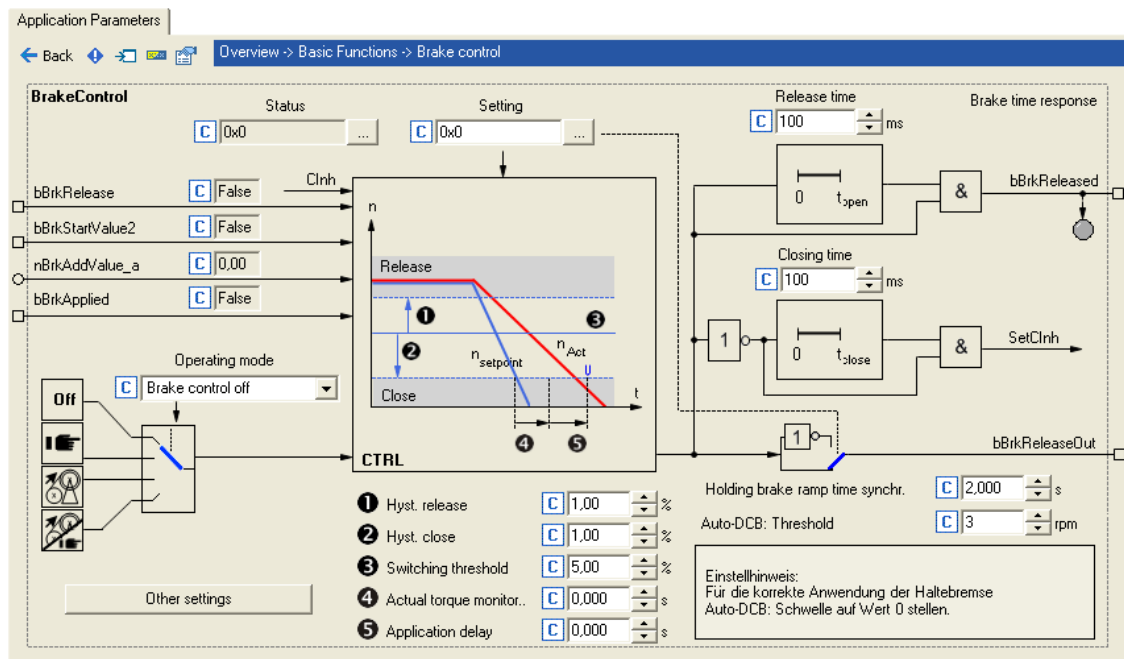
A faultless holding brake control function requires a correct setting of the different deceleration times in the following parameters!

A wrong setting of the delay times can cause a faulty control of the brake!



How to go to the parameterisation dialog of the holding brake control:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the "**Basic functions**" button.
4. Go to the *Overview* → *Basic functions* dialog box and click the **Holding brake control** button.



Short overview of parameters for the holding brake control:

Parameter	Info	Lenze setting	
		Value	Unit
C02580	Holding brake: Operating mode	0: Brake control off	
C02581/1	Holding brake: Switching threshold	5.00	%
C02581/2	Holding brake: Hysteresis for releasing	1.00	%
C02581/3	Holding brake: Hysteresis for applying	1.00	%
C02581/4	Holding brake: FF control starting value 1	0	%
C02581/5	Holding brake: FF control starting value 2	0	%
C02582	Holding brake: Setting	0	
C02589/1	Holding brake: Application time	100	ms
C02589/2	Holding brake: Release time	100	ms
C02589/3	Holding brake: Waiting time status	100	ms
C02589/4	Holding brake: Ramp FF control	0	ms
C02593/1	Holding brake: Actual value monitoring	0.000	ms
C02593/2	Holding brake: Application delay	0.000	ms
C02610/1	MCK: Holding brake ramp time synchron.	2.000	s
C02607	Holding brake: Status	-	
C00830/68	MCK: nBrkTorqueAdd_a	-	%
C00833/80	MCK: bBrkRelease	-	
C00833/81	MCK: bBrkStartTorqueDir	-	
C00833/82	MCK: bBrkApplied	-	

Highlighted in grey = display parameter

9.12.2.1 Operating mode

For different applications and tasks, different operating modes are available in [C02580](#). The selected operating mode determines whether the holding brake control is used and how the holding brake will be switched.

Mode 0: Brake control off

In this mode, brake control is switched off (not active).

- ▶ The trigger signal *bBrkReleaseOut* for the holding brake control switching element is set to FALSE.
- ▶ The status signal *bBrkReleased* is set to FALSE.



Note!

In the Lenze setting, the mode 0 is preset to get into a safe state after the mains is switched on.

Mode 11: Manual control

In this mode, brake release and brake application can be directly controlled via the input *bBrkReleaseBrake* without special logic or automatic.

- ▶ Setting pulse inhibit or controller inhibit has no influence on the trigger signal *bBrkReleaseOut* for the holding brake control switching element.
- ▶ After the brake has been activated and the brake application time has expired, the controller is inhibited automatically by the basic "Holding brake control" function.



Tip!

You can use mode 11 to easily check if the brake switches correctly.

Mode 12: Automatic control

In this mode, the brake is controlled automatically.



Danger!

In this mode, the input *bBrkReleaseBrake* should be permanently set to FALSE unless manual release (supervisor operation) is required.

If the *bBrkReleaseBrake* input is set to TRUE, the brake is released immediately, even if the controller is inhibited!

- ▶ If the requested speed setpoint reaches a parameterisable upper speed threshold that allows traversing of the drive, the brake will be released and operation enabled.
- ▶ On the other hand, if speed setpoint and actual speed fall below a parameterisable lower speed threshold, the brake will be applied under consideration of different time parameters.

- ▶ For operating modes with setpoint request via control signal (e.g. "PosExecute" in the [Positioning](#) operating mode), the speed thresholds do not apply. Here the control logic opens and closes the holding brake through internal commands in the **Motion Control Kernel**.
- ▶ The brake will also be activated automatically if quick stop is activated in the drive, e.g. by a device command or as response to an error, and in the event of controller inhibit or pulse inhibit.
- ▶ After automatic brake activation and elapse of the brake application time, the controller is inhibited automatically by the basic "Holding brake control" function.



Tip!

The 2/12 mode is the common mode to control the brake.

Modus 13: Semi-automatic control

In this mode, brake release and brake application can be directly controlled via the input *bBrkReleaseBrake* without special logic or automatic.

In contrast to the manual operation (mode 11)

- ▶ the feedforward control is active in this mode, preventing a sagging e.g. in case of a hoist.
- ▶ the brake in this mode also closes when the controller is inhibited in order to prevent the axis in a hoist from falling.

Related topics:

- ▶ [TroubleQSP](#) (📖 109)
- ▶ [Behaviour in case of pulse inhibit](#) (📖 578)

9.12.2.2 Functional settings

The following bit coded functional settings for the holding brake control can be made in [C02582](#):

Bit	Option	Info
Bit 0	bBrkReleaseOut invert.	Activation of inverted control <ul style="list-style-type: none"> "1" ≡ Inverted logic of trigger signal for holding brake control switching element
Bit 1	Horizontal brake protection	Brake response in case of pulse inhibit <ul style="list-style-type: none"> "1" ≡ In the case of a pulse inhibit, the actual speed value is monitored which must reach the "Close" threshold value to cause the holding brake to be applied. Note: <ul style="list-style-type: none"> This function is only active if bit 3 (horizontal/winding technology) is set as well. The function is used in order that, when the controller is inhibited, the holding brake of a drive with horizontal traverse path does not wear out during rotation. With vertical motion (bit 3 = 0), this function is not active. Especially with hoists and activated pulse inhibit of the controller, an immediate application of the brake is essential for safety-related reasons!
Bit 2	with hoist inv. feedfwd. control	Direction of feedforward control with vertical/hoist technology: <ul style="list-style-type: none"> "0" ≡ Positive direction "1" ≡ Negative direction Note: Reversal (Ccw) is then considered.
Bit 3	Horizontal application	Direction of movement of the axis <ul style="list-style-type: none"> "0" ≡ The axis performs vertical movements. Gravitational acceleration causes movements. "1" ≡ The direction of the axis is horizontal or rotary. The gravitational acceleration does not cause any movement.
Bit 4	Feedforward control C2581	Selection of the feedforward control value <ul style="list-style-type: none"> "0" ≡ Automatic selection. <ul style="list-style-type: none"> –The torque saved at the last stop is used. "1" ≡ Manual selection. <ul style="list-style-type: none"> –bBrkStartValue = FALSE: The feedforward control value 1 set in C02581/4 is used. –bBrkStartValue = TRUE: The feedforward control value 2 set in C02581/5 is used.
Bit 5	Feedback monitoring	Activation of status monitoring <ul style="list-style-type: none"> "1" ≡ The bBrkApplied input for status detection of the brake (via a switching contact at the brake) is monitored after the waiting time set in C02589/3 has expired.
Bit 6	Sync ramp L_NSet_1 (from version 02.00.00)	Selection of the ramp time for the synchronisation process to setpoint speed after the brake opening time has elapsed Revised behaviour from version 02.00.00: <ul style="list-style-type: none"> "1" ≡ The ramp time of the effective acceleration of the ramp function generator (L_NSet_1) is used (Lenze setting). "0" ≡ As before, the ramp time set in C02610/1 is used. Note: The changeover can be dynamically both via the ramp parameter and via bit 6.
Bit 7	Reserved	

Related topics:

- ▶ [Behaviour in case of pulse inhibit](#) (📖 578)
- ▶ [Feedforward control of the motor before release](#) (📖 579)

9.12.2.3 Switching thresholds



Stop!

Do not set the lower speed threshold for brake application too high to prevent an excessive wear of the brake!



Note!

For the speed comparison, only the absolute motor speed value is considered, the direction of rotation is not taken into account.

Upper speed threshold for brake release:

Switching threshold ([C02581/1](#)) + hysteresis for release ([C02581/2](#))

Lower speed threshold for brake application:

Switching threshold ([C02581/1](#)) - hysteresis for application ([C02581/3](#))



Tip!

The lower speed threshold for brake application should be set to approximately 5 ... 20 % of the maximum speed to minimise the wear of the brake and provide for an optimum brake reaction by a low grinding of the brake.

Related topics:

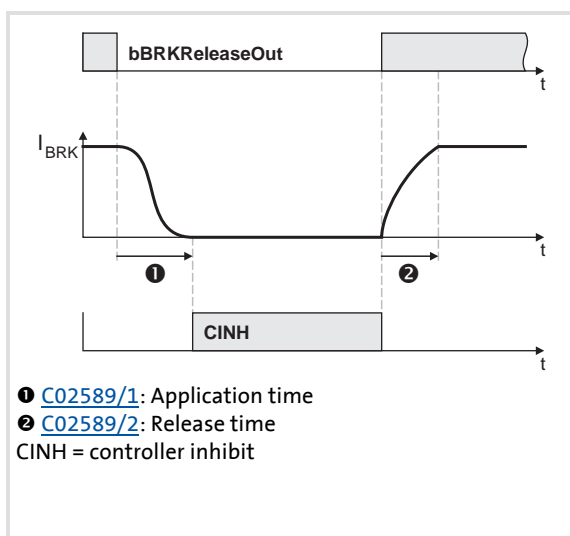
- ▶ [Process when brake is released](#) (📖 575)
- ▶ [Process when brake is closed](#) (📖 576)

9.12.2.4 Application and release time

**Danger!**

A wrong setting of the application and release time can cause a faulty control of the brake!

- If the application time is set too low, the controller is inhibited and the drive becomes torqueless before the brake is applied completely.



► Every mechanical holding brake comes with a construction-conditioned application and release time which must be considered by the holding brake control and is set in [C02589](#).

► The application and release time of the Lenze holding brake is indicated in the supplied operating instructions in the "Technical data" chapter.

► If the application and release times are too long, this is uncritical in respect of safety but leads to unnecessarily long delays during cyclical braking processes.

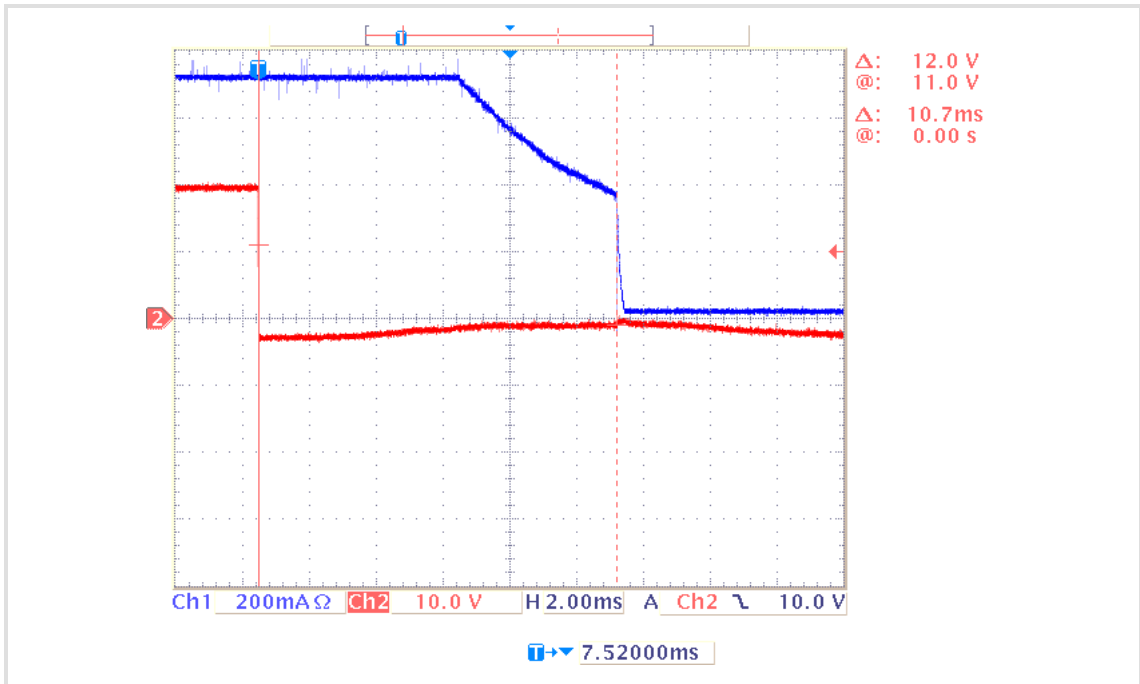
[9-28] Definition of the application and release time with the example of the PM brake

**Tip!**

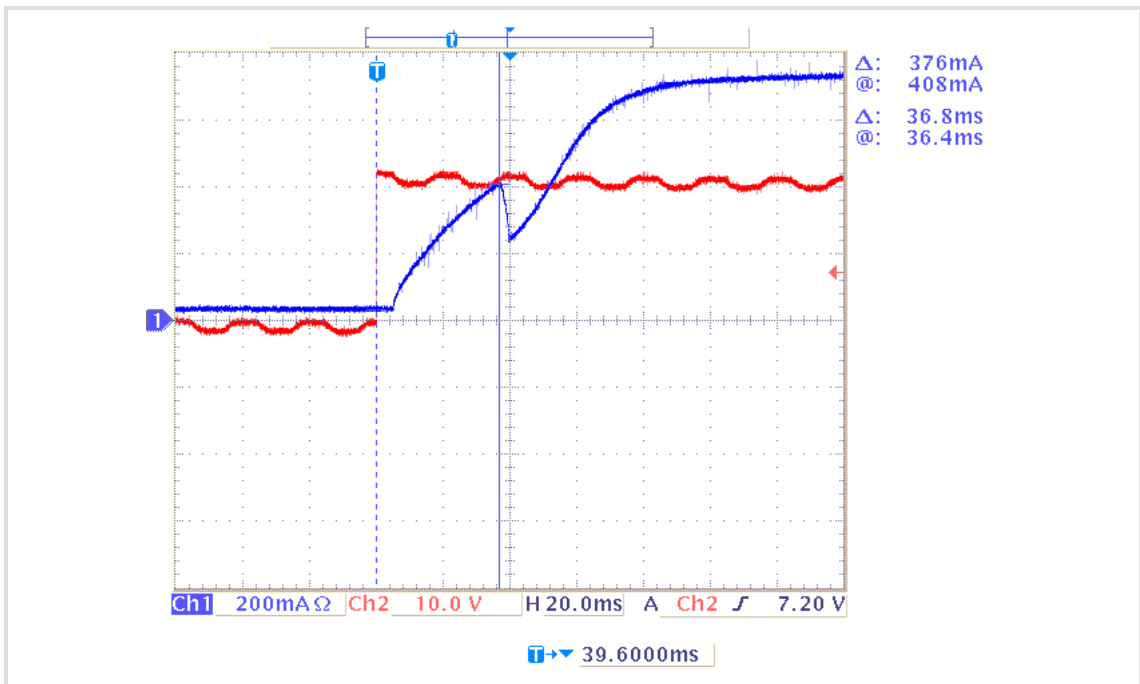
The application and release times do not only vary between the brake types but also depend on the basic conditions in the plant:

- Parameters of the hardware (cable length, temperature, level of supply voltage etc.)
- Contact elements used (brake module or contactor at the digital output)
- Type of overvoltage limitation/suppressor circuit

For optimisation purposes, detect in individual cases the response times by measurement.



[9-29] Oscillogram 1: Current characteristic when a mechanical holding brake is closed (application time: 10.7 ms)



[9-30] Oscillogram 2: Current characteristic when a mechanical holding brake is released (release time: 36.8 ms)

Related topics:

- ▶ [Process when brake is released](#) (📖 575)
- ▶ [Process when brake is closed](#) (📖 576)

9.12.2.5 Ramp time for approaching the setpoint speed

For the "[Speed follower](#)" operating mode, a ramp time can be set in [C02610/1](#) if the setpoint is already out of reach while the holding brake is initiating the feedforward control process.



Note!

The "[Homing](#)", "[Manual jog](#)", and "[Positioning](#)" operating modes are based on a different control/release process of the holding brake. In these operating modes, the [C02610/1](#) setting parameter does not have any effect!

Example:

A setpoint of 90 % is selected via the ramp function generator while the brake is applied (controller is inhibited).

1. At the set ramp (in most cases [C00012](#)), the ramp function generator ramps up to 90 %.
2. The brake identifies the setpoint selection of 5 % (release switching threshold). The feedforward control of the brake provides 3 % of the setpoint and will not report the release of the brake after approx. 1 s has expired.

Conclusion: 90 % of the selected setpoint is already ramped up while the brake is only providing 3 % of the setpoint via the feedforward control.

Since at this point a step change from 3 % to 90 % may cause mechanical jerks, the setpoint is ramped up from 3 % to 90 %, using the ramp time set in [C02610/1](#) (Lenze setting: 2 s).

Our example is based on the V/f characteristic control (VFCplus) operating mode since the servo control (SC) operating mode does not use the switching threshold for the application of the holding brake for speed feedforward control. However, ramping up to a setpoint that is out of reach is carried out for all motor control operating modes because there is always a mechanical/electric delay when controlling a holding brake.

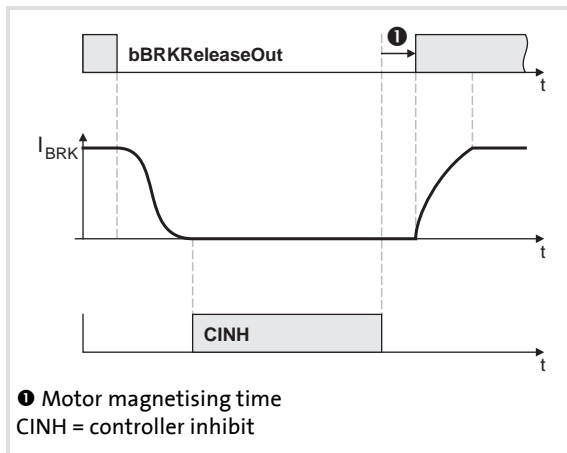
This delay is due to:

- ▶ Motor magnetisation (in the case of servo control only)
- ▶ Mechanical delay of all switching elements connected upstream to the holding brake
- ▶ Mechanical delay of the holding brake itself
- ▶ Generation of the holding torque by the motor

Related topics:

- ▶ [Process when brake is released](#) (□ 575)

9.12.2.6 Motor magnetising time (only with asynchronous motor)



- ▶ When an asynchronous motor is used, first the magnetic field required for the holding torque is created (which is already available when a synchronous motor is used) after the controller inhibit is deactivated.
- ▶ The motor is internally magnetised through internal feedforward control of the lower speed threshold. The release time set in [C02589/2](#) is considered here.

[9-31] Considering the motor magnetising time taking the PM brake as an example

Related topics:

- ▶ [Process when brake is released](#) (□ 575)

9.12.2.7 Actual value monitoring

If an actual value monitoring time > 0 s is selected in [C02593/1](#), the actual speed time monitoring is active.

- ▶ The monitoring time starts when the speed setpoint has reached the lower switching threshold and the actual speed is still above this threshold. (see illustration [\[9-34\]](#) in chapter "[Process when brake is closed](#)".)
- ▶ If the actual speed is still above the threshold when the monitoring time has expired, the brake will be automatically applied in the automatic brake control mode (mode 12).



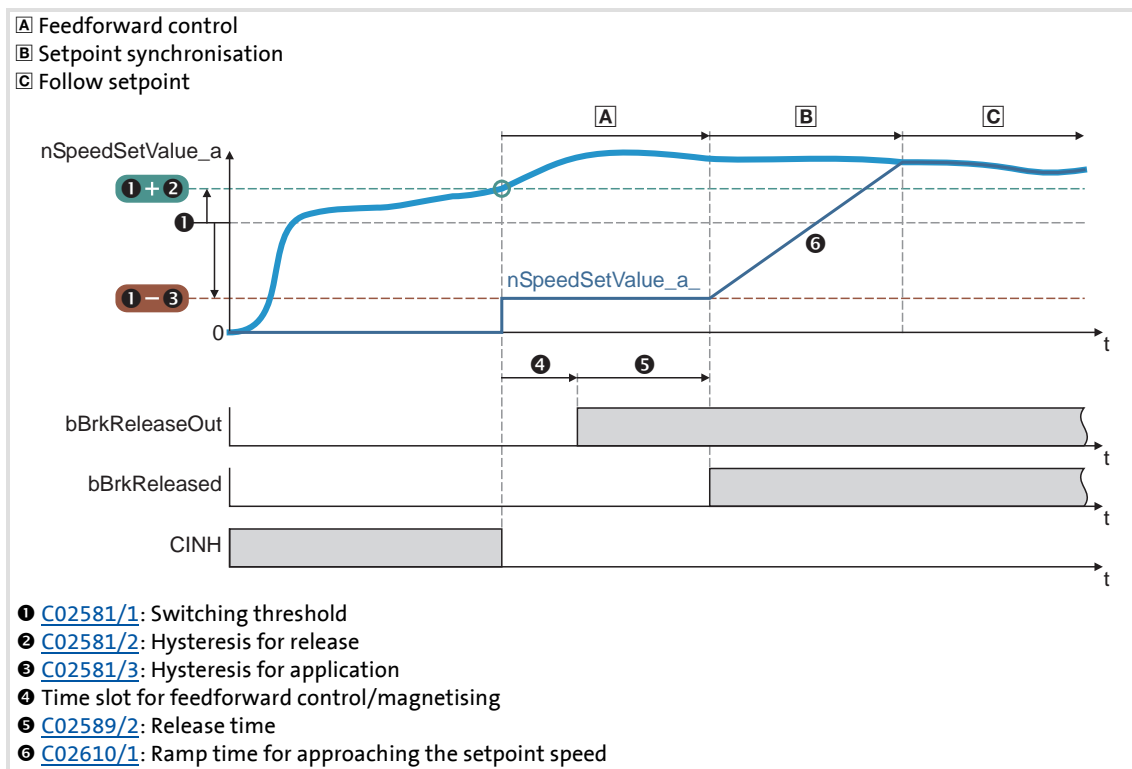
Note!

In the Lenze setting, the actual speed time monitoring is deactivated ([C02593/1](#) = "0 s"), i.e. the brake will only be applied when the actual speed has reached the lower switching threshold.

9.12.3 Process when brake is released

1. The controller inhibit is deactivated.
2. The magnetic field required for the holding torque is created in the motor (is already available when a synchronous machine is used).
3. The *bBrkReleaseOut* trigger signal for holding brake switching element is set to TRUE for releasing the brake.
4. After the brake opening time has elapsed:
 - The *bBrkReleased* status signal ("brake released") is set to TRUE.
 - In the "Speed follower" operating mode, the drive synchronises to the already accelerated speed setpoint.
 - In the operating modes with setpoint request via control signal (operating modes "Homing", "Manual jog" and "Positioning"), the ramping process starts after the brake release at 0.
5. After the waiting time set in [C02589/3](#) has additionally expired, the status monitoring starts again (if activated via bit 5 in [C02582](#)).

Time diagram



[9-32] Release holding brake in automatic mode via speed threshold

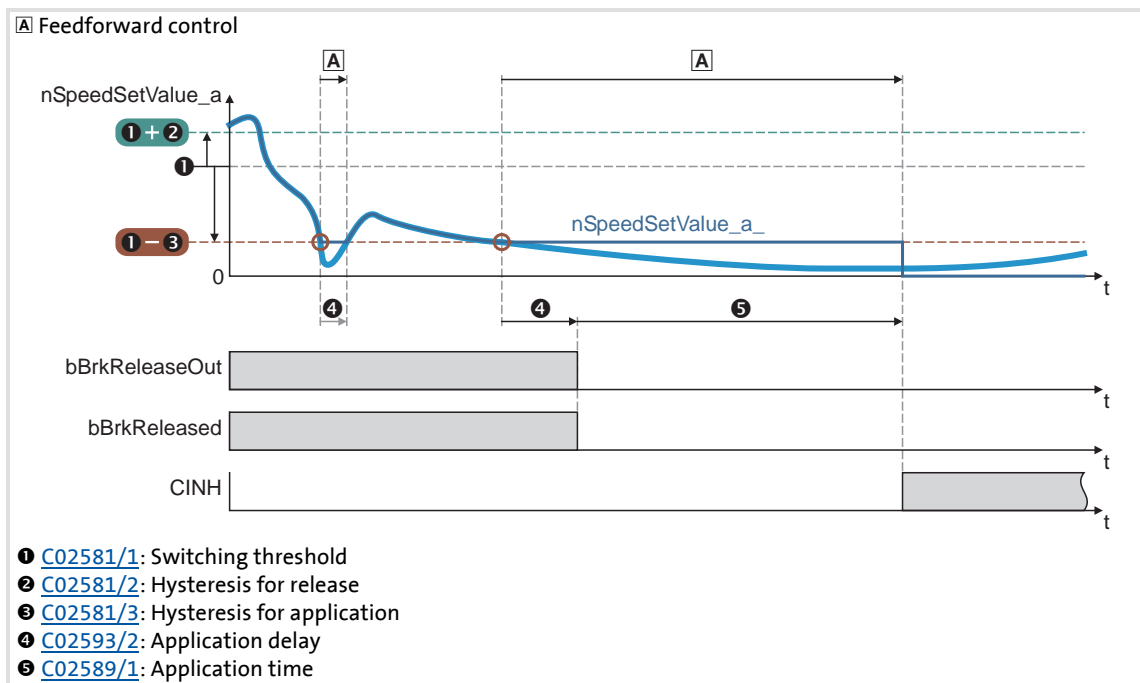
Related topics:

- ▶ [Feedforward control of the motor before release](#) (579)

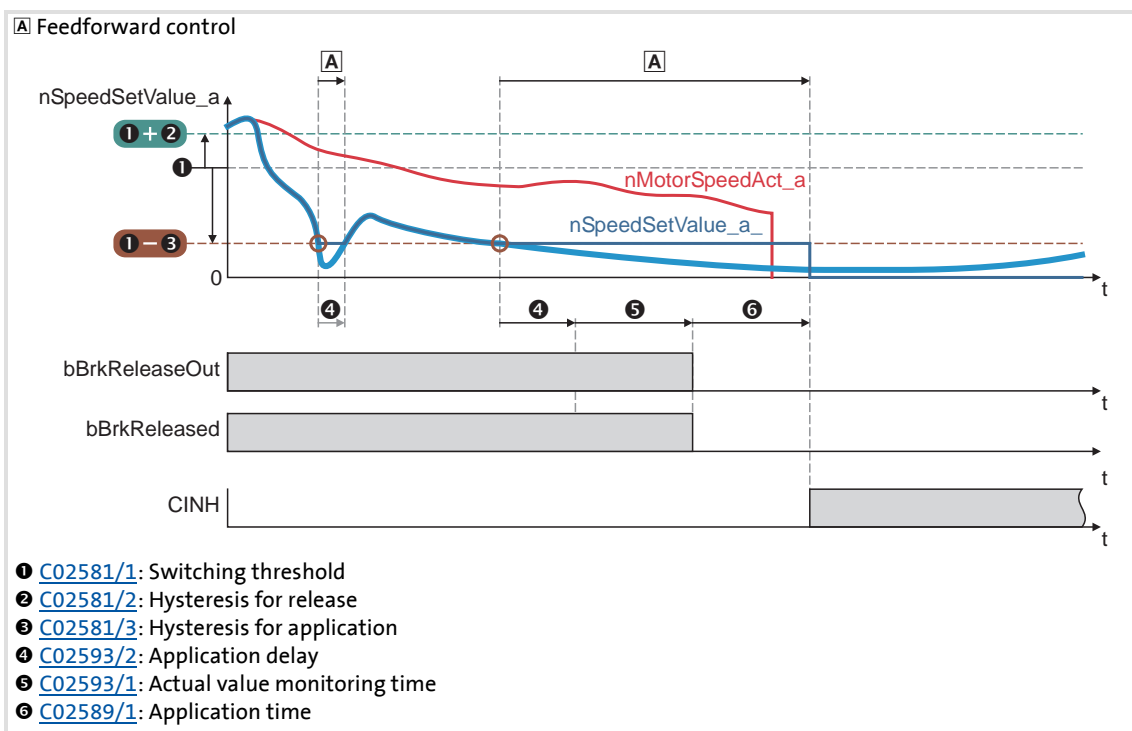
9.12.4 Process when brake is closed

1. The motor is decelerated when the setpoint is reduced by the user (e.g. turn down the potentiometer, setpoint selection via CAN).
 - The motor can also be decelerated by the "Quick stop" function or by "DC-injection braking", either directly requested by the user or as response to an error.
2. If the speed setpoint and the actual speed have fallen below the lower speed threshold or only the speed setpoint has fallen below the lower speed threshold and the actual value monitoring time has expired:
 - The *bBrkReleaseOut* trigger signal for the holding brake switching element is set to FALSE for closing the brake.
 - The *bBrkReleased* status signal is reset to FALSE.
 - In the operating modes with setpoint request via control signal (operating modes "[Homing](#)", "[Manual jog](#)" and "[Positioning](#)"), the brake closes depending on the internal state *bBusy* (setpoint generation through active profile generator) of the **Motion Control Kernel**.
 - The elapse of the brake application time starts.
3. After the brake application time has expired, the controller is inhibited.
4. After the waiting time set in [C02589/3](#) has additionally expired, the status monitoring starts again (if activated via bit 5 in [C02582](#)).
5. In order to prevent the drive from further rotating/accelerating in the event of an error of the feedback contact, controller inhibit is cancelled again and the drive is held at standstill in a speed-controlled manner.

Time diagrams



[9-33] Close holding brake in automatic mode via speed threshold (actual value = setpoint)



[9-34] Close holding brake in automatic mode with actual value monitoring time ([C02593/1](#) > 0 s)

9.12.5 Behaviour in case of pulse inhibit

Setting the pulse inhibit causes a load-controlled coasting of the motor until the pulse is enabled again. In the enabled controller, the pulse can be inhibited e.g. due to a DC overvoltage, DC undervoltage or the "Safe torque off" request.

The brake response to pulse inhibit can be parameterised under [C02582](#).



Stop!

For parameterising the response to pulse inhibit in [C02582](#), the energy conditions of the machine should be evaluated first.

The energy stored in the machine can be considerably higher than the permissible switching energy and thus lead to the destruction of the brake if applied directly!

Activate brake immediately when pulse is inhibited

If bit 1 is set to "0" in [C02582](#) (Lenze setting), the brake will be immediately applied when the pulse is inhibited to avoid damage to the mechanical components.

Especially in the case of hoist drives, immediate engagement of the brake is absolutely necessary for safety reasons if the pulse inhibit function of the drive controller has been activated!



Danger!

This behaviour is valid in (semi) automatic operation when the *bBrkRelease* input is set to FALSE.

When the *bBrkRelease* input is set to TRUE (supervisor operation) in automatic mode, the brake is not applied at pulse inhibit!

Only activate brake below threshold for brake activation

If bit 1 and bit 3 are set to "1" in [C02582](#), the brake remains released until the lower speed threshold is reached to avoid an excessive wear of the brake.

- ▶ The braking action only takes places due to the friction in the load mechanics.
- ▶ Only when the motor speed has reached the threshold for brake activation, the brake will be closed. Thus, the function depends on the signal of the speed encoder.

During uncritical operation (horizontal loading condition), delayed brake application may be required to protect the brake in case of high centrifugal masses.

In case of vertical motion (Bit 3 = 0), this function is not active due to safety-related reasons.

Related topics:

- ▶ [Functional settings](#) (📖 569)
- ▶ [Switching thresholds](#) (📖 570)

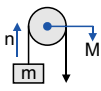
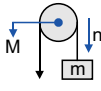
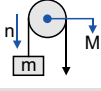
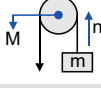
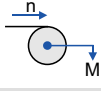
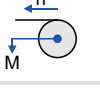
9.12.6 Feedforward control of the motor before release

The motor is precontrolled by selecting the lower speed threshold for applying the brake (control modes without feedback). When the upper speed threshold for brake release is reached, the motor is precontrolled with the for the release time set in [C02589](#) with the lower threshold value before the brake switches to the release mode.

The direction of the feedforward control depends on two conditions:

1. On the settings selected under [C02582](#):
 - Bit 2 = feedforward control inverted (for vertical drives/hoists)
 - Bit 3 = Direction of movement of the axis
2. On the sign of the setpoint.

Truth table for the direction of the feedforward control

Setpoint	Direction	Feedforward control	Scheme	Direction	
				Feedforward control value	Start value
$n \geq 0$	Vertical/hoist (C02582 : Bit 3 = 0)	not inverted (C02582 : Bit 2 = 0)		+	+
		inverted (C02582 : Bit 2 = 1)		-	+
$n < 0$	Vertical/hoist (C02582 : Bit 3 = 0)	not inverted (C02582 : Bit 2 = 0)		+	-
		inverted (C02582 : Bit 2 = 1)		-	-
$n \geq 0$	Horizontal/winding drive (C02582 : Bit 3 = 1)	Inversion via bit 2 with horizontal direction not effective		+	+
$n < 0$				-	-

Selection of the feedforward control value

The feedforward control value can be selected via bit 4 in [C02582](#):

- ▶ Bit 4 = 0: Automatic selection
 - The torque saved at the last stop is used.
- ▶ Bit 4 = 1: Manual selection
 - *bBrkStartValue* = FALSE: The feedforward control value 1 set in [C02581/4](#) is used.
 - *bBrkStartValue* = TRUE: The feedforward control value 2 set in [C02581/5](#) is used.

Additive torque

If the servo control (SC) operating mode has been selected, an additive torque value in [%] can be selected via the *nBrkTorqueAdd_a* input.

Related topics:

- ▶ [Functional settings](#) (📖 569)
- ▶ [Switching thresholds](#) (📖 570)

10 Diagnostics & error management

This chapter provides information on error handling, drive diagnostics, and fault analysis.

10.1 Basics on error handling in the controller

Many of the functions integrated into the controller can

- ▶ detect errors and thus protect the device from damage or overload, e.g. short-circuit detection, Ixt overload detection, overtemperature detection, etc.
- ▶ detect an operating error by the user, e.g. a missing memory module, a required or missing communication module, etc.
- ▶ output a warning signal if desired, e.g. if the speed is too high or too low, etc.

Depending on the importance, the error detection in the device responds very fast (e.g. short-circuit detection < 1 ms) or in a slower cycle (e.g. temperature monitoring approx. 100 ms).

All functions provided with an error detection (e.g. the motor control) supply information to a so-called error handler. The error handler is processed every 1 ms and evaluates all information.

In this evaluation, the so-called status determining error (display in [C00168](#)) and the current error (display in [C00170](#)) are generated, and the controller is caused to take the respective error status (e.g. TroubleQSP).

These two types of error information serve to diagnose errors systematically and contain the following information:

1. The error type (e.g. "Warning")
2. The error subject area (e.g. "CAN generally integrated")
3. The error ID within the error subject area

Together all types of information form the real error number which is unique in the whole device system. ▶ [Structure of the 32-bit error number \(bit coding\)](#) (📖 602)

In addition to the control of the device status by the error handler, a logbook function records the errors and their histories. ▶ [Logbook](#) (📖 590)

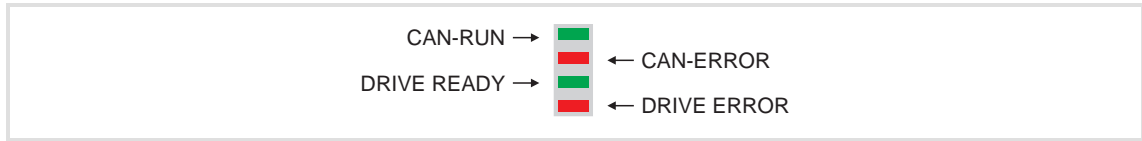


Tip!

For many device errors, the error type and hence the response of the controller to the error can be parameterised. ▶ [Setting the error response](#) (📖 597)

10.2 LED status displays

Information on some operating statuses can quickly be obtained via LED displays:



[10-1] LED display on the controller front panel

Labelling	Colour	Description	
CAN-RUN	green	CAN bus ok	▶ LED status displays for the system bus (□ 644)
CAN-ERR	red	CAN bus error	
DRIVE READY	green	Standard device ready for operation	▶ LED status displays of the device status (□ 583)
DRIVE ERROR	red	Warning/fault/error	



Note!

The four other LEDs have no function at present!

Related topics:

- ▶ [Device control \(DCTRL\) \(□ 89\)](#)
- ▶ [Device state machine and device statuses \(□ 101\)](#)
- ▶ [System bus "CAN on board" \(□ 638\)](#)

10.2.1 LED status displays of the device status

The control of the two "DRIVE READY" and "DRIVE ERROR" LED in the lower part on the front of the controller depends on the device status. ▶ [Device state machine and device statuses](#) (101)



[10-2] DRIVE READY and DRIVE ERROR LED status displays

The meaning can be seen from the table below:

DRIVE READY	DRIVE ERROR	Description	Device status (Display in C00137)
Off	Off	OFF or initialisation active	Init
	Off	Safe torque off is active	SafeTorqueOff
	Off	Device is ready to start	ReadyToSwitchOn
	Off	Device is switched on	SwitchedOn
	Off	Motor data identification/operation	OperationEnabled
		The controller is ready to switch on, switched on or the operation is enabled and a warning is indicated.	
		Fault active, quick stop	TroubleQSP
Off		Trouble is active	Trouble
Off		Fault is active	Fault
Off		System fault is active	SystemFault

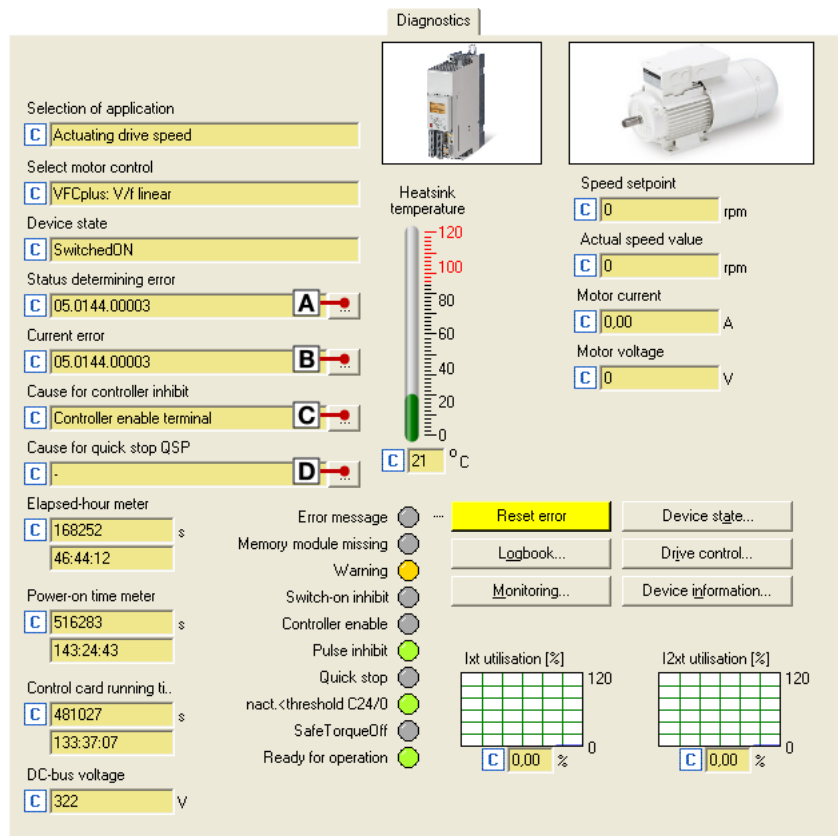
Legend

The symbols used for indicating the LED states have the following meaning:

	LED is flashing once approx. every 3 seconds (<i>slow flash</i>)
	LED is flashing once approx. every 1.25 seconds (<i>flash</i>)
	LED is flashing twice approx. every 1.25 seconds (<i>double flash</i>)
	LED is blinking every second
	LED is permanently on

10.3 Drive diagnostics with the »Engineer«


When an online connection to the controller has been established, the connected controller can be diagnosed and relevant actual controller states can be displayed in a clearly arranged visualisation using the »Engineer«:



Button	Function
	A Display details of the status determining error.
	B Display details of the current error.
	C Display all active sources of a controller inhibit.
	D Display all active sources of a quick stop.
Resetting an error	Acknowledge fault message (if the error cause has been eliminated).
Logbook...	Display the Logbook of the controller. (☞ 590)
Monitoring...	Configure the Monitoring . (☞ 595)
Device status...	Display the internal state machine including the current device status.
Drive control...	Display the bit assignment of the following control-related words: <ul style="list-style-type: none"> • MCI control word (C00136/1) • CAN control word (C00136/2) • Cause of controller inhibit (C00158) • Cause of quick stop (C00159) • Status word (C00150) • Status word 2 (C00155)
Device information...	Display identification data, e.g. firmware information or serial number of individual controller components.



How to diagnose a drive with the »Engineer«:

1. Select the 8400 TopLine controller in the *project view*.
2. Click the  icon or execute the **Online→Go online** command to establish an online connection to the controller.
3. Select the **Diagnostics** tab.
 - With an online connection, the **Diagnostics** tab displays current status information about the controller.



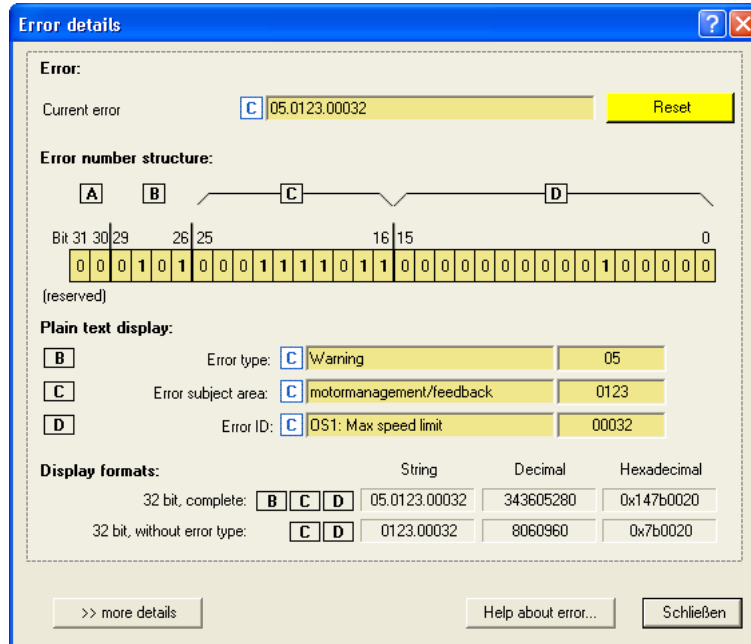
Tip!

The online connection to the controller can be established via the following device interfaces:

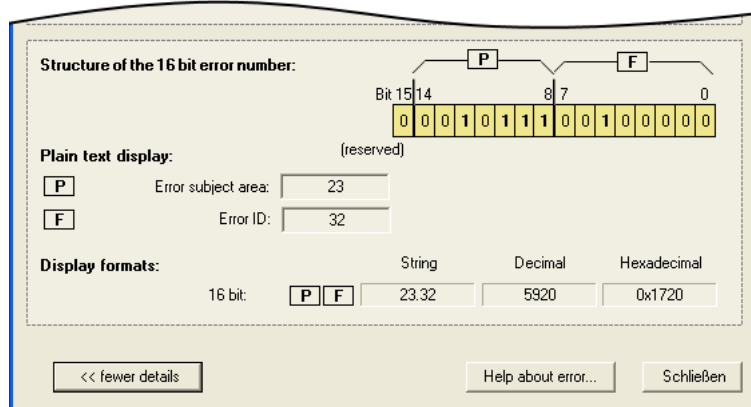
- CAN interface X1
Diagnostics via the [System bus "CAN on board"](#) (□ 638)
- X6 diagnostic interface
We recommend this diagnostic connection when the X1 CAN interface is used for process communication.

10.3.1 Display details of the status determining error.

If you go to the **Diagnostics** tab and click the **...** button for the status determining or current error, the *Error details* dialog box displays further information on the error:



- ▶ Click the **Help about error...** button to open the online help with information on the error cause and possible remedies.
- ▶ The **>> more details** button serves to provide more information about the structure of the 16-bit error number:

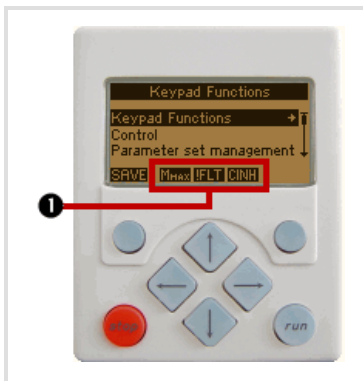


Related topics:

- ▶ [Structure of the 32-bit error number \(bit coding\)](#) (602)
- ▶ [Structure of the 16-bit error number \(bit coding\)](#) (605)

10.4 Drive diagnostics via keypad/bus system

Keypad display of the controller status



- When the keypad is connected to the diagnostic interface X6 at the front of the controller, the status of the controller is displayed via different symbols on the LCD display in the area ❶.

Symbol	Meaning	Note
RDY	Controller is switched on.	► SwitchedOn (📖 107)
RUN	Controller is enabled.	
QSP	Quick stop is active	
CINH	Controller is inhibited.	The power outputs are inhibited.
Mmax	Speed controller 1 in the limitation.	The drive is torque-controlled.
I_{max}	Set current limit has been exceeded in motor or generator mode.	
IMP	Pulse inhibit is active	The power outputs are inhibited.
I_{SFLT}	System fault is active	
IFLT	Fault	► Fault (📖 111)
ITRB	Trouble	► Trouble (📖 110)
ITQSP	TroubleQSP	► TroubleQSP (📖 109)
WRN	Warning is active	

Display parameters

The parameters listed in the following tables serve to query current states and actual values of the controller for diagnostic purposes, e.g. by using the keypad, a bus system or the »Engineer« (with an online connection to the controller).

- ▶ These parameters are listed in the »Engineer« parameter list and the keypad in the **Diagnostics** category.
- ▶ A detailed description of these parameters can be found in the chapter "[Parameter reference](#)" (□ 742).

Parameter	Display
C00051	MCTRL: Actual speed value
C00052	Motor voltage
C00053	DC-bus voltage
C00054	Motor current
C00056/1	Torque setpoint
C00056/2	Actual torque value
C00058	Output frequency
C00061	Heatsink temperature
C00064/1	Device utilisation (lxt)
C00064/2	Device utilisation (lxt) 15s
C00064/3	Device utilisation (lxt) 3 min
C00133	Brake resistor utilisation
C00136/1	MCI control word
C00136/2	CAN control word
C00137	Device status
C00138/1	SYS control signals
C00138/2	MCK control signals
C00138/3	FWM control signals
C00150	Status word
C00158	Cause of controller inhibit
C00159	Cause of quick stop QSP
C00165/1	Status determining error (displayed as a numeric text)
C00165/2	Current error (displayed as a numeric text)
C00168	Status determining error (display of 32-bit number)
C00170	Current error
C00166/1	Error type, status determining
C00166/2	Error subject area, status determining
C00166/3	Error ID, status determining
C00166/4	Error type, current
C00166/5	Error subject area, current
C00166/6	Error ID, current

Parameter	Display
C00177/1	Switching cycles mains switching
C00177/2	Switching cycles output relay
C00177/3	Stress counter - short circuit
C00177/4	Stress counter - earth fault
C00177/5	Stress meter clamp
C00178	Time the controller was enabled (elapsed-hour meter)
C00179	Power-up time (power-on time meter)
C00180/1	Running time - control card
C00180/2	Running time - heatsink fan
C00180/3	Running time - internal fan

Identification data

The parameters listed in the following table belong to the **Identification →Controller** category of the »Engineer« parameter list and the keypad and serve to display the identification data of the controller:

Parameter	Display
C00099	Firmware version (as a string)
C00100	Firmware version (divided into subitems)
C00200	Firmware product type
C00201/1...6	Firmware of the control card and the power section
C00203/1...9	Product type code of the individual device components
C00204/1...9	Serial numbers of the individual device components

10.5 Logbook

The integrated logbook function of the controller chronologically logs important events within the system and plays an important role for troubleshooting and controller diagnostics.

Events that can be logged

The following events can be logged in the logbook:

- ▶ [Error messages of the operating system](#) (☰ 602)
- ▶ Error messages generated by the application (via [LS_SetError](#))
- ▶ Loading/saving of parameter sets, loading of the Lenze setting (*in preparation*)
- ▶ Transmitting the firmware to the controller (*in preparation*)
- ▶ Switching the controller on/off

Information saved

For each event, the following information is saved in the logbook:

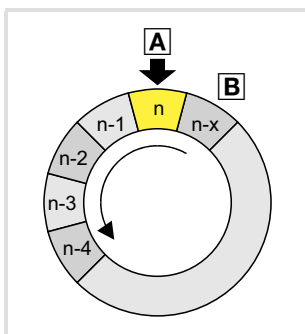
- ▶ Type of response to the event (e.g. fault, warning or information)
- ▶ Subject area that activated the event (e.g. CAN or USER).
- ▶ Event
- ▶ Value of power-on time meter
- ▶ Selected process values (analog % signals, binary signals)

Memory depth

Maximum number of logbook entries: 14 (*extension in preparation*)

10.5.1 Functional description

The structure of the logbook corresponds to a ring buffer:



- ▶ As long as free logbook memory locations are available, the entries will be saved to the next free memory location (A).
- ▶ If all memory locations are occupied, the oldest entry (B) will be deleted in favour of a new entry.
- ▶ The newest entries will always remain available.



Note!

In the event of a supply voltage failure, the logbook is saved and reloaded automatically when the controller is switched on. This ensures that the error history of the device does not get lost. For this reason it is very important to act with caution when deleting the logbook entries.

10.5.2 Filtering logbook entries

The logbook adds new entries to the ring buffer after they have been passed through a parameterisable filter. This filter helps you to exclude certain events from being entered into the logbook which would trigger a certain error response (fault, trouble, warning, information, etc.).

[C00169](#) (bit 1 ... bit 6) includes a bit coded specification of the events which are to be entered into the logbook. In the Lenze setting, all events are entered into the logbook.



Note!

Events with the "No response" setting are not entered into the logbook.

Counter for multiple entries

In order to prevent the ring buffer from overflowing with identical errors with frequent occurrence e.g. during commissioning, identical errors will not lead to new line entries in the configuration of the logbook in the Lenze setting. Instead, one counter will be counted up for this error.


- ▶ The time of the error is always the time of its first occurrence. Hence, a new logbook line will only be generated if a new error occurs.
- ▶ The error counter can be deactivated by resetting bit 9 in [C00169](#).

10.5.3 Reading out logbook entries

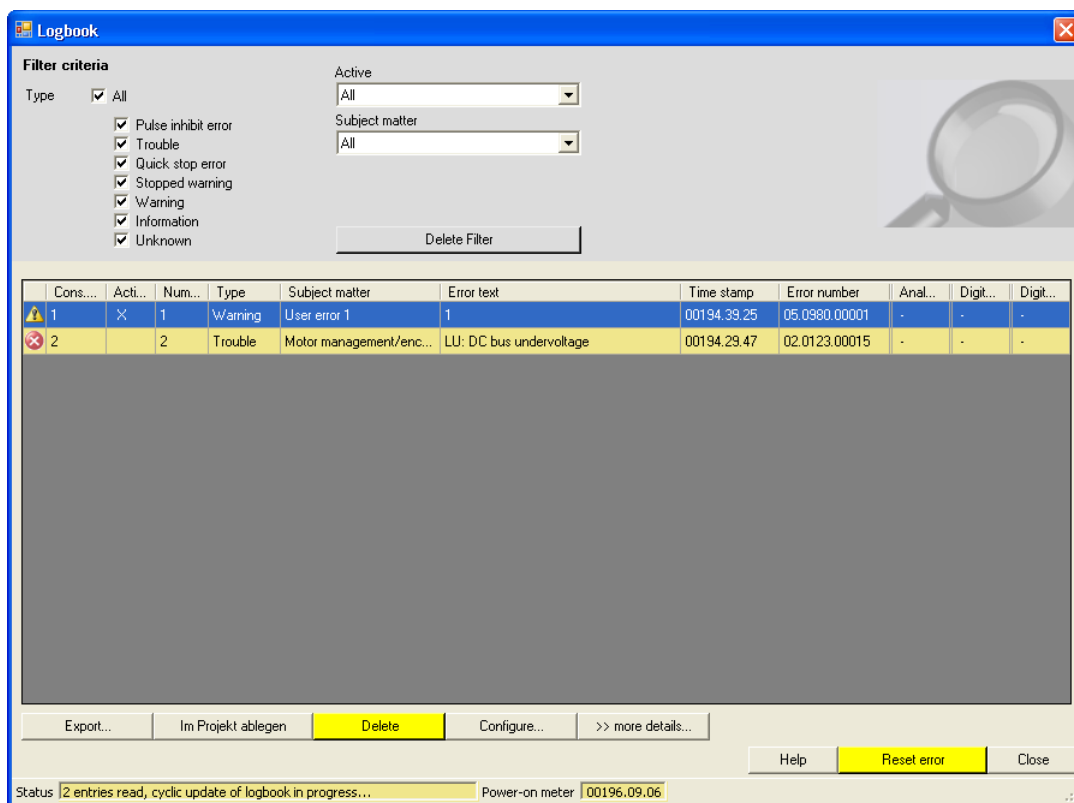
With an online connection, the existing logbook entries can easily be displayed in the »Engineer«. Alternatively, the logbook entries can also be read out via the corresponding parameters (e.g. using the keypad).



How to display logbook entries in the »Engineer«:

1. Select the 8400 TopLine controller in the *project view*.
2. Click the  icon or execute the **Online→Go online** command to establish an online connection to the controller.
3. Select the **Diagnostics** tab from the *Workspace*.
4. Click **Logbook**.

Example: Representation of the logbook in the »Engineer« V2.13



Button	Function
Reset filters	Reset set filter criteria to display all available logbook entries.
Export...	Export the entries available in the logbook into a *.log file. ▶ Exporting logbook entries to a file (593)
File in project	File the current logbook in the Engineer project to be able to access it offline, too. ▶ File logbook in project (594)
Delete	Delete all entries available in the logbook.
Configure...	Open parameterisation dialog for configuring the logbook.

Button	Function
>> more details	Show more details: <ul style="list-style-type: none"> Analog value 1, digital values 1 & 2 More output types of the error numbers (32-bit, internal 32-bit and internal 16-bit). Instead of the >> more details button, the << less details is now displayed via which the details can be hidden again.
Help	Open online help for the logbook.
Resetting an error	Acknowledge existing error message if the error cause has been eliminated and thus the error is not pending anymore. <ul style="list-style-type: none"> After the reset (acknowledgement) of the current error, further errors may be pending which must also be reset.
Close	Close the <i>Logbook</i> dialog box again.

10.5.4 Exporting logbook entries to a file



How to export the logbook entries to a file:

- Go to the *Logbook* dialog box and click the **Export...** button.
 - The *Export logbook* dialog box is displayed.
- Specify the folder, file name, and file type for the file.
- Click the **Save** button to export the logbook entries to the specified file.
 - Hidden logbook entries are not exported, i.e. the filter criteria specified are accounted for during the export.
 - The logbook entries are written to the file in the form of a semicolon separated list.

Structure of the semicolon separated list

The list includes the following information:

- | | |
|------------------|------------------------------|
| 1. Cons. no. | 9. Error number |
| 2. Active | 10. Source - analog value 1 |
| 3. Numerator | 11. Analog value 1 |
| 4. Type | 12. Source - digital value 1 |
| 5. Subject area | 13. Digital value 1 |
| 6. Error text | 14. Source - digital value 2 |
| 7. Time stamp | 15. Digital value 2 |
| 8. Relative time | |

10.5.5 File logbook in project

If you want to display the currently available logbook entries at a later date in offline mode, i.e. without a connection to the controller, you can file the current logbook in the project.



How to file the logbook in the project:

Go to the *Logbook* dialog box and click the **File in project** button.

- ▶ The logbook with all the entries uploaded up to now is filed in the Engineer project independent of the set filter criteria.
- ▶ A logbook of the same device already filed before will be overwritten without querying the user.
- ▶ The filter settings are not filed in the project.
- ▶ When a logbook is filed in the project, the logbook can also be opened in offline mode via the **Logbook** button on the **Diagnostics** tab.



Note!






Filing the logbook changes the project.

- When the project is closed, you are asked to save the changed project.
- Only if the changed project is saved, the new logbook entries filed in the project remain stored.

10.6 Monitoring

The controller is provided with various monitoring functions which protect the drive against impermissible operating conditions.

- ▶ If a monitoring function responds,
 - an entry will be made into the [Logbook](#) of the controller,
 - the response (TroubleQSP, Warning, Fault, etc.) set for this monitoring function will be triggered,
 - the status of the internal device control changes according to the selected response, controller inhibit is set, and the "DRIVE ERROR" LED on the front of the controller goes on:

Response	Entry in the logbook	Display in C00168	Pulse inhibit	Controller inhibit	Acknowledgement required	LED "DRIVE ERROR"
None						Off
Fault	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Trouble	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (after 0.5 s)		
TroubleQSP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
WarningLocked	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
Warning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Information	<input checked="" type="checkbox"/>					Off
System error	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mains switching is required!	

Related topics:

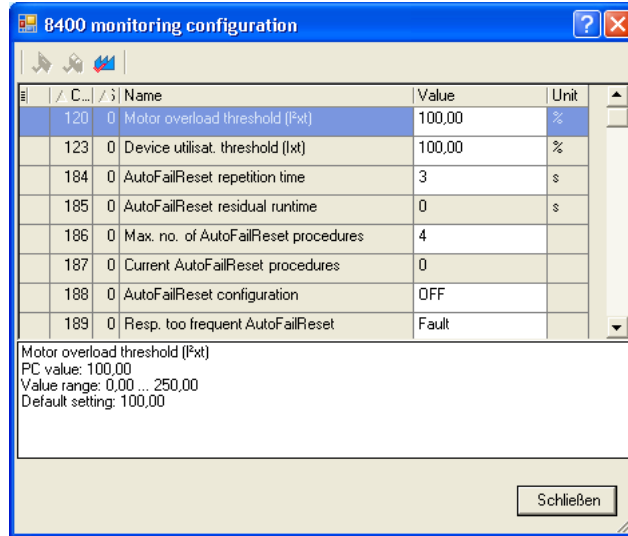
- ▶ [LED status displays of the device status](#) (📖 583)
- ▶ [Device state machine and device statuses](#) (📖 101)
- ▶ [Device overload monitoring \(lxt\)](#) (📖 275)
- ▶ [Motor load monitoring \(I2xt\)](#) (📖 276)
- ▶ [Motor temperature monitoring \(PTC\)](#) (📖 278)
- ▶ [Brake resistor monitoring \(I2xt\)](#) (📖 279)
- ▶ [Motor phase failure monitoring](#) (📖 281)
- ▶ [Mains phase failure monitoring](#) (📖 283)
- ▶ [Maximum current monitoring](#) (📖 283)
- ▶ [Maximum torque monitoring](#) (📖 284)
- ▶ [Resolver/multi-encoder open-circuit monitoring](#) (📖 320)
- ▶ [Open-circuit monitoring HTL encoder](#) (📖 322)
- ▶ [Motor temperature monitoring \(KTY\)](#) (📖 323)

10.6.1 Monitoring configuration



How to configure the monitoring functions using the »Engineer«:

1. Select the 8400 TopLine controller in the *project view*.
2. Select the **Diagnostics** tab from the *Workspace*.
3. Click the **Monitoring...** button.
 - The *8400 monitoring configuration* dialog box is displayed via which the desired settings can be made:



Related topics:

- ▶ [Setting the error response](#) (597)

10.6.2 Setting the error response

When a monitoring function responds, the response set for this monitoring function (TroubleQSP, Warning, Fault, etc.) will be triggered.

- For many monitoring functions the response can be individually parameterised via parameters.

C...	S	Name	Value	Unit
581	1	Resp. LS_SetError_1 bSetError1	0: No Reaction	

0: No Reaction
 1: Fault
 2: Trouble
 3: TroubleQuickStop
 4: WarningLocked
 5: Warning
 6: Information



Tip!

The table in chapter "[Short overview \(A-Z\)](#)" contains the error messages for which the response can be set. (📖 608)

Warning thresholds

Some of the monitoring functions are activated if a defined warning threshold (e.g. temperature) has been exceeded.

- The corresponding preset threshold values can be changed via the following parameters:

Parameter	Info
C00120	Setting of motor overload (I ² xt)
C00123	Device utilisat. threshold (Ixt)
C00572	Brake resistor overload threshold
C00599	Motor phase failure threshold

10.6.3 AutoFailReset function

The AutoFailReset function serves to automatically reset the latching "Fault" and "TroubleQSP" errors as well as the latching "WarningLocked" warning.

The "latching" term means that the effect on the controller remains active even after the error cause has been removed.

To reset latching errors and warnings, the following options are available:

- ▶ Manual reset
 - with device command [C00002/19](#) (activated by LOW/HIGH edge)
 - by a LOW/HIGH edge at the *bResetFail* input of the [LS DriveInterface](#) system block (the "FailReset" control bit in the control word must be parameterised with a value of "1").
- ▶ Automatic reset
 - using the AutoFailReset function.

Overview of the relevant parameters

Parameter	Info
C00184	Repetition time of the error reset processes
C00185	Time left until the next error reset process
C00186	Max. number of error reset processes
C00187	Current number of error reset processes carried out ineffectively
C00188	Configuration of the AutoFailReset function <ul style="list-style-type: none">• 0: Off• 1: Fault + TroubleQSP• 2: WarningLocked• 3: All locking
C00189	Response after max. number of error reset processes has been reached

Highlighted in grey = display parameter

10.7 Maloperation of the drive

Maloperation	Cause	Remedy
Motor does not rotate	DC-bus voltage is too low <ul style="list-style-type: none"> Red LED is blinking every 1 s Display in the keypad: LU 	Check mains voltage
	Controller is inhibited <ul style="list-style-type: none"> Green LED is blinking Display in the keypad: CINH 	Deactivate controller inhibit <ul style="list-style-type: none"> Note: Controller inhibit can be set via several sources ! C00158 displays all active sources for controller inhibit.
	Automatic start is inhibited (Bit 0 in C00142 = 1)	LOW/HIGH edge at RFR If required, correct starting condition with C00142
	DC-injection braking (DCB) is active	Deactivate DC injection brake
	Mechanical motor brake is not released	Release mechanical motor brake manually or electrically
	Quick stop (QSP) is active <ul style="list-style-type: none"> Display in the keypad: IMP 	Deactivate quick stop <ul style="list-style-type: none"> Note: Quick stop can be set via several sources! C00159 displays all active sources of quick stop.
	Setpoint = 0	Select setpoint
	JOG frequency = 0 at activated JOG setpoint	Set JOG setpoint in C00039/1...15
	Trouble is active	Clear fault
	With C00006 = 4 "SLVC: Vector control" has been set, but no motor parameter identification has been carried out.	Execute automatic motor parameter identification with the C00002/23 device command
Assignment of several mutually exclusive functions with a signal source in C00701	Correct configuration in C00701	
Motor rotates irregularly	Motor cable is defective	Check motor cable
	Maximum motor current in motor or generator mode is set too low	Adjust settings to the application: C00022 : I _{max} in motor mode C00023 : I _{max} in generator mode
	Motor is underexcited or overexcited	Check parameterisation: C00006 : Motor control C00015 : VFC: V/f base frequency C00016 : VFC: V _{min} boost
	Rated motor data (stator resistance, speed, current, frequency, voltage) and cos φ and/or magnetising inductance is not adapted to the motor data	Execute automatic motor parameter identification with the C00002/23 device command - or - Adjust motor parameters manually: C00084 : Motor stator resistance C00087 : Rated motor speed C00088 : Rated motor current C00089 : Rated motor frequency C00090 : Rated motor voltage C00091 : Motor cosine phi C00092 : Motor magnetising inductance
	Motor windings are wired incorrectly	Reverse from star connection to delta connection

Maloperation	Cause	Remedy
Motor consumes too much current	V_{\min} boost has been selected too high	Correct setting with C00016
	V/f base frequency has been selected too low	Correct setting with C00015
	Rated motor data (stator resistance, speed, current, frequency, voltage) and $\cos \varphi$ and/or magnetising inductance is not adapted to the motor data	Execute automatic motor parameter identification with the C00002/23 device command - or - Adjust motor parameters manually: C00084 : Motor stator resistance C00087 : Rated motor speed C00088 : Rated motor current C00089 : Rated motor frequency C00090 : Rated motor voltage C00091 : Motor cosine phi C00092 : Motor magnetising inductance
Motor parameter identification is aborted with error LP1	Motor is too small compared to the rated device power (>1 : 3)	Use device with lower rated power
	DC injection brake (DCB) is active via terminal	Deactivate DC injection brake
Drive behaviour with vector control is not satisfactory	different	Optimise or manually adapt vector control Execute automatic motor parameter identification with the C00002/23 device command
Torque dip in field weakening range or motor stalling when being operated in the field weakening range	Motor is overloaded	Check motor load
	Motor windings are wired incorrectly	Reverse from star connection to delta connection
	V/f reference point is set too high	Correct setting with C00015
	Override point of field weakening is set too low	Correct setting with C00080
Mains voltage is too low		Increase mains voltage
An asynchronous motor with feedback rotates without control and with too low speed	<p>Motor phases have been interchanged</p> <ul style="list-style-type: none"> • Thus the rotating field of the motor is not identical anymore with the rotating field of the feedback system. • Therefore, the drive shows the following behaviour if V/f characteristic control (C00006 = 7) is performed: <ul style="list-style-type: none"> – The motor rotates faster than the speed setpoint by the value set in C00074. – After the controller has been enabled, the controller will not stop if the speed setpoint = 0 or a quick stop (QSP) occurs. – Among other things, the final motor current depends on the value set for the V_{\min} boost and may rise up to I_{\max} which can trigger the "OC5: Ixt overload" fault message. 	Check the phase position of the motor cable If possible: Operate the motor with deactivated feedback (C00006 = 6) and check direction of rotation of the motor
Motor phase (LP1) monitoring does not respond if the motor phases are interrupted	Monitoring is not active (C00597 = 0)	Activate monitoring (C00597 = 1)

10.8 Operation without mains supply

The following display parameters have a value of "0" if the mains supply is switched off and the external 24 V supply of the controller is switched on:

Parameter	Info
C00050	MCTRL: Speed setpoint
C00051	MCTRL: Actual speed value
C00052	Motor voltage
C00053	DC-bus voltage
C00054	Motor current
C00058	Output frequency
C00061	Heatsink temperature
C00064/1...3	Device utilisation (Ixt)
C00066	Thermal motor load (I ² xt)
C00177	Switching cycles
C00725	Current switching frequency

10.9 Error messages of the operating system

This chapter describes all error messages of the controller operating system and possible causes & remedies.

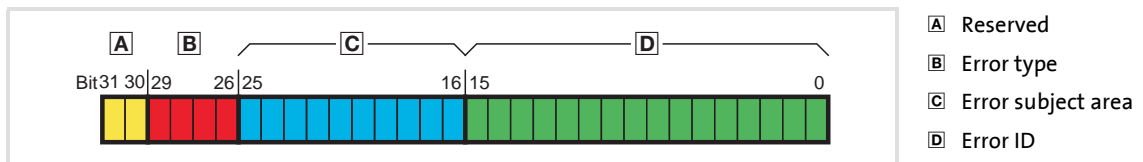


Tip!

Each error message is also saved to the logbook in chronological order. ▶ [Logbook](#) (590)

10.9.1 Structure of the 32-bit error number (bit coding)

If an error occurs in the controller, the internal fault memory saves a 32-bit value which contains the following information:



[10-3] Structure of the error number

- ▶ Display parameter: [C00168](#)
- ▶ For the sake of legibility, the error number in the logbook and in [C00165](#) is displayed with the following syntax:
[Error type].[Error subject area no.].[Error ID]

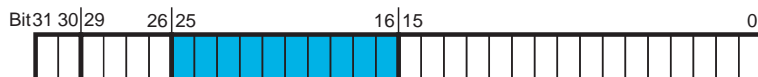
Error type



The error type gives information about the behaviour/response of the controller to the error. The error type for some device errors can also be parameterised.

Bit 29	Bit 28	Bit 27	Bit 26	Meaning
0	0	0	0	0: No response
0	0	0	1	1: Fault
0	0	1	0	2: Trouble
0	0	1	1	3: TroubleQSP
0	1	0	0	4: WarningLocked
0	1	0	1	5: Warning
0	1	1	0	6: Information

Error subject area



The error subject area indicates the internal "function unit" of the controller in which the error has occurred:

Error subject area		Assigned errors	Remedy possible by user?
No.	Name		
111	Supply voltage	Errors that occur in connection with the supply voltage of the device.	Yes
119	Temperature	Errors that occur for temperature reasons.	Yes
123	Motor management / encoder	Errors that occur within the motor control or encoder evaluation.	Yes
125	Analog I/O integrated	Errors that occur in connection with the analog inputs and outputs.	Yes
127	Extension module slot 1	Errors that are reported by the extension module, and communication errors to the plugged-in extension module.	Yes if it is a fieldbus error.
131	CAN integrated (general)	Errors related to general CAN functions.	Yes
135	CAN process data object (PDO)	Errors that are explicitly only related to the CAN-PDO (process data objects).	Yes
140	Device configuration	Errors that occur due to incompatibilities of the plugged-in individual components (fieldbus module, safety module, et al.).	Yes if the error relates to a module plugged-in by the user.
144	Parameter set	Errors that occur in connection with the parameter set or the parameter set memory (memory module).	Yes if the error relates to a missing or incompatible memory module.
145	Device firmware (internal error)	Internal error of the device firmware.	No
184	MotionControlKernel	Errors that occur within the MotionControl basic functions (e.g. profile generation, brake control, positioning).	Yes
400	Defective device hardware	Errors that occur due to defective device hardware.	No
444	Fieldbus	Errors that occur in connection with fieldbus communication.	Yes
980	User error 1	Errors generated by the user (by the application) via the LS_SetError_1 system block.	Yes
...	...		
983	User error 4		
984	User error 5	Errors generated by the user (by the application) via the LS_SetError_2 system block.	Yes
...	...		
987	User error 8		

Error ID

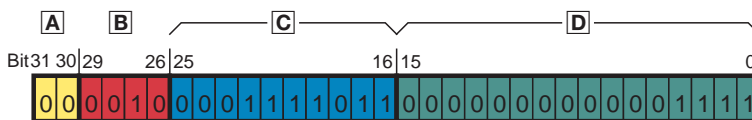


16-bit value (0 ... 65535) for error identification within the error subject area.

Example for bit coding of the error number

[C00168](#) displays an internal error number: "142278671".

- This decimal value corresponds to the following bit sequence:

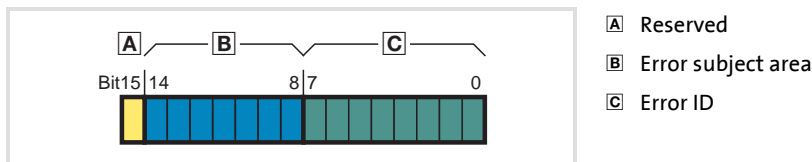


Assignment	Information	Meaning in the example
	Reserved	-
	Error type	2: Trouble
	Error subject area	123: Motor management / encoder
	Error ID	15: " LU: DC bus undervoltage "

- Thus, error number "142278671" means:
A DC bus undervoltage has been detected in the "Motor management / encoder" subject area. The error response is a "Fault" which must be unlocked separately after the error has been eliminated.

10.9.2 Structure of the 16-bit error number (bit coding)

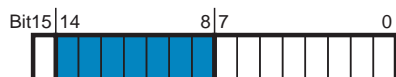
In addition to the 32-bit error number, a 16-bit error number is generated if an error occurs. It consists of the following information:



[10-4] Structure of the error number

- ▶ Display parameter: [C00160](#)
- ▶ For the sake of legibility, the 16-bit error number in the logbook is displayed with the following syntax::
[Error subject area no.].[Error ID]

Error subject area



The error subject area indicates the internal "function unit" of the controller in which the error has occurred.



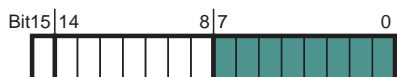
Note!

Due to the smaller value range (0 ...127), the number assignment to the error subject area differs from the 32-bit error number.

Error subject area		Assigned errors	Remedy possible by user?
No.	Name		
11	Supply voltage	Errors that occur in connection with the supply voltage of the device.	Yes
19	Temperature	Errors that occur for temperature reasons.	Yes
23	Motor management / encoder	Errors that occur within the motor control or encoder evaluation.	Yes
25	Analog I/O integrated	Errors that occur in connection with the analog inputs and outputs.	Yes
26	Defective device hardware	Errors that occur due to defective device hardware.	No
27	Extension module slot 1	Errors that are reported by the extension module, and communication errors to the plugged-in extension module.	Yes if it is a fieldbus error.
31	CAN integrated (general)	Errors related to general CAN functions.	Yes
35	CAN process data object (PDO)	Errors that are explicitly only related to the CAN-PDO (process data objects).	Yes
40	Device configuration	Errors that occur due to incompatibilities of the plugged-in individual components (fieldbus module, safety module, et al.).	Yes if the error relates to a module plugged-in by the user.
44	Parameter set	Errors that occur in connection with the parameter set or the parameter set memory (memory module).	Yes if the error relates to a missing or incompatible memory module.
45	Device firmware (internal error)	Internal error of the device firmware.	No
54	Fieldbus	Errors that occur in connection with fieldbus communication.	Yes
84	MotionControlKernel	Errors that occur within the MotionControl basic functions (e.g. profile generation, brake control, positioning).	Yes

Error subject area		Assigned errors	Remedy possible by user?
No.	Name		
100 ... 103	User error 1 ... User error 4	Errors generated by the user (by the application) via the LS_SetError_1 system block.	Yes
104 ... 107	User error 5 ... User error 8	Errors generated by the user (by the application) via the LS_SetError_2 system block.	Yes

Error ID



8-bit value (0 ... 255) for error identification within the error subject area.



Tip!

All possible 16-bit error numbers are listed in the table "[Short overview \(A-Z\)](#)" in the second column. [\(608\)](#)

10.9.3 Reset error messages

An error message with the response "Fault", "Trouble", "TroubleQSP" or "Warning locked" must be explicitly reset (acknowledged) after the cause of the error has been eliminated.



To reset (acknowledge) a pending error message, execute the device command [C00002/19](#) = "1".



Tip!

With an online connection to the controller, use the **Diagnostics** tab of the »Engineer« and click **Error reset** to reset a pending error message.

10.9.4 Export error texts

All error texts of the controller can be exported into a text file (*.txt) for further processing.

- ▶ The error text is preceded with the corresponding 32-bit and 16-bit error number (decimal).
- ▶ If there is no corresponding 16-bit error number for a 32-bit error number, the field remains empty.

Example

Output of the German and English error texts:

32-BitError	16-BitError	DE-de	EN-en
0	0	Kein Fehler	No error
111	11	Versorgungsspannung	Supply voltage
119 / 19			
12323		Motor management / encoder	
125	25	E/A integriert	I/O integrated
...			
26214416	6672	dH10: Lüfterausfall	dH10: Fan failure
26214505	6761	dH69: Abgleichdatenfehler	dH69: Adjustment fault



How to export the error texts into a text file:

1. Go to the *Project view* in the *context menu* of the 8400 TopLine controller and execute the **Export error texts...** command.
2. Define the following options in the *Export error texts* dialog box:
 - Output file and memory location
 - Languages to be exported (German/English/French)
 - Device/module to be exported
 - Separator (tabulator or semicolon)
 - Font (UTF8, standard font or ASCII)
3. Click **OK** to start the export.
 - After the export, a message appears indicating whether the export was successful.

10.9.5 Short overview (A-Z)

The table below contains all error messages of the controller operating system in alphabetical order.



Note!

For the sake of legibility, the [Logbook](#) and [C00165](#) display the 32-bit error number with the following syntax:

[Error type].[Error subject area no.].[Error ID]

In this documentation, "xx", a wildcard, stands for the error type since it is configurable for many error messages.



Tip!

If you click the cross-reference in the first column, "Error number", you will reach the detailed description of the respective error message in the following chapter, "[Cause & possible remedies](#)". (📖 611)

Error number			Error message	Response (Lenze setting)	can be set in	CAN Emergency Error Code
	32 bits	16 bits _{hex}				
xx.0125.00001	0x1901	6401	An01: AIN1_< 4 mA	TroubleQuickStop	C00598/1	0xF000
xx.0125.00002	0x1902	6402	An02: AIN2_< 4 mA	TroubleQuickStop	C00598/2	0xF000
xx.0131.00006	0x1f06	7942	CA06: CAN CRC error	No Reaction	C00592/1	0x8000
xx.0131.00007	0x1f07	7943	CA07: CAN Bus Warn	No Reaction	C00592/3	0x8000
xx.0131.00008	0x1f08	7944	CA08: CAN Bus Stopped	No Reaction	C00592/4	0x8000
xx.0131.00011	0x1f0b	7947	CA0b: CAN HeartBeatEvent	No Reaction	C00592/5	0x8130
xx.0131.00015	0x1f0f	7951	CA0F: CAN control word	Fault	C00594/1	0xF000
xx.0127.00002	0x1b02	6914	CE04: MCI communication error	No Reaction	C01501/1	0x7000
xx.0127.00015	0x1b0f	6927	CE0F: MCI control word	Fault	C00594/2	0xF000
xx.0135.00001	0x2301	8961	CE1: CAN RPDO1	No Reaction	C00593/1	0x8100
xx.0135.00002	0x2302	8962	CE2: CAN RPDO2	No Reaction	C00593/2	0x8100
xx.0135.00003	0x2303	8963	CE3: CAN RPDO3	No Reaction	C00593/3	0x8100
xx.0131.00000	0x1f00	7936	CE4: CAN Bus Off	No Reaction	C00592/2	0x8000
xx.0184.00001	0x5401	21505	Ck01: Pos. HW limit switch	TroubleQuickStop	C00595/1	0x8600
xx.0184.00002	0x5402	21506	Ck02: Neg. HW limit switch	TroubleQuickStop	C00595/2	0x8600
xx.0184.00007	0x5407	21511	Ck03: Pos. SW limit position	TroubleQuickStop	C00595/3	0x8600
xx.0184.00008	0x5408	21512	Ck04: Neg. SW limit position	TroubleQuickStop	C00595/4	0x8600
xx.0184.00153	0x5499	21657	Ck05: Error following error 1	Warning	C00595/5	0x8611
xx.0184.00154	0x549a	21658	Ck06: Following Error 2	Warning	C00595/6	0x8611
xx.0184.00155	0x549b	21659	Ck07: Travel range limit exceeded	TroubleQuickStop	C00595/7	0x8612
xx.0184.00156	0x549c	21660	Ck08: Home position unknown	WarningLocked	C00595/8	0x8612
xx.0184.08005	0x54cd	21709	Ck09: Positioning mode invalid	WarningLocked	C00595/9	0x8600
xx.0184.08007	0x54cf	21711	Ck10: Profile data implausible	WarningLocked	C00595/10	0x8600
xx.0184.08009	0x54d1	21713	Ck11: Operating mode invalid	Warning	C00595/11	0x8600
xx.0184.08014	0x54d6	21718	Ck12: Profile no. invalid	WarningLocked	C00595/12	0x8600
xx.0184.08015	0x54d7	21719	Ck13: Error FB MCKCtrlInterface	Warning	C00595/13	0x8600
xx.0184.00015	0x540f	21519	Ck14: Target position beyond SW limit position	WarningLocked	C00595/14	0x8600
xx.0184.00005	0x5405	21509	Ck15: Error status sign. brake	TroubleQuickStop	-	0x8600
xx.0184.00064	0x5440	21568	Ck16: Time overflow manual control	Fault	C00595/15	0x8600

Error number			Error message	Response (Lenze setting)	can be set in	CAN Emergency Error Code
	32 bits	16 bits _{hex}				
▶ xx.0140.00013	0x280d	10253	Cl01: Module missing/incompatible	No Reaction	C01501/2	0x7000
▶ xx.0135.00004	0x2304	8964	CP04: CAN RPDO4	No Reaction	C00593/4	0x8100
▶ xx.0145.00035	0x2d23	11555	dF10: AutoTrip Reset	Fault	C00189	0xF000
▶ xx.0145.00014	0x2d0e	11534	dF14: SW/HW invalid	Fault	-	
▶ xx.0145.00015	0x2d0f	11535	dF15: DCCOM CU2 error	Fault	-	
▶ xx.0145.00024	0x2d18	11544	dF18: BU RCOM error	Fault	-	0x6100
▶ xx.0145.00033	0x2d21	11553	dF21: BU Watchdog	Fault	-	0x6100
▶ xx.0145.00034	0x2d22	11554	dF22: CU watchdog	Fault	-	0x6100
▶ xx.0145.00025	0x2d19	11545	dF25: CU RCOM error	Fault	-	0x6100
▶ xx.0145.00026	0x2d1a	11546	dF26: Appl. watchdog	No Reaction	C00580/1	0x6200
▶ xx.0145.00050	0x2d32	11570	dF50: Retain error	Fault	-	0x6100
▶ xx.0145.00051	0x2d33	11571	dF51: CuCcr error	Fault	-	0x6100
▶ xx.0145.00052	0x2d34	11572	dF52: BuCcr error	Fault	-	0x6100
▶ xx.0400.00009	0x1a09	6665	dH09: EEPROM power section	Fault	-	0x5530
▶ xx.0400.00016	0x1a10	6672	dH10: Fan failure	Warning	C00566	0x5000
▶ xx.0400.00104	0x1a68	6760	dH68: Adjustment data error CU	Fault	-	0x5530
▶ xx.0400.00105	0x1a69	6761	dH69: Adjustment data error BU	Fault	-	0x5530
▶ xx.0123.00094	0x175e	5982	FC01: Switching frequency reduction	No Reaction	C00590	0x2000
▶ xx.0123.00095	0x175f	5983	FC02: Maximum speed for Fchop	No Reaction	C00588	0xF000
▶ xx.0123.00099	0x1763	5987	FC03: Field controller limitation	No Reaction	C00570/4	0xF000
▶ xx.0123.00057	0x1739	5945	Id1: Motor data identification error	WarningLocked	-	0xF000
▶ xx.0123.00056	0x1738	5944	Id2: Motor data identification error	Fault	-	0xF000
▶ xx.0123.00058	0x173a	5946	Id3: CINH motor data identification	WarningLocked	-	0xF000
▶ xx.0123.00059	0x173b	5947	Id4: Resistance identification error	Warning	-	0xF000
▶ xx.0123.00074	0x174a	5962	Id5: Pole position identification error	Fault	C00643/1	
▶ xx.0123.00075	0x174b	5963	Id6: Resolver ident error	Fault	-	
▶ xx.0123.00145	0x1791	6033	LP1: Motor phase failure	No Reaction	C00597	0x3000
▶ xx.0123.00015	0x170f	5903	LU: DC bus undervoltage	Trouble	C00600/1	0x3100
▶ xx.0123.00016	0x1710	5904	oC1: Power section - short circuit	Fault	-	0x2000
▶ xx.0123.00017	0x1711	5905	oC2: Power section - earth fault	Fault	-	0x2000
▶ xx.0119.00050	0x1332	4914	oC5: Ixt overload	Warning	C00604	0x2000
▶ xx.0123.00105	0x1769	5993	oC6: I2xt motor overload	Warning	C00606	0x2000
▶ xx.0123.00007	0x1707	5895	oC7: Motor overcurrent	Fault	-	0x2000
▶ xx.0123.00030	0x171e	5918	oC10: Maximum current reached	No Reaction	C00609	0x2000
▶ xx.0123.00071	0x1747	5959	oC11: Clamp operation active	Fault	-	0xF000
▶ xx.0123.00065	0x1741	5953	oC12: I2xt brake resistor overload	No Reaction	C00574	0xF000
▶ xx.0123.00090	0x175a	5978	oC13: Maximum current for Fch exceeded	Fault	-	0xF000
▶ xx.0123.00096	0x1760	5984	oC14: Direct-axis current controller limitation	No Reaction	C00570/1	0xF000
▶ xx.0123.00097	0x1761	5985	oC15: Cross current controller limitation	No Reaction	C00570/2	0xF000
▶ xx.0123.00098	0x1762	5986	oC16: Torque controller limitation	No Reaction	C00570/3	0xF000
▶ xx.0123.00031	0x171f	5919	oC17: Clamp sets pulse inhibit	No Reaction	C00569/1	0xF000
▶ xx.0119.00001	0x1301	4865	oH1: Heatsink overtemperature	Fault	-	0x4000
▶ xx.0119.00015	0x130f	4879	oH3: Motor temperature (X106) triggered	Fault	C00585	0x4000
▶ xx.0119.00000	0x1300	4864	oH4: Heatsink temp. > shutdown temp. -5°C	No Reaction	C00582	0x4000
▶ xx.0119.00020	0x1314	4884	oH6: Motor temperature MultiEncoder > C121	Warning	C00583/4	
▶ xx.0119.00002	0x1302	4866	oH7: Motor temperature resolver > C121	Warning	C00583/3	
▶ xx.0119.00003	0x1303	4867	oH9: Motor overtemperature resolver	Fault	C00583/1	
▶ xx.0119.00021	0x1315	4885	oH12: Motor overtemperature MultiEncoder	Fault	C00583/2	
▶ xx.0123.00032	0x1720	5920	oS1: Maximum speed limit reached	No Reaction	C00579	0x8400
▶ xx.0123.00033	0x1721	5921	oS2: Max. motor speed	Fault	-	0x8400
▶ xx.0123.00001	0x1701	5889	ot1: Max. torque reached	No Reaction	C00608	0x8300

8400 TopLine C | Software Manual

Diagnostics & error management

Error messages of the operating system

Error number			Error message	Response (Lenze setting)	can be set in	CAN Emergency Error Code
	32 bits	16 bits _{hex}				
▶ xx.0123.00093	0x175d	5981	ot2: Speed controller output limited	No Reaction	C00567	0xF000
▶ xx.0123.00014	0x170e	5902	OU: DC bus overvoltage	Trouble	-	0x3100
▶ xx.0144.00001	0x2c01	11265	PS01: No memory module	Warning	-	0x6300
▶ xx.0144.00002	0x2c02	11266	PS02: Invalid par. set	Fault	-	0x6300
▶ xx.0144.00003	0x2c03	11267	PS03: Invalid device par. set	Fault	-	0x6300
▶ xx.0144.00004	0x2c04	11268	PS04: Invalid MCI par. set	Fault	-	0x6300
▶ xx.0144.00007	0x2c07	11271	PS07: Par. mem. module invalid	Fault	-	0x6300
▶ xx.0144.00008	0x2c08	11272	PS08: Par. device invalid	Fault	-	0x6300
▶ xx.0144.00009	0x2c09	11273	PS09: Par. format invalid	Fault	-	0x6300
▶ xx.0144.00010	0x2c0a	11274	PS10: Memory module binding invalid	Fault	-	
▶ xx.0123.00024	0x1718	5912	Sd2: Resolver open circuit	Fault	C00603/2	
▶ xx.0123.00205	0x17cd	6093	Sd3: Feedback system open circuit	Fault	C00586	0x7300
▶ xx.0123.00027	0x171b	5915	Sd4: MultiEncoder open circuit	Fault	C00603/1	
▶ xx.0119.00012	0x130c	4876	Sd6: Error thermal detector resolver	Fault	C00583/5	
▶ xx.0123.00026	0x171a	5914	Sd7: Error encoder communication	Fault	C00603/4	
▶ xx.0123.00062	0x173e	5950	Sd8: Encoder angular drift monit.	Fault	C00603/3	
▶ xx.0123.00200	0x17c8	6088	Sd10: Speed limit for feedback system 12	Fault	C00607	0x7300
▶ xx.0123.00201	0x17c9	6089	Sd11: Speed limit for feedback system 67	Fault	C00607	0x7300
▶ xx.0119.00022	0x1316	4886	Sd12: Error thermal detector MultiEncoder	Fault	C00583/6	
▶ xx.0111.00002	0x0b02	2818	Su02: One mains phase is missing	Warning	C00565	0x3000
▶ xx.0111.00003	0x0b03	2819	Su03: Too frequent mains switching	Fault	-	0x3000
▶ xx.0111.00004	0x0b04	2820	Su04: CU Insufficiently Supplied	Fault	-	0x3000
▶ xx.0111.00006	0x0b06	2822	Su06: Mains input overload	Fault	-	0x3000
▶ xx.0980.00001	-	-	US01: User error 1	No Reaction	C00581/1	0x6200
▶ xx.0981.00002	-	-	US02: User error 2	No Reaction	C00581/2	0x6200
▶ xx.0982.00003	-	-	US03: User error 3	No Reaction	C00581/3	0x6200
▶ xx.0983.00004	-	-	US04: User error 4	No Reaction	C00581/4	0x6200
▶ xx.0984.00001	-	-	US05: User error 5	No Reaction	C00581/5	0x6200
▶ xx.0985.00002	-	-	US06: User error 6	No Reaction	C00581/6	0x6200
▶ xx.0986.00003	-	-	US07: User error 7	No Reaction	C00581/7	0x6200
▶ xx.0987.00004	-	-	US08: User error 8	No Reaction	C00581/8	0x6200

10.9.6 Cause & possible remedies

This chapter contains all error messages of the controller operating system in numerical order of the error numbers. The list provides detailed information on the response to the error message as well as information on the cause & possible remedies.



Note!

For the sake of legibility, the [Logbook](#) and [C00165](#) display the error number with the following syntax:

[Error type].[Error subject area no.].[Error ID]

In this documentation, "xx", a wildcard, stands for the error type since it is configurable for many error messages.



Tip!

A list of all error messages of the controller operating system in alphabetical order can be found in the previous chapter "[Short overview \(A-Z\)](#)" ([book 608](#)).

Su02: One mains phase is missing [xx.0111.00002]

Response (Lenze setting printed in bold)		Setting: C00565 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
One mains phase of a three-phase supply has failed.	Check mains connection (terminal X100).	

Su03: Too frequent mains switching [xx.0111.00003]

Response (Lenze setting printed in bold)	
☐ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☐ 5: Warning ☐ 6: Information	
Cause	Remedy
<p>Too frequent mains switching of the power section.</p> <ul style="list-style-type: none"> The device recognises if the power section is switched on and off too frequently. To protect internal charging connections from destruction, the device reports this error and prevents the controller inhibit. All other functions are active. 	<p>The error must be acknowledged by mains switching. The charging circuit can only cool down when the mains is switched off.</p> <ul style="list-style-type: none"> After switching the mains 3 times in one minute, there must be a switching pause of 9 minutes. Cyclic mains switching every 3 minutes is permissible.

Su04: CU insufficiently supplied [xx.0111.00004]

Response (Lenze setting printed in bold)	
☐ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☐ 5: Warning ☐ 6: Information	
Cause	Remedy
<p>After switching on the device, the 24V supply voltage for the control electronics is too low (100ms after switch-on U is < 19V).</p> <ul style="list-style-type: none"> The current supply voltage is displayed in C00065. 	<p>The error must be acknowledged.</p> <p>With internal supply voltage via the power electronics, the controller must be replaced.</p> <p>With external supply voltage, check the correct connection and/or the stability of the supply voltage.</p>

Su06: Mains input overload [xx.0111.00006]

Response (Lenze setting printed in bold) <input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information	
Cause	Remedy
Overtemperature in case of devices from type 6 in the input rectifier or the mains choke.	<ul style="list-style-type: none">• Check whether all mains phases are connected (a 2-phase supply may be existent).• Provide for sufficient cooling of the device.

oH4: Heatsink temp. > shutdown temp. -5°C [xx.0119.00000]

Response (Lenze setting printed in bold) Setting: C00582 (<input checked="" type="checkbox"/> Adjustable response) <input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information	
Cause	Remedy
The heatsink temperature now only differs by 5 °C from the shutdown temperature of the motor.	Prevent further heating, i.e. reduce motor load or set controller inhibit so that the heatsink can cool down again.

oH1: Overtemperature heatsink [xx.0119.00001]

Response (Lenze setting printed in bold) <input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information	
Cause	Remedy
The heatsink temperature is higher than the fixed limit temperature (90 °C). Maybe the ambient temperature of the controller is too high or the fan or its ventilation slots are dirty.	<ul style="list-style-type: none">• Check control cabinet temperature.• Clean filter.• Clean controller.• If required, clean or replace the fan.• Provide for sufficient cooling of the device.

oH7: Motor temperature resolver > C121 [xx.0119.00002]

Response (Lenze setting printed in bold) Setting: C00583/3 (<input checked="" type="checkbox"/> Adjustable response) <input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information	
Cause	Remedy
The motor temperature detected via the resolver interface has exceeded the warning threshold set in C00121/1 .	<ul style="list-style-type: none">• Check motor temperature monitoring.• Provide for sufficient cooling of the motor.• Check terminals for open circuit or loose contact.

oH9: Motor overtemperature resolver [xx.0119.00003]

Response (Lenze setting printed in bold) Setting: C00583/1 (<input checked="" type="checkbox"/> Adjustable response) <input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information	
Cause	Remedy
The motor temperature detected via the resolver interface is higher than the fixed limit temperature (90 °C).	<ul style="list-style-type: none">• Check motor temperature monitoring.• Provide for sufficient cooling of the motor.• Check terminals for open circuit or loose contact.

Sd6: Error thermal detector resolver [xx.0119.00012]

Response (Lenze setting printed in bold)		Setting: C00583/5 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
The signals of the encoder connected to the resolver interface are outside the defined operating range of the motor temperature detection.	<ul style="list-style-type: none"> • Check the contacting of the encoder cable at the motor and the controller. • Check the selected motor thermal sensor in C01190/1 whether it complies with the assembly in the motor. • If required, switch off thermal sensor monitoring (C00583/5="0"). 	

oH3: Motor temperature (X106) triggered [xx.0119.00015]

Response (Lenze setting printed in bold)		Setting: C00585 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
The motor temperature monitoring function at the plug connector X106, terminal T1 /T2, has tripped. Possible causes: <ul style="list-style-type: none"> • The motor is overheated so that the thermal contact integrated into the motor has been switched. • An open circuit or a loose contact at the connections mentioned above has occurred. 	<ul style="list-style-type: none"> • Check motor temperature monitoring. • Provide for sufficient cooling of the motor. • Check terminals for open circuit or loose contact. 	

oH6: Motor temperature MultiEncoder > C121 [xx.0119.00020]

Response (Lenze setting printed in bold)		Setting: C00583/4 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
The motor temperature detected via the encoder interface has exceeded the warning threshold set in C00121/2 .	<ul style="list-style-type: none"> • Check motor temperature monitoring. • Provide for sufficient cooling of the motor. • Check terminals for open circuit or loose contact. 	

oH12: Motor overtemperature MultiEncoder [xx.0119.00021]

Response (Lenze setting printed in bold)		Setting: C00583/2 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
The motor temperature detected via the encoder interface is higher than the fixed limit temperature (90 °C).	<ul style="list-style-type: none"> • Check motor temperature monitoring. • Provide for sufficient cooling of the motor. • Check terminals for open circuit or loose contact. 	

Sd12: Error thermal detector MultiEncoder [xx.0119.00022]

Response (Lenze setting printed in bold)		Setting: C00583/6 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
The signals of the encoder connected to the encoder interface are outside the defined operating range of the motor temperature detection.	<ul style="list-style-type: none"> • Check the contacting of the encoder cable at the motor and the controller. • Check the selected motor thermal sensor in C01190/2 whether it complies with the assembly in the motor. • If required, switch off thermal sensor monitoring (C00583/6="0"). 	

8400 TopLine C | Software Manual

Diagnostics & error management

Error messages of the operating system

oC5: Ixt overload [xx.0119.00050]

Response (Lenze setting printed in bold)		Setting: C00604 (☑ Adjustable response)
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
The Ixt overload check has tripped. <ul style="list-style-type: none">Operating threshold = 100 % Ixt (adjustable in C00123) Possible causes: <ul style="list-style-type: none">Wrong dimensioning of the device with regard to its motor load.Load cycles are not complied with.	<ul style="list-style-type: none">Check and, if required, correct dimensioning of the device and the motor load with regard to technical data.Reduce motor load cycles (observe load cycles according to documentation).	

ot1: Maximum torque reached [xx.0123.00001]

Response (Lenze setting printed in bold)		Setting: C00608 (☑ Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
The device indicates that the maximally possible torque at the motor shaft has been reached. <ul style="list-style-type: none">C00057 displays the current torque.	Reduce motor load.	

oC7: Motor overcurrent [xx.0123.00007]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
The maximum current monitoring has tripped. <ul style="list-style-type: none">The instantaneous value of the motor current has exceeded the limit value set in C00939.	Check and, if required, correct dimensioning of the load with regard to the installed device power.	

oU: DC bus overvoltage [xx.0123.00014]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
The device has detected an overvoltage in the DC bus. To protect the device hardware, the inverter control is switched off. <ul style="list-style-type: none">Depending on the configuration of the auto-start lock function, C00142 serves to set that, if this error has been tripped, the controller only starts after the controller inhibit is switched.If this error message remains active longer than the time set in C00601, a "Fault" is tripped.	<ul style="list-style-type: none">Reduce load in generator mode.Use a brake resistor.Use a regenerative power supply unit.Establish a DC-bus connection.	

LU: DC bus undervoltage [xx.0123.00015]

Response (Lenze setting printed in bold)		Setting: C00600/1 (<input checked="" type="checkbox"/> Adjustable response)
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
<p>The device has detected a DC bus undervoltage. The inverter control is switched off because the drive properties of the motor control cannot be provided anymore due to the DC bus undervoltage.</p> <ul style="list-style-type: none"> Depending on the configuration of the auto-start lock function, C00142 serves to set that, if this error has been tripped, the controller only starts after the controller inhibit is switched. 	<ul style="list-style-type: none"> Switch on mains supply or ensure sufficient supply via DC bus. Adjust setting in C00142 if required. 	

oC1: Power section - short circuit [xx.0123.00016]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
<p>The device has recognised a short circuit of the motor phases. To protect the device electronics, the inverter control is switched off.</p> <ul style="list-style-type: none"> Mostly, incorrectly executed motor connections are the cause. If the device is inappropriately dimensioned with regard to the motor load and the current limitation in the controller (Imax controller) is set incorrectly, this error message may also occur. <p>► Motor control: Defining current limits</p>	<ul style="list-style-type: none"> Check motor connections and the corresponding plug connector on the device. Only use permissible combinations of device power and motor power. Do not set the dynamics of the current limitation controller too high. 	

oC2: Power section - earth fault [xx.0123.00017]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
<p>The device has recognised an earth fault at one of the motor phases. To protect the device electronics, the inverter control is switched off.</p> <ul style="list-style-type: none"> Mostly, incorrectly executed motor connections are the cause. If motor filter, motor cable length, and cable type (shielding capacity) are dimensioned incorrectly, this error message may occur due to leakage currents to PE. If motor filters with additional terminals for +UG and -UG and devices greater or equal 3 kW are used, the earth fault detection may be triggered due to leakage currents to +UG and -UG. A cause can also be the use of shielded motor cables longer than 50 m. 	<ul style="list-style-type: none"> Check motor connections and the corresponding plug connector on the device. Use motor filters, cable lengths, and cable types recommended by Lenze. If motor filters with additional terminals for +UG and -UG and devices greater or equal 3 kW are used: <ul style="list-style-type: none"> Deactivate earth fault detection during operation by setting the filter time (C01770) to 250 ms. If motor cables longer than 50 m are used: <ul style="list-style-type: none"> Increase filter time for earth fault detection during operation (C01770). 	

Sd2: Open circuit resolver [xx.0123.00024]

Response (Lenze setting printed in bold)		Setting: C00603/2 (<input checked="" type="checkbox"/> Adjustable response)	
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information			
Cause		Remedy	
<ul style="list-style-type: none"> Encoder signal interferences (EMC). Resolver cable interrupted. Resolver defective. 		<ul style="list-style-type: none"> Check resolver cable. Check resolver. Switch off monitoring (C00603/2 = "0: No reaction") if the resolver is not used. 	

Sd7: Encoder communication error [xx.0123.00026]

Response (Lenze setting printed in bold)		Setting: C00603/4 (<input checked="" type="checkbox"/> Adjustable response)	
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information			
Cause		Remedy	
<ul style="list-style-type: none"> Encoder cable interrupted. Encoder defective. 		<ul style="list-style-type: none"> Check encoder cable Check encoder. Check parameter setting. 	

Sd4: Open circuit MultiEncoder [xx.0123.00027]

Response (Lenze setting printed in bold)		Setting: C00603/1 (<input checked="" type="checkbox"/> Adjustable response)	
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information			
Cause		Remedy	
<ul style="list-style-type: none"> Encoder cable interrupted. Encoder defective. 		<ul style="list-style-type: none"> Check encoder cable. Check encoder. Switch off monitoring (C00603/1 = "0: No reaction") is the encoder is not used. 	

oC10: Maximum current reached [xx.0123.00030]

Response (Lenze setting printed in bold)		Setting: C00609 (<input checked="" type="checkbox"/> Adjustable response)	
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information			
Cause		Remedy	
The device displays that the maximum current has been reached.		<ul style="list-style-type: none"> Check and, if required, correct dimensioning of the load with regard to the installed device power. Check the maximum current settings in C00022 (Imax in motor mode) and C00023 (Imax in generator mode). 	

oC17: Clamp sets pulse inhibit [xx.0123.00031]

Response (Lenze setting printed in bold)		Setting: C00569/1 (<input checked="" type="checkbox"/> Adjustable response)	
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information			
Cause		Remedy	
Due to a short overcurrent, the inverter was switched off for a short time (clamp disconnection).		<ul style="list-style-type: none"> Check and, if required, correct dimensioning of the load with regard to the installed device power. Reduce the dynamics of the setpoint change or speed control. 	

oS1: Maximum speed limit reached [xx.0123.00032]

Response (Lenze setting printed in bold)		Setting: C00579 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
The device has recognised that the maximum speed has been reached.	<ul style="list-style-type: none"> Limit setpoint selection to maximum values. Adjust set speed limitation (C00909) and frequency limitation (C00910) if necessary. 	

oS2: Max. motor speed [xx.0123.00033]

Response (Lenze setting printed in bold)		
☐ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☐ 5: Warning ☐ 6: Information		
Cause	Remedy	
The device has recognised that the maximally permissible motor speed has been reached.	<ul style="list-style-type: none"> Limit setpoint selection to the maximally permissible motor speed. If required, adapt set maximum motor speed (C00965). 	

Id2: Motor data identification error [xx.0123.00056]

Response (Lenze setting printed in bold)		
☐ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☐ 5: Warning ☐ 6: Information		
Cause	Remedy	
<p>During the identification of the motor parameters, an error has occurred that caused an abortion of the identification process.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> Interrupted motor cable. Switched-off power section during the identification. Implausible start parameter settings. 	<ul style="list-style-type: none"> Check the motor connections and the corresponding plug connector on the device and, if necessary, the motor terminal box. Correct start parameters for the motor parameter identification (motor nameplate data). Stable power supply of the device. 	

Id1: Motor data identification error [xx.0123.00057]

Response (Lenze setting printed in bold)		
☐ 0: No Reaction ☐ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☑ 4: WarningLocked ☐ 5: Warning ☐ 6: Information		
Cause	Remedy	
<p>During the identification of the motor parameters, an error has occurred.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> Interrupted motor cable. Switched-off power section during the identification. Implausible start parameter settings. 	<ul style="list-style-type: none"> Check the motor connections and the corresponding plug connector on the device and, if necessary, the motor terminal box. Correct start parameters for the motor parameter identification (motor nameplate data). Stable power supply of the device. 	

Id3: CINH motor data identification [xx.0123.00058]

Response (Lenze setting printed in bold)		
☐ 0: No Reaction ☐ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☑ 4: WarningLocked ☐ 5: Warning ☐ 6: Information		
Cause	Remedy	
<p>The device has detected controller inhibit during the motor data identification.</p> <ul style="list-style-type: none"> This cancels the identification process. The Lenze setting of the motor data is used. 	<ul style="list-style-type: none"> Do not set controller inhibit during the motor data identification. Do not execute any device function which may activate controller inhibit. 	

Id4: Resistor identification error [xx.0123.00059]

Response (Lenze setting printed in bold)	
<input type="checkbox"/> 0: No Reaction <input type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information	
Cause	Remedy
The device has recognised that an error has occurred in the calculation of the motor cable resistance. <ul style="list-style-type: none"> The parameters for cable cross-section and cable length are implausible. 	Enter sensible values for cable cross-section and motor cable length.

Sd8: Encoder angular drift monit. [xx.0123.00062]

Response (Lenze setting printed in bold)		Setting: C00603/3 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
<ul style="list-style-type: none"> Encoder signal interferences (EMC). Encoder cable interrupted. Encoder is defective. Faulty parameter setting of the encoder. 	<ul style="list-style-type: none"> Check encoder cable, use shorter encoder cable if required. Check encoder. Check parameter setting. If required, check monitoring (C00603/3). 	

oC12: I2xt overload - brake resistor [xx.0123.00065]

Response (Lenze setting printed in bold)		Setting: C00574 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Too frequent and too long braking processes.	Check drive dimensioning.	

oC11: Clamp operation active [xx.0123.00071]

Response (Lenze setting printed in bold)	
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information	
Cause	Remedy
The device indicates that the "CLAMP" overcurrent limitation has been activated. <ul style="list-style-type: none"> A permanent clamp operation causes an overload disconnection. 	Reduce setpoint generation dynamics or motor load.

Id5: Pole position identification error [xx.0123.00074]

Response (Lenze setting printed in bold)		Setting: C00643/1 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
<p>With 360° pole position identification:</p> <ul style="list-style-type: none"> The rotor position detected via the encoder system does not comply with the controlled output position (plausibility check). <p>With pole position identification with minimum motion:</p> <ul style="list-style-type: none"> The encoder system detected a motion higher than the permitted one set in C00645/1. 	<p>With 360° pole position identification:</p> <ul style="list-style-type: none"> Check parameter setting of the pole position identification. If required, adapt error tolerance for plausibility check in C00645/2. <p>With pole position identification with minimum motion:</p> <ul style="list-style-type: none"> If required, adjust permitted motion in C00645/1. 	

Id6: Resolver ident. error [xx.0123.00075]

Response (Lenze setting printed in bold)

 0: No Reaction 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause	Remedy
<ul style="list-style-type: none"> A controller inhibit was set during resolver error identification. A time-out occurred while the algorithm was being processed. This error may occur if more than 60 seconds pass by between the setting of the "Resolver error identification" device command and the enable of the controller. The setpoint speed was too small ($\text{nset} < 500 \text{ rpm}$). The setpoint speed was not traversed for at least 1 second. 	<ul style="list-style-type: none"> Reduce the gain of the speed controller. Check the shielding of the motor and encoder. Check encoder/encoder connection. Controller is enabled after the "Resolver error identification" device command has been set. Ensure that the speed profile is traversed for at least 1 second at constant setpoint speed ($\text{nset} > 500 \text{ rpm}$).

oC13: Maximum current for Fch exceeded [xx.0123.00090]

Response (Lenze setting printed in bold)

 0: No Reaction 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause	Remedy
<p>The device has detected a motor current which exceeds the maximum current limit at permanent switching frequency of the inverter.</p> <ul style="list-style-type: none"> If a permanent switching frequency inverter is set, a certain limit arises for the maximum current, depending on the setting. If this current limit is exceeded due to a load impulse or overload, an error message is displayed. 	<ul style="list-style-type: none"> Observe the maximum current setting depending on the set switching frequency of the inverter. Reduce the required load or setting of the dynamic switching frequency if necessary.

ot2: Speed controller output limited [xx.0123.00093]

Response (Lenze setting printed in bold)

Setting: [C00567](#) (Adjustable response) 0: **No Reaction** 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: **Warning** 6: Information

Cause	Remedy
<p>The output of the speed controller has reached the internal limit value. In this state, the speed controller is not able anymore to correct the system deviation.</p> <ul style="list-style-type: none"> Only with "Closed loop" operation or vector control (SLVC). 	<ul style="list-style-type: none"> Observe load requirements. Correct dimensioning or reduce setpoint generation dynamics if necessary. <p>▶ Motor control</p>

FC01: Switching frequency reduction [xx.0123.00094]

Response (Lenze setting printed in bold)

Setting: [C00590](#) (Adjustable response) 0: **No Reaction** 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: **Warning** 6: Information

Cause	Remedy
Load-dependent switching frequency reduction	<ul style="list-style-type: none"> Observe load requirements. Correct dimensioning or reduce setpoint generation dynamics if necessary. <p>▶ Motor control</p>

FC02: Maximum speed for Fchop [xx.0123.00095]

Response (Lenze setting printed in bold)		Setting: C00588 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Maximum speed for chopper frequency has been reached. <ul style="list-style-type: none">The maximum speed has been exceeded depending on the switching frequency.	Select the correct maximum speed as a function of the switching frequency. <ul style="list-style-type: none">▶ Motor control: Defining speed limits	

oC14: Direct-axis current controller limitation [xx.0123.00096]

Response (Lenze setting printed in bold)		Setting: C00570/1 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Direct-axis current controller limitation is active.	<ul style="list-style-type: none">Observe load requirements.Correct dimensioning or reduce setpoint generation dynamics if necessary. ▶ Motor control	

oC15: Cross current controller limitation [xx.0123.00097]

Response (Lenze setting printed in bold)		Setting: C00570/2 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Cross current controller limitation is active.	<ul style="list-style-type: none">Observe load requirements.Correct dimensioning or reduce setpoint generation dynamics if necessary.Check parameter setting of the current controller with regard to the motor controllers (e.g. reduce Vp). ▶ Motor control	

oC16: Torque controller limitation [xx.0123.00098]

Response (Lenze setting printed in bold)		Setting: C00570/3 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Actuator limitation according to speed controller.	<ul style="list-style-type: none">Observe load requirements.Correct dimensioning or reduce setpoint generation dynamics if necessary. ▶ Motor control	

FC03: Field controller limitation [xx.0123.00099]

Response (Lenze setting printed in bold)		Setting: C00570/4 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
The output of the field controller has reached its maximum limit value. The drive is at the torque limit in the field weakening range.	<ul style="list-style-type: none">Observe load requirements.Correct dimensioning or reduce setpoint from the field weakening range if necessary. ▶ Motor control	

oC6: I2xt overload - motor [xx.0123.00105]

Response (Lenze setting printed in bold)		Setting: C00606 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
Thermal overload of the motor.	<ul style="list-style-type: none"> • Observe load requirements. • Correct dimensioning if necessary. • In case of VFCplus operation: Check Vmin boost (C00016). Set ▶ Vmin boost	

LP1: Motor phase failure [xx.0123.00145]

Response (Lenze setting printed in bold)		Setting: C00597 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
Motor phase failure - power section <ul style="list-style-type: none"> • This error message is displayed if a motor phase carries less current of one half-wave than set in C00599. 	<ul style="list-style-type: none"> • Check the motor connections and the corresponding plug connector on the device and, if necessary, the motor terminal box. • Check the trigger threshold C00599. 	

Sd10: Speed limit - feedback system 12 [xx.0123.00200]

Response (Lenze setting printed in bold)		Setting: C00607 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
Maximally permissible speed of the feedback system connected to DI1/DI2 reached.	Reduce speed of the rotation shaft/feedback system. $n_{\text{encoder}} \leq (f_{\text{max}} \times 60) / \text{encoder increment}$ (for $f_{\text{max}} = 10 \text{ kHz}$)	

Sd11: Speed limit for feedback system 67 [xx.0123.00201]

Response (Lenze setting printed in bold)		Setting: C00607 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
Maximally permissible speed of the feedback system connected to DI6/DI7 reached.	Reduce speed of the rotation shaft/feedback system. $n_{\text{encoder}} \leq (f_{\text{max}} \times 60) / \text{encoder increment}$ (for $f_{\text{max}} = 10 \text{ kHz}$)	

Sd3: Open circuit - feedback system [xx.0123.00205]

Response (Lenze setting printed in bold)		Setting: C00586 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☐ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
<ul style="list-style-type: none"> • HTL encoder cable interrupted. • HTL encoder is defective. Note: May also be caused by a very dynamic acceleration or starting up against a blocked motor shaft (e.g. with a closed holding brake).	<ul style="list-style-type: none"> • Check HTL encoder cable. • Check HTL encoder. • Check related terminals. • Switch off monitoring (C00603 = "0: No reaction") is the HTL encoder is not used. 	

An01: AIN1_I < 4 mA [xx.0125.00001]

Response (Lenze setting printed in bold) Setting: C00598/1 (☑ Adjustable response)	
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information	
Cause	Remedy
Open-circuit monitoring for analog input 1 has tripped. <ul style="list-style-type: none">• Only if the analog input has been configured as a current loop of 4 ... 20 (C00034/1 = 2).	<ul style="list-style-type: none">• Check wiring of the analog X3/A11 input terminal for open circuit.• Check minimum current values of the signal sources.

An02: AIN2_I < 4 mA [xx.0125.00002]

Response (Lenze setting printed in bold) Setting: C00598/2 (☑ Adjustable response)	
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information	
Cause	Remedy
Open-circuit monitoring for analog input 2 has tripped. <ul style="list-style-type: none">• Only if the analog input has been configured as a current loop of 4 ... 20 (C00034/2 = 2).	<ul style="list-style-type: none">• Check wiring of the analog X3/A21 input terminal for open circuit.• Check minimum current values of the signal sources.

CE04: MCI communication error [xx.0127.00002]

Response (Lenze setting printed in bold) Setting: C01501/1 (☑ Adjustable response)	
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information	
Cause	Remedy
Communication error with extension module in slot 1.	<ul style="list-style-type: none">• Eliminate EMC interference.• Switch off controller, correctly plug in the module, switch on the controller again.• Mains switching or restart of the controller, respectively.• Replace module/controller.• If the problem occurs again, you need to consult Lenze.

CE0F: MCI control word [xx.0127.00015]

Response (Lenze setting printed in bold) Setting: C00594/2 (☑ Adjustable response)	
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information	
Cause	Remedy
Bit 14 ("SetFail") of the wMciCtrl control word of the LS_DriveInterface system block has been set.	Trace back signal source on the bus (e.g. PROFIBUS) that sets bit 14 ("SetFail").

CE4: CAN bus off [xx.0131.00000]

Response (Lenze setting printed in bold) Setting: C00592/2 (☑ Adjustable response)	
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information	
Cause	Remedy
CAN on board : "Bus off" status <ul style="list-style-type: none">• Received too many faulty telegrams.• Damaged cable (e.g. loose contact).• Two nodes have the same ID.	<ul style="list-style-type: none">• Check wiring and bus terminating resistor.• Set identical baud rate for each bus node.• Assign different IDs to nodes.• Eliminate electrical interference (e.g. EMC).

CA06: CAN CRC error [xx.0131.00006]

Response (Lenze setting printed in bold)		Setting: C00592/1 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
CAN on board : A faulty CAN telegram has been detected.	<ul style="list-style-type: none"> • Check wiring and bus terminating resistor. • Eliminate electrical interference (e.g. EMC). 	

CA07: CAN bus warning [xx.0131.00007]

Response (Lenze setting printed in bold)		Setting: C00592/3 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
CAN on board : Incorrect transmission or reception of more than 96 CAN telegrams. <ul style="list-style-type: none"> • The current number of incorrectly transmitted CAN telegrams is displayed in C00372/1. • The current number of incorrectly received CAN telegrams is displayed in C00372/2. • The current CAN error status is displayed in C00345. 	<ul style="list-style-type: none"> • Check wiring and bus terminating resistor. • Set identical baud rate for each bus node. • Assign different IDs to nodes. • Eliminate electrical interference (e.g. EMC). 	

CA08: CAN bus stopped [xx.0131.00008]

Response (Lenze setting printed in bold)		Setting: C00592/4 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
CAN on board : The device has received the "Stop Remote Node" NMT telegram.	Check CAN master (NMT master).	

CA0b: CAN HeartBeatEvent [xx.0131.00011]

Response (Lenze setting printed in bold)		Setting: C00592/5 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
CAN on board : Cyclic node monitoring <ul style="list-style-type: none"> • Being a Heartbeat consumer, the device has not received a Heartbeat telegram from Heartbeat producer 1 ... 15 within the defined time. • The current statuses of the Heartbeat producers are displayed in C00347/1...15. 	<ul style="list-style-type: none"> • Reactivate Heartbeat producers by mains switching, restarting the controller, or a CAN Reset Node. • Reparameterise CAN Heartbeat producer time or switch off consumer monitoring and reset error status if latched. <p>▶ Heartbeat protocol</p>	

CA0F: CAN control word [xx.0131.00015]

Response (Lenze setting printed in bold)		Setting: C00594/1 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☐ 4: WarningLocked ☑ 5: Warning ☐ 6: Information		
Cause	Remedy	
Bit 14 ("SetFail") in the wCANControl control word of the LS DriveInterface system block has been set.	Trace back signal source on the CAN bus that sets bit 14 ("SetFail").	

CE1: CAN RPDO1 [xx.0135.00001]

Response (Lenze setting printed in bold)		Setting: C00593/1 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
<p>CAN on board: Time monitoring for RPDO1 has tripped.</p> <ul style="list-style-type: none"> RPDO1 has not been received within the monitoring time set in C00357/1 or was faulty. 	<ul style="list-style-type: none"> Set the correct telegram length at the CAN master (transmitter). Eliminate electrical interference (e.g. EMC). Adjust monitoring time in C00357/1 or switch off time monitoring. 	

CE2: CAN RPDO2 [xx.0135.00002]

Response (Lenze setting printed in bold)		Setting: C00593/2 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
<p>CAN on board: Time monitoring for RPDO2 has tripped.</p> <ul style="list-style-type: none"> RPDO2 has not been received within the monitoring time set in C00357/2 or was faulty. 	<ul style="list-style-type: none"> Set the correct telegram length at the CAN master (transmitter). Eliminate electrical interference (e.g. EMC). Adjust monitoring time in C00357/2 or switch off time monitoring. 	

CE3: CAN RPDO3 [xx.0135.00003]

Response (Lenze setting printed in bold)		Setting: C00593/3 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
<p>CAN on board: Time monitoring for RPDO3 has tripped.</p> <ul style="list-style-type: none"> RPDO3 has not been received within the monitoring time set in C00357/3 or was faulty. 	<ul style="list-style-type: none"> Set the correct telegram length at the CAN master (transmitter). Eliminate electrical interference (e.g. EMC). Adjust monitoring time in C00357/3 or switch off time monitoring. 	

CP04: CAN RPDO4 [xx.0135.00004]

Response (Lenze setting printed in bold)		Setting: C00593/4 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
<p>CAN on board: Time monitoring for RPDO4 has tripped.</p> <ul style="list-style-type: none"> RPDO4 has not been received within the monitoring time set in C00357/4 or was faulty. 	<ul style="list-style-type: none"> Set the correct telegram length at the CAN master (transmitter). Eliminate electrical interference (e.g. EMC). Adjust monitoring time in C00357/4 or switch off time monitoring. 	

CI01: Module missing/incompatible [xx.0140.00013]

Response (Lenze setting printed in bold)		Setting: C01501/2 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
The optional communication module has been removed or there is a connection problem or incompatibility with the standard device.	<ul style="list-style-type: none"> Check connection between the communication module and standard device. Check if the module is plugged in correctly. In case of an incompatibility, either the module or the software of the standard device is out of date. In this case, please contact Lenze. 	

PS01: No memory module [xx.0144.00001]**Response** (Lenze setting printed in bold) 0: No Reaction 1: Fault 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause	Remedy
Memory module is either not available or not snapped into place correctly.	<ul style="list-style-type: none"> If a memory module has been provided: Plug the memory module into the slot of the standard device intended for this purpose. If a memory module has been provided: Check if the memory module has been plugged-in correctly.

PS02: Par. set invalid [xx.0144.00002]**Response** (Lenze setting printed in bold) 0: No Reaction 1: Fault 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause	Remedy
The parameter set saved to the memory module is invalid because it has not been saved completely. <ul style="list-style-type: none"> This can be due to voltage failure or caused by removing the memory module while saving the parameter set. 	Ensure voltage supply during the storage process and that the module remains plugged into the slot.

PS03: Par. set device invalid [xx.0144.00003]**Response** (Lenze setting printed in bold) 0: No Reaction 1: Fault 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause	Remedy
The parameter set saved to the memory module is incompatible to the standard device. <ul style="list-style-type: none"> An incompatibility of the parameter set is caused e.g. when the memory module of an 8400 HighLine is plugged into an 8400 StateLine or the parameter set in the memory module has a higher version than expected by the standard device. 	When the memory modules are exchanged, observe the downward compatibility: <ul style="list-style-type: none"> OK: StateLine V2.0 to StateLine V3.0 OK: StateLine V2.0 to HighLine V2.0 Not OK: HighLine Vx.x to StateLine Vx.x Not OK: StateLine V3.0 to StateLine < V3.0

PS04: Par. set Mci invalid [xx.0144.00004]**Response** (Lenze setting printed in bold) 0: No Reaction 1: Fault 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause	Remedy
The parameter set saved to the communication module is incompatible to the standard device. <ul style="list-style-type: none"> An incompatibility of the parameter set is caused e.g. when the MCI module parameters in the memory module do not match the plugged communication module. 	When the memory modules are exchanged, observe the downward compatibility: <ul style="list-style-type: none"> OK: StateLine V2.0 to StateLine V3.0 OK: StateLine V2.0 to HighLine V2.0 Not OK: HighLine Vx.x to StateLine Vx.x Not OK: StateLine V3.0 to StateLine < V3.0

PS07: Par. memory module invalid [xx.0144.00007]

Response (Lenze setting printed in bold)

0: No Reaction 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

The parameter set saved to the memory module is invalid.

- The error occurs while loading the parameter set.
- The memory module plugged in the device lacks a code or a code is incorrect.

Remedy

Consultation with Lenze required.

PS08: Par. device invalid [xx.0144.00008]

Response (Lenze setting printed in bold)

0: No Reaction 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

The parameter set in the device is invalid.

- The error occurs while loading the parameter set.
- One code in the device is incorrect.

Remedy

Consultation with Lenze required.

PS09: Par. format invalid [xx.0144.00009]

Response (Lenze setting printed in bold)

0: No Reaction 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

The code format is invalid.

- The error occurs while loading the parameter set.

Remedy

Consultation with Lenze required.

PS10: Memory module binding invalid [xx.0144.00010]

Response (Lenze setting printed in bold)

0: No Reaction 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Active device personalisation: The memory module and the controller do not have identical binding IDs.

Remedy

- Use memory modules/controllers with matching binding IDs.
- Consult the machine manufacturer.

Note:

Lenze cannot modify e.g. a replacement device via special access to make it work with a personalised memory module.

dF14: SW-HW invalid [xx.0145.00014]

Response (Lenze setting printed in bold)

0: No Reaction 1: **Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Device error

Remedy

Consultation with Lenze required.

dF15: DCCOM CU2 error [xx.0145.00015]

Response (Lenze setting printed in bold)

 0: No Reaction **1: Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Device error

Remedy

Consultation with Lenze required.

dF18: BU RCOM error [xx.0145.00024]

Response (Lenze setting printed in bold)

 0: No Reaction **1: Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Device error

Remedy

Consultation with Lenze required.

dF25: CU RCOM error [xx.0145.00025]

Response (Lenze setting printed in bold)

 0: No Reaction **1: Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Mains switching too frequent.
• Cyclic mains switching every 3 minutes is permissible.

Remedy

- After switching the mains 3 times in one minute, there must be a switching pause of 9 minutes.
- If the problem occurs again, you need to consult Lenze.

dF26: Appl. watchdog [xx.0145.00026]

Response (Lenze setting printed in bold)

Setting: [C00580/1](#) Adjustable response) **0: No Reaction** **1: Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Time-out of the application. The required computing time of the application exceeds the available computing time.

Remedy

Reduction of the function block interconnection or the complexity of the application.

dF21: BU watchdog [xx.0145.00033]

Response (Lenze setting printed in bold)

 0: No Reaction **1: Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Device error

Remedy

Consultation with Lenze required.

dF22: CU watchdog [xx.0145.00034]

Response (Lenze setting printed in bold)

 0: No Reaction **1: Fault** 2: Trouble 3: TroubleQuickStop 4: WarningLocked 5: Warning 6: Information

Cause

Device error

Remedy

Consultation with Lenze required.

dF10: AutoTrip reset [xx.0145.00035]

Response (Lenze setting printed in bold)		Setting: C00189 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
Too frequent auto-trip reset.	<ul style="list-style-type: none">• Check the error cause that activates the auto-trip reset.• Eliminate error cause and reset (acknowledge) error manually afterwards.	

dF50: Retain error [xx.0145.00050]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
An error has occurred when accessing retain data. <ul style="list-style-type: none">• Either caused by an internal hardware error or by lack of mains switching after a firmware download.	Mains switching <ul style="list-style-type: none">• If the problem occurs again, you needs to consult Lenze.	

dF51: CuCcr error [xx.0145.00051]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Device error	Mains switching <ul style="list-style-type: none">• If the problem occurs again, you needs to consult Lenze.	

dF52: BuCcr error [xx.0145.00052]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Device error	Mains switching <ul style="list-style-type: none">• If the problem occurs again, you needs to consult Lenze.	

Ck01: Pos. HW limit switch [xx.0184.00001]

Response (Lenze setting printed in bold)		Setting: C00595/1 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: The hardware limit switch in positive traversing direction has tripped. <ul style="list-style-type: none">• The <i>bLimitSwitchPos</i> input for travel range monitoring via positive hardware limit switch has been set to FALSE (fail-safe).	Reset error message and retract limit switch.	

Ck02: Neg. HW limit switch [xx.0184.00002]

Response (Lenze setting printed in bold)		Setting: C00595/2 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: The hardware limit switch in negative traversing direction has tripped. <ul style="list-style-type: none"> The <i>bLimitSwitchNeg</i> input for travel range monitoring via negative hardware limit switch has been set to FALSE (fail-safe). 	Reset error message and retract limit switch.	

Ck15: Error status sign. brake [xx.0184.00005]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: The status monitoring of the holding brake control has tripped.	<ul style="list-style-type: none"> Check configuration of the <i>bBrkApplied</i> input for status detection of the brake (via a switching contact at the brake). Check wiring/function of the switching contact. Adapt waiting time (C02589/3). Deactivate status monitoring (via bit 5 in C02582). 	

Ck03: Pos. SW limit position [xx.0184.00007]

Response (Lenze setting printed in bold)		Setting: C00595/3 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: The device has detected that the position is beyond the positive software limit position (C01229/1).	<ul style="list-style-type: none"> Enlarge permissible traversing range (change settings of the software limit positions). Deactivate software limit position monitoring. 	

Ck04: Neg. SW limit position [xx.0184.00008]

Response (Lenze setting printed in bold)		Setting: C00595/4 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: The device has detected that the position is beyond the negative software limit position (C01229/2).	<ul style="list-style-type: none"> Enlarge permissible traversing range (change settings of the software limit positions). Deactivate software limit position monitoring. 	

Ck14: Target position outside SW limit position [xx.0184.00015]

Response (Lenze setting printed in bold)		Setting: C00595/14 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: A target beyond the software limit positions (C01229/1 and C01229/2) has been attempted to position to.	<ul style="list-style-type: none"> Select a target within the software limit positions. Enlarge permissible traversing range (change settings of the software limit positions). Deactivate software limit position monitoring. 	

Ck16: Time overflow manual operation [xx.0184.00064]

Response (Lenze setting printed in bold)		Setting: C00595/15 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
Manual PC control: The connection monitoring has tripped. <ul style="list-style-type: none"> The online connection between the PC and the controller has been interrupted for a longer period of time than the timeout set in C00464/1. 	<ul style="list-style-type: none"> Check the communication link between the PC and the controller. Check the voltage supply/function of the controller. Adjust the timeout (C00464/1). 	

Ck05: Following error 1 [xx.0184.00153]

Response (Lenze setting printed in bold)		Setting: C00595/5 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
MCK: The following error limit 1 (C01215/1) has been exceeded.	<ul style="list-style-type: none"> Optimise control mode. Increase following error limit. Deactivate following error monitoring. 	

Ck06: Following error 2 [xx.0184.00154]

Response (Lenze setting printed in bold)		Setting: C00595/6 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
MCK: The following error limit 2 (C01215/2) has been exceeded.	<ul style="list-style-type: none"> Optimise control mode. Increase following error limit. Deactivate following error monitoring. 	

Ck07: Travel range limit exceeded [xx.0184.00155]

Response (Lenze setting printed in bold)		Setting: C00595/7 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
MCK: The maximum travel distance has been exceeded. <ul style="list-style-type: none"> The maximum travel distance is displayed in C01213/1. 	<ul style="list-style-type: none"> Check profile parameters. Deactivate travel range limit monitoring. 	

Ck08: Home position unknown [xx.0184.00156]

Response (Lenze setting printed in bold)		Setting: C00595/8 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
MCK: Home position is unknown.	Perform homing.	

Ck09: Positioning mode invalid [xx.0184.08005]

Response (Lenze setting printed in bold)		Setting: C00595/9 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☐ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
MCK: The positioning mode defined via the <i>wPosProfileMode</i> input is not supported.	Define a valid positioning mode.	

Ck10: Implausible profile data [xx.0184.08007]

Response (Lenze setting printed in bold)		Setting: C00595/10 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: Implausible profile data are at hand.	Check profile data set.	

Ck11: Invalid operating mode [xx.0184.08009]

Response (Lenze setting printed in bold)		Setting: C00595/11 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: The operating mode defined via the <i>wMckOperationMode</i> input is not supported.	Define a valid operating mode.	

Ck12: Invalid profile number [xx.0184.08014]

Response (Lenze setting printed in bold)		Setting: C00595/12 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: The positioning profile number in the positioning operating mode specified via the <i>wPosProfileNo</i> input is invalid.	Define a valid profile number.	

Ck13: Error - MCKCtrlInterface function block [xx.0184.08015]

Response (Lenze setting printed in bold)		Setting: C00595/13 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information		
Cause	Remedy	
MCK: An error has occurred in the L_MckCtrlInterface_1 function block.	Check wiring and parameterisation of the L_MckCtrlInterface_1 function block.	

dH09: EEPROM power section [xx.0400.00009]

Response (Lenze setting printed in bold)		
<input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
Device error	Consultation with Lenze required.	

dH10: Fan failure [xx.0400.00016]

Response (Lenze setting printed in bold)		Setting: C00566 (<input checked="" type="checkbox"/> Adjustable response)
<input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information		
Cause	Remedy	
The device fan has failed. Possible causes: <ul style="list-style-type: none"> The short-circuit check of the fan connection has tripped. The speed monitoring of the fan has tripped. 	<ul style="list-style-type: none"> Check the fan for short-circuit. Clean the fan. 	

dH68: Adjustment data error CU [xx.0400.00104]

Response (Lenze setting printed in bold) <input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information	
Cause	Remedy
Device error	Consultation with Lenze required.

dH69: Adjustment data error BU [xx.0400.00105]

Response (Lenze setting printed in bold) <input type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input type="checkbox"/> 2: Trouble <input type="checkbox"/> 3: TroubleQuickStop <input type="checkbox"/> 4: WarningLocked <input type="checkbox"/> 5: Warning <input type="checkbox"/> 6: Information	
Cause	Remedy
Device error	Consultation with Lenze required.

US01: User error 1 [xx.0980.00001]

Response (Lenze setting printed in bold) Setting: C00581/1 (<input checked="" type="checkbox"/> Adjustable response) <input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information	
Cause	Remedy
User error 1 has been tripped via the <i>bSetError1</i> input of the LS_SetError_1 system block.	User-defined.

US02: User error 2 [xx.0981.00002]

Response (Lenze setting printed in bold) Setting: C00581/2 (<input checked="" type="checkbox"/> Adjustable response) <input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information	
Cause	Remedy
User error 2 has been tripped via the <i>bSetError2</i> input of the LS_SetError_1 system block.	User-defined.

US03: User error 3 [xx.0982.00003]

Response (Lenze setting printed in bold) Setting: C00581/3 (<input checked="" type="checkbox"/> Adjustable response) <input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information	
Cause	Remedy
User error 3 has been tripped via the <i>bSetError3</i> input of the LS_SetError_1 system block.	User-defined.

US04: User error 4 [xx.0983.00004]

Response (Lenze setting printed in bold) Setting: C00581/4 (<input checked="" type="checkbox"/> Adjustable response) <input checked="" type="checkbox"/> 0: No Reaction <input checked="" type="checkbox"/> 1: Fault <input checked="" type="checkbox"/> 2: Trouble <input checked="" type="checkbox"/> 3: TroubleQuickStop <input checked="" type="checkbox"/> 4: WarningLocked <input checked="" type="checkbox"/> 5: Warning <input checked="" type="checkbox"/> 6: Information	
Cause	Remedy
User error 4 has been tripped via the <i>bSetError4</i> input of the LS_SetError_1 system block.	User-defined.

US05: User error 5 [xx.0984.00001]

Response (Lenze setting printed in bold)		Setting: C00581/5 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
User error 5 has been tripped via the <i>bSetError1</i> input of the LS_SetError_2 system block.	User-defined.	

US06: User error 6 [xx.0985.00002]

Response (Lenze setting printed in bold)		Setting: C00581/6 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
User error 6 has been tripped via the <i>bSetError2</i> input of the LS_SetError_2 system block.	User-defined.	

US07: User error 7 [xx.0986.00003]

Response (Lenze setting printed in bold)		Setting: C00581/7 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
User error 7 has been tripped via the <i>bSetError3</i> input of the LS_SetError_2 system block.	User-defined.	

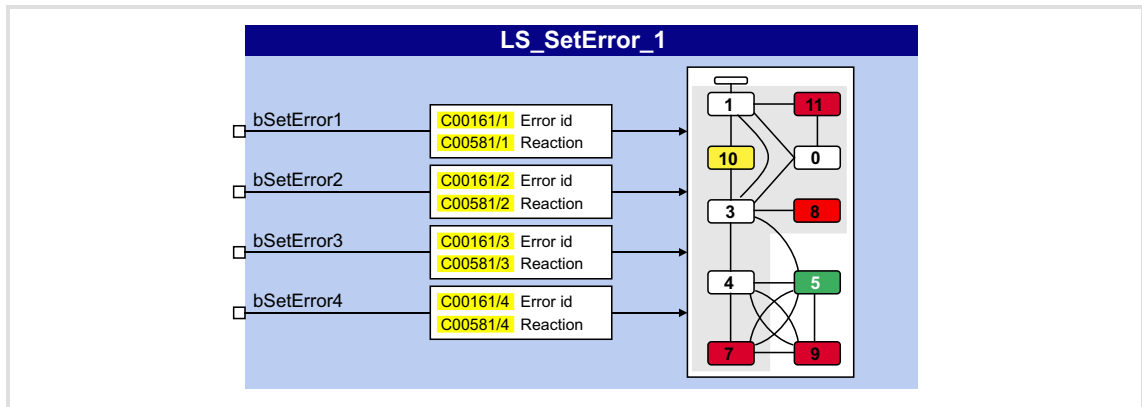
US08: User error 8 [xx.0987.00004]

Response (Lenze setting printed in bold)		Setting: C00581/8 (☑ Adjustable response)
☑ 0: No Reaction ☑ 1: Fault ☑ 2: Trouble ☑ 3: TroubleQuickStop ☑ 4: WarningLocked ☑ 5: Warning ☑ 6: Information		
Cause	Remedy	
User error 8 has been tripped via the <i>bSetError4</i> input of the LS_SetError_2 system block.	User-defined.	

10.10 System block "LS_SetError_1"

This system block is used for error handling within the application.

- ▶ The application can trip up to four different user error messages with parameterisable error IDs and error responses via the four boolean inputs.
- ▶ If several inputs are set to TRUE at the same time, the input with the lowest number will trip the error message.



Inputs

Identifier	Data type	Information/possible settings
bSetError1	BOOL	Input for tripping " US01: User error 1 " <ul style="list-style-type: none"> Error subject number: 980 Error number: $(C00581/1 \times 0x0400000) + (980 \times 0x10000) + (C00161/1)$
bSetError2	BOOL	Input for tripping " US02: User error 2 " <ul style="list-style-type: none"> Error subject number: 981 Error number: $(C00581/2 \times 0x0400000) + (981 \times 0x10000) + (C00161/2)$
bSetError3	BOOL	Input for tripping " US03: User error 3 " <ul style="list-style-type: none"> Error subject number: 982 Error number: $(C00581/3 \times 0x0400000) + (982 \times 0x10000) + (C00161/3)$
bSetError4	BOOL	Input for tripping " US04: User error 4 " <ul style="list-style-type: none"> Error subject number: 983 Error number: $(C00581/4 \times 0x0400000) + (983 \times 0x10000) + (C00161/4)$

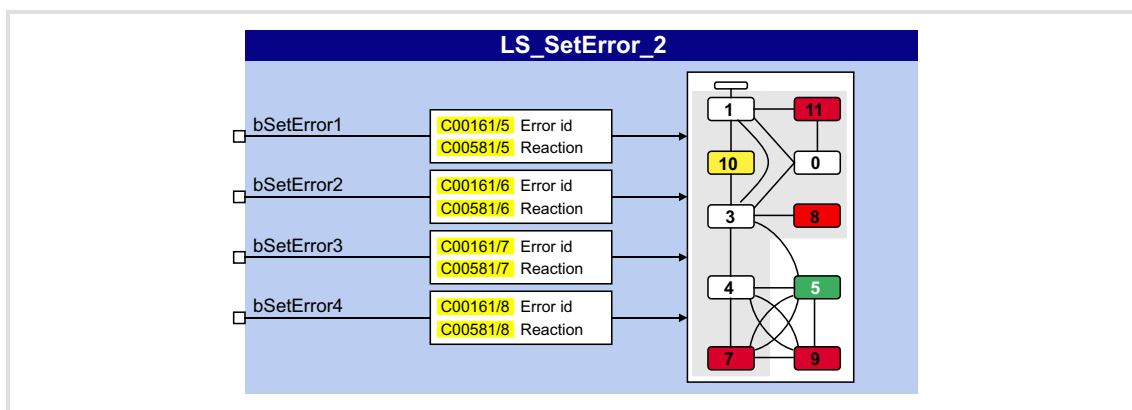
Parameter

Parameter	Possible settings			Info
C00161/1...4	0	...	65535	Error ID for user errors 1 ... 4
C00581/1...4				Response to user errors 1 ... 4
	0	No Reaction		
	1	Fault (pulse inhibit)		
	2	Trouble		
	3	TroubleQuickStop		
	4	WarningLocked		
	5	Warning		
	6	Information		

10.11 System block "LS_SetError_2"

This system block is used for error handling within the application.

- ▶ The application can trip up to four different user error messages with parameterisable error IDs and error responses via the four boolean inputs.
- ▶ If several inputs are set to TRUE at the same time, the input with the lowest number will trip the error message.



Inputs

Identifier	Data type	Information/possible settings
bSetError1	BOOL	Input for tripping " US05: User error 5 " <ul style="list-style-type: none"> Error subject number: 984 Error number: $(C00581/5 \times 0x0400000) + (984 \times 0x10000) + (C00161/5)$
bSetError2	BOOL	Input for tripping " US06: User error 6 " <ul style="list-style-type: none"> Error subject number: 985 Error number: $(C00581/6 \times 0x0400000) + (985 \times 0x10000) + (C00161/6)$
bSetError3	BOOL	Input for tripping " US07: User error 7 " <ul style="list-style-type: none"> Error subject number: 986 Error number: $(C00581/7 \times 0x0400000) + (986 \times 0x10000) + (C00161/7)$
bSetError4	BOOL	Input for tripping " US08: User error 8 " <ul style="list-style-type: none"> Error subject number: 987 Error number: $(C00581/8 \times 0x0400000) + (987 \times 0x10000) + (C00161/8)$

Parameter

Parameter	Possible settings	Info														
C00161/5...8	0 ... 65535	Error ID for user errors 5 ... 8														
C00581/5...8	<table border="1"> <tr><td>0</td><td>No Reaction</td></tr> <tr><td>1</td><td>Fault (pulse inhibit)</td></tr> <tr><td>2</td><td>Trouble</td></tr> <tr><td>3</td><td>TroubleQuickStop</td></tr> <tr><td>4</td><td>WarningLocked</td></tr> <tr><td>5</td><td>Warning</td></tr> <tr><td>6</td><td>Information</td></tr> </table>	0	No Reaction	1	Fault (pulse inhibit)	2	Trouble	3	TroubleQuickStop	4	WarningLocked	5	Warning	6	Information	Response to user errors 5 ... 8
0	No Reaction															
1	Fault (pulse inhibit)															
2	Trouble															
3	TroubleQuickStop															
4	WarningLocked															
5	Warning															
6	Information															

11 System bus "CAN on board"

The controller has an integrated CANopen system bus interface ("CAN on board") which is used to exchange i.a. process data and parameter values between the nodes. Furthermore, other modules can be connected via this interface such as decentralised terminals, operator and input devices (HMIs), as well as external controls and host systems.

The interface transfers CAN objects following the CANopen communication profile (CiA DS301, version 4.02) developed by the umbrella organisation of CiA (CAN in Automation) in conformity with the CAL (CAN Application Layer).



Tip!

- In the »Engineer« parameter list and in the keypad, category **CAN**, you can find the parameters relevant for the CANopen system bus interface classified in different subcategories.
- Information on CAN communication modules and CANopen system bus interfaces of other Lenze devices is provided in the "CAN" communication manual in the Lenze library.

11.1 General information

For many years, the system bus (CAN) based on the CANopen communication profile has been integrated in Lenze controllers. Due to the lower number of data objects available, the functionality and compatibility of the previous system bus are lower as compared to CANopen. For parameter setting, two parameter data channels are always available to the user while CANopen provides only one active parameter channel.

The system bus (CANopen) of the Inverter Drives 8400 is a further development of the system bus (CAN) including the following properties:

- ▶ Full compatibility according to CANopen DS301, V4.02.
- ▶ Support of the "Heartbeat" NMT slave function (DS301, V4.02).
- ▶ Number of parameterisable server SDO channels:
 - Max. 2 channels with 1 ... 8 bytes
 - Due to the 2 server SDO channels, an address range of 1 ... 63 is provided.
- ▶ Number of parameterisable PDO channels:
 - For device version "BaseLine C":
 - max. 2 transmit PDOs (TPDOs) with 1 ... 8 bytes (adjustable)
 - max. 2 receive PDOs (RPDOs) with 1 ... 8 bytes (adjustable)
 - From device version "StateLine":
 - max. 3 transmit PDOs (TPDOs) with 1 ... 8 bytes (adjustable)
 - max. 3 receive PDOs (RPDOs) with 1 ... 8 bytes (adjustable)
- ▶ All PDO channels are functionally equivalent.
- ▶ Monitoring of the RPDOs for data reception
- ▶ Adjustable error response to ...
 - physical CAN errors (frame, bit, ACK error)
 - bus-stop, bus working
 - absent PDOs
- ▶ Telegram counters for SDOs and PDOs
- ▶ Bus status diagnostics
- ▶ Boot-up telegram generation
- ▶ Emergency telegram generation
- ▶ Reset node telegram generation (in case of master configuration)
- ▶ Sync telegram generation and response to sync telegrams:
 - Data transmission/reception
 - Device-internal time base synchronisation
- ▶ Abort codes
- ▶ All CAN on board functions can be parameterised via codes
- ▶ Object directory (all mandatory functions, optional functions, indexes)

11.1.1 General data and application conditions

Range	Values
Communication profile	CANopen, DS301 V4.02
Communication medium	DIN ISO 11898
Network topology	Line terminated at both ends
Adjustable node addresses (max. number of nodes)	Depending on the number of SDO channels set in C00366 : <ul style="list-style-type: none"> • 1 SDO: Node address 1 ... 127 (max. 127 nodes) • 2 SDO: Node address 1 ... 63 (max. 63 nodes) • adjustable via DIP switches or via code C00350.
Adjustable baud rates	20, 50, 125, 250, 500, 1000 kbps <ul style="list-style-type: none"> • adjustable via DIP switches or via code C00351.
Process data	<ul style="list-style-type: none"> • Max. 3 transmit PDOs (TPDOs) with 1 ... 8 bytes (adjustable) • Max. 3 receive PDOs (RPDOs) with 1 ... 8 bytes (adjustable)
Parameter data	Max. 2 server SDO channels with 1 ... 8 bytes
Transfer mode for TPDOs	<ul style="list-style-type: none"> • in case of data change (including adjustable blocking time) • Time-controlled, 1 to x ms • After the reception of 1 to 240 sync telegrams

11.1.2 Supported protocols

Protocols		
Standard PDO protocols	PDO write PDO read	
SDO protocols	SDO download SDO download initiate SDO download segment	
	SDO upload SDO upload initiate SDO upload segment	
	SDO abort transfer	
	SDO block download SDO block download initiate SDO block download end	
	SDO block upload SDO block upload initiate SDO block upload end	
	NMT protocols	Start remote node (master and slave)
		Stop remote node (slave)
Enter pre-operational (slave)		
Reset node (slave and local device)		
Reset communication protocol (slave)		
Monitoring protocols	Heartbeat (heartbeat producer and heartbeat consumer) <ul style="list-style-type: none"> • Up to 15 Heartbeat Producers can be monitored. 	
	Emergency telegram (to master)	
More protocols	Transmitting and receiving a sync telegram <ul style="list-style-type: none"> • Synchronisation of the internal time base to the reception of the CAN sync telegram is possible. ▶ Synchronisation of the internal time base 	

11.1.3 Communication time

The communication time is the time between the start of a request and the arrival of the corresponding response.

**Tip!**

The communication times in the CAN network depend on:

- the processing time in the device
- the telegram runtime (baud rate/telegram length)
- the bus load (especially if the bus is charged with PDOs and SDOs at a low baud rate)

Processing time in the 8400 controller

No dependencies exist between parameter data and process data.

- ▶ Parameter data: approx. 5 ms (typical value)
 - For parameters concerning the motor control (e.g. C00011), the processing time may be longer (up to 30 ms).
- ▶ Process data: 1 ms

11.2 Possible settings via DIP switch

The following settings for the "CAN on board" system bus can be made via the front panel DIP switches:

DIP switch	Possible settings/detailed information
	a ... c ▶ Setting the baud rate
	1 ... 64 ▶ Setting the node address
	CA ▶ Activating the bus terminating resistor

Lenze setting: All DIP switches are in the "OFF" position



Note!

- The DIP switch settings are accepted if a node address is unequal zero when the device or the 24-V supply is switched on by the DIP address.
- If all DIP switches are OFF when the device or the 24 V supply is switched on, the setting of the baud rate and node address are read out of the parameter set/parameter.



Tip!

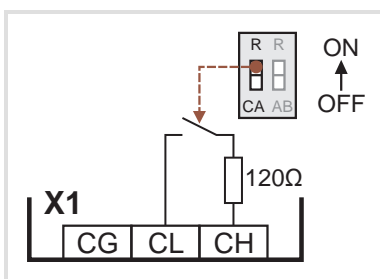
The current DIP switch settings are displayed in code [C00349](#).

Bit 15 indicates that the setting of the DIP switches has been accepted when the device or the 24V supply has been switched on.

11.2.1 Activating the bus terminating resistor

The CAN bus must be terminated between CAN low and CAN high at the first and last physical node each by a resistor (120 Ω).

The 8400 controller is provided with an integrated bus terminating resistor, which can be activated via the DIP switch labelled with "CA":



- ▶ OFF = bus terminating resistor is inactive
- ▶ ON = bus terminating resistor is active

[11-1] Activation of the integrated bus terminating resistor

11.2.2 Setting the baud rate

The baud rate can be set via code [C00351](#) or with the DIP switches a to c:



Note!

- All DIP switches (a ... c, 1 ... 64) = OFF (Lenze setting):
 - At switching on, the settings under code [C00350](#) (node address) and [C00351](#) (baud rate) will become active.
- Preset baud rate: 500 kbps

DIP switch position			Baud rate
c	b	a	
ON	OFF	ON	20 kbps
OFF	ON	ON	50 kbps
OFF	ON	OFF	125 kbps
OFF	OFF	ON	250 kbps
OFF	OFF	OFF	500 kbps
ON	OFF	OFF	1000 kbps

11.2.3 Setting the node address

The node address can be set via code [C00350](#) or with the DIP switches 1 to 64.

- ▶ The labelling on the housing corresponds to the values of the individual DIP switches for determining the node address.
- ▶ The valid address range depends on the number of SDO channels set in [C00366](#):
 - 1 SDO (Lenze setting): 1 ... 127
 - 2 SDO: 1 ... 63



Note!

- The addresses of the nodes must differ from each other.
- All DIP switches (a ... c, 1 ... 64) = OFF (Lenze setting):
 - At switching on, the settings under code [C00350](#) (node address) and [C00351](#) (baud rate) will become active.

Example: Setting of the node address 23

DIP switch	64	32	16	8	4	2	1
Switch position	OFF	OFF	ON	OFF	ON	ON	ON
Value	0	0	16	0	4	2	1
Node address	= Sum of the values = 16 + 4 + 2 + 1 = 23						

11.3 LED status displays for the system bus



- ▶ **CAN-RUN:**
Signals the CANopen state
- ▶ **CAN-ERROR:**
Signals a CANopen error

Frequency of the display	CAN signalling and meaning
Permanently red	CAN-Run: -, CAN-Error: Bus Off
Flashes	Automatic detection of baud rate is active
Green is blinking every 0.2 s	CAN-Run: Pre-Operational , CAN-Error: -
Green is blinking every 0.2 s Red is blinking once, 1 s off	CAN-Run: Pre-Operational , CAN-Error: Warning Limit reached
Green is blinking every 0.2 s Red is blinking twice, 1 s off	CAN-Run: Pre-Operational , CAN-Error: Node Guard Event
Permanently green	CAN-Run: Operational , CAN-Error: -
Permanently green Red is blinking once, 1 s off	CAN-Run: Operational , Fault: Warning Limit reached
Permanently green Red is blinking twice, 1 s off	CAN-Run: Operational , CAN-Error: Node Guard Event
Permanently green Red is blinking 3 times, 1 s off	CAN-Run: Operational , CAN-Error: Sync Message Error
Green is blinking every second	CAN-Run: Stopped , CAN-Error: -
Green is blinking every second Red is blinking once, 1 s off	CAN-Run: Stopped , CAN-Error: Warning Limit reached
Green is blinking every second Red is blinking twice, 1 s off	CAN-Run: Stopped , CAN-Error: Node Guard Event

11.4 Going online via system bus (CAN on board)

The integrated system bus interface (CAN on board, X1 terminal) can also be used for the communication between the »Engineer« and the controller, alternatively to the USB diagnostic adapter.

► Lenze offers the following communication accessories for connection to the PC:

Communication accessories	PC interface
PC system bus adapter 2173 incl. connection cable and voltage supply adapter <ul style="list-style-type: none"> • for DIN keyboard connection (EMF2173IB) • for PS/2 keyboard connection (EMF2173IBV002) • for PS/2 keyboard connection with electrical isolation (EMF2173IBV003) 	Parallel interface (LPT port)
PC system bus adapter 2177 incl. connection cable (EMF2177IB)	USB (Universal Serial Bus)



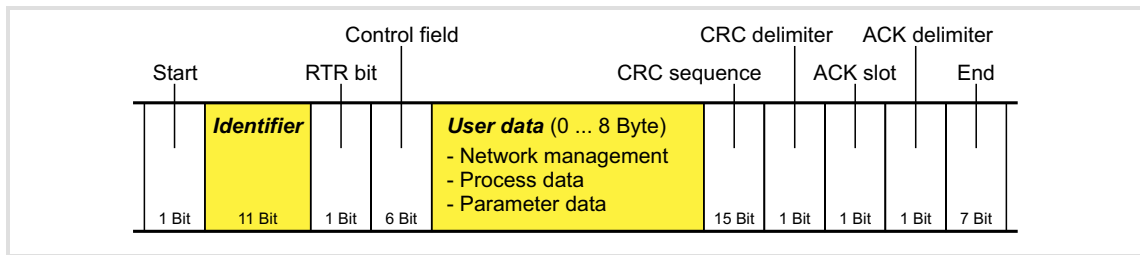
Note!

- For detailed information about the PC system bus adapter, please see the "CAN Communication Manual".
- Please observe the documentation for the PC system bus adapter!
- In the »Engineer«, go to the *Device assignment offline devices* dialog box and select the "System bus CAN" entry from the **Bus connection** list field to establish an online connection.

11.5 Reinitialising the CANopen system bus interface

The [C00002/26](#) = "1: On / start" device command reinitialises the CANopen system bus interface of the controller ("Reset node"), which is required after e.g. changing the data transfer rate, the node address or the identifiers, respectively.

11.6 Structure of the CAN data telegram



[11-2] Basic structure of the CAN telegram

The following subchapters provide a detailed description of the identifier and the user data. The other signals refer to the transfer characteristics of the CAN telegram whose description is not included in the scope of this documentation.

11.6.1 Identifier

The principle of the CAN communication is based on a message-oriented data exchange between a transmitter and many receivers. All nodes can transmit and receive quasi-simultaneously.

The identifier, also called COB-ID (abbr. for communication object identifier), is used to control which node is to receive a transmitted message. In addition to the addressing, the identifier contains information on the priority of the message and the type of user data.

The identifier consists of a basic identifier and the node address of the node to be addressed:

Identifier (COB-ID) = basic identifier + node address (node ID)

Exception: The identifier for process data/heartbeat/emergency objects as well as network management and sync telegrams is freely assigned by the user (either manually or automatically by the network configurator), or is permanently assigned.

Node address (node ID)

Every node of the system bus network must be assigned to a node address (also called node ID) within the valid address range (1 ... 127) for unambiguous identification.

- ▶ Assigning a node address more than once within a network is impermissible.
- ▶ The own node address can be configured via the DIP switches or via code [C00350](#).
 - ▶ [Setting the node address](#) (☐ 643)

Identifier assignment

The system bus is message-oriented instead of node-oriented. Every message has an unambiguous identification, the identifier. For CANopen, node-oriented transfer is achieved by the fact that every message has only one transmitter.

- ▶ The basic identifiers for network management (NMT) and sync as well as the basic SDO channel (SDO1) are defined in the CANopen protocol and cannot be changed.
- ▶ In the Lenze setting, the basic identifiers of the PDOs are preset according to the "Predefined connection set" of DS301, V4.02 and can be changed via parameters/indexes if required. ▶ [Identifiers of the process data objects](#) (☐ 661)

Object	Direction		Lenze-Base-ID		CANopen-Base-ID	
	from device	to device	dec	hex	dec	hex
Network management (NMT)			0	0	0	0
Sync ¹⁾			128	80	128	80
Emergency ¹⁾	●		128	80	128	80
PDO1 (Process data channel 1)	TPDO1	●	384	180	384	180
	RPDO1		512	200	512	200
PDO2 (Process data channel 2)	TPDO2	●	640	280	640	280
	RPDO2		641	281	768	300
PDO3 (Process data channel 3)	TPDO3	●	768	300	896	380
	RPDO3		769	301	1024	400
SDO1 (Parameter data channel 1)	TSDO1	●	1408	580	1408	580
	RSDO1		1536	600	1536	600
SDO2 (Parameter data channel 2)	TSDO2	●	1472	5C0	1472	5C0
	RSDO2		1600	640	1600	640
Heartbeat	●		1792	700	1792	700
Boot-up	●		1792	700	1792	700

1) If you set the sync transmit/receive identifier manually, observe the use of the emergency telegram, since it has the same COB-ID.

11.6.2 User data

All nodes communicate by exchanging data telegrams via the system bus. The user data area of the CAN telegram either contains network management data or parameter data or process data:

Network management data

(NMT data)

- ▶ Control information on start, stop, reset, etc. of communication to specific nodes or to all nodes of the CAN network.

Process data

(PDOs – process data objects)

- ▶ Process data are transferred via the process data channel.
- ▶ Process data can be used to control the controller.
- ▶ Process data are not saved to the controller.
- ▶ Process data are transmitted between host system and nodes to ensure continuous exchange of current input and output data.
- ▶ Process data usually are unscaled/scalable raw data.
- ▶ Process data are, for instance, setpoints and actual values.
- ▶ The exact meaning of the PDO file contents is determined via the function block editor (FB Editor) in the I/O level or via the PDO mapping.

Parameter data

(SDOs – service data objects)

- ▶ Parameter data are the CANopen indexes or, in case of Lenze devices, the codes.
- ▶ Parameters are, for instance, used for one-off plant setting during commissioning or when the material is changed on a production machine.
- ▶ Parameter data are transmitted as SDOs via the parameter data channel. They are acknowledged by the receiver, i.e. the transmitter gets a feedback about the transmission being successful or not.
- ▶ The parameter data channel enables access to all Lenze codes and CANopen indexes.
- ▶ Parameter changes are automatically saved to the controller until mains switching.
- ▶ In general, the parameter transfer is not time-critical.
- ▶ Parameter data are, for instance, operating parameters, diagnostic information and motor data as well as control information on the interconnection of function blocks in the I/O level of the FB Editor.

11.7 Communication phases/network management

Regarding communication via the system bus, the controller distinguishes between the following statuses:

Status	Explanation
"Initialisation" (Initialisation)	After switch-on, an initialisation run is carried out. <ul style="list-style-type: none"> • During this phase, the controller is not involved in the data exchange via the bus. • The standard values are re-written to all CAN-relevant parameters. • After initialisation is completed, the controller is automatically set to the "Pre-Operational" status.
"Pre-Operational" (before being ready for operation)	Parameter data can be received, process data are ignored.
"Operational" (ready for operation)	Parameter data and process data can be received!
"Stopped" (stopped)	Only network management telegrams can be received.

Communication object	Initialisation	Pre-Operational	Operational	Stopped
PDO			●	
SDO		●	●	
Sync		●	●	
Emergency		●	●	
Boot-up	●			
Network management (NMT)		●	●	●

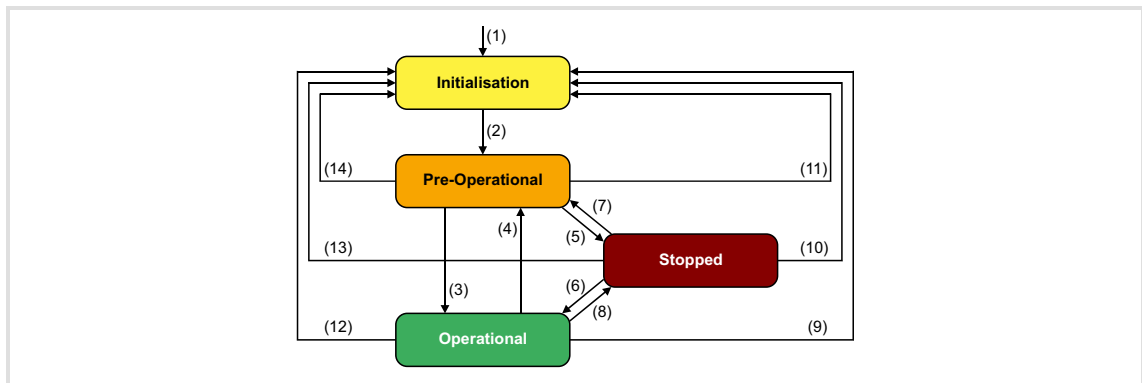


Tip!



Part of the initialisation or the entire initialisation can be carried out anew in every status by transferring the corresponding network management telegrams.

The current CAN status is displayed in [C00359](#) for diagnostic purposes.

11.7.1 Status transitions

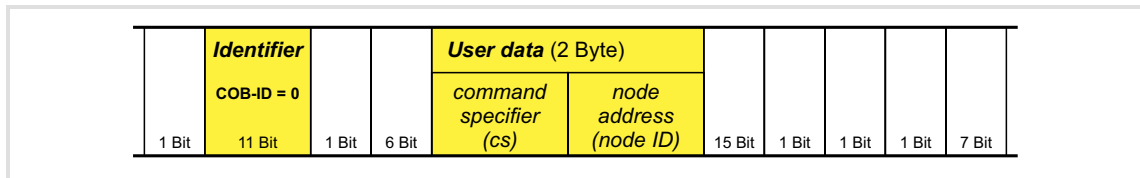


[11-3] NMT status transitions in the CAN network

Transition	NMT command	Status after change	Effects on process/parameter data after status change
(1)	-	Initialisation	Initialisation starts automatically when the mains is switched on. <ul style="list-style-type: none"> During initialisation, the controller is not involved in the data exchange. After the initialisation is completed, the node sends a boot-up message with an individual identifier and automatically changes to the "pre-operational" status.
(2)	-	Pre-Operational	In this phase, the master determines the way in which the node(s) takes/take part in communication.
	From here, the master changes the statuses for the entire network. <ul style="list-style-type: none"> A target address included in the NMT command defines the receiver(s). If the 8400 controller is configured as CAN master, the status is automatically changed to "Operational" after a waiting time has expired (C00356/1), and the 0x0100 ("Start remote node") NMT command is transmitted to all nodes. Data can only be exchanged via process data objects if the status is "Operational"! 		
(3), (6)	0x01 xx Start remote node	Operational	Network management/sync/emergency telegrams as well as process data (PDO) and parameter data (SDO) are active. Optional: When the status is changed, event and time-controlled process data (PDOs) are transmitted once.
(4), (7)	0x80 xx Enter Pre-Operational	Pre-Operational	Network management/sync/emergency telegrams and parameter data (SDO) are active.
(5), (8)	0x02 xx Stop remote node	Stopped	Only network management telegrams can be received.
(9), (10), (11)	0x81 xx Reset node	Initialisation	All CAN-relevant parameters (CiA DS 301) are initialised with the saved values.
(12), (13), (14)	0x82 xx Reset communication		All CAN-relevant parameters (CiA DS 301) are initialised with the saved values.
	Meaning of the node address in the NMT command: <ul style="list-style-type: none"> xx = 0x00: If this assignment is selected, the telegram addresses all nodes (broadcast telegram). The status of all nodes can be changed at the same time. xx = Node ID: If a node address is specified, only the status of the node with the corresponding address changes. 		

11.7.2 Network management telegram (NMT)

The telegram for the network management contains identifier "0" and the command included in the user data which consists of the command byte and the node address:



[11-4] Network management telegram for changing over the communication phases

Command specifier (cs)		NMT command
dec	hex	
1	0x01	Start remote node
2	0x02	Stop remote node
128	0x80	Enter Pre-Operational
129	0x81	Reset node
130	0x82	Reset communication

The change-over of the communication phases for the entire network is carried out by one node, the CAN master. The function of the CAN master can also be carried out by the controller. [▶ Parameterising the controller as CAN master \(652\)](#)

Meaning of the node address in the user data:

- ▶ node ID = "0": The telegram addresses all nodes (broadcast telegram). The status of all nodes can be changed at the same time.
- ▶ node ID = "1" ... "127": If a node address is specified, only the status of the node with the corresponding address changes.

Example:

Data can only be exchanged via process data objects if the status is "Operational". If the CAN master is supposed to switch all nodes connected to the bus from the "Pre-Operational" communication status to the "Operational" communication status, the identifier and user data in the transmission telegram must be set as follows:

- ▶ Identifier: 0x00 (network management)
- ▶ User data: 0x0100 ("Start remote node" NMT command to all nodes)

11.7.3 Parameterising the controller as CAN master

If the initialisation of the system bus and the associated status change from "Pre-Operational" to "Operational" is not effected by a superimposed host system, the controller can instead be defined to be a "quasi" master to execute this task.

The controller is configured as CAN master in [C00352](#).

- ▶ Being the CAN master, the controller sets all nodes connected to the bus (broadcast telegram) to the "Operational" communication status with the "Start remote node" NMT telegram. Only in this communication status, data can be exchanged via process data objects.
- ▶ A delay time can be set in [C00356/1](#) which must expire after mains switching before the controller transmits the "Start remote node" NMT telegram.

Parameter	Info	Lenze setting	
		Value	Unit
C00352	CAN Slave/Master	Slave	
C00356/1	CAN delay boot-up - Operational	3000	ms



Note!

The changes of the master/slave operation in [C00352](#) will not be activated until

- another mains switching of the controller

or

- the "Reset node" or "Reset communication" NMT telegram has been transmitted to the controller.

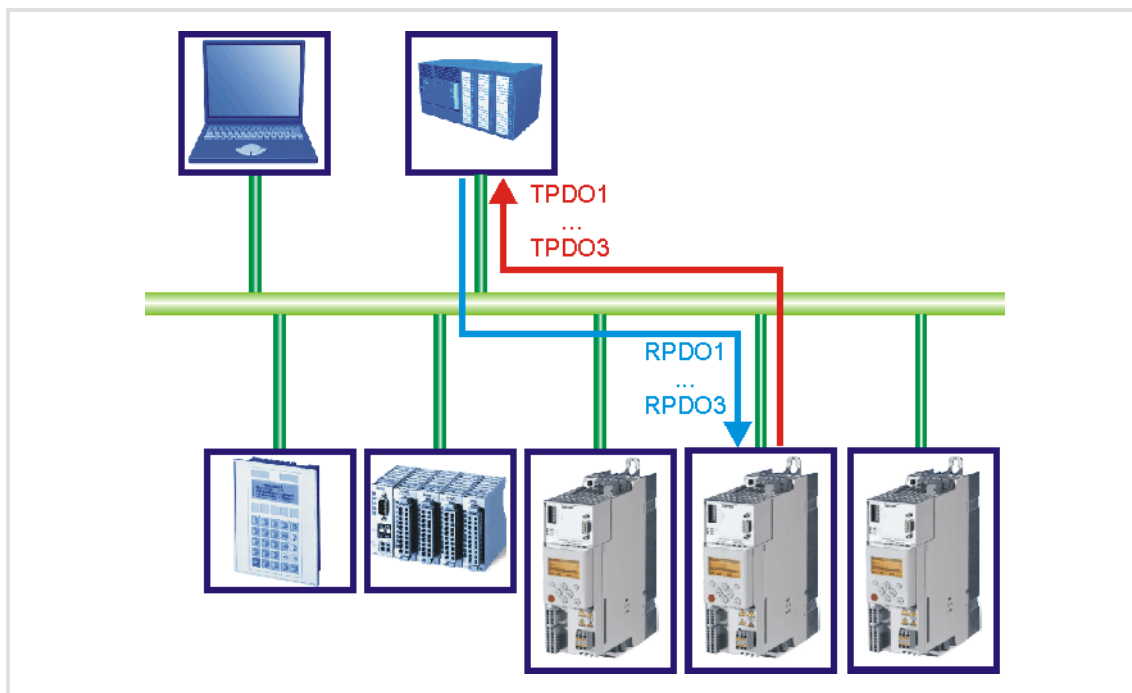
The "CAN reset node" device command ([C00002/26](#)) is provided as an alternative to the "Reset node" NMT telegram for the reinitialisation of the CAN-specific device parameters.



Tip!

Master functionality is only required during the initialisation phase of the drive system.

11.8 Process data transfer



[11-5] PDO data transfer from / to the higher-level host system

"BaseLine C" versions have two separate process channels (PDO1 and PDO2) and from the "StateLine" version three separate process data channels (PDO1 ... PDO3) for process data transfer.

Definitions

- ▶ Process data telegrams between the host system and the devices are distinguished in terms of direction as follows:
 - Process data telegrams to the device (RPDO)
 - Process data telegrams from the device (TPDO)
- ▶ The CANopen process data objects are designated as seen from the node's view:
 - Receive PDOs (RPDOx): Process data object received by a node
 - Transmit PDOs (TPDOx): Process data object sent by a node



Note!

Data can only be exchanged via process data objects if the status is "Operational"!

▶ [Communication phases/network management](#) (📖 649)

11.8.1 Available process data objects

Controllers of the 8400 series have a maximum number of 3 receive PDOs (RPDOs) and 3 transmit PDOs (TPDOs).

Process data object	Version "BaseLine C"	from version "StateLine"
RPDO1 Port block "LP_CanIn1"	●	●
RPDO2 Port block "LP_CanIn2"	●	●
RPDO3 Port block "LP_CanIn3"		●
TPDO1 Port block "LP_CanOut1"	●	●
TPDO2 Port block "LP_CanOut2"	●	●
TPDO3 Port block "LP_CanOut3"		●

Receive PDOs (RPDOs)

The process data objects transmitted from the CAN bus to the drive are processed via the [LP_CanIn1](#) ... [LP_CanIn3](#) port blocks.

- ▶ Every port block provides 4 words (2 bytes/word). The data of every first word are provided in a bit decoded manner (bit 0 ... 15).
- ▶ The first word of the [LP_CanIn1](#) port block is defined as control word *wCtrl*. The *wCtrl* control word does not have a permanent connection to the device control and can be used as required. The predefined assignment of the *wCtrl* control word in the [C00007](#) = "30: CAN" control mode depends on the technology application selected in [C00005](#):
 - TA "Actuating drive speed":
[Process data assignment for fieldbus communication](#) (📖 403)
 - TA "Table positioning":
[Process data assignment for fieldbus communication](#) (📖 434)
 - TA "Switch-off positioning":
[Process data assignment for fieldbus communication](#) (📖 460)

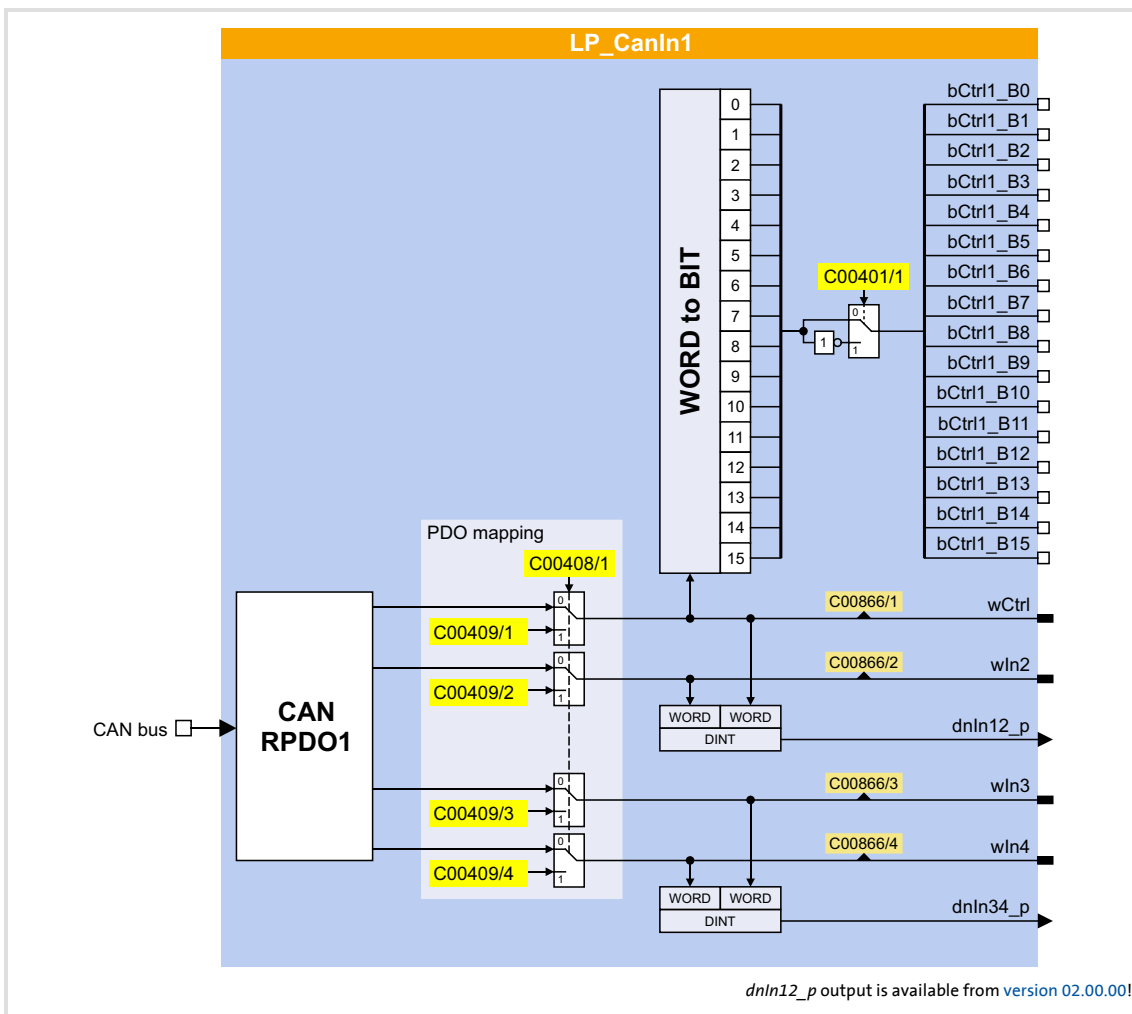
Transmit PDOs (TPDOs)

The process data transmitted from the drive to the CAN bus are processed via the [LP_CanOut1](#) ... [LP_CanOut3](#) port blocks.

- ▶ Every port block receives 4 words (2 bytes/word). The data of every first word are transmitted bit by bit (bit 0 ... 15).
- ▶ The first word of the [LP_CanOut1](#) port block is defined as the *wState* status word. The *wState* status word does not have a permanent connection to the device control and can be used as required.
 - For the predefined assignment, see the [wDeviceStatusWord status word](#) of the drive interface.

11.8.1.1 RPDO1 | Port block "LP_CanIn1"

The LP_CanIn1 port block maps process data object RPDO1 in the FB Editor.



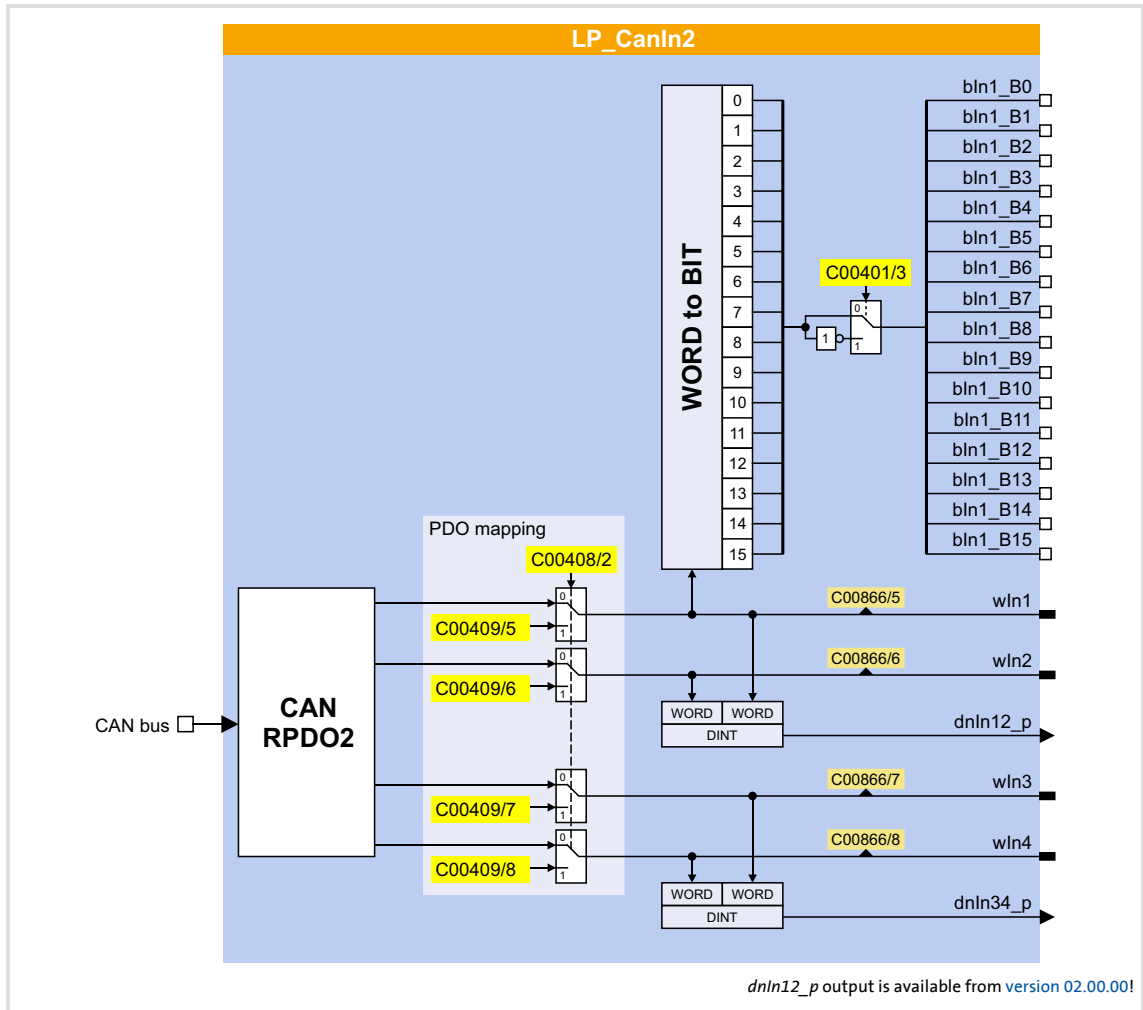
Short overview of the parameters for LP_CanIn1:

Parameter	Info	Lenze setting
C00401/1	LP_CanIn1: Inversion bCtrl1_B0..15	0x0000
C00866/1	LP_CanIn1: wCtrl	-
C00866/2	LP_CanIn1: wIn2	-
C00866/3	LP_CanIn1: wIn3	-
C00866/4	LP_CanIn1: wIn4	-
PDO mapping		
C00408/1	LP_CanIn1: Mapping selection	CanIn
C00409/1	LP_CanIn1: wCtrl MapVal	0
C00409/2	LP_CanIn1: wIn2 MapVal	0
C00409/3	LP_CanIn1: wIn3 MapVal	0
C00409/4	LP_CanIn1: wIn4 MapVal	0

Highlighted in grey = display parameter

11.8.1.2 RPDO2 | Port block "LP_CanIn2"

The LP_CanIn2 port block maps process data object RPDO2 in the FB Editor.



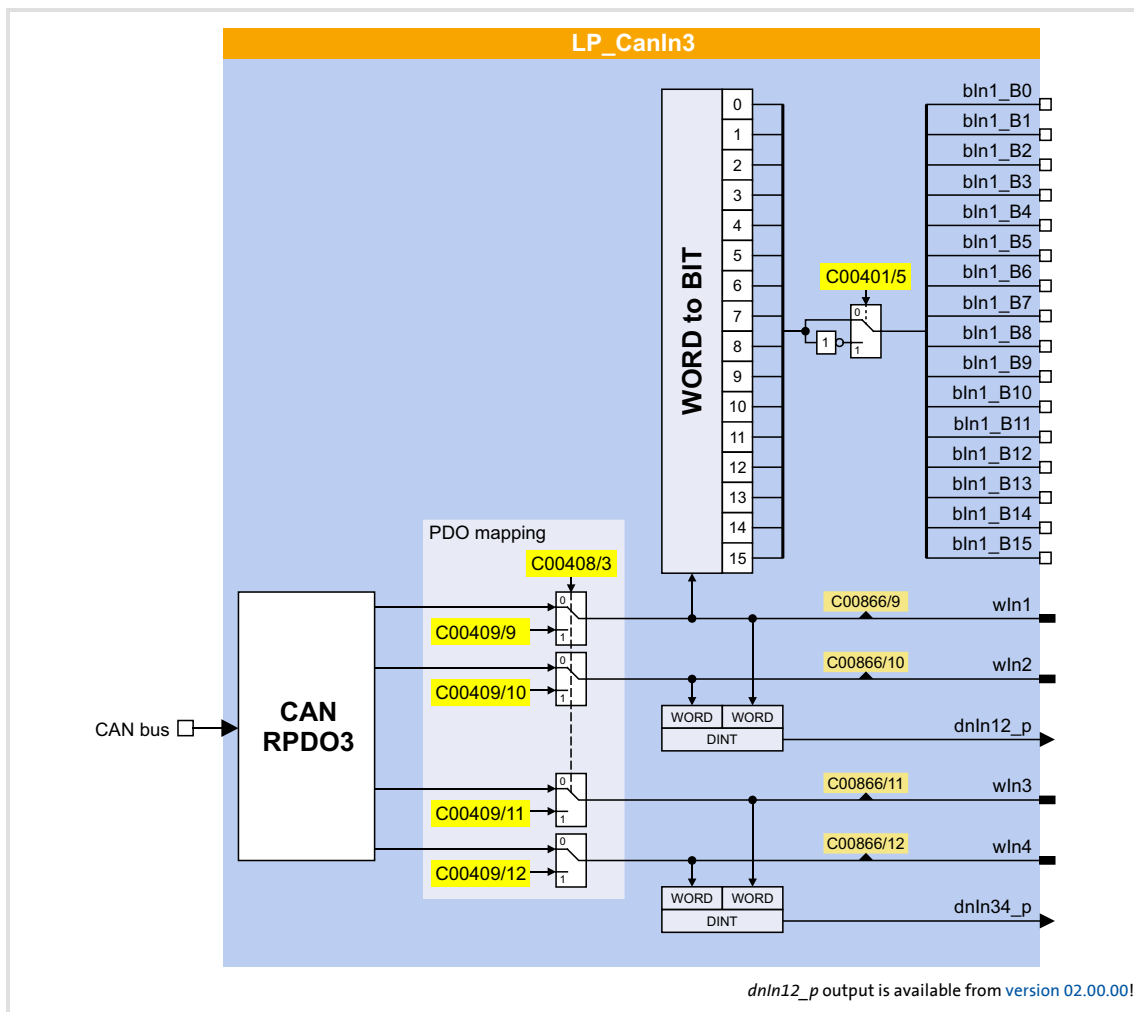
Short overview of the parameters for LP_CanIn2:

Parameter	Info	Lenze setting
C00401/3	LP_CanIn2: Inversion bln1_B0..15	0x0000
C00866/5	LP_CanIn2: wln1	-
C00866/6	LP_CanIn2: wln2	-
C00866/7	LP_CanIn2: wln3	-
C00866/8	LP_CanIn2: wln4	-
PDO mapping		
C00408/2	LP_CanIn2: Mapping selection	CanIn
C00409/5	LP_CanIn2: wln1 MapVal	0
C00409/6	LP_CanIn2: wln2 MapVal	0
C00409/7	LP_CanIn2: wln3 MapVal	0
C00409/8	LP_CanIn2: wln4 MapVal	0

Highlighted in grey = display parameter

11.8.1.3 RPDO3 | Port block "LP_CanIn3"

The LP_CanIn3 port block maps process data object RPDO3 in the FB Editor.



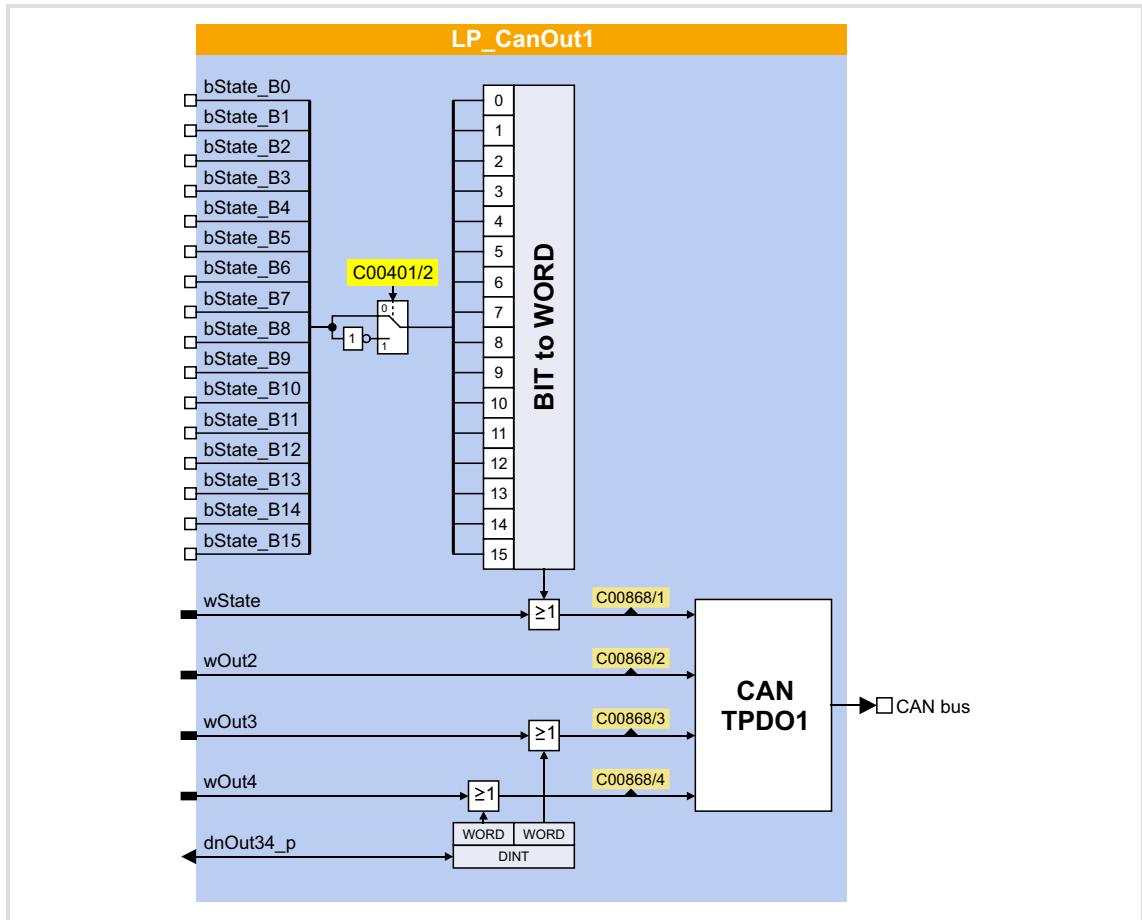
Short overview of the parameters for LP_CanIn3:

Parameter	Info	Lenze setting
C00401/5	LP_CanIn3: Inversion bln1_B0..15	0x0000
C00866/9	LP_CanIn3: wln1	-
C00866/10	LP_CanIn3: wln2	-
C00866/11	LP_CanIn3: wln3	-
C00866/12	LP_CanIn3: wln4	-
PDO mapping		
C00408/3	LP_CanIn3: Mapping selection	CanIn
C00409/9	LP_CanIn3: wln1 MapVal	0
C00409/10	LP_CanIn3: wln2 MapVal	0
C00409/11	LP_CanIn3: wln3 MapVal	0
C00409/12	LP_CanIn3: wln4 MapVal	0

Highlighted in grey = display parameter

11.8.1.4 TPDO1 | Port block "LP_CanOut1"

The LP_CanOut1 port block maps process data object TPDO1 in the FB Editor.



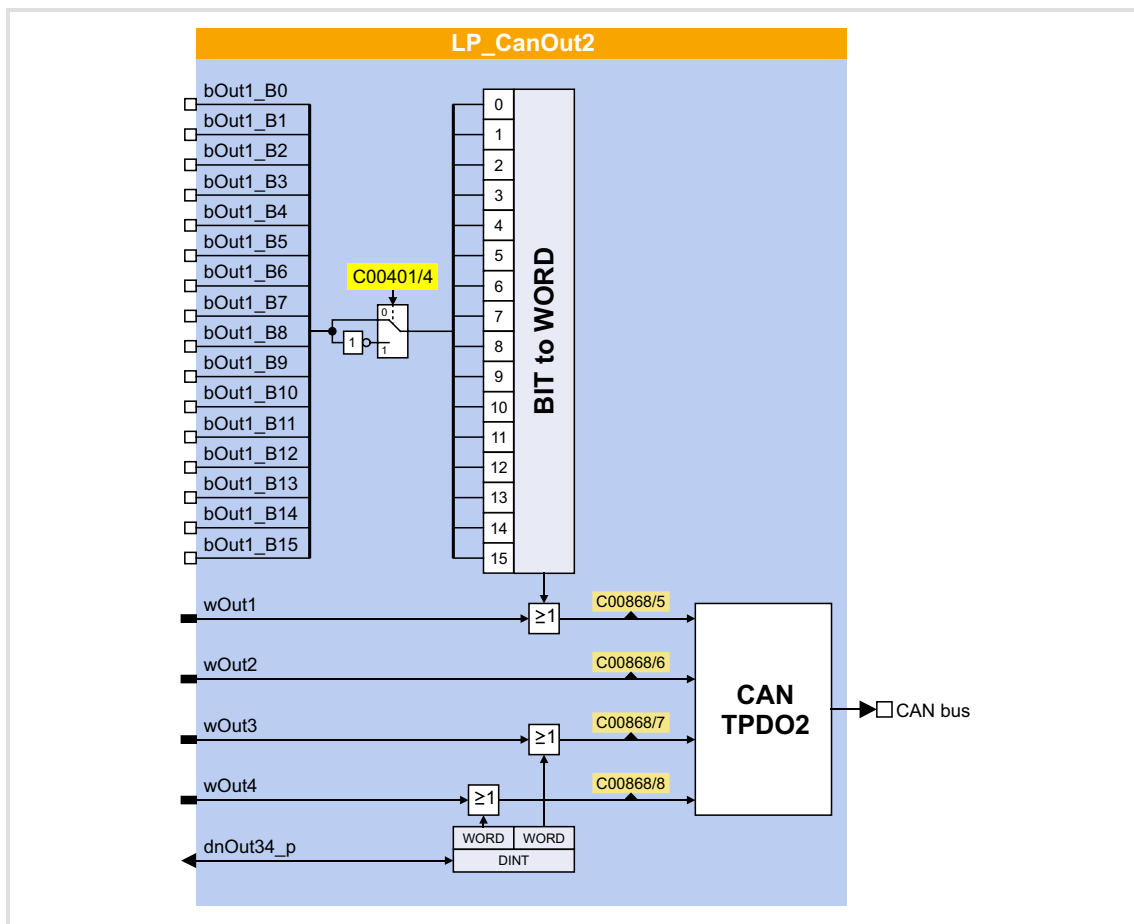
Short overview of the parameters for LP_CanOut1:

Parameter	Info	Lenze setting
C00401/2	LP_CanOut1: Inversion bState_B0..15	0x0000
C00868/1	LP_CanOut1:wState	-
C00868/2	LP_CanOut1:wOut2	-
C00868/3	LP_CanOut1:wOut3	-
C00868/4	LP_CanOut1: wOut4	-

Highlighted in grey = display parameter

11.8.1.5 TPDO2 | Port block "LP_CanOut2"

The LP_CanOut2 port block maps process data object TPDO2 in the FB Editor.



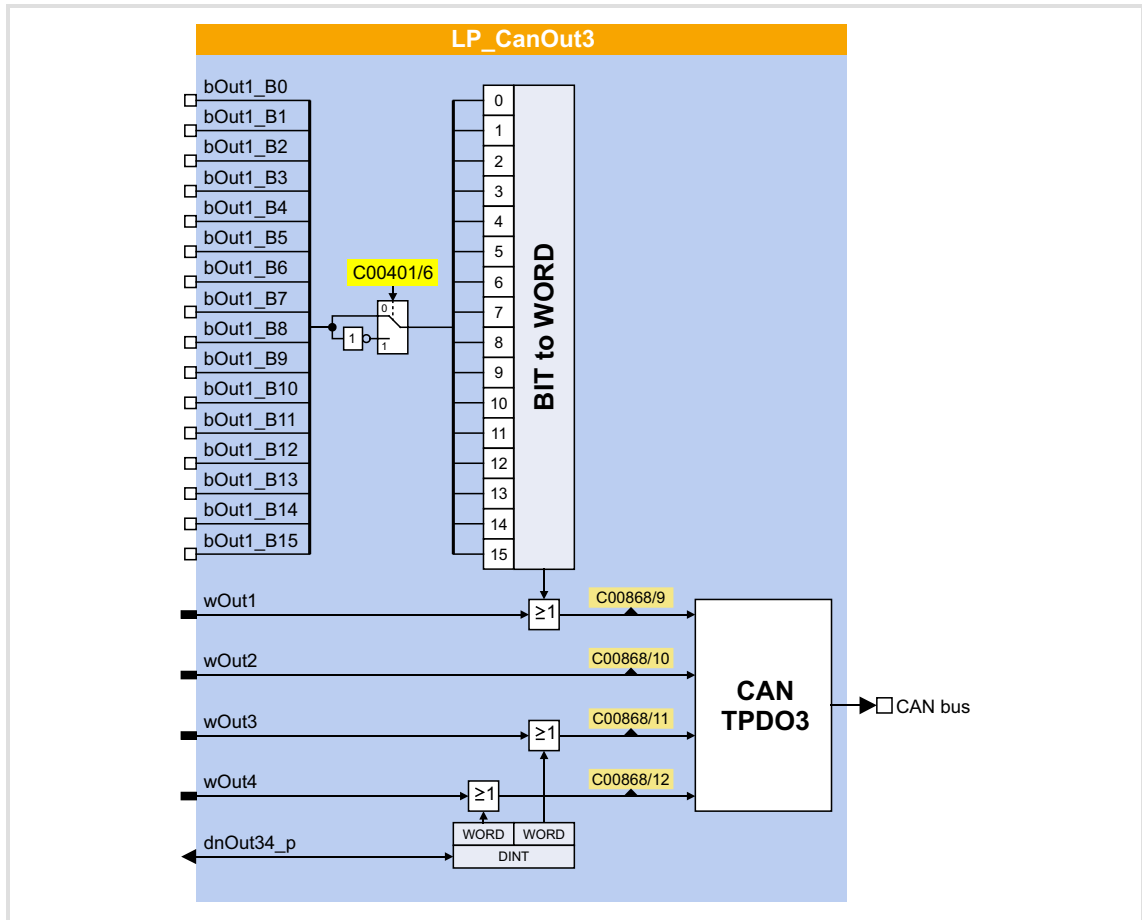
Short overview of the parameters for LP_CanOut2:

Parameter	Info	Lenze setting
C00401/4	LP_CanOut2: Inversion bOut1_B0..15	0x0000
C00868/5	LP_CanOut2: wOut1	-
C00868/6	LP_CanOut2: wOut2	-
C00868/7	LP_CanOut2: wOut3	-
C00868/8	LP_CanOut2: wOut4	-

Highlighted in grey = display parameter

11.8.1.6 TPDO3 | Port block "LP_CanOut3"

The LP_CanOut3 port block maps process data object TPDO3 in the FB Editor.



Short overview of the parameters for LP_CanOut3:

Parameter	Info	Lenze setting
C00401/6	LP_CanOut3: Inversion bOut1_B0..15	0x0000
C00868/9	LP_CanOut3: wOut1	-
C00868/10	LP_CanOut3: wOut2	-
C00868/11	LP_CanOut3: wOut3	-
C00868/12	LP_CanOut3: wOut4	-

Highlighted in grey = display parameter

11.8.2 Identifiers of the process data objects

In the Lenze setting, the identifier for process data objects PDO1 ... PDO3 consists of a so-called basic identifier (CANBaseID) and the node address set in [C00350](#):

Identifier (COB-ID) = basic identifier + node address (node ID)

- ▶ The basic identifiers of the PDOs comply with the "Predefined connection set" of DS301, V4.02.
- ▶ Alternatively, define via code [C00353](#) that the identifiers of the PDOs are to be assigned according to Lenze definition or that individual settings are to be made.
 - If [C00353](#) = "2: COBID = C0354/x", the identifiers of the PDOs can be individually set via the Lenze codes and CANopen indexes listed in the table below. That way, identifiers independent of the node address can be set for specific PDOs.
 - If identifiers are assigned individually, all PDOs must have basic identifier values in the range of 385 ... 1407.

Process data object	Basic identifier		Individual setting	
	dec	hex	Lenze code	CANopen index
PDO1				
RPDO1	512	0x200	C00354/1	I-1400/1
TPDO1	384	0x180	C00354/2	I-1800/1
PDO2				
RPDO2	768	0x300	C00354/3	I-1401/1
TPDO2	640	0x280	C00354/4	I-1801/1
PDO3				
RPDO3	1024	0x400	C00354/5	I-1402/1
TPDO3	896	0x380	C00354/6	I-1802/1



Note!

After a node address change ([C00350](#)) and a CAN reset node afterwards, the subcodes of [C00354](#) automatically resume the values which result from the respective basic identifier and the set node address.

Short overview: Parameters for setting the identifiers

Parameter	Info	Lenze setting	
		Value	Unit
C00353/1	COBID source CAN1_IN/OUT	0: COBID = C0350 + CANBaseID	
C00353/2	COBID source CAN2_IN/OUT	0: COBID = C0350 + CANBaseID	
C00353/3	COBID source CAN3_IN/OUT	0: COBID = C0350 + CANBaseID	
C00354/1	COBID CAN1_IN	0x0000201	
C00354/2	COBID CAN1_OUT	0x00000181	
C00354/3	COBID CAN2_IN	0x00000301	
C00354/4	COBID CAN2_OUT	0x00000281	
C00354/5	COBID CAN3_IN	0x00000401	
C00354/6	COBID CAN3_OUT	0x00000381	

11.8.3 Transmission type

Process data objects can be transmitted in an event-controlled or time-controlled manner. The below table shows that it is possible to combine the different methods by means of logic operations (AND, OR):

- ▶ **Event-controlled**
The PDO is sent when a special device-internal event has occurred, e.g. when the data contents of the TPDO have changed or when a transmission cycle time has elapsed
- ▶ **Synchronous transmission**
A TPDO (or RPDO) is transmitted (or received) after the device has received a sync telegram (COB-ID 0x80).
- ▶ **Cyclic transmission**
The cyclic transmission of PDOs takes place when the transmission cycle time has elapsed.
- ▶ **Polled via RTR**
A TPDO is transmitted when another device requests it by means of a data request telegram (RTR remote transmit request). For this purpose, the data requester (e.g. the master) sends the data request telegram with the COB-ID of the TPDO requested to be sent. The receiver recognises the RTR and transmits the corresponding PDO.

Transmission type	PDO transmission			Logic combination of different transmission types
	cyclic	synchronous	event-controlled	
0		●	●	AND
1 ... 240		●		-
254, 255	●		●	OR

Transmission type	Description
0	Synchronous and acyclic: The PDO is transmitted on an event-controlled basis with every sync (e.g. when a bit change occurs in the PDO).
1 ... 240	Synchronous and cyclic (sync-controlled with response): <ul style="list-style-type: none"> • Selection n = 1: The PDO is transmitted with <u>every</u> sync. • Selection 1 < n ≤ 240: The PDO is transmitted with <u>every n-th</u> sync.
241 ... 251	Reserved
252	Synchronous - RTR only
253	Asynchronous - RTR only
254, 255	Asynchronous - manufacturer-specific / device profile-specific: If this value is entered, the PDO transmission is event-controlled <u>or</u> cyclic. (Note: The values "254" and "255" have the same meaning). For a cyclic transmission, a cycle time must be entered for the respective PDO. In this case, cyclic transmission takes place in addition to event-controlled transmission.

The communication parameters such as the transmission mode and cycle time can be set freely for every PDO and independently of the settings of other PDOs:

Parameter	Info	Lenze setting	
		Value	Unit
CAN1_OUT			
C00322/1	Transmission mode	254	
C00324/2	Blocking time	0	ms
C00356/5	Cycle time	0	ms
C00358/1	Data length	8	Byte
CAN2_OUT			
C00322/2	Transmission mode	254	
C00324/3	Blocking time	0	ms
C00356/2	Cycle time	0	ms
C00358/2	Data length	8	Byte
CAN3_OUT			
C00322/3	Transmission mode	254	
C00324/4	Blocking time	0	ms
C00356/3	Cycle time	0	ms
C00358/3	Data length	8	Byte
CAN1_IN ... CAN3_IN			
C00323/1...3	Transmission mode CAN1_IN ... CAN3_IN <ul style="list-style-type: none"> • In the case of the RPDO serves as monitoring setting in the case of sync-controlled PDOs. 	254	

Blocking time

In [C00324/x](#) a "blocking time" can be set which defines the shortest transmission cycle with the transmission type "asynchronous - manufacturer-specific/device profile-specific".

Example: Cycle time = 500 ms, blocking time = 100 ms, data change sporadically:

- ▶ In the case of a sporadic data change < 500 ms, due to the blocking time set, a transmission takes place every 100 ms as quickly as possible (event-controlled transmission). The transmission cycle timer is reset to 0 if "event-controlled transmission" has been activated.
- ▶ In the case of a sporadic data change > 500 ms, due to the cycle time set, transmission takes place every 500 ms (cyclic transmission).



Tip!

The communication parameters can also be set via the following CANopen objects:

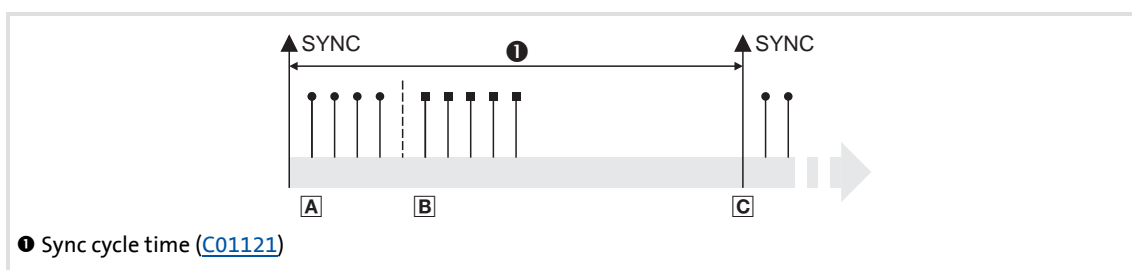
- [I-1400](#) ... [I-1402](#): Communication parameters for RPDO1 ... RPDO3
- [I-1800](#) ... [I-1802](#): Communication parameters for TPDO1 ... TPDO3

11.8.4 PDO synchronisation via sync telegram

During cyclic transmission, one or more PDOs are transmitted/received in fixed time intervals. An additional specific telegram, the so-called sync telegram, is used for synchronising cyclic process data.

- ▶ The sync telegram is the trigger point for the transmission of process data from the slaves to the master and for the acceptance of process data from the master in the slaves.
- ▶ For sync-controlled process data processing, the sync telegram must be generated accordingly.
- ▶ The response to a sync telegram is determined by the selected transmission type. ▶ [Transmission type](#) (☐ 662)

Basic workflow



[11-6] Sync telegram

- A. After the sync telegram has been received, the slaves transmit the synchronous process data to the master (TPDOs). The master reads them as process input data.
- B. When the transmission process is completed, the slaves receive (RPDOs) the process output data (of the master).
 - All other telegrams (e.g. parameters or event-controlled process data) are accepted acyclically by the slaves after the transmission is completed.
 - Illustration [11-6] does not include acyclic data. However, they need to be considered when dimensioning the cycle time.
- C. The data are accepted in the slave with the next sync telegram if the Rx mode is set to 1 ... 240. If the Rx mode is 254 or 255, the data are accepted in the next device cycle, irrespective of the sync telegram.

Short overview: Parameters for the synchronisation via sync telegram

Parameter	Info	Lenze setting		Assignment	
		Value	Unit	Sync master	Sync slave
C00367	CAN Sync-Rx-Identifier	128			●
C00368	CAN Sync-Tx-Identifier	128		●	
C00369	CAN Sync transmission cycle time	0	ms	●	

Related topics:

- ▶ [Synchronisation of the internal time base](#) (☐ 731)

11.8.5 Monitoring of the RPDOs for data reception

Every RPDO1 ... RPDO3 has a parameterisable monitoring time in which the RPDO must arrive. If the RPDO is not received within the monitoring time or with the configured sync, the response parameterised for the respective RPDO is activated.

Short overview: Parameters for RPDO monitoring

Parameter	Info	Lenze setting	
		Value	Unit
C00357/1...3	CAN1...3_IN monitoring time	3000	ms
C00593/1...3	Resp. to CAN1...3_IN monitoring	No response	

11.8.6 Configuring exception handling of the CAN PDOs

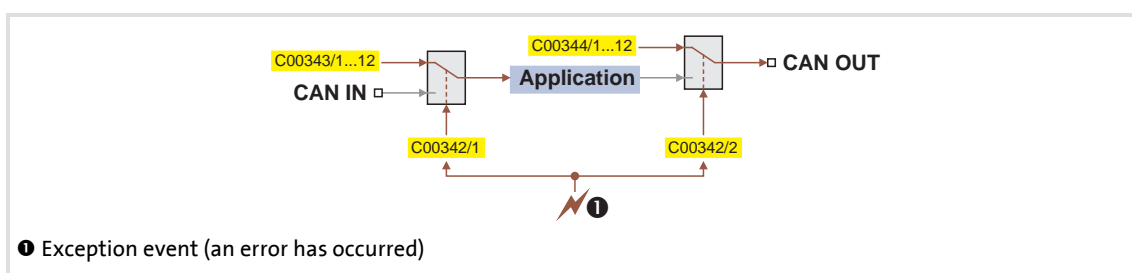
Exception handling for the CAN PDOs in the event of an error can be set via decoupling configuration and decoupling values.

- ▶ Bit coded selection is carried out in [C00342/1](#) for the process data words read by the bus, defining the events that will trigger decoupling.
- ▶ Bit coded selection is carried out in [C00342/2](#) for the process data words output by the application, defining the events that will trigger decoupling.

Bit	Event
Bit 0 <input type="checkbox"/>	BusOff_MsgErr
Bit 1 <input type="checkbox"/>	Warning
Bit 2 <input type="checkbox"/>	NodeStopped
Bit 3 <input type="checkbox"/>	HeartBeatEvent
Bit 4 <input type="checkbox"/>	CAN1_In_Überw.
Bit 5 <input type="checkbox"/>	CAN2_In_Überw.
Bit 6 <input type="checkbox"/>	CAN3_In_Überw.
Bit 7 <input type="checkbox"/>	Reserved
Bit 8 <input type="checkbox"/>	Reserved
Bit 9 <input type="checkbox"/>	Reserved
Bit 10 <input type="checkbox"/>	Reserved
Bit 11 <input type="checkbox"/>	Reserved
Bit 12 <input type="checkbox"/>	Reserved
Bit 13 <input type="checkbox"/>	Reserved
Bit 14 <input type="checkbox"/>	Trouble
Bit 15 <input type="checkbox"/>	Fault

Finally, the following parameters define the value that the process data words are to have when they are decoupled:

Parameter	Info	Lenze setting	
		Value	Unit
C00343/1	LP_CanIn1:wCtrl DiscVal	0	
C00343/2...4	LP_CanIn1:wIn2...wIn4 DiscVal	0	
C00343/5...8	LP_CanIn2:wIn1...wIn4 DiscVal	0	
C00343/9...12	LP_CanIn3:wIn1...wIn4 DiscVal	0	
C00344/1	LP_CanOut1:wState DiscVal	0	
C00344/2...4	LP_CanOut1:wOut2...wOut4 DiscVal	0	
C00344/5...8	LP_CanOut2:wOut1...wOut4 DiscVal	0	
C00344/9...12	LP_CanOut3:wOut1...wOut4 DiscVal	0	

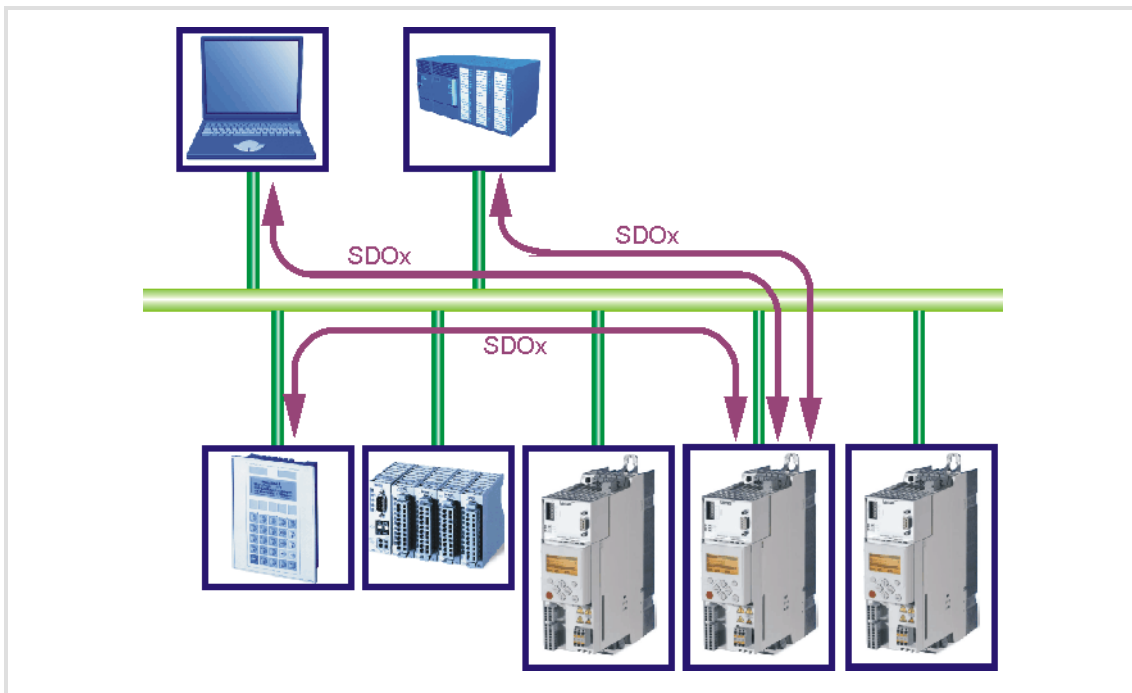


[11-7] General signal flow in the event of a configured exception

Related topics:

▶ [Configuring exception handling of the output terminals](#) (□ 369)

11.9 Parameter data transfer



[11-8] Parameter data transfer via the available parameter data channels

Parameters are values stored in codes on Lenze controllers.

Two parameter data channels are available for parameter setting, enabling the simultaneous connection of different devices for configuration purposes.

Parameter data are transmitted via the system bus as SDOs (*Service Data Objects*) and acknowledged by the receiver. The SDO enables read and write access to all device parameters and to the CANopen object directory integrated in the device. Indices (e.g. 0x1000) ensure access to device parameters and functions included in the object directory. To transfer SDOs, the information contained in the user data must comply with the CAN SDO protocol.



Note!

In the Lenze setting, only the parameter data channel 1 is activated according to CANopen.

- In [C00366](#), set "2 SDO Lenze" to activate both parameter data channels.

11.9.1 Identifiers of the parameter data objects

In the Lenze setting, the basic identifiers of the SDOs are preset according to the "Predefined Connection Set".

The identifiers of the parameter data objects SDO1 and SDO2 result from the basic identifier and the node address set under code [C00350](#):

Identifier = basic identifier + node address

Object		Direction		Lenze-Base-ID		CANopen-Base-ID	
		from device	to device	dec	hex	dec	hex
SDO1 (Parameter data channel 1)	TSDO1	●		1408	580	1408	580
	RSDO1		●	1536	600	1536	600
SDO2 (Parameter data channel 2)	TSDO2	●		1472	5C0	1472	5C0
	RSDO2		●	1600	640	1600	640
Heartbeat		●		1792	700	1792	700
Boot-up		●		1792	700	1792	700

11.9.2 User data

Structure of the user data of the parameter data telegram

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
	LOW byte	HIGH byte		LOW word		HIGH word	
				LOW byte	HIGH byte	LOW byte	HIGH byte



Note!

For the user data, the Motorola format is used.

▶ [Parameter data telegram examples](#) (📖 675)

The following subchapters provide detailed information on user data.

11.9.2.1 Command

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
	LOW byte	HIGH byte		LOW word		HIGH word	
				LOW byte	HIGH byte	LOW byte	HIGH byte

The following commands can be transmitted or received for writing and reading the parameters:

Command	1st byte		Data length	Info
	hex	dec		
Write request	0x23	35	4 bytes	Writing of a parameter to the controller.
	0x2B	43	2 bytes	
	0x2F	47	1 byte	
	0x21	33	Block	
Write response	0x60	96	4 bytes	Controller acknowledges a write request.
Read request	0x40	64	4 bytes	Reading of a parameter from the controller.
Read response	0x43	67	4 bytes	Controller's response to a read request with the current parameter value.
	0x4B	75	2 bytes	
	0x4F	79	1 byte	
	0x41	65	Block	
Error response	0x80	128	4 bytes	Controller's response if the write/read request could not be executed correctly. ▶ Error messages (673)

More precisely, the command byte comprises the following information:

Command	1st byte							
	Command specifier (cs)			Toggle (t)	Length*		e	s
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Write request	0	0	1	0	0/1	0/1	1	1
Write response	0	1	1	0	0	0	0	0
Read request	0	1	0	0	0	0	0	0
Read response	0	1	0	0	0/1	0/1	1	1
Error response	1	0	0	0	0	0	0	0

*Bit coding of the length: 00 = 4 bytes, 01 = 3 bytes, 10 = 2 bytes, 11 = 1 byte
 e: expedited (shortened block service)
 s: segmented (normal block service)



Tip!

More commands are defined in CANopen specification DS301, V4.02 (e.g. segmented transfer).

11.9.2.2 Addressing by means of index and subindex

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
	LOW byte	HIGH byte		LOW word		HIGH word	
				LOW byte	HIGH byte	LOW byte	HIGH byte

A parameter (a Lenze code) is addressed as per the following formula:

$$\text{Index} = 24575 - (\text{Lenze code number})$$

Example

The C00011 parameter (motor reference speed) is to be addressed.

Calculation:

► Index:

- Decimal: $24575 - 11 = 24564$
- Hexadecimal: $0x5FFF - 0xB = 0x5FF4$

► Subindex: 0x00 (subindex 0 since the parameter does not have any subcodes)

Entries:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
	0xF4	0x5F	0x00				

11.9.2.3 Data 1 ... Data 4

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
	LOW byte	HIGH byte		LOW word		HIGH word	
				LOW byte	HIGH byte	LOW byte	HIGH byte

Maximally 4 bytes are available for parameter value entries. Depending on the data format, they are assigned as follows:

5th byte	6th byte	7th byte	8th byte
Parameter value (1 byte)	0x00	0x00	0x00
Parameter value (2 bytes)		0x00	0x00
LOW byte	HIGH byte		
Parameter value (4 bytes)			
LOW word		HIGH word	
LOW byte	HIGH byte	LOW byte	HIGH byte



Note!

The "Factor" column of the [Table of attributes](#) contains a so-called scaling factor for all Lenze parameters. The scaling factor is relevant to the transfer of parameter values which have one or more decimal positions in the parameter list.

If the scaling factor is > 1, the value must be multiplied by the indicated scaling factor prior to transmission to be able to transfer the value as an integer. At the SDO client end, the integer must be divided by the scaling factor to obtain the original value including decimal positions again.

Example

A value of "123.45" is to be transmitted for a code, unit: "%" (e.g. C00039/1: "Fixed setpoint-JOG1").

In controllers of the 8400 series, parameters with the "%" unit have two decimal positions and hence a scaling factor of "100".

Calculation:

- ▶ Value to be transmitted = scaling factor x value
- ▶ Data (1 ... 4) = 100 x 123.45 = 12345 (0x00 00 30 39)

Entries:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
				0x39	0x30	0x00	0x00

11.9.2.4 Error messages

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Error code			
0x80 (128)	LOW byte	HIGH byte		LOW word		HIGH word	
				LOW byte	HIGH byte	LOW byte	HIGH byte

In the event of an error, the addressed node generates a telegram with the "Error response" (0x80) command.

- ▶ The telegram includes the index and subindex of the code where the error occurred.
- ▶ The error code is entered in bytes 5 ... 8.
 - The error codes are standardised according to DS301, V4.02.
 - The representation of the error codes is provided in reverse read direction (see example below).

Example

Representation of error code "0x06 04 00 41" in bytes 5 ... 8:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Error code			
				0x41	0x00	0x04	0x06

Meaning of the error codes

The error codes are standardised acc. to DS301, V4.02.

Error code	Explanation
0x0503 0000	Toggle bit not changed
0x0504 0000	SDO protocol expired
0x0504 0001	Invalid or unknown client/server command specifier
0x0504 0002	Invalid block size (only block mode)
0x0504 0003	Invalid sequence number (only block mode)
0x0504 0004	CRC error (only block mode)
0x0504 0005	Not sufficient memory
0x0601 0000	Object access not supported
0x0601 0001	Attempt to read a write-only object
0x0601 0002	Attempt to write to a read-only object
0x0602 0000	Object not listed in object directory
0x0604 0041	Object not mapped to PDO
0x0604 0042	Number and length of the objects to be transferred exceed the PDP length.
0x0604 0043	General parameter incompatibility
0x0604 0047	General internal device incompatibility
0x0606 0000	Access denied because of hardware error
0x0607 0010	Unsuitable data type, unsuitable service parameter length
0x0607 0012	Unsuitable data type, service parameter length exceeded
0x0607 0013	Unsuitable data type, service parameter length not long enough
0x0609 0011	Subindex does not exist
0x0609 0030	Parameter value range exceeded
0x0609 0031	Parameter values too high
0x0609 0032	Parameter values too low
0x0609 0036	Maximum value falls below minimum value
0x0800 0000	General error
0x0800 0020	Data cannot be transferred/saved for application.
0x0800 0021	Data cannot be transferred/saved for application due to local control.
0x0800 0022	Data cannot be transferred/saved for application due to current device status.
0x0800 0023	Dynamic generation of object directory failed or no object directory available (e.g. object directory generated from file, generation not possible because of a file error).

11.9.3 Parameter data telegram examples

11.9.3.1 Read parameters

Task: The heatsink temperature of 43 °C (code [C00061](#), data format INTEGER16, scaling factor 1) of the controller with node address "5" is to be read.

Telegram to drive

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
0x0605	0x40	0xC2	0x5F	0x00	0x00	0x00	0x00	0x00

Explanations on the telegram to the drive

Identifier	= 1536 + node address = 1536 + 5 = 1541 = 0x0605 (1536 = SDO1 basic identifier to the controller)
Command	= 0x40 = "Read request" (request to read a parameter from the controller)
Index	= 24575 - code number = 24575 - 61 = 24514 = 0x5FC2
Subindex	= 0 (code C00061 does not have any subcodes)

Response telegram from drive (if data have been correctly transmitted)

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Index		Subindex	Data 1	Data 2	-	-
0x0585	0x4B	0xC2	0x5F	0x00	0x2B	0x00	-	-

Explanations on the telegram from the drive

Identifier	= 1408 + node address = 1408 + 5 = 1413 = 0x0585 (1408 = SDO1 basic identifier from the controller)
Command	= 0x4B = "Read Response" (response to the read request with current value)
Index	as in telegram to the drive
Subindex	
Data 1 ... 2	= 0x002B = 43 [°C]

11.9.3.2 Write parameters

Task: The rated current of the connected motor is to be entered with $I_N = 10.20$ A (code [C00088](#)) into the controller with node address "2".

Data 1 ... 4	Calculation
Value for motor current, (data type U16; display factor 1/100)	$10.20 \times 100 = 1020$ (0x03 FC)

Telegram to drive

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
0x0602	0x23	0xA7	0x5F	0x00	0xFC	0x03	0x00	0x00

Explanations on the telegram to the drive

Identifier	= $1536 + \text{node address} = 1536 + 2 = 1538 = 0x0602$ (1536 = SDO1 basic identifier to the controller)
Command	= $0x23 = \text{"Write request"}$ (request to write a parameter to the controller)
Index	= $24575 - \text{code number} = 24575 - 88 = 24487 = 0x5FA7$
Subindex	= 0 (code C00088 does not have any subcodes)
Data 1 ... 4	= $10.20 \times 100 = 1020 = 0x000003FC$ (motor current value; data type U32; display factor 1/100)

Response telegram from drive (if data have been correctly transmitted)

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
0x0582	0x60	0xA7	0x5F	0x00	0x00	0x00	0x00	0x00

Explanations on the telegram from the drive

Identifier	= $1408 + \text{node address} = 1408 + 2 = 1410 = 0x0582$ (1408 = SDO1 basic identifier from the controller)
Command	= $0x60 = \text{"Write response"}$ (acknowledgement of the write access from the controller)
Index	as in telegram to the drive
Subindex	

11.9.3.3 Read block parameters

Task: The firmware version (code [C00099](#)) is to be read from the parameter set of the controller with node address "12". The firmware version has a length of 11 ASCII characters which are transmitted as a block parameter. Depending on the block, the data width from the 2nd to 8th byte is assigned within the user data.

Telegram 1 to the drive: Read request

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
0x060C	0x40	0x9C	0x5F	0x00	0x00	0x00	0x00	0x00

Explanations on the telegram to the drive

Identifier	= 1536 + node address = 1536 + 12 = 1548 = 0x060C (1536 = SDO1 basic identifier to the controller)
Command	= 0x40 = "Read request" (request to read a parameter from the controller)
Index	= 24575 - code number = 24575 - 99 = 24476 = 0x5F9C
Subindex	= 0 (code C00099 does not have any subcodes)

Response telegram 1 from the drive: Indication of the block length (11 characters)

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
0x058C	0x41	0x9C	0x5F	0x00	0x0B	0x00	0x00	0x00

Explanations on the telegram from the drive

Identifier	= 1408 + node address = 1408 + 12 = 1420 = 0x058C (1408 = SDO1 basic identifier from the controller)
Command	= 0x41 = "Read response" (response is block telegram)
Index	as in telegram to the drive
Subindex	
Data 1 ... 4	= 0x0000000B = data length of 11 characters in the ASCII format

Telegram 2 to the drive: Request of the 1st data block

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7
0x060C	0x60	0x00	0x00	0x00	0x00	0x00	0x00	0x00

Explanations on the telegram to the drive

Command = 0x60 = "Read segment request" (request: read data block)
 • Bit 4 = 0 (toggle bit)

Influence of the toggle bit on the request command

The blocks are toggled one after another, i.e. the request is made with the "0x60" (= $0110 * 0000_{bin}$) command, then with the "0x70" (= $0111 * 0000_{bin}$) command, and then again with the "0x60" command, etc.

* Toggle bit

Response telegram 2 from the drive: Transmission of the 1st data block

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7
0x058C	0x00	0x30	0x31	0x2E	0x30	0x30	0x2E	0x30
		0 _{asc}	1 _{asc}	·asc	0 _{asc}	0 _{asc}	·asc	0 _{asc}

Explanations on the telegram to the drive

Command = 0x00 = 00000000_{bin}
 • Bit 4 = 0 (toggle bit)

Influence of the toggle bit on the transmission command

- The 1st response of the controller in the command byte is " $0x0000 * 0000_{bin}$ " if bytes 2 ... 8 are completely filled with data and other telegrams are following.
- The 2nd response of the controller in the command byte is " $0x0001 * 0000_{bin}$ " if bytes 2 ... 8 are completely filled with data and other telegrams are following, etc.

* Toggle bit

Data 1 ... 7 = "01.00.0" (ASCII representation)

Telegram 3 to the drive: Request of the 2nd data block

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7
0x060C	0x70	0x00	0x00	0x00	0x00	0x00	0x00	0x00

Explanations on telegram 3 to the drive

Command	= 0x70 = "Read segment request" (request: read data block) • Bit 4 = 1 (toggle bit)
---------	--

Response telegram 3 from the drive: Transmission of the 2nd data block including end identifier

Identifier	User data							
	1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
	Command	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7
0x058C	0x17	0x30	0x2E	0x30	0x30	0x00	0x00	0x00
		0 _{asc}	·asc	0 _{asc}	0 _{asc}	-	-	-

Explanations on telegram 3 from the drive

Command	= 0x17 = 00010111 _{bin} : • Bit 0 = 1 (end of transmission) • Bit 1 ... bit 3 = 011 _{bin} (3 bytes do not contain any data) • Bit 4 = 1 (toggle bit)
	Influence of the final bit and the residual data length on the transmission command • The end of transmission is signalled via the set final bit 0. • Bits 1 ... 3 reveal the number of bytes that do not contain any data anymore. * Toggle bit
Data 1 ... 7	= "0.00" (ASCII representation) The result of the data block transmission is: "01.00.00.00"

11.10 Monitoring

11.10.1 Integrated error detection

If a node detects an error, it rejects the CAN telegram bits received so far and transmits an error flag. The error flag consists of 6 consecutive bits with the same logic value.

The following errors are detected:

Bit error

The sending node follows the transmission on the bus and interrupts the transmission if it receives a different logic value than the value transmitted. With the next bit, the sending node starts the transmission of an error flag.

In the arbitration phase, the transmitter only detects a bit error if a dominantly sent bit is received as recessive bit. In the ACK slot as well, the dominant overwriting of a recessive bit is not indicated as a bit error.

Stuff-bit error

If more than 5 consecutive bits have the same logic value before the ACK delimiter in the CAN telegram, the previously transmitted telegram will be rejected and an error flag will be sent with the next bit.

CRC error

If the received CRC checksum does not correspond to the checksum calculated in the CAN chip, the CAN controller will send an error flag after the ACK delimiter and the previously transmitted telegram will be annulled.

Acknowledgement error

If the sent ACK slot recessively sent by the transmitting node is not dominantly overwritten by a receiver, the transmitting node will cancel the transmission. The transmitting node will annul the transmitted telegram and will send an error flags with the next bit.

Format error

If a dominant bit is detected in the CRC delimiter, in the ACK delimiter or in the first 6 bits of the EOF field, the received telegram will be rejected and an error flag will be sent with the next bit.



Tip!

The errors mentioned before indicate that a physical error has occurred in the bus system.

Possible causes are:

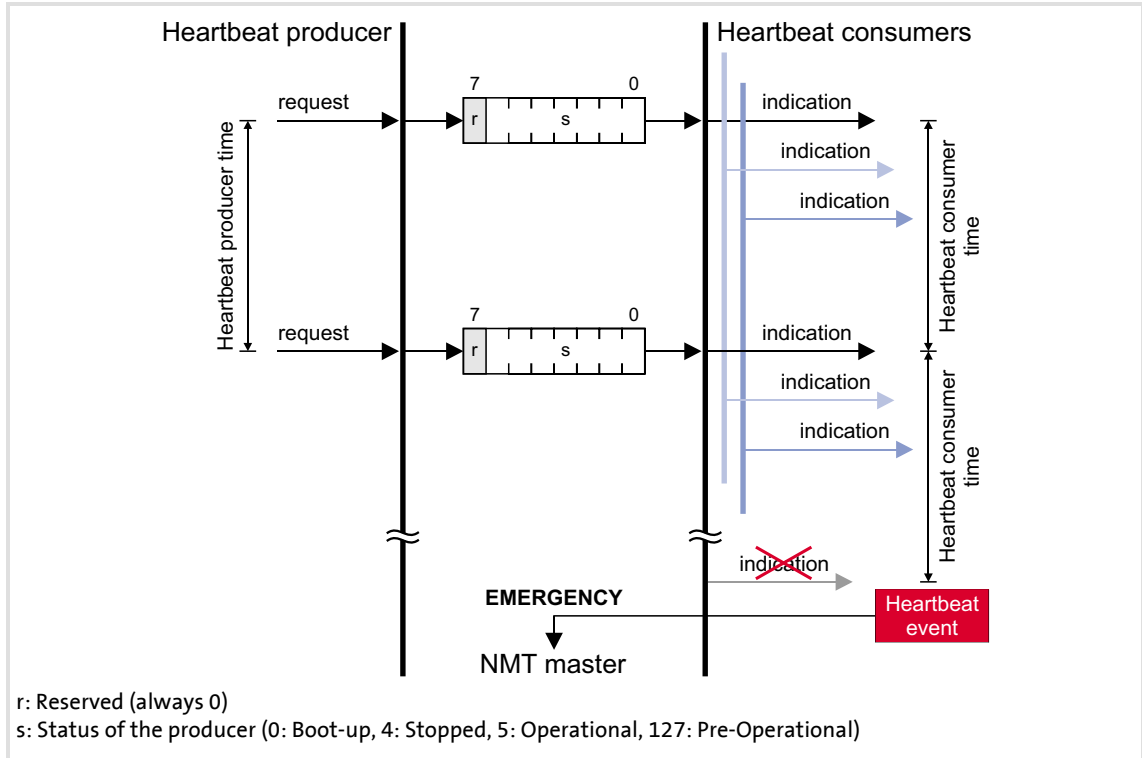
- Several nodes with identical node address
- Wrong baud rate of one or several nodes
- Too high cable length
- Too many or no terminating resistors
- Too high bus load/too many data telegrams
(e.g. since a node permanently transmits event-controlled due to data changes of an analog signal/actual value.)
- EMC interferences on the CAN bus
(e.g. since the CAN bus cable next to the motor cable is unshielded.)

[C00364](#) displays whether such an error is active.

11.10.2 Heartbeat protocol

The heartbeat protocol can be used for node monitoring purposes within a CAN network.

Basic workflow



[11-9] Heartbeat protocol

1. A heartbeat producer cyclically transmits a so-called heartbeat telegram to one or more consumers.
2. The consumer(s) monitor the heartbeat telegram for arrival on a regular basis.

11.10.2.1 Telegram structure

- ▶ The heartbeat telegram of the producer has the following identifier:
Identifier (COB-ID) = 1792 + producer's node address
- ▶ The user data (1 byte) contain the status (s) of the producer:

Heartbeat producer status		Data							
Communication status	Decimal value (s)	(r)	Producer status (s)						
		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Boot-up	0	0	0	0	0	0	0	0	0
Stopped	4	0	0	0	0	0	1	0	0
Operational	5	0	0	0	0	0	1	0	1
Pre-Operational	127	0	1	1	1	1	1	1	1

11.10.2.2 Parameter setting

Short overview of the parameters for the "Heartbeat" monitoring function:

Parameter	Info	Lenze setting		Assignment	
		Value	Unit	Consumer	Producer
C00347/1...n	CAN status of the heartbeat producer 1 ... n	-		●	
C00381	Heartbeat producer time	0	ms		●
C00385/1...n	CAN node address of the heartbeat producer 1 ... n	0		●	
C00386/1...n	Heartbeat consumer time for the heartbeat producer 1 ... n	0	ms	●	
C00592/5	Resp. to heartbeat event	No response		●	

Highlighted in grey = display parameter

Heartbeat producer time

Time interval for the transmission of the heartbeat telegram to the consumer(s).

- ▶ Parameterisable in [C00381](#) or via object [I-1017](#). The parameterised time is rounded down to an integer multiple of 5 ms.
- ▶ The heartbeat telegram is sent automatically as soon as a time > 0 ms is set.

Heartbeat consumer time

Monitoring time for the nodes (producers) to be monitored.

- ▶ Parameterisable in [C00386/1...n](#) or via object [I-1016](#).
- ▶ The parameterised time is rounded down to an integer multiple of 5 ms and must have a greater value than the heartbeat producer time of the node to be monitored.

- ▶ The maximum number of the nodes to be monitored depends on the device version:
 - "BaseLine C": 1 Heartbeat Producer can be monitored.
 - "Stateline": Up to 7 Heartbeat Producers can be monitored.
 - "HighLine": Up to 15 Heartbeat Producers can be monitored.
- ▶ The node address(es) of the nodes to be monitored is/are set in [C00385/1...n](#) or via object [I-1016](#), too.

Heartbeat event

The "Heartbeat event" is activated in the consumer if it does not receive any heartbeat telegram from the producer within the heartbeat consumer time:

- ▶ The consumer changes from the "Operational" communication status to the "Pre-Operational" communication status.
- ▶ The NMT master receives an emergency telegram containing emergency error code 0x8130.
- ▶ The response parameterised in [C00592/5](#) is activated (Lenze setting: "No response").



Note!

The heartbeat monitoring will not start until the first heartbeat telegram of a monitored producer has been received successfully and the "Pre-Operational" NMT status has been assumed.

The boot-up telegram counts as the first heartbeat telegram.

11.10.2.3 Commissioning example

Task

An 8400 controller (node 2) which is configured as heartbeat consumer is to monitor another 8400 controller (heartbeat producer, node 1).

- ▶ The heartbeat producer is to transmit a heartbeat telegram to the heartbeat consumer every 10 ms.
- ▶ The heartbeat consumer monitors the heartbeat telegram for arrival. A response is to be activated in the event of an error.

Parameterising the heartbeat producer (node 1)

1. Set the heartbeat producer time ([C00381](#)) to 10 ms.

Parameterising the heartbeat consumer (node 2)

1. Set the CAN node address of the producer in [C00385/1](#).
2. Set the heartbeat consumer time in [C00386/1](#).
 - Note: The heartbeat consumer time must be greater than the heartbeat producer time of the node to be monitored set in [C00381](#).
3. Set the desired response in [C00592/5](#) which is to be activated should a heartbeat event in the consumer occur.



Tip!

[C00347/1...n](#) displays the heartbeat status of the monitored nodes.

Heartbeat telegram

- ▶ The heartbeat telegram of the producer has the following identifier:
Identifier (COB-ID) = 1792 + producer's node address = 1792 + 1 = 1793 = 0x701

11.10.3 Emergency telegram

If the error status changes because an internal device error occurs or has been eliminated, the NMT master receives an emergency telegram once with the following structure:

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Emergency error codes		Error register	Manufacturer-specific error message				
LOW byte	HIGH byte	I-1001	0x00 (Reserved)	LOW word		HIGH word	
See table below				LOW byte	HIGH byte	LOW byte	HIGH byte
			<ul style="list-style-type: none"> For emergency error code 0xF000: Lenze error number (value displayed in C00168) All other emergency error codes have a value of "0" here. 				

Emergency error codes	Error register	Cause
0x0000	0xXX	One of several errors eliminated
	0x00	One error has been eliminated (error-free status afterwards)
0x3100	0x01	Supply voltage of standard device faulty or failed
0x8100	0x11	Communication error (warning)
0x8130	0x11	Life guarding error or heartbeat error
0x8150	0x11	Collision of identifiers (COB-IDs): An identifier parameterised for reception is also used for transmission.
0x8210	0x11	PDO length shorter than expected
0x8220	0x11	PDO length greater than expected
0x8700	0x11	Monitoring of the sync telegram
0xF000	0x01	Generic error <ul style="list-style-type: none"> An error with a "Fault", "Trouble", "TroubleQSP", "Warning", or "SystemFault" error response occurred in the standard device. Error message is the Lenze error number (C00168).

The [Short overview \(A-Z\)](#) of error messages of the operating system includes a list of more emergency error codes. ([608](#))

Example

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Emergency error codes		Error register	Manufacturer-specific error message				
0x00	0xF0	0x01	0x00 (Reserved)	Lenze error number			
Generic error				▶ Error messages of the operating system Corresponding error-free message: Value "0x00000000"			



Tip!

A detailed description can be found in CAN specification DS301, V4.02.

11.11 Implemented CANopen objects

Lenze devices can both be parameterised with Lenze codes and manufacturer-independent "CANopen objects". A completely CANopen-compliant communication can only be achieved by using CANopen objects for parameter setting. The CANopen objects described in this chapter are defined in the CAN specification DS301 V4.02.

Many CANopen objects can be mapped on Lenze codes. In the following table, the corresponding Lenze codes are listed in the column "Relationship to Lenze codes".



Note!

Some of the terms used here derive from the CANopen protocol.

Overview of CANopen indices and their relationship to Lenze codes

CANopen object			Relationship to Lenze code
Index	Subindex	Name	
I-1000	0	Device type	-
I-1001	0	Error register	-
I-1003	Predefined error field		
	0	Number of errors	-
	1 ... 10	Standard error field	-
I-1005	0	COB-ID SYNC message	C00367 C00368
I-1006	0	Communication cycle period	C00369
I-1014	0	COB-ID EMCY	-
I-1016	Consumer heartbeat time		
	0	Highest subindex supported	-
	1 ... n	Consumer heartbeat time • "BaseLine C" version: n = 1 • "StateLine" version: n = 7 • "HighLine" version: n = 15	C00385/1...n C00386/1...n
I-1017	0	Producer heartbeat time	C00381
I-1018	Identity object		
	0	Highest subindex supported	-
	1	Vendor ID	-
	2	Product code	-
	3	Revision number	-
	4	Serial number	-
I-1200	SDO1 server parameter		
	0	Highest subindex supported	-
	1	COB-ID client → server (rx)	-
	2	COB-ID server → client (tx)	-
I-1201	SDO2 server parameter		
	0	Highest subindex supported	-
	1	COB-ID client → server (rx)	-
	2	COB-ID server → client (tx)	-

8400 TopLine C | Software Manual

System bus "CAN on board"
Implemented CANopen objects

CANopen object			Relationship to Lenze code
Index	Subindex	Name	
I-1400	RPDO1 communication parameter		
	0	Highest subindex supported	-
	1	COB-ID used by RPDO	C00355/1
	2	Transmission type	C00323/1
I-1401	RPDO2 communication parameter		
	0	Highest subindex supported	-
	1	COB-ID used by RPDO	C00355/3
	2	Transmission type	C00323/2
I-1402	RPDO3 communication parameter		
	0	Highest subindex supported	-
	1	COB-ID used by RPDO	C00355/5
	2	Transmission type	C00323/3
I-1600	RPDO1 mapping parameter		
	0	Number of mapped application objects in PDO	-
	1 ... 4	Application object 1 ... 4	C00409/1...4 C00866/1...4
I-1601	RPDO2 mapping parameter		
	0	Number of mapped application objects in PDO	-
	1 ... 4	Application object 1 ... 4	C00409/5...8 C00866/5...8
I-1602	RPDO3 mapping parameter		
	0	Number of mapped application objects in PDO	-
	1 ... 4	Application object 1 ... 4	C00409/9...12 C00866/9...12
I-1800	TPDO1 communication parameter		
	0	Highest subindex supported	-
	1	COB-ID used by TPDO	C00355/2
	2	Transmission type	C00322/1
	3	Inhibit time	C00324/2
	5	Event timer	C00356/5 C00369
I-1801	TPDO2 communication parameter		
	0	Highest subindex supported	-
	1	COB-ID used by TPDO	C00355/4
	2	Transmission type	C00322/2
	3	Inhibit time	C00324/3
	5	Event timer	C00356/2 C00369
I-1802	TPDO3 communication parameter		
	0	Highest subindex supported	-
	1	COB-ID used by TPDO	C00355/6
	2	Transmission type	C00322/3
	3	Inhibit time	C00324/4
	5	Event timer	C00356/3 C00369

CANopen object			Relationship to Lenze code
Index	Subindex	Name	
I-1A00	TPDO1 mapping parameter		
	0	Number of mapped application objects in PDO	-
	1 ... 4	Application object 1 ... 4	C00868/1...4
I-1A01	TPDO2 mapping parameter		
	0	Number of mapped application objects in PDO	-
	1 ... 4	Application object 1 ... 4	C00868/5...8
I-1A02	TPDO3 mapping parameter		
	0	Number of mapped application objects in PDO	-
	1 ... 4	Application object 1 ... 4	C00868/9...12

I-1000

Index: I-1000	Name: Device type				
Subindex	Default setting	Display range (min. value unit max. value)		Access	Data type
0: Device type	0	0		4294967295	ro U32

The CANopen index I-1000 specifies the profile for this device. Furthermore, additional information defined in the device profile itself can be stored here.

8th byte	7th byte	6th byte	5th byte
Data 4	Data 3	Data 2	Data 1
HIGH word		LOW word	
HIGH byte	LOW byte	HIGH byte	LOW byte
Additional information		Device profile number	

[11-1] Data telegram assignment

In case of 8400 series controllers, the four bytes contain the following values:

- ▶ 5th and 6th byte: The data content is 0x0000, i.e. no profile definition.
- ▶ 7th byte: The data content specifies the device type: Here the value is 0x00 for controllers.
- ▶ 8th byte: The data content is 0x00.

The data content for the 8400 controller thus is: 00 00 00 00

I-1001

Index: I-1001	Name: Error register				
Subindex	Default setting	Display range (min. value unit max. value)		Access	Data type
0: Error register	-	0		255	ro U8

Error register

The error status in the data byte (U8) is bit coded. The following error states are coded in the data byte (U8):

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Error status
0	0	0	0	0	0	0	0	No error
0	0	0	0	0	0	0	1	Device error message
0	0	0	1	0	0	0	1	Communication error

I-1003

Index: I-1003	Name: Predefined error field			
Subindex	Default setting	Setting range (min. value unit max. value)		Access
0: Number of errors	0	0	255	rw
1 ... 10: Standard error field	-	0	4294967295	ro

Error history

This object indicates that an error has occurred in the module and in the standard device.

Subindex	Meaning
0	Number of saved error messages
1 ... 10	Display of the error list The error messages (U32) consist of a 16-bit error code and a manufacturer-specific information field comprising 16 bits.

**Note!**

The values in the "standard error field" under subindex 1 ... 10 will be deleted if the subindex "number of recorded errors" is overwritten with the value "0".

Emergency error codes	Cause	Entry in the error register (I-1001)
0x0000	One of several errors eliminated	0xXX
	Elimination of one single error (afterwards no more errors)	0x00
0x1000	Standard device is in error status (error response "fault", "message", "warning", "error", "quick stop by trouble", or "system error")	0x01
0x3100	Supply voltage of standard device faulty or failed	0x01
0x8100	Communication error (warning)	0x11
0x8130	Life guard error or heartbeat error	0x11
0x8150	Collision of COB-IDs: An ID parameterised for reception is also used for transmission.	0x11
0x8210	PDO length shorter than expected	0x11
0x8220	PDO length greater than expected	0x11
0x8700	Monitoring of the sync telegram	0x11

I-1005

Index: I-1005	Name: COB-ID SYNC message				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: COB-ID SYNC message	0x0000 0080 or 0x8000 0080	0		4294967295 rw	U32

This object can be used to activate the generation of sync telegrams and to write the identifier value.

- ▶ This object relates to codes [C00367](#) and [C00368](#).

Creating sync telegrams

Sync telegrams are created by setting bit 30 (see below) to "1". The time between the sync telegrams can be set using the object [I-1006](#).

Writing identifiers

To receive PDOs, the value 0x80 must be entered in the 11-bit identifier in the Lenze setting (and according to CANopen specification) . This means that all modules are by default set to the same sync telegram.

- ▶ If sync telegrams are only to be received by certain communication modules, their identifiers can be entered with values up to and including 0x07FF.
- ▶ The identifier can only be changed if the communication module does not send any sync telegrams (bit 30 = "0").
- ▶ How to change the identifier:
 - Deactivate identifier (set bit 30 to "0").
 - Change identifier.
 - Activate identifier (set bit 30 to "1").

8th byte		7th byte		6th byte		5th byte	
Data 4		Data 3		Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11				Bit 10 ... bit 0	
X	0/1	Extended identifier*				11-bit identifier	
* The extended identifier is not supported. Bit 11 ... bit 29 must be set to "0".							

[11-2] Data telegram assignment

I-1006

Index: I-1006	Name: Communication cycle period					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Communication cycle period	0 μ s	0	μ s	65535000	rw	U32

Setting the sync telegram cycle time.

- ▶ The cycle time can be selected as "1000" or as an integer multiple of it.
- ▶ If "0 μ s" is set (Lenze setting), no sync telegrams are created.
- ▶ This object relates to code [C00369](#).

I-1014

Index: I-1014	Name: COB-ID EMCY					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: COB-ID EMCY	0x80 + node ID	0		4294967295	rw	U32

When communication errors occur and are acknowledged or when internal errors occur in the communication module or controller (e.g. "fault"), the system bus sends an error message. The telegram is sent once for every error. This function can be activated or deactivated with bit 31.

8th byte		7th byte		6th byte		5th byte	
Data 4		Data 3		Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11				Bit 10 ... bit 0	
0/1	0	Extended identifier*				11-bit identifier	
* The extended identifier is not supported. Bit 11 ... bit 29 must be set to "0".							

[11-3] Data telegram assignment

Bit	Setting
Bit 31	0 Emergency object is valid.
	1 Emergency object is invalid.

**Note!**

The identifier can only be changed in the "emergency object invalid" status (bit 31 = 1).

I-1016

Index: I-1016	Name: Consumer heartbeat time					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Highest subindex supported	1 (for BaseLine) 7 (for Stateline) 15 (for HighLine)	- (read access only)			ro	U16
1 ... n: Consumer heartbeat time	0	0		65535	rw	U16

Monitoring time for the nodes to be monitored via heartbeat. ▶ [Heartbeat protocol \(682\)](#)

- ▶ The parameterised time is rounded down to an integer multiple of 5 ms and must have a greater value than the heartbeat producer time of the node to be monitored.

Subindex	Meaning	Lenze code
0	Number of nodes to be monitored	
1 ... n	Node ID and heartbeat time of the node to be monitored	Node ID: C00385/x Heartbeat time: C00386/x

8th byte	7th byte	6th byte	5th byte
Data 4	Data 3	Data 2	Data 1
Bit 31 ... bit 24	Bit 23 ... Bit 16	Bit 15 ... Bit 0	
0 (Reserved)	Node ID	Heartbeat time in [ms]	

[11-4] Data telegram assignment

I-1017

Index: I-1017		Name: Producer heartbeat time				
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Producer heartbeat time	0	0	ms	65535	rw	U16

Time interval for sending the heartbeat telegram to the consumer(s). ▶ [Heartbeat protocol](#) (682)

- ▶ The parameterised time is rounded down to an integer multiple of 5 ms.
- ▶ The heartbeat telegram is automatically sent as soon as a time > 0 ms is entered. In this case, the "node guarding" monitoring function is deactivated.
- ▶ This object relates to code [C00381](#).

I-1018

Index: I-1018		Name: Identity object				
Subindex	Default setting	Display range (min. value unit max. value)			Access	Data type
0: Highest subindex supported	see below	0		4294967295	ro	U32
1: Vendor ID						
2: Product code						
3: Revision number						
4: Serial number						

Subindex	Meaning						
1	Manufacturer's identification number <ul style="list-style-type: none"> • The identification number allocated to Lenze by the organisation "CAN in Automation e. V." is "0x0000003B". 						
2	Product code <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td>0x84001</td> <td>8400 BaseLine C</td> </tr> <tr> <td>0x84002</td> <td>8400 StateLine C</td> </tr> <tr> <td>0x84003</td> <td>8400 HighLine C</td> </tr> </table>	0x84001	8400 BaseLine C	0x84002	8400 StateLine C	0x84003	8400 HighLine C
0x84001	8400 BaseLine C						
0x84002	8400 StateLine C						
0x84003	8400 HighLine C						
3	Main and subversion of firmware						
4	Serial number						

I-1200

Index: I-1200	Name: SDO1 server parameter					
Subindex	Default setting	Display range (min. value unit max. value)		Access	Data type	
0: Highest subindex supported	2	2		2	ro	U8
1: COB-ID client -> server (rx)	node ID + 0x600	0		4294967295	ro	U32
2: COB-ID server -> client (tx)	node ID + 0x580	0		4294967295	ro	U32

Identifiers for SDO server channel 1 (basic SDO channel).

- ▶ According to DS301 V4.02, the basic SDO channel can neither be changed nor deactivated.

Subindex	Meaning
1	Specification of receive identifier <ul style="list-style-type: none"> • For SDO server channel 1: node address (C00350) + 0x600
2	Specification of send identifier <ul style="list-style-type: none"> • For SDO server channel 1: node address (C00350) + 0x580

8th byte		7th byte		6th byte		5th byte	
Data 4		Data 3		Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11				Bit 10 ... bit 0	
0	0	Extended identifier*				11-bit identifier	

* The extended identifier is not supported. Bit 11 ... bit 29 must be set to "0".

[11-5] Data telegram assignment

I-1201

Index: I-1201	Name: SDO2 server parameter					
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type	
0: Highest subindex supported	3	- (read access only)		ro	U8	
1: COB-ID client -> server (rx)	0x80000000	0		4294967295	rw	U32
2: COB-ID server -> client (tx)	0x80000000	0		4294967295	rw	U32

Identifiers for SDO server channel 2.

- ▶ The SDO server parameter is only valid, if bit 31 is set to "0" for both transmission directions (subindex 1 and 2).
- ▶ In the Lenze setting, the SDO server channels 2 are deactivated (bit 31 = "1").
- ▶ The identifier can only be changed if the SDO is invalid (bit 31 = "1").

Subindex	Meaning
1	Specification of receive identifier
2	Specification of send identifier

8th byte		7th byte		6th byte		5th byte	
Data 4		Data 3		Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11				Bit 10 ... bit 0	
0/1	0	Extended identifier*				11-bit identifier	

* The extended identifier is not supported. Bit 11 ... bit 29 must be set to "0".

[11-6] Data telegram assignment

Bit	Setting
Bit 31	0 SDO is valid.
	1 SDO is invalid.

How to change the identifier:

1. Deactivate identifier (set bit 31 to "1").
2. Change identifier.
3. Activate identifier (set bit 31 to "0").

Example

Parameter data channel 2 of the controller with node address 4 shall be activated.

- ▶ For this, bit 31 must be set to "0" (≡ "SDO is valid") in subindices 1 and 2 of the object [1201](#).
- ▶ The master must send the two "write request" commands to the nodes via the basic SDO channel.

Identifier calculation

- ▶ Identifier (COB-ID) = basic identifier + node address (node ID)
- ▶ Basic identifier SDO2 from master to drive: 1600 (0x640)
→ Identifier = 0x640 + 0x4 = 0x644
- ▶ Basic identifier SDO2 from drive to master: 1472 (0x5C0)
→ Identifier = 0x5C0 + 0x4 = 0x5C4

Resulting data (data 1 ... data 4)

8th byte		7th byte			6th byte		5th byte	
Data 4		Data 3			Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11			Bit 10 ... bit 0			
0	0	Extended identifier = 0			11-bit identifier = 0x644			
0x00		0x00			0x06		0x44	

[11-7] Data telegram assignment for subindex 1

8th byte		7th byte			6th byte		5th byte	
Data 4		Data 3			Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11			Bit 10 ... bit 0			
0	0	Extended identifier = 0			11-bit identifier = 0x5C4			
0x00		0x00			0x05		0xC4	

[11-8] Data telegram assignment for subindex 2

User data assignment

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
0x23	0x01	0x12	0x01	0x44	0x06	0x00	0x00

[11-9] User data assignment for writing to subindex 1

1st byte	2nd byte	3rd byte	4th byte	5th byte	6th byte	7th byte	8th byte
Command	Index		Subindex	Data 1	Data 2	Data 3	Data 4
0x23	0x01	0x12	0x02	0xC4	0x05	0x00	0x00

[11-10] User data assignment for writing to subindex 2

I-1400

Index: I-1400	Name: RPDO1 communication parameter				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: Highest subindex supported	5	- (read access only)		ro	U8
1: COB-ID used by RPDO	0x200 + node ID	0	4294967295	rw	U32
2: Transmission type	254	0	255	rw	U8
3: Inhibit time	-	- (not used for RPDOs)		rw	U16
4: Compatibility entry	-	- (reserved, read or write access leads to error message 0x06090011)		rw	U8
5: Event timer	-	- (not used for RPDOs)		rw	U16

Communication parameter for receiving process data via RPDO1

Subindex	Meaning	Code
0	"5" is permanently set. • Max. 5 subindices are supported.	-
1	RPDO1 identifier • According to the "Predefined Connection Set", the basic setting is: Identifier = 0x200 + node ID	C00354/1
2	RPDO Transmission type according to DS301 V4.02 ▶ Transmission type (662)	C00323/1

8th byte		7th byte		6th byte		5th byte	
Data 4		Data 3		Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11				Bit 10 ... bit 0	
0/1	0/1	Extended identifier*				11-bit identifier	

* The extended identifier is not supported. Bit 11 ... bit 29 must be set to "0".

[11-11] Data telegram assignment

How to change the identifier:

1. Deactivate identifier (set bit 31 to "1").
2. Change identifier.
3. Activate identifier (set bit 31 to "0").

Description of subindex 1

Bit no.	Value	Explanation
0 ... 10	0/1	11-bit identifier
(11 ... 28)*	0	*) The extended identifier (29 bits) is not supported. Any of these bits must be "0".
29*	0	
30	0	RTR to this PDO possible (cannot be set)
	1	RTR to this PDO not possible (Lenze)
31	0	PDO active
	1	PDO not active

[11-12] I-1400 ... I-1402, subindex 1

Description of subindex 2

PDO transmission			Transmission type	Explanation
cyclic	synchronous	event-controlled		
X	X		n = 1 ... 240	When a value n is entered, this PDO will be accepted with every nth SYNC.
		X	n = 254	PDO will be accepted immediately.

[11-13] I-1400 ... I-1402, subindex 2

I-1401

Index: I-1401	Name: RPDO2 communication parameter				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: Highest subindex supported	5	- (read access only)		ro	U8
1: COB-ID used by RPDO	0x300 + node ID	0	4294967295	rw	U32
2: Transmission type	254	0	255	rw	U8
3: Inhibit time	-	- (not used for RPDOs)		rw	U16
4: Compatibility entry	-	- (reserved, read or write access leads to error message 0x06090011)		rw	U8
5: Event timer	-	- (not used for RPDOs)		rw	U16

Communication parameter for receiving process data via RPDO2

Subindex	Meaning	Code
0	"5" is permanently set. • Max. 5 subindices are supported.	-
1	RPDO2 identifier • According to the "Predefined Connection Set", the basic setting is: Identifier = 0x300 + node ID	C00354/3
2	RPDO Transmission type according to DS301 V4.02 ▶ Transmission type (☐ 662)	C00323/2

▶ For data telegram assignment and description of subindices 1 and 2, see object [I-1400](#).

How to change the identifier:

1. Deactivate identifier (set bit 31 to "1").
2. Change identifier.
3. Activate identifier (set bit 31 to "0").

I-1402

Index: I-1402	Name: RPDO3 communication parameter				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: Highest subindex supported	5	- (read access only)		ro	U8
1: COB-ID used by RPDO	0x400 + node ID	0	4294967295	rw	U32
2: Transmission type	254	0	255	rw	U8
3: Inhibit time	-	- (not used for RPDOs)		rw	U16
4: Compatibility entry	-	- (reserved, read or write access leads to error message 0x06090011)		rw	U8
5: Event timer	-	- (not used for RPDOs)		rw	U16

Communication parameter for receiving process data via RPDO3

Subindex	Meaning	Code
0	"5" is permanently set. • Max. 5 subindices are supported.	-
1	RPDO3 identifier • According to the "Predefined Connection Set", the basic setting is: Identifier = 0x400 + node ID	C00354/5
2	RPDO Transmission type according to DS301 V4.02 ▶ Transmission type (□ 662)	C00323/3

► For data telegram assignment and description of subindices 1 and 2, see object [I-1400](#).

How to change the identifier:

1. Deactivate identifier (set bit 31 to "1").
2. Change identifier.
3. Activate identifier (set bit 31 to "0").

I-1600

Index: I-1600	Name: RPDO1 mapping parameter				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: Number of mapped application objects in PDO	0	0		8 rw	U8
1 ... 4: Application object 1 ... 4	0	0		4294967295 rw	U32

The object I-1600 serves to receive parameter data as RPDO1.

► This object relates to codes [C00409/1...4](#) and [C00866/1...4](#).

Subindex	Meaning
0	Number of mapped objects
1 ... 4	Mapping entries 1 ... 4 for RPDO1 <ul style="list-style-type: none"> The 4th mapping entry is used for the statistic mapping. For this, there is no value available.

8th byte	7th byte	6th byte	5th byte
Data 4	Data 3	Data 2	Data 1
Bit 31 ... bit 16		Bit 15 ... bit 8	Bit 7 ... bit 0
Index		Subindex	Length

[11-14] Data telegram assignment

IEC 61131 process data words are mapped. Only whole bytes can be mapped (1-byte/mapping entry).

Related topics:

► [RPDO1 | Port block "LP_CanIn1"](#) (655)

I-1601

Index: I-1601	Name: RPDO2 mapping parameter				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: Number of mapped application objects in PDO	0	0		8 rw	U8
1 ... 4: Application object 1 ... 4	0	0		4294967295 rw	U32

The object I-1601 serves to receive parameter data as RPDO2.

► This object relates to codes [C00409/5...8](#) and [C00866/5...8](#).

Subindex	Meaning
0	Number of mapped objects
1 ... 4	Mapping entries 1 ... 4 for RPDO2 <ul style="list-style-type: none"> The 4th mapping entry is used for the statistic mapping. For this, there is no value available.

► For data telegram assignment, see object [I-1600](#).

Related topics:

► [RPDO2 | Port block "LP_CanIn2"](#) (656)

I-1602

Index: I-1602	Name: RPDO3 mapping parameter					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Number of mapped application objects in PDO	0	0			8 rw	U8
1 ... 4: Application object 1 ... 4	0	0		4294967295	rw	U32

The object I-1602 serves to receive parameter data as RPDO3.

- This object relates to codes [C00409/9...12](#) and [C00866/9...12](#).

Subindex	Meaning
0	Number of mapped objects
1 ... 4	Mapping entries 1 ... 4 for RPDO3 <ul style="list-style-type: none"> The 4th mapping entry is used for the statistic mapping. For this, there is no value available.

- For data telegram assignment, see object [I-1600](#).

Related topics:

- [RPDO3 | Port block "LP CanIn3"](#) (657)

I-1800

Index: I-1800	Name: TPDO1 communication parameter					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Highest subindex supported	5	- (read access only)			ro	U8
1: COB-ID used by TPDO	0x180 + node ID	0		4294967295	rw	U32
2: Transmission type	254	0		255	rw	U8
3: Inhibit time	0 ms	0	0.1 ms	65535	rw	U16
4: Reserved	-	-(reserved, read or write access leads to error message 0x06090011)			rw	U8
5: Event timer	0 ms	0	ms	65535	rw	U16

Communication parameter for sending process data via TPDO1

Subindex	Meaning	Code
0	"5" is permanently set. • Max. 5 subindices are supported.	-
1	TPDO1 identifier • According to the "Predefined Connection Set", the basic setting is: Identifier = 0x180 + node ID	C00354/2
2	TPDO transmission type according to DS301 V4.02 ▶ Transmission type (□ 662)	C00322/1
3	Minimum time between sending two identical TPDOs (see DS301 V4.02).	C00324/2
5	Cycle time for PDO transmission with transmission type "254".	C00356/5 C00369

8th byte		7th byte		6th byte		5th byte	
Data 4		Data 3		Data 2		Data 1	
Bit 31	Bit 30	Bit 29 ... bit 11				Bit 10 ... bit 0	
0/1	0/1	Extended identifier*				11-bit identifier	

* The extended identifier is not supported. Bit 11 ... bit 29 must be set to "0".

[11-15] Data telegram assignment

Bit	Setting
Bit 30	0 RTR to this PDO possible (Lenze).
	1 RTR to this PDO not possible (not adjustable)
Bit 31	0 PDO active
	1 PDO inactive

How to change the identifier:

1. Deactivate identifier (set bit 31 to "1").
2. Change identifier.
3. Activate identifier (set bit 31 to "0").

Subindex 2 - transmission type

PDO transmission			Transmission type	Explanation
cyclic	synchronous	event-controlled		
●	●		n = 1 ... 240	When a value n is entered, this PDO will be accepted with every nth SYNC.
	●		n = 252	On sync, the PDO is filled with new data, but only sent on RTR.
		●	n = 254, 255	Event-controlled or cyclic

Subindex 3 - inhibit time**Note!**

The delay time can only be changed when the PDO is not active (see subindex 1, bit 31 = 1).

The entered value multiplied by 0.1 gives the delay time in [ms]. Only integers will be considered, i.e. fractional numbers will be **rounded down** to integers.

Example:

- ▶ Entered value: 26
- ▶ Calculated time = 26×0.1 [ms] = 2.6 [ms] → delay time = 2 [ms]

Subindex 5 - event timer

For cyclic operation (transmission type 254), the cycle time for sending the process data object on the CAN bus can be set under subindex 5:

The entered value corresponds to the time in [ms].

I-1801

Index: I-1801	Name: TPDO2 communication parameter					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Highest subindex supported	5	- (read access only)			ro	U8
1: COB-ID used by TPDO	0x280 + node ID	0		4294967295	rw	U32
2: Transmission type	254	0		255	rw	U8
3: Inhibit time	0 ms	0	0.1 ms	65535	rw	U16
4: Reserved	-	- (reserved, read or write access leads to error message 0x06090011)			rw	U8
5: Event timer	0 ms	0	ms	65535	rw	U16

Communication parameter for sending process data via TPDO2

Subindex	Meaning	Code
0	"5" is permanently set. • Max. 5 subindices are supported.	-
1	TPDO2 identifier • According to the "Predefined Connection Set", the basic setting is: Identifier = 0x280 + node ID	C00354/4
2	TPDO transmission type according to DS301 V4.02 ▶ Transmission type (□ 662)	C00322/2
3	Minimum time between sending two identical TPDOs (see DS301 V4.02).	C00324/3
5	Cycle time for PDO transmission with transmission type "254".	C00356/2 C00369

► For data telegram assignment and description of subindices, see object [I-1800](#).

How to change the identifier:

1. Deactivate identifier (set bit 31 to "1").
2. Change identifier.
3. Activate identifier (set bit 31 to "0").

I-1802

Index: I-1802	Name: TPDO3 communication parameter					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Highest subindex supported	5	- (read access only)			ro	U8
1: COB-ID used by TPDO	0x380 + node ID	0		4294967295	rw	U32
2: Transmission type	254	0		255	rw	U8
3: Inhibit time	0 ms	0	0.1 ms	65535	rw	U16
4: Reserved	-	-(reserved, read or write access leads to error message 0x06090011)			rw	U8
5: Event timer	0 ms	0	ms	65535	rw	U16

Communication parameter for sending process data via TPDO3

Subindex	Meaning	Code
0	"5" is permanently set. • Max. 5 subindices are supported.	-
1	TPDO3 identifier • According to the "Predefined Connection Set", the basic setting is: Identifier = 0x380 + node ID	C00354/6
2	TPDO transmission type according to DS301 V4.02 ▶ Transmission type (□ 662)	C00322/3
3	Minimum time between sending two identical TPDOs (see DS301 V4.02).	C00324/4
5	Cycle time for PDO transmission with transmission type "254".	C00356/3 C00369

► For data telegram assignment and description of subindices, see object [I-1800](#).

How to change the identifier:

1. Deactivate identifier (set bit 31 to "1").
2. Change identifier.
3. Activate identifier (set bit 31 to "0").

I-1A00

Index: I-1A00	Name: TPDO1 mapping parameter				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: Number of mapped application objects in PDO	0	0		8 rw	U8
1 ... 4: Application object 1 ... 4	0	0		4294967295 rw	U32

The object I-1A00 serves to send parameter data as TPDO1.

► This object relates to code [C00868/1...4](#).

Subindex	Meaning
0	Number of mapped objects
1 ... 4	Mapping entries 1 ... 4 for TPDO1 <ul style="list-style-type: none"> The 4th mapping entry is used for the statistic mapping. For this, there is no value available.

8th byte	7th byte	6th byte	5th byte
Data 4	Data 3	Data 2	Data 1
Bit 31 ... bit 16		Bit 15 ... bit 8	Bit 7 ... bit 0
Index		Subindex	Length

[11-16] Data telegram assignment

IEC 61131 process data words are mapped. Only whole bytes can be mapped (1-byte/mapping entry).

Related topics:

► [TPDO1 | Port block "LP_CanOut1"](#) (📖 658)

I-1A01

Index: I-1A01	Name: TPDO2 mapping parameter				
Subindex	Default setting	Setting range (min. value unit max. value)		Access	Data type
0: Number of mapped application objects in PDO	0	0		8 rw	U8
1 ... 4: Application object 1 ... 4	0	0		4294967295 rw	U32

The object I-1A01 serves to send parameter data as TPDO2.

► This object relates to code [C00868/5...8](#).

Subindex	Meaning
0	Number of mapped objects
1 ... 4	Mapping entries 1 ... 4 for TPDO2 <ul style="list-style-type: none"> The 4th mapping entry is used for the statistic mapping. For this, there is no value available.

► For data telegram assignment, see object [I-1A00](#).

Related topics:

► [TPDO2 | Port block "LP_CanOut2"](#) (📖 659)

I-1A02

Index: I-1A02	Name: TPDO3 mapping parameter					
Subindex	Default setting	Setting range (min. value unit max. value)			Access	Data type
0: Number of mapped application objects in PDO	0	0			8 rw	U8
1 ... 4: Application object 1 ... 4	0	0		4294967295	rw	U32

The object I-1A02 serves to send parameter data as TPDO3.

- ▶ This object relates to code [C00868/9...12](#).

Subindex	Meaning
0	Number of mapped objects
1 ... 4	Mapping entries 1 ... 4 for TPDO3 <ul style="list-style-type: none"> The 4th mapping entry is used for the statistic mapping. For this, there is no value available.

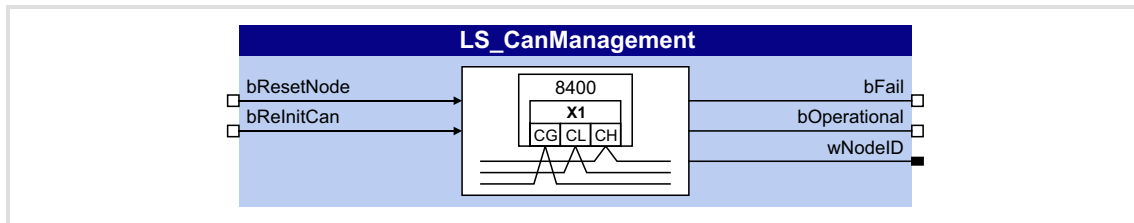
- ▶ For data telegram assignment, see object [I-1A00](#).

Related topics:

- ▶ [TPDO3 | Port block "LP CanOut3"](#) (📖 660)

11.12 Internal interfaces | System block "LS_CANManagement"

The **LS_CANManagement** system block serves to control internal functions of the CAN driver (reset node and re-initialisation) and to display the "Operational" status as well as the node address (analogous to the 9300 ServoPLC and ECS devices).



Inputs

Identifier	Data type	Information/possible settings
bResetNode	BOOL	Reset node
		TRUE Carry out reset node <ul style="list-style-type: none"> If the controller is configured as CAN master in C00352, the NMT command "Start Remote Node" is sent to all nodes at the bus (broadcast telegram). ▶ Network management telegram (NMT)
bReInitCAN	BOOL	Reinitialisation
		TRUE Reinitialise "CAN on board" interface.

Outputs

Identifier	Data type	Value/meaning
bFail	BOOL	Error
		TRUE An event according to the error configuration in C00341 has occurred
bOperational	BOOL	"Operational" status signal
		TRUE The system bus is in the "Operational" status
wNodeID	WORD	Output of the node address



Note!

If a "Bus off" error is detected, the "CAN on board" interface will automatically be reinitialised after 1 second.

Hence, 1 second after the "Bus off" has occurred, the controller will automatically be active again on the CAN bus ("Auto bus off recovery").

12 Fieldbus interface

The drive controllers of the 8400 series can accommodate plug-in communication modules and can therefore take part in the data transfer of an existing fieldbus system.

When using a communication module, the major advantage for the user is the possibility of parameterising, controlling, and diagnosing the drive system via the available fieldbus.

The following fieldbuses are supported by the 8400 TopLine controller:

- ▶ EtherCAT
- ▶ Ethernet POWERLINK
- ▶ INTERBUS
- ▶ PROFIBUS
- ▶ PROFINET

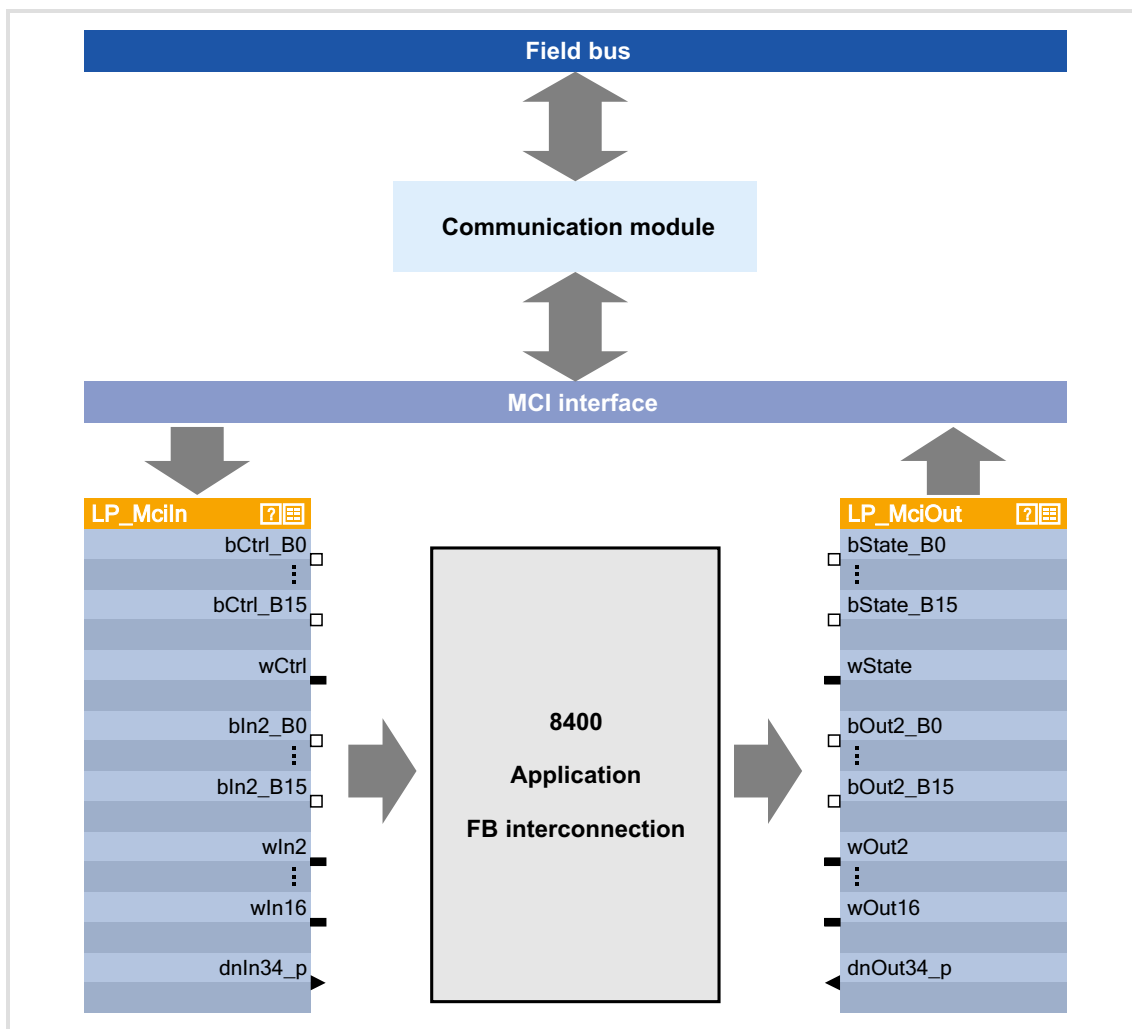


Detailed information is provided in the communication manual (KHB) for the respective fieldbus and in the »Engineer« online help.

12.1 Process data transfer

The process data serve to control the controller. Thus the transfer of the process data is time-critical.

- ▶ The process cycle is 1 ms, irrespective of the respectively plugged-in bus system and the type of drive controller.
- ▶ Process data transfer takes place cyclically between the master system and the drive controllers.
 - This concerns the continuous exchange of current input and output data.
 - In the case of the 8400 drive controller, 16 words per direction are exchanged.
- ▶ The master computer can directly access the process data. Access to the process data takes place via the port blocks **LP_MciIn** and **LP_MciOut** (see FB interconnection of the »Engineer«). These port blocks are also called process data channels.
- ▶ The process data are not saved in the controller.



[12-1] External and internal data transfer between bus system, drive controller and function block interconnection

Voltage supply

Depending on the complexity and functional range of the fieldbus, the communication modules are supplied by the standard device or an external 24 supply at the module.

The external 24 V voltage supply of the communication module is required if the supply of the standard device fails but the communication via the bus is to continue.

Parameter setting of the communication modules

All codes which must be parameterised for establishing the fieldbus communication are saved in the memory module of the controller.

The archived data can be addressed by all bus systems supported by the controller.

Hotplug

The communication module (MCI module) can be plugged in/out while the controller is switched on. When the module is plugged in, it is automatically detected and checked for plausibility regarding the function and version.

Fieldbus-specific device profiles and PDO mapping

When specific bus systems are used, the controller is to behave according to a defined, manufacturer-spanning standard. The following definitions have been made for this:

- ▶ Definitions of the device state machine (e.g. DSP402, DriveCOM, ProfiDrive etc.)
- ▶ Definition of the bit assignment of control and status words
- ▶ Definition of signal scaling (on a limited scale)
- ▶ Definition of parameter scaling (on a limited scale)
- ▶ Definition of the process data mapping

These device profiles are not mapped in the communication module since some definitions have a strong effect on the device-internal behaviour and the device profiles are not uniform regarding this matter.

- ▶ The task of the communication modules is
 - to address parameters (SDOs),
 - to transfer PDOs and
 - the signal mapping of the PDOs.
- ▶ The process data objects (e.g. the meaning of the control word bits or the speed setpoint stipulated) are interpreted in the drive controller.

12.2 Control mode "MCI"

"40: MCI" can be selected as a control mode in [C00007](#) in order to quickly and easily set-up drive controller control by means of MCI-PDOs via the fieldbus interface.

Given that the technology applications are fundamentally different and have different requirements regarding the signals sent to them, predefined assignment of the MCI-PDOs depends on the technology application selected in [C00005](#):

- ▶ **TA "Actuating drive speed":**
[Process data assignment for fieldbus communication](#) (403)
- ▶ **TA "Table positioning":**
[Process data assignment for fieldbus communication](#) (434)
- ▶ **TA "Switch-off positioning":**
[Process data assignment for fieldbus communication](#) (460)

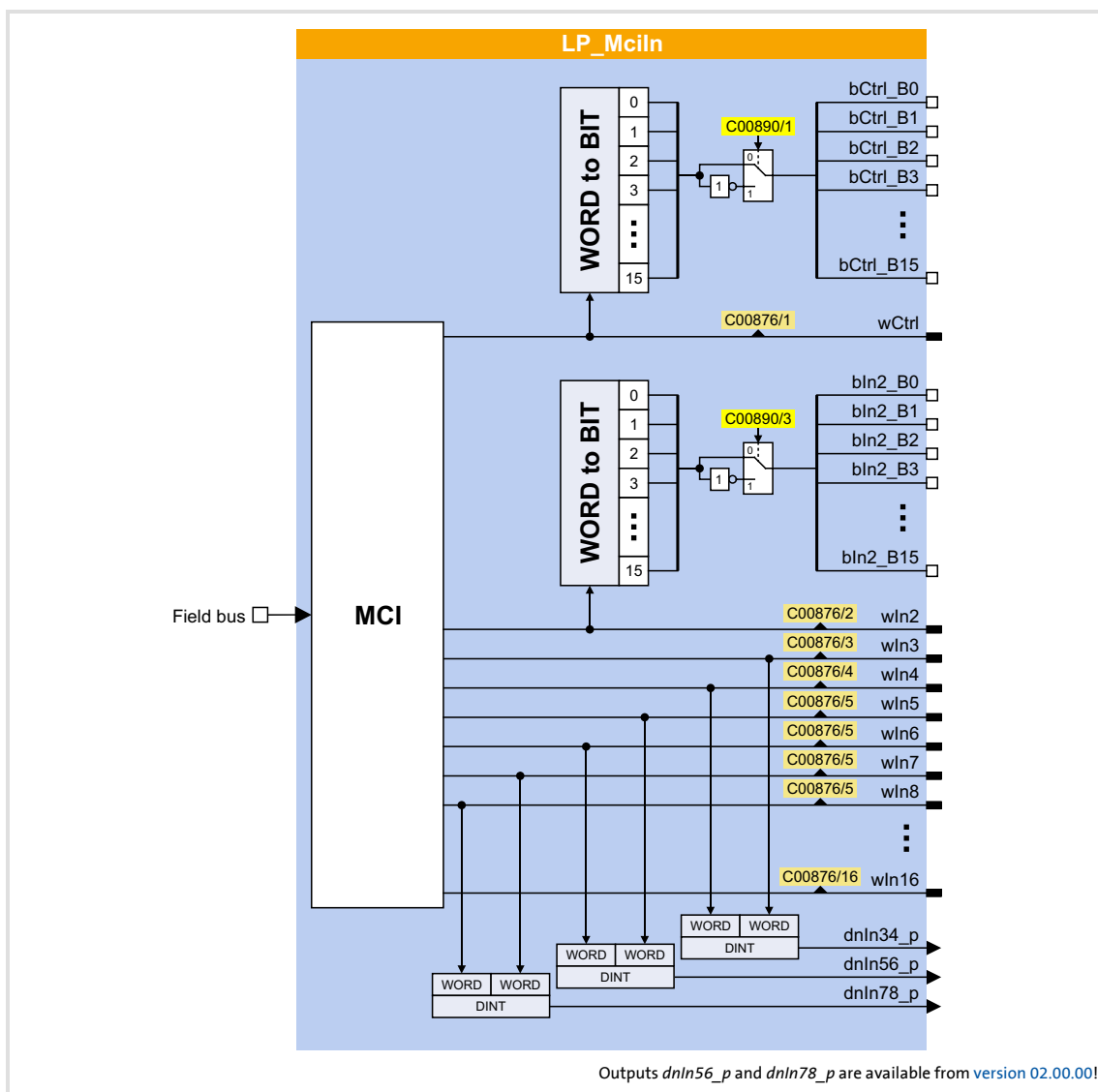


Tip!

The predefined assignment of the MCI-PDOs can be parameterised by means of PDO mapping and can be freely configured on the I/O level in the function block editor (FB editor).

12.2.1 Port block "LP_MciIn"

The LP_MciIn port block maps the received MCI-PDOs in the FB Editor.



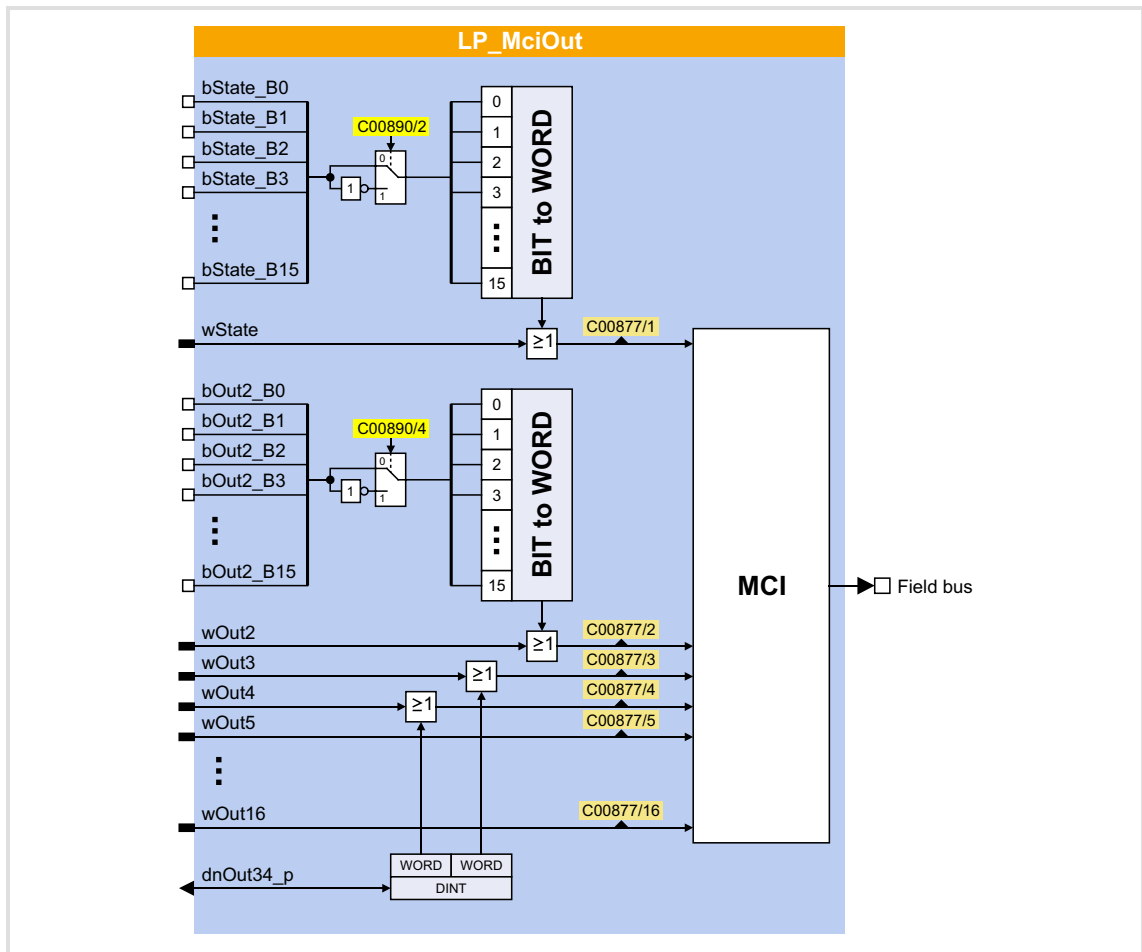
Short overview of the parameters for LP_MciIn:

Parameter	Info	Lenze setting
C00876/1	LP_MciIn:wCtrl	-
C00876/2...16	LP_MciIn: wln2 ... wln16	-
C00890/1	LP_MciIn: Inversion bCtrl_B0..15	0x0000
C00890/3	LP_MciIn: Inversion bln2_B0..15	0x0000

Highlighted in grey = display parameter

12.2.2 Port block "LP_MciOut"

The LP_MciOut port block maps the MCI-PDOs to be transmitted in the FB Editor.



Short overview of the parameters for LP_MciOut:

Parameter	Info	Lenze setting
C00877/1	LP_MciOut:wState	-
C00877/2...16	LP_MciOut: wOut2 ... wOut16	-
C00890/2	LP_MciOut: Inversion bState_B0..15	0x0000
C00890/4	LP_MciOut: Inversion bOut2_B0..15	0x0000

Highlighted in grey = display parameter

13 Axis bus

This function extension is available from version 02.00.00!

The 8400 TopLine controller has an integrated axis bus which is used to couple several 8400 TopLine controllers in an axis interconnection. The main task of the axis bus is a simple cross-data exchange from axis to axis.

Axis bus operation uses two transmission media, "data transfer axis bus" and "IO axis bus" that can be used independently of each other:

- ▶ The data transfer axis bus is based on CAN physics and enables a high-performance data transfer of master values and control signals to other 8400 TopLine controllers.
- ▶ The IO axis bus is a 1-wire bus with open-collector circuitry (5 V isolated). The IO axis bus can either be used to transfer controller errors in the interconnection ("release cord" principle) or as a pure open-collector IO function. In the first case, the internal time base of the controllers can be synchronised via the IO axis bus.

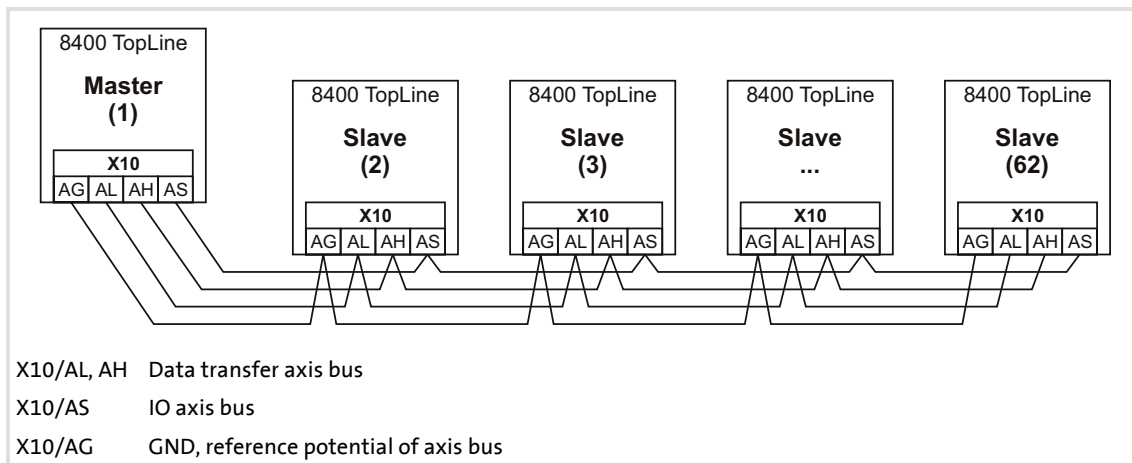
Max. 62 controllers can be connected to the axis bus.



Stop!

The data transfer axis bus of the 8400 TopLine controller is designed especially for performance and simplicity. HMI's and other peripherals as well as the L-force »Engineer« are not supported at the axis bus.

The IO axis bus of the 8400 TopLine controller is not compatible to the state bus of the 9300/9400 device series due to different voltage levels!



[13-1] Axis bus topology

13.1 Data transfer axis bus



Stop!

The data transfer axis bus of the 8400 TopLine controller is designed especially for performance and simplicity. HMIs and other peripherals as well as the L-force »Engineer« are not supported at the axis bus.

The data transfer axis bus is based on isolated CAN physics.

- ▶ Max. 62 nodes are supported at the bus (1 master and max. 61 slaves).
- ▶ The baud rate is permanently set to 500 kbits.
- ▶ Transfer cycle = 1 ms (at baud rate = 500 kbits)

13.1.1 Topologies

There are generally two different topologies for an interconnected operation:

- All nodes of the network are connected to the higher-level master control via MCI module and the respective fieldbus.
 - The axes can exchange data via the axis bus.
 - Moreover, the CAN bus is available.
- Only the axis bus master of the network is connected to the higher-level master control via MCI module and the respective fieldbus.
 - For cost reasons, this topology only makes sense if only few information has to be transferred from the master control to the network.

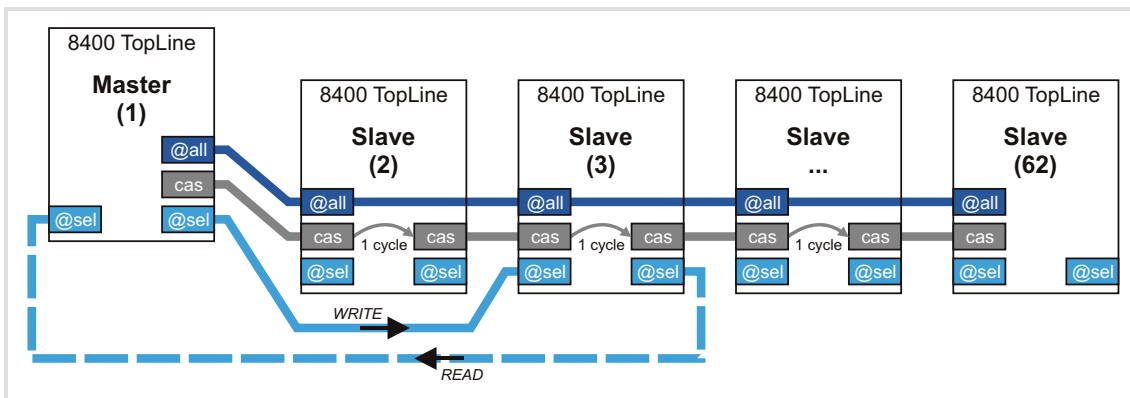
In both cases, the axes can exchange data via the axis bus and the CAN bus is available in addition.

13.1.2 Transfer mechanisms

The axis bus supports three different transfer mechanisms simultaneously according to the following methodology:

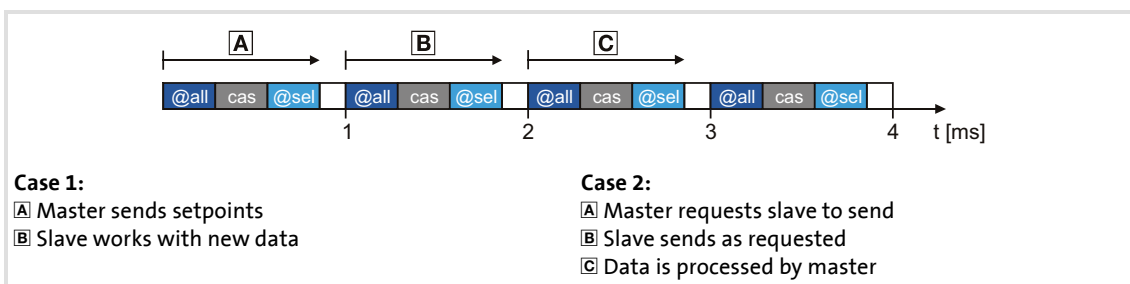
- ▶ "@all": Data transfer from master to all slaves
 - A data packet is sent from the master to all slaves in the transmission cycle.
 - Application: Data distribution according to line topology
 - Cycle time = transmission cycle = 1 ms (at baud rate = 500 kbits)
- ▶ "cas": Data transfer from node to node (cascade)
 - In the first transmission cycle, a data packet is sent from master to slave 1, in the next transmission cycle from slave 1 to slave 2, etc.
 - Application: Data distribution according to cascade topology
 - Cycle time = transmission cycle * no. of slaves+1

- ▶ "@sel": Data transfer from master to a slave
 - A data packet is sent from the master to one selected slave in the transmission cycle.
 - More options: Send to no slave, send to all slaves, and read one selected slave.
 - Application: Data distribution according to line topology for controlling one single node.
 - Cycle time = transmission cycle



[13-2] Transfer mechanisms

The axis bus data is transferred in 1-ms transmission cycle:



[13-3] Data transfer

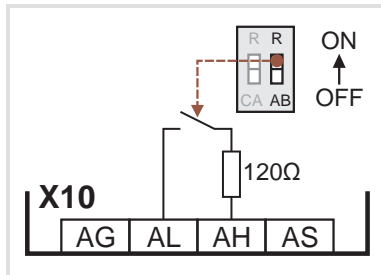
The axis bus data transfer is connected to the master/slave application via the **LS_AxisBus** systems blocks:

- ▶ For a data transfer from the master to all slaves (@all) and/or a cascaded data transfer (cas), the systems blocks [LS_AxisBusIn](#) and [LS_AxisBusOut](#) are available in the FB Editor.
- ▶ For a data transfer from the master to a certain slave (@sel), the [LS_AxisBusAux](#) system block is available.

13.1.3 Activating the bus terminating resistor

The axis bus must be terminated between axis bus low (AL) and axis bus high (AH) at the first and last physical node each by a resistor (120 Ω).

The 8400 controller is provided with an integrated bus terminating resistor, which can be activated via the DIP switch labelled with "AB":



- ▶ OFF = bus terminating resistor is inactive
- ▶ ON = bus terminating resistor is active

[13-4] Activation of the integrated bus terminating resistor

13.1.4 Parameter setting

Short overview of the relevant parameters:

Parameter	Info	Lenze setting	
		Value	Unit
C01120	Sync signal source	0	Off
C02430/1	Axis bus address • 1 ≙ Master • 2 ... 62 ≙ slave 1 ... slave 61	1	
C02430/2	Axis bus no. of nodes • Number of slaves connected to the axis bus. • Setting only required for the master.	2	
C02431/1	Axis bus decel. boot-up operat. • Delay during status change from "Boot-up" to "Operational".	3000	ms
C02431/2	Axis bus decel. operat.- 1.transmit • "Operational" time until "first transmission".	1000	ms
C02431/3	Axis bus decel. BusOffRecovery	1000	ms
C02435	Axis bus status	-	
C02436	Axis bus error status	-	
C02437	Axis bus MessageError	-	
C02440/1	Axis bus IO function	0	Off

Highlighted in grey = display parameter

Defining the master

For a "safe" data transfer, one controller must be the master in the network. The master controls and synchronises the network.

Make the following settings for the controller which is to be the master in the network:

- ▶ Axis bus address ([C02430/1](#)) = "1"
 - With this setting, the controller automatically takes over the control in the network.
 - Only one master is allowed in the network.
- ▶ Axis bus IO function ([C02440/1](#)) = "1: Master"
 - With this setting, the controller outputs a synchronisation cycle to the I/O axis bus to which the slaves can orient themselves.

Required settings for the slaves

Make the following settings for the other controllers in the network:

- ▶ Axis bus address ([C02430/1](#)) = "2" ... "62"
 - Make sure that all controllers connected to the axis bus have different axis bus addresses.
- ▶ Sync signal source ([C01120](#)) = "2: AxisBusIO"
 - With this setting, the synchronisation cycle output by the master is used as synchronisation source.
 - Basically, only one source is allowed to synchronise the internal time base.
- ▶ Optional: Axis bus IO function ([C02440/1](#)) = "2: Slave"
 - Only required if the IO axis bus is to be used for transfer of controller errors in the network ("release cord" principle).

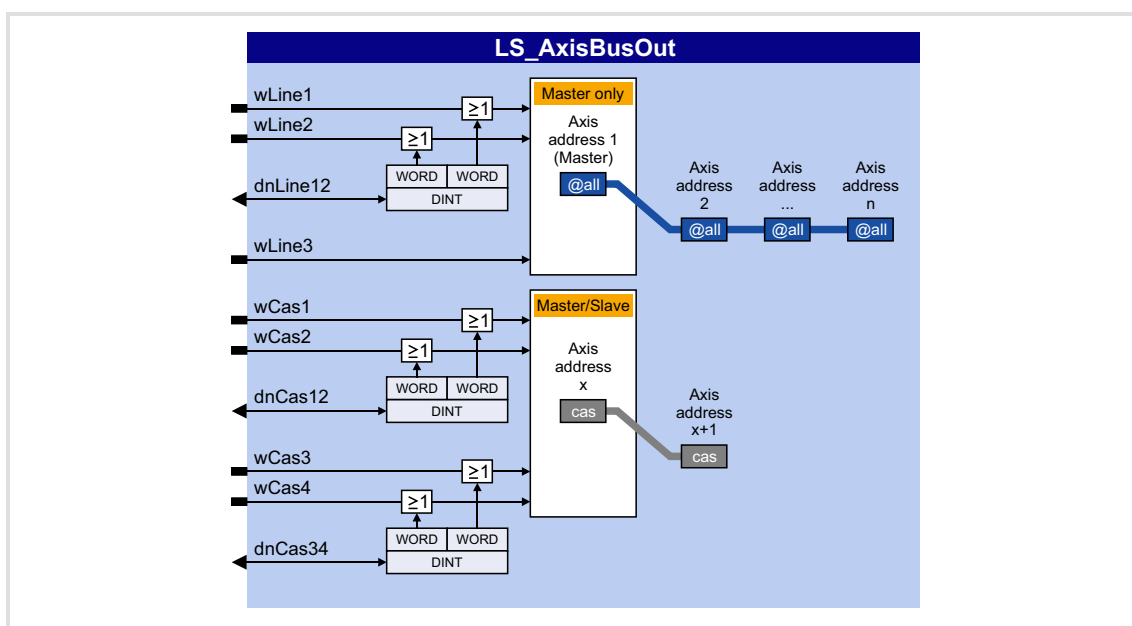
Related topics:

- ▶ ["Master/slave" function](#) (📖 727)

13.1.5 Internal interfaces | System block "LS_AxisBusOut"

This system block is used to send line data from the master to all slaves (@all) and/or send the cascaded data (cas).

- ▶ The line data is sent as process data object (PDO) per transmission cycle to all slaves and forwarded to the application. Moreover, this PDO serves to transmit an internal control word (thus, only three words are available for data transfer).
- ▶ The cascaded data is also sent as PDO per transmission cycle from one slave to the next. The control which slave has to send when and at what time a slave in the chain has to accept the data, is executed by the internal control word in the PDO of the line data.

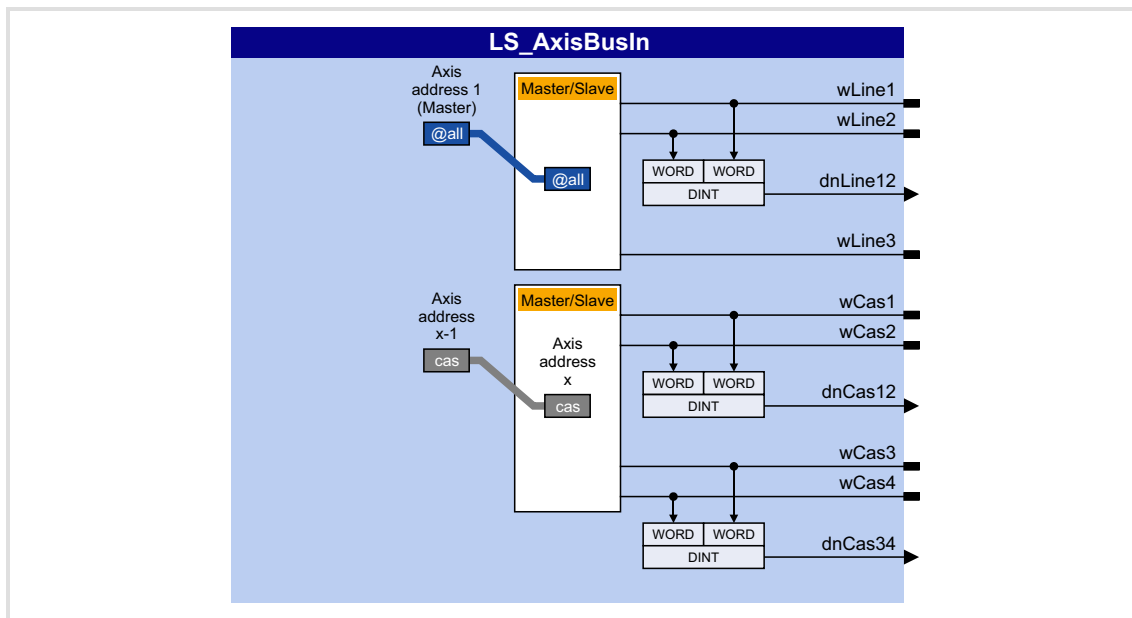


Inputs

Input	Data type	Information/possible settings
wLine1/wLine2	WORD	Line data - word 1 and word 2 • Selection as separate words or as double word. • The double word is OR'd with word 1 and word 2.
dnLine12	DINT	
wLine3	WORD	Line data - word 3
wCas1/wCas2	WORD	Cascaded data - word 1 and word 2 • Selection as separate words or as double word. • The double word is OR'd with word 1 and word 2.
dnCas12	DINT	
wCas3/wCas4	WORD	Cascaded data - word 3 and word 4 • Selection as separate words or as double word. • The double word is OR'd with word 3 and word 4.
dnCas34	DINT	

13.1.6 Internal interfaces | System block "LS_AxisBusIn"

This system block is used to receive the (line) data from the master (@all) and/or receive the cascaded data (cas).

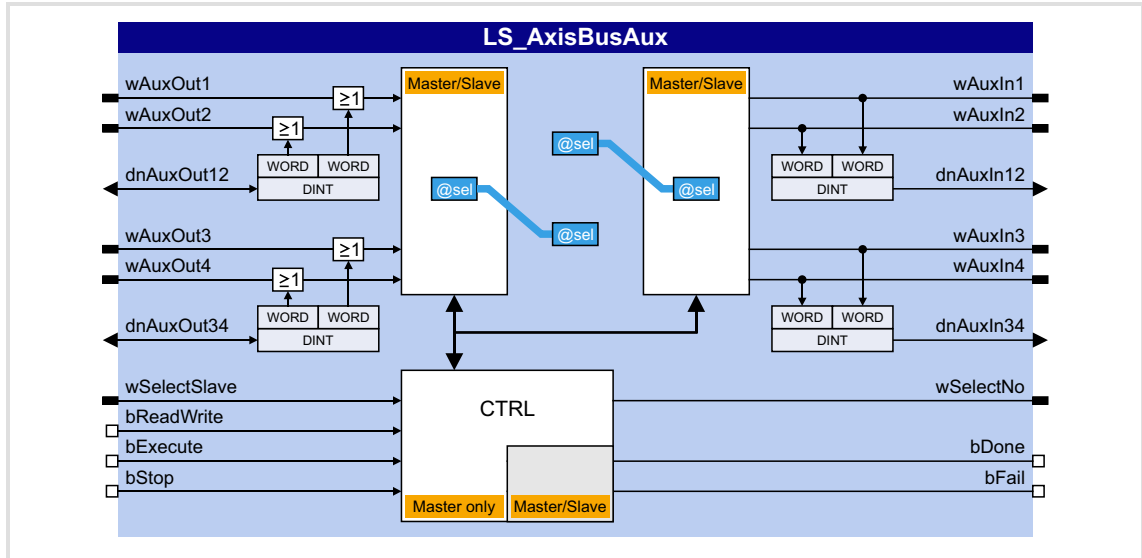


Outputs

Output	Data type	Value/meaning
wLine1/wLine2	WORD	Line data - word 1 and word 2
dnLine12	DINT	Line data - word 1 and word 2 as double word
wLine3	WORD	Line data - word 3
wCas1/wCas2	WORD	Cascaded data - word 1 and word 2
dnCas12	DINT	Cascaded data - word 1 and word 2 as double word
wCas3/wCas4	WORD	Cascaded data - word 3 and word 4
dnCas34	DINT	Cascaded data - word 3 and word 4 as double word

13.1.7 Internal interfaces | System block "LS_AxisBusAux"

This system block is used for data transfer between the master and one selected slave (@sel). Data can either be received from the slave ("read") or sent to the slave ("write"). By selecting the axis bus address "63", data can also be sent to all slaves at the axis bus.



Inputs

Input	Data type	Information/possible settings
wAuxOut1/wAuxOut2	WORD	Data to be sent - word 1 and word 2 <ul style="list-style-type: none"> • Selection as separate words or as double word. • The double word is OR'd with word 1 and word 2.
dnAuxOut12	DINT	
wAuxOut3/wAuxOut4	WORD	Data to be sent - word 3 and word 4 <ul style="list-style-type: none"> • Selection as separate words or as double word. • The double word is OR'd with word 3 and word 4.
dnAuxOut34	DINT	
The following inputs are only relevant for the master. Via these inputs, the master controls the data acceptance of the "@sel" data in the slave.		
wSelectSlave	WORD	Axis bus address of the slave data is to be received of or data is to be sent to. <ul style="list-style-type: none"> • "0" ≡ data is sent to no slave. • "63" ≡ data is sent to all slaves.
bReadWrite	BOOL	FALSE Data is received by selected slave.
		TRUE Data is sent to selected slave.
bExecute	BOOL	TRUE The pending data is accepted and the read/write access is executed.
bStop	BOOL	TRUE The axis bus changes to the "Stopped" status. In this status, the entire data transfer is switched off.

Outputs

Output	Data type	Value/meaning
wAuxIn1/wAuxIn2	WORD	Received data - word 1 and word 2
dnAuxIn12	DINT	Received data - word 1 and word 2 as double word
wAuxIn3/wAuxIn4	WORD	Received data - word 3 and word 4
dnAuxIn34	DINT	Received data - word 3 and word 4 as double word
wSlaveNo	WORD	Display which slave has sent its data. • Output only relevant for master.
bDone	BOOL	Status signal "Data transfer completed"
		TRUE Data has been received correctly.
bFail	BOOL	Status signal "Error"
		TRUE Data has not been received correctly (e.g. bus error).

13.2 IO axis bus



Stop!

The IO axis bus of the 8400 TopLine controller is not compatible to the state bus of the 9300/9400 device series due to different voltage levels!

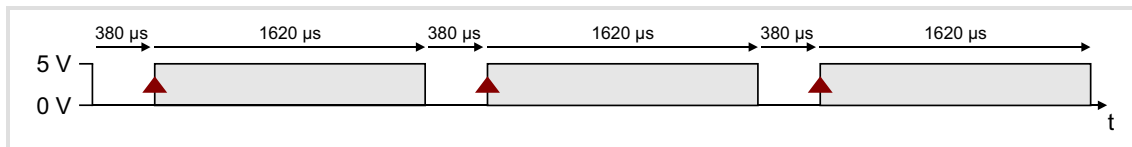
In order to use the IO axis bus, first decide whether the IO axis bus is to be used for transferring controller errors in the network ("release cord" principle) or as a pure open-collector IO function. The required function of the IO axis bus must then be set for all nodes in [C02440/1](#).

- ▶ "Master/slave" function ("release cord" principle)
 - In this setting, the IO axis bus only knows the two statuses "OK" and "Error".
 - Each node connected to the IO axis bus can set the IO axis bus into the "Error" status.
 - In the "Error" status, all nodes start their adjustable response, e.g. a synchronised braking of the drive system or the master only brakes the network to standstill.
 - The "Error" status can only be reset by the node defined as "master".
 - The internal time base of the controllers can be synchronised via the IO axis bus.
- ▶ "IO" function
 - With this setting, the IO axis bus is used as a pure IO transmission medium.
 - Each node connected to the IO axis bus can transmit a TRUE signal to all nodes.

13.2.1 "Master/slave" function

With this setting, the IO axis bus can be used as "release cord", i.e. each node can set all other nodes into an error status.

One IO axis bus node takes over the master role. The master's task is to output a synchronisation cycle to the IO axis bus to which the slaves can orient themselves:

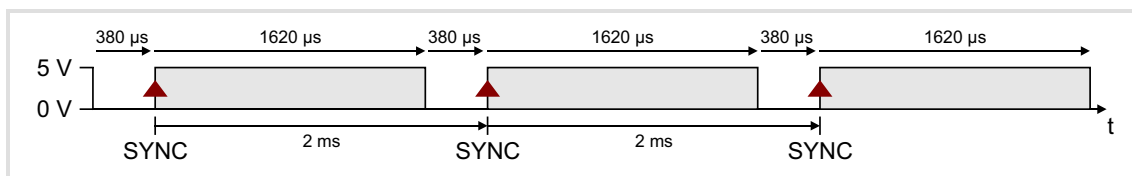


[13-5] IO axis bus: Synchronisation cycle from the master (error-free status)

The controller is configured as master or slave in [C02440/1](#) or by selecting "1: Master" or "2: Slave".

Synchronisation of the internal time base

The internal time base of the slaves can be synchronised via the IO axis bus. The slaves orient themselves to the synchronisation cycle output by the master:



[13-6] Synchronisation cycle

- ▶ In order that the IO axis bus is used as synchronisation source, all slaves must be set to "AxisBusIO" in [C01120](#).
 - The internal time base is synchronised based on the HIGH edge in a 2-ms cycle (see illustration above).
 - Internal timing and trimming of the phase position are set automatically.
- ▶ Basically, only one source is allowed to synchronise the internal time base. If "AxisBusIO" is selected, this is the IO axis bus master.



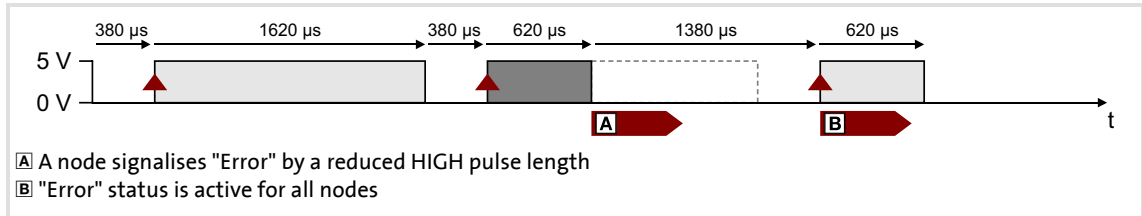
More information on this subject can be found in the following main chapter "[Synchronisation of the internal time base](#)". (📖 731)

Error-free status

In the error-free status, all nodes are error-active, i.e. each node can set the IO axis bus into the "Error" status.

Error status

By setting the [LS AxisBusIO.bSetFail_DigOut](#) input to TRUE, each node can set the IO axis bus into the "Error" status. The node signals this by reducing the HIGH pulse length to 620 µs:



[13-7] Synchronisation cycle (error status)

All other nodes detect the "error status" due to the changed pulse length which has the following effect:

- ▶ The [LS AxisBusIO.bFail_DigIn](#) output is set to TRUE. This digital signal can be used for any application within the function block interconnection.
- ▶ The nodes are now error-passive, i.e. they cannot signalise any further errors in order that the HIGH edge for synchronisation can be detected after 2 ms.



Tip!

In order to trigger a parameterisable error response, you can connect the *bFail_DigIn* output signal of the SB [LS AxisBusIO](#) to a *bSetError* input of the SB [LS SetError 1](#) or SB [LS SetError 2](#).

Reset "error" status



Note!

The "error" status can only be reset by the master!

A FALSE/TRUE edge at the [LS AxisBusIO.bResetFail](#) input (for the master) serves to reset the "error" status again. The master signals this by providing a LOW pulse for 3 ms.

All other nodes detect the error reset due to this signal, which has the following effect:

- ▶ The [LS AxisBusIO.bFail_DigIn](#) output is reset to FALSE.
- ▶ After a delay time of 2 ms, the [LS AxisBusIO.bResetFailIn](#) output is set for 3 ms to TRUE. This digital signal can be used within the function block interconnection to e.g. reset errors.

13.2.2 "IO" function

With this setting, the IO axis bus is used as a pure IO transmission medium, just like it the case for the 9300 and 9400 device series.

The "IO" function is activated in [C02440/1](#) by selecting "3: IO".

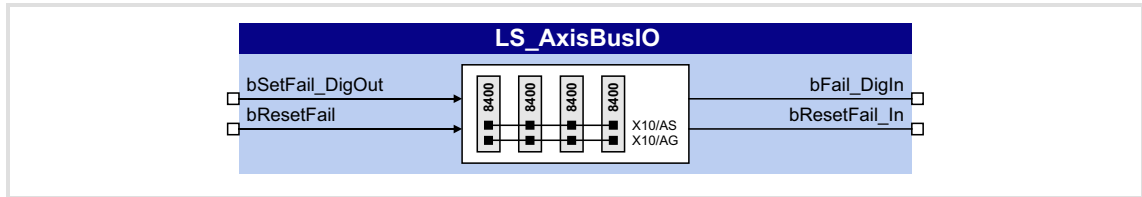


Note!

- "IO" function and [Data transfer axis bus](#) are mutually exclusive since with activated "IO" function, a synchronisation of the internal time base is not possible (which is required for a "safe" data transfer).
 - The "IO" function must be set for all IO axis bus nodes.
 - Triggering an error message with this function is only possible by function block interconnection.
 - Resetting an error message is not possible with this function.
- ▶ By setting the [LS AxisBusIO.bSetFail_DigOut](#) input to TRUE, the IO axis bus is set to the dominant level and for all nodes, the [LS AxisBusIO.bFail_DigIn](#) output is set to TRUE.
- ▶ The [LS AxisBusIO.bResetFail](#) input has no function.
- ▶ The [LS AxisBusIO.bResetFail_In](#) output is always FALSE.

13.2.3 Internal interfaces | System block "LS_AxisBusIO"

The LS_AxisBusIO system block maps the IO axis bus in the FB Editor:



Inputs

Identifier	Data type	Information/possible settings
bSetFail_DigOut	BOOL	Set IO axis bus into the "error" status / IO data exchange TRUE For all IO axis bus nodes, the <i>bFail_DigIn</i> output is set to TRUE.
bResetFail	BOOL	Reset "error" status • Only possible with "Master/slave" function via the IO axis bus master. FALSE → TRUE For all IO axis bus nodes, the <i>bFail_DigIn</i> output is reset to FALSE. After a delay time of 2 ms, the <i>bResetFail_In</i> output is set to TRUE for 3 ms for error reset.

Outputs

Identifier	Data type	Value/meaning
bFail_DigIn	BOOL	With "master/slave" function: "Error" status With "IO" function: Data exchange TRUE An IO axis bus nodes has set the <i>bSetFail_Digout</i> input to TRUE.
bResetFail_In	BOOL	"Error" status has been reset • With "IO" function, this output is always FALSE. TRUE The IO axis bus master has reset the error message. This status is only pending for 3 ms.

14 Synchronisation of the internal time base

In a drive system, synchronising the internal time bases of all controllers involved makes sense because cyclic process data should be processed synchronously in all drives.

- ▶ One of the following signal sources can be used for automatic synchronisation of the internal time base of the controller:
 - CAN bus ("CAN on board") → [sync telegram](#)
 - Axis bus ("AxisBusIO") → [master/slave function](#)
 - MCI → sync signal of a plugged-in communication module (EtherCAT, PROFINET or Powerlink)

Short overview of the parameters for the synchronisation of the internal time base:

Parameter	Info	Lenze setting	
		Value	Unit
C00370/1	CAN Sync instant of transmission	-	µs
C00370/2	Sync instant of reception	-	µs
C01120	Sync signal source	Off	
C01121	Sync cycle time setpoint	1000	µs
C01122	Sync phase position	0	µs
C01123	Sync window	100	µs
C01124	Sync correction width	320	ns

Highlighted in grey = display parameter

Sync signal source

The synchronisation signal source can be selected in [C01120](#). As a general rule, only one source can be used to synchronise the internal time base.

Sync cycle time setpoint

Time after which the internal phase-locking loop (PLL) anticipates the synchronisation signals. The time must be set in [C01121](#) according to the cycle of the synchronisation source selected in [C01120](#).



Note!

- Only integer multiples of 1000 µs can be set in [C01121](#).
- Intelligent communication modules usually define the cycle time setpoint derived from the bus cycle. In this case, a manual change is not possible.
- Even in case of a synchronisation via axis bus, a setting of the cycle time and the phase position is not required/possible and is executed automatically.

Example: For the CAN bus, 2 ms has been selected as interval between two synchronisation signals. If the CAN bus is to be used as synchronisation source, a cycle time setpoint of 2000 µs must be selected in [C01121](#).

Sync phase position

The phase position determines the zero-time of the internal system cycle with regard to the synchronisation signal (bus cycle). Since PDO processing is an inherent part of the system part of the application, the instant of acceptance of the PDOs is postponed as well by a changed phase position.

- ▶ If "0" is set, the internal system cycle starts at the same time as the synchronisation signal.
- ▶ If a value > 0 is set, the internal system cycle starts by the set time earlier (the phase position has a negative effect) than the synchronisation signal.
- ▶ Intelligent communication modules define the optimal time with activated synchronisation by themselves. In this case, a manual change is not possible.
- ▶ For determining [C01122](#), the point in time where all bus nodes have valid PDOs is decisive.

Example: If the phase position is set to $550 \mu\text{s}$, the system part of the application starts $550 \mu\text{s}$ before the arrival of the synchronisation signal.

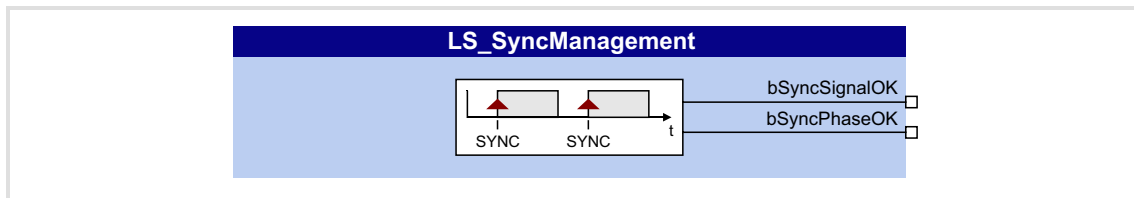
Sync correction width

If the cycle times of the synchronisation signal and the phase-locking loop (PLL) are different, the setting in [C01124](#) defines the correction increments for the phase-locking loop.

- ▶ The recommended reset time for the CAN bus as synchronisation source in case of occurring deviations is 320 ns (Lenze setting).
- ▶ If synchronisation is not reached, select a higher correction width.
- ▶ The optimum setting depends on quartz precision and must be determined empirically if required.

14.1 Internal interfaces | System block "LS_SyncManagement"

The SB **LS_SyncManagement** provides status information for synchronising the internal time base:



Outputs

Identifier	Data type	Value/meaning	
bSyncSignalOK	BOOL	TRUE	Sync signal OK
bSyncPhaseOK	BOOL	TRUE	Sync phase position OK

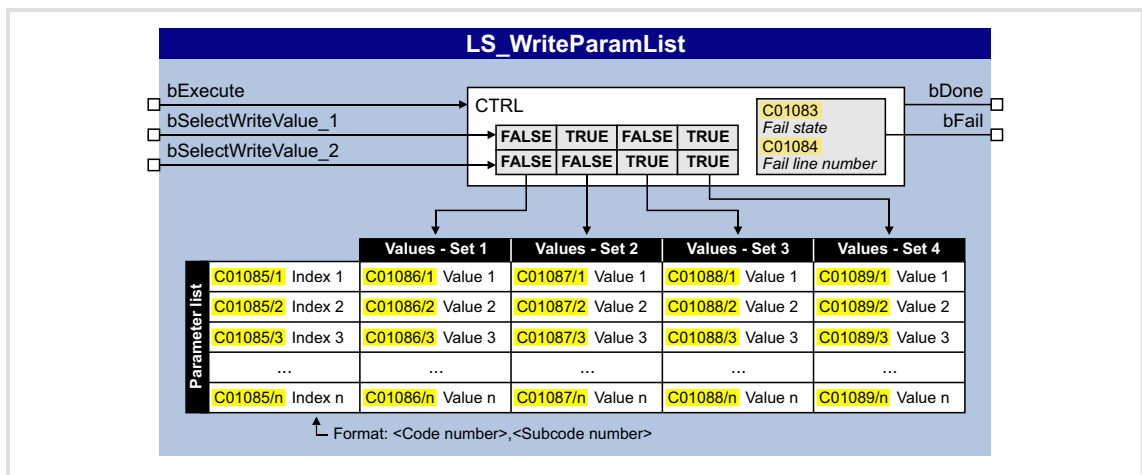
15 Parameter change-over

For up to 32 freely selectable parameters, this basic function provides a change-over between four sets with different parameter values.

The parameter list is created in the same way as the user menu is composed, namely by means of parameterisation. In the »Engineer«, a user-friendly parameterisation dialog with import and export functions is available for this purpose.

15.1 Internal interfaces | System block "LS_WriteParamList"

The LS_WriteParamList system block provides the internal interfaces for the basic "Parameter change-over" function:



Inputs

Identifier	Data type	Information/possible settings															
bExecute	BOOL	FALSE → TRUE If Execute Mode (C01082) = "0: by Execute": Activate writing of the parameter list															
bSelectWriteValue_1 bSelectWriteValue_2	BOOL	Binary coded selection of the value set 1 ... 4 to be used.															
		<table border="1"> <thead> <tr> <th>bSelectWrite Value_1</th> <th>bSelectWrite Value_2</th> <th></th> </tr> </thead> <tbody> <tr> <td>FALSE</td> <td>FALSE</td> <td>Value set 1 (C01086/1 ... n)</td> </tr> <tr> <td>TRUE</td> <td>FALSE</td> <td>Value set 2 (C01087/1 ... n)</td> </tr> <tr> <td>FALSE</td> <td>TRUE</td> <td>Value set 3 (C01088/1 ... n)</td> </tr> <tr> <td>TRUE</td> <td>TRUE</td> <td>Value set 4 (C01089/1 ... n)</td> </tr> </tbody> </table>	bSelectWrite Value_1	bSelectWrite Value_2		FALSE	FALSE	Value set 1 (C01086/1 ... n)	TRUE	FALSE	Value set 2 (C01087/1 ... n)	FALSE	TRUE	Value set 3 (C01088/1 ... n)	TRUE	TRUE	Value set 4 (C01089/1 ... n)
bSelectWrite Value_1	bSelectWrite Value_2																
FALSE	FALSE	Value set 1 (C01086/1 ... n)															
TRUE	FALSE	Value set 2 (C01087/1 ... n)															
FALSE	TRUE	Value set 3 (C01088/1 ... n)															
TRUE	TRUE	Value set 4 (C01089/1 ... n)															

Outputs

Identifier	Data type	Value/meaning	
bDone	BOOL	"Writing of the parameter list completed" status signal <ul style="list-style-type: none"> The output is automatically reset to FALSE if writing via <i>bExecute</i> is activated again. 	
		TRUE	Writing of the parameter list successfully completed.
		FALSE	The FALSE status can have the following meanings: <ol style="list-style-type: none"> There is no active writing of the parameter list. Writing of the parameter list has not been completed yet. An error has occurred (if <i>bFail</i> = TRUE).
bFail	BOOL	"Error" status	
		TRUE	An error has occurred (group signal). <ul style="list-style-type: none"> For details see display parameter C01083.

15.2 Configuring the list using the »Engineer« parameterisation dialog



Proceed as follows to open the dialog for parameterising the parameter change-over:

1. »Engineer« Go to the *Project view* and select the 8400 TopLine controller.
2. Go to *Workspace* and change to the **Application parameters** tab.
3. Go to the *Overview* dialog level and click the "basic functions" button.
4. Go to the *Overview* → *Basic functions* dialog box and click the **Parameter change-over** button.

8400 TopLine C | Software Manual

Parameter change-over

Configuring the list using the »Engineer« parameterisation dialog

Application Parameters

Overview -> Basic Functions -> WriteParamList

Control

bExecute

Value 1 selected

Value 2 selected

Value 3 selected

Value 4 selected

Diagnostics

FailState

Error line

Settings

Execute Mode

Modify list Copy values Reload list Import list Export list

Line	Code	Name	Unit	Active value	Value 1	Value 2	Value 3	Value 4
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								
11								
12								

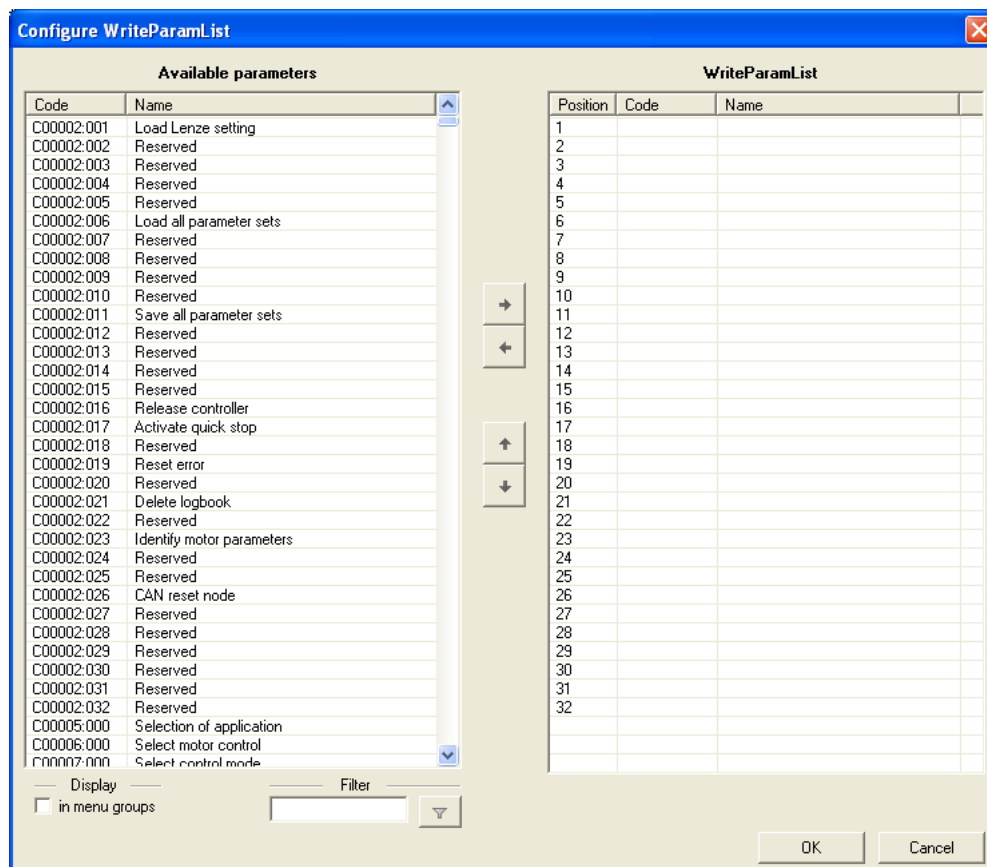
Nothing selected Nothing selected


Creating/changing the list







To create or change the list, proceed as follows:

1. Click on **Change list** button.
 - The dialog box entitled *Configure WriteParamList* is shown:



- On the left-hand side, all the parameters of the drive controller with write and read access are shown in the list entitled **Available parameters**.
 - If the option **In menu groups** is activated, all parameters are shown assigned to their functions.
 - By clicking on the  button in the **Filter** area, you can shorten the list of available parameters. If, for example, you enter the text "ain1" and then click on the button, only those parameters whose designation contains this text are shown for selection.
2. Highlight the parameter/parameters in the **Available parameters** list that is/are to be added to the *WriteParamList*.
 - Here, you can use the <Ctrl> key and the <Shift> key for multiple selection, as in the case of general Windows functions.

- Click on the  button in order to add the highlighted parameters to the *WriteParamList* on the right-hand side.
 - With the  and  buttons, you can alter the sequence of parameters in the *WriteParamList*.To remove parameters from the *WriteParamList*, proceed as follows:
 - Highlight the parameter/parameters in the **WriteParamList** that is/are to be removed from the *WriteParamList*.
 - Click on the  button to remove the highlighted parameters from the *WriteParamList*.
- Click on the **OK** button to accept the configuration and close the dialog box.
 - You can call the configuration dialog again at any time in order to change or expand the *WriteParamList* retrospectively.

Entering values

After composing the list, you can directly enter the desired parameter values into the input fields (columns **1st value ... 4th value**).

If you place the cursor in an input field, the permitted value range for the corresponding parameter is shown under the table.

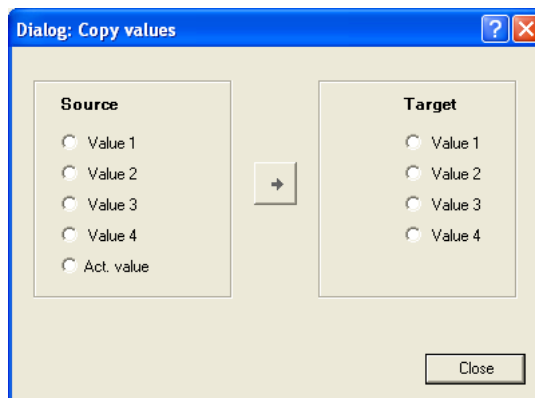
Copying values


All the settings of a value set can be copied to another value set.



To copy values, proceed as follows:

- Click on the **Copy values** button.
 - The *Copy values* dialog box is displayed:



- Select **Source** and **Target**.
- Click on  button in order to copy the values from **Source** to **target**.

Importing/exporting the list

For cross-device reuse of the configured *WriteParamList*, you can click on the **Export list** and **Import list** buttons to save the parameter selection as an *.epc file and then to re-import the saved *.epc file into another drive controller 8400.

15.3 Configuring the list by means of parameterisation

The following application example shows the necessary procedure for configuring the list without using the »Engineer« parameterisation dialog.

Task:

Using the *LS_WriteParamList* SB, the [C00012](#), [C00026/1](#), [C00027/1](#), and [C00222](#) to [C00224](#) parameters are to be written.

Compiling the parameter list

In [C01085/1 ... n](#), specify the above-named parameters in the <Code>,<Subcode> format:

- ▶ [C01085/1](#) = 12.000
- ▶ [C01085/2](#) = 26.001
- ▶ [C01085/3](#) = 27.001
- ▶ [C01085/4](#) = 222.000
- ▶ [C01085/5](#) = 223.000
- ▶ [C01085/6](#) = 224.000
- ▶ [C01085/7 ... n](#) = 0.000 (no parameter)



Note!

Gaps in the parameter list (setting = 0.000) are permissible and are skipped in the process.

Invalid parameter entries are not accepted at the input.

Entering values for the parameters (value set 1)

In [C01086/1 ... n](#), specify the values to be used to describe the selected parameters. The values are entered according to the scaling format/scaling factor of the respective parameter.

- ▶ [C01086/1](#) = <value> for list entry 1 (in our example: for parameter [C00012](#))
- ▶ [C01086/2](#) = <value> for list entry 2 (in our example: for parameter [C00026/1](#))
- ▶ [C01086/3](#) = <value> for list entry 3 (in our example: for parameter [C00027/1](#))
- ▶ etc.

These values are used in the writing process if the two *bSelectWriteValue_1* and *bSelectWriteValue_2* inputs are not assigned or both set to FALSE.

Entering other values for the parameters (value sets 2 ... 4)

If required, up to three other sets can be set in the same way in [C01087/1 ... n](#) to [C01089/1 ... n](#) which can optionally be written to the parameters. The decision as to which value set is finally used is dependent upon the assignment of the two `bSelectWriteValue_1` and `bSelectWriteValue_2` inputs:

15.4 Selecting a value set

The value set to be used is selected via the selection inputs `bSelectWriteValue_1` and `bSelectWriteValue_2` of the SB [LS_WriteParamList](#):

<code>bSelectWriteValue_1</code>	<code>bSelectWriteValue_2</code>	Value set used
FALSE	FALSE	Value set 1 (C01086/1 ... n)
TRUE	FALSE	Value set 2 (C01087/1 ... n)
FALSE	TRUE	Value set 3 (C01088/1 ... n)
TRUE	TRUE	Value set 4 (C01089/1 ... n)

15.5 Activating the writing of the parameters

For writing the parameter list, two modes are available in [C01082](#):

- ▶ 0: by Execute (Lenze setting)
The writing of the parameter list is activated by a FALSE/TRUE edge at the `bExecute` control input.
- ▶ 1: by Input Select
The parameter list is written when the selection inputs `bSelectWriteValue_1` and `bSelectWriteValue_2` are changed and once during the initialisation of the controller.

The parameters are written one at a time every time the main program is executed until the entire parameter list is processed. In the event of an error, respective error messages are output.



Note!

The "parameter change-over" basic function is always processed, even if the `LS_WriteParamList` system block has been removed from the interconnection by the FB Editor.

If you do not require this basic function anymore, delete the composed parameter list in order that no unwanted parameter write operations take place.

After successful completion

... the *bDone* output is set to TRUE.

- ▶ The *bDone* output is automatically reset to FALSE if writing via *bExecute* is activated again.

In the event of an error

... the *bDone* output remains set to FALSE and the *bFail* output is set to TRUE.

- ▶ [C01083](#) displays an error status and [C01084](#) displays the number of the list entry at which the error occurred (in connection with the selected value set).
- ▶ If several errors occur at the same time, only the first incorrect list entry will be displayed. Hence, after elimination of the displayed error and another activation, more errors may be displayed.
- ▶ The parameter list will always be processed from beginning to end, even if errors occur in the meantime.

16 Parameter reference

This chapter describes all parameters which can be used for parameterising and monitoring the controller.

Parameters which are only available in the controller from a certain software version onwards are marked with a corresponding note in the parameter description ("from version xx.xx.xx").

The parameter descriptions are based on software version V02.00.00



Tip!

For quick reference of a parameter with a certain name, simply use the **index** of the online documentation. The index always contains the corresponding code in parentheses after the name.

General information on parameter setting can be found in the chapter "[Introduction: Parameterising the controller](#)". (📖 30)

For general information on how to read and change parameters, please see the online documentation for the »Engineer«.

16.1 Structure of the parameter descriptions

Each parameter is described in the [Parameter list](#) in the form of a table which consists of the following three areas:

Table header

The table header contains the following general information:

- ▶ Parameter number (Cxxxxx)
- ▶ Parameter name (display text in the »Engineer« and keypad)
- ▶ [Data type](#)
- ▶ Parameter index in decimal and hexadecimal notation for access via a fieldbus (e.g. CAN system bus).



Tip!

The parameter index is calculated as follows:

- Index [dec] = 24575 - code
- Index [hex] = 0x5FFF - code

Example for code C00005:

- Index [dec] = 24575 - 5 = 24570
- Index [hex] = 0x5FFF - 0x{5} = 0x5FFA

Table contents

The table contains further general explanations & notes on the parameter and the possible settings, which are represented in different ways depending on the parameter type:

- ▶ [Parameters with read-only access](#)
- ▶ [Parameters with write access](#)

Table footer

The table footer contains the [Parameter attributes](#).

16.1.1 Data type

The parameters can be of the following data types:

Data type	Meaning
INTEGER_16	16-bit value with sign
INTEGER_32	32-bit value with sign
UNSIGNED_8	8-bit value without sign
UNSIGNED_16	16-bit value without sign
UNSIGNED_32	32-bit value without sign
VISIBLE_STRING	String of characters from printable characters

16.1.2 Parameters with read-only access

Parameters for which the "write access" attribute has not been set, can only be read. They cannot be changed by the user.

Description structure

Parameter Name: Cxxxxx _____	Data type: _____ Index: _____
Description	
Display range (min. value unit max. value)	

<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

Representation in the »Engineer«

The »Engineer« displays these parameters with a grey background or, with an online connection, with a pale-yellow background:

▲	C...	S	Name	Value	Unit
	3	0	Status of last device command	Successful	

16.1.3 Parameters with write access

Only parameters with a check mark () in front of the "write access" attribute can be changed by the user. The Lenze setting for these parameters is **printed in bold**.

- ▶ The settings can either be selected from a selection list or the values can be entered directly.
- ▶ Values outside the valid setting range are represented in red in the »Engineer«.

16.1.3.1 Parameters with setting range

Description structure

Parameter Name: Cxxxxx _____		Data type: _____ Index: _____
Description		
Setting range (min. value unit max. value)		Lenze setting
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

Parameter setting in the »Engineer«

In the »Engineer«, parameters are set by entering the desired value into the input field:

▲	C...	S	Name	Value	Unit
	11	0	Appl.: Reference speed	1500	rpm

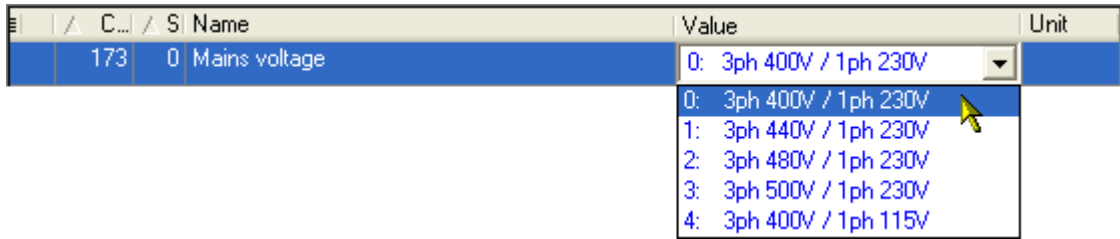
16.1.3.2 Parameters with selection list

Description structure

Parameter Name: Cxxxxx _____		Data type: _____ Index: _____
Description		
Selection list (Lenze setting printed in bold)		
	1	
	2	
	3	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

Parameter setting in the »Engineer«

In the »Engineer«, a list field is used for parameter setting:



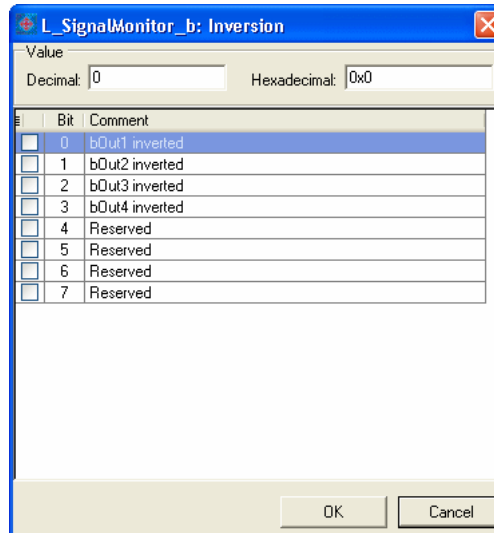
16.1.3.3 Parameters with bit-coded setting

Description structure

Parameter Name: Cxxxxx _____	Data type: _____ Index: _____
Description	
Value is bit-coded:	
Bit 0	
...	
Bit 31	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

Parameter setting in the »Engineer«

The »Engineer« uses a dialog box for parameter setting in which the individual bits can be set or reset. Alternatively, the value can be entered as a decimal or hexadecimal value:



16.1.3.4 Parameters with subcodes

Description structure

Parameter | Name: **Cxxxxx** | _____ Data type: _____
 Index: _____

Description

Setting range (min. value | unit | max. value)

Subcodes	Lenze setting
Cxxxxx/1	
Cxxxxx/2	
Cxxxxx/3	
Cxxxxx/4	

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

Parameter setting in the »Engineer«

The »Engineer« parameter list displays each subcode individually. The parameters are set as described in the previous chapters.

C...	S	Name	Value	Unit
39	1	Fixed setpoint 1	40.00	%
39	2	Fixed setpoint 2	60.00	%
39	3	Fixed setpoint 3	80.00	%
39	4	Fixed setpoint 4	0.00	%

16.1.4 Parameter attributes

The table footers contain the parameter attributes:

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

Attribute	Meaning
<input checked="" type="checkbox"/> Read access	Read access to parameter possible.
<input checked="" type="checkbox"/> Write access	Write access to parameter possible. • Please also observe the following attributes:
<input checked="" type="checkbox"/> CINH	Parameter value can only be changed when the controller is inhibited.
<input checked="" type="checkbox"/> PLC STOP	Parameter value can only be changed when the application is stopped.
<input checked="" type="checkbox"/> No transfer	Parameter is not transferred to controller when the command <u>Download parameter set</u> is executed.
<input checked="" type="checkbox"/> COM	Communication-relevant parameter • This parameter is relevant for parameter data transfer via the (CAN) system bus.
<input checked="" type="checkbox"/> MOT	Motor control parameters

Scaling factor

The "scaling factor" is important for parameter access via a bus system.

Signal type	Scaling factor	Resolution	Value range
Analog (scaled)	100	16 bits signed	± 199.99 %
Angular velocity	1	16 bits signed	± 32767 incr./ms
Position in [units]	10000	32 bits signed	± 214748.3647 [units]
Digital (BOOL)	1	8 bits unsigned	0 ≡ FALSE; 1 ≡ TRUE
Time	1000	16 bits unsigned	0 ... 999.000 s
Selection value	1	16 bits unsigned	0 ... 65535

Example 1: The value "654" of the parameter [C00028/1](#) (AIN1: input voltage) read via a bus system must be divided by the corresponding scaling factor "100" to obtain the actual display value "6.54 V".

$$\frac{\text{Read value (via bus system)}}{\text{Scaling factor}} = \text{Indicated value (Engineer)}$$

[16-1] Conversion formula for read access via bus system

Example 2: In order to set the parameter [C00012](#) (acceleration time main setpoint) to the value "123.45 %" via a bus system, the integer value "12345" must be transferred, i.e. the value to be set must be multiplied by the corresponding scaling factor "100".

$$\text{Value to be written (via bus system)} = \text{Value to be set} \cdot \text{Scaling factor}$$

[16-2] Conversion formula for write access via bus system

Character length

In case of parameters of "VISIBLE_STRING" data type, the character length is given in addition. This is also important for the parameter access via a bus system.

16.2 Parameter list

This chapter lists all parameters of the operating system in numerically ascending order.



Note!

The parameter descriptions are based on the software version V02.00.00.

C00002

Parameter | Name:

C00002 | Device command

Data type: UNSIGNED_8

Index: 24573_d = 5FFD_h

Note:

- Before switching off the supply voltage after carrying out a device command, check whether the device command has been carried out successfully via the status display under [C00003!](#)
- Before activating device commands by a master control, wait for the "Ready" signal of the controller.
- The device will reject a write process to C00002/x if the value is >1 and issue an error message.

► [Drive control \(DCTRL\): Device commands](#)

Selection list		
0	Off / ready	
1	On / start	
4	Action cancelled	
5	No access	
6	No access controller inhibit	
20	20% working	
40	40% working	
60	60% working	
80	80% working	
Subcodes	Lenze setting	Info
C00002/1	0: Off / ready	Load Lenze setting <ul style="list-style-type: none"> • All parameters are reset to the Lenze setting. • Only possible when the controller is inhibited.
C00002/2	0: Off / ready	Reserved
C00002/3	0: Off / ready	Reserved
C00002/4	0: Off / ready	Reserved
C00002/5	0: Off / ready	Reserved
C00002/6	0: Off / ready	Load all parameter sets <ul style="list-style-type: none"> • All parameter sets are loaded by the memory module. • Only possible when the controller is inhibited.
C00002/7	0: Off / ready	Reserved
C00002/8	0: Off / ready	Reserved
C00002/9	0: Off / ready	Reserved
C00002/10	0: Off / ready	Reserved
C00002/11	0: Off / ready	Save all parameter sets <ul style="list-style-type: none"> • All parameter sets are saved to the memory module safe against mains failure.
C00002/12	0: Off / ready	Reserved
C00002/13	0: Off / ready	Reserved

Parameter Name:		Data type: UNSIGNED_8 Index: 24573 _d = 5FFD _h
C00002 Device command		
C00002/14	0: Off / ready	Reserved
C00002/15	0: Off / ready	Reserved
C00002/16	1: On / start	Enable controller "1" ≡ Enable controller "0" ≡ Inhibit controller
C00002/17	0: Off / ready	Activate quick stop "1" ≡ Activate quick stop "0" ≡ Deactivate quick stop
C00002/18	0: Off / ready	Reserved
C00002/19	0: Off / ready	Reset error <ul style="list-style-type: none"> After the reset (acknowledgement) of the current error, further errors may be pending which must also be reset. The status determining error is displayed in C00168. The current error is displayed in C00170.
C00002/20	0: Off / ready	Reserved
C00002/21	0: Off / ready	Delete logbook <ul style="list-style-type: none"> All entries in the logbook of the controller are deleted. In the logbook, information on the error history is saved.
C00002/22	0: Off / ready	Reserved
C00002/23	0: Off / ready	Motor parameter identification <ul style="list-style-type: none"> This device command serves to carry out automatic motor parameter identification. The identification method can be selected in C02867. The device command is only executed when the drive controller is in the "SwitchedOn" status. In order to identify the motor parameters, the controller must be enabled after this device command. <p>▶ Automatic motor parameter identification</p>
C00002/24	0: Off / ready	Reserved
C00002/25	0: Off / ready	Identify resolver error ▶ Optimise resolver behaviour
C00002/26	0: Off / ready	CAN reset node <ul style="list-style-type: none"> Reinitialise "CAN on board" interface. Required when changing the baud rate, node address, or identifiers. <p>▶ System bus "CAN on board"</p>
C00002/27	0: Off / ready	Device search function <ul style="list-style-type: none"> This device command serves to optically locate a controller connected online (e.g. for maintenance work). <p>▶ Device search function</p>
C00002/28	0: Off / ready	Check MasterPin ▶ Unlocking the controller with a MasterPin
C00002/29	0: Off / ready	Set binding ID ▶ Device personalisation
C00002/30	0: Off / ready	Delete binding ID ▶ Device personalisation
C00002/31	0: Off / ready	Set password ▶ Password protection

Parameter Name: C00002 Device command		Data type: UNSIGNED_8 Index: 24573 _d = 5FFD _h
C00002/32	0: Off / ready	Check password ▶ Password protection
C00002/33	0: Off / ready	Delete password ▶ Password protection
C00002/34	0: Off / ready	Identify pole position (360°) <ul style="list-style-type: none"> • This device command is serves to carry out an automatic identification of the pole position. • The device command is only carried out if the controller is in the "Switched On" status • In order to identify the pole position, the controller must be enabled after this device command. ▶ Pole position identification

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00003

Parameter Name: C00003 Status of last device command		Data type: UNSIGNED_8 Index: 24572 _d = 5FFC _h
--	--	--

Status of the device command executed last ([C00002](#)).

Note:

Before switching off the supply voltage after carrying out a device command, check whether the device command has been carried out successfully via the status display!

▶ [Drive control \(DCTRL\): Device commands](#)

Selection list (read only)	Info
0 Successful	Device command has been executed successfully.
1 Command unknown	Device command implausible or unknown to the system.
2 Password protection	Unauthorised access for requested device command. ▶ Password protection
3 Time-out	Device command could not be processed in the defined time (timeout).
4 System error	
5 Command server assigned	
6 Controller inhibit required	
10 Memory module binding error	▶ Device personalisation
11 Password too short	▶ Password protection
12 Wrong password	
13 Password already set	
14 Password not assigned	

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00005

Parameter Name: C00005 Application		Data type: UNSIGNED_16 Index: 24570 _d = 5FFA _h
Selection of the technology application		
Selection list (Lenze setting printed in bold)		Info
0	Wiring has changed	This display appears if the FB interconnection has been changed in the application level using the FB Editor.
1000	Actuating drive speed	This technology application is used to solve speed-controlled drive tasks, e.g. conveying belts.
2000	Table positioning	This technology application is used to solve position-controlled drive tasks which are usually controlled by a higher-level control system using a fieldbus.
3000	Switch-off positioning	This technology application is used to solve speed-controlled drive tasks which require a pre-switch off or stopping at certain positions, e.g. roller conveyors and conveying belts. This is implemented by connecting switch-off sensors.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00006

Parameter Name: C00006 Motor control		Data type: UNSIGNED_8 Index: 24569 _d = 5FF9 _h
Selection of the motor control mode		
▶ Motor control (MCTRL): Select control mode		
Selection list (Lenze setting printed in bold)		Info
1	SC: Servo control PSM	This control type is used for the servo control of a synchronous motor. <ul style="list-style-type: none"> The control type requires a speed feedback via an encoder mounted to the motor! ▶ Servo control
2	SC: Servo control ASM	This control type is used for the servo control of an asynchronous motor. <ul style="list-style-type: none"> The control type requires a speed feedback via an encoder mounted to the motor! ▶ Servo control
3	SLPSM: Sensorless PSM	This control type is used for the sensorless control of a synchronous motor. <ul style="list-style-type: none"> ▶ Sensorless control for synchronous motors
4	SLVC: Vector control	This control type is used for sensorless vector control of an asynchronous motor. <ul style="list-style-type: none"> The control type requires motor parameters to be set as exactly as possible! ▶ Sensorless vector control
6	VFCplus: V/f linear	This control type is used for the speed control of an asynchronous motor via a linear V/f characteristic and is the simplest control type. <ul style="list-style-type: none"> For setting the V/f characteristic, only the rated frequency (C00089) and the rated voltage (C00090) of the motor have to be entered. ▶ V/f characteristic control
7	VFCplus: V/f linear + encoder	This control type is used for speed control of an asynchronous motor via a linear V/f characteristic. <ul style="list-style-type: none"> The control type requires a speed feedback via an encoder mounted to the motor! For setting the V/f characteristic, only the rated frequency (C00089) and the rated voltage (C00090) of the motor have to be entered. ▶ V/f control

Parameter Name: C00006 Motor control		Data type: UNSIGNED_8 Index: 24569 _d = 5FF9 _h
8	VFCplus: V/f quadr	<p>This control type is used for speed control of an asynchronous motor via a square-law V/f characteristic.</p> <ul style="list-style-type: none"> For setting the V/f characteristic, only the rated frequency (C00089) and the rated voltage (C00090) of the motor have to be entered. <p>▶ V/f characteristic control</p>
9	VFCplus: V/f quadr + encoder	<p>This control type is used for speed control of an asynchronous motor via a square-law V/f characteristic.</p> <ul style="list-style-type: none"> The control type requires a speed feedback via an encoder mounted to the motor! For setting the V/f characteristic, only the rated frequency (C00089) and the rated voltage (C00090) of the motor have to be entered. <p>▶ V/f control</p>
10	VFCplus: V/f definable	<p>This type of control is used for the speed control of an asynchronous motor via a user-definable characteristic with several interpolation points.</p> <ul style="list-style-type: none"> For setting the V/f characteristic, only the rated frequency (C00089) and the rated voltage (C00090) of the motor have to be entered. <p>▶ V/f characteristic control</p>
11	VFCplusEco: V/f energy-saving	<p>This control type is used for energy-saving speed control of an asynchronous motor via a linear V/f characteristic.</p> <ul style="list-style-type: none"> For setting the V/f characteristic, only the rated frequency (C00089) and the rated voltage (C00090) of the motor have to be entered. Predestinated application areas of this control type are materials handling technology and pump and fan systems. <p>▶ V/f characteristic control, energy-saving</p>

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00007

Parameter Name: C00007 Control mode		Data type: UNSIGNED_16 Index: 24568 _d = 5FF8 _h
<p>With this parameter the control mode for the technology application selected under C00005 is defined, i.e. how the inputs and outputs of the technology application are connected to the I/Os of the controller.</p> <ul style="list-style-type: none"> How the inputs and outputs are connected in the individual control modes is described in the corresponding technology application: <ul style="list-style-type: none"> "Actuating drive speed" TA "TA "Table positioning" "Switch-off positioning" TA 		
Selection list (Lenze setting printed in bold)		Info
0	Wiring has changed	This is displayed when the FB interconnection has been changed in the I/O level via the FB Editor.
10	Terminals 0	The technology application is controlled via the digital and analog input terminals of the controller. <ul style="list-style-type: none"> For a short overview of the preconfigured terminal assignment see the following section "Terminal assignment of the control modes 10 ... 16".
12	Terminals 2	
14	Terminals 11	
16	Terminal 16	
20	Keypad	The technology application is controlled via the keypad.
21	PC	The technology application is controlled via the "Free parameters" of the controller (PC control).
30	CAN	The technology application is controlled by means of CAN-PDOs via the system bus "CAN on board". ▶ System bus "CAN on board"
40	MCI	The technology application is controlled by means of MCI-PDOs via the MCI-interface of an attached communication module (e.g. PROFIBUS).
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

Terminal assignment of the control modes 10 ... 16

Note: The following tables only list the connected inputs/outputs.

Input/output	"Actuating drive speed" TA			
	10: Terminals 0	12: Terminals 2	14: Terminals 11	16: Terminals 16
RFR	Controller enable / Reset of error message			
DI1	Fixed setpoint 1/3		Change of direction of rotation	Fixed setpoint 1/3
DI2	Fixed setpoint 2/3		Activate manual DC-injection braking (DCB)	Fixed setpoint 2/3
DI3	Activate manual DC-injection braking (DCB)	Quick stop	Motor potentiometer: Increase speed	CW rotation quick stop
DI4	Change of direction of rotation		Motor potentiometer: Decrease speed	CCW rotation quick stop
A1U, A1I	Main speed setpoint (10 V ≙ 100 % reference speed)			
O1U, O1I	Actual speed value (10 V ≙ 100 % reference speed)			
DO1	Status "Drive is ready"			
Relay output	Status "Error is pending"			

TA "Table positioning"				
Input/output	10: Terminals 0	12: Terminals 2	14: Terminals 11	16: Terminals 16
RFR	Controller enable / Reset of error message			
DI1	-	-	Positive limit switch	-
DI2	-	-	Negative limit switch	-
DI3	Positive limit switch	-	-	Manual jog in positive direction
DI4	Negative limit switch	Positioning profile, array bit (valency 4)		Manual jog in negative direction
DI5	Positioning profile, array bit (valency 2)			
DI6	Positioning profile, array bit (valency 1)			
DI7	Start of profile generation			
A1U, A1I	Main speed setpoint (10 V ≙ 100 % reference speed)			
O1U, O1I	Actual speed value (10 V ≙ 100 % reference speed)			
O2U, O2I	Current motor current (10 V ≙ 100 % I _{max_mot})			
DO1	Status "Drive is ready"			
DO2	Status "Target position (actual value) is in the target window"			
DO3	Status "Home position is known"			
BD1, BD2	Control of the holding brake			
Relay output	Status "Error is pending"			

"Switch-off positioning" TA				
Input/output	10: Terminals 0	12: Terminals 2	14: Terminals 11	16: Terminals 16
RFR	Controller enable	Controller enable / Reset of error message		
DI1	Fixed setpoint 1/3	Stop function 1		Fixed setpoint 1/3
DI2	Fixed setpoint 2/3	Stop function 2	Selection: Pre-switch off 1	Fixed setpoint 2/3
DI3	Reset error messages	CW rotation quick stop Selection: Switch-off position 1		CW rotation quick stop
DI4	Change of direction of rotation	CCW rotation quick stop Selection: Switch-off position 2		CCW rotation quick stop
DI5	-	-	Stop function 2	-
DI6	-	-	Selection: Pre-switch off 2	-
A1U	Main speed setpoint (10 V ≙ 100 % reference speed)			
BD1, BD2	Control of the holding brake			

C00008

Parameter | Name: **C00008 | Original application|control source** Data type: UNSIGNED_16
Index: 24567_d = 5FF7_h

Display of the originally selected technology application and the originally selected control mode.

- This parameter shows the selection that was set with [C00005](#) and [C00007](#) before a change in the I/O level or the application level was carried out.
- For diagnostic purposes, this display serves to determine whether there is a standard interconnection in the controller or a change carried out by the user.

Selection list (read only)	Info
0 Free Free	Application: Interconnection has been changed. I/O level: Interconnection has been changed.
10 Free Terminal0	Application: Interconnection has been changed. I/O level: "Terminals 0" control mode
12 Free Terminal2	Application: Interconnection has been changed. I/O level: "Terminal 2" control mode
14 Free Terminal11	Application: Interconnection has been changed. I/O level: "Terminal 11" control mode

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00008

Parameter	Name:	Data type: UNSIGNED_16 Index: 24567 _d = 5FF7 _h
C00008	Original application control source	
16	Free Terminal 16	Application: Interconnection has been changed. I/O level: "Terminal 16" control mode
20	Free Keypad	Application: Interconnection has been changed. I/O level: "Keypad" control mode
21	Free PC	Application: Interconnection has been changed. I/O level: "PC" control mode
30	Free CAN	Application: Interconnection has been changed. I/O level: "CAN" control mode
40	Free MCI	Application: Interconnection has been changed. I/O level: "MCI" control mode
1000	Speed Free	Application: Actuating drive speed I/O level: Interconnection has been changed.
1010	Speed Terminal0	Application: Actuating drive speed I/O level: "Terminals 0" control mode
1012	Speed Terminal2	Application: Actuating drive speed I/O level: "Terminal 2" control mode
1014	Speed Terminal11	Application: Actuating drive speed I/O level: "Terminal 11" control mode
1016	Speed Terminal16	Application: Actuating drive speed I/O level: "Terminal 16" control mode
1020	Speed Keypad	Application: Actuating drive speed I/O level: "Keypad" control mode
1021	Speed PC	Application: Actuating drive speed I/O level: "PC" control mode
1030	Speed CAN	Application: Actuating drive speed I/O level: "CAN" control mode
1040	Speed MCI	Application: Actuating drive speed I/O level: "MCI" control mode
2000	TabPos Free	Application: Table positioning I/O level: Interconnection has been changed.
2010	TabPos Terminal0	Application: Table positioning I/O level: "Terminals 0" control mode
2012	TabPos Terminal2	Application: Table positioning I/O level: "Terminal 2" control mode
2014	TabPos Terminal11	Application: Table positioning I/O level: "Terminal 11" control mode
2016	TabPos Terminal16	Application: Table positioning I/O level: "Terminal 16" control mode
2020	TabPos Keypad	Application: Table positioning I/O level: "Keypad" control mode
2021	TabPos PC	Application: Table positioning I/O level: "PC" control mode
2030	TabPos CAN	Application: Table positioning I/O level: "CAN" control mode
2040	TabPos MCI	Application: Table positioning I/O level: "MCI" control mode
3000	SwitchPos Free	Application: Switch-off positioning I/O level: Interconnection has been changed.
3010	SwitchPos Terminal0	Application: Switch-off positioning I/O level: "Terminals 0" control mode

Parameter Name:			Data type: UNSIGNED_16 Index: 24567 _d = 5FF7 _h
C00008 Original application control source			
3012	SwitchPos Terminal 2	Application: Switch-off positioning I/O level: "Terminal 2" control mode	
3014	SwitchPos Terminal 11	Application: Switch-off positioning I/O level: "Terminal 11" control mode	
3016	SwitchPos Terminal 16	Application: Switch-off positioning I/O level: "Terminal 16" control mode	
3020	SwitchPos Keypad	Application: Switch-off positioning I/O level: "Keypad" control mode	
3021	SwitchPos PC	Application: Switch-off positioning I/O level: "PC" control mode	
3030	SwitchPos CAN	Application: Switch-off positioning I/O level: "CAN" control mode	
3040	SwitchPos MCI	Application: Switch-off positioning I/O level: "MCI" control mode	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00010

Parameter Name:			Data type: INTEGER_16 Index: 24565 _d = 5FF5 _h
C00010 AIN1: Characteristic			▶ Analog terminals: Signal adaptation via characteristic
Setting range (min. value unit max. value)			
0.00	%	199.99	
Subcodes	Lenze setting	Info	
C00010/1	0.00 %	AIN1: (+y0) = min	
C00010/2	0.00 %	AIN1: (+x0) = Dead band	
C00010/3	0.00 %	AIN1: (-y0) = (-min)	
C00010/4	0.00 %	AIN1: (-x0) = (-Dead band)	
C00010/5	100.00 %	AIN1: (+ymax)	
C00010/6	100.00 %	AIN1: (+xmax)	
C00010/7	100.00 %	AIN1: (-ymax)	
C00010/8	100.00 %	AIN1: (-xmax)	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00011

Parameter Name:			Data type: UNSIGNED_16 Index: 24564 _d = 5FF4 _h
C00011 Appl.: Reference speed			
Setting the reference speed			
<ul style="list-style-type: none"> In the controller, all speed-related signals are processed to one reference variable in percent. Set a reference speed here that corresponds to 100 %. The frequency that corresponds to the set reference speed is displayed in C00059. 			
Note:			
This is not a maximum limitation!			
All values in percent in the controller may be in a range of 0 ... 199.99 %.			
Setting range (min. value unit max. value)			Lenze setting
50	rpm	60000	1500 rpm
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00012

Parameter Name: C00012 Accel. time - main setpoint		Data type: UNSIGNED_32 Index: 24563 _d = 5FF3 _h	
<p>The L_NSet_1 FB: Acceleration time of the ramp generator for the main speed setpoint</p> <ul style="list-style-type: none"> Generally, this ramp generator is used for all speed-controlled technology applications. 			
Setting range (min. value unit max. value)		Lenze setting	
0.000	s	999.999	2.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000			

C00013

Parameter Name: C00013 Decel. time - main setpoint		Data type: UNSIGNED_32 Index: 24562 _d = 5FF2 _h	
<p>The L_NSet_1 FB: Deceleration time of the ramp generator for the main speed setpoint</p> <ul style="list-style-type: none"> Generally, this ramp generator is used for all speed-controlled technology applications. 			
Setting range (min. value unit max. value)		Lenze setting	
0.000	s	999.999	2.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000			

C00015

Parameter Name: C00015 VFC: V/f base frequency		Data type: UNSIGNED_16 Index: 24560 _d = 5FF0 _h	
<p>V/f base frequency for V/f characteristic control (VFCplus) and V/f control (VFCplus+encoder)</p> <ul style="list-style-type: none"> The motor voltage increases linearly with the frequency until the base frequency is reached. From this value on, the motor voltage remains constant, the speed increases and the maximum torque decreases. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well. 			
Setting range (min. value unit max. value)		Lenze setting	
7.5	Hz	2600.0	50.0 Hz
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10			

C00016

Parameter Name: C00016 VFC: Vmin boost		Data type: UNSIGNED_16 Index: 24559 _d = 5FEF _h	
<p>Boost of the V/f voltage characteristic in the range of small speeds or frequencies with V/f characteristic control (VFCplus) and V/f control (VFCplus+encoder)</p> <ul style="list-style-type: none"> This may increase the starting torque. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well. <p style="text-align: right;">▶ Motor control (MCTRL): Setting the Vmin boost</p>			
Setting range (min. value unit max. value)		Lenze setting	
0.00	%	100.00	1.60 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00018

Parameter | Name: **C00018 | Switching frequency** Data type: UNSIGNED_8
Index: 24557_d = 5FED_h

Selection of the pulse width modulated switching frequency transferred from the inverter to the motor

- Select between an ideal setting for the drive which provides smooth running, and an optimal setting with regard to the inverter which keeps its losses to a minimum (min. Pv).
- Both possibilities offer fixed and variable switching frequencies.
- When a variable switching frequency is selected, the switching frequency may change as a function of the load and rotational frequency.

▶ [Selection of switching frequency](#)

Selection list (Lenze setting printed in bold)	
1	4 kHz var./drive-optimised
2	8 kHz var./drive-optimised
3	16 kHz var./drive-optimised
5	2 kHz constant/drive-optimised
6	4 kHz constant/drive-optimised
7	8 kHz constant/drive-optimised
8	16 kHz constant/drive-optimised
11	4 kHz var./min. Pv
12	8 kHz var./min. Pv
13	16 kHz var./min. Pv
15	2 kHz constant/min. Pv
16	4 kHz constant/min. Pv
17	8 kHz constant/min. Pv
18	16 kHz constant/min. Pv
21	8 kHz var./drive-opt./4 kHz min
22	16 kHz var./drive-opt./4 kHz min
23	16 kHz var./drive-opt./8 kHz min
31	8 kHz var./min. Pv/4 kHz min
32	16 kHz var./min. Pv/4 kHz min
33	16 kHz var./min. Pv/8 kHz min

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00019

Parameter | Name: **C00019 | Auto DCB: Threshold** Data type: UNSIGNED_16
Index: 24556_d = 5FEC_h

Setpoint speed threshold for automatic DC injection braking

- For speed setpoints with values below the thresholds a DC current is injected or the motor is not supplied with current, depending on the setting.

▶ [DC-injection braking](#)

Setting range (min. value unit max. value)	Lenze setting
0 rpm 60000	3 rpm

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00020

Parameter Name: C00020 AIN2: Characteristic		Data type: INTEGER_16 Index: 24555 _d = 5FE8 _h
▶ Analog terminals: Signal adaptation via characteristic		
Setting range (min. value unit max. value)		
0.00	%	199.99
Subcodes	Lenze setting	Info
C00020/1	0.00 %	AIN2: (+y0) = min
C00020/2	0.00 %	AIN2: (+x0) = Dead band
C00020/3	0.00 %	AIN2: (-y0) = (-min)
C00020/4	0.00 %	AIN2: (-x0) = (-Dead band)
C00020/5	100.00 %	AIN2: (+ymax)
C00020/6	100.00 %	AIN2: (+xmax)
C00020/7	100.00 %	AIN2: (-ymax)
C00020/8	100.00 %	AIN2: (-xmax)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00021

Parameter Name: C00021 Slip comp.		Data type: INTEGER_16 Index: 24554 _d = 5FEA _h
Slip compensation for V/f characteristic control (VFCplus) and sensorless vector control (SLVC) <ul style="list-style-type: none"> A higher slip compensation results in a higher increase in frequency and voltage when the machine is under load. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well. ▶ Motor control (MCTRL): Optimising the operational performance by slip compensation		
Setting range (min. value unit max. value)		Lenze setting
-100.00	%	100.00 2.67 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00022

Parameter Name: C00022 I_{max} in motor mode		Data type: UNSIGNED_16 Index: 24553 _d = 5FE9 _h
Maximum current in motor mode for all motor control modes		
Setting range (min. value unit max. value)		Lenze setting
0.00	A	655.35 47.00 A
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00023

Parameter Name: C00023 I_{max} in generator mode		Data type: INTEGER_16 Index: 24552 _d = 5FE8 _h
Maximum current in generator mode for all motor control modes		
<ul style="list-style-type: none"> 100 % ≡ I_{max} in motor mode (C00022) 		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	100.00 100.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00024

Parameter Name: C00024 LS_DriveInterface: bNActCompare			Data type: INTEGER_16 Index: 24551 _d = 5FE7 _h
Threshold for the actual speed comparison			
<ul style="list-style-type: none"> This parameter serves to set a threshold that is compared with the actual speed value. If the value falls below this threshold, the <i>bNActCompare</i> output sets the LS_DriveInterface system block to TRUE. Switching hysteresis = +1 % 			
Setting range (min. value unit max. value)			Lenze setting
0.00	%	199.99	0.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00026

Parameter Name: C00026 AINx: Offset			Data type: INTEGER_16 Index: 24549 _d = 5FE5 _h
Offset for analog inputs			
▶ Analog terminals			
Setting range (min. value unit max. value)			Lenze setting
-199.99	%	199.99	
Subcodes	Lenze setting	Info	
C00026/1	0.00 %	AIN1: Offset	
C00026/2	0.00 %	AIN2: Offset	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00027

Parameter Name: C00027 AINx: Gain			Data type: INTEGER_32 Index: 24548 _d = 5FE4 _h
Gain for analog inputs			
▶ Analog terminals			
Setting range (min. value unit max. value)			Lenze setting
-100.0000		100.0000	
Subcodes	Lenze setting	Info	
C00027/1	1.0000	AIN1: Gain	
C00027/2	1.0000	AIN2: Gain	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000			

C00028

Parameter Name: C00028 AINx: Input voltage			Data type: INTEGER_16 Index: 24547 _d = 5FE3 _h
Display of the input voltage at the analog inputs			
▶ Analog terminals			
Display range (min. value unit max. value)			Lenze setting
-10.00	V	10.00	
Subcodes	Lenze setting	Info	
C00028/1		AIN1: Input voltage	
C00028/2		AIN2: Input voltage	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00029

Parameter | Name: **C00029 | AINx: Input current** Data type: INTEGER_16
Index: 24546_d = 5FE2_h

Display of the input current at the analog inputs

- When the corresponding analog input is configured for current measurement ([C00034/x](#) = 1 or 2).
- When [C00034/x](#) is set = 2 (4 ... 20 mA), 0 ... 16 mA is displayed.

[▶ Analog terminals](#)

Display range (min. value unit max. value)		
0.00	mA	20.00
Subcodes		Info
C00029/1		AIN1: Input current
C00029/2		AIN2: Input current
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00033

Parameter | Name: **C00033 | AINx: Output value** Data type: INTEGER_16
Index: 24542_d = 5FDE_h

Display of the output value in percent of the analog input amplifier

- 100 % ≙ 16384 ≙ +10 V / +20 mA

[▶ Analog terminals](#)

Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes		Info
C00033/1		AIN1: Output value
C00033/2		AIN2: Output value
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00034

Parameter | Name: **C00034 | AINx: Configuration** Data type: UNSIGNED_8
Index: 24541_d = 5FDD_h

Configuration of the analog inputs for current or voltage measurement

[▶ Analog terminals](#)

Selection list		Info
0	-10V..+10V	Input signal is the voltage signal -10 V ... +10 V • -10 V ... +10 V ≙ -100 % ... +100 %
1	0mA..20mA	Input signal is the current signal 0 mA ... 20 mA • 0 mA ... 20 mA ≙ 0 % ... +100 %
2	4mA..20mA	Input signal is the current signal 4 mA ... 20 mA • 4 mA ... 20 mA ≙ 0 % ... +100 % • The current loop is monitored for open circuit (I < 4 mA) by the device.
Subcodes		Info
C00034/1		AIN1: Config.
C00034/2		AIN2: Config.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00036

Parameter | Name: **C00036 | DC braking: Current** Data type: INTEGER_16
Index: 24539_d = 5FDB_h

Braking current in [%] based on rated device current ([C00098](#))

[▶ DC-injection braking](#)

Setting range (min. value unit max. value)			Lenze setting
0.00	%	200.00	50.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00039

Parameter Name: C00039 Fixed setpoint x (L_NSet_1 n-Fix)		Data type: INTEGER_16 Index: 24536 _d = 5FD8 _h
The <u>L_NSet_1</u> FB: Fixed speed setpoints (JOG values) for the setpoint generator		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00039/1	40.00 %	Fixed setpoint 1
C00039/2	60.00 %	Fixed setpoint 2
C00039/3	80.00 %	Fixed setpoint 3
C00039/4	0.00 %	Fixed setpoint 4
C00039/5	0.00 %	Fixed setpoint 5
C00039/6	0.00 %	Fixed setpoint 6
C00039/7	0.00 %	Fixed setpoint 7
C00039/8	0.00 %	Fixed setpoint 8
C00039/9	0.00 %	Fixed setpoint 9
C00039/10	0.00 %	Fixed setpoint 10
C00039/11	0.00 %	Fixed setpoint 11
C00039/12	0.00 %	Fixed setpoint 12
C00039/13	0.00 %	Fixed setpoint 13
C00039/14	0.00 %	Fixed setpoint 14
C00039/15	0.00 %	Fixed setpoint 15
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00050

Parameter Name: C00050 MCTRL: Speed setpoint		Data type: INTEGER_32 Index: 24525 _d = 5FCD _h
Display of the speed setpoint at the speed setpoint input of the motor control		
Display range (min. value unit max. value)		
-60000	rpm	60000
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00051

Parameter Name: C00051 MCTRL: Actual speed value		Data type: INTEGER_32 Index: 24524 _d = 5FCC _h
Display of the actual speed value of the motor shaft		
Note:		
The displayed value only corresponds to the real actual speed value of the motor shaft if an encoder is connected to the motor and the evaluation of the feedback signal has been set correctly ("Closed loop" operation). In case of operation without speed feedback, the signal is calculated from the motor control and thus may not correspond to the real actual speed.		
Display range (min. value unit max. value)		
-60000	rpm	60000
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00052

Parameter Name:	C00052 Motor voltage		Data type: UNSIGNED_16 Index: 24523 _d = 5FCB _h
Display of the current motor voltage/output voltage of the inverter			
Display range (min. value unit max. value)			
0	V	1000	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00053

Parameter Name:	C00053 DC-bus voltage		Data type: UNSIGNED_16 Index: 24522 _d = 5FCA _h
Display of the current DC-bus voltage			
Display range (min. value unit max. value)			
0	V	1000	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00054

Parameter Name:	C00054 Motor current		Data type: UNSIGNED_16 Index: 24521 _d = 5FC9 _h
Display of the current motor current/output current of the inverter			
Display range (min. value unit max. value)			
0.00	A	300.00	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00055

Parameter Name:	C00055 Actual values		Data type: INTEGER_16 Index: 24520 _d = 5FC8 _h
Actual value of the encoder/feedback system			
Note:			
When a single-track feedback has been selected for the HTL encoder (C00115 = 1 or 3), the sign of the actual speed value is created from the sign of the speed setpoint. In C00055/1 und C00055/2, a positive speed is always displayed.			
▶ Encoder/feedback system			
Display range (min. value unit max. value)			
-32767	rpm	32767	
Subcodes		Info	
C00055/1		Actual value - HTL encoder FreqIn12	
C00055/2		Actual value - HTL encoder FreqIn67	
C00055/3		Actual value - MultiEncoder TTL	
C00055/4		Actual value - resolver	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00056

Parameter Name: C00056 Torque		Data type: INTEGER_32 Index: 24519 _d = 5FC7 _h
Display of the current torque		
Display range (min. value unit max. value)		
-65000.00	Nm	65000.00
Subcodes		Info
C00056/1		Torque setpoint <ul style="list-style-type: none"> • Only in case of sensorless vector control (SLVC) and servo control (SC).
C00056/2		Actual torque value <ul style="list-style-type: none"> • Estimated actual torque for all motor control modes.
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00057

Parameter Name: C00057 Maximum torque		Data type: UNSIGNED_32 Index: 24518 _d = 5FC6 _h
Display of the maximum torque to be generated by the motor <ul style="list-style-type: none"> • The maximum torque to be generated by the motor depends on various factors, e.g. on I_{max} in motor mode (C00022) and the motor type used. 		
Display range (min. value unit max. value)		
0.00	Nm	65000.00
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00058

Parameter Name: C00058 Output frequency		Data type: INTEGER_32 Index: 24517 _d = 5FC5 _h
Display of the current output frequency		
Display range (min. value unit max. value)		
-1300.00	Hz	1300.00
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00059

Parameter Name: C00059 Appl.: Reference frequency C11		Data type: UNSIGNED_32 Index: 24516 _d = 5FC4 _h
Display of the field frequency which corresponds to the reference speed set in C00011 .		
Display range (min. value unit max. value)		
0.00	Hz	1300.00
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00060

Parameter Name: C00060 Motor rotor position		Data type: UNSIGNED_16 Index: 24515 _d = 5FC3 _h
Display range (min. value unit max. value)		
0		2047
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00061

Parameter Name: C00061 Heatsink temperature		Data type: INTEGER_16 Index: 24514 _d = 5FC2 _h
Display of the current heatsink temperature		
Display range (min. value unit max. value)		
-50	°C	150
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00062

Parameter Name: C00062 Temperature inside the controller		Data type: INTEGER_16 Index: 24513 _d = 5FC1 _h
From version 02.00.00		
Display of the current temperature inside the controller		
Display range (min. value unit max. value)		
-200	°C	200
Subcodes		Info
C00062/1		Interior temperature of CU
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00063

Parameter Name: C00063 Motor temperature		Data type: INTEGER_16 Index: 24512 _d = 5FC0 _h
Display of the current motor temperature		
Display range (min. value unit max. value)		
-200	°C	250
Subcodes		Info
C00063/1		Motor temperature
C00063/2		Motor temperature via resolver
C00063/3		Motor temperature via MultiEncoder
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00064

Parameter Name: C00064 Device utilisation (lxt)		Data type: INTEGER_16 Index: 24511 _d = 5FBF _h
Display of the device utilisation lxt in different time resolutions		
<ul style="list-style-type: none"> If the value displayed here exceeds the threshold set in C00123, the fault message "OC5: Device overload (lxt)" is output and the fault response set in C00604 is executed (default setting: "Warning"). 		
Display range (min. value unit max. value)		
0.00	%	250.00
Subcodes		Info
C00064/1		Device utilisation (lxt) <ul style="list-style-type: none"> Maximum value of the pulse utilisation (C00064/2) and permanent utilisation (C00064/3).
C00064/2		Device utilisation (lxt) 15s <ul style="list-style-type: none"> Pulse utilisation over the last 15 seconds (only for loads >160 %).
C00064/3		Device utilisation (lxt) 3 min <ul style="list-style-type: none"> Permanent utilisation over the last 3 minutes.
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00065

Parameter Name: C00065 Supply voltage 24V		Data type: INTEGER_16 Index: 24510 _d = 5FBE _h
Display of the 24V supply voltage for the supply of the control electronics		
Note:		
The 24 V supply for the control electronics is either provided by an external supply or by the controller itself if it is connected to the mains voltage.		
Display range (min. value unit max. value)		
0.0	V	3276.7
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10		

C00066

Parameter Name:	C00066 Thermal motor load (I²xt)		Data type: INTEGER_16 Index: 24509 _d = 5FB9 _h
Display of the thermal motor load, sensorlessly determined using a motor model			
<ul style="list-style-type: none"> If the value displayed here exceeds the motor overload setting (C00120), the fault message "OC6: Thermal motor overload (I²xt)" is output and the fault response set in C00606 is executed (default setting: "Warning"). 			
Display range (min. value unit max. value)			
0.00	%	199.99	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00070

Parameter Name:	C00070 Vp speed controller		Data type: UNSIGNED_16 Index: 24505 _d = 5FB9 _h
Amplification factor Vp of the speed controller for different motor control modes			
Setting range (min. value unit max. value)			
0.00		600.00	
Subcodes	Lenze setting	Info	
C00070/1	15.00	SLVC : Vp speed controller	
C00070/2	6.00	SC : Vp speed controller	
C00070/3	3.00	SLPSM : Vp speed controller	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100			

C00071

Parameter Name:	C00071 Ti speed controller		Data type: UNSIGNED_16 Index: 24504 _d = 5FB8 _h
Reset time Ti of the speed controller for different motor control modes			
Setting range (min. value unit max. value)			
0.0	ms	6000.0	
Subcodes	Lenze setting	Info	
C00071/1	100.0 ms	SLVC : Ti speed controller	
C00071/2	50.0 ms	SC : Ti speed controller	
C00071/3	100.0 ms	SLPSM : Ti speed controller	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10			

C00072

Parameter Name:	C00072 SC: Tdn speed controller		Data type: UNSIGNED_16 Index: 24503 _d = 5FB7 _h
Differential time constant Tdn of the speed controller for servo control (SC) and sensorless control for synchronous motors (SLPSM)			
Setting range (min. value unit max. value)		Lenze setting	
0.00	ms	3.00	0.00 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100			

C00073

Parameter Name: C00073 I_{max}/M controller gain		Data type: UNSIGNED_16 Index: 24502 _d = 5FB6 _h
Amplification factor V _p of certain controllers for different motor control modes		
Setting range (min. value unit max. value)		
0.00		16.00
Subcodes	Lenze setting	Info
C00073/1	0.25	VFC : V _p I _{max} controller • After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.
C00073/2	1.25	SLVC : V _p torque controller
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100		

C00074

Parameter Name: C00074 Reset time I_{max}/M controller		Data type: UNSIGNED_16 Index: 24501 _d = 5FB5 _h
Reset time T _i of certain controllers for different motor control modes		
Setting range (min. value unit max. value)		
0	ms	9990
Subcodes	Lenze setting	Info
C00074/1	65 ms	VFC : T _i I _{max} controller
C00074/2	30 ms	SLVC : T _i torque controller
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00075

Parameter Name: C00075 V_p current controller		Data type: UNSIGNED_16 Index: 24500 _d = 5FB4 _h
Gain factor V _p of the current controller for servo control (SC) and certain inverter functions (parameter identification, flying restart circuit)		
<ul style="list-style-type: none"> • After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. 		
Setting range (min. value unit max. value)		Lenze setting
0.00	V/A	500.00 7.00 V/A
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100		

C00076

Parameter Name: C00076 T_i current controller		Data type: UNSIGNED_16 Index: 24499 _d = 5FB3 _h
Reset time T _i of the current controller for servo control (SC) and certain inverter functions (parameter identification, flying restart circuit)		
<ul style="list-style-type: none"> • After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. 		
Setting range (min. value unit max. value)		Lenze setting
0.00	ms	500.00 10.61 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100		

C00077

Parameter | Name: **C00077 | SC: Vp field controller** Data type: UNSIGNED_16
Index: 24498_d = 5FB2_h

Gain factor Vp of the field controller for servo control ([SC](#))

- After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.

Setting range (min. value unit max. value)	Lenze setting
0.00	500.00 12.80

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00078

Parameter | Name: **C00078 | SC: Tn field controller** Data type: UNSIGNED_16
Index: 24497_d = 5FB1_h

Reset time Tn of the field controller for servo control ([SC](#))

- After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.

Setting range (min. value unit max. value)	Lenze setting
0.1	ms 6000.0 256.0 ms

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10

C00079

Parameter | Name: **C00079 | SC: Settings** Data type: UNSIGNED_8
Index: 24496_d = 5FB0_h

Configuration of different options for servo control ([SC](#)) and sensorless control for synchronous motors ([SLPSM](#))

Selection list		
0	Off	
1	On	
Subcodes	Lenze setting	Info
C00079/1	0: Off	SC : Current controller - feedforward control • Feedforward control/decoupling network of the current controller.
C00079/2	1: On	SC : Adapt. field weakening controller • Speed-dependent adaptive field weakening controller.
C00079/3	0: Off	SC : n-ctrl anti-wind-up • "Anti-wind-up" effect of the speed controller in case of an output voltage limitation in the field weakening range.
C00079/4	0: Off	Field weakening for synchronous motors • From version 02.00.00

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00080

Parameter | Name: **C00080 | Override point of field weakening** Data type: INTEGER_16
Index: 24495_d = 5FAF_h

Offset of the override point of field weakening

- In the V/f characteristic control mode ([VFCplus](#)), the stall protection function or the max. permissible current in the field weakening range can be adapted.

Setting range (min. value unit max. value)	Lenze setting
-500	Hz 500 0 Hz

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00081

Parameter Name: C00081 Rated motor power	Data type: UNSIGNED_16 Index: 24494 _d = 5FAE _h
<p>This value can be obtained from the motor nameplate. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.</p> <p>Note: It is mandatory to give the rated motor power for the sensorless vector control (SLVC) and the servo control (SC).</p>	
Setting range (min. value unit max. value)	Lenze setting
0.00 kW 500.00	11.00 kW
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100	

C00082

Parameter Name: C00082 Motor rotor resistance	Data type: UNSIGNED_32 Index: 24493 _d = 5FAD _h
<p>After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well.</p>	
Setting range (min. value unit max. value)	Lenze setting
0 mOhm 200000	276 mOhm
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1	

C00083

Parameter Name: C00083 Motor rotor time constant	Data type: UNSIGNED_16 Index: 24492 _d = 5FAC _h
<p>Display of the rotor time constant of the motor</p> <ul style="list-style-type: none"> This value is calculated from the rotor resistance and the rotor inductance (leakage and magnetising inductance). 	
Display range (min. value unit max. value)	
0 ms 32767	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00084

Parameter Name: C00084 Motor stator resistance	Data type: UNSIGNED_32 Index: 24491 _d = 5FAB _h
<p>After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well.</p>	
Setting range (min. value unit max. value)	Lenze setting
0 mOhm 200000	330 mOhm
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1	

C00085

Parameter Name: C00085 Motor stator leakage inductance	Data type: UNSIGNED_16 Index: 24490 _d = 5FAA _h
<p>After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well.</p>	
Setting range (min. value unit max. value)	Lenze setting
0.00 mH 650.00	3.50 mH
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100	

C00087

Parameter | Name: **C00087 | Rated motor speed** Data type: UNSIGNED_16
Index: 24488_d = 5FA8_h

This value can be obtained from the motor nameplate. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.

Note:

It is mandatory to give the rated motor speed for the sensorless vector control ([SLVC](#)) and the servo control ([SC](#)).

Setting range (min. value unit max. value)			Lenze setting
50	rpm	60000	1460 rpm
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1			

C00088

Parameter | Name: **C00088 | Rated motor current** Data type: UNSIGNED_16
Index: 24487_d = 5FA7_h

This value can be obtained from the motor nameplate. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.

Setting range (min. value unit max. value)			Lenze setting
0.20	A	320.00	21.00 A
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100			

C00089

Parameter | Name: **C00089 | Rated motor frequency** Data type: UNSIGNED_16
Index: 24486_d = 5FA6_h

This value can be obtained from the motor nameplate. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.

Note:

It is mandatory to give the rated motor frequency for the sensorless vector control ([SLVC](#)) and the servo control ([SC](#)).

Setting range (min. value unit max. value)			Lenze setting
1	Hz	1000	50 Hz
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1			

C00090

Parameter | Name: **C00090 | Rated motor voltage** Data type: UNSIGNED_16
Index: 24485_d = 5FA5_h

This value can be obtained from the motor nameplate. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.

Setting range (min. value unit max. value)			Lenze setting
0	V	5000	400 V
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1			

C00091

Parameter | Name: **C00091 | Motor cosine phi** Data type: UNSIGNED_8
Index: 24484_d = 5FA4_h

This value can be obtained from the motor nameplate. After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically.

Setting range (min. value unit max. value)			Lenze setting
0.40		1.00	0.85
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100			

C00092

Parameter Name:		Data type: UNSIGNED_16	
C00092 Motor magnetising inductance		Index: 24483 _d = 5FA3 _h	
After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well.			
Setting range (min. value unit max. value)		Lenze setting	
0.0	mH	6500.0	81.0 mH
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10			

C00093

Parameter Name:		Data type: UNSIGNED_16	
C00093 Power section identification		Index: 24482 _d = 5FA2 _h	
Display of the identification of the detected power section of the controller			
Display range (min. value unit max. value)			
0		65535	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00095

Parameter Name:		Data type: UNSIGNED_16	
C00095 Motor magnetising current		Index: 24480 _d = 5FA0 _h	
After the motor to be used has been selected from the motor catalogue, the suitable value can be entered automatically. An automatic detection via the motor parameter identification is possible as well.			
Setting range (min. value unit max. value)		Lenze setting	
0.00	A	320.00	8.50 A
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100			

C00097

Parameter Name:		Data type: UNSIGNED_32	
C00097 Rated motor torque		Index: 24478 _d = 5F9E _h	
Display of the rated motor torque			
<ul style="list-style-type: none"> The value displayed here is calculated from different parameters, e.g. the maximum current set in C00022. 			
Display range (min. value unit max. value)			
0.00	Nm	65535.00	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00098

Parameter Name:		Data type: UNSIGNED_16	
C00098 Device rated current		Index: 24477 _d = 5F9D _h	
Display of the rated inverter current which is defined by the integrated power section.			
Display range (min. value unit max. value)			
0.0	A	6000.0	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10			

C00099

Parameter Name:		Data type: VISIBLE_STRING	
C00099 Firmware version		Index: 24476 _d = 5F9C _h	
Display of the firmware version of the device as string			
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC-STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Character length: 12			

C00100

Parameter Name: C00100 Firmware version		Data type: UNSIGNED_8 Index: 24475 _d = 5F9B _h
Display of the firmware version of the device, divided into subsections.		
Display range (min. value unit max. value)		
0		99
Subcodes	Lenze setting	Info
C00100/1		Firmware version - main version
C00100/2		Firmware version - subversion
C00100/3		Firmware version - release
C00100/4		Firmware version - build
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00101

Parameter Name: C00101 Add. accel. time x		Data type: UNSIGNED_32 Index: 24474 _d = 5F9A _h
The L_NSet 1 FB: Additional acceleration times for the main setpoint		
<ul style="list-style-type: none"> The additional acceleration times set here can be selected via the binary inputs <i>bT11 ... bT18</i> of the L_NSet 1 FB. 		
Setting range (min. value unit max. value)		
0.000	s	999.999
Subcodes	Lenze setting	Info
C00101/1	0.000 s	Add. accel. time 1 ... 15
C00101/...		
C00101/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00103

Parameter Name: C00103 Add. decel. time x		Data type: UNSIGNED_32 Index: 24472 _d = 5F98 _h
The L_NSet 1 FB: Additional deceleration times for the main setpoint		
<ul style="list-style-type: none"> The additional deceleration times set here can be selected via the binary inputs <i>bT11 ... bT18</i> of the L_NSet 1 FB. 		
Setting range (min. value unit max. value)		
0.000	s	999.999
Subcodes	Lenze setting	Info
C00103/1	0.000 s	Add. decel. time 1 ... 15
C00103/...		
C00103/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00104

Parameter Name: C00104 Position control with quick stop		Data type: UNSIGNED_16 Index: 24471 _d = 5F97 _h
From version 02.00.00		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	Standstill position-controlled	
Bit 1 <input type="checkbox"/>	Ramp position-controlled	
Bit 2 <input type="checkbox"/>	Reserved	
Bit 3 <input type="checkbox"/>	Reserved	
Bit 4 <input type="checkbox"/>	Reserved	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	
Bit 8 <input type="checkbox"/>	Reserved	
Bit 9 <input type="checkbox"/>	Reserved	
Bit 10 <input type="checkbox"/>	Reserved	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Reserved	
Subcodes	Lenze setting	Info
C00104/1	0	Position control at quick stop
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00105

Parameter Name: C00105 Decel. time - quick stop		Data type: UNSIGNED_32 Index: 24470 _d = 5F96 _h
The set deceleration time determines the ramp slope at quick stop		
Setting range (min. value unit max. value)		Lenze setting
0.000	s	999.900
		2.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00106

Parameter Name: C00106 Auto DCB: Hold time		Data type: UNSIGNED_32 Index: 24469 _d = 5F95 _h
Hold time of the automatic DC injection brake		
<ul style="list-style-type: none"> The DC injection brake is applied for the time set here if the value falls below the speed setpoint set in C00019. 		
Setting range (min. value unit max. value)		Lenze setting
0.000	s	999.000
		0.500 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00107

Parameter Name: C00107 DC braking: Hold time		Data type: UNSIGNED_32 Index: 24468 _d = 5F94 _h
Maximum hold time of the manual DC injection brake		
<ul style="list-style-type: none"> A time can be set here after which the DC injection brake is switched off automatically to prevent the motor from thermal overload. 		
Setting range (min. value unit max. value)		Lenze setting
0.000	s	999.000 999.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00114

Parameter Name: C00114 DigInX: Inversion		Data type: UNSIGNED_16 Index: 24461 _d = 5F8D _h
The polarity of each digital input of the device can be inverted via this bit field.		
▶ Digital input terminals		
Setting range (min. hex value max. hex value)		Lenze setting
0x0000	0xFFFF	0x0000 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	Invert. DI1	Inversion of digital input 1
Bit 1 <input type="checkbox"/>	Invert. DI2	Inversion of digital input 2
Bit 2 <input type="checkbox"/>	Invert. DI3	Inversion of digital input 3
Bit 3 <input type="checkbox"/>	Invert. DI4	Inversion of digital input 4
Bit 4 <input type="checkbox"/>	Invert. DI5	Inversion of digital input 5
Bit 5 <input type="checkbox"/>	Invert. DI6	Inversion of digital input 6
Bit 6 <input type="checkbox"/>	Invert. DI7	Inversion of digital input 7
Bit 7 <input type="checkbox"/>	Reserved	
Bit 8 <input type="checkbox"/>	Reserved	
Bit 9 <input type="checkbox"/>	Reserved	
Bit 10 <input type="checkbox"/>	Reserved	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Invert CInh	Inversion of digital input RFR (controller enable)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00115

Parameter | Name: **C00115 | DI 1/2 & 6/7: Fct.** Data type: UNSIGNED_8
Index: 24460_d = 5F8C_h

Function assignment of the digital terminals DI1/2 and DI6/7

► [Digital input terminals: Function assignment](#)

Selection list		Info
0	DI1(6)=In / DI2(7)=In	DI1/6 = digital input DI2/7 = digital input
1	DI1(6)=FreqIn / DI2(7)=In	DI1/6 = 1-track frequency input DI2/7 = digital input
2	DI1(6)&DI2(7)=FreqIn (2-track)	DI1/6 and DI2/7 = 2-track frequency input
3	DI1(6)=FreqIn / DI2(7)=direction	DI1/6 = 1-track frequency input DI2/7 = specification of direction
4	DI1(6)=CountIn / DI2(7)=In	DI1/6 = counter input DI2/7 = digital input
Subcodes	Lenze setting	Info
C00115/1	0: DI1(6)=In / DI2(7)=In	Function assignment of DI1 and DI2
C00115/2	0: DI1(6)=In / DI2(7)=In	Function assignment of DI6 and DI7

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00117

Parameter | Name: **C00117 | Status of brake output BD** Data type: UNSIGNED_8
Index: 24458_d = 5F8A_h

Status message of brake output

Selection list (read only)		Info
0	Inactive	Brake output is inactive
1	Active	Brake output is active

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00118

Parameter | Name: **C00118 | DigOutX: Inversion** Data type: UNSIGNED_8
Index: 24457_d = 5F89_h

The polarity of each digital output of the device can be inverted via this bit field.

► [Digital output terminals](#)

Setting range (min. hex value max. hex value)		Lenze setting
0x00	0xFF	0x00 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	Relay inverted	Relay inversion
Bit 1 <input type="checkbox"/>	DO1 inverted	Inversion of digital output 1
Bit 2 <input type="checkbox"/>	DO2 inverted	Inversion of digital output 2
Bit 3 <input type="checkbox"/>	DO3 inverted	Inversion of digital output 3
Bit 4 <input type="checkbox"/>	High current inverted	Inversion of high-current output
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	

Read access Write access CINH PLC STOP No transfer COM MOT

C00120

Parameter Name: C00120 Setting of motor overload (I²t)		Data type: INTEGER_16 Index: 24455 _d = 5F87 _h
Operating threshold for the "OC6: Motor overload (I ² t)" error message		
<ul style="list-style-type: none"> The response for reaching the threshold can be selected in C00606. The current thermal motor load is displayed in C00066. 		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	250.00
		100.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00121

Parameter Name: C00121 Warning threshold motor temperature		Data type: UNSIGNED_16 Index: 24454 _d = 5F86 _h
Operating threshold for error message "Motor: Temperature at Res./Enc. > C121"		
<ul style="list-style-type: none"> The response for reaching the threshold can be selected in C00583. The current motor temperature is displayed in C00063. 		
Encoder/feedback system: Motor temperature monitoring (KTY)		
Setting range (min. value unit max. value)		Lenze setting
0	°C	250
		120 °C
Subcodes	Lenze setting	Info
C00121/1	120 °C	Warning threshold motor temperature resolver
C00121/2	120 °C	Warning threshold motor temperature MultiEncoder
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00123

Parameter Name: C00123 Device utilisation threshold (Ixt)		Data type: INTEGER_16 Index: 24452 _d = 5F84 _h
Operating threshold for the "OC5: Device overload (Ixt)" error message		
<ul style="list-style-type: none"> The response for reaching the threshold can be selected in C00604. The current device utilisation is displayed in C00064. 		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	200.00
		100.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00129

Parameter Name: C00129 Brake resistance value		Data type: UNSIGNED_16 Index: 24446 _d = 5F7E _h
Resistance value of the connected brake resistor		
<ul style="list-style-type: none"> The value to be entered can be obtained from the nameplate of the brake resistor. 		
Setting range (min. value unit max. value)		Lenze setting
0.0	Ohm	500.0
		39.0 Ohm
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10		

C00130

Parameter Name: C00130 Rated power - brake resistor		Data type: UNSIGNED_16 Index: 24445 _d = 5F7D _h
Rated power of the connected brake resistor		
<ul style="list-style-type: none"> The value to be entered can be obtained from the nameplate of the brake resistor. 		
Setting range (min. value unit max. value)		Lenze setting
0	W	65535
		100 W
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00131

Parameter Name: C00131 Thermal capacity - brake resistor	Data type: UNSIGNED_16 Index: 24444 _d = 5F7C _h
Thermal capacity of the connected brake resistor	
<ul style="list-style-type: none"> The value to be entered can be obtained from the nameplate of the brake resistor. 	
Setting range (min. value unit max. value)	Lenze setting
0.0 kW 6553.5	10.0 kW
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10	

C00133

Parameter Name: C00133 Brake resistor utilisation	Data type: UNSIGNED_16 Index: 24442 _d = 5F7A _h
Display of the utilisation of the connected brake resistor	
Display range (min. value unit max. value)	
0 % 65535	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1	

C00134

Parameter Name: C00134 L_NSet_1: Ramp smoothing	Data type: UNSIGNED_8 Index: 24441 _d = 5F79 _h
The <u>L_NSet_1</u> FB: Configuration of the ramp rounding for the main setpoint	
Selection list (Lenze setting printed in bold)	Info
0 Off	Ramp rounding deactivated
1 PT1 behaviour	Ramp rounding with PT1 behaviour <ul style="list-style-type: none"> The corresponding S-ramp time must be set in C00182.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00136

Parameter Name:		Data type: UNSIGNED_16 Index: 24439 _d = 5F77 _h
C00136 Communication control words		
Control words of the communication interfaces		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	SwitchOn	
Bit 1	DisableVoltage	
Bit 2	SetQuickStop	
Bit 3	EnableOperation	
Bit 4	ModeSpecific_1	
Bit 5	ModeSpecific_2	
Bit 6	ModeSpecific_3	
Bit 7	ResetFault	
Bit 8	SetHalt	
Bit 9	Reserved_1	
Bit 10	Reserved_2	
Bit 11	LenzeSpecific_1	
Bit 12	LenzeSpecific_2	
Bit 13	LenzeSpecific_3	
Bit 14	SetFail	
Bit 15	LenzeSpecific_4	
Subcodes	Info	
C00136/1	MCI control word <ul style="list-style-type: none"> Control word of the MCI communication interface (communication module) 	
C00136/2	CAN control word <ul style="list-style-type: none"> Control word of the CAN communication interface (CAN on board) 	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00137

Parameter Name: C00137 Device status	Data type: UNSIGNED_16 Index: 24438 _d = 5F76 _h
Display of the current device status	
Selection list (read only)	
0	FirmwareUpdate
1	Init
2	MotorIdent
3	ReadyToSwitchON
4	SwitchedON
5	OperationEnable
6	Warning
7	Trouble
8	Fault
9	TroubleQSP
10	SafeTorqueOff
11	SystemFail
12	Reserved_1
13	Reserved_2
14	Reserved_3
15	Reserved_4
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00138

Parameter Name: C00138 Internal control signals		Data type: UNSIGNED_16 Index: 24437 _d = 5F75 _h
Bit coded display of internal control signals of different sources		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Reserved	
Bit 1	DisableVoltage	
Bit 2	SetQuickStop	
Bit 3	EnableOperation	
Bit 4	InitFinishedOK	
Bit 5	ModeSpecific_2	
Bit 6	ModeSpecific_3	
Bit 7	ResetFault	
Bit 8	SetHalt	
Bit 9	FirmwareUpdate	
Bit 10	MotorIdent	
Bit 11	SetMessage	
Bit 12	SetIMP	
Bit 13	SetSystemFail	
Bit 14	SetFail	
Bit 15	SetFailQSP	
Subcodes	Info	
C00138/1	SYS control signals	
C00138/2	MCK control signals	
C00138/3	FWM control signals	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00142

Parameter Name: C00142 Auto-start option		Data type: UNSIGNED_8 Index: 24433 _d = 5F71 _h
Starting performance of the controller after mains connection, undervoltage, loading of the Lenze setting as well as a reset of "Trouble" or "Fault" can be parameterised individually.		
▶ Automatic restart after mains connection/fault...		
Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF 0x19 (decimal: 25)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0	<input checked="" type="checkbox"/> Inhibit at power-on	
Bit 1	<input type="checkbox"/> Inhibit at trouble	
Bit 2	<input type="checkbox"/> Inhibit at fault	
Bit 3	<input checked="" type="checkbox"/> Inhibit at undervoltage	
Bit 4	<input checked="" type="checkbox"/> Inhibit at Lenze setting	
Bit 5	<input type="checkbox"/> Reserved	
Bit 6	<input type="checkbox"/> Reserved	
Bit 7	<input type="checkbox"/> Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00144

Parameter Name: C00144 Switching freq. reduct. (Temp.)		Data type: UNSIGNED_8 Index: 24431 _d = 5F6F _h
Activation of the automatic switching frequency reduction if the temperature is too high		
Selection list (Lenze setting printed in bold)		Info
0	Off	Automatic switching frequency reduction deactivated
1	On	Automatic switching frequency reduction activated
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00148

Parameter Name: C00148 LS_DriveInterface: Error message config.		Data type: UNSIGNED_16 Index: 24427 _d = 5F6B _h
Selection of the device statuses for which the <i>bCollectedFail</i> group error output of SB LS_DriveInterface is to be set to TRUE.		
Setting range (min. hex value max. hex value)		Lenze setting
0x0000		0xFFFF
0x0030 (decimal: 48)		
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0	<input type="checkbox"/> SafeTorqueOff	
Bit 1	<input type="checkbox"/> ReadyToSwitchOn	
Bit 2	<input type="checkbox"/> SwitchedOn	
Bit 3	<input type="checkbox"/> TroubleQSP	
Bit 4	<input checked="" type="checkbox"/> Trouble	
Bit 5	<input checked="" type="checkbox"/> Fault	
Bit 6	<input type="checkbox"/> Warning	
Bit 7	<input type="checkbox"/> ImplsActive	
Bit 8	<input type="checkbox"/> ClnhlsActive	
Bit 9	<input type="checkbox"/> Fail CAN_Management	
Bit 10	<input type="checkbox"/> Reserved	
Bit 11	<input type="checkbox"/> Reserved	
Bit 12	<input type="checkbox"/> Reserved	
Bit 13	<input type="checkbox"/> Reserved	
Bit 14	<input type="checkbox"/> Lock bFail at TroubleQSP	From version 02.00.00 If this bit is set, the <i>bFail</i> output of the SB LS_DriveInterface is also set in the "TroubleQSP" status. <ul style="list-style-type: none"> • Advantage: Even in the "TroubleQSP" status, an error occurred before can still be recognised.
Bit 15	<input type="checkbox"/> Use 16BitFailNo.	If this bit is set, the short 16-bit error number (<i>wStateDetermFailNoShort</i>) is also provided at the <i>wStateDetermFailNoLow</i> output of the SB LS_DriveInterface . <ul style="list-style-type: none"> • In this case, the <i>wStateDetermFailNoHigh</i> output is "0". • Advantage: The bus transfer of the error numbers is possible via a data word without changing the interconnection of the technology application.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00150

Parameter Name: C00150 Status word		Data type: UNSIGNED_16 Index: 24425 _d = 5F69 _h
Bit coded device status word		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	FreeStatusBit0	Free status bit 0
Bit 1	PowerDisabled	Power switched off
Bit 2	FreeStatusBit2	Free status bit 2
Bit 3	FreeStatusBit3	Free status bit 3
Bit 4	FreeStatusBit4	Free status bit 4
Bit 5	FreeStatusBit5	Free status bit 5
Bit 6	ActSpeedIsZero	Current speed is 0
Bit 7	ControllerInhibit	Controller is inhibited
Bit 8	StatusCodeBit0	Status code bit 0
Bit 9	StatusCodeBit1	Status code bit 1
Bit 10	StatusCodeBit2	Status code bit 2
Bit 11	StatusCodeBit3	Status code bit 3
Bit 12	Warning	Warning
Bit 13	Trouble	Trouble
Bit 14	FreeStatusBit14	Free status bit 14
Bit 15	FreeStatusBit15	Free status bit 15
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00155

Parameter Name: C00155 Extended status word		Data type: UNSIGNED_16 Index: 24420 _d = 5F64 _h
Bit coded device status word 2		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	Fail	Error
Bit 1	M_max	Maximum torque
Bit 2	I_max	Maximum current
Bit 3	PowerDisabled	Power switched off
Bit 4	Ready	Controller is ready for operation
Bit 5	ControllerInhibit	Controller is inhibited
Bit 6	Trouble	Trouble
Bit 7	InitState	Initialisation
Bit 8	CwCcw	CW/CCW rotation
Bit 9	TroubleQSP	Quick stop due to fault is active
Bit 10	SafeTorqueOff	Safe torque off
Bit 11	AplicationRunning	Application is running
Bit 12	AplParSetBit0	Application parameter set - bit 0
Bit 13	AplParSetBit1	Application parameter set - bit 1
Bit 14	Quick stop	Quick stop is active
Bit 15	Motor parameter identification	Motor parameter identification is active
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00158

Parameter Name:		Data type: UNSIGNED_16
C00158 Cause of controller inhibit		Index: 24417 _d = 5F61 _h
Bit coded display of the cause/source of the controller inhibit		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Terminal controller enable	
Bit 1	CAN control word	
Bit 2	MCI control word	
Bit 3	SwitchOn	
Bit 4	Application	
Bit 5	Device command	
Bit 6	Error response	
Bit 7	Internal signal	
Bit 8	Reserved	
Bit 9	Reserved	
Bit 10	AutoStartLock	
Bit 11	Motor parameter identification	
Bit 12	Automatic brake operation	
Bit 13	DCB-IMP	
Bit 14	Reserved	
Bit 15	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00159

Parameter Name:		Data type: UNSIGNED_16
C00159 Cause of quick stop QSP		Index: 24416 _d = 5F60 _h
Bit coded display of the cause/source of the quick stop		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Reserved	
Bit 1	CAN control word	
Bit 2	MCI control word	
Bit 3	Reserved	
Bit 4	Application	
Bit 5	Device command	
Bit 6	Error response	
Bit 7	Internal signal	
Bit 8	Reserved	
Bit 9	Reserved	
Bit 10	Operating system	
Bit 11	Reserved	
Bit 12	MCK	
Bit 13	Reserved	
Bit 14	Reserved	
Bit 15	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00160

Parameter Name:		Data type: UNSIGNED_16
C00160 Status determining error (16bit)		Index: 24415 _d = 5F5F _h
Display of the status determining error as short 16-bit error number		
Display range (min. value unit max. value)		
0		65535
Subcodes		Info
C00160/1		Status determining error (16-bit)
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00161

Parameter Name: C00161 LS_SetError_x: Error number		Data type: UNSIGNED_16 Index: 24414 _d = 5F5E _h
Setting of the error number for user error messages		
Setting range (min. value unit max. value)		
0		65535
Subcodes	Lenze setting	Info
C00161/1	1	LS_SetError_1 : Error no.1
C00161/2	2	LS_SetError_1 : Error no.2
C00161/3	3	LS_SetError_1 : Error no.3
C00161/4	4	LS_SetError_1 : Error no.4
C00161/5	1	LS_SetError_2 : Error no.1
C00161/6	2	LS_SetError_2 : Error no.2
C00161/7	3	LS_SetError_2 : Error no.3
C00161/8	4	LS_SetError_2 : Error no.4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00163

Parameter Name: C00163 Logbook - binary elements		Data type: UNSIGNED_16 Index: 24412 _d = 5F5C _h
Selection of two binary signals to be logged in the logbook		
Selection list		Info
0	No signal	
1	DI1: Input signal	
2	DI2: Input signal	
3	DI3: Input signal	
4	DI4: Input signal	
5	Controller inhibit signal	
6	Digital counter: Comparison bit	
7	CAN1 input bit 0	
8	CAN1 input bit 1	
9	CAN1 input bit 2	
10	CAN1 input bit 3	
11	CAN1 input bit 4	
12	CAN1 input bit 5	
13	CAN1 input bit 6	
14	CAN1 input bit 7	
15	CAN1 input bit 8	
16	CAN1 input bit 9	
17	CAN1 input bit 10	
18	CAN1 input bit 11	
19	CAN1 input bit 12	
20	CAN1 input bit 13	
21	CAN1 input bit 14	
22	CAN1 input bit 15	
23	CAN2 input bit 0	
24	CAN2 input bit 1	
25	CAN2 input bit 2	

Parameter	Name:	Data type: UNSIGNED_16 Index: 24412 _d = 5F5C _h
C00163	Logbook - binary elements	
26	CAN2 input bit 3	
27	CAN2 input bit 4	
28	CAN2 input bit 5	
29	CAN2 input bit 6	
30	CAN2 input bit 7	
31	CAN2 input bit 8	
32	CAN2 input bit 9	
33	CAN2 input bit 10	
34	CAN2 input bit 11	
35	CAN2 input bit 12	
36	CAN2 input bit 13	
37	CAN2 input bit 14	
38	CAN2 input bit 15	
39	CAN3 input bit 0	
40	CAN3 input bit 1	
41	CAN3 input bit 2	
42	CAN3 input bit 3	
43	CAN3 input bit 4	
44	CAN3 input bit 5	
45	CAN3 input bit 6	
46	CAN3 input bit 7	
47	CAN3 input bit 8	
48	CAN3 input bit 9	
49	CAN3 input bit 10	
50	CAN3 input bit 11	
51	CAN3 input bit 12	
52	CAN3 input bit 13	
53	CAN3 input bit 14	
54	CAN3 input bit 15	
55	MCI word1 input bit0	
56	MCI word1 input bit1	
57	MCI word1 input bit2	
58	MCI word1 input bit3	
59	MCI Word 1 Input bit 4	
60	MCI word1 input bit5	
61	MCI word1 input bit6	
62	MCI word1 input bit7	
63	MCI word1 input bit8	
64	MCI word1 input bit9	
65	MCI word1 input bit10	
66	MCI word1 input bit11	
67	MCI word1 input bit12	
68	MCI word1 input bit13	
69	MCI word1 input bit14	

Parameter	Name:	Data type: UNSIGNED_16 Index: 24412 _d = 5F5C _h
C00163	Logbook - binary elements	
70	MCI word1 input bit15	
71	MCI word2 input bit0	
72	MCI word2 input bit1	
73	MCI Word 2 Input bit 2	
74	MCI word2 input bit3	
75	MCI word2 input bit4	
76	MCI word2 input bit5	
77	MCI word2 input bit6	
78	MCI word 2 input bit 7	
79	MCI word2 input bit8	
80	MCI word2 input bit9	
81	MCI word2 input bit10	
82	MCI word2 input bit11	
83	MCI Word 2 Input bit 12	
84	MCI word2 input bit13	
85	MCI word2 input bit14	
86	MCI word2 input bit15	
87	Position controller: Limit	
88	Speed controller: Limit	
89	Speed setpoint: Limit	
90	Torque setpoint: Limit	
91	Current setpoint: Limit	
92	DC injection brake active	
93	Quick stop is active	
94	Pulse inhibit is active	
95	Controller inhibit is active	
96	Safe status active	
97	Direction of rotation ccw	
98	Actual speed = 0	
99	L_Or_1: Out	
100	L_DFliPlop_1: Out	
101	L_DigitalDelay_1: Out	
102	L_Compare_1: Out	
103	L_Compare_2: Out	
104	L_NSet_1: Setpoint reached	
105	L_DigitalLogic_1: Out	
106	L_SignalMonitor_b: Out1	
107	L_SignalMonitor_b: Out2	
108	L_SignalMonitor_b: Out3	
109	L_SignalMonitor_b: Out4	
110	L_PCTRL_1: act=set	

Parameter Name: C00163 Logbook - binary elements		Data type: UNSIGNED_16 Index: 24412 _d = 5F5C _h
Subcodes	Lenze setting	Info
C00163/1	0: No signal	Logbook - binary element 1
C00163/2	0: No signal	Logbook - binary element 2
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00164

Parameter Name: C00164 Logbook - analog elements		Data type: UNSIGNED_16 Index: 24411 _d = 5F5B _h
Selection of an analog signal to be logged in the logbook		
Selection list		Info
0	No signal	
1	AIN1	
2	CAN1 control word	
3	CAN1 input word 2	
4	CAN1 input word 3	
5	CAN1 input word 4	
6	CAN2 input word 1	
7	CAN2 input word 2	
8	CAN2 input word 3	
9	CAN2 input word 4	
10	CAN3 input word 1	
11	CAN3 input word 2	
12	CAN3 input word 3	
13	CAN3 input word 4	
14	Digital counter LowWord	
15	Digital counter HighWord	
16	MCI word 1	
17	MCI word 2	
18	MCI word 3	
19	MCI word 4	
20	MCI word 5	
21	MCI word 6	
22	MCI word 7	
23	MCI word 8	
24	MCI word 9	
25	MCI word 10	
26	MCI word 11	
27	MCI word 12	
28	MCI word 13	
29	MCI word 14	
30	MCI word 15	
31	MCI word 16	
32	Current motor speed	
33	Current motor torque	
34	DC-bus voltage	

Parameter Name:		Data type: UNSIGNED_16 Index: 24411 _d = 5F5B _h
C00164 Logbook - analog elements		
35	Current motor current	
36	Current motor voltage	
37	Current motor frequency	
38	Effective speed setpoint	
39	Device utilisation	
40	Motor utilisation	
41	L_OffsetGainPar_1: Out	
42	L_OffsetGainPar_2: Out	
43	L_OffsetGainPar_3: Out	
44	L_Arithmetik_1: Out	
45	L_AnalogSwitch_1: Out	
46	L_NSet_1: Out	
47	L_MotorPoti_1: Out	
48	L_PCTRL_1: Out	
49	L_SignalMonitor_a: Out1	
50	L_SignalMonitor_a: Out2	
51	L_SignalMonitor_a: Out3	
52	L_SignalMonitor_a: Out4	
53	L_MulDiv_1: Out	
54	L_NSet_1: Target setpoint	
Subcodes	Lenze setting	Info
C00164/1	0: No signal	Logbook - analog element 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00165

Parameter Name:		Data type: VISIBLE_STRING Index: 24410 _d = 5F5A _h
C00165 Error information		
Display of the error number divided into sectors in the event of an error		
Subcodes	Info	
C00165/1	Status determining error	
C00165/2	Current error	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC-STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Character length: 14		

C00166

Parameter Name: C00166 Error information text		Data type: VISIBLE_STRING Index: 24409 _d = 5F59 _h
Display of details on the status determining error and on the currently pending error		
Subcodes	Info	
C00166/1	Resp. to status det. error • Response to the status determining error	
C00166/2	Subj. - status det. error • Subject area of the status determining error	
C00166/3	Mess. - status det. error • Textual message of the status determining error	
C00166/4	Resp. to curr. error • Response of the currently pending error	
C00166/5	Subj. - curr. error • Subject area of the currently pending error	
C00166/6	Mess. - curr. error • Textual message of the currently pending error	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC-STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Character length: 30		

C00167

Parameter Name: C00167 Logbook data		Data type: OCTET_STRING Index: 24408 _d = 5F58 _h
This code is for device-internal use only and must not be written to by the user!		

C00168

Parameter Name: C00168 Status determining error		Data type: UNSIGNED_32 Index: 24407 _d = 5F57 _h
Display of the internal error number for the status determining error		
Display range (min. value unit max. value)		
0	4294967295	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00169

Parameter Name: C00169 Logbook setting		Data type: UNSIGNED_16 Index: 24406 _d = 5F56 _h
Configuration which message types are to be logged in the logbook.		
Setting range (min. hex value max. hex value)		Lenze setting
0x0000	0xFFFF	0x067E (decimal: 1662)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	Reserved	
Bit 1 <input checked="" type="checkbox"/>	Log entry: Fault	
Bit 2 <input checked="" type="checkbox"/>	Log entry: Trouble	
Bit 3 <input checked="" type="checkbox"/>	Log entry: TroubleQuickstop	
Bit 4 <input checked="" type="checkbox"/>	Log entry: WarningLocked	
Bit 5 <input checked="" type="checkbox"/>	Log entry: Warning	
Bit 6 <input checked="" type="checkbox"/>	Log entry: Information	
Bit 7 <input type="checkbox"/>	Reserved	
Bit 8 <input type="checkbox"/>	Reserved	
Bit 9 <input checked="" type="checkbox"/>	Activation: Error counter	
Bit 10 <input checked="" type="checkbox"/>	Activation: Log line refresh	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00170

Parameter Name: C00170 Current error		Data type: UNSIGNED_32 Index: 24405 _d = 5F55 _h
Display of the internal error number of the currently pending error		
Display range (min. value unit max. value)		
0	4294967295	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00171

Parameter Name: C00171 Logbook access index		Data type: UNSIGNED_8 Index: 24404 _d = 5F54 _h
This code is for device-internal use only and must not be written to by the user!		

C00173

Parameter Name: C00173 Mains voltage		Data type: UNSIGNED_8 Index: 24402 _d = 5F52 _h
Selection of the mains voltage for operating the device.		
Selection list (Lenze setting printed in bold)		Info
0	3ph 400V / 1ph 230V	3-phase 400 V or 1-phase 230 V
1	3ph 440V / 1ph 230V	3-phase 440 V or 1-phase 230 V
2	3ph 480V / 1ph 230V	3-phase 480 V or 1-phase 230 V
3	3ph 500V / 1ph 230V	3-phase 500 V or 1-phase 230 V
4	3ph 400V / 1ph 115V	3-phase 400 V or 1-phase 115 V
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00174

Parameter Name: C00174 Reduc. brake chopper threshold	Data type: UNSIGNED_8 Index: 24401 _d = 5F51 _h
The threshold from which on the brake chopper is controlled is reduced by the voltage value set here.	
Setting range (min. value unit max. value)	Lenze setting
0 V 150	0 V
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00175

Parameter Name: C00175 Brake energy management	Data type: UNSIGNED_8 Index: 24400 _d = 5F50 _h
Selection of the braking procedure	
▶ Select response if the brake resistor is controlled	
Selection list (Lenze setting printed in bold)	Info
0 R_Brems	The brake resistor is used. When the threshold voltage (C00174) is exceeded, the brake resistor is energised.
1 RfgStop	The "Ramp function generator stop" signal (<i>MCTRL_bRfgStop</i>) is used. When the threshold voltage is exceeded (C00174), the ramp function generator is stopped.
2 R_Brems + HlgStop	The brake resistor and the "Ramp function generator stop" signal are used. When the threshold voltage is exceeded (C00174), the brake resistor is energised and the ramp function generator is stopped.
3 FI_MotBrk + RfgStop	Braking is performed by a superimposed speed setpoint vibration in conjunction with "Ramp function generator stop".
4 R_Brems + FU_MotBrk + HlgStop	Braking is performed by combining all three braking procedures.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00176

Parameter Name: C00176 Undervoltage threshold for mains OFF	Data type: UNSIGNED_16 Index: 24399 _d = 5F4F _h
This code is for device-internal use only and must not be written to by the user!	

C00177

Parameter Name: C00177 Switching cycles	Data type: UNSIGNED_32 Index: 24398 _d = 5F4E _h
Counter of different switching cycles and stressful situations	
Display range (min. value unit max. value)	
0 2147483647	
Subcodes	Info
C00177/1	Number of mains switching cycles
C00177/2	Number of switching cycles of the output relay
C00177/3	Short circuit counter
C00177/4	Earth fault counter
C00177/5	"Clamp" counter
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00178

Parameter Name: C00178 Elapsed-hour meter	Data type: UNSIGNED_32 Index: 24397 _d = 5F4D _h
Display of operating hours in seconds	
Display range (min. value unit max. value)	
0	s 2147483647
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00179

Parameter Name: C00179 Power-on time meter	Data type: UNSIGNED_32 Index: 24396 _d = 5F4C _h
Display of the power-on time in seconds	
Display range (min. value unit max. value)	
0	s 2147483647
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00180

Parameter Name: C00180 Running time	Data type: UNSIGNED_32 Index: 24395 _d = 5F4B _h
Display of various running times in seconds	
Display range (min. value unit max. value)	
0	s 2147483647
Subcodes	Info
C00180/1	Running time - control card
C00180/2	Running time - heatsink fan
C00180/3	Running time - internal fan
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00181

Parameter Name: C00181 Time settings	Data type: UNSIGNED_16 Index: 24394 _d = 5F4A _h
Time for device search function (optical location)	
▶ Device search function	
Setting range (min. value unit max. value)	
0	s 6000
Subcodes	Lenze setting Info
C00181/1	5 s Time - device search function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00182

Parameter Name: C00182 L_NSet_1: S-ramp time PT1	Data type: INTEGER_16 Index: 24393 _d = 5F49 _h
FB L_NSet_1 : PT1 S-ramp time for the main setpoint ramp function generator • Only effective with activated ramp rounding (C00134 = "1").	
Setting range (min. value unit max. value)	
0.01	s 50.00 20.00 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00184

Parameter | Name: **C00184 | AutoFailReset repetition time** Data type: UNSIGNED_16
Index: 24391_d = 5F47_h

After the time set here has expired, an error message of an error that has occurred will be reset automatically if "AutoFailReset" had been configured correspondingly in [C00188](#).

▶ [AutoFailReset function](#)

Setting range (min. value unit max. value)			Lenze setting
1	s	600	3 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00185

Parameter | Name: **C00185 | AutoFailReset remaining time** Data type: UNSIGNED_16
Index: 24390_d = 5F46_h

Display of the residual runtime of the "AutoFailReset" function

▶ [AutoFailReset function](#)

Display range (min. value unit max. value)		
0	s	600
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00186

Parameter | Name: **C00186 | Max. number of AutoFailReset processes** Data type: UNSIGNED_8
Index: 24389_d = 5F45_h

Maximum number of "AutoFailReset" procedures

▶ [AutoFailReset function](#)

Setting range (min. value unit max. value)			Lenze setting
1		16	4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00187

Parameter | Name: **C00187 | Current AutoFailReset processes** Data type: UNSIGNED_8
Index: 24388_d = 5F44_h

Data of the current number of "AutoFailReset" procedures

▶ [AutoFailReset function](#)

Display range (min. value unit max. value)		
0		16
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00188

Parameter | Name: **C00188 | AutoFailReset configuration** Data type: UNSIGNED_8
Index: 24387_d = 5F43_h

Setting which error messages are to be reset automatically.

▶ [AutoFailReset function](#)

Selection list (Lenze setting printed in bold)		Info
0	Off	No automatic error message reset
1	Fault + TroubleQSP	Error messages with the response "Fault" and "TroubleQSP" are reset automatically
2	WarningLocked	Error messages with the response "WarningLocked" are reset automatically
3	All locking	All "locking" error messages are reset automatically
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00189

Parameter | Name: **C00189 | Resp. to too frequent AutoFailReset** Data type: UNSIGNED_8
Index: 24386_d = 5F42_h

Response to exceeding the maximum number of "AutoFailReset" processes set in [C00186](#).

► [AutoFailReset function](#)

Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
2	Trouble
3	TroubleQuickStop
4	WarningLocked
5	Warning
6	Information

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00190

Parameter | Name: **C00190 | L_NSet_1: Setpoint arithmetic** Data type: UNSIGNED_8
Index: 24385_d = 5F41_h

The [L_NSet_1](#) FB: Selection of arithmetics

- To be able to influence the main setpoint (NSet) by an additional setpoint (NAdd).

Selection list (Lenze setting printed in bold)	
0	Out = Set
1	Out = Set + Add
2	NOut = NSet - NAdd
3	NOut = (NSet * NAdd) / 100%
4	NOut = (NSet * 1%) / NAdd
5	Out = (Set*100%)/(100%-Add)

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00199

Parameter | Name: **C00199 | Description data** Data type: VISIBLE_STRING
Index: 24376_d = 5F38_h

Parameters for storing decription data for the controller

Subcodes	Lenze setting	Info
C00199/1		Device name

Read access Write access CINH PLC-STOP No transfer COM MOT Character length: 24

C00200

Parameter | Name: **C00200 | Firmware product type** Data type: VISIBLE_STRING
Index: 24375_d = 5F37_h

Display of the firmware product type

Read access Write access CINH PLC-STOP No transfer COM MOT Character length: 19

C00201

Parameter Name: C00201 Firmware		Data type: VISIBLE_STRING Index: 24374 _d = 5F36 _h
Display of the firmware data of the control card and the power section		
Subcodes	Info	
C00201/1	Firmware type - ctrl card	
C00201/2	Firmware version - ctrl card	
C00201/3	Firmware comp. file - ctrl card	
C00201/4	Firmware type - power section	
C00201/5	Firmware version - power sect.	
C00201/6	Firmw. comp. file - power sect.	
C00201/7	Firmware type CU2	
C00201/8	Firmware version CU2	
C00201/9	Firmware comp. dat. CU2	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC-STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Character length: 22		

C00203

Parameter Name: C00203 Product type code		Data type: VISIBLE_STRING Index: 24372 _d = 5F34 _h
Display of the types of the individual device components		
Subcodes	Info	
C00203/1	Type: Control card	
C00203/2	Type: Power section	
C00203/3	Type: MCI module	
C00203/4	Reserved	
C00203/5	Type: Memory module	
C00203/6	Type: Safety card	
C00203/7	Type: Standard device	
C00203/8	Type: Complete device	
C00203/9	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC-STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Character length: 24		

C00204

Parameter Name: C00204 Serial number		Data type: VISIBLE_STRING Index: 24371 _d = 5F33 _h
Display of the serial numbers of the individual device components		
Subcodes	Info	
C00204/1	Serial no.: Control card	
C00204/2	Serial no.: Power section	
C00204/3	Serial no.: MCI module	
C00204/4	Reserved	
C00204/5	Serial no.: Memory module	
C00204/6	Serial no.: Safety card	
C00204/7	Serial no.: Standard device	
C00204/8	Serial no.: Complete device	
C00204/9	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC-STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Character length: 24		

C00205

Parameter | Name: **C00205 | Info** Data type: VISIBLE_STRING
Index: 24370_d = 5F32_h**This code is for device-internal use only and must not be written to by the user!**

C00206

Parameter | Name: **C00206 | Production date** Data type: VISIBLE_STRING
Index: 24369_d = 5F31_h**This code is for device-internal use only and must not be written to by the user!**

C00210

Parameter | Name: **C00210 | HW version** Data type: VISIBLE_STRING
Index: 24365_d = 5F2D_h**This code is for device-internal use only and must not be written to by the user!**

C00220

Parameter | Name: **C00220 | L_NSet_1: Acceleration time - add. setpoint** Data type: UNSIGNED_32
Index: 24355_d = 5F23_hThe [L_NSet_1](#) FB: Acceleration time for the additional setpoint *nNAdd_a*

Setting range (min. value unit max. value)			Lenze setting
0.000	s	999.999	0.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000			

C00221

Parameter | Name: **C00221 | L_NSet_1: Deceleration time - add. setpoint** Data type: UNSIGNED_32
Index: 24354_d = 5F22_hThe [L_NSet_1](#) FB: Deceleration time for the additional setpoint *nNAdd_a*

Setting range (min. value unit max. value)			Lenze setting
0.000	s	999.999	0.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000			

C00222

Parameter | Name: **C00222 | L_PCTRL_1: Vp** Data type: INTEGER_16
Index: 24353_d = 5F21_hThe [L_PCTRL_1](#) FB: Gain factor Vp for the PID process controller

Setting range (min. value unit max. value)			Lenze setting
0.1		500.0	1.0
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10			

C00223

Parameter | Name: **C00223 | L_PCTRL_1: Tn** Data type: UNSIGNED_16
Index: 24352_d = 5F20_hThe [L_PCTRL_1](#) FB: Reset time Tn for the PID process controller

Setting range (min. value unit max. value)			Lenze setting
20	ms	6000	400 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00224

Parameter | Name: **C00224 | L_PCTRL_1: Kd** Data type: UNSIGNED_16
Index: 24351_d = 5F1F_hThe [L_PCTRL_1](#) FB: Derivative-action coefficient Kd for the PID process controller

Setting range (min. value unit max. value)			Lenze setting
0.0		5.0	0.0
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10			

C00225

Parameter Name: C00225 L_PCTRL_1: MaxLimit	Data type: INTEGER_16 Index: 24350 _d = 5F1E _h
The L_PCTRL_1 FB: Maximum output value of the PID process controller	
Setting range (min. value unit max. value)	Lenze setting
-199.99 % 199.99	199.99 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00226

Parameter Name: C00226 L_PCTRL_1: MinLimit	Data type: INTEGER_16 Index: 24349 _d = 5F1D _h
The L_PCTRL_1 FB: Minimum output value of the PID process controller	
Setting range (min. value unit max. value)	Lenze setting
-199.99 % 199.99	-199.99 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00227

Parameter Name: C00227 L_PCTRL_1: Acceleration time	Data type: UNSIGNED_32 Index: 24348 _d = 5F1C _h
The L_PCTRL_1 FB: Acceleration time for the output value of the PID process controller	
Setting range (min. value unit max. value)	Lenze setting
0.000 s 999.999	0.010 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000	

C00228

Parameter Name: C00228 L_PCTRL_1: Deceleration time	Data type: UNSIGNED_32 Index: 24347 _d = 5F1B _h
The L_PCTRL_1 FB: Deceleration time for the output value of the PID process controller	
Setting range (min. value unit max. value)	Lenze setting
0.000 s 999.999	0.010 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000	

C00231

Parameter Name: C00231 L_PCTRL_1: Operating range	Data type: INTEGER_16 Index: 24344 _d = 5F18 _h
The L_PCTRL_1 FB: Operating range for the PID process controller	
Setting range (min. value unit max. value)	
0.00 % 199.99	
Subcodes	Lenze setting
C00231/1	199.99 %
C00231/2	0.00 %
C00231/3	0.00 %
C00231/4	199.99 %
	Info
	L_PCTRL_1 : Pos. maximum
	L_PCTRL_1 : Pos. minimum
	L_PCTRL_1 : Neg. minimum
	L_PCTRL_1 : Neg. maximum
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00233

Parameter Name: C00233 L_PCTRL_1: Root function		Data type: UNSIGNED_8 Index: 24342 _d = 5F16 _h
The L_PCTRL_1 FB: Use of the root function at the actual value input		
Selection list (Lenze setting printed in bold)		Info
0	Off	Root function inactive <ul style="list-style-type: none"> The actual value <i>nAct_a</i> remains unchanged for further processing
1	On	Root function active <ul style="list-style-type: none"> The root is extracted of the actual value <i>nAct_a</i> for further processing
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00234

Parameter Name: C00234 Oscillation damping influence		Data type: UNSIGNED_16 Index: 24341 _d = 5F15 _h
Oscillation damping		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	250.00 5.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00235

Parameter Name: C00235 Oscillation damping filter time		Data type: UNSIGNED_8 Index: 24340 _d = 5F14 _h
Oscillation damping		
Setting range (min. value unit max. value)		Lenze setting
2	ms	250 32 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00236

Parameter Name: C00236 Field weakening oscillation damping		Data type: UNSIGNED_8 Index: 24339 _d = 5F13 _h
Oscillation damping for idling machines		
Oscillation damping		
Setting range (min. value unit max. value)		Lenze setting
0		40 14
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00241

Parameter Name: C00241 L_NSet_1: Hyst. NSet reached		Data type: INTEGER_16 Index: 24334 _d = 5F0E _h
The L_NSet_1 FB: Hysteresis window for the zero detection of the speed output setpoint <ul style="list-style-type: none"> The speed threshold for the zero detection is 1 % 		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	100.00 0.50 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00242

Parameter Name: C00242 L_PCTRL_1: Operating mode	Data type: UNSIGNED_8 Index: 24333 _d = 5F0D _h
The L_PCTRL_1 FB: Selection of the operating mode	
<ul style="list-style-type: none"> Depending on the selection, the blue switches in the displayed signal flow are set accordingly in the Engineer on the Application parameters tab for the L_PCTRL_1 FB. 	
Selection list (Lenze setting printed in bold)	Info
0 Off	The input setpoint <i>nNSet_a</i> is output without any changes at the output <i>nOut_a</i> .
1 nNSet + nNSet_PID	<i>nNSet_a</i> and <i>nAct_a</i> are used as PID input values. The arriving <i>nNSet_a</i> is additively linked to the value output by the PID element.
2 nSet_PID	<i>nSet_a</i> and <i>nAct_a</i> are used as PID input values. The input <i>nNSet_a</i> is not considered.
3 nNSet_PID	<i>nNSet_a</i> and <i>nAct_a</i> are used as PID input values. The input <i>nSet_a</i> is not considered.
4 nNSet + nSet_PID	<i>nSet_a</i> and <i>nAct_a</i> are used as PID input values. The arriving <i>nNSet_a</i> setpoint is additively linked to the value output by the PID element.
5 nNSet nSet_PID	<i>nSet_a</i> and <i>nAct_a</i> are used as PID input values. The setpoint <i>nNSet_a</i> is output at the output <i>nOut_a</i> . The PID output value is output at the output <i>nPIDOut_a</i> .
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00243

Parameter Name: C00243 L_PCTRL_1: Acceleration time influence	Data type: UNSIGNED_32 Index: 24333 _d = 5F0C _h
The L_PCTRL_1 FB: Acceleration time for showing the PID output value	
Setting range (min. value unit max. value)	Lenze setting
0.000 s 999.999	5.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000	

C00244

Parameter Name: C00244 L_PCTRL_1: Deceleration time influence	Data type: UNSIGNED_32 Index: 24331 _d = 5F0B _h
The L_PCTRL_1 FB: Deceleration time for masking out the PID output value	
Setting range (min. value unit max. value)	Lenze setting
0.000 s 999.999	5.000 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000	

C00245

Parameter Name: C00245 L_PCTRL_1: PID output value	Data type: INTEGER_16 Index: 24330 _d = 5F0A _h
The L_PCTRL_1 FB: Display of the output value of the PID process controller	
Display range (min. value unit max. value)	Lenze setting
-199.99 % 199.99	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00246

Parameter Name: C00246 L_PCTRL_1: nAct_a internal	Data type: INTEGER_16 Index: 24329 _d = 5F09 _h
FB L_PCTRL_1 : Display of the internal actual value	
Display range (min. value unit max. value)	Lenze setting
-199.99 % 199.99	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00247

Parameter Name: C00247 L_PCTRL_1: Window setpoint reached		Data type: INTEGER_16 Index: 24328 _d = 5F08 _h	
FB L_PCTRL_1 : Window for comparison operation "actual value = setpoint"			
Setting range (min. value unit max. value)		Lenze setting	
0.00	%	100.00	2.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00249

Parameter Name: C00249 L_PT1_1: Time constant		Data type: UNSIGNED_16 Index: 24326 _d = 5F06 _h	
FB L_PT1_1 : Time constant Tn			
Setting range (min. value unit max. value)		Lenze setting	
0	ms	5000	2000 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00250

Parameter Name: C00250 L_PT1 2-3: Time constant		Data type: INTEGER_16 Index: 24325 _d = 5F05 _h	
Setting range (min. value unit max. value)			
0	ms	5000	
Subcodes	Lenze setting	Info	
C00250/1	2000 ms	L_PT1_2 : Time constant	
C00250/2	2000 ms	L_PT1_3 : Time constant	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00251

Parameter Name: C00251 L_DT1_1: Time constant		Data type: INTEGER_16 Index: 24324 _d = 5F04 _h	
FB L_DT1_1 : Time constant Tn			
Setting range (min. value unit max. value)		Lenze setting	
10	ms	5000	1000 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00252

Parameter Name: C00252 L_DT1_1: Gain		Data type: INTEGER_16 Index: 24323 _d = 5F03 _h	
FB L_DT1_1 : Gain factor Vp			
Setting range (min. value unit max. value)		Lenze setting	
-320.00		320.00	1.00
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00253

Parameter | Name: **C00253 | L_DT1_1: Sensitivity** Data type: UNSIGNED_8
Index: 24322_d = 5F02_h

FB [L_DT1_1](#): Selection of sensitivity

- Depending on the selection, the number of indicated higher-order bits is evaluated.

Note:

The most significant bit determines the sign of the value, the remaining bits determine the numerical value.

Selection list (Lenze setting printed in bold)		Info
1	15 bits	Bit 0 ... bit 14 are evaluated
2	14 bits	Bit 0 ... bit 13 are evaluated
3	13 bits	Bit 0 ... bit 12 are evaluated
4	12 bits	Bit 0 ... bit 11 are evaluated
5	11 Bit	Bit 0 ... bit 10 are evaluated
6	10 Bit	Bit 0 ... bit 9 are evaluated
7	9 Bit	Bit 0 ... bit 8 are evaluated

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00254

Parameter | Name: **C00254 | Kp position controller** Data type: UNSIGNED_16
Index: 24321_d = 5F01_h

Gain for following error compensation

Setting range (min. value unit max. value)			Lenze setting
0.00	1/s	500.00	5.00 1/s

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00265

Parameter | Name: **C00265 | SLVC: Tn torque controller** Data type: UNSIGNED_8
Index: 24310_d = 5EF6_h

This code is for device-internal use only and must not be written to by the user!

C00270

Parameter | Name: **C00270 | SC: Freq. current setpoint filter** Data type: UNSIGNED_16
Index: 24305_d = 5EF1_h

Frequency to be inhibited by the current setpoint filter at servo control ([SC](#)) and sensorless control for synchronous motors ([SLPSM](#)).

Setting range (min. value unit max. value)			Lenze setting
40.0	Hz	1000.0	200.0 Hz

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10

C00271

Parameter | Name: **C00271 | SC: Width of current setpoint filter** Data type: UNSIGNED_16
Index: 24304_d = 5EF0_h

Frequency width of the current setpoint filter at servo control ([SC](#)) and sensorless control for synchronous motors ([SLPSM](#)).

- Width around the frequency to be inhibited ([C00270](#)).

Setting range (min. value unit max. value)			Lenze setting
0.0	Hz	500.0	0.0 Hz

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10

C00272

Parameter Name: C00272 SC: Depth of current setpoint filter		Data type: UNSIGNED_16 Index: 24303 _d = 5EEF _h	
Damping of the current setpoint filter at servo control (SC) and sensorless control for synchronous motors (SLPSM)			
Setting range (min. value unit max. value)		Lenze setting	
0	db	100	0 db
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1			

C00273

Parameter Name: C00273 Moment of inertia		Data type: UNSIGNED_32 Index: 24302 _d = 5EEE _h	
Moment of inertia for setpoint feedforward control at servo control (SC) and sensorless vector control (SLVC)			
Setting range (min. value unit max. value)		Lenze setting	
0.00	kg cm ²	600000.00	0.00 kg cm²
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100			

C00274

Parameter Name: C00274 SC: Max. change in acceleration		Data type: UNSIGNED_16 Index: 24301 _d = 5EEC _h	
Limitation of the acceleration change at servo control (SC) and sensorless control for synchronous motors (SLPSM)			
<ul style="list-style-type: none"> Setting in % of M_Nenn per ms. 			
Setting range (min. value unit max. value)		Lenze setting	
0.0	%/ms	400.0	400.0 %/ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10			

C00275

Parameter Name: C00275 Filter setpoint feedforward control		Data type: UNSIGNED_16 Index: 24300 _d = 5EEC _h	
Filter time of setpoint feedforward control at servo control (SC) and sensorless vector control (SLVC)			
<ul style="list-style-type: none"> The setpoint feedforward control requires the entry of the moment of inertia in C00273. 			
Setting range (min. value unit max. value)		Lenze setting	
0.0	ms	1000.0	1.0 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10			

C00276

Parameter Name: C00276 SC: Max. output voltage		Data type: UNSIGNED_8 Index: 24299 _d = 5EEB _h	
Maximum output voltage at servo control (SC)			
<ul style="list-style-type: none"> Regarding the current DC-bus voltage. 			
Setting range (min. value unit max. value)		Lenze setting	
80	%	99	95 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1			

C00280

Parameter Name: C00280 SC: Filter time const. DC detection		Data type: UNSIGNED_16 Index: 24295 _d = 5EE7 _h	
Filter time constant for DC-bus voltage filtering			
<ul style="list-style-type: none"> The filter time constant is e.g. used for field weakening control at servo control (SC). 			
Setting range (min. value unit max. value)		Lenze setting	
1	ms	1000	25 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00290

C00290

Parameter | Name:

C00290 | RCOM error counter

Data type: UNSIGNED_16
Index: 24285_d = 5EDD_h

This code is for device-internal use only and must not be written to by the user!

C00291

Parameter | Name:

C00291 | Error type RCOM

Data type: UNSIGNED_8
Index: 24284_d = 5EDC_h

This code is for device-internal use only and must not be written to by the user!

C00296

Parameter | Name:

C00296 | ICOM error number

Data type: UNSIGNED_16
Index: 24279_d = 5ED7_h

This code is for device-internal use only and must not be written to by the user!

C00297

Parameter | Name:

C00297 | Counter Receive Error Isr

Data type: UNSIGNED_8
Index: 24273_d = 5ED6_h

This code is for device-internal use only and must not be written to by the user!

C00301

Parameter | Name:

C00301 | DebugAccess

Data type: UNSIGNED_16
Index: 24274_d = 5ED2_h

This code is for device-internal use only and must not be written to by the user!

C00302

Parameter | Name:

C00302 | Internal Commands

Data type: UNSIGNED_8
Index: 24273_d = 5ED1_h

This code is for device-internal use only and must not be written to by the user!

C00304

Parameter | Name:

C00304 | Password1

Data type: UNSIGNED_32
Index: 24271_d = 5ECF_h

This code is for device-internal use only and must not be written to by the user!

C00305

Parameter | Name:

C00305 | Password2

Data type: UNSIGNED_32
Index: 24270_d = 5ECE_h

This code is for device-internal use only and must not be written to by the user!

C00306

Parameter | Name:

C00306 | Debug address

Data type: UNSIGNED_32
Index: 24269_d = 5ECD_h

This code is for device-internal use only and must not be written to by the user!

C00307

Parameter | Name:

C00307 | Debug value

Data type: UNSIGNED_16
Index: 24268_d = 5ECB_h

This code is for device-internal use only and must not be written to by the user!

C00308

Parameter | Name:

C00308 | PartitionOffset

Data type: UNSIGNED_16
Index: 24267_d = 5ECB_h

This code is for device-internal use only and must not be written to by the user!

C00309

Parameter | Name:

C00309 | PartitionSel

Data type: UNSIGNED_8
Index: 24266_d = 5ECA_h

This code is for device-internal use only and must not be written to by the user!

C00310

Parameter | Name: **C00310 | PartitionValue** Data type: UNSIGNED_16
Index: 24265_d = 5EC9_h**This code is for device-internal use only and must not be written to by the user!**

C00311

Parameter | Name: **C00311 | Runtime measurement** Data type: UNSIGNED_32
Index: 24264_d = 5EC8_h**This code is for device-internal use only and must not be written to by the user!**

C00312

Parameter | Name: **C00312 | System runtimes** Data type: UNSIGNED_32
Index: 24263_d = 5EC7_h

From version 02.00.00

Setting range (min. value | unit | max. value)

0.000 μs 1310.700

Subcodes

Lenze setting

Info

C00312/1

0.000 μs

System runtime reserve

 Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1000

C00313

Parameter | Name: **C00313 | LS_DataAccess: Activation** Data type: UNSIGNED_8
Index: 24262_d = 5EC6_h**This code is for device-internal use only and must not be written to by the user!**

C00314

Parameter | Name: **C00314 | LS_DataAccess: Address access** Data type: UNSIGNED_32
Index: 24261_d = 5EC5_h**This code is for device-internal use only and must not be written to by the user!**

C00315

Parameter | Name: **C00315 | SystemFail-Adr** Data type: UNSIGNED_32
Index: 24260_d = 5EC4_h**This code is for device-internal use only and must not be written to by the user!**

C00316

Parameter | Name: **C00316 | SystemFail-Info** Data type: UNSIGNED_16
Index: 24259_d = 5EC3_h**This code is for device-internal use only and must not be written to by the user!**

C00317

Parameter | Name: **C00317 | WatchdogTimeMax** Data type: UNSIGNED_16
Index: 24258_d = 5EC2_h**This code is for device-internal use only and must not be written to by the user!**

C00320

Parameter | Name: **C00320 | Debug information** Data type: UNSIGNED_32
Index: 24255_d = 5EBF_h**This code is for device-internal use only and must not be written to by the user!**

C00321

Parameter Name:		Data type: UNSIGNED_16 Index: 24254 _d = 5EBE _h	
C00321 Main program runtime			
Display of the current and the maximum runtime of the main program in the controller			
Setting range (min. value unit max. value)			
0	ms	65535	
Subcodes	Lenze setting	Info	
C00321/1	0 ms	Curr. runtime of main program	
C00321/2	0 ms	Max. runtime of main program	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00322

Parameter Name:		Data type: UNSIGNED_8 Index: 24253 _d = 5EBD _h	
C00322 Transmission mode CAN TxPDOs			
TPDO transmission type according to DS301 V4.02			
<ul style="list-style-type: none"> The following transmission modes are supported: <ul style="list-style-type: none"> -0: Synchronous and acyclic -1 ... 240: Synchronous and cyclic -252: Synchronous - RTR only -253: Asynchronous - RTR only -254: Asynchronous - manufacturer-specific -255: Asynchronous - device-profile specific The basic setting for all PDOs is "Asynchronous - manufacturer-specific" (254). Illustration of the CANopen objects I-1800/2 ... I-1802/2 (see DS301 V4.02). 			
▶ System bus "CAN on board"			
Setting range (min. value unit max. value)			
0		255	
Subcodes	Lenze setting	Info	
C00322/1	254	Transmission mode CAN1 OUT	
C00322/2	254	Transmission mode CAN2 OUT	
C00322/3	254	Transmission mode CAN3 OUT	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00323

Parameter Name:		Data type: UNSIGNED_8 Index: 24252 _d = 5EBC _h	
C00323 Transmission mode CAN Rx PDOs			
RPDO transmission type according to DS301 V4.02			
<ul style="list-style-type: none"> In the case of the RPDO serves as monitoring setting in the case of sync-controlled PDOs. The following transmission modes are supported: <ul style="list-style-type: none"> -0: Synchronous and acyclic -1 ... 240: Synchronous and cyclic -252: Synchronous - RTR only -253: Asynchronous - RTR only -254: Asynchronous - manufacturer-specific -255: Asynchronous - device-profile specific The basic setting for all PDOs is "Asynchronous - manufacturer-specific" (254). Illustration of the CANopen objects I-1400/2 ... I-1402/2 (see DS301 V4.02). 			
▶ System bus "CAN on board"			
Setting range (min. value unit max. value)			
0		255	
Subcodes	Lenze setting	Info	
C00323/1	254	Transmission mode CAN1 IN	
C00323/2	254	Transmission mode CAN2 IN	
C00323/3	254	Transmission mode CAN3 IN	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00324

Parameter Name:	Data type: UNSIGNED_16 Index: 24251 _d = 5EBB _h
C00324 CAN transmission blocking time	

Blocking time for the transmission of the emergency telegram and the process data

Note:

If the "Asynchronous - manufacturer-specific/device profile-specific" transmission type is set, the transmission cycle timer is reset to 0 if event-controlled transmission has been triggered.

Example: Cycle time ([C00356/x](#)) = 500 ms, blocking time = 100 ms, data change sporadically:

- In the case of a sporadic data change < 500 ms, due to the blocking time set, transmission takes place every 100 ms (event-controlled transmission) as quickly as possible.
- In the case of a sporadic data change > 500 ms, due to the cycle time set, transmission takes place every 500 ms (cyclic transmission).

► [System bus "CAN on board"](#)

Setting range (min. value unit max. value)		
0	ms	6500
Subcodes	Lenze setting	Info
C00324/1	0 ms	CAN emergency blocking time
C00324/2	0 ms	CAN1_OUT blocking time
C00324/3	0 ms	CAN2_OUT blocking time
C00324/4	0 ms	CAN3_OUT blocking time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00338

Parameter Name:	Data type: UNSIGNED_8 Index: 24237 _d = 5EAD _h
C00338 L_Arithmetik_1: Function	

The [L_Arithmetik_1](#) FB: Selection of internal arithmetics

Selection list (Lenze setting printed in bold)	
0	Out = In1
1	Out = In1 + In2
2	nOut_a = nIn1_a - nIn2_a
3	Out = (In1 * In2) / 100%
4	nOut_a = (nIn1_a * 1%) / nIn2_a
5	nOut_a = (nIn1_a * 100%) / (100% - nIn2_a)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00339

Parameter Name:	Data type: UNSIGNED_8 Index: 24236 _d = 5EAC _h
C00339 L_Arithmetik_2: Function	

The [L_Arithmetik_2](#) FB: Selection of internal arithmetics

Selection list (Lenze setting printed in bold)	
0	nOut_a = nIn1_a
1	nOut_a = nIn1_a + nIn2_a
2	nOut_a = nIn1_a - nIn2_a
3	nOut_a = (nIn1_a * nIn2_a) / 100%
4	nOut_a = (nIn1_a * 1%) / nIn2_a
5	nOut_a = (nIn1_a * 100%) / (100% - nIn2_a)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00341

Parameter Name:		Data type: UNSIGNED_16	
C00341 CAN management - error configuration		Index: 24234 _d = 5EAA _h	
Selection of the events for which the <i>bFail</i> error output of the LS CANManagement SB must be set to TRUE.			
Setting range (min. hex value max. hex value)		Lenze setting	
0x0000		0xFFFF	0x0000 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)			
Bit 0 <input type="checkbox"/>	BusOff_MsgErr		
Bit 1 <input type="checkbox"/>	Warning		
Bit 2 <input type="checkbox"/>	NodeStopped		
Bit 3 <input type="checkbox"/>	HeartBeatEvent		
Bit 4 <input type="checkbox"/>	CAN1_In_Überw.		
Bit 5 <input type="checkbox"/>	CAN2_In_Überw.		
Bit 6 <input type="checkbox"/>	CAN3_In_Überw.		
Bit 7 <input type="checkbox"/>	Reserved		
Bit 8 <input type="checkbox"/>	Reserved		
Bit 9 <input type="checkbox"/>	Reserved		
Bit 10 <input type="checkbox"/>	Reserved		
Bit 11 <input type="checkbox"/>	Reserved		
Bit 12 <input type="checkbox"/>	Reserved		
Bit 13 <input type="checkbox"/>	Reserved		
Bit 14 <input type="checkbox"/>	Reserved		
Bit 15 <input type="checkbox"/>	Reserved		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT			

C00342

Parameter Name: C00342 CAN decoupling PDOInOut		Data type: UNSIGNED_16 Index: 24233 _d = 5EA9 _h
Configuration defining the events that lead to a decoupling of the process data words. ▶ Configuring exception handling of the CAN PDOs		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	BusOff_MsgErr	
Bit 1 <input type="checkbox"/>	Warning	
Bit 2 <input type="checkbox"/>	NodeStopped	
Bit 3 <input type="checkbox"/>	HeartBeatEvent	
Bit 4 <input type="checkbox"/>	CAN1_In_Überw.	
Bit 5 <input type="checkbox"/>	CAN2_In_Überw.	
Bit 6 <input type="checkbox"/>	CAN3_In_Überw.	
Bit 7 <input type="checkbox"/>	Reserved	
Bit 8 <input type="checkbox"/>	Reserved	
Bit 9 <input type="checkbox"/>	Reserved	
Bit 10 <input type="checkbox"/>	Reserved	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Trouble	
Bit 15 <input type="checkbox"/>	Fault	
Subcodes	Lenze setting	Info
C00342/1	0	CAN decoupling PDO_In from the bus
C00342/2	0	CAN decoupling PDO_Out from the appl.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00343

Parameter | Name: **C00343 | LP_CanIn decoupling value** Data type: UNSIGNED_16
Index: 24232_d = 5EA8_h

Definition of the value the process data words are to have in the decoupled state.

[▶ Configuring exception handling of the CAN PDOs](#)

Setting range (min. value unit max. value)		
0		65535
Subcodes	Lenze setting	Info
C00343/1	0	LP_CanIn1:wCtrl DiscVal
C00343/2	0	LP_CanIn1:wIn2 DiscVal
C00343/3	0	LP_CanIn1:wIn3 DiscVal
C00343/4	0	LP_CanIn1:wIn4 DiscVal
C00343/5	0	LP_CanIn2:wIn1 DiscVal
C00343/6	0	LP_CanIn2:wIn2 DiscVal
C00343/7	0	LP_CanIn2:wIn3 DiscVal
C00343/8	0	LP_CanIn2:wIn4 DiscVal
C00343/9	0	LP_CanIn3:wIn1 DiscVal
C00343/10	0	LP_CanIn3:wIn2 DiscVal
C00343/11	0	LP_CanIn3:wIn3 DiscVal
C00343/12	0	LP_CanIn3:wIn4 DiscVal
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00344

Parameter | Name: **C00344 | LP_CanOut decoupling value** Data type: UNSIGNED_16
Index: 24231_d = 5EA7_h

Definition of the value the process data words are to have in the decoupled state.

[▶ Configuring exception handling of the CAN PDOs](#)

Setting range (min. value unit max. value)		
0		65535
Subcodes	Lenze setting	Info
C00344/1	0	LP_CanOut1:wState DiscVal
C00344/2	0	LP_CanOut1:wOut2 DiscVal
C00344/3	0	LP_CanOut1:wOut3 DiscVal
C00344/4	0	LP_CanOut1:wOut4 DiscVal
C00344/5	0	LP_CanOut2:wOut1 DiscVal
C00344/6	0	LP_CanOut2:wOut2 DiscVal
C00344/7	0	LP_CanOut2:wOut3 DiscVal
C00344/8	0	LP_CanOut2:wOut4 DiscVal
C00344/9	0	LP_CanOut3:wOut1 DiscVal
C00344/10	0	LP_CanOut3:wOut2 DiscVal
C00344/11	0	LP_CanOut3:wOut3 DiscVal
C00344/12	0	LP_CanOut3:wOut4 DiscVal
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00345

Parameter | Name: **C00345 | CAN error status** Data type: UNSIGNED_8
Index: 24230_d = 5EA6_h

[▶ System bus "CAN on board"](#)

Selection list (read only)	
0	No Error
1	Warning ErrActive
2	Warning ErrPassive
3	Bus off
4	Reserved
5	Reserved

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00347

Parameter | Name: **C00347 | CAN status HeartBeat producer** Data type: UNSIGNED_8
Index: 24228_d = 5EA4_h

[▶ Heartbeat protocol](#)

Selection list	
0	Boot-up
4	Stopped
5	Operational
127	Pre-Operat.
250	Failed
255	NoResponse

Subcodes	Info
C00347/1	Status node 1 ... 15
C00347/...	
C00347/15	

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00349

Parameter | Name: **C00349 | CAN setting - DIP switch** Data type: UNSIGNED_16
Index: 24226_d = 5EA2_h

DIP switch setting during last mains power-on

[▶ System bus "CAN on board"](#)

Display area (min. hex value max. hex value)	
0x0000	0xFFFF
Value is bit-coded:	
Bit 0	Node address 1
Bit 1	Node address 2
Bit 2	Node address 4
Bit 3	Node address 8
Bit 4	Node address 16
Bit 5	Node address 32
Bit 6	Node address 64
Bit 7	Baud rate 1
Bit 8	Baud rate 2
Bit 9	Baud rate 4
Bit 10	Reserved
Bit 11	Reserved
Bit 12	Reserved
Bit 13	Reserved
Bit 14	Reserved
Bit 15	DIP switch at 24V-ON accepted

Read access Write access CINH PLC STOP No transfer COM MOT

C00350

Parameter | Name: **C00350 | CAN node address** Data type: UNSIGNED_8
Index: 24225_d = 5EA1_h

Setting of the node address via parameters

- The node address can only be parameterised if the node address "0" is set via the DIP switches.
- A change in the node address will not be effective until a CAN Reset Node is performed.

[▶ System bus "CAN on board"](#)

Setting range (min. value unit max. value)	Lenze setting
1 127	1

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00351

Parameter | Name: **C00351 | CAN baud rate** Data type: UNSIGNED_8
Index: 24224_d = 5EA0_h

Setting of the baud rate via parameters

- The baud rate can only be parameterised if the baud rate "0" is set via the DIP switches.
- A change in the baud rate will not be effective until a CAN Reset Node is performed.

► [System bus "CAN on board"](#)

Selection list (Lenze setting printed in bold)	
0	500 kbps
1	250 kbps
2	125 kbps
3	50 kbps
4	1000 kbps
5	20 kbps

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00352

Parameter | Name: **C00352 | CAN slave/master** Data type: UNSIGNED_8
Index: 24223_d = 5E9F_h

The drive starts as CAN master after mains switching if a value of "1" has been entered and saved here.

► [System bus "CAN on board"](#)

Selection list (Lenze setting printed in bold)	
0	Slave
1	Master

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00353

Parameter | Name: **C00353 | CAN IN/OUT COBID source** Data type: UNSIGNED_8
Index: 24222_d = 5E9E_h

Identifier assignment procedure for the CANx In/Out process data

► [System bus "CAN on board"](#)

Selection list		Info
0	COBID = C0350 + LenzeBaseID	COBID = device address + LenzeBaseID
1	COBID = C0350 + CANBaseID	COBID = device address + CANBaseID (C00354/x)
2	COBID = C0354/x	COBID = direct setting from C00354/x
Subcodes	Lenze setting	Info
C00353/1	1: COBID = C0350 + CANBaseID	COBID source CAN1_IN/OUT
C00353/2	1: COBID = C0350 + CANBaseID	COBID source CAN2_IN/OUT
C00353/3	1: COBID = C0350 + CANBaseID	COBID source CAN3_IN/OUT

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00354

Parameter | Name: **C00354 | COBID** Data type: UNSIGNED_32
Index: 24221_d = 5E9D_h

Setting of the default COBID according to CANopen

- A change in the COBID will not be effective until a CAN reset node is performed.

► [System bus "CAN on board"](#)

Setting range (min. hex value max. hex value)		
0x00000000		0xFFFFFFFF
Value is bit-coded:		Info
Bit 0	COBID Bit0	<ul style="list-style-type: none"> • Bit 0 ... 10: COB-ID • Bit 11 ... 30: Reserved • Bit 31: PDO invalid (is not transmitted)
...	...	
Bit 31	PDO invalid	
Subcodes	Lenze setting	Info
C00354/1	513	COBID CAN1_IN
C00354/2	385	COBID CAN1_OUT
C00354/3	769	COBID CAN2_IN
C00354/4	641	COBID CAN2_OUT
C00354/5	1025	COBID CAN3_IN
C00354/6	897	COBID CAN3_OUT
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT		

C00355

Parameter | Name: **C00355 | Active COBID** Data type: UNSIGNED_16
Index: 24220_d = 5E9C_h

Display of the COBID of the PDOs that is active in the CAN stack

► [System bus "CAN on board"](#)

Display range (min. value unit max. value)		
0		2047
Subcodes	Info	
C00355/1	Active COBID CAN1_IN	
C00355/2	Active COBID CAN1_OUT	
C00355/3	Active COBID CAN2_IN	
C00355/4	Active COBID CAN2_OUT	
C00355/5	Active COBID CAN3_IN	
C00355/6	Active COBID CAN3_OUT	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00356

Parameter | Name: **C00356 | CAN time settings** Data type: UNSIGNED_16
Index: 24219_d = 5E9B_h

Different time settings for the CAN interface

► [System bus "CAN on board"](#)

Setting range (min. value unit max. value)		
0	ms	65000
Subcodes	Lenze setting	Info
C00356/1	3000 ms	CAN delay during status change from "Boot-up" to "Operational"
C00356/2	0 ms	CAN2_OUT cycle time
C00356/3	0 ms	CAN3_OUT cycle time
C00356/4	0 ms	CANx_OUT time "Operational" until "first transmission"
C00356/5	0 ms	CAN1_OUT cycle time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00357

Parameter | Name: **C00357 | CAN monitoring times** Data type: UNSIGNED_16
Index: 24218_d = 5E9A_h

Mapping of the RPDO event time (see DS301 V4.02)

- If a value unequal to "0" is entered, the RPDO is not expected before the set time has expired.
- If the RPDO is not received within the expected time, the response set in [C00593/1...3](#) will be triggered.

► [System bus "CAN on board"](#)

Setting range (min. value unit max. value)		
0	ms	65000
Subcodes	Lenze setting	Info
C00357/1	3000 ms	CAN1_IN monitoring time
C00357/2	3000 ms	CAN2_IN monitoring time
C00357/3	3000 ms	CAN3_IN monitoring time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00358

Parameter | Name: **C00358 | CANx_OUT data length** Data type: UNSIGNED_8
Index: 24217_d = 5E99_h

Setting of the data length for TX PDOs

► [System bus "CAN on board"](#)

Setting range (min. value unit max. value)		
1		8
Subcodes	Lenze setting	Info
C00358/1	8	CAN1_OUT data length
C00358/2	8	CAN2_OUT data length
C00358/3	8	CAN3_OUT data length
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00359

Parameter Name: C00359 CAN status	Data type: UNSIGNED_8 Index: 24216 _d = 5E98 _h
▶ System bus "CAN on board"	
Selection list (read only)	
0	Operational
1	Pre-Operat.
2	Reserved
3	Reserved
4	BootUp
5	Stopped
6	Reserved
7	Reset
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00360

Parameter Name: C00360 CAN telegram counter	Data type: UNSIGNED_16 Index: 24215 _d = 5E97 _h
▶ System bus "CAN on board"	
Display range (min. value unit max. value)	
0	65535
Subcodes	Info
C00360/1	All PDO/SDO sent
C00360/2	All PDO/SDO received
C00360/3	Telegram counter CAN1_OUT
C00360/4	Telegram counter CAN2_OUT
C00360/5	Telegram counter CAN3_OUT
C00360/6	Telegram counter SDO1_OUT
C00360/7	Telegram counter SDO2_OUT
C00360/8	Telegram counter CAN1_IN
C00360/9	Telegram counter CAN2_IN
C00360/10	Telegram counter CAN3_IN
C00360/11	Telegram counter SDO1_IN
C00360/12	Telegram counter SDO2_IN
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00364

Parameter | Name: **C00364 | CAN MessageError** Data type: UNSIGNED_8
Index: 24211_d = 5E93_h

▶ [System bus "CAN on board"](#)

Selection list (read only)	
0	No Error
1	StuffError
2	FormError
3	AckError
4	Bit1Error
5	Bit0Error
6	CRCErrror
7	Reserved

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00366

Parameter | Name: **C00366 | Number of CAN SDO channels** Data type: UNSIGNED_8
Index: 24209_d = 5E91_h

Selection of the number of active parameter data channels

- In the Lenze setting, only the parameter data channel 1 is activated according to CANopen.
- In order to activate both parameter data channels, set the selection "2 SDO Lenze".

▶ [System bus "CAN on board"](#)

Selection list (Lenze setting printed in bold)	
0	1 SDO CANOpen
1	2 SDO Lenze

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00367

Parameter Name: C00367 CAN Sync-Rx-Identifier	Data type: UNSIGNED_16 Index: 24208 _d = 5E90 _h
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Identifier by means of which the sync slave is to receive sync telegrams.

- Mapping of the CANopen object [I-1005](#) (see DS301 V4.02).

► [System bus "CAN on board"](#)

Setting range (min. hex value max. hex value)	Lenze setting
0x0000 0xFFFF	0x0080 (decimal: 128)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)	
Bit 0 <input type="checkbox"/> COBID Bit0	
Bit 1 <input type="checkbox"/> COBID Bit1	
Bit 2 <input type="checkbox"/> COBID Bit2	
Bit 3 <input type="checkbox"/> COBID Bit3	
Bit 4 <input type="checkbox"/> COBID Bit4	
Bit 5 <input type="checkbox"/> COBID Bit5	
Bit 6 <input type="checkbox"/> COBID Bit6	
Bit 7 <input checked="" type="checkbox"/> COBID Bit7	
Bit 8 <input type="checkbox"/> COBID Bit8	
Bit 9 <input type="checkbox"/> COBID Bit9	
Bit 10 <input type="checkbox"/> COBID Bit10	
Bit 11 <input type="checkbox"/> Reserved	
Bit 12 <input type="checkbox"/> Reserved	
Bit 13 <input type="checkbox"/> Reserved	
Bit 14 <input type="checkbox"/> Reserved	
Bit 15 <input type="checkbox"/> Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT	

C00368

Parameter | Name: **C00368 | CAN Sync-Tx-Identifier** Data type: UNSIGNED_16
Index: 24207_d = 5E8F_h

Identifier by means of which the sync master is to transmit sync telegrams.

- Mapping of the CANopen object [I-1005](#) (see DS301 V4.02).

► [System bus "CAN on board"](#)

Setting range (min. hex value max. hex value)		Lenze setting
0x0000	0xFFFF	0x0080 (decimal: 128)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	COBID Bit0	
Bit 1 <input type="checkbox"/>	COBID Bit1	
Bit 2 <input type="checkbox"/>	COBID Bit2	
Bit 3 <input type="checkbox"/>	COBID Bit3	
Bit 4 <input type="checkbox"/>	COBID Bit4	
Bit 5 <input type="checkbox"/>	COBID Bit5	
Bit 6 <input type="checkbox"/>	COBID Bit6	
Bit 7 <input checked="" type="checkbox"/>	COBID Bit7	
Bit 8 <input type="checkbox"/>	COBID Bit8	
Bit 9 <input type="checkbox"/>	COBID Bit9	
Bit 10 <input type="checkbox"/>	COBID Bit10	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Sync-transmit off	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT		

C00369

Parameter | Name: **C00369 | CAN sync transmission cycle time** Data type: UNSIGNED_16
Index: 24206_d = 5E8E_h

Cycle during which the sync master is to transmit sync telegrams.

- If "0 ms" is set (Lenze setting), no sync telegrams are generated.
- Mapping of the CANopen object [I-1006](#) (see DS301 V4.02).

► [System bus "CAN on board"](#)

Setting range (min. value unit max. value)		Lenze setting
0	ms	0 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00370

Parameter | Name: **C00370 | SyncTxRxTimes** Data type: INTEGER_16
Index: 24205_d = 5E8D_h

► [System bus "CAN on board"](#)

Display range (min. value unit max. value)		Info
-1310	µs	1310
Subcodes		
C00370/1		CAN Sync instant of transmission
C00370/2		Sync instant of reception
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00372

Parameter Name: C00372 CAN_Tx_Rx_Error		Data type: UNSIGNED_8 Index: 24203 _d = 5E8B _h
▶ System bus "CAN on board"		
Display range (min. value unit max. value)		
0		255
Subcodes	Info	
C00372/1	CAN Tx_Error	
C00372/2	CAN Rx_Error	
C00372/3	CAN Tx_Overflow	
C00372/4	CAN Rx_Overflow	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00381

Parameter Name: C00381 CAN Heartbeat producer time		Data type: UNSIGNED_16 Index: 24194 _d = 5E82 _h
Time interval for the transmission of the heartbeat telegram to the consumer(s). <ul style="list-style-type: none"> The heartbeat telegram is sent automatically as soon as a time > 0 ms is set. Mapping of the CANopen object I-1017 (see DS301 V4.02). 		
▶ Heartbeat protocol		
Setting range (min. value unit max. value)		Lenze setting
0	ms	65535 0 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00385

Parameter Name: C00385 CAN node addr. HeartBeat producer		Data type: UNSIGNED_8 Index: 24190 _d = 5E7E _h
The subcodes represent the nodes to be monitored by heartbeat.		
▶ Heartbeat protocol		
Setting range (min. value unit max. value)		
0		127
Subcodes	Lenze setting	Info
C00385/1	0	CAN node address HeartBeat producer 1 ... 15
C00385/...		
C00385/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00386

Parameter Name: C00386 CAN HeartBeat ConsumerTime		Data type: UNSIGNED_16 Index: 24189 _d = 5E7D _h
The subcodes represent the nodes to be monitored by heartbeat.		
▶ Heartbeat protocol		
Setting range (min. value unit max. value)		
0	ms	60000
Subcodes	Lenze setting	Info
C00386/1	0 ms	ConsumerTime HeartBeat producer 1 ... 15
C00386/...		
C00386/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00400

Parameter Name: C00400 LS_PulseGenerator		Data type: UNSIGNED_16 Index: 24175 _d = 5E6F _h
Time setting of the pulse to be output by the SB LS_PulseGenerator		
Setting range (min. value unit max. value)		
0	ms	60000
Subcodes	Lenze setting	Info
C00400/1	1000 ms	Length of LOW level (break)
C00400/2	1000 ms	Length of HIGH level
C00400/3	100 ms	Delay time for status signal <i>bFirstCycleDone</i> <ul style="list-style-type: none"> The <i>bFirstCycleDone</i> status signal is set to TRUE when the first task cycle is complete and the time set here has expired.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00401

Parameter Name: C00401 CANxInOut: Inversion		Data type: UNSIGNED_16 Index: 24174 _d = 5E6E _h
This parameter serves to invert the control/status bits of the CAN port blocks.		
▶ CAN port block		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	Active	Bit set = bit is inverted
...	...	
Bit 15	Active	
Subcodes	Lenze setting	Info
C00401/1	0	Inversion of LP_CanIn1.bCtrl1_B0...15
C00401/2	0	Inversion of LP_CanOut1.bState1_B0...15
C00401/3	0	Inversion of LP_CanIn2.bIn1_B0...15
C00401/4	0	Inversion of LP_CanOut2.bOut1_B0...15
C00401/5	0	Inversion of LP_CanIn3.bIn1_B0...15
C00401/6	0	Inversion of LP_CanOut3.bOut1_B0...15
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00408

Parameter Name: C00408 LP_CanIn mapping selection		Data type: UNSIGNED_8 Index: 24167 _d = 5E67 _h
Selection of the mapping source for port blocks LP_CanIn1...3		
▶ CAN port block		
Selection list		Info
0	CanIn	CanIn
1	Par.C409	Mapping configured in C00409
Subcodes	Lenze setting	Info
C00408/1	0: CanIn	Mapping selection LP_CanIn1
C00408/2	0: CanIn	Mapping selection LP_CanIn2
C00408/3	0: CanIn	Mapping selection LP_CanIn3
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00409

Parameter Name: C00409 LP_CanIn Mapping		Data type: UNSIGNED_16 Index: 24166 _d = 5E66 _h
Mapping for port blocks LP_CanIn1...3		
▶ CAN port block		
Setting range (min. value unit max. value)		
0		65535
Subcodes	Lenze setting	Info
C00409/1	0	LP_CanIn1:wCtrl MapVal
C00409/2	0	LP_CanIn1:wIn2 MapVal
C00409/3	0	LP_CanIn1:wIn3 MapVal
C00409/4	0	LP_CanIn1:wIn4 MapVal
C00409/5	0	LP_CanIn2:wIn1 MapVal
C00409/6	0	LP_CanIn2:wIn2 MapVal
C00409/7	0	LP_CanIn2:wIn3 MapVal
C00409/8	0	LP_CanIn2:wIn4 MapVal
C00409/9	0	LP_CanIn3:wIn1 MapVal
C00409/10	0	LP_CanIn3:wIn2 MapVal
C00409/11	0	LP_CanIn3:wIn3 MapVal
C00409/12	0	LP_CanIn3:wIn4 MapVal
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00410

Parameter Name: C00410 L_SignalMonitor_a: Signal sources		Data type: UNSIGNED_16 Index: 24165 _d = 5E65 _h
The L_SignalMonitor_a FB: Selection of the signal sources		
Selection list		
See selection list - analog signals		
Subcodes	Lenze setting	Info
C00410/1	0: Not connected	Signal source for output <i>nOut1_a</i>
C00410/2	0: Not connected	Signal source for output <i>nOut2_a</i>
C00410/3	0: Not connected	Signal source for output <i>nOut3_a</i>
C00410/4	0: Not connected	Signal source for output <i>nOut4_a</i>
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00411

Parameter Name: C00411 L_SignalMonitor_b: Signal sources		Data type: UNSIGNED_16 Index: 24164 _d = 5E64 _h
The L_SignalMonitor_b FB: Selection of the signal sources		
Selection list		
See selection list - digital signals		
Subcodes	Lenze setting	Info
C00411/1	0: Not connected	Signal source for output <i>bOut1</i>
C00411/2	0: Not connected	Signal source for output <i>bOut2</i>
C00411/3	0: Not connected	Signal source for output <i>bOut3</i>
C00411/4	0: Not connected	Signal source for output <i>bOut4</i>
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00412

Parameter Name: C00412 L_SignalMonitor_b: Inversion		Data type: UNSIGNED_8 Index: 24163 _d = 5E63 _h
The L_SignalMonitor_b FB: Inversion of the binary outputs		
Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF 0x00 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	bOut1 inverted	Bit set = inversion active
Bit 1 <input type="checkbox"/>	bOut2 inverted	
Bit 2 <input type="checkbox"/>	bOut3 inverted	
Bit 3 <input type="checkbox"/>	bOut4 inverted	
Bit 4 <input type="checkbox"/>	Reserved	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00413

Parameter Name: C00413 L_SignalMonitor_a: Offs./gain		Data type: INTEGER_16 Index: 24162 _d = 5E62 _h
The L_SignalMonitor_a FB: Gain and offset of the analog signals		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00413/1	0.00 %	Offset for output <i>nOut1_a</i>
C00413/2	100.00 %	Gain for output <i>nOut1_a</i>
C00413/3	0.00 %	Offset for output <i>nOut2_a</i>
C00413/4	100.00 %	Gain for output <i>nOut2_a</i>
C00413/5	0.00 %	Offset for output <i>nOut3_a</i>
C00413/6	100.00 %	Gain for output <i>nOut3_a</i>
C00413/7	0.00 %	Offset for output <i>nOut4_a</i>
C00413/8	100.00 %	Gain for output <i>nOut4_a</i>
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00417

Parameter Name: C00417 Activate resolver error comp.		Data type: UNSIGNED_8 Index: 24158 _d = 5E5E _h
▶ Encoder/feedback system: Resolver		
Selection list (Lenze setting printed in bold)		
0	Resolver error comp. act.	
1	Resolver error comp. deact.	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00420

Parameter Name: C00420 Number of encoder increments		Data type: UNSIGNED_16 Index: 24155 _d = 5E5B _h
Indication of the encoder constant		
Encoder/feedback system: Multi-Encoder		
Setting range (min. value unit max. value)		
1	Incr./rev.	32768
Subcodes	Lenze setting	Info
C00420/1	128 incr./rev.	FreqIn12: Encoder increment
C00420/2	128 incr./rev.	FreqIn67: Encoder increment
C00420/3	512 incr./rev.	LS_Multi-Encoder: Encoder increment
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00421

Parameter Name: C00421 LS_Multi-Encoder: Supply voltage		Data type: UNSIGNED_16 Index: 24154 _d = 5E5A _h
Stop! Before connecting an encoder, make sure that the encoder supply voltage is set correctly! If the set supply voltage exceeds the permissible supply voltage of the connected encoder, the encoder may be destroyed!		
Encoder/feedback system: Multi-Encoder		
Setting range (min. value unit max. value)		Lenze setting
5.0	V	12.0 5.0 V
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10		

C00422

Parameter Name: C00422 LS_Multi-Encoder: Encoder type		Data type: UNSIGNED_8 Index: 24153 _d = 5E59 _h
Encoder/feedback system: Multi-Encoder		
Selection list (Lenze setting printed in bold)		
0	Incremental encoder (TTL)	
1	Sine/cosine encoder	
2	Absolute value encoder (hiperface)	
4	Absolute value encoder (SSI)	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00423

Parameter Name: C00423 DOx: Delay times		Data type: UNSIGNED_16 Index: 24152 _d = 5E58 _h
Delay times for the digital output terminals		
▶ Digital output terminals		
Setting range (min. value unit max. value)		
0.000	s	65.000
Subcodes	Lenze setting	Info
C00423/1	0.000 s	Relay ON delay
C00423/2	0.000 s	Relay OFF delay
C00423/3	0.000 s	DO1 ON delay
C00423/4	0.000 s	DO1 OFF delay
C00423/5	0.000 s	DO2 ON delay
C00423/6	0.000 s	DO2 OFF delay
C00423/7	0.000 s	DO3 ON delay
C00423/8	0.000 s	DO3 OFF delay
C00423/9	0.000 s	DO "High Current" ON delay
C00423/10	0.000 s	DO "High Current" OFF delay
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00424

Parameter Name: C00424 Pulse form TTL encoder		Data type: UNSIGNED_8 Index: 24151 _d = 5E57 _h
▶ Encoder/feedback system: Multi-Encoder		
Selection list (Lenze setting printed in bold)		
0	4x evaluation A/B	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00425

Parameter Name: C00425 Encoder scanning time		Data type: UNSIGNED_8 Index: 24150 _d = 5E56 _h
Encoder sample time for the digital input terminals when configured as frequency inputs		
▶ Using DI1(6) and DI2(7) as frequency inputs		
Selection list		
0	1 ms	
1	2 ms	
2	5 ms	
3	10 ms	
4	20 ms	
5	50 ms	
6	100 ms	
7	200 ms	
8	500 ms	
9	1000 ms	
Subcodes	Lenze setting	Info
C00425/1	3: 10 ms	FreqIn12: Encoder scanning time • Only active with edge-counting procedure (C00496 = 3).
C00425/2	3: 10 ms	FreqIn67: Encoder scanning time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00426

Parameter | Name: **C00426 | SSI encoder: Data bits** Data type: UNSIGNED_8
Index: 24149_d = 5E5_h

Example: Setting for an SSI encode with the coding "8192x4096":

- $8192 = 2^{13} = 13$ bits Multiturn $\rightarrow C00426/4 = 13$
- $4096 = 2^{12} = 12$ bits Singleturn $\rightarrow C00426/2 = 12$
- This results in a data word length of 25 bits $\rightarrow C00426/1 = 25$
- Start bit Singleturn = bit 0 $\rightarrow C00426/3 = 0$
- Start bit Multiturn = bit 12 $\rightarrow C00426/5 = 12$

[Encoder/feedback system: SSI encoder](#)

Setting range (min. value unit max. value)		
0		32
Subcodes	Lenze setting	Info
C00426/1	25	SSI encoder: Data word length
C00426/2	13	SSI encoder: Bits SingleTurn
C00426/3	0	SSI encoder: Start bit Singleturn
C00426/4	12	SSI encoder: Bits Multiturn
C00426/5	13	SSI encoder: Start bit Multiturn
C00426/6	0	SSI encoder: Status bit • From version 02.00.00
C00426/7	0	SSI encoder: Left shift of raw value • From version 02.00.00

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00427

Parameter | Name: **C00427 | SSI encoder: Bit rate** Data type: UNSIGNED_8
Index: 24148_d = 5E54_h

[Encoder/feedback system: SSI encoder](#)

Selection list (Lenze setting printed in bold)	
1	100 kbps
2	200 kbps
3	300 kbps
4	400 kbps
5	500 kbps
6	750 kbps
7	1000 kbps

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00428

Parameter | Name: **C00428 | SSI encoder: Coding** Data type: UNSIGNED_8
Index: 24147_d = 5E53_h

[Encoder/feedback system: SSI encoder](#)

Selection list (Lenze setting printed in bold)	
0	Binary code
1	Gray code

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00434

Parameter Name: C00434 OxU/I: Gain		Data type: INTEGER_16 Index: 24141 _d = 5E4D _h
Gain of the analog outputs		
▶ Analog terminals		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00434/1	100.00 %	O1U: Gain
C00434/2	100.00 %	O2U: Gain
C00434/3	100.00 %	O1I: Gain
C00434/4	100.00 %	O2I: Gain
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00435

Parameter Name: C00435 OxU/I: Offset		Data type: INTEGER_16 Index: 24140 _d = 5E4C _h
Offset of the analog outputs		
▶ Analog terminals		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00435/1	0.00 %	O1U: Offset
C00435/2	0.00 %	O2U: Offset
C00435/3	0.00 %	O1I: Offset
C00435/4	0.00 %	O2I: Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00436

Parameter Name: C00436 OxU: Voltage		Data type: INTEGER_16 Index: 24139 _d = 5E4B _h
Display of the voltage at the analog outputs		
▶ Analog terminals		
Display range (min. value unit max. value)		
0.00	V	10.00
Subcodes	Info	
C00436/1	O1U: Voltage	
C00436/2	O2U: Voltage	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00437

Parameter Name: C00437 OxI: Current		Data type: INTEGER_32 Index: 24138 _d = 5E4A _h
Display of the current at the analog outputs		
▶ Analog terminals		
Display range (min. value unit max. value)		
0.000	mA	20.000
Subcodes	Info	
C00437/1	O1I: Current	
C00437/2	O2I: Current	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00439

Parameter Name: C00439 OxU/I: Input value		Data type: INTEGER_16 Index: 24136 _d = 5E48 _h
Display of the input values for the analog outputs		
▶ Analog terminals		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00439/1		O1U: Input value
C00439/2		O2U: Input value
C00439/3		O1I: Input value
C00439/4		O2I: Input value
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00440

Parameter Name: C00440 LS_AnalogIn1: PT1 time constant		Data type: UNSIGNED_16 Index: 24135 _d = 5E47 _h
PT1 time constant (S-ramp time) for the analog inputs		
▶ Analog terminals		
Setting range (min. value unit max. value)		
0	ms	1000
Subcodes	Lenze setting	Info
C00440/1	10 ms	PT1 rounding AnalogIn1
C00440/2	10 ms	PT1 rounding AnalogIn2
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00441

Parameter Name: C00441 Decoupling AnalogOut		Data type: UNSIGNED_16 Index: 24134 _d = 5E46 _h
Configuration defining the events that lead to a decoupling of the analog output terminals. ▶ Configuring exception handling of the output terminals		
Setting range (min. hex value max. hex value)		Lenze setting
0x0000	0xFFFF	0x0000 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0	<input type="checkbox"/> SafeTorqueOff	
Bit 1	<input type="checkbox"/> ReadyToSwitchOn	
Bit 2	<input type="checkbox"/> SwitchedOn	
Bit 3	<input type="checkbox"/> Reserved	
Bit 4	<input type="checkbox"/> Trouble	
Bit 5	<input type="checkbox"/> Fault	
Bit 6	<input type="checkbox"/> Reserved	
Bit 7	<input type="checkbox"/> Reserved	
Bit 8	<input type="checkbox"/> Reserved	
Bit 9	<input type="checkbox"/> Fail CAN_Management	
Bit 10	<input type="checkbox"/> Reserved	
Bit 11	<input type="checkbox"/> Reserved	
Bit 12	<input type="checkbox"/> Reserved	
Bit 13	<input type="checkbox"/> Reserved	
Bit 14	<input type="checkbox"/> Reserved	
Bit 15	<input type="checkbox"/> Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00442

Parameter Name: C00442 AOutx: Decoupling value		Data type: INTEGER_16 Index: 24133 _d = 5E45 _h
Definition of the value the analog output terminals are to have in the decoupled state. ▶ Configuring exception handling of the output terminals		
Setting range (min. value unit max. value)		
0.00	%	100.00
Subcodes	Lenze setting	Info
C00442/1	0.00 %	AOut1_U: Decoupling value
C00442/2	0.00 %	AOut2_U: Decoupling value
C00442/3	0.00 %	AOut1_I: Decoupling value
C00442/4	0.00 %	AOut2_I: Decoupling value
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00443

Parameter Name: C00443 DIx: Level		Data type: UNSIGNED_16 Index: 24132 _d = 5E44 _h
Bit coded display of the level of the digital inputs		
▶ Digital input terminals		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	DI1	Bit set = HIGH level
Bit 1	DI2	
Bit 2	DI3	
Bit 3	DI4	
Bit 4	DI5	
Bit 5	DI6	
Bit 6	DI7	
Bit 7	Reserve	
Bit 8	Reserve	
Bit 9	Reserve	
Bit 10	Reserve	
Bit 11	Reserve	
Bit 12	Reserve	
Bit 13	Reserve	
Bit 14	Reserve	
Bit 15	CINH	
Subcodes		Info
C00443/1		DIx: Terminal level
C00443/2		DIx: Output level
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00444

Parameter | Name: **C00444 | DOx: Level** Data type: UNSIGNED_16
Index: 24131_d = 5E43_h

Bit coded display of the level of the digital outputs

[▶ Digital output terminals](#)

Display area (min. hex value max. hex value)	
0x0000	0xFFFF
Value is bit-coded:	
Bit 0	Relay
Bit 1	DO1
Bit 2	DO2
Bit 3	DO3
Bit 4	High current
Bit 5	Reserve
Bit 6	Reserve
Bit 7	Reserve
Bit 8	Reserve
Bit 9	Reserve
Bit 10	Reserve
Bit 11	Reserve
Bit 12	Reserve
Bit 13	Reserve
Bit 14	Reserve
Bit 15	Reserve
Subcodes	
C00444/1	DOx: Input level
C00444/2	DOx: Terminal level
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT	

C00445

Parameter | Name: **C00445 | FreqInxx_nOut_v** Data type: INTEGER_16
Index: 24130_d = 5E42_h

Display of the frequency input signals which are fed into the application.

[▶ Using DI1\(6\) and DI2\(7\) as frequency inputs](#)

Display range (min. value unit max. value)	
-32767	Incr/ms 32767
Subcodes	
C00445/1	FreqIn12_nOut_v
C00445/2	FreqIn67_nOut_v
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00446

Parameter Name: C00446 FreqInxx_nOut_a		Data type: INTEGER_16 Index: 24129 _d = 5E41 _h
Display of the frequency input signals which are fed into the application. ▶ Using DI1(6) and DI2(7) as frequency inputs		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes		Info
C00446/1		FreqIn12_nOut_a
C00446/2		FreqIn67_nOut_a
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00447

Parameter Name: C00447 DigOut decoupling		Data type: UNSIGNED_16 Index: 24128 _d = 5E40 _h
Configuration defining the events that lead to a decoupling of the digital output terminals. ▶ Configuring exception handling of the output terminals		
Setting range (min. hex value max. hex value)		Lenze setting
0x0000	0xFFFF	0x0000 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	SafeTorqueOff	
Bit 1 <input type="checkbox"/>	ReadyToSwitchOn	
Bit 2 <input type="checkbox"/>	SwitchedOn	
Bit 3 <input type="checkbox"/>	Reserved	
Bit 4 <input type="checkbox"/>	Trouble	
Bit 5 <input type="checkbox"/>	Fault	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	
Bit 8 <input type="checkbox"/>	Reserved	
Bit 9 <input type="checkbox"/>	Fail CAN_Management	
Bit 10 <input type="checkbox"/>	Reserved	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00448

Parameter | Name: **C00448 | DigOut decoupling value** Data type: UNSIGNED_16
Index: 24127_d = 5E3F_h

Definition of the value the digital output terminals are to have in the decoupled state.

- Bit set = HIGH level

[▶ Configuring exception handling of the output terminals](#)

Setting range (min. hex value max. hex value)		Lenze setting
0x0000	0xFFFF	0x0000 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0	<input type="checkbox"/> Relay_ON	
Bit 1	<input type="checkbox"/> DigOut1_ON	
Bit 2	<input type="checkbox"/> DigOut2_ON	
Bit 3	<input type="checkbox"/> DigOut3_ON	
Bit 4	<input type="checkbox"/> DigOut4_ON	
Bit 5	<input type="checkbox"/> HighCurrent_ON	
Bit 6	<input type="checkbox"/> Reserved	
Bit 7	<input type="checkbox"/> Reserved	
Bit 8	<input type="checkbox"/> Reserved	
Bit 9	<input type="checkbox"/> Reserved	
Bit 10	<input type="checkbox"/> Reserved	
Bit 11	<input type="checkbox"/> Reserved	
Bit 12	<input type="checkbox"/> Reserved	
Bit 13	<input type="checkbox"/> Reserved	
Bit 14	<input type="checkbox"/> Reserved	
Bit 15	<input type="checkbox"/> Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00449

Parameter | Name: **C00449 | FreqInxx_dnOut_p** Data type: INTEGER_32
Index: 24126_d = 5E3E_h

[▶ Output of the encoder position of the DI1/DI2 frequency input](#)

Display range (min. value unit max. value)		
-2147483647	Incr.	2147483647
Subcodes		Info
C00449/1		FreqIn12_dnOut_p
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00455

Parameter | Name: **C00455 | FB_call table** Data type: UNSIGNED_16
Index: 24120_d = 5E38_h

This code is for device-internal use only and must not be written to by the user!

C00456

Parameter | Name: **C00456 | Editor level** Data type: UNSIGNED_8
Index: 24119_d = 5E37_h

This code is for device-internal use only and must not be written to by the user!

C00458

Parameter | Name: **C00458 | SYS_call table** Data type: UNSIGNED_16
Index: 24117_d = 5E35_h

This code is for device-internal use only and must not be written to by the user!

C00459

Parameter Name: C00459 SYS_Output table	Data type: UNSIGNED_16 Index: 24116 _d = 5E34 _h
This code is for device-internal use only and must not be written to by the user!	

C00461

Parameter Name: C00461 Remote: Acceleration/deceleration time	Data type: UNSIGNED_32 Index: 24114 _d = 5E32 _h
▶ PC manual control	
Setting range (min. value unit max. value)	
0.000	s 999.999
Subcodes	Lenze setting Info
C00461/1	2.000 s Remote: Acceleration/deceleration time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000	

C00462

Parameter Name: C00462 Remote: Control	Data type: UNSIGNED_16 Index: 24113 _d = 5E31 _h
▶ PC manual control	
Setting range (min. value unit max. value)	
0	65535
Subcodes	Lenze setting Info
C00462/1	0 Remote: Control mode
C00462/2	0 Remote: Monitoring counter
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00463

Parameter Name: C00463 Remote: MCK control		Data type: UNSIGNED_32 Index: 24112 _d = 5E30 _h
This parameter serves to control the functions of the Motion Control Kernel for PC manual control .		
Setting range (min. hex value max. hex value)		
0x00000000		0xFFFFFFFF
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	OpMode_Bit0	
Bit 1 <input type="checkbox"/>	OpMode_Bit1	
Bit 2 <input type="checkbox"/>	OpMode_Bit2	
Bit 3 <input type="checkbox"/>	OpMode_Bit3	
Bit 4 <input type="checkbox"/>	ManJogPos	
Bit 5 <input type="checkbox"/>	ManJogNeg	
Bit 6 <input type="checkbox"/>	ManExecute2ndSpeed	
Bit 7 <input type="checkbox"/>	ReleaseLimitSwitch	
Bit 8 <input type="checkbox"/>	HomStartStop	
Bit 9 <input type="checkbox"/>	HomSetPos	
Bit 10 <input type="checkbox"/>	HomResetPos	
Bit 11 <input type="checkbox"/>	EnableSpeedOverride	
Bit 12 <input type="checkbox"/>	EnableAccOverride	
Bit 13 <input type="checkbox"/>	EnableSRampOverride	
Bit 14 <input type="checkbox"/>	PosTeachSetPos	
Bit 15 <input type="checkbox"/>	PosTeachActPos	
Bit 16 <input type="checkbox"/>	PosExecute	
Bit 17 <input type="checkbox"/>	PosFinishTarget	
Bit 18 <input type="checkbox"/>	PosDisableFollowProfile	
Bit 19 <input type="checkbox"/>	PosStop	
Bit 20 <input type="checkbox"/>	PosModeBit0	
Bit 21 <input type="checkbox"/>	PosModeBit1	
Bit 22 <input type="checkbox"/>	PosModeBit2	
Bit 23 <input type="checkbox"/>	PosModeBit3	
Bit 24 <input type="checkbox"/>	ProfileNo_Bit0	
Bit 25 <input type="checkbox"/>	ProfileNo_Bit1	
Bit 26 <input type="checkbox"/>	ProfileNo_Bit2	
Bit 27 <input type="checkbox"/>	ProfileNo_Bit3	
Bit 28 <input type="checkbox"/>	ProfileNo_Bit4	
Bit 29 <input type="checkbox"/>	ProfileNo_Bit5	
Bit 30 <input type="checkbox"/>	ProfileNo_Bit6	
Bit 31 <input type="checkbox"/>	ProfileNo_Bit7	
Subcodes	Lenze setting	Info
C00463/1	0	Remote: MCK control
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00464

Parameter Name: C00464 Remote: Monitoring timeout		Data type: UNSIGNED_16 Index: 24111 _d = 5E2F _h
PC manual control		
Setting range (min. value unit max. value)		
200	ms	5000
Subcodes	Lenze setting	Info
C00464/1	2000 ms	Remote: Monitoring timeout
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00465

Parameter Name: C00465 Keypad: Timeout welcome screen		Data type: INTEGER_32 Index: 24110 _d = 5E2E _h
Time setting for the automatic change of the keypad display to the welcome screen		
Selection list (Lenze setting printed in bold)		
0	Never display welcome screen	
5	5 min	
15	15 min	
30	30 min	
60	60 min	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00466

Parameter Name: C00466 Keypad: Default parameter		Data type: INTEGER_32 Index: 24109 _d = 5E2D _h
Setting of the default parameter for the keypad		
Setting range (min. value unit max. value)		Lenze setting
0		65535 51
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00467

Parameter Name: C00467 Keypad: Default welcome screen		Data type: INTEGER_32 Index: 24108 _d = 5E2C _h
Selection of the welcome screen for the keypad		
Selection list (Lenze setting printed in bold)		
0	Main menu	
1	Parameter list	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00468

Parameter Name: C00468 Service code		Data type: INTEGER_32 Index: 24107 _d = 5E2B _h
This code is for device-internal use only and must not be written to by the user!		

C00469

Parameter Name: C00469 Keypad: STOP key function		Data type: INTEGER_32 Index: 24106 _d = 5E2A _h
Selection of the function for the STOP key on the keypad		
Selection list (Lenze setting printed in bold)		Info
0	No function	STOP key does not have any function
1	Inhibit controller	STOP key sets controller inhibit in the drive
2	Activate quick stop	STOP key sets quick stop in the drive
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00470

Parameter Name: C00470 LS_ParFree_b		Data type: UNSIGNED_8 Index: 24105 _d = 5E29 _h
The LS_ParFree_b SB: Setting of the signal level to be output		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C00470/1	0: FALSE	Signal level for output <i>bPar1</i> ... <i>bPar32</i>
C00470/...		
C00470/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00471

Parameter Name: C00471 LS_ParFree		Data type: UNSIGNED_16 Index: 24104 _d = 5E28 _h
The LS_ParFree SB: Setting of the words to be output		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Bit0	
...	...	
Bit 15	Bit15	
Subcodes	Lenze setting	Info
C00471/1	0	Value for output <i>wPar1</i> ... <i>wPar32</i>
C00471/...		
C00471/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00472

Parameter Name: C00472 LS_ParFree_a		Data type: INTEGER_16 Index: 24103 _d = 5E27 _h
The LS_ParFree_a SB: Setting of the analog signals to be output		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00472/1	0.00 %	Value for output <i>nPar1_a</i>
C00472/2	0.00 %	Value for output <i>nPar2_a</i>
C00472/3	100.00 %	Value for output <i>nPar3_a</i>
C00472/4	100.00 %	Value for output <i>nPar4_a</i>
C00472/5	0.00 %	Value for output <i>nPar5_a</i>
C00472/6	0.00 %	Value for output <i>nPar6_a</i>
C00472/7	0.00 %	Value for output <i>nPar7_a</i>
C00472/8	0.00 %	Value for output <i>nPar8_a</i>
C00472/9	0.00 %	Value for output <i>nPar9_a</i>
C00472/10	0.00 %	Value for output <i>nPar10_a</i>
C00472/11	0.00 %	Value for output <i>nPar11_a</i>
C00472/12	0.00 %	Value for output <i>nPar12_a</i>
C00472/13	0.00 %	Value for output <i>nPar13_a</i>
C00472/14	0.00 %	Value for output <i>nPar14_a</i>
C00472/15	0.00 %	Value for output <i>nPar15_a</i>
C00472/16	0.00 %	Value for output <i>nPar16_a</i>
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00473

Parameter Name: C00473 LS_ParFree_v		Data type: INTEGER_16 Index: 24102 _d = 5E26 _h
The LS_ParFree_v SB: Setting of the speed signals to be output		
Setting range (min. value unit max. value)		
-32767	Incr./ms	32767
Subcodes	Lenze setting	Info
C00473/1	0 incr./ms	Values for output <i>nPar1_v</i> ... <i>nPar8_v</i>
C00473/...		
C00473/8		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00474

Parameter Name: C00474 LS_ParFree_p		Data type: INTEGER_32 Index: 24101 _d = 5E25 _h
SB LS_ParFree_p : Setting of the position signals to be output		
Setting range (min. value unit max. value)		
-2147483647	Incr.	2147483647
Subcodes	Lenze setting	Info
C00474/1	0 incr.	Values for output <i>dnPar1_p</i> ... <i>dnPar8_p</i>
C00474/...		
C00474/8		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00475

Parameter Name: C00475 LS_ParFreeUnit_1_2		Data type: INTEGER_32 Index: 24100 _d = 5E24 _h
From version 02.00.00		
SB LS_ParFreeUnit / LS_ParFreeUnit_2 : Setting of the position signals to be output		
Setting range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Lenze setting	Info
C00475/1	0.0000 units	Values for output <i>dnC475_1 ... dnC475_32</i>
C00475/...		
C00475/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C00476

Parameter Name: C00476 LS_ParFree_a_2		Data type: INTEGER_16 Index: 24099 _d = 5E23 _h
From version 02.00.00		
SB LS_ParFree_a_2 : Setting of the analog signals to be output		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00476/1	0.00 %	Value for output <i>nC476_1_a</i>
C00476/2	0.00 %	Value for output <i>nC476_2_a</i>
C00476/3	0.00 %	Value for output <i>nC476_3_a</i>
C00476/4	0.00 %	Value for output <i>nC476_4_a</i>
C00476/5	0.00 %	Value for output <i>nC476_5_a</i>
C00476/6	0.00 %	Value for output <i>nC476_6_a</i>
C00476/7	0.00 %	Value for output <i>nC476_7_a</i>
C00476/8	0.00 %	Value for output <i>nC476_8_a</i>
C00476/9	0.00 %	Value for output <i>nC476_9_a</i>
C00476/10	0.00 %	Value for output <i>nC476_10_a</i>
C00476/11	0.00 %	Value for output <i>nC476_11_a</i>
C00476/12	0.00 %	Value for output <i>nC476_12_a</i>
C00476/13	0.00 %	Value for output <i>nC476_13_a</i>
C00476/14	0.00 %	Value for output <i>nC476_14_a</i>
C00476/15	0.00 %	Value for output <i>nC476_15_a</i>
C00476/16	0.00 %	Value for output <i>nC476_16_a</i>
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00477

Parameter Name: C00477 LS_ParFree_2		Data type: UNSIGNED_16 Index: 24098 _d = 5E22 _h
From version 02.00.00		
SB LS_ParFree_2 : Setting of the words to be output		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Bit0	
...	...	
Bit 15	Bit15	
Subcodes	Lenze setting	Info
C00477/1	0	Value for output wC477_1 ... wC477_32
C00477/...		
C00477/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00478

Parameter Name: C00478 LS_ParFree_v_2		Data type: INTEGER_16 Index: 24097 _d = 5E21 _h
From version 02.00.00		
SB LS_ParFree_v_2 : Setting of the speed signals to be output		
Setting range (min. value unit max. value)		
-32767	Incr./ms	32767
Subcodes	Lenze setting	Info
C00478/1	0 incr./ms	Values for output nC478_1_v ... nC478_8_v
C00478/...		
C00478/8		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00479

Parameter Name: C00479 LS_ParFree32		Data type: INTEGER_32 Index: 24096 _d = 5E20 _h
From version 02.00.00		
SB LS_ParFree32 : Setting of the 32-bit values to be output		
Setting range (min. value unit max. value)		
-2147483647		2147483647
Subcodes	Lenze setting	Info
C00479/1	0	Values for output dnC479_1 ... dnC479_8
C00479/...		
C00479/8		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00480

Parameter Name: C00480 LS_DisFree_b		Data type: UNSIGNED_16 Index: 24095 _d = 5E1F _h
The LS_DisFree_b SB: Display of the input values		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	bDis1	Signal level input <i>bDis1 ... bDis16</i>
...	...	
Bit 15	bDis16	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00481

Parameter Name: C00481 LS_DisFree		Data type: UNSIGNED_16 Index: 24094 _d = 5E1E _h
The LS_DisFree SB: Display of the input values		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Active	
...	...	
Bit 15	Active	
Subcodes		Info
C00481/1		Input values <i>wDis1 ... wDis8</i>
C00481/...		
C00481/8		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00482

Parameter Name: C00482 LS_DisFree_a		Data type: INTEGER_16 Index: 24093 _d = 5E1D _h
The LS_DisFree_a SB: Display of the input values		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes		Info
C00482/1		Input values <i>nDis1_a ... nDis8_a</i>
C00482/...		
C00482/8		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00483

Parameter Name: C00483 LS_DisFree_p		Data type: INTEGER_32 Index: 24092 _d = 5E1C _h
SB LS_DisFree_p : Display of the input values		
Display range (min. value unit max. value)		
-2147483647	Incr.	2147483647
Subcodes		Info
C00483/1		Input values <i>dnDis1_p ... dnDis8_p</i>
C00483/...		
C00483/8		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00484

Parameter | Name: **C00484 | Application units: Offset** Data type: INTEGER_16
Index: 24091_d = 5E1B_h

The [LS_DisFree_a](#) SB: Offset for display of the input variables in application unit

[▶ Display of internal process factors in application units](#)

Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00484/1	0.00 %	Application unit 1: Offset
C00484/2	0.00 %	Application unit 2: Offset
C00484/3	0.00 %	Application unit 3: Offset
C00484/4	0.00 %	Application unit 4: Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00485

Parameter | Name: **C00485 | Application units - display factor** Data type: INTEGER_32
Index: 24090_d = 5E1A_h

The [LS_DisFree_a](#) SB: Display factor for display of the input variables in application unit

[▶ Display of internal process factors in application units](#)

Setting range (min. value unit max. value)		
-65536.0000		65536.0000
Subcodes	Lenze setting	Info
C00485/1	1.0000	Application unit 1: Display factor
C00485/2	1.0000	Application unit 2: Display factor
C00485/3	1.0000	Application unit 3: Display factor
C00485/4	1.0000	Application unit 4: Display factor
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C00486

Parameter | Name: **C00486 | Application units:** Data type: VISIBLE_STRING
Index: 24089_d = 5E19_h

The [LS_DisFree_a](#) SB: Text for the display of the input variables in application unit

[▶ Display of internal process factors in application units](#)

Subcodes	Lenze setting	Info
C00486/1		Application unit 1: Text
C00486/2		Application unit 2: Text
C00486/3		Application unit 3: Text
C00486/4		Application unit 4: Text
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC-STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Character length: 7		

C00487

Parameter Name: C00487 - Application units		Data type: INTEGER_32 Index: 24088 _d = 5E18 _h
SB LS_DisFree_a : Display of the input values in a configurable application unit ▶ Display of internal process factors in application units		
Display range (min. value unit max. value)		
-21474836.47	units	21474836.47
Subcodes		Info
C00487/1		Application units 1
C00487/2		Application units 2
C00487/3		Application units 3
C00487/4		Application units 4
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00488

Parameter Name: C00488 L_JogCtrlEdgeDetect		Data type: UNSIGNED_8 Index: 24087 _d = 5E17 _h
The L_JogCtrlExtension_1 FB: Signal methodology <ul style="list-style-type: none"> • Selection whether the corresponding function is to be activated by edge or level. 		
Selection list		
0	Level	
1	Edge	
Subcodes	Lenze setting	Info
C00488/1	0: Level	InputSens.SlowDown1 • Selection of edge or level for starting slow-down function 1
C00488/2	0: Level	InputSens.Stop1 • Selection of edge or level for stop function 1
C00488/3	0: Level	InputSens.SlowDown2 • Selection of edge or level for starting slow-down function 2
C00488/4	0: Level	InputSens.Stop2 • Selection of edge or level for stop function 2
C00488/5	0: Level	InputSens.SlowDown3 • Selection of edge or level for starting slow-down function 3
C00488/6	0: Level	InputSens.Stop3 • Selection of edge or level for stop function 3
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00490

Parameter | Name: **C00490 | Position encoder selection** Data type: UNSIGNED_8
Index: 24085_d = 5E15_h

Selection of the feedback system for the generation of the actual position on the load

► [Encoder/feedback system](#)

Selection list (Lenze setting printed in bold)		Info
0	No sensor	No encoder available on the load
1	Sensor signal FreqIn12	Position encoder signal is fed via digital inputs DI1 and DI2
2	Encoder signal FreqIn67	Position encoder signal is fed via digital inputs DI6 and DI7
3	Multi encoder	Position encoder signal is supplied via multi-encoder interface
4	Resolver	Position encoder signal is supplied via resolver interface

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00492

Parameter | Name: **C00492 | Hiperface: Detected TypCode** Data type: UNSIGNED_8
Index: 24083_d = 5E13_h

From version 02.00.00

► [Encoder/feedback system: Absolute value encoder \(sin/cos encoder with hiperface\)](#)

Display range (min. value unit max. value)	
0	255

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00493

Parameter | Name: **C00493 | Hiperface: TypCode** Data type: UNSIGNED_8
Index: 24082_d = 5E12_h

From version 02.00.00

► [Encoder/feedback system: Absolute value encoder \(sin/cos encoder with hiperface\)](#)

Setting range (min. value unit max. value)		Lenze setting
0	255	0

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00494

Parameter | Name: **C00494 | Hiperface: Resolutions** Data type: UNSIGNED_32
Index: 24081_d = 5E11_h

From version 02.00.00

► [Encoder/feedback system: Absolute value encoder \(sin/cos encoder with hiperface\)](#)

Setting range (min. value unit max. value)	
0	65536

Subcodes	Lenze setting	Info
C00494/1	0	Hiperface: Number of revolutions
C00494/2	0	Hiperface: Steps per revolution

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00495

Parameter | Name: **C00495 | Speed sensor selection** Data type: UNSIGNED_8
Index: 24080_d = 5E10_h

Selection of the feedback system for the actual speed for motor control and display

► [Encoder/feedback system](#)

Selection list (Lenze setting printed in bold)		Info
0	No sensor	No sensor available for the actual speed detection
1	Sensor signal FreqIn12	Speed sensor signal is fed via the digital DI1 and DI2 inputs
2	Encoder signal FreqIn67	Speed encoder signal is fed via digital inputs DI6 and DI7
3	Multi encoder	Speed encoder signal is supplied via multi-encoder interface
4	Resolver	Speed encoder signal is supplied via resolver interface

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00496

Parameter | Name: **C00496 | Encoder evaluation method DigiIn12** Data type: UNSIGNED_8
Index: 24079_d = 5E0F_h

► [Encoder/feedback system](#)

Selection list (Lenze setting printed in bold)		Info
0	High-resolution encoders	High-precision procedure for high-resolution encoders (>=512 increments)
1	Low-resolution encoder (StateLine)	High-precision procedure for low-resolution encoders (<=128 increments)
2	Comb. encoder procedure	Combination of the first two procedures as a function of the speed (recommended procedure)
3	Edge-counting procedure	Simple edge counting procedure with adjustable scanning time (C00425)

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00497

Parameter | Name: **C00497 | Nact filter time constant** Data type: UNSIGNED_16
Index: 24078_d = 5E0E_h

► [Encoder/feedback system](#)

Setting range (min. value unit max. value)		
0.0	ms	500.0
Subcodes	Lenze setting	Info
C00497/1	1.0 ms	FreqIn12: Encoder filter time
C00497/2	1.0 ms	FreqIn67: Encoder filter time
C00497/3	1.0 ms	LS_Multi-Encoder: Encoder filter time
C00497/4	2.0 ms	LS Resolver : Encoder filter time

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10

C00498

Parameter | Name: **C00498 | Open-circuit monitoring** Data type: UNSIGNED_8
Index: 24077_d = 5E0D_h

Configuration of open-circuit monitoring for encoder/feedback system

- We recommend using the Lenze setting.
- The settings 1 ... 3 make sense if the respective encoder is not to be used as speed encoder or position encoder but within the scope of the application. Moreover, a directed disconnection of the monitoring is possible.

▶ [Encoder/feedback system](#)

Selection list		Info
0	Speed and position encoder	Open-circuit monitoring is active for the speed encoder selected in C00495 and the position encoder selected in C00490 . <ul style="list-style-type: none"> • Depending on whether a speed encoder or position encoder has been selected, the monitoring mode for the resolver and/or encoder is activated. • If no speed encoder and position encoder have been selected, open-circuit monitoring is deactivated.
1	Resolver only	Open-circuit monitoring is only active for the resolver, independent on the selection of the speed encoder and position encoder. <ul style="list-style-type: none"> • Open-circuit monitoring for the encoder is deactivated. Open-circuit monitoring is active for the resolver and encoder, independent on the selection of the speed encoder and position encoder.
2	Encoder only	Open-circuit monitoring is only active for the encoder, independent on the selection of the speed encoder and position encoder. <ul style="list-style-type: none"> • Open-circuit monitoring for the resolver is deactivated.
3	Resolver and encoder	

Subcodes	Lenze setting	Info
C00498/1	0: Speed encoder and position encoder	Open-circuit monitoring

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00505

Parameter | Name: **C00505 | Password data** Data type: VISIBLE_STRING
Index: 24070_d = 5E06_h

▶ [Device access protection](#)

Subcodes	Lenze setting	Info
C00505/1		MasterPin
C00505/2		Binding ID
C00505/3		Password

Read access Write access CINH PLC-STOP No transfer COM MOT Character length: 16

C00507

Parameter Name: C00507 Current password protection		Data type: UNSIGNED_16 Index: 24068 _d = 5E04 _h
Display of the currently active device access protection		
▶ Device access protection		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Only access to user menu	
Bit 1	Parameter write protection	
Bit 2	Parameter read protection	
Bit 3	Reserved	
Bit 4	Reserved	
Bit 5	Reserved	
Bit 6	Reserved	
Bit 7	Reserved	
Bit 8	Reserved	
Bit 9	Reserved	
Bit 10	Reserved	
Bit 11	Reserved	
Bit 12	Reserved	
Bit 13	Reserved	
Bit 14	Reserved	
Bit 15	Memory module binding on	
Subcodes		Info
C00507/1		Password protection - all communication channels
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00516

Parameter Name: C00516 Checksums		Data type: UNSIGNED_32 Index: 24059 _d = 5DFB _h
This code is for device-internal use only and must not be written to by the user!		

C00517

Parameter | Name: **C00517 | User menu** Data type: INTEGER_32
Index: 24058_d = 5DFA_h

When a system is installed, parameters must be changed time and again until the system runs satisfactorily. The user menu of a device serves to create a selection of frequently used parameters to be able to access and change these parameters quickly.

- Format: <code number>, <subcode number>
- If "0.000" is set, no entry will be displayed in the user menu.

Setting range (min. value unit max. value)		
0.000		16000.000
Subcodes	Lenze setting	Info
C00517/1	51.000	C00051 : Display of actual speed value
C00517/2	53.000	C00053 : Display of DC-bus voltage
C00517/3	54.000	C00054 : Display of motor current
C00517/4	61.000	C00061 : Display of heatsink temperature
C00517/5	137.000	C00137 : Display of device status
C00517/6	166.003	C00166/3 : Display of current error message
C00517/7	0.000	User menu: Entry 7
C00517/8	11.000	C00011 : Reference speed
C00517/9	39.001	C00039/1 : Fixed setpoint 1
C00517/10	39.002	C00039/2 : Fixed setpoint 2
C00517/11	12.000	C00012 : Accel. time - main setpoint
C00517/12	13.000	C00013 : Decel. time - main setpoint
C00517/13	15.000	C00015 : V/f base frequency
C00517/14	16.000	C00016 : Vmin boost
C00517/15	22.000	C00022 : I _{max} in motor mode
C00517/16	120.000	C00120 : Setting of motor overload (I ² xt)
C00517/17	87.000	C00087 : Rated motor speed
C00517/18	99.000	C00099 : Display of firmware version
C00517/19	200.000	C00200 : Display of firmware product type
C00517/20	0.000	User menu: Entry 20
C00517/21	0.000	User menu: Entry 21
C00517/22	0.000	User menu: Entry 22
C00517/23	0.000	User menu: Entry 23
C00517/24	105.000	C00105 : Decel. time - quick stop
C00517/25	173.000	C00173 : Mains voltage
C00517/26	0.000	User menu: Entry 26
C00517/27	0.000	User menu: Entry 27
C00517/28	0.000	User menu: Entry 28
C00517/29	0.000	User menu: Entry 29
C00517/30	0.000	User menu: Entry 30
C00517/31	0.000	User menu: Entry 31
C00517/32	0.000	User menu: Entry 32

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1000

C00560

Parameter Name: C00560 Fan switching status		Data type: UNSIGNED_8 Index: 24015 _d = 5DCF _h
Display of the function status of the device fans		
Selection list		
0	Off	
1	On	
2	No fan	
Subcodes		Info
C00560/1		Switching status - internal fan
C00560/2		Switching status - heatsink fan
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00561

Parameter Name: C00561 Failure indication		Data type: UNSIGNED_8 Index: 24014 _d = 5DC _E _h
Failure display of device fans and motor phases		
Selection list		
0	No error	
1	Error	
Subcodes		Info
C00561/1		Internal fan
C00561/2		Heatsink fan
C00561/3		Motor phase U
C00561/4		Motor phase V
C00561/5		Motor phase W
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00565

Parameter Name: C00565 Resp. to mains phase failure		Data type: UNSIGNED_8 Index: 24010 _d = 5DCA _h
Response to the failure of mains phases		
Selection list (Lenze setting printed in bold)		
0	No Reaction	
1	Fault	
5	Warning	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00566

Parameter Name: C00566 Resp. to fan failure		Data type: UNSIGNED_8 Index: 24009 _d = 5DC9 _h
Response to the detection of a fan failure		
Selection list (Lenze setting printed in bold)		
0	No Reaction	
1	Fault	
5	Warning	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00567

Parameter Name:	C00567 Resp. to speed controller limited	Data type: UNSIGNED_8 Index: 24008 _d = 5DC8 _h
Response if speed controller output is limited (<i>bLimSpeedCtrlOut</i> = TRUE)		
Selection list (Lenze setting printed in bold)		
0	No Reaction	
1	Fault	
5	Warning	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00569

Parameter Name:	C00569 Resp. to peak current	Data type: UNSIGNED_8 Index: 24006 _d = 5DC6 _h
Configuration of monitoring of the motor control (group 1)		
Selection list		
0	No Reaction	
1	Fault	
5	Warning	
Subcodes	Lenze setting	Info
C00569/1	0: No Reaction	Response for overcurrent detection and clamp operation
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00570

Parameter Name:	C00570 Resp. to controller limitations	Data type: UNSIGNED_8 Index: 24005 _d = 5DC5 _h
Configuration of monitoring of the motor control (group 2)		
Selection list		
0	No Reaction	
1	Fault	
5	Warning	
Subcodes	Lenze setting	Info
C00570/1	0: No Reaction	Response if direct-axis current controller is limited • e.g. at servo control (SC)
C00570/2	0: No Reaction	Response if cross current controller is limited • e.g. at servo control (SC)
C00570/3	0: No Reaction	Response if torque setpoint is limited • Limitation of the speed controller output, the differential setpoint precontrol, and of the additive torque at (SC) servo control and (SLVC) sensorless vector control.
C00570/4	0: No Reaction	Response if field controller is limited
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00572

Parameter Name:	C00572 Brake resistor overload threshold	Data type: UNSIGNED_8 Index: 24003 _d = 5DC3 _h
Adjustable threshold for monitoring the brake resistor utilisation		
• The response for reaching the threshold can be selected in C00574 .		
Setting range (min. value unit max. value)		Lenze setting
0	%	100
		100 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00574

Parameter Name:			Data type: UNSIGNED_8 Index: 24001 _d = 5DC1 _h
C00574 Resp. to brake resist. overtemp.			
Response which is triggered if the threshold set in C00572 for monitoring brake resistor utilisation is reached.			
Selection list (Lenze setting printed in bold)			
0	No Reaction		
1	Fault		
5	Warning		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00576

Parameter Name:			Data type: UNSIGNED_16 Index: 23999 _d = 5DBF _h
C00576 SC: Field feedforward control			
Point of action of the direct-axis current setpoint precontrol for an early reduction of the field current. In this way, the acceleration behaviour can be improved in the field weakening range.			
<ul style="list-style-type: none"> The entry [%] refers to the slip of the asynchronous motor. 			
Setting range (min. value unit max. value)		Lenze setting	
0	%	600	200 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1			

C00577

Parameter Name:			Data type: UNSIGNED_16 Index: 23998 _d = 5DBE _h
C00577 SC: Vp field weakening controller			
Proportional gain of the field weakening controller			
<ul style="list-style-type: none"> When "0" is set, the P component of the controller is deactivated. The recommended setting is in the range between 0 and 0.0020 			
Setting range (min. value unit max. value)		Lenze setting	
0.0000		2.0000	0.0010
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000			

C00578

Parameter Name:			Data type: UNSIGNED_16 Index: 23997 _d = 5DBD _h
C00578 SC: Tn field weakening controller			
Time constant of the field weakening controller			
<ul style="list-style-type: none"> The recommended setting is in the range between 10 and 30 ms 			
Setting range (min. value unit max. value)		Lenze setting	
0.1	ms	6000.0	20.0 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10			

C00579

Parameter Name:			Data type: UNSIGNED_8 Index: 23996 _d = 5DBC _h
C00579 Resp. to max. speed/output freq. reached			
Response when the max. speed limit (C00909) or output frequency limit (C00910) has been reached.			
Selection list (Lenze setting printed in bold)			
0	No Reaction		
1	Fault		
5	Warning		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00580

Parameter Name: C00580 Resp. to operating system error		Data type: UNSIGNED_8 Index: 23995 _d = 5DBB _h
From version 02.00.00		
Response if the required computing time of the application exceeds the available computing time.		
Selection list		
0	No Reaction	
1	Fault	
5	Warning	
Subcodes	Lenze setting	Info
C00580/1	0: No Reaction	Resp. to runtime exceedance
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00581

Parameter Name: C00581 Resp. to LS_SetError_x		Data type: UNSIGNED_8 Index: 23994 _d = 5DBA _h
Selection of the error responses for application error messages		
<ul style="list-style-type: none"> An application error message is tripped by a FALSE/TRUE edge at the binary inputs <i>bSetError1...4</i>. 		
Selection list		
0	No Reaction	
1	Fault	
2	Trouble	
3	TroubleQuickStop	
4	WarningLocked	
5	Warning	
6	Information	
Subcodes	Lenze setting	Info
C00581/1	0: No Reaction	LS_SetError 1 : Resp. to bSetError1
C00581/2	0: No Reaction	LS_SetError 1 : Resp. to bSetError2
C00581/3	0: No Reaction	LS_SetError 1 : Resp. to bSetError3
C00581/4	0: No Reaction	LS_SetError 1 : Resp. to bSetError4
C00581/5	0: No Reaction	LS_SetError 2 : Resp. to bSetError1
C00581/6	0: No Reaction	LS_SetError 2 : Resp. to bSetError2
C00581/7	0: No Reaction	LS_SetError 2 : Resp. to bSetError3
C00581/8	0: No Reaction	LS_SetError 2 : Resp. to bSetError4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00582

Parameter Name: C00582 Resp. to heatsink temp. > shutdown temp. -5°C		Data type: UNSIGNED_8 Index: 23993 _d = 5DB9 _h
Response if the heatsink temperature has reached the switch-off temperature threshold.		
Selection list (Lenze setting printed in bold)		
0	No Reaction	
1	Fault	
5	Warning	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00583

Parameter Name: C00583 Resp. to motor temperature KTY		Data type: UNSIGNED_8 Index: 23992 _d = 5DB8 _h
Response to motor overtemperature		
<ul style="list-style-type: none"> The motor temperature is measured via the resolver or encoder cable. 		
<ul style="list-style-type: none"> ▶ Encoder/feedback system: Motor temperature monitoring (KTY) 		
Selection list		
0	No Reaction	
1	Fault	
3	TroubleQuickStop	
4	WarningLocked	
5	Warning	
6	Information	
Subcodes	Lenze setting	Info
C00583/1	1: Fault	Resp. to motor overtemp. KTY resolver
C00583/2	1: Fault	Resp. to motor overtemp. KTY MultiEncoder
C00583/3	5: Warning	Resp. to motor temp. > C00121 resolver
C00583/4	5: Warning	Resp. to motor temp. > C00121 encoder
C00583/5	1: Fault	Resp. to temp. sensor error KTY resolver
C00583/6	1: Fault	Resp. to temp. sensor error KTY MultiEncoder
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00585

Parameter Name: C00585 Resp. to motor overtemp. PTC		Data type: UNSIGNED_8 Index: 23990 _d = 5DB6 _h
Response to motor overtemperature		
<ul style="list-style-type: none"> The motor temperature is measured by means of a PTC thermistor at terminal X106. 		
Selection list (Lenze setting printed in bold)		
0	No Reaction	
1	Fault	
5	Warning	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00586

Parameter Name: C00586 Resp. to encoder open circuit HTL		Data type: UNSIGNED_8 Index: 23989 _d = 5DB5 _h
Response to encoder feedback system failure or encoder feedback system track failure due to open circuit		
Selection list (Lenze setting printed in bold)		
0	No Reaction	
1	Fault	
5	Warning	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00588

Parameter Name: C00588 Resp. to max. speed at switching freq.	Data type: UNSIGNED_8 Index: 23987 _d = 5DB3 _h
Response if the maximum speed for the set inverter switching frequency is reached (C00018)	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
5	Warning
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00590

Parameter Name: C00590 Resp. to switching frequency red.	Data type: UNSIGNED_8 Index: 23985 _d = 5DB1 _h
Response to reduction of the inverter switching frequency (C00018)	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
5	Warning
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00592

Parameter Name: C00592 Resp. to CAN bus connection	Data type: UNSIGNED_8 Index: 23983 _d = 5DAF _h	
Configuration of monitoring of the CAN interface (group 1)		
▶ System bus "CAN on board"		
Selection list		
0	No Reaction	
1	Fault	
2	Trouble	
3	TroubleQuickStop	
4	WarningLocked	
5	Warning	
6	Information	
Subcodes	Lenze setting	Info
C00592/1	0: No Reaction	Response to incorrect telegram for CAN communication
C00592/2	0: No Reaction	Response to "BusOff" (bus system switched off)
C00592/3	0: No Reaction	Response to warnings of the CAN controller
C00592/4	0: No Reaction	Response to communication stop of a CAN bus node
C00592/5	0: No Reaction	Response to an event in the case of monitoring via heartbeat protocol
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00593

Parameter | Name: **C00593 | Resp. to CANx_IN monitoring** Data type: UNSIGNED_8
Index: 23982_d = 5DAE_h

Configuration of monitoring of the CAN interface (group 2)

► [System bus "CAN on board"](#)

Selection list		
0	No Reaction	
1	Fault	
2	Trouble	
3	TroubleQuickStop	
4	WarningLocked	
5	Warning	
6	Information	
Subcodes	Lenze setting	Info
C00593/1	0: No Reaction	Response if the monitoring time set in C00357/1 for the reception of the PDO CAN1_IN is exceeded.
C00593/2	0: No Reaction	Response if the monitoring time set in C00357/2 for the reception of the PDO CAN2_IN is exceeded.
C00593/3	0: No Reaction	Response if the monitoring time set in C00357/3 for the reception of the PDO CAN3_IN is exceeded.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00594

Parameter | Name: **C00594 | Resp. to control word error** Data type: UNSIGNED_8
Index: 23981_d = 5DAD_h

Configuration of device control monitoring

Selection list		
0	No Reaction	
1	Fault	
2	Trouble	
3	TroubleQuickStop	
5	Warning	
Subcodes	Lenze setting	Info
C00594/1	1: Fault	Response if error bit 14 in the CAN control word is set.
C00594/2	1: Fault	Response if error bit 14 in the MCI control word is set.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00595

Parameter Name: C00595 MCK: Resp. to MCK error		Data type: UNSIGNED_8 Index: 23980 _d = 5DAC _h
Configuration of monitoring of the Motion Control Kernel		
▶ Basic drive functions		
Selection list		
0	No Reaction	
1	Fault	
3	TroubleQuickStop	
4	WarningLocked	
5	Warning	
6	Information	
Subcodes	Lenze setting	Info
C00595/1	3: TroubleQuickStop	Response if the input <i>bLimitSwitchPos</i> for travel range monitoring is set to FALSE (fail-safe) by the positive hardware limit switch .
C00595/2	3: TroubleQuickStop	Response if the input <i>bLimitSwitchNeg</i> for travel range monitoring is set to FALSE (fail-safe) by the negative hardware limit switch .
C00595/3	3: TroubleQuickStop	Response for detection that the position is beyond the positive software limit position (C01229/1).
C00595/4	3: TroubleQuickStop	Response for detection that the position is beyond the negative software limit position (C01229/2).
C00595/5	5: Warning	Response if following error limit 1 is exceeded (C01215/1)
C00595/6	5: Warning	Response if following error limit 2 is exceeded (C01215/2)
C00595/7	3: TroubleQuickStop	Response if the maximum travel distance (display in C01213/1) is exceeded
C00595/8	4: WarningLocked	Response to start procedures with reference condition when the reference is not set
C00595/9	4: WarningLocked	Response to a non-supported positioning mode
C00595/10	4: WarningLocked	Response to implausible profile set data
C00595/11	5: Warning	Response to the selection of an invalid operating mode of the MCK
C00595/12	4: WarningLocked	Response to indicating an invalid profile data set
C00595/13	5: Warning	Response to an error of the FB L_MckCtrlInterface_1
C00595/14	4: WarningLocked	Response to a profile start with a target position outside the software limit positions (C01229/1 and C01229/2).
C00595/15	1: Fault	MCK: Resp. to remote timeout
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00597

Parameter Name: C00597 Resp. to motor phase failure		Data type: UNSIGNED_8 Index: 23978 _d = 5DAA _h
Response to motor phase failure		
<ul style="list-style-type: none"> If a phase current does not exceed the threshold set in C00599 for more than one period, the response set here will be triggered. 		
Selection list (Lenze setting printed in bold)		
0	No Reaction	
1	Fault	
5	Warning	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00598

Parameter | Name: **C00598 | Resp. to open circuit AINx** Data type: UNSIGNED_8
Index: 23977_d = 5DA9_h

Configuration of monitoring of the analog inputs

[▶ Analog terminals](#)

Selection list		
0	No Reaction	
1	Fault	
2	Trouble	
3	TroubleQuickStop	
5	Warning	
Subcodes	Lenze setting	Info
C00598/1	3: TroubleQuickStop	Response to open circuit at AIN1 if configured as 4 ... 20 mA current loop
C00598/2	3: TroubleQuickStop	Response to open circuit at AIN2 when being configured as 4 ... 20 mA-current loop
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00599

Parameter | Name: **C00599 | Motor phase failure threshold** Data type: INTEGER_16
Index: 23976_d = 5DA8_h

Threshold for motor phase failure monitoring

- 100 % ≙ rated inverter current ([C00098](#))
- If a phase current does not exceed the threshold set here for more than one period, the response to motor phase failure set in [C00597](#) will be triggered.

Setting range (min. value unit max. value)			Lenze setting
1.00	%	100.00	5.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00600

Parameter | Name: **C00600 | Resp. to DC bus voltage** Data type: UNSIGNED_8
Index: 23975_d = 5DA7_h

Configuration of monitoring of the motor control (group 3)

Selection list		
1	Fault	
2	Trouble	
Subcodes	Lenze setting	Info
C00600/1	2: Trouble	Response to DC bus undervoltage
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00601

Parameter | Name: **C00601 | Del. resp. to fault: DC bus overvoltage** Data type: UNSIGNED_16
Index: 23974_d = 5DA6_h

Error response delay times

Setting range (min. value unit max. value)		
0.000	s	65.000
Subcodes	Lenze setting	Info
C00601/1	2.000 s	Delay time for triggering the "DC-bus overvoltage" error <ul style="list-style-type: none"> • If a DC-bus overvoltage occurs, an error will not be triggered until the set delay time has elapsed.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00602

Parameter Name: C00602 Resp. to earth fault	Data type: UNSIGNED_8 Index: 23973 _d = 5DA5 _h
Response to earth fault in the motor phase(s)	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00603

Parameter Name: C00603 Resp. to feedback	Data type: UNSIGNED_8 Index: 23972 _d = 5DA4 _h	
Response of different monitoring modes for the encoder/feedback system		
Encoder/feedback system		
Selection list		
0	No Reaction	
1	Fault	
2	Trouble	
3	TroubleQuickStop	
4	WarningLocked	
5	Warning	
6	Information	
Subcodes	Lenze setting	Info
C00603/1	1: Fault	Resp. to MultiEncoder open circuit
C00603/2	1: Fault	Resp. to resolver open circuit
C00603/3	1: Fault	Resp. to encoder comm. error
C00603/4	1: Fault	Resp. to encoder angular drift monit.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00604

Parameter Name: C00604 Resp. to device overload (Ixt)	Data type: UNSIGNED_8 Index: 23971 _d = 5DA3 _h
Response if the adjustable device utilisation threshold (C00123) is reached.	
<ul style="list-style-type: none"> The current device utilisation is displayed in C00064. 	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
5	Warning
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00606

Parameter Name: C00606 Resp. to motor overload (I*xt)	Data type: UNSIGNED_8 Index: 23969 _d = 5DA1 _h
Response if the adjustable motor overload threshold (C00120) is reached.	
<ul style="list-style-type: none"> The current thermal motor load is displayed in C00066. 	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
5	Warning
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00607

Parameter Name:	Data type: UNSIGNED_8 Index: 23968 _d = 5DA0 _h
C00607 Resp. to max freq. feedb. DIG12/67	
Response when the maximum input frequency has been reached via the digital inputs.	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
5	Warning
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00608

Parameter Name:	Data type: UNSIGNED_8 Index: 23967 _d = 5D9F _h
C00608 Resp. to maximum torque	
Response if the maximum torque (C00057) is reached.	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
5	Warning
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00609

Parameter Name:	Data type: UNSIGNED_8 Index: 23966 _d = 5D9E _h
C00609 Resp. to maximum current	
Response if the maximum current (C00022 , C00023) is reached.	
Selection list (Lenze setting printed in bold)	
0	No Reaction
1	Fault
5	Warning
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00610

Parameter Name:	Data type: UNSIGNED_16 Index: 23964 _d = 5D9D _h
C00610 16-bit connection table	
This code is for device-internal use only and must not be written to by the user!	

C00611

Parameter Name:	Data type: UNSIGNED_16 Index: 23964 _d = 5D9C _h
C00611 Bool connection table	
This code is for device-internal use only and must not be written to by the user!	

C00612

Parameter Name:	Data type: UNSIGNED_16 Index: 23963 _d = 5D9B _h
C00612 32-bit connection table	
This code is for device-internal use only and must not be written to by the user!	

C00613

Parameter Name:	Data type: UNSIGNED_16 Index: 23962 _d = 5D9A _h
C00613 16-bit connection table AdditionalFBsHL	
This code is for device-internal use only and must not be written to by the user!	

C00615

Parameter Name:	Data type: UNSIGNED_16 Index: 23960 _d = 5D98 _h
C00615 Bool connection table AdditionalFBsHL	
This code is for device-internal use only and must not be written to by the user!	

C00617

Parameter Name: C00617 32-bit connection table AdditionalFBsHL	Data type: UNSIGNED_16 Index: 23958 _d = 5D96 _h
This code is for device-internal use only and must not be written to by the user!	

C00620

Parameter Name: C00620 System connection list: 16-bit	Data type: UNSIGNED_16 Index: 23955 _d = 5D93 _h
---	---

Connection parameters: 16-bit inputs

- Selection of the 16 bit output signals to be connected to the 16 bit input signals
- The selection list contains all 16 bit output signals which can be assigned to the 16 bit inputs displayed by the subcodes.

Selection list		
See selection list - analog signals		
Subcodes	Lenze setting	Info
C00620/1	1003: LA_nCtrl_nMotorSpeedAct_a	LS_AnalogOutput : nOut1_a (V)
C00620/2	0: Not connected	LP_CanOut1 : wState
C00620/3	0: Not connected	LP_CanOut1 : wOut2
C00620/4	0: Not connected	LP_CanOut1 : wOut3
C00620/5	0: Not connected	LP_CanOut1 : wOut4
C00620/6	0: Not connected	LP_CanOut2 : wOut1
C00620/7	0: Not connected	LP_CanOut2 : wOut2
C00620/8	0: Not connected	LP_CanOut2 : wOut3
C00620/9	0: Not connected	LP_CanOut2 : wOut4
C00620/10	0: Not connected	LP_CanOut3 : wOut1
C00620/11	0: Not connected	LP_CanOut3 : wOut2
C00620/12	0: Not connected	LP_CanOut3 : wOut3
C00620/13	0: Not connected	LP_CanOut3 : wOut4
C00620/14	0: Not connected	LS_DisFree_a : nDis1_a
C00620/15	0: Not connected	LS_DisFree_a : nDis2_a
C00620/16	0: Not connected	LS_DisFree_a : nDis3_a
C00620/17	0: Not connected	LS_DisFree_a : nDis4_a
C00620/18	0: Not connected	LS_DisFree : wDis1
C00620/19	0: Not connected	LS_DisFree : wDis2
C00620/20	0: Not connected	LS_DisFree : wDis3
C00620/21	0: Not connected	LS_DisFree : wDis4
C00620/22	0: Not connected	LP_MciOut : wState
C00620/23	0: Not connected	LP_MciOut : wOut2
C00620/24	0: Not connected	LP_MciOut : wOut3
C00620/25	0: Not connected	LP_MciOut : wOut4
C00620/26	0: Not connected	LP_MciOut : wOut5
C00620/27	0: Not connected	LP_MciOut : wOut6
C00620/28	0: Not connected	LP_MciOut : wOut7
C00620/29	0: Not connected	LP_MciOut : wOut8
C00620/30	0: Not connected	LP_MciOut : wOut9
C00620/31	0: Not connected	LP_MciOut : wOut10
C00620/32	0: Not connected	LP_MciOut : wOut11
C00620/33	0: Not connected	LP_MciOut : wOut12
C00620/34	0: Not connected	LP_MciOut : wOut13

Parameter Name: C00620 System connection list: 16-bit		Data type: UNSIGNED_16 Index: 23955 _d = 5D93 _h
C00620/35	0: Not connected	LP_MciOut : wOut14
C00620/36	0: Not connected	LP_MciOut : wOut15
C00620/37	0: Not connected	LP_MciOut : wOut16
C00620/38	0: Not connected	LS_AnalogOutput : nOut2_a (V)
C00620/39	0: Not connected	LS_AnalogOutput : nOut1_a (I)
C00620/40	0: Not connected	LS_AnalogOutput : nOut2_a (I)
C00620/41	0: Not connected	LS_DisFree_a : nDis5_a
C00620/42	0: Not connected	LS_DisFree_a : nDis6_a
C00620/43	0: Not connected	LS_DisFree_a : nDis7_a
C00620/44	0: Not connected	LS_DisFree_a : nDis8_a
C00620/45	0: Not connected	LS_DisFree : wDis5
C00620/46	0: Not connected	LS_DisFree : wDis6
C00620/47	0: Not connected	LS_DisFree : wDis7
C00620/48	0: Not connected	LS_DisFree : wDis8
C00620/49	0: Not connected	LS_ParReadWrite_1 : wParIndex
C00620/50	0: Not connected	LS_ParReadWrite_1 : wParSubindex
C00620/51	0: Not connected	LS_ParReadWrite_1 : wInHWord
C00620/52	0: Not connected	LS_ParReadWrite_1 : wInLWord
C00620/53	0: Not connected	LS_ParReadWrite_2 : wParIndex
C00620/54	0: Not connected	LS_ParReadWrite_2 : wParSubindex
C00620/55	0: Not connected	LS_ParReadWrite_2 : wInHWord
C00620/56	0: Not connected	LS_ParReadWrite_2 : wInLWord
C00620/57	0: Not connected	LS_ParReadWrite_3 : wParIndex
C00620/58	0: Not connected	LS_ParReadWrite_3 : wParSubindex
C00620/59	0: Not connected	LS_ParReadWrite_3 : wInHWord
C00620/60	0: Not connected	LS_ParReadWrite_3 : wInLWord
C00620/61	0: Not connected	LS_ParReadWrite_4 : wParIndex
C00620/62	0: Not connected	LS_ParReadWrite_4 : wParSubindex
C00620/63	0: Not connected	LS_ParReadWrite_4 : wInHWord
C00620/64	0: Not connected	LS_ParReadWrite_4 : wInLWord
C00620/65	0: Not connected	LS_ParReadWrite_5 : wParIndex
C00620/66	0: Not connected	LS_ParReadWrite_5 : wParSubindex
C00620/67	0: Not connected	LS_ParReadWrite_5 : wInHWord
C00620/68	0: Not connected	LS_ParReadWrite_5 : wInLWord
C00620/69	0: Not connected	LS_ParReadWrite_6 : wParIndex
C00620/70	0: Not connected	LS_ParReadWrite_6 : wParSubindex
C00620/71	0: Not connected	LS_ParReadWrite_6 : wInHWord
C00620/72	0: Not connected	LS_ParReadWrite_6 : wInLWord
C00620/73	0: Not connected	Reserved
C00620/74	0: Not connected	Reserved
C00620/75	0: Not connected	Reserved
C00620/76	0: Not connected	Reserved
C00620/77	0: Not connected	Reserved
C00620/78	0: Not connected	Reserved

Parameter Name:		Data type: UNSIGNED_16 Index: 23955 _d = 5D93 _h
C00620 System connection list: 16-bit		
C00620/79	0: Not connected	Reserved
C00620/80	0: Not connected	Reserved
C00620/81	0: Not connected	Reserved
C00620/82	0: Not connected	Reserved
C00620/83	0: Not connected	Reserved
C00620/84	0: Not connected	Reserved
C00620/85	0: Not connected	Reserved
C00620/86	0: Not connected	Reserved
C00620/87	0: Not connected	Reserved
C00620/88	0: Not connected	Reserved
C00620/89	0: Not connected	LS_RetainData : wIn1
C00620/90	0: Not connected	LS_RetainData : wIn2
C00620/91	0: Not connected	LS_RetainData : wIn3
C00620/92	0: Not connected	LS_RetainData : wIn4
C00620/93	0: Not connected	LS_AxisBusIn : wLine1
C00620/94	0: Not connected	LS_AxisBusIn : wLine2
C00620/95	0: Not connected	LS_AxisBusIn : wLine3
C00620/96	0: Not connected	LS_AxisBusIn : wCas1
C00620/97	0: Not connected	LS_AxisBusIn : wCas2
C00620/98	0: Not connected	LS_AxisBusIn : wCas3
C00620/99	0: Not connected	LS_AxisBusIn : wCas4
C00620/100	0: Not connected	LS_AxisBusAux : wAuxOut1
C00620/101	0: Not connected	LS_AxisBusAux : wAuxOut2
C00620/102	0: Not connected	LS_AxisBusAux : wAuxOut3
C00620/103	0: Not connected	LS_AxisBusAux : wAuxOut4
C00620/104	0: Not connected	LS_AxisBusAux : wSelectSlave
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00621

Parameter Name:		Data type: UNSIGNED_16 Index: 23954 _d = 5D92 _h
C00621 System connection list: Bool		
Connection parameters: Binary inputs		
<ul style="list-style-type: none"> • Selection of the binary output signals to be connected to the binary input signals • The selection list contains all binary output signals which can be assigned to the binary inputs mapped by the subcodes. 		
Selection list		
See selection list - digital signals		
Subcodes	Lenze setting	Info
C00621/1	1001: LA_nCtrl_bDriveFail	LS_DigitalOutput : bRelay
C00621/2	1000: LA_nCtrl_bDriveReady	LS_DigitalOutput : bOut1
C00621/3	0: Not connected	LS_DigitalInput : bCountIn1_Reset
C00621/4	0: Not connected	LS_DigitalInput : bCountIn1_LoadStartValue
C00621/5	0: Not connected	LP_CanOut1 : bState_B0
C00621/6	0: Not connected	LP_CanOut1 : bState_B1
C00621/7	0: Not connected	LP_CanOut1 : bState_B2
C00621/8	0: Not connected	LP_CanOut1 : bState_B3

Parameter Name: C00621 System connection list: Bool		Data type: UNSIGNED_16 Index: 23954 _d = 5D92 _h
C00621/9	0: Not connected	LP_CanOut1 : bState_B4
C00621/10	0: Not connected	LP_CanOut1 : bState_B5
C00621/11	0: Not connected	LP_CanOut1 : bState_B6
C00621/12	0: Not connected	LP_CanOut1 : bState_B7
C00621/13	0: Not connected	LP_CanOut1 : bState_B8
C00621/14	0: Not connected	LP_CanOut1 : bState_B9
C00621/15	0: Not connected	LP_CanOut1 : bState_B10
C00621/16	0: Not connected	LP_CanOut1 : bState_B11
C00621/17	0: Not connected	LP_CanOut1 : bState_B12
C00621/18	0: Not connected	LP_CanOut1 : bState_B13
C00621/19	0: Not connected	LP_CanOut1 : bState_B14
C00621/20	0: Not connected	LP_CanOut1 : bState_B15
C00621/21	0: Not connected	LS_DisFree_b : bDis1
C00621/22	0: Not connected	LS_DisFree_b : bDis2
C00621/23	0: Not connected	LS_DisFree_b : bDis3
C00621/24	0: Not connected	LS_DisFree_b : bDis4
C00621/25	0: Not connected	LS_DisFree_b : bDis5
C00621/26	0: Not connected	LS_DisFree_b : bDis6
C00621/27	0: Not connected	LS_DisFree_b : bDis7
C00621/28	0: Not connected	LS_DisFree_b : bDis8
C00621/29	0: Not connected	LP_CanOut2 : bOut1_B0
C00621/30	0: Not connected	LP_CanOut2 : bOut1_B1
C00621/31	0: Not connected	LP_CanOut2 : bOut1_B2
C00621/32	0: Not connected	LP_CanOut2 : bOut1_B3
C00621/33	0: Not connected	LP_CanOut2 : bOut1_B4
C00621/34	0: Not connected	LP_CanOut2 : bOut1_B5
C00621/35	0: Not connected	LP_CanOut2 : bOut1_B6
C00621/36	0: Not connected	LP_CanOut2 : bOut1_B7
C00621/37	0: Not connected	LP_CanOut2 : bOut1_B8
C00621/38	0: Not connected	LP_CanOut2 : bOut1_B9
C00621/39	0: Not connected	LP_CanOut2 : bOut1_B10
C00621/40	0: Not connected	LP_CanOut2 : bOut1_B11
C00621/41	0: Not connected	LP_CanOut2 : bOut1_B12
C00621/42	0: Not connected	LP_CanOut2 : bOut1_B13
C00621/43	0: Not connected	LP_CanOut2 : bOut1_B14
C00621/44	0: Not connected	LP_CanOut2 : bOut1_B15
C00621/45	0: Not connected	LP_CanOut3 : bOut1_B0
C00621/46	0: Not connected	LP_CanOut3 : bOut1_B1
C00621/47	0: Not connected	LP_CanOut3 : bOut1_B2
C00621/48	0: Not connected	LP_CanOut3 : bOut1_B3
C00621/49	0: Not connected	LP_CanOut3 : bOut1_B4
C00621/50	0: Not connected	LP_CanOut3 : bOut1_B5
C00621/51	0: Not connected	LP_CanOut3 : bOut1_B6
C00621/52	0: Not connected	LP_CanOut3 : bOut1_B7

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00621

Parameter Name: C00621 System connection list: Bool		Data type: UNSIGNED_16 Index: 23954 _d = 5D92 _h
C00621/53	0: Not connected	LP_CanOut3 : bOut1_B8
C00621/54	0: Not connected	LP_CanOut3 : bOut1_B9
C00621/55	0: Not connected	LP_CanOut3 : bOut1_B10
C00621/56	0: Not connected	LP_CanOut3 : bOut1_B11
C00621/57	0: Not connected	LP_CanOut3 : bOut1_B12
C00621/58	0: Not connected	LP_CanOut3 : bOut1_B13
C00621/59	0: Not connected	LP_CanOut3 : bOut1_B14
C00621/60	0: Not connected	LP_CanOut3 : bOut1_B15
C00621/61	0: Not connected	LP_MciOut : bState_B0
C00621/62	0: Not connected	LP_MciOut : bState_B1
C00621/63	0: Not connected	LP_MciOut : bState_B2
C00621/64	0: Not connected	LP_MciOut : bState_B3
C00621/65	0: Not connected	LP_MciOut : bState_B4
C00621/66	0: Not connected	LP_MciOut : bState_B5
C00621/67	0: Not connected	LP_MciOut : bState_B6
C00621/68	0: Not connected	LP_MciOut : bState_B7
C00621/69	0: Not connected	LP_MciOut : bState_B8
C00621/70	0: Not connected	LP_MciOut : bState_B9
C00621/71	0: Not connected	LP_MciOut : bState_B10
C00621/72	0: Not connected	LP_MciOut : bState_B11
C00621/73	0: Not connected	LP_MciOut : bState_B12
C00621/74	0: Not connected	LP_MciOut : bState_B13
C00621/75	0: Not connected	LP_MciOut : bState_B14
C00621/76	0: Not connected	LP_MciOut : bState_B15
C00621/77	0: Not connected	LP_MciOut : bOut2_B0
C00621/78	0: Not connected	LP_MciOut : bOut2_B1
C00621/79	0: Not connected	LP_MciOut : bOut2_B2
C00621/80	0: Not connected	LP_MciOut : bOut2_B3
C00621/81	0: Not connected	LP_MciOut : bOut2_B4
C00621/82	0: Not connected	LP_MciOut : bOut2_B5
C00621/83	0: Not connected	LP_MciOut : bOut2_B6
C00621/84	0: Not connected	LP_MciOut : bOut2_B7
C00621/85	0: Not connected	LP_MciOut : bOut2_B8
C00621/86	0: Not connected	LP_MciOut : bOut2_B9
C00621/87	0: Not connected	LP_MciOut : bOut2_B10
C00621/88	0: Not connected	LP_MciOut : bOut2_B11
C00621/89	0: Not connected	LP_MciOut : bOut2_B12
C00621/90	0: Not connected	LP_MciOut : bOut2_B13
C00621/91	0: Not connected	LP_MciOut : bOut2_B14
C00621/92	0: Not connected	LP_MciOut : bOut2_B15
C00621/93	0: Not connected	LS_SetError_1 : bSetError1
C00621/94	0: Not connected	LS_SetError_1 : bSetError2
C00621/95	0: Not connected	LS_SetError_1 : bSetError3
C00621/96	0: Not connected	LS_SetError_1 : bSetError4

Parameter Name: C00621 System connection list: Bool		Data type: UNSIGNED_16 Index: 23954 _d = 5D92 _h
C00621/97	0: Not connected	LS_DigitalInput : bCountIn6_Reset
C00621/98	0: Not connected	LS_DigitalInput : bCountIn6_LoadStartValue
C00621/99	0: Not connected	LS_DigitalOutput : bOut2
C00621/100	0: Not connected	LS_DigitalOutput : bOut3
C00621/101	0: Not connected	LS_DigitalOutput : bOut HighCurrent
C00621/102	0: Not connected	LS_DisFree_b : bDis9
C00621/103	0: Not connected	LS_DisFree_b : bDis10
C00621/104	0: Not connected	LS_DisFree_b : bDis11
C00621/105	0: Not connected	LS_DisFree_b : bDis12
C00621/106	0: Not connected	LS_DisFree_b : bDis13
C00621/107	0: Not connected	LS_DisFree_b : bDis14
C00621/108	0: Not connected	LS_DisFree_b : bDis15
C00621/109	0: Not connected	LS_DisFree_b : bDis16
C00621/110	0: Not connected	Reserved
C00621/111	0: Not connected	LS_ParReadWrite_1 : bExecute
C00621/112	0: Not connected	LS_ParReadWrite_1 : bReadWrite
C00621/113	0: Not connected	LS_ParReadWrite_2 : bExecute
C00621/114	0: Not connected	LS_ParReadWrite_2 : bReadWrite
C00621/115	0: Not connected	LS_ParReadWrite_3 : bExecute
C00621/116	0: Not connected	LS_ParReadWrite_3 : bReadWrite
C00621/117	0: Not connected	LS_ParReadWrite_4 : bExecute
C00621/118	0: Not connected	LS_ParReadWrite_4 : bReadWrite
C00621/119	0: Not connected	LS_ParReadWrite_5 : bExecute
C00621/120	0: Not connected	LS_ParReadWrite_5 : bReadWrite
C00621/121	0: Not connected	LS_ParReadWrite_6 : bExecute
C00621/122	0: Not connected	LS_ParReadWrite_6 : bReadWrite
C00621/123	0: Not connected	LS_WriteParamList : bExecute
C00621/124	0: Not connected	LS_WriteParamList : bSelectWriteValue_1
C00621/125	0: Not connected	LS_WriteParamList : bSelectWriteValue_2
C00621/126	0: Not connected	LS_CANManagement : bResetNode
C00621/127	0: Not connected	LS_CANManagement : bReInitCAN
C00621/128	0: Not connected	LS_DigitalInput : bPosIn12_Load
C00621/129	0: Not connected	Reserved
C00621/130	0: Not connected	Reserved
C00621/131	0: Not connected	Reserved
C00621/132	0: Not connected	Reserved
C00621/133	0: Not connected	Reserved
C00621/134	0: Not connected	Reserved
C00621/135	0: Not connected	Reserved
C00621/136	0: Not connected	Reserved
C00621/137	0: Not connected	Reserved
C00621/138	0: Not connected	Reserved
C00621/139	0: Not connected	Reserved
C00621/140	0: Not connected	Reserved

Parameter Name:		Data type: UNSIGNED_16 Index: 23954 _d = 5D92 _h
C00621 System connection list: Bool		
C00621/141	0: Not connected	Reserved
C00621/142	0: Not connected	Reserved
C00621/143	0: Not connected	Reserved
C00621/144	0: Not connected	Reserved
C00621/145	0: Not connected	Reserved
C00621/146	0: Not connected	Reserved
C00621/147	0: Not connected	LS_TouchProbe : bDisableTPDigIn3
C00621/148	0: Not connected	LS_TouchProbe : bDisableTPDigIn4
C00621/149	0: Not connected	LS_TouchProbe : bDisableTPDigIn5
C00621/150	0: Not connected	LS_TouchProbe : bDisableTPDigIn6
C00621/151	0: Not connected	LS_TouchProbe : bDisableTPDigIn7
C00621/152	0: Not connected	LS_TouchProbe : bDisableTPDigIn3_Rising
C00621/153	0: Not connected	LS_TouchProbe : bDisableTPDigIn3_Falling
C00621/154	0: Not connected	LS_TouchProbe : bDisableTPDigIn4_Rising
C00621/155	0: Not connected	LS_TouchProbe : bDisableTPDigIn4_Falling
C00621/156	0: Not connected	LS_TouchProbe : bDisableTPDigIn5_Rising
C00621/157	0: Not connected	LS_TouchProbe : bDisableTPDigIn5_Falling
C00621/158	0: Not connected	LS_TouchProbe : bDisableTPDigIn3Window
C00621/159	0: Not connected	LS_TouchProbe : bDisableTPDigIn4Window
C00621/160	0: Not connected	LS_TouchProbe : bDisableTPDigIn5Window
C00621/161	0: Not connected	LS_AxisBusIO : bSetFail
C00621/162	0: Not connected	LS_AxisBusIO : bResetFail
C00621/163	0: Not connected	Reserved
C00621/164	0: Not connected	LS_MultiEncoder : bSetRef
C00621/165	0: Not connected	LS_RetainData : bSetRetain_1
C00621/166	0: Not connected	LS_RetainData : bSetRetain_2
C00621/167	0: Not connected	LS_RetainData : bSetRetain_3
C00621/168	0: Not connected	LS_RetainData : bLoadParams
C00621/169	0: Not connected	LS_RetainData : bIn1
C00621/170	0: Not connected	LS_RetainData : bIn2
C00621/171	0: Not connected	LS_RetainData : bIn3
C00621/172	0: Not connected	LS_RetainData : bIn4
C00621/173	0: Not connected	LS_AxisBusAux : bReadWrite
C00621/174	0: Not connected	LS_AxisBusAux : bExecute
C00621/175	0: Not connected	LS_AxisBusAux : bStop

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00622

Parameter Name: C00622 System connection list: Angle	Data type: UNSIGNED_16 Index: 23953 _d = 5D91 _h
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Connection parameters: 32-bit inputs

- Selection of the 32-bit output signals for connection with the 32-bit input signals.
- The selection list contains all 32-bit output signals which can be assigned to the 32-bit inputs mapped by the subcodes.

Selection list		
See selection list - angle signals		
Subcodes	Lenze setting	Info
C00622/1	0: Not connected	LS_DisFree_p : dnDis1_p
C00622/2	0: Not connected	LS_DisFree_p : dnDis2_p
C00622/3	0: Not connected	LS_DisFree_p : dnDis3_p
C00622/4	0: Not connected	LS_DisFree_p : dnDis4_p
C00622/5	0: Not connected	LS_DisFree_p : dnDis5_p
C00622/6	0: Not connected	LS_DisFree_p : dnDis6_p
C00622/7	0: Not connected	LS_DisFree_p : dnDis7_p
C00622/8	0: Not connected	LS_DisFree_p : dnDis8_p
C00622/9	0: Not connected	LP_CanOut1 : dnOut34_p
C00622/10	0: Not connected	LP_CanOut2 : dnOut34_p
C00622/11	0: Not connected	LP_CanOut3 : dnOut34_p
C00622/12	0: Not connected	LP_MciOut : dnOut34_p
C00622/13	0: Not connected	LS_DigitalInput : dnPosIn12_Set_p
C00622/14	0: Not connected	Reserved
C00622/15	0: Not connected	Reserved
C00622/16	0: Not connected	LS_RetainData : dnIn1
C00622/17	0: Not connected	LS_RetainData : dnIn2
C00622/18	0: Not connected	LS_RetainData : dnIn3
C00622/19	0: Not connected	LS_RetainData : dnIn4
C00622/20	0: Not connected	LS_AxisBusOut : dnLine12
C00622/21	0: Not connected	LS_AxisBusOut : dnCas12
C00622/22	0: Not connected	LS_AxisBusOut : dnCas34
C00622/23	0: Not connected	LS_AxisBusAux : dnAuxOut12
C00622/24	0: Not connected	LS_AxisBusAux : dnAuxOut34
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00630

Parameter Name: C00630 L_Limit 1-2: Min/Max	Data type: INTEGER_16 Index: 23945 _d = 5D89 _h
---	--

Setting the limits

Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00630/1	-199.99 %	L_Limit_1 : Min.Limit
C00630/2	199.99 %	L_Limit_1 : Max.Limit
C00630/3	-199.99 %	L_Limit_2 : Min.Limit
C00630/4	199.99 %	L_Limit_2 : Max.Limit
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00631

Parameter | Name: **C00631 | L_LimitPhi 1-3: Min/Max** Data type: INTEGER_32
Index: 23944_d = 5D88_h

Setting the limits

Setting range (min. value unit max. value)		
-2147483647	Incr.	2147483647

Subcodes	Lenze setting	Info
C00631/1	-2147483647 incr.	L_LimitPhi 1 : Min.Limit
C00631/2	2147483647 incr.	L_LimitPhi 1 : Max.Limit
C00631/3	-2147483647 incr.	L_LimitPhi 2 : Min.Limit
C00631/4	2147483647 incr.	L_LimitPhi 2 : Max.Limit
C00631/5	-2147483647 incr.	L_LimitPhi 3 : Min.Limit
C00631/6	2147483647 incr.	L_LimitPhi 3 : Max.Limit

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00632

Parameter | Name: **C00632 | L_NSet 1: Max.SkipFrq.** Data type: INTEGER_16
Index: 23943_d = 5D87_h

Maximum limit values for the speed blocking zones

- Selection of the maximum limit values for the blocking zones in which the speed must not be constant.

Setting range (min. value unit max. value)		
0.00	%	199.99

Subcodes	Lenze setting	Info
C00632/1	0.00 %	L_NSet 1 : Max. skip freq.1
C00632/2	0.00 %	L_NSet 1 : Max. skip freq.2
C00632/3	0.00 %	L_NSet 1 : Max. skip freq.3

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00633

Parameter | Name: **C00633 | L_NSet 1: Min.SkipFrq.** Data type: INTEGER_16
Index: 23942_d = 5D86_h

Minimum limit values for the speed blocking zones

- Selection of the minimum limit values for the blocking zones in which the speed must not be constant.

Setting range (min. value unit max. value)		
0.00	%	199.99

Subcodes	Lenze setting	Info
C00633/1	0.00 %	L_NSet 1 : Min. skip freq.1
C00633/2	0.00 %	L_NSet 1 : Min. skip freq.2
C00633/3	0.00 %	L_NSet 1 : Min. skip freq.3

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00634

Parameter Name: C00634 L_NSet_1: wState		Data type: UNSIGNED_16 Index: 23941 _d = 5D85 _h
The L_NSet_1 FB: Bit coded status display		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	No blocking zone active	"1" ≡ No blocking zone set for constant speeds
Bit 1	Blocking zone 1 active	"1" ≡ Suppression of constant speed characteristics within the limits of blocking zone 1
Bit 2	Blocking zone 2 active	"1" ≡ Suppression of constant speed characteristics within the limits of blocking zone 2
Bit 3	Blocking zone 3 active	"1" ≡ Suppression of constant speed characteristics within the limits of blocking zone 3
Bit 4	Jog in blocking zone	"1" ≡ A ramp is used to keep the speed setpoint within a speed blocking zone
Bit 5	MaxLimit active	"1" ≡ Speed setpoint is at the maximum speed limit
Bit 6	MinLimit active	"1" ≡ Speed setpoint is at the minimum speed limit
Bit 7	Reserved	
Bit 8	Reserved	
Bit 9	Reserved	
Bit 10	Reserved	
Bit 11	Reserved	
Bit 12	Reserved	
Bit 13	Reserved	
Bit 14	Reserved	
Bit 15	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00635

Parameter Name: C00635 L_NSet_1: nMaxLimit		Data type: INTEGER_16 Index: 23940 _d = 5D84 _h
The L_NSet_1 FB: Maximum speed setpoint for speed setpoint limitation		
Setting range (min. value unit max. value)		Lenze setting
-199.99	%	199.99 199.99 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00636

Parameter Name: C00636 L_NSet_1: nMinLimit		Data type: INTEGER_16 Index: 23939 _d = 5D83 _h
The L_NSet_1 FB: Minimum speed setpoint for speed setpoint limitation		
Setting range (min. value unit max. value)		Lenze setting
-199.99	%	199.99 -199.99 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00637

Parameter Name: C00637 L_NSet_1: Output blocking zones		Data type: INTEGER_16 Index: 23938 _d = 5D82 _h
The L_NSet_1 FB: Speed setpoint is displayed after being processed by blocking zone function		
Display range (min. value unit max. value)		
-199.99	%	199.99
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00638

Parameter | Name: **C00638 | L_NSet_1: Output ramp rounding** Data type: INTEGER_16
Index: 23937_d = 5D81_h

The [L_NSet_1](#) FB: Speed setpoint is displayed after being processed by PT1 filter function

Display range (min. value unit max. value)		
-199.99	%	199.99

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00639

Parameter | Name: **C00639 | L_NSet_1: Output additional value** Data type: INTEGER_16
Index: 23936_d = 5D80_h

The [L_NSet_1](#) FB: Additional speed setpoint is displayed after being processed by the ramp generator

Display range (min. value unit max. value)		
-199.99	%	199.99

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00640

Parameter | Name: **C00640 | L_NSet_1: nNOut_a** Data type: INTEGER_16
Index: 23935_d = 5D7F_h

The [L_NSet_1](#) FB: Display of the generated main speed setpoint at the output *nNOut_a*

Display range (min. value unit max. value)		
-199.99	%	199.99

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00643

Parameter | Name: **C00643 | Resp. to PLI monitoring** Data type: UNSIGNED_8
Index: 23932_d = 5D7C_h

[▶ Pole position identification](#)

Selection list	
0	No Reaction
1	Fault
3	TroubleQuickStop
4	WarningLocked
5	Warning
6	Information

Subcodes	Lenze setting	Info
C00643/1	1: Fault	Response to PLI monitoring

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00644

Parameter | Name: **C00644 | PLI traversing direction** Data type: UNSIGNED_8
Index: 23931_d = 5D7B_h

[▶ Pole position identification](#)

Selection list	
0	right rotating field
1	left rotating field

Subcodes	Lenze setting	Info
C00644/1	0: right rotating field	PLI 360° traversing direction

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00645

Parameter Name: C00645 PLI max. permissible deflection		Data type: INTEGER_16 Index: 23930 _d = 5D7A _h
▶ Pole position identification		
Setting range (min. value unit max. value)		
-6.0	°	90.0
Subcodes	Lenze setting	Info
C00645/1	0.0 °	Reserved
C00645/2	0.0 °	PLI 360° max. error tolerance
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10		

C00646

Parameter Name: C00646 PLI current amplitude		Data type: UNSIGNED_16 Index: 23929 _d = 5D79 _h
▶ Pole position identification		
Setting range (min. value unit max. value)		
1	%	1000
Subcodes	Lenze setting	Info
C00646/1	1 %	Reserved
C00646/2	100 %	PLI 360° current amplitude
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00647

Parameter Name: C00647 PLI ramp time		Data type: UNSIGNED_16 Index: 23928 _d = 5D78 _h
▶ Pole position identification		
Setting range (min. value unit max. value)		
5	%	1000
Subcodes	Lenze setting	Info
C00647/1	5 %	Reserved
C00647/2	100 %	PLI 360° ramp time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00650

Parameter Name: C00650 L_Arithmetik 3-5: Function		Data type: UNSIGNED_8 Index: 23925 _d = 5D75 _h
Selection of the internal arithmetics		
Selection list		
0	nOut_a = nln1_a	
1	nOut_a = nln1_a + nln2_a	
2	nOut_a = nln1_a - nln2_a	
3	nOut_a = (nln1_a * nln2_a) / 100%	
4	nOut_a = (nln1_a * 1%) / nln2_a	
5	nOut_a = (nln1_a * 100%) / (100% - nln2_a)	
Subcodes	Lenze setting	Info
C00650/1	0: nOut_a = nln1_a	L_Arithmetik 3 : Function
C00650/2	0: nOut_a = nln1_a	L_Arithmetik 4 : Function
C00650/3	0: nOut_a = nln1_a	L_Arithmetik 5 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00660

C00660

Parameter Name: C00660 L_FixSet_a_1: Analog values		Data type: INTEGER_16 Index: 23915 _d = 5D6B _h
FB L_FixSet_a_1 : Setting of the fixed values		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00660/1	0.00 %	Fixed value 0 ... 15
C00660/...		
C00660/16		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00661

Parameter Name: C00661 L_FixSet_w_1: Fixed values		Data type: UNSIGNED_16 Index: 23914 _d = 5D6A _h
FB L_FixSet_w_1 : Setting of the fixed values		
Setting range (min. value unit max. value)		
0		65535
Subcodes	Lenze setting	Info
C00661/1	0	Fixed value 0 ... 15
C00661/...		
C00661/16		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00662

Parameter Name: C00662 L_FixSet_w_2: Fixed values		Data type: UNSIGNED_16 Index: 23913 _d = 5D69 _h
FB L_FixSet_w_2 : Setting of the fixed values		
Setting range (min. value unit max. value)		
0		65535
Subcodes	Lenze setting	Info
C00662/1	0	Fixed value 0 ... 15
C00662/...		
C00662/16		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00670

Parameter Name: C00670 L_OffsetGainP_1: Gain		Data type: INTEGER_32 Index: 23905 _d = 5D61 _h
The L_OffsetGainP_1 FB: Gain as multiplier of the input signal + offset		
Setting range (min. value unit max. value)		Lenze setting
-100.0000		100.0000 1.0000
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C00671

Parameter Name: C00671 L_OffsetGainP_2: Gain		Data type: INTEGER_32 Index: 23904 _d = 5D60 _h
The L_OffsetGainP_2 FB: Gain as multiplier of the input signal + offset		
Setting range (min. value unit max. value)		Lenze setting
-100.0000		100.0000 1.0000
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C00672

Parameter Name: C00672 L_OffsetGainP_3: Gain		Data type: INTEGER_32 Index: 23903 _d = 5D5F _h
The L_OffsetGainP_3 FB: Gain as multiplier of the input signal + offset		
Setting range (min. value unit max. value)		Lenze setting
-100.0000		100.0000 1.0000
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C00673

Parameter Name: C00673 L_OffsetGainPhiP 1-2: Offset		Data type: INTEGER_32 Index: 23902 _d = 5D5E _h
Angular offset (is added to the angular input signal)		
Setting range (min. value unit max. value)		Lenze setting
-2147483647	Incr.	2147483647
Subcodes	Lenze setting	Info
C00673/1	0 incr.	L_OffsetGainPhiP_1 : Offset
C00673/2	0 incr.	L_OffsetGainPhiP_2 : Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00674

Parameter Name: C00674 L_OffsetGainPhiP 1-2: Gain		Data type: INTEGER_32 Index: 23901 _d = 5D5D _h
Angular gain as multiplier of the input signal + angular offset		
Setting range (min. value unit max. value)		Lenze setting
-2147483647		2147483647
Subcodes	Lenze setting	Info
C00674/1	0	L_OffsetGainPhiP_1 : Gain
C00674/2	0	L_OffsetGainPhiP_2 : Gain
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00677

Parameter Name: C00677 L_GainOffsetP 1-3: Parameter		Data type: INTEGER_16 Index: 23898 _d = 5D5A _h
Gain and offset		
Setting range (min. value unit max. value)		Lenze setting
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00677/1	100.00 %	L_GainOffsetP_1 : Gain
C00677/2	0.00 %	L_GainOffsetP_1 : Offset
C00677/3	100.00 %	L_GainOffsetP_2 : Gain
C00677/4	0.00 %	L_GainOffsetP_2 : Offset
C00677/5	100.00 %	L_GainOffsetP_3 : Gain
C00677/6	0.00 %	L_GainOffsetP_3 : Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00678

Parameter Name: C00678 L_GainOffsetPhiP 1-2: Parameter		Data type: INTEGER_32 Index: 23897 _d = 5D59 _h
Gain and offset		
Setting range (min. value unit max. value)		
-2147483647		2147483647
Subcodes	Lenze setting	Info
C00678/1	65536	L_GainOffsetPhiP 1 : Gain
C00678/2	0	L_GainOffsetPhiP 1 : Offset
C00678/3	65536	L_GainOffsetPhiP 2 : Gain
C00678/4	0	L_GainOffsetPhiP 2 : Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00679

Parameter Name: C00679 L_MulDiv 2: Parameter		Data type: INTEGER_16 Index: 23896 _d = 5D58 _h
The L_MulDiv 2 FB: Numerator and denominator		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C00679/1	0	L_MulDiv 2 : Numerator
C00679/2	10000	L_MulDiv 2 : Denominator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00680

Parameter Name: C00680 L_Compare 1: Fct.		Data type: UNSIGNED_8 Index: 23895 _d = 5D57 _h
The L_Compare 1 FB: Comparison operation		
<ul style="list-style-type: none"> If the statement of the selected comparison operation is true, the binary <i>bOut</i> output will be set to TRUE. 		
Selection list (Lenze setting printed in bold)		
1	In1 = In2	
2	In1 > In2	
3	In1 < In2	
4	In1 = In2	
5	In1 > In2	
6	 In1 < In2 	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00681

Parameter Name: C00681 L_Compare 1: Hysteresis		Data type: INTEGER_16 Index: 23894 _d = 5D56 _h
The L_Compare 1 FB: Hysteresis for the comparison function selected in C00680		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	100.00 0.50 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00682

Parameter Name: C00682 L_Compare_1: Window			Data type: INTEGER_16 Index: 23893 _d = 5D55 _h
The L_Compare_1 FB: Window for the comparison function selected in C00680			
Setting range (min. value unit max. value)			Lenze setting
0.00	%	100.00	2.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00685

Parameter Name: C00685 L_Compare_2: Fct.			Data type: UNSIGNED_8 Index: 23890 _d = 5D52 _h
The L_Compare_2 FB: Comparison operation			
<ul style="list-style-type: none"> If the statement of the selected comparison operation is true, the binary <i>bOut</i> output will be set to TRUE. 			
Selection list (Lenze setting printed in bold)			
1	In1 = In2		
2	In1 > In2		
3	In1 < In2		
4	 In1 = In2 		
5	In1 > In2		
6	In1 < In2		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00686

Parameter Name: C00686 L_Compare_2: Hysteresis			Data type: INTEGER_16 Index: 23889 _d = 5D51 _h
The L_Compare_2 FB: Hysteresis for the comparison function selected in C00685			
Setting range (min. value unit max. value)			Lenze setting
0.00	%	100.00	0.50 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00687

Parameter Name: C00687 L_Compare_2: Window			Data type: INTEGER_16 Index: 23888 _d = 5D50 _h
The L_Compare_2 FB: Window for the comparison function selected in C00685			
Setting range (min. value unit max. value)			Lenze setting
0.00	%	100.00	2.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00690

Parameter Name: C00690 L_Compare_3: Function			Data type: UNSIGNED_8 Index: 23885 _d = 5D4D _h
The L_Compare_3 FB: Comparison operation			
<ul style="list-style-type: none"> If the statement of the selected comparison operation is true, the binary <i>bOut</i> output will be set to TRUE. 			
Selection list (Lenze setting printed in bold)			
1	In1 = In2		
2	In1 > In2		
3	In1 < In2		
4	In1 = In2		
5	In1 > In2		
6	In1 < In2		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00691

Parameter Name: C00691 L_Compare_3: Hysteresis			Data type: INTEGER_16 Index: 23884 _d = 5D4C _h
FB L_Compare_3 : Hysteresis for the comparison operation selected in C00690			
Setting range (min. value unit max. value)			Lenze setting
0.00	%	100.00	0.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00692

Parameter Name: C00692 L_Compare_3: Window			Data type: INTEGER_16 Index: 23883 _d = 5D4B _h
FB L_Compare_3 : window for the comparison operation selected in C00690			
Setting range (min. value unit max. value)			Lenze setting
0.00	%	100.00	0.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00693

Parameter Name: C00693 L_Compare 4-5: Function			Data type: UNSIGNED_8 Index: 23882 _d = 5D4A _h
Comparison operation			
<ul style="list-style-type: none"> If the statement of the selected comparison operation is true, the binary <i>bOut</i> output will be set to TRUE. 			
Selection list			
1	In1 = In2		
2	In1 > In2		
3	In1 < In2		
4	In1 = In2		
5	In1 > In2		
6	In1 < In2		
Subcodes	Lenze setting	Info	
C00693/1	1: In1 = In2	L_Compare_4 : Function	
C00693/2	1: In1 = In2	L_Compare_5 : Function	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C00694

Parameter Name: C00694 L_Compare 4-5: Hysteresis			Data type: INTEGER_16 Index: 23881 _d = 5D49 _h
Hysteresis for the comparison operation selected in C00693			
Setting range (min. value unit max. value)			Lenze setting
0.00	%	100.00	
Subcodes	Lenze setting	Info	
C00694/1	0.00 %	L_Compare_4 : Hysteresis	
C00694/2	0.00 %	L_Compare_5 : Hysteresis	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100			

C00695

Parameter Name: C00695 L_Compare 4-5: Window		Data type: INTEGER_16 Index: 23880 _d = 5D48 _h
Window for the comparison operation selected in C00693		
Setting range (min. value unit max. value)		
0.00	%	100.00
Subcodes	Lenze setting	Info
C00695/1	0.00 %	L_Compare 4 : Window
C00695/2	0.00 %	L_Compare 5 : Window
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00696

Parameter Name: C00696 L_OffsetGainP_1: Offset		Data type: INTEGER_16 Index: 23879 _d = 5D47 _h
The L_OffsetGainP_1 FB: Offset (additive to the input signal)		
Setting range (min. value unit max. value)		Lenze setting
-199.99	%	199.99 0.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00697

Parameter Name: C00697 L_OffsetGainP_2: Offset		Data type: INTEGER_16 Index: 23878 _d = 5D46 _h
The L_OffsetGainP_2 FB: Offset (additive to the input signal)		
Setting range (min. value unit max. value)		Lenze setting
-199.99	%	199.99 0.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00698

Parameter Name: C00698 L_OffsetGainP_3: Offset		Data type: INTEGER_16 Index: 23877 _d = 5D45 _h
The L_OffsetGainP_3 FB: Offset (additive to the input signal)		
Setting range (min. value unit max. value)		Lenze setting
-199.99	%	199.99 0.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00699

Parameter Name: C00699 L_MulDiv_1: Parameter		Data type: INTEGER_16 Index: 23876 _d = 5D44 _h
The L_MulDiv_1 FB: Numerator and denominator		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C00699/1	0	L_MulDiv_1 : Numerator
C00699/2	10000	L_MulDiv_1 : Denominator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00700

Parameter | Name: **C00700 | LA_NCtrl: Analog connection list** Data type: UNSIGNED_16
Index: 23875_d = 5D43_h

Connection parameters for "Actuating drive speed" application: 16-bit inputs

- Selection of the 16 bit output signals to be connected to the 16 bit input signals
- The selection list contains all 16 bit output signals which can be assigned to the 16 bit inputs displayed by the subcodes.

Selection list		
See selection list - analog signals		
Subcodes	Lenze setting	Info
C00700/1	20005: LS_ParFix_wDriveCtrl	LA_NCtrl : wCANDriveControl (input for control word from CAN to device control)
C00700/2	20005: LS_ParFix_wDriveCtrl	LA_NCtrl : wMCIDriveControl (input for control word from communication interface to device control)
C00700/3	20012: LS_ParFree_nC472_3_a	LA_NCtrl : nTorqueMotLim_a (input for maximum torque in motor mode)
C00700/4	20013: LS_ParFree_nC472_4_a	LA_NCtrl : nTorqueGenLim_a (input for maximum torque in generator mode)
C00700/5	0: Not connected	LA_NCtrl : nPIDVpAdapt_a (input for adapting the PID controller gain)
C00700/6	0: Not connected	LA_NCtrl : nPIDActValue_a (input for actual PID controller value)
C00700/7	16000: AIN1_Out	LA_NCtrl : nMainSetValue_a (input for main speed setpoint)
C00700/8	0: Not connected	LA_NCtrl : nAuxSetValue_a (input for additional speed setpoint)
C00700/9	0: Not connected	LA_NCtrl : nGPAnalogSwitchIn1_a (input for analog-value selector analog signal 1)
C00700/10	0: Not connected	LA_NCtrl : nGPAnalogSwitchIn2_a (input for analog-value selector analog signal 2)
C00700/11	0: Not connected	LA_NCtrl : nGPArithmetikIn1_a (input for arithmetic function analog signal 1)
C00700/12	0: Not connected	LA_NCtrl : nGPArithmetikIn2_a (input for arithmetic function analog signal 2)
C00700/13	0: Not connected	LA_NCtrl : nGPMulDivIn_a (input for analog signal for multiplication/division)
C00700/14	0: Not connected	LA_NCtrl : nGPCompareIn1_a (input for comparison operation analog signal 1)
C00700/15	0: Not connected	LA_NCtrl : nGPCompareIn2_a (input for comparison operation analog signal 2)
C00700/16	0: Not connected	LA_NCtrl : nVoltageAdd_a (input for additive voltage boost)
C00700/17	0: Not connected	LA_NCtrl : nPIDInfluence_a (input for influence signal of PID controller correcting variable)
C00700/18	0: Not connected	LA_NCtrl : nPIDSetValue_a (input for PID controller setpoint)
C00700/19	0: Not connected	LA_NCtrl : nPWMAngleOffset (input for pulse width modulation phase offset)
C00700/20	0: Not connected	LA_NCtrl : nBoost_a (input for additional setpoint for the motor voltage at speed = 0)

Parameter Name: C00700 LA_NCtrl: Analog connection list		Data type: UNSIGNED_16 Index: 23875 _d = 5D43 _h
C00700/21	0: Not connected	LA_NCtrl : wSMCtrl (interface to optional safety system)
C00700/22	0: Not connected	Reserved
C00700/23	0: Not connected	Reserved
C00700/24	0: Not connected	Reserved
C00700/25	0: Not connected	Reserved
C00700/26	0: Not connected	LA_NCtrl : wFreeIn1 (input for user signal 1)
C00700/27	0: Not connected	LA_NCtrl : wFreeIn2 (input for user signal 2)
C00700/28	0: Not connected	LA_NCtrl : wFreeIn3 (input for user signal 3)
C00700/29	0: Not connected	LA_NCtrl : wFreeIn4 (input for user signal 4)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00701

Parameter Name: C00701 LA_NCtrl: Digital connection list		Data type: UNSIGNED_16 Index: 23874 _d = 5D42 _h
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Connection parameters for "Actuating drive speed" application: Binary inputs

- Selection of the binary output signals to be connected to the binary input signals
- The selection list contains all binary output signals which can be assigned to the binary inputs mapped by the subcodes.

Selection list		
See selection list - digital signals		
Subcodes	Lenze setting	Info
C00701/1	0: Not connected	LA_NCtrl : bClnh (control input for setting controller inhibit)
C00701/2	16008: DigIn_Clnh	LA_NCtrl : bFailReset (control input for error acknowledgement)
C00701/3	0: Not connected	LA_NCtrl : bSetQuickstop (control input for quick stop request)
C00701/4	16002: DigIn_bln3	LA_NCtrl : bSetDCBrake (control input for DC-injection braking request)
C00701/5	0: Not connected	LA_NCtrl : bRFG_Stop (control input for stopping the speed ramp function generator)
C00701/6	0: Not connected	LA_NCtrl : bRFG_0 (control input for setting the speed ramp function generator to 0)
C00701/7	0: Not connected	Reserved
C00701/8	16003: DigIn_bln4	LA_NCtrl : bSetSpeedCcw (control input for change of direction of rotation)
C00701/9	16000: DigIn_bln1	LA_NCtrl : bJogSpeed1 (selection input for fixed setpoints)
C00701/10	16001: DigIn_bln2	LA_NCtrl : bJogSpeed2 (selection input for fixed setpoints)
C00701/11	0: Not connected	LA_NCtrl : bJogSpeed4 (selection input for fixed setpoints)
C00701/12	0: Not connected	LA_NCtrl : bJogSpeed8 (selection input for fixed setpoints)

Parameter Name: C00701 LA_NCtrl: Digital connection list		Data type: UNSIGNED_16 Index: 23874 _d = 5D42 _h
C00701/13	0: Not connected	LA_NCtrl: bJogRamp1 (selection input for additional acceleration/deceleration times)
C00701/14	0: Not connected	LA_NCtrl: bJogRamp2 (selection input for additional acceleration/deceleration times)
C00701/15	0: Not connected	LA_NCtrl: bJogRamp4 (selection input for additional acceleration/deceleration times)
C00701/16	0: Not connected	LA_NCtrl: bJogRamp8 (selection input for additional acceleration/deceleration times)
C00701/17	0: Not connected	LA_NCtrl: bMPOTInAct (control input for deactivation of motor potentiometer)
C00701/18	0: Not connected	LA_NCtrl: bMPOTUp (control input for motor potentiometer ramp-up)
C00701/19	0: Not connected	LA_NCtrl: bMPOTDown (control input for motor potentiometer ramp-down)
C00701/20	0: Not connected	LA_NCtrl: bMBRKRelease (control input for manual holding brake release request)
C00701/21	0: Not connected	LA_NCtrl: bGPFree1 (control input for manual jog in positive direction request)
C00701/22	0: Not connected	LA_NCtrl: bGPFree2 (control input for manual jog in negative direction request)
C00701/23	0: Not connected	LA_NCtrl: bGPAnalogSwitchSet (control input for analog-value selector change-over)
C00701/24	0: Not connected	LA_NCtrl: bGPDigitalDelayIn (input for digital signal with time delay)
C00701/25	0: Not connected	LA_NCtrl: bGPLogicIn1 (input signal 1 for digital logic)
C00701/26	0: Not connected	LA_NCtrl: bGPLogicIn2 (input signal 2 for digital logic)
C00701/27	0: Not connected	LA_NCtrl: bGPLogicIn3 (input signal 3 for digital logic)
C00701/28	0: Not connected	LA_NCtrl: bGPDFlipFlopInD (control input for DFlipFlop setting signal)
C00701/29	0: Not connected	LA_NCtrl: bGPDFlipFlopInClk (control input for DFlipFlop clock signal)
C00701/30	0: Not connected	LA_NCtrl: bGPDFlipFlopInClr (control input for DFlipFlop reset signal)
C00701/31	0: Not connected	LA_NCtrl: bMPotEnable (control input for activation of motor potentiometer)
C00701/32	0: Not connected	LA_NCtrl: bPIDEnableInfluenceRamp (control input for activation of influence of output correcting variable of PID controller)
C00701/33	0: Not connected	LA_NCtrl: bPIDIOff (control input for deactivation of PID controller I component)
C00701/34	20000: LS_ParFix_True	LA_NCtrl: bRLQCw (control input for activation of CW direction of rotation of speed setpoint)

Parameter Name: C00701 LA_NCtrl: Digital connection list		Data type: UNSIGNED_16 Index: 23874 _d = 5D42 _h
C00701/35	0: Not connected	LA_NCtrl : bRLQCcw (control input for activation of CCW direction of rotation of speed setpoint)
C00701/36	0: Not connected	Reserved
C00701/37	0: Not connected	Reserved
C00701/38	0: Not connected	Reserved
C00701/39	0: Not connected	Reserved
C00701/40	0: Not connected	Reserved
C00701/41	0: Not connected	LA_NCtrl : bFreeIn1 (input for binary user signal 1)
C00701/42	0: Not connected	LA_NCtrl : bFreeIn2 (input for binary user signal 2)
C00701/43	0: Not connected	LA_NCtrl : bFreeIn3 (input for binary user signal 3)
C00701/44	0: Not connected	LA_NCtrl : bFreeIn4 (input for binary user signal 4)
C00701/45	0: Not connected	LA_NCtrl : bFreeIn5 (input for binary user signal 5)
C00701/46	0: Not connected	LA_NCtrl : bFreeIn6 (input for binary user signal 6)
C00701/47	0: Not connected	LA_NCtrl : bFreeIn7 (input for binary user signal 7)
C00701/48	0: Not connected	LA_NCtrl : bFreeIn8 (input for binary user signal 8)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00705

Parameter Name: C00705 LA_NCtrl_Out: Analog signal list		Data type: UNSIGNED_16 Index: 23870 _d = 5D3E _h
This code is for device-internal use only and must not be written to by the user!		

C00706

Parameter Name: C00706 LA_NCtrl_Out digital signal list		Data type: UNSIGNED_16 Index: 23869 _d = 5D3D _h
This code is for device-internal use only and must not be written to by the user!		

C00710

Parameter Name: C00710 LA_TabPos: Analog connection list		Data type: UNSIGNED_16 Index: 23865 _d = 5D39 _h
Connection parameters for "Table positioning" application: 16-bit inputs <ul style="list-style-type: none"> • Selection of the 16 bit output signals to be connected to the 16 bit input signals • The selection list contains all 16 bit output signals which can be assigned to the 16 bit inputs displayed by the subcodes. 		
Selection list		
See selection list - analog signals		
Subcodes	Lenze setting	Info
C00710/1	0: Not connected	LA_TabPos : wCanDriveControl (input for control word from CAN to device control)
C00710/2	0: Not connected	LA_TabPos : wMciDriveControl (input for control word from communication interface to device control)

Parameter Name: C00710 LA_TabPos: Analog connection list		Data type: UNSIGNED_16 Index: 23865 _d = 5D39 _h
C00710/3	0: Not connected	LA_TabPos: nTorqueMotLim_a (input for maximum torque in motor mode)
C00710/4	0: Not connected	LA_TabPos: nTorqueGenLim_a (input for maximum torque in generator mode)
C00710/5	0: Not connected	LA_TabPos: nMainSetValue_a (input for main speed setpoint)
C00710/6	0: Not connected	LA_TabPos: nAuxSetValue_a (input for additional speed setpoint)
C00710/7	0: Not connected	LA_TabPos: wMckCtrl1 (input for MCK control word 1)
C00710/8	0: Not connected	LA_TabPos: wMckCtrl2 (input for MCK control word 2)
C00710/9	0: Not connected	LA_TabPos: wMckOperationMode (input for selection of MCK operating mode)
C00710/10	0: Not connected	LA_TabPos: wPosProfileMode (input for selection of MCK positioning mode in positioning mode)
C00710/11	0: Not connected	LA_TabPos: wPosProfileNo (input for MCK positioning profile number in positioning mode)
C00710/12	0: Not connected	LA_TabPos: nGPAnalogSwitchIn1_a (input for analog-value selector analog signal 1)
C00710/13	0: Not connected	LA_TabPos: nGPAnalogSwitchIn2_a (input for analog-value selector analog signal 2)
C00710/14	0: Not connected	LA_TabPos: nGPArithmetikIn1_a (input for arithmetic function analog signal 1)
C00710/15	0: Not connected	LA_TabPos: nGPArithmetikIn2_a (input for arithmetic function analog signal 2)
C00710/16	0: Not connected	LA_TabPos: nGPMulDivIn_a (input for analog signal for multiplication/division)
C00710/17	0: Not connected	LA_TabPos: nGPCompareIn1_a (input for comparison operation analog signal 1)
C00710/18	0: Not connected	LA_TabPos: nGPCompareIn2_a (input for comparison operation analog signal 2)
C00710/19	0: Not connected	LA_TabPos: wGPCounter1LdVal (input for load value for counter module 1)
C00710/20	0: Not connected	LA_TabPos: wGPCounter1CmpVal (input for comparison value for counter module 1)
C00710/21	0: Not connected	LA_TabPos: nSpeedOverride_a (input for speed override)
C00710/22	0: Not connected	LA_TabPos: nAccOverride_a (input for acceleration override)
C00710/23	0: Not connected	LA_TabPos: wFreeIn1 (input for user signal 1)
C00710/24	0: Not connected	LA_TabPos: wFreeIn2 (input for user signal 2)
C00710/25	0: Not connected	LA_TabPos: wFreeIn3 (input for user signal 3)
C00710/26	0: Not connected	LA_TabPos: wFreeIn4 (input for user signal 4)

Parameter Name: C00710 LA_TabPos: Analog connection list		Data type: UNSIGNED_16 Index: 23865 _d = 5D39 _h
C00710/27	0: Not connected	LA_TabPos : nPosCtrlOutLimit (input for correcting variable limitation of position controller)
C00710/28	0: Not connected	LA_TabPos : nPosCtrlPAdapt (input for adapting the position controller gain)
C00710/29	0: Not connected	LA_TabPos : wSMCtrl (interface to optional safety system)
C00710/30	0: Not connected	LA_TabPos : wPosProfileUnitsLW (input for selecting the target position in [units], Low-Word)
C00710/31	0: Not connected	LA_TabPos : wPosProfileUnitsHW (input for selecting the target position in [units], High-Word)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00711

Parameter Name: C00711 LA_TabPos: Digital connection list		Data type: UNSIGNED_16 Index: 23864 _d = 5D38 _h
Connection parameters for "Table positioning" application: Binary inputs <ul style="list-style-type: none"> • Selection of the binary output signals to be connected to the binary input signals • The selection list contains all binary output signals which can be assigned to the binary inputs mapped by the subcodes. 		
Selection list		
See selection list - digital signals		
Subcodes	Lenze setting	Info
C00711/1	0: Not connected	LA_TabPos : bCInh (control input for setting controller inhibit)
C00711/2	0: Not connected	LA_TabPos : bFailReset (control input for error acknowledgement)
C00711/3	0: Not connected	LA_TabPos : bSetQuickstop (control input for quick stop request)
C00711/4	0: Not connected	LA_TabPos : bSetSpeedCcw (control input for negation of speed direction)
C00711/5	0: Not connected	LA_TabPos : bJogSpeed1 (control input for fixed speed selection valency 1)
C00711/6	0: Not connected	LA_TabPos : bJogSpeed2 (control input for fixed speed selection valency 2)
C00711/7	0: Not connected	LA_TabPos : bMPotEnable (control input for activation of motor potentiometer)
C00711/8	0: Not connected	LA_TabPos : bMPotUp (control input for motor potentiometer ramp-up)
C00711/9	0: Not connected	LA_TabPos : bMPotDown (control input for motor potentiometer ramp-down)
C00711/10	0: Not connected	LA_TabPos : bMBrakeRelease (control input for manual holding brake release request)
C00711/11	0: Not connected	LA_TabPos : bPosCtrlOn (control input for activation of position controller)
C00711/12	0: Not connected	LA_TabPos : bLimitSwitchPos (input for positive hardware limit switch signal)
C00711/13	0: Not connected	LA_TabPos : bLimitSwitchNeg (input for negative hardware limit switch signal)

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00711

Parameter Name: C00711 LA_TabPos: Digital connection list		Data type: UNSIGNED_16 Index: 23864 _d = 5D38 _h
C00711/14	0: Not connected	LA_TabPos: bReleaseLimitSwitch (control input for hardware limit switch retracting request)
C00711/15	0: Not connected	LA_TabPos: bManJogPos (control input for manual jog in positive direction request)
C00711/16	0: Not connected	LA_TabPos: bManJogNeg (control input for manual jog in negative direction request)
C00711/17	0: Not connected	LA_TabPos: bManEnable2ndSpeed (control input for activation of the second manual speed for manual jog)
C00711/18	0: Not connected	LA_TabPos: bEnableSpeedOverride (control input for activation of speed override)
C00711/19	0: Not connected	LA_TabPos: bEnableAccOverride (control input for activation of acceleration override)
C00711/20	0: Not connected	LA_TabPos: bHomeStartStop (control input for start/stop homing)
C00711/21	0: Not connected	LA_TabPos: bHomeSetPosition (control input for setting the home position)
C00711/22	0: Not connected	LA_TabPos: bHomeResetPosition (control input for reset of "Home position known")
C00711/23	0: Not connected	LA_TabPos: bHomeMark (input for pre-stop signal for homing)
C00711/24	0: Not connected	LA_TabPos: bPosSetProfilePosition (control input for accepting the profile position in the profile data set)
C00711/25	0: Not connected	LA_TabPos: bPosSetActualPosition (control input for accepting the current position in the profile data set)
C00711/26	0: Not connected	LA_TabPos: bPosExecute (control input for positioning start)
C00711/27	0: Not connected	LA_TabPos: bPosFinishTarget (control input for completion of positioning to target position)
C00711/28	0: Not connected	LA_TabPos: bPosDisableFollowProfile (control input for suppression of sequence profile linkage)
C00711/29	0: Not connected	LA_TabPos: bPosStop (control input for interruption of profile generation by ramp-down procedure)
C00711/30	0: Not connected	LA_TabPos: bGPAnalogSwitchSet (control input for analog-value selector change-over)
C00711/31	0: Not connected	LA_TabPos: bGPDigitalDelayIn (input for digital signal with time delay)
C00711/32	0: Not connected	LA_TabPos: bGPLogicIn1 (input signal 1 for digital logic)
C00711/33	0: Not connected	LA_TabPos: bGPLogicIn2 (input signal 2 for digital logic)
C00711/34	0: Not connected	LA_TabPos: bGPLogicIn3 (input signal 3 for digital logic)
C00711/35	0: Not connected	LA_TabPos: bGPDFlipFlop_InD (control input for DFlipFlop setting signal)

Parameter Name: C00711 LA_TabPos: Digital connection list		Data type: UNSIGNED_16 Index: 23864 _d = 5D38 _h
C00711/36	0: Not connected	LA_TabPos: bGPDFlipFlop_InClk (control input for DFlipFlop clock signal)
C00711/37	0: Not connected	LA_TabPos: bGPDFlipFlop_InClr (control input for DFlipFlop reset signal)
C00711/38	0: Not connected	LA_TabPos: bGPCounter1ClkUp (control input for up-counting counter module 1)
C00711/39	0: Not connected	LA_TabPos: bGPCounter1ClkDown (control input for down-counting counter module 1)
C00711/40	0: Not connected	LA_TabPos: bGPCounter1Load (control input for load value acceptance in counter module 1)
C00711/41	0: Not connected	LA_TabPos: bMckOperationMode_1 (control input for MCK operating mode changeover valency 1)
C00711/42	0: Not connected	LA_TabPos: bMckOperationMode_2 (control input for MCK operating mode changeover valency 2)
C00711/43	0: Not connected	LA_TabPos: bMckOperationMode_4 (control input for MCK operating mode changeover valency 4)
C00711/44	0: Not connected	LA_TabPos: bMckOperationMode_8 (control input for MCK operating mode changeover valency 8)
C00711/45	0: Not connected	LA_TabPos: bPosProfileNo_1 (control input for selection of profile number valency 1)
C00711/46	0: Not connected	LA_TabPos: bPosProfileNo_2 (control input for selection of profile number valency 2)
C00711/47	0: Not connected	LA_TabPos: bPosProfileNo_4 (control input for selection of profile number valency 4)
C00711/48	0: Not connected	LA_TabPos: bPosProfileNo_8 (control input for selection of profile number valency 8)
C00711/49	0: Not connected	LA_TabPos: bFreeIn1 (input for binary user signal 1)
C00711/50	0: Not connected	LA_TabPos: bFreeIn2 (input for binary user signal 2)
C00711/51	0: Not connected	LA_TabPos: bFreeIn3 (input for binary user signal 3)
C00711/52	0: Not connected	LA_TabPos: bFreeIn4 (input for binary user signal 4)
C00711/53	0: Not connected	LA_TabPos: bFreeIn5 (input for binary user signal 5)
C00711/54	0: Not connected	LA_TabPos: bFreeIn6 (input for binary user signal 6)
C00711/55	0: Not connected	LA_TabPos: bFreeIn7 (input for binary user signal 7)
C00711/56	0: Not connected	LA_TabPos: bFreeIn8 (input for binary user signal 8)

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00712

Parameter | Name: **C00712 | LA_TabPos: phi connection list** Data type: UNSIGNED_16
Index: 23863_d = 5D37_h

Connection parameters for "Table positioning" application: 32-bit inputs

- Selection of the 32-bit output signals for connection with the 32-bit input signals
- The selection list contains all 32-bit output signals which can be assigned to the 32-bit inputs mapped by the subcodes.

Selection list		
See selection list - angle signals		
Subcodes	Lenze setting	Info
C00712/1	0: Not connected	LA_TabPos : dnPosProfilePosition (input for selecting the target position in [increments])
C00712/2	0: Not connected	LA_TabPos : dnFreeIn1 (input for 32-bit user signal 1)
C00712/3	0: Not connected	LA_TabPos : dnFreeIn2 (input for 32-bit user signal 2)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00715

Parameter | Name: **C00715 | LA_TabPos_Out: Analog signal list** Data type: UNSIGNED_16
Index: 23860_d = 5D34_h

This code is for device-internal use only and must not be written to by the user!

C00716

Parameter | Name: **C00716 | LA_TabPos_Out: Digital signal list** Data type: UNSIGNED_16
Index: 23859_d = 5D33_h

This code is for device-internal use only and must not be written to by the user!

C00717

Parameter | Name: **C00717 | LA_TabPos_Out: phi signal list** Data type: UNSIGNED_16
Index: 23858_d = 5D32_h

This code is for device-internal use only and must not be written to by the user!

C00720

Parameter | Name: **C00720 | L_DigitalDelay_1: Delay** Data type: UNSIGNED_32
Index: 23855_d = 5D2F_h

Switch-on/off delay time

Setting range (min. value unit max. value)		
0.000	s	3600.000
Subcodes	Lenze setting	Info
C00720/1	0.000 s	L_DigitalDelay_1 : ON delay
C00720/2	0.000 s	L_DigitalDelay_1 : OFF delay
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00721

Parameter Name: C00721 L_DigitalDelay 2,3: Delay		Data type: UNSIGNED_32 Index: 23854 _d = 5D2E _h
Switch-on/off delay time		
Setting range (min. value unit max. value)		
0.000	s	3600.000
Subcodes	Lenze setting	Info
C00721/1	0.000 s	L_DigitalDelay 2 : ON delay
C00721/2	0.000 s	L_DigitalDelay 2 : OFF delay
C00721/3	0.000 s	L_DigitalDelay 3 : ON delay
C00721/4	0.000 s	L_DigitalDelay 3 : OFF delay
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00725

Parameter Name: C00725 Current switching frequency		Data type: UNSIGNED_8 Index: 23850 _d = 5D2A _h
Display of the current switching frequency		
<ul style="list-style-type: none"> In C00018 you can choose between a drive-optimised setting for good smooth-running characteristics and an inverter loss-optimised setting (min. Pv). Both possibilities offer fixed and variable switching frequencies. When a variable switching frequency is selected in C00018, the switching frequency may change as a function of the load and rotational frequency. 		
Selection list (read only)		
1	4 kHz var./drive-optimised	
2	8 kHz var./drive-optimised	
3	16 kHz var./drive-optimised	
5	2 kHz constant/drive-optimised	
6	4 kHz constant/drive-optimised	
7	8 kHz constant/drive-optimised	
8	16 kHz constant/drive-optimised	
11	4 kHz var./min. Pv	
12	8 kHz var./min. Pv	
13	16 kHz var./min. Pv	
14	Reserved	
15	2 kHz constant/min. Pv	
16	4 kHz constant/min. Pv	
17	8 kHz constant/min. Pv	
18	16 kHz constant/min. Pv	
21	8 kHz var./drive-opt./4 kHz min	
22	16 kHz var./drive-opt./4 kHz min	
23	16 kHz var./drive-opt./8 kHz min	
31	8 kHz var./min. Pv/4 kHz min	
32	16 kHz var./min. Pv/4 kHz min	
33	16 kHz var./min. Pv/8 kHz min	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00726

Parameter Name: C00726 Current limit values		Data type: UNSIGNED_8 Index: 23849 _d = 5D29 _h
This code is for device-internal use only and must not be written to by the user!		

C00727

Parameter Name: C00727 LS_Keypad digital values		Data type: UNSIGNED_8 Index: 23848 _d = 5D28 _h
Execution of control commands for keypad operation		
Setting range (min. value unit max. value)		
0		1
Subcodes	Lenze setting	Info
C00727/1	0	"1" ≡ request quick stop
C00727/2	0	"1" ≡ request DC-injection braking
C00727/3	0	"1" ≡ request change of direction of rotation
C00727/4	0	"1" ≡ request fixed speed setpoint 1
C00727/5	0	"1" ≡ request fixed speed setpoint 2
C00727/6	0	"1" ≡ motor potentiometer: request activation
C00727/7	0	"1" ≡ motor potentiometer: request pos. acceleration
C00727/8	0	"1" ≡ motor potentiometer: request neg. acceleration
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00728

Parameter Name: C00728 Keypad analog values		Data type: INTEGER_16 Index: 23847 _d = 5D27 _h
Selection of different setpoints when operating via keypad		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00728/1	100.00 %	Torque limit in motor mode
C00728/2	100.00 %	Torque limit in generator mode
C00728/3	0.00 %	Setpoint speed
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00729

Parameter Name: C00729 Remote: Setpoint selection		Data type: INTEGER_16 Index: 23846 _d = 5D26 _h
Setting range (min. value unit max. value)		
-199.99		199.99
Subcodes	Lenze setting	Info
C00729/1	0.00	Remote: Setpoint keypad
C00729/2	0.00	Remote: Setpoint PC
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00730

Parameter Name: C00730 Oscilloscope scanning interval		Data type: UNSIGNED_32 Index: 23845 _d = 5D25 _h
This code is for device-internal use only and must not be written to by the user!		

C00731

Parameter Name: C00731 Oscilloscope recording length		Data type: UNSIGNED_32 Index: 23844 _d = 5D24 _h
This code is for device-internal use only and must not be written to by the user!		

C00732

Parameter Name: C00732 Oscilloscope command		Data type: UNSIGNED_8 Index: 23843 _d = 5D23 _h
This code is for device-internal use only and must not be written to by the user!		

C00734	Parameter Name: C00734 Oscilloscope trigger channel selection	Data type: UNSIGNED_16 Index: 23841 _d = 5D21 _h
This code is for device-internal use only and must not be written to by the user!		
C00735	Parameter Name: C00735 Oscilloscope channel source type	Data type: UNSIGNED_8 Index: 23840 _d = 5D20 _h
This code is for device-internal use only and must not be written to by the user!		
C00736	Parameter Name: C00736 Oscilloscope data type/data width	Data type: UNSIGNED_16 Index: 23839 _d = 5D1F _h
This code is for device-internal use only and must not be written to by the user!		
C00740	Parameter Name: C00740 Oscilloscope offset variables	Data type: UNSIGNED_32 Index: 23834 _d = 5D1B _h
This code is for device-internal use only and must not be written to by the user!		
C00741	Parameter Name: C00741 Oscilloscope trigger mode	Data type: UNSIGNED_8 Index: 23834 _d = 5D1A _h
This code is for device-internal use only and must not be written to by the user!		
C00742	Parameter Name: C00742 Oscilloscope trigger delay	Data type: INTEGER_16 Index: 23833 _d = 5D19 _h
This code is for device-internal use only and must not be written to by the user!		
C00743	Parameter Name: C00743 Oscilloscope trigger level	Data type: UNSIGNED_32 Index: 23832 _d = 5D18 _h
This code is for device-internal use only and must not be written to by the user!		
C00744	Parameter Name: C00744 Oscilloscope trigger mask	Data type: UNSIGNED_32 Index: 23831 _d = 5D17 _h
This code is for device-internal use only and must not be written to by the user!		
C00746	Parameter Name: C00746 Oscilloscope trigger counter	Data type: UNSIGNED_32 Index: 23829 _d = 5D15 _h
This code is for device-internal use only and must not be written to by the user!		
C00747	Parameter Name: C00747 Oscilloscope status word	Data type: UNSIGNED_16 Index: 23828 _d = 5D14 _h
This code is for device-internal use only and must not be written to by the user!		
C00748	Parameter Name: C00748 Oscilloscope no. of measured values	Data type: UNSIGNED_32 Index: 23827 _d = 5D13 _h
This code is for device-internal use only and must not be written to by the user!		
C00749	Parameter Name: C00749 Oscilloscope recording	Data type: UNSIGNED_32 Index: 23826 _d = 5D12 _h
This code is for device-internal use only and must not be written to by the user!		

C00750

Parameter | Name: **C00750 | Select. of BU oscillos. channels** Data type: UNSIGNED_8
Index: 23825_d = 5D11_h

This code is for device-internal use only and must not be written to by the user!

C00751

Parameter | Name: **C00751 | Oscilloscope data memory** Data type: UNSIGNED_32
Index: 23824_d = 5D10_h

This code is for device-internal use only and must not be written to by the user!

C00753

Parameter | Name: **C00753 | Oscilloscope data memory octet string** Data type: OCTET_STRING
Index: 23822_d = 5D0E_h

This code is for device-internal use only and must not be written to by the user!

C00760

Parameter | Name: **C00760 | LA_SwitchPos: Analog connection list** Data type: UNSIGNED_16
Index: 23815_d = 5D07_h

Connection parameters for "Switch-off positioning" application: 16-bi inputs

- Selection of the 16 bit output signals to be connected to the 16 bit input signals
- The selection list contains all 16 bit output signals which can be assigned to the 16 bit inputs displayed by the subcodes.

Selection list		
See selection list - analog signals		
Subcodes	Lenze setting	Info
C00760/1	0: Not connected	LA_SwitchPos : wCANDriveControl (input for control word from CAN to device control)
C00760/2	0: Not connected	LA_SwitchPos : wMCIDriveControl (input for control word from communication interface to device control)
C00760/3	0: Not connected	LA_SwitchPos : nVoltageAdd_a (input for additive voltage impression)
C00760/4	0: Not connected	LA_SwitchPos : nBoost_a (input for additional setpoint for the motor voltage at speed = 0)
C00760/5	0: Not connected	LA_SwitchPos : nPWMAngleOffset (input for additional offset for the electrical angle of rotation)
C00760/6	0: Not connected	LA_SwitchPos : nTorqueMotLim_a (input for maximum torque in motor mode)
C00760/7	0: Not connected	LA_SwitchPos : nTorqueGenLim_a (input for maximum torque in generator mode)
C00760/8	0: Not connected	LA_SwitchPos : nMainSetValue_a (input for main speed setpoint)
C00760/9	0: Not connected	LA_SwitchPos : nAuxSetValue_a (input for additional speed setpoint)
C00760/10	0: Not connected	LA_SwitchPos : nGPAnalogSwitchIn1_a (input for analog-value selector analog signal 1)
C00760/11	0: Not connected	LA_SwitchPos : nGPAnalogSwitchIn2_a (input for analog-value selector analog signal 2)
C00760/12	0: Not connected	LA_SwitchPos : nGPArithmetikIn1_a (input for arithmetic function analog signal 1)
C00760/13	0: Not connected	LA_SwitchPos : nGPArithmetikIn2_a (input for arithmetic function analog signal 2)
C00760/14	0: Not connected	LA_SwitchPos : nGPMulDivIn_a (input for analog signal for multiplication/division)

Parameter Name: C00760 LA_SwitchPos: Analog connection list		Data type: UNSIGNED_16 Index: 23815 _d = 5D07 _h
C00760/15	0: Not connected	LA_SwitchPos : nGPCompareIn1_a (input for comparison operation analog signal 1)
C00760/16	0: Not connected	LA_SwitchPos : nGPCompareIn2_a (input for comparison operation analog signal 2)
C00760/17	0: Not connected	LA_SwitchPos : wSMCtrl (interface to optional safety system)
C00760/18	0: Not connected	Reserved
C00760/19	0: Not connected	Reserved
C00760/20	0: Not connected	Reserved
C00760/21	0: Not connected	Reserved
C00760/22	0: Not connected	LA_SwitchPos : wFreeIn1 (input for user signal 1)
C00760/23	0: Not connected	LA_SwitchPos : wFreeIn2 (input for user signal 2)
C00760/24	0: Not connected	LA_SwitchPos : wFreeIn3 (input for user signal 3)
C00760/25	0: Not connected	LA_SwitchPos : wFreeIn4 (input for user signal 4)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00761

Parameter Name: C00761 LA_SwitchPos: Digital connection list		Data type: UNSIGNED_16 Index: 23814 _d = 5D06 _h
Connection parameters for "Switch-off positioning" application: Binary inputs <ul style="list-style-type: none"> • Selection of the binary output signals to be connected to the binary input signals • The selection list contains all binary output signals which can be assigned to the binary inputs mapped by the subcodes. 		
Selection list		
See selection list - digital signals		
Subcodes	Lenze setting	Info
C00761/1	0: Not connected	LA_SwitchPos : bCInh (control input for setting controller inhibit)
C00761/2	0: Not connected	LA_SwitchPos : bFailReset (control input for error acknowledgement)
C00761/3	0: Not connected	LA_SwitchPos : bSetQuickstop (control input for quick stop request)
C00761/4	0: Not connected	LA_SwitchPos : bSetDCBrake (control input for DC-injection braking request)
C00761/5	0: Not connected	LA_SwitchPos : bRFG_Stop (control input for stopping the speed ramp function generator)
C00761/6	0: Not connected	LA_SwitchPos : bSetSpeedCcw (control input for change of direction of rotation)
C00761/7	0: Not connected	LA_SwitchPos : bRLQCw (control input for activation of CW rotation (fail-safe))
C00761/8	0: Not connected	LA_SwitchPos : bRLQCcw (control input for activation of CCW rotation (fail-safe))
C00761/9	0: Not connected	LA_SwitchPos : bJogCtrlInputSel1 (selection input 1 for binary coded selection of the switch-off position 1 ... 3)

Parameter Name: C00761 LA_SwitchPos: Digital connection list		Data type: UNSIGNED_16 Index: 23814 _d = 5D06 _h
C00761/10	0: Not connected	LA_SwitchPos : bJogCtrlInputSel2 (selection input 2 for binary coded selection of the switch-off position 1 ... 3)
C00761/11	0: Not connected	LA_SwitchPos : bJogCtrlRfgln (control input for setpoint generator ramp-down)
C00761/12	0: Not connected	LA_SwitchPos : bJogCtrlJog1 (selection input 1 for overriding fixed setpoints (JOG setpoints) for the main setpoint)
C00761/13	0: Not connected	LA_SwitchPos : bJogCtrlJog2 (selection input 2 for overriding fixed setpoints (JOG setpoints) for the main setpoint)
C00761/14	0: Not connected	LA_SwitchPos : bJogCtrlSlowDown1 (control input for selection of pre-switch off 1)
C00761/15	0: Not connected	LA_SwitchPos : bJogCtrlStop1 (control input for stop function 1)
C00761/16	0: Not connected	LA_SwitchPos : bJogCtrlSlowDown2 (control input for selection of pre-switch off 2)
C00761/17	0: Not connected	LA_SwitchPos : bJogCtrlStop2 (control input for stop function 2)
C00761/18	0: Not connected	LA_SwitchPos : bJogCtrlSlowDown3 (control input for selection of pre-switch off 3)
C00761/19	0: Not connected	LA_SwitchPos : bJogCtrlStop3 (control input for stop function 3)
C00761/20	0: Not connected	LA_SwitchPos : bJogSpeed4 (selection input for fixed setpoints)
C00761/21	0: Not connected	LA_SwitchPos : bJogSpeed8 (selection input for fixed setpoints)
C00761/22	0: Not connected	LA_SwitchPos : bJogRamp1 (selection input for additional acceleration/deceleration times)
C00761/23	0: Not connected	LA_SwitchPos : bJogRamp2 (selection input for additional acceleration/deceleration times)
C00761/24	0: Not connected	LA_SwitchPos : bJogRamp4 (selection input for additional acceleration/deceleration times)
C00761/25	0: Not connected	LA_SwitchPos : bJogRamp8 (selection input for additional acceleration/deceleration times)
C00761/26	0: Not connected	LA_SwitchPos : bMBrkRelease (control input for manual holding brake release request)
C00761/27	0: Not connected	LA_SwitchPos : bGPAnalogSwitchSet (control input for analog-value selector change-over)
C00761/28	0: Not connected	LA_SwitchPos : bGPDigitalDelayIn (input for digital signal with time delay)
C00761/29	0: Not connected	LA_SwitchPos : bGPLogicIn1 (input signal 1 for digital logic)
C00761/30	0: Not connected	LA_SwitchPos : bGPLogicIn2 (input signal 2 for digital logic)
C00761/31	0: Not connected	LA_SwitchPos : bGPLogicIn3 (input signal 3 for digital logic)
C00761/32	0: Not connected	LA_SwitchPos : bGPDFlipFlop_InD (control input for DFlipFlop setting signal)

Parameter Name:		Data type: UNSIGNED_16 Index: 23814 _d = 5D06 _h
C00761 LA_SwitchPos: Digital connection list		
C00761/33	0: Not connected	LA_SwitchPos : bGPDFlipFlop_InClk (control input for DFlipFlop clock signal)
C00761/34	0: Not connected	LA_SwitchPos : bGPDFlipFlop_InClr (control input for DFlipFlop reset signal)
C00761/35	0: Not connected	Reserved
C00761/36	0: Not connected	Reserved
C00761/37	0: Not connected	Reserved
C00761/38	0: Not connected	Reserved
C00761/39	0: Not connected	Reserved
C00761/40	0: Not connected	LA_SwitchPos : bFreeIn1 (input for binary user signal 1)
C00761/41	0: Not connected	LA_SwitchPos : bFreeIn2 (input for binary user signal 2)
C00761/42	0: Not connected	LA_SwitchPos : bFreeIn3 (input for binary user signal 3)
C00761/43	0: Not connected	LA_SwitchPos : bFreeIn4 (input for binary user signal 4)
C00761/44	0: Not connected	LA_SwitchPos : bFreeIn5 (input for binary user signal 5)
C00761/45	0: Not connected	LA_SwitchPos : bFreeIn6 (input for binary user signal 6)
C00761/46	0: Not connected	LA_SwitchPos : bFreeIn7 (input for binary user signal 7)
C00761/47	0: Not connected	LA_SwitchPos : bFreeIn8 (input for binary user signal 8)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00762

Parameter Name:		Data type: UNSIGNED_16 Index: 23813 _d = 5D05 _h
C00762 LA_SwitchPos: phi connection list		
This code is for device-internal use only and must not be written to by the user!		

C00765

Parameter Name:		Data type: UNSIGNED_16 Index: 23810 _d = 5D02 _h
C00765 LA_SwitchPos_Out: Analog signal list		
This code is for device-internal use only and must not be written to by the user!		

C00766

Parameter Name:		Data type: UNSIGNED_16 Index: 23809 _d = 5D01 _h
C00766 LA_SwitchPos_Out: Digital signal list		
This code is for device-internal use only and must not be written to by the user!		

C00767

Parameter Name:		Data type: UNSIGNED_16 Index: 23808 _d = 5D00 _h
C00767 LA_SwitchPos_Out: phi signal list		
This code is for device-internal use only and must not be written to by the user!		

C00800

Parameter Name: C00800 L_MPot_1: Upper limit	Data type: INTEGER_16 Index: 23775 _d = 5CDF _h
The L_MPot_1 FB: Upper limit of the motor potentiometer function	
Setting range (min. value unit max. value)	Lenze setting
-199.99 % 199.99	100.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00801

Parameter Name: C00801 L_MPot_1: Lower limit	Data type: INTEGER_16 Index: 23774 _d = 5CDE _h
The L_MPot_1 FB: Lower limit of the motor potentiometer function	
Setting range (min. value unit max. value)	Lenze setting
-199.99 % 199.99	-100.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00802

Parameter Name: C00802 L_MPot_1: Acceleration time	Data type: UNSIGNED_16 Index: 23773 _d = 5CDD _h
The L_MPot_1 FB: Acceleration time of the motor potentiometer function	
Setting range (min. value unit max. value)	Lenze setting
0.1 s 6000.0	10.0 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10	

C00803

Parameter Name: C00803 L_MPot_1: Deceleration time	Data type: UNSIGNED_16 Index: 23772 _d = 5CDC _h
The L_MPot_1 FB: Deceleration time of the motor potentiometer function	
Setting range (min. value unit max. value)	Lenze setting
0.1 s 6000.0	10.0 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10	

C00804

Parameter Name: C00804 L_MPot_1: Inactive fct.	Data type: UNSIGNED_8 Index: 23771 _d = 5CDB _h
The L_MPot_1 FB: Selection of the response if the motor potentiometer is deactivated via input <i>blnAct</i>	
Selection list (Lenze setting printed in bold)	Info
0 Retain value	Retain output value
1 Deceleration to 0	Deceleration via ramp to 0
2 Deceleration to lower limit	Deceleration via ramp to the lower limit (C00801)
3 Without ramp to 0	Step change to 0
4 Without ramp to lower limit	Jump to lower limit (C00800)
5 Acceleration to upper limit	Acceleration via ramp to upper limit (C00800)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00805

Parameter Name: C00805 L_MPot_1: Init fct.	Data type: UNSIGNED_8 Index: 23770 _d = 5CDA _h
The L_MPot_1 FB: Selection of the response at device switch-on	
Selection list (Lenze setting printed in bold)	
0	Load last value
1	Load lower limit
2	Load 0
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00806

Parameter Name: C00806 L_MPot_1: Use	Data type: UNSIGNED_8 Index: 23769 _d = 5CD9 _h	
The L_MPot_1 FB: Use of the motor potentiometer		
Selection list (Lenze setting printed in bold)		
0	No	The motor potentiometer is not used. <ul style="list-style-type: none"> The analog value applied to the <i>nIn_a</i> input is looped through without any changes to the <i>nOut_a</i> output.
1	Yes	The motor potentiometer is used. <ul style="list-style-type: none"> The analog value applied at the <i>nIn_a</i> input is led via the motor potentiometer and provided at the <i>nOut_a</i> output.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00807

Parameter Name: C00807 L_NLim_1: Max.SkipFrq.	Data type: INTEGER_16 Index: 23768 _d = 5CD8 _h	
FB L_NLim_1 : Maximum blocking frequencies		
Setting range (min. value unit max. value)		
0.00	%	199.99
Subcodes	Lenze setting	Info
C00807/1	0.00 %	Maximum blocking frequency for zone 1
C00807/2	0.00 %	Maximum blocking frequency for zone 2
C00807/3	0.00 %	Maximum blocking frequency for zone 3
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00808

Parameter Name: C00808 L_NLim_1: Min.SkipFrq.	Data type: INTEGER_16 Index: 23767 _d = 5CD7 _h	
FB L_NLim_1 : Minimum blocking frequencies		
Setting range (min. value unit max. value)		
0.00	%	199.99
Subcodes	Lenze setting	Info
C00808/1	0.00 %	Minimum blocking frequency for zone 1
C00808/2	0.00 %	Minimum blocking frequency for zone 2
C00808/3	0.00 %	Minimum blocking frequency for zone 2
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00809

Parameter Name: C00809 L_NLim_2: Max.SkipFrq.		Data type: INTEGER_16 Index: 23766 _d = 5CD6 _h
FB L_NLim_2 : Maximum blocking frequencies		
Setting range (min. value unit max. value)		
0.00	%	199.99
Subcodes	Lenze setting	Info
C00809/1	0.00 %	Maximum blocking frequency for zone 1
C00809/2	0.00 %	Maximum blocking frequency for zone 2
C00809/3	0.00 %	Maximum blocking frequency for zone 3
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00810

Parameter Name: C00810 L_NLim_2: Min.SkipFrq.		Data type: INTEGER_16 Index: 23765 _d = 5CD5 _h
FB L_NLim_2 : Minimum blocking frequencies		
Setting range (min. value unit max. value)		
0.00	%	199.99
Subcodes	Lenze setting	Info
C00810/1	0.00 %	Minimum blocking frequency for zone 1
C00810/2	0.00 %	Minimum blocking frequency for zone 2
C00810/3	0.00 %	Minimum blocking frequency for zone 3
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00811

Parameter Name: C00811 L_NLim_1: Current output value		Data type: INTEGER_16 Index: 23764 _d = 5CD4 _h
From version 02.00.00		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Info	
C00811/1	L_NLim_1 : Current output value	
C00811/2	L_NLim_2 : Current output value	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00812

Parameter Name: C00812 L_NLim: Current status		Data type: UNSIGNED_16 Index: 23763 _d = 5CD3 _h
From version 02.00.00		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	No blocking zone active	
Bit 1	Blocking zone 1 active	
Bit 2	Blocking zone 2 active	
Bit 3	Blocking zone 3 active	
Bit 4	Value in blocking zone	
Bit 5	Reserved	
Bit 6	Reserved	
Bit 7	Reserved	
Bit 8	Reserved	
Bit 9	Reserved	
Bit 10	Reserved	
Bit 11	Reserved	
Bit 12	Reserved	
Bit 13	Reserved	
Bit 14	Reserved	
Bit 15	Reserved	
Subcodes		Info
C00812/1		L_NLim_1 : Current status
C00812/2		L_NLim_2 : Current status
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00820

Parameter Name: C00820 L_DigitalLogic_1: Function		Data type: UNSIGNED_8 Index: 23755 _d = 5CCB _h
The L_DigitalLogic_1 FB: Selection of the internal logic function		
Selection list (Lenze setting printed in bold)		Info
0	bOut = 0	Constant value "FALSE"
1	bOut = 1	Constant value "TRUE"
2	bOut = bln1 AND bln2 AND bln3	AND operation
3	bOut = bln1 OR bln2 OR bln3	OR operation
4	bOut = f (truth table)	The truth table parameterised in C00821 is used.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00821

Parameter Name: C00821 L_DigitalLogic_1: Truth table		Data type: UNSIGNED_8 Index: 23754 _d = 5CCA _h
The L_DigitalLogic_1 FB: Parameterisation of the truth table		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C00821/1	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=0 0 0
C00821/2	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=0 0 1
C00821/3	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=0 1 0
C00821/4	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=0 1 1
C00821/5	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=1 0 0
C00821/6	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=1 0 1
C00821/7	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=1 1 0
C00821/8	0: FALSE	L_DigitalLogic_1 : bIn3...bIn1=1 1 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00822

Parameter Name: C00822 L_DigitalLogic_2: Function		Data type: UNSIGNED_8 Index: 23753 _d = 5CC9 _h
The L_DigitalLogic_2 FB: Selection of the internal logic function		
Selection list (Lenze setting printed in bold)		Info
0	bOut = 0	Constant value "FALSE"
1	bOut = 1	Constant value "TRUE"
2	bOut = bIn1 AND ... bIn3	AND operation
3	bOut = bIn1 OR ... bIn3	OR operation
4	bOut = f (truth table)	The truth table parameterised in C00823 is used.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00823

Parameter Name: C00823 L_DigitalLogic_2: Truth table		Data type: UNSIGNED_8 Index: 23752 _d = 5CC8 _h
The L_DigitalLogic_2 FB: Parameterisation of the truth table		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C00823/1	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=0 0 0
C00823/2	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=0 0 1
C00823/3	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=0 1 0
C00823/4	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=0 1 1
C00823/5	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=1 0 0
C00823/6	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=1 0 1
C00823/7	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=1 1 0
C00823/8	0: FALSE	L_DigitalLogic_2 : bIn3...bIn1=1 1 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00824

Parameter Name: C00824 L_DigitalLogic5_1: Function		Data type: UNSIGNED_8 Index: 23751 _d = 5CC7 _h
FB L_DigitalLogic5_1 : Selection of the interna logic operation		
Selection list (Lenze setting printed in bold)		Info
0	bOut = 0	
1	bOut = 1	
2	bOut = f (truth table)	The truth table parameterised in C00825 is used.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00825

Parameter Name: C00825 L_DigitalLogic5_1: Truth table		Data type: UNSIGNED_8 Index: 23750 _d = 5CC6 _h
FB L_DigitalLogic5_1 : Parameter setting of the truth table		
Selection list		Info
0	False	
1	True	
Subcodes	Lenze setting	Info
C00825/1	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 0 0
C00825/2	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 0 1
C00825/3	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 0 1 0
C00825/4	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 0 1 1
C00825/5	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 1 0 0
C00825/6	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 1 0 1
C00825/7	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 1 1 0
C00825/8	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 0 1 1 1
C00825/9	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 0 0 0
C00825/10	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 0 0 1
C00825/11	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 0 1 0
C00825/12	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 0 1 1
C00825/13	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 1 0 0
C00825/14	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 1 0 1
C00825/15	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 1 1 0
C00825/16	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=0 1 1 1 1
C00825/17	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 0 0 0
C00825/18	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 0 0 1
C00825/19	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 0 1 0
C00825/20	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 0 1 1
C00825/21	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 1 0 0
C00825/22	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 1 0 1
C00825/23	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 1 1 0
C00825/24	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 0 1 1 1
C00825/25	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 0 0 0
C00825/26	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 0 0 1
C00825/27	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 0 1 0
C00825/28	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 0 1 1

Parameter Name: C00825 L_DigitalLogic5_1: Truth table		Data type: UNSIGNED_8 Index: 23750 _d = 5CC6 _h
C00825/29	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 1 0 0
C00825/30	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 1 0 1
C00825/31	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 1 1 0
C00825/32	0: FALSE	L_DigitalLogic5_1 : bIn5...bIn1=1 1 1 1 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00826

Parameter Name: C00826 L_DigitalLogic5_2: Function		Data type: UNSIGNED_8 Index: 23749 _d = 5CC5 _h
FB L_DigitalLogic5_2 : Selection of the interna logic operation		
Selection list (Lenze setting printed in bold)		Info
0	bOut = 0	
1	bOut = 1	
2	bOut = f (truth table)	The truth table parameterised in C00827 is used.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00827

Parameter Name: C00827 L_DigitalLogic5_2: Truth table		Data type: UNSIGNED_8 Index: 23748 _d = 5CC4 _h
FB L_DigitalLogic5_2 : Parameter setting of the truth table		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C00827/1	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 0 0 0
C00827/2	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 0 0 1
C00827/3	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 0 1 0
C00827/4	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 0 1 1
C00827/5	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 1 0 0
C00827/6	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 1 0 1
C00827/7	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 1 1 0
C00827/8	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 0 1 1 1
C00827/9	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 0 0 0
C00827/10	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 0 0 1
C00827/11	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 0 1 0
C00827/12	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 0 1 1
C00827/13	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 1 0 0
C00827/14	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 1 0 1
C00827/15	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 1 1 0
C00827/16	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=0 1 1 1 1
C00827/17	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 0 0 0
C00827/18	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 0 0 1
C00827/19	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 0 1 0
C00827/20	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 0 1 1
C00827/21	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 1 0 0
C00827/22	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 1 0 1

Parameter Name: C00827 L_DigitalLogic5_2: Truth table		Data type: UNSIGNED_8 Index: 23748 _d = 5CC4 _h
C00827/23	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 1 1 0
C00827/24	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 0 1 1 1
C00827/25	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 0 0 0
C00827/26	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 0 0 1
C00827/27	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 0 1 0
C00827/28	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 0 1 1
C00827/29	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 1 0 0
C00827/30	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 1 0 1
C00827/31	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 1 1 0
C00827/32	0: FALSE	L_DigitalLogic5_2 : bIn5...bIn1=1 1 1 1 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00828

Parameter Name: C00828 L_DigitalLogic_3: Function		Data type: UNSIGNED_8 Index: 23747 _d = 5CC3 _h
From version 02.00.00 The L_DigitalLogic_3 FB: Selection of the internal logic function		
Selection list (Lenze setting printed in bold)		Info
0	bOut = 0	Constant value "FALSE"
1	bOut = 1	Constant value "TRUE"
2	bOut = bIn1 AND bIn2 AND bIn3	AND operation
3	bOut = bIn1 OR bIn2 OR bIn3	OR operation
4	bOut = f (truth table)	The truth table parameterised in C00829 is used.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00829

Parameter Name: C00829 L_DigitalLogic_3: Truth table		Data type: UNSIGNED_8 Index: 23746 _d = 5CC2 _h
From version 02.00.00 The L_DigitalLogic_3 FB: Parameterisation of the truth table		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C00829/1	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=0 0 0
C00829/2	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=0 0 1
C00829/3	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=0 1 0
C00829/4	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=0 1 1
C00829/5	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=1 0 0
C00829/6	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=1 0 1
C00829/7	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=1 1 0
C00829/8	0: FALSE	L_DigitalLogic_3 : bIn3...bIn1=1 1 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00830

Parameter Name: C00830 16-bit inputs [%]		Data type: INTEGER_16 Index: 23745 _d = 5CC1 _h
Display in percent of 16-bit input values of different blocks		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Info	
C00830/1	L Absolut 1 : nIn_a	
C00830/2	L AddSub 1 : nIn1_a	
C00830/3	L AddSub 1 : nIn2_a	
C00830/4	L AddSub 1 : nIn3_a	
C00830/5	L OffsetGain 1 : nIn_a	
C00830/6	L OffsetGain 1 : nOffset_a	
C00830/7	L OffsetGain 1 : nGain_a	
C00830/8	L Negation 1 : nIn_a	
C00830/9	L GainOffset 1 : nIn_a	
C00830/10	L GainOffset 1 : nGain_a	
C00830/11	L GainOffset 1 : nOffset_a	
C00830/12	L Arithmetik 1 : nIn1_a	
C00830/13	L Arithmetik 1 : nIn2_a	
C00830/14	L AnalogSwitch 1 : nIn1_a	
C00830/15	L AnalogSwitch 1 : nIn2_a	
C00830/16	L Compare 1 : nIn1_a	
C00830/17	L Compare 1 : nIn2_a	
C00830/18	MCTRL : nTorqueLimitAdapt_a	
C00830/19	Reserved	
C00830/20	MCTRL : nPosCtrlPAdapt_a	
C00830/21	MCTRL : nPosCtrlOutLimit_a	
C00830/22	MCTRL : nSpeedSetValue_a	
C00830/23	MCTRL : nSpeedLowLimit_a	
C00830/24	MCTRL : nSpeedCtrlI_a	
C00830/25	MCTRL : nSpeedCtrlPAdapt_a	
C00830/26	MCTRL : nBoost_a	
C00830/27	MCTRL : nTorqueSetValue_a	
C00830/28	MCTRL : nTorqueGenLimit_a	
C00830/29	MCTRL : nTorqueMotLimit_a	
C00830/30	Reserved	
C00830/31	MCTRL : nVoltageAdd_a	
C00830/32	MCTRL : nPWMAngleOffset_a	
C00830/33	L NSet 1 : nCInhVal_a	
C00830/34	L NSet 1 : nNSet_a	
C00830/35	L NSet 1 : nSet_a	
C00830/36	L NSet 1 : nNAdd_a	
C00830/37	DCTRL : wCANControl	
C00830/38	DCTRL : wCCMControl	
C00830/39	L NLim 1 : nIn_a	
C00830/40	Reserved	

Parameter Name:	Data type: INTEGER_16 Index: 23745 _d = 5CC1 _h
C00830 16-bit inputs [%]	
C00830/41	L Compare 2 : nIn1_a
C00830/42	L Compare 2 : nIn2_a
C00830/43	L Compare 3 : nIn1_a
C00830/44	L Compare 3 : nIn2_a
C00830/45	L AnalogSwitch 2 : nIn1_a
C00830/46	L AnalogSwitch 2 : nIn2_a
C00830/47	L AnalogSwitch 3 : nIn1_a
C00830/48	L AnalogSwitch 3 : nIn2_a
C00830/49	L Arithmetik 2 : nIn1_a
C00830/50	L Arithmetik 2 : nIn2_a
C00830/51	Reserved
C00830/52	Reserved
C00830/53	L GainOffset 2 : nIn_a
C00830/54	L GainOffset 2 : nGain_a
C00830/55	L GainOffset 2 : nOffset_a
C00830/56	L OffsetGainP 1 : nIn_a
C00830/57	L OffsetGainP 2 : nIn_a
C00830/58	L OffsetGain 2 : nIn_a
C00830/59	L OffsetGain 2 : nOffset_a
C00830/60	L OffsetGain 2 : nGain_a
C00830/61	L PCTRL 1 : nAct_a
C00830/62	L PCTRL 1 : nAdapt_a
C00830/63	L PCTRL 1 : nSet_a
C00830/64	L PCTRL 1 : nInfluence_a
C00830/65	MCK: nSpeedCtrl1_a
C00830/66	MCK: nPWMAngleOffset_a
C00830/67	Reserved
C00830/68	MCK: nBrkAddValue_a
C00830/69	MCK: nTorqueSetValue_a
C00830/70	MCK: nTorqueLimitAdapt_a
C00830/71	MCK: nSRampOverride_a
C00830/72	MCK: nSpeedSetValue_a
C00830/73	MCK: wMotionCtrl2
C00830/74	MCK: wMotionCtrl1
C00830/75	MCK: nSpeedOverride_a
C00830/76	MCK: nAccOverride_a
C00830/77	MCK: nSpeedAdd_v
C00830/78	MCK: wAuxCtrl
C00830/79	MCK: wSMCtrl
C00830/80	L OffsetGainP 3 : nIn_a
C00830/81	L MPot 1 : nIn_a
C00830/82	L MulDiv 1 : nIn_a
C00830/83	LS_DataAccess: wIn1 (Lenze-internal)

Parameter Name: C00830 16-bit inputs [%]		Data type: INTEGER_16 Index: 23745 _d = 5CC1 _h
C00830/84	LS_DataAccess: wIn2 (Lenze-internal)	
C00830/85	LS_DataAccess: wIn3 (Lenze-internal)	
C00830/86	LS_DataAccess: wIn4 (Lenze-internal)	
C00830/87	L_PT1_1 : nIn_a	
C00830/88	MCTRL : nSpeedHighLimit_a	
C00830/89	L_PCTRL_1 : nNSet_a	
C00830/90	L_PCTRL_1 : nISet_a	
C00830/91	L_Interpolator_1 : nPhdIn_v	
C00830/92	L_Interpolator_1 : nNIn_a	
C00830/93	Reserved	
C00830/94	Reserved	
C00830/95	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00831

Parameter Name: C00831 16-bit inputs		Data type: UNSIGNED_16 Index: 23744 _d = 5CC0 _h
Decimal/hexadecimal/bit coded display of 16 bit input values of various blocks		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Active	
...	...	
Bit 15	Active	
Subcodes	Info	
C00831/1	L_Absolut_1 : nIn_a	
C00831/2	L_AddSub_1 : nIn1_a	
C00831/3	L_AddSub_1 : nIn2_a	
C00831/4	L_AddSub_1 : nIn3_a	
C00831/5	L_OffsetGain_1 : nIn_a	
C00831/6	L_OffsetGain_1 : nOffset_a	
C00831/7	L_OffsetGain_1 : nGain_a	
C00831/8	L_Negation_1 : nIn_a	
C00831/9	L_GainOffset_1 : nIn_a	
C00831/10	L_GainOffset_1 : nGain_a	
C00831/11	L_GainOffset_1 : nOffset_a	
C00831/12	L_Arithmetik_1 : nIn1_a	
C00831/13	L_Arithmetik_1 : nIn2_a	
C00831/14	L_AnalogSwitch_1 : nIn1_a	
C00831/15	L_AnalogSwitch_1 : nIn2_a	
C00831/16	L_Compare_1 : nIn1_a	
C00831/17	L_Compare_1 : nIn2_a	
C00831/18	MCTRL : nTorqueLimitAdapt_a	

Parameter Name:	Data type: UNSIGNED_16 Index: 23744 _d = 5CC0 _h
C00831 16-bit inputs	
C00831/19	Reserved
C00831/20	MCTRL : nPosCtrlPAdapt_a
C00831/21	MCTRL : nPosCtrlOutLimit_a
C00831/22	MCTRL : nSpeedSetValue_a
C00831/23	MCTRL : nSpeedLowLimit_a
C00831/24	MCTRL : nSpeedCtrlI_a
C00831/25	MCTRL : nSpeedCtrlPAdapt_a
C00831/26	MCTRL : nBoost_a
C00831/27	MCTRL : nTorqueSetValue_a
C00831/28	MCTRL : nTorqueGenLimit_a
C00831/29	MCTRL : nTorqueMotLimit_a
C00831/30	Reserved
C00831/31	MCTRL : nVoltageAdd_a
C00831/32	MCTRL : nPWMAngleOffset_a
C00831/33	L_NSet_1 : nCInhVal_a
C00831/34	L_NSet_1 : nNSet_a
C00831/35	L_NSet_1 : nSet_a
C00831/36	L_NSet_1 : nNAdd_a
C00831/37	DCTRL : wCANControl
C00831/38	DCTRL : wMCIControl
C00831/39	L_NLim_1 : nIn_a
C00831/40	Reserved
C00831/41	L_Compare_2 : nIn1_a
C00831/42	L_Compare_2 : nIn2_a
C00831/43	L_Compare_3 : nIn1_a
C00831/44	L_Compare_3 : nIn2_a
C00831/45	L_AnalogSwitch_2 : nIn1_a
C00831/46	L_AnalogSwitch_2 : nIn2_a
C00831/47	L_AnalogSwitch_3 : nIn1_a
C00831/48	L_AnalogSwitch_3 : nIn2_a
C00831/49	L_Arithmetik_2 : nIn1_a
C00831/50	L_Arithmetik_2 : nIn2_a
C00831/51	Reserved
C00831/52	Reserved
C00831/53	L_GainOffset_2 : nIn_a
C00831/54	L_GainOffset_2 : nGain_a
C00831/55	L_GainOffset_2 : nOffset_a
C00831/56	L_OffsetGainP_1 : nIn_a
C00831/57	L_OffsetGainP_2 : nIn_a
C00831/58	L_OffsetGain_2 : nIn_a
C00831/59	L_OffsetGain_2 : nOffset_a
C00831/60	L_OffsetGain_2 : nGain_a
C00831/61	L_PCTRL_1 : nAct_a
C00831/62	L_PCTRL_1 : nAdapt_a

Parameter Name:	Data type: UNSIGNED_16 Index: 23744 _d = 5CC0 _h
C00831 16-bit inputs	
C00831/63	L_PCTRL_1 : nSet_a
C00831/64	L_PCTRL_1 : nInfluence_a
C00831/65	MCK: nSpeedCtrlI_a
C00831/66	MCK: nPWMAngleOffset_a
C00831/67	Reserved
C00831/68	MCK: nBrkTorqueAdd_a
C00831/69	MCK: nTorqueSetValue_a
C00831/70	MCK: nTorqueLimitAdapt_a
C00831/71	MCK: nSRampOverride_a
C00831/72	MCK: nSpeedSetValue_a
C00831/73	MCK: wMotionCtrl2
C00831/74	MCK: wMotionCtrl1
C00831/75	MCK: nSpeedOverride_a
C00831/76	MCK: nAccOverride_a
C00831/77	MCK: nSpeedAdd_v
C00831/78	MCK: wAuxCtrl
C00831/79	MCK: wSMCtrl
C00831/80	L_OffsetGainP_3 : nIn_a
C00831/81	L_MPot_1 : nIn_a
C00831/82	L_MulDiv_1 : nIn_a
C00831/83	LS_DataAccess: wIn1 (Lenze-internal)
C00831/84	LS_DataAccess: wIn2 (Lenze-internal)
C00831/85	LS_DataAccess: wIn3 (Lenze-internal)
C00831/86	LS_DataAccess: wIn4 (Lenze-internal)
C00831/87	L_PT1_1 : nIn_a
C00831/88	MCTRL : nSpeedHighLimit_a
C00831/89	L_PCTRL_1 : nNSet_a
C00831/90	L_PCTRL_1 : nISet_a
C00831/91	L_Interpolator_1 : nPhdIn_v
C00831/92	L_Interpolator_1 : nNIn_a
C00831/93	Reserved
C00831/94	Reserved
C00831/95	Reserved

Read access
 Write access
 CINH
 PLC STOP
 No transfer
 COM
 MOT

C00832

Parameter Name: C00832 16-bit inputs [rpm]		Data type: INTEGER_16 Index: 23743 _d = 5CBF _h
Display of 16-bit input values of different blocks in [rpm]		
Display range (min. value unit max. value)		
-32767	rpm	32767
Subcodes	Info	
C00832/1	L Absolut 1 : nIn_a	
C00832/2	L AddSub 1 : nIn1_a	
C00832/3	L AddSub 1 : nIn2_a	
C00832/4	L AddSub 1 : nIn3_a	
C00832/5	L OffsetGain 1 : nIn_a	
C00832/6	L OffsetGain 1 : nOffset_a	
C00832/7	L OffsetGain 1 : nGain_a	
C00832/8	L Negation 1 : nIn_a	
C00832/9	L GainOffset 1 : nIn_a	
C00832/10	L GainOffset 1 : nGain_a	
C00832/11	L GainOffset 1 : nOffset_a	
C00832/12	L Arithmetik 1 : nIn1_a	
C00832/13	L Arithmetik 1 : nIn2_a	
C00832/14	L AnalogSwitch 1 : nIn1_a	
C00832/15	L AnalogSwitch 1 : nIn2_a	
C00832/16	L Compare 1 : nIn1_a	
C00832/17	L Compare 1 : nIn2_a	
C00832/18	MCTRL : nTorqueLimitAdapt_a	
C00832/19	Reserved	
C00832/20	MCTRL : nPosCtrlPAdapt_a	
C00832/21	MCTRL : nPosCtrlOutLimit_a	
C00832/22	MCTRL : nSpeedSetValue_a	
C00832/23	MCTRL : nSpeedLowLimit_a	
C00832/24	MCTRL : nSpeedCtrlI_a	
C00832/25	MCTRL : nSpeedCtrlPAdapt_a	
C00832/26	MCTRL : nBoost_a	
C00832/27	MCTRL : nTorqueSetValue_a	
C00832/28	MCTRL : nTorqueGenLimit_a	
C00832/29	MCTRL : nTorqueMotLimit_a	
C00832/30	Reserved	
C00832/31	MCTRL : nVoltageAdd_a	
C00832/32	MCTRL : nPWMAngleOffset_a	
C00832/33	L NSet 1 : nCInhVal_a	
C00832/34	L NSet 1 : nNSet_a	
C00832/35	L NSet 1 : nSet_a	
C00832/36	L NSet 1 : nNAdd_a	
C00832/37	DCTRL : wCANControl	
C00832/38	DCTRL : wCCMControl	
C00832/39	L NLim 1 : nIn_a	
C00832/40	Reserved	

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00832

Parameter Name:	Data type: INTEGER_16 Index: 23743 _d = 5CBF _h
C00832 16-bit inputs [rpm]	
C00832/41	L Compare 2 : nIn1_a
C00832/42	L Compare 2 : nIn2_a
C00832/43	L Compare 3 : nIn1_a
C00832/44	L Compare 3 : nIn2_a
C00832/45	L AnalogSwitch 2 : nIn1_a
C00832/46	L AnalogSwitch 2 : nIn2_a
C00832/47	L AnalogSwitch 3 : nIn1_a
C00832/48	L AnalogSwitch 3 : nIn2_a
C00832/49	L Arithmetik 2 : nIn1_a
C00832/50	L Arithmetik 2 : nIn2_a
C00832/51	Reserved
C00832/52	Reserved
C00832/53	L GainOffset 2 : nIn_a
C00832/54	L GainOffset 2 : nGain_a
C00832/55	L GainOffset 2 : nOffset_a
C00832/56	L OffsetGainP 1 : nIn_a
C00832/57	L OffsetGainP 2 : nIn_a
C00832/58	L OffsetGain 2 : nIn_a
C00832/59	L OffsetGain 2 : nOffset_a
C00832/60	L OffsetGain 2 : nGain_a
C00832/61	L PCTRL 1 : nAct_a
C00832/62	L PCTRL 1 : nAdapt_a
C00832/63	L PCTRL 1 : nSet_a
C00832/64	L PCTRL 1 : nInfluence_a
C00832/65	MCK: nSpeedCtrlI_a
C00832/66	MCK: nPWMAngleOffset_a
C00832/67	Reserved
C00832/68	MCK: nBrkTorqueAdd_a
C00832/69	MCK: nTorqueSetValue_a
C00832/70	MCK: nTorqueLimitAdapt_a
C00832/71	MCK: nSRampOverride_a
C00832/72	MCK: nSpeedSetValue_a
C00832/73	MCK: wMotionCtrl2
C00832/74	MCK: wMotionCtrl1
C00832/75	MCK: nSpeedOverride_a
C00832/76	MCK: nAccOverride_a
C00832/77	MCK: nSpeedAdd_v
C00832/78	MCK: wAuxCtrl
C00832/79	MCK: wSMCtrl
C00832/80	L OffsetGainP 3 : nIn_a
C00832/81	L MPot 1 : nIn_a
C00832/82	L MulDiv 1 : nIn_a
C00832/83	LS_DataAccess: wIn1 (Lenze-internal)

Parameter Name: C00832 16-bit inputs [rpm]		Data type: INTEGER_16 Index: 23743 _d = 5CBF _h
C00832/84	LS_DataAccess: wIn2 (Lenze-internal)	
C00832/85	LS_DataAccess: wIn3 (Lenze-internal)	
C00832/86	LS_DataAccess: wIn4 (Lenze-internal)	
C00832/87	L_PT1_1 : nIn_a	
C00832/88	MCTRL : nSpeedHighLimit_a	
C00832/89	L_PCTRL_1 : nNSet_a	
C00832/90	L_PCTRL_1 : nISet_a	
C00832/91	L_Interpolator_1 : nPhdIn_v	
C00832/92	L_Interpolator_1 : nNIn_a	
C00832/93	Reserved	
C00832/94	Reserved	
C00832/95	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00833

Parameter Name: C00833 Binary inputs		Data type: UNSIGNED_8 Index: 23742 _d = 5CBE _h
Display of the signal status of the binary inputs of different blocks		
Selection list		
0	False	
1	True	
Subcodes	Info	
C00833/1	L_And_1 : bIn1	
C00833/2	L_And_1 : bIn2	
C00833/3	L_And_1 : bIn3	
C00833/4	L_DFlipFlop_1 : bD	
C00833/5	L_DFlipFlop_1 : bClk	
C00833/6	L_DFlipFlop_1 : bClr	
C00833/7	L_Not_1 : bIn	
C00833/8	L_Or_1 : bIn1	
C00833/9	L_Or_1 : bIn2	
C00833/10	L_Or_1 : bIn3	
C00833/11	L_RLO_1 : bCw	
C00833/12	L_RLO_1 : bCcw	
C00833/13	L_AnalogSwitch_1 : bSet	
C00833/14	L_NSet_1 : bRfgStop	
C00833/15	L_NSet_1 : bRfg0	
C00833/16	L_NSet_1 : bNSetInv	
C00833/17	L_NSet_1 : bJog1	
C00833/18	L_NSet_1 : bJog2	
C00833/19	L_NSet_1 : bJog4	
C00833/20	L_NSet_1 : bJog8	
C00833/21	L_NSet_1 : bTi1	

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00833

Parameter Name:	Data type: UNSIGNED_8 Index: 23742 _d = 5CBE _h
C00833 Binary inputs	
C00833/22	L_NSet_1 : bTi2
C00833/23	L_NSet_1 : bTi4
C00833/24	L_NSet_1 : bTi8
C00833/25	L_NSet_1 : bLoad
C00833/26	L_NSet_1 : bExternalCINH
C00833/27	MCTRL : bPosCtrlOn
C00833/28	MCTRL : bSpeedInterpolatorOn
C00833/29	MCTRL : bTorqueInterpolatorOn
C00833/30	MCTRL : bTorquemodeOn
C00833/31	MCTRL : bSpeedCtrlOn
C00833/32	MCTRL : bAutoBoostOn
C00833/33	MCTRL : bQSPOn
C00833/34	MCTRL : bDcBrakeOn
C00833/35	MCTRL : bDeltaPosOn
C00833/36	DCTRL : bCINH
C00833/37	DCTRL : bFailReset
C00833/38	DCTRL : bStatus_B0
C00833/39	DCTRL : bStatus_B2
C00833/40	DCTRL : bStatus_B3
C00833/41	DCTRL : bStatus_B4
C00833/42	DCTRL : bStatus_B5
C00833/43	DCTRL : bStatus_B14
C00833/44	DCTRL : bStatus_B15
C00833/45	DCTRL : bFree_1
C00833/46	DCTRL : bFree_2
C00833/47	DCTRL : bFree_3
C00833/48	DCTRL : bFree_4
C00833/49	L_And_2 : bIn1
C00833/50	L_And_2 : bIn2
C00833/51	L_And_2 : bIn3
C00833/52	L_And_3 : bIn1
C00833/53	L_And_3 : bIn2
C00833/54	L_And_3 : bIn3
C00833/55	L_Or_2 : bIn1
C00833/56	L_Or_2 : bIn2
C00833/57	L_Or_2 : bIn3
C00833/58	L_Or_3 : bIn1
C00833/59	L_Or_3 : bIn2
C00833/60	L_Or_3 : bIn3
C00833/61	L_Not_2 : bIn
C00833/62	L_Not_3 : bIn
C00833/63	L_DigitalLogic_1 : bIn1
C00833/64	L_DigitalLogic_1 : bIn2
C00833/65	L_DigitalLogic_1 : bIn3

Parameter Name:	Data type: UNSIGNED_8 Index: 23742 _d = 5CBE _h
C00833 Binary inputs	
C00833/66	L DigitalDelay 1 : bIn
C00833/67	MCTRL : bPosDerivativeOn
C00833/68	MCTRL : bMotorRefOffsetOn
C00833/69	MCTRL : bSpeedCtrlPAdaptOn
C00833/70	L AnalogSwitch 2 : bSet
C00833/71	L AnalogSwitch 3 : bSet
C00833/72	L MPot 1 : bUp
C00833/73	L MPot 1 : bInAct
C00833/74	L MPot 1 : bDown
C00833/75	L PCTRL 1 : bPIDOff
C00833/76	L PCTRL 1 : bInAct
C00833/77	L PCTRL 1 : bIOff
C00833/78	MCK: bSpeedCtrlIOn
C00833/79	MCK: bDcBrakeOn
C00833/80	MCK: bBrkRelease
C00833/81	MCK: bBrkStartTorqueDir
C00833/82	MCK: bBrkApplied
C00833/83	MCK: bLimitSwitchPos
C00833/84	MCK: bLimitSwitchNeg
C00833/85	MCK: bPosCtrlOn
C00833/86	MCK: bDeltaPosOn
C00833/87	MCK: bPosDerivativeOn
C00833/88	MCK: bMotorRefOffsetOn
C00833/89	MCK: bQspOn
C00833/90	MCK: bTorquemodeOn
C00833/91	MCK: bTorqueLimitAdaptOn
C00833/92	MCK: bHomMark
C00833/93	L Transient 1 : bIn
C00833/94	L Transient 2 : bIn
C00833/95	L Transient 3 : bIn
C00833/96	L Transient 4 : bIn
C00833/97	Reserved
C00833/98	MCTRL : bTorqueLimitAdaptOn
C00833/99	L NSet 1 : bNAddInv
C00833/100	L MPot 1 : bEnable
C00833/101	L NLim 1 : bEnable
C00833/102	LS_DataAccess: bEnableIn1 (Lenze-internal)
C00833/103	LS_DataAccess: bEnableIn2 (Lenze-internal)
C00833/104	LS_DataAccess: bEnableIn3 (Lenze-internal)
C00833/105	LS_DataAccess: bEnableIn4 (Lenze-internal)
C00833/106	L PCTRL 1 : bEnableInfluenceRamp

Parameter Name: C00833 Binary inputs		Data type: UNSIGNED_8 Index: 23742 _d = 5CBE _h
C00833/107	LS_SetError_2 : bSetError1	
C00833/108	LS_SetError_2 : bSetError2	
C00833/109	LS_SetError_2 : bSetError3	
C00833/110	LS_SetError_2 : bSetError4	
C00833/111	L_JogCtrlExtension : bInputSel1	
C00833/112	L_JogCtrlExtension : bInputSel2	
C00833/113	L_JogCtrlExtension : bRfgIn	
C00833/114	L_JogCtrlExtension : bJog1In	
C00833/115	L_JogCtrlExtension : bJog2In	
C00833/116	L_JogCtrlExtension : bSlowDown1	
C00833/117	L_JogCtrlExtension : bStop1	
C00833/118	L_JogCtrlExtension : bbSlowDown2	
C00833/119	L_JogCtrlExtension : bStop2	
C00833/120	L_JogCtrlExtension : bSlowDown3	
C00833/121	L_JogCtrlExtension : bStop3	
C00833/122	L_PCTRL_1 : bISet	
C00833/123	L_Interpolator_1 : bSpeedAct0	
C00833/124	L_Or_4 : bIn1	
C00833/125	L_Or_4 : bIn2	
C00833/126	L_Or_4 : bIn3	
C00833/127	L_DigitalLogic_3 : bIn1	
C00833/128	L_DigitalLogic_3 : bIn2	
C00833/129	L_DigitalLogic_3 : bIn3	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00834

Parameter Name: C00834 32-bit inputs [incr]		Data type: INTEGER_32 Index: 23741 _d = 5CBD _h
Display in [increments] of 32 bit input values of various blocks		
Display range (min. value unit max. value)		
-2147483647	Incr.	2147483647
Subcodes	Info	
C00834/1	MCK: dnPosSetValue_p	
C00834/2	MCK: dnMotorRefOffset_p	
C00834/3	MCK: dnDeltaPos_p	
C00834/4	MCTRL : dnDeltaPos_p	
C00834/5	MCTRL : dnPosSetValue_p	
C00834/6	MCTRL : dnMotorRefOffset_p	
C00834/7	MCK: dnProfilePosition_p	
C00834/8	L_Interpolator_1 : dnPhiIn_p	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00835

Parameter Name: C00835 16-bit inputs [%] (Set2)		Data type: INTEGER_16 Index: 23740 _d = 5CBC _h
Display in percent of 16-bit input values of different blocks		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Info	
C00835/1	L Absolut 2 : nIn_a	
C00835/2	L AnalogSwitch 4 : nIn1_a	
C00835/3	L AnalogSwitch 4 : nIn2_a	
C00835/4	L AnalogSwitch 5 : nIn1_a	
C00835/5	L AnalogSwitch 5 : nIn2_a	
C00835/6	L Compare 4 : nIn1_a	
C00835/7	L Compare 4 : nIn2_a	
C00835/8	L Compare 5 : nIn1_a	
C00835/9	L Compare 5 : nIn2_a	
C00835/10	L Arithmetik 3 : nIn1_a	
C00835/11	L Arithmetik 3 : nIn2_a	
C00835/12	L Arithmetik 4 : nIn1_a	
C00835/13	L Arithmetik 4 : nIn2_a	
C00835/14	L Arithmetik 5 : nIn1_a	
C00835/15	L Arithmetik 5 : nIn2_a	
C00835/16	L Counter 2 : wLdVal	
C00835/17	L Counter 2 : wCmpVal	
C00835/18	L Counter 3 : wLdVal	
C00835/19	L Counter 3 : wCmpVal	
C00835/20	L PhaseIntK 1 : nIn_v	
C00835/21	L Negation 2 : nIn_a	
C00835/22	L NLim 2 : nIn_a	
C00835/23	L OffsetGain 3 : nIn_a	
C00835/24	L OffsetGain 3 : nOffset_a	
C00835/25	L OffsetGain 3 : nGain_a	
C00835/26	L PT1 2 : nIn_a	
C00835/27	L PT1 3 : nIn_a	
C00835/28	L PhaseIntK 2 : nIn_v	
C00835/29	L SampleHold 1 : nIn_a	
C00835/30	L SampleHold 2 : nIn_a	
C00835/31	L Mux 1 : wInSelect	
C00835/32	L GainOffset 3 : nIn_a	
C00835/33	L GainOffset 3 : nGain_a	
C00835/34	L GainOffset 3 : nOffset_a	
C00835/35	L MulDiv 2 : nIn_a	
C00835/36	L DT1 1 : nIn_a	
C00835/37	L Counter 1 : wLdVal	
C00835/38	L Counter 1 : wCmpVal	
C00835/39	L GainOffsetP 1 : nIn_a	
C00835/40	L GainOffsetP 2 : nIn_a	

Parameter Name:	Data type: INTEGER_16 Index: 23740 _d = 5CBC _h
C00835 16-bit inputs [%] (Set2)	
C00835/41	L GainOffsetP 3: nIn_a
C00835/42	L Limit 1: nIn_a
C00835/43	L Limit 2: nIn_a
C00835/44	L MckCtrlInterface 1: wOperationMode
C00835/45	L MckCtrlInterface 1: wPosMode
C00835/46	L MckCtrlInterface 1: wProfileNo
C00835/47	L MckCtrlInterface 1: wInMckPosCtrl_1
C00835/48	L MckCtrlInterface 1: wInMckPosCtrl_2
C00835/49	L MckStateInterface 1: wInMckPosState_1
C00835/50	L MckStateInterface 1: wInMckPosState_2
C00835/51	L PosiShaftCtrlInterface 1: wInPosiShaftCtrl_1
C00835/52	L PosiShaftCtrlInterface 1: wInPosiShaftCtrl_2
C00835/53	L PosiShaftCtrlInterface 1: wInPosiShaftCtrl_3
C00835/54	L PosiShaftCtrlInterface 1: wInPosiShaftCtrl_4
C00835/55	L ConvWordToBits 1: wInInput
C00835/56	L ConvWordToBits 2: wInInput
C00835/57	L ConvWordToBits 3: wInInput
C00835/58	L ConvWordsToDInt 1: wInLWord
C00835/59	L ConvWordsToDInt 1: wInHWord
C00835/60	L ConvWordsToDInt 2: wInLWord
C00835/61	L ConvWordsToDInt 2: wInHWord
C00835/62	L ConvWordsToDInt 3: wInLWord
C00835/63	L ConvWordsToDInt 3: wInHWord
C00835/64	L ConvUnitsToIncr 1: wInLWord
C00835/65	L ConvUnitsToIncr 1: wInHWord
C00835/66	L ConvUnitsToIncr 2: wInLWord
C00835/67	L ConvUnitsToIncr 2: wInHWord
C00835/68	L ConvUnitsToIncr 3: wInLWord
C00835/69	L ConvUnitsToIncr 3: wInHWord
C00835/70	L Curve 1: nIn_a
C00835/71	L ConvW 1: wIn
C00835/72	L ConvW 2: wIn
C00835/73	L ConvW 3: wIn
C00835/74	L ConvW 4: wIn
C00835/75	L MckCtrlInterface 1: wPosSetHW
C00835/76	L MckCtrlInterface 1: wPosSetLW
C00835/77	L PhaseDiff 1: nIn_v
C00835/78	L PhaseDiff 2: nIn_v
C00835/79	L SRFG 1: nIn_a
C00835/80	L SRFG 2: nIn_a
C00835/81	L SRFG 1: nSet_a
C00835/82	L SRFG 2: nSet_a
C00835/83	L SignalSwitch 1: wIn1
C00835/84	L SignalSwitch 2: wIn1

Parameter Name:	Data type: INTEGER_16 Index: 23740 _d = 5CBC _h
C00835 16-bit inputs [%] (Set2)	
C00835/85	L SignalSwitch 3 : wIn1
C00835/86	L SignalSwitch 4 : wIn1
C00835/87	L SignalSwitch 1 : wIn2
C00835/88	L SignalSwitch 2 : wIn2
C00835/89	L SignalSwitch 3 : wIn2
C00835/90	L SignalSwitch 4 : wIn2
C00835/91	L Odometer 1 : nInSpeed_v
C00835/92	L CalcDiameter 1 : wDMax
C00835/93	L CalcDiameter 1 : wDMin
C00835/94	L CalcDiameter 1 : wVMax
C00835/95	L CalcDiameter 1 : nVLine_a
C00835/96	L CalcDiameter 1 : nMotorSpeedAct_v
C00835/97	L CalcDiameter 1 : wGearNum
C00835/98	L CalcDiameter 1 : wGearDenom
C00835/99	L CalcDiameter 1 : nSetD_a
C00835/100	L ProcessCtrl 1 : nVpAdapt_a
C00835/101	L ProcessCtrl 1 : nSet_a
C00835/102	L ProcessCtrl 1 : nAct_a
C00835/103	L ProcessCtrl 1 : nRTimeAdapt_a
C00835/104	L ProcessCtrl 1 : nInfluence_a
C00835/105	L PhilIntegrator 1 : nIn_v
C00835/106	L PhilIntegrator 1 : wGearNum
C00835/107	L PhilIntegrator 1 : wGearDenom
C00835/108	L SwitchPoint 1 : nActSpeed_v
C00835/109	L PhilIntegrator 1 : nSpeedAdd_v
C00835/110	L DFSET 1 : nSpeedTrim_v
C00835/111	L DFSET 1 : nSpeedTrim_a
C00835/112	L DFSET 1 : wGearNum
C00835/113	L DFSET 1 : wGainNum
C00835/114	L DFSET 1 : nSet_v
C00835/115	L DFSET 1 : wGainDenom
C00835/116	L DFSET 1 : wGearDenom
C00835/117	L DFSET 1 : nPositionTrimming
C00835/118	L DFSET 1 : nNAct_v
C00835/119	L DFRFG 1 : nIn_v
C00835/120	L GearComp 1 : nTorque_a
C00835/121	L ConvAP 1 : nIn_a
C00835/122	L ConvAP 2 : nIn_a
C00835/123	L ConvAP 3 : nIn_a
C00835/124	L ConvX 1 : nIn_a
C00835/125	L ConvX 1 : nNum
C00835/126	L ConvX 1 : wDenom
C00835/127	L ConvX 2 : nIn_a
C00835/128	L ConvX 2 : nNum

Parameter Name: C00835 16-bit inputs [%] (Set2)		Data type: INTEGER_16 Index: 23740 _d = 5CBB _h
C00835/129	L_ConvX_2 : wDenom	
C00835/130	L_ConvX_3 : nIn_a	
C00835/131	L_ConvX_3 : nNum	
C00835/132	L_ConvX_3 : wDenom	
C00835/133	L_ConvPP_1 : nNum	
C00835/134	L_ConvPP_1 : wDenom	
C00835/135	L_ConvPP_2 : nNum	
C00835/136	L_ConvPP_2 : wDenom	
C00835/137	L_ConvPP_3 : nNum	
C00835/138	L_ConvPP_3 : wDenom	
C00835/139	L_Curve_2 : nIn_a	
C00835/140	L_Curve_3 : nIn_a	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00836

Parameter Name: C00836 16-bit inputs (Set2)		Data type: UNSIGNED_16 Index: 23739 _d = 5CBB _h
Decimal/hexadecimal/bit coded display of 16 bit input values of various blocks		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Active	
...	...	
Bit 15	Active	
Subcodes	Info	
C00836/1	L_Absolut_2 : nIn_a	
C00836/2	L_AnalogSwitch_4 : nIn1_a	
C00836/3	L_AnalogSwitch_4 : nIn2_a	
C00836/4	L_AnalogSwitch_5 : nIn1_a	
C00836/5	L_AnalogSwitch_5 : nIn2_a	
C00836/6	L_Compare_4 : nIn1_a	
C00836/7	L_Compare_4 : nIn2_a	
C00836/8	L_Compare_5 : nIn1_a	
C00836/9	L_Compare_5 : nIn2_a	
C00836/10	L_Arithmetik_3 : nIn1_a	
C00836/11	L_Arithmetik_3 : nIn2_a	
C00836/12	L_Arithmetik_4 : nIn1_a	
C00836/13	L_Arithmetik_4 : nIn2_a	
C00836/14	L_Arithmetik_5 : nIn1_a	
C00836/15	L_Arithmetik_5 : nIn2_a	
C00836/16	L_Counter_2 : wLdVal	
C00836/17	L_Counter_2 : wCmpVal	
C00836/18	L_Counter_3 : wLdVal	
C00836/19	L_Counter_3 : wCmpVal	
C00836/20	L_PhaseIntK_1 : nIn_v	

Parameter Name:	Data type: UNSIGNED_16 Index: 23739 _d = 5CBB _h
C00836 16-bit inputs (Set2)	
C00836/21	L Negation 2 : nIn_a
C00836/22	L NLim 2 : nIn_a
C00836/23	L OffsetGain 3 : nIn_a
C00836/24	L OffsetGain 3 : nOffset_a
C00836/25	L OffsetGain 3 : nGain_a
C00836/26	L PT1 2 : nIn_a
C00836/27	L PT1 3 : nIn_a
C00836/28	L PhaseIntK 2 : nIn_v
C00836/29	L SampleHold 1 : nIn_a
C00836/30	L SampleHold 2 : nIn_a
C00836/31	L Mux 1 : wInSelect
C00836/32	L GainOffset 3 : nIn_a
C00836/33	L GainOffset 3 : nGain_a
C00836/34	L GainOffset 3 : nOffset_a
C00836/35	L MulDiv 2 : nIn_a
C00836/36	L DT1 1 : nIn_a
C00836/37	L Counter 1 : wLdVal
C00836/38	L Counter 1 : wCmpVal
C00836/39	L GainOffsetP 1 : nIn_a
C00836/40	L GainOffsetP 2 : nIn_a
C00836/41	L GainOffsetP 3 : nIn_a
C00836/42	L Limit 1 : nIn_a
C00836/43	L Limit 2 : nIn_a
C00836/44	L MckCtrlInterface 1 : wOperationMode
C00836/45	L MckCtrlInterface 1 : wPosMode
C00836/46	L MckCtrlInterface 1 : wProfileNo
C00836/47	L MckCtrlInterface 1 : wInMckPosCtrl_1
C00836/48	L MckCtrlInterface 1 : wInMckPosCtrl_2
C00836/49	L MckStateInterface 1 : wInMckPosState_1
C00836/50	L MckStateInterface 1 : wInMckPosState_2
C00836/51	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_1
C00836/52	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_2
C00836/53	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_3
C00836/54	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_4
C00836/55	L ConvWordToBits 1 : wInput
C00836/56	L ConvWordToBits 2 : wInput
C00836/57	L ConvWordToBits 3 : wInput
C00836/58	L ConvWordsToDInt 1 : wInLWord
C00836/59	L ConvWordsToDInt 1 : wInHWord
C00836/60	L ConvWordsToDInt 2 : wInLWord
C00836/61	L ConvWordsToDInt 2 : wInHWord
C00836/62	L ConvWordsToDInt 3 : wInLWord
C00836/63	L ConvWordsToDInt 3 : wInHWord
C00836/64	L ConvUnitsToIncr 1 : wInLWord

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00836

Parameter Name:	Data type: UNSIGNED_16 Index: 23739 _d = 5CBB _h
C00836 16-bit inputs (Set2)	
C00836/65	L ConvUnitsTolncr 1 : wInHWord
C00836/66	L ConvUnitsTolncr 2 : wInLWord
C00836/67	L ConvUnitsTolncr 2 : wInHWord
C00836/68	L ConvUnitsTolncr 3 : wInLWord
C00836/69	L ConvUnitsTolncr 3 : wInHWord
C00836/70	L Curve 1 : nIn_a
C00836/71	L ConvW 1 : wIn
C00836/72	L ConvW 2 : wIn
C00836/73	L ConvW 3 : wIn
C00836/74	L ConvW 4 : wIn
C00836/75	L MckCtrlInterface 1 : wPosSetHW
C00836/76	L MckCtrlInterface 1 : wPosSetLW
C00836/77	L PhaseDiff 1 : nIn_v
C00836/78	L PhaseDiff 2 : nIn_v
C00836/79	L SRFG 1 : nIn_a
C00836/80	L SRFG 2 : nIn_a
C00836/81	L SRFG 1 : nSet_a
C00836/82	L SRFG 2 : nSet_a
C00836/83	L SignalSwitch 1 : wIn1
C00836/84	L SignalSwitch 2 : wIn1
C00836/85	L SignalSwitch 3 : wIn1
C00836/86	L SignalSwitch 4 : wIn1
C00836/87	L SignalSwitch 1 : wIn2
C00836/88	L SignalSwitch 2 : wIn2
C00836/89	L SignalSwitch 3 : wIn2
C00836/90	L SignalSwitch 4 : wIn2
C00836/91	L Odometer 1 : nInSpeed_v
C00836/92	L CalcDiameter 1 : wDMax
C00836/93	L CalcDiameter 1 : wDMin
C00836/94	L CalcDiameter 1 : wVMax
C00836/95	L CalcDiameter 1 : nVLine_a
C00836/96	L CalcDiameter 1 : nMotorSpeedAct_v
C00836/97	L CalcDiameter 1 : wGearNum
C00836/98	L CalcDiameter 1 : wGearDenom
C00836/99	L CalcDiameter 1 : nSetD_a
C00836/100	L ProcessCtrl 1 : nVpAdapt_a
C00836/101	L ProcessCtrl 1 : nSet_a
C00836/102	L ProcessCtrl 1 : nAct_a
C00836/103	L ProcessCtrl 1 : nRTIMEAdapt_a
C00836/104	L ProcessCtrl 1 : nInfluence_a
C00836/105	L PhilIntegrator 1 : nIn_v
C00836/106	L PhilIntegrator 1 : wGearNum
C00836/107	L PhilIntegrator 1 : wGearDenom
C00836/108	L SwitchPoint 1 : nActSpeed_v

Parameter Name:	Data type: UNSIGNED_16 Index: 23739 _d = 5CBB _h
C00836 16-bit inputs (Set2)	
C00836/109	L_PhilIntegrator 1 : nSpeedAdd_v
C00836/110	L_DFSET 1 : nSpeedTrim_v
C00836/111	L_DFSET 1 : nSpeedTrim_a
C00836/112	L_DFSET 1 : wGearNum
C00836/113	L_DFSET 1 : wGainNum
C00836/114	L_DFSET 1 : nSet_v
C00836/115	L_DFSET 1 : wGainDenom
C00836/116	L_DFSET 1 : wGearDenom
C00836/117	L_DFSET 1 : nPositionTrimming
C00836/118	L_DFSET 1 : nNAct_v
C00836/119	L_DFRFG 1 : nIn_v
C00836/120	L_GearComp 1 : nTorque_a
C00836/121	L_ConvAP 1 : nIn_a
C00836/122	L_ConvAP 2 : nIn_a
C00836/123	L_ConvAP 3 : nIn_a
C00836/124	L_ConvX 1 : nIn_a
C00836/125	L_ConvX 1 : nNum
C00836/126	L_ConvX 1 : wDenom
C00836/127	L_ConvX 2 : nIn_a
C00836/128	L_ConvX 2 : nNum
C00836/129	L_ConvX 2 : wDenom
C00836/130	L_ConvX 3 : nIn_a
C00836/131	L_ConvX 3 : nNum
C00836/132	L_ConvX 3 : wDenom
C00836/133	L_ConvPP 1 : nNum
C00836/134	L_ConvPP 1 : wDenom
C00836/135	L_ConvPP 2 : nNum
C00836/136	L_ConvPP 2 : wDenom
C00836/137	L_ConvPP 3 : nNum
C00836/138	L_ConvPP 3 : wDenom
C00836/139	L_Curve 2 : nIn_a
C00836/140	L_Curve 3 : nIn_a
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT	

C00837

Parameter Name:	Data type: INTEGER_16 Index: 23738 _d = 5CBA _h
C00837 16-bit inputs [rpm] (Set2)	
Display of 16-bit input values of different blocks in [rpm]	
Display range (min. value unit max. value)	
-32767	rpm 32767
Subcodes	Info
C00837/1	L_Absolut 2 : nIn_a
C00837/2	L_AnalogSwitch 4 : nIn1_a
C00837/3	L_AnalogSwitch 4 : nIn2_a
C00837/4	L_AnalogSwitch 5 : nIn1_a

Parameter Name:	Data type: INTEGER_16 Index: 23738 _d = 5CBA _h
C00837 16-bit inputs [rpm] (Set2)	
C00837/5	L AnalogSwitch 5 : nIn2_a
C00837/6	L Compare 4 : nIn1_a
C00837/7	L Compare 4 : nIn2_a
C00837/8	L Compare 5 : nIn1_a
C00837/9	L Compare 5 : nIn2_a
C00837/10	L Arithmetik 3 : nIn1_a
C00837/11	L Arithmetik 3 : nIn2_a
C00837/12	L Arithmetik 4 : nIn1_a
C00837/13	L Arithmetik 4 : nIn2_a
C00837/14	L Arithmetik 5 : nIn1_a
C00837/15	L Arithmetik 5 : nIn2_a
C00837/16	L Counter 2 : wLdVal
C00837/17	L Counter 2 : wCmpVal
C00837/18	L Counter 3 : wLdVal
C00837/19	L Counter 3 : wCmpVal
C00837/20	L PhaseIntK 1 : nIn_v
C00837/21	L Negation 2 : nIn_a
C00837/22	L NLim 2 : nIn_a
C00837/23	L OffsetGain 3 : nIn_a
C00837/24	L OffsetGain 3 : nOffset_a
C00837/25	L OffsetGain 3 : nGain_a
C00837/26	L PT1 2 : nIn_a
C00837/27	L PT1 3 : nIn_a
C00837/28	L PhaseIntK 2 : nIn_v
C00837/29	L SampleHold 1 : nIn_a
C00837/30	L SampleHold 2 : nIn_a
C00837/31	L Mux 1 : wInSelect
C00837/32	L GainOffset 3 : nIn_a
C00837/33	L GainOffset 3 : nGain_a
C00837/34	L GainOffset 3 : nOffset_a
C00837/35	L MulDiv 2 : nIn_a
C00837/36	L DT1 1 : nIn_a
C00837/37	L Counter 1 : wLdVal
C00837/38	L Counter 1 : wCmpVal
C00837/39	L GainOffsetP 1 : nIn_a
C00837/40	L GainOffsetP 2 : nIn_a
C00837/41	L GainOffsetP 3 : nIn_a
C00837/42	L Limit 1 : nIn_a
C00837/43	L Limit 2 : nIn_a
C00837/44	L MckCtrlInterface 1 : wOperationMode
C00837/45	L MckCtrlInterface 1 : wPosMode
C00837/46	L MckCtrlInterface 1 : wProfileNo
C00837/47	L MckCtrlInterface 1 : wInMckPosCtrl_1
C00837/48	L MckCtrlInterface 1 : wInMckPosCtrl_2

Parameter Name:	Data type: INTEGER_16 Index: 23738 _d = 5CBA _h
C00837 16-bit inputs [rpm] (Set2)	
C00837/49	L MckStateInterface 1 : wInMckPosState_1
C00837/50	L MckStateInterface 1 : wInMckPosState_2
C00837/51	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_1
C00837/52	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_2
C00837/53	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_3
C00837/54	L PosiShaftCtrlInterface 1 : wInPosiShaftCtrl_4
C00837/55	L ConvWordToBits 1 : wInInput
C00837/56	L ConvWordToBits 2 : wInInput
C00837/57	L ConvWordToBits 3 : wInInput
C00837/58	L ConvWordsToDInt 1 : wInLWord
C00837/59	L ConvWordsToDInt 1 : wInHWord
C00837/60	L ConvWordsToDInt 2 : wInLWord
C00837/61	L ConvWordsToDInt 2 : wInHWord
C00837/62	L ConvWordsToDInt 3 : wInLWord
C00837/63	L ConvWordsToDInt 3 : wInHWord
C00837/64	L ConvUnitsToIncr 1 : wInLWord
C00837/65	L ConvUnitsToIncr 1 : wInHWord
C00837/66	L ConvUnitsToIncr 2 : wInLWord
C00837/67	L ConvUnitsToIncr 2 : wInHWord
C00837/68	L ConvUnitsToIncr 3 : wInLWord
C00837/69	L ConvUnitsToIncr 3 : wInHWord
C00837/70	L Curve 1 : nIn_a
C00837/71	L ConvW 1 : wIn
C00837/72	L ConvW 2 : wIn
C00837/73	L ConvW 3 : wIn
C00837/74	L ConvW 4 : wIn
C00837/75	L MckCtrlInterface 1 : wPosSetHW
C00837/76	L MckCtrlInterface 1 : wPosSetLW
C00837/77	L PhaseDiff 1 : nIn_v
C00837/78	L PhaseDiff 2 : nIn_v
C00837/79	L SRFG 1 : nIn_a
C00837/80	L SRFG 2 : nIn_a
C00837/81	L SRFG 1 : nSet_a
C00837/82	L SRFG 2 : nSet_a
C00837/83	L SignalSwitch 1 : wIn1
C00837/84	L SignalSwitch 2 : wIn1
C00837/85	L SignalSwitch 3 : wIn1
C00837/86	L SignalSwitch 4 : wIn1
C00837/87	L SignalSwitch 1 : wIn2
C00837/88	L SignalSwitch 2 : wIn2
C00837/89	L SignalSwitch 3 : wIn2
C00837/90	L SignalSwitch 4 : wIn2
C00837/91	L Odometer 1 : nInSpeed_v
C00837/92	L CalcDiameter 1 : wDMax

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00837

Parameter Name:	Data type: INTEGER_16 Index: 23738 _d = 5CBA _h
C00837 16-bit inputs [rpm] (Set2)	
C00837/93	L_CalcDiameter_1 : wDMin
C00837/94	L_CalcDiameter_1 : wVMax
C00837/95	L_CalcDiameter_1 : nVLine_a
C00837/96	L_CalcDiameter_1 : nMotorSpeedAct_v
C00837/97	L_CalcDiameter_1 : wGearNum
C00837/98	L_CalcDiameter_1 : wGearDenom
C00837/99	L_CalcDiameter_1 : nSetD_a
C00837/100	L_ProcessCtrl_1 : nVpAdapt_a
C00837/101	L_ProcessCtrl_1 : nSet_a
C00837/102	L_ProcessCtrl_1 : nAct_a
C00837/103	L_ProcessCtrl_1 : nRTimeAdapt_a
C00837/104	L_ProcessCtrl_1 : nInfluence_a
C00837/105	L_PhilIntegrator_1 : nIn_v
C00837/106	L_PhilIntegrator_1 : wGearNum
C00837/107	L_PhilIntegrator_1 : wGearDenom
C00837/108	L_SwitchPoint_1 : nActSpeed_v
C00837/109	L_PhilIntegrator_1 : nSpeedAdd_v
C00837/110	L_DFSET_1 : nSpeedTrim_v
C00837/111	L_DFSET_1 : nSpeedTrim_a
C00837/112	L_DFSET_1 : wGearNum
C00837/113	L_DFSET_1 : wGainNum
C00837/114	L_DFSET_1 : nSet_v
C00837/115	L_DFSET_1 : wGainDenom
C00837/116	L_DFSET_1 : wGearDenom
C00837/117	L_DFSET_1 : nPositionTrimming
C00837/118	L_DFSET_1 : nNAct_v
C00837/119	L_DFRFG_1 : nIn_v
C00837/120	L_GearComp_1 : nTorque_a
C00837/121	L_ConvAP_1 : nIn_a
C00837/122	L_ConvAP_2 : nIn_a
C00837/123	L_ConvAP_3 : nIn_a
C00837/124	L_ConvX_1 : nIn_a
C00837/125	L_ConvX_1 : nNum
C00837/126	L_ConvX_1 : wDenom
C00837/127	L_ConvX_2 : nIn_a
C00837/128	L_ConvX_2 : nNum
C00837/129	L_ConvX_2 : wDenom
C00837/130	L_ConvX_3 : nIn_a
C00837/131	L_ConvX_3 : nNum
C00837/132	L_ConvX_3 : wDenom
C00837/133	L_ConvPP_1 : nNum
C00837/134	L_ConvPP_1 : wDenom
C00837/135	L_ConvPP_2 : nNum
C00837/136	L_ConvPP_2 : wDenom

Parameter Name: C00837 16-bit inputs [rpm] (Set2)		Data type: INTEGER_16 Index: 23738 _d = 5CBA _h
C00837/137	L_ConvPP_3 : nNum	
C00837/138	L_ConvPP_3 : wDenom	
C00837/139	L_Curve_2 : nIn_a	
C00837/140	L_Curve_3 : nIn_a	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00838

Parameter Name: C00838 Binary inputs (Set2)		Data type: UNSIGNED_8 Index: 23737 _d = 5CB9 _h
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Display of the signal status of the binary inputs of different blocks

- In addition to the parameter [C00833](#).

Selection list	
0	False
1	True
Subcodes	Info
C00838/1	L_And5_1 : bIn1
C00838/2	L_And5_1 : bIn2
C00838/3	L_And5_1 : bIn3
C00838/4	L_And5_1 : bIn4
C00838/5	L_And5_1 : bIn5
C00838/6	L_And5_2 : bIn1
C00838/7	L_And5_2 : bIn2
C00838/8	L_And5_2 : bIn3
C00838/9	L_And5_2 : bIn4
C00838/10	L_And5_2 : bIn5
C00838/11	L_AnalogSwitch_4 : bSet
C00838/12	L_AnalogSwitch_5 : bSet
C00838/13	L_DFlipFlop_2 : bD
C00838/14	L_DFlipFlop_2 : bClk
C00838/15	L_DFlipFlop_2 : bClr
C00838/16	L_DigitalDelay_2 : bIn
C00838/17	L_DigitalDelay_3 : bIn
C00838/18	L_PhaseIntK_1 : bLoad
C00838/19	L_PhaseIntK_2 : bLoad
C00838/20	L_DigitalLogic_2 : bIn1
C00838/21	L_DigitalLogic_2 : bIn2
C00838/22	L_DigitalLogic_2 : bIn3
C00838/23	L_DigitalLogic5_1 : bIn1
C00838/24	L_DigitalLogic5_1 : bIn2
C00838/25	L_DigitalLogic5_1 : bIn3
C00838/26	L_DigitalLogic5_1 : bIn4
C00838/27	L_DigitalLogic5_1 : bIn5
C00838/28	L_DigitalLogic5_2 : bIn1
C00838/29	L_DigitalLogic5_2 : bIn2
C00838/30	L_DigitalLogic5_2 : bIn3

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00838

Parameter Name:	Data type: UNSIGNED_8 Index: 23737 _d = 5CB9 _h
C00838/31	L_DigitalLogic5_2 : bIn4
C00838/32	L_DigitalLogic5_2 : bIn5
C00838/33	L_NLim_2 : bEnable
C00838/34	L_Or5_1 : bIn1
C00838/35	L_Or5_1 : bIn2
C00838/36	L_Or5_1 : bIn3
C00838/37	L_Or5_1 : bIn4
C00838/38	L_Or5_1 : bIn5
C00838/39	L_Or5_2 : bIn1
C00838/40	L_Or5_2 : bIn2
C00838/41	L_Or5_2 : bIn3
C00838/42	L_Or5_2 : bIn4
C00838/43	L_Or5_2 : bIn5
C00838/44	L_Not_4 : bIn
C00838/45	L_Not_5 : bIn
C00838/46	L_Not_6 : bIn
C00838/47	L_Not_7 : bIn
C00838/48	L_RSFlipFlop_1 : bSet
C00838/49	L_RSFlipFlop_1 : bReset
C00838/50	L_RSFlipFlop_2 : bSet
C00838/51	L_RSFlipFlop_2 : bReset
C00838/52	L_SampleHold_1 : bLoad
C00838/53	L_SampleHold_2 : bLoad
C00838/54	L_Counter_2 : bClkUp
C00838/55	L_Counter_2 : bClkDown
C00838/56	L_Counter_2 : bLoad
C00838/57	L_Counter_3 : bClkUp
C00838/58	L_Counter_3 : bClkDown
C00838/59	L_Counter_3 : bLoad
C00838/60	L_Transient_5 : bIn
C00838/61	L_Transient_6 : bIn
C00838/62	L_Transient_7 : bIn
C00838/63	L_Transient_8 : bIn
C00838/64	L_Counter_1 : bCountUp
C00838/65	L_Counter_1 : bCountDown
C00838/66	L_Counter_1 : bLoad
C00838/67	L_ConvBitsToWord_1 : bBit0
C00838/68	L_ConvBitsToWord_1 : bBit1
C00838/69	L_ConvBitsToWord_1 : bBit2
C00838/70	L_ConvBitsToWord_1 : bBit3
C00838/71	L_ConvBitsToWord_1 : bBit4
C00838/72	L_ConvBitsToWord_1 : bBit5
C00838/73	L_ConvBitsToWord_1 : bBit6
C00838/74	L_ConvBitsToWord_1 : bBit7

Parameter Name:	Data type: UNSIGNED_8 Index: 23737 _d = 5CB9 _h
C00838 Binary inputs (Set2)	
C00838/75	L_ConvBitsToWord_1 : bBit8
C00838/76	L_ConvBitsToWord_1 : bBit9
C00838/77	L_ConvBitsToWord_1 : bBit10
C00838/78	L_ConvBitsToWord_1 : bBit11
C00838/79	L_ConvBitsToWord_1 : bBit12
C00838/80	L_ConvBitsToWord_1 : bBit13
C00838/81	L_ConvBitsToWord_1 : bBit14
C00838/82	L_ConvBitsToWord_1 : bBit15
C00838/83	L_ConvBitsToWord_2 : bBit0
C00838/84	L_ConvBitsToWord_2 : bBit1
C00838/85	L_ConvBitsToWord_2 : bBit2
C00838/86	L_ConvBitsToWord_2 : bBit3
C00838/87	L_ConvBitsToWord_2 : bBit4
C00838/88	L_ConvBitsToWord_2 : bBit5
C00838/89	L_ConvBitsToWord_2 : bBit6
C00838/90	L_ConvBitsToWord_2 : bBit7
C00838/91	L_ConvBitsToWord_2 : bBit8
C00838/92	L_ConvBitsToWord_2 : bBit9
C00838/93	L_ConvBitsToWord_2 : bBit10
C00838/94	L_ConvBitsToWord_2 : bBit11
C00838/95	L_ConvBitsToWord_2 : bBit12
C00838/96	L_ConvBitsToWord_2 : bBit13
C00838/97	L_ConvBitsToWord_2 : bBit14
C00838/98	L_ConvBitsToWord_2 : bBit15
C00838/99	L_ConvBitsToWord_3 : bBit0
C00838/100	L_ConvBitsToWord_3 : bBit1
C00838/101	L_ConvBitsToWord_3 : bBit2
C00838/102	L_ConvBitsToWord_3 : bBit3
C00838/103	L_ConvBitsToWord_3 : bBit4
C00838/104	L_ConvBitsToWord_3 : bBit5
C00838/105	L_ConvBitsToWord_3 : bBit6
C00838/106	L_ConvBitsToWord_3 : bBit7
C00838/107	L_ConvBitsToWord_3 : bBit8
C00838/108	L_ConvBitsToWord_3 : bBit9
C00838/109	L_ConvBitsToWord_3 : bBit10
C00838/110	L_ConvBitsToWord_3 : bBit11
C00838/111	L_ConvBitsToWord_3 : bBit12
C00838/112	L_ConvBitsToWord_3 : bBit13
C00838/113	L_ConvBitsToWord_3 : bBit14
C00838/114	L_ConvBitsToWord_3 : bBit15
C00838/115	MckCtrlInterface_1 : bManJogPos
C00838/116	MckCtrlInterface_1 : bManJogNeg
C00838/117	MckCtrlInterface_1 : bManJogExecute2ndVel
C00838/118	MckCtrlInterface_1 : bReleaseLimitSwitch

Parameter Name:	Data type: UNSIGNED_8 Index: 23737 _d = 5CB9 _h
C00838 Binary inputs (Set2)	
C00838/119	MckCtrlInterface 1 : bHomingStartStop
C00838/120	MckCtrlInterface 1 : bHomingSetPos
C00838/121	MckCtrlInterface 1 : bHomingResetPos
C00838/122	MckCtrlInterface 1 : bEnableVelOverride
C00838/123	MckCtrlInterface 1 : bEnableAccOverride
C00838/124	MckCtrlInterface 1 : bDisableSShaping
C00838/125	MckCtrlInterface 1 : bPosExecute
C00838/126	MckCtrlInterface 1 : bPosExecuteFinish
C00838/127	MckCtrlInterface 1 : bPosDisableFollowProfile
C00838/128	MckCtrlInterface 1 : bPosStop
C00838/129	MckCtrlInterface 1 : bPosTeachSetPos
C00838/130	MckCtrlInterface 1 : bPosTeachActPos
C00838/131	MckCtrlInterface 1 : bProfileNo_1
C00838/132	MckCtrlInterface 1 : bProfileNo_2
C00838/133	MckCtrlInterface 1 : bProfileNo_4
C00838/134	MckCtrlInterface 1 : bProfileNo_8
C00838/135	MckCtrlInterface 1 : bOperationMode_1
C00838/136	MckCtrlInterface 1 : bOperationMode_2
C00838/137	MckCtrlInterface 1 : bOperationMode_4
C00838/138	MckCtrlInterface 1 : bOperationMode_8
C00838/139	L PhaseDiff 1 : bEnable
C00838/140	L PhaseDiff 2 : bEnable
C00838/141	L PhaseDiff 1 : bReset
C00838/142	L PhaseDiff 2 : bReset
C00838/143	L SRFG 1 : bLoad
C00838/144	L SRFG 2 : bLoad
C00838/145	L SignalSwitch 1 : bSet
C00838/146	L SignalSwitch 2 : bSet
C00838/147	L SignalSwitch 3 : bSet
C00838/148	L SignalSwitch 4 : bSet
C00838/149	L Odometer 1 : bTriggerPulse
C00838/150	L Odometer 1 : bReset
C00838/151	L FixSet a 1 : bSelect1
C00838/152	L FixSet a 1 : bSelect2
C00838/153	L FixSet a 1 : bSelect4
C00838/154	L FixSet a 1 : bSelect8
C00838/155	L FixSet w 1 : bSelect1
C00838/156	L FixSet w 1 : bSelect2
C00838/157	L FixSet w 1 : bSelect4
C00838/158	L FixSet w 1 : bSelect8
C00838/159	L FixSet w 2 : bSelect1
C00838/160	L FixSet w 2 : bSelect2
C00838/161	L FixSet w 2 : bSelect4
C00838/162	L FixSet w 2 : bSelect8

Parameter Name:	Data type: UNSIGNED_8 Index: 23737 _d = 5CB9 _h
C00838 Binary inputs (Set2)	
C00838/163	L CalcDiameter 1 : bResetPos
C00838/164	L CalcDiameter 1 : bHoldD
C00838/165	L CalcDiameter 1 : bUnidirect
C00838/166	L CalcDiameter 1 : bUnwind
C00838/167	L CalcDiameter 1 : bLoadDiameter
C00838/168	L CalcDiameter 1 : bCalcRef
C00838/169	L ProcessCtrl 1 : bLoadAct
C00838/170	L ProcessCtrl 1 : bOff
C00838/171	L ProcessCtrl 1 : bReset
C00838/172	L PhilIntegrator 1 : bTPReceived
C00838/173	L PhilIntegrator 1 : bReset
C00838/174	L PhilIntegrator 1 : bLoad
C00838/175	L PosCtrlLin 1 : bExecute
C00838/176	L PosCtrlLin 1 : bSetPos0
C00838/177	L PosCtrlLin 1 : bPosMode
C00838/178	L PosCtrlLin 1 : bEnable
C00838/179	L PosCtrlLin 2 : bExecute
C00838/180	L PosCtrlLin 2 : bSetPos0
C00838/181	L PosCtrlLin 2 : bPosMode
C00838/182	L PosCtrlLin 2 : bEnable
C00838/183	L SwitchPoint 1 : bDisable
C00838/184	L DFSET 1 : bZeroPulse
C00838/185	L DFSET 1 : bSetTPReceived
C00838/186	L DFSET 1 : bActTPReceived
C00838/187	L DFSET 1 : bSetActIntegrator
C00838/188	L DFSET 1 : bResetAllIntegrators
C00838/189	L DFRFG 1 : bSetTPReceived
C00838/190	L DFRFG 1 : bRfg0
C00838/191	L DFRFG 1 : bRfgStop
C00838/192	L DFRFG 1 : bReset
C00838/193	L ConvX 1 : bInvers
C00838/194	L ConvX 2 : bInvers
C00838/195	L ConvX 3 : bInvers
C00838/196	L ConvPP 1 : bAct
C00838/197	L ConvPP 2 : bAct
C00838/198	L ConvPP 3 : bAct
C00838/199	L SignalSwitch32 1 : bSet
C00838/200	L SignalSwitch32 2 : bSet
C00838/201	L SignalSwitch32 3 : bSet
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00839

Parameter Name: C00839 32-bit inputs [incr] (Set2)	Data type: INTEGER_32 Index: 23736 _d = 5CB8 _h
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Display in [increments] of 32 bit input values of various blocks

- In addition to the parameter [C00834](#).

Display range (min. value unit max. value)		
-2147483647	Incr.	2147483647
Subcodes	Info	
C00839/1	L ComparePhi 1 : dnIn1_p	
C00839/2	L ComparePhi 1 : dnIn2_p	
C00839/3	L ComparePhi 2 : dnIn1_p	
C00839/4	L ComparePhi 2 : dnIn2_p	
C00839/5	L ComparePhi 3 : dnIn1_p	
C00839/6	L ComparePhi 3 : dnIn2_p	
C00839/7	L ComparePhi 4 : dnIn1_p	
C00839/8	L ComparePhi 4 : dnIn2_p	
C00839/9	L ComparePhi 5 : dnIn1_p	
C00839/10	L ComparePhi 5 : dnIn2_p	
C00839/11	L ArithmetikPhi 1 : dnIn1_p	
C00839/12	L ArithmetikPhi 1 : dnIn2_p	
C00839/13	L ArithmetikPhi 2 : dnIn1_p	
C00839/14	L ArithmetikPhi 2 : dnIn2_p	
C00839/15	L ArithmetikPhi 3 : dnIn1_p	
C00839/16	L ArithmetikPhi 3 : dnIn2_p	
C00839/17	L GainOffsetPhiP 1 : dnIn_p	
C00839/18	L GainOffsetPhiP 2 : dnIn_p	
C00839/19	L LimitPhi 1 : dnIn_p	
C00839/20	L LimitPhi 2 : dnIn_p	
C00839/21	L LimitPhi 3 : dnIn_p	
C00839/22	L OffsetGainPhiP 1 : dnIn_p	
C00839/23	L OffsetGainPhiP 2 : dnIn_p	
C00839/24	L PhaseIntK 1 : dnSet_p	
C00839/25	L PhaseIntK 2 : dnSet_p	
C00839/26	L Mux 1 : dnInput1_p	
C00839/27	L Mux 1 : dnInput2_p	
C00839/28	L Mux 1 : dnInput3_p	
C00839/29	L Mux 1 : dnInput4_p	
C00839/30	L Mux 1 : dnInput5_p	
C00839/31	L Mux 1 : dnInput6_p	
C00839/32	L Mux 1 : dnInput7_p	
C00839/33	L Mux 1 : dnInput8_p	
C00839/34	L SOrt 1 : dnInput_p	
C00839/35	L ConvDIntToWords 1 : dnInput_p	
C00839/36	L ConvDIntToWords 2 : dnInput_p	
C00839/37	L ConvDIntToWords 3 : dnInput_p	
C00839/38	L MckCtrlInterface 1 : dnPosSetIn_p	
C00839/39	L PhaseDiff 1 : dnSet_p	

Parameter Name:	Data type: INTEGER_32 Index: 23736 _d = 5CB8 _h
C00839 32-bit inputs [incr] (Set2)	
C00839/40	L PhaseDiff 2 : dnSet_p
C00839/41	L PhaseDiff 1 : dnAdd_p
C00839/42	L PhaseDiff 2 : dnAdd_p
C00839/43	L MckStateInterface 1 : dnPosIn_p
C00839/44	L Odometer 1 : dnInPosition_p
C00839/45	L PhilIntegrator 1 : dnTPPosition_p
C00839/46	L PhilIntegrator 1 : dnLoadVal_p
C00839/47	L PosCtrlLin 1 : dnSet_p
C00839/48	L PosCtrlLin 1 : dnAct_p
C00839/49	L PosCtrlLin 2 : dnSet_p
C00839/50	L PosCtrlLin 2 : dnAct_p
C00839/51	L SwitchPoint 1 : dnActPos_p
C00839/52	L SwitchPoint 1 : dnSwitchPoint1_p
C00839/53	L SwitchPoint 1 : dn2ndPoint_Size1_p
C00839/54	L SwitchPoint 1 : dnSwitchPoint2_p
C00839/55	L SwitchPoint 1 : dn2ndPoint_Size2_p
C00839/56	L SwitchPoint 1 : dnSwitchPoint3_p
C00839/57	L SwitchPoint 1 : dn2ndPoint_Size3_p
C00839/58	L SwitchPoint 1 : dnSwitchPoint4_p
C00839/59	L SwitchPoint 1 : dn2ndPoint_Size4_p
C00839/60	L DFSET 1 : dnSetTPPos_p
C00839/61	L DFSET 1 : dnActTPPos_p
C00839/62	L DFSET 1 : dnPosOffset
C00839/63	L DFRFG 1 : dnSetTPPos_p
C00839/64	L GearComp 1 : dnPhiln_p
C00839/65	L ConvPA 1 : dnIn_p
C00839/66	L ConvPA 2 : dnIn_p
C00839/67	L ConvPA 3 : dnIn_p
C00839/68	L ConvPP 1 : dnIn_p
C00839/69	L ConvPP 2 : dnIn_p
C00839/70	L ConvPP 3 : dnIn_p
C00839/71	L SignalSwitch32 1 : dnIn1
C00839/72	L SignalSwitch32 1 : dnIn2
C00839/73	L SignalSwitch32 2 : dnIn1
C00839/74	L SignalSwitch32 2 : dnIn2
C00839/75	L SignalSwitch32 3 : dnIn1
C00839/76	L SignalSwitch32 3 : dnIn2
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00840

Parameter Name: C00840 16-bit inputs I/O level [%]		Data type: INTEGER_16 Index: 23735 _d = 5CB7 _h
Display in percent of 16 bit input values of various blocks of the I/O level		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Info	
C00840/1	LS_AnalogOutput : nOut1_a (V)	
C00840/2	LP_CanOut1 : wState	
C00840/3	LP_CanOut1 : wOut2	
C00840/4	LP_CanOut1 : wOut3	
C00840/5	LP_CanOut1 : wOut4	
C00840/6	LP_CanOut2 : wOut1	
C00840/7	LP_CanOut2 : wOut2	
C00840/8	LP_CanOut2 : wOut3	
C00840/9	LP_CanOut2 : wOut4	
C00840/10	LP_CanOut3 : wOut1	
C00840/11	LP_CanOut3 : wOut2	
C00840/12	LP_CanOut3 : wOut3	
C00840/13	LP_CanOut3 : wOut4	
C00840/14	LS_DisFree_a : nDis1_a	
C00840/15	LS_DisFree_a : nDis2_a	
C00840/16	LS_DisFree_a : nDis3_a	
C00840/17	LS_DisFree_a : nDis4_a	
C00840/18	LS_DisFree : wDis1	
C00840/19	LS_DisFree : wDis2	
C00840/20	LS_DisFree : wDis3	
C00840/21	LS_DisFree : wDis4	
C00840/22	LP_MciOut : wState	
C00840/23	LP_MciOut : wOut2	
C00840/24	LP_MciOut : wOut3	
C00840/25	LP_MciOut : wOut4	
C00840/26	LP_MciOut : wOut5	
C00840/27	LP_MciOut : wOut6	
C00840/28	LP_MciOut : wOut7	
C00840/29	LP_MciOut : wOut8	
C00840/30	LP_MciOut : wOut9	
C00840/31	LP_MciOut : wOut10	
C00840/32	LP_MciOut : wOut11	
C00840/33	LP_MciOut : wOut12	
C00840/34	LP_MciOut : wOut13	
C00840/35	LP_MciOut : wOut14	
C00840/36	LP_MciOut : wOut15	
C00840/37	LP_MciOut : wOut16	
C00840/38	LS_AnalogOutput : nOut2_a (V)	
C00840/39	LS_AnalogOutput : nOut1_a (I)	
C00840/40	LS_AnalogOutput : nOut2_a (I)	

Parameter Name:	Data type: INTEGER_16 Index: 23735 _d = 5CB7 _h
C00840 16-bit inputs I/O level [%]	
C00840/41	LS_DisFree_a : nDis5_a
C00840/42	LS_DisFree_a : nDis6_a
C00840/43	LS_DisFree_a : nDis7_a
C00840/44	LS_DisFree_a : nDis8_a
C00840/45	LS_DisFree : wDis5
C00840/46	LS_DisFree : wDis6
C00840/47	LS_DisFree : wDis7
C00840/48	LS_DisFree : wDis8
C00840/49	LS_ParReadWrite_1 : wParIndex
C00840/50	LS_ParReadWrite_1 : wParSubindex
C00840/51	LS_ParReadWrite_1 : wInHWord
C00840/52	LS_ParReadWrite_1 : wInLWord
C00840/53	LS_ParReadWrite_2 : wParIndex
C00840/54	LS_ParReadWrite_2 : wParSubindex
C00840/55	LS_ParReadWrite_2 : wInHWord
C00840/56	LS_ParReadWrite_2 : wInLWord
C00840/57	LS_ParReadWrite_3 : wParIndex
C00840/58	LS_ParReadWrite_3 : wParSubindex
C00840/59	LS_ParReadWrite_3 : wInHWord
C00840/60	LS_ParReadWrite_3 : wInLWord
C00840/61	LS_ParReadWrite_4 : wParIndex
C00840/62	LS_ParReadWrite_4 : wParSubindex
C00840/63	LS_ParReadWrite_4 : wInHWord
C00840/64	LS_ParReadWrite_4 : wInLWord
C00840/65	LS_ParReadWrite_5 : wParIndex
C00840/66	LS_ParReadWrite_5 : wParSubindex
C00840/67	LS_ParReadWrite_5 : wInHWord
C00840/68	LS_ParReadWrite_5 : wInLWord
C00840/69	LS_ParReadWrite_6 : wParIndex
C00840/70	LS_ParReadWrite_6 : wParSubindex
C00840/71	LS_ParReadWrite_6 : wInHWord
C00840/72	LS_ParReadWrite_6 : wInLWord
C00840/73	Reserved
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00841

Parameter Name:	Data type: UNSIGNED_16 Index: 23734 _d = 5CB6 _h
C00841 16-bit inputs I/O level	
Decimal/hexadecimal/bit coded display of 16 bit input values of various blocks of the I/O level	
Display area (min. hex value max. hex value)	
0x0000	0xFFFF
Value is bit-coded:	
Bit 0	Active
...	...
Bit 15	Active

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00841

Parameter Name: C00841 16-bit inputs I/O level		Data type: UNSIGNED_16 Index: 23734 _d = 5CB6 _h
Subcodes	Info	
C00841/1	LS_AnalogOutput : nOut1_a (V)	
C00841/2	LP_CanOut1 : wState	
C00841/3	LP_CanOut1 : wOut2	
C00841/4	LP_CanOut1 : wOut3	
C00841/5	LP_CanOut1 : wOut4	
C00841/6	LP_CanOut2 : wOut1	
C00841/7	LP_CanOut2 : wOut2	
C00841/8	LP_CanOut2 : wOut3	
C00841/9	LP_CanOut2 : wOut4	
C00841/10	LP_CanOut3 : wOut1	
C00841/11	LP_CanOut3 : wOut2	
C00841/12	LP_CanOut3 : wOut3	
C00841/13	LP_CanOut3 : wOut4	
C00841/14	LS_DisFree_a : nDis1_a	
C00841/15	LS_DisFree_a : nDis2_a	
C00841/16	LS_DisFree_a : nDis3_a	
C00841/17	LS_DisFree_a : nDis4_a	
C00841/18	LS_DisFree : wDis1	
C00841/19	LS_DisFree : wDis2	
C00841/20	LS_DisFree : wDis3	
C00841/21	LS_DisFree : wDis4	
C00841/22	LP_MciOut : wState	
C00841/23	LP_MciOut : wOut2	
C00841/24	LP_MciOut : wOut3	
C00841/25	LP_MciOut : wOut4	
C00841/26	LP_MciOut : wOut5	
C00841/27	LP_MciOut : wOut6	
C00841/28	LP_MciOut : wOut7	
C00841/29	LP_MciOut : wOut8	
C00841/30	LP_MciOut : wOut9	
C00841/31	LP_MciOut : wOut10	
C00841/32	LP_MciOut : wOut11	
C00841/33	LP_MciOut : wOut12	
C00841/34	LP_MciOut : wOut13	
C00841/35	LP_MciOut : wOut14	
C00841/36	LP_MciOut : wOut15	
C00841/37	LP_MciOut : wOut16	
C00841/38	LS_AnalogOutput : nOut2_a (V)	
C00841/39	LS_AnalogOutput : nOut1_a (I)	
C00841/40	LS_AnalogOutput : nOut2_a (I)	
C00841/41	LS_DisFree_a : nDis5_a	
C00841/42	LS_DisFree_a : nDis6_a	
C00841/43	LS_DisFree_a : nDis7_a	

Parameter Name:	Data type: UNSIGNED_16 Index: 23734 _d = 5CB6 _h
C00841 16-bit inputs I/O level	
C00841/44	LS_DisFree_a : nDis8_a
C00841/45	LS_DisFree : wDis5
C00841/46	LS_DisFree : wDis6
C00841/47	LS_DisFree : wDis7
C00841/48	LS_DisFree : wDis8
C00841/49	LS_ParReadWrite_1 : wParIndex
C00841/50	LS_ParReadWrite_1 : wParSubindex
C00841/51	LS_ParReadWrite_1 : wInHWord
C00841/52	LS_ParReadWrite_1 : wInLWord
C00841/53	LS_ParReadWrite_2 : wParIndex
C00841/54	LS_ParReadWrite_2 : wParSubindex
C00841/55	LS_ParReadWrite_2 : wInHWord
C00841/56	LS_ParReadWrite_2 : wInLWord
C00841/57	LS_ParReadWrite_3 : wParIndex
C00841/58	LS_ParReadWrite_3 : wParSubindex
C00841/59	LS_ParReadWrite_3 : wInHWord
C00841/60	LS_ParReadWrite_3 : wInLWord
C00841/61	LS_ParReadWrite_4 : wParIndex
C00841/62	LS_ParReadWrite_4 : wParSubindex
C00841/63	LS_ParReadWrite_4 : wInHWord
C00841/64	LS_ParReadWrite_4 : wInLWord
C00841/65	LS_ParReadWrite_5 : wParIndex
C00841/66	LS_ParReadWrite_5 : wParSubindex
C00841/67	LS_ParReadWrite_5 : wInHWord
C00841/68	LS_ParReadWrite_5 : wInLWord
C00841/69	LS_ParReadWrite_6 : wParIndex
C00841/70	LS_ParReadWrite_6 : wParSubindex
C00841/71	LS_ParReadWrite_6 : wInHWord
C00841/72	LS_ParReadWrite_6 : wInLWord
C00841/73	Reserved
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT	

C00843

Parameter Name:	Data type: UNSIGNED_8 Index: 23732 _d = 5CB4 _h
C00843 Binary inputs I/O level	
Display of the signal status of the binary inputs of different I/O level blocks	
Selection list	
0	False
1	True
Subcodes	Info
C00843/1	LS_DigitalOutput : bRelay
C00843/2	LS_DigitalOutput : bOut1
C00843/3	LS_DigitalInput : bCountIn1_Reset
C00843/4	LS_DigitalInput : bCountIn1_LoadStartValue
C00843/5	LP_CanOut1 : bState_B0

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00843

Parameter Name:	Data type: UNSIGNED_8 Index: 23732 _d = 5CB4 _h
C00843/6	LP_CanOut1 : bState_B1
C00843/7	LP_CanOut1 : bState_B2
C00843/8	LP_CanOut1 : bState_B3
C00843/9	LP_CanOut1 : bState_B4
C00843/10	LP_CanOut1 : bState_B5
C00843/11	LP_CanOut1 : bState_B6
C00843/12	LP_CanOut1 : bState_B7
C00843/13	LP_CanOut1 : bState_B8
C00843/14	LP_CanOut1 : bState_B9
C00843/15	LP_CanOut1 : bState_B10
C00843/16	LP_CanOut1 : bState_B11
C00843/17	LP_CanOut1 : bState_B12
C00843/18	LP_CanOut1 : bState_B13
C00843/19	LP_CanOut1 : bState_B14
C00843/20	LP_CanOut1 : bState_B15
C00843/21	LS_DisFree_b : bDis1
C00843/22	LS_DisFree_b : bDis2
C00843/23	LS_DisFree_b : bDis3
C00843/24	LS_DisFree_b : bDis4
C00843/25	LS_DisFree_b : bDis5
C00843/26	LS_DisFree_b : bDis6
C00843/27	LS_DisFree_b : bDis7
C00843/28	LS_DisFree_b : bDis8
C00843/29	LP_CanOut2 : bOut1_B0
C00843/30	LP_CanOut2 : bOut1_B1
C00843/31	LP_CanOut2 : bOut1_B2
C00843/32	LP_CanOut2 : bOut1_B3
C00843/33	LP_CanOut2 : bOut1_B4
C00843/34	LP_CanOut2 : bOut1_B5
C00843/35	LP_CanOut2 : bOut1_B6
C00843/36	LP_CanOut2 : bOut1_B7
C00843/37	LP_CanOut2 : bOut1_B8
C00843/38	LP_CanOut2 : bOut1_B9
C00843/39	LP_CanOut2 : bOut1_B10
C00843/40	LP_CanOut2 : bOut1_B11
C00843/41	LP_CanOut2 : bOut1_B12
C00843/42	LP_CanOut2 : bOut1_B13
C00843/43	LP_CanOut2 : bOut1_B14
C00843/44	LP_CanOut2 : bOut1_B15
C00843/45	LP_CanOut3 : bOut1_B0
C00843/46	LP_CanOut3 : bOut1_B1
C00843/47	LP_CanOut3 : bOut1_B2
C00843/48	LP_CanOut3 : bOut1_B3
C00843/49	LP_CanOut3 : bOut1_B4

Parameter Name:	Data type: UNSIGNED_8 Index: 23732 _d = 5CB4 _h
C00843 Binary inputs I/O level	
C00843/50	LP_CanOut3 : bOut1_B5
C00843/51	LP_CanOut3 : bOut1_B6
C00843/52	LP_CanOut3 : bOut1_B7
C00843/53	LP_CanOut3 : bOut1_B8
C00843/54	LP_CanOut3 : bOut1_B9
C00843/55	LP_CanOut3 : bOut1_B10
C00843/56	LP_CanOut3 : bOut1_B11
C00843/57	LP_CanOut3 : bOut1_B12
C00843/58	LP_CanOut3 : bOut1_B13
C00843/59	LP_CanOut3 : bOut1_B14
C00843/60	LP_CanOut3 : bOut1_B15
C00843/61	LP_MciOut : bState_B0
C00843/62	LP_MciOut : bState_B1
C00843/63	LP_MciOut : bState_B2
C00843/64	LP_MciOut : bState_B3
C00843/65	LP_MciOut : bState_B4
C00843/66	LP_MciOut : bState_B5
C00843/67	LP_MciOut : bState_B6
C00843/68	LP_MciOut : bState_B7
C00843/69	LP_MciOut : bState_B8
C00843/70	LP_MciOut : bState_B9
C00843/71	LP_MciOut : bState_B10
C00843/72	LP_MciOut : bState_B11
C00843/73	LP_MciOut : bState_B12
C00843/74	LP_MciOut : bState_B13
C00843/75	LP_MciOut : bState_B14
C00843/76	LP_MciOut : bState_B15
C00843/77	LP_MciOut : bOut2_B0
C00843/78	LP_MciOut : bOut2_B1
C00843/79	LP_MciOut : bOut2_B2
C00843/80	LP_MciOut : bOut2_B3
C00843/81	LP_MciOut : bOut2_B4
C00843/82	LP_MciOut : bOut2_B5
C00843/83	LP_MciOut : bOut2_B6
C00843/84	LP_MciOut : bOut2_B7
C00843/85	LP_MciOut : bOut2_B8
C00843/86	LP_MciOut : bOut2_B9
C00843/87	LP_MciOut : bOut2_B10
C00843/88	LP_MciOut : bOut2_B11
C00843/89	LP_MciOut : bOut2_B12
C00843/90	LP_MciOut : bOut2_B13
C00843/91	LP_MciOut : bOut2_B14
C00843/92	LP_MciOut : bOut2_B15
C00843/93	LS_SetError_1 : bSetError1

8400 TopLine C | Software Manual

Parameter reference

Parameter list | C00843

Parameter Name:	Data type: UNSIGNED_8 Index: 23732 _d = 5CB4 _h
C00843 Binary inputs I/O level	
C00843/94	LS_SetError_1 : bSetError2
C00843/95	LS_SetError_1 : bSetError3
C00843/96	LS_SetError_1 : bSetError4
C00843/97	LS_DigitalInput : bCountIn6_Reset
C00843/98	LS_DigitalInput : bCountIn6_LoadStartValue
C00843/99	LS_DigitalOutput : bOut2
C00843/100	LS_DigitalOutput : bOut3
C00843/101	LS_DigitalOutput : bOut HighCurrent
C00843/102	LS_DisFree_b : bDis9
C00843/103	LS_DisFree_b : bDis10
C00843/104	LS_DisFree_b : bDis11
C00843/105	LS_DisFree_b : bDis12
C00843/106	LS_DisFree_b : bDis13
C00843/107	LS_DisFree_b : bDis14
C00843/108	LS_DisFree_b : bDis15
C00843/109	LS_DisFree_b : bDis16
C00843/110	Reserved
C00843/111	LS_ParReadWrite_1 : bExecute
C00843/112	LS_ParReadWrite_1 : bReadWrite
C00843/113	LS_ParReadWrite_2 : bExecute
C00843/114	LS_ParReadWrite_2 : bReadWrite
C00843/115	LS_ParReadWrite_3 : bExecute
C00843/116	LS_ParReadWrite_3 : bReadWrite
C00843/117	LS_ParReadWrite_4 : bExecute
C00843/118	LS_ParReadWrite_4 : bReadWrite
C00843/119	LS_ParReadWrite_5 : bExecute
C00843/120	LS_ParReadWrite_5 : bReadWrite
C00843/121	LS_ParReadWrite_6 : bExecute
C00843/122	LS_ParReadWrite_6 : bReadWrite
C00843/123	LS_WriteParamList : bExecute
C00843/124	LS_WriteParamList : bSelectWriteValue_1
C00843/125	LS_WriteParamList : bSelectWriteValue_2
C00843/126	LS_CANManagement : bResetNode
C00843/127	LS_CANManagement : bReInitCAN
C00843/128	LS_DigitalInput : bPosIn12_Load
C00843/129	Reserved
C00843/130	Reserved
C00843/131	Reserved
C00843/132	Reserved
C00843/133	Reserved
C00843/134	Reserved
C00843/135	Reserved
C00843/136	Reserved
C00843/137	Reserved

Parameter Name:		Data type: UNSIGNED_8 Index: 23732 _d = 5CB4 _h
C00843 Binary inputs I/O level		
C00843/138	Reserved	
C00843/139	Reserved	
C00843/140	Reserved	
C00843/141	Reserved	
C00843/142	Reserved	
C00843/143	Reserved	
C00843/144	Reserved	
C00843/145	Reserved	
C00843/146	Reserved	
C00843/147	LS_TouchProbe : bDisableTPDigIn3	
C00843/148	LS_TouchProbe : bDisableTPDigIn4	
C00843/149	LS_TouchProbe : bDisableTPDigIn5	
C00843/150	LS_TouchProbe : bDisableTPDigIn6	
C00843/151	LS_TouchProbe : bDisableTPDigIn7	
C00843/152	LS_TouchProbe : bDisableTPDigIn3_Rising	
C00843/153	LS_TouchProbe : bDisableTPDigIn3_Falling	
C00843/154	LS_TouchProbe : bDisableTPDigIn4_Rising	
C00843/155	LS_TouchProbe : bDisableTPDigIn4_Falling	
C00843/156	LS_TouchProbe : bDisableTPDigIn5_Rising	
C00843/157	LS_TouchProbe : bDisableTPDigIn5_Falling	
C00843/158	LS_TouchProbe : bDisableTPDigIn3Window	
C00843/159	LS_TouchProbe : bDisableTPDigIn4Window	
C00843/160	LS_TouchProbe : bDisableTPDigIn5Window	
C00843/161	LS_AxisBusIO : bSetFail	
C00843/162	LS_AxisBusIO : bResetFail	
C00843/163	Reserved	
C00843/164	LS_MultiEncoder : bSetRef	
C00843/165	LS_RetainData : bSetRetain_1	
C00843/166	LS_RetainData : bSetRetain_2	
C00843/167	LS_RetainData : bSetRetain_3	
C00843/168	LS_RetainData : bLoadParams	
C00843/169	LS_RetainData : bIn1	
C00843/170	LS_RetainData : bIn2	
C00843/171	LS_RetainData : bIn3	
C00843/172	LS_RetainData : bIn4	
C00843/173	LS_AxisBusAux : bReadWrite	
C00843/174	LS_AxisBusAux : bExecute	
C00843/175	LS_AxisBusAux : bStop	

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00844

Parameter Name: C00844 32-bit inputs I/O level [incr]		Data type: INTEGER_32 Index: 23731 _d = 5CB3 _h
Display of 32-bit input values of different I/O level blocks in [increments]		
Display range (min. value unit max. value)		
-2147483647	Incr.	2147483647
Subcodes	Info	
C00844/1	LS_DisFree_p : dnDis1_p	
C00844/2	LS_DisFree_p : dnDis2_p	
C00844/3	LS_DisFree_p : dnDis3_p	
C00844/4	LS_DisFree_p : dnDis4_p	
C00844/5	LS_DisFree_p : dnDis5_p	
C00844/6	LS_DisFree_p : dnDis6_p	
C00844/7	LS_DisFree_p : dnDis7_p	
C00844/8	LS_DisFree_p : dnDis8_p	
C00844/9	LP_CanOut1 : dnOut34_p	
C00844/10	LP_CanOut2 : dnOut34_p	
C00844/11	LP_CanOut3 : dnOut34_p	
C00844/12	LP_MciOut : dnOut34_p	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00866

Parameter Name: C00866 CAN input words		Data type: UNSIGNED_16 Index: 23709 _d = 5C9D _h
Display of the 16 bit input values of the CAN interface		▶ System bus "CAN on board"
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Active	
...	...	
Bit 15	Active	
Subcodes	Info	
C00866/1	LP_CanIn1 : wCtrl	
C00866/2	LP_CanIn1 : wIn2	
C00866/3	LP_CanIn1 : wIn3	
C00866/4	LP_CanIn1 : wIn4	
C00866/5	LP_CanIn2 : wIn1	
C00866/6	LP_CanIn2 : wIn2	
C00866/7	LP_CanIn2 : wIn3	
C00866/8	LP_CanIn2 : wIn4	
C00866/9	LP_CanIn3 : wIn1	
C00866/10	LP_CanIn3 : wIn2	
C00866/11	LP_CanIn3 : wIn3	
C00866/12	LP_CanIn3 : wIn4	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00868

Parameter Name: C00868 CAN output words		Data type: UNSIGNED_16 Index: 23707 _d = 5C9B _h
Display of the 16 bit output values of the CAN interface		
▶ System bus "CAN on board"		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Active	
Bit 1	Active	
Bit 2	Active	
Bit 3	Active	
Bit 4	Active	
Bit 5	Active	
Bit 6	Active	
Bit 7	Active	
Bit 8	Active	
Bit 9	Active	
Bit 10	Active	
Bit 11	Active	
Bit 12	Active	
Bit 13	Active	
Bit 14	Active	
Bit 15	Active	
Subcodes	Info	
C00868/1	LP_CanOut1 : wState	
C00868/2	LP_CanOut1 : wOut2	
C00868/3	LP_CanOut1 : wOut3	
C00868/4	LP_CanOut1 : wOut4	
C00868/5	LP_CanOut2 : wOut1	
C00868/6	LP_CanOut2 : wOut2	
C00868/7	LP_CanOut2 : wOut3	
C00868/8	LP_CanOut2 : wOut4	
C00868/9	LP_CanOut3 : wOut1	
C00868/10	LP_CanOut3 : wOut2	
C00868/11	LP_CanOut3 : wOut3	
C00868/12	LP_CanOut3 : wOut4	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00876

Parameter Name: C00876 MCI input words		Data type: UNSIGNED_16 Index: 23699 _d = 5C93 _h
Display of the 16 bit input values of the communication module		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Active	
...	...	
Bit 15	Active	
Subcodes	Info	
C00876/1	LP_MciIn : wCtrl	
C00876/2	LP_MciIn : wIn2	
C00876/3	LP_MciIn : wIn3	
C00876/4	LP_MciIn : wIn4	
C00876/5	LP_MciIn : wIn5	
C00876/6	LP_MciIn : wIn6	
C00876/7	LP_MciIn : wIn7	
C00876/8	LP_MciIn : wIn8	
C00876/9	LP_MciIn : wIn9	
C00876/10	LP_MciIn : wIn10	
C00876/11	LP_MciIn : wIn11	
C00876/12	LP_MciIn : wIn12	
C00876/13	LP_MciIn : wIn13	
C00876/14	LP_MciIn : wIn14	
C00876/15	LP_MciIn : wIn15	
C00876/16	LP_MciIn : wIn16	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00877

Parameter Name: C00877 MCI output words		Data type: UNSIGNED_16 Index: 23698 _d = 5C92 _h
Display of the 16 bit output values of the communication module		
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	Active	
...	...	
Bit 15	Active	
Subcodes		Info
C00877/1		LP_MciOut : wState
C00877/2		LP_MciOut : wOut2
C00877/3		LP_MciOut : wOut3
C00877/4		LP_MciOut : wOut4
C00877/5		LP_MciOut : wOut5
C00877/6		LP_MciOut : wOut6
C00877/7		LP_MciOut : wOut7
C00877/8		LP_MciOut : wOut8
C00877/9		LP_MciOut : wOut9
C00877/10		LP_MciOut : wOut10
C00877/11		LP_MciOut : wOut11
C00877/12		LP_MciOut : wOut12
C00877/13		LP_MciOut : wOut13
C00877/14		LP_MciOut : wOut14
C00877/15		LP_MciOut : wOut15
C00877/16		LP_MciOut : wOut16
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00890

Parameter Name: C00890 MCI_InOut: Inversion		Data type: UNSIGNED_16 Index: 23685 _d = 5C85 _h
This parameter serves to invert the control/status bits of the MCI port blocks.		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	Active	Bit set = inversion active
...	...	
Bit 15	Active	
Subcodes	Lenze setting	Info
C00890/1	0	Inversion of LP_MciIn.wCtrl
C00890/2	0	Inversion of LP_MciOut.wState
C00890/3	0	Inversion of LP_MciIn.bIn2_B0...15
C00890/4	0	Inversion of LP_MciOut.bOut2_B0...15
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C00905

Parameter Name:	C00905 Motor phase direction of rotation	Data type: UNSIGNED_8 Index: 23670 _d = 5C76 _h
To correct such misconnected motor phases, the rotating field of the controller's output can be reversed by selecting "1: Inverted". In this case, a phase will be reversed at the output of the inverter.		
Selection list (Lenze setting printed in bold)		
0	not inverted	
1	inverted	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00909

Parameter Name:	C00909 Speed limitation	Data type: INTEGER_16 Index: 23666 _d = 5C72 _h
Max. positive/negative speed for all motor control modes		
Setting range (min. value unit max. value)		
0.00	%	175.00
Subcodes	Lenze setting	Info
C00909/1	120.00 %	Max. pos. speed
C00909/2	120.00 %	Max. neg. speed
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00910

Parameter Name:	C00910 Frequency limitation	Data type: UNSIGNED_16 Index: 23665 _d = 5C71 _h
Max. positive/negative output frequency for all motor control modes		
Setting range (min. value unit max. value)		
0	Hz	1000
Subcodes	Lenze setting	Info
C00910/1	1000 Hz	Max. pos. output frequency
C00910/2	1000 Hz	Max. neg. output frequency
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00915

Parameter Name:	C00915 Motor cable length	Data type: UNSIGNED_16 Index: 23660 _d = 5C6C _h
Single motor cable length for calculating the motor cable resistance		
<ul style="list-style-type: none"> The calculated motor cable resistance is displayed in C00917. 		
Setting range (min. value unit max. value)		Lenze setting
0.0	m	1000.0 5.0 m
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10		

C00916

Parameter Name:	C00916 Motor cable cross-section	Data type: UNSIGNED_16 Index: 23659 _d = 5C6B _h
Motor cable cross-section of a phase/cable for calculating the motor cable resistance		
<ul style="list-style-type: none"> The calculated motor cable resistance is displayed in C00917. 		
Setting range (min. value unit max. value)		Lenze setting
0.50	mm ²	100.00 6.00 mm²
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100		

C00917

Parameter | Name: **C00917 | Motor cable resistance** Data type: UNSIGNED_16
Index: 23658_d = 5C6A_h

Display of the motor cable resistance of a motor cable phase

- The motor cable resistance is calculated from the motor cable length set in [C00915](#) and the motor cable cross-section set in [C00916](#).

Display range (min. value unit max. value)		
0	mOhm	64000

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00918

Parameter | Name: **C00918 | SC: Start motor magnetising current** Data type: UNSIGNED_8
Index: 23657_d = 5C69_h

Setting range (min. value unit max. value)		Lenze setting
0	%	90 87 %

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00922

Parameter | Name: **C00922 | ICM_DiagnosticCounter** Data type: UNSIGNED_16
Index: 23653_d = 5C65_h

This code is for device-internal use only and must not be written to by the user!

C00925

Parameter | Name: **C00925 | LS_Resolver: Number of pole pairs** Data type: UNSIGNED_8
Index: 23650_d = 5C62_h

► [Encoder/feedback system](#)

Setting range (min. value unit max. value)		Lenze setting
1		10 1

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00926

Parameter | Name: **C00926 | Pole position** Data type: INTEGER_16
Index: 23649_d = 5C61_h

► [Encoder/feedback system](#)

Setting range (min. value unit max. value)		
-179.9	°	179.9
Subcodes	Lenze setting	Info
C00926/1	-90.0 °	LS_Resolver : Pole position
C00926/2	0.0 °	LS_MultiEncoder : Pole position

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10

C00927

Parameter | Name: **C00927 | Motor rotor position** Data type: UNSIGNED_16
Index: 23648_d = 5C60_h

► [Encoder/feedback system](#)

Display range (min. value unit max. value)	
0	2047

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00937

Parameter Name: C00937 Field-oriented motor currents		Data type: INTEGER_16 Index: 23638 _d = 5C56 _h
From version 02.00.00		
▶ Field weakening for synchronous motors		
Display range (min. value unit max. value)		
0.00	A	320.00
Subcodes		Info
C00937/1		Field-producing current
C00937/2		Torque-producing current
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100		

C00938

Parameter Name: C00938 PSM: Maximum motor current field weakening		Data type: UNSIGNED_16 Index: 23637 _d = 5C55 _h
From version 02.00.00		
▶ Field weakening for synchronous motors		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	500.00
		100.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100		

C00939

Parameter Name: C00939 Ultimate motor current		Data type: UNSIGNED_16 Index: 23636 _d = 5C54 _h
Setting range (min. value unit max. value)		Lenze setting
0.0	A	3000.0
		3000.0 A
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10		

C00940

Parameter Name: C00940 L_ConvW numerator		Data type: INTEGER_16 Index: 23635 _d = 5C53 _h
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C00940/1	1	L_ConvW 1 : Numerator
C00940/2	1	L_ConvW 2 : Numerator
C00940/3	1	L_ConvW 3 : Numerator
C00940/4	1	L_ConvW 4 : Numerator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00941

Parameter Name: C00941 L_ConvW denominator		Data type: INTEGER_16 Index: 23634 _d = 5C52 _h
Setting range (min. value unit max. value)		
1		32767
Subcodes	Lenze setting	Info
C00941/1	1	L_ConvW 1 : Denominator
C00941/2	1	L_ConvW 2 : Denominator
C00941/3	1	L_ConvW 3 : Denominator
C00941/4	1	L_ConvW 4 : Denominator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00942

Parameter Name: C00942 L_ConvW conversion method		Data type: UNSIGNED_8 Index: 23633 _d = 5C51 _h
Selection list		
0	no conversion	
1	from [%] into [incr./ms]	
2	from [incr./ms] into [%]	
3	Factors signed	
4	Factors unsigned	
Subcodes	Lenze setting	Info
C00942/1	0: No conversion	L_ConvW 1 : Conversion method
C00942/2	0: No conversion	L_ConvW 2 : Conversion method
C00942/3	0: No conversion	L_ConvW 3 : Conversion method
C00942/4	0: No conversion	L_ConvW 4 : Conversion method
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00950

Parameter Name: C00950 L_Interpolator_1: Activation FB functions		Data type: UNSIGNED_8 Index: 23625 _d = 5C49 _h
The L_Interpolator 1 FB: Activation of signal interpolation and signal monitoring		
Selection list		
0	Off	
1	On	
Subcodes	Lenze setting	Info
C00950/1	0: Off	L_Interpolator 1 : Signal interpolation
C00950/2	0: Off	L_Interpolator 1 : Signal monitoring
C00950/3	0: Off	L_Interpolator 1 : Master value monitoring
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00951

Parameter Name: C00951 L_Interpolator_1: No. of interpolation steps		Data type: UNSIGNED_16 Index: 23624 _d = 5C48 _h
The L_Interpolator 1 FB: No. of interpolation steps		
Setting range (min. value unit max. value)		Lenze setting
0		65535 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00952

Parameter Name: C00952 L_Interpolator_1: Limit value - error cycles		Data type: UNSIGNED_16 Index: 23623 _d = 5C47 _h
The L_Interpolator 1 FB: Limit value for missing data telegrams		
Setting range (min. value unit max. value)		Lenze setting
0		65535 5
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00953

Parameter Name: C00953 L_Interpolator_1: Speed-up		Data type: UNSIGNED_8 Index: 23622 _d = 5C46 _h
FB L_Interpolator 1 : Filter		
Setting range (min. value unit max. value)		Lenze setting
0		100 0
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00959

Parameter Name: C00959 L_Curve: Current output value		Data type: INTEGER_16 Index: 23616 _d = 5C40 _h
From version 02.00.00		
FB L_Curve_1 : Display of the current output value <i>nOut_a</i>		
Display range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Info	
C00959/1	L_Curve_1 : Current output value	
C00959/2	L_Curve_2 : Current output value	
C00959/3	L_Curve_3 : Current output value	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00960

Parameter Name: C00960 L_Curve_1: Selected curve type		Data type: UNSIGNED_8 Index: 23615 _d = 5C3F _h
FB L_Curve_1 : Selected curve type		
Selection list		
0	Out = 0	
1	Out = In	
2	Out = f(In)	
3	Out = f(table)	
Subcodes	Lenze setting	Info
C00960/1	1: Out = In	L_Curve_1 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00961

Parameter Name: C00961 L_Curve_1: Input limitation		Data type: INTEGER_16 Index: 23614 _d = 5C3E _h
FB L_Curve_1 : Upper and lower limit for input value		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C00961/1	199.99 %	L_Curve_1 : Max. input
C00961/2	-199.99 %	L_Curve_1 : Min. input
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00963

Parameter Name: C00963 L_Curve_1: Table X-values		Data type: INTEGER_16 Index: 23612 _d = 5C3C _h
FB L_Curve_1 : X-values for characteristic function		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C00963/1	0	X values 1 ... 32 for characteristic function
C00963/...		
C00963/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00964

Parameter Name: C00964 L_Curve_1: Table Y-values		Data type: INTEGER_16 Index: 23611 _d = 5C3B _h
FB L_Curve_1 : Y-value for characteristic function		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C00964/1	0	Y values 1 ... 32 for characteristic function
C00964/...		
C00964/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00965

Parameter Name: C00965 Max. motor speed		Data type: UNSIGNED_16 Index: 23610 _d = 5C3A _h
When the drive reaches the motor speed set here:		
<ul style="list-style-type: none"> The "Fault" error response takes place, i.e. the motor is shut down immediately. The error message "OS2: Max. motor speed reached" is entered into the logbook. 		
Setting range (min. value unit max. value)		Lenze setting
50	rpm	60000 60000 rpm
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00966

Parameter Name: C00966 VFC: Time const. slip comp.		Data type: UNSIGNED_16 Index: 23609 _d = 5C39 _h
Filter time constant of the slip compensation for V/f characteristic control (VFCplus)		
<ul style="list-style-type: none"> The time constant of slip compensation serves to specify the dynamics of slip compensation for V/f characteristic control without feedback. The lower the selected time constant, the higher the dynamic performance of the slip compensation. 		
Setting range (min. value unit max. value)		Lenze setting
1	ms	6000 100 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C00967

Parameter Name: C00967 VFC: Frequency interpol. point n		Data type: INTEGER_16 Index: 23608 _d = 5C38 _h
Selection of the interpolation points (frequency values) for the V/f characteristic control (VFCplus) with user-definable V/f characteristic (C00006 = "10")		
Setting range (min. value unit max. value)		
-2600.0	Hz	2600.0
Subcodes	Lenze setting	Info
C00967/1	-50.0 Hz	VFC : Frequency interpol. point 1
C00967/2	-40.0 Hz	VFC : Frequency interpol. point 2
C00967/3	-30.0 Hz	VFC : Frequency interpol. point 3
C00967/4	-20.0 Hz	VFC : Frequency interpol. point 4
C00967/5	-10.0 Hz	VFC : Frequency interpol. point 5
C00967/6	0.0 Hz	VFC : Frequency interpol. point 6
C00967/7	10.0 Hz	VFC : Frequency interpol. point 7
C00967/8	20.0 Hz	VFC : Frequency interpol. point 8
C00967/9	30.0 Hz	VFC : Frequency interpol. point 9
C00967/10	40.0 Hz	VFC : Frequency interpol. point 10
C00967/11	50.0 Hz	VFC : Frequency interpol. point 11
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10		

C00968

Parameter Name: C00968 VFC: Voltage interpol. point n		Data type: UNSIGNED_16 Index: 23607 _d = 5C37 _h
Selection of the interpolation points (voltage values) for the V/f characteristic control (VFCplus) with user-definable V/f characteristic (C00006 = "10")		
Setting range (min. value unit max. value)		
0.00	V	600.00
Subcodes	Lenze setting	Info
C00968/1	400.00 V	VFC : Voltage interpol. point 1
C00968/2	320.00 V	VFC : Voltage interpol. point 2
C00968/3	240.00 V	VFC : Voltage interpol. point 3
C00968/4	160.00 V	VFC : Voltage interpol. point 4
C00968/5	80.00 V	VFC : Voltage interpol. point 5
C00968/6	0.00 V	VFC : Voltage interpol. point 6
C00968/7	80.00 V	VFC : Voltage interpol. point 7
C00968/8	160.00 V	VFC : Voltage interpol. point 8
C00968/9	240.00 V	VFC : Voltage interpol. point 9
C00968/10	320.00 V	VFC : Voltage interpol. point 10
C00968/11	400.00 V	VFC : Voltage interpol. point 11
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00971

Parameter Name: C00971 VFC: Limitation V/f +encoder		Data type: UNSIGNED_16 Index: 23604 _d = 5C34 _h
Limitation of the output frequency of the slip regulator and limitation of the injected stator frequency for the V/f control (VFCplus+encoder)		
Setting range (min. value unit max. value)		
0.00	Hz	100.00
Subcodes	Lenze setting	Info
C00971/1	10.00 Hz	Maximum output / correcting variable of the slip regulator <ul style="list-style-type: none"> The slip regulator output is limited to the value set here in motor/generator mode. It is recommended to select 1 to 3 times the slip frequency of the motor as limit value.
C00971/2	100.00 Hz	Maximum frequency deviation between the rotational frequency (speed) measured mechanically by the encoder and the injected stator frequency. <ul style="list-style-type: none"> A limitation may e.g. avoid overcurrent interruption when traversing to a fixed limit stop.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00972

Parameter Name: C00972 VFC: Vp V/f +encoder		Data type: UNSIGNED_16 Index: 23603 _d = 5C33 _h
Proportional gain of the slip regulator for V/f control (VFCplus+encoder) <ul style="list-style-type: none"> The gain must be selected depending on the drive system and the sensor resolution (range: 0.005 ... 5). A high gain requires a high number of increments. 		
Setting range (min. value unit max. value)		Lenze setting
0.000	Hz/Hz	64.000 0.100 Hz/Hz
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1000		

C00973

Parameter Name: C00973 VFC: Ti V/f +encoder		Data type: UNSIGNED_16 Index: 23602 _d = 5C32 _h
Integral time constant of the slip regulator for V/f control (VFCplus+encoder) <ul style="list-style-type: none"> In general, the time constant should be selected in a range of 20 ms (high dynamics) to 200 (low dynamics). 		
Setting range (min. value unit max. value)		Lenze setting
0.0	ms	6000.0 100.0 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10		

C00975

Parameter Name: C00975 VFC-ECO: Vp CosPhi controller		Data type: UNSIGNED_16 Index: 23600 _d = 5C30 _h
Proportional gain of the Cos-Phi controller for energy-saving V/f characteristic control (VFCplusEco)		
Setting range (min. value unit max. value)		Lenze setting
0.000	Hz/Hz	64.000 0.500 Hz/Hz
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00976

Parameter Name: C00976 VFC-ECO: Ti CosPhi controller		Data type: UNSIGNED_16 Index: 23599 _d = 5C2F _h
Reset time of the Cos-Phi controller for energy-saving V/f characteristic control (VFCplusEco)		
Setting range (min. value unit max. value)		Lenze setting
0.0	ms	6000.0 200.0 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10		

C00977

Parameter Name: C00977 VFC-ECO: Minimum voltage V/f		Data type: INTEGER_16 Index: 23598 _d = 5C2E _h
Minimum voltage V/f of the Cos-Phi controller for energy-saving V/f characteristic control (VFCplusEco)		
Setting range (min. value unit max. value)		Lenze setting
20.00	%	100.00 20.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00978

Parameter Name: C00978 VFC-ECO: Voltage reduction		Data type: INTEGER_16 Index: 23597 _d = 5C2D _h
Display of the voltage reduction with energy-saving V/f characteristic control (VFCplusEco)		
Display range (min. value unit max. value)		
-1000	V	1000
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C00979

Parameter Name: C00979 Cosine phi		Data type: INTEGER_16 Index: 23596 _d = 5C2C _h
Display of the cosφ setpoint and actual value with energy-saving V/f characteristic control (VFCplusEco)		
Display range (min. value unit max. value)		
-1.00		1.00
Subcodes		Info
C00979/1		Cosine phi act
C00979/2		Cosine phi set
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00980

Parameter Name: C00980 Output power		Data type: INTEGER_32 Index: 23595 _d = 5C2B _h
Display parameter for an energy analysis in the prevailing application. From this, decisions can be deduced whether a measure for energy optimisation is economic.		
Display range (min. value unit max. value)		
0.000	kW	32.000
Subcodes		Info
C00980/1		Active output power
C00980/2		Apparent output power
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C00981

Parameter Name: C00981 Energy display		Data type: INTEGER_32 Index: 23594 _d = 5C2A _h
Display parameter for an energy analysis in the prevailing application. From this, decisions can be deduced whether a measure for energy optimisation is economic.		
<ul style="list-style-type: none"> The values are saved to the device by switching off the mains and cannot be reset. 		
Display range (min. value unit max. value)		
0.00	kWh	21474836.47
Subcodes		Info
C00981/1		Output energy in motor mode
C00981/2		Output energy in generator mode
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00982

Parameter Name: C00982 VFC-ECO: Voltage reduction ramp	Data type: UNSIGNED_8 Index: 23593 _d = 5C29 _h
Voltage ramp for cancelling V-Sub with energy-saving V/f characteristic control (VFCplusEco)	
Setting range (min. value unit max. value)	Lenze setting
0.1 s 5.0	0.8 s
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10	

C00985

Parameter Name: C00985 SLVC: Field current controller gain	Data type: INTEGER_16 Index: 23590 _d = 5C26 _h
Gain of the direct-axis current difference (Id) between setpoint and actual current for the voltage model of the sensorless vector control (SLVC)	
<ul style="list-style-type: none"> The gain should be selected in a range of 0 ...1 %. 	
Setting range (min. value unit max. value)	Lenze setting
0.00 % 10.00	0.50 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00986

Parameter Name: C00986 SLVC: Cross current controller gain	Data type: INTEGER_16 Index: 23589 _d = 5C25 _h
Gain of the cross current difference for the voltage model of the sensorless vector control (SLVC)	
Setting range (min. value unit max. value)	Lenze setting
0.00 % 10.00	0.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100	

C00987

Parameter Name: C00987 Inverter motor brake: nAdd	Data type: INTEGER_16 Index: 23588 _d = 5C24 _h
Speed lift which is connected in pulses to the brake rampe when the motor is braked.	
▶ Inverter motor brake	
Setting range (min. value unit max. value)	Lenze setting
0 rpm 1000	80 rpm
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1	

C00988

Parameter Name: C00988 Inverter motor brake: PT1 filter time	Data type: INTEGER_16 Index: 23587 _d = 5C23 _h
PT1 filter time for smoothing the speed lift which is added in pulses (C00987)	
▶ Inverter motor brake	
Setting range (min. value unit max. value)	Lenze setting
0.0 ms 100.0	0.0 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10	

C00990

Parameter Name: C00990 Flying restart fct.: Activation	Data type: UNSIGNED_8 Index: 23585 _d = 5C21 _h
Switch on/activate flying restart circuit for non-feedback drive systems	
▶ Flying restart fct.	
Selection list (Lenze setting printed in bold)	
0 Off	
1 On	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C00991

Parameter | Name: **C00991 | Flying restart fct.: Process** Data type: UNSIGNED_16
Index: 23584_d = 5C20_h

Selection of the starting value and the speed search range for the flying restart function

[▶ Flying restart fct.](#)

Selection list (Lenze setting printed in bold)		Info
0	0...+n Start: +10 Hz	Search positive speed range (0 ... +n) with a start frequency of +10 Hz
1	-n...0 Start: -10 Hz	Search negative speed range (-n ... 0) with a start frequency of -10 Hz
2	-n...+n Start: +10 Hz	Search negative and positive speed range (-n ... n) with a start frequency of +10 Hz
3	-n...+n Start: -10 Hz	Search negative and positive speed range (-n ... n) with a start frequency of -10 Hz
4	-n...+n Start: Cx992	Search the negative and positive speed range (-n ... n) with the start frequency set in C00992

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00992

Parameter | Name: **C00992 | Flying restart fct.: Start frequency** Data type: INTEGER_16
Index: 23583_d = 5C1F_h

Manual selection of the starting value for the flying restart function

- Only active if [C00991](#) = 4

[▶ Flying restart fct.](#)

Setting range (min. value unit max. value)			Lenze setting
-200	Hz	200	10 Hz

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C00993

Parameter | Name: **C00993 | Flying restart fct.: Int. time** Data type: UNSIGNED_16
Index: 23582_d = 5C1E_h

Time constant of the angular difference controller of the flying restart function

- The time constant is to amount between 60 ... 300 ms.

[▶ Flying restart fct.](#)

Setting range (min. value unit max. value)			Lenze setting
0.0	ms	6000.0	300.0 ms

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10

C00994

Parameter | Name: **C00994 | Flying restart fct.: Current** Data type: INTEGER_16
Index: 23581_d = 5C1D_h

Current to be injected during the flying restart process

- 100 % ≙ rated motor current ([C00088](#)).
- The flying restart current should amount to 10 ... 25 % of the rated motor current.

[▶ Flying restart fct.](#)

Setting range (min. value unit max. value)			Lenze setting
0.00	%	100.00	25.00 %

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C00995

Parameter Name: C00995 SLPSM: Controlled current setpoint		Data type: UNSIGNED_16 Index: 23580 _d = 5C1C _h
▶ Sensorless control for synchronous motor		
Setting range (min. value unit max. value)		
5.00	%	400.00
Subcodes	Lenze setting	Info
C00995/1	100.00 %	SLPSM : Controlled accelerating current
C00995/2	20.00 %	SLPSM : Controlled standstill current
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 100		

C00996

Parameter Name: C00996 SLPSM: Switching speed		Data type: INTEGER_16 Index: 23579 _d = 5C1B _h
▶ Sensorless control for synchronous motor		
Setting range (min. value unit max. value)		
0.00	%	100.00
Subcodes	Lenze setting	Info
C00996/1	13.00 %	SLPSM : Switching speed, closed-loop control
C00996/2	8.00 %	SLPSM : Switching speed, open-loop control
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00997

Parameter Name: C00997 SLPSM: Filter cutoff frequency		Data type: INTEGER_16 Index: 23578 _d = 5C1A _h
▶ Sensorless control for synchronous motor		
Setting range (min. value unit max. value)		Lenze setting
0.00	%	100.00 5.00 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C00998

Parameter Name: C00998 SLPSM: Filter time rotor position		Data type: INTEGER_16 Index: 23577 _d = 5C19 _h
▶ Sensorless control for synchronous motor		
Setting range (min. value unit max. value)		
0.5	ms	20.0
Subcodes	Lenze setting	Info
C00998/1	3.0 ms	SLPSM : Filter time rotor position
C00998/2	5.0 ms	SLPSM : Filter time actual speed value
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 10		

C00999

Parameter Name: C00999 SLPSM: PLL gain		Data type: INTEGER_16 Index: 23576 _d = 5C18 _h
▶ Sensorless control for synchronous motor		
Setting range (min. value unit max. value)		Lenze setting
0	%	1000 400 %
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C01000

Parameter Name: C01000 MCTRL: Status		Data type: UNSIGNED_16 Index: 23575 _d = 5C17 _h
Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		
Bit 0	SL PSM: Mode	
Bit 1	Reserved	
Bit 2	Reserved	
Bit 3	Reserved	
Bit 4	Reserved	
Bit 5	Reserved	
Bit 6	Reserved	
Bit 7	Reserved	
Bit 8	Reserved	
Bit 9	Reserved	
Bit 10	Reserved	
Bit 11	Reserved	
Bit 12	Reserved	
Bit 13	Reserved	
Bit 14	Reserved	
Bit 15	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT		

C01010

Parameter Name: C01010 L_ArithmetikPhi 1-3: Function		Data type: UNSIGNED_8 Index: 23565 _d = 5C0D _h
Selection of the internal arithmetics		
Selection list		
0	dnOut_p = dnIn1_p	
1	dnOut_p = dnIn1_p + dnIn2_p	
2	dnOut_p = dnIn1_p - dnIn2_p	
3	dnOut_p = dnIn1_p * dnIn2_p	
4	dnOut_p = dnIn1_p / dnIn2_p	
Subcodes	Lenze setting	Info
C01010/1	0: dnOut_p = dnIn1_p	L_ArithmetikPhi 1 : Function
C01010/2	0: dnOut_p = dnIn1_p	L_ArithmetikPhi 2 : Function
C01010/3	0: dnOut_p = dnIn1_p	L_ArithmetikPhi 3 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01020

Parameter Name:	C01020 L_Odometer_1: Memory length	Data type: UNSIGNED_8 Index: 23554 _d = 5C03 _h
FB L_Odometer_1 : No. of measurements		
Selection list (Lenze setting printed in bold)		
1	1 measurement	
2	2 measurements	
3	3 measurements	
4	4 measurements	
5	5 measurements	
6	6 measurements	
7	7 measurements	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01021

Parameter Name:	C01021 L_Odometer_1: Memory type	Data type: UNSIGNED_8 Index: 23554 _d = 5C02 _h
FB L_Odometer_1 : If "ring buffer" is selected, it is started again after the measurements set in C01020 and the old values are overwritten. Otherwise, the measurement stops.		
Selection list (Lenze setting printed in bold)		
0	No ring buffer	
1	Ring buffer	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01022

Parameter Name:	C01022 L_Odometer_1: Input selection	Data type: UNSIGNED_8 Index: 23553 _d = 5C01 _h
FB L_Odometer_1 : Selection of position or speed input		
Selection list (Lenze setting printed in bold)		
0	Pos input	
1	V input	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01023

Parameter Name:	C01023 L_Odometer_1: Edge selection	Data type: UNSIGNED_8 Index: 23552 _d = 5C00 _h
FB L_Odometer_1 : No. of the edge triggering the measurement		
Selection list (Lenze setting printed in bold)		
0	High edge	
1	Low edge	
2	High and low edge	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01025

Parameter Name: C01025 L_Curve_2: Selected curve type		Data type: UNSIGNED_8 Index: 23550 _d = 5BF _{Eh}
From version 02.00.00		
FB L_Curve_2 : Selected curve type		
Selection list		
0	Out = 0	
1	Out = In	
2	Out = f(In)	
3	Out = f(table)	
Subcodes	Lenze setting	Info
C01025/1	1: Out = In	L_Curve_2 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01026

Parameter Name: C01026 L_Curve_2: Input limitation		Data type: INTEGER_16 Index: 23549 _d = 5BF _{Dh}
From version 02.00.00		
FB L_Curve_2 : Upper and lower limit for input value		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C01026/1	199.99 %	L_Curve_2 : Max. input
C01026/2	-199.99 %	L_Curve_2 : Min. input
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C01028

Parameter Name: C01028 L_Curve_2: Table X-values		Data type: INTEGER_16 Index: 23547 _d = 5BF _{Bh}
From version 02.00.00		
FB L_Curve_2 : X-values for characteristic function		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C01028/1	0	X values 1 ... 32 for characteristic function
C01028/...		
C01028/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01029

Parameter Name: C01029 L_Curve_2: Table Y-values		Data type: INTEGER_16 Index: 23546 _d = 5BF _{Ah}
From version 02.00.00		
FB L_Curve_2 : Y-value for characteristic function		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C01029/1	0	Y values 1 ... 32 for characteristic function
C01029/...		
C01029/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01030

Parameter Name: C01030 L_Curve_3: Selected curve type		Data type: UNSIGNED_8 Index: 23545 _d = 5BF9 _h
From version 02.00.00		
FB L_Curve_3 : Selected curve type		
Selection list		
0	Out = 0	
1	Out = In	
2	Out = f(In)	
3	Out = f(table)	
Subcodes	Lenze setting	Info
C01030/1	1: Out = In	L_Curve_3 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01031

Parameter Name: C01031 L_Curve_3: Input limitation		Data type: INTEGER_16 Index: 23544 _d = 5BF8 _h
From version 02.00.00		
FB L_Curve_3 : Upper and lower limit for input value		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C01031/1	199.99 %	L_Curve_3 : Max. input
C01031/2	-199.99 %	L_Curve_3 : Min. input
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C01033

Parameter Name: C01033 L_Curve_3: Table X-values		Data type: INTEGER_16 Index: 23542 _d = 5BF6 _h
From version 02.00.00		
FB L_Curve_3 : X-values for characteristic function		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C01033/1	0	X values 1 ... 32 for characteristic function
C01033/...		
C01033/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01034

Parameter Name: C01034 L_Curve_3: Table Y-values		Data type: INTEGER_16 Index: 23541 _d = 5BF5 _h
From version 02.00.00		
FB L_Curve_3 : Y-value for characteristic function		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C01034/1	0	Y values 1 ... 32 for characteristic function
C01034/...		
C01034/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01040

Parameter Name: C01040 L_SRFG_1..2 linear ramp time		Data type: UNSIGNED_32 Index: 23535 _d = 5BEF _h
Symmetrical acceleration/deceleration time for the ramp function generator		
Setting range (min. value unit max. value)		
0.001	s	999.999
Subcodes	Lenze setting	Info
C01040/1	100.000 s	L_SRFG_1 : linear ramp time
C01040/2	100.000 s	L_SRFG_2 : linear ramp time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01041

Parameter Name: C01041 L_SRFG_1..2 S-ramp time		Data type: UNSIGNED_32 Index: 23534 _d = 5BEF _h
S-ramp time for jerk-free acceleration		
Setting range (min. value unit max. value)		
0.001	s	50.000
Subcodes	Lenze setting	Info
C01041/1	0.200 s	L_SRFG_1 : S-ramp time
C01041/2	0.200 s	L_SRFG_2 : S-ramp time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01042

Parameter Name: C01042 L_SRFG_1..2 limitations of output values		Data type: INTEGER_16 Index: 23533 _d = 5BED _h
Limitation of the output values		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C01042/1	100.00 %	L_SRFG_1 : Pos. Limit
C01042/2	-100.00 %	L_SRFG_1 : Neg. Limit
C01042/3	100.00 %	L_SRFG_2 : Pos. Limit
C01042/4	-100.00 %	L_SRFG_2 : Neg. Limit
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C01045

Parameter Name: C01045 L_ConvAP 1-3: Numerator/denominator		Data type: INTEGER_16 Index: 23530 _d = 5BEA _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C01045/1	1	L_ConvAP_1 : Numerator
C01045/2	1	L_ConvAP_1 : Numerator
C01045/3	1	L_ConvAP_2 : Numerator
C01045/4	1	L_ConvAP_2 : Numerator
C01045/5	1	L_ConvAP_3 : Numerator
C01045/6	1	L_ConvAP_3 : Numerator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01046

Parameter Name: C01046 L_ConvPA 1-3: byDivision		Data type: INTEGER_8 Index: 23529 _d = 5BE9 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0		31
Subcodes	Lenze setting	Info
C01046/1	1	L_ConvPA 1 : Division factor
C01046/2	1	L_ConvPA 2 : Division factor
C01046/3	1	L_ConvPA 3 : Division factor
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01047

Parameter Name: C01047 L_GearComp: Offset		Data type: INTEGER_16 Index: 23528 _d = 5BE8 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-16383		16383
Subcodes	Lenze setting	Info
C01047/1	0	L_GearComp 1 : Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01048

Parameter Name: C01048 L_GearComp: Num_Denom		Data type: INTEGER_16 Index: 23527 _d = 5BE7 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-32767		32767
Subcodes	Lenze setting	Info
C01048/1	1	L_GearComp 1 : Numerator
C01048/2	1	L_GearComp 1 : Denominator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01049

Parameter Name: C01049 L_CalcDiameter: Status		Data type: INTEGER_16 Index: 23526 _d = 5BE6 _h
From version 02.00.00		
Display range (min. value unit max. value)		
-10		30
Subcodes	Info	
C01049/1	L_CalcDiameter 1 : Status	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01050

Parameter Name: C01050 L_CalcDiameter_1: Diameter recalculation		Data type: UNSIGNED_32 Index: 23525 _d = 5BE5 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.001	Rev.	1000.000
Subcodes	Lenze setting	Info
C01050/1	1.000 rev.	L_CalcDiameter_1 : Diameter recalculation 0
C01050/2	0.100 rev.	L_CalcDiameter_1 : Diameter recalculation 1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01051

Parameter Name: C01051 L_CalcDiameter: Filter time constant		Data type: UNSIGNED_16 Index: 23524 _d = 5BE4 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.010	s	3.000
Subcodes	Lenze setting	Info
C01051/1	1.000 s	L_CalcDiameter_1 : Filter time constant
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01052

Parameter Name: C01052 L_CalcDiameter: Web break monitoring		Data type: INTEGER_16 Index: 23523 _d = 5BE3 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.00	%	100.00
Subcodes	Lenze setting	Info
C01052/1	10.00 %	L_CalcDiameter_1 : Permissible diameter change
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C01053

Parameter Name: C01053 L_ProcessCtrl: Controller times		Data type: UNSIGNED_16 Index: 23522 _d = 5BE2 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.000	s	30.000
Subcodes	Lenze setting	Info
C01053/1	0.000 s	L_ProcessCtrl_1 : Acceleration/deceleration time
C01053/2	0.000 s	L_ProcessCtrl_1 : Filter time constant
C01053/3	0.000 s	L_ProcessCtrl_1 : Rate time
C01053/4	1.000 s	L_ProcessCtrl_1 : Reset time
C01053/5	0.000 s	L_ProcessCtrl_1 : Rate action
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01054

Parameter Name: C01054 L_ProcessCtrl: System deviation		Data type: INTEGER_16 Index: 23521 _d = 5BE1 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.00	%	199.99
Subcodes	Lenze setting	Info
C01054/1	100.00 %	L_ProcessCtrl_1 : Gain of system deviation
C01054/2	0.00 %	L_ProcessCtrl_1 : Area of system deviation
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C01055

Parameter Name: C01055 L_ProcessCtrl: Correcting value limitation		Data type: UNSIGNED_8 Index: 23520 _d = 5BE0 _h
From version 02.00.00		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C01055/1	0: FALSE	L_ProcessCtrl_1 : Correcting variable limitation
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01056

Parameter Name: C01056 L_ProcessCtrl: Controller gain		Data type: UNSIGNED_16 Index: 23519 _d = 5BDF _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.00		100.00
Subcodes	Lenze setting	Info
C01056/1	0.10	L_ProcessCtrl_1 : Controller gain
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C01057

Parameter Name: C01057 L_CalcDiameter: Current diameter		Data type: UNSIGNED_32 Index: 23518 _d = 5BDE _h
From version 02.00.00		
Display range (min. value unit max. value)		
0.000	mm	10000.000
Subcodes	Info	
C01057/1	L_CalcDiameter_1 : Current diameter	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01058

Parameter Name: C01058 L_PosCtrlLin 1-2: Limit stop		Data type: UNSIGNED_8 Index: 23517 _d = 5BDD _h
From version 02.00.00		
Selection list		
0	deactivated	
1	activated	
Subcodes	Lenze setting	Info
C01058/1	0: Deactivated	L_PosCtrlLin 1 : Limit stop
C01058/2	0: Deactivated	L_PosCtrlLin 2 : Limit stop
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01059

Parameter Name: C01059 L_PosCtrlLin 1-2: Positioning behaviour		Data type: UNSIGNED_8 Index: 23516 _d = 5BDC _h
From version 02.00.00		
Selection list		
0	dnOut_p = 0	
1	dnOut_p/nOut_v follow dnAct_p	
2	dnOut_p/nOut_v follow dnSet_p	
3	dnOut_p/nOut_v follow dnAct_p (without limitation)	
Subcodes	Lenze setting	Info
C01059/1	0: dnOut_p = 0	L_PosCtrlLin 1 : Positioning behaviour
C01059/2	0: dnOut_p = 0	L_PosCtrlLin 2 : Positioning behaviour
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01060

Parameter Name: C01060 L_PosCtrlLin 1-2: Ramps		Data type: INTEGER_32 Index: 23515 _d = 5BDB _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.010	s	130.000
Subcodes	Lenze setting	Info
C01060/1	1.000 s	L_PosCtrlLin 1 : Deceleration of set position
C01060/2	1.000 s	L_PosCtrlLin 1 : Acceleration ramp
C01060/3	1.000 s	L_PosCtrlLin 1 : Deceleration ramp
C01060/4	1.000 s	L_PosCtrlLin 2 : Deceleration of set position
C01060/5	1.000 s	L_PosCtrlLin 2 : Acceleration ramp
C01060/6	1.000 s	L_PosCtrlLin 2 : Deceleration ramp
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01061

Parameter Name: C01061 L_PosCtrlLin 1-2: Traversing speeds		Data type: INTEGER_16 Index: 23514 _d = 5BD _{Ah}
From version 02.00.00		
Setting range (min. value unit max. value)		
-15000	rpm	15000
Subcodes	Lenze setting	Info
C01061/1	199 rpm	L_PosCtrlLin 1 : Forward motion
C01061/2	199 rpm	L_PosCtrlLin 1 : Return motion
C01061/3	199 rpm	L_PosCtrlLin 2 : Forward motion
C01061/4	199 rpm	L_PosCtrlLin 2 : Return motion
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01062

Parameter Name: C01062 L_SwitchPoint: Dead time		Data type: UNSIGNED_16 Index: 23513 _d = 5BD _{9h}
From version 02.00.00		
Setting range (min. value unit max. value)		
0	µs	65535
Subcodes	Lenze setting	Info
C01062/1	0 µs	L_SwitchPoint 1 : Dead time 1
C01062/2	0 µs	L_SwitchPoint 1 : Dead time 2
C01062/3	0 µs	L_SwitchPoint 1 : Dead time 3
C01062/4	0 µs	L_SwitchPoint 1 : Dead time 4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01063

Parameter Name: C01063 L_SwitchPoint: Hysteresis		Data type: UNSIGNED_16 Index: 23512 _d = 5BD _{8h}
From version 02.00.00		
Setting range (min. value unit max. value)		
0	Incr.	65535
Subcodes	Lenze setting	Info
C01063/1	0 incr.	L_SwitchPoint 1 : Hysteresis 1
C01063/2	0 incr.	L_SwitchPoint 1 : Hysteresis 2
C01063/3	0 incr.	L_SwitchPoint 1 : Hysteresis 3
C01063/4	0 incr.	L_SwitchPoint 1 : Hysteresis 4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01064

Parameter Name: C01064 L_SwitchPoint: CenterMode		Data type: UNSIGNED_8 Index: 23511 _d = 5BD7 _h
From version 02.00.00		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C01064/1	0: FALSE	L_SwitchPoint 1 : CenterMode 1
C01064/2	0: FALSE	L_SwitchPoint 1 : CenterMode 2
C01064/3	0: FALSE	L_SwitchPoint 1 : CenterMode 3
C01064/4	0: FALSE	L_SwitchPoint 1 : CenterMode 4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01065

Parameter Name: C01065 L_SwitchPoint: Running time		Data type: UNSIGNED_16 Index: 23510 _d = 5BD6 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0	ms	60000
Subcodes	Lenze setting	Info
C01065/1	0 ms	L_SwitchPoint 1 : Running time 1
C01065/2	0 ms	L_SwitchPoint 1 : Running time 2
C01065/3	0 ms	L_SwitchPoint 1 : Running time 3
C01065/4	0 ms	L_SwitchPoint 1 : Running time 4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01066

Parameter Name: C01066 L_SwitchPoint: Status		Data type: INTEGER_16 Index: 23509 _d = 5BD5 _h
From version 02.00.00		
Selection list		
-10	Switching points not plausible	
0	OK	
10	FB not active	
Subcodes	Info	
C01066/1	L_SwitchPoint 1 : Status 1	
C01066/2	L_SwitchPoint 1 : Status 2	
C01066/3	L_SwitchPoint 1 : Status 3	
C01066/4	L_SwitchPoint 1 : Status 4	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01067

Parameter Name: C01067 Inversion of gearbox stages		Data type: UNSIGNED_8 Index: 23508 _d = 5BD4 _h
From version 02.00.00		
Selection list		
0	not inverted	
1	inverted	
2	Automatically from MCK	
Subcodes	Lenze setting	Info
C01067/1	0: Not inverted	L_PhilIntegrator_1 : Invert. gearbox nSet_v
C01067/2	0: Not inverted	L_DFSET_1 : Invert. gearbox nSet_v
C01067/3	0: Not inverted	L_CalcDiameter_1 : Invert. gearbox nMotorSpeedAct_v
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01069

Parameter Name: C01069 L_DFSET: Ramp settings		Data type: UNSIGNED_16 Index: 23506 _d = 5BD2 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
1	Incr./ms	32767
Subcodes	Lenze setting	Info
C01069/1	10 incr./ms	L_DFSET_1 : Ramp SpeedTrim
C01069/2	100 incr./ms	L_DFSET_1 : Ramp angle compensation
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01070

Parameter Name: C01070 L_DFSET: Angular trimming		Data type: INTEGER_32 Index: 23505 _d = 5BD1 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-134217728	Incr.	134217728
Subcodes	Lenze setting	Info
C01070/1	0 incr.	L_DFSET_1 : Speed-dependent angle adjustment
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01071

Parameter Name: C01071 L_DFSET: Following error limit		Data type: UNSIGNED_32 Index: 23504 _d = 5BD0 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
10	Incr.	2147483647
Subcodes	Lenze setting	Info
C01071/1	32768 incr.	L_DFSET_1 : Following error limit
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01072

Parameter Name: C01072 L_DFSET: Multiplier - angular trimming		Data type: INTEGER_16 Index: 23503 _d = 5BCF _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-20000		20000
Subcodes	Lenze setting	Info
C01072/1	1	L_DFSET 1 : Multiplier - angular trimming
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01073

Parameter Name: C01073 L_DFSET: Evaluation - setpoint angle integrator		Data type: UNSIGNED_8 Index: 23502 _d = 5BCF _h
From version 02.00.00		
Selection list		
0	Evaluation with gearbox factor	
1	Evaluation without gearbox factor	
Subcodes	Lenze setting	Info
C01073/1	0: Evaluation with gearbox factor	L_DFSET 1 : Evaluation - setpoint angle integrator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01074

Parameter Name: C01074 L_DFSET: Zero pulse divider		Data type: UNSIGNED_16 Index: 23501 _d = 5BCD _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0		16384
Subcodes	Lenze setting	Info
C01074/1	0	L_DFSET 1 : Divider for actual value zero pulse
C01074/2	0	L_DFSET 1 : Divider for setpoint zero pulse
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01075

Parameter Name: C01075 L_DFSET: Synchronisation mode		Data type: UNSIGNED_8 Index: 23500 _d = 5BCF _h
From version 02.00.00		
Selection list		
0	Inactive	
1	Permanent sync. without enable (bZeroPulse)	
2	Permanent sync. with enable (bZeroPulse)	
10	1x sync. - Angular diff. shortest path setpoint	
11	1x Sync. - Angular diff. Cw	
12	1x Sync. - Angular diff. Ccw	
13	1x Sync. - Angular diff. shortest path act. value	
Subcodes	Lenze setting	Info
C01075/1	0: Inactive	L_DFSET 1 : Synchronisation mode
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01076

Parameter Name: C01076 L_DFRFG: Times		Data type: UNSIGNED_32 Index: 23499 _d = 5BCB _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0.000	s	999.900
Subcodes	Lenze setting	Info
C01076/1	1.000 s	L_DFRFG_1 : Acceleration and deceleration time
C01076/2	0.000 s	L_DFRFG_1 : Deceleration time for quick stop
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01077

Parameter Name: C01077 L_DFRFG: Max. speed-up		Data type: INTEGER_16 Index: 23498 _d = 5BCA _h
From version 02.00.00		
Setting range (min. value unit max. value)		
1	rpm	15000
Subcodes	Lenze setting	Info
C01077/1	3000 rpm	L_DFRFG_1 : Max. speed-up
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01078

Parameter Name: C01078 L_DFRFG: Following error		Data type: UNSIGNED_32 Index: 23497 _d = 5BC9 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
10	Incr.	2000000000
Subcodes	Lenze setting	Info
C01078/1	2000000000 incr.	L_DFRFG_1 : Following error limit
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01079

Parameter Name: C01079 L_DFRFG: Synchronisation window		Data type: UNSIGNED_16 Index: 23496 _d = 5BC8 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0	Incr.	65535
Subcodes	Lenze setting	Info
C01079/1	100 incr.	L_DFRFG_1 : Synchronisation window (position)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01080

Parameter Name: C01080 L_DFRFG: Offset		Data type: INTEGER_32 Index: 23495 _d = 5BC7 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-2147483647	Incr.	2147483647
Subcodes	Lenze setting	Info
C01080/1	0 incr.	L_DFRFG_1 : Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01081

Parameter Name: C01081 L_DFRFG: Sync. direction / TP function		Data type: UNSIGNED_8 Index: 23494 _d = 5BC6 _h
From version 02.00.00		
Selection list		
1	cw/ccw - without TP	
2	cw - without TP	
3	ccw - without TP	
4	cw/ccw - with TP	
5	cw - with TP	
6	ccw - with TP	
Subcodes	Lenze setting	Info
C01081/1	1: cw/ccw - without TP	L_DFRFG_1 : Sync. direction / TP function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01082

Parameter Name: C01082 LS_WriteParamList: Execute Mode		Data type: UNSIGNED_8 Index: 23493 _d = 5BC5 _h
Parameter change-over : Selection of the activation method		
Selection list (Lenze setting printed in bold)		Info
0	by Execute	The writing of the parameter list is activated by a FALSE/TRUE edge at the <i>bExecute</i> input.
1	by Input Select	The writing of the parameter list is carried out if a change is made at the select inputs and if the controller is initialised.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01083

Parameter Name: C01083 LS_WriteParamList: Error status		Data type: UNSIGNED_16 Index: 23492 _d = 5BC4 _h
Parameter change-over : Error status:		
<ul style="list-style-type: none"> • 0 = no error • 33803 = Invalid data type (e.g. STRING) • 33804 = limit violation • 33806 = invalid code • 33813 = no element of the selection list • 33815 = writing of the parameter not permitted • 33816 = writing of the parameter only permitted if controller is inhibited • 33829 = invalid subcode • 33865 = no parameter with subcodes 		
Display range (min. value unit max. value)		
0		34000
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01084

Parameter Name: C01084 LS_WriteParamList: Error line		Data type: UNSIGNED_8 Index: 23491 _d = 5BC3 _h
Parameter change-over : Display of the number of list entry where the error occurred (in connection with the value set selected via <i>bSelectWriteValue_1</i> and <i>bSelectWriteValue_2</i>).		
Display range (min. value unit max. value)		
0		32
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01085

Parameter Name: C01085 LS_WriteParamList: Index		Data type: INTEGER_32 Index: 23490 _d = 5BC2 _h
Parameter change-over : Parameter for entry 1 ... 32		
Setting range (min. value unit max. value)		
0.000		16000.000
Subcodes	Lenze setting	Info
C01085/1	0.000	Parameter for entries 1 ... 32
C01085/...		• Format: <code number>.<subcode number>
C01085/32		• Examples: "12.000" = C00012; "26.001" = C00026/1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01086

Parameter Name: C01086 LS_WriteParamList: WriteValue_1		Data type: INTEGER_32 Index: 23489 _d = 5BC1 _h
Parameter change-over : Parameter values - value set 1		
Setting range (min. value unit max. value)		
-2147483647		2147483647
Subcodes	Lenze setting	Info
C01086/1	0	Parameter values - value set 1
C01086/...		• Parameter values for the parameters defined in C01085/1 ... 32 .
C01086/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01087

Parameter Name: C01087 LS_WriteParamList: WriteValue_2		Data type: INTEGER_32 Index: 23488 _d = 5BC0 _h
Parameter change-over : Parameter values - value set 2		
Setting range (min. value unit max. value)		
-2147483647		2147483647
Subcodes	Lenze setting	Info
C01087/1	0	Parameter values - value set 2
C01087/...		• Parameter values for the parameters defined in C01085/1 ... 32 .
C01087/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01088

Parameter Name: C01088 LS_WriteParamList: WriteValue_3		Data type: INTEGER_32 Index: 23487 _d = 5BBF _h
Parameter change-over : Parameter values - value set 3		
Setting range (min. value unit max. value)		
-2147483647		2147483647
Subcodes	Lenze setting	Info
C01088/1	0	Parameter values - value set 3
C01088/...		• Parameter values for the parameters defined in C01085/1 ... 32 .
C01088/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01089

Parameter Name: C01089 LS_WriteParamList: WriteValue_4		Data type: INTEGER_32 Index: 23486 _d = 5BBE _h
Parameter change-over : Parameter values - value set 4		
Setting range (min. value unit max. value)		
-2147483647		2147483647
Subcodes	Lenze setting	Info
C01089/1	0	Parameter values - value set 4 • Parameter values for the parameters defined in C01085/1 ... 32 .
C01089/...		
C01089/32		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01090

Parameter Name: C01090 LS_ParReadWrite 1-6: Index		Data type: INTEGER_32 Index: 23485 _d = 5BBD _h
Parameter to be read or written.		
<ul style="list-style-type: none"> • Format: <code number>,<subcode number> • For a setting of "0,000", inputs <i>wParIndex</i> and <i>wParSubindex</i> are effective for addressing purposes instead. 		
Setting range (min. value unit max. value)		
0.000		16000.000
Subcodes	Lenze setting	Info
C01090/1	0.000	LS_ParReadWrite 1 : Index
C01090/2	0.000	LS_ParReadWrite 2 : Index
C01090/3	0.000	LS_ParReadWrite 3 : Index
C01090/4	0.000	LS_ParReadWrite 4 : Index
C01090/5	0.000	LS_ParReadWrite 5 : Index
C01090/6	0.000	LS_ParReadWrite 6 : Index
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01091

Parameter Name: C01091 LS_ParReadWrite 1-6: Cycle time		Data type: UNSIGNED_16 Index: 23484 _d = 5BBC _h
Time interval for cyclic reading/writing		
Selection list		
0	0 (by Execute)	
20	20 ms	
50	50 ms	
100	100 ms	
200	200 ms	
500	500 ms	
1000	1 s	
2000	2 s	
5000	5 s	
10000	10 s	
Subcodes	Lenze setting	Info
C01091/1	0: 0 (by Execute)	LS_ParReadWrite 1 : Cycle time
C01091/2	0: 0 (by Execute)	LS_ParReadWrite 2 : Cycle time
C01091/3	0: 0 (by Execute)	LS_ParReadWrite 3 : Cycle time
C01091/4	0: 0 (by Execute)	LS_ParReadWrite 4 : Cycle time
C01091/5	0: 0 (by Execute)	LS_ParReadWrite 5 : Cycle time
C01091/6	0: 0 (by Execute)	LS_ParReadWrite 6 : Cycle time
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01092

Parameter Name: C01092 LS_ParReadWrite 1-6: FailState		Data type: UNSIGNED_16 Index: 23483 _d = 5BBB _h
Error status:		
<ul style="list-style-type: none"> • 0 = no error • 33803 = Invalid data type (e.g. STRING) • 33804 = limit violation • 33806 = invalid code • 33813 = no element of the selection list • 33815 = writing of the parameter not permitted • 33816 = writing of the parameter only permitted if controller is inhibited • 33829 = invalid subcode • 33865 = no parameter with subcodes 		
Display range (min. value unit max. value)		
0		34000
Subcodes	Info	
C01092/1	LS_ParReadWrite 1 : Error status	
C01092/2	LS_ParReadWrite 2 : Error status	
C01092/3	LS_ParReadWrite 3 : Error status	
C01092/4	LS_ParReadWrite 4 : Error status	
C01092/5	LS_ParReadWrite 5 : Error status	
C01092/6	LS_ParReadWrite 6 : Error status	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01093

Parameter Name: C01093 - LS_ParReadWrite 1-6: Arithmetic mode		Data type: UNSIGNED_8 Index: 23482 _d = 5BB _{Ah}
The integrated arithmetic function allows for easy arithmetic conversion of the process value to be written or which was read into the format of the target parameter via parameterisable factors and without the need for an additional arithmetic FB.		
Selection list		
	0	No arithmetic
	1	In16Bit: LW=+/-32767
	2	In16Bit: HW=+/-; LW=0.65535
	3	In32Bit: HW_LW=+/-2147483647
Subcodes	Lenze setting	Info
C01093/1	0: no arithmetic	LS_ParReadWrite 1 : Arithmetic mode
C01093/2	0: no arithmetic	LS_ParReadWrite 2 : Arithmetic mode
C01093/3	0: no arithmetic	LS_ParReadWrite 3 : Arithmetic mode
C01093/4	0: no arithmetic	LS_ParReadWrite 4 : Arithmetic mode
C01093/5	0: no arithmetic	LS_ParReadWrite 5 : Arithmetic mode
C01093/6	0: no arithmetic	LS_ParReadWrite 6 : Arithmetic mode
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01094

Parameter Name: C01094 - LS_ParReadWrite 1-6: Numerator		Data type: INTEGER_16 Index: 23481 _d = 5BB _{9h}
Arithmetic function : Factor (numerator) for internal conversion in arithmetic modes 1 ... 3.		
Setting range (min. value unit max. value)		
	-32767	32767
Subcodes	Lenze setting	Info
C01094/1	1	LS_ParReadWrite 1 : Numerator
C01094/2	1	LS_ParReadWrite 2 : Numerator
C01094/3	1	LS_ParReadWrite 3 : Numerator
C01094/4	1	LS_ParReadWrite 4 : Numerator
C01094/5	1	LS_ParReadWrite 5 : Numerator
C01094/6	1	LS_ParReadWrite 6 : Numerator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01095

Parameter Name: C01095 - LS_ParReadWrite 1-6: Denominator		Data type: INTEGER_16 Index: 23480 _d = 5BB _{8h}
Arithmetic function : Factor (denominator) for internal conversion in arithmetic modes 1 ... 3.		
Setting range (min. value unit max. value)		
	1	32767
Subcodes	Lenze setting	Info
C01095/1	1	LS_ParReadWrite 1 : Denominator
C01095/2	1	LS_ParReadWrite 2 : Denominator
C01095/3	1	LS_ParReadWrite 3 : Denominator
C01095/4	1	LS_ParReadWrite 4 : Denominator
C01095/5	1	LS_ParReadWrite 5 : Denominator
C01095/6	1	LS_ParReadWrite 6 : Denominator
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01100

Parameter Name: C01100 Function L_Counter 1-3		Data type: UNSIGNED_8 Index: 23475 _d = 5BB3 _h
Selection of reset function		
Selection list		
0	Normal counting	
1	Auto reset	
2	Manual reset	
Subcodes	Lenze setting	Info
C01100/1	0: Normal counting	L_Counter 1 : Function
C01100/2	0: Normal counting	L_Counter 2 : Function
C01100/3	0: Normal counting	L_Counter 3 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01101

Parameter Name: C01101 Comparison L_Counter 1-3		Data type: UNSIGNED_8 Index: 23474 _d = 5BB2 _h
Selection of comparison operation		
Selection list		
0	Greater than or equal to	
1	Less than or equal to	
2	equal to	
Subcodes	Lenze setting	Info
C01101/1	0: Greater than or equal to	L_Counter 1 : Comparison
C01101/2	0: Greater than or equal to	L_Counter 2 : Comparison
C01101/3	0: Greater than or equal to	L_Counter 3 : Comparison
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01110

Parameter Name: C01110 LS_MultiEncoder: Solid measure		Data type: UNSIGNED_8 Index: 23465 _d = 5BA9 _h
From version 02.00.00		
▶ Encoder/feedback system: SSI encoder		
Selection list (Lenze setting printed in bold)		
0	rotatively unipolar	
1	linearly unipolar	
2	rotatively bipolar	
3	linearly bipolar	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01111

Parameter Name: C01111 SSI: Encoder constant		Data type: INTEGER_32 Index: 23464 _d = 5BA8 _h
From version 02.00.00		
▶ Encoder/feedback system: SSI encoder		
Setting range (min. value unit max. value)		
1		2147483647
Subcodes	Lenze setting	Info
C01111/1	1	LS_MultiEncoder : Difference - traverse path
C01111/2	1	LS_MultiEncoder : Difference - encoder value
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01112

Parameter Name: C01112 LS_MultiEncoder: PosValues		Data type: INTEGER_32 Index: 23463 _d = 5BA7 _h
Setting range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Lenze setting	Info
C01112/1	0.0000 units	LS_MultiEncoder : Position offset
C01112/2	-214748.3647 units	LS_MultiEncoder : Data area min
C01112/3	214748.3647 units	LS_MultiEncoder : Data area max
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01119

Parameter Name: C01119 LS_MultiEncoder: Current position		Data type: INTEGER_32 Index: 23456 _d = 5BA0 _h
From version 02.00.00		
▶ Encoder/feedback system: Multi-Encoder		
Display range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Lenze setting	Info
C01119/1		LS_MultiEncoder : Current position
C01119/2		LS_MultiEncoder : Maximum travel distance
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01120

Parameter Name: C01120 Sync signal source		Data type: UNSIGNED_8 Index: 23455 _d = 5B9F _h
Selection of the signal source for device synchronisation		
<ul style="list-style-type: none"> Basically, only one source is allowed to synchronise the drive. 		
▶ Synchronisation of the internal time base		
Selection list (Lenze setting printed in bold)		Info
0	Off	Synchronisation off
1	CAN on board	Synchronisation via CAN bus ▶ Sync telegram
2	AxisBusIO	Synchronisation via axis bus ▶ Axis bus
4	MCI	Synchronisation via MCI (communication module)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01121

Parameter Name: C01121 Sync cycle time setpoint		Data type: UNSIGNED_16 Index: 23454 _d = 5B9E _h
Cycle time setpoint for device synchronisation		
<ul style="list-style-type: none"> Time at which the phase-locking loop (PLL) in the controller expects the synchronisation signals to arrive. The cycle time setpoint must be set according to the cycle of the respective synchronisation source. 		
Note:		
<ul style="list-style-type: none"> Only integer multiples of 1000 µs can be set. Intelligent communication modules usually define the cycle time setpoint derived from the bus cycle. In this case, a manual change is not possible. 		
Example: For the CAN bus, a distance of 2 ms has been set between two synchronisation signals. If the CAN bus is to be used as synchronisation source, a synchronisation cycle of 2000 µs must be set in C01121.		
▶ Synchronisation of the internal time base		
Setting range (min. value unit max. value)		Lenze setting
1000	µs	20000 1000 µs
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01122

Parameter | Name: **C01122 | Sync phase position** Data type: UNSIGNED_16
Index: 23453_d = 5B9D_h

Phase position for device synchronisation

- The phase position determines the zero-time of the internal system cycle with regard to the synchronisation signal (bus cycle). Since PDO processing is an inherent part of the system part of the application, the instant of acceptance of the PDOs is postponed as well by a changed phase position.
- With a setting = 0, the system cycle starts simultaneously with the synchronisation signal.
- With a setting > 0, the internal system cycle starts earlier by the set time with regard to the synchronisation signal (the phase position acts negatively).
- Intelligent communication modules define the optimal time with activated synchronisation by themselves. In this case, a manual change is not possible.
- The decisive factor for defining C01122 is the time where all nodes are provided with valid PDOs.

Example: If the phase position is set to 550 µs, the system part of the application starts 550 µs before the arrival of the synchronisation signal.

▶ [Synchronisation of the internal time base](#)

Setting range (min. value unit max. value)			Lenze setting
0	µs	1000	0 µs
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C01123

Parameter | Name: **C01123 | Sync window** Data type: UNSIGNED_16
Index: 23452_d = 5B9C_h

Time slot for monitoring the synchronisation signal or the phase position

- The synchronisation signal or the current phase position must be within this time slot around the corresponding expected value ([C01122](#)).
- With the setting "1000 µs" there will be no monitoring.

▶ [Synchronisation of the internal time base](#)

Setting range (min. value unit max. value)			Lenze setting
0	µs	10000	100 µs
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1			

C01124

Parameter | Name: **C01124 | Sync correction width** Data type: UNSIGNED_8
Index: 23451_d = 5B9B_h

Correction increment for device synchronisation

- If the cycle times of the synchronisation signal differs and phase-locked loop (PLL) differ from each other, this setting defines the measure the phase-locking loop is reset with.
- If synchronisation is not reached, select a higher correction constant.
- The optimum setting depends on quartz precision and must be determined empirically if required.

▶ [Synchronisation of the internal time base](#)

Selection list (Lenze setting printed in bold)	
1	80ns
2	160ns
3	240ns
4	320ns
5	400ns
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1	

C01130

Parameter Name: C01130 LS_RetainData: Selection		Data type: UNSIGNED_16 Index: 23445 _d = 5B95 _h
From version 02.00.00		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	wIn1	
Bit 1 <input type="checkbox"/>	wIn2	
Bit 2 <input type="checkbox"/>	wIn3	
Bit 3 <input type="checkbox"/>	wIn4	
Bit 4 <input type="checkbox"/>	dnIn1	
Bit 5 <input type="checkbox"/>	dnIn2	
Bit 6 <input type="checkbox"/>	dnIn3	
Bit 7 <input type="checkbox"/>	dnIn4	
Bit 8 <input type="checkbox"/>	bln1	
Bit 9 <input type="checkbox"/>	bln2	
Bit 10 <input type="checkbox"/>	bln3	
Bit 11 <input type="checkbox"/>	bln4	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Reserved	
Subcodes	Lenze setting	Info
C01130/1	0	LS_RetainData: Selection bSetRetain_1
C01130/2	0	LS_RetainData: Selection bSetRetain_2
C01130/3	0	LS_RetainData: Selection bSetRetain_3
C01130/4	0	LS_RetainData: Selection bLoadParams
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C01131

Parameter Name: C01131 LS_RetainData: 16Bit data		Data type: UNSIGNED_16 Index: 23444 _d = 5B94 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
0		65535
Subcodes	Lenze setting	Info
C01131/1	0	LS_RetainData: wValue1
C01131/2	0	LS_RetainData: wValue2
C01131/3	0	LS_RetainData: wValue3
C01131/4	0	LS_RetainData: wValue4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01132

Parameter Name: C01132 LS_RetainData: 32Bit data		Data type: INTEGER_32 Index: 23443 _d = 5B93 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-2147483647		2147483647
Subcodes	Lenze setting	Info
C01132/1	0	LS_RetainData : dnValue1
C01132/2	0	LS_RetainData : dnValue2
C01132/3	0	LS_RetainData : dnValue3
C01132/4	0	LS_RetainData : dnValue4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01133

Parameter Name: C01133 LS_RetainData: Bool data		Data type: UNSIGNED_8 Index: 23442 _d = 5B92 _h
From version 02.00.00		
Selection list		
0	False	
1	True	
Subcodes	Lenze setting	Info
C01133/1	0: FALSE	LS_RetainData : bValue1
C01133/2	0: FALSE	LS_RetainData : bValue2
C01133/3	0: FALSE	LS_RetainData : bValue3
C01133/4	0: FALSE	LS_RetainData : bValue4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01138

Parameter Name: C01138 L_Transient 1-4: Function		Data type: UNSIGNED_8 Index: 23437 _d = 5B8D _h
Selection of edge evaluation		
Selection list		
0	High edge	
1	Low edge	
2	High and low edge	
Subcodes	Lenze setting	Info
C01138/1	0: High edge	L_Transient 1 : Function
C01138/2	0: High edge	L_Transient 2 : Function
C01138/3	0: High edge	L_Transient 3 : Function
C01138/4	0: High edge	L_Transient 4 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01139

Parameter Name: C01139 L_Transient 1-4: Pulse duration		Data type: UNSIGNED_16 Index: 23436 _d = 5B8C _h
Setting range (min. value unit max. value)		
0.000	s	60.000
Subcodes	Lenze setting	Info
C01139/1	0.000 s	L_Transient 1 : Pulse duration
C01139/2	0.000 s	L_Transient 2 : Pulse duration
C01139/3	0.000 s	L_Transient 3 : Pulse duration
C01139/4	0.000 s	L_Transient 4 : Pulse duration
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01140

Parameter Name: C01140 L_Transient 5-8: Function		Data type: UNSIGNED_8 Index: 23435 _d = 5B8B _h
Selection of edge evaluation		
Selection list		
0	High edge	
1	Low edge	
2	High and low edge	
Subcodes	Lenze setting	Info
C01140/1	0: High edge	L_Transient 5 : Function
C01140/2	0: High edge	L_Transient 6 : Function
C01140/3	0: High edge	L_Transient 7 : Function
C01140/4	0: High edge	L_Transient 8 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01141

Parameter Name: C01141 L_Transient 5-8 pulse duration		Data type: UNSIGNED_16 Index: 23434 _d = 5B8A _h
Setting range (min. value unit max. value)		
0.000	s	60.000
Subcodes	Lenze setting	Info
C01141/1	0.000 s	L_Transient 5 : Pulse duration
C01141/2	0.000 s	L_Transient 6 : Pulse duration
C01141/3	0.000 s	L_Transient 7 : Pulse duration
C01141/4	0.000 s	L_Transient 8 : Pulse duration
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01150

Parameter Name: C01150 L_PhaseIntK: Function		Data type: UNSIGNED_8 Index: 23425 _d = 5B81 _h
Loading behaviour of the integrator		
Selection list		Info
0	Loading with level	Load integrator with TRUE level at the input <i>bLoad</i>
1	Loading with edge	Load integrator with FALSE/TRUE edge at the input <i>bLoad</i>
2	Loading with level + reset	Load integrator when the comparison value (C01151) is reached or with TRUE level at the <i>bLoad</i> input
Subcodes	Lenze setting	Info
C01150/1	0: Loading with level	L_PhaseIntK_1 : Function
C01150/2	0: Loading with level	L_PhaseIntK_2 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01151

Parameter Name: C01151 L_PhaseIntK: Compare		Data type: INTEGER_32 Index: 23424 _d = 5B80 _h
Comparison value		
Setting range (min. value unit max. value)		
0		2147418112
Subcodes	Lenze setting	Info
C01151/1	0	L_PhaseIntK_1 : Comparison value
C01151/2	0	L_PhaseIntK_2 : Comparison value
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01190

Parameter Name: C01190 Motor thermal sensor		Data type: UNSIGNED_8 Index: 23385 _d = 5B59 _h
Selection of the thermal sensor for monitoring the motor temperature		
<p style="text-align: right;">▶ Encoder/feedback system: Motor temperature monitoring (KTY)</p>		
Selection list		Info
0	KTY83-110	Lenze standard KTY83-110 (MDSKX, MCS06)
1	Spec. characteristic	Characteristic defined via C01191 and C01192
2	KTY83-110 + 2 x PTC	Lenze standard KTY83-110 + 2 x PTC 150°C (MCS09-MCS19)
4	KTY84-130	Lenze standard KTY83-130
Subcodes	Lenze setting	Info
C01190/1	0: KTY83-110	Type of motor temperature sensor resolver
C01190/2	0: KTY83-110	Type of motor temperature sensor MultiEncoder
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01191

Parameter Name: C01191 PTC characteristic: Temperature 1/2		Data type: UNSIGNED_8 Index: 23384 _d = 5B58 _h
The spec. thermal sensor characteristic is selected through the setting C01190 ="1" ▶ Encoder/feedback system: Motor temperature monitoring (KTY)		
Setting range (min. value unit max. value)		
0	°C	255
Subcodes	Lenze setting	Info
C01191/1	100 °C	PTC characteristic: Temperature 1
C01191/2	150 °C	PTC characteristic: Temperature 2
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01192

Parameter Name: C01192 PTC characteristic: Resistance 1/2		Data type: INTEGER_32 Index: 23383 _d = 5B57 _h
The spec. thermal sensor characteristic is selected through the setting C01190 ="1" ▶ Encoder/feedback system: Motor temperature monitoring (KTY)		
Setting range (min. value unit max. value)		
0	Ohm	30000
Subcodes	Lenze setting	Info
C01192/1	1070 Ohms	PTC characteristic: Resistance 1
C01192/2	2225 Ohms	PTC characteristic: Resistance 2
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01193

Parameter Name: C01193 Feedback system motor temperature		Data type: UNSIGNED_8 Index: 23382 _d = 5B56 _h
Selection of the feedback system for monitoring the motor temperature ▶ Encoder/feedback system: Motor temperature monitoring (KTY)		
Selection list (Lenze setting printed in bold)		
0	Speed feedback	
1	Resolver input	
2	Encoder input	
5	Res. and enc. parallel	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01201

Parameter Name: C01201 MCK: Cycle		Data type: INTEGER_32 Index: 23374 _d = 5B4E _h
Cycle for Modulo measuring system • When the cycle is set to 0 units (Lenze setting), the traversing range is unlimited (classical measuring system). ▶ Activation of the Modulo measuring system		
Setting range (min. value unit max. value)		
0.0000	units	214748.3647
Subcodes	Lenze setting	Info
C01201/1	0.0000 units	MCK: Cycle
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01202

Parameter | Name: **C01202 | MCK: iM motor/process** Data type: UNSIGNED_16
Index: 23373_d = 5B4D_h

Gearbox factor - motor

- Entry of the gearbox factor as numerator/denominator ratio (numerator = motor speed and denominator = output speed of gearbox) or from the number of teeth of the gearbox arrangement.

▶ [Machine parameter](#)

Setting range (min. value unit max. value)		
1		65535
Subcodes	Lenze setting	Info
C01202/1	1	MCK: iM: Numerator gearbox factor Z2
C01202/2	1	MCK: iM: Denominator gearbox factor Z1
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01203

Parameter | Name: **C01203 | MCK: iG motor/position encoder** Data type: UNSIGNED_16
Index: 23372_d = 5B4C_h

Gearbox factor - position encoder

- Entry of the gearbox factor as numerator/denominator ratio, with numerator = motor speed and denominator = position encoder speed.

▶ [Machine parameter](#)

Setting range (min. value unit max. value)		
1		65535
Subcodes	Lenze setting	Info
C01203/1	1	MCK: iG: Numerator (motor speed)
C01203/2	1	MCK: iG: Denominator (encoder speed)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01204

Parameter | Name: **C01204 | MCK: Feed constant** Data type: INTEGER_32
Index: 23371_d = 5B4B_h

The feed constant corresponds to the machine movement for one revolution of the gearbox output shaft.

- The value is entered in application units referred to one revolution.

▶ [Machine parameter](#)

Setting range (min. value unit max. value)			Lenze setting
0.0001	units/rev.	214748.3647	360.0000 units/rev.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000			

C01205

Parameter | Name: **C01205 | MCK: Position resolution** Data type: INTEGER_32
Index: 23370_d = 5B4A_h

Display of the number of increments corresponding to one unit.

- 1 motor revolution ≙ 65536 increments

▶ [Machine parameter](#)

Display range (min. value unit max. value)		
0.0000	Incr./unit	214748.3647
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01206

Parameter Name: C01206 MCK: Mounting direction		Data type: UNSIGNED_8 Index: 23369 _d = 5B49 _h
Inversion for mirrored motor and encoder mounting		
▶ Machine parameter		
Selection list		
0	not inverted	
1	inverted	
Subcodes	Lenze setting	Info
C01206/1	0: Not inverted	Motor mounting direction <ul style="list-style-type: none"> Setting for motor mounting turned by 180°.
C01206/2	0: Not inverted	Position encoder mounting direction <ul style="list-style-type: none"> Setting for position encoder system mounting turned by 180°.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01210

Parameter Name: C01210 MCK: Current positions		Data type: INTEGER_32 Index: 23365 _d = 5B45 _h
Display of current position data of the Motion Control Kernel		
Display range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Info	
C01210/1	MCK: Feed <ul style="list-style-type: none"> Display of the current feed for positioning profiles as a relative distance. 	
C01210/2	MCK: Set position <ul style="list-style-type: none"> Display of the current setpoint position calculated by the MCK. 	
C01210/3	MCK: Actual position <ul style="list-style-type: none"> Display of the current actual position calculated by an optional encoder system. 	
C01210/4	MCK: Following error <ul style="list-style-type: none"> Display of the current following error as a difference between setpoint position and actual position. 	
C01210/5	MCK: Positioning accuracy <ul style="list-style-type: none"> Display of the current positioning accuracy referred to the actual number of increments of the position encoder. 	
C01210/6	MCK: Target position	
C01210/7	MCK: Modulo position	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01211

Parameter Name: C01211 MCK: Speed		Data type: INTEGER_32 Index: 23364 _d = 5B44 _h
Display of the current speed data		
Display range (min. value unit max. value)		
-214748.3647	units/s	214748.3647
Subcodes	Info	
C01211/1	MCK: Max. traversing speed 100%_C11 <ul style="list-style-type: none"> Display of the maximum traversing speed based on the reference speed set in C00011. 	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01213

Parameter Name: C01213 MCK: Max. traversing distance		Data type: INTEGER_32 Index: 23362 _d = 5B42 _h
Display of current position limits		
Display range (min. value unit max. value)		
-2147480000	units	2147480000
Subcodes		Info
C01213/1		MCK: Max. traversing distance • Display of the maximum distance to be traversed referred to the 32-bit display area (max. 2147483647 increments).
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01215

Parameter Name: C01215 MCK: Following error		Data type: INTEGER_32 Index: 23360 _d = 5B40 _h
Limits for following error monitoring system		
▶ Following error monitoring system		
Setting range (min. value unit max. value)		
0.0000	units	214748.0000
Subcodes		Info
C01215/1	0.0000 units	MCK: Following error limit 1 • First limit of the maximum following error for monitoring and response activation.
C01215/2	0.0000 units	MCK: Following error limit 2 • Second limit of the maximum following error for monitoring and response activation.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01216

Parameter Name: C01216 MCK: Positioning setting		Data type: UNSIGNED_8 Index: 23359 _d = 5B3F _h
▶ Positioning		
Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF 0x01 (decimal: 1)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input checked="" type="checkbox"/>	PosAbort at Poslnit	
Bit 1 <input type="checkbox"/>	PosExecute active at Poslnit	
Bit 2 <input type="checkbox"/>	Reserved	
Bit 3 <input type="checkbox"/>	Reserved	
Bit 4 <input type="checkbox"/>	ProfilStart at Poslnit	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C01218

Parameter | Name: **C01218 | PosFollower: Setting** Data type: UNSIGNED_8
Index: 23357_d = 5B3D_h

Settings for "Position follower" mode

[▶ Position follower](#)

Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF 0x0C (decimal: 12)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	Speed FF control.: nSpeedSetValue_a	"1" ≙ speed feedforward control value comes from main setpoint <i>nSpeedSetValue_a</i>
Bit 1 <input type="checkbox"/>	Speed FF control: nSpeedAddValue_v	"1" ≙ speed feedforward control value comes from additive speed value <i>nSpeedAddValue_v</i>
Bit 2 <input checked="" type="checkbox"/>	HW limit switch on	"1" ≙ Travel range monitoring via hardware limit switch is active. The error response can be parameterised in C00595/1 and C00595/2 .
Bit 3 <input checked="" type="checkbox"/>	SW limit switch on	"1" ≙ Travel range monitoring via parameterised software limit positions is active. The error response can be parameterised in C00595/3 and C00595/4 .
Bit 4 <input type="checkbox"/>	Reserved	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C01219

Parameter | Name: **C01219 | MCK: Speed follower setting** Data type: UNSIGNED_8
Index: 23356_d = 5B3C_h

Settings for "Speed follower" mode

[▶ Speed follower](#)

Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF 0x0C (decimal: 12)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	Reserved	
Bit 1 <input type="checkbox"/>	Reserved	
Bit 2 <input checked="" type="checkbox"/>	HW limit switch on	"1" ≙ Travel range monitoring via hardware limit switch is active. The error response can be parameterised in C00595/1 and C00595/2 .
Bit 3 <input checked="" type="checkbox"/>	SW limit switch on	"1" ≙ Travel range monitoring via parameterised software limit positions is active. The error response can be parameterised in C00595/3 and C00595/4 .
Bit 4 <input type="checkbox"/>	Reserved	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Position controller off	"1" ≙ Position controller is deactivated. Thus, the compensation of the following error is switched off.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C01221

Parameter | Name: **C01221 | MCK: Ref. mode** Data type: UNSIGNED_8
Index: 23354_d = 5B3A_h

Selection of the homing mode.

[▶ Homing](#)

Selection list (Lenze setting printed in bold)		Info
6	>_Rn_>_TP	Positive direction - via home mark (neg. edge) - continuing in positive direction - to TP
7	<_Rn_<_TP	Negative direction - via home mark (neg. edge) - continuing in negative direction - to TP
8	>_TP	Positive direction - to TP
9	<_TP	Negative direction - to TP
10	>_Lp_<_TP	Positive direction - reversing on pos. limit switch - to TP
11	<_Ln_>_TP	Negative direction - reversing on neg. limit switch - to TP
12	>_Lp	Positive direction - to pos. limit switch
13	<_Ln	Negative direction - to neg. limit switch
14	>_Mlim	Positive direction towards torque limit (C01222)
15	<_Mlim	Negative direction towards torque limit (C01222)
100	SetRef	Direct acceptance and setting of the home position <ul style="list-style-type: none"> The measuring system is set based on the home position parameterised in C01227/2 when the drive is at standstill.

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01222

Parameter | Name: **C01222 | MCK: Ref. M limit mode 14/15** Data type: INTEGER_16
Index: 23353_d = 5B39_h

Torque limit for homing modes 14 and 15 (homing towards positive stop)

- 100 % ≡ maximum torque ([C00057](#))

[▶ Homing](#)

Setting range (min. value unit max. value)			Lenze setting
0.00	%	199.99	10.00 %

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C01223

Parameter | Name: **C01223 | MCK: Ref. waiting time mode 14/15** Data type: UNSIGNED_16
Index: 23352_d = 5B38_h

Blocking time for homing modes 14 and 15 (homing towards positive stop)

- The reference is set if an excess of the torque limit set in [C01222](#) has been detected over a time period defined here.

[▶ Homing](#)

Setting range (min. value unit max. value)			Lenze setting
0	ms	65000	100 ms

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01224

Parameter Name: C01224 MCK: Ref. speeds		Data type: INTEGER_32 Index: 23351 _d = 5B37 _h
Speeds for reference search/homing		
▶ Homing		
Setting range (min. value unit max. value)		
0.0000	unit/s	214748.3647
Subcodes	Lenze setting	Info
C01224/1	720.0000 unit/s	MCK: Ref. initial speed • Starting speed for approaching the pre-stop signals.
C01224/2	180.0000 unit/s	MCK: Ref. search speed • Search speed for detecting the reference initiator.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01225

Parameter Name: C01225 MCK: Ref. accelerations		Data type: INTEGER_32 Index: 23350 _d = 5B36 _h
Accelerations for reference search/homing		
▶ Homing		
Setting range (min. value unit max. value)		
0.0000	unit/s ²	214748.3647
Subcodes	Lenze setting	Info
C01225/1	720.0000 unit/s ²	MCK: Ref. initial acceleration • Starting acceleration for the starting speed ramps.
C01225/2	720.0000 unit/s ²	MCK: Ref. search acceleration • Search acceleration for the search speed ramps.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01226

Parameter Name: C01226 MCK: Ref. S-ramp time		Data type: UNSIGNED_16 Index: 23349 _d = 5B35 _h
S-ramp time for reference search/homing		
<ul style="list-style-type: none"> Setting "0 s" ≡ no rounding 		
▶ Homing		
Setting range (min. value unit max. value)		
0.000	s	10.000
Subcodes	Lenze setting	Info
C01226/1	0.000 s	MCK: Ref. S-ramp time • S-ramp time for the starting and search speed ramps.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01227

Parameter | Name: **C01227 | MCK: Ref. positions** Data type: INTEGER_32
Index: 23348_d = 5B34_h

Positions for determining the zero position of the reference measuring system

[▶ Homing](#)

Setting range (min. value unit max. value)		
-214748.3647	unit	214748.3647
Subcodes	Lenze setting	Info
C01227/1	0.0000 unit	MCK: Ref. offset reference degree <ul style="list-style-type: none"> Relative traverse path by which the drive traverses after detection of the reference initiator.
C01227/2	0.0000 unit	MCK: Ref. home position <ul style="list-style-type: none"> Position with which setpoint and actual position are loaded after completion of homing.

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10000

C01228

Parameter | Name: **C01228 | MCK: Ref. sequence profile** Data type: UNSIGNED_8
Index: 23347_d = 5B33_h

Number of the sequence profile the absolute position of which will be approached after homing.

[▶ Homing](#)

Setting range (min. value unit max. value)	Lenze setting
0	15 0

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01229

Parameter | Name: **C01229 | MCK: Position limiting values** Data type: INTEGER_32
Index: 23346_d = 5B32_h

Software limit position for limiting the valid traversing range

- The error response to leaving the valid traversing range can be parameterised in [C00595/3](#) and [C00595/4](#).

Note:

For limiting the traversing range by means of software limit positions, the home position must be known and the positive software limit position must be higher than the negative software limit position!

[▶ Limit position monitoring](#)

Setting range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Lenze setting	Info
C01229/1	0.0000 units	MCK: Positive SW limit position (positive travel range limit)
C01229/2	0.0000 units	MCK: Negative SW limit position (negative travel range limit)

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10000

C01230

Parameter Name: C01230 Manual jog: Setting		Data type: UNSIGNED_8 Index: 23345 _d = 5B31 _h
Settings for "Manual jog" mode		
▶ Manual jog		
Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF
0x00 (decimal: 0)		
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	Breakpoints 1..4 on	"1" ≙ approach of the parameterised breakpoint in manual jog direction
Bit 1 <input type="checkbox"/>	Time-based start of 2nd speed	"1" ≙ Automatic change-over to second manual speed after the waiting time set in C01235/1 .
Bit 2 <input type="checkbox"/>	HW limit switch on	"1" ≙ Travel range monitoring via hardware limit switch is active. The error response can be parameterised in C00595/1 and C00595/2 .
Bit 3 <input type="checkbox"/>	SW limit switch on	"1" ≙ Travel range monitoring via parameterised software limit positions is active. The error response can be parameterised in C00595/3 and C00595/4 .
Bit 4 <input type="checkbox"/>	Reserved	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Position controller off	"1" ≙ Position controller is deactivated. Thus, the compensation of the following error is switched off.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C01231

Parameter Name: C01231 MCK: Manual jog speeds		Data type: INTEGER_32 Index: 23344 _d = 5B30 _h
Manual jog speeds		
▶ Manual jog		
Setting range (min. value unit max. value)		Lenze setting
-214748.3647	units/s	214748.3647
Subcodes	Lenze setting	Info
C01231/1	360.0000 units/s	Manual jog: speed 1 • Regular manual speed
C01231/2	720.0000 units/s	Manual jog: Speed 2 • Second manual speed (can be activated via MCK control word)
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01232

Parameter Name: C01232 MCK: Manual jog accelerations		Data type: INTEGER_32 Index: 23343 _d = 5B2F _h
Acceleration/deceleration for manual jog		
▶ Manual jog		
Setting range (min. value unit max. value)		Lenze setting
-214748.3647	units/s ²	214748.3647
Subcodes	Lenze setting	Info
C01232/1	720.0000 units/s ²	Manual jog: Acceleration • Acceleration for ramp-up to manual speed.
C01232/2	720.0000 units/s ²	Manual jog: Deceleration • Deceleration for manual speed ramp-down to standstill.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01233

Parameter Name: C01233 MCK: Manual jog S-ramp time		Data type: UNSIGNED_16 Index: 23342 _d = 5B2E _h
S-ramp time for manual jog		
<ul style="list-style-type: none"> Setting "0 s" ≡ no rounding 		
▶ Manual jog		
Setting range (min. value unit max. value)		
0.000	s	10.000
Subcodes	Lenze setting	Info
C01233/1	0.000 s	Manual jog: S-ramp time <ul style="list-style-type: none"> S-ramp time for the manual speed ramps.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01234

Parameter Name: C01234 MCK: Manual jog breakpoints		Data type: INTEGER_32 Index: 23341 _d = 5B2D _h
Breakpoint positions for manual jog		
<ul style="list-style-type: none"> The drive stops at the parameterised positions if these are located in the manual jog direction and the approaching of the breakpoints is switched on in C01230 via bit 0. 		
▶ Manual jog		
Setting range (min. value unit max. value)		
-214748.3647	unit	214748.3647
Subcodes	Lenze setting	Info
C01234/1	0.0000 unit	Manual jog: Breakpoint 1
C01234/2	0.0000 unit	Manual jog: Breakpoint 2
C01234/3	0.0000 unit	Manual jog: Breakpoint 3
C01234/4	0.0000 unit	Manual jog: Breakpoint 4
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01235

Parameter Name: C01235 MCK: Manual jog waiting times		Data type: UNSIGNED_16 Index: 23340 _d = 5B2C _h
Waiting times for manual jog		
▶ Manual jog		
Setting range (min. value unit max. value)		
0.000	s	65.000
Subcodes	Lenze setting	Info
C01235/1	5.000 s	Manual jog: Waiting time 2nd speed <ul style="list-style-type: none"> Time after which the first manual speed (C01231/1) is accelerated to the second manual speed (C01231/2).
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01236

Parameter Name: C01236 MCK: Speed follower		Data type: INTEGER_32 Index: 23339 _d = 5B2B _h
Speeds for position follower		
▶ Position follower		
Setting range (min. value unit max. value)		
-214748.3647	units/s	214748.3647
Subcodes	Lenze setting	Info
C01236/1	360.0000 units/s	PosFollower: Sync. speed <ul style="list-style-type: none"> Synchronisation speed for approaching the setpoint position of the master.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01237

Parameter Name: C01237 MCK: Acceleration follower		Data type: INTEGER_32 Index: 23338 _d = 5B2A _h
Accelerations for position follower		
▶ Position follower		
Setting range (min. value unit max. value)		
-214748.3647	units/s ²	214748.3647
Subcodes	Lenze setting	Info
C01237/1	720.0000 units/s ²	Pos follower: Sync. accel. • Acceleration for ramp-up to synchronisation speed.
C01237/2	720.0000 units/s ²	Pos follower: Sync. decel. • Deceleration for synchronisation speed ramp-down to standstill (to the setpoint position of the master).
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01238

Parameter Name: C01238 MCK: S-ramp time follower		Data type: UNSIGNED_16 Index: 23337 _d = 5B29 _h
S-ramp times for position follower		
<ul style="list-style-type: none"> Setting "0 s" ≡ no rounding 		
▶ Position follower		
Setting range (min. value unit max. value)		
0.000	s	10.000
Subcodes	Lenze setting	Info
C01238/1	0.000 s	Pos follower: Sync. S-ramp time • S-ramp time for the synchronisation speed ramps.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01239

Parameter Name: C01239 Reserved		Data type: UNSIGNED_32 Index: 23336 _d = 5B28 _h
Interpolator cycle for position follower		
<ul style="list-style-type: none"> Cycle time for the position interpolation of the position from the master. 		
▶ Position follower		
Setting range (min. value unit max. value)		Lenze setting
0.000	ms	60.000
		0.000 ms
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01240

Parameter Name: C01240 MCK: Control word		Data type: UNSIGNED_32 Index: 23335 _d = 5B27 _h
Bit-coded status of the MCK control word		
<ul style="list-style-type: none"> The MCK control word is used to control the functions of the Motion Control Kernel. 		
▶ MCK control word		
Display area (min. hex value max. hex value)		
0x00000000		0xFFFFFFFF
Value is bit-coded:		Info
Bit 0	OpMode_Bit0	Active operating mode - control bit 0
Bit 1	OpMode_Bit1	Active operating mode - control bit 1
Bit 2	OpMode_Bit2	Active operating mode - control bit 2
Bit 3	OpMode_Bit3	Active operating mode - control bit 4
Bit 4	ManJogPos	Control bit for manual jog in positive direction
Bit 5	ManJogNeg	Control bit for manual jog in negative direction
Bit 6	ManExecute2ndSpeed	Control bit for activation of second manual speed

Parameter Name: C01240 MCK: Control word		Data type: UNSIGNED_32 Index: 23335 _d = 5827 _h
Bit 7	ReleaseLimitSwitch	Control bit for retracting the hardware limit positions
Bit 8	HomStartStop	Control bit for start/stop homing
Bit 9	HomSetPos	Control bit for setting of home position <ul style="list-style-type: none"> "0->1" ≡ sets position setpoint and actual position value to the home position at the MCK. This function is independent of the operating modes.
Bit 10	HomResetPos	Control bit for reset of home position <ul style="list-style-type: none"> "0->1" ≡ resets the information bit for the status "Home position known" (home position not known). The position displays are not influenced by this.
Bit 11	EnableSpeedOverride	Control bit for activation of speed override <ul style="list-style-type: none"> "1" ≡ activation of the override speed at the MCK for acceptance in a running speed profile.
Bit 12	EnableAccOverride	Control bit for activation of acceleration override <ul style="list-style-type: none"> "1" ≡ activation of the override acceleration at the MCK for acceptance in a running speed profile.
Bit 13	EnableSRampOverride	Control bit for deactivation of S-shaping for speed profiles <ul style="list-style-type: none"> "1" ≡ deactivates S-shaping for speed profiles
Bit 14	PosTeachSetPos	Control bit for accepting the selected setpoint position in the selected profile <ul style="list-style-type: none"> "0->1" ≡ accepts the setpoint position at the MCK in the profile with the profile number defined via the MCK control word.
Bit 15	PosTeachActPos	Control bit for accepting the current actual position in the selected profile <ul style="list-style-type: none"> "0->1" ≡ accepts the current actual position in the profile with the profile number defined via the MCK control word.
Bit 16	PosExecute	Control bit for starting a positioning profile <ul style="list-style-type: none"> "0->1" ≡ starts a positioning profile selected via the control word in the "Positioning" mode.
Bit 17	PosFinishTarget	Control bit for completing processing of an interrupted positioning profile <ul style="list-style-type: none"> "0->1" ≡ processing of a positioning profile which has already been started and has been interrupted because of a cancellation condition or a change of the operating mode is completed in the "Positioning" mode when the home position is known. Note: Completion of profile processing through this control is based on the target position detected at the profile start!
Bit 18	PosDisableFollowProfile	Control bit for suppression of the sequence profile <ul style="list-style-type: none"> "1" ≡ positioning profiles whose profile numbers are entered in profile data sets for sequence profiles are not started after completion of the corresponding profile.
Bit 19	PosStop	Control bit for stopping the positioning profile <ul style="list-style-type: none"> "0->1" ≡ ("Positioning" mode): Interrupts a running profile through deceleration along the set deceleration ramp to standstill. "0->1" ≡ ("Stop" mode): Starts a new deceleration to standstill with the parameterised stop ramp.
Bit 20	PosModeBit0	Active positioning mode - control bit 0
Bit 21	PosModeBit1	Active positioning mode - control bit 1
Bit 22	PosModeBit2	Active positioning mode - control bit 2
Bit 23	PosModeBit3	Active positioning mode - control bit 3

Parameter Name: C01240 MCK: Control word		Data type: UNSIGNED_32 Index: 23335 _d = 5B27 _h
Bit 24	ProfileNo_Bit0	Active positioning profile number - control bit 0
Bit 25	ProfileNo_Bit1	Active positioning profile number - control bit 1
Bit 26	ProfileNo_Bit2	Active positioning profile number - control bit 2
Bit 27	ProfileNo_Bit3	Active positioning profile number - control bit 3
Bit 28	ProfileNo_Bit4	Active positioning profile number - control bit 4
Bit 29	ProfileNo_Bit5	Active positioning profile number - control bit 5
Bit 30	ProfileNo_Bit6	Active positioning profile number - control bit 6
Bit 31	ProfileNo_Bit7	Active positioning profile number - control bit 7
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C01241

Parameter Name: C01241 MCK: Status word		Data type: UNSIGNED_32 Index: 23334 _d = 5B26 _h
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Bit-coded status of the MCK status word

- The MCK status word is used to output status messages of the MotionControlKernel.

[▶ MCK status word](#)

Display area (min. hex value max. hex value)		
0x00000000		0xFFFFFFFF
Value is bit-coded:		Info
Bit 0	ActOpModeBit00	Active operating mode - status bit 0
Bit 1	ActOpModeBit01	Active operating mode - status bit 1
Bit 2	ActOpModeBit02	Active operating mode - status bit 2
Bit 3	ActOpModeBit03	Active operating mode - status bit 4
Bit 4	Busy	Status bit - profile generation active <ul style="list-style-type: none"> "1" ≡ Internal profile generation is active. A speed profile is being generated.
Bit 5	Done	Status bit - profile generation completed <ul style="list-style-type: none"> "1" ≡ Generation of a speed profile with the selected position has been completed.
Bit 6	AcceleratingActive	Status bit - acceleration process for profile generation active <ul style="list-style-type: none"> "1" ≡ Profile generation phase is in the acceleration process.
Bit 7	ConstSpeedDuty	Status bit - constant speed for profile generation active <ul style="list-style-type: none"> "1" ≡ Profile generation phase at constant speed active.
Bit 8	DeceleratingActive	Status bit - deceleration process for profile generation active <ul style="list-style-type: none"> "1" ≡ Profile generation phase is in the deceleration process.
Bit 9	S_ShapingActive	Status bit - rounding for profile generation active <ul style="list-style-type: none"> "1" ≡ Rounding during acceleration/deceleration active.
Bit 10	Pos. HW-Limit Detected	Status bit - positive hardware limit detected <ul style="list-style-type: none"> "1" ≡ Positive limit switch has triggered. Reset only possible via "Manual jog" mode!
Bit 11	Neg. HW-Limit Detected	Status bit - negative hardware limit detected <ul style="list-style-type: none"> "1" ≡ Negative limit switch has triggered. Reset only possible via "Manual jog" mode!
Bit 12	HomPosDone	Status bit - homing completed <ul style="list-style-type: none"> "1" ≡ Homing has been completed.

Parameter Name: C01241 MCK: Status word		Data type: UNSIGNED_32 Index: 23334 _d = 5B26 _h
Bit 13	HomPosAvailable	Status bit - home position known • "1" ≡ The home position has been detected and is known in the drive.
Bit 14	Pos. SW-Limit Detected	Status bit - positive software limit detected • "1" ≡ Positive software limit position overtravelled.
Bit 15	Neg. SW-Limit Detected	Status bit - negative software limit detected • "1" ≡ Negative software limit position overtravelled.
Bit 16	DwellTime	Status bit - transient effects in target position active • "1" ≡ Dwell time after reaching the setpoint position is active.
Bit 17	InTarget	Status bit - actual position is in the target window • "1" ≡ Dwell time has expired and current actual position is in the set target window.
Bit 18	PosDone	Status bit - positioning process completed • "1" ≡ Positioning profile has been completed in the "Positioning" mode. Setpoint position is in target.
Bit 19	Reserved	
Bit 20	ActPosMode_Bit00	Active positioning mode - status bit 0
Bit 21	ActPosMode_Bit01	Active positioning mode - status bit 1
Bit 22	ActPosMode_Bit02	Active positioning mode - status bit 2
Bit 23	ActPosMode_Bit03	Active positioning mode - status bit 3
Bit 24	ActProfileNo_Bit00	Active positioning profile - status bit 0
Bit 25	ActProfileNo_Bit01	Active positioning profile - status bit 1
Bit 26	ActProfileNo_Bit02	Active positioning profile - status bit 2
Bit 27	ActProfileNo_Bit03	Active positioning profile - status bit 3
Bit 28	ActProfileNo_Bit04	Active positioning profile - status bit 4
Bit 29	ActProfileNo_Bit05	Active positioning profile - status bit 5
Bit 30	ActProfileNo_Bit06	Active positioning profile - status bit 6
Bit 31	ActProfileNo_Bit07	Active positioning profile - status bit 7

Read access Write access CINH PLC STOP No transfer COM MOT

C01242

Parameter Name: C01242 MCK: Current pos profile number		Data type: UNSIGNED_8 Index: 23333 _d = 5B25 _h
Display of the current profile number of the active profile in the "Positioning" mode		
► Positioning		
Display range (min. value unit max. value)		
0		255
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01243

Parameter | Name: **C01243 | MCK: Current operating mode** Data type: UNSIGNED_8
Index: 23332_d = 5B24_h

Display of the active operating mode of the Motion Control Kernel

[▶ Basic drive functions](#)

Selection list (read only)	Info
0 Speed follower	Drive traverses according to a preselected speed setpoint
1 Homing	Drive finds its reference measuring system by setting the home position or homing
2 ManualJog	Drive can be traversed manually via initiators, e.g. for cleaning purposes or tool changes.
3 Positioning	Drive traverses according to defined travel profiles and motion processes
4 Stop	Drive is decelerated to standstill along a parameterised deceleration ramp
5 Position follower	Drive traverses according to a preselected position setpoint
15 StandBy	Internal operating mode for quick stop and pulse inhibit

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01244

Parameter | Name: **C01244 | MCK: Target detection - times** Data type: UNSIGNED_16
Index: 23331_d = 5B23_h

Timing for various MCK functions

Setting range (min. value unit max. value)		
0	ms	60000
Subcodes	Lenze setting	Info
C01244/1	100 ms	MCK: Dwell time - target position <ul style="list-style-type: none"> • Time expiring after reaching the setpoint position for positioning processes and enabling the actual position detection in the target position window. ▶ Target position monitoring
C01244/2	0 ms	MCK: Waiting time following error 1 From version 02.00.00 ▶ Following error monitoring system
C01244/3	0 ms	MCK: Waiting time following error 2 From version 02.00.00 ▶ Following error monitoring system

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01245

Parameter Name: C01245 MCK: Target detection - positions		Data type: INTEGER_32 Index: 23330 _d = 5B22 _h
Position settings for various MCK functions		
Setting range (min. value unit max. value)		
0.0000	units	214748.3647
Subcodes	Lenze setting	Info
C01245/1	1.0000 units	MCK: Window target position <ul style="list-style-type: none"> Window around the target position for comparison with the actual position to see whether the drive is in target. ▶ Target position monitoring
C01245/2	1.0000 units	MCK: Blocking zone Modulo <ul style="list-style-type: none"> ▶ Activation of the Modulo measuring system
C01245/3	0.0000 units	MCKI: Hysteresis position change
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01246

Parameter Name: C01246 MCK: Select signal source		Data type: UNSIGNED_8 Index: 23329 _d = 5B21 _h
Selection of the touch probe signal source for reference search with touch probe detection		
<ul style="list-style-type: none"> If the reference signal is to follow a reach touch probe, the Touch-Probe-Interface must be configured accordingly. 		
▶ Homing		
Selection list		
0	No TP	
3	TP-DigIn3	
4	TP-DigIn4	
5	TP-DigIn5	
6	TP-DigIn6	
7	TP-DigIn7	
Subcodes	Lenze setting	Info
C01246/1	0: No TP	MCK: Ref. TP signal source
C01246/2	0: No TP	MCK: Set.Ref. signal source
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01251

Parameter Name: C01251 MCK: Acceleration stop		Data type: INTEGER_32 Index: 23324 _d = 5B1C _h
Acceleration parameter for stop		
▶ Stop		
Setting range (min. value unit max. value)		
-214748.3647	units/s ²	214748.3647
Subcodes	Lenze setting	Info
C01251/1	720.0000 units/s ²	MCK: Stop: Decel. <ul style="list-style-type: none"> Deceleration for setpoint speed ramp-down to standstill.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01252

Parameter Name: C01252 MCK: S-ramp times stop		Data type: UNSIGNED_16 Index: 23323 _d = 5B1B _h
S-ramp times for stop		
<ul style="list-style-type: none"> Setting "0 s" ≡ no rounding 		
Stop		
Setting range (min. value unit max. value)		
0.000	s	10.000
Subcodes	Lenze setting	Info
C01252/1	0.000 s	MCK: Stop: S-ramp time <ul style="list-style-type: none"> S-ramp time for setpoint speed ramp-down to standstill.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C01295

Parameter Name: C01295 L_MCKStateInterface_1: Pos. selection		Data type: UNSIGNED_8 Index: 23280 _d = 5AF0 _h
Selection of the position to be provided at the <i>dnPosOut_p</i> output of the FB L_MckStateInterface		
Selection list (Lenze setting printed in bold)		
0	<i>dnPosIn_p</i>	
1	Current feed	
2	<i>dnSetPos_p</i>	
3	<i>dnActPos_p</i>	
4	<i>dnDeltaPos_p</i>	
5	<i>dnTargetPos_p</i>	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01296

Parameter Name: C01296 Mode: Position calculation		Data type: UNSIGNED_8 Index: 23279 _d = 5AEF _h
MCKInterface		
Selection list		
0	<i>dnPosOut_p=dnPosIn_p</i>	
1	16 bits: LW=+/-32767	
2	16 bits: HW=+/-; LW=0..65535	
3	32 bits: HW_LW=+/-214748_3647	
Subcodes	Lenze setting	Info
C01296/1	0: <i>dnPosOut_p=dnPosIn_p</i>	L_MckCtrlInterface_1 : PosCalcMode
C01296/2	1: 16Bit: LW=+/-32767	L_MckCtrlInterface_1 : PosDisplayMode
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01297

Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF
0x00		0x03 (decimal: 3)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input checked="" type="checkbox"/>	PosStop with PosExecute = FALSE	"1" ≙ Stop positioning with <i>PosExecute</i> <ul style="list-style-type: none"> • PosExecute="0" stops a running positioning process by ramp-down to standstill.
Bit 1 <input checked="" type="checkbox"/>	HomingStartStop with PosExecute	"1" ≙ Start/stop homing with <i>PosExecute</i> <ul style="list-style-type: none"> • PosExecute="1" starts homing, PosExecute="0" stops homing in the "Homing" mode.
Bit 2 <input type="checkbox"/>	SetProfilPosition with PosExecute	"1" ≙ Teach set position with <i>PosExecute</i> <ul style="list-style-type: none"> • PosExecute="0->1" accepts the setpoint position at the MCK in the profile with the specified profile number.
Bit 3 <input type="checkbox"/>	SetProfilPosition at position change	"1" ≙ Automatic acceptance of set position <ul style="list-style-type: none"> • The set position pending at the MCKInterface is automatically transferred to the profile with the preset profile number if a data change at the corresponding input for the setpoint is detected.
Bit 4 <input type="checkbox"/>	Profile start at position change	From version 02.00.00 "1" ≙ Automatic profile start at position change <ul style="list-style-type: none"> • An automatic "PosExecute" takes place if the incremental position selection changes and this change is higher than set in the hysteresis for position change (C01245/3).

Read access Write access CINH PLC STOP No transfer COM MOT

C01298

Parameter Name: C01298 MCK: Operating mode change with profile no.		Data type: UNSIGNED_8 Index: 23277 _d = 5AEC _h
FB L_MckCtrlInterface_1 : Assignment of an operating mode to a profile		
Selection list		Info
0	No change	There will be no changed operating mode when the profile is changed. Instead, the operating mode requested "from outside" via the MCK control word applies.
1	Follower	Change to the "Speed follower" mode
2	Homing	Change to the "Homing" mode
3	ManualJog	Change to the "Manual jog" mode
4	Positioning	Change to the "Positioning" mode
Subcodes	Lenze setting	Info
C01298/1	1: Follower	MCK operating mode at profile no. 0 • Selection of the operating mode for profile 0 at L_MckCtrlInterface_1 .
C01298/2	2: Homing	MCK operating mode at profile no. 1 • Selection of the operating mode for profile 1 at L_MckCtrlInterface_1 .
C01298/3	3: ManualJog	MCK operating mode at profile no. 2 • Selection of the operating mode for profile 2 at L_MckCtrlInterface_1 .
C01298/4	4: Positioning	MCK operating mode at profile no. 3...15 • Selection of the operating mode for profile 3 ... 15 at L_MckCtrlInterface_1 .
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01299

Parameter Name: C01299 MCK: Status MCKInterface		Data type: UNSIGNED_8 Index: 23276 _d = 5AEC _h
FB L_MckCtrlInterface_1 : Status messages		
Display area (min. hex value max. hex value)		Info
0x00	0xFF	
Value is bit-coded:		Info
Bit 0	InvalidOperationMode	Invalid operating mode selection • "1" ≙ The selected operating mode is not defined/invalid.
Bit 1	InvalidPosMode	Invalid positioning mode selection • "1" ≙ The selected positioning mode is not defined/invalid.
Bit 2	InvalidProfileNo	Invalid profile number selection • "1" ≙ The selected profile number refers to a profile data set that does not exist.
Bit 3	Reserved	
Bit 4	Reserved	
Bit 5	Reserved	
Bit 6	Reserved	
Bit 7	Reserved	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C01300

Parameter | Name: **C01300 | Profile data: Positioning mode** Data type: UNSIGNED_8
Index: 23275_d = 5AEB_h

Selection of the positioning mode for profiles 1 ... 15

[▶ Profile entry](#)

Selection list		Info
1	Absolute (shortest path)	Absolute positioning <ul style="list-style-type: none"> The profile position corresponds to the target position.
2	Continuous	Continuous positioning without approaching a target position
3	Relative	Relative positioning <ul style="list-style-type: none"> The profile position determines the distance to be traversed.
4	absolute (Cw)	Clockwise absolute positioning <ul style="list-style-type: none"> The zero position of the axis can be exceed in this direction. The profile position corresponds to the target position.
5	absolute (Ccw)	Counter-clockwise absolute positioning <ul style="list-style-type: none"> The zero position of the axis can be exceed in this direction. The profile position corresponds to the target position.
8	Absolute (shortest path) to TP	Absolute positioning <ul style="list-style-type: none"> The profile position corresponds to the target position. After a touch probe is detected, the TP profile (C01308/1...15) is executed.
9	Continuous to TP	Continuous positioning without approaching a target position <ul style="list-style-type: none"> After a touch probe is detected, the TP profile (C01308/1...15) is executed.
10	Relative to TP	Relative positioning <ul style="list-style-type: none"> The profile position determines the distance to be traversed. After a touch probe is detected, the TP profile (C01308/1...15) is executed.
11	Absolute (Cw) on TP	Clockwise absolute positioning <ul style="list-style-type: none"> The zero position of the axis can be exceed in this direction. The profile position corresponds to the target position. After a touch probe is detected, the TP profile (C01308/1...15) is executed.
12	Absolute (Ccw) on TP	Counter-clockwise absolute positioning <ul style="list-style-type: none"> The zero position of the axis can be exceed in this direction. The profile position corresponds to the target position. After a touch probe is detected, the TP profile (C01308/1...15) is executed.
Subcodes	Lenze setting	Info
C01300/1	1: absolute (beeline)	Profiles 1 ... 15: Positioning mode
C01300/...		
C01300/15		

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01301

Parameter Name: C01301 Profile data: Position		Data type: INTEGER_32 Index: 23274 _d = 5AEAh _h
Selection of the positions for profiles 1 ... 15		
▶ Profile entry		
Setting range (min. value unit max. value)		
-214748.3647	unit	214748.3647
Subcodes	Lenze setting	Info
C01301/1	360.0000 unit	Profiles 1 ... 15: Position
C01301/...		
C01301/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01302

Parameter Name: C01302 Profile data: Speed		Data type: INTEGER_32 Index: 23273 _d = 5AE9 _h
Selection of the maximum speeds for profiles 1 ... 15		
▶ Profile entry		
Setting range (min. value unit max. value)		
-214748.3647	unit/s	214748.3647
Subcodes	Lenze setting	Info
C01302/1	360.0000 unit/s	Profiles 1 ... 15: Speed
C01302/...		
C01302/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01303

Parameter Name: C01303 Profile data: Acceleration		Data type: INTEGER_32 Index: 23272 _d = 5AE8 _h
Selection of the accelerations for profiles 1 ... 15		
▶ Profile entry		
Setting range (min. value unit max. value)		
-214748.3647	unit/s ²	214748.3647
Subcodes	Lenze setting	Info
C01303/1	720.0000 unit/s ²	Profiles 1 ... 15: Acceleration
C01303/...		
C01303/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01304

Parameter Name: C01304 Profile data: Deceleration		Data type: INTEGER_32 Index: 23271 _d = 5AE7 _h
Selection of the decelerations for profiles 1 ... 15		
▶ Profile entry		
Setting range (min. value unit max. value)		
-214748.3647	unit/s ²	214748.3647
Subcodes	Lenze setting	Info
C01304/1	720.0000 unit/s ²	Profiles 1 ... 15: Deceleration
C01304/...		
C01304/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C01305

Parameter | Name: **C01305 | Profile data: Final speed** Data type: INTEGER_32
Index: 23270_d = 5AE6_h

Selection of the final speeds for profiles 1 ... 15

- For profile linkage with overchange.

[▶ Profile entry](#)

Setting range (min. value unit max. value)		
-214748.3647	unit/s	214748.3647
Subcodes	Lenze setting	Info
C01305/1	0.0000 unit/s	Profiles 1 ... 15: Final speed
C01305/...		
C01305/15		

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10000

C01306

Parameter | Name: **C01306 | Profile data: S-ramp time** Data type: UNSIGNED_16
Index: 23269_d = 5AE5_h

Selection of the S-ramp times for profiles 1 ... 15

- The maximum S-ramp time is the time in which the maximum acceleration or the maximum deceleration is reached along a ramp (jerk limitation).

[▶ Profile entry](#)

Setting range (min. value unit max. value)		
0.000	s	10.000
Subcodes	Lenze setting	Info
C01306/1	0.000 s	Profiles 1 ... 15: S-ramp time
C01306/...		
C01306/15		

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1000

C01307

Parameter | Name: **C01307 | Profile data: Sequence profile** Data type: UNSIGNED_8
Index: 23268_d = 5AE4_h

Selection of the sequence profile numbers for profiles 1 ... 15

- For profile linkage

[▶ Profile entry](#)

Setting range (min. value unit max. value)		
0		15
Subcodes	Lenze setting	Info
C01307/1	0	Profiles 1 ... 15: Sequence profile
C01307/...		
C01307/15		

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01308

Parameter | Name: **C01308 | Profile data: TP profile** Data type: UNSIGNED_8
Index: 23267_d = 5AE3_h

Selection of the touch-probe profile numbers for profile 1 ... 15

- Only relevant for positioning modes with touch-probe.

[▶ Profile entry](#)

Setting range (min. value unit max. value)		
0		15
Subcodes	Lenze setting	Info
C01308/1	0	Profile 1 ... 15: TP profile
C01308/...		
C01308/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01309

Parameter | Name: **C01309 | Profile data: TP signal source** Data type: UNSIGNED_8
Index: 23266_d = 5AE2_h

Selection of the touch-probe signal sources for profile 1 ... 15

- Only relevant for positioning modes with touch-probe.

[▶ Profile entry](#)

Selection list		
3	TP-DigIn3	
4	TP-DigIn4	
5	TP-DigIn5	
6	TP-DigIn6	
7	TP-DigIn7	
Subcodes	Lenze setting	Info
C01309/1	3: TP-DigIn3	Profiles 1 ... 15: Sequence profile
C01309/...		
C01309/15		
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01501

Parameter | Name: **C01501 | Resp. to communication error with MCI** Data type: UNSIGNED_8
Index: 23074_d = 5A22_h

Configuration of monitoring functions for the communication module

Selection list		
0	No Reaction	
1	Fault	
2	Trouble	
3	TroubleQuickStop	
4	WarningLocked	
5	Warning	
6	Information	
Subcodes	Lenze setting	Info
C01501/1	0: No Reaction	Resp. to MCI connection error • Response to a communication error of the attached communication module.
C01501/2	0: No Reaction	Resp. to MCI invalid module • Response to an unplugged or incompatible communication module
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01670

Parameter Name: C01670 L_ComparePhi 1-5: Function		Data type: UNSIGNED_8 Index: 22905 _d = 5979 _h
Selection of comparison operation		
• If the statement of the selected comparison operation is true, the binary <i>bOut</i> output will be set to TRUE.		
Selection list		
1	In1 = In2	
2	In1 > In2	
3	In1 < In2	
4	In1 = In2	
5	In1 > In2	
6	In1 < In2	
Subcodes	Lenze setting	Info
C01670/1	1: In1 = In2	L_ComparePhi 1 : Function
C01670/2	1: In1 = In2	L_ComparePhi 2 : Function
C01670/3	1: In1 = In2	L_ComparePhi 3 : Function
C01670/4	1: In1 = In2	L_ComparePhi 4 : Function
C01670/5	1: In1 = In2	L_ComparePhi 5 : Function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01671

Parameter Name: C01671 L_ComparePhi 1-5: Hysteresis		Data type: INTEGER_32 Index: 22904 _d = 5978 _h
Hysteresis for the comparison function		
Setting range (min. value unit max. value)		
0	Incr.	1073741824
Subcodes	Lenze setting	Info
C01671/1	0 incr.	L_ComparePhi 1 : Hysteresis
C01671/2	0 incr.	L_ComparePhi 2 : Hysteresis
C01671/3	0 incr.	L_ComparePhi 3 : Hysteresis
C01671/4	0 incr.	L_ComparePhi 4 : Hysteresis
C01671/5	0 incr.	L_ComparePhi 5 : Hysteresis
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01672

Parameter Name: C01672 L_ComparePhi 1-5: Window		Data type: INTEGER_32 Index: 22903 _d = 5977 _h
Window for the comparison operation		
Setting range (min. value unit max. value)		
0	Incr.	1073741824
Subcodes	Lenze setting	Info
C01672/1	0 incr.	L_ComparePhi 1 : Window
C01672/2	0 incr.	L_ComparePhi 2 : Window
C01672/3	0 incr.	L_ComparePhi 3 : Window
C01672/4	0 incr.	L_ComparePhi 4 : Window
C01672/5	0 incr.	L_ComparePhi 5 : Window
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C01751

Parameter | Name: **C01751 | Service code inverter characteristic** Data type: UNSIGNED_8
Index: 22824_d = 5928_h

This code is for device-internal use only and must not be written to by the user!

C01752

Parameter | Name: **C01752 | Service par. inverter charact. function** Data type: UNSIGNED_8
Index: 22823_d = 5927_h

This code is for device-internal use only and must not be written to by the user!

C01755

Parameter | Name: **C01755 | Service par. inverter charact. factor** Data type: INTEGER_16
Index: 22820_d = 5924_h

This code is for device-internal use only and must not be written to by the user!

C01763

Parameter | Name: **C01763 | Service code -clamp threshold** Data type: INTEGER_16
Index: 22812_d = 591C_h

This code is for device-internal use only and must not be written to by the user!

C01764

Parameter | Name: **C01764 | Service par. clamp time** Data type: UNSIGNED_8
Index: 22811_d = 591B_h

This code is for device-internal use only and must not be written to by the user!

C01765

Parameter | Name: **C01765 | Service code - difference threshold UG** Data type: UNSIGNED_16
Index: 22810_d = 591A_h

This code is for device-internal use only and must not be written to by the user!

C01770

Parameter | Name: **C01770 | Filter time - earth-fault detect. is running** Data type: UNSIGNED_8
Index: 22805_d = 5915_h

Setting range (min. value unit max. value)		Lenze setting
0	ms	250 2 ms

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01902

Parameter | Name: **C01902 | Diagnostics X6: Max. baud rate** Data type: UNSIGNED_16
Index: 22673_d = 5891_h

Maximally permissible baud rate in the standard device after determination of the baud rate at the diagnostic interface X6

Selection list (Lenze setting printed in bold)	
192	19.200 Bd
384	38.400 Bd
576	57.600 Bd
750	75.000 Bd
1152	115.200 Bd
1500	150.000 Bd
2500	250.000 Bd
3750	375.000 Bd
7500	750.000 Bd

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01903

Parameter | Name: **C01903 | Diagnostics X6: Change baud rate** Data type: UNSIGNED_8
Index: 22672_d = 5890_h

New baud rate determination at the diagnostic interface X6

Selection list (Lenze setting printed in bold)	
0	Ignore changes
1	Negotiate baud rate

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C01905

Parameter | Name: **C01905 | Diagnostics X6: Current baud rate** Data type: UNSIGNED_32
Index: 22670_d = 588E_h

Current baud rate at the diagnostic interface X6

Display range (min. value unit max. value)		
0	Bd	3000000

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02430

Parameter | Name: **C02430 | Axis bus address and no. of nodes** Data type: UNSIGNED_8
Index: 22145_d = 5681_h

From version 02.00.00 [▶ Axis bus](#)

Setting range (min. value unit max. value)		
0		62

Subcodes	Lenze setting	Info
C02430/1	1	Axis bus address <ul style="list-style-type: none"> • 1 ≡ Master • 2 ... 62 ≡ slave 1 ... slave 61
C02430/2	2	Axis bus no. of nodes <ul style="list-style-type: none"> • Number of slaves connected to the axis bus. • Setting only required for the master.

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02431

Parameter | Name: **C02431 | Axis bus time settings** Data type: UNSIGNED_16
Index: 22144_d = 5680_h

From version 02.00.00 [▶ Axis bus](#)

Setting range (min. value unit max. value)		
0	ms	65000

Subcodes	Lenze setting	Info
C02431/1	3000 ms	Axis bus decel. boot-up operat. <ul style="list-style-type: none"> • Delay during status change from "Boot-up" to "Operational".
C02431/2	1000 ms	Axis bus decel. operat.- 1.transmit <ul style="list-style-type: none"> • "Operational" time until "first transmission".
C02431/3	1000 ms	Axis bus decel. BusOff recovery

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02435

Parameter | Name: **C02435 | Axis bus status** Data type: UNSIGNED_8
Index: 22140_d = 567C_h

From version 02.00.00

[▶ Axis bus](#)

Selection list (read only)	
0	PDO active
1	SDO active
2	Reserved
3	Reserved
4	BootUp
5	Stopped
6	Reserved
7	Reset

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02436

Parameter | Name: **C02436 | Axis bus error status** Data type: UNSIGNED_8
Index: 22139_d = 567B_h

From version 02.00.00

[▶ Axis bus](#)

Selection list (read only)	
0	No Error
1	Warning ErrActive
2	Warning ErrPassive
3	Bus off
4	Reserved
5	Reserved

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02437

Parameter | Name: **C02437 | Axis bus MessageError** Data type: UNSIGNED_8
Index: 22138_d = 567A_h

From version 02.00.00

[▶ Axis bus](#)

Selection list (read only)	
0	No Error
1	StuffError
2	FormError
3	AckError
4	Bit1Error
5	Bit0Error
6	CRCError
7	Reserved

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02440

Parameter | Name: **C02440 | AxisBusIO slave/master** Data type: UNSIGNED_8
Index: 22135_d = 5677_h

From version 02.00.00

[▶ Axis bus](#)

Selection list		
0	Off	
1	Master	
2	Slave	
3	IO	
Subcodes	Lenze setting	Info
C02440/1	0: Off	Axis bus IO function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input checked="" type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02580

Parameter | Name: **C02580 | Holding brake: Operating mode** Data type: UNSIGNED_8
Index: 21995_d = 55EB_h

Selection of the operating mode for holding brake control

[▶ Holding brake control](#)

Selection list (Lenze setting printed in bold)		Info
0	Brake control off	No holding brake is used. Internal control is switched off.
11	Manually controlled	The holding brake is released and closed via a control bit in the MCK control word.
12	Autom. controlled	The holding brake is automatically released and closed via speed setpoint comparisons.
13	Semi-automat. controlled	The holding brake is released and closed via a control bit in the MCK control word. <ul style="list-style-type: none"> In contrast to the manual operation (mode 11) <ul style="list-style-type: none"> –the feedforward control is active in this mode, preventing a sagging e.g. in case of a hoist. –the brake in this mode also closes when the controller is inhibited in order to prevent the axis in a hoist from falling.
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02581

Parameter Name: C02581 Holding brake: Speed thresholds		Data type: INTEGER_16 Index: 21994 _d = 55EA _h
Speed setpoint threshold and hysteresis for automatic holding brake control		
▶ Holding brake control		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C02581/1	5.00 %	Holding brake: Switching threshold <ul style="list-style-type: none"> Switching threshold of the speed setpoint from which on the holding brake is released/applied automatically.
C02581/2	1.00 %	Holding brake: Hyst.release <ul style="list-style-type: none"> Hysteresis for holding brake release. Release threshold = switching threshold + release hysteresis
C02581/3	1.00 %	Holding brake: Hyst. close <ul style="list-style-type: none"> Hysteresis for holding brake application. Application threshold = switching threshold - application hysteresis
C02581/4	0.00 %	Holding brake: FF control starting value 1
C02581/5	0.00 %	Holding brake: FF control starting value 2
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C02582

Parameter Name: C02582 Holding brake: Setting		Data type: UNSIGNED_8 Index: 21993 _d = 55E9 _h
Activation of functional holding brake control options		
▶ Holding brake control		
Setting range (min. hex value max. hex value)		Lenze setting
0x00		0xFF 0x40 (decimal: 64)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	bBrkReleaseOut invert.	Activation of inverted control <ul style="list-style-type: none"> "1" ≡ Inverted logic of the control signal for the holding brake control switching element.
Bit 1 <input type="checkbox"/>	Horizontal brake protection	Brake response in case of pulse inhibit <ul style="list-style-type: none"> "1" ≡ In the case of a pulse inhibit, the actual speed value is monitored which must reach the "Close" threshold value to cause the holding brake to be applied. Note: <ul style="list-style-type: none"> This function is only active if bit 3 (horizontal/winding technology) is set as well. The function is used in order that, when the controller is inhibited, the holding brake of a drive with horizontal traverse path does not wear out during rotation. With vertical motion (bit 3 = 0), this function is not active. Especially with hoists and activated pulse inhibit of the controller, an immediate application of the brake is essential for safety-related reasons!
Bit 2 <input type="checkbox"/>	with hoist inv. feedfwd. control	Direction of feedforward control with vertical/hoist technology: <ul style="list-style-type: none"> "0" ≡ Positive direction "1" ≡ Negative direction Note: Reversal (Ccw) is then considered.

Parameter Name: C02582 Holding brake: Setting		Data type: UNSIGNED_8 Index: 21993 _d = 55E9 _h
Bit 3 <input type="checkbox"/>	Horizontal application	<p>Direction of movement of the axis</p> <ul style="list-style-type: none"> "0" ≡ The axis performs vertical movements. Gravitational acceleration causes movements. "1" ≡ The direction of the axis is horizontal or rotary. The gravitational acceleration does not cause any movement.
Bit 4 <input type="checkbox"/>	Feedforward control C2581	<p>Selection of the feedforward control value</p> <ul style="list-style-type: none"> "0" ≡ Automatic selection. <ul style="list-style-type: none"> – The torque saved at the last stop is used. "1" ≡ Manual selection. <ul style="list-style-type: none"> – <i>bBrkStartValue</i> = FALSE: The feedforward control value 1 set in C02581/4 is used. – <i>bBrkStartValue</i> = TRUE: The feedforward control value 2 set in C02581/5 is used.
Bit 5 <input type="checkbox"/>	Feedback monitoring	<p>Activation of status monitoring</p> <ul style="list-style-type: none"> "1" ≡ The <i>bBrkApplied</i> input for status detection of the brake (via a switching contact at the brake) is monitored after the waiting time set in C02589/3 has expired. <p>Activation of status monitoring</p> <ul style="list-style-type: none"> "1" ≡ The <i>bBrkApplied</i> input for status detection of the brake (via a switching contact at the brake) is monitored after the waiting time set in C02589/3 has expired.
Bit 6 <input checked="" type="checkbox"/>	SyncRampe L_NSet_1	<p>From version 02.00.00</p> <p>Selection of the ramp time for the synchronisation process to setpoint speed after the brake opening time has elapsed</p> <p>Revised behaviour from version 02.00.00:</p> <ul style="list-style-type: none"> "1" ≡ The ramp time of the effective acceleration of the ramp function generator (L_NSet_1) is used (Lenze setting). "0" ≡ As before, the ramp time set in C02610/1 is used. <p>Note:</p> <p>The changeover can be dynamically both via the ramp parameter and via bit 6.</p>
Bit 7 <input type="checkbox"/>	Reserved	

Read access Write access CINH PLC STOP No transfer COM MOT

C02589

Parameter Name: C02589 Holding brake: Time system		Data type: UNSIGNED_16 Index: 21986 _d = 55E2 _h
Operating times of the holding brake		
<ul style="list-style-type: none"> The electromechanical delay times of the holding brake are specified in the data sheets or on the holding brake nameplate. 		
▶ Holding brake control		
Setting range (min. value unit max. value)		
0	ms	60000
Subcodes	Lenze setting	Info
C02589/1	100 ms	Holding brake: Application time <ul style="list-style-type: none"> Time in which the holding brake is completely applied from the beginning of control and in which the controller is inhibited.
C02589/2	100 ms	Holding brake: Release time <ul style="list-style-type: none"> Time in which the holding brake is completely released from the beginning of control.
C02589/3	100 ms	Holding brake: Waiting time status <ul style="list-style-type: none"> Time after which all transient reactions are completed and the switching status of the holding brake is stable. Beginning of monitoring the feedback signal for the switching status of the holding brake.
C02589/4	0 ms	Holding brake: Ramp time FF ctrl
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02593

Parameter Name: C02593 Holding brake: Activation time		Data type: UNSIGNED_32 Index: 21982 _d = 55DE _h
Time parameter for the delay of trigger signals of the holding brake control		
▶ Holding brake control		
Setting range (min. value unit max. value)		
0.000	s	3600.000
Subcodes	Lenze setting	Info
C02593/1	0.000 s	Holding brake: Actual value monitoring <ul style="list-style-type: none"> Time in which the actual value is supposed to reach the threshold for closing the brake if the setpoint has already reached the threshold. Time > 0 s: If the actual speed value has not reached the threshold within the time for brake application, the holding brake is applied by control. Time = 0 s: The brake is only applied by control when the actual speed has reached the application threshold.
C02593/2	0.000 s	Holding brake: Application delay <ul style="list-style-type: none"> Time by which the control process for holding brake application is delayed. The time expires when the speed setpoint has reached the switching threshold for application. With positioning processes, a continuous application and release of the holding brake can thus be suppressed for the set time.
C02593/3	0.000 s	Holding brake: Reserved
C02593/4	0.000 s	Holding brake: Reserved
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1000		

C02607

Parameter Name: C02607 Holding brake: Status	Data type: UNSIGNED_16 Index: 21968 _d = 55D0 _h
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Switching status of the holding brake control

▶ [Holding brake control](#)

Display area (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded:		Info
Bit 0	Brake applied	Holding brake is completely applied
Bit 1	Brake released	Holding brake is completely released
Bit 2	Feedforward control active	Feedforward control for holding of the load via the motor is active before the holding brake releases.
Bit 3	Closing active	The brake closing time (C02589/1) expires
Bit 4	Forced release active	In case of automatic operation of the holding brake control, the brake is directly released via the MCK input <i>bBrkRelease</i> = TRUE
Bit 5	Release active	The brake release time (C02589/2) expires
Bit 6	Setpoint synchronisation active	A speed setpoint at the MCK is approached along a defined ramp after brake release
Bit 7	Signalling contact error	The status monitoring has tripped.
Bit 8	Reserved	
Bit 9	Reserved	
Bit 10	Reserved	
Bit 11	Reserved	
Bit 12	Reserved	
Bit 13	Reserved	
Bit 14	Reserved	
Bit 15	Reserved	

Read access Write access CINH PLC STOP No transfer COM MOT

C02610

Parameter Name: C02610 MCK: Accel./decel. times	Data type: UNSIGNED_32 Index: 21965 _d = 55CD _h
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Ramp times for speed setpoint synchronisation

Setting range (min. value unit max. value)		
0.000	s	999.999
Subcodes	Lenze setting	Info
C02610/1	2.000 s	Holding brake: ramp time synchr. <ul style="list-style-type: none"> Ramp time for the synchronisation process to setpoint speed after the brake opening time has elapsed Revised behaviour from version 02.00.00: <ul style="list-style-type: none"> The setting made here is only effective if bit 6 "SyncRampe L_NSet_1" in C02582 is set to "0". In the Lenze setting of C02582 (Bit 6 = "1"), the ramp time of the effective acceleration of the ramp function generator (L_NSet_1) is used. ▶ Holding brake control
C02610/2	2.000 s	MCK: Ramp time synchr. setpoint <ul style="list-style-type: none"> Time for synchronisation ramps between setpoint jumps occurring through the exceedance of minimum and maximum speed setpoint limit ranges.
C02610/3	2.000 s	MCK: SM stopping ramp

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1000

C02611

Parameter Name: C02611 MCK: Limitations	Data type: INTEGER_16 Index: 21964 _d = 55CC _h
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Speed setpoint limits for the determination of limited validity ranges

Note:

Traversing with setpoints through resulting blocking zones is executed with the ramp set in [C02610/2](#).

▶ [Min/Max speed](#)

Setting range (min. value unit max. value)		
0.00	%	199.99
Subcodes	Lenze setting	Info
C02611/1	199.99 %	MCK: Pos. max. speed • Upper limit of the speed setpoint limitation in positive direction of rotation.
C02611/2	0.00 %	MCK: Pos. min. speed • Lower limit of the speed setpoint limitation in positive direction of rotation.
C02611/3	0.00 %	MCK: Neg. min. speed • Lower limit of the speed setpoint limitation in negative direction of rotation.
C02611/4	199.99 %	MCK: Neg. max. speed • Upper limit of the speed setpoint limitation in negative direction of rotation.

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C02652

Parameter Name: C02652 Memorise positions at power-off	Data type: UNSIGNED_16 Index: 21923 _d = 55A3 _h
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From version 02.00.00

Setting range (min. hex value max. hex value)		Lenze setting
0x0000	0xFFFF	0x0000 (decimal: 0)
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0 <input type="checkbox"/>	Actual MCTRL position	
Bit 1 <input type="checkbox"/>	Reserved	
Bit 2 <input type="checkbox"/>	Reserved	
Bit 3 <input type="checkbox"/>	Reserved	
Bit 4 <input type="checkbox"/>	Reserved	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	
Bit 8 <input type="checkbox"/>	Reserved	
Bit 9 <input type="checkbox"/>	Reserved	
Bit 10 <input type="checkbox"/>	Reserved	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Reserved	

Read access Write access CINH PLC STOP No transfer COM MOT

C02810

Parameter | Name: **C02810 | TP: Edge selection** Data type: UNSIGNED_8
Index: 21765_d = 5505_h

[▶ Touch-probe detection](#)

Selection list		
0	Off	
1	Rising	
2	Falling	
3	Rising and falling	
Subcodes	Lenze setting	Info
C02810/1	0: Off	Reserved
C02810/2	0: Off	Reserved
C02810/3	0: Off	TPDigIn3: Edge selection
C02810/4	0: Off	TPDigIn4: Edge selection
C02810/5	0: Off	TPDigIn5: Edge selection
C02810/6	0: Off	TPDigIn6: Edge selection
C02810/7	0: Off	TPDigIn7: Edge selection
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02811

Parameter | Name: **C02811 | TP: Sensor delay** Data type: UNSIGNED_16
Index: 21764_d = 5504_h

[▶ Touch-probe detection](#)

Setting range (min. value unit max. value)		
0	µs	6999
Subcodes	Lenze setting	Info
C02811/1	0 µs	Reserved
C02811/2	0 µs	Reserved
C02811/3	0 µs	TPDigIn3: Sensor delay
C02811/4	0 µs	TPDigIn4: Sensor delay
C02811/5	0 µs	TPDigIn5: Sensor delay
C02811/6	0 µs	TPDigIn6: Sensor delay
C02811/7	0 µs	TPDigIn7: Sensor delay
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02812

Parameter Name: C02812 TP: Position offset		Data type: INTEGER_32 Index: 21763 _d = 5503 _h
▶ Touch-probe detection		
Setting range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Lenze setting	Info
C02812/1	0.0000 units	Reserved
C02812/2	0.0000 units	Reserved
C02812/3	0.0000 units	TPDigIn3: Pos offset
C02812/4	0.0000 units	TPDigIn4: Pos offset
C02812/5	0.0000 units	TPDigIn5: Pos offset
C02812/6	0.0000 units	TPDigIn6: Pos offset
C02812/7	0.0000 units	TPDigIn7: Pos offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C02813

Parameter Name: C02813 TP: Pos. window start		Data type: INTEGER_32 Index: 21762 _d = 5502 _h
▶ Touch-probe detection		
Setting range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Lenze setting	Info
C02813/1	-214748.3647 units	TPDigIn3: Window start
C02813/2	-214748.3647 units	TPDigIn4: Window start
C02813/3	-214748.3647 units	TPDigIn5: Window start
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C02814

Parameter Name: C02814 TP: Pos. window end		Data type: INTEGER_32 Index: 21761 _d = 5501 _h
▶ Touch-probe detection		
Setting range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes	Lenze setting	Info
C02814/1	214748.3647 units	TPDigIn3: Window end
C02814/2	214748.3647 units	TPDigIn4: Window end
C02814/3	214748.3647 units	TPDigIn5: Window end
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C02815

Parameter Name: C02815 TP: Position source		Data type: UNSIGNED_8 Index: 21760 _d = 5500 _h
▶ Touch-probe detection		
Selection list		
0	Position encoder actual value	
1	Pos DigIn1/2	
2	Pos resolver	
3	Pos MultiEncoder	
Subcodes	Lenze setting	Info
C02815/1	0: Position encoder actual value	Reserved
C02815/2	0: Position encoder actual value	Reserved
C02815/3	0: Position encoder actual value	TPDigIn3: Position source
C02815/4	0: Position encoder actual value	TPDigIn4: Position source
C02815/5	0: Position encoder actual value	TPDigIn5: Position source
C02815/6	0: Position encoder actual value	TPDigIn6: Position source
C02815/7	0: Position encoder actual value	TPDigIn7: Position source
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02816

Parameter Name: C02816 TP: Signal counter		Data type: UNSIGNED_16 Index: 21759 _d = 54FF _h
▶ Touch-probe detection		
Display range (min. value unit max. value)		
0		65535
Subcodes	Info	
C02816/1	Reserved	
C02816/2	Reserved	
C02816/3	TPDigIn3: Signal counter	
C02816/4	TPDigIn4: Signal counter	
C02816/5	TPDigIn5: Signal counter	
C02816/6	TPDigIn6: Signal counter	
C02816/7	TPDigIn7: Signal counter	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02817

Parameter | Name: **C02817 | TP: TouchProbe position** Data type: INTEGER_32
Index: 21758_d = 54FE_h

[▶ Touch-probe detection](#)

Display range (min. value unit max. value)		
-214748.3647	units	214748.3647
Subcodes		Info
C02817/1		Reserved
C02817/2		Reserved
C02817/3		TPDigIn3: TP position
C02817/4		TPDigIn4: TP position
C02817/5		TPDigIn5: TP position
C02817/6		TPDigIn6: TP position
C02817/7		TPDigIn7: TP position
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 10000		

C02830

Parameter Name: C02830 DIx: Debounce time	Data type: UNSIGNED_8 Index: 21745 _d = 54F1 _h
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Debounce times for the digital inputs

[▶ Digital input terminals](#)

Selection list	
0	0.00 ms
1	0.25 ms
2	0.50 ms
3	0.75 ms
4	1.00 ms
5	1.25 ms
6	1.50 ms
7	1.75 ms
8	2.00 ms
10	2.50 ms
12	3.00 ms
14	3.50 ms
16	4.00 ms
18	4.50 ms
20	5.00 ms
22	5.50 ms
24	6.00 ms
28	7.00 ms
32	8.00 ms
36	9.00 ms
40	10.0 ms
44	11.0 ms
48	12.0 ms
52	13.0 ms
56	14.0 ms
64	16.0 ms
72	18.0 ms
80	20.0 ms
88	22.0 ms
96	24.0 ms
104	26.0 ms
112	28.0 ms
120	30.0 ms
128	32.0 ms

Subcodes	Lenze setting	Info
C02830/1	1: 0.25 ms	DI1 ... DI7: Debounce time
C02830/...		
C02830/7		

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02840

Parameter Name: C02840 CountInx: Parameter		Data type: UNSIGNED_32 Index: 21735 _d = 54E7 _h
Starting and comparison values for digital count inputs		
▶ Use DI1(6) as counting input		
Setting range (min. value unit max. value)		
0	Incr.	2147483647
Subcodes	Lenze setting	Info
C02840/1	0 incr.	CountIn1: Starting value
C02840/2	65535 incr.	CountIn1: Comparison value
C02840/3	0 incr.	CountIn6: Starting value
C02840/4	65535 incr.	CountIn6: Comparison value
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02841

Parameter Name: C02841 CountInx: Counter content		Data type: UNSIGNED_32 Index: 21734 _d = 54E6 _h
Display of the current counter content of the digital count inputs		
▶ Use DI1(6) as counting input		
Display range (min. value unit max. value)		
0	Incr.	2147483647
Subcodes	Lenze setting	Info
C02841/1		CountIn1: Counter content
C02841/2		CountIn6: Counter content
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input checked="" type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02842

Parameter Name: C02842 FreqInxx: Offset		Data type: INTEGER_16 Index: 21733 _d = 54E5 _h
Offset for digital frequency inputs		
▶ Using DI1(6) and DI2(7) as frequency inputs		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C02842/1	0.00 %	FreqIn12: Offset
C02842/2	0.00 %	FreqIn67: Offset
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C02843

Parameter Name: C02843 FreqInxx: Gain		Data type: INTEGER_16 Index: 21732 _d = 54E4 _h
Gain for digital frequency inputs		
▶ Using DI1(6) and DI2(7) as frequency inputs		
Setting range (min. value unit max. value)		
-199.99	%	199.99
Subcodes	Lenze setting	Info
C02843/1	100.00 %	FreqIn12: Gain
C02843/2	100.00 %	FreqIn67: Gain
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C02844

Parameter Name: C02844 FreqIn12: Function		Data type: UNSIGNED_8 Index: 21731 _d = 54E3 _h
▶ Output of the encoder position of the DI1/DI2 frequency input		
Selection list		
0	Loading with level	
1	Loading with edge	
2	Loading with level + reset	
Subcodes	Lenze setting	Info
C02844/1	0: Loading with level	FreqIn12: PosIn function
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02845

Parameter Name: C02845 FreqIn12: PosIn comparison value		Data type: INTEGER_32 Index: 21730 _d = 54E2 _h
▶ Output of the encoder position of the DI1/DI2 frequency input		
Setting range (min. value unit max. value)		Lenze setting
0	Incr.	2147418112
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02853

Parameter Name: C02853 PSM: Lss saturation characteristic		Data type: UNSIGNED_8 Index: 21722 _d = 54DA _h
▶ Correction via saturation characteristic		
Setting range (min. value unit max. value)		Lenze setting
0	%	255
Subcodes	Lenze setting	Info
C02853/1	100 %	PSM: Lss saturation characteristic
C02853/2	100 %	PSM: Lss saturation characteristic
C02853/3	100 %	PSM: Lss saturation characteristic
C02853/4	100 %	PSM: Lss saturation characteristic
C02853/5	100 %	PSM: Lss saturation characteristic
C02853/6	100 %	PSM: Lss saturation characteristic
C02853/7	100 %	PSM: Lss saturation characteristic
C02853/8	100 %	PSM: Lss saturation characteristic
C02853/9	100 %	PSM: Lss saturation characteristic
C02853/10	100 %	PSM: Lss saturation characteristic
C02853/11	100 %	PSM: Lss saturation characteristic
C02853/12	100 %	PSM: Lss saturation characteristic
C02853/13	100 %	PSM: Lss saturation characteristic
C02853/14	100 %	PSM: Lss saturation characteristic
C02853/15	100 %	PSM: Lss saturation characteristic
C02853/16	100 %	PSM: Lss saturation characteristic
C02853/17	100 %	PSM: Lss saturation characteristic
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C02855

Parameter | Name: **C02855 | PSM: I_{max} Lss saturation characteristic** Data type: UNSIGNED_16
Index: 21720_d = 54D8_h

[▶ Correction via saturation characteristic](#)

Setting range (min. value unit max. value)			Lenze setting
0.0	A	3000.0	3000.0 A

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 10

C02859

Parameter | Name: **C02859 | PSM: Activate Lss saturation char.** Data type: UNSIGNED_8
Index: 21716_d = 54D4_h

[▶ Correction via saturation characteristic](#)

Selection list (Lenze setting printed in bold)	
0	Off
1	On

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02862

Parameter | Name: **C02862 | Resolver gain** Data type: UNSIGNED_16
Index: 21713_d = 54D1_h

[▶ Encoder/feedback system: Resolver](#)

Setting range (min. value unit max. value)		
0.00	%	199.99

Subcodes	Lenze setting	Info
C02862/1	100.00 %	Resolver: Cos gain
C02862/2	100.00 %	Resolver: Sin gain

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C02863

Parameter | Name: **C02863 | Resolver: Phase error** Data type: INTEGER_16
Index: 21712_d = 54D0_h

[▶ Encoder/feedback system: Resolver](#)

Setting range (min. value unit max. value)			Lenze setting
-199.99	%	199.99	0.00 %

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 100

C02866

Parameter | Name: **C02866 | MCTRL: Special settings** Data type: UNSIGNED_8
Index: 21709_d = 54CD_h

Activation of special functions of the internal motor control

Selection list	
0	No
1	Yes

Subcodes	Lenze setting	Info
C02866/1	1: Yes	Motor ident.: Current controller par. C075 C076 ▶ Automatic motor data identification
C02866/2	0: No	From version 02.00.00 ▶ Motor phase error monitoring before operation

Read access Write access CINH PLC STOP No transfer COM MOT Scaling factor: 1

C02867

Parameter Name: C02867 - Identification procedure		Data type: UNSIGNED_8 Index: 21708 _d = 54CC _h
Selection of the identification procedure for motor parameter identification ▶ Automatic motor parameter identification		
Selection list		Info
0	automatic	Automatic selection of the optimum identification procedure: <ul style="list-style-type: none"> For synchronous motors, the extended identification procedure is always used. For asynchronous motors with a rated motor power of up to 11 kW, the basic identification procedure is used. For asynchronous motors with a rated motor power of more than 11 kW, the extended identification procedure is used.
1	standard identification	<ul style="list-style-type: none"> Only for asynchronous motors. Duration approx. 30 s
2	extended identification	<ul style="list-style-type: none"> Stands out due to increased accuracy of the determined motor parameters. Also supports synchronous motors and asynchronous motors with a power of more than 11 kW. Duration approx. 80 s
Subcodes	Lenze setting	Info
C02867/1	0: automatic	Motor parameter identification: Process
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input checked="" type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input checked="" type="checkbox"/> MOT Scaling factor: 1		

C02870

Parameter Name: C02870 PLI without motion: Optimisation factor		Data type: INTEGER_16 Index: 21705 _d = 54C9 _h
From version 02.00.00 ▶ Pole position identification without motion		
Display range (min. value unit max. value)		
0.00	%	300.00
Subcodes	Info	
C02870/1	PLI without motion: Optimisation factor	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C02871

Parameter Name: C02871 PLI without motion: Running time		Data type: INTEGER_16 Index: 21704 _d = 54C8 _h
From version 02.00.00 ▶ Pole position identification without motion		
Display range (min. value unit max. value)		
0.00	ms	300.00
Subcodes	Info	
C02871/1	PLI without motion: Running time	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C02872

Parameter Name: C02872 PLI without motion: Adaptation of time duration		Data type: INTEGER_8 Index: 21703 _d = 54C7 _h
From version 02.00.00		
▶ Pole position identification without motion		
Setting range (min. value unit max. value)		
-10		10
Subcodes	Lenze setting	Info
C02872/1	0	PLI without motion: Adaptation of time duration
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02873

Parameter Name: C02873 PLI without motion: Ident. el. rotor displ. angle		Data type: INTEGER_16 Index: 21702 _d = 54C6 _h
From version 02.00.00		
▶ Pole position identification without motion		
Display range (min. value unit max. value)		
0	°	360
Subcodes	Lenze setting	Info
C02873/1		PLI without motion: Ident. el. rotor displ. angle
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02874

Parameter Name: C02874 PLI without motion		Data type: UNSIGNED_16 Index: 21701 _d = 54C5 _h
From version 02.00.00		
▶ Pole position identification without motion		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		
Bit 0	<input type="checkbox"/> for SLPSM with controller enable	
Bit 1	<input type="checkbox"/> for SC PSM with mains on	
Bit 2	<input type="checkbox"/> for SC PSM with controller enable	
Bit 3	<input type="checkbox"/> Reserved	
Bit 4	<input type="checkbox"/> Reserved	
Bit 5	<input type="checkbox"/> Reserved	
Bit 6	<input type="checkbox"/> Reserved	
Bit 7	<input type="checkbox"/> Reserved	
Bit 8	<input type="checkbox"/> Reserved	
Bit 9	<input type="checkbox"/> Reserved	
Bit 10	<input type="checkbox"/> Reserved	
Bit 11	<input type="checkbox"/> Reserved	
Bit 12	<input type="checkbox"/> Reserved	
Bit 13	<input type="checkbox"/> Reserved	
Bit 14	<input type="checkbox"/> Reserved	
Bit 15	<input type="checkbox"/> Reserved	
Subcodes	Lenze setting	Info
C02874/1	1	PLI without motion
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C02875

Parameter Name: C02875 PLI without motion: Adaptation of ident angle		Data type: INTEGER_8 Index: 21700 _d = 54C4 _h
From version 02.00.00		
▶ Pole position identification without motion		
Setting range (min. value unit max. value)		
-100	°	100
Subcodes	Lenze setting	Info
C02875/1	0 °	PLI without motion: Adaptation of ident angle
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02876

Parameter Name: C02876 PSM: Max. motor temperature		Data type: UNSIGNED_8 Index: 21699 _d = 54C3 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
90	°C	200
Subcodes	Lenze setting	Info
C02876/1	150 °C	PSM: Max. motor temperature
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 1		

C02877

Parameter Name: C02877 PSM temperature coefficient		Data type: INTEGER_16 Index: 21698 _d = 54C2 _h
From version 02.00.00		
Setting range (min. value unit max. value)		
-0.30	%/°C	0.00
Subcodes	Lenze setting	Info
C02877/1	-0.11 %/°C	PSM temperature coefficient
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT Scaling factor: 100		

C02878

Parameter | Name: **C02878 | KTY motor temperature compensation** Data type: UNSIGNED_16
Index: 21697_d = 54C1_h

From version 02.00.00

A temperature compensation over the detected motor temperature (display in [C00063/1](#)) serves to compensate inaccuracies in the output torque within the motor control in case of temperature changes of the asynchronous or synchronous motor.

Note!

In the Lenze setting, the temperature compensation within the motor control is activated. The temperature compensation, however, is only active with speed encoder selection "3: Multi encoder" or "4: Resolver" in [C00495](#) as well as error-free KTY temperature detection (display in [C00063/1](#) ≠ 255 °C).

▶ [Temperature compensation within the motor control](#)

Setting range (min. hex value max. hex value)	
0x0000	0xFFFF
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)	
Bit 0 <input type="checkbox"/>	for SC PSM
Bit 1 <input type="checkbox"/>	for SC ASM
Bit 2 <input type="checkbox"/>	Reserved
Bit 3 <input type="checkbox"/>	Reserved
Bit 4 <input type="checkbox"/>	Reserved
Bit 5 <input type="checkbox"/>	Reserved
Bit 6 <input type="checkbox"/>	Reserved
Bit 7 <input type="checkbox"/>	Reserved
Bit 8 <input type="checkbox"/>	Reserved
Bit 9 <input type="checkbox"/>	Reserved
Bit 10 <input type="checkbox"/>	Reserved
Bit 11 <input type="checkbox"/>	Reserved
Bit 12 <input type="checkbox"/>	Reserved
Bit 13 <input type="checkbox"/>	Reserved
Bit 14 <input type="checkbox"/>	Reserved
Bit 15 <input type="checkbox"/>	Reserved
Subcodes	Lenze setting
C02878/1	3
Info	
KTY motor temperature compensation	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT	

C02879

Parameter Name: C02879 Slip calculation from equivalent circuit diagram		Data type: UNSIGNED_16 Index: 21696 _d = 54C0 _h
From version 02.00.00		
In order to achieve a better speed stability and torque accuracy, the slip calculation can be either derived from the motor nameplate data (e.g. rated motor speed) or the motor equivalent circuit diagram data (stator resistance, rotor resistance etc.).		
Setting range (min. hex value max. hex value)		
0x0000		0xFFFF
Value is bit-coded: (<input checked="" type="checkbox"/> = bit set)		Info
Bit 0 <input type="checkbox"/>	SLVC	▶ Slip calculation for SLVC
Bit 1 <input type="checkbox"/>	SC ASM	▶ Slip calculation for SC
Bit 2 <input type="checkbox"/>	Reserved	
Bit 3 <input type="checkbox"/>	Reserved	
Bit 4 <input type="checkbox"/>	Reserved	
Bit 5 <input type="checkbox"/>	Reserved	
Bit 6 <input type="checkbox"/>	Reserved	
Bit 7 <input type="checkbox"/>	Reserved	
Bit 8 <input type="checkbox"/>	Reserved	
Bit 9 <input type="checkbox"/>	Reserved	
Bit 10 <input type="checkbox"/>	Reserved	
Bit 11 <input type="checkbox"/>	Reserved	
Bit 12 <input type="checkbox"/>	Reserved	
Bit 13 <input type="checkbox"/>	Reserved	
Bit 14 <input type="checkbox"/>	Reserved	
Bit 15 <input type="checkbox"/>	Reserved	
Subcodes	Lenze setting	Info
C02879/1	2	Slip calculation from equivalent circuit diagram
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer <input type="checkbox"/> COM <input type="checkbox"/> MOT		

C02994

Parameter Name: C02994 FB xy position		Data type: UNSIGNED_32 Index: 21581 _d = 544D _h
This code is for device-internal use only and must not be written to by the user!		

C02995

Parameter Name: C02995 FB display InputOutput		Data type: UNSIGNED_32 Index: 21580 _d = 544C _h
This code is for device-internal use only and must not be written to by the user!		

C02996

Parameter Name: C02996 FB display InputOutput2		Data type: UNSIGNED_32 Index: 21579 _d = 544B _h
This code is for device-internal use only and must not be written to by the user!		

16.2.1 Selection lists for connection parameters

16.2.1.1 Selection list - analog signals

This selection list is relevant for the following parameters:

Parameter	
C00410	L_SignalMonitor_a: Signal sources
C00620	System connection list: 16-bit
C00700	LA_NCtrl: Analog connection list
C00710	LA_TabPos: Analog connection list
C00760	LA_SwitchPos: Analog connection list

Selection list - analog signals	
0	Not connected
1000	LA_nCtrl_wDriveControlStatus
1001	LA_nCtrl_wFailNumber
1002	LA_nCtrl_nMotorCurrent_a
1003	LA_nCtrl_nMotorSpeedAct_a
1006	LA_nCtrl_nGPAnalogSwitchOut_a
1007	LA_nCtrl_nGPArithmetikOut_a
1008	LA_nCtrl_nGPMulDivOut_a
1009	LA_nCtrl_nGPSignalOut1_a
1010	LA_nCtrl_nGPSignalOut2_a
1011	LA_nCtrl_nGPSignalOut3_a
1012	LA_nCtrl_nGPSignalOut4_a
1013	LA_nCtrl_nMotorTorqueAct_a
1014	LA_nCtrl_nDCVoltage_a
1015	LA_nCtrl_nMotorVoltage_a
1016	LA_nCtrl_nMotorSpeedSet_a
1017	LA_nCtrl_wFailTypeDomain
1023	LA_nCtrl_wFreeOut1
1024	LA_nCtrl_wFreeOut2
1025	LA_nCtrl_wFreeOut3
1026	LA_nCtrl_wFreeOut4
1100	LA_TabPos_wDriveControlStatus
1101	LA_TabPos_wFailNoLow
1102	LA_TabPos_wFailNoHigh
1103	LA_TabPos_nMotorCurrent_a
1104	LA_TabPos_nMotorSpeedSet_a
1105	LA_TabPos_nMotorSpeedAct_a
1106	LA_TabPos_nMotorTorqueAct_a
1107	LA_TabPos_nDCVoltage_a
1108	LA_TabPos_nMotorVoltage_a
1109	LA_TabPos_wMckState1
1110	LA_TabPos_wMckState2
1111	LA_TabPos_wMckActOperationMode
1112	LA_TabPos_wActProfileNo
1113	LA_TabPos_wActPosMode
1114	LA_TabPos_nGPAnalogSwitchOut_a
1115	LA_TabPos_nGPArithmetikOut_a
1116	LA_TabPos_nGPMulDivOut_a

Selection list - analog signals

1117	LA_TabPos_nGPSignalOut1_a
1118	LA_TabPos_nGPSignalOut2_a
1119	LA_TabPos_nGPSignalOut3_a
1120	LA_TabPos_nGPSignalOut4_a
1121	LA_TabPos_wGPCounter1Out
1122	LA_TabPos_wFreeOut1
1123	LA_TabPos_wFreeOut2
1124	LA_TabPos_wFreeOut3
1125	LA_TabPos_wFreeOut4
1126	LA_TabPos_nPosCtrlOutLimit_a
1127	LA_TabPos_nPosCtrlPADapt_a
1128	LA_TabPos_wPosOutUnitsLW
1129	LA_TabPos_wPosOutUnitsHW
1200	LA_SwitchPos_wDriveControlStatus
1201	LA_SwitchPos_wFailNoLow
1202	LA_SwitchPos_wFailNoHigh
1203	LA_SwitchPos_nMotorCurrent_a
1204	LA_SwitchPos_nMotorSpeedSet_a
1205	LA_SwitchPos_nMotorSpeedAct_a
1206	LA_SwitchPos_nMotorTorqueAct_a
1207	LA_SwitchPos_nDCVoltage_a
1208	LA_SwitchPos_nMotorVoltage_a
1209	LA_SwitchPos_nGPAnalogSwitchOut_a
1210	LA_SwitchPos_nGPArithmetikOut_a
1211	LA_SwitchPos_nGPMulDivOut_a
1212	LA_SwitchPos_nGPSignalOut1_a
1213	LA_SwitchPos_nGPSignalOut2_a
1214	LA_SwitchPos_nGPSignalOut3_a
1215	LA_SwitchPos_nGPSignalOut4_a
1221	LA_SwitchPos_wFreeOut1
1222	LA_SwitchPos_wFreeOut2
1223	LA_SwitchPos_wFreeOut3
1224	LA_SwitchPos_wFreeOut4
16000	AIN1_Out
16001	AIN2_Out
16002	CAN1_wCtrl
16003	CAN1_wln2
16004	CAN1_wln3
16005	CAN1_wln4
16006	CAN2_wln1
16007	CAN2_wln2
16008	CAN2_wln3
16009	CAN2_wln4
16010	CAN3_wln1
16011	CAN3_wln2
16012	CAN3_wln3
16013	CAN3_wln4
16014	DIGIN_wCountIn1_LW

Selection list - analog signals	
16015	DIGIN_wCountIn1_HW
16016	DIGIN_nFreqIn12_a
16017	DIGIN_nFreqIn12_v
16018	DIGIN_wCountIn6_LW
16019	DIGIN_wCountIn6_HW
16020	DIGIN_nFreqIn67_a
16021	DIGIN_nFreqIn67_v
16100	LS_DataAccess_Out1
16101	LS_DataAccess_Out2
16102	LS_DataAccess_Out3
16103	LS_DataAccess_Out4
16104	LP_McIln_wCtrl
16105	LP_McIln_wIn2
16106	LP_McIln_wIn3
16107	LP_McIln_wIn4
16108	LP_McIln_wIn5
16109	LP_McIln_wIn6
16110	LP_McIln_wIn7
16111	LP_McIln_wIn8
16112	LP_McIln_wIn9
16113	LP_McIln_wIn10
16114	LP_McIln_wIn11
16115	LP_McIln_wIn12
16116	LP_McIln_wIn13
16117	LP_McIln_wIn14
16118	LP_McIln_wIn15
16119	LP_McIln_wIn16
16120	LS_Keypad_nTorqueMotLim_a
16121	LS_Keypad_nTorqueGenLim_a
16122	LS_Keypad_nMainSetValue_a
16123	LS_CANManagement_wNodeID
16130	LS_ParReadWrite_1_wOutHWord
16131	LS_ParReadWrite_1_wOutLWord
16132	LS_ParReadWrite_2_wOutHWord
16133	LS_ParReadWrite_2_wOutLWord
16134	LS_ParReadWrite_3_wOutHWord
16135	LS_ParReadWrite_3_wOutLWord
16136	LS_ParReadWrite_4_wOutHWord
16137	LS_ParReadWrite_4_wOutLWord
16138	LS_ParReadWrite_5_wOutHWord
16139	LS_ParReadWrite_5_wOutLWord
16140	LS_ParReadWrite_6_wOutHWord
16141	LS_ParReadWrite_6_wOutLWord
16170	LS_AxisBusIn_wLine1
16171	LS_AxisBusIn_wLine2
16172	LS_AxisBusIn_wLine3
16173	LS_AxisBusIn_wCas1
16174	LS_AxisBusIn_wCas2
16175	LS_AxisBusIn_wCas3
16176	LS_AxisBusIn_wCas4
16177	LS_AxisBusAux_wAuxIn1
16178	LS_AxisBusAux_wAuxIn2

Selection list - analog signals	
16179	LS_AxisBusAux_wAuxIn3
16180	LS_AxisBusAux_wAuxIn4
16181	LS_AxisBusAux_wSlaveNo
16300	LS_MultiEncoder_nActSpeed_v
16301	LS_MultiEncoder_nActSpeed_a
16302	LS_MultiEncoder_wHighWord
16303	LS_MultiEncoder_wLowWord
16320	LS_BUSEncoder_nActSpeed_v
16321	LS_BUSEncoder_nActSpeed_a
16322	LS_BUSEncoder_wHighWord
16323	LS_BUSEncoder_wLowWord
16340	LS_Resolver_nActSpeed_v
16341	LS_Resolver_nActSpeed_a
16350	LS_RetainData_wOut1
16351	LS_RetainData_wOut2
16352	LS_RetainData_wOut3
16353	LS_RetainData_wOut4
20000	LS_ParFix_Pos100_a
20001	LS_ParFix_Neg100_a
20002	LS_ParFix_Pos199_99_a
20003	LS_ParFix_Neg199_99_a
20004	LS_ParFix_65535
20005	LS_ParFix_wDriveCtrl
20010	LS_ParFree_nC472_1_a
20011	LS_ParFree_nC472_2_a
20012	LS_ParFree_nC472_3_a
20013	LS_ParFree_nC472_4_a
20014	LS_ParFree_nC472_5_a
20015	LS_ParFree_nC472_6_a
20016	LS_ParFree_nC472_7_a
20017	LS_ParFree_nC472_8_a
20018	LS_ParFree_nC473_1_v
20019	LS_ParFree_nC473_2_v
20020	LS_ParFree_nC473_3_v
20021	LS_ParFree_nC473_4_v
20022	LS_ParFree_nC473_5_v
20023	LS_ParFree_nC473_6_v
20024	LS_ParFree_nC473_7_v
20025	LS_ParFree_nC473_8_v
20026	LS_ParFree_wC471_1
20027	LS_ParFree_wC471_2
20028	LS_ParFree_wC471_3
20029	LS_ParFree_wC471_4
20030	LS_ParFree_wC471_5
20031	LS_ParFree_wC471_6
20032	LS_ParFree_wC471_7
20033	LS_ParFree_wC471_8
20034	LS_ParFree_wC471_9
20035	LS_ParFree_wC471_10
20036	LS_ParFree_wC471_11
20037	LS_ParFree_wC471_12
20038	LS_ParFree_wC471_13

Selection list - analog signals	
20039	LS_ParFree_wC471_14
20040	LS_ParFree_wC471_15
20041	LS_ParFree_wC471_16
20042	LS_ParFree_wC471_17
20043	LS_ParFree_wC471_18
20044	LS_ParFree_wC471_19
20045	LS_ParFree_wC471_20
20046	LS_ParFree_wC471_21
20047	LS_ParFree_wC471_22
20048	LS_ParFree_wC471_23
20049	LS_ParFree_wC471_24
20050	LS_ParFree_wC471_25
20051	LS_ParFree_wC471_26
20052	LS_ParFree_wC471_27
20053	LS_ParFree_wC471_28
20054	LS_ParFree_wC471_29
20055	LS_ParFree_wC471_30
20056	LS_ParFree_wC471_31
20057	LS_ParFree_wC471_32
20058	LS_ParFree_nC472_9_a
20059	LS_ParFree_nC472_10_a
20060	LS_ParFree_nC472_11_a
20061	LS_ParFree_nC472_12_a
20062	LS_ParFree_nC472_13_a
20063	LS_ParFree_nC472_14_a
20064	LS_ParFree_nC472_15_a
20065	LS_ParFree_nC472_16_a
20066	LS_ParFree_nC476_1_a
20067	LS_ParFree_nC476_2_a
20068	LS_ParFree_nC476_3_a
20069	LS_ParFree_nC476_4_a
20070	LS_ParFree_nC476_5_a
20071	LS_ParFree_nC476_6_a
20072	LS_ParFree_nC476_7_a
20073	LS_ParFree_nC476_8_a
20074	LS_ParFree_nC476_9_a
20075	LS_ParFree_nC476_10_a
20076	LS_ParFree_nC476_11_a
20077	LS_ParFree_nC476_12_a
20078	LS_ParFree_nC476_13_a
20079	LS_ParFree_nC476_14_a
20080	LS_ParFree_nC476_15_a
20081	LS_ParFree_nC476_16_a
20082	LS_ParFix2_Pos100_a
20083	LS_ParFix2_Neg100_a
20084	LS_ParFix2_Pos199_99_a
20085	LS_ParFix2_Neg199_99_a
20086	LS_ParFix2_65535
20087	LS_ParFix2_wDriveCtrl
20088	LS_ParFree_wC477_1
20089	LS_ParFree_wC477_2
20090	LS_ParFree_wC477_3

Selection list - analog signals	
20091	LS_ParFree_wC477_4
20092	LS_ParFree_wC477_5
20093	LS_ParFree_wC477_6
20094	LS_ParFree_wC477_7
20095	LS_ParFree_wC477_8
20096	LS_ParFree_wC477_9
20097	LS_ParFree_wC477_10
20098	LS_ParFree_wC477_11
20099	LS_ParFree_wC477_12
20100	LS_ParFree_wC477_13
20101	LS_ParFree_wC477_14
20102	LS_ParFree_wC477_15
20103	LS_ParFree_wC477_16
20104	LS_ParFree_wC477_17
20105	LS_ParFree_wC477_18
20106	LS_ParFree_wC477_19
20107	LS_ParFree_wC477_20
20108	LS_ParFree_wC477_21
20109	LS_ParFree_wC477_22
20110	LS_ParFree_wC477_23
20111	LS_ParFree_wC477_24
20112	LS_ParFree_wC477_25
20113	LS_ParFree_wC477_26
20114	LS_ParFree_wC477_27
20115	LS_ParFree_wC477_28
20116	LS_ParFree_wC477_29
20117	LS_ParFree_wC477_30
20118	LS_ParFree_wC477_31
20119	LS_ParFree_wC477_32
20120	LS_ParFree_nC478_1_v
20121	LS_ParFree_nC478_2_v
20122	LS_ParFree_nC478_3_v
20123	LS_ParFree_nC478_4_v
20124	LS_ParFree_nC478_5_v
20125	LS_ParFree_nC478_6_v
20126	LS_ParFree_nC478_7_v
20127	LS_ParFree_nC478_8_v
32000	MCTRL_nMotorSpeedAct_a
32001	MCTRL_nOutputSpeedCtrl_a
32002	MCTRL_nInputJerkCtrl_a
32003	MCTRL_nInputTorqueCtrl_a
32004	MCTRL_nMotorTorqueAct_a
32005	MCTRL_nActualFluxx_a
32006	MCTRL_nDCVoltage_a
32007	MCTRL_nStatorCurrentIS_a
32008	MCTRL_nEffCurrentIq_a
32009	MCTRL_nReaktCurrentId_a
32010	MCTRL_wMaxMotorSpeed
32011	MCTRL_wMaxMotorTorque
32012	MCTRL_nMotorVoltage_a
32013	MCTRL_nMotorFreqAct_a
32014	MCTRL_nEffSpeedSetValue_a

Selection list - analog signals	
32015	LS_DeviceMonitor_MCTRL_nIxTRate_a
32016	LS_DeviceMonitor_MCTRL_nI2xTRate_a
32017	MCTRL_nOutputPosCtrl_a
32018	MCTRL_nHlgSetValue_a
32019	MCTRL_nMotorSpeedAct_v
32020	MCTRL_nSpeedCtrlAct_a
32100	DCTRL_wDeviceStateWord
32101	DCTRL_wDeviceAuxStateWord
32102	DCTRL_wDetermFailNoLow
32103	DCTRL_wDetermFailNoHigh
32104	DCTRL_wDetermFailNoShort
32200	MCK_nSpeedSet_v
32201	MCK_nSpeedCtrl_a
32202	MCK_nSpeedSetValue_a
32203	MCK_nTorqueSetValue_a
32204	MCK_wActProfileNo
32205	MCK_wFollowProfileNo
32206	MCK_wMotionState1
32207	MCK_wMotionState2
32208	MCK_wAuxState
32209	MCK_nPWMAngleOffset
32210	MCK_nTorqueLimitAdapt_a
32211	Reserved
34900	MCTRL_OszCh1
34901	MCTRL_OszCh2
34902	MCTRL_OszCh3
34903	MCTRL_OszCh4
34904	MCTRL_Status1
34905	MCTRL_Status2
34906	MCTRL_Status3
34907	LS_DeviceMonitor_wUB_24V
36000	L_Absolut_Out_1
36001	L_AddSub_Out_1
36002	L_OffsetGain_Out_1
36003	L_OffsetGain_Out_2
36004	L_OffsetGainP_1
36005	L_OffsetGainP_2
36006	L_GainOffset_Out_1
36007	L_GainOffset_Out_2
36008	L_GainOffsetP_1
36009	L_GainOffsetP_2
36010	L_Negation_Out_1
36011	L_Aritmethik_Out_1
36012	L_Aritmethik_Out_2
36013	L_AnalogSwitch_Out_1
36014	L_AnalogSwitch_Out_2
36015	L_AnalogSwitch_Out_3
36016	L_Limit_Out_1
36017	L_Limit_Out_2
36018	L_NSet_NOut_1
36019	L_MotorPoti_1_Out
36020	L_PCTRL_1_Out

Selection list - analog signals	
36021	L_SigMonitor_a_Out1
36022	L_SigMonitor_a_Out2
36023	L_NLim_1_nOut_a
36024	L_Counter_1_wOut
36025	L_OffsetGainP_3
36026	L_GainOffsetP_3
36027	L_SigMonitor_a_Out3
36028	L_SigMonitor_a_Out4
36029	L_MulDiv_1_nOut_a
36030	L_NLim_1_wState
36031	L_NSet_1_wState
36032	L_NSet_1_nSetValue
36033	L_PT1_1_nOut_a
36034	L_Absolut_Out_2
36035	L_AnalogSwitch_4_Out
36036	L_AnalogSwitch_5_Out
36037	L_Aritmethik_3_Out
36038	L_Aritmethik_4_Out
36039	L_Aritmethik_5_Out
36045	L_GainOffset_Out_3
36053	L_MulDiv_2_nOut_a
36054	L_Negation_2_Out
36055	L_NLim_2_nOut_a
36056	L_NLim_2_wState
36057	L_OffsetGain_Out_3
36058	L_PT1_2_nOut_a
36059	L_PT1_3_nOut_a
36064	L_SampleHold_1_nOut_a
36065	L_SampleHold_2_nOut_a
36068	L_Counter_2_wOut
36069	L_Counter_3_wOut
36073	L_DT1_1_nOut_a
36074	L_ConvBitsToWorld_1_wOut
36075	L_ConvBitsToWorld_2_wOut
36076	L_ConvBitsToWorld_3_wOut
36077	L_ConvDIntToWords_1_wOutLWord
36078	L_ConvDIntToWords_1_wOutHWord
36079	L_ConvDIntToWords_2_wOutLWord
36080	L_ConvDIntToWords_2_wOutHWord
36081	L_ConvDIntToWords_3_wOutLWord
36082	L_ConvDIntToWords_3_wOutHWord
36083	L_MckCtrlInterface_1_wOutMckPosCtrl_1
36084	L_MckCtrlInterface_1_wOutMckPosCtrl_2
36085	L_MckCtrlInterface_1_wFailState
36086	L_MckStateInterface_1_wOperationMode
36087	L_MckStateInterface_1_wActProfileNo
36088	L_MckStateInterface_1_wActPosMode
36089	L_PosShaftCtrlInterface_1_wOutMckPosCtrl_1
36090	L_PosShaftCtrlInterface_1_wOutMckPosCtrl_2
36091	L_PCTRL_1_nPIDOut1_a
36092	L_PCTRL_1_nPIDOut2_a
36093	L_PCTRL_1_nInfluenceOut_a

Selection list - analog signals	
36094	L_Curve_1_nOut_a
36095	L_Interpolator_1_nPhdOut_v
36096	L_Interpolator_1_nNOut_a
36097	L_ConvW_1_wOut
36098	L_ConvW_2_wOut
36099	L_ConvW_3_wOut
36100	L_ConvW_4_wOut
36101	L_SRFG_1_nOut_a
36102	L_SRFG_2_nOut_a
36103	L_MckStateInterface_1_wPosUnitsLW
36104	L_MckStateInterface_1_wPosUnitsHW
36105	L_SignalSwitch_1_wOut
36106	L_SignalSwitch_2_wOut
36107	L_SignalSwitch_3_wOut
36108	L_SignalSwitch_4_wOut
36109	L_SRFG_1_nDeltaOut_a
36110	L_SRFG_2_nDeltaOut_a
36111	L_Odometer_1_wLastMeasure
36112	L_FixSet_a_1_nOut_a
36113	L_FixSet_a_1_wSelect
36114	L_FixSet_w_1_wOut
36115	L_FixSet_w_1_wSelect
36116	L_FixSet_w_2_wOut
36117	L_FixSet_w_2_wSelect
36120	L_CalcDiameter_nDiameter_a
36121	L_CalcDiameter_nReziprDiameter_a
36122	L_CalcDiameter_nNReel_v
36123	L_CalcDiameter_nDMin_a
36124	L_ProcessCtrl_nOut_a
36125	L_ProcessCtrl_nOutRed_a
36126	L_ProcessCtrl_nDeviation_a
36127	L_ProcessCtrl_nDComponent
36128	L_Philntegrator_nOut16
36129	L_Philntegrator_nSpeedGearAdd_v
36130	L_PosCtrlLin_1_nNOut_v
36131	L_PosCtrlLin_2_nNOut_v
36132	L_Philntegrator_nSpeedGear_v
36133	L_DFSet_nSetGain_v
36134	L_DFSet_nSetGearTrim_v
36135	L_DFSet_nSetGearTrim_a
36136	L_DFRFG_nOut_v
36137	L_ConvPA_1_nOut
36138	L_ConvPA_2_nOut
36139	L_ConvPA_3_nOut
36140	L_ConvX_1_nOut
36141	L_ConvX_2_nOut
36142	L_ConvX_3_nOut
36143	MCK_wGearNum
36144	MCK_wGearDenom
36145	L_DFSet_nSpeedSetOut_v
36146	L_Curve_2_nOut_a
36147	L_Curve_3_nOut_a

Selection list - analog signals	
42000	LA_nCtrl_In_wCANDriveControl
42001	LA_nCtrl_In_wCCMDriveControl
42002	LA_nCtrl_In_nTorqueMotLim
42003	LA_nCtrl_In_nTorqueGenLim
42004	LA_nCtrl_In_nPIDVpAdapt_a
42005	LA_nCtrl_In_nPIDActValue_a
42006	LA_nCtrl_In_nMainSetValue
42007	LA_nCtrl_In_nAuxSetValue
42008	LA_nCtrl_In_nGPAnalogSwitchIn1_a
42009	LA_nCtrl_In_nGPAnalogSwitchIn2_a
42010	LA_nCtrl_In_nGPArithmetikIn1_a
42011	LA_nCtrl_In_nGPArithmetikIn2_a
42012	LA_nCtrl_In_nGPMulDivIn_a
42013	LA_nCtrl_In_nGPCCompareIn1_a
42014	LA_nCtrl_In_nGPCCompareIn2_a
42015	LA_nCtrl_In_nVoltageAdd_a
42016	LA_nCtrl_In_nPIDInfluence_a
42017	LA_nCtrl_In_nPIDSetValue_a
42018	LA_nCtrl_In_nPWMAngleOffset
42019	LA_nCtrl_In_nBoost_a
42020	LA_NCtrl_In_wSMControl
42025	LA_nCtrl_In_wFreel1
42026	LA_nCtrl_In_wFreel2
42027	LA_nCtrl_In_wFreel3
42028	LA_nCtrl_In_wFreel4
42100	LA_TabPos_In_wCanDriveControl
42101	LA_TabPos_In_wMciDriveControl
42102	LA_TabPos_In_nTorqueMotLim_a
42103	LA_TabPos_In_nTorqueGenLim_a
42104	LA_TabPos_In_nMainSetValue_a
42105	LA_TabPos_In_nAuxSetValue_a
42106	LA_TabPos_In_wMckCtrl1
42107	LA_TabPos_In_wMckCtrl2
42108	LA_TabPos_In_wMckOperationMode
42109	LA_TabPos_In_wPosProfileMode
42110	LA_TabPos_In_wPosProfileNo
42111	LA_TabPos_In_nGPAnalogSwitchIn1_a
42112	LA_TabPos_In_nGPAnalogSwitchIn2_a
42113	LA_TabPos_In_nGPArithmetikIn1_a
42114	LA_TabPos_In_nGPArithmetikIn2_a
42115	LA_TabPos_In_nGPMulDivIn_a
42116	LA_TabPos_In_nGPCCompareIn1_a
42117	LA_TabPos_In_nGPCCompareIn2_a
42118	LA_TabPos_In_wGPCCounter1LdVal
42119	LA_TabPos_In_wGPCCounter1CmpVal
42120	LA_TabPos_In_nSpeedOverride_a
42121	LA_TabPos_In_nAccOverride_a
42122	LA_TabPos_In_wFreel1
42123	LA_TabPos_In_wFreel2
42124	LA_TabPos_In_wFreel3
42125	LA_TabPos_In_wFreel4
42126	LA_TabPos_In_wSMControl

Selection list - analog signals	
42127	LA_TabPos_In_wPosProfileUnitsLW
42128	LA_TabPos_In_wPosProfileUnitsHW
42200	LA_SwitchPos_In_wCANDriveControl
42201	LA_SwitchPos_In_wMCIDriveControl
42202	LA_SwitchPos_In_nVoltageAdd_a
42203	LA_SwitchPos_In_nBoost_a
42204	LA_SwitchPos_In_nPWMAngleOffset
42205	LA_SwitchPos_In_nTorqueMotLim_a
42206	LA_SwitchPos_In_nTorqueGenLim_a
42207	LA_SwitchPos_In_nMainSetValue_a
42208	LA_SwitchPos_In_nAuxSetValue_a
42209	LA_SwitchPos_In_nGPAnalogSwitchIn1_a
42210	LA_SwitchPos_In_nGPAnalogSwitchIn2_a
42211	LA_SwitchPos_In_nGPArithmetikIn1_a
42212	LA_SwitchPos_In_nGPArithmetikIn2_a
42213	LA_SwitchPos_In_nGPMulDivIn_a
42214	LA_SwitchPos_In_nGPCompareIn1_a
42215	LA_SwitchPos_In_nGPCompareIn2_a
42216	LA_SwitchPos_In_wSMControl
42221	LA_SwitchPos_In_wFreeln1
42222	LA_SwitchPos_In_wFreeln2
42223	LA_SwitchPos_In_wFreeln3
42224	LA_SwitchPos_In_wFreeln4

16.2.1.2 Selection list - digital signals

This selection list is relevant for the following parameters:

Parameter	
C00411	L_SignalMonitor_b: Signal sources
C00621	System connection list: Bool
C00701	LA_nCtrl: Digital connection list
C00711	LA_TabPos: Digital connection list
C00761	LA_SwitchPos: Digital connection list

Selection list - digital signals	
0	Not connected
1000	LA_nCtrl_bDriveReady
1001	LA_nCtrl_bDriveFail
1002	LA_nCtrl_bClnhActive
1003	LA_nCtrl_bQSPIsActive
1004	LA_nCtrl_bSpeedCcw
1005	LA_nCtrl_bSpeedActCompare
1008	LA_nCtrl_bGPDigitalDelayOut
1009	LA_nCtrl_bGPLogicOut
1010	LA_nCtrl_bGPSignalOut1
1011	LA_nCtrl_bGPSignalOut2
1012	LA_nCtrl_bGPSignalOut3
1013	LA_nCtrl_bGPSignalOut4
1014	LA_nCtrl_bOverLoadActive
1015	LA_nCtrl_bBrakeReleaseOut
1016	LA_nCtrl_bBrakeReleased
1017	LA_nCtrl_bGPCompareOut
1018	LA_nCtrl_bUnderLoadActive
1019	LA_nCtrl_bImaxActive
1020	LA_nCtrl_bSpeedSetReached
1021	LA_nCtrl_bSpeedActEqSet
1022	LA_nCtrl_bGPDFlipFlopOut
1023	LA_nCtrl_bGPDFlipFlopNegOut
1029	LA_nCtrl_bFreeOut1
1030	LA_nCtrl_bFreeOut2
1031	LA_nCtrl_bFreeOut3
1032	LA_nCtrl_bFreeOut4
1033	LA_nCtrl_bFreeOut5
1034	LA_nCtrl_bFreeOut6
1035	LA_nCtrl_bFreeOut7
1036	LA_nCtrl_bFreeOut8
1100	LA_TabPos_bDriveFail
1101	LA_TabPos_bDriveReady
1102	LA_TabPos_bClnhActive
1103	LA_TabPos_bQSPIsActive
1104	LA_TabPos_bSpeedCcw
1105	LA_TabPos_bSpeedActCompare
1106	LA_TabPos_bImaxActive
1107	LA_TabPos_bSpeedSetReached
1108	LA_TabPos_bMBrakeReleaseOut

Selection list - digital signals

1109	LA_TabPos_bMBrakeReleased
1110	LA_TabPos_bHomeDone
1111	LA_TabPos_bHomePosAvailable
1112	LA_TabPos_bProfileDone
1113	LA_TabPos_bProfileBusy
1114	LA_TabPos_bAccelerating
1115	LA_TabPos_bConstantDuty
1116	LA_TabPos_bDecelerating
1117	LA_TabPos_bDwellTime
1118	LA_TabPos_bInTarget
1119	LA_TabPos_bGPDigitalDelayOut
1120	LA_TabPos_bGPLogicOut
1121	LA_TabPos_bGPCompareOut
1122	LA_TabPos_bGPSignalOut1
1123	LA_TabPos_bGPSignalOut2
1124	LA_TabPos_bGPSignalOut3
1125	LA_TabPos_bGPSignalOut4
1126	LA_TabPos_bGPDFlipFlop_Out
1127	LA_TabPos_bGPDFlipFlop_NegOut
1128	LA_TabPos_bGPCounter1Equal
1129	LA_TabPos_bFreeOut1
1130	LA_TabPos_bFreeOut2
1131	LA_TabPos_bFreeOut3
1132	LA_TabPos_bFreeOut4
1133	LA_TabPos_bFreeOut5
1134	LA_TabPos_bFreeOut6
1135	LA_TabPos_bFreeOut7
1136	LA_TabPos_bFreeOut8
1200	LA_SwitchPos_bDriveFail
1201	LA_SwitchPos_bWarningActive
1202	LA_SwitchPos_bSafeTorqueOff
1203	LA_SwitchPos_bDriveReady
1204	LA_SwitchPos_bClnhActive
1205	LA_SwitchPos_bImplsActive
1206	LA_SwitchPos_bQSPIsActive
1207	LA_SwitchPos_bSpeedCcw
1208	LA_SwitchPos_bSpeedActCompare
1209	LA_SwitchPos_bImaxActive
1210	LA_SwitchPos_bSpeedSetReached
1211	LA_SwitchPos_bSpeedActEqSet
1212	LA_SwitchPos_bBrakeReleaseOut
1213	LA_SwitchPos_bBrakeReleased
1214	LA_SwitchPos_bGPDigitalDelayOut
1215	LA_SwitchPos_bGPLogicOut
1216	LA_SwitchPos_bGPCompareOut
1217	LA_SwitchPos_bGPDFlipFlop_Out
1218	LA_SwitchPos_bGPDFlipFlop_NegOut
1219	LA_SwitchPos_bGPSignalOut1
1220	LA_SwitchPos_bGPSignalOut2
1221	LA_SwitchPos_bGPSignalOut3

Selection list - digital signals	
1222	LA_SwitchPos_bGPSignalOut4
1228	LA_SwitchPos_bFreeOut1
1229	LA_SwitchPos_bFreeOut2
1230	LA_SwitchPos_bFreeOut3
1231	LA_SwitchPos_bFreeOut4
1232	LA_SwitchPos_bFreeOut5
1233	LA_SwitchPos_bFreeOut6
1234	LA_SwitchPos_bFreeOut7
1235	LA_SwitchPos_bFreeOut8
16000	DigIn_bln1
16001	DigIn_bln2
16002	DigIn_bln3
16003	DigIn_bln4
16004	DigIn_bln5
16005	DigIn_bln6
16006	DigIn_bln7
16008	DigIn_Clnh
16009	DigIn_bCountIn1_Compare
16010	DigIn_bCountIn6_Compare
16011	Ain_bCurrentErrorIn1
16012	Ain_bCurrentErrorIn2
16013	CAN1_bCtrl1_B0
16014	CAN1_bCtrl1_B1
16015	CAN1_bCtrl1_B2
16016	CAN1_bCtrl1_B3
16017	CAN1_bCtrl1_B4
16018	CAN1_bCtrl1_B5
16019	CAN1_bCtrl1_B6
16020	CAN1_bCtrl1_B7
16021	CAN1_bCtrl1_B8
16022	CAN1_bCtrl1_B9
16023	CAN1_bCtrl1_B10
16024	CAN1_bCtrl1_B11
16025	CAN1_bCtrl1_B12
16026	CAN1_bCtrl1_B13
16027	CAN1_bCtrl1_B14
16028	CAN1_bCtrl1_B15
16029	CAN2_bln1_B0
16030	CAN2_bln1_B1
16031	CAN2_bln1_B2
16032	CAN2_bln1_B3
16033	CAN2_bln1_B4
16034	CAN2_bln1_B5
16035	CAN2_bln1_B6
16036	CAN2_bln1_B7
16037	CAN2_bln1_B8
16038	CAN2_bln1_B9
16039	CAN2_bln1_B10
16040	CAN2_bln1_B11
16041	CAN2_bln1_B12
16042	CAN2_bln1_B13
16043	CAN2_bln1_B14

Selection list - digital signals	
16044	CAN2_bln1_B15
16045	CAN3_bln1_B0
16046	CAN3_bln1_B1
16047	CAN3_bln1_B2
16048	CAN3_bln1_B3
16049	CAN3_bln1_B4
16050	CAN3_bln1_B5
16051	CAN3_bln1_B6
16052	CAN3_bln1_B7
16053	CAN3_bln1_B8
16054	CAN3_bln1_B9
16055	CAN3_bln1_B10
16056	CAN3_bln1_B11
16057	CAN3_bln1_B12
16058	CAN3_bln1_B13
16059	CAN3_bln1_B14
16060	CAN3_bln1_B15
16061	MciIn_bCtrl_B0
16062	MciIn_bCtrl_B1
16063	MciIn_bCtrl_B2
16064	MciIn_bCtrl_B3
16065	MciIn_bCtrl_B4
16066	MciIn_bCtrl_B5
16067	MciIn_bCtrl_B6
16068	MciIn_bCtrl_B7
16069	MciIn_bCtrl_B8
16070	MciIn_bCtrl_B9
16071	MciIn_bCtrl_B10
16072	MciIn_bCtrl_B11
16073	MciIn_bCtrl_B12
16074	MciIn_bCtrl_B13
16075	MciIn_bCtrl_B14
16076	MciIn_bCtrl_B15
16077	MciIn_bln2_B0
16078	MciIn_bln2_B1
16079	MciIn_bln2_B2
16080	MciIn_bln2_B3
16081	MciIn_bln2_B4
16082	MciIn_bln2_B5
16083	MciIn_bln2_B6
16084	MciIn_bln2_B7
16085	MciIn_bln2_B8
16086	MciIn_bln2_B9
16087	MciIn_bln2_B10
16088	MciIn_bln2_B11
16089	MciIn_bln2_B12
16090	MciIn_bln2_B13
16091	MciIn_bln2_B14
16092	MciIn_bln2_B15
16093	LS_Keypad_bSetQuickstop
16094	LS_Keypad_bSetDCBrake
16095	LS_Keypad_bSetSpeedCcw

Selection list - digital signals	
16096	LS_Keypad_bJogSpeed1
16097	LS_Keypad_bJogSpeed2
16098	LS_Keypad_bMPotEnable
16099	LS_Keypad_bMPotUp
16100	LS_Keypad_bMPotDown
16101	DigIn_bPosIn12_State
16110	LS_ParReadWrite_1_bDone
16111	LS_ParReadWrite_1_bFail
16112	LS_ParReadWrite_2_bDone
16113	LS_ParReadWrite_2_bFail
16114	LS_ParReadWrite_3_bDone
16115	LS_ParReadWrite_3_bFail
16116	LS_ParReadWrite_4_bDone
16117	LS_ParReadWrite_4_bFail
16118	LS_ParReadWrite_5_bDone
16119	LS_ParReadWrite_5_bFail
16120	LS_ParReadWrite_6_bDone
16121	LS_ParReadWrite_6_bFail
16122	LS_WriteParamList_bDone
16123	LS_WriteParamList_bFail
16161	LS_CANManagement_bFail
16162	LS_CANManagement_bOperational
16165	LS_MultiEncoder_bFail
16166	LS_Resolver_bFail
16200	LS_SyncManagement_bSyncSignalOK
16201	LS_SyncManagement_bSyncPhaseOK
16202	LS_MultiEncoder_bState
16303	LS_TouchProbe_bTP_DigIn3_Received
16304	LS_TouchProbe_bTP_DigIn4_Received
16305	LS_TouchProbe_bTP_DigIn5_Received
16306	LS_TouchProbe_bTP_DigIn6_Received
16307	LS_TouchProbe_bTP_DigIn7_Received
16308	LS_AxisBusIO_bFail_DigIn
16309	LS_AxisBusIO_bResetFail_In
16310	LS_RetainData_bOut1
16311	LS_RetainData_bOut2
16312	LS_RetainData_bOut3
16313	LS_RetainData_bOut4
16320	LS_AxisBusAux_bDone
16321	LS_AxisBusAux_bFail
20000	LS_ParFix_True
20001	bC470_1
20002	bC470_2
20003	bC470_3
20004	bC470_4
20005	bC470_5
20006	bC470_6
20007	bC470_7
20008	bC470_8
20009	bC470_9
20010	bC470_10
20011	bC470_11

Selection list - digital signals	
20012	bC470_12
20013	bC470_13
20014	bC470_14
20015	bC470_15
20016	bC470_16
20017	bC470_17
20018	bC470_18
20019	bC470_19
20020	bC470_20
20021	bC470_21
20022	bC470_22
20023	bC470_23
20024	bC470_24
20025	bC470_25
20026	bC470_26
20027	bC470_27
20028	bC470_28
20029	bC470_29
20030	bC470_30
20031	bC470_31
20032	bC470_32
20033	b100Hz
20034	b10Hz
20035	b2Hz
20036	b1Hz
20037	b1HzFlash
20038	b2HzFlash
20039	bSingleFlash1
20040	bSingleFlash2
20041	bDoubleFlash
20042	bSquareWave
20043	bFirstCycle
20044	LS_ParFix2_True
20045	LS_ParFreeUnit_bDataValid
20046	LS_ParFreeUnit2_bDataValid
32000	LS_DeviceMonitor_MCTRL_bFanFault
32001	LS_DeviceMonitor_MCTRL_bHeatSinkTemp
32002	MCTRL_bLimPosCtrlOut
32003	MCTRL_bLimSpeedCtrlOut
32004	MCTRL_bLimSpeedSetVal
32005	MCTRL_bLimTorqueSetVal
32006	MCTRL_bLimCurrentSetVal
32007	LS_DeviceMonitor_MCTRL_bUVDetected
32008	LS_DeviceMonitor_MCTRL_bOVDetected
32009	LS_DeviceMonitor_MCTRL_bMotorPhaseFault
32010	LS_DeviceMonitor_MCTRL_bEncoderComFault
32011	LS_DeviceMonitor_MCTRL_bIxtOverload
32012	LS_DeviceMonitor_MCTRL_bI2xtOverload
32013	MCTRL_bIdentificationActive
32014	MCTRL_bFlyingSyncActive
32015	LS_DeviceMonitor_MCTRL_bTorqueMax
32016	LS_DeviceMonitor_MCTRL_bNMax

Selection list - digital signals	
32017	LS_DeviceMonitor_MCTRL_bFChopReduced
32018	LS_DeviceMonitor_MCTRL_bMotorPTC
32019	LS_DeviceMonitor_MCTRL_bMotorTemp
32020	MCTRL_bAutoGSBIsActive
32021	LS_DeviceMonitor_MCTRL_bBrakeChopper
32022	MCTRL_bQsplsActive
32023	MCTRL_bHlgLoad
32024	MCTRL_bHlgStop
32025	LS_DeviceMonitor_MCTRL_bImpActive
32026	LS_DeviceMonitor_MCTRL_bClampActive
32027	LS_DeviceMonitor_MCTRL_bMainsFault
32028	LS_DeviceMonitor_MCTRL_bNmaxForFChop
32029	LS_DeviceMonitor_MCTRL_bShortCircuit
32030	LS_DeviceMonitor_MCTRL_bEarthFault
32100	DCTRL_bInit
32101	DCTRL_bReady
32102	DCTRL_bReadyToSwitchOn
32103	DCTRL_bOperationEnable
32104	DCTRL_bWarning
32105	DCTRL_bTrouble
32106	DCTRL_bFail
32107	DCTRL_bCollectedFail
32108	DCTRL_bSafeTorqueOff
32109	DCTRL_bIMPIsActive
32110	DCTRL_bCINHIsActive
32111	DCTRL_bSafetyIsActive
32112	DCTRL_bCwCcw
32113	DCTRL_bNactCompare
32200	MCK_bPosCtrlOn
32201	MCK_bSpeedCtrlOn
32202	MCK_bTorquemodeOn
32203	MCK_bDcBrakeOn
32204	MCK_bBrkReleaseOut
32205	MCK_bBrkReleased
32206	MCK_bDeltaPosOn
32207	MCK_bPosDerivativeOn
32208	MCK_bMotorRefOffsetOn
32209	MCK_bQspOn
32210	MCK_bPosBusy
32211	MCK_bPosDone
32212	MCK_bHomDone
32213	MCK_bHomAvailable
32214	MCK_bTorqueLimitAdaptOn
32215	Reserved
32216	Reserved
32217	Reserved
32218	Reserved
36000	L_AND_Out_1
36001	L_AND_Out_2
36002	L_AND_Out_3
36003	L_OR_Out_1
36004	L_OR_Out_2

Selection list - digital signals	
36005	L_OR_Out_3
36006	L_NOT_Out_1
36007	L_NOT_Out_2
36008	L_NOT_Out_3
36009	L_DFlipFlop_Out_1
36010	L_RLQ_1_Qsp
36011	L_RLQ_1_Ccw
36012	L_DigDelay_Out_1
36013	L_Compare_Out_1
36014	L_Compare_Out_2
36015	L_Compare_Out_3
36016	L_Nset_RfgEq0_1
36017	L_DigitalLogic_1_bOut
36018	L_Counter_1_bEqual
36019	L_SigMonitor_b_bOut1
36020	L_SigMonitor_b_bOut2
36021	L_SigMonitor_b_bOut3
36022	L_SigMonitor_b_bOut4
36023	L_PCTRL_1_bActEqSet
36024	L_NLim_1_bLimitActive
36025	L_DFlipFlop_1_NegOut
36026	L_AND5_1_Out
36027	L_AND5_2_Out
36028	L_Compare_4_bOut
36029	L_Compare_5_bOut
36030	L_Compare_6_bOut
36031	L_Compare_7_bOut
36032	L_Compare_8_bOut
36033	L_Compare_9_bOut
36034	L_Compare_10_bOut
36035	L_DFlipFlop_2_bOut
36036	L_DFlipFlop_2_bNegOut
36037	L_DigDelay_2_Out
36038	L_DigDelay_3_Out
36039	L_OR_Out_4
36040	L_DigitalLogic_3_bOut
36041	L_DigitalLogic_2_bOut
36042	L_DigitalLogic5_1_bOut
36043	L_DigitalLogic5_2_bOut
36044	L_NLim_2_bLimitActive
36045	L_OR5_1_Out
36046	L_OR5_2_Out
36047	L_NOT_4_Out
36048	L_NOT_5_Out
36049	L_NOT_6_Out
36050	L_NOT_7_Out
36055	L_PhaseIntK_1_bState
36056	L_PhaseIntK_2_bState
36057	L_Counter_2_bEqual
36058	L_Counter_3_bEqual
36059	L_RSFlipflop_1_bOut
36060	L_RSFlipflop_1_bNegOut

Selection list - digital signals	
36061	L_RSFlipflop_2_bOut
36062	L_RSFlipflop_2_bNegOut
36063	L_Transient_5_bOut
36064	L_Transient_6_bOut
36065	L_Transient_7_bOut
36066	L_Transient_8_bOut
36067	L_ConvWordToBits_1_bBit0
36068	L_ConvWordToBits_1_bBit1
36069	L_ConvWordToBits_1_bBit2
36070	L_ConvWordToBits_1_bBit3
36071	L_ConvWordToBits_1_bBit4
36072	L_ConvWordToBits_1_bBit5
36073	L_ConvWordToBits_1_bBit6
36074	L_ConvWordToBits_1_bBit7
36075	L_ConvWordToBits_1_bBit8
36076	L_ConvWordToBits_1_bBit9
36077	L_ConvWordToBits_1_bBit10
36078	L_ConvWordToBits_1_bBit11
36079	L_ConvWordToBits_1_bBit12
36080	L_ConvWordToBits_1_bBit13
36081	L_ConvWordToBits_1_bBit14
36082	L_ConvWordToBits_1_bBit15
36083	L_ConvWordToBits_2_bBit0
36084	L_ConvWordToBits_2_bBit1
36085	L_ConvWordToBits_2_bBit2
36086	L_ConvWordToBits_2_bBit3
36087	L_ConvWordToBits_2_bBit4
36088	L_ConvWordToBits_2_bBit5
36089	L_ConvWordToBits_2_bBit6
36090	L_ConvWordToBits_2_bBit7
36091	L_ConvWordToBits_2_bBit8
36092	L_ConvWordToBits_2_bBit9
36093	L_ConvWordToBits_2_bBit10
36094	L_ConvWordToBits_2_bBit11
36095	L_ConvWordToBits_2_bBit12
36096	L_ConvWordToBits_2_bBit13
36097	L_ConvWordToBits_2_bBit14
36098	L_ConvWordToBits_2_bBit15
36099	L_ConvWordToBits_3_bBit0
36100	L_ConvWordToBits_3_bBit1
36101	L_ConvWordToBits_3_bBit2
36102	L_ConvWordToBits_3_bBit3
36103	L_ConvWordToBits_3_bBit4
36104	L_ConvWordToBits_3_bBit5
36105	L_ConvWordToBits_3_bBit6
36106	L_ConvWordToBits_3_bBit7
36107	L_ConvWordToBits_3_bBit8
36108	L_ConvWordToBits_3_bBit9
36109	L_ConvWordToBits_3_bBit10
36110	L_ConvWordToBits_3_bBit11
36111	L_ConvWordToBits_3_bBit12
36112	L_ConvWordToBits_3_bBit13

Selection list - digital signals	
36113	L_ConvWordToBits_3_bBit14
36114	L_ConvWordToBits_3_bBit15
36115	L_MckCtrlInterface_1_bFail
36116	L_MckStateInterface_1_bAccelerating
36117	L_MckStateInterface_1_bDecelerating
36118	L_MckStateInterface_1_bConstantSpeedDuty
36119	L_MckStateInterface_1_bSShaping
36120	L_MckStateInterface_1_bBusy
36121	L_MckStateInterface_1_bDone
36122	L_MckStateInterface_1_bHomingPosAvailable
36123	L_MckStateInterface_1_bHomingDone
36124	L_MckStateInterface_1_bDwellTime
36125	L_MckStateInterface_1_bInTarget
36126	L_MckStateInterface_1_bPosDone
36127	L_PosShaftCtrlInterface_1_bQsp
36128	L_PosShaftCtrlInterface_1_bRsp
36129	L_PosShaftCtrlInterface_1_bTripSet
36130	L_PosShaftCtrlInterface_1_bTripReset
36131	L_JogCtrlExtension_bRfgOut
36132	L_JogCtrlExtension_bJog1Out
36133	L_JogCtrlExtension_bJog2Out
36134	L_Curve_1_bLimit
36135	L_Interpolator_1_bPulse
36136	L_Interpolator_1_bSignalError
36137	L_MckCtrlInterface_1_bPosSetDataValid
36138	L_Transient_1_bOut
36139	L_Transient_2_bOut
36140	L_Transient_3_bOut
36141	L_Transient_4_bOut
36142	L_CalcDiameter_bDMaxLimit
36143	L_CalcDiameter_bDMinLimit
36144	L_CalcDiameter_bWebBreak
36145	L_PhilIntegrator_bOvfl32
36146	L_PhilIntegrator_bOvfl16
36147	L_PhilIntegrator_bInItDone
36148	L_PosCtrlLin_1_bInTarget
36149	L_PosCtrlLin_2_bInTarget
36150	L_SwitchPoint_bOut1
36151	L_SwitchPoint_bOut2
36152	L_SwitchPoint_bOut3
36153	L_SwitchPoint_bOut4
36154	L_DFSet_bAck_b
36155	L_DFSet_bFollowingErr_b
36156	L_DFSet_bPosOverflow_b
36157	L_DFRFG_bSync_b
36158	L_DFRFG_bFail_b
36159	L_Curve_2_bLimit
36160	L_Curve_3_bLimit
42000	LA_NCtrl_In_bClnh
42001	LA_NCtrl_In_bFailReset
42002	LA_NCtrl_In_bSetQuickstop
42003	LA_NCtrl_In_bSetDCBrake

Selection list - digital signals	
42004	LA_NCtrl_In_bRFG_Stop
42005	LA_NCtrl_In_bRFG_0
42007	LA_NCtrl_In_bSetSpeedCcw
42008	LA_NCtrl_bJogSpeed1
42009	LA_NCtrl_bJogSpeed2
42010	LA_NCtrl_bJogSpeed4
42011	LA_NCtrl_bJogSpeed8
42012	LA_NCtrl_bJogRamp1
42013	LA_NCtrl_bJogRamp2
42014	LA_NCtrl_bJogRamp4
42015	LA_NCtrl_bJogRamp8
42017	LA_NCtrl_bMPOTInAct
42018	LA_NCtrl_bMPOTUp
42019	LA_NCtrl_bMPOTDown
42020	LA_NCtrl_bMBRKRelease
42021	LA_NCtrl_bMANJogPos
42022	LA_NCtrl_bMANJogNeg
42023	LA_NCtrl_bGPAnalogSwitchSet
42024	LA_NCtrl_bGPDigitalDelayIn
42025	LA_NCtrl_bGPLogicIn1
42026	LA_NCtrl_bGPLogicIn2
42027	LA_NCtrl_bGPLogicIn3
42028	LA_NCtrl_bGPDFlipFlopInD
42029	LA_NCtrl_bGPDFlipFlopInClk
42030	LA_NCtrl_bGPDFlipFlopInClr
42031	LA_NCtrl_bMPotEnable
42032	LA_NCtrl_bPIDEnableInfluenceRamp
42033	LA_NCtrl_bPIDIOff
42034	LA_NCtrl_bRLQCw
42035	LA_NCtrl_bRLQCcw
42041	LA_NCtrl_bFreeln1
42042	LA_NCtrl_bFreeln2
42043	LA_NCtrl_bFreeln3
42044	LA_NCtrl_bFreeln4
42045	LA_NCtrl_bFreeln5
42046	LA_NCtrl_bFreeln6
42047	LA_NCtrl_bFreeln7
42048	LA_NCtrl_bFreeln8
42100	LA_TabPos_In_bCInh
42101	LA_TabPos_In_bFailReset
42102	LA_TabPos_In_bSetQuickstop
42103	LA_TabPos_In_bSetSpeedCcw
42104	LA_TabPos_In_bJogSpeed1
42105	LA_TabPos_In_bJogSpeed2
42106	LA_TabPos_In_bMPotEnable
42107	LA_TabPos_In_bMPotUp
42108	LA_TabPos_In_bMPotDown
42109	LA_TabPos_In_bMBrakeRelease
42110	LA_TabPos_In_bPosCtrlOn
42111	LA_TabPos_In_bLimitSwitchPos
42112	LA_TabPos_In_bLimitSwitchNeg
42113	LA_TabPos_In_bReleaseLimitSwitch

Selection list - digital signals	
42114	LA_TabPos_In_bManJogPos
42115	LA_TabPos_In_bManJogNeg
42116	LA_TabPos_In_bManEnable2ndSpeed
42117	LA_TabPos_In_bEnableSpeedOverride
42118	LA_TabPos_In_bEnableAccOverride
42119	LA_TabPos_In_bHomeStartStop
42120	LA_TabPos_In_bHomeSetPosition
42121	LA_TabPos_In_bHomeResetPosition
42122	LA_TabPos_In_bHomeMark
42123	LA_TabPos_In_bPosSetProfilePosition
42124	LA_TabPos_In_bPosSetActualPosition
42125	LA_TabPos_In_bPosExecute
42126	LA_TabPos_In_bPosFinishTarget
42127	LA_TabPos_In_bPosDisableFollowProfile
42128	LA_TabPos_In_bPosStop
42129	LA_TabPos_In_bGPAnalogSwitchSet
42130	LA_TabPos_In_bGPDigitalDelayIn
42131	LA_TabPos_In_bGPLogicIn1
42132	LA_TabPos_In_bGPLogicIn2
42133	LA_TabPos_In_bGPLogicIn3
42134	LA_TabPos_In_bGPDFlipFlop_InD
42135	LA_TabPos_In_bGPDFlipFlop_InClk
42136	LA_TabPos_In_bGPDFlipFlop_InClr
42137	LA_TabPos_In_bGPCounter1ClkUp
42138	LA_TabPos_In_bGPCounter1ClkDown
42139	LA_TabPos_In_bGPCounter1Load
42140	LA_TabPos_In_bMckOperationMode_1
42141	LA_TabPos_In_bMckOperationMode_2
42142	LA_TabPos_In_bMckOperationMode_4
42143	LA_TabPos_In_bMckOperationMode_8
42144	LA_TabPos_In_bPosProfileNo_1
42145	LA_TabPos_In_bPosProfileNo_2
42146	LA_TabPos_In_bPosProfileNo_4
42147	LA_TabPos_In_bPosProfileNo_8
42148	LA_TabPos_In_bFreeln1
42149	LA_TabPos_In_bFreeln2
42150	LA_TabPos_In_bFreeln3
42151	LA_TabPos_In_bFreeln4
42152	LA_TabPos_In_bFreeln5
42153	LA_TabPos_In_bFreeln6
42154	LA_TabPos_In_bFreeln7
42155	LA_TabPos_In_bFreeln8
42200	LA_SwitchPos_bCInh
42201	LA_SwitchPos_bFailReset
42202	LA_SwitchPos_bSetQuickstop
42203	LA_SwitchPos_bSetDCBrake
42204	LA_SwitchPos_bRFG_Stop
42205	LA_SwitchPos_bSetSpeedCcw
42206	LA_SwitchPos_bRLQCw
42207	LA_SwitchPos_bRLQCcw
42208	LA_SwitchPos_bJogCtrlInputSel1
42209	LA_SwitchPos_bJogCtrlInputSel2

Selection list - digital signals	
42210	LA_SwitchPos_bJogCtrlRfglIn
42211	LA_SwitchPos_bJogCtrlJog1
42212	LA_SwitchPos_bJogCtrlJog2
42213	LA_SwitchPos_bJogCtrlSlowDown1
42214	LA_SwitchPos_bJogCtrlStop1
42215	LA_SwitchPos_bJogCtrlSlowDown2
42216	LA_SwitchPos_bJogCtrlStop2
42217	LA_SwitchPos_bJogCtrlSlowDown3
42218	LA_SwitchPos_bJogCtrlStop3
42219	LA_SwitchPos_bJogSpeed4
42220	LA_SwitchPos_bJogSpeed8
42221	LA_SwitchPos_bJogRamp1
42222	LA_SwitchPos_bJogRamp2
42223	LA_SwitchPos_bJogRamp4
42224	LA_SwitchPos_bJogRamp8
42225	LA_SwitchPos_bMBrkRelease
42226	LA_SwitchPos_bGPAnalogSwitchSet
42227	LA_SwitchPos_bGPDigitalDelayIn
42228	LA_SwitchPos_bGPLogicIn1
42229	LA_SwitchPos_bGPLogicIn2
42230	LA_SwitchPos_bGPLogicIn3
42231	LA_SwitchPos_bGPDFlipFlop_InD
42232	LA_SwitchPos_bGPDFlipFlop_InClk
42233	LA_SwitchPos_bGPDFlipFlop_InClr
42239	LA_SwitchPos_bFreeIn1
42240	LA_SwitchPos_bFreeIn2
42241	LA_SwitchPos_bFreeIn3
42242	LA_SwitchPos_bFreeIn4
42243	LA_SwitchPos_bFreeIn5
42244	LA_SwitchPos_bFreeIn6
42245	LA_SwitchPos_bFreeIn7
42246	LA_SwitchPos_bFreeIn8

16.2.1.3 Selection list - angle signals

This selection list is relevant for the following parameters:

Parameter	
C00622	System connection list: Angle
C00712	LA_TabPos: phi connection list

Selection list - angle signals	
0	Not connected
1005	LA_NCtrl_dnFreeOut1_p
1006	LA_NCtrl_dnFreeOut1_p
1100	LA_TabPos_dnTargetPos_p
1101	LA_TabPos_dnSetPos_p
1102	LA_TabPos_dnFreeOut1_p
1103	LA_TabPos_dnFreeOut2_p
1104	LA_TabPos_dnPosAct_p
1105	LA_TabPos_dnDeltaPosAct_p
1205	LA_SwitchPos_dnFreeOut1_p
1206	LA_SwitchPos_dnFreeOut2_p
16000	CAN1_dnIn34_p
16001	CAN2_dnIn34_p
16002	CAN3_dnIn34_p
16003	LP_McIn_dnIn34_p
16006	CAN1_dnIn12_p
16007	CAN2_dnIn12_p
16008	CAN3_dnIn12_p
16009	LP_McIn_dnIn56_p
16010	LP_McIn_dnIn78_p
17000	LS_MultiEncoder_dnPosition_p
17001	LS_Resolver_dnPosition_p
17010	LS_BusEncoder_dnPosition_p
17020	DigIn_dnPosIn12_p
17101	LS_TouchProbe_TPDigIn1_dnPosition_p
17102	LS_TouchProbe_TPDigIn2_dnPosition_p
17103	LS_TouchProbe_TPDigIn3_dnPosition_p
17104	LS_TouchProbe_TPDigIn4_dnPosition_p
17105	LS_TouchProbe_TPDigIn5_dnPosition_p
17106	LS_TouchProbe_TPDigIn6_dnPosition_p
17107	LS_TouchProbe_TPDigIn7_dnPosition_p
17120	LS_RetainData_dnOut1
17121	LS_RetainData_dnOut2
17122	LS_RetainData_dnOut3
17123	LS_RetainData_dnOut4
17130	LS_AxisBusIn_dnLine12
17131	LS_AxisBusIn_dnCas12
17132	LS_AxisBusIn_dnCas34
17133	LS_AxisBusAux_dnAuxIn12
17134	LS_AxisBusAux_dnAuxIn34
20000	dnC474_1_p
20001	dnC474_2_p
20002	dnC474_3_p

Selection list - angle signals

20003	dnC474_4_p
20004	dnC474_5_p
20005	dnC474_6_p
20006	dnC474_7_p
20007	dnC474_8_p
20008	dnC479_1
20009	dnC479_2
20010	dnC479_3
20011	dnC479_4
20012	dnC479_5
20013	dnC479_6
20014	dnC479_7
20015	dnC479_8
20016	dnC475_1
20017	dnC475_2
20018	dnC475_3
20019	dnC475_4
20020	dnC475_5
20021	dnC475_6
20022	dnC475_7
20023	dnC475_8
20024	dnC475_9
20025	dnC475_10
20026	dnC475_11
20027	dnC475_12
20028	dnC475_13
20029	dnC475_14
20030	dnC475_15
20031	dnC475_16
20032	dnC475_17
20033	dnC475_18
20034	dnC475_19
20035	dnC475_20
20036	dnC475_21
20037	dnC475_22
20038	dnC475_23
20039	dnC475_24
20040	dnC475_25
20041	dnC475_26
20042	dnC475_27
20043	dnC475_28
20044	dnC475_29
20045	dnC475_30
20046	dnC475_31
20047	dnC475_32
32000	MCTRL_dnMotorPosAct_p
32001	MCTRL_dnMotorDeltaPosAct_p
32200	MCK_dnPosTarget_p
32201	MCK_dnPosSetValue_p
32202	MCK_dnDeltaPos_p

Selection list - angle signals	
32203	MCK_dnMotorRefOffset_p
32204	MCK_dnPosSet_p
32205	MCK_dnPosSetRelative_p
36040	L_ArithmetikPhi_1_Out_p
36046	L_GainOffsetParPhi_1_Out_p
36047	L_GainOffsetParPhi_2_Out_p
36050	L_LimitPhi_1_Out_p
36051	L_LimitPhi_2_Out_p
36052	L_LimitPhi_3_Out_p
36060	L_OffsetGainParPhi_1_Out_p
36061	L_OffsetGainParPhi_2_Out_p
36066	L_PhaseIntK_1_dnOut_p
36067	L_PhaseIntK_2_dnOut_p
36070	L_ArithmetikPhi_2_Out_p
36071	L_ArithmetikPhi_3_Out_p
36072	L_Sqrt_1_Out_p
36073	L_Mux_1_Out_p
36074	L_ConvWordsToDInt_1_dnOut_p
36075	L_ConvWordsToDInt_2_dnOut_p
36076	L_ConvWordsToDInt_3_dnOut_p
36077	L_ConvUnitsToIncr_1_dnOut_p
36078	L_ConvUnitsToIncr_2_dnOut_p
36079	L_ConvUnitsToIncr_3_dnOut_p
36080	L_Interpolator_1_dnPhiOut_p
36081	L_MckCtrlInterface_1_dnPosSetOut_p
36082	L_PhaseDiff_1_dnOut_p
36083	L_PhaseDiff_2_dnOut_p
36086	L_MckStateInterface_1_dnPosOut_p
36087	L_Odometer_1_dnPosOut_1_p
36088	L_Odometer_1_dnPosOut_2_p
36089	L_Odometer_1_dnPosOut_3_p
36090	L_Odometer_1_dnPosOut_4_p
36091	L_Odometer_1_dnPosOut_5_p
36092	L_Odometer_1_dnPosOut_6_p
36093	L_Odometer_1_dnPosOut_7_p
36094	L_Odometer_1_dnPosOut_8_p
36095	L_Odometer_1_dnDeltaPos_12_p
36096	L_Odometer_1_dnDeltaPos_23_p
36097	L_Odometer_1_dnDeltaPos_34_p
36098	L_Odometer_1_dnDeltaPos_45_p
36099	L_Odometer_1_dnDeltaPos_56_p
36100	L_Odometer_1_dnDeltaPos_67_p
36101	L_Odometer_1_dnDeltaPos_78_p
36102	L_Odometer_1_dnDeltaPos_18_p
36103	L_CalcDiameter_dnPos_p
36104	L_PhilIntegrator_dnOut32_p
36105	L_PosCtrlLin_1_dnPosOut_p
36106	L_PosCtrlLin_2_dnPosOut_p
36107	L_DFSet_dnPosDiffOut_p
36108	L_DFSet_dnPosSetOut_p
36109	L_GearComp_dnOut_p
36110	L_ConvAP_1_dnOut_p

Selection list - angle signals	
36111	L_ConvAP_2_dnOut_p
36112	L_ConvAP_3_dnOut_p
36113	L_ConvPP_1_dnOut_p
36114	L_ConvPP_2_dnOut_p
36115	L_ConvPP_3_dnOut_p
36116	L_SignalSwitch32_1_dnOut
36117	L_SignalSwitch32_2_dnOut
36118	L_SignalSwitch32_3_dnOut
36119	L_CalcDiameter_dwDiameter
42005	LA_NCtrl_dnFreeln1_p
42006	LA_NCtrl_dnFreeln2_p
42100	LA_TabPos_In_dnPosProfilePosition
42101	LA_TabPos_In_dnFreeln1_p
42102	LA_TabPos_In_dnFreeln2_p
42205	LA_SwitchPos_dnFreeln1_p
42206	LA_SwitchPos_dnFreeln2_p

16.3 Table of attributes

The table of attributes contains information required for a communication with the controller via parameters.

How to read the table of attributes:

Column	Meaning		Entry	
Code	Parameter name		Cxxxxx	
Name	Parameter short text (display text)		Text	
Index	dec	Index under which the parameter is addressed. The subindex for array variables corresponds to the Lenze subcode number.	24575 - Lenze code number	Is only required for access via a bus system.
	hex		5FFF _h - Lenze code number	
Data	DS	Data structure	E	Single variable (only one parameter element)
			A	Array variable (several parameter elements)
	DA	Number of array elements (subcodes)	Number	
	DT	Data type	INTEGER_16	2 bytes with sign
			INTEGER_32	4 bytes with sign
			UNSIGNED_8	1 byte without sign
			UNSIGNED_16	2 bytes without sign
UNSIGNED_32			4 bytes without sign	
Factor	Factor for data transmission via a bus system, depending on the number of decimal positions	Factor	1 ≙ no decimal positions 10 ≙ 1 decimal position 100 ≙ 2 decimal positions 1000 ≙ 3 decimal positions 10000 ≙ 4 decimal positions	
Access	R	Read access	<input checked="" type="checkbox"/> Reading permitted	
	W	Write access	<input checked="" type="checkbox"/> Writing permitted	
	CINH	Controller inhibit required	<input checked="" type="checkbox"/> Writing is only possible if the controller is inhibited	

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00002	Device commands	24573	5FFD	A	34	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00003	Status of the last device command	24572	5FFC	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00005	Application	24570	5FFA	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00006	Motor control	24569	5FF9	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00007	Control mode	24568	5FF8	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00008	Original application control source	24567	5FF7	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00010	AIN1: Characteristic	24565	5FF5	A	8	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00011	Appl.: Reference speed	24564	5FF4	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00012	Accel. time - main setpoint	24563	5FF3	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00013	Decel. time - main setpoint	24562	5FF2	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00015	VFC: V/f base frequency	24560	5FF0	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00016	VFC: Vmin boost	24559	5FEF	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00018	Switching frequency	24557	5FED	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00019	Auto DCB: Threshold	24556	5FEC	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00020	AIN2: Characteristic	24555	5FEB	A	8	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00021	Slip comp.	24554	5FEA	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00022	I _{max} in motor mode	24553	5FE9	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00023	I _{max} in generator mode	24552	5FE8	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00024	LS_DriveInterface: bNActCompare	24551	5FE7	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00026	AINx: Offset	24549	5FE5	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

8400 TopLine C | Software Manual

Parameter reference

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00027	AINx: Gain	24548	5FE4	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00028	AINx: Input voltage	24547	5FE3	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00029	AINx: Input current	24546	5FE2	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00033	AINx: Output value	24542	5FDE	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00034	AINx: Configuration	24541	5FDD	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00036	DC braking: Current	24539	5FDB	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00039	Fixed setpoint x (L_NSet_1 n-Fix)	24536	5FD8	A	15	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00050	MCTRL: Speed setpoint	24525	5FCD	E	1	INTEGER_32	1	<input checked="" type="checkbox"/>		
C00051	MCTRL: Actual speed value	24524	5FCC	E	1	INTEGER_32	1	<input checked="" type="checkbox"/>		
C00052	Motor voltage	24523	5FCB	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00053	DC-bus voltage	24522	5FCA	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00054	Motor current	24521	5FC9	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>		
C00055	Actual values	24520	5FC8	A	4	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00056	Torque	24519	5FC7	A	2	INTEGER_32	100	<input checked="" type="checkbox"/>		
C00057	Maximum torque	24518	5FC6	E	1	UNSIGNED_32	100	<input checked="" type="checkbox"/>		
C00058	Output frequency	24517	5FC5	E	1	INTEGER_32	100	<input checked="" type="checkbox"/>		
C00059	Appl.: Reference frequency C11	24516	5FC4	E	1	UNSIGNED_32	100	<input checked="" type="checkbox"/>		
C00060	Motor rotor position	24515	5FC3	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00061	Heatsink temperature	24514	5FC2	E	1	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00062	Interior temperature	24513	5FC1	A	1	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00063	Motor temperature	24512	5FC0	A	3	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00064	Device utilisation (lxt)	24511	5FBF	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00065	Supply voltage 24V	24510	5FBE	E	1	INTEGER_16	10	<input checked="" type="checkbox"/>		
C00066	Thermal motor load (l*xt)	24509	5FBD	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00070	Vp speed controller	24505	5FB9	A	3	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00071	Ti speed controller	24504	5FB8	A	3	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00072	SC: Tdn speed controller	24503	5FB7	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00073	Imax/M controller gain	24502	5FB6	A	2	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00074	Reset time Imax/M controller	24501	5FB5	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00075	Vp current controller	24500	5FB4	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00076	Ti current controller	24499	5FB3	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00077	SC: Vp field controller	24498	5FB2	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00078	SC: Tn field controller	24497	5FB1	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00079	SC: Settings	24496	5FB0	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00080	Override point of field weakening	24495	5FAF	E	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00081	Rated motor power	24494	5FAE	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00082	Motor rotor resistance	24493	5FAD	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00083	Motor rotor time constant	24492	5FAC	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00084	Motor stator resistance	24491	5FAB	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00085	Motor stator leakage inductance	24490	5FAA	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00087	Rated motor speed	24488	5FA8	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00088	Rated motor current	24487	5FA7	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00089	Rated motor frequency	24486	5FA6	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00090	Rated motor voltage	24485	5FA5	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00091	Motor cosine phi	24484	5FA4	E	1	UNSIGNED_8	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00092	Motor magnetising inductance	24483	5FA3	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00093	Power section ID	24482	5FA2	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00095	Motor magnetising current	24480	5FA0	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00097	Rated motor torque	24478	5F9E	E	1	UNSIGNED_32	100	<input checked="" type="checkbox"/>		
C00098	Rated device current	24477	5F9D	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>		
C00099	Firmware version	24476	5F9C	E	1	VISIBLE_STRING [12]		<input checked="" type="checkbox"/>		

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00100	Firmware version	24475	5F9B	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00101	Add. acceleration time x	24474	5F9A	A	15	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00103	Add. deceleration time x	24472	5F98	A	15	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00104	Position control at quick stop	24471	5F97	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00105	Decel. time - quick stop	24470	5F96	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00106	Auto DCB: Hold time	24469	5F95	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00107	DC braking: Hold time	24468	5F94	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00114	DigInX: Inversion	24461	5F8D	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00115	DI 1/2 & 6/7: Function	24460	5F8C	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00117	Status of brake output BD	24458	5F8A	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00118	DigOutX: Inversion	24457	5F89	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00120	Setting of motor overload (I*xt)	24455	5F87	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00121	Warning threshold motor temperature	24454	5F86	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00123	Device utilisat. threshold (lxt)	24452	5F84	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00129	Brake resistance value	24446	5F7E	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00130	Rated brake resistor power	24445	5F7D	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00131	Thermal capacity - brake resistor	24444	5F7C	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00133	Brake resistor utilisation	24442	5F7A	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00134	L_NSet_1: Ramp smoothing	24441	5F79	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00136	Communication control words	24439	5F77	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00137	Device status	24438	5F76	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00138	Internal control signals	24437	5F75	A	3	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00142	Auto-start option	24433	5F71	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00144	Thermal switching frequency reduction	24431	5F6F	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00148	LS_DriveInterface: Error message config.	24427	5F6B	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00150	Status word	24425	5F69	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00155	Extended status word	24420	5F64	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00158	Cause of controller inhibit	24417	5F61	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00159	Cause of quick stop QSP	24416	5F60	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00160	Status determining error (16-bit)	24415	5F5F	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00161	LS_SetError_x: Error number	24414	5F5E	A	8	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00163	Logbook - binary elements	24412	5F5C	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00164	Logbook - analog elements	24411	5F5B	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00165	Error information	24410	5F5A	A	2	VISIBLE_STRING [14]		<input checked="" type="checkbox"/>		
C00166	Error information text	24409	5F59	A	6	VISIBLE_STRING [30]		<input checked="" type="checkbox"/>		
C00168	Status determining error	24407	5F57	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C00169	Logbook setting	24406	5F56	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00170	Current error	24405	5F55	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C00173	Mains voltage	24402	5F52	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00174	Reduc. brake chopper threshold	24401	5F51	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00175	Brake energy management	24400	5F50	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00177	Switching cycles	24398	5F4E	A	5	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C00178	Elapsed-hour meter	24397	5F4D	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C00179	Power-on time meter	24396	5F4C	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C00180	Running time	24395	5F4B	A	3	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C00181	Time settings	24394	5F4A	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00182	L_NSet_1: S-ramp time PT1	24393	5F49	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00184	AutoFailReset repetition time	24391	5F47	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00185	AutoFailReset residual runtime	24390	5F46	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		

8400 TopLine C | Software Manual

Parameter reference

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00186	Max. number of AutoFailReset processes	24389	5F45	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00187	Current AutoFailReset processes	24388	5F44	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00188	AutoFailReset configuration	24387	5F43	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00189	Resp. to too frequent AutoFailReset	24386	5F42	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00190	L_NSet_1: Setpoint arithmetic	24385	5F41	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00199	Description data	24376	5F38	A	1	VISIBLE_STRING [24]		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00200	Firmware product type	24375	5F37	E	1	VISIBLE_STRING [19]		<input checked="" type="checkbox"/>		
C00201	Firmware	24374	5F36	A	9	VISIBLE_STRING [22]		<input checked="" type="checkbox"/>		
C00203	Product type code	24372	5F34	A	9	VISIBLE_STRING [24]		<input checked="" type="checkbox"/>		
C00204	Serial number	24371	5F33	A	9	VISIBLE_STRING [24]		<input checked="" type="checkbox"/>		
C00220	L_NSet_1: Acceleration time - add. setpoint	24355	5F23	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00221	L_NSet_1: Deceleration time - add. setpoint	24354	5F22	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00222	L_PCTRL_1: Vp	24353	5F21	E	1	INTEGER_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00223	L_PCTRL_1: Tn	24352	5F20	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00224	L_PCTRL_1: Kd	24351	5F1F	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00225	L_PCTRL_1: MaxLimit	24350	5F1E	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00226	L_PCTRL_1: MinLimit	24349	5F1D	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00227	L_PCTRL_1: Accel. time	24348	5F1C	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00228	L_PCTRL_1: Deceleration time	24347	5F1B	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00231	L_PCTRL_1: Operating range	24344	5F18	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00233	L_PCTRL_1: Root function	24342	5F16	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00234	Oscillation damping influence	24341	5F15	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00235	Oscillation damping filter time	24340	5F14	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00236	Oscillation damping field weakening	24339	5F13	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00241	L_NSet_1: Hyst. NSet reached	24334	5F0E	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00242	L_PCTRL_1: Operating mode	24333	5F0D	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00243	L_PCTRL_1: Accel. time influence	24332	5F0C	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00244	L_PCTRL_1: Decel. time influence	24331	5F0B	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00245	L_PCTRL_1: PID output value	24330	5F0A	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00246	L_PCTRL_1: nAct_a internal	24329	5F09	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00247	L_PCTRL_1: Window setpoint reached	24328	5F08	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00249	L_PT1_1: Time constant	24326	5F06	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00250	L_PT1 2-3: Time constant	24325	5F05	A	2	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00251	L_DT1_1: Time constant	24324	5F04	E	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00252	L_DT1_1: Gain	24323	5F03	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00253	L_DT1_1: Sensitivity	24322	5F02	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00254	Kp position controller	24321	5F01	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00270	SC: Freq. current setpoint filter	24305	5EF1	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00271	SC: Current setpoint filter width	24304	5EF0	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00272	SC: Current setpoint filter depth	24303	5EEF	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00273	Moment of inertia	24302	5EEE	E	1	UNSIGNED_32	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00274	SC: Max. change in acceleration	24301	5EED	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00275	Setpoint feedforward control filtering	24300	5EEC	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00276	SC: max. output voltage	24299	5EEB	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00280	SC: Filter time const. DC detection	24295	5EE7	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00312	System runtimes	24263	5EC7	A	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00321	Main program runtime	24254	5EBE	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00322	Transmission mode CAN TxPDOs	24253	5EBD	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00323	Transmission mode CAN Rx PDOs	24252	5EBC	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00324	CAN transmit blocking time	24251	5EBB	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00338	L_Arithmetik_1: Function	24237	5EAD	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00339	L_Arithmetik_2: Function	24236	5EAC	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00341	CAN management - error configuration	24234	5EAA	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00342	CAN decoupling PDOInOut	24233	5EA9	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00343	LP_CanIn decoupling value	24232	5EA8	A	12	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00344	LP_CanOut decoupling value	24231	5EA7	A	12	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00345	CAN error status	24230	5EA6	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00347	CAN status HeartBeat producer	24228	5EA4	A	15	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00349	CAN setting - DIP switch	24226	5EA2	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00350	CAN node address	24225	5EA1	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00351	CAN baud rate	24224	5EA0	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00352	CAN Slave/Master	24223	5E9F	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00353	CAN IN/OUT COBID source	24222	5E9E	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00354	COBID	24221	5E9D	A	6	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00355	Active COBID	24220	5E9C	A	6	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00356	CAN time settings	24219	5E9B	A	5	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00357	CAN monitoring times	24218	5E9A	A	3	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00358	CANx_OUT data length	24217	5E99	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00359	CAN status	24216	5E98	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00360	CAN telegram counter	24215	5E97	A	12	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00364	CAN MessageError	24211	5E93	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00366	Number of CAN SDO channels	24209	5E91	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00367	CAN Sync-Rx-Identifier	24208	5E90	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00368	CAN Sync-Tx-Identifier	24207	5E8F	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00369	CAN Sync transmission cycle time	24206	5E8E	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00370	SyncTxRxTimes	24205	5E8D	A	2	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00372	CAN_Tx_Rx_Error	24203	5E8B	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00381	CAN Heartbeat producer time	24194	5E82	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00385	CAN node addr. HeartBeat producer	24190	5E7E	A	15	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00386	CAN HeartBeat-ConsumerTime	24189	5E7D	A	15	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00400	LS_PulseGenerator	24175	5E6F	A	3	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00401	CANxInOut: Inversion	24174	5E6E	A	6	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00408	LP_CanIn mapping selection	24167	5E67	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00409	LP_CanIn mapping	24166	5E66	A	12	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00410	L_SignalMonitor_a: Signal sources	24165	5E65	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00411	L_SignalMonitor_b: Signal sources	24164	5E64	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00412	L_SignalMonitor_b: Inversion	24163	5E63	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00413	L_SignalMonitor_a: Offs./gain	24162	5E62	A	8	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00417	Activate resolver error comp.	24158	5E5E	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00420	Encoder number of increments	24155	5E5B	A	3	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00421	LS_Multi-Encoder: Supply voltage	24154	5E5A	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00422	LS_Multi-Encoder: Encoder type	24153	5E59	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00423	DOx: Delay times	24152	5E58	A	10	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00424	Pulse form TTL encoder	24151	5E57	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00425	Encoder scanning time	24150	5E56	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00426	SSI encoder: Data bits	24149	5E55	A	7	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00427	SSI encoder: Bit rate	24148	5E54	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00428	SSI encoder: Coding	24147	5E53	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00434	OxU/I: Gain	24141	5E4D	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

8400 TopLine C | Software Manual

Parameter reference

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00435	OxU/I: Offset	24140	5E4C	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00436	OxU: Voltage	24139	5E4B	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00437	OxI: Current	24138	5E4A	A	2	INTEGER_32	1000	<input checked="" type="checkbox"/>		
C00439	OxU/I: Input value	24136	5E48	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00440	LS_AnalogIn1: PT1 time constant	24135	5E47	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00441	Decoupling AnalogOut	24134	5E46	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00442	AOutx: Decoupling value	24133	5E45	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00443	Dlx: Level	24132	5E44	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00444	DOx: Level	24131	5E43	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00445	FreqInxx_nOut_v	24130	5E42	A	2	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00446	FreqInxx_nOut_a	24129	5E41	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00447	DigOut decoupling	24128	5E40	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00448	DigOut decoupling value	24127	5E3F	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00449	FreqInxx_dnOut_p	24126	5E3E	A	1	INTEGER_32	1	<input checked="" type="checkbox"/>		
C00461	Remote: Acceleration/deceleration time	24114	5E32	A	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00462	Remote: Control	24113	5E31	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00463	Remote: MCK control	24112	5E30	A	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00464	Remote: Monitoring timeout	24111	5E2F	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00465	Keypad: Time-out welcome screen	24110	5E2E	E	1	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00466	Keypad: Default parameter	24109	5E2D	E	1	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00467	Keypad: Default welcome screen	24108	5E2C	E	1	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00469	Keypad: STOP key function	24106	5E2A	E	1	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00470	LS_ParFree_b	24105	5E29	A	32	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00471	LS_ParFree	24104	5E28	A	32	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00472	LS_ParFree_a	24103	5E27	A	16	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00473	LS_ParFree_v	24102	5E26	A	8	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00474	LS_ParFree_p	24101	5E25	A	8	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00475	LS_ParFreeUnit_1_2	24100	5E24	A	32	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00476	LS_ParFree_a_2	24099	5E23	A	16	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00477	LS_ParFree_2	24098	5E22	A	32	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00478	LS_ParFree_v_2	24097	5E21	A	8	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00479	LS_ParFree32	24096	5E20	A	8	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00480	LS_DisFree_b	24095	5E1F	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00481	LS_DisFree	24094	5E1E	A	8	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00482	LS_DisFree_a	24093	5E1D	A	8	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00483	LS_DisFree_p	24092	5E1C	A	8	INTEGER_32	1	<input checked="" type="checkbox"/>		
C00484	Application units: Offset	24091	5E1B	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00485	Application units display factor	24090	5E1A	A	4	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00486	Application units:	24089	5E19	A	4	VISIBLE_STRING [7]		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00487	Application units	24088	5E18	A	4	INTEGER_32	100	<input checked="" type="checkbox"/>		
C00488	L_LogCtrlEdgeDetect_1	24087	5E17	A	6	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00490	Position encoder selection	24085	5E15	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00492	Hiperface: Detected TypCode	24083	5E13	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00493	Hiperface: TypCode	24082	5E12	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00494	Hiperface: Resolutions	24081	5E11	A	2	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00495	Speed sensor selection	24080	5E10	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00496	Encoder evaluation method DigIn12	24079	5E0F	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00497	Nact filter time constant	24078	5E0E	A	4	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00498	Open-circuit monitoring	24077	5E0D	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00505	Password data	24070	5E06	A	3	VISIBLE_STRING [16]		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00507	Current password protection	24068	5E04	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00517	User menu	24058	5DFA	A	32	INTEGER_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00560	Fan switching status	24015	5DCF	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00561	Failure indication	24014	5DCE	A	5	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00565	Resp. to mains phase failure	24010	5DCA	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00566	Resp. to fan failure	24009	5DC9	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00567	Resp. to speed controller limited	24008	5DC8	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00569	Resp. to peak current	24006	5DC6	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00570	Resp. to controller limitations	24005	5DC5	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00572	Brake resistor overload threshold	24003	5DC3	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00574	Resp. to brake resist. overtemp.	24001	5DC1	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00576	SC: Field feedforward control	23999	5DBF	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00577	SC: Vp field weakening controller	23998	5DBE	E	1	UNSIGNED_16	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00578	SC: Tn field weakening controller	23997	5DBD	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00579	Resp. to max. speed/output freq. reached	23996	5DBC	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00580	Resp. to operating system error	23995	5DBB	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00581	Resp. to LS_SetError_x	23994	5DBA	A	8	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00582	Resp. to heatsink temp. > shutdown temp. -5°C	23993	5DB9	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00583	Resp. to motor temperature KTY	23992	5DB8	A	6	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00585	Resp. to motor overtemp. PTC	23990	5DB6	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00586	Resp. to encoder open circuit HTL	23989	5DB5	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00588	Resp. to max. speed at switching freq.	23987	5DB3	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00590	Resp. to switch. frequency red.	23985	5DB1	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00592	Resp. to CAN bus connection	23983	5DAF	A	5	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00593	Resp. to CANx_IN monitoring	23982	5DAE	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00594	Resp. to control word error	23981	5DAD	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00595	MCK: Resp. to MCK error	23980	5DAC	A	15	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00597	Resp. to motor phase failure	23978	5DAA	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00598	Resp. to open circuit AlNx	23977	5DA9	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00599	Motor phase failure threshold	23976	5DA8	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00600	Resp. to DC bus voltage	23975	5DA7	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00601	Delayed resp. to fault: DC bus overvoltage	23974	5DA6	A	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00602	Resp. to earth fault	23973	5DA5	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00603	Resp. to feedback	23972	5DA4	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00604	Resp. to device overload (lxt)	23971	5DA3	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00606	Resp. to motor overload (l*xt)	23969	5DA1	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00607	Resp. to max. freq. feedb. DIG12/67	23968	5DA0	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00608	Resp. to maximum torque	23967	5D9F	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00609	Resp. to maximum current	23966	5D9E	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00620	System connection list: 16-bit	23955	5D93	A	104	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00621	System connection list: Bool	23954	5D92	A	175	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00622	System connection list: Angle	23953	5D91	A	24	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00630	L_Limit 1-2: Min/Max	23945	5D89	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00631	L_LimitPhi 1-3: Min/Max	23944	5D88	A	6	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00632	L_NSet_1: Max. skip freq.	23943	5D87	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00633	L_NSet_1: Min. skip freq.	23942	5D86	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00634	L_NSet_1: wState	23941	5D85	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00635	L_NSet_1: nMaxLimit	23940	5D84	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00636	L_NSet_1: nMinLimit	23939	5D83	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

8400 TopLine C | Software Manual

Parameter reference

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00637	L_NSet_1: Output blocking zones	23938	5D82	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00638	L_NSet_1: Output ramp rounding	23937	5D81	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00639	L_NSet_1: Output add.value	23936	5D80	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00640	L_NSet_1: nNOut_a	23935	5D7F	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00643	Resp. to PLI monitoring	23932	5D7C	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00644	PLI traversing direction	23931	5D7B	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00645	PLI max. permissible deflection	23930	5D7A	A	2	INTEGER_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00646	PLI current amplitude	23929	5D79	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00647	PLI ramp time	23928	5D78	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00650	L_Arithmetik 3-5: Function	23925	5D75	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00660	L_FixSet_a_1: Analog values	23915	5D6B	A	16	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00661	L_FixSet_w_1: Fixed values	23914	5D6A	A	16	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00662	L_FixSet_w_2: Fixed values	23913	5D69	A	16	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00670	L_OffsetGainP_1: Gain	23905	5D61	E	1	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00671	L_OffsetGainP_2: Gain	23904	5D60	E	1	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00672	L_OffsetGainP_3: Gain	23903	5D5F	E	1	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00673	L_OffsetGainPhiP 1-2: Offset	23902	5D5E	A	2	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00674	L_OffsetGainPhiP 1-2: Gain	23901	5D5D	A	2	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00677	L_GainOffsetP 1-3: Parameter	23898	5D5A	A	6	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00678	L_GainOffsetPhiP 1-2: Parameter	23897	5D59	A	4	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00679	L_MulDiv_2: Parameter	23896	5D58	A	2	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00680	L_Compare_1: Fct.	23895	5D57	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00681	L_Compare_1: Hysteresis	23894	5D56	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00682	L_Compare_1: Window	23893	5D55	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00685	L_Compare_2: Fct.	23890	5D52	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00686	L_Compare_2: Hysteresis	23889	5D51	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00687	L_Compare_2: Window	23888	5D50	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00690	L_Compare_3: Fct.	23885	5D4D	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00691	L_Compare_3: Hysteresis	23884	5D4C	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00692	L_Compare_3: Window	23883	5D4B	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00693	L_Compare 4-5: Fct.	23882	5D4A	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00694	L_Compare 4-5: Hysteresis	23881	5D49	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00695	L_Compare 4-5: Window	23880	5D48	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00696	L_OffsetGainP_1: Offset	23879	5D47	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00697	L_OffsetGainP_2: Offset	23878	5D46	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00698	L_OffsetGainP_3: Offset	23877	5D45	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00699	L_MulDiv_1: Parameter	23876	5D44	A	2	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00700	LA_NCtrl: Analog connection list	23875	5D43	A	29	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00701	LA_NCtrl: Digital connection list	23874	5D42	A	48	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00710	LA_TabPos: Analog connection list	23865	5D39	A	31	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00711	LA_TabPos: Digital connection list	23864	5D38	A	56	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00712	LA_TabPos: phi connection list	23863	5D37	A	3	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00720	L_DigitalDelay_1: Delay	23855	5D2F	A	2	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00721	L_DigitalDelay 2,3: Delay	23854	5D2E	A	4	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00725	Current switching frequency	23850	5D2A	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00727	LS_Keypad digital values	23848	5D28	A	8	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00728	Analog values - keypad	23847	5D27	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00729	Remote: Setpoint selection	23846	5D26	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00760	LA_SwitchPos: Analog connection list	23815	5D07	A	25	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00761	LA_SwitchPos: Digital connection list	23814	5D06	A	47	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00800	L_MPot_1: Upper limit	23775	5CDF	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00801	L_MPot_1: Lower limit	23774	5CDE	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00802	L_MPot_1: Accel. time	23773	5CDD	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00803	L_MPot_1: Decel. time	23772	5CDC	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00804	L_MPot_1: Inactive fct.	23771	5CDB	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00805	L_MPot_1: Init fct.	23770	5CDA	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00806	L_MPot_1: Use	23769	5CD9	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00807	L_NLim_1: Max.SkipFrq.	23768	5CD8	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00808	L_NLim_1: Min.SkipFrq.	23767	5CD7	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00809	L_NLim_2: Max.SkipFrq.	23766	5CD6	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00810	L_NLim_2: Min.SkipFrq.	23765	5CD5	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00811	L_NLim_1: Current output value	23764	5CD4	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00812	L_NLim: Current status	23763	5CD3	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00820	L_DigitalLogic_1: Function	23755	5CCB	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00821	L_DigitalLogic_1: Truth table	23754	5CCA	A	8	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00822	L_DigitalLogic_2: Function	23753	5CC9	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00823	L_DigitalLogic_2: Truth table	23752	5CC8	A	8	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00824	L_DigitalLogic5_1: Function	23751	5CC7	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00825	L_DigitalLogic5_1: Truth table	23750	5CC6	A	32	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00826	L_DigitalLogic5_2: Function	23749	5CC5	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00827	L_DigitalLogic5_2: Truth table	23748	5CC4	A	32	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00828	L_DigitalLogic_3: Function	23747	5CC3	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00829	L_DigitalLogic_3: truth table	23746	5CC2	A	8	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00830	16-bit inputs [%]	23745	5CC1	A	95	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00831	16-bit inputs	23744	5CC0	A	95	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00832	16-bit inputs [rpm]	23743	5CBF	A	95	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00833	Binary inputs	23742	5CBE	A	129	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00834	32-bit inputs [incr]	23741	5CBD	A	8	INTEGER_32	1	<input checked="" type="checkbox"/>		
C00835	16-bit inputs [%] (Set2)	23740	5CBC	A	140	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00836	16-bit inputs (Set2)	23739	5CBB	A	140	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00837	16-bit inputs [rpm] (Set2)	23738	5CBA	A	140	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00838	Binary inputs (Set2)	23737	5CB9	A	201	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00839	32-bit inputs [incr] (Set2)	23736	5CB8	A	76	INTEGER_32	1	<input checked="" type="checkbox"/>		
C00840	16-bit inputs I/O level [%]	23735	5CB7	A	73	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00841	16-bit inputs I/O level	23734	5CB6	A	73	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00843	Binary inputs I/O level	23732	5CB4	A	175	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C00844	32-bit inputs I/O level [incr]	23731	5CB3	A	12	INTEGER_32	1	<input checked="" type="checkbox"/>		
C00866	CAN input words	23709	5C9D	A	12	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00868	CAN output words	23707	5C9B	A	12	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00876	MCI input words	23699	5C93	A	16	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00877	MCI output words	23698	5C92	A	16	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00890	MCI_InOut: Inversion	23685	5C85	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00905	Motor phase direction of rotation	23670	5C76	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00909	Speed limitation	23666	5C72	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00910	Frequency limitation	23665	5C71	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00915	Motor cable length	23660	5C6C	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00916	Motor cable cross-section	23659	5C6B	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00917	Motor cable resistance	23658	5C6A	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C00918	SC: Start motor magnetising current	23657	5C69	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00925	LS_Resolver: Number of pole pairs	23650	5C62	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00926	Pole position	23649	5C61	A	2	INTEGER_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00927	Motor rotor position	23648	5C60	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		

8400 TopLine C | Software Manual

Parameter reference

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C00937	Field-oriented motor currents	23638	5C56	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00938	PSM: Maximum motor current field weakening	23637	5C55	E	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00939	Ultimate motor current	23636	5C54	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00940	L_ConvW numerator	23635	5C53	A	4	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00941	L_ConvW denominator	23634	5C52	A	4	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00942	L_ConvW conversion method	23633	5C51	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00950	L_Interpolator_1: Activation FB functions	23625	5C49	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00951	L_Interpolator_1: No. of interpolation steps	23624	5C48	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00952	L_Interpolator_1: Limit value - error cycles	23623	5C47	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00953	L_Interpolator_1: Speed-up	23622	5C46	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00959	L_Curve: Current output value	23616	5C40	A	3	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00960	L_Curve_1: Selected curve type	23615	5C3F	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00961	L_Curve_1: Input limitation	23614	5C3E	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00963	L_Curve_1: Table X-values	23612	5C3C	A	32	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00964	L_Curve_1: Table Y-values	23611	5C3B	A	32	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00965	Max. motor speed	23610	5C3A	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00966	VFC: Time const. slip comp.	23609	5C39	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00967	VFC: Frequency interpol. point n	23608	5C38	A	11	INTEGER_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00968	VFC: Voltage interpol. point n	23607	5C37	A	11	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00971	VFC: V/f+encoder limitation	23604	5C34	A	2	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00972	VFC: Vp V/f+encoder	23603	5C33	E	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00973	VFC: Ti V/f+encoder	23602	5C32	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00975	VFC-ECO: Vp CosPhi controller	23600	5C30	E	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00976	VFC-ECO: Ti CosPhi controller	23599	5C2F	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00977	VFC-ECO: Minimum voltage V/f	23598	5C2E	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00978	VFC-ECO: Voltage reduction	23597	5C2D	E	1	INTEGER_16	1	<input checked="" type="checkbox"/>		
C00979	Cosine phi	23596	5C2C	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>		
C00980	Output power	23595	5C2B	A	2	INTEGER_32	1000	<input checked="" type="checkbox"/>		
C00981	Energy display	23594	5C2A	A	2	INTEGER_32	100	<input checked="" type="checkbox"/>		
C00982	VFC-ECO: Voltage reduction ramp	23593	5C29	E	1	UNSIGNED_8	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00985	SLVC: Field current controller gain	23590	5C26	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00986	SLVC: Cross current controller gain	23589	5C25	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00987	Inverter motor brake: nAdd	23588	5C24	E	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00988	Inverter motor brake: PT1 filter time	23587	5C23	E	1	INTEGER_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00990	Flying restart fct.: Activate	23585	5C21	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C00991	Flying restart fct.: Process	23584	5C20	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00992	Flying restart fct.: Start frequency	23583	5C1F	E	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00993	Flying restart fct.: Int. time	23582	5C1E	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00994	Flying restart fct.: Current	23581	5C1D	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00995	SLPSM: Controlled current setpoint	23580	5C1C	A	2	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00996	SLPSM: Switching speed	23579	5C1B	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00997	SLPSM: Filter cutoff frequency	23578	5C1A	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00998	SLPSM: Filter time rotor position	23577	5C19	A	2	INTEGER_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C00999	SLPSM: PLL gain	23576	5C18	E	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01000	MCTRL: Status	23575	5C17	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C01010	L_ArithmetikPhi 1-3: Function	23565	5C0D	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01020	L_Odometer_1: Memory length	23555	5C03	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01021	L_Odometer_1: Memory type	23554	5C02	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C01022	L_Odometer_1: Input selection	23553	5C01	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01023	L_Odometer_1: Edge selection	23552	5C00	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01025	L_Curve_2: Selected curve type	23550	5BFE	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01026	L_Curve_2: Input limitation	23549	5BFD	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01028	L_Curve_2: Table X-values	23547	5BFB	A	32	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01029	L_Curve_2: Table Y-values	23546	5BFA	A	32	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01030	L_Curve_3: Selected curve type	23545	5BF9	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01031	L_Curve_3: Input limitation	23544	5BF8	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01033	L_Curve_3: Table X-values	23542	5BF6	A	32	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01034	L_Curve_3: Table Y-values	23541	5BF5	A	32	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01040	L_SRFG_1..2 linear ramp time	23535	5BEF	A	2	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01041	L_SRFG_1..2 S-ramp time	23534	5BEE	A	2	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01042	L_SRFG_1..2 limitations of output values	23533	5BED	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01045	L_ConvAP 1-3: numerator/denominator	23530	5BEA	A	6	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01046	L_ConvPA 1-3: byDivision	23529	5BE9	A	3	INTEGER_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01047	L_GearComp: Offset	23528	5BE8	A	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01048	L_GearComp: Num_Denom	23527	5BE7	A	2	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01049	L_CalcDiameter: Status	23526	5BE6	A	1	INTEGER_16	1	<input checked="" type="checkbox"/>		
C01050	L_CalcDiameter_1: Diameter recalculation	23525	5BE5	A	2	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01051	L_CalcDiameter: Filter time constant	23524	5BE4	A	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01052	L_CalcDiameter: Web break monitoring	23523	5BE3	A	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01053	L_ProcessCtrl: Controller times	23522	5BE2	A	5	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01054	L_ProcessCtrl: System deviation	23521	5BE1	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01055	L_ProcessCtrl: Correcting variable limitation	23520	5BE0	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01056	L_ProcessCtrl: Controller gain	23519	5BDF	A	1	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01057	L_CalcDiameter: Current diameter	23518	5BDE	A	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>		
C01058	L_PosCtrlLin_1-2: bDisable	23517	5BDD	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01059	L_PosCtrlLin 1-2: Positioning behaviour	23516	5BDC	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01060	L_PosCtrlLin 1-2: Ramps	23515	5BDB	A	6	INTEGER_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01061	L_PosCtrlLin 1-2: Traversing speed	23514	5BDA	A	4	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01062	L_SwitchPoint: Dead time	23513	5BD9	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01063	L_SwitchPoint: Hysteresis	23512	5BD8	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01064	L_SwitchPoint: CenterMode	23511	5BD7	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01065	L_SwitchPoint: Running time	23510	5BD6	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01066	L_SwitchPoint: Status	23509	5BD5	A	4	INTEGER_16	1	<input checked="" type="checkbox"/>		
C01067	Inversion of gearbox stages	23508	5BD4	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01069	L_DFSET: Ramp settings	23506	5BD2	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01070	L_DFSET: Angular trimming	23505	5BD1	A	1	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01071	L_DFSET: Following error limit	23504	5BD0	A	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01072	L_DFSET: Multiplier - angular trimming	23503	5BCF	A	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01073	L_DFSET: Evaluation - setpoint angle integrator	23502	5BCE	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01074	L_DFSET: Zero pulse divider	23501	5BCD	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01075	L_DFSET: Synchronisation mode	23500	5BCC	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01076	L_DFRFG: Times	23499	5BCB	A	2	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01077	L_DFRFG: Max. speed-up	23498	5BCA	A	1	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01078	L_DFRFG: Following error	23497	5BC9	A	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

8400 TopLine C | Software Manual

Parameter reference

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C01079	L_DFRFG: Synchronisation window	23496	5BC8	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01080	L_DFRFG: Offset	23495	5BC7	A	1	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01081	L_DFRFG: Sync. direction / TP function	23494	5BC6	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01082	LS_WriteParamList: Execute Mode	23493	5BC5	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01083	LS_WriteParamList: Error status	23492	5BC4	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C01084	LS_WriteParamList: Error line	23491	5BC3	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C01085	LS_WriteParamList: Index	23490	5BC2	A	32	INTEGER_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01086	LS_WriteParamList: WriteValue_1	23489	5BC1	A	32	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01087	LS_WriteParamList: WriteValue_2	23488	5BC0	A	32	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01088	LS_WriteParamList: WriteValue_3	23487	5BBF	A	32	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01089	LS_WriteParamList: WriteValue_4	23486	5BBE	A	32	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01090	LS_ParReadWrite 1-6: Index	23485	5BBD	A	6	INTEGER_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01091	LS_ParReadWrite 1-6: Cycle time	23484	5BBC	A	6	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01092	LS_ParReadWrite 1-6: FailState	23483	5BBB	A	6	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C01093	LS_ParReadWrite 1-6: Arithmetic mode	23482	5BBA	A	6	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01094	LS_ParReadWrite 1-6: Numerator	23481	5BB9	A	6	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01095	LS_ParReadWrite 1-6: Denominator	23480	5BB8	A	6	INTEGER_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01100	Function L_Counter 1-3	23475	5BB3	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01101	Comparison L_Counter 1-3	23474	5BB2	A	3	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01110	LS_MultiEncoder: Solid measure	23465	5BA9	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01111	SSI: Encoder constant	23464	5BA8	A	2	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01112	LS_MultiEncoder: PosValues	23463	5BA7	A	3	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01119	LS_MultiEncoder: Current position	23456	5BA0	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>		
C01120	Sync signal source	23455	5B9F	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01121	Sync cycle time setpoint	23454	5B9E	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01122	Sync phase position	23453	5B9D	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01123	Sync window	23452	5B9C	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01124	Sync correction width	23451	5B9B	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01130	LS_RetainData: Selection	23445	5B95	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01131	LS_RetainData: 16Bit data	23444	5B94	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01132	LS_RetainData: 32Bit data	23443	5B93	A	4	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01133	LS_RetainData: Bool data	23442	5B92	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01138	L_Transient 1-4: Function	23437	5B8D	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01139	L_Transient 1-4: Pulse duration	23436	5B8C	A	4	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01140	L_Transient 5-8: Function	23435	5B8B	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01141	L_Transient 5-8 pulse duration	23434	5B8A	A	4	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01150	L_PhaseIntK: Function	23425	5B81	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01151	L_PhaseIntK: Compare	23424	5B80	A	2	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01190	Motor thermal sensor	23385	5B59	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01191	PTC characteristic: Temperature 1/2	23384	5B58	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01192	PTC characteristic: Resistance 1/2	23383	5B57	A	2	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01193	Feedback system motor temperature	23382	5B56	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01201	MCK: Cycle	23374	5B4E	A	1	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01202	MCK: iM motor/process	23373	5B4D	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01203	MCK: iG motor/position encoder	23372	5B4C	A	2	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01204	MCK: Feed constant	23371	5B4B	E	1	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01205	MCK: Position resolution	23370	5B4A	E	1	INTEGER_32	10000	<input checked="" type="checkbox"/>		
C01206	MCK: Mounting direction	23369	5B49	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C01210	MCK: Current positions	23365	5B45	A	7	INTEGER_32	10000	<input checked="" type="checkbox"/>		
C01211	MCK: Speed	23364	5B44	A	1	INTEGER_32	10000	<input checked="" type="checkbox"/>		

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C01213	MCK: Max. traversing distance	23362	5B42	A	1	INTEGER_32	1	<input checked="" type="checkbox"/>		
C01215	MCK: Following error	23360	5B40	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01216	MCK: Positioning setting	23359	5B3F	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01218	PosFolger: Setting	23357	5B3D	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01219	MCK: Speed follower setting	23356	5B3C	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01221	MCK: Ref. mode	23354	5B3A	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01222	MCK: Ref. M limit mode 14/15	23353	5B39	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01223	MCK: Ref. waiting time mode 14/15	23352	5B38	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01224	MCK: Ref. speeds	23351	5B37	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01225	MCK: Ref. accelerations	23350	5B36	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01226	MCK: Ref. S-ramp time	23349	5B35	A	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01227	MCK: Ref. positions	23348	5B34	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01228	MCK: Ref. sequence profile	23347	5B33	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01229	MCK: Position limiting values	23346	5B32	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01230	Manual jog: Setting	23345	5B31	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01231	MCK: Manual jog speeds	23344	5B30	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01232	MCK: Manual jog accelerations	23343	5B2F	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01233	MCK: Manual jog S-ramp time	23342	5B2E	A	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01234	MCK: Manual jog breakpoints	23341	5B2D	A	4	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01235	MCK: Manual jog waiting times	23340	5B2C	A	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01236	MCK: Speed follower	23339	5B2B	A	1	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01237	MCK: Acceleration follower	23338	5B2A	A	2	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01238	MCK: S-ramp time follower	23337	5B29	A	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01239	Reserved	23336	5B28	E	1	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01240	MCK: Control word	23335	5B27	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C01241	MCK: Status word	23334	5B26	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C01242	MCK: Current pos profile number	23333	5B25	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C01243	MCK: Current operating mode	23332	5B24	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C01244	MCK: Target detection - times	23331	5B23	A	3	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01245	MCK: Target detection - positions	23330	5B22	A	3	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01246	MCK: Select signal source	23329	5B21	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01251	MCK: Acceleration stop	23324	5B1C	A	1	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01252	MCK: S-ramp times stop	23323	5B1B	A	1	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01295	L_MckStateInterface_1: Pos. selection	23280	5AF0	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01296	Mode: Position calculation	23279	5AEF	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01297	L_MckStateInterface_1: Alternative function	23278	5AEE	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01298	MCK: Operating mode change with profile no.	23277	5AED	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01299	MCKI: Status MCKInterface	23276	5AEC	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C01300	Profile data: Positioning mode	23275	5AEB	A	15	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01301	Profile data: Position	23274	5AEA	A	15	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01302	Profile data: Speed	23273	5AE9	A	15	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01303	Profile data: Acceleration	23272	5AE8	A	15	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01304	Profile data: Deceleration	23271	5AE7	A	15	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01305	Profile data: Final speed	23270	5AE6	A	15	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01306	Profile data: S-ramp time	23269	5AE5	A	15	UNSIGNED_16	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01307	Profile data: Sequence profile	23268	5AE4	A	15	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01308	Profile data: TP profile	23267	5AE3	A	15	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01309	Profile data: TP signal source	23266	5AE2	A	15	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01501	Resp. to communication error with MCI	23074	5A22	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

8400 TopLine C | Software Manual

Parameter reference

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C01670	L_ComparePhi 1-5: Function	22905	5979	A	5	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01671	L_ComparePhi 1-5: Hysteresis	22904	5978	A	5	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01672	L_ComparePhi 1-5: Window	22903	5977	A	5	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01770	Filter time - earth-fault detect. is running	22805	5915	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01902	Diagnostics X6: Max. baud rate	22673	5891	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01903	Diagnostics X6: Change baud rate	22672	5890	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C01905	Diagnostics X6: Current baud rate	22670	588E	E	1	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C02430	Axis bus address and no. of nodes	22145	5681	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02431	Axis bus time settings	22144	5680	A	3	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02435	Axis bus status	22140	567C	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C02436	Axis bus error status	22139	567B	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C02437	Axis bus MessageError	22138	567A	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C02440	AxisBusIO slave/master	22135	5677	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02580	Holding brake: Operating mode	21995	55EB	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02581	Holding brake: Speed thresholds	21994	55EA	A	5	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02582	Holding brake: Setting	21993	55E9	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02589	Holding brake: Time system	21986	55E2	A	4	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02593	Holding brake: Activation time	21982	55DE	A	4	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02607	Holding brake: Status	21968	55D0	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C02610	MCK: Accel./decel. times	21965	55CD	A	3	UNSIGNED_32	1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02611	MCK: Limitations	21964	55CC	A	4	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02652	Memorise positions at power-off	21923	55A3	E	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02810	TP: Edge selection	21765	5505	A	7	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02811	TP: Sensor delay	21764	5504	A	7	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02812	TP: Position offset	21763	5503	A	7	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02813	TP: Pos window start	21762	5502	A	3	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02814	TP: Pos window end	21761	5501	A	3	INTEGER_32	10000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02815	TP: Position source	21760	5500	A	7	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02816	TP: Signal counter	21759	54FF	A	7	UNSIGNED_16	1	<input checked="" type="checkbox"/>		
C02817	TP: TouchProbe position	21758	54FE	A	7	INTEGER_32	10000	<input checked="" type="checkbox"/>		
C02830	Dlx: Debounce time	21745	54F1	A	7	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02840	CountInx: Parameter	21735	54E7	A	4	UNSIGNED_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02841	CountInx: Counter content	21734	54E6	A	2	UNSIGNED_32	1	<input checked="" type="checkbox"/>		
C02842	FreqInxx: Offset	21733	54E5	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02843	FreqInxx: Gain	21732	54E4	A	2	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02844	FreqIn12: Function	21731	54E3	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02845	FreqIn12: PosIn comparison value	21730	54E2	E	1	INTEGER_32	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02853	PSM: Lss saturation characteristic	21722	54DA	A	17	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02855	PSM: Imax Lss saturation characteristic	21720	54D8	E	1	UNSIGNED_16	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02859	PSM: Activate Ppp saturation char.	21716	54D4	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02862	Resolver gain	21713	54D1	A	2	UNSIGNED_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02863	Resolver: Phase error	21712	54D0	E	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02866	MCTRL: Special settings	21709	54CD	A	2	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C02867	Identification process	21708	54CC	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C02870	PLI without motion: Optimisation factor	21705	54C9	A	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C02871	PLI without motion: Running time	21704	54C8	A	1	INTEGER_16	100	<input checked="" type="checkbox"/>		
C02872	PLI without motion: Adaptation of time duration	21703	54C7	A	1	INTEGER_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02873	PLI without motion: Ident. el. rotor displ. angle	21702	54C6	A	1	INTEGER_16	1	<input checked="" type="checkbox"/>		

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C02874	PLI without motion	21701	54C5	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02875	PLI without motion: Adaptation of ident angle	21700	54C4	A	1	INTEGER_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02876	PSM: Max. motor temperature	21699	54C3	A	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02877	PSM temperature coefficient	21698	54C2	A	1	INTEGER_16	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02878	KTY motor temperature compensation	21697	54C1	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C02879	Slip calculation from equivalent circuit diagram	21696	54C0	A	1	UNSIGNED_16	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

17 Working with the FB Editor

The function block editor (in the following called "FB Editor") is available in the »Engineer« from the "StateLine" device version.

The FB Editor serves, for example, to:

- ▶ execute an online monitoring of the technology application running in the device (e.g. for diagnostic purposes).
- ▶ reconfigure the I/O interconnection of the technology application.
- ▶ implement an individual drive solution (from the "HighLine" version).



Note!

The illustrations of the FB Editor user interface and the dialog boxes in this documentation are based on the »Engineer« V2.10.

17.1 Basics

Using the function block interconnection, any signal interconnection can be implemented. Various FBs are available for digital signal processing, signal conversion and logic modules.

For special tasks it has proved of value to use the integrated technology applications as a basis for modifications or extensions of the available FB interconnections. Moreover, from the HighLine device version experienced users are offered the opportunity to implement their own drive solutions independent of the predefined technology applications by using so-called "free interconnections".

For this purpose, the FB Editor provides the following functions:

- ▶ Copying & pasting of interconnection elements (also device-independent)
- ▶ Export & import of the interconnection
- ▶ Comparison of two interconnections (also online <-> offline comparison)
- ▶ Overview window and zoom functions
- ▶ Comments on the signal flow
- ▶ Online monitoring

The option to mask out non-used inputs and outputs of modules is also sensible to minimise the complexity of the FB interconnection and to adapt the clarity of the interconnection to the customers need.

All graphical information of the FB interconnection view (positions of the FBs, line or flag presentation of the connection, visibility of the inputs/outputs) are saved with the parameter set in the memory module of the controller and can be uploaded anytime into the FB Editor of the »Engineer« even if the Engineer project is not available.

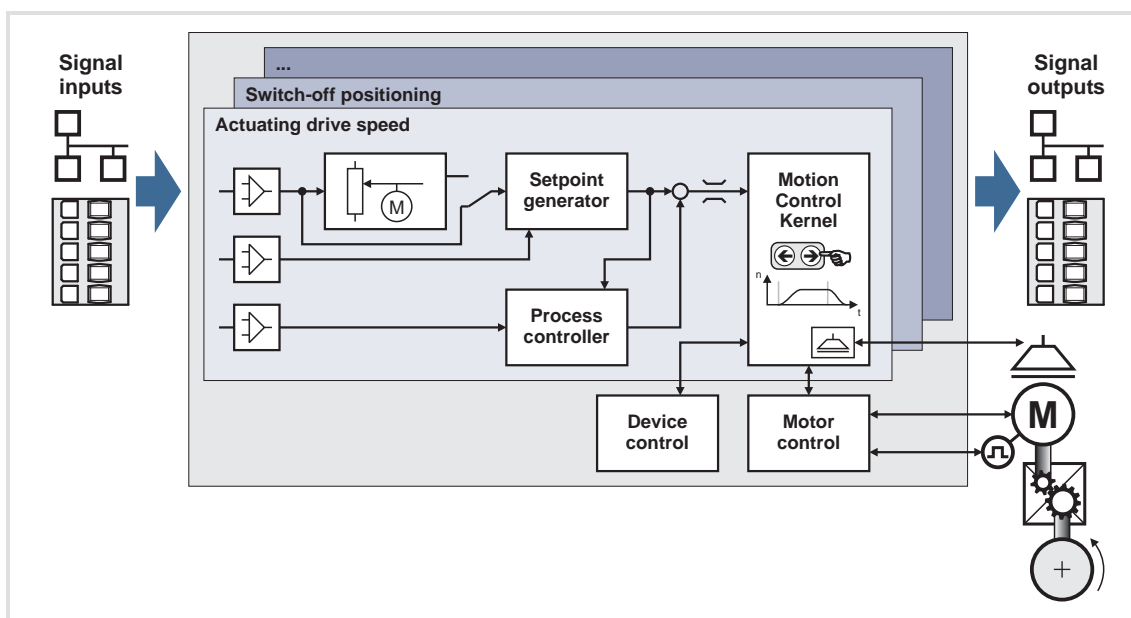
**Note!**

With the "StateLine" version, the interconnection shown in the application level cannot be edited.

17.1.1 Basic components of a drive solution

A drive solution consists of the following basic components:

- ▶ Signal inputs (for control and setpoint signals)
- ▶ Signal flow of the technology application
- ▶ Signal outputs (for status and actual value signals)



[17-1] Basic components of a drive solution

Regarding the 8400 device series, these three components are available for the FB interconnection and classified as follows:

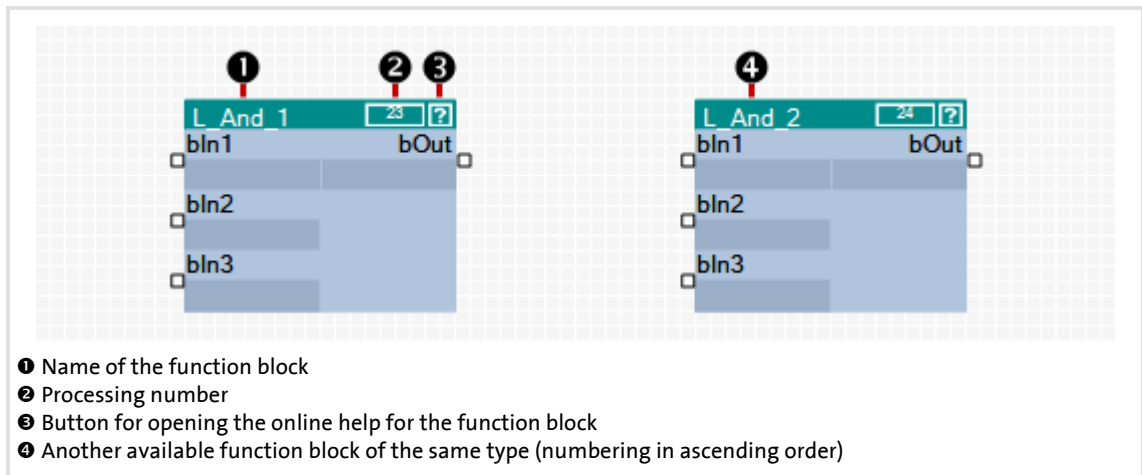
Module type	Name	Task	Example
Function block	L_name	General function block for free interconnection (only HighLine)	L_Compare_1 L_PCTRL_1
System block	LS_name	Signal interface to inverter-internal functions	LS_DigitalInput LS_DriveInterface
Port block	LP_name	<ul style="list-style-type: none"> • Process data communication via a fieldbus using a communication module • Process data communication via CAN on board 	LP_CanIn1 LP_CanOut1 LP_MciIn LP_MciOut
Application block	LA_name	Block for a technology application	LA_NCtrl LA_SwitchPos

Further information on the individual modules can be obtained from the following subchapters!

17.1.1.1 What is a function block?

A function block (FB) can be compared with an integrated circuit that contains a specific control logic and delivers one or several values when being executed.

- ▶ The function blocks are classified alphabetically in a "function library".
- ▶ Each function block has a unique identifier and a processing number which defines the position at which the function block is calculated during runtime.



[17-2] Information on a function block in the FB Editor




Tip!

A detailed description of all available function blocks can be found in the main chapter "[Function library](#)". (📖 1110)

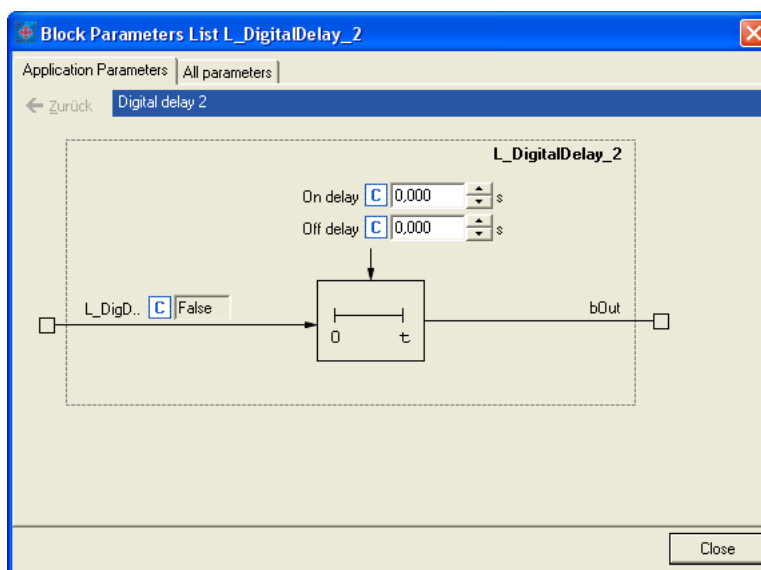
17.1.1.2 Parameterisable function blocks

Some function blocks have parameters which serve to change particular settings during operation, if required, or which display actual values & status information.

- ▶ The  icon in the head of the module, a double-click on the module, or the **Parameter...** command in the *Context menu* of the module serve to open the parameterisation dialog or the parameter list for the module.

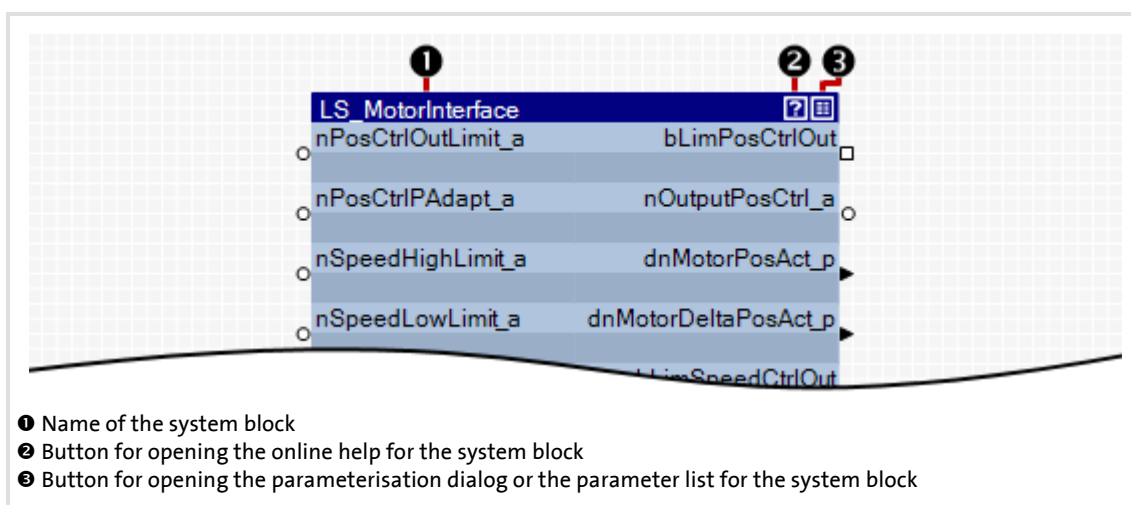
Example

Parameterisation dialog for the FB L_DigitalDelay_2:



17.1.1.3 What is a system block?

System blocks are a special variant of a function block. They partly activate real hardware, e. g. the digital and analog inputs/outputs and the motor control.



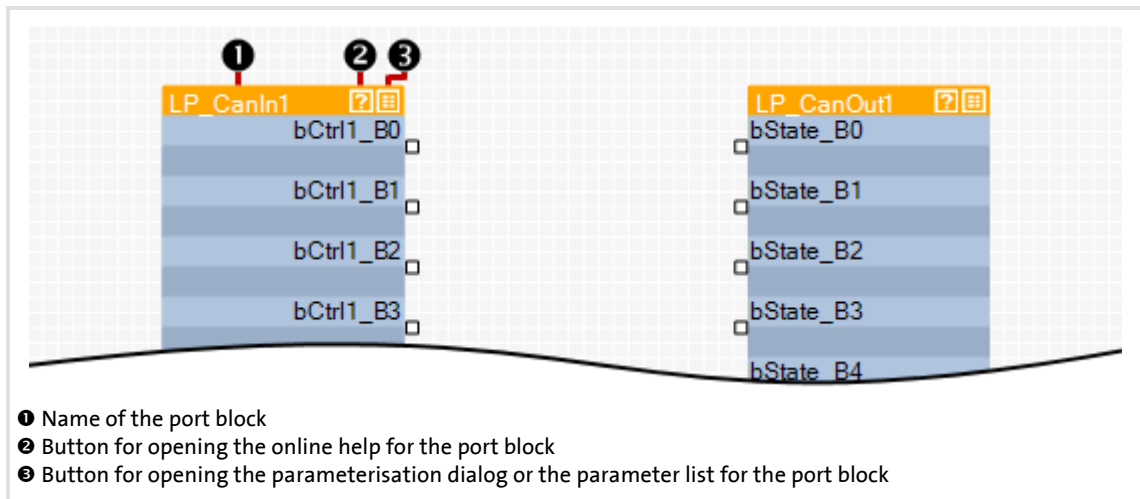
[17-3] Example: System block "LS_MotorInterface" for mapping the motor control

17.1.1.4 What is a port block?

A port block is a signal interface to a fieldbus. Input/output ports represent the input and output process data of the fieldbus.

- ▶ Port blocks LP_CanIn/LP_CanOut: Signal interface to the CAN bus
- ▶ Port blocks LP_MciIn/LP_MciOut: Signal interface to a plugged fieldbus module

If, for instance, the controller is to be controlled via CAN bus or a fieldbus module, the input/output ports are connected to the application block (device-internal signal processing) in the I/O level of the FB Editor.



[17-4] Example: Input port "LP_CanIn1" and output port "LP_CanOut1"

17.1.1.5 What is an application block?

The application/technology function set in [C00005](#) is shown as application block in the I/O level of the FB Editor.

The application block comprises the signal flow processing generated via function block interconnection for the selected application in each case (e.g. "actuating drive speed" or "switch-off positioning"). The function block interconnection is shown in detail on the application level.

17.1.2 Conventions used for input/output identifiers

This chapter describes the conventions used for the identifiers of the inputs/outputs of the blocks. The conventions ensure a uniform and consistent terminology and make reading and comprehending the interconnection and application easier.



Tip!

The conventions used by Lenze are based on the "Hungarian Notation". This ensures that the most significant characteristics of the corresponding input/output (e.g. the data type) can be instantly recognised from its identifier.

An identifier consists of

- ▶ a data type entry
- ▶ an identifier (the "proper" name of the input/output)
- ▶ an (optional) signal type specification

Data type entry

The data type entry provides information about the data type of the corresponding input/output:

Data type entry	Meaning	Resolution	Value range
b	BOOL	1bit	0 ≡ FALSE / 1 ≡ TRUE
dn	DINT	32 bits	-2147483647 ... 2147483647
n	INT	16 bits	-32767 ... 32767
w	WORD	16 bits	0 ... 65535

Identifier

The identifier is the proper name of the input/output and should indicate the application or function.

- ▶ Identifiers always start with a capital letter.
- ▶ If an identifier consists of several "words", then each "word" must start with a capital letter.
- ▶ All other letters are written in lower case.

Signal type entry

In general, it is possible to assign a certain signal type to the inputs and outputs of the Lenze function blocks. There are e.g. digital, scaled, position, acceleration and speed signals.

- ▶ A corresponding ending (preceded by an underscore) is added to the identifier of the corresponding input/output to indicate the signal type.

Signal type entry & port symbol in the FB Editor	Meaning	Resolution	Value range	
_a	○	Analog/scaled	16 bits	± 199.99 %
_v	◀/▶	Angular velocity	16 bits	± 30000.0 rpm
_p	◀/▶	Position	32 bits	-2 ³¹ ... 2 ³¹ -1 increments
	□	Digital (BOOL)	8 bits	0 ≡ FALSE; 1 ≡ TRUE
	■	Other (WORD)	16 bits	0 ... 65535
	■	Other (DINT)	32 bits	-2147483647 ... 2147483647

17.1.3 Scaling of physical units

With regard to the parameter setting & configuration of the controller it is very helpful to know the signal types and their scaling listed in the following table, which are used to process physical values (e.g. an angular velocity or position) in the function block interconnection.

Signal type entry & port symbol in the FB Editor	Meaning	Scaling	
		external value	≡ internal value
_a	○	Analog/scaled	100 % ≡ 2 ¹⁴ ≡ 16384
_v	◀/▶	Angular velocity	15000 rpm ≡ 2 ¹⁴ ≡ 16384
_p	◀/▶	Position	1 encoder revolution ≡ 2 ¹⁶ increments

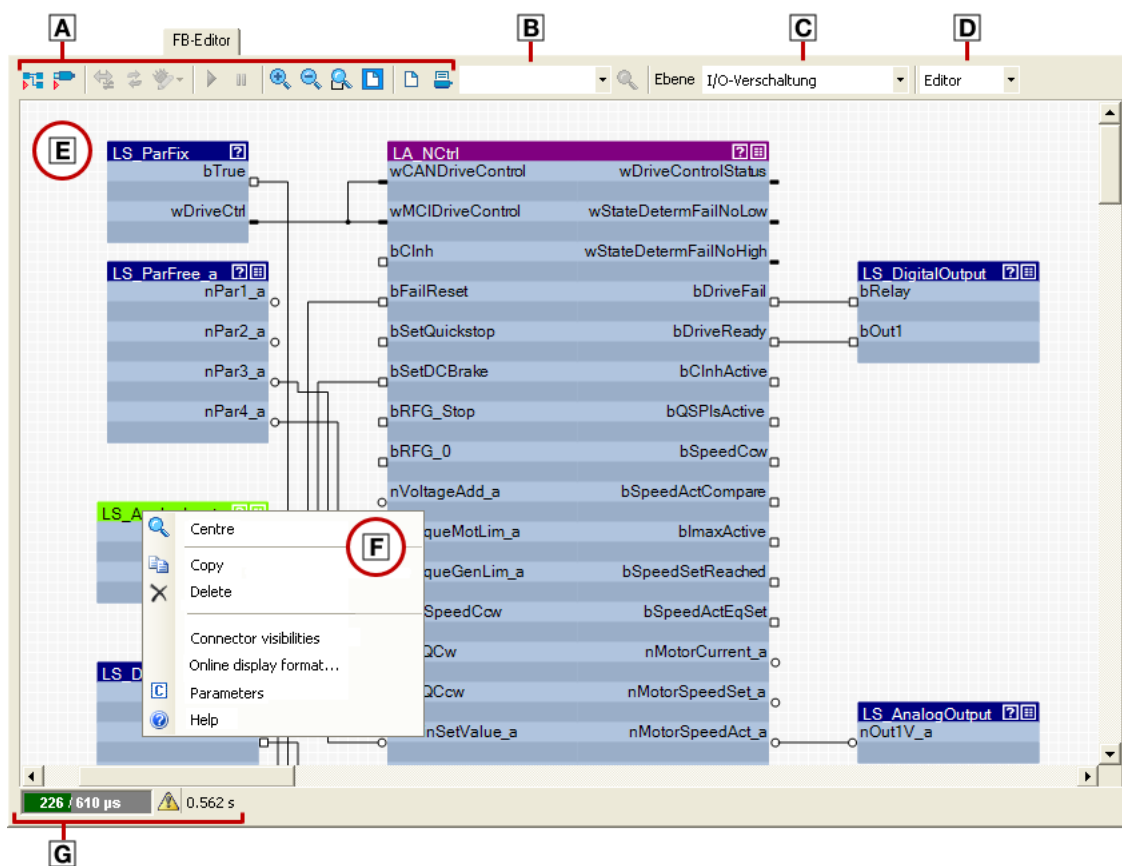
17.2 User interface

**How to access the FB Editor:**

1. Go to *Project View* and select the 8400 controller.
2. Go to *Workspace* and select the **FB Editor** tab.

The FB Editor displays the wiring of the technology function selected in [C00005](#). The interconnection of the I/Os of the controller depend on the control mode selected in [C00007](#).

The user interface of the FB Editor includes the following control and function elements:



A [Toolbar](#)

B [Search function](#)

C [Level selection](#)

D [Editor view/overview](#)


E Drawing area

F [Context menu](#)

G [Status bar](#)

Not shown:
[Overview window](#)
















**Tip!**

Go to the »Engineer« toolbar and click the  icon to hide the *Project View* and the *Message Window*. This increases the *Workspace* available for the FB Editor. A renewed click on the symbol shows the *Project View* and the *Message Window* again.

17.2.1 Toolbar

The FB Editor is provided with an individual toolbar in the upper position which in the following text is called *FB Editor toolbar*.

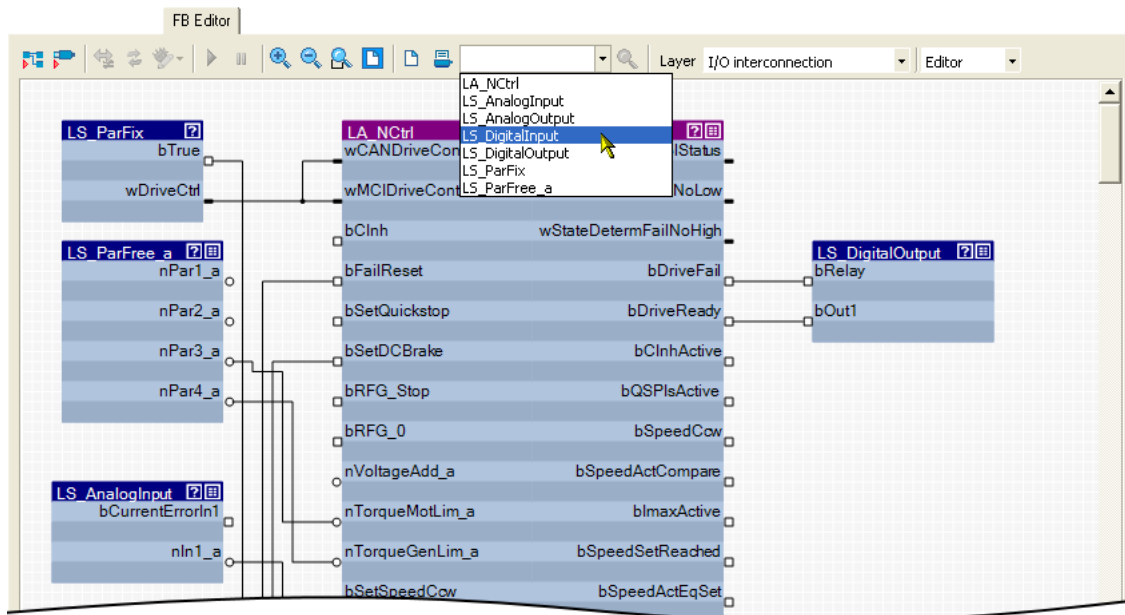
- ▶ Click an icon to execute the corresponding function.

Symbol	Function
	Insert function block or system block ▶ Inserting a function block (📖 1080) ▶ Inserting a system block (📖 1082)
	Inserting a port block (📖 1084)
	Adjusting online and offline interconnection (📖 1103)
	Acknowledge error in the interconnection / reload interconnection
	Correct interconnection
	Start online monitoring
	Interrupt online monitoring
	Close online monitoring
	Enlarge view of interconnection
	Reduce view of interconnection
	Enlarge cutout of interconnection
	Show total interconnection in the drawing area
	Show print view
	Printing the interconnection (📖 1104)
	Search function (📖 1067)

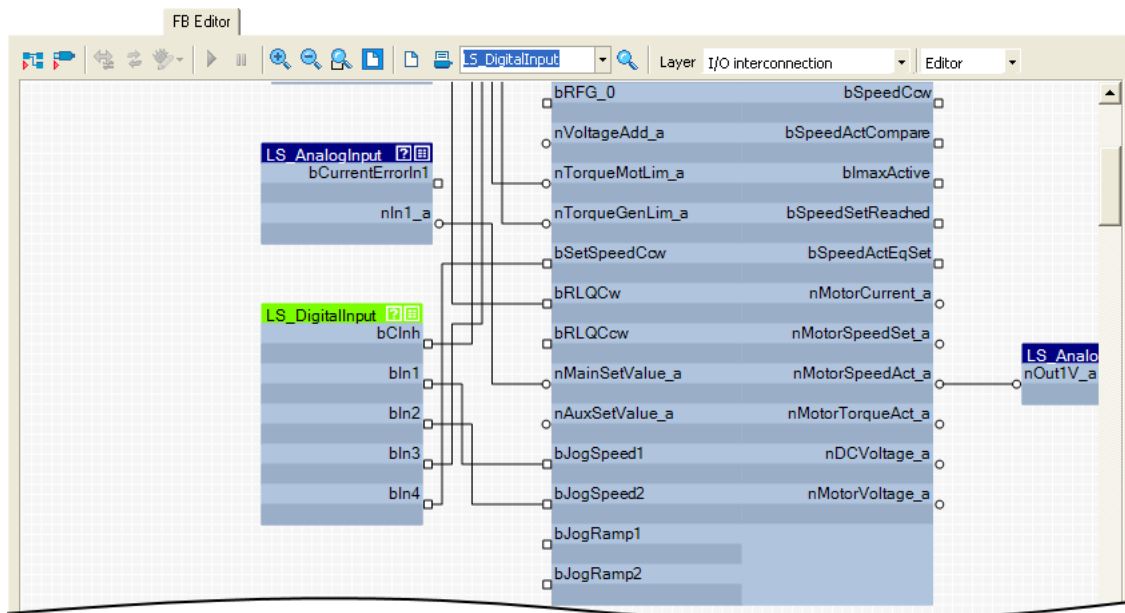
17.2.2 Search function

Use the search function to get quickly to a certain module of the interconnection.

- The list field of the search function contains all function blocks, system blocks, and port blocks of the interconnection:





- When you select a module in the list field, this module is zoomed in and selected at the same time (the following example shows the **LS_DigitalInput** system block):





Tip!

You can also enter any search text in the input field.

- If you click the  icon, the cutout is moved to the object which contains this search text.
- Another click on the  icon leads to a new search. Thus, you can navigate successively to all objects which contain the entered search text.
- The search text does not consider case sensitivity.

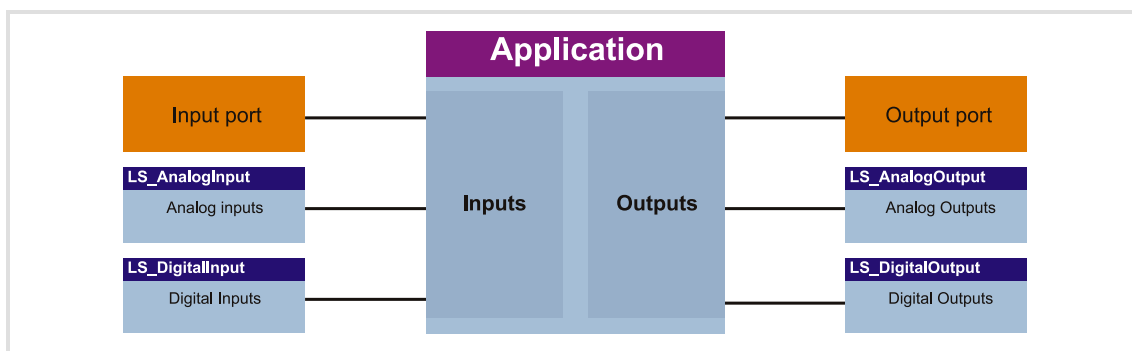
17.2.3 Level selection

Go to the **Level selection** list field and select the interconnection level to be displayed.

"I/O interconnection" level

This level displays only the I/O interconnection of the currently selected technology application for a better overview.

- ▶ Details of the application are masked out in this level.
- ▶ The interconnection of the I/Os of the controller with the inputs and outputs of the application in detail depends on the control mode selected in [C00007](#).
- ▶ The parameterisation dialogs on the **Application parameter** tab correspond to the application block displayed in this level.

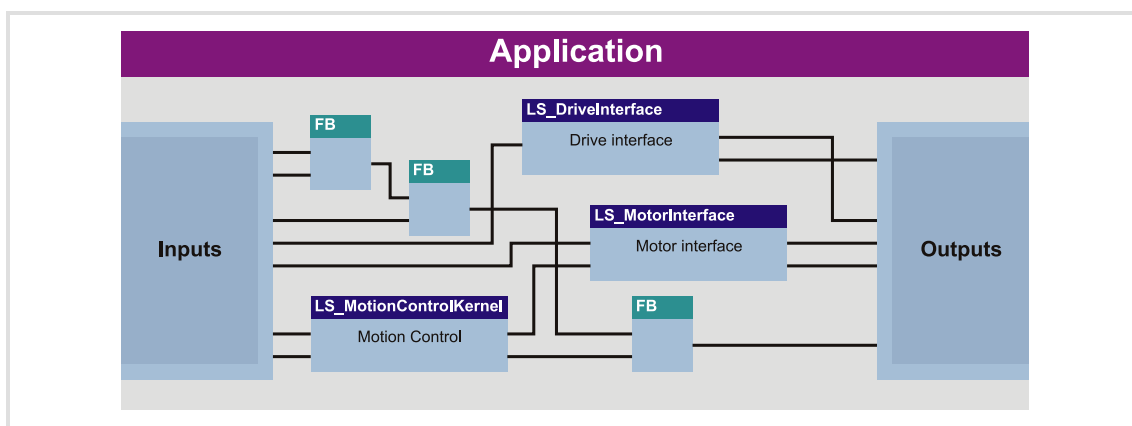


[17-5] Schematic diagram of "I/O interconnection"

"Application interconnection" level

This level displays the interconnection of the application selected in [C00005](#) in detail. All function blocks used in the application and the system blocks which provide the interfaces to the drive and motor interface and to the MotionControlKernel (MCK) are displayed with their connections.

- The interconnection of the I/Os of the controller with the inputs and outputs of the application is masked out in this level.



[17-6] Schematic diagram of "Application interconnection"



Note!

With the "StateLine" version, the interconnection shown in the application level cannot be edited.



Tip!

Every application block features so-called "free inputs and outputs" which you can use to transfer signals from the I/O level to the application level and vice versa.

- In the Lenze setting, these connectors are hidden in the function block editor.
- These connections can be shown via the **Connector visibilities** command in the *Context menu* of the application block.

"Free interconnection" level

This level serves to implement an individual drive solution for the "HighLine" version.



Note!

When you select the "Free interconnection" level for the first time, you are prompted to confirm whether the interconnection from the I/O level and the application level are to be combined and copied into this level.

When you confirm this confirmation prompt with **Yes**, the I/O level and the application level are not available anymore. This action can only be undone by resetting the application to a predefined Lenze application! ▶ [Resetting changed interconnection](#) (📖 1102)

17.2.4 Editor view/overview

Use the list field at the top right to change from the Editor to the overview and vice versa.

The overview shows all function blocks used of the interconnection in the upper list field in the order of their processing. The lower list field shows all used system blocks.

The screenshot shows the FB Editor interface with the following components:

- Toolbar: Includes icons for undo, redo, save, and other editing functions.
- Layer: I/O interconnection
- Overview: A dropdown menu currently set to 'Overview'.
- Function blocks used (23/50): A table listing function blocks and their processing times.
- System blocks used (10/40): A list of system blocks.
- Optimisation of the processing order via: manual entry
- Status bar: 226 / 610 µs, 0.563 s

ID	Name	Time
1	LA_NCtrl_In	20 µs
2	L_RLQ_1	3 µs
3	L_Dr_2	2 µs
4	L_Dr_3	2 µs
5	L_OffsetGainP_1	17 µs
6	L_OffsetGainP_2	17 µs
7	L_OffsetGainP_3	17 µs
8	L_MPot_1	10 µs
9	L_Dr_1	2 µs
10	L_NSet_1	50 µs
11	L_PCTRL_1	20 µs
12	L_AnalogSwitch_1	2 µs
13	L_Arithmetik_1	7 µs
14	L_DigitalDelay_1	2 µs
15	L_DigitalLogic_1	2 µs
16	L_MulDiv_1	4 µs

System blocks used (10/40):

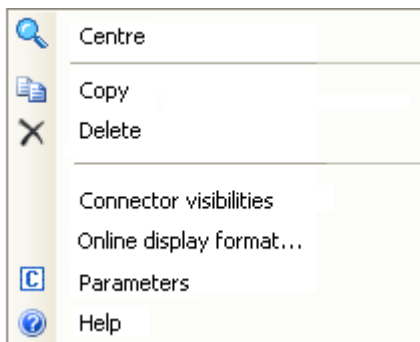
- LS_MotorInterface
- LS_DriveInterface
- LS_DigitalInput
- LS_DigitalOutput
- LS_AnalogInput
- LS_AnalogOutput
- LS_MotionControlKernel
- LS_ParFix
- LS_ParFree_a
- LA_NCtrl

▶ The processing order of the function blocks can be optimised manually or according to an automatically generated selection. ▶ [Changing the processing order](#) (📖 1097)

17.2.5 Context menu

You can open a *context menu* via the right mouse button for each object (function block, system block, line, comment, etc.) and for the drawing area:

- ▶ The contents of the *context menu* depend on the type of object you click on.
- ▶ Example: *Context menu* for a function block:



17.2.6 Status bar

The status bar of the FB Editor shows, among other things, information about the system load and the error status of the interconnection:



Symbol	Meaning
A System load	
	Here: out of the available computing time of 610 µs, 226 µs are required by the application.
B Error status of the interconnection	
	The interconnection has no errors and no warnings
	The interconnection has errors and/or warnings
C Communication status	
	Offline
	Online
	Communication error
D Adjustment status	
	Offline and online interconnection match
	Offline and online interconnection are different
E Update rate for monitoring values	

17.2.7 Overview window

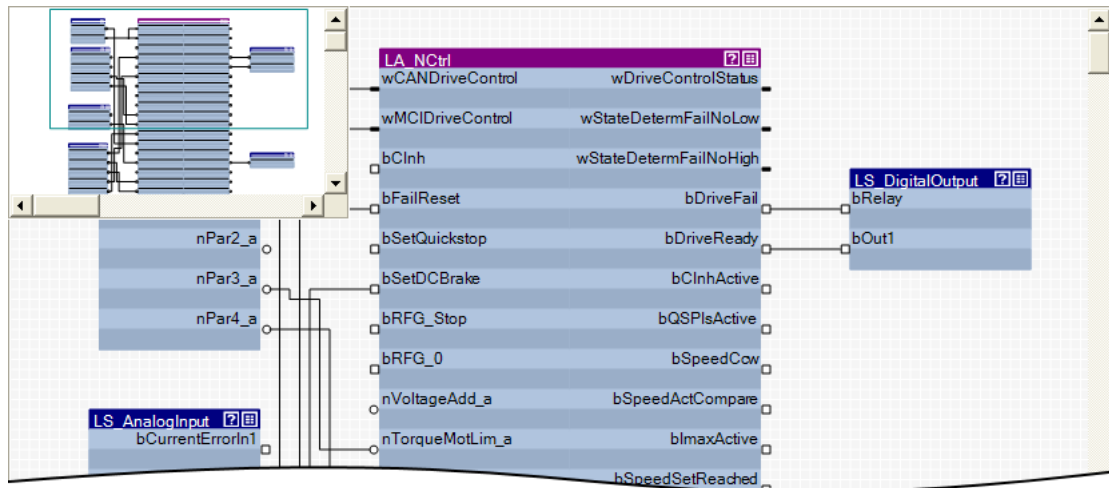
The overview window shows the drawing area in a reduced view. The overview window serves to e.g. move quickly through a more complex interconnection.



How to show the monitor window:

Go to the *Context Menu* of the drawing area and select the **Overview Window**.

- If you execute this command again, the overview window is hidden again.



- ▶ The green frame in the overview window indicates the interconnection cutout that is currently displayed in the drawing area.
- ▶ Use the mouse pointer to shift and resize the cutout to be displayed.



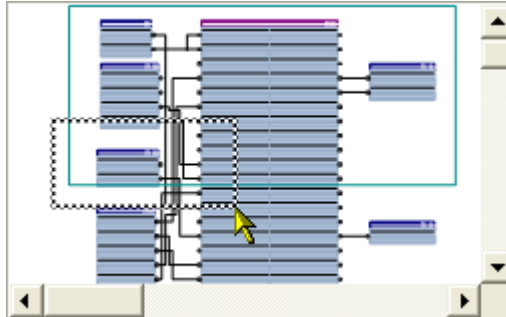
How to shift the cutout presented in the drawing area:

1. Position the mouse pointer to the green frame in the overview window.
 - The mouse pointer symbol becomes a positioning cross.
2. Click left mouse button and shift the green frame to its new position by keeping the mouse button pressed, so that the desired cutout of the interconnection is displayed in the drawing area.



How to redefine the cutout to be presented:


In the overview window draw a frame around the area of the interconnection which is to be presented in the drawing window by keeping the left mouse button pressed:



- The aspect ratio of the frame is automatically adapted to the aspect ratio of the drawing area.
- According to the size of the frame that is drawn, also the presentation size of the objects in the drawing area changes.



Tip!

Go to the *FB Editor toolbar* and click the  icon to adapt the view size so that all objects included in the interconnection are visible in the drawing area.

Automatic scroll ("AutoScroll function")

If you reach a window limitation in the drawing area when shifting an object or in the overview window when shifting the green frame, and if you then shortly hold the mouse pointer in this position, an automatic scrolling into the corresponding direction is carried out:

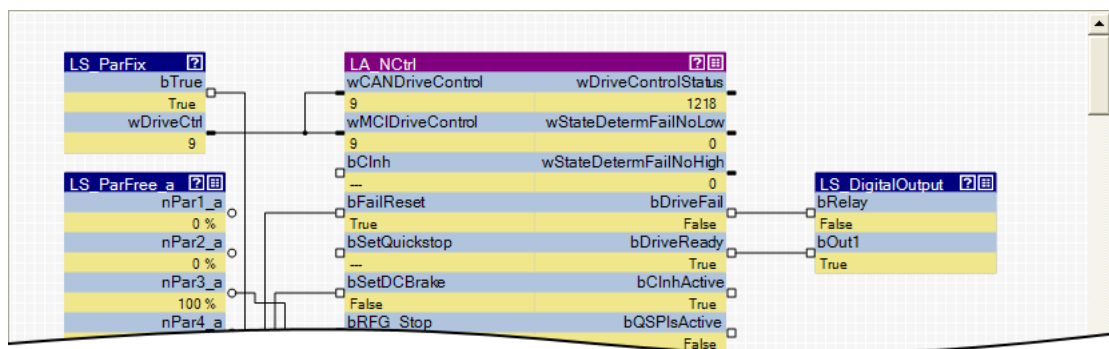
17.3 Using the FB Editor as "Viewer"

The main purpose of the FB Editor is the individual configuration of the selected technology application. However, you can also use the FB Editor to

- ▶ make a diagnosis of the application (when an online connection has been established),
- ▶ get a better understanding for the operating mode of the application,
- ▶ use the interconnection as an alternative parameterisation access.

Diagnostics of the application

When an online connection to the controller has been established, the current values are displayed at the inputs and outputs of the objects.



- ▶ Process-scaled signals can be scaled in a "user-defined" way for easy diagnostics in the FB Editor. ▶ [Change online display format](#) (1077)

Getting a better understanding for the operating mode of the application

Make yourself familiar with the signal flow of the interconnection to get a better understanding of the operating mode of the application or individual functional areas.

- ▶ The symbol in the head of the block or the **Help** command in the *context menu* for the block serve to open the online help for the block.

Using the interconnection as an alternative parameterisation access

- ▶ The icon in the head of the module, a double-click on the module, or the **Parameter...** command in the *Context menu* of the module serve to open the parameterisation dialog or the parameter list for the module.

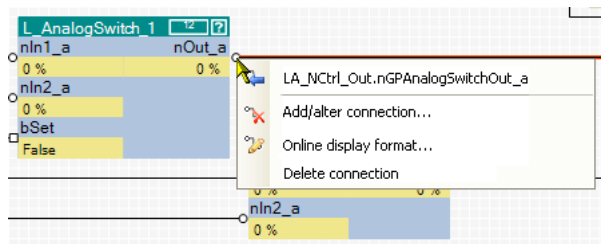
17.3.1 Following connections of inputs and outputs


In addition to the [Search function](#) you can use the *context menu* of inputs and outputs to follow connections and quickly reach certain signals.

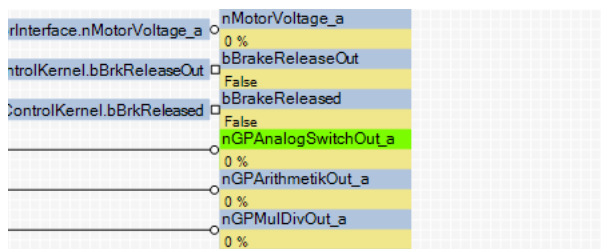


How to navigate from one output to another connected input:

1. Open the *context menu* (right mouse button) of the port symbol at the output.
 - The *context menu* for the port symbol contains all inputs which are connected to the output:



2.  Select input in the *context menu* to which you want to navigate.
 - As a result, the selected input is displayed in the centre of the drawing area (in this example: nGPAnalogSwitchOut_a):

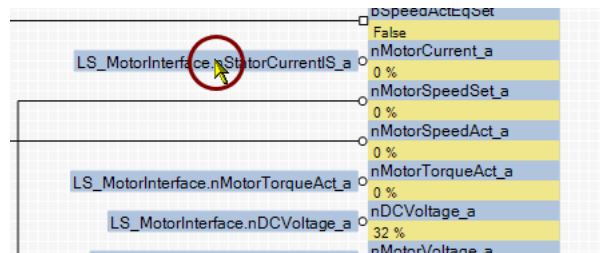




How to navigate from one input to another connected output:

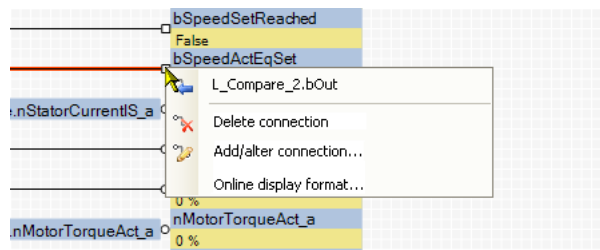
If the input is connected to a flag:

- Double-click the flag:



If the input is connected to a line:

1. Open the *context menu* (right mouse button) of the port symbol at the output:



2. Select output in the *context menu*.
 - Since an output can only be connected to an input, the *context menu* contains only an output.

The output is displayed in the centre of the drawing area.

17.3.2 Keyboard commands for navigation

Keyboard command	Function
<Picture ▲ >	Scroll up
<Picture ▼ >	Scroll down
<Shift> + <picture ▲ >	Scroll to the left
<Shift> + <picture ▼ >	Scroll to the right
<POS1>	Scroll to the left edge of the interconnection
<END>	Scroll to the right edge of the interconnection
<Ctrl> + <Pos1>	Scroll to the left upper corner of the interconnection
<Ctrl> + <End>	Scroll to the right lower corner of the interconnection

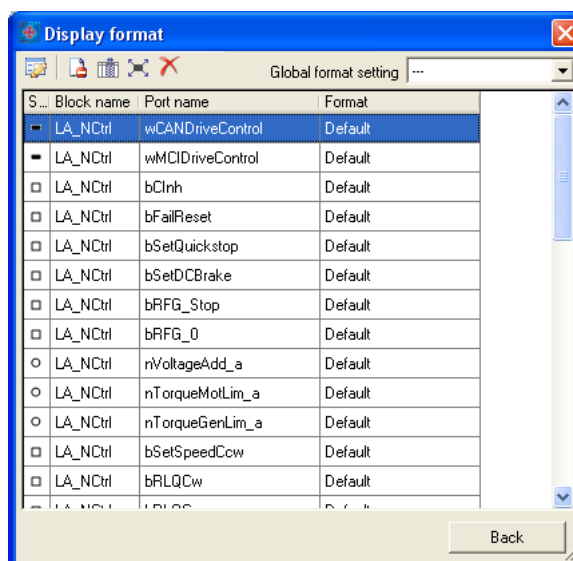
17.3.3 Change online display format





For online monitoring in the FB Editor the display format of the input and output data of a block can be adapted individually. Process-scaled signals can be scaled in a "user-defined" way for easy diagnostics in the FB Editor. Thus, the display of these signals gets a process reference.




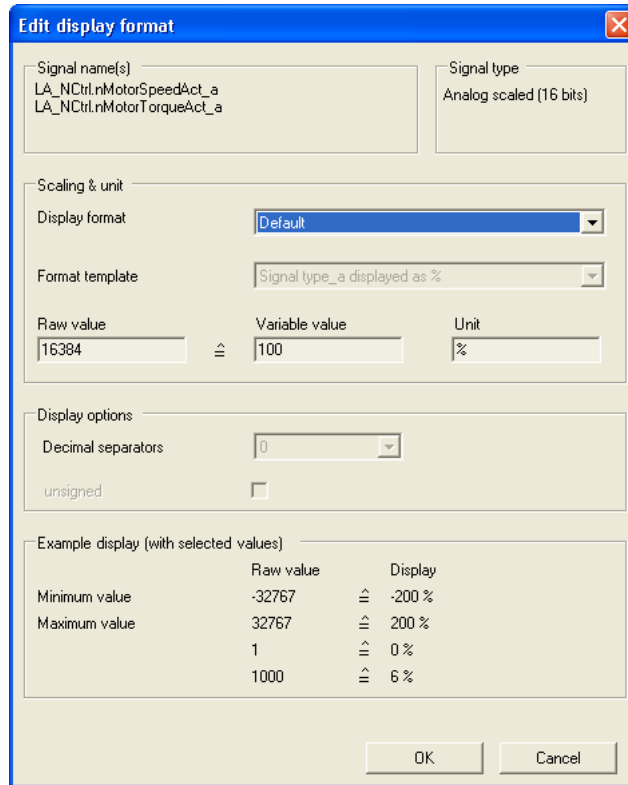
How to change the data display format of block inputs/outputs:

- Go to the *context menu* of the block and select the **Online display format** command.
 - Tip:** You can call the *context menu* of a block by clicking with the right mouse button on the header of the block.
 - The *Display format* dialog box is displayed:



- Select the inputs/outputs from the list the display format of which is to be changed.
 - Note:** In the **Global format setting** list field the "---" entry must be selected so that the display format can be changed.
 - If you click further inputs/outputs while pressing **<Ctrl>** they are added to an already existing selection (multi-selection).
 - The **<Shift>** key serves to select a related area of inputs/outputs.
 - More functions:
 -  Display masked out connections
 -  Display additional information
 -  Select all inputs/outputs
 -  Reset all format information

- Click the  symbol to edit the display format of the selected inputs/outputs.
 - The *Edit display format* dialog box is displayed:



- Go to the **Display format** list field and select the "User-defined" entry.
- Go to the **Format template** list field and select "No template".
- Select the required scaling, unit, number of decimal positions, and sign handling.
- Click **OK** to accept the settings and close the *Edit display format* dialog box.
 - The *Display format* dialog box now displays the text "User-defined" for the changed inputs/outputs in the **Format** column.

After all required formats have been changed:

- Click **Back** to close the *Display format* dialog box.
 - For online monitoring, the changed format is used.

17.4 Reconfiguring the predefined interconnection

How to proceed:

1. Insert additionally required objects into the interconnection.
2. Hide unneeded inputs/outputs of function blocks and system blocks to obtain a clearly arranged interconnection.
3. Arrange the objects in the drawing area in a reasonable manner.
4. Establish the connections required for the desired function.
5. If required, change (optimise) the processing order of the function blocks.



Tip!

Detailed information on the individual steps can be obtained from the following subchapters!







Note!

With the "StateLine" version, the interconnection shown in the application level cannot be edited.

17.4.1 Inserting/Deleting objects

Objects can be inserted in the interconnection via the *FB Editor toolbar* and the *context menu* of the drawing area. The following subchapters provide detailed information on how to insert/delete the different objects.

Symbol	Function
	Inserting a function block (📖 1080)
	Inserting a system block (📖 1082)
	Inserting a port block (📖 1084)
	Inserting a comment (📖 1086)



Tip!

Use the *context menu* of the drawing area to insert a function block, system block, port block or comment directly to the current position of the mouse pointer in the drawing area.

If you insert an object via the corresponding icon in the *FB Editor toolbar*, the object is always placed at the top left corner in the drawing area.

Interconnection elements cannot only be copied within the same interconnection but also across all devices within the same project, as long as the devices stem from the same product family. ▶ [Copying interconnection elements \(across all devices\)](#) (📖 1099)

17.4.1.1 Inserting a function block




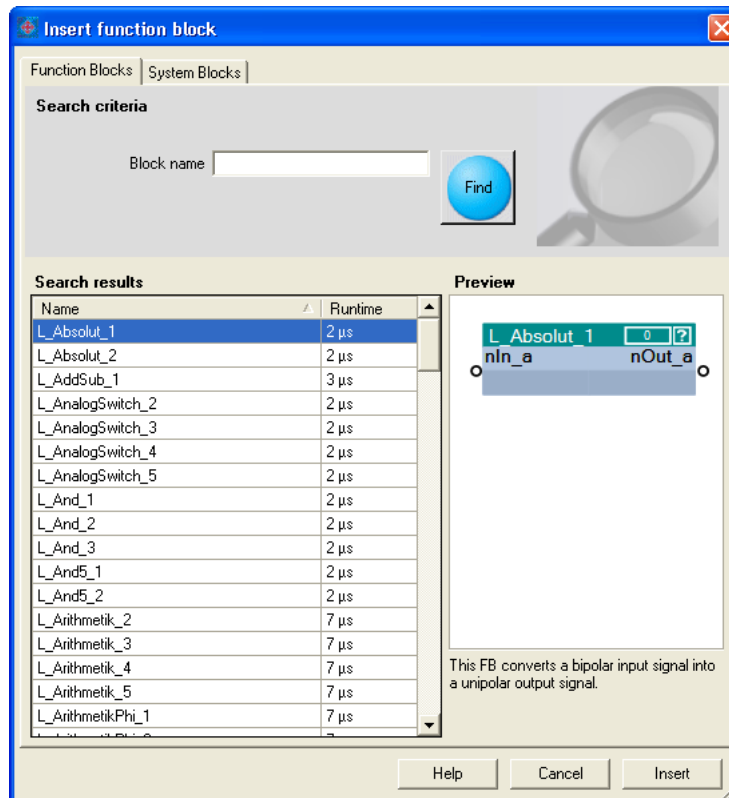
Note!

In the FB Editor, function blocks are only available in the "Application interconnection" level!



How to insert a function block into the interconnection:

1. In the *FB Editor toolbar*, click the  icon.
 - The *Insert Function Block* dialog box appears:
2. Unless it is already displayed, select the **Function Blocks** tab.
 - All function blocks available are displayed in the **Search results** list field.






- A preview of the selected function block is displayed.
 - A detailed description of all available function blocks can be found in the main chapter "[Function library](#)". (📖 1110)
3. If required, define **Search criteria** to narrow down the available function blocks:
 - **Block name:**
String which must be contained in the name of the function block.
 4. After changing the search criteria, press the **Find** button to update the selection.
 - Then, only the function blocks complying with the features set in the search criteria are shown in the **Search Results** list field.
 - If no search criteria are set, all function blocks available are shown.

5. Select the function block to be inserted in the **Search results** list field.
6. Press **Insert** button.
 - The dialog box is closed and the selected function block is inserted into the interconnection.

Context menu for the function block

If you right-click on the header of a function block, a *context menu* opens via which you can execute the following functions in addition to the general processing functions (Copy, Insert, Delete):

Command	Function
 Center	Move the visible cutout of the drawing area so that the block is centred.
Connector visibilities...	Define visible inputs and outputs of the block. ▶ Changing connector visibilities (📖 1089)
Online display format...	Adapt the display format of the input and output data of the block individually for online monitoring. ▶ Change online display format (📖 1077)
 Parameter...	Open the parameter list/parameterisation dialog for the block. <ul style="list-style-type: none"> • Only if function block is parameterisable.
 Help	Show online help for the block.

Related topics


- ▶ [Deleting objects that are no longer required](#) (📖 1088)
- ▶ [Changing connector visibilities](#) (📖 1089)
- ▶ [Arranging objects in the drawing area](#) (📖 1090)
- ▶ [Creating/deleting connections](#) (📖 1091)
- ▶ [Changing the processing order](#) (📖 1097)

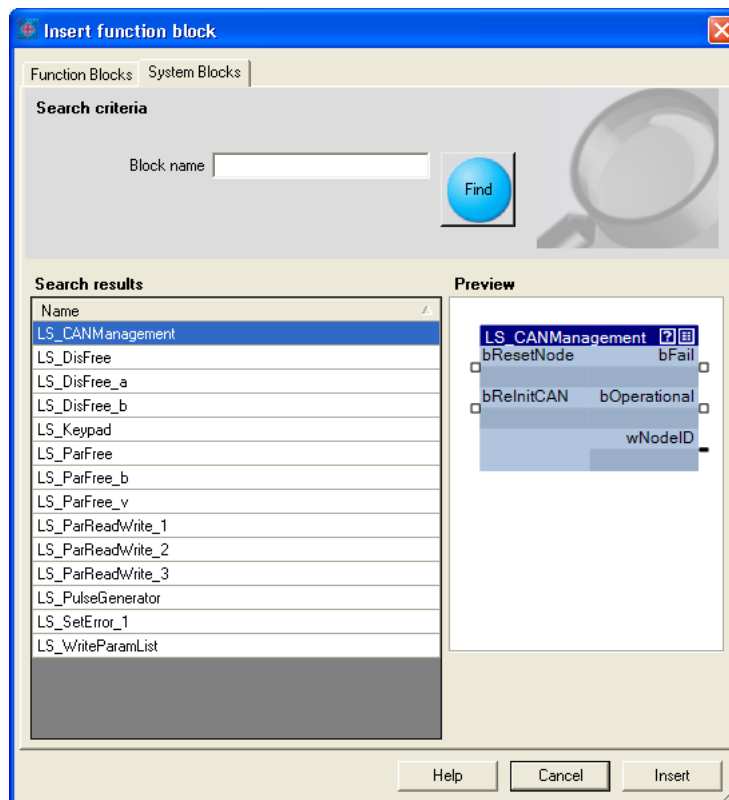
17.4.1.2 Inserting a system block

A system block is inserted similarly to the way a function block is inserted.



How to insert a system block into the interconnection:

1. In the *FB Editor toolbar*, click the  icon.
 - The *Insert Function Block* dialog box appears:
2. Unless it is already displayed, select the **System Blocks** tab.
 - All system blocks available are displayed in the **Search results** list field.






- A preview of the selected function block is displayed.
3. If required, define **Search criteria** to accordingly narrow down the system blocks available:
 - **Block name:**
String which must be contained in the name of the system block.
 4. After changing the search criteria, press the **Find** button to update the selection.
 - Then, only the system blocks complying with the features set in the search criteria are shown in the **Search Results** list field.
 - If no search criteria are set, all system blocks available are shown.

5. Select the system block to be inserted in the **Search results** list field.
6. Press **Insert** button.
 - The dialog box is closed and the selected system block is inserted into the interconnection.

Context menu for the system block

If you right-click on the header of a system block, a *context menu* opens via which you can execute the following functions in addition to the general processing functions (Copy, Insert, Delete):

Command	Function
 Center	Move the visible cutout of the drawing area so that the block is centred.
Connector visibilities...	Define visible inputs and outputs of the block. ▶ Changing connector visibilities (1089)
Online display format...	Adapt the display format of the input and output data of the block individually for online monitoring. ▶ Change online display format (1077)
 Parameter...	Open the parameter list/parameterisation dialog for the block.
 Help	Show online help for the block.

Related topics

- ▶ [Deleting objects that are no longer required \(1088\)](#)
- ▶ [Changing connector visibilities \(1089\)](#)
- ▶ [Arranging objects in the drawing area \(1090\)](#)
- ▶ [Creating/deleting connections \(1091\)](#)

17.4.1.3 Inserting a port block

All input/output ports defined for the application on the **Ports** tab can be inserted into the interconnection in the form of port blocks in order to get access to the associated element variables.




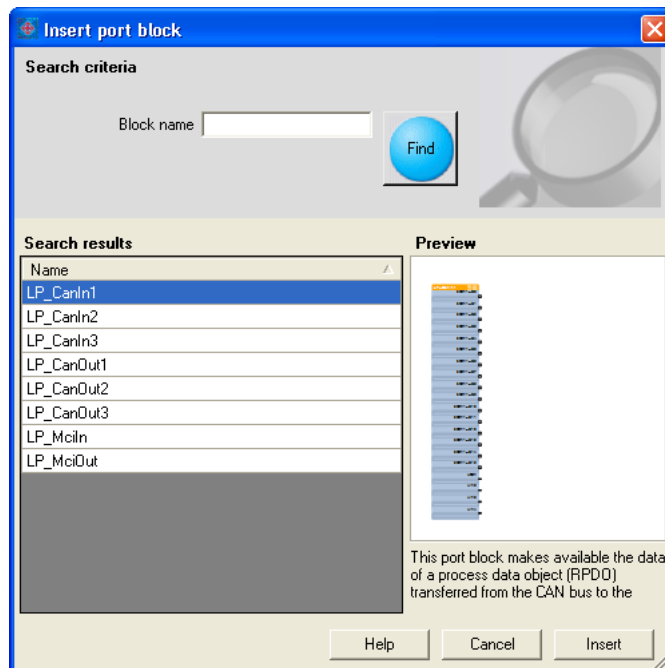
Tip!

You can change between the **Ports** and **FB Editor** tabs at any time to define new ports and afterwards insert them into the interconnection.



How to insert a port block into the interconnection:

1. In the *FB Editor toolbar*, click the  icon.
 - The *Insert port block* dialog box appears.
 - All port blocks available are displayed in the **Search results** list field.






- A preview of the selected port block is displayed.
2. If required, define **search criteria** to accordingly narrow down the port blocks available:
 - **Block name:**
String which must be contained in the name of the port block.
 3. After changing the search criteria, press the **Find** button to update the selection.
 - Then, only the port blocks complying with the features set in the search criteria are shown in the **Search Results** list field.
 - If no search criteria are set, all port blocks available are shown.
 4. Select the port block to be inserted in the **Search results** list field.

5. Press **Insert** button.
 - The dialog box is closed and the selected port block is inserted into the interconnection.

Context menu for the port block

If you right-click on the header of a port block, a *context menu* opens via which you can execute the following functions in addition to the general processing functions (Copy, Insert, Delete):

Command	Function
 Center	Move the visible cutout of the drawing area so that the block is centred.
Connector visibilities...	Define visible inputs and outputs of the block. ▶ Changing connector visibilities (1089)
Online display format...	Adapt the display format of the input and output data of the block individually for online monitoring. ▶ Change online display format (1077)
 Parameter...	Open the parameter list/parameterisation dialog for the block.
 Help	Show online help for the block.

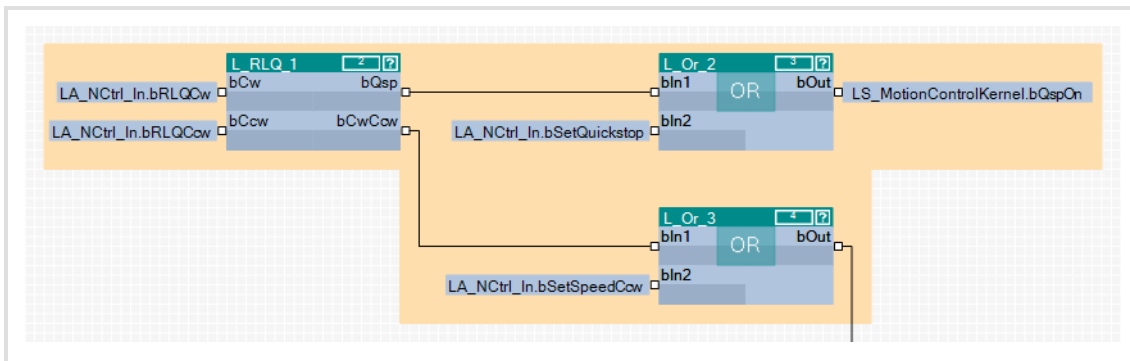
Related topics

- ▶ [Deleting objects that are no longer required \(1088\)](#)
- ▶ [Changing connector visibilities \(1089\)](#)
- ▶ [Arranging objects in the drawing area \(1090\)](#)
- ▶ [Creating/deleting connections \(1091\)](#)

17.4.1.4 Inserting a comment

Comments can be inserted at any position in the drawing area.

As of the »Engineer« V2.10, the interior colour and text alignment of a comment can be changed via a properties dialog. Now the sizes of comments can also be changed using the mouse pointer. When using different interior colours you can use comments to graphically arrange areas that belong together in terms of function or separate them from other areas:



[17-7] Example: Graphical arrangement of FBs by means of two comments that overlap.



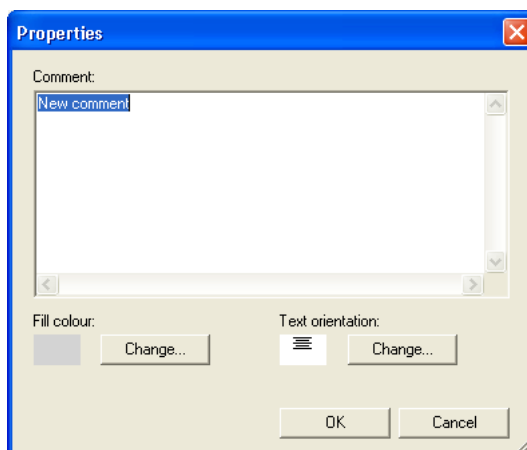
Note!

The term "Arrangement" does not mean a logical arrangement of the function blocks. The comments are only graphical presentation elements of the FB Editor.



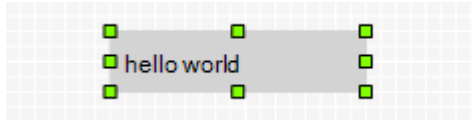
How to insert a new comment into the interconnection:

1. Move the mouse pointer to the (free) position in the drawing area where the comment is to be inserted.
2. Go to the *Context menu* (right mouse key) and select the **New comment** command.
 - The *Properties* dialog box is displayed:



3. Enter the required comment into the text field.

4. **Optional:** Change preset interior colour.
 - For this purpose, click the left **Change...** button to open the *Colour* dialog box to select another interior colour.
5. **Optional:** Change preset text alignment.
 - For this purpose, click the right **Change...** button to open the *Text alignment* dialog box to select another text alignment.
6. Press **OK** to close the *Properties* dialog box and insert the comment.
 - After being inserted, the corner points of the comment are shown:



7. **Optional:** Change size of the comment.
 - For this purpose click one of the corner points with the left mouse button and enlarge the comment to the required size with the mouse button pressed.



8. **Optional:** Drag comment.
 - For this purpose click the comment with the left mouse button and move the comment to the required position with the mouse button pressed.

**Tip!**

The *Properties* dialog box for a comment already available can be opened by double-clicking the comment.

Related topics

- ▶ [Deleting objects that are no longer required](#) (📖 1088)
- ▶ [Arranging objects in the drawing area](#) (📖 1090)
- ▶ [Creating/deleting connections](#) (📖 1091)

17.4.1.5 Deleting objects that are no longer required

Objects that are no longer required can be easily deleted again. "Delete" only means that the object is removed from the drawing area. If you have deleted an object from the drawing area, you can reinsert it any time into the interconnection.



Note!

Deleting an object cannot be undone.

Together with the object, all available connections to this object are deleted.



How to delete objects that are no longer required:

1. Select objects to be deleted.
 - You can select a single object by clicking the header of the object.
 - You can select objects that are placed together by drawing a frame around these objects while keeping the mouse button pressed.
 - If you click the header of further objects while pressing **<Ctrl>**, these will be added to an already existing selection (multi-selection).
 - All selected objects are highlighted by a light green header.
2. Press ****.

Related topics

- ▶ [Deleting connections that are no longer required](#) (📖 1096)

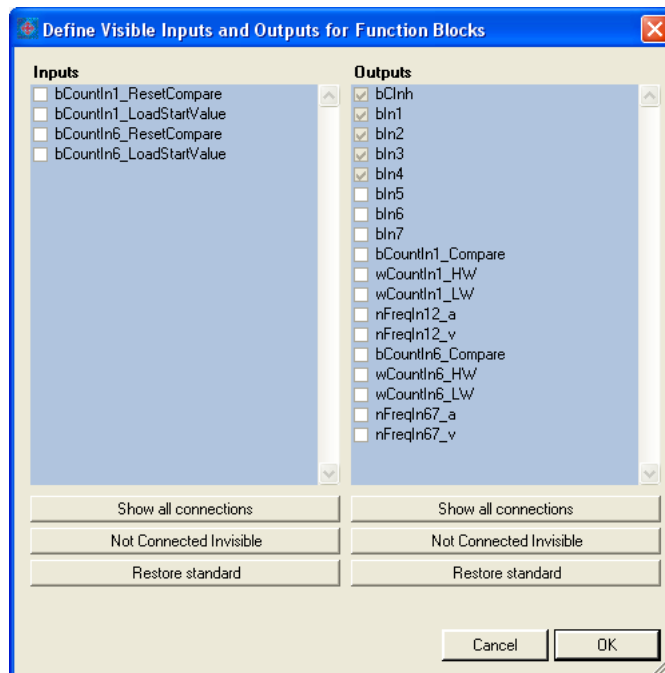
17.4.2 Changing connector visibilities

Inputs and outputs that are not connected can be hidden for each block. This serves to reduce the dimension of the block. The interconnection becomes clearer.



How to define the visible inputs and outputs:

1. Go to the context menu of the block and select the **Connector visibilities** command.
 - The *Define Visible Inputs and Outputs for Function Blocks* is displayed:



- All visible connections have a checkmark.
 - In case of a block that is inserted anew, all inputs and outputs are visible at first.
 - Inputs and outputs with a light grey checkbox are already connected and thus cannot be hidden.
2. By setting/removing the checkmarks or via the buttons you can define the visible inputs and outputs.
 3. Press **OK** to accept the selected definition and close the dialog box.

17.4.3 Arranging objects in the drawing area

All objects can be freely arranged in the drawing area by dragging with the mouse.

We recommend to make an arrangement in which the required connections between the inputs and outputs can be created easily. A division into functional areas may also be sensible to get a better understanding of the application.

Objects which are already connected, can also be dragged to another (free) position in the drawing area. The available connections will be automatically re-routed after dragging.



How to drag an object:

1. Click the header of the object (and keep the button pressed).
2. Keep the button pressed and drag the object to the required position in the drawing area.
 - Via <Esc> you can cancel this action.



How to drag several objects at the same time:

1. Select the objects to be dragged.
 - You can select a single object by clicking the header of the object.
 - If you click the header of further objects while pressing <Ctrl>, these will be added to an already existing selection (multi-selection).
 - You can easily select objects that are placed together by drawing a frame around these objects while keeping the mouse button pressed.
 - All selected objects are highlighted by a light green header.
2. Keep the mouse button pressed on the header of one of the selected objects and drag it to the required position in the drawing area.
 - Via <Esc> you can cancel this action.



Note!

A red header indicates that the object overlaps with other objects in the drawing area!

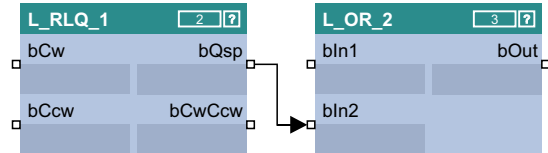
Arrange the objects so that no overlap occurs.

17.4.4 Creating/deleting connections

After adding objects and arranging them in a reasonable manner within the drawing area, you can create the connections between the available objects which are required for the desired function.

A connection always has a direction and therefore always has a source and a target.

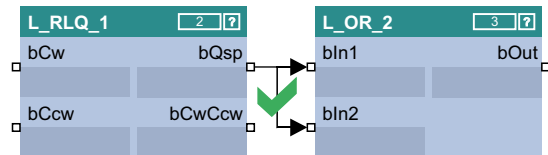
- ▶ An output represents a possible source in the interconnection.
- ▶ An input represents a possible target in the interconnection.



Permissible/impermissible connections

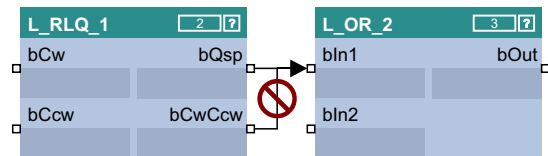
Several connections can lead from one output.

- ▶ Therefore it is always possible to start a new connection from an output.



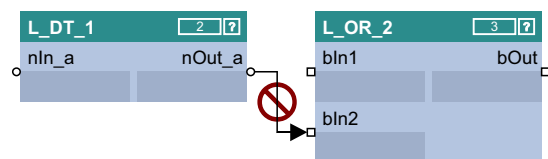
However, maximally one connection may end in an input.

- ▶ Therefore it is only possible to start a new connection from an input if there is no connection already ending in this input.



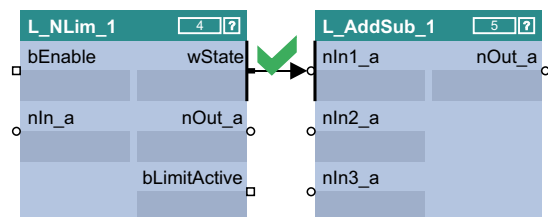
Only inputs/outputs of the same signal type can be connected.

- ▶ Thus, a connection between different port symbols cannot be established.



From the »Engineer« V2.12 "Analog/scaled" (_a) and "Miscellaneous (WORD)" signal types can also be interconnected.

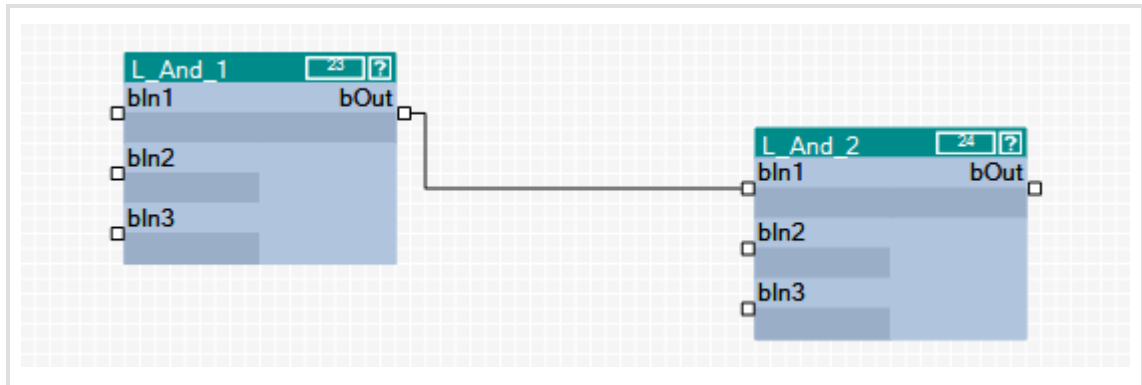
- ▶ The implicit type conversion is indicated by a vertical black bar at the port symbol.



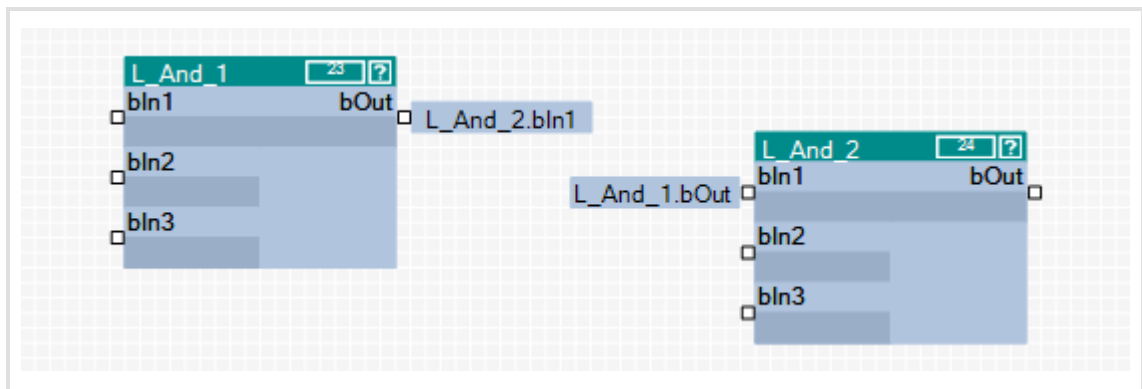
From the »Engineer« V2.13 "Analog/scaled" (_a) and "Angular velocity" (_v) signal types can also be interconnected.

Connection types

Connections can either be created by means of connection lines or port identifiers ("flags")



[17-8] Example 1: Connection via connection line



[17-9] Example 2: Connection via flags



Tip!

The commands **Show as flag** or **Show as line** in the *context menu* of a connection serve to change the representation of the connection at any time.

When an output is connected to several inputs via flags, three points are displayed ("...") at the output instead of the concrete input identifier. The *context menu* of the port symbol shows all inputs which are connected to the output.

17.4.4.1 Creating a connection using the connection line

**How to create a connection using the connection line:**

1. Click the port symbol from which the new connection is to be started.
 - It is only possible to start a new connection from an input if there is no connection already ending in this input.
 - If you then move the mouse pointer away from the port symbol, a new connection is "drawn" from this port symbol.
 - Via <Esc> you can cancel this action.
2. Click the port symbol where the connection is to end.
 - Thereupon the corresponding connection is routed automatically if the connection is permissible.

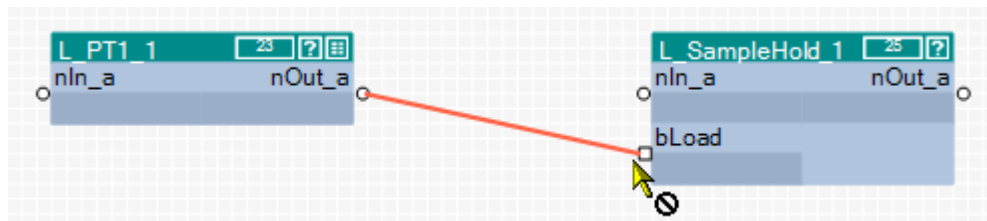
**Tip!**

If you move the mouse pointer across the port symbol while drawing a new connection, you can see whether the connection is permissible or not from the colour of the drawn line and from the mouse pointer symbol.

- Permissible connection:



- Impermissible connection (different port symbol):



The command **Show as flag** in the *context menu* of a line serves to change the representation of the connection at any time.

17.4.4.2 Creating a connection using port identifiers

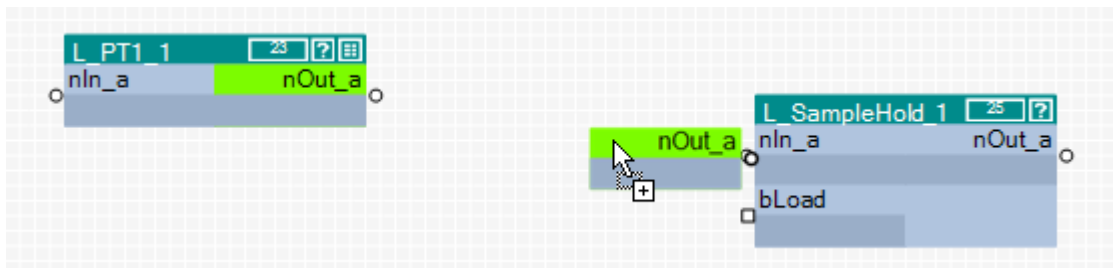


How to create a connection with port identifiers:

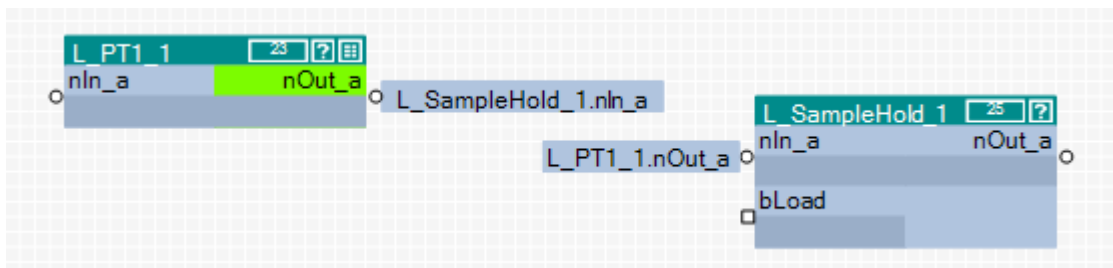
1. Click the port identifier.
 - The selected port is highlighted in light green:



2. Drag the port segment to the required port while keeping the left mouse button pressed:



After releasing the mouse button, the connection via port identifiers (flags) is created. The corresponding port identifier consists of the block name and the name of the input/output:



Tip!

The command **Show as line** in the *context menu* of a flag serves to change the representation of the connection at any time.

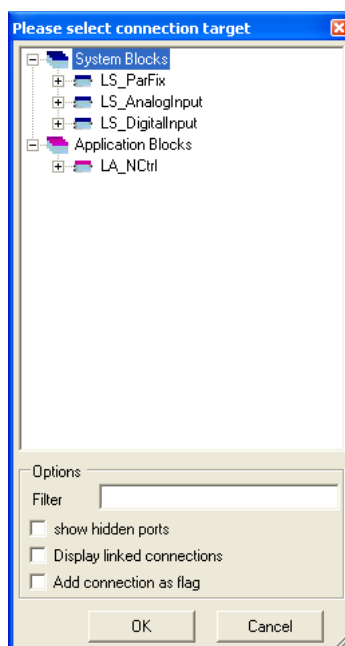
17.4.4.3 Creating a connection via connection dialog

You can also create connections by means of a selection dialog instead of dragging by mouse. This especially makes sense if there is a great distance between the ports to be connected in the drawing area.



How to create a connection using the selection dialog:

1. Right-click the port identifier or click the port symbol from which the connection is to start.
 - The *context menu* for the port is displayed.
2. Go to the *context menu* for the port and select the **Add/change connection...** command.
 - The *Add/change connection* dialog box is displayed:



- In a tree structure all inputs and outputs of the application are shown to which a connection is permissible.
 - You can enter an optional text into the **Filter** input field to reduce the selection to the blocks or ports which contain the entered text.
 - If you activate the **Show hidden ports** control field, the hidden ports for system and function blocks are shown as well.
3. Select the port where the connection is to end from the tree structure.
 4. Activate the **Add connection as flag** control field if a port identifier (flag) is to be inserted instead of a connection line.
 5. Press **OK** to create the connection to the selected port and close the dialog box.

17.4.4.4 Deleting connections that are no longer required



How to delete connection lines:

1. Select connection lines to be deleted.
 - Select a single connection line by directly clicking on the connection line with the right mouse button.
 - If you click further connection lines while pressing **<Ctrl>** they are added to an already existing selection (multi-selection).
 - All connection lines are highlighted in red.
2. Press ****.



How to delete port identifiers/flags:

1. Select the port identifiers to be deleted.
 - Select a single port identifier by directly clicking on the port identifier with the left mouse button.
 - If you click further port identifiers while pressing **<Ctrl>** they are added to an already existing selection (multi-selection).
 - All selected port identifiers are highlighted by a light green header.
2. Press ****.

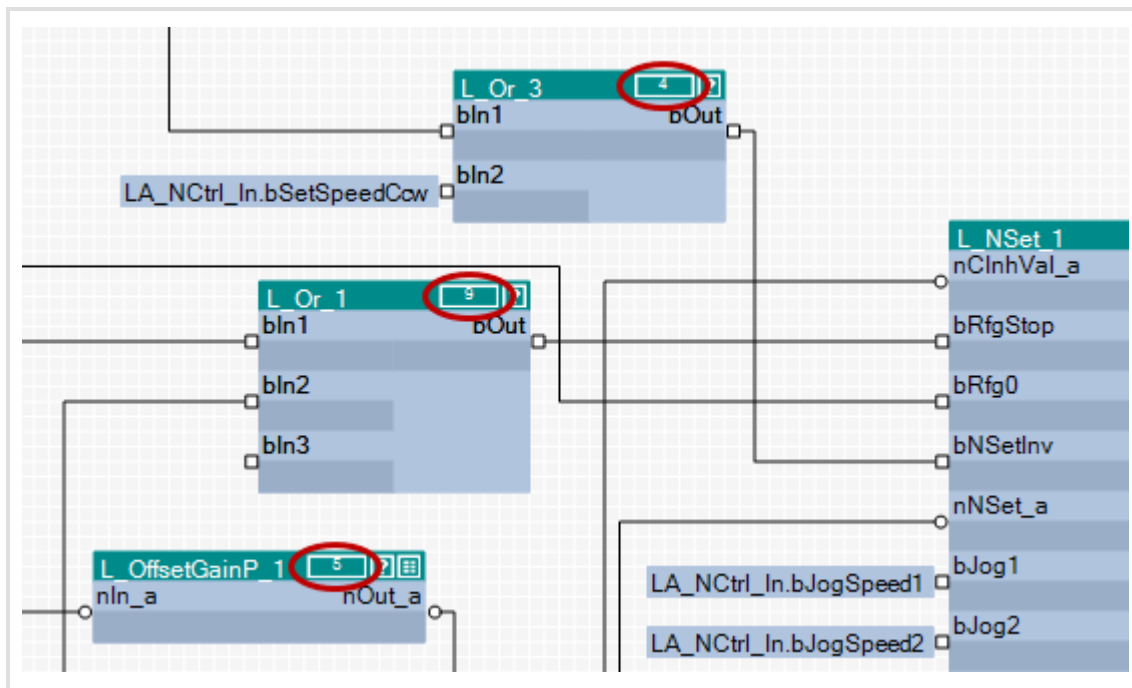
Related topics

- ▶ [Deleting objects that are no longer required](#) (📖 1088)

17.4.5 Changing the processing order

If you insert a function block into the interconnection, an order index is automatically assigned to this function block. By means of this order index it is defined in which order the individual function blocks are calculated at runtime.

- ▶ The first function block inserted contains the order index "1", the next function block inserted contains the order index "2", etc.
- ▶ The respective order index is displayed in the header of the function block in the rectangle after the block name.



[17-10] Example: Function blocks with order index



Note!

When a function block is shifted, its order index is maintained.

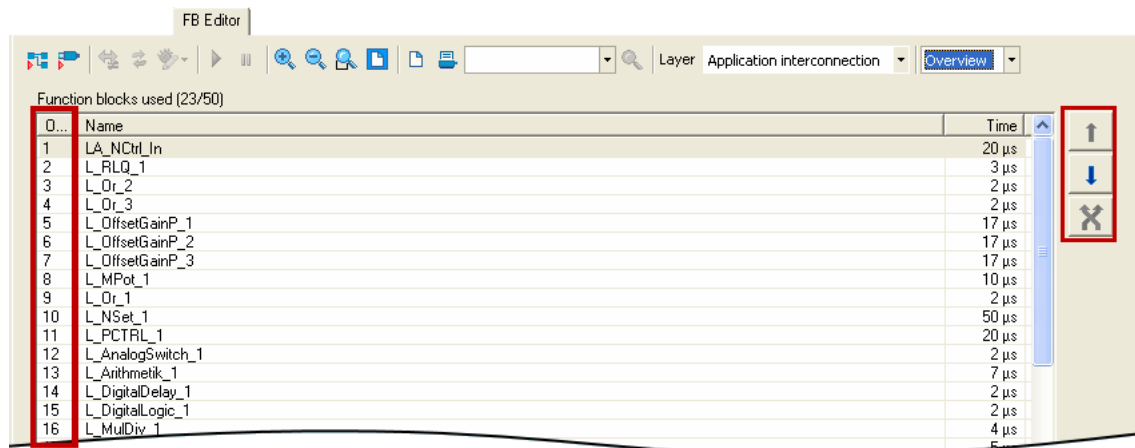
The processing order influences the result!

- In certain cases it may be sensible to change the processing order, but if you select an unfavourable processing order, errors may arise!



How to change the processing order manually:

1. Use the list field at the top right to change from the Editor to the overview.
 - The overview displays all function blocks of the interconnection in the order of their processing
 - In the first "Order" column the order index of each function block is listed.
2. Unless already selected, select the entry "Manual selection" in the **Optimisation...** list field.



3. Select the function block which is to receive a different position within the processing order.
 - If you click further function blocks while pressing **<Ctrl>** they are added to an already existing selection (multi-selection).
 - The **<Shift>** key serves to select a related area of function blocks.
4. Move the function block(s) to the desired position using the **↑** and **↓** buttons.
 - The **X** button serves to exchange two selected function blocks with regard to their order.
5. Repeat steps 3 and 4 until the required processing order has been established.

Changing the processing order according to an automatically generated selection

In addition to the manual selection, the **Optimisation...** list field also offers two options for an automatic adaptation of the processing order:

- ▶ **Signal flow:** The processing order is optimised according to the signal flow.
- ▶ **Topology:** The processing order is optimised according to the x/y arrangement of the function blocks in the FB Editor.

As long as an automatic adaptation has been selected, a manual change of the processing order is not possible.

17.4.6 Copying interconnection elements (across all devices)

Interconnection elements can be copied across the devices within the project if the devices belong to the same product family (e.g. Inverter Drives 8400).

All types of blocks and comments can be copied to the clipboard via the **Copy** command or the **<Ctrl>+<c>** shortcut and then be inserted into the FB interconnection of the same or another project device of the same product family using the **Paste** command or the **<Ctrl>+<v>** shortcut.

- ▶ During the copy process into the clipboard, existing connections between copied blocks are copied as well, and the layout is kept too. Moreover, the separate technical objects (e.g. port definition) are copied. Selected connections cannot be copied on their own.
- ▶ The **Paste** command is available if the clipboard is not empty and if it was copied from a device of the same product family. Within this product family, all device types (e.g. 8400 xxxxLine Vxx.xx) are permitted.
- ▶ After the **Paste** command has been selected, a dialog box is displayed which serves to select which elements are to be inserted from the clipboard and how to solve name conflicts, if any.
- ▶ After inserting the elements, they are marked in the target interconnection in order to be repositioned or deleted again to undo the insertion.
- ▶ Inserting from the clipboard can be repeated. The originally copied contents of the clipboard remains unchanged when it is inserted.



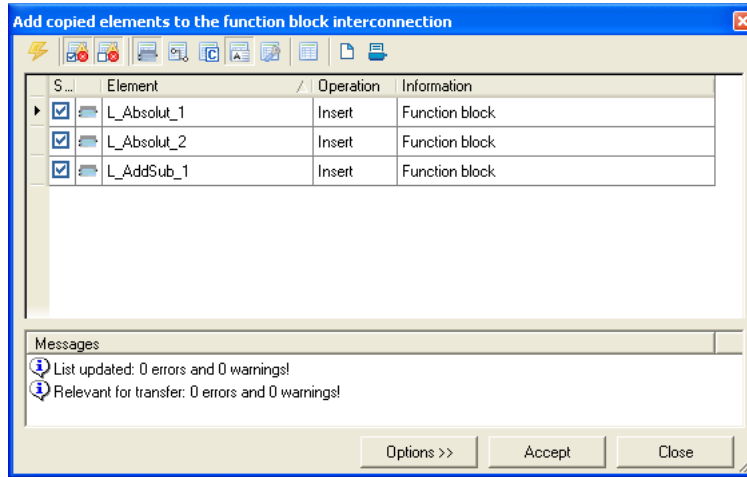
How to copy one or several interconnection elements:

1. Select the objects to be copied.
 - You can select a single object by clicking the header of the object.
 - If you click the header of further objects while pressing **<Ctrl>**, these will be added to an already existing selection (multi-selection).
 - You can easily select elements that are placed together by drawing a frame around these elements while keeping the mouse button pressed.
 - All selected objects are highlighted by a light green header.
2. Go to the *context menu* and select the **Copy** command (or **<Ctrl>+<c>**).
 - The selected elements are copied into the clipboard of the FB Editor.

3. If the elements are to be copied into a function block interconnection of another project device, change to the corresponding interconnection via the *project view*.
4. Go to the *context menu* and select the **Paste** command (or <Ctrl>+<v>).
5. Go to the *Insert FB interconnection* dialog box and select the elements to be inserted from the clipboard.
 - Detailed information on this dialog box can be obtained from the following subchapter "[Insert options for copied elements](#)". (📖 1101)
6. Click **Insert** to insert the selected elements into the target interconnection as defined.
 - Only possible if at least one element in the list has been selected for insertion.
 - Insertion is also possible via the <Enter> button if at least one element is selected from the list for insertion.
 - The original layout and the relative position of the inserted blocks to each other are maintained.
 - When copying across the devices, you also insert the corresponding separate technical objects (e.g. port definition).
 - The inserted elements are deleted from the list. If the list is empty, the dialog box is closed and the connections are inserted depending on the selected option.
7. If there are still elements to be entered in the list, repeat steps 5 and 6 until all elements are inserted as intended.
8. Press **Close** to stop the insertion and close the dialog box.
 - You can also use <Esc> or <Enter> to close the dialog box if "Insert" is not active.
 - The elements inserted into the target interconnection so far are maintained.
 - The connections for the blocks inserted so far are inserted depending on the selected option.

17.4.6.1 Insert options for copied elements

If interconnection elements have been copied to the clipboard, the »Engineer« will display a list of all elements contained in the clipboard when selecting the command **Insert** in the *Insert FB interconnection* dialog box:



The list shows the elements which can be added to the target interconnection, and the elements which cannot be added.

- ▶ In the "Selection" column, you can check/uncheck the elements to be added.
- ▶ Connections are only inserted when the dialog box is closed, which applies to all modules inserted so far. They are displayed as lines or flags, like in the original, but re-routed.
- ▶ The symbols in the *Toolbar* serve to execute the following functions:

Symbol	Function
	Add the selected elements to the interconnection
	Show the elements to be added but are marked with an error or warning.
	Show the elements not to be added and marked with an error or warning.
	Show blocks
	Show connections
	Show parameters
	Show comments
	Show system elements
	Show all
	Print view
	Print list

► The buttons serve to execute the following functions:

Button	Function
Insert	<p>Add elements selected in the list to the target interconnection</p> <ul style="list-style-type: none">• Only possible if at least one element in the list has been selected for insertion.• Insertion is also possible via the <Enter> button if at least one element is selected from the list for insertion.• The original layout and the relative position of the inserted blocks to each other are maintained.• When copying across the devices, you also insert the corresponding separate technical objects (e.g. port definition).• The added elements are simultaneously deleted from the list. The connections are added depending on the selected option.
Close	<p>Close dialog box.</p> <ul style="list-style-type: none">• You can also use <Esc> or <Enter> to close the dialog box if "Insert" is not active.• The elements inserted into the target interconnection so far are maintained.• The connections for the blocks inserted so far are inserted depending on the selected option.

17.4.7 Resetting changed interconnection

If you only made changes on the I/O level, you can reset them by selecting a predefined control scheme in [C00007](#). If you have also made changes on the application level, you must first reset the changed application to a predefined application in [C00005](#).



How to reset the application interconnection to a predefined application:

1. Go to the **Application parameters** tab.
2. Select the required application in the **Application** list field.

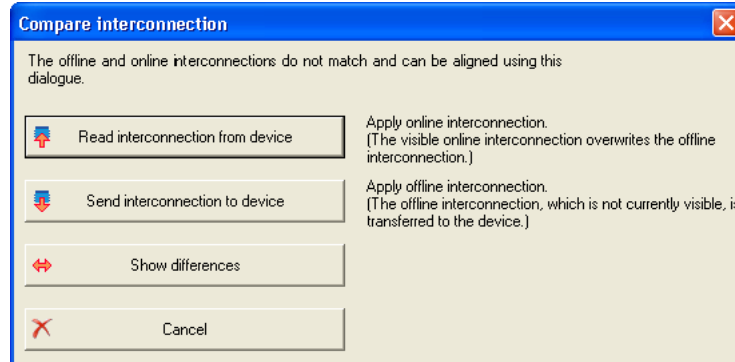


How to reset the I/O interconnection to a predefined control scheme:


1. Go to the **Application parameters** tab.
2. Select the required control scheme in the **Control source** list field.

17.5 Adjusting online and offline interconnection

If the »Engineer« detects that online and offline interconnection differ from each other, the *Compare interconnection* dialog box is displayed with various options for the adjustment:



Tip!

The dialog box can also be opened via the  symbol in the *FB Editor toolbar*.


Button	Function
Accepting the interconnection from the device	Add the interconnection in the device to the FB Editor. The interconnection existing in the FB Editor will be overwritten by this action.
Transferring the interconnection to the device	Transfer the offline interconnection which is currently not visible in the FB Editor to the device. The interconnection existing in the device will be overwritten by this action.
Showing differences	Showing differences between online and offline interconnection.
Cancel	Close the <i>Adjust interconnection</i> dialog box without making an adjustment.

17.6 Printing the interconnection

The interconnection can be printed for documentation purposes, optionally on one page, on four pages, or not scaled.




Tip!

By clicking the  icon in the *FB Editor toolbar*, you can get a print view before printing.



How to print the interconnection:

1. In the *FB Editor toolbar*, click the  icon.
 - The *Circuit print size* dialog box is displayed.
2. Select the desired size and press **OK**.
 - The standard dialog box *Print* appears.
3. Press **OK** to start the printing process.

17.7 Comparing interconnections

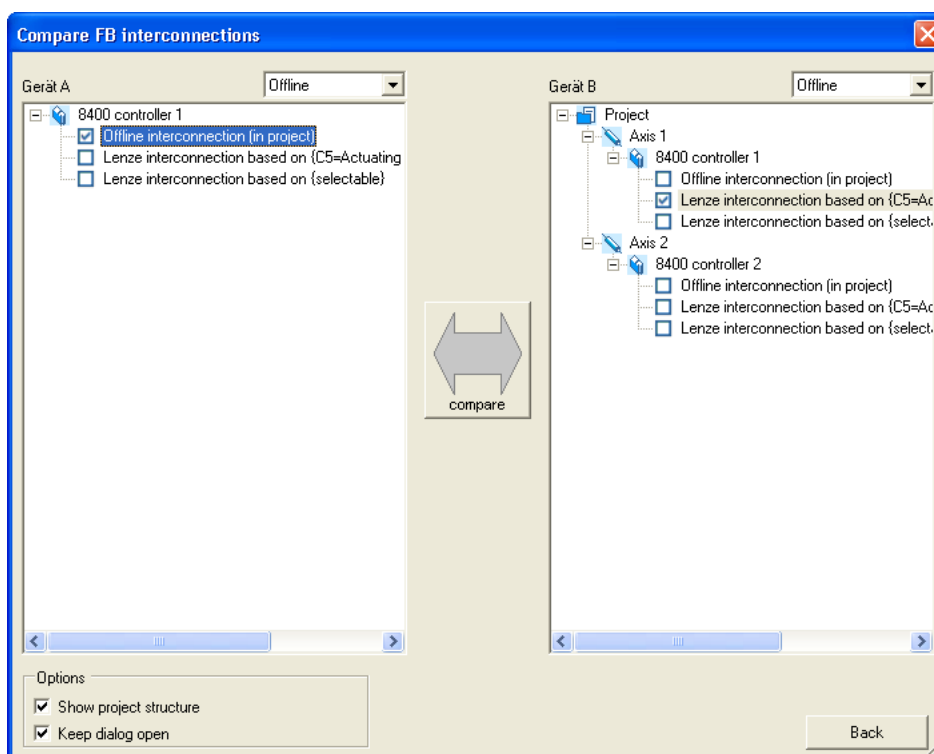
The comparison operation serves to compare FB interconnections of 8400 devices within the project. An offline<>online comparison and the comparison of two online devices are possible.

**Note!**

Only applications can be compared which have been enabled in the FB Editor!
Block positions, line representations, and connector visibilities are not compared.

**How to compare two FB interconnections:**

1. Select the command **Application data**→**Compare FB interconnections....**
 - The *Compare FB interconnections* dialog box is displayed:

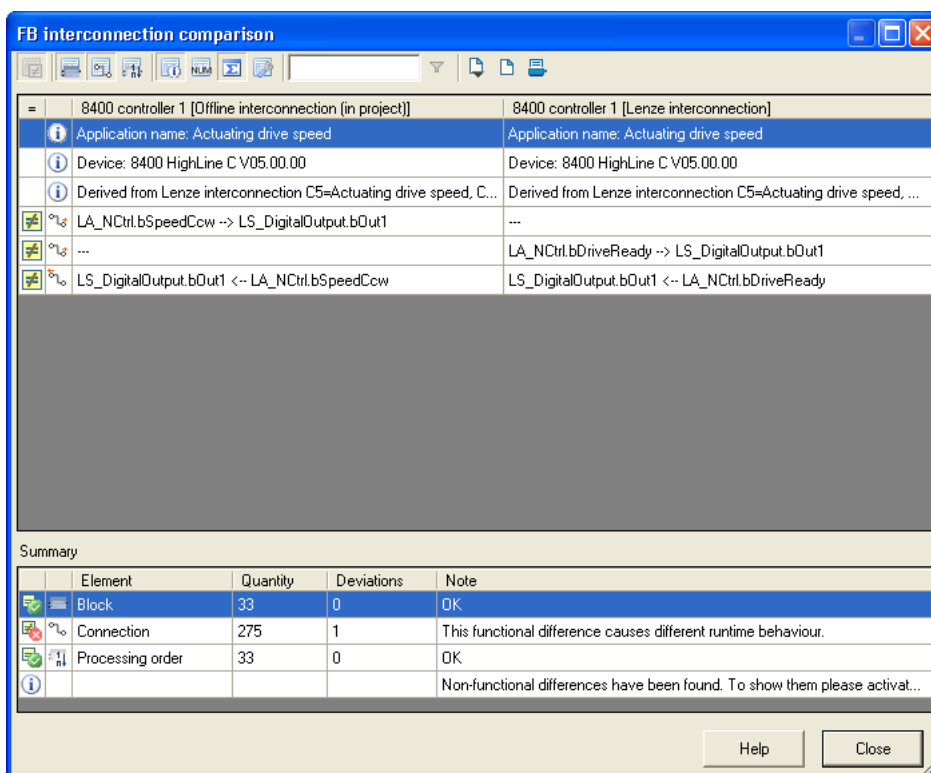


2. Select the interconnections to be compared in the project view represented on the left and right.
 - In order to execute a comparison with an online device, select "Online" in one of the two upper list fields. Then all available online devices are displayed for selection.
 - If you select "Online" in one of the two upper list fields, you can also compare the interconnections of two available online devices.

3. Click **Compare**.
 - If the comparison was executed successfully, the comparison result is displayed as a list (see the following section).
 - If a comparison of the selected interconnections is not possible, a corresponding message is displayed.
4. In order to stop the comparison operation and close the dialog box: Press **Back**.











Representation of the comparison result

The comparison result is displayed in the form of a list in the *FB interconnection comparison* dialog box:



- The symbols in the *Toolbar* serve to show or hide different details and export and print the shown list.

Symbol	Function
	Only show differences <ul style="list-style-type: none"> • Button can only be activated in expert mode.
	Show blocks
	Show connections
	Show processing order
	Show properties of blocks and connections <ul style="list-style-type: none"> • Function is only available in expert mode.
	Show comments <ul style="list-style-type: none"> • Function is only available in expert mode.

Symbol	Function
	Show block parameters <ul style="list-style-type: none"> Function is only available in expert mode.
	Show application parameters <ul style="list-style-type: none"> Function is only available in expert mode.
	Show all <ul style="list-style-type: none"> Function is only available in expert mode.
	Show general information
	Show summary
	Activate expert mode <ul style="list-style-type: none"> In the expert mode, also non-functional differences are shown.
	Apply filter <ul style="list-style-type: none"> Only show list entries which contain the text entered in the input field. Function is only available in expert mode.
	Export shown list as comma-separated list (*.csv)
	Print view
	Print list

17.8 Copying an interconnection

In contrast to copying/inserting selected interconnection elements via the clipboard, the function described in this chapter serves to replace the current FB interconnection of a device completely by the FB interconnection of another project device.



Note!

The complete FB interconnection can only be copied between devices of the same device type and version (e.g. 8400 HighLine C V1.0).

A complete interconnection comprises:

- ▶ Function blocks (use and parameter values)
- ▶ System blocks (application and parameter values)
- ▶ Port blocks (use and parameter values)
- ▶ Connections
- ▶ Comments
- ▶ Interconnection layout (arrangement of the modules)
- ▶ Port definition of the ports used in the FB interconnection



How to copy the complete interconnection into another project device:

1. Select the application with the FB interconnection to be copied in the *project view*.
2. Select the command **Application data**→**Copy FB interconnections...**
3. Go to *project view* and select the application which is to be inserted into the copied FB interconnection.
4. Select the command **Application data**→**Add FB interconnection...**
 - The command can only be activated if an FB interconnection has been copied from a device of the same device type and version.
 - After the command has been executed, the module assembly is compared. If there are relevant deviations, the insertion is refused and a corresponding message is displayed.
 - If an insertion is possible, you are asked if the FB interconnection is to be inserted.
5. Confirm the question if the copied FB interconnection is to be inserted with **Yes**.
 - After the insertion, an update of the project is required.

17.9 Exporting/Importing an interconnection

The interconnection existing in the project can be exported to a file for reuse/transfer to other devices.



Note!

The file can only be imported to devices of the same device type and version (e.g. 8400 HighLine C V1.0).



How to export the interconnection from the project to a file:

1. Go to the *Project view* in the *context menu* of the controller and select the **Export FB interconnection...** command.
2. Enter the memory location and the file name for the interconnection to be exported in the *Export FB interconnection* dialog box.
3. Click **Save** to export the interconnection and close the dialog box.



How to import the interconnection from a file to the project:

1. Go to the *Project view* in the *context menu* of the controller and select the **Import FB interconnection...** command.
2. Select the file with the interconnection to be imported in the *Import FB interconnection* dialog box.
3. Click **Open** to import the interconnection and close the dialog box.

18 Function library

18.1 Function blocks

This chapter describes the function blocks which are available for the controller in the FB Editor.



The system blocks are described in the chapter "[System blocks](#)". (📖 1382)



Note!

A maximum of 75 function blocks can be used for a function block interconnection. The maximum calculating time is approx. 300 μ s.

Overview of function blocks available

Function block	Runtime	Function
L Absolute 1 L Absolute 2	2 μ s	... converts a bipolar input signal into a unipolar output signal.
L AddSub 1	3 μ s	... adds / subtracts analog input signals.
L AnalogSwitch 1 L AnalogSwitch 2 L AnalogSwitch 3 L AnalogSwitch 4 L AnalogSwitch 5	2 μ s	... switches between two analog input signals.
L And 1 L And 2 L And 3	2 μ s	... ANDs three binary signals.
L And5 1 L And5 2	2 μ s	... ANDs five binary signals.
L Arithmetik 1 L Arithmetik 2 L Arithmetik 3 L Arithmetik 4 L Arithmetik 5	7 μ s	... combines two analog signals arithmetically.
L ArithmetikPhi 1 L ArithmetikPhi 2 L ArithmetikPhi 3	7 μ s	... combines two angle signals arithmetically.
L CalcDiameter 1	2 μ s	... can calculate the reel diameter from line speed and winding speed. • This FB is available from version 02.00.00.
L Compare 1 L Compare 2 L Compare 3 L Compare 4 L Compare 5	5 μ s	... compares two analog signals and can be used e.g. to implement a trigger.
L ComparePhi 1 L ComparePhi 2 L ComparePhi 3 L ComparePhi 4 L ComparePhi 5	5 μ s	... compares two angle signals.

Function block	Runtime	Function
L_ConvAP_1 L_ConvAP_2 L_ConvAP_3	0 µs	... converts an analog value into a position. • This FB is available from version 02.00.00.
L_ConvBitsToWorld_1 L_ConvBitsToWorld_2 L_ConvBitsToWorld_3	3 µs	... converts 16 bit input values of the type "BOOL" into an output value of the type "WORD".
L_ConvDIntToWords_1 L_ConvDIntToWords_2 L_ConvDIntToWords_3	3 µs	... converts an input value of the type "DINT" into two output values of the type "WORD".
L_ConvPA_1 L_ConvPA_2 L_ConvPA_3	3 µs	... converts a position into an analog value. • This FB is available from version 02.00.00.
L_ConvPP_1 L_ConvPP_2 L_ConvPP_3	3 µs	... converts a position with dynamic fraction. • This FB is available from version 02.00.00.
L_ConvUnitsToIncr_1 L_ConvUnitsToIncr_2 L_ConvUnitsToIncr_3	3 µs	FB in preparation! ... converts a position value provided in the real unit of the machine into an internal 32-bit position value.
L_ConvW_1 L_ConvW_2 L_ConvW_3 L_ConvW_4	2 µs	... enables parameterisable conversion between analog signal forms. • Division is remainder considered.
L_ConvWordsToDInt_1 L_ConvWordsToDInt_2 L_ConvWordsToDInt_3	3 µs	... converts two inputs values of the type "WORD" into an output value of the type "DINT".
L_ConvWordToBits_1 L_ConvWordToBits_2 L_ConvWordToBits_3	3 µs	... converts an input value of "WORD" type into 16 individual binary signals.
L_ConvX_1 L_ConvX_2 L_ConvX_3	0 µs	... scales an analog value. • This FB is available from version 02.00.00.
L_Counter_1 L_Counter_2 L_Counter_3	3 µs	... is a digital upcounter and downcounter.
L_Curve_1 L_Curve_2 L_Curve_3	4 µs	... can optionally display a characteristic function or a curve function $y=f(x)$, the X axis being the input signal and the Y axis being the output signal. • L_Curve_2 and L_Curve_3 are available from version 02.00.00.
L_DFlipFlop_1 L_DFlipFlop_2	3 µs	... provides two stable states depending on the input signals.
L_DFRFG_1	3 µs	... synchronises a drive (slave) to the master value of a master drive and then executes a angular synchronism with regard to the digital frequency. • This FB is available from version 02.00.00.
L_DFSET_1	3 µs	... prepares the master value for a slave drive. This FB enables the controller to follow the master drive true to speed and angle. • This FB is available from version 02.00.00.
L_DigitalDelay_1 L_DigitalDelay_2 L_DigitalDelay_3	2 µs	... delays binary signals.
L_DigitalLogic_1 L_DigitalLogic_2 L_DigitalLogic_3	2 µs	... provides a binary output signal which is generated by the logic combination of three input signals. • L_DigitalLogic_3 is available from version 02.00.00.
L_DigitalLogic5_1 L_DigitalLogic5_2	2 µs	... provides a binary output signal which is generated by the logic combination of five input signals.

Function block	Runtime	Function
L_DT1_1	3 µs	...differentiates signals. The function block can, for instance, be used to apply an acceleration (dv/dt).
L_FixSet_a_1	2 µs	... outputs one of 16 parameterisable analog signals.
L_FixSet_w_1 L_FixSet_w_2	2 µs	... outputs one of 16 parameterisable data words.
L_GainOffset_1 L_GainOffset_2 L_GainOffset_3	3 µs	... can amplify an analog input signal and then add an offset to it. <ul style="list-style-type: none"> Gain and offset can be set via FB inputs.
L_GainOffsetP_1 L_GainOffsetP_2 L_GainOffsetP_3	3 µs	... can amplify an analog input signal and then add an offset to it. <ul style="list-style-type: none"> Gain and offset can be set via parameters.
L_GainOffsetPhiP_1 L_GainOffsetPhiP_2	3 µs	... can amplify an angle signal and then add an offset to it. <ul style="list-style-type: none"> Gain and offset can be set via parameters.
L_GearComp_1	3 µs	... compensates elasticities in the drive train (gearbox compensation). <ul style="list-style-type: none"> This FB is available from version 02.00.00.
L_Interpolator_1	5 µs	... can interpolate a position setpoint and/or an analog value e.g. to compensate for larger bus transmission cycles or to continue signal characteristics if data telegrams are missing.
L_JogCtrlExtension_1	5 µs	... can be connected upstream to the L_NSet ramp generator to implement a switch-off positioning at limit switch.
L_Limit_1 L_Limit_2	3 µs	... limits an analog input signal to an adjustable value range.
L_LimitPhi_1 L_LimitPhi_2 L_LimitPhi_3	3 µs	... limits an angle signal to an adjustable value range.
L_MckCtrlInterface_1	5 µs	... provides the application with process inputs for controlling various basic functions of the Motion Control Kernel. ▶ MCKInterface (□ 487)
L_MckStateInterface_1	5 µs	... provides the application with various items of status information of the Motion Control via process outputs. ▶ MCKInterface (□ 487)
L_MPot_1	10 µs	... replaces a hardware motor potentiometer as setpoint source.
L_MulDiv_1 L_MulDiv_2	4 µs	... multiplies the analog input signal with a factor. <ul style="list-style-type: none"> Not remainder considered.
L_Mux_1	3 µs	... switches one of eight selectable input signals to the output.
L_Negation_1 L_Negation_2	2 µs	... negates an analog input signal.
L_NLim_1 L_NLim_2	3 µs	... can suppress up to three parameterisable blocking zones within a continuous signal characteristic of an analog input signal.
L_Not_1 L_Not_2 L_Not_3 L_Not_4 L_Not_5 L_Not_6 L_Not_7	2 µs	... inverts a digital input signal.
L_NSet_1	50 µs	... contains a ramp generator with comprehensive parameterisation and control options to condition a setpoint signal.
L_Odometer_1	2 µs	... detects positions and calculates distances.
L_OffsetGain_1 L_OffsetGain_2 L_OffsetGain_3	4 µs	... can add an offset to an analog input signal and amplify it afterwards. <ul style="list-style-type: none"> Offset and gain can be set via FB inputs.
L_OffsetGainP_1 L_OffsetGainP_2 L_OffsetGainP_3	17 µs	... can add an offset to an analog input signal and amplify it afterwards. <ul style="list-style-type: none"> Offset and gain can be set via parameters.

Function block	Runtime	Function
L_OffsetGainPhiP_1 L_OffsetGainPhiP_2	17 µs	... can add an offset to an angle signal and amplify it afterwards. • Offset and gain can be set via parameters.
L_Or_1 L_Or_2 L_Or_3 L_Or_4	2 µs	... ORs three binary signals. • L_Or_4 is available from version 02.00.00.
L_Or5_1 L_Or5_2	2 µs	... ORs five binary signals.
L_PCTRL_1	20 µs	... is a PID controller and can be used for various control tasks.
L_PhaseDiff_1 L_PhaseDiff_2	2 µs	... generates a position difference for the defined position setpoint from a position value and a speed signal.
L_PhaseIntK_1 L_PhaseIntK_2	5 µs	... integrates a speed to an angle.
L_PhiIntegrator_1	2 µs	... evaluates a speed with a gearbox factor and adds them in an integrator. • This FB is available from version 02.00.00.
L_PosCtrlLin_1 L_PosCtrlLin_2	2 µs	... is a simple linear profile generator. • This FB is available from version 02.00.00.
L_PosiShaftCtrlInterface_1	5 µs	FB in preparation!
L_ProcessCtrl_1	2 µs	... can realise a dancer position or tension control. • This FB is available from version 02.00.00.
L_PT1_1 L_PT1_2 L_PT1_3	3 µs	... filters and delays analog signals.
L_RLO_1	3 µs	... links a selected direction of rotation to the QSP function with wire-break protection.
L_RSFlipFlop_1 L_RSFlipFlop_2	3 µs	... saves a binary input information element and resets it on command..
L_SampleHold_1 L_SampleHold_2	3 µs	... saves a value.
L_SignalMonitor_a	15 µs	... serves to output analog output signals of other FBs, SBs or LAs.
L_SignalMonitor_b	3 µs	... serves to output binary output signals of other FBs, SBs or LAs.
L_SignalSwitch_1 L_SignalSwitch_2 L_SignalSwitch_3 L_SignalSwitch_4	2 µs	... switches between two input signals of the "WORD" data type.
L_SignalSwitch32_1 L_SignalSwitch32_2 L_SignalSwitch32_3	2 µs	... switches between two input signals of "DINT" data type. • This FB is available from version 02.00.00.
L_SQrt_1	3 µs	... outputs the square root for a DINT input value.
L_SRFG_1 L_SRFG_2	2 µs	... is a ramp function generator with S-shaped ramps for limiting the temporal rise of analog signals.
L_SwitchPoint_1	3 µs	... provides four position switch points, i.e. digital switches the binary statuses (FALSE/TRUE) of which depend on the actual position. • This FB is available from version 02.00.00.
L_Transient_1 L_Transient_2 L_Transient_3 L_Transient_4 L_Transient_5 L_Transient_6 L_Transient_7 L_Transient_8	3 µs	... evaluates digital signal edges and converts them into timed pulses.

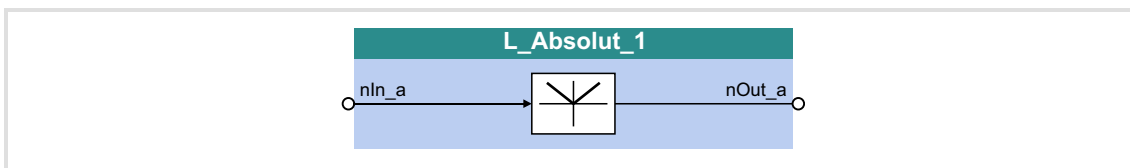
Related topics:

▶ [Overview of system blocks available](#) (📖 1382)

▶ [Working with the FB Editor](#) (📖 1058)

18.1.1 L_Absolute_1

This FB converts a bipolar input signal into a unipolar output signal.

**Inputs**

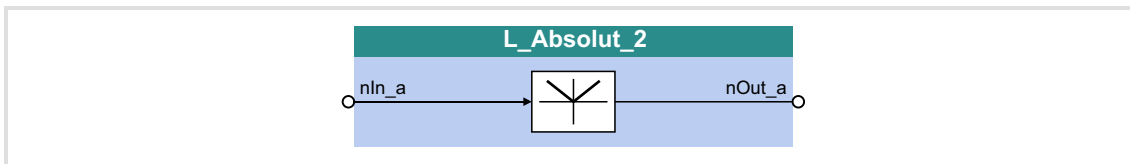
Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.2 L_Absolute_2

This FB converts a bipolar input signal into a unipolar output signal.

**Inputs**

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

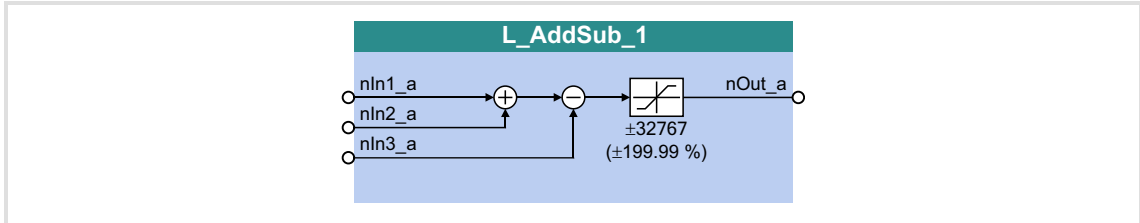
Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.3 L_AddSub_1

This FB is provided with two adding inputs and one subtracting input.

- The value provided at the *nOut_a* output is internally limited to ± 32767 .



Inputs

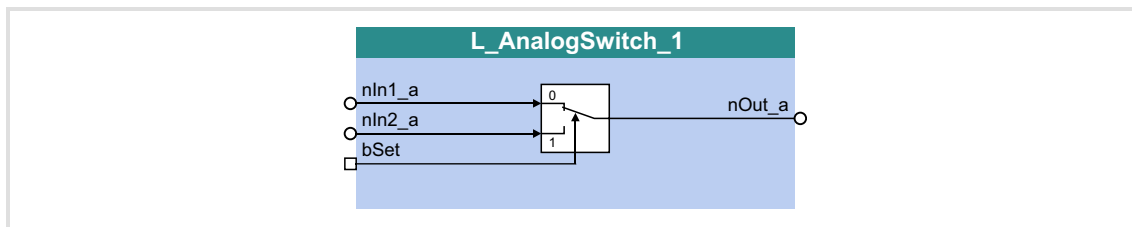
Identifier	Data type	Information/possible settings
nIn1_a	INT	Input signal 1 • This input is added
nIn2_a	INT	Input signal 2 • This input is added
nIn3_a	INT	Input signal 3 • This input is subtracted

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • $nOut_a = nIn1_a + nIn2_a - nIn3_a$ • Internal limitation to ± 32767 ($\pm 199.99\%$)

18.1.4 L_AnalogSwitch_1

This function block switches between two analog input signals. The switching is controlled via a boolean input signal.



Inputs

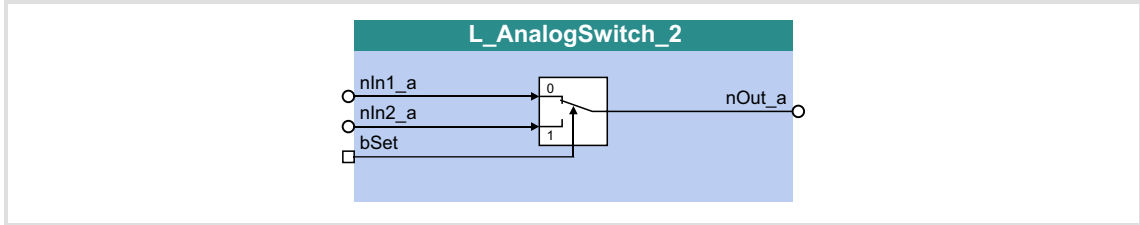
Identifier	Data type	Information/possible settings
nIn1_a	INT	Input signal 1
nIn2_a	INT	Input signal 2
bSet	BOOL	Selection of the input signal for the output to <i>nOut_a</i>
		FALSE <i>nIn1_a</i>
		TRUE <i>nIn2_a</i>

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.5 L_AnalogSwitch_2

This function block switches between two analog input signals. The switching is controlled via a boolean input signal.



Inputs

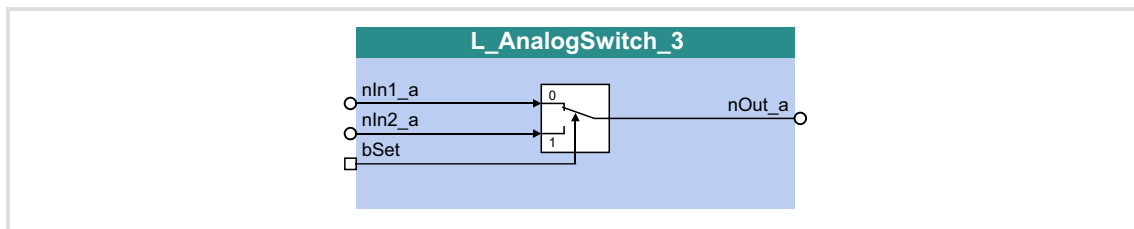
Identifier	Data type	Information/possible settings	
nIn1_a	INT	Input signal 1	
nIn2_a	INT	Input signal 2	
bSet	BOOL	Selection of the input signal for the output to <i>nOut_a</i>	
		FALSE	<i>nIn1_a</i>
		TRUE	<i>nIn2_a</i>

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.6 L_AnalogSwitch_3

This function block switches between two analog input signals. The switching is controlled via a boolean input signal.



Inputs

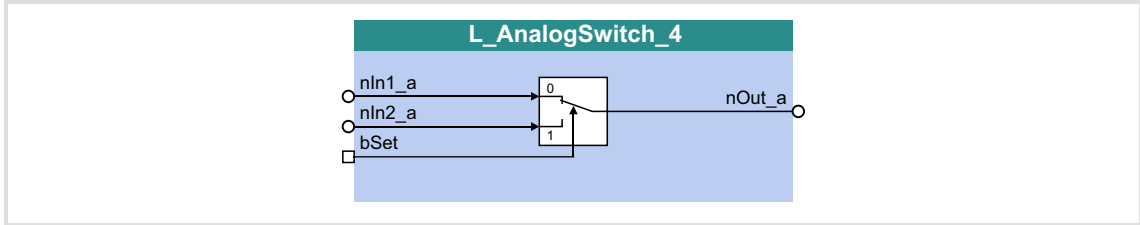
Identifier	Data type	Information/possible settings
nIn1_a	INT	Input signal 1
nIn2_a	INT	Input signal 2
bSet	BOOL	Selection of the input signal for the output to <i>nOut_a</i>
		FALSE <i>nIn1_a</i>
		TRUE <i>nIn2_a</i>

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.7 L_AnalogSwitch_4

This function block switches between two analog input signals. The switching is controlled via a boolean input signal.



Inputs

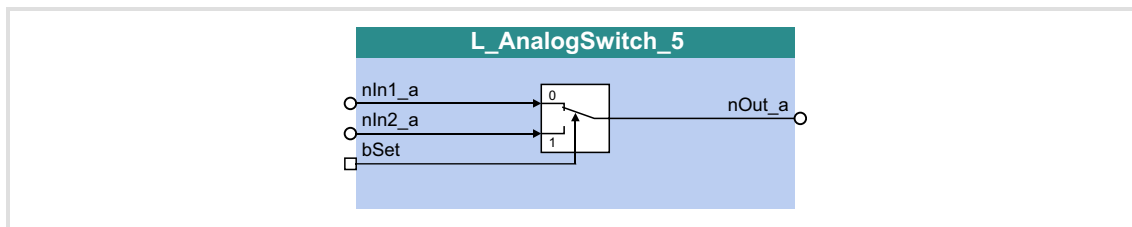
Identifier	Data type	Information/possible settings	
nIn1_a	INT	Input signal 1	
nIn2_a	INT	Input signal 2	
bSet	BOOL	Selection of the input signal for the output to <i>nOut_a</i>	
		FALSE	<i>nIn1_a</i>
		TRUE	<i>nIn2_a</i>

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.8 L_AnalogSwitch_5

This function block switches between two analog input signals. The switching is controlled via a boolean input signal.



Inputs

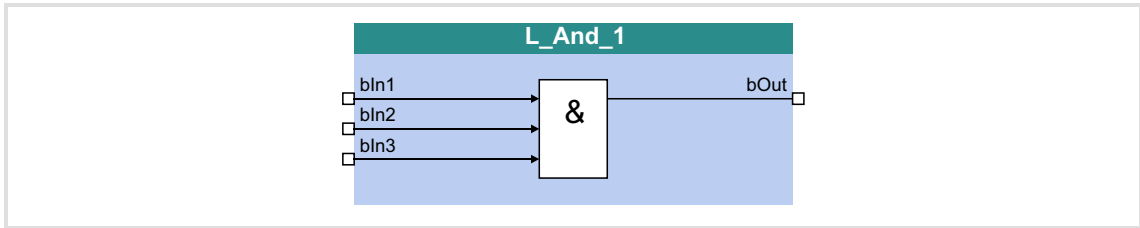
Identifier	Data type	Information/possible settings
nIn1_a	INT	Input signal 1
nIn2_a	INT	Input signal 2
bSet	BOOL	Selection of the input signal for the output to <i>nOut_a</i>
		FALSE <i>nIn1_a</i>
		TRUE <i>nIn2_a</i>

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.9 L_And_1

This FB implements the ANDing of the input signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 bIn2 bIn3	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

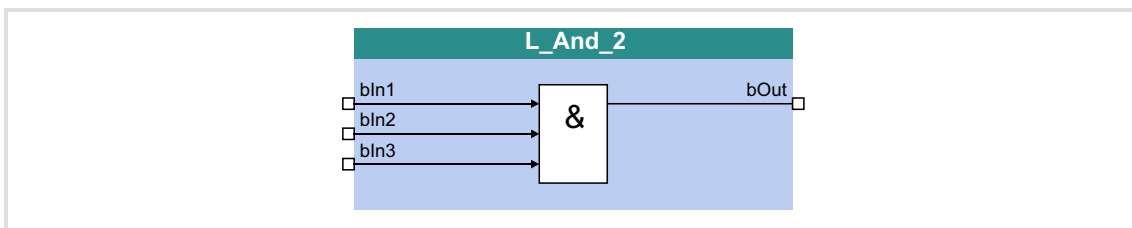
Function

Inputs			Output
bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	TRUE	FALSE
FALSE	TRUE	FALSE	FALSE
FALSE	TRUE	TRUE	FALSE
TRUE	FALSE	FALSE	FALSE
TRUE	FALSE	TRUE	FALSE
TRUE	TRUE	FALSE	FALSE
TRUE	TRUE	TRUE	TRUE

[18-1] Truth table of the FB L_And_1

18.1.10 L_And_2

This FB implements the ANDing of the input signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 bIn2 bIn3	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

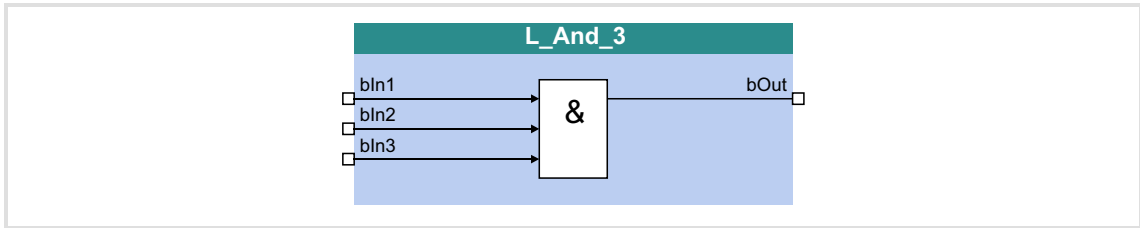
Function

Inputs			Output
bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	TRUE	FALSE
FALSE	TRUE	FALSE	FALSE
FALSE	TRUE	TRUE	FALSE
TRUE	FALSE	FALSE	FALSE
TRUE	FALSE	TRUE	FALSE
TRUE	TRUE	FALSE	FALSE
TRUE	TRUE	TRUE	TRUE

[18-2] Truth table of the FB L_And_2

18.1.11 L_And_3

This FB implements the ANDing of the input signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 bIn2 bIn3	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

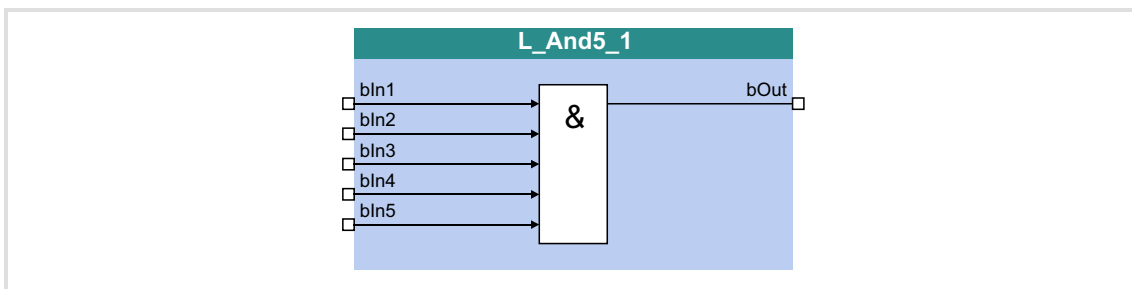
Function

Inputs			Output
bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	TRUE	FALSE
FALSE	TRUE	FALSE	FALSE
FALSE	TRUE	TRUE	FALSE
TRUE	FALSE	FALSE	FALSE
TRUE	FALSE	TRUE	FALSE
TRUE	TRUE	FALSE	FALSE
TRUE	TRUE	TRUE	TRUE

[18-3] Truth table of the FB L_And_3

18.1.12 L_And5_1

This FB implements the ANDing of the input signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1		Input signal
...		
bIn5		
	BOOL	

Outputs

Identifier	Data type	Value/meaning
bOut		Output signal
	BOOL	

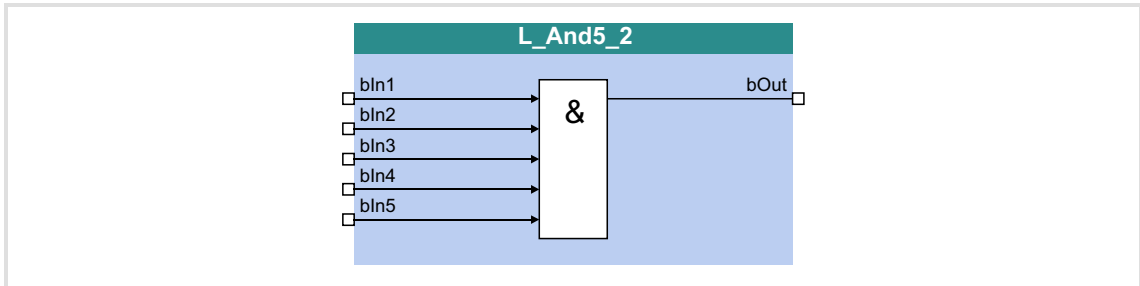
Function

Inputs					Output
bIn5	bIn4	bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	FALSE	FALSE	TRUE	
FALSE	FALSE	FALSE	TRUE	FALSE	
FALSE	FALSE	FALSE	TRUE	TRUE	
FALSE	FALSE	TRUE	FALSE	FALSE	
...					
TRUE	TRUE	TRUE	FALSE	TRUE	
TRUE	TRUE	TRUE	TRUE	FALSE	
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

[18-4] Truth table of the FB L_And5_1

18.1.13 L_And5_2

This FB implements the ANDing of the input signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 ... bIn5	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

Function

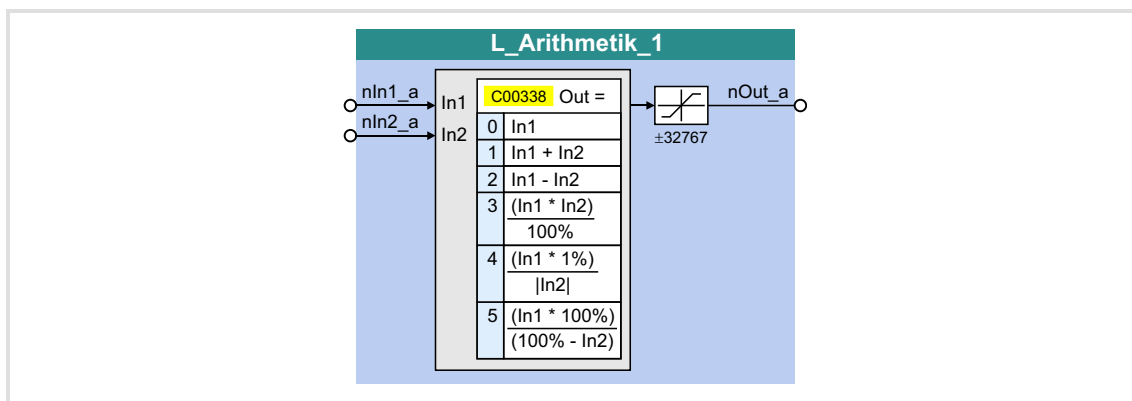
Inputs					Output
bIn5	bIn4	bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	FALSE	FALSE	TRUE	
FALSE	FALSE	FALSE	TRUE	FALSE	
FALSE	FALSE	FALSE	TRUE	TRUE	
FALSE	FALSE	TRUE	FALSE	FALSE	
...					
TRUE	TRUE	TRUE	FALSE	TRUE	
TRUE	TRUE	TRUE	TRUE	FALSE	
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

[18-5] Truth table of the FB L_And5_2

18.1.14 L_Arithmetik_1

This FB can combine two analog signals arithmetically.

- ▶ The arithmetic function is selected in [C00338](#).
- ▶ All internal intermediate results and the value output at the *nOut_a* output are internally limited to ± 32767 .
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ± 32767 ($\pm 199.99\%$)

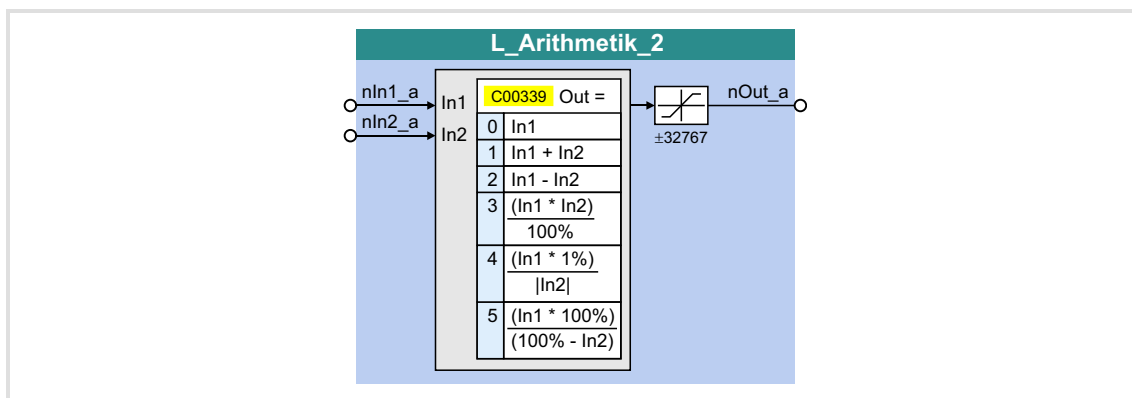
Parameter

Parameter	Possible settings	Info
C00338		Function selection
	0 $nOut_a = nIn1_a$	
	1 $nOut_a = nIn1_a + nIn2_a$	
	2 $nOut_a = nIn1_a - nIn2_a$	
	3 $nOut_a = \frac{nIn1_a \cdot nIn2_a}{16384}$	
	4 $nOut_a = \frac{nIn1_a}{ nIn2_a } \cdot 164$	When the denominator has the value "0", it will be set to "1".
	5 $nOut_a = \frac{nIn1_a}{16384 - nIn2_a} \cdot 16384$	

18.1.15 L_Arithmetik_2

This FB can combine two analog signals arithmetically.

- ▶ The arithmetic function is selected in [C00339](#).
- ▶ All internal intermediate results and the value output at the *nOut_a* output are internally limited to ± 32767 .
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ± 32767 ($\pm 199.99\%$)

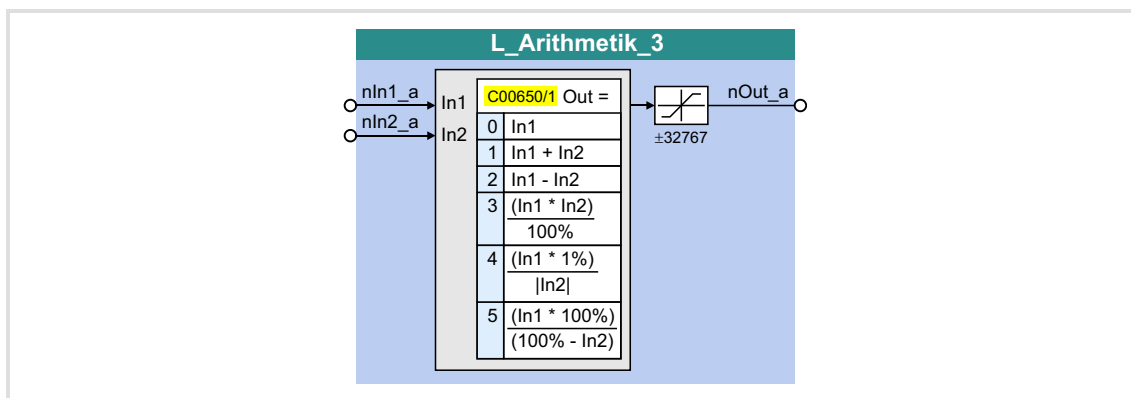
Parameter

Parameter	Possible settings	Info
C00339		Function selection
	0 $nOut_a = nln1_a$	
	1 $nOut_a = nln1_a + nln2_a$	
	2 $nOut_a = nln1_a - nln2_a$	
	3 $nOut_a = \frac{nln1_a \cdot nln2_a}{16384}$	
	4 $nOut_a = \frac{nln1_a}{ nln2_a } \cdot 164$	When the denominator has the value "0", it will be set to "1".
	5 $nOut_a = \frac{nln1_a}{16384 - nln2_a} \cdot 16384$	

18.1.16 L_Arithmetik_3

This FB can combine two analog signals arithmetically.

- ▶ The arithmetic function is selected in [C00650/1](#).
- ▶ All internal intermediate results and the value output at the *nOut_a* output are internally limited to ± 32767 .
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ± 32767 ($\pm 199.99\%$)

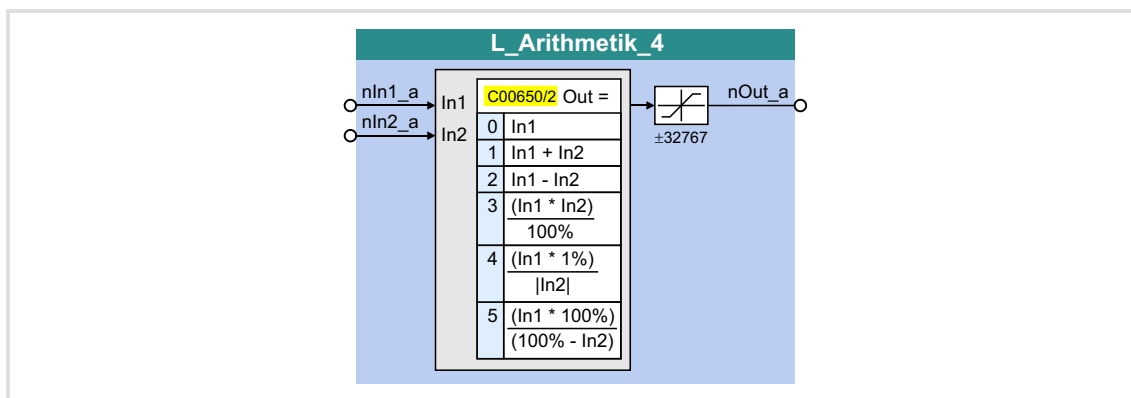
Parameter

Parameter	Possible settings	Info
C00650/1		Function selection
	0 $nOut_a = nIn1_a$	
	1 $nOut_a = nIn1_a + nIn2_a$	
	2 $nOut_a = nIn1_a - nIn2_a$	
	3 $nOut_a = \frac{nIn1_a \cdot nIn2_a}{16384}$	
	4 $nOut_a = \frac{nIn1_a}{ nIn2_a } \cdot 164$	When the denominator has the value "0", it will be set to "1".
	5 $nOut_a = \frac{nIn1_a}{16384 - nIn2_a} \cdot 16384$	

18.1.17 L_Arithmetik_4

This FB can combine two analog signals arithmetically.

- ▶ The arithmetic function is selected in [C00650/2](#).
- ▶ All internal intermediate results and the value output at the *nOut_a* output are internally limited to ± 32767 .
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ± 32767 ($\pm 199.99\%$)

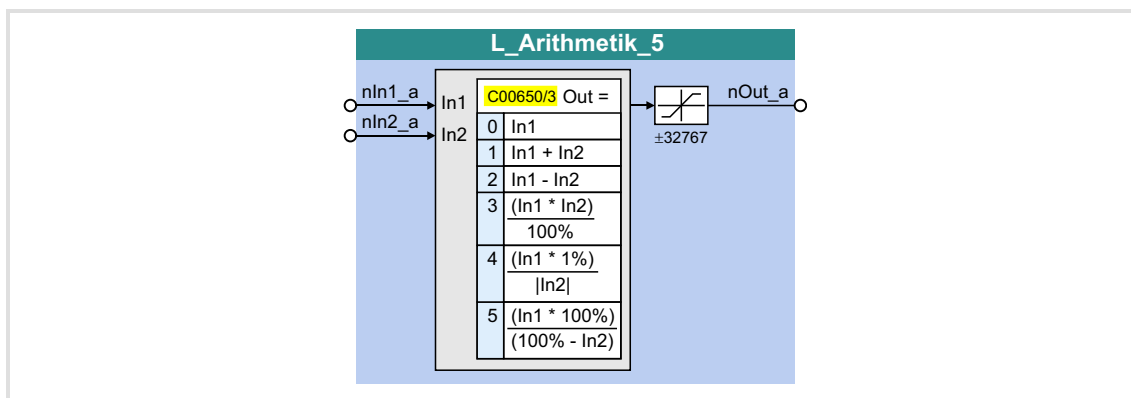
Parameter

Parameter	Possible settings	Info
C00650/2		Function selection
	0 $nOut_a = nIn1_a$	
	1 $nOut_a = nIn1_a + nIn2_a$	
	2 $nOut_a = nIn1_a - nIn2_a$	
	3 $nOut_a = \frac{nIn1_a \cdot nIn2_a}{16384}$	
	4 $nOut_a = \frac{nIn1_a}{ nIn2_a } \cdot 164$	When the denominator has the value "0", it will be set to "1".
	5 $nOut_a = \frac{nIn1_a}{16384 - nIn2_a} \cdot 16384$	

18.1.18 L_Arithmetik_5

This FB can combine two analog signals arithmetically.

- ▶ The arithmetic function is selected in [C00650/3](#).
- ▶ All internal intermediate results and the value output at the *nOut_a* output are internally limited to ± 32767 .
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ± 32767 ($\pm 199.99\%$)

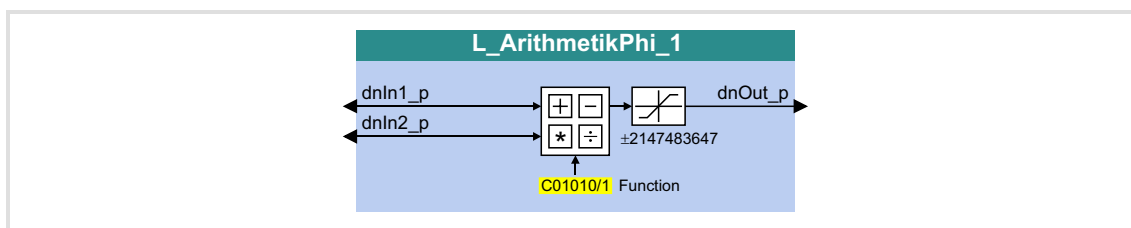
Parameter

Parameter	Possible settings	Info
C00650/3		Function selection
	0 $nOut_a = nIn1_a$	
	1 $nOut_a = nIn1_a + nIn2_a$	
	2 $nOut_a = nIn1_a - nIn2_a$	
	3 $nOut_a = \frac{nIn1_a \cdot nIn2_a}{16384}$	
	4 $nOut_a = \frac{nIn1_a}{ nIn2_a } \cdot 164$	When the denominator has the value "0", it will be set to "1".
	5 $nOut_a = \frac{nIn1_a}{16384 - nIn2_a} \cdot 16384$	

18.1.19 L_ArithmetikPhi_1

This FB can combine two angle signals arithmetically.

- ▶ The arithmetic function is selected in [C01010/1](#).
- ▶ All internal intermediate results and the value provided at the *dnOut_p* output are internally limited to ± 2147483647 ($\pm 2^{31} - 1$).
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
dnIn1_p	DINT	Input signal 1
dnIn2_p	DINT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to ± 2147483647

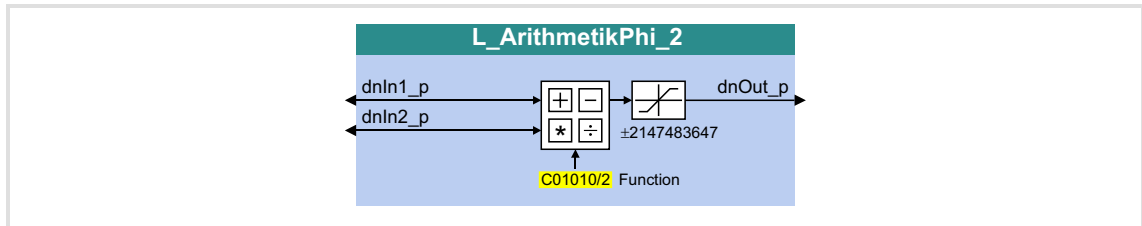
Parameter

Parameter	Possible settings	Info
C01010/1		Function selection
	0 dnOut_p = dnIn1_p	
	1 dnOut_p = dnIn1_p + dnIn2_p	
	2 dnOut_p = dnIn1_p - dnIn2_p	
	3 dnOut_p = dnIn1_p * dnIn2_p	
	4 dnOut_p = dnIn1_p / dnIn2_p	

18.1.20 L_ArithmetikPhi_2

This FB can combine two angle signals arithmetically.

- ▶ The arithmetic function is selected in [C01010/2](#).
- ▶ All internal intermediate results and the value provided at the *dnOut_p* output are internally limited to ± 2147483647 ($\pm 2^{31} - 1$).
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
dnIn1_p	DINT	Input signal 1
dnIn2_p	DINT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to ± 2147483647

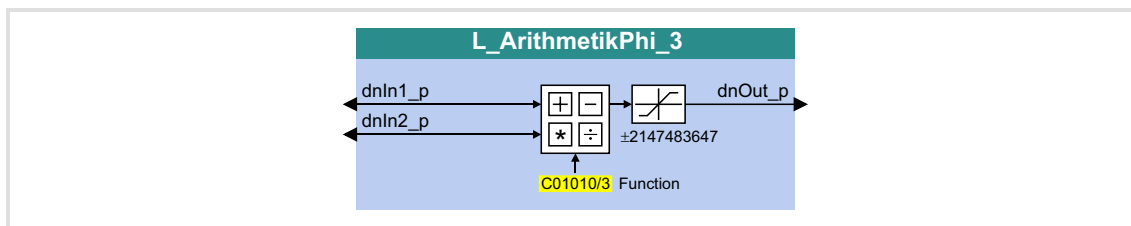
Parameter

Parameter	Possible settings	Info										
C01010/2	<table border="1"> <tr> <td>0</td> <td>$dnOut_p = dnIn1_p$</td> </tr> <tr> <td>1</td> <td>$dnOut_p = dnIn1_p + dnIn2_p$</td> </tr> <tr> <td>2</td> <td>$dnOut_p = dnIn1_p - dnIn2_p$</td> </tr> <tr> <td>3</td> <td>$dnOut_p = dnIn1_p * dnIn2_p$</td> </tr> <tr> <td>4</td> <td>$dnOut_p = dnIn1_p / dnIn2_p$</td> </tr> </table>	0	$dnOut_p = dnIn1_p$	1	$dnOut_p = dnIn1_p + dnIn2_p$	2	$dnOut_p = dnIn1_p - dnIn2_p$	3	$dnOut_p = dnIn1_p * dnIn2_p$	4	$dnOut_p = dnIn1_p / dnIn2_p$	Function selection
0	$dnOut_p = dnIn1_p$											
1	$dnOut_p = dnIn1_p + dnIn2_p$											
2	$dnOut_p = dnIn1_p - dnIn2_p$											
3	$dnOut_p = dnIn1_p * dnIn2_p$											
4	$dnOut_p = dnIn1_p / dnIn2_p$											

18.1.21 L_ArithmetikPhi_3

This FB can combine two angle signals arithmetically.

- ▶ The arithmetic function is selected in [C01010/3](#).
- ▶ All internal intermediate results and the value provided at the *dnOut_p* output are internally limited to ± 2147483647 ($\pm 2^{31} - 1$).
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
dnIn1_p	DINT	Input signal 1
dnIn2_p	DINT	Input signal 2

Outputs

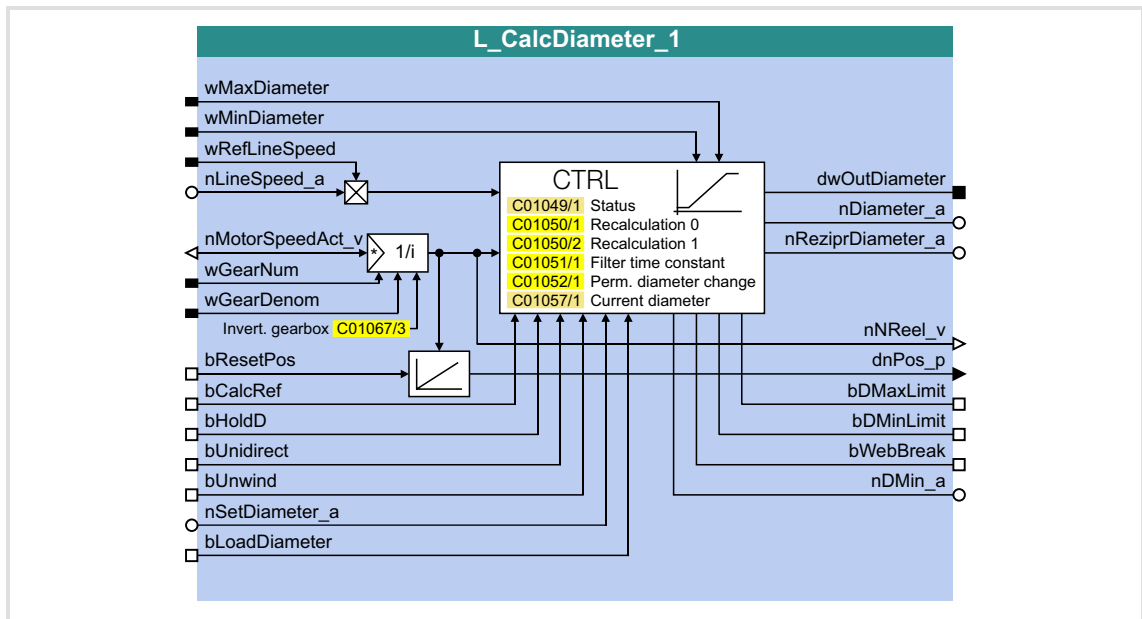
Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to ± 2147483647

Parameter

Parameter	Possible settings	Info
C01010/3		Function selection
	0 dnOut_p = dnIn1_p	
	1 dnOut_p = dnIn1_p + dnIn2_p	
	2 dnOut_p = dnIn1_p - dnIn2_p	
	3 dnOut_p = dnIn1_p * dnIn2_p	
	4 dnOut_p = dnIn1_p / dnIn2_p	

18.1.22 L_CalcDiameter_1

This FB serves to calculate the reel diameter from line speed and winding speed.



Inputs

Identifier	Data type	Information/possible settings
wMaxDiameter	WORD	Maximum diameter in [mm] • Internal limitation to 10000 mm (≅ 10 m)
wMinDiameter	WORD	Minimum diameter in [mm] • Internal limitation to 10000 mm (≅ 10 m)
wRefLineSpeed	WORD	Maximum material speed in [0.1 m/min] • Scaling: 2500 ≅ 250.0 m/min • Internal limitation to 3000 m/min
nLineSpeed_a	INT	Material speed setpoint • Scaling: 16384 ≅ maximum material speed (<i>wRefLineSpeed</i>)
nMotorSpeedAct_v	INT	Current motor speed in [increments/ms] • Scaling: 16384 ≅ 15000 rpm
wGearNum	WORD	Gearbox factor (numerator) • Internal limitation to -32767 ... -1 / 1 ... 32767
wGearDenom	WORD	Gearbox factor (denominator) • Internal limitation to 1 ... 32767
bResetPos	BOOL	Reset angle of rotation <i>dnPos_p</i> TRUE The angle of rotation <i>dnPos_p</i> is reset.
bCalcRef	BOOL	Selection of the calculation cycle FALSE Use diameter recalculation 0 (C01050/1). TRUE Use diameter recalculation 1 (C01050/2).
bHoldD	BOOL	Hold last diameter value TRUE The diameter value output last is not overwritten by the new values.
bUnidirect	BOOL	Enable of only one change of direction and activation of the web break monitoring TRUE Only the change of direction defined via <i>bUnwind</i> is enabled.

Identifier	Data type	Information/possible settings				
bUnwind	BOOL	Selection of the enabled change or direction <ul style="list-style-type: none"> Only when <i>bUnidirect</i> = TRUE <table border="1"> <tr> <td>FALSE</td> <td>Clockwise rotation (Cw)</td> </tr> <tr> <td>TRUE</td> <td>Counter-clockwise rotation (Ccw)</td> </tr> </table>	FALSE	Clockwise rotation (Cw)	TRUE	Counter-clockwise rotation (Ccw)
FALSE	Clockwise rotation (Cw)					
TRUE	Counter-clockwise rotation (Ccw)					
nSetDiameter_a	DINT	Selection of an initial value/external diameter signal <ul style="list-style-type: none"> Scaling: 16384 \equiv maximum diameter (<i>wMaxDiameter</i>) The value is accepted by setting <i>bLoadDiameter</i> to TRUE. 				
bLoadDiameter	BOOL	Accept initial value <i>nSetDiameter_a</i> <ul style="list-style-type: none"> This input has a higher priority than the <i>bHoldDinput</i>. <table border="1"> <tr> <td>TRUE</td> <td>Accept the value at <i>nSetDiameter_a</i>.</td> </tr> </table>	TRUE	Accept the value at <i>nSetDiameter_a</i> .		
TRUE	Accept the value at <i>nSetDiameter_a</i> .					

Outputs

Identifier	Data type	Value/meaning		
dwOutDiameter	DWORD	Current diameter in [μ m] <ul style="list-style-type: none"> Internal limitation to 10 m Unfiltered 		
nDiameter_a	INT	Current diameter in [%] <ul style="list-style-type: none"> 100 % \equiv Maximum diameter (<i>wMaxDiameter</i>) filtered via PT1 element (filter time constant can be set in C01051/1) 		
nReziprDiameter_a	INT	Reciprocal value of the current diameter in [%] <ul style="list-style-type: none"> 100 % \equiv Minimum diameter (<i>wMinDiameter</i>) 		
nNReel_v	INT	Current winding speed in [increments/ms] <ul style="list-style-type: none"> Scaling: 16384 \equiv 15000 rpm 		
bDMaxLimit	BOOL	Limit value monitoring <table border="1"> <tr> <td>TRUE</td> <td>Upper limit value <i>wMaxDiameter</i> reached.</td> </tr> </table>	TRUE	Upper limit value <i>wMaxDiameter</i> reached.
TRUE	Upper limit value <i>wMaxDiameter</i> reached.			
bDMinLimit	BOOL	Limit value monitoring <table border="1"> <tr> <td>TRUE</td> <td>Lower limit value <i>wMinDiameter</i> reached.</td> </tr> </table>	TRUE	Lower limit value <i>wMinDiameter</i> reached.
TRUE	Lower limit value <i>wMinDiameter</i> reached.			
bWebBreak	BOOL	Web break monitoring <table border="1"> <tr> <td>TRUE</td> <td>Web break after passing the monitor window set in C01052/1.</td> </tr> </table>	TRUE	Web break after passing the monitor window set in C01052/1 .
TRUE	Web break after passing the monitor window set in C01052/1 .			
nDMin_a	INT	Minimum diameter in [%] <ul style="list-style-type: none"> 100 % \equiv Maximum diameter (<i>wMaxDiameter</i>) 		

Parameter

Parameter	Possible settings	Info
C01049/1		Status
	-10	Line speed overflow
	-1	<i>wMinDiameter</i> > <i>wMaxDiameter</i>
	0	OK - diameter has been recalculated
	10	Diameter has been initialised with minimum diameter (<i>wMinDiameter</i>)
	20	Diameter is loaded (<i>bLoadDiameter</i> active)
	30	Diameter is held (<i>bHoldD</i> active)

8400 TopLine C | Software Manual

Function library

Function blocks | L_CalcDiameter_1

Parameter	Possible settings			Info
C01050/1	0.001	Rev.	2.000	Diameter recalculation 0 <ul style="list-style-type: none"> Number of revolutions after which a diameter calculation is executed. Setting is effective when <i>bCalcRef</i> = FALSE. Initialisation: 1.000
C01050/2	0.001	Rev.	2.000	Diameter recalculation 1 <ul style="list-style-type: none"> Number of revolutions after which a diameter calculation is executed. Setting is effective when <i>bCalcRef</i> = TRUE. Initialisation: 0.100
C01051/1	0.010	s	3.000	Filter time constant for calculated diameter values <ul style="list-style-type: none"> Initialisation: 1.000 s
C01052/1	0.00	%	100.00	Permissible diameter change in opposite direction (web break monitoring) <ul style="list-style-type: none"> Only relevant when <i>bUnidirect</i> = TRUE. Referring to the maximum diameter (<i>wMaxDiameter</i>). Initialisation: 10.00 %
C01057/1	0.000	mm	10000.000	Current diameter <ul style="list-style-type: none"> Read only
C01067/3				Invert. gearbox nMotorSpeedAct_v
	0	not inverted		
	1	inverted		
	2	Automatically from MCK		

18.1.22.1 Set initial value

An initial value or an external diameter signal can be defined at the *nSetDiameter_a* input.

- ▶ this value is accepted if *bLoadDiameter* is set to TRUE.
- ▶ In case of acceptance, the diameter calculation will be reset and the filter for diameter calculation is loaded with the defined initial value.

18.1.22.2 Calculate diameter

For reel diameter calculation, the material speed and the current winding speed are integrated cyclically.

- ▶ The material speed is defined via *nLineSpeed_a*.
- ▶ The winding speed is calculated from the *nMotorSpeedAct_v* motor speed and the current *wGearNum/wGearDenom* gearbox factor.
- ▶ [C01050/1...2](#) can be used to define two different calculation cycles. The setting to be used is selected via *bCalcRef*.
- ▶ At the end of each integration interval, a new diameter value results from the division of the integrator values.
- ▶ An absolute value generation and smoothing via a first order low pass is carried out. The time constant of this filter can be set in [C01051/1](#). The *dwOutDiameter* output is not filtered.

18.1.22.3 Select change direction, web break monitoring

By setting *bUnidirect* to TRUE, you only enable one change direction for diameter calculation and simultaneously activate the web break monitoring.

- ▶ The permissible change direction can be defined via *bUnwind*.
- ▶ A recalculated value is only accepted if it exceeds the value saved last in the permissible direction.

After a web break, the diameter values calculated successively mostly run very quickly in the opposite direction.

- ▶ [C01052/1](#) serves to define the maximally permissible deviation in the opposite direction. If it is exceeded, the *bWebBreak* output is set to TRUE.
- ▶ If *bUnidirect* is set to FALSE, both change directions are enabled and the internal memory is always overwritten with the recalculated value which switches off the web break monitoring.

18.1.22.4 Holding the current value

By setting *bHoldD* to TRUE, you fix the diameter value *nDiameter_a* output last.

- ▶ The diameter calculation is reset and the filter for diameter calculation is loaded with the internally held diameter value.

18.1.22.5 Limit value monitoring

wMinDiameter and *wMaxDiameter* serve to define the limit values for the given diameter values. If they are reached/exceeded, the corresponding output (*bDMaxLimit/bDminLimit*) is set to TRUE.

- ▶ The unfiltered diameter value *dwOutDiameter* and the filtered diameter value *nDiameter_a* are limited.
- ▶ The limit values are entered in [mm].
- ▶ The hysteresis for resetting *bDMaxLimit/bDminLimit* is permanently set to 1 % of *wMaxDiameter*.
- ▶ For parameter setting of further FBs, the value in *wMinDiameter* with regard to *wMaxDiameter* is provided via the *nDMin_a* output.

18.1.22.6 Converting diameter in 1/D

For evaluating the material speed with 1/D (speed-controlled winder), the reciprocal value of the reel diameter is provided via *nReziprDiameter_a*.

- ▶ This value refers to the limitation value *wMinDiameter*.

18.1.22.7 Physical state variables

The *dwOutDiameter* output provides the current diameter as physical quantity (1 LSB \equiv 1 m).

nNReel_v outputs the winding speed which results from the *nMotorSpeedAct_v* motor speed and the current (*wGearNum/wGearDenom*) gearbox factor.

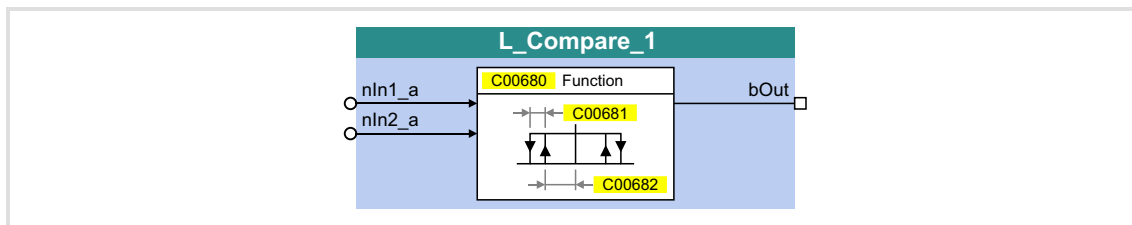
For supporting further functions (e.g. a traversing control), the winding speed is integrated additionally.

- ▶ The angle of rotation is output via *dnPos_p*.
- ▶ By setting *bResetPos* to TRUE, the angle of rotation is reset.

18.1.23 L_Compare_1

This FB compares two analog signals and can be used e.g. to implement a trigger.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

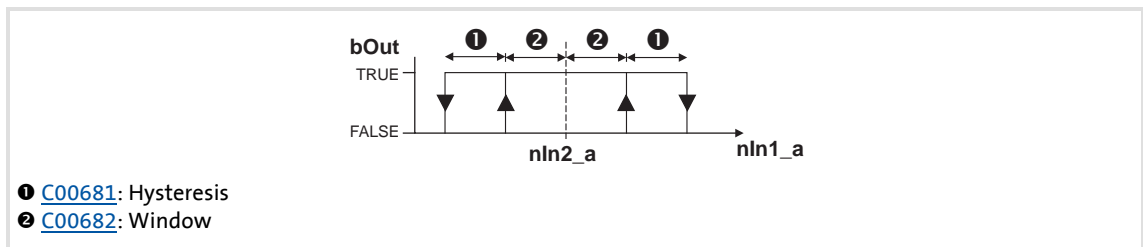
Parameter

Parameter	Possible settings	Info												
C00680	<table border="1"> <tr><td>1</td><td>$nln1 = nln2$</td></tr> <tr><td>2</td><td>$nln1 > nln2$</td></tr> <tr><td>3</td><td>$nln1 < nln2$</td></tr> <tr><td>4</td><td>$nln1 = nln2$</td></tr> <tr><td>5</td><td>$nln1 > nln2$</td></tr> <tr><td>6</td><td>$nln1 < nln2$</td></tr> </table>	1	$nln1 = nln2$	2	$nln1 > nln2$	3	$nln1 < nln2$	4	$ nln1 = nln2 $	5	$ nln1 > nln2 $	6	$ nln1 < nln2 $	Function selection
1	$nln1 = nln2$													
2	$nln1 > nln2$													
3	$nln1 < nln2$													
4	$ nln1 = nln2 $													
5	$ nln1 > nln2 $													
6	$ nln1 < nln2 $													
C00681	0.00 % 100.00	Hysteresis • Lenze setting: 0.50 %												
C00682	0.00 % 100.00	Window • Lenze setting: 2.00 %												

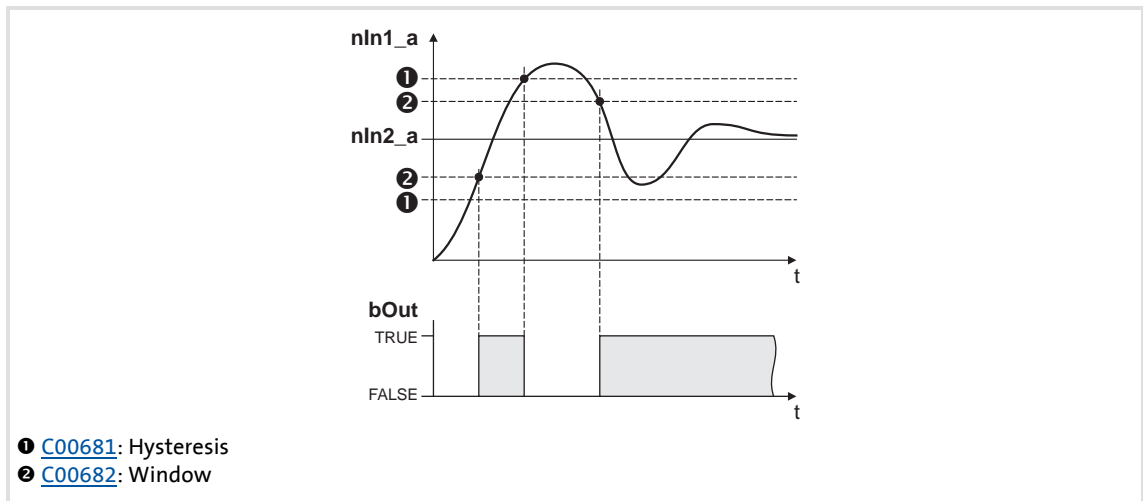
18.1.23.1 Function 1: nIn1 = nIn2

This function compares two signals with regard to equality. It can, for instance, provide the comparison "actual speed equals setpoint speed" ($n_{act} = n_{set}$).

- ▶ Use [C00682](#) to set the window within which the equality is to apply.
- ▶ Use [C00681](#) to set a hysteresis if the input signals are not stable and the output oscillates.



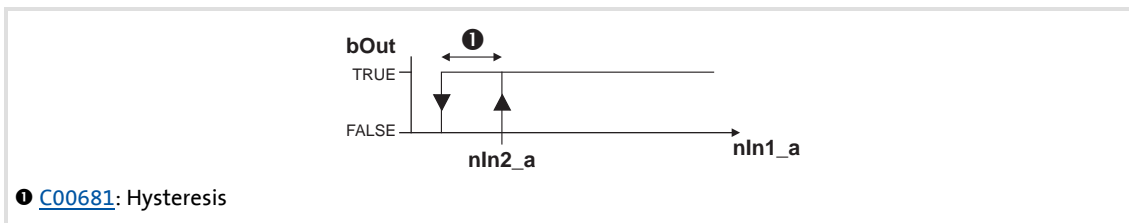
[18-6] Function 1: Switching performance



[18-7] Function 1: Example

18.1.23.2 Function 2: $nIn1 > nIn2$

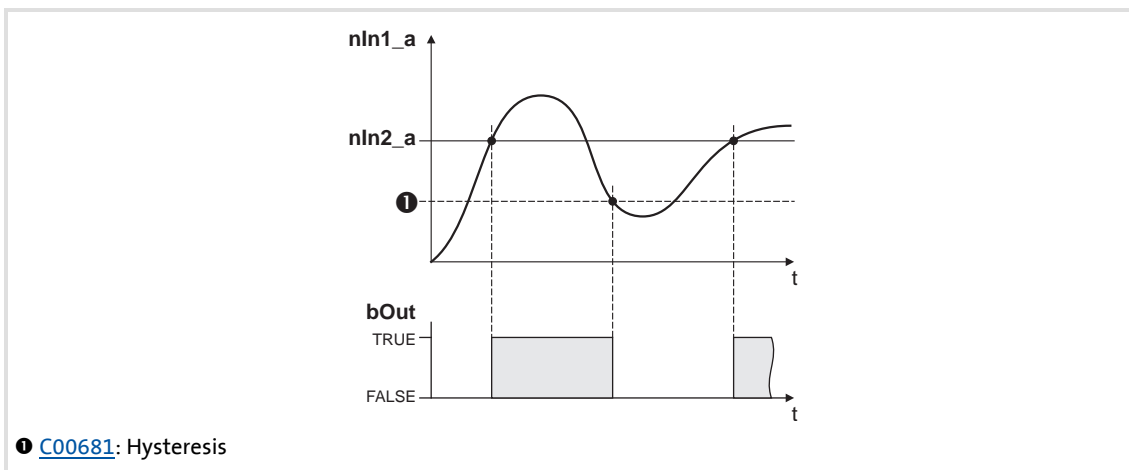
This function serves, for instance, to implement the comparison "actual speed is higher than a limit value" ($n_{act} > n_x$) for one direction of rotation.



[18-8] Function 2: Switching performance

Functional sequence

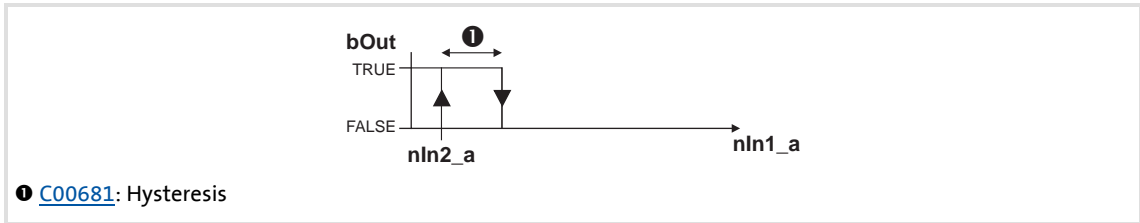
1. If the value at $nIn1_a$ exceeds the value $nIn2_a$, $bOut$ changes from FALSE to TRUE.
2. Only if the signal at $nIn1_a$ falls below the value of $nIn2_a - \text{hysteresis}$ again, $bOut$ changes back from TRUE to FALSE.



[18-9] Function 2: Example

18.1.23.3 Function 3: $nIn1 < nIn2$

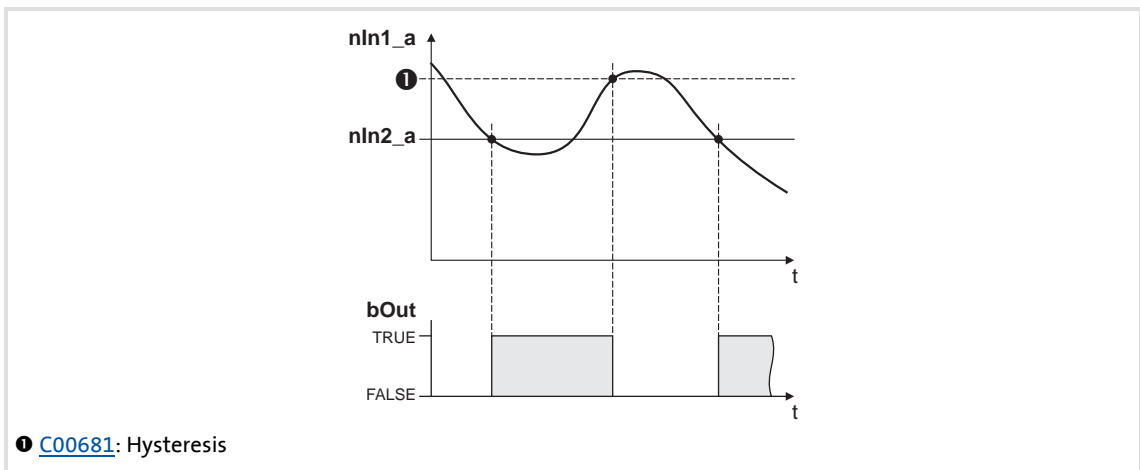
This function serves, for instance, to implement the comparison "actual speed is lower than a limit value" ($n_{act} < n_x$) for one direction of rotation.



[18-10] Function 3: Switching performance

Functional sequence

1. If the value at $nIn1_a$ falls below the value at $nIn2_a$, $bOut$ changes from FALSE to TRUE.
2. Only if the signal at $nIn1_a$ exceeds the value of $nIn2_a$ - *hysteresis* again, $bOut$ changes back from TRUE to FALSE.



[18-11] Function 3: Example

18.1.23.4 Function 4: $|n_{ln1}| = |n_{ln2}|$

This function serves to implement e.g. the comparison " $n_{act} = 0$ ". This function is similar to function 1. However, the amount is generated by the input signals before signal processing (without sign).

▶ [Function 1: \$n_{ln1} = n_{ln2}\$](#)

18.1.23.5 Function 5: $|n_{ln1}| > |n_{ln2}|$

This function serves to implement e.g. the comparison " $|n_{act}| > |n_x|$ " irrespective of the direction of rotation. This function is similar to function 2. However, the amount is generated by the input signals before signal processing (without sign).

▶ [Function 2: \$n_{ln1} > n_{ln2}\$](#)

18.1.23.6 Function 6: $|n_{ln1}| < |n_{ln2}|$

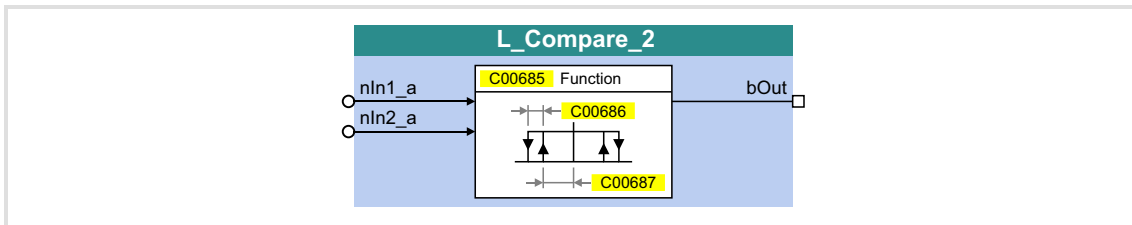
This function serves to implement the comparison " $|n_{act}| < |n_x|$ " independent of the direction of rotation. This function is similar to function 3. However, the amount is generated by the input signals before signal processing (without sign).

▶ [Function 3: \$n_{ln1} < n_{ln2}\$](#)

18.1.24 L_Compare_2

This FB compares two analog signals and can be used e.g. to implement a trigger.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

Parameter

Parameter	Possible settings	Info												
C00685	<table border="1"> <tr><td>1</td><td>$nln1 = nln2$</td></tr> <tr><td>2</td><td>$nln1 > nln2$</td></tr> <tr><td>3</td><td>$nln1 < nln2$</td></tr> <tr><td>4</td><td>$nln1 = nln2$</td></tr> <tr><td>5</td><td>$nln1 > nln2$</td></tr> <tr><td>6</td><td>$nln1 < nln2$</td></tr> </table>	1	$nln1 = nln2$	2	$nln1 > nln2$	3	$nln1 < nln2$	4	$ nln1 = nln2 $	5	$ nln1 > nln2 $	6	$ nln1 < nln2 $	Function selection
1	$nln1 = nln2$													
2	$nln1 > nln2$													
3	$nln1 < nln2$													
4	$ nln1 = nln2 $													
5	$ nln1 > nln2 $													
6	$ nln1 < nln2 $													
C00686	0.00 % 100.00	Hysteresis • Lenze setting: 0.50 %												
C00687	0.00 % 100.00	Window • Lenze setting: 2.00 %												

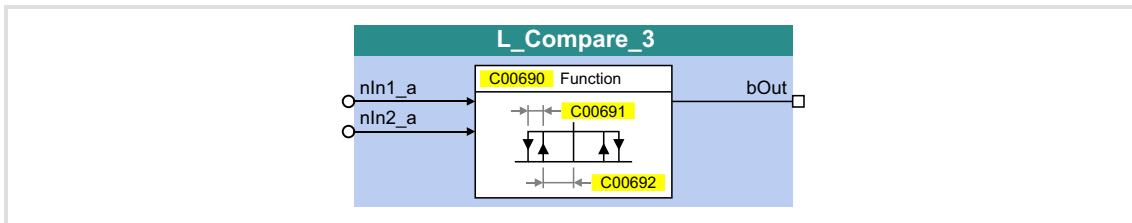


For a detailed functional description see [L_Compare_1](#).

18.1.25 L_Compare_3

This FB compares two analog signals and can be used e.g. to implement a trigger.

► Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true" TRUE The statement of the selected comparison mode is true.

Parameter

Parameter	Possible settings	Info												
C00690	<table border="1"> <tr><td>1</td><td>$nln1 = nln2$</td></tr> <tr><td>2</td><td>$nln1 > nln2$</td></tr> <tr><td>3</td><td>$nln1 < nln2$</td></tr> <tr><td>4</td><td>$nln1 = nln2$</td></tr> <tr><td>5</td><td>$nln1 > nln2$</td></tr> <tr><td>6</td><td>$nln1 < nln2$</td></tr> </table>	1	$nln1 = nln2$	2	$nln1 > nln2$	3	$nln1 < nln2$	4	$ nln1 = nln2 $	5	$ nln1 > nln2 $	6	$ nln1 < nln2 $	Function selection
1	$nln1 = nln2$													
2	$nln1 > nln2$													
3	$nln1 < nln2$													
4	$ nln1 = nln2 $													
5	$ nln1 > nln2 $													
6	$ nln1 < nln2 $													
C00691	0.00 % 100.00	Hysteresis • Lenze setting: 0.50 %												
C00692	0.00 % 100.00	Window • Lenze setting: 2.00 %												

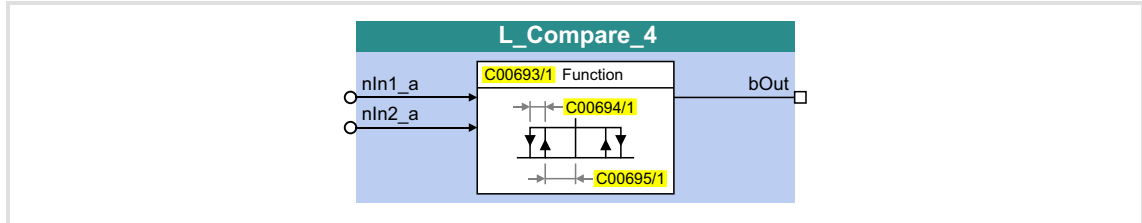


For a detailed functional description see [L_Compare_1](#).

18.1.26 L_Compare_4

This FB compares two analog signals and can be used e.g. to implement a trigger.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

Parameter

Parameter	Possible settings	Info												
C00693/1	<table border="1"> <tr><td>1</td><td>$nln1 = nln2$</td></tr> <tr><td>2</td><td>$nln1 > nln2$</td></tr> <tr><td>3</td><td>$nln1 < nln2$</td></tr> <tr><td>4</td><td>$nln1 = nln2$</td></tr> <tr><td>5</td><td>$nln1 > nln2$</td></tr> <tr><td>6</td><td>$nln1 < nln2$</td></tr> </table>	1	$nln1 = nln2$	2	$nln1 > nln2$	3	$nln1 < nln2$	4	$ nln1 = nln2 $	5	$ nln1 > nln2 $	6	$ nln1 < nln2 $	Function selection
1	$nln1 = nln2$													
2	$nln1 > nln2$													
3	$nln1 < nln2$													
4	$ nln1 = nln2 $													
5	$ nln1 > nln2 $													
6	$ nln1 < nln2 $													
C00694/1	0.00 % 100.00	Hysteresis • Lenze setting: 0.00 %												
C00695/1	0.00 % 100.00	Window • Lenze setting: 0.00 %												

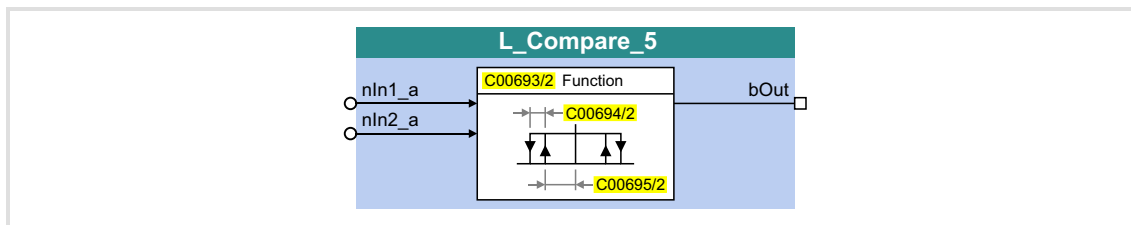


For a detailed functional description see [L_Compare_1](#).

18.1.27 L_Compare_5

This FB compares two analog signals and can be used e.g. to implement a trigger.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
nln1_a	INT	Input signal 1
nln2_a	INT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

Parameter

Parameter	Possible settings	Info												
C00693/2	<table border="1"> <tr><td>1</td><td>$nln1 = nln2$</td></tr> <tr><td>2</td><td>$nln1 > nln2$</td></tr> <tr><td>3</td><td>$nln1 < nln2$</td></tr> <tr><td>4</td><td>$nln1 = nln2$</td></tr> <tr><td>5</td><td>$nln1 > nln2$</td></tr> <tr><td>6</td><td>$nln1 < nln2$</td></tr> </table>	1	$nln1 = nln2$	2	$nln1 > nln2$	3	$nln1 < nln2$	4	$ nln1 = nln2 $	5	$ nln1 > nln2 $	6	$ nln1 < nln2 $	Function selection
1	$nln1 = nln2$													
2	$nln1 > nln2$													
3	$nln1 < nln2$													
4	$ nln1 = nln2 $													
5	$ nln1 > nln2 $													
6	$ nln1 < nln2 $													
C00694/2	0.00 % 100.00	Hysteresis • Lenze setting: 0.00 %												
C00695/2	0.00 % 100.00	Window • Lenze setting: 0.00 %												

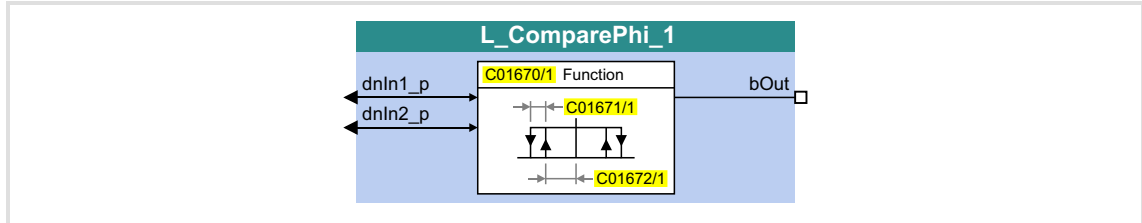


For a detailed functional description see [L_Compare_1](#).

18.1.28 L_ComparePhi_1

This FB compares two angle signals.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
dnIn1_p	DINT	Input signal 1
dnIn2_p	DINT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

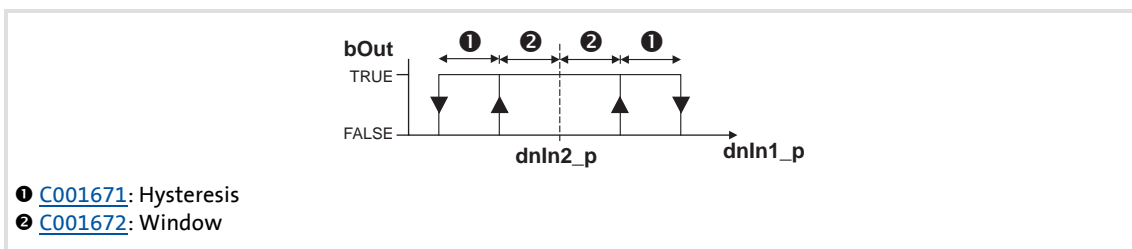
Parameter

Parameter	Possible settings			Info
C01670/1				Function selection
	1	dnIn1 = dnIn2		
	2	dnIn1 > dnIn2		
	3	dnIn1 < dnIn2		
	4	dnIn1 = dnIn2		
	5	dnIn1 > dnIn2		
	6	dnIn1 < dnIn2		
C01671/1	0	Incr.	1073741824	Hysteresis • Lenze setting: 0 incr.
C01672/1	0	Incr.	1073741824	Window • Lenze setting: 0 incr.

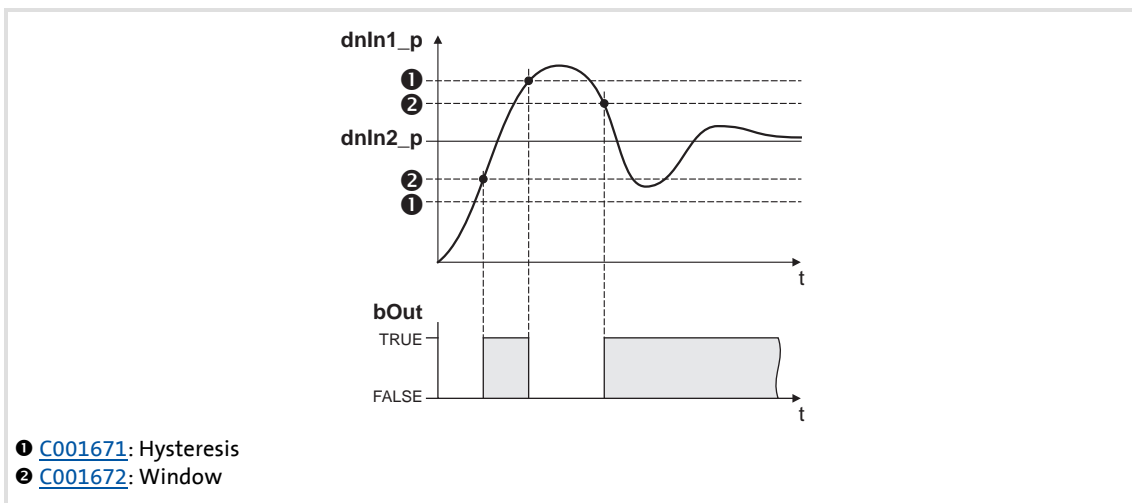
18.1.28.1 Function 1: $dnIn1 = dnIn2$

This function compares two signals with regard to equality. It can, for instance, provide the comparison "actual speed equals setpoint speed" ($n_{act} = n_{set}$).

- ▶ Use [C01672](#) to set the window within which the equality is to apply.
- ▶ Use [C01671](#) to set a hysteresis if the input signals are not stable and the output oscillates.



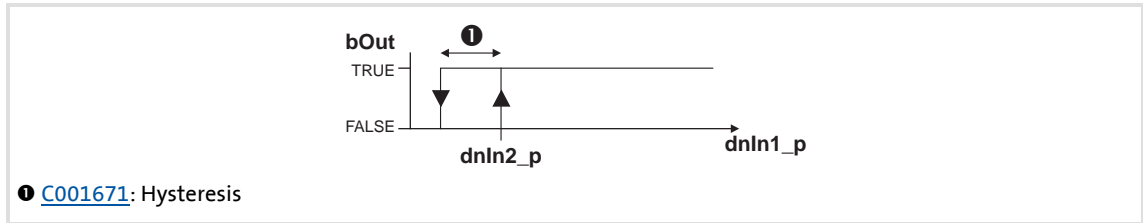
[18-12] Function 1: Switching performance



[18-13] Function 1: Example

18.1.28.2 Function 2: $dnIn1 > dnIn2$

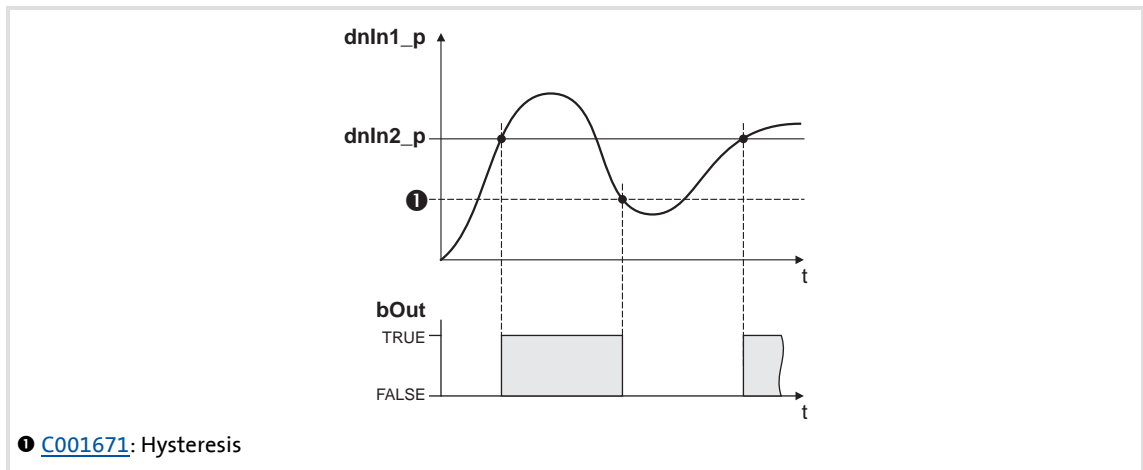
This function serves, for instance, to implement the comparison "actual speed is higher than a limit value" ($n_{act} > n_x$) for one direction of rotation.



[18-14] Function 2: Switching performance

Functional sequence

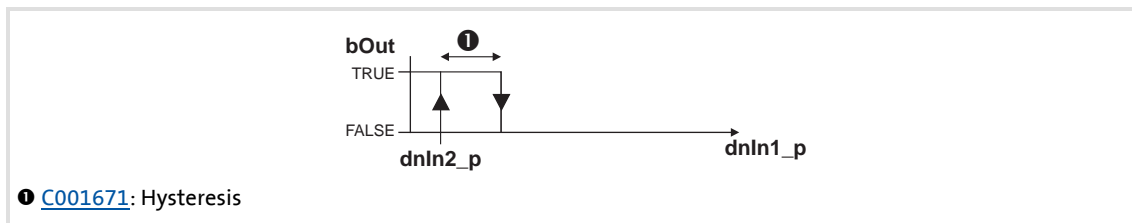
1. If the value at $dnIn1_p$ exceeds the value at $dnIn2_p$, $bOut$ changes from FALSE to TRUE.
2. Only if the signal at $dnIn1_p$ falls below the value of $dnIn2_p - \text{hysteresis}$ again, $bOut$ changes back from TRUE to FALSE.



[18-15] Function 2: Example

18.1.28.3 Function 3: $dnIn1 < dnIn2$

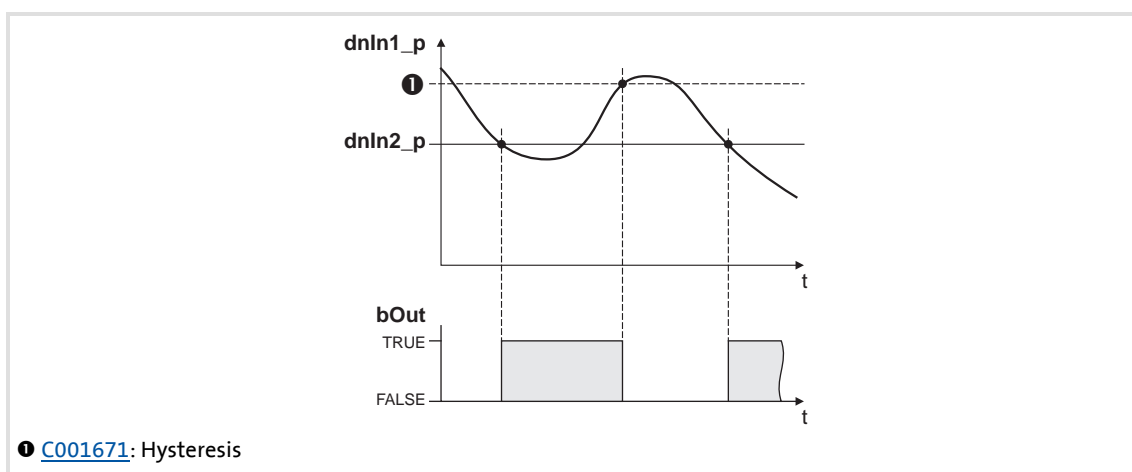
This function serves, for instance, to implement the comparison "actual speed is lower than a limit value" ($n_{act} < n_x$) for one direction of rotation.



[18-16] Function 3: Switching performance

Functional sequence

1. If the value at $dnIn1_p$ falls below the value at $dnIn2_p$, $bOut$ changes from FALSE to TRUE.
2. Only if the signal at $dnIn1_p$ exceeds the value of $dnIn2_p - \text{hysteresis}$ again, $bOut$ changes back from TRUE to FALSE.



[18-17] Function 3: Example

18.1.28.4 Function 4: $|\text{dnIn1}| = |\text{dnIn2}|$

This function serves to implement e.g. the comparison " $n_{\text{act}} = 0$ ". This function is similar to function 1. However, the amount is generated by the input signals before signal processing (without sign).

▶ [Function 1: \$\text{dnIn1} = \text{dnIn2}\$](#)

18.1.28.5 Function 5: $|\text{dnIn1}| > |\text{dnIn2}|$

This function serves to implement e.g. the comparison " $|n_{\text{act}}| > |n_x|$ " irrespective of the direction of rotation. This function is similar to function 2. However, the amount is generated by the input signals before signal processing (without sign).

▶ [Function 2: \$\text{dnIn1} > \text{dnIn2}\$](#)

18.1.28.6 Function 6: $|\text{dnIn1}| < |\text{dnIn2}|$

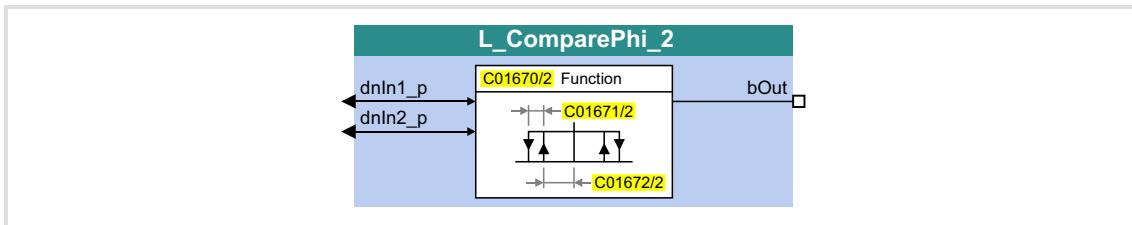
This function serves to implement the comparison " $|n_{\text{act}}| < |n_x|$ " independent of the direction of rotation. This function is similar to function 3. However, the amount is generated by the input signals before signal processing (without sign).

▶ [Function 3: \$\text{dnIn1} < \text{dnIn2}\$](#)

18.1.29 L_ComparePhi_2

This FB compares two angle signals.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
dnln1_p	DINT	Input signal 1
dnln2_p	DINT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

Parameter

Parameter	Possible settings	Info												
C01670/2	<table border="1"> <tr><td>1</td><td>dnln1 = dnln2</td></tr> <tr><td>2</td><td>dnln1 > dnln2</td></tr> <tr><td>3</td><td>dnln1 < dnln2</td></tr> <tr><td>4</td><td> dnln1 = dnln2 </td></tr> <tr><td>5</td><td> dnln1 > dnln2 </td></tr> <tr><td>6</td><td> dnln1 < dnln2 </td></tr> </table>	1	dnln1 = dnln2	2	dnln1 > dnln2	3	dnln1 < dnln2	4	dnln1 = dnln2	5	dnln1 > dnln2	6	dnln1 < dnln2	Function selection
1	dnln1 = dnln2													
2	dnln1 > dnln2													
3	dnln1 < dnln2													
4	dnln1 = dnln2													
5	dnln1 > dnln2													
6	dnln1 < dnln2													
C01671/2	0 Incr. 1073741824	Hysteresis • Lenze setting: 0 incr.												
C01672/2	0 Incr. 1073741824	Window • Lenze setting: 0 incr.												

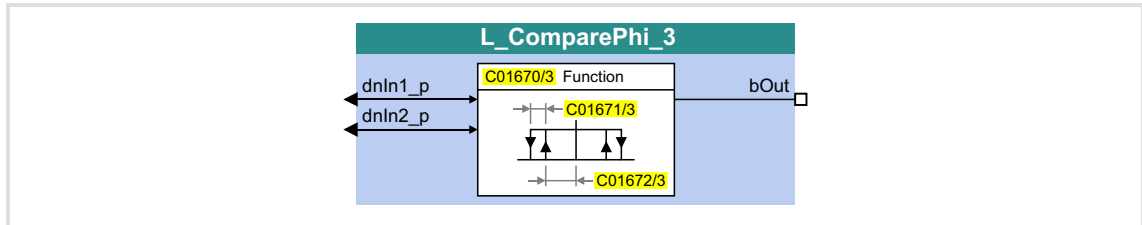


For a detailed functional description see [L_ComparePhi_1](#).

18.1.30 L_ComparePhi_3

This FB compares two angle signals.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
dnIn1_p	DINT	Input signal 1
dnIn2_p	DINT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

Parameter

Parameter	Possible settings			Info
C01670/3				Function selection
	1	dnIn1 = dnIn2		
	2	dnIn1 > dnIn2		
	3	dnIn1 < dnIn2		
	4	dnIn1 = dnIn2		
	5	dnIn1 > dnIn2		
	6	dnIn1 < dnIn2		
C01671/3	0	Incr.	1073741824	Hysteresis • Lenze setting: 0 incr.
C01672/3	0	Incr.	1073741824	Window • Lenze setting: 0 incr.

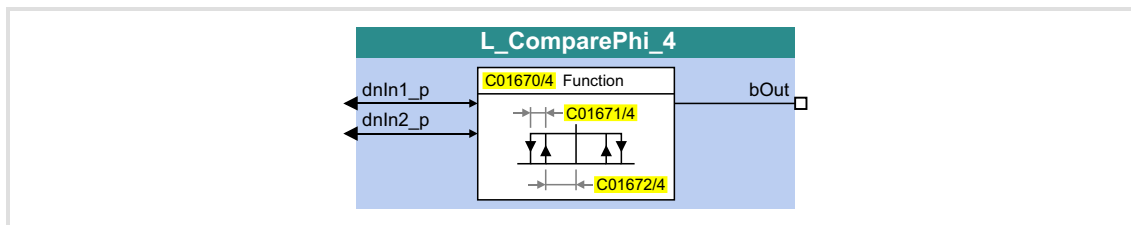


For a detailed functional description see [L_ComparePhi_1](#).

18.1.31 L_ComparePhi_4

This FB compares two angle signals.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
dnIn1_p	DINT	Input signal 1
dnIn2_p	DINT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

Parameter

Parameter	Possible settings			Info
C01670/4				Function selection
	1	dnIn1 = dnIn2		
	2	dnIn1 > dnIn2		
	3	dnIn1 < dnIn2		
	4	dnIn1 = dnIn2		
	5	dnIn1 > dnIn2		
	6	dnIn1 < dnIn2		
C01671/4	0	Incr.	1073741824	Hysteresis • Lenze setting: 0 incr.
C01672/4	0	Incr.	1073741824	Window • Lenze setting: 0 incr.

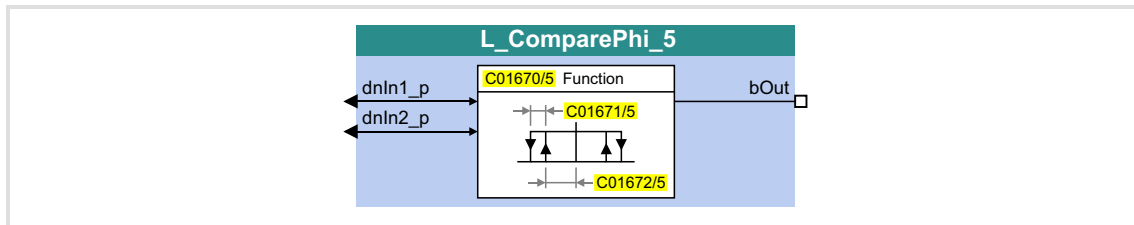


For a detailed functional description see [L_ComparePhi_1](#).

18.1.32 L_ComparePhi_5

This FB compares two angle signals.

- Comparison operation, hysteresis and window size can be parameterised.



Inputs

Identifier	Data type	Information/possible settings
dnIn1_p	DINT	Input signal 1
dnIn2_p	DINT	Input signal 2

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Status signal "Comparison statement is true"
		TRUE The statement of the selected comparison mode is true.

Parameter

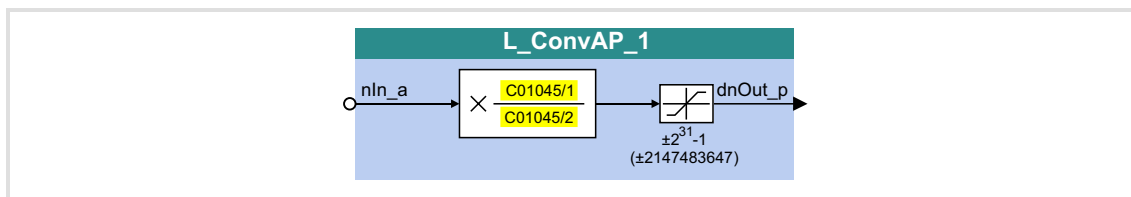
Parameter	Possible settings			Info
C01670/5				Function selection
	1	dnIn1 = dnIn2		
	2	dnIn1 > dnIn2		
	3	dnIn1 < dnIn2		
	4	dnIn1 = dnIn2		
	5	dnIn1 > dnIn2		
	6	dnIn1 < dnIn2		
C01671/5	0	Incr.	1073741824	Hysteresis • Lenze setting: 0 incr.
C01672/5	0	Incr.	1073741824	Window • Lenze setting: 0 incr.



For a detailed functional description see [L_ComparePhi_1](#).

18.1.33 L_ConvAP_1

This FB converts an analog value into a position.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input value • Scaling: 16384 ≙ 100 %

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

Parameter

Parameter	Possible settings	Info
C01045/1	-32767	32767 Numerator • Lenze setting: 1
C01045/2	-32767	32767 Denominator • Lenze setting: 1

Function

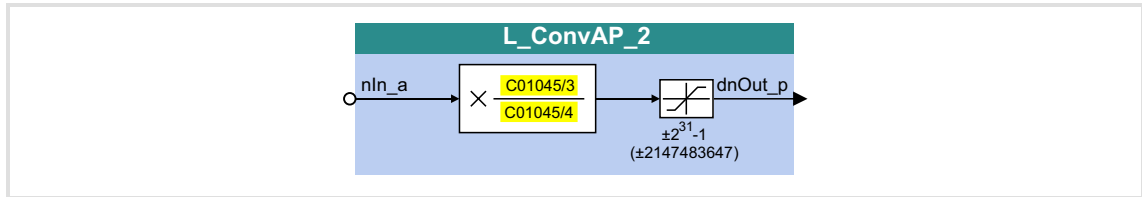
**Note!**

Conversion is remainder considered.

$$\text{dnOut}_p = \text{nIn}_a \cdot \frac{\text{C01045/1}}{\text{C01045/2}}$$

18.1.34 L_ConvAP_2

This FB converts an analog value into a position.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input value • Scaling: 16384 ≙ 100 %

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

Parameter

Parameter	Possible settings	Info
C01045/3	-32767	32767 Numerator • Lenze setting: 1
C01045/4	-32767	32767 Denominator • Lenze setting: 1

Function



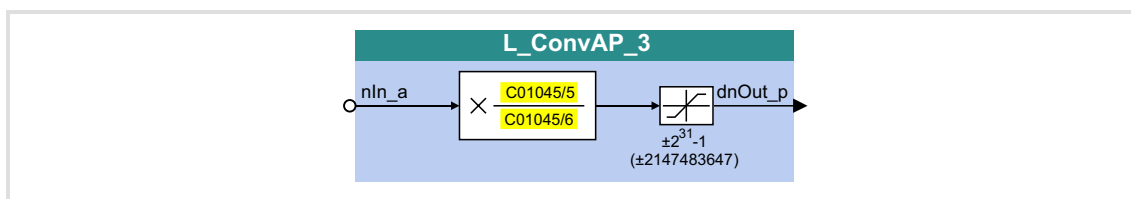
Note!

Conversion is remainder considered.

$$dnOut_p = nIn_a \cdot \frac{C01045/3}{C01045/4}$$

18.1.35 L_ConvAP_3

This FB converts an analog value into a position.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input value • Scaling: 16384 ≙ 100 %

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

Parameter

Parameter	Possible settings	Info
C01045/5	-32767	32767 Numerator • Lenze setting: 1
C01045/6	-32767	32767 Denominator • Lenze setting: 1

Function

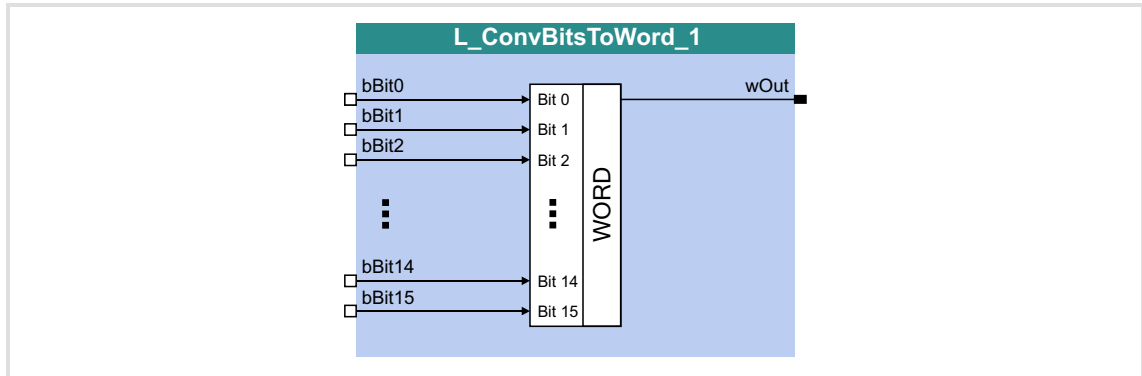
**Note!**

Conversion is remainder considered.

$$\text{dnOut}_p = \text{nIn}_a \cdot \frac{\text{C01045/5}}{\text{C01045/6}}$$

18.1.36 L_ConvBitsToWord_1

This FB converts 16 bit input values of the type "BOOL" into an output value of the type "WORD".



Inputs

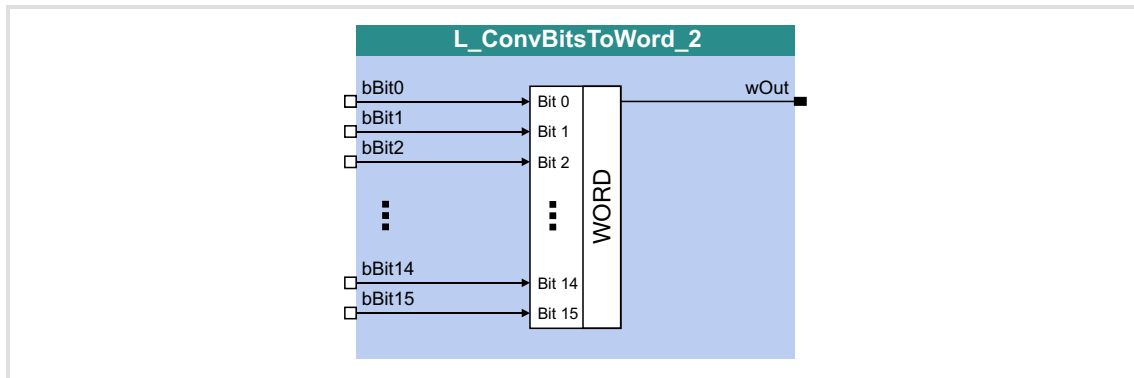
Identifier	Data type	Information/possible settings
bBit0	BOOL	Input signal
...		
bBit15		

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

18.1.37 L_ConvBitsToWord_2

This FB converts 16 bit input values of the type "BOOL" into an output value of the type "WORD".



Inputs

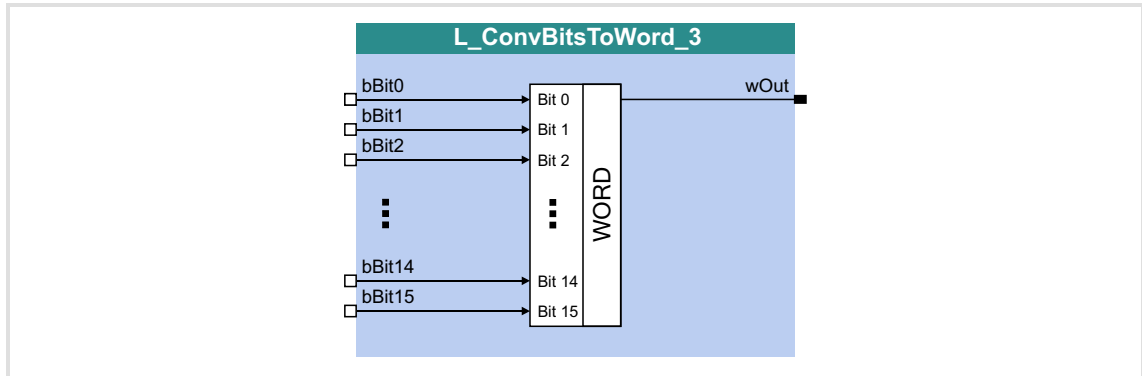
Identifier	Data type	Information/possible settings
bBit0		Input signal
...		
bBit15		
	BOOL	

Outputs

Identifier	Data type	Value/meaning
wOut		Output signal
	WORD	

18.1.38 L_ConvBitsToWord_3

This FB converts 16 bit input values of the type "BOOL" into an output value of the type "WORD".



Inputs

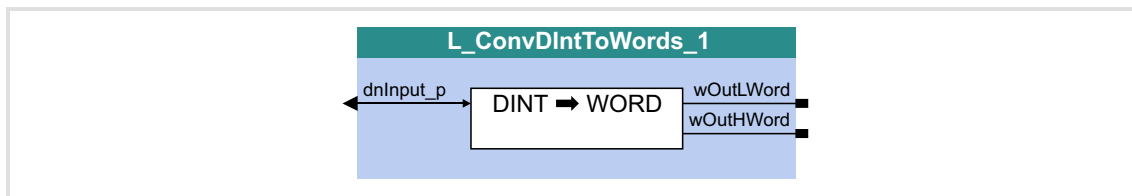
Identifier	Data type	Information/possible settings
bBit0	BOOL	Input signal
...		
bBit15		

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

18.1.39 L_ConvDIntToWords_1

This FB converts an input value of the type "DINT" into two output values of the type "WORD".



Inputs

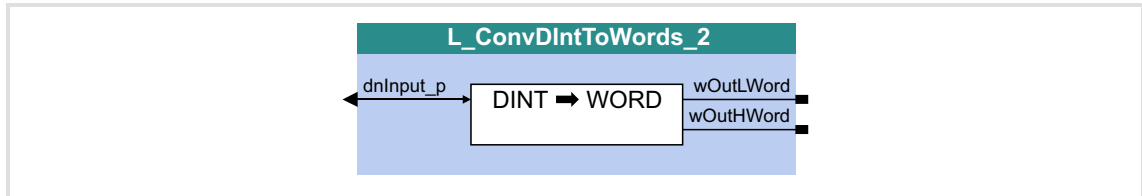
Identifier	Data type	Information/possible settings
dnInput_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
wOutLWord	WORD	Output signal Low Word
wOutHWord	WORD	Output signal High Word

18.1.40 L_ConvDIntToWords_2

This FB converts an input value of the type "DINT" into two output values of the type "WORD".



Inputs

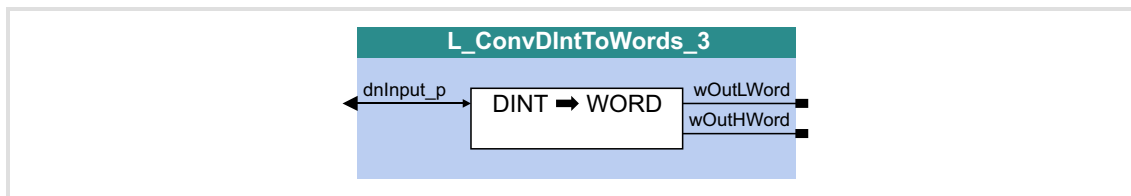
Identifier	Data type	Information/possible settings
dnInput_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
wOutLWord	WORD	Output signal Low Word
wOutHWord	WORD	Output signal High Word

18.1.41 L_ConvDIntToWords_3

This FB converts an input value of the type "DINT" into two output values of the type "WORD".

**Inputs**

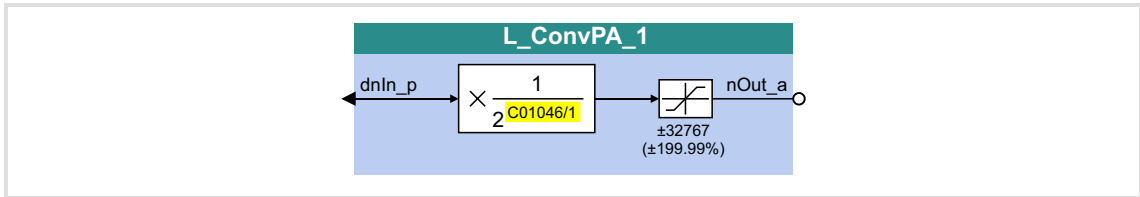
Identifier	Data type	Information/possible settings
dnInput_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
wOutLWord	WORD	Output signal Low Word
wOutHWord	WORD	Output signal High Word

18.1.42 L_ConvPA_1

This FB converts a position into an analog value.



Inputs

Identifier	Data type	Information/possible settings
dnln_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ±199 % (100 % = 16384)

Parameter

Parameter	Possible settings	Info
C01046/1	0	31 Division factor • Lenze setting: 1

Function



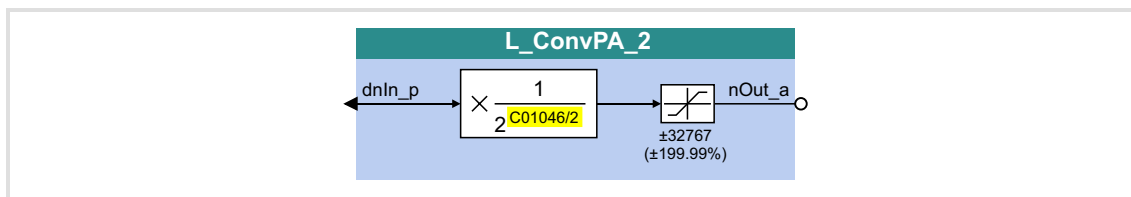
Note!

Conversion is remainder considered.

$$nOut_a = dnln_p \cdot \frac{1}{2 \cdot C01046/1}$$

18.1.43 L_ConvPA_2

This FB converts a position into an analog value.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ±199 % (100 % = 16384)

Parameter

Parameter	Possible settings	Info
C01046/2	0	31 Division factor • Lenze setting: 1

Function

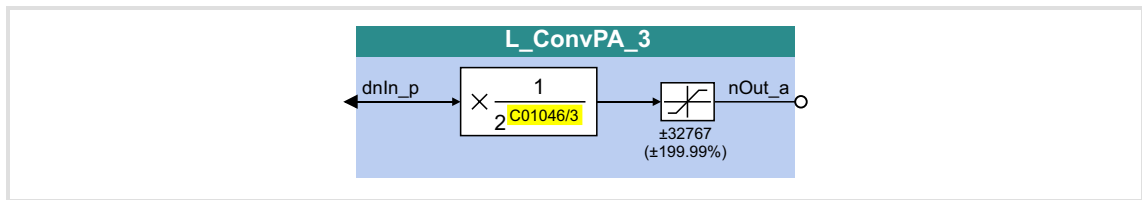
**Note!**

Conversion is remainder considered.

$$nOut_a = dnIn_p \cdot \frac{1}{2 \cdot C01046/2}$$

18.1.44 L_ConvPA_3

This FB converts a position into an analog value.



Inputs

Identifier	Data type	Information/possible settings
dnln_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ±199 % (100 % = 16384)

Parameter

Parameter	Possible settings	Info
C01046/3	0	31 Division factor • Lenze setting: 1

Function



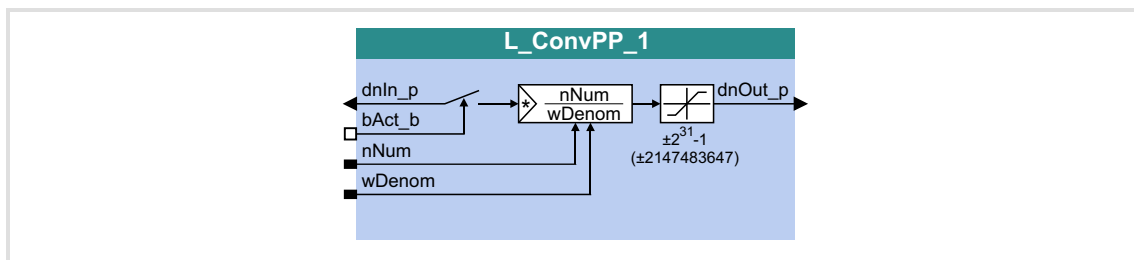
Note!

Conversion is remainder considered.

$$nOut_a = dnln_p \cdot \frac{1}{2 \cdot C01046/3}$$

18.1.45 L_ConvPP_1

This FB converts a position with dynamic fraction.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal
bAct_b	BOOL	Conversion mode
		FALSE $\text{InOut}_p = \text{Remainder} \cdot \frac{\text{nNum}}{\text{wDenom}}$
		TRUE $\text{dnOut}_p = \text{dnIn}_p \cdot \frac{\text{nNum}}{\text{wDenom}}$
nNum	INT	Factor (numerator) • Internal limitation to -32767 ... -1 / 1 ... 32767
wDenom	WORD	Factor (denominator) • Internal limitation to 1 ... 32767

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

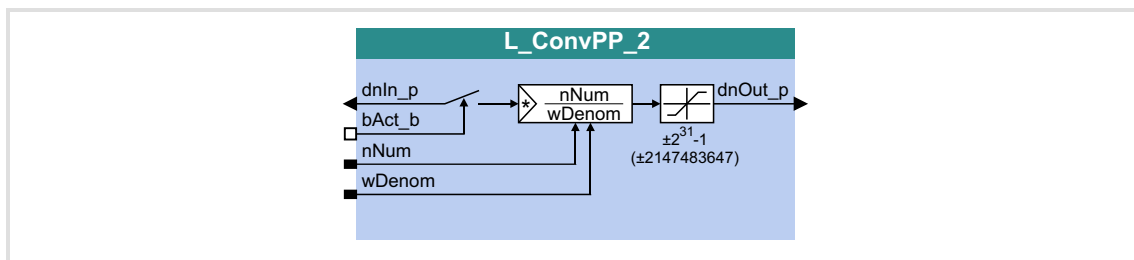


Note!

Conversion is remainder considered.

18.1.46 L_ConvPP_2

This FB converts a position with dynamic fraction.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal
bAct_b	BOOL	Conversion mode
		FALSE: $dnOut_p = \text{Remainder} \cdot \frac{nNum}{wDenom}$
		TRUE: $dnOut_p = dnIn_p \cdot \frac{nNum}{wDenom}$
nNum	INT	Factor (numerator) • Internal limitation to -32767 ... -1 / 1 ... 32767
wDenom	WORD	Factor (denominator) • Internal limitation to 1 ... 32767

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

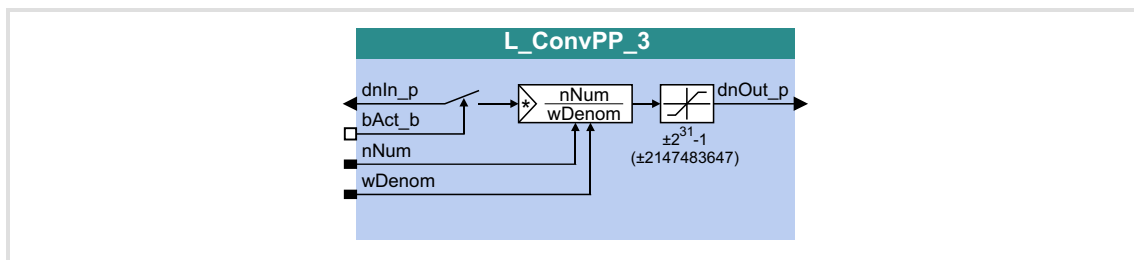


Note!

Conversion is remainder considered.

18.1.47 L_ConvPP_3

This FB converts a position with dynamic fraction.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal
bAct_b	BOOL	Conversion mode
		FALSE $\text{InOut}_p = \text{Remainder} \cdot \frac{\text{nNum}}{\text{wDenom}}$
		TRUE $\text{dnOut}_p = \text{dnIn}_p \cdot \frac{\text{nNum}}{\text{wDenom}}$
nNum	INT	Factor (numerator) • Internal limitation to -32767 ... -1 / 1 ... 32767
wDenom	WORD	Factor (denominator) • Internal limitation to 1 ... 32767

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)



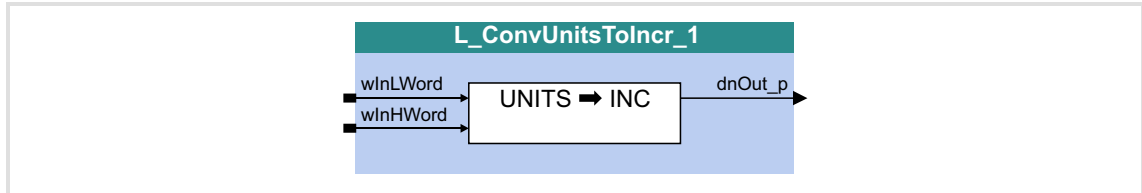
Note!

Conversion is remainder considered.

18.1.48 L_ConvUnitsToIncr_1

FB in preparation!

Taking into account the machine parameters, this FB converts a position value provided in the real unit of the machine into an internal 32-bit position value.



Inputs

Identifier	Data type	Information/possible settings
wInLWord	WORD	Input signal Low Word
wInHWord	WORD	Input signal High Word

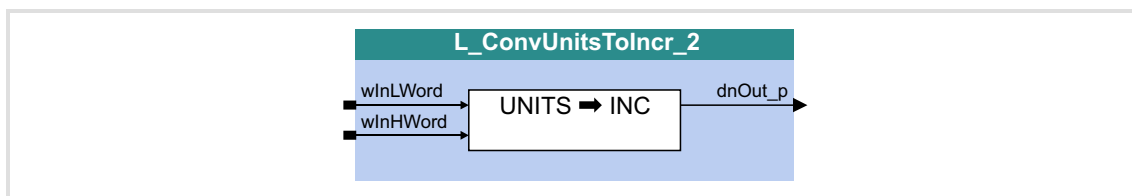
Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

18.1.49 L_ConvUnitsToIncr_2

FB in preparation!

Taking into account the machine parameters, this FB converts a position value provided in the real unit of the machine into an internal 32-bit position value.



Inputs

Identifier	Data type	Information/possible settings
wInLWord	WORD	Input signal Low Word
wInHWord	WORD	Input signal High Word

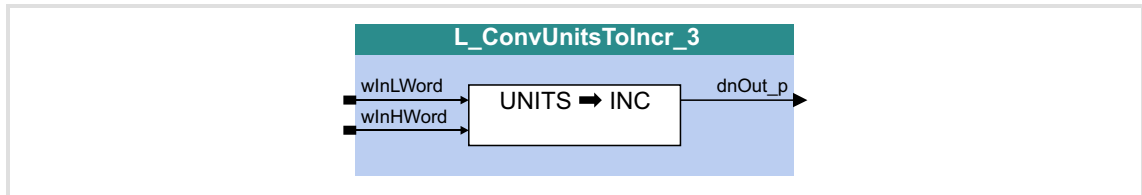
Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

18.1.50 L_ConvUnitsToIncr_3

FB in preparation!

Taking into account the machine parameters, this FB converts a position value provided in the real unit of the machine into an internal 32-bit position value.



Inputs

Identifier	Data type	Information/possible settings
wInLWord	WORD	Input signal Low Word
wInHWord	WORD	Input signal High Word

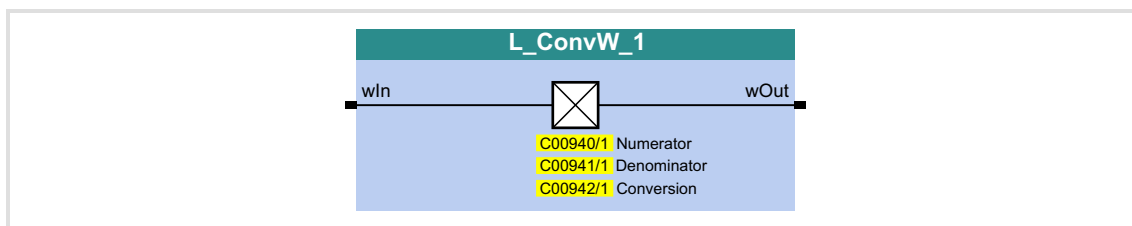
Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

18.1.51 L_ConvW_1

This FB serves to convert analog signal forms. The following conversions per parameter can be selected:

- ▶ [%] → [incr/ms]
- ▶ [incr/ms] → [%]
- ▶ Conversion via parameterisable factors
- ▶ Input signal is passed through without conversion



Inputs

Identifier	Data type	Information/possible settings
wIn	WORD	Input signal

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

Parameter

Parameter	Possible settings	Info								
C00940/1	-2147483647 2147483647	Numerator • Lenze setting: 1								
C00941/1	-2147483647 2147483647	Denominator • Lenze setting: 1								
C00942/1	<table border="1"> <tbody> <tr> <td>0</td> <td>$wOut = wIn$ (no conversion)</td> </tr> <tr> <td>1</td> <td>[%] → [incr/ms]</td> </tr> <tr> <td>2</td> <td>[incr/ms] → [%]</td> </tr> <tr> <td>3</td> <td>$wOut = wIn * \frac{C00940}{C00941}$</td> </tr> </tbody> </table>	0	$wOut = wIn$ (no conversion)	1	[%] → [incr/ms]	2	[incr/ms] → [%]	3	$wOut = wIn * \frac{C00940}{C00941}$	Selection of the conversion
0	$wOut = wIn$ (no conversion)									
1	[%] → [incr/ms]									
2	[incr/ms] → [%]									
3	$wOut = wIn * \frac{C00940}{C00941}$									

Conversion formulae



Note!

Division is remainder considered.

$$w_{\text{Out}} [\text{incr/ms}] = \frac{w_{\text{In}} [\%] \cdot C00011 [\text{rpm}] \cdot 65536 [\text{incr/rev.}]}{100 \% \cdot 60 [\text{s/min}] \cdot 1000 [\text{ms/s}]}$$

[18-18] Conversion formula for selection 1: [%] → [incr/ms]

$$w_{\text{Out}} [\%] = \frac{w_{\text{In}} [\text{incr/ms}] \cdot 100 \% \cdot 60 [\text{s/min}] \cdot 1000 [\text{ms/s}]}{C00011 [\text{rpm}] \cdot 65536 [\text{incr/rev.}]}$$

[18-19] Conversion formula for selection 2: [incr/ms] → [%]

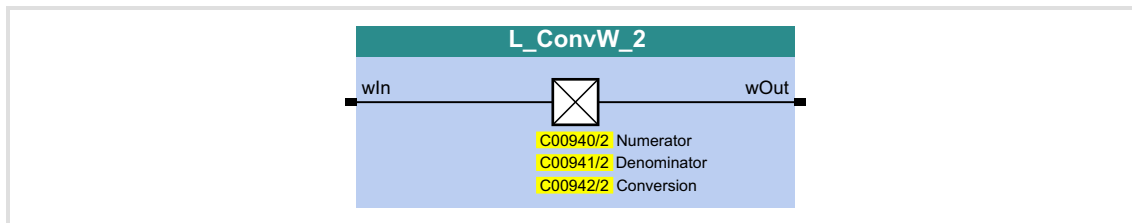
$$w_{\text{Out}} = w_{\text{In}} \cdot \frac{C00940}{C00941}$$

[18-20] Conversion formula for selection 3: Parameterisable factors

18.1.52 L_ConvW_2

This FB serves to convert analog signal forms. The following conversions per parameter can be selected:

- ▶ [%] → [incr/ms]
- ▶ [incr/ms] → [%]
- ▶ Conversion via parameterisable factors
- ▶ Input signal is passed through without conversion



Inputs

Identifier	Data type	Information/possible settings
wIn	WORD	Input signal

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

Parameter

Parameter	Possible settings	Info								
C00940/2	-2147483647 2147483647	Numerator • Lenze setting: 1								
C00941/2	-2147483647 2147483647	Denominator • Lenze setting: 1								
C00942/2	<table border="1"> <tbody> <tr> <td>0</td> <td>$wOut = wIn$ (no conversion)</td> </tr> <tr> <td>1</td> <td>[%] → [incr/ms]</td> </tr> <tr> <td>2</td> <td>[incr/ms] → [%]</td> </tr> <tr> <td>3</td> <td>$wOut = wIn * \frac{C00940}{C00941}$</td> </tr> </tbody> </table>	0	$wOut = wIn$ (no conversion)	1	[%] → [incr/ms]	2	[incr/ms] → [%]	3	$wOut = wIn * \frac{C00940}{C00941}$	Selection of the conversion
0	$wOut = wIn$ (no conversion)									
1	[%] → [incr/ms]									
2	[incr/ms] → [%]									
3	$wOut = wIn * \frac{C00940}{C00941}$									

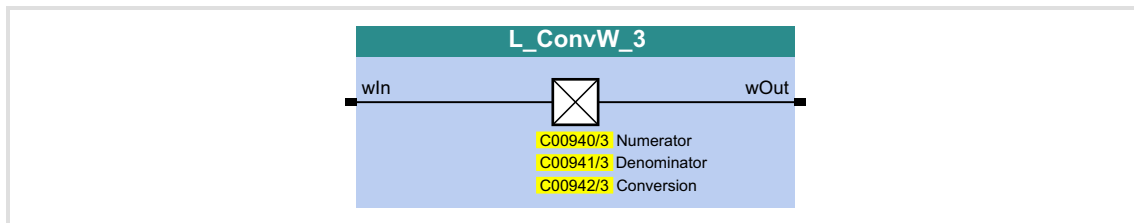


For conversion formulae see [L_ConvW_1](#).

18.1.53 L_ConvW_3

This FB serves to convert analog signal forms. The following conversions per parameter can be selected:

- ▶ [%] → [incr/ms]
- ▶ [incr/ms] → [%]
- ▶ Conversion via parameterisable factors
- ▶ Input signal is passed through without conversion



Inputs

Identifier	Data type	Information/possible settings
wIn	WORD	Input signal

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

Parameter

Parameter	Possible settings	Info
C00940/3	-2147483647 2147483647	Numerator • Lenze setting: 1
C00941/3	-2147483647 2147483647	Denominator • Lenze setting: 1
C00942/3	0 1 2 3	Selection of the conversion
	0	$wOut = wIn$ (no conversion)
	1	$[\%] \rightarrow [incr/ms]$
	2	$[incr/ms] \rightarrow [\%]$
	3	$wOut = wIn * \frac{C00940}{C00941}$

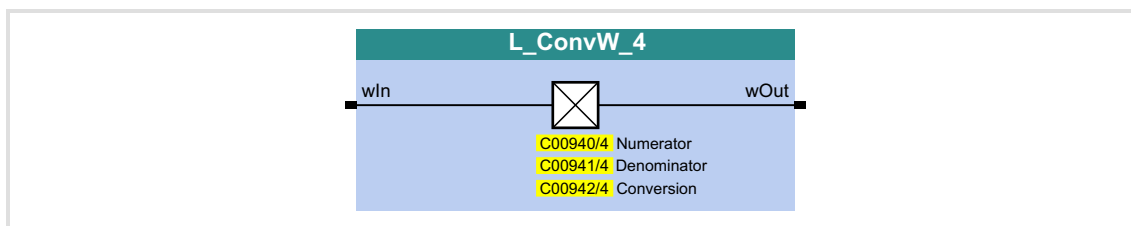


For conversion formulae see [L_ConvW_1](#).

18.1.54 L_ConvW_4

This FB serves to convert analog signal forms. The following conversions per parameter can be selected:

- ▶ [%] → [incr/ms]
- ▶ [incr/ms] → [%]
- ▶ Conversion via parameterisable factors
- ▶ Input signal is passed through without conversion



Inputs

Identifier	Data type	Information/possible settings
wIn	WORD	Input signal

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

Parameter

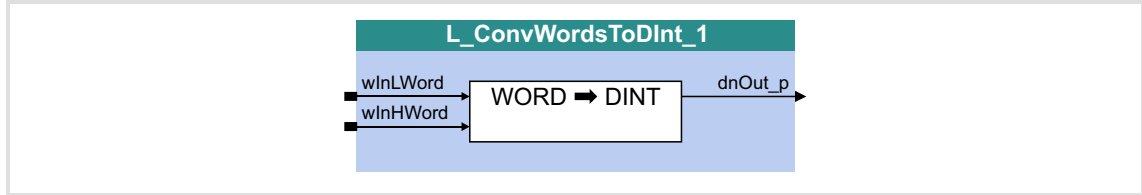
Parameter	Possible settings	Info								
C00940/4	-2147483647 2147483647	Numerator • Lenze setting: 1								
C00941/4	-2147483647 2147483647	Denominator • Lenze setting: 1								
C00942/4	<table border="1"> <tbody> <tr> <td>0</td> <td>$wOut = wIn$ (no conversion)</td> </tr> <tr> <td>1</td> <td>[%] → [incr/ms]</td> </tr> <tr> <td>2</td> <td>[incr/ms] → [%]</td> </tr> <tr> <td>3</td> <td>$wOut = wIn * \frac{C00940}{C00941}$</td> </tr> </tbody> </table>	0	$wOut = wIn$ (no conversion)	1	[%] → [incr/ms]	2	[incr/ms] → [%]	3	$wOut = wIn * \frac{C00940}{C00941}$	Selection of the conversion
0	$wOut = wIn$ (no conversion)									
1	[%] → [incr/ms]									
2	[incr/ms] → [%]									
3	$wOut = wIn * \frac{C00940}{C00941}$									



For conversion formulae see [L_ConvW_1](#).

18.1.55 L_ConvWordsToDInt_1

This FB converts two input values of the type "WORD" into one output value of the type "DINT".



Inputs

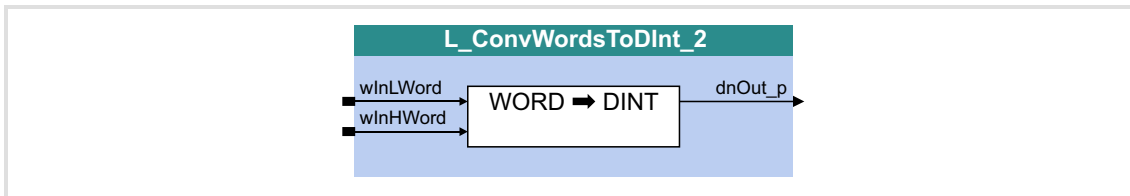
Identifier	Data type	Information/possible settings
wInLWord	WORD	Input signal Low Word
wInHWord	WORD	Input signal High Word

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

18.1.56 L_ConvWordsToDInt_2

This FB converts two input values of the type "WORD" into one output value of the type "DINT".



Inputs

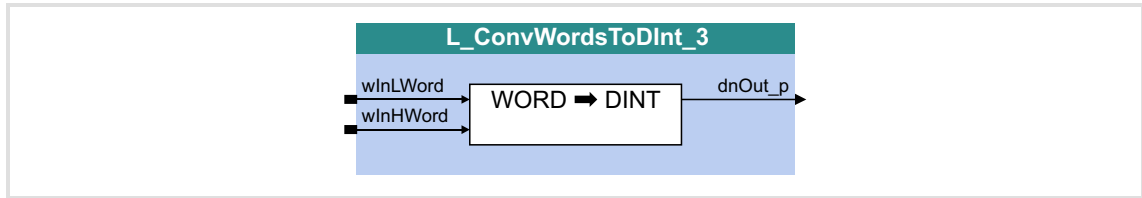
Identifier	Data type	Information/possible settings
wInLWord	WORD	Input signal Low Word
wInHWord	WORD	Input signal High Word

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

18.1.57 L_ConvWordsToDInt_3

This FB converts two input values of the type "WORD" into one output value of the type "DINT".



Inputs

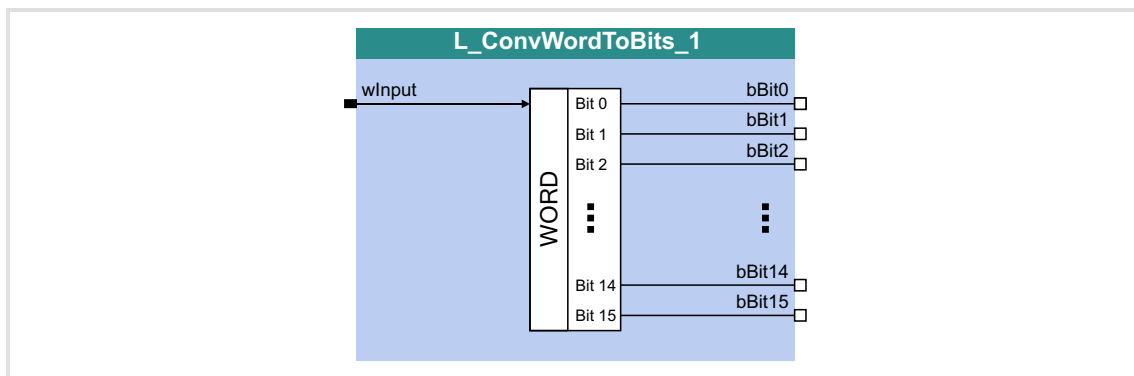
Identifier	Data type	Information/possible settings
wInLWord	WORD	Input signal Low Word
wInHWord	WORD	Input signal High Word

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

18.1.58 L_ConvWordToBits_1

This FB converts an input value of "WORD" type into 16 individual binary signals.



Inputs

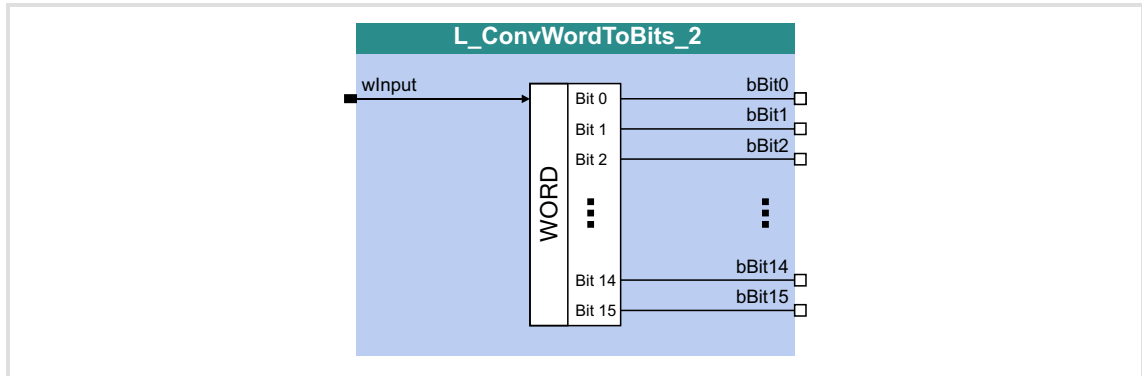
Identifier	Data type	Information/possible settings
wInput	WORD	Input signal

Outputs

Identifier	Data type	Value/meaning
bBit0 ... bBit15	BOOL	Output signal

18.1.59 L_ConvWordToBits_2

This FB converts an input value of "WORD" type into 16 individual binary signals.



Inputs

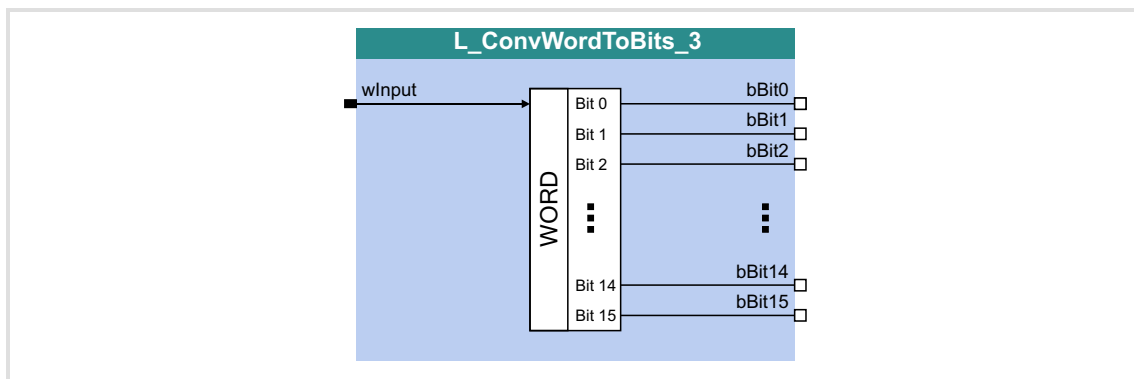
Identifier	Data type	Information/possible settings
wInput	WORD	Input signal

Outputs

Identifier	Data type	Value/meaning
bBit0 ... bBit15	BOOL	Output signal

18.1.60 L_ConvWordToBits_3

This FB converts an input value of "WORD" type into 16 individual binary signals.



Inputs

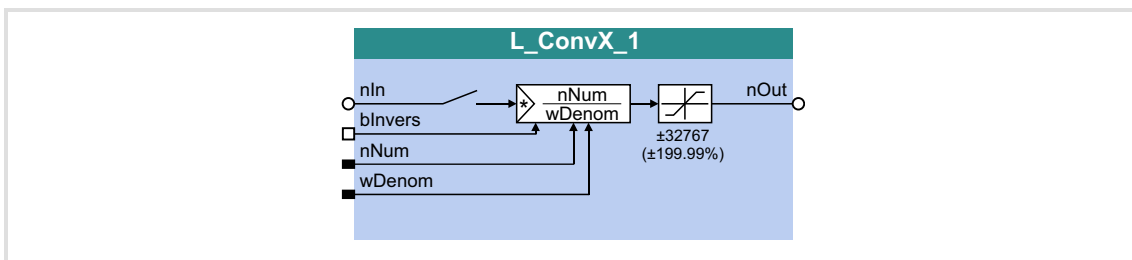
Identifier	Data type	Information/possible settings
wInput	WORD	Input signal

Outputs

Identifier	Data type	Value/meaning
bBit0 ... bBit15	BOOL	Output signal

18.1.61 L_ConvX_1

This FB scales an analog value.



Inputs

Identifier	Data type	Information/possible settings				
nIn	INT	Input signal				
blInvers	BOOL	Invert sign of the output signal				
		<table border="1"> <tr> <td>FALSE</td> <td>$nOut = nIn \cdot \frac{nNum}{wDenom}$</td> </tr> <tr> <td>TRUE</td> <td>$nOut = nIn \cdot \frac{nNum}{wDenom} \cdot (-1)$</td> </tr> </table>	FALSE	$nOut = nIn \cdot \frac{nNum}{wDenom}$	TRUE	$nOut = nIn \cdot \frac{nNum}{wDenom} \cdot (-1)$
FALSE	$nOut = nIn \cdot \frac{nNum}{wDenom}$					
TRUE	$nOut = nIn \cdot \frac{nNum}{wDenom} \cdot (-1)$					
nNum	INT	Factor (numerator) • Internal limitation to -32767 ... -1 / 1 ... 32767				
wDenom	WORD	Factor (denominator) • Internal limitation to 1 ... 32767				

Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal • Internal limitation to ±199 % (100 % = 16384)

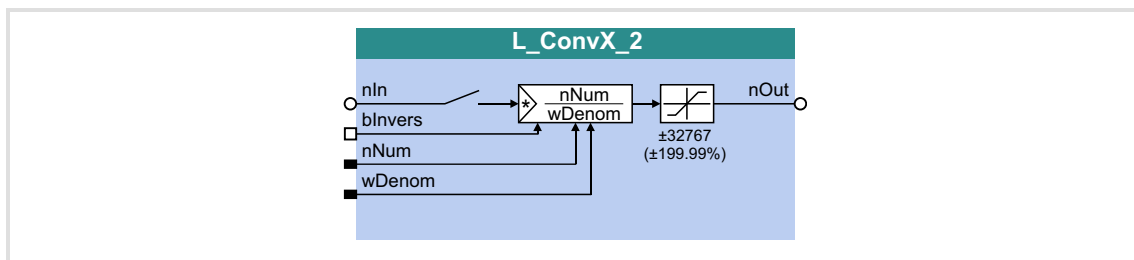


Note!

Conversion is remainder considered.

18.1.62 L_ConvX_2

This FB scales an analog value.



Inputs

Identifier	Data type	Information/possible settings
nIn	INT	Input signal
bInvers	BOOL	Invert sign of the output signal
		FALSE $nOut = nIn \cdot \frac{nNum}{wDenom}$
		TRUE $nOut = nIn \cdot \frac{nNum}{wDenom} \cdot (-1)$
nNum	INT	Factor (numerator) • Internal limitation to -32767 ... -1 / 1 ... 32767
wDenom	WORD	Factor (denominator) • Internal limitation to 1 ... 32767

Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal • Internal limitation to ±199 % (100 % = 16384)

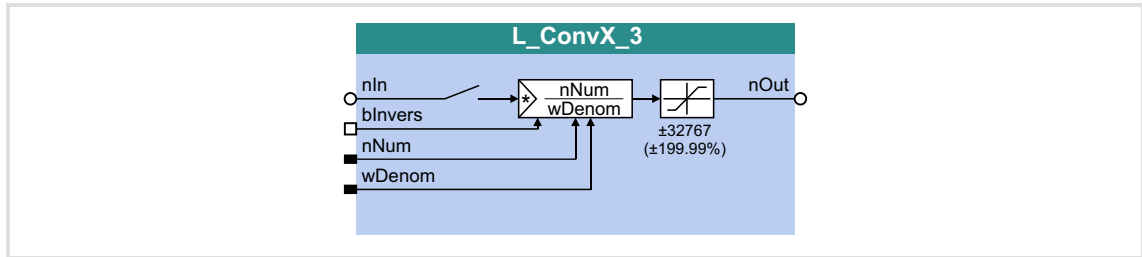


Note!

Conversion is remainder considered.

18.1.63 L_ConvX_3

This FB scales an analog value.



Inputs

Identifier	Data type	Information/possible settings
nIn	INT	Input signal
blInvers	BOOL	Invert sign of the output signal
		FALSE $nOut = nIn \cdot \frac{nNum}{wDenom}$
		TRUE $nOut = nIn \cdot \frac{nNum}{wDenom} \cdot (-1)$
nNum	INT	Factor (numerator) • Internal limitation to -32767 ... -1 / 1 ... 32767
wDenom	WORD	Factor (denominator) • Internal limitation to 1 ... 32767

Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal • Internal limitation to ±199 % (100 % = 16384)

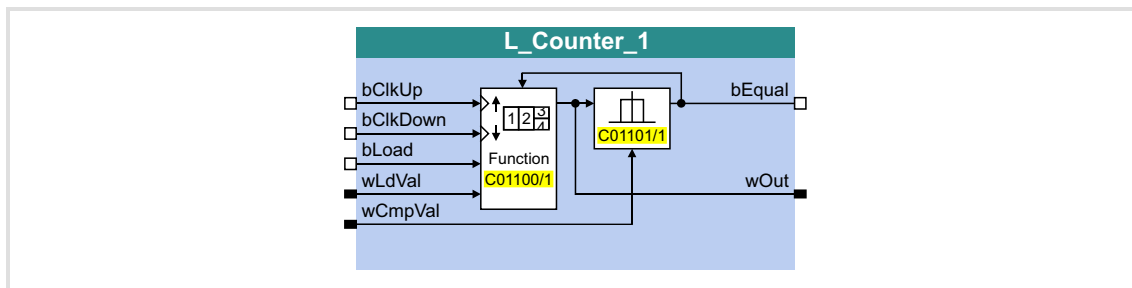


Note!

Conversion is remainder considered.

18.1.64 L_Counter_1

This FB is a digital upcounter and downcounter with a parameterisable comparison operation.



Inputs

Identifier	Data type	Information/possible settings
bClkUp	BOOL	Clock input <ul style="list-style-type: none"> With each edge, the module counts up by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bClkDown	BOOL	Clock input <ul style="list-style-type: none"> With each edge, the module counts down by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bLoad	BOOL	Load input <ul style="list-style-type: none"> The input has the highest priority. <p style="text-align: center;">TRUE Accept starting value <i>wLdVal</i>.</p>
wLdVal	WORD	Starting value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.
wCmpVal	WORD	Comparison value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.

Outputs

Identifier	Data type	Value/meaning
bEqual	BOOL	Status signal "Comparison statement is true" <ul style="list-style-type: none"> The TRUE output is active in the Lenze setting if the current counter content is greater than or equal to the comparison value <i>wCmpVal</i>. <p style="text-align: center;">TRUE The statement of the comparison mode selected in C01101/1 is true.</p>
wOut	WORD	Counter content <ul style="list-style-type: none"> Internal limitation to ± 32767 The most significant bit determines the sign!

Parameter

Parameter	Possible settings	Info
C01100/1	0 Normal counting	Function selection • Lenze setting: Normal counting
	1 Auto reset	
	2 Manual reset	
C01101/1	0 Counter content \geq comparison value	Selection of comparison operation • Lenze setting: Counter content \geq comparison value
	1 Counter content \leq comparison value	
	2 Counter content = comparison value	

General function

- ▶ Every FALSE/TRUE edge at the *bClkUp* input causes the block to count upwards by "1".
- ▶ Every FALSE/TRUE edge at the *bClkDown* input causes the block to count downwards by "1".

Function "Normal counting"

If the statement of the comparison mode selected in [C01101/1](#) is true, the *bCompare* output is set to TRUE.

Function "Auto reset"

If the statement of the comparison mode selected in [C01101/1](#) is true, the *bCompare* output is set to TRUE for 1 ms and the counter is reset to the *wLdVal* starting value.

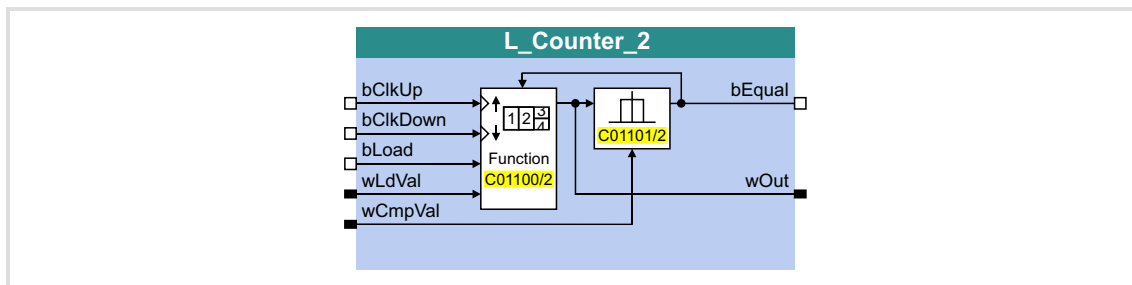
Function "Manual reset"

If the statement of the comparison mode selected in [C01101/1](#) is true, the *bCompare* output is set to TRUE and the counter stops.

- ▶ Edges at *bClkUp* and *bClkDown* are ignored.
- ▶ The counter must be reset via the *bLoad* input.

18.1.65 L_Counter_2

This FB is a digital upcounter and downcounter with a parameterisable comparison operation.



Inputs

Identifier	Data type	Information/possible settings
bClkUp	BOOL	Clock input <ul style="list-style-type: none"> With each edge, the module counts up by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bClkDown	BOOL	Clock input <ul style="list-style-type: none"> With each edge, the module counts down by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bLoad	BOOL	Load input <ul style="list-style-type: none"> The input has the highest priority. TRUE Accept starting value <i>wLdVal</i> .
wLdVal	WORD	Starting value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.
wCmpVal	WORD	Comparison value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.

Outputs

Identifier	Data type	Value/meaning
bEqual	BOOL	Status signal "Comparison statement is true" <ul style="list-style-type: none"> The TRUE output is active in the Lenze setting if the current counter content is greater than or equal to the comparison value <i>wCmpVal</i>. TRUE The statement of the comparison mode selected in C01101/2 is true.
wOut	WORD	Counter content <ul style="list-style-type: none"> Internal limitation to ± 32767 The most significant bit determines the sign!

Parameter

Parameter	Possible settings	Info
C01100/2	0 Normal counting	Function selection • Lenze setting: Normal counting
	1 Auto reset	
	2 Manual reset	
C01101/2	0 Counter content \geq comparison value	Selection of comparison operation • Lenze setting: Counter content \geq comparison value
	1 Counter content \leq comparison value	
	2 Counter content = comparison value	

General function

- ▶ Every FALSE/TRUE edge at the *bClkUp* input causes the block to count upwards by "1".
- ▶ Every FALSE/TRUE edge at the *bClkDown* input causes the block to count downwards by "1".

Function "Normal counting"

If the statement of the comparison mode selected in [C01101/2](#) is true, the *bCompare* output is set to TRUE.

Function "Auto reset"

If the statement of the comparison mode selected in [C01101/2](#) is true, the *bCompare* output is set to TRUE for 1 ms and the counter is reset to the *wLdVal* starting value.

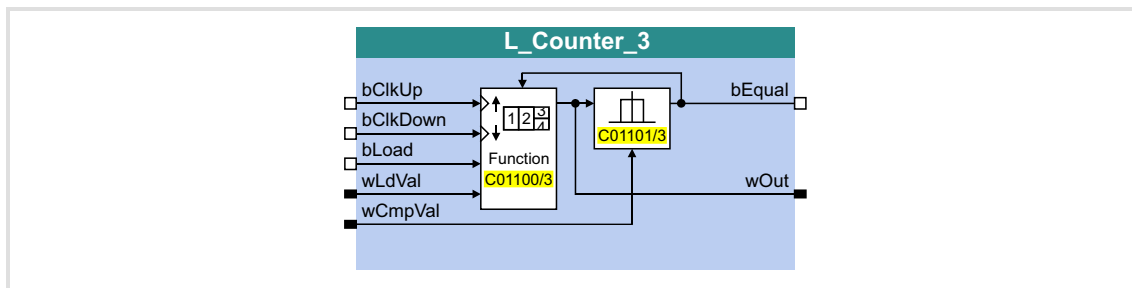
Function "Manual reset"

If the statement of the comparison mode selected in [C01101/2](#) is true, the *bCompare* output is set to TRUE and the counter stops.

- ▶ Edges at *bClkUp* and *bClkDown* are ignored.
- ▶ The counter must be reset via the *bLoad* input.

18.1.66 L_Counter_3

This FB is a digital upcounter and downcounter with a parameterisable comparison operation.



Inputs

Identifier	Data type	Information/possible settings
bClkUp	BOOL	Clock input <ul style="list-style-type: none"> With each edge, the module counts up by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bClkDown	BOOL	Clock input <ul style="list-style-type: none"> With each edge, the module counts down by "1". Only FALSE-TRUE edges are evaluated. Note: The static state "1" is not permissible at this input.
bLoad	BOOL	Load input <ul style="list-style-type: none"> The input has the highest priority. <p style="text-align: center;">TRUE Accept starting value <i>wLdVal</i>.</p>
wLdVal	WORD	Starting value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.
wCmpVal	WORD	Comparison value <ul style="list-style-type: none"> Assigned value is internally interpreted as "INT" data type (-32767 ... +32767), i.e. the most significant bit determines the sign.

Outputs

Identifier	Data type	Value/meaning
bEqual	BOOL	Status signal "Comparison statement is true" <ul style="list-style-type: none"> The TRUE output is active in the Lenze setting if the current counter content is greater than or equal to the comparison value <i>wCmpVal</i>. <p style="text-align: center;">TRUE The statement of the comparison mode selected in C01101/3 is true.</p>
wOut	WORD	Counter content <ul style="list-style-type: none"> Internal limitation to ± 32767 The most significant bit determines the sign!

Parameter

Parameter	Possible settings	Info
C01100/3	0 Normal counting	Function selection • Lenze setting: Normal counting
	1 Auto reset	
	2 Manual reset	
C01101/3	0 Counter content \geq comparison value	Selection of comparison operation • Lenze setting: Counter content \geq comparison value
	1 Counter content \leq comparison value	
	2 Counter content = comparison value	

General function

- ▶ Every FALSE/TRUE edge at the *bClkUp* input causes the block to count upwards by "1".
- ▶ Every FALSE/TRUE edge at the *bClkDown* input causes the block to count downwards by "1".

Function "Normal counting"

If the statement of the comparison mode selected in [C01101/3](#) is true, the *bCompare* output is set to TRUE.

Function "Auto reset"

If the statement of the comparison mode selected in [C01101/3](#) is true, the *bCompare* output is set to TRUE for 1 ms and the counter is reset to the *wLdVal* starting value.

Function "Manual reset"

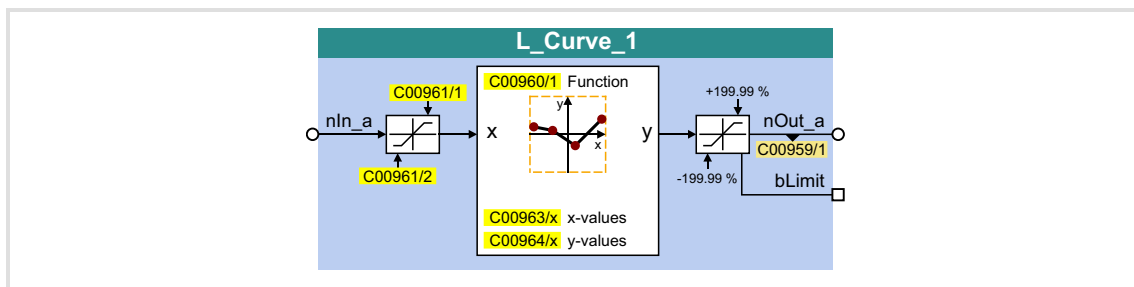
If the statement of the comparison mode selected in [C01101/3](#) is true, the *bCompare* output is set to TRUE and the counter stops.

- ▶ Edges at *bClkUp* and *bClkDown* are ignored.
- ▶ The counter must be reset via the *bLoad* input.

18.1.67 L_Curve_1

This FB can optionally display a characteristic function or a curve function $y=f(x)$, the X axis being the input signal and the Y axis being the output signal.

- ▶ A limitation of the input value can be set in [C00961/1](#) (upper limit) and [C00961/2](#) (lower limit).
- ▶ The output value is internally limited to $\pm 199.99\%$. If a limitation of the output value is active, *bLimit* is set to TRUE.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input value (x) <ul style="list-style-type: none"> $\pm 16384 \equiv \pm 100\%$ A limitation of the input value can be set in C00961/1 (upper limit) and C00961/2 (lower limit).

Outputs

Identifier	Data type	Value/meaning		
nOut_a	INT	Output value (y) <ul style="list-style-type: none"> $\pm 16384 \equiv \pm 100\%$ Internal limitation to ± 32767 ($\pm 199.99\%$) 		
bLimit	BOOL	"Limitation active" status signal <table border="1"> <tr> <td>TRUE</td> <td>The output value is limited to $\pm 199.99\%$.</td> </tr> </table>	TRUE	The output value is limited to $\pm 199.99\%$.
TRUE	The output value is limited to $\pm 199.99\%$.			

Parameter

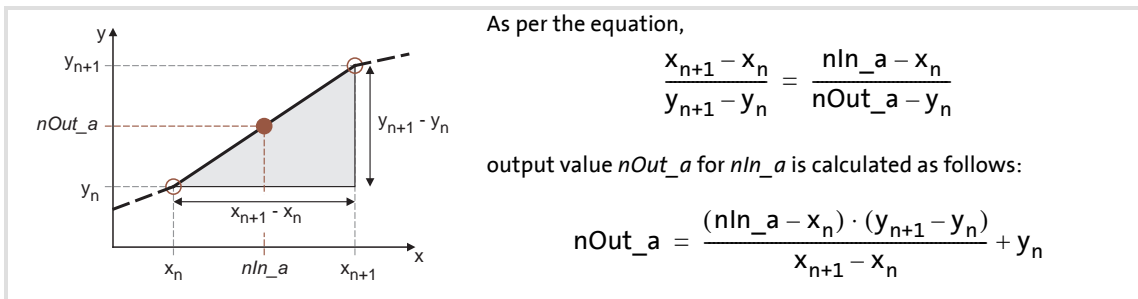
Parameter	Possible settings			Info
C00959/1 From version 02.00.00	-199.99	%	199.99	Output value <ul style="list-style-type: none"> Read only
C00960/1				Function selection
	0	$nOut_a = 0$ (FB deactivated)		Lenze setting
	1	$nOut_a = nIn_a$		
	2	$nOut_a = f(x)$		In preparation!
	3	$nOut_a = f(\text{table})$		▶ Function 3: $nOut_a = f(\text{table})$
C00961/1	-199.99	%	199.99	Upper limit for input value <ul style="list-style-type: none"> Lenze setting: 199.99 %

Parameter	Possible settings			Info
C00961/2	-199.99	%	199.99	Lower limit for input value • Lenze setting: -199.99 %
C00963/1...32	-32767		32767	X values for characteristic function • Subcodes 1 ... 32 correspond to interpolation point values X1 ... X32. • Lenze setting: 0 ▶ Function 3: nOut_a = f(table)
C00964/1...32	-32767		32767	Y values for characteristic function • Subcodes 1 ... 32 correspond to interpolation point values Y1 ... Y32. • Lenze setting: 0 ▶ Function 3: nOut_a = f(table)

18.1.67.1 Function 3: nOut_a = f(table)

If function 3 has been selected in [C00960](#), the output value is calculated according to a characteristic.

- ▶ The characteristic may comprise up to 32 interpolation points which are defined by parameters.
- ▶ If the *nIn_a* input value is equal to one of the X interpolation points, the corresponding Y interpolation point will be output to *nOut_a*.
- ▶ If the *nIn_a* input value lies between two X interpolation points, the *nOut_a* output value will be interpolated linearly:



[18-21] Linear interpolation between two interpolation points

Selecting the characteristic

The max. 32 interpolation points of the characteristic are selected via the subcodes of [C00963](#) and [C00964](#).

- ▶ The same subcodes of [C00963](#) and [C00964](#) correspond to one pair of variates/interpolation point (x_n, y_n).

	1	2	...	32
x	C00963/1	C00963/2	C00963/...	C00963/32
y	C00964/1	C00964/2	C00964/...	C00964/32

- ▶ The first pair of variates ([C00963/1](#) and [C00964/1](#)) is always valid.
- ▶ The X values of the characteristic must be entered in ascending order ($x_1 < x_2 < \dots < x_{32}$).

- ▶ An interruption of the ascending order of the X values represents the end of the characteristic (in our example: $x_5 < x_4$):

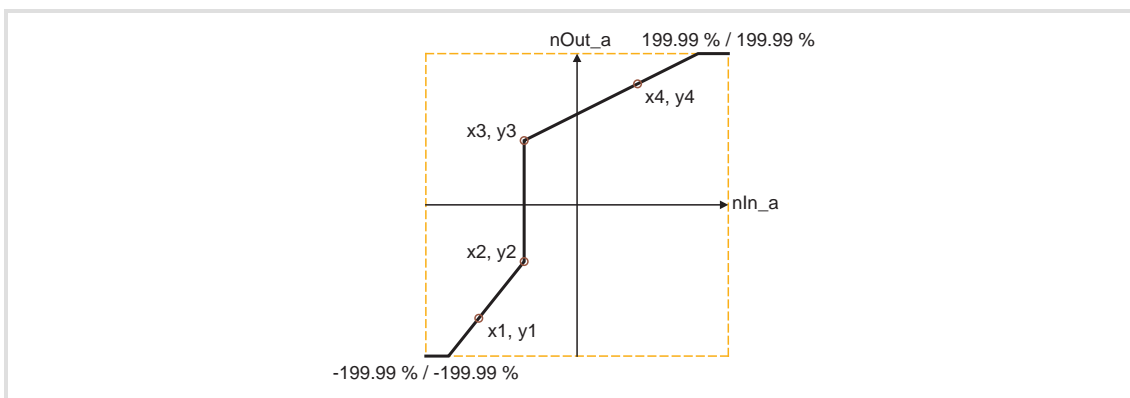
	1	2	3	4	5	6	7	...	32
X	-140 %	-90 %	70 %	145 %	0 %	0 %	0 %	0 %	0 %
y	-140 %	-40 %	115 %	160 %	0 %	0 %	0 %	0 %	0 %

- ▶ Starting at the last valid pairs of variates, extrapolation is performed on both sides until the end of the X value range ($\pm 199.99\%$).

Exceptions

- ▶ Step changes/discontinuities can be displayed by using the same parameter setting for two consecutive X values. A step change is only valid if it has a valid pair of variates. Otherwise, extrapolation continues, starting at the last valid pair of variates.

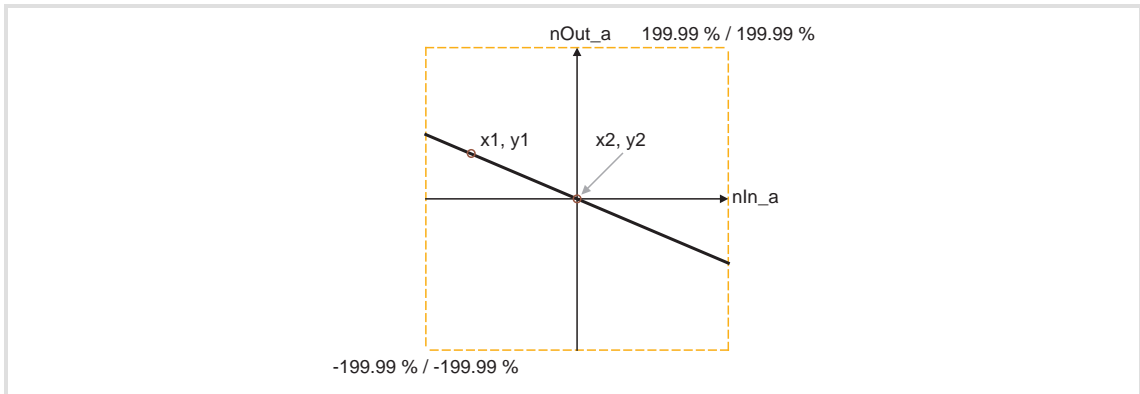
	1	2	3	4	5	6	7	...	32
X	-130 %	-70 %	-70 %	80 %	0 %	0 %	0 %	0 %	0 %
y(x)	-150 %	-75 %	85 %	160 %	0 %	0 %	0 %	0 %	0 %



[18-22] Example: Characteristic with step change

- If only one interpolation point, x_1 , in the negative range is defined, x_2 exists with the "0 %" Lenze setting being the valid interpolation point ($x_2 > x_1$), and a line is drawn through both interpolation points:

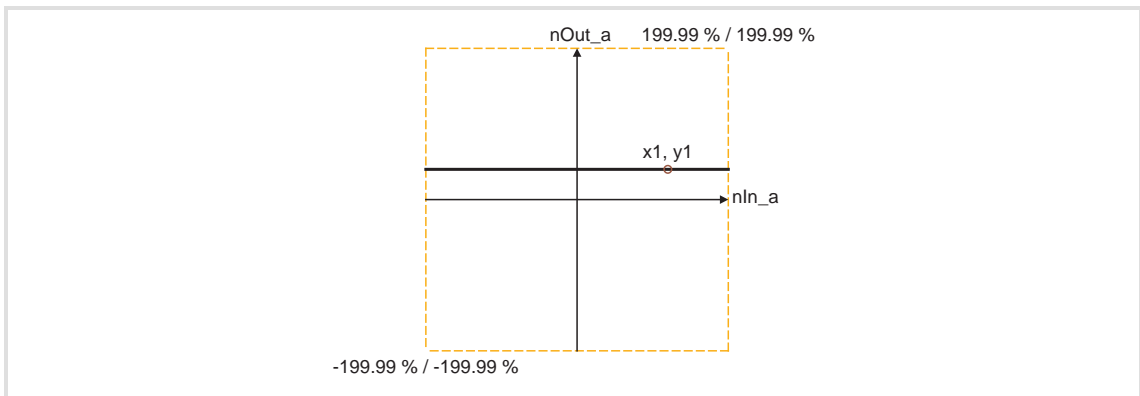
	1	2	3	4	5	6	7	8	9
x	-130 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
y(x)	40 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %



[18-23] Example: Characteristic with only one defined interpolation point and $x_1 < 0$

- If only one interpolation point, x_1 , is defined in the positive range, a line is extrapolated:

	1	2	3	4	5	6	7	8	9
x	120 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
y(x)	40 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %

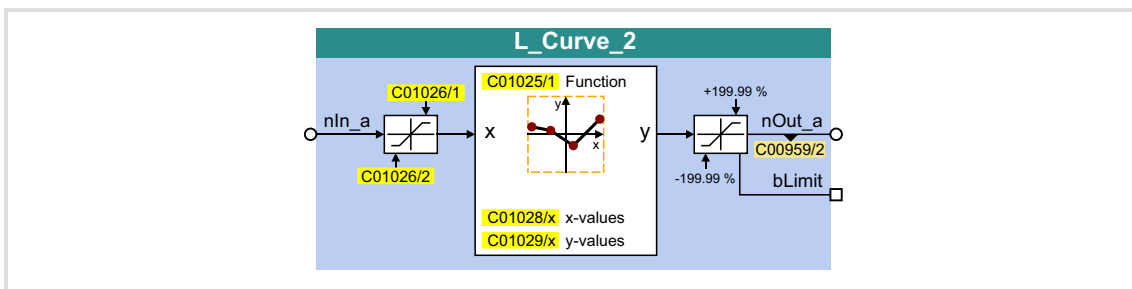


[18-24] Example: Characteristic with only one defined interpolation point and $x_1 < 0$

18.1.68 L_Curve_2

This FB can optionally display a characteristic function or a curve function $y=f(x)$, the X axis being the input signal and the Y axis being the output signal.

- ▶ A limitation of the input value can be set in [C01026/1](#) (upper limit) and [C01026/2](#) (lower limit).
- ▶ The output value is internally limited to $\pm 199.99\%$. If a limitation of the output value is active, *bLimit* is set to TRUE.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input value (x) <ul style="list-style-type: none"> • $\pm 16384 \equiv \pm 100\%$ • A limitation of the input value can be set in C01026/1 (upper limit) and C01026/2 (lower limit).

Outputs

Identifier	Data type	Value/meaning		
nOut_a	INT	Output value (y) <ul style="list-style-type: none"> • $\pm 16384 \equiv \pm 100\%$ • Internal limitation to ± 32767 ($\pm 199.99\%$) 		
bLimit	BOOL	"Limitation active" status signal <table border="1"> <tr> <td>TRUE</td> <td>The output value is limited to $\pm 199.99\%$.</td> </tr> </table>	TRUE	The output value is limited to $\pm 199.99\%$.
TRUE	The output value is limited to $\pm 199.99\%$.			

Parameter

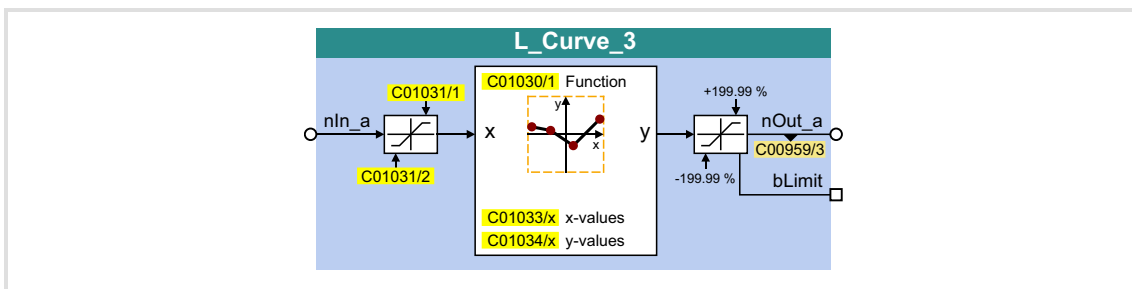
Parameter	Possible settings	Info
C00959/2	-199.99 % 199.99	Output value <ul style="list-style-type: none"> • Read only
C001025/1		Function selection
	0 $nOut_a = 0$ (FB deactivated)	Lenze setting
	1 $nOut_a = nIn_a$	
	2 $nOut_a = f(x)$	In preparation!
	3 $nOut_a = f(\text{table})$	See description of L_Curve_1: ▶ Function 3: $nOut_a = f(\text{table})$
C01026/1	-199.99 % 199.99	Upper limit for input value <ul style="list-style-type: none"> • Lenze setting: 199.99 %

Parameter	Possible settings			Info
C01026/2	-199.99	%	199.99	Lower limit for input value <ul style="list-style-type: none"> • Lenze setting: -199.99 %
C01028/1...32	-32767		32767	X values for characteristic function <ul style="list-style-type: none"> • Subcodes 1 ... 32 correspond to interpolation point values X1 ... X32. • Lenze setting: 0 See description of L_Curve_1: ▶ Function 3: nOut_a = f(table)
C01029/1...32	-32767		32767	Y values for characteristic function <ul style="list-style-type: none"> • Subcodes 1 ... 32 correspond to interpolation point values Y1 ... Y32. • Lenze setting: 0 See description of L_Curve_1: ▶ Function 3: nOut_a = f(table)

18.1.69 L_Curve_3

This FB can optionally display a characteristic function or a curve function $y=f(x)$, the X axis being the input signal and the Y axis being the output signal.

- ▶ A limitation of the input value can be set in [C01031/1](#) (upper limit) and [C01031/2](#) (lower limit).
- ▶ The output value is internally limited to $\pm 199.99\%$. If a limitation of the output value is active, *bLimit* is set to TRUE.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input value (x) <ul style="list-style-type: none"> • $\pm 16384 \equiv \pm 100\%$ • A limitation of the input value can be set in C01031/1 (upper limit) and C01031/2 (lower limit).

Outputs

Identifier	Data type	Value/meaning		
nOut_a	INT	Output value (y) <ul style="list-style-type: none"> • $\pm 16384 \equiv \pm 100\%$ • Internal limitation to ± 32767 ($\pm 199.99\%$) 		
bLimit	BOOL	"Limitation active" status signal <table border="1"> <tr> <td>TRUE</td> <td>The output value is limited to $\pm 199.99\%$.</td> </tr> </table>	TRUE	The output value is limited to $\pm 199.99\%$.
TRUE	The output value is limited to $\pm 199.99\%$.			

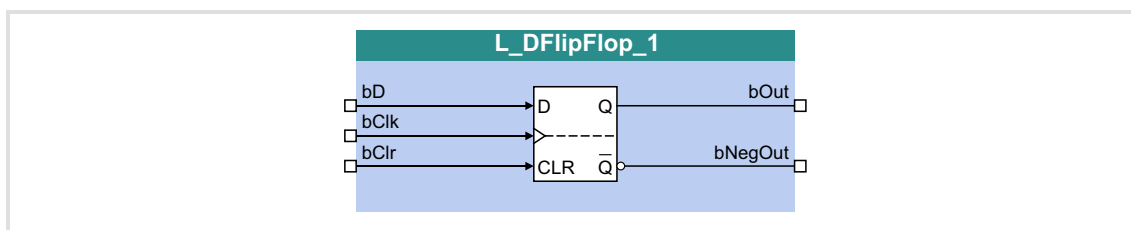
Parameter

Parameter	Possible settings	Info
C00959/3	-199.99 % 199.99	Output value <ul style="list-style-type: none"> • Read only
C01030/1		Function selection
	0 $nOut_a = 0$ (FB deactivated)	Lenze setting
	1 $nOut_a = nIn_a$	
	2 $nOut_a = f(x)$	In preparation!
	3 $nOut_a = f(\text{table})$	See description of L_Curve_1: ▶ Function 3: $nOut_a = f(\text{table})$
C01031/1	-199.99 % 199.99	Upper limit for input value <ul style="list-style-type: none"> • Lenze setting: 199.99 %

Parameter	Possible settings			Info
C01031/2	-199.99	%	199.99	Lower limit for input value <ul style="list-style-type: none"> • Lenze setting: -199.99 %
C01033/1...32	-32767		32767	X values for characteristic function <ul style="list-style-type: none"> • Subcodes 1 ... 32 correspond to interpolation point values X1 ... X32. • Lenze setting: 0 See description of L_Curve_1: ▶ Function 3: nOut a = f(table)
C01034/1...32	-32767		32767	Y values for characteristic function <ul style="list-style-type: none"> • Subcodes 1 ... 32 correspond to interpolation point values Y1 ... Y32. • Lenze setting: 0 See description of L_Curve_1: ▶ Function 3: nOut a = f(table)

18.1.70 L_DFlipFlop_1

The FB saves binary signals (DFlipFlop) in a clock-controlled way.



Inputs

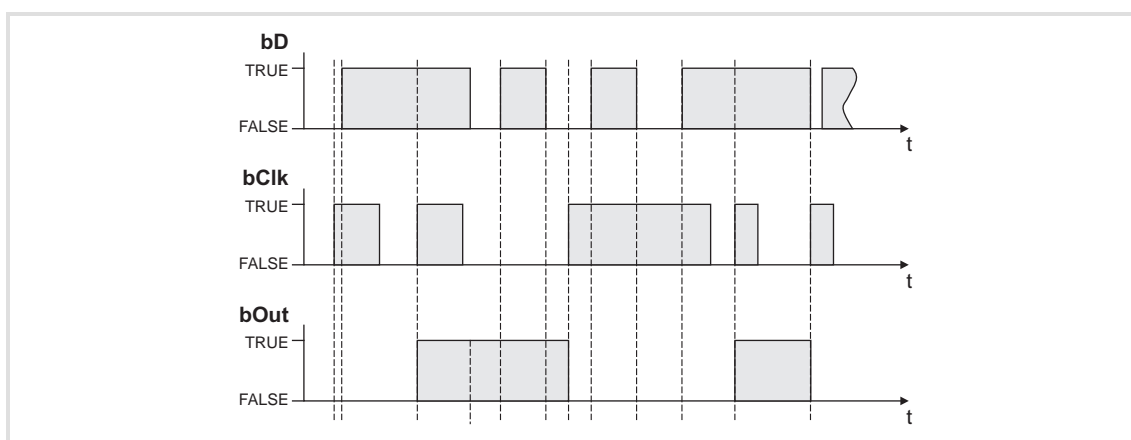
Identifier	Data type	Information/possible settings
bD	BOOL	Data input
bClk	BOOL	Clock input • Only FALSE/TRUE edges are evaluated
bClr	BOOL	Reset input
		TRUE <ul style="list-style-type: none"> • The <i>bOut</i> output is set to FALSE. • The <i>bNegOut</i> output is set to TRUE.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal
bNegOut	BOOL	Output signal, inverted

Function

If the *bClr* input = FALSE, a signal edge at the *bClk* input switches the static input signal *bD* to the *bOut* output, where it is retained:

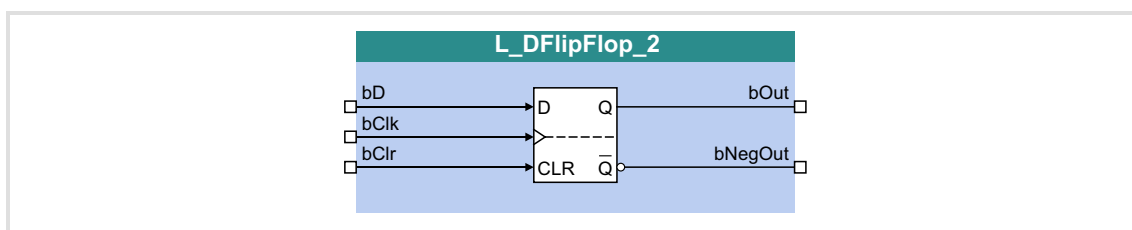


If the *bClr* input = TRUE:

- ▶ Due to the priority *bClr* > *bClk*, *bD* the *bOut* output signal can be set any time to the *FALSE* status by the *bClr* input signal = TRUE.
- ▶ The output signal is kept in this status independent of the other input signals.

18.1.71 L_DFliPfloP_2

The FB saves binary signals (DFliPfloP) in a clock-controlled way.



Inputs

Identifier	Data type	Information/possible settings
bD	BOOL	Data input
bClk	BOOL	Clock input • Only FALSE/TRUE edges are evaluated
bClr	BOOL	Reset input
		TRUE

Outputs

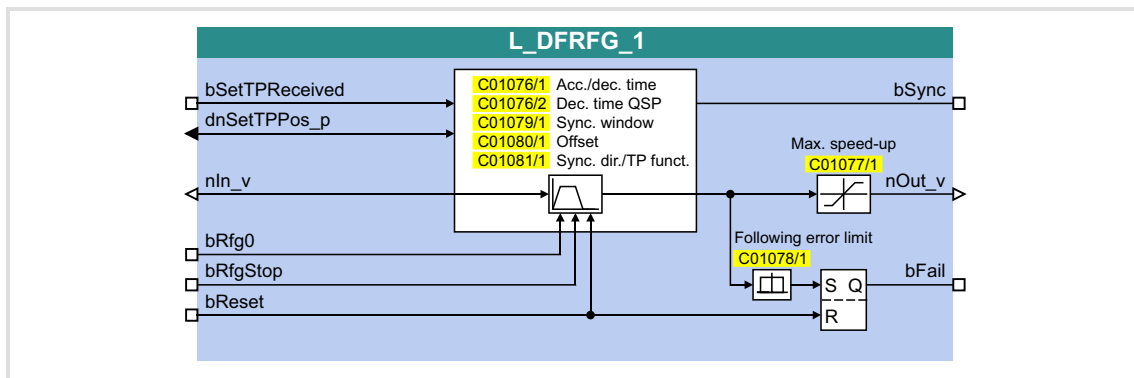
Identifier	Data type	Value/meaning
bOut	BOOL	Output signal
bNegOut	BOOL	Output signal, inverted



For a detailed functional description see [L_DFliPfloP_1](#).

18.1.72 L_DFRFG_1

This FB synchronises a drive (slave) to the master value of a master drive and then executes a angular synchronism with regard to the digital frequency.



Inputs

Identifier	Data type	Information/possible settings
bSetTPReceived	BOOL	Input for status signal "Touch probe detected" FALSE → TRUE Touch probe or zero pulse received.
dnSetTPPos_p	DINT	Input for accepting the position measured via touch probe
nIn_v	INT	Speed setpoint of the master • Scaling: 16384 ≙ 15000 rpm
bRfg0	BOOL	Ramp down ramp function generator to "0" (quick stop function) • This input can, for instance, be connected to the status signal "quick stop active". TRUE Ramp down the ramp function generator to "0" • The drive is brought to a standstill with the deceleration time set in C01076/2 .
bRfgStop	BOOL	Stop ramp function generator TRUE Stop ramp function generator • The last status is output to <i>nOut_v</i> . • The speed/angle setpoint <i>nIn_v</i> is saved. • After <i>bStop</i> is reset to FALSE, the setpoint angle is approached via the ramp function generator.
bReset	BOOL	Reset added angle setpoint TRUE The internally added angle setpoint is reset and the ramp function generator is activated. If the status signal <i>bFail</i> is set, it will also be reset. TRUE → FALSE Detect speed/angle setpoint.

Outputs

Identifier	Data type	Value/meaning
bSync	BOOL	Status signal "Drive is running synchronously"
		TRUE The drive is running synchronously, the speed input id directly applied to the speed output.
nOut_v	INT	Speed/angle setpoint • Scaling: 16384 \equiv 15000 rpm
bFail	BOOL	Status signal "Angular difference exceeded"
		TRUE The angular difference set in C01078/1 has been exceeded.

Parameter

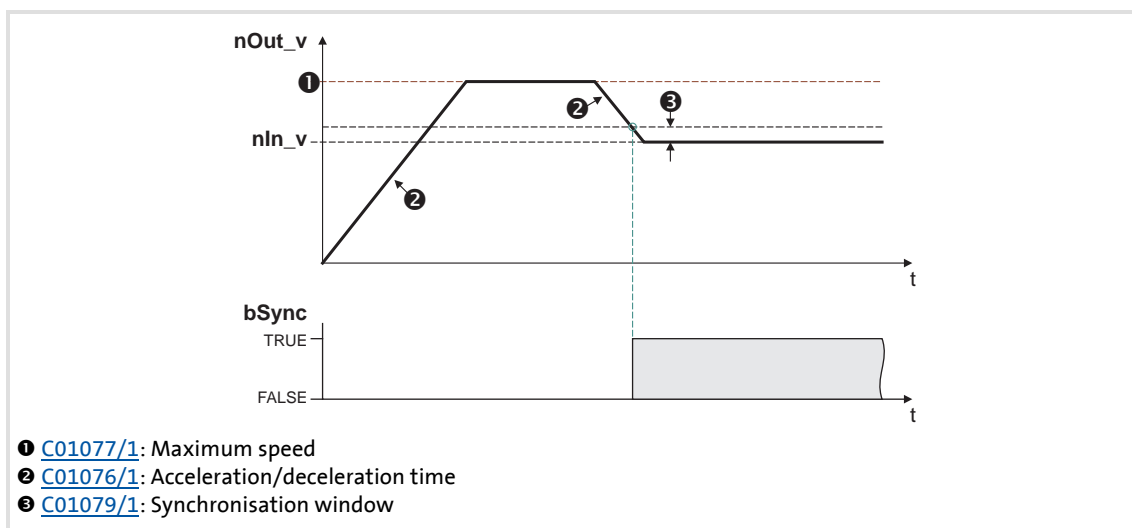
Parameter	Possible settings			Info
C01076/1	0.000	s	999.900	Acceleration and deceleration time • Relating to the reference speed (constant acceleration and deceleration) set in C00011 . • It is a maximum value which limits the acceleration of the ramp function generator. • Lenze setting: 1.000 s
C01076/2	0.000	s	999.900	Deceleration time for quick stop of the slave drive • Relating to the reference speed (constant acceleration and deceleration) set in C00011 . • It is a maximum value which limits the deceleration of the ramp function generator. • Lenze setting: 0.000 s
C01077/1	1	rpm	15000	Max. speed-up • Lenze setting: 3000 rpm
C01078/1	10	Incr.	2000000000	Following error limit • Scaling: a revolution is displayed with 65536 increments or steps. • Lenze setting: 2000000000 incr.
C01079/1	0	Incr.	65535	Synchronisation window (position) • If the difference between the master and the slave is lower than the synchronisation window, the <i>bSync</i> status signal is set to TRUE. • Lenze setting: 100 incr.
C01080/1	-2147483647	Incr.	2147483647	Offset • Angular offset for the internal actual position of the FB • Scaling: a revolution is displayed with 65536 increments or steps. • Lenze setting: 0 incr.

Parameter	Possible settings	Info
C01081/1		Sync. direction/TP function
	1 cw/ccw - without TP (Lenze setting)	• Selection of the direction of rotation for synchronising
	2 cw - without TP	• With high offset values and low input speed, the drive may change its direction of rotation. In order to prevent this, a direction of rotation can be permanently defined via this parameter.
	3 ccw - without TP	
	4 cw/ccw - with TP	
	5 cw - with TP	
	6 ccw - with TP	

18.1.72.1 Ramp function generator (profile generator)

The ramp function generator accelerates the slave drive to the input master speed.

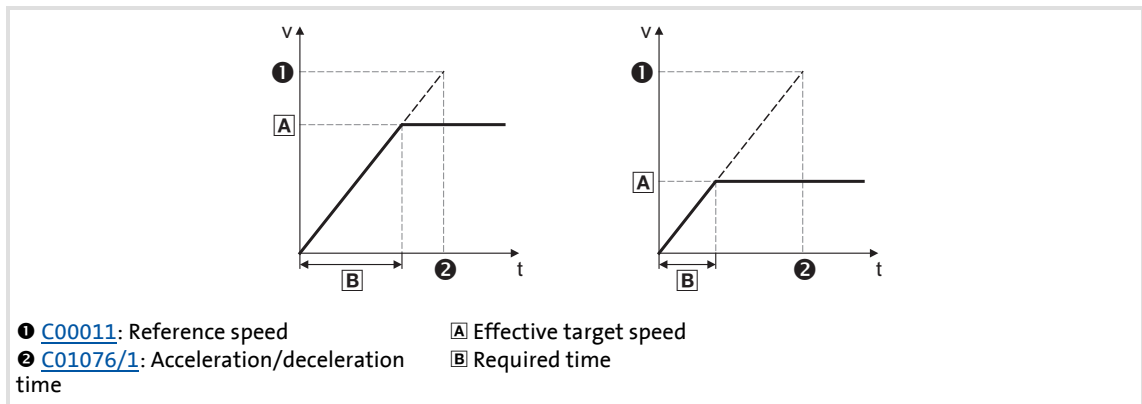
- ▶ Synchronising starts when the FB receives a touch probe edge from the master axis (e.g. a conveying belt) at the *bSetTPReceived* input.
- ▶ When the slave reaches the setpoint speed of the master and the made up path difference is lower than the synchronisation window set in [C01079/1](#), the *bSync* output is set to TRUE. At the same time, the FB switches the profile generator to inactive and outputs the *nIn_v* input speed to *nOut_v*.



[18-25] Example: Synchronisation

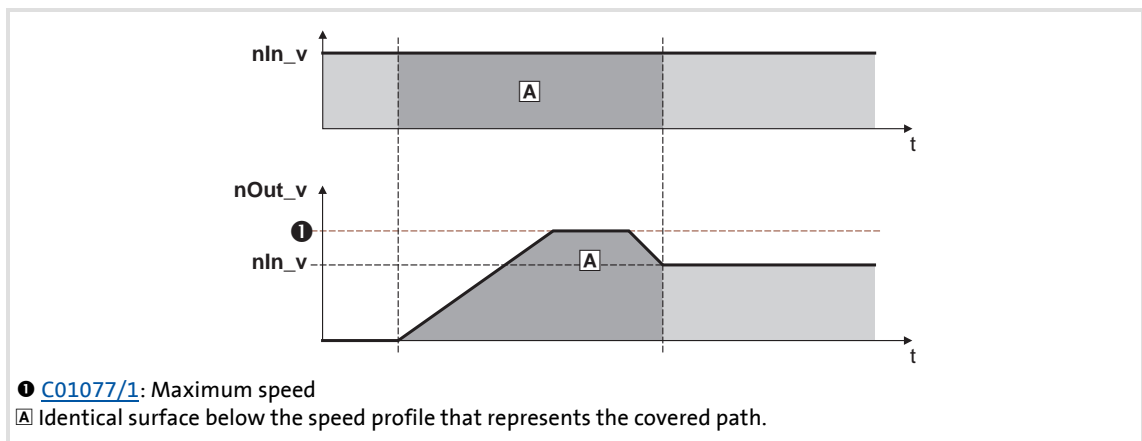
- ▶ [C01077/1](#) serves to set a maximum speed which limits the speed of the slave.

- ▶ The acceleration or deceleration in the synchronous point results from the acceleration/deceleration time set in [C01076/1](#).
 - Reference for the acceleration/deceleration time is the reference speed ([C00011](#)):



[18-26] Connection between acceleration time and acceleration

- ▶ Based on the input speed of the master axis, a setpoint angle is calculated from the starting time onwards which leads the actual angle of the slave.
- ▶ Dependent on the master speed and the settings for acceleration and offset, the FB may travel oversynchronously for reducing the angular difference, i.e. $nOut_v$ is higher than nIn_v :



[18-27] Speed/time diagram

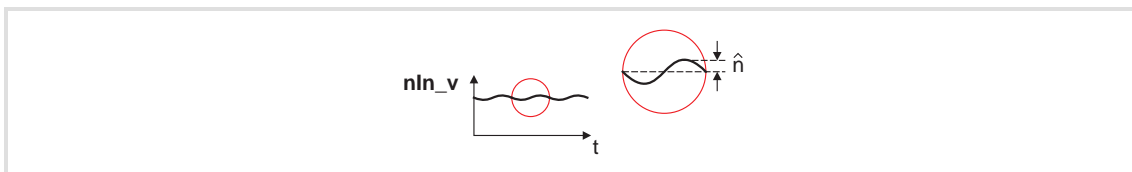


Note!

- Set the maximum speed in [C01077/1](#) higher than the master speed to be expected. The speed is selected on the motor side and is independent of the reference speed ([C00011](#)). The higher the difference between maximum speed and master speed, the less time to the synchronous time is required.
- In case of a heavily oscillating input speed it may occur that directly after setting the *bSync* status signal to TRUE the FB still executes slight angle corrections.
- Generally avoid acceleration or deceleration processes of the master axis while the slave axes are synchronising.

**Tip!**

Set the synchronisation window in [C01079/1](#) higher than the amplitude of beat available on the input signal:

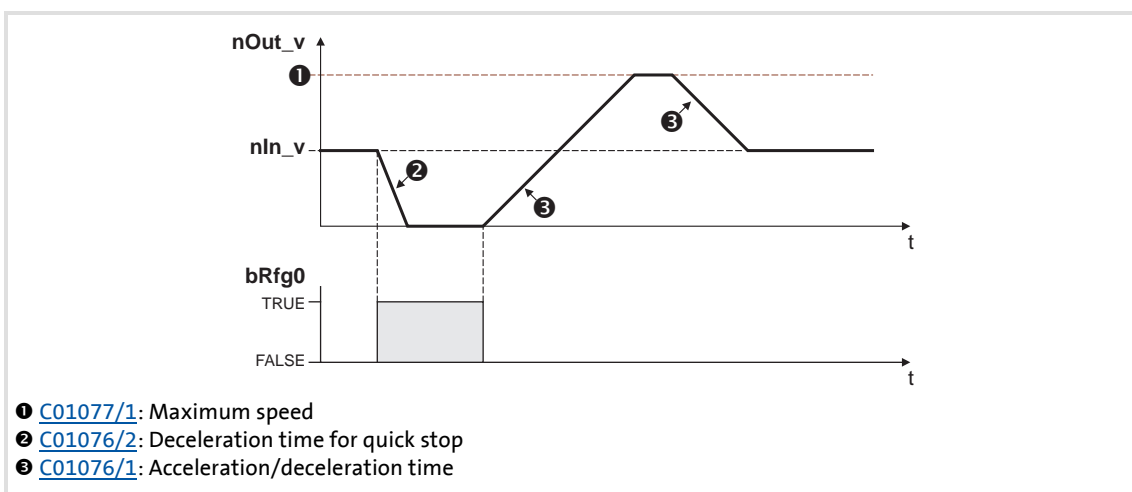


[18-28] Example: Beat on the input signal

18.1.72.2 Quick stop

The quick stop function removes the drive from the interconnection and leads it to standstill.

- ▶ Quick stop is activated by setting *bRfg0* to TRUE.
- ▶ [C01076/2](#) is used to set the delay time in [s] which refers as the acceleration/deceleration time to the reference speed ([C00011](#)).
- ▶ The angle setpoint created internally on the basis of the input signal *nIn_v* is saved.
- ▶ After *bRfg0* is reset to FALSE, the angle setpoint is approached via the ramp function generator again.

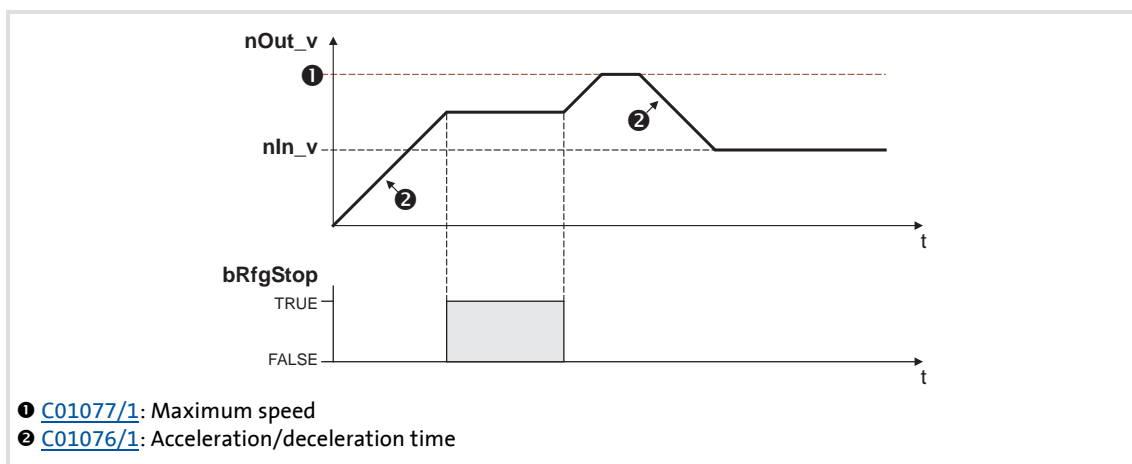


[18-29] Example: Quick stop function (QSP)

18.1.72.3 Ramp function generator stop

The stop function holds the status of the ramp function generator during operation.

- ▶ The stop function is activated by setting *bRfgStop* to TRUE.
- ▶ The last status is output to *nOut_v* (16384 \equiv 15000 rpm).
- ▶ The angle setpoint created internally on the basis of the input signal *nIn_v* is saved, thus the monitoring function of the angular difference between the created setpoint angle and actual angle cannot be activated.
- ▶ After *bRfgStop* is reset to FALSE, the angle setpoint is approached via the ramp function generator again.



[18-30] Example: Stop function

18.1.72.4 Reset angle setpoint

By setting *bReset* to TRUE, the internally created angle setpoint is set to "0" and the ramp function generator is activated.

18.1.72.5 Detecting the angular difference

In [C01078/1](#), a limit value for monitoring the angular difference between the created setpoint and actual angles can be set.

- ▶ Scaling: a revolution is displayed with 65536 increments or steps.
- ▶ The ramp function generator can accept a angular difference of up to ± 2140000000 increments (≈ 32000 revolutions).
- ▶ If monitoring responds, the status signal *bFail* is set to TRUE.
- ▶ If the internally added angle setpoint is reset by setting *bReset* to TRUE, the *bFail* status signal is reset to FALSE.

18.1.72.6 Offset setting

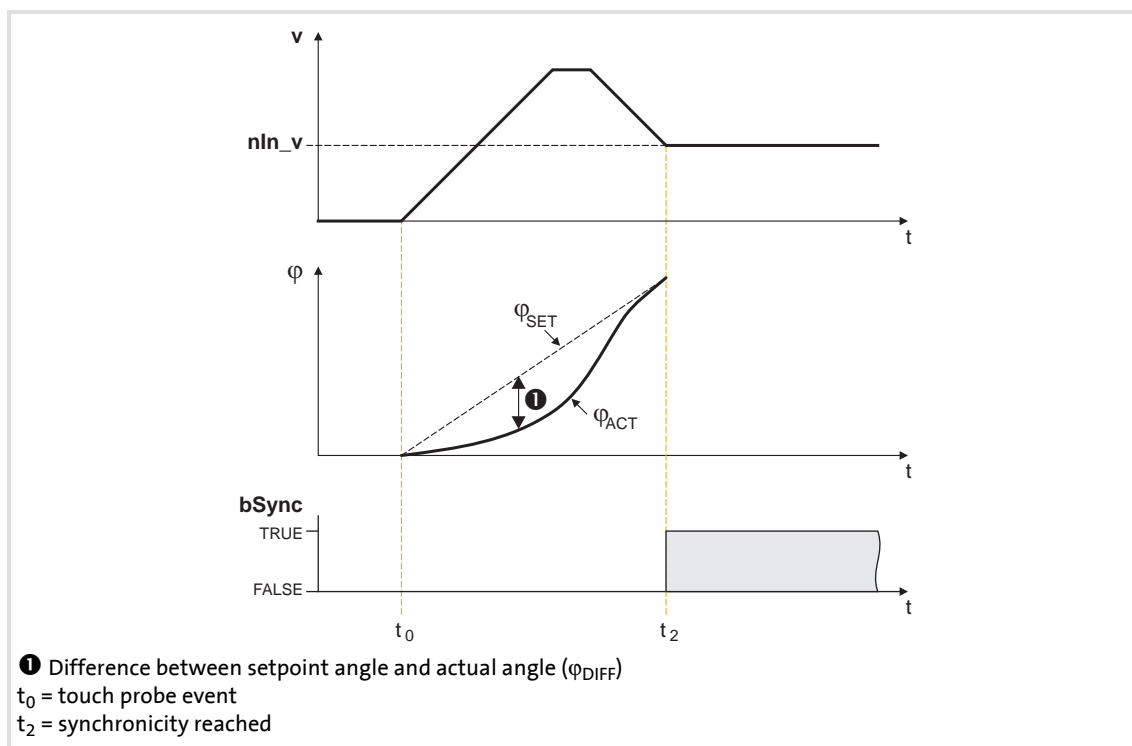
If the time to synchronicity is too long or the slave drive must not be operated oversynchronously, either the acceleration can be adapted or the touch probe initiator can be shifted. Since this is only possible to a limited extent due to construction conditions, in this case the better solution is selecting a virtual angular offset.

- In order to reach angle synchronicity, the difference between created setpoint and actual angle must be zero:

$$\varphi_{\text{DIFF}} = \varphi_{\text{SET}} - \varphi_{\text{ACT}} = 0$$

Behaviour without offset

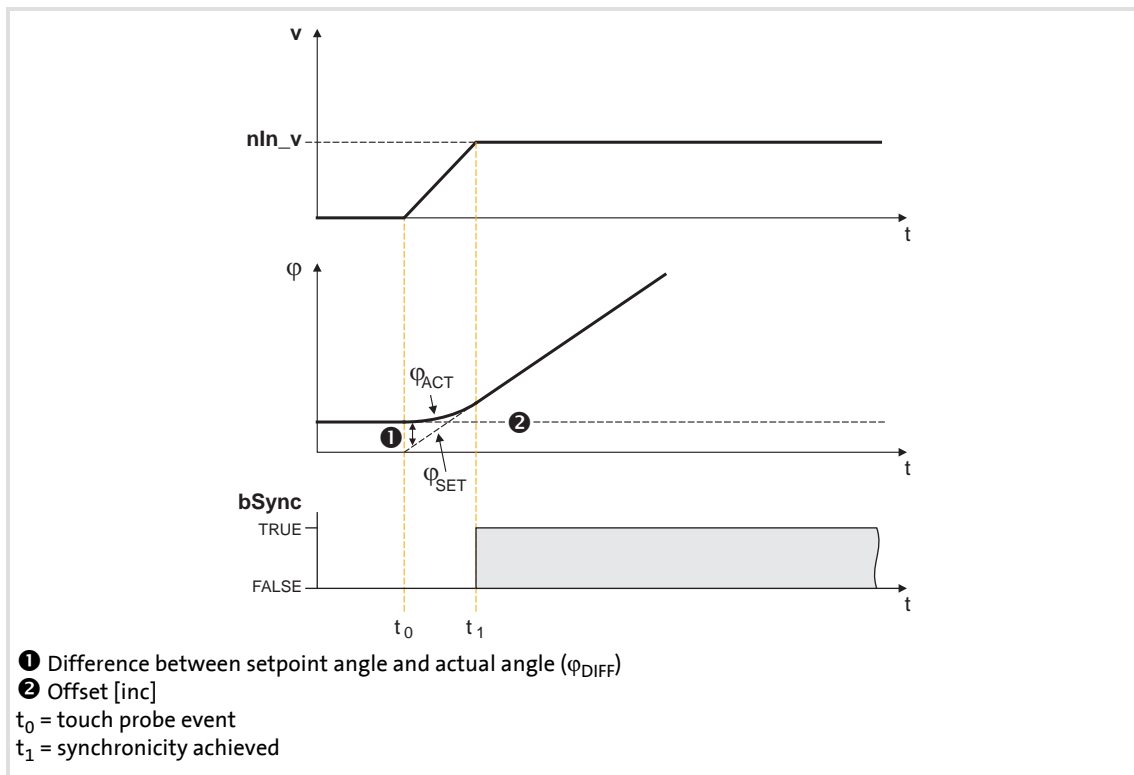
If the actual angle starts with an offset = 0, a higher difference between setpoint angle and actual angle develops:



[18-31] Example: Without offset selection (offset = 0)

Behaviour with offset

By selecting an offset, the actual position is preloaded with a non-zero value. This reduces the distance and the time to synchronicity.



[18-32] Example 1: With offset selection

- ▶ When a positive offset is selected, the sign of the distance between setpoint and actual value changes. This distance is reduced due to the acceleration of the slave from the input of the touch probe pulse. Thus, the time to synchronicity is shorter.
- ▶ The offset refers to the master value selection and is scaled with an encoder revolution ($\cong 65536$ increments).
- ▶ The offset can be determined empirically, but it is sensible to calculate the required acceleration distance and select this value as offset:

$$\phi_{ACC} = \frac{1}{2} \cdot \frac{(v_{SET})^2}{C00011 [rpm]} \cdot C01076/1 [ms] \cdot \frac{16384 [incr./ms]}{15000 [rpm]}$$

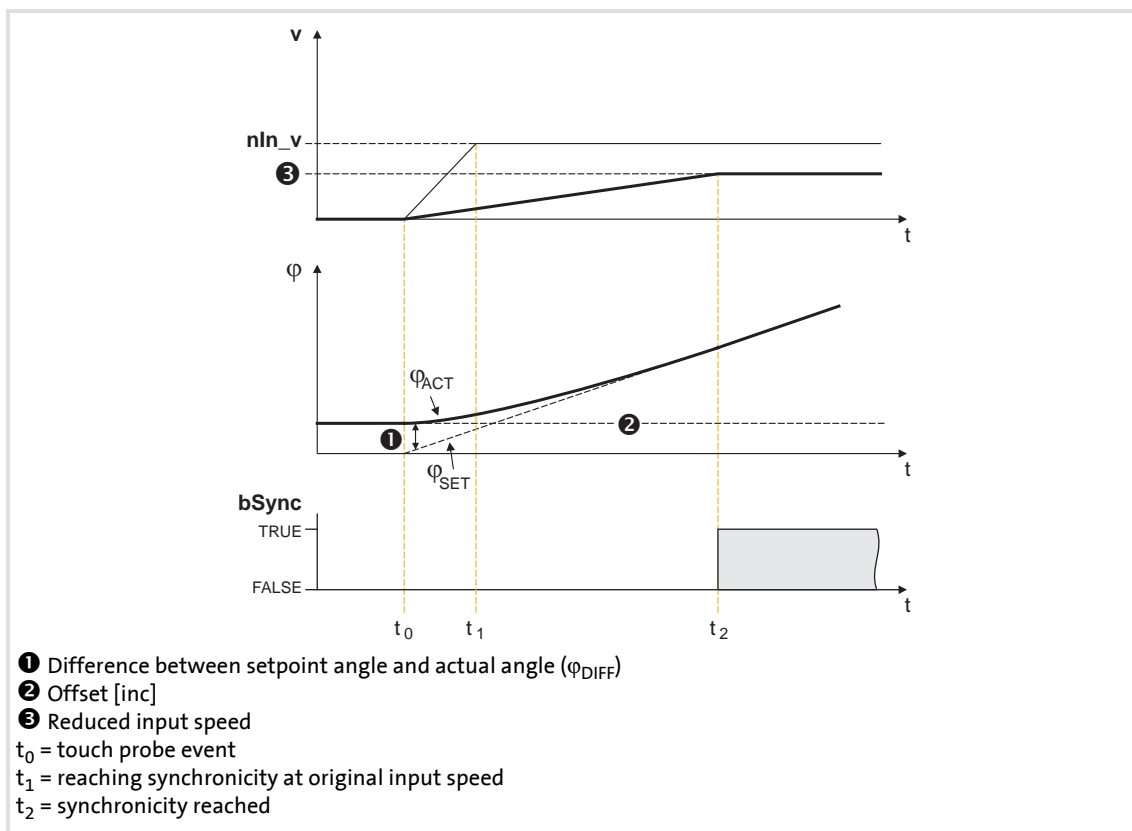
ϕ_{ACC} = acceleration distance in [increments]

v_{SET} = setpoint speed in [rpm]

[C00011](#) = reference speed of the motor in [rpm]

[C01076/1](#) = acceleration/deceleration time of the ramp generator in [ms]

The acceleration calculated from the acceleration/deceleration time ([C01076/1](#)) is a maximum acceleration that will not be reached if the input speed is reduced and the FB has to reach its target with a too high offset.



[18-33] Example 2: With offset selection and reduced input speed



Note!

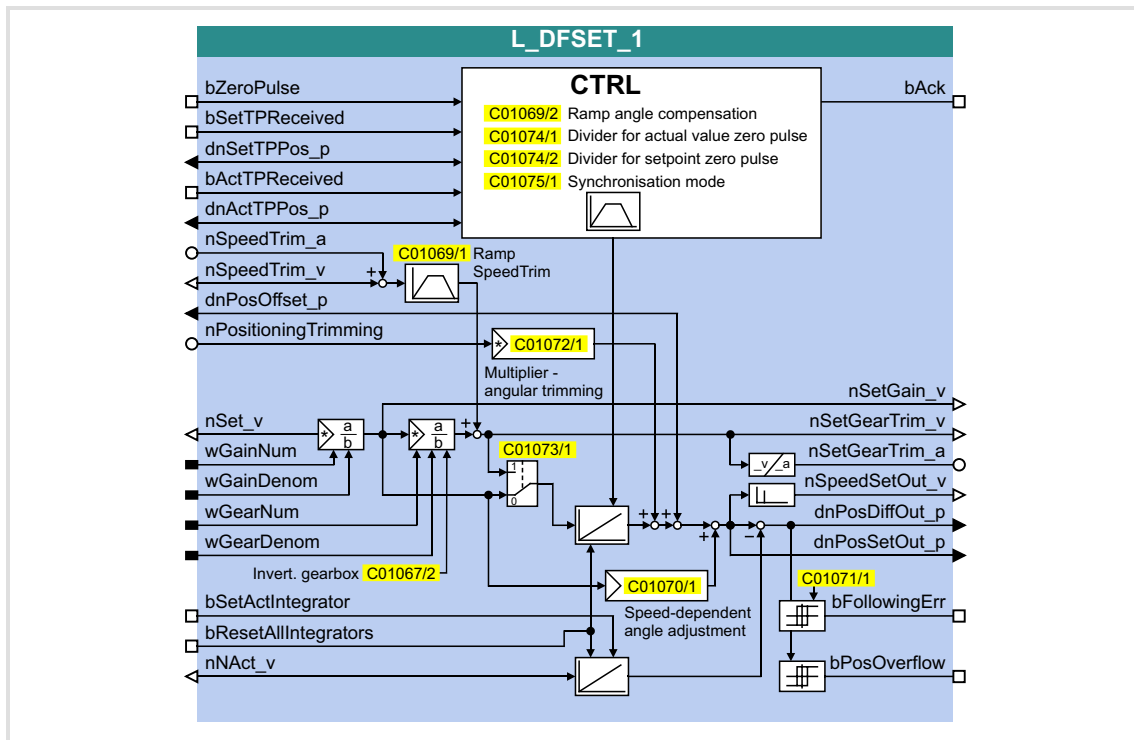
With a very low input speed, the acceleration can also get negative which causes the slave drive to change its direction of rotation.

In order to prevent a change of the direction of rotation, [C01069/1](#) serves to select a permanent direction of rotation.

18.1.73 L_DFSET_1

This FB prepares the master value for a slave drive. This FB enables the controller to follow the master drive true to speed and angle.

- ▶ You can select values for the stretch factor and gearbox factor of the slave.
- ▶ A speed trimming or angular trimming is possible.



Inputs

Identifier	Data type	Information/possible settings
bZeroPulse	BOOL	Enable of the zero pulse-/touch probe synchronisation for the modes 2, 10 ... 13 <ul style="list-style-type: none"> • The mode is selected in C01075/1. <p style="text-align: center;">TRUE Synchronisation enabled.</p>
bSetTPReceived	BOOL	Input for status signal "Touch probe detected" <p style="text-align: center;">FALSE↗TRUE Touch probe or zero pulse received.</p>
dnSetTPPos_p	DINT	Input for accepting the position measured via touch probe
bActTPReceived	BOOL	Input for detecting an actual value touch probe or zero pulse <p style="text-align: center;">FALSE↗TRUE Actual value touch probe or zero pulse received.</p>
dnActTPPos_p	DINT	Difference in [increments] between the occurrence of the actual value touch probe and the start of the task
nSpeedTrim_a	INT	Speed trimming in [%] <ul style="list-style-type: none"> • Scaling: 16384 ≙ 100 %
nSpeedTrim_v	INT	Speed trimming in [increments/ms] <ul style="list-style-type: none"> • Scaling: 16384 ≙ 15000 rpm • Speed trimming via this input is more precise.
dnPosOffset_p	DINT	Angular offset in [increments] <ul style="list-style-type: none"> • Scaling: a revolution is displayed with 65536 increments or steps.

Identifier	Data type	Information/possible settings				
nPositionTrimming	INT	Angular trimming in [increments] <ul style="list-style-type: none"> Scaling: a revolution is displayed with 65536 increments or steps. When analog values are selected: 100 % \equiv 1/4 revolution \equiv 16384 increments The setting range can be extended via C01072/1. 				
nSet_v	INT	Speed setpoint <ul style="list-style-type: none"> Scaling: 16384 \equiv 15000 rpm 				
wGainNum	WORD	Stretch factor (numerator)				
wGainDenom	WORD	Stretch factor (denominator)				
wGearNum	WORD	Gearbox factor (numerator)				
wGearDenom	WORD	Gearbox factor (denominator)				
bSetActIntegrator	BOOL	Equalise angle integrators (current position = set position) <ul style="list-style-type: none"> This input has a higher priority than the <i>bResetAllIntegrators</i> input. <table border="1"> <tr> <td>FALSE \rightarrow TRUE</td> <td><i>dnPosDiffOut_p</i> = 0</td> </tr> <tr> <td>TRUE</td> <td>Equalise angle integrators.</td> </tr> </table>	FALSE \rightarrow TRUE	<i>dnPosDiffOut_p</i> = 0	TRUE	Equalise angle integrators.
FALSE \rightarrow TRUE	<i>dnPosDiffOut_p</i> = 0					
TRUE	Equalise angle integrators.					
bResetAllIntegrators	BOOL	Reset angle integrators <ul style="list-style-type: none"> This input has a higher priority than the <i>bResetAllIntegrators</i> input. <table border="1"> <tr> <td>TRUE</td> <td>Positional deviation, <i>dnPosSetOut_p</i> and <i>dnPosDiffOut_p</i> are set to "0".</td> </tr> </table>	TRUE	Positional deviation, <i>dnPosSetOut_p</i> and <i>dnPosDiffOut_p</i> are set to "0".		
TRUE	Positional deviation, <i>dnPosSetOut_p</i> and <i>dnPosDiffOut_p</i> are set to "0".					
nNAct_v	INT	Actual value in [increments/ms] for calculating the actual position <ul style="list-style-type: none"> Scaling: 16384 \equiv 15000 rpm 				

Outputs

Identifier	Data type	Value/meaning		
bAck	BOOL	Status signal "Synchronising is executed" <table border="1"> <tr> <td>TRUE</td> <td>Synchronising is executed.</td> </tr> </table>	TRUE	Synchronising is executed.
TRUE	Synchronising is executed.			
nSetGain_v	INT	Speed setpoint in [increments/ms] evaluated with stretch factor <ul style="list-style-type: none"> Scaling: 16384 \equiv 15000 rpm 		
nSetGearTrim_v	INT	Speed setpoint in [increments/ms] evaluated with stretch factor and gearbox factor <ul style="list-style-type: none"> Scaling: 16384 \equiv 15000 rpm 		
nSetGearTrim_a	INT	Speed setpoint in [%] evaluated with stretch factor and gearbox factor <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % reference speed (C00011) 		
nSpeedSetOut_v	INT	Speed setpoint <ul style="list-style-type: none"> Derived from angle setpoint <i>dnPosSetOut_p</i>. Can change abruptly if e.g. the angular offset changes abruptly. 		
dnPosDiffOut_p	DINT	Following error between set position and actual position <ul style="list-style-type: none"> This output can be used for display purposes. 		
dnPosSetOut_p	DINT	Angle setpoint <ul style="list-style-type: none"> Scaling: a revolution is displayed with 65536 increments or steps. 		
bFollowingErr	BOOL	Status signal "Following error" <table border="1"> <tr> <td>TRUE</td> <td>Following error occurred. <ul style="list-style-type: none"> The limit value set in C01071/1 has been exceeded. </td> </tr> </table>	TRUE	Following error occurred. <ul style="list-style-type: none"> The limit value set in C01071/1 has been exceeded.
TRUE	Following error occurred. <ul style="list-style-type: none"> The limit value set in C01071/1 has been exceeded. 			
bPosOverflow	BOOL	Status signal "angle controller overflow" <table border="1"> <tr> <td>TRUE</td> <td>Angle controller overflow occurred.</td> </tr> </table>	TRUE	Angle controller overflow occurred.
TRUE	Angle controller overflow occurred.			

Parameter

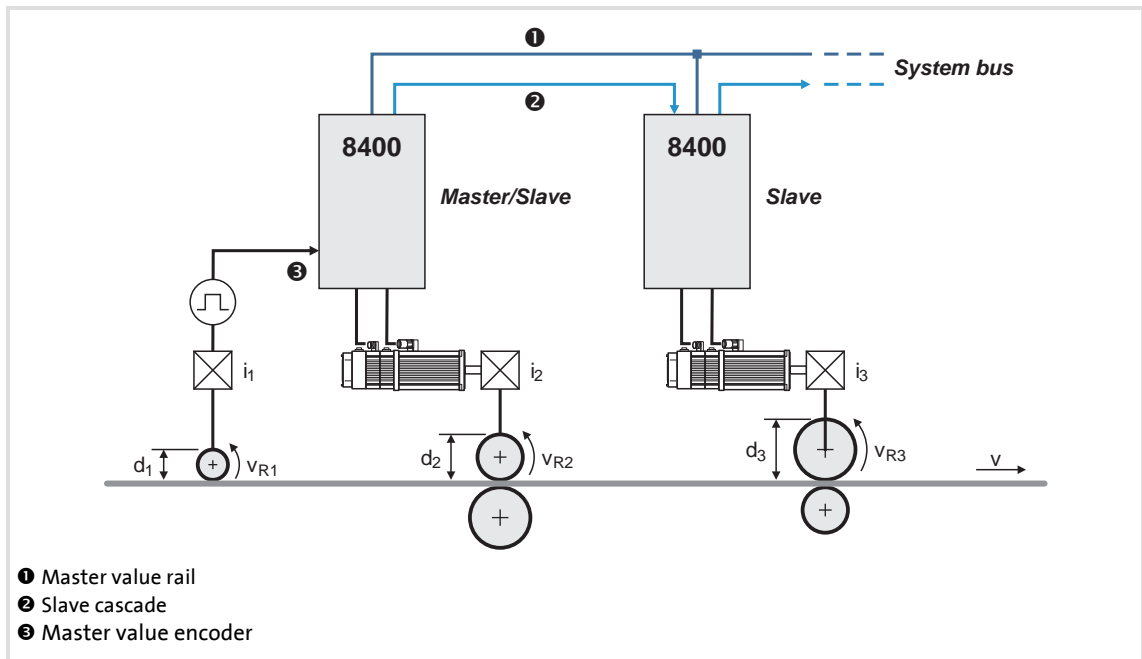
Parameter	Possible settings			Info
C01067/2				Invert. gearbox nSet_v
	0	not inverted		
	1	inverted		
	2	Automatically from MCK		
C01069/1	1	Incr./ms	32767	Ramp SpeedTrim • Lenze setting: 10 incr./ms
C01069/2	1	Incr./ms	32767	Ramp angle compensation • Lenze setting: 100 incr./ms
C01070/1	-134217728	Incr.	134217728	Speed-dependent angle adjustment • Scaling: a revolution is displayed with 65536 increments or steps. • Lenze setting: 0 incr.
C01071/1	10	Incr.	2147483647	Following error limit • Scaling: a revolution is displayed with 65536 increments or steps. • Lenze setting: 32768 incr.
C01072/1	-20000		20000	Multiplier - angular trimming • Lenze setting: 1
C01073/1				Evaluation - setpoint integrator
	0	Evaluation with gearbox factor		Lenze setting
	1	Evaluation without gearbox factor		
C01074/1	0		16384	Divisor for actual value zero pulse • Number of signals to be received at least until synchronisation gets active. • Initialisation: 0
C01074/2	0		16384	Divisor for setpoint zero pulse • Number of signals to be received at least until synchronisation gets active. • Initialisation: 0

Parameter	Possible settings	Info
C01075/1		Synchronisation mode
	0 Synchronisation inactive	Lenze setting
	1 Permanent synchronisation without enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> Correction is executed over the shortest possible path. 	Synchronisation is only executed after 2 zero pulses have been received.
	2 Permanent synchronisation only with enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> Correction is executed over the shortest possible path. 	When <i>bZeroPulse</i> is set to TRUE, a permanent zero pulse/touch probe synchronisation is executed. Synchronisation is only executed after 2 setpoint signals have been received.
	10 One-time synchronisation <ul style="list-style-type: none"> An angular difference is compensated over the shortest possible path. 	Synchronisation is only executed after 2 setpoint signals have been received.
	11 One-time synchronisation <ul style="list-style-type: none"> An angle difference is compensated in CW direction. 	Synchronisation is only executed after 2 setpoint signals have been received.
	12 One-time synchronisation <ul style="list-style-type: none"> An angular difference is compensated in CCW direction. 	Synchronisation is only executed after 2 setpoint signals have been received.
	13 One-time synchronisation <ul style="list-style-type: none"> An angular difference is compensated over the shortest possible path. 	Synchronisation is only executed after the 1. actual value signal has been received

18.1.73.1 Master value rail/slave cascade

If there is only one master speed that is transmitted to all slave drives involved, e.g. via system bus (CAN), it is called master value rail.

If a slave drive takes over the master value generation for the following slave, it is called slave cascade.



[18-34] Example: Master value rail/slave cascade

18.1.73.2 Setpoint conditioning with stretch factor and gearbox factor

Stretch factor

The stretch factor is required for the "speed synchronism via master value cascade" mode. It defines the ratio the slave drive is to be running with regard to its master value.

- ▶ The stretch factor evaluates the setpoint at the $nSet_v$ input.
- ▶ The stretch factor must be selected via the $wGainNum$ and $wGainDenom$ inputs in the form of numerators and denominators.
- ▶ The result is provided at the $nSetGain_v$ output.
 - Scaling: $16384 \equiv 15000 \text{ rpm}$

$$nSetGain_v = nSet_v \cdot \frac{wGainNum}{wGainDenom}$$

- ▶ If the stretch factor is 1 and the gearbox factors are selected correctly, the circumferential speeds of the rolls for master and slave 1 are identical in the example shown in the illustration [\[18-34\]](#).

Gearbox factor

The gearbox factor defines the gearbox ratio of the drive. Enter the ratio of the drive.

- ▶ The gearbox factor evaluates the setpoint at the $nSet_v$ input multiplied by the stretch factor.
- ▶ The gearbox factor has to be selected via the inputs $wGearNum$ and $wGearDenom$ in the form of numerators and denominators.

- ▶ [C01073/1](#) serves to simply deactivate the evaluation with the gearbox factor (does not apply to the speed outputs $nSetGain_v$, $nSetGearTrim_v$ and $nSetGearTrim_a$).
- ▶ The result is provided at the outputs $nSetGearTrim_v$ and $nSetGearTrim_a$.
 - Scaling $nSetGearTrim_v$: 16384 \equiv 15000 rpm
 - Scaling $nSetGearTrim_a$: 16384 \equiv 100 % reference speed ([C00011](#))

$$nSetGearTrim_v = \text{Stretch factor} \cdot \frac{wGearNum}{wGearDenom}$$

$$nSetGearTrim_v = nSet_v \cdot \frac{wGainNum}{wGainDenom} \cdot \frac{wGearNum}{wGearDenom}$$

$$nSetGearTrim_a = nSet_v \cdot \frac{C00011}{15000} \cdot \frac{wGainNum}{wGainDenom} \cdot \frac{wGearNum}{wGearDenom}$$



Note!

The intermediate results and the result of the evaluation are limited to ± 32767 increments (16 bits).

If a limitation is active, increments and thus the real drive position will get lost!

When stretch factors are higher than "1", check if the FB gets in the limitation of calculation at maximum speed. If so, assign the required numerator and denominator values to the stretch and gearbox factors so that neither a limitation takes place in the end result nor in the intermediate result.

18.1.73.3 Processing correction values

Speed trimming

Speed trimming enables the connection of correction values, e.g. from a higher-level control loop. This permits an acceleration or deceleration of the drive.

The correction value can either be transmitted as an analog value via the $nSpeedTrim_a$ input or for exact speed trimming as a speed value via the $nSpeedTrim_v$ input.

- ▶ Scaling $nSpeedTrim_a$: 16384 \equiv 100 % reference speed ([C00011](#))
- ▶ Scaling $nSpeedTrim_v$: 16384 \equiv 15000 rpm



Stop!

Change the speed trimming only step by step as the FB does not contain a ram generator for preventing torque impulses.

Angular trimming

Angular trimming enables the rotor position to be put forward or back with regard to the setpoint (the drive is leading or lagging).

The correction value must have to be defined in [increments] via the $nPositionTrimming$ input. It is internally added to the angle setpoint.

- ▶ Scaling: a revolution is displayed with 65536 increments or steps.
- ▶ The maximum angular trimming amounts to $\pm\frac{1}{2}$ motor revolution (± 32767 increments).
- ▶ When analog values are selected: 100 % \equiv $\frac{1}{4}$ motor revolution \equiv 16384 increments.
- ▶ The setting range can be extended with the multiplier to be set in [C00072/1](#).

Angular offset

The *dnPosOffset_p* input serves to define a permanent angular offset for the setpoint of the drive.

- ▶ The maximum angular offset amounts to ± 3750 motor revolutions.
- ▶ The adjustment is exclusively made via the following error (output *dnPosDiffOut_p*).
- ▶ Example: A angular offset of 90° is to be set on the load side with a gearbox ratio of 3.8147:

$$\text{dnPosOffset}_p = \frac{90^\circ}{360^\circ} \cdot 65535 \text{ [increments]} \cdot 3.8147 = 62500 \text{ [increments]}$$



Stop!

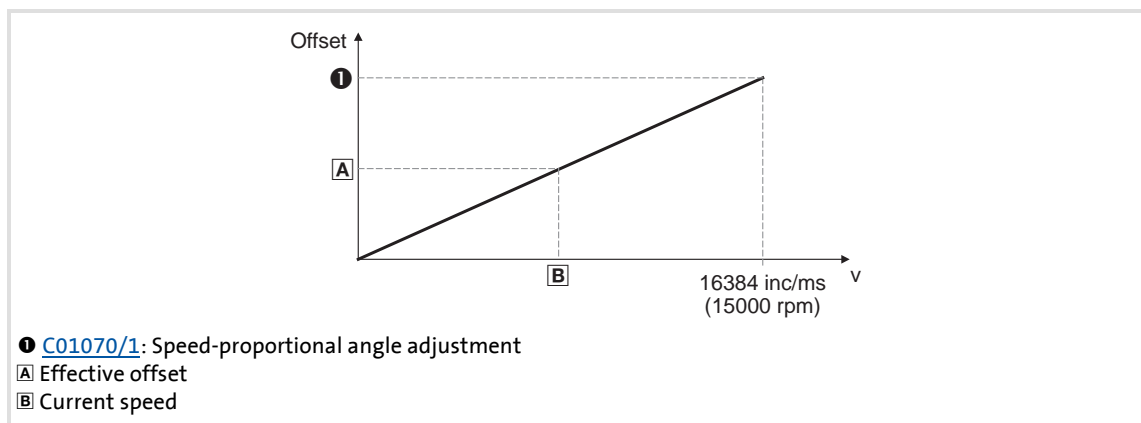
Change the angular offset only step by step as the FB does not contain a ram generator for preventing torque impulses.

Otherwise limit the jump by limiting the position controller output: Enter a maximum compensating speed in [%] at the *nPosCtrlOutLimit_a* input of the SB [LS MotorInterface](#) with regard to the reference speed ([C00011](#)).

Speed-proportional angle adjustment

The speed-proportional angle adjustment enables a leading or lagging of the angle with increasing speed and serves to compensate dead times and transmission times.

The correction value selected in [C01070/1](#), in [increments] refers to a speed of 15000 rpm (linear relationship):



[18-35] Connection between offset/speed

18.1.73.4 Synchronising slave drive to master drive

If an angular synchronism of the drives is required (e.g. in printing units), the slave drives must be synchronised to the master position since the FB L_DFSET as a master value can only receive and process on relative signal.

The FB L_DFSET receives the master value either via a real-time capable MotionBus as e.g. system bus (CAN) or via the master frequency channel that requires an additional module.



Tip!

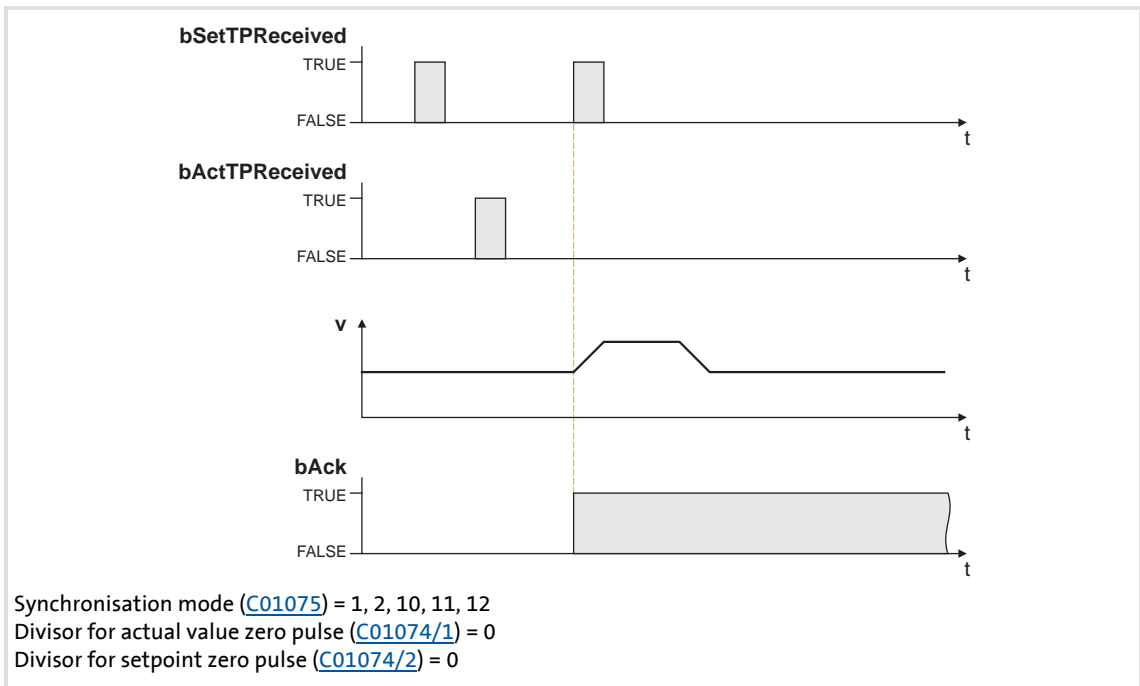
A master value cascade can be realised very easily via a master frequency connection of the drives.

For synchronisation purposes, the slave drive is informed cyclically or once about its drive position by a pulse generated by the master drive. This pulse is either the zero pulse of the master feedback or the edge of a touch probe sensor. Moreover, a pulse must be generated by the slave drive. Only if the FB L_DFSET receives both signals, it can execute a synchronisation.

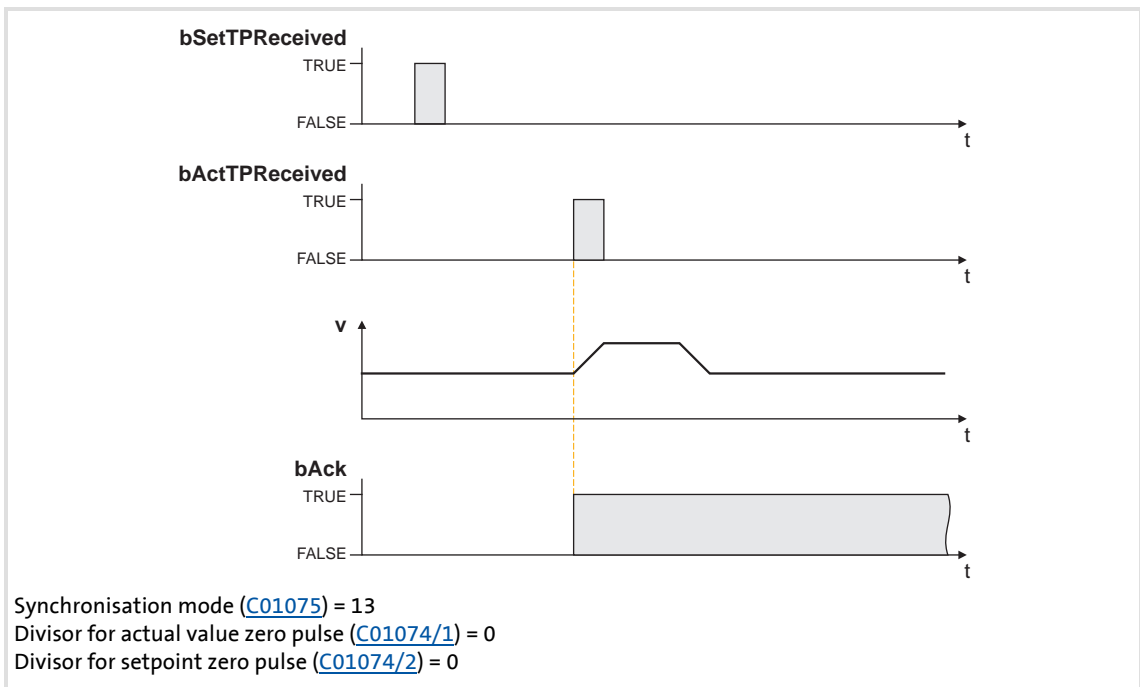
Synchronisation mode

For synchronisation, the following modes are available in [C01075](#):

Mode	Info
0	Synchronisation inactive
1	Permanent synchronisation without enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> Correction is executed over the shortest possible path.
2	Permanent synchronisation only with enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> Correction is executed over the shortest possible path.
10	One-time synchronisation only with enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> An angular difference is compensated over the shortest possible path.
11	One-time synchronisation only with enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> An angle difference is compensated in CW direction.
12	One-time synchronisation only with enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> An angular difference is compensated in CCW direction.
13	One-time synchronisation only with enable via the <i>bZeroPulse</i> input <ul style="list-style-type: none"> An angular difference is compensated over the shortest possible path.



[18-36] Synchronisation process in the modes 1, 2, 10, 11, 12



[18-37] Synchronisation process in mode 13

Compensating movement

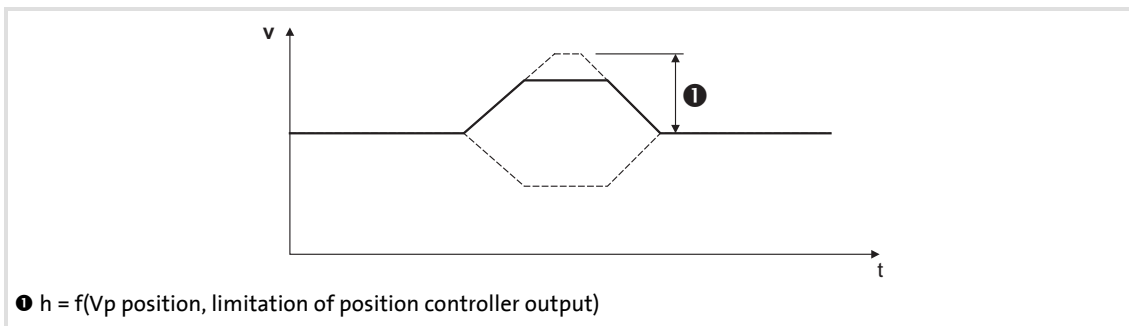
When the second set or act touch probe pulse is received, the difference between master and slave position is detected which is then communicated via the following error output to the motor control and then compensated via the position controller.



Stop!

The compensating movement is executed abruptly (with jerk) as the FB has no ramp generator for preventing torque pulses!

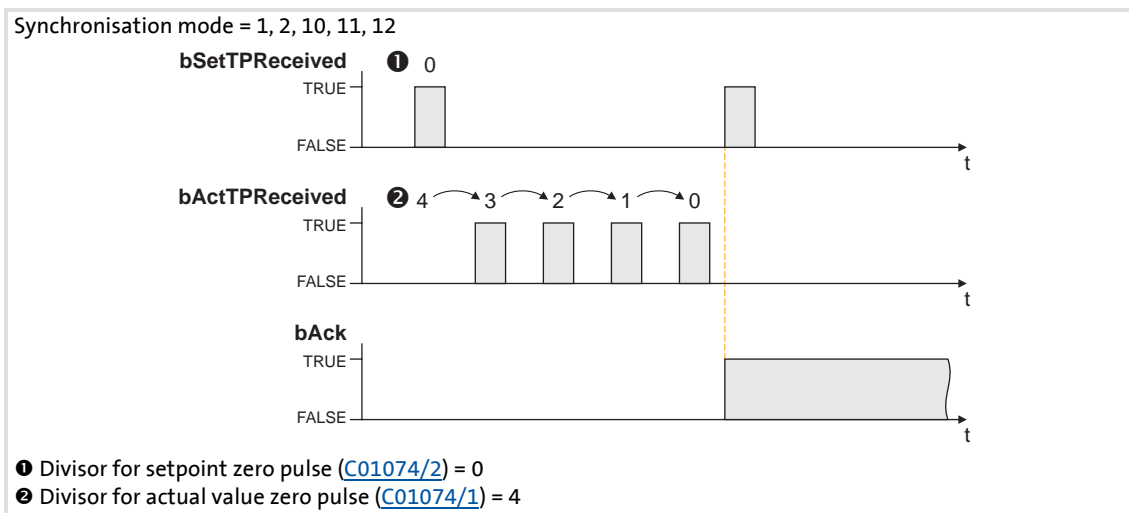
Limit the jump by limiting the position controller output: Enter a maximum compensating speed in [%] at the *nPosCtrlOutLimit_a* input of the SB [LS_MotorInterface](#) with regard to the reference speed ([C00011](#)).



[18-38] Compensating movement

18.1.73.5 Masking out touch probe signals

When passing-through material is used, e.g. printed foil, touch probe initiators may respond several times per cycle. For suppressing such "interference pulses", count values can be selected in [C01074/1](#) and [C01074/2](#) that are decremented when the touch probe pulse has been received. Only when the counter content is "0", the synchronisation will be enabled.



[18-39] Synchronisation process in the modes 1, 2, 10, 11, 12 with a masking out of the touch probe pulses

18.1.73.6 Process monitoring functions

Following error

The *bFollowingErr* status output is set to TRUE if the drive cannot follow its setpoint angle.

► Possible causes:

- The centrifugal mass is too high for the set acceleration or deceleration time.
- The torque limit has been reached (load torque > drive torque).

► Remedy: Unload drive or increase torque limit at the servo controller (if the power limits of the controller have not yet been reached).

The following error is derived from the angular difference of the setpoint angle integrator minus the actual angle integrator. The comparison value (following error limit) can be set in [C01071/1](#).

Angle controller overflow (*bPosOverflow* = TRUE)

The *bPosOverflow* status output is set to TRUE if the angular difference that can be displayed device-internally has been exceeded. Home positions get lost here.



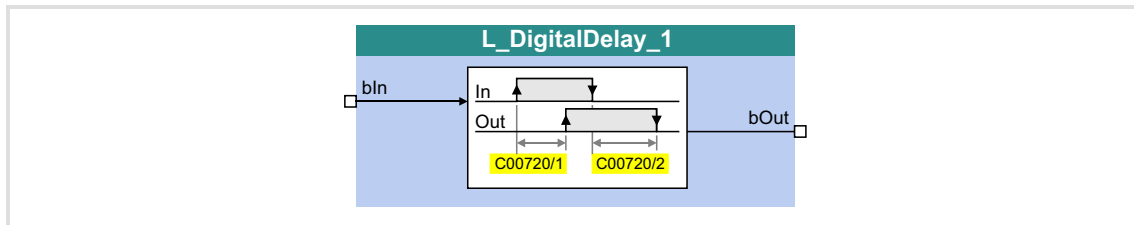
Tip!

If an error response is to be triggered in case of a following error and/or angle controller overflow, connect the corresponding status output with a free *bSetError* input of the SB [LS_SetError_2](#) and parameterise the requested error response for this input in [C00581](#).

18.1.74 L_DigitalDelay_1

This FB delays binary signals.

- The ON and OFF delays can be parameterised independently of one another.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input signal

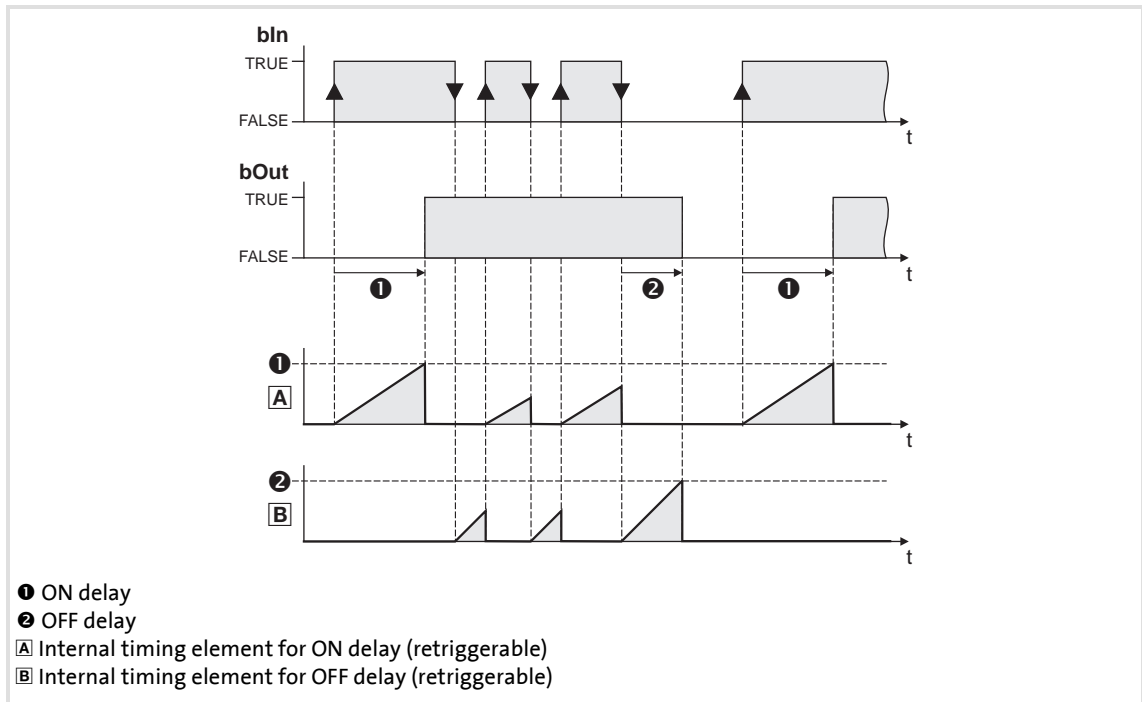
Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal (time-delayed input signal)

Parameter

Parameter	Possible settings			Info
C00720/1	0.000	s	3600.000	ON delay • Lenze setting: 0.000 s
C00720/2	0.000	s	3600.000	OFF delay • Lenze setting: 0.000 s

Function

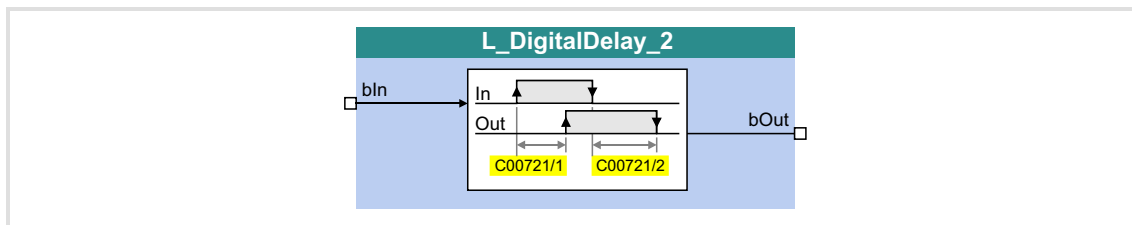


1. A FALSE-TRUE edge at *bIn* starts the internal timing element for the ON delay.
2. After the defined ON delay, the input signal *bIn* is output at *bOut*.
3. A TRUE-FALSE edge at *bIn* starts the internal timing element for the OFF delay.
4. After the defined OFF delay, the input signal *bIn* is output at *bOut*.

18.1.75 L_DigitalDelay_2

This FB delays binary signals.

- The ON and OFF delays can be parameterised independently of one another.



Inputs


Identifier	Data type	Information/possible settings
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal (time-delayed input signal)

Parameter

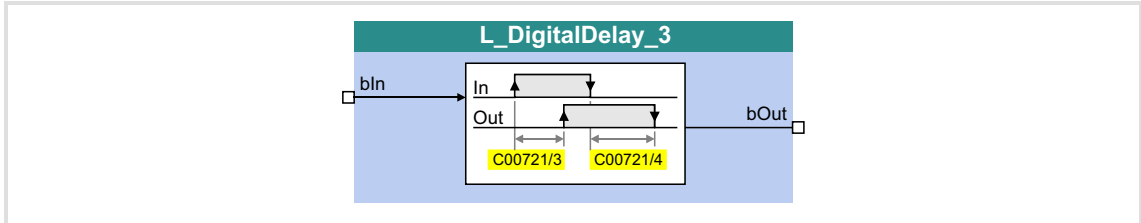
Parameter	Possible settings			Info
C00721/1	0.000	s	3600.000	ON delay • Lenze setting: 0.000 s
C00721/2	0.000	s	3600.000	OFF delay • Lenze setting: 0.000 s

 For a detailed functional description see [L_DigitalDelay_1](#).

18.1.76 L_DigitalDelay_3

This FB delays binary signals.

- The ON and OFF delays can be parameterised independently of one another.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal (time-delayed input signal)

Parameter

Parameter	Possible settings			Info
C00721/3	0.000	s	3600.000	ON delay • Lenze setting: 0.000 s
C00721/4	0.000	s	3600.000	OFF delay • Lenze setting: 0.000 s

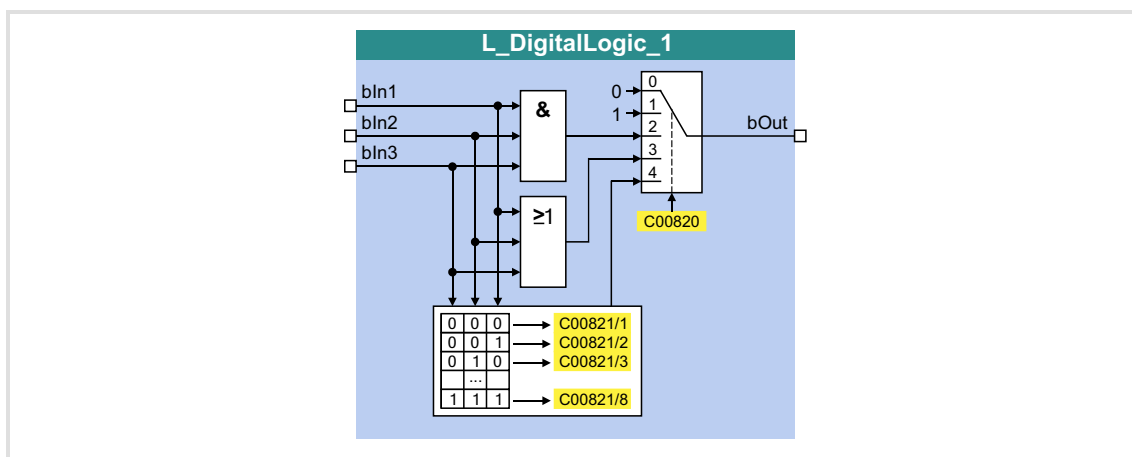


For a detailed functional description see [L_DigitalDelay_1](#).

18.1.77 L_DigitalLogic_1

This FB provides a binary output signal created by a logic operation of the input signals. Optionally, one of the constant binary values independent from the input signals can be output.

- ▶ Output of a constant binary value
- ▶ Logical ANDing of the inputs
- ▶ Logical ORing of the inputs
- ▶ Output depending on the combination of the input signals



Inputs

Identifier	Data type	Information/possible settings
bIn1	BOOL	Input signal 1
bIn2	BOOL	Input signal 2
bIn3	BOOL	Input signal 3

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

Parameter

Parameter	Possible settings	Info
C00820		Function selection
	0 "0"	Constant value "FALSE"
	1 "1"	Constant value "TRUE"
	2 $bOut = bIn1 \wedge bIn2 \wedge bIn3$	AND operation
	3 $bOut = bIn1 \vee bIn2 \vee bIn3$	OR operation
	4 $bOut = f(\text{truth table})$	The output value depends on the parameterised truth table
C00821	see truth table	Truth table Each of the 8 possible input combinations can be assigned to the output value FALSE or TRUE.

Truth table for C00820 = 4

bIn3	bIn2	bIn1	Output signal bOut
FALSE	FALSE	FALSE	C00821/1 (FALSE or TRUE)
FALSE	FALSE	TRUE	C00821/2 (FALSE or TRUE)
FALSE	TRUE	FALSE	C00821/3 (FALSE or TRUE)
FALSE	TRUE	TRUE	C00821/4 (FALSE or TRUE)
TRUE	FALSE	FALSE	C00821/5 (FALSE or TRUE)
TRUE	FALSE	TRUE	C00821/6 (FALSE or TRUE)
TRUE	TRUE	FALSE	C00821/7 (FALSE or TRUE)
TRUE	TRUE	TRUE	C00821/8 (FALSE or TRUE)

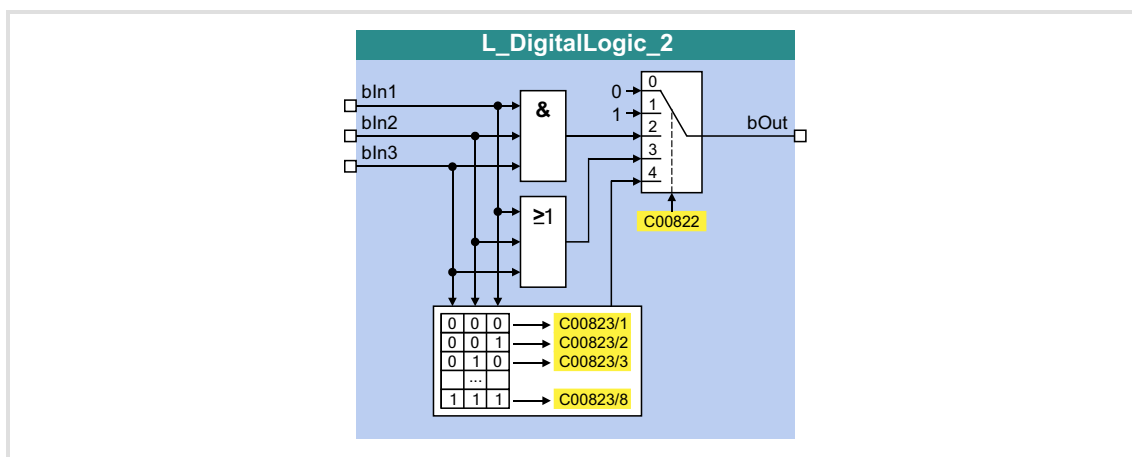
Example: If in case of the signal combination $bIn1 = \text{FALSE}$, $bIn2 = \text{FALSE}$ and $bIn3 = \text{TRUE}$, the output signal $bOut$ is to be = TRUE, [C00821/5](#) must be set to "TRUE":

bIn3	bIn2	bIn1	Output signal bOut
TRUE	FALSE	FALSE	C00821/5 (TRUE)

18.1.78 L_DigitalLogic_2

This FB provides a binary output signal created by a logic operation of the input signals. Optionally, one of the constant binary values independent from the input signals can be output.

- ▶ Output of a constant binary value
- ▶ Logical ANDing of the inputs
- ▶ Logical ORing of the inputs
- ▶ Output depending on the combination of the input signals



Inputs

Identifier	Data type	Information/possible settings
bIn1	BOOL	Input signal 1
bIn2	BOOL	Input signal 2
bIn3	BOOL	Input signal 3

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

Parameter

Parameter	Possible settings	Info
C00822		Function selection
	0 "0"	Constant value "FALSE"
	1 "1"	Constant value "TRUE"
	2 $bOut = bIn1 \wedge bIn2 \wedge bIn3$	AND operation
	3 $bOut = bIn1 \vee bIn2 \vee bIn3$	OR operation
	4 $bOut = f(\text{truth table})$	The output value depends on the parameterised truth table
C00823	see truth table	Truth table Each of the 8 possible input combinations can be assigned to the output value FALSE or TRUE.

Truth table for C00822 = 4

bIn3	bIn2	bIn1	Output signal bOut
FALSE	FALSE	FALSE	C00823/1 (FALSE or TRUE)
FALSE	FALSE	TRUE	C00823/2 (FALSE or TRUE)
FALSE	TRUE	FALSE	C00823/3 (FALSE or TRUE)
FALSE	TRUE	TRUE	C00823/4 (FALSE or TRUE)
TRUE	FALSE	FALSE	C00823/5 (FALSE or TRUE)
TRUE	FALSE	TRUE	C00823/6 (FALSE or TRUE)
TRUE	TRUE	FALSE	C00823/7 (FALSE or TRUE)
TRUE	TRUE	TRUE	C00823/8 (FALSE or TRUE)

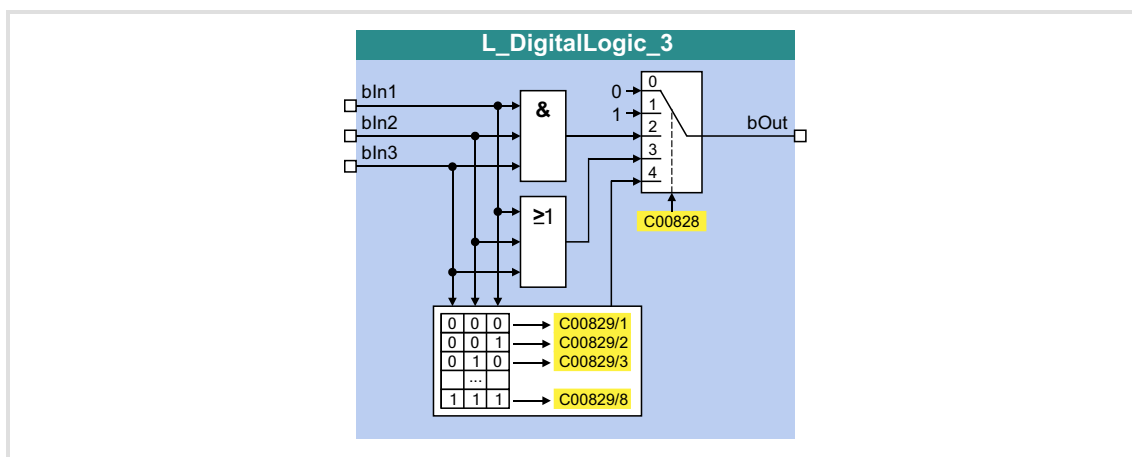
Example: If in case of the signal combination $bIn1 = \text{FALSE}$, $bIn2 = \text{FALSE}$ and $bIn3 = \text{TRUE}$, the output signal $bOut$ is to be = TRUE, [C00823/5](#) must be set to "TRUE":

bIn3	bIn2	bIn1	Output signal bOut
TRUE	FALSE	FALSE	C00823/5 (TRUE)

18.1.79 L_DigitalLogic_3

This FB provides a binary output signal created by a logic operation of the input signals. Optionally, one of the constant binary values independent from the input signals can be output.

- ▶ Output of a constant binary value
- ▶ Logical ANDing of the inputs
- ▶ Logical ORing of the inputs
- ▶ Output depending on the combination of the input signals



Inputs

Identifier	Data type	Information/possible settings
bIn1	BOOL	Input signal 1
bIn2	BOOL	Input signal 2
bIn3	BOOL	Input signal 3

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

Parameter

Parameter	Possible settings	Info
C00828		Function selection
	0 "0"	Constant value "FALSE"
	1 "1"	Constant value "TRUE"
	2 $bOut = bIn1 \wedge bIn2 \wedge bIn3$	AND operation
	3 $bOut = bIn1 \vee bIn2 \vee bIn3$	OR operation
	4 $bOut = f(\text{truth table})$	The output value depends on the parameterised truth table
C00829	see truth table	Truth table Each of the 8 possible input combinations can be assigned to the output value FALSE or TRUE.

Truth table for C00822 = 4

bIn3	bIn2	bIn1	Output signal bOut
FALSE	FALSE	FALSE	C00829/1 (FALSE or TRUE)
FALSE	FALSE	TRUE	C00829/2 (FALSE or TRUE)
FALSE	TRUE	FALSE	C00829/3 (FALSE or TRUE)
FALSE	TRUE	TRUE	C00829/4 (FALSE or TRUE)
TRUE	FALSE	FALSE	C00829/5 (FALSE or TRUE)
TRUE	FALSE	TRUE	C00829/6 (FALSE or TRUE)
TRUE	TRUE	FALSE	C00829/7 (FALSE or TRUE)
TRUE	TRUE	TRUE	C00829/8 (FALSE or TRUE)

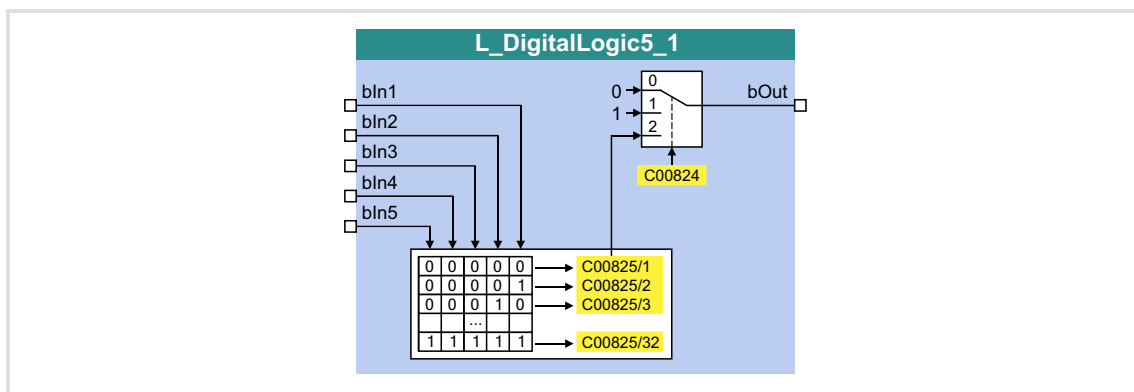
Example: If in case of the signal combination $bIn1 = \text{FALSE}$, $bIn2 = \text{FALSE}$ and $bIn3 = \text{TRUE}$, the output signal $bOut$ is to be = TRUE, [C00829/5](#) must be set to "TRUE":

bIn3	bIn2	bIn1	Output signal bOut
TRUE	FALSE	FALSE	C00829/5 (TRUE)

18.1.80 L_DigitalLogic5_1

This FB provides a binary output signal created by a logic operation of the input signals. Optionally, one of the constant binary values independent from the input signals can be output.

- ▶ Output of a constant binary value
- ▶ Output depending on the combination of the input signals



Inputs

Identifier	Data type	Information/possible settings
bIn1	BOOL	Input signal 1 ... 5
...		
bIn5		

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

Parameter

Parameter	Possible settings	Info
C00824	0 "0"	Function selection Constant value "FALSE"
	1 "1"	Constant value "TRUE"
	2 bOut = f (truth table)	The output value depends on the parameterised truth table
C00825	see truth table	Truth table Each of the 32 possible input combinations can be assigned to the output value FALSE or TRUE.

Truth table for C00824 = 4

bIn5	bIn4	bIn3	bIn2	bIn1	Output signal bOut
FALSE	FALSE	FALSE	FALSE	FALSE	C00825/1 (FALSE or TRUE)
FALSE	FALSE	FALSE	FALSE	TRUE	C00825/2 (FALSE or TRUE)
FALSE	FALSE	FALSE	TRUE	FALSE	C00825/3 (FALSE or TRUE)
...					C00825/... (FALSE or TRUE)
TRUE	TRUE	TRUE	FALSE	TRUE	C00825/30 (FALSE or TRUE)
TRUE	TRUE	TRUE	TRUE	FALSE	C00825/31 (FALSE or TRUE)
TRUE	TRUE	TRUE	TRUE	TRUE	C00825/32 (FALSE or TRUE)

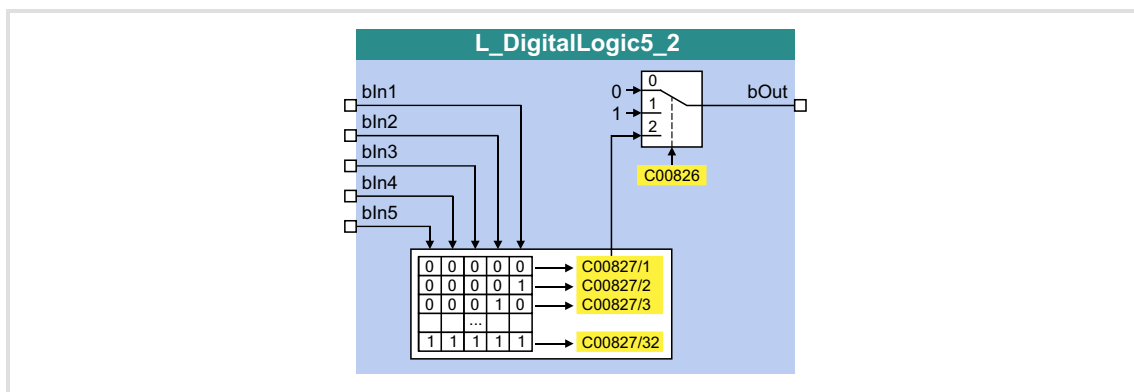
Example: If in case of the signal combination *bIn1* = TRUE, *bIn2* = FALSE, *bIn3* = TRUE, *bIn4* = TRUE and *bIn5* = TRUE, the output signal *bOut* is to be = TRUE, [C00825/30](#) must be set to "TRUE":

bIn5	bIn4	bIn3	bIn2	bIn1	Output signal bOut
TRUE	TRUE	TRUE	FALSE	TRUE	C00825/30 (TRUE)

18.1.81 L_DigitalLogic5_2

This FB provides a binary output signal created by a logic operation of the input signals. Optionally, one of the constant binary values independent from the input signals can be output.

- ▶ Output of a constant binary value
- ▶ Output depending on the combination of the input signals



Inputs

Identifier	Data type	Information/possible settings
bIn1	BOOL	Input signal 1 ... 5
...		
bIn5		

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

Parameter

Parameter	Possible settings	Info
C00826	0 "0"	Function selection Constant value "FALSE"
	1 "1"	Constant value "TRUE"
	2 bOut = f (truth table)	The output value depends on the parameterised truth table
C00827	see truth table	Truth table Each of the 32 possible input combinations can be assigned to the output value FALSE or TRUE.

Truth table for C00826 = 4

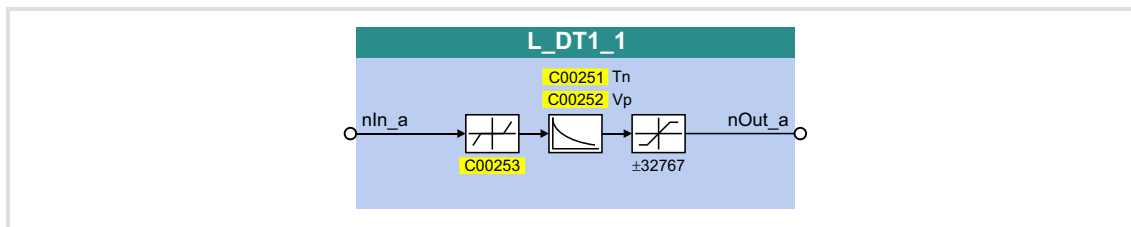
bIn5	bIn4	bIn3	bIn2	bIn1	Output signal bOut
FALSE	FALSE	FALSE	FALSE	FALSE	C00827/1 (FALSE or TRUE)
FALSE	FALSE	FALSE	FALSE	TRUE	C00827/2 (FALSE or TRUE)
FALSE	FALSE	FALSE	TRUE	FALSE	C00827/3 (FALSE or TRUE)
...					C00827/... (FALSE or TRUE)
TRUE	TRUE	TRUE	FALSE	TRUE	C00827/30 (FALSE or TRUE)
TRUE	TRUE	TRUE	TRUE	FALSE	C00827/31 (FALSE or TRUE)
TRUE	TRUE	TRUE	TRUE	TRUE	C00827/32 (FALSE or TRUE)

Example: If in case of the signal combination *bIn1* = TRUE, *bIn2* = FALSE, *bIn3* = TRUE, *bIn4* = TRUE and *bIn5* = TRUE, the output signal *bOut* is to be = TRUE, [C00827/30](#) must be set to "TRUE":

bIn5	bIn4	bIn3	bIn2	bIn1	Output signal bOut
TRUE	TRUE	TRUE	FALSE	TRUE	C00827/30 (TRUE)

18.1.82 L_DT1_1

This FB differentiates signals. The function block can, for instance, be used to apply an acceleration (dv/dt).



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

Outputs

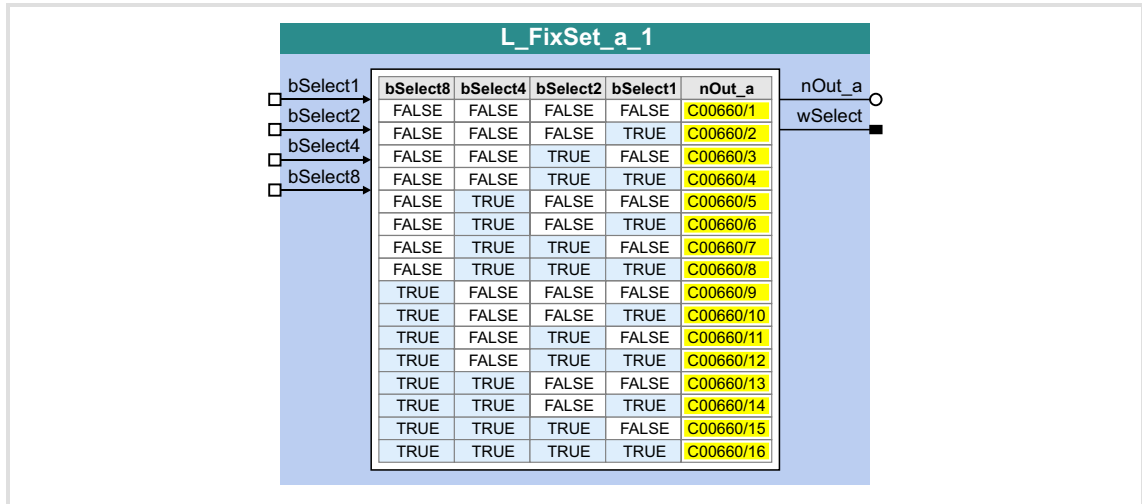
Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

Parameter

Parameter	Possible settings			Info
C00251	10	ms	5000	Time constant Tn • Lenze setting: 1000 ms
C00252	-320.00		320.00	Gain factor Vp • Lenze setting: 1.00
C00253	Note: The most significant bit determines the sign of the value, the remaining bits determine the numerical value.			Selection of sensitivity • Depending on the selection, the number of indicated higher-order bits is evaluated. • Lenze setting: 15 bit
	1	15 bits		Bit 0 ... bit 14 are evaluated
	2	14 bits		Bit 0 ... bit 13 are evaluated
	3	13 bits		Bit 0 ... bit 12 are evaluated
	4	12 bits		Bit 0 ... bit 11 are evaluated
	5	11 bits		Bit 0 ... bit 10 are evaluated
	6	10 bits		Bit 0 ... bit 9 are evaluated
	7	9 bits		Bit 0 ... bit 8 are evaluated

18.1.83 L_FixSet_a_1

This FB outputs one of 16 parameterisable analog signals. Binary coded selection of the "fixed value" to be output via the four selection inputs.



Inputs

Identifier	Data type	Information/possible settings
bSelect1 ... bSelect8	BOOL	Binary coded selection of the fixed value to be output • See truth table displayed in the FB above.

Outputs

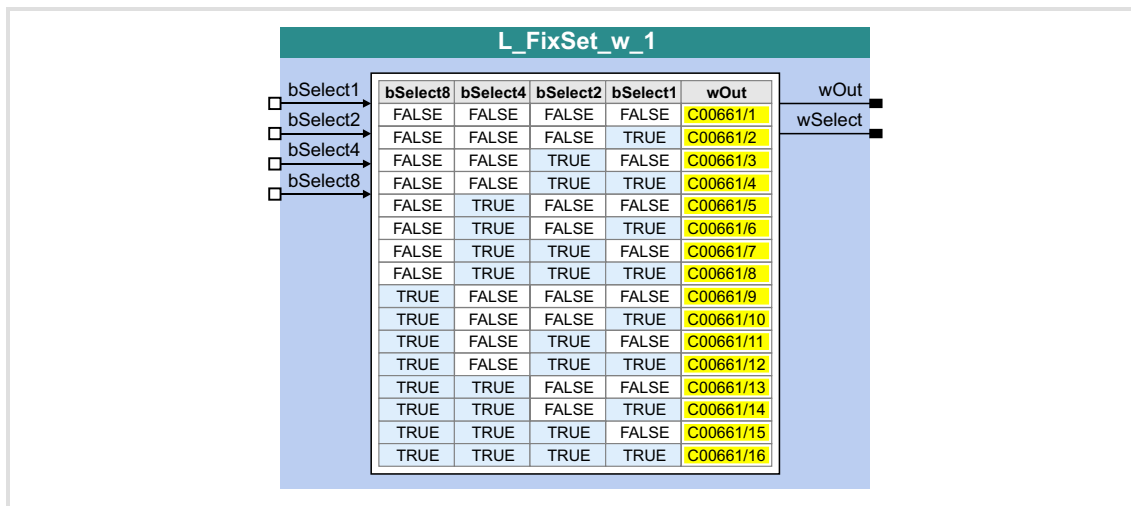
Identifier	Data type	Value/meaning
nOut_a	INT	Output of the selected fixed value
wSelect	WORD	Current selection (0 ... 15)

Parameter

Parameter	Possible settings			Info
C00660/1...16	-199.99	%	199.99	Fixed value 0 ... 15 • Lenze setting: 0.00 %

18.1.84 L_FixSet_w_1

This FB outputs one of 16 parameterisable data words. Binary coded selection of the "fixed value" to be output via the four selection inputs.



Inputs

Identifier	Data type	Information/possible settings
bSelect1 ... bSelect8	BOOL	Binary coded selection of the fixed value to be output <ul style="list-style-type: none"> See truth table displayed in the FB above.

Outputs

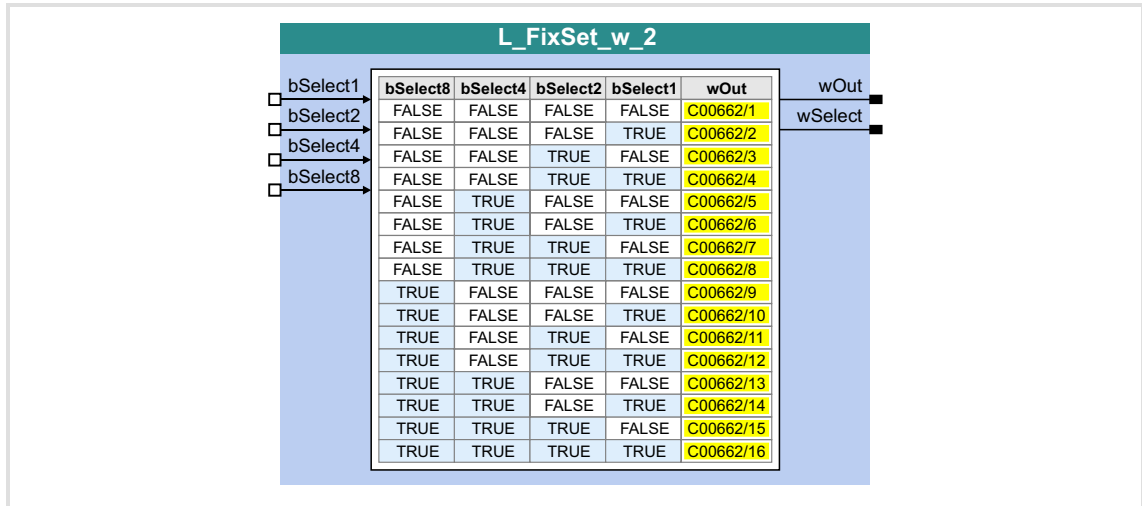
Identifier	Data type	Value/meaning
wOut	WORD	Output of the selected fixed value
wSelect	WORD	Current selection (0 ... 15)

Parameter

Parameter	Possible settings	Info
C00661/1...16	0	65535 Fixed values 0 ... 15 <ul style="list-style-type: none"> Lenze setting: 0

18.1.85 L_FixSet_w_2

This FB outputs one of 16 parameterisable data words. Binary coded selection of the "fixed value" to be output via the four selection inputs.



Inputs

Identifier	Data type	Information/possible settings
bSelect1 ... bSelect8	BOOL	Binary coded selection of the fixed value to be output • See truth table displayed in the FB above.

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output of the selected fixed value
wSelect	WORD	Current selection (0 ... 15)

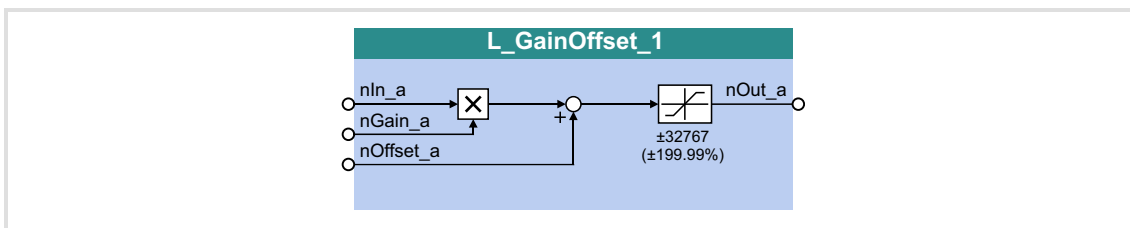
Parameter

Parameter	Possible settings	Info
C00662/1...16	0	65535 Fixed values 0 ... 15 • Lenze setting: 0

18.1.86 L_GainOffset_1

This FB can amplify an analog input signal and then add an offset to it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via FB inputs.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %
nGain_a	INT	Gain factor <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % • 199.99 % \approx 2
nOffset_a	INT	Offset <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199.99\%$

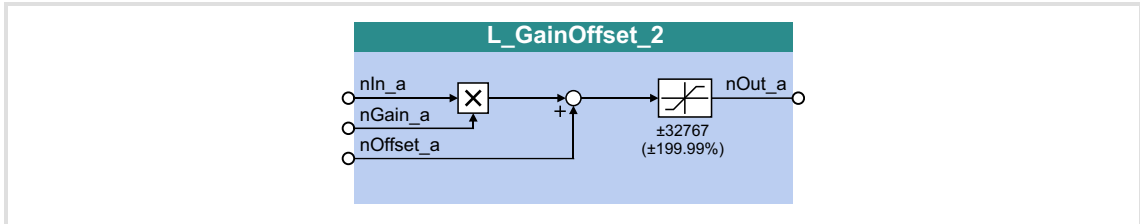
Function

$$nOut_a = (nIn_a \cdot \text{Gain factor}) + \text{Offset}$$

18.1.87 L_GainOffset_2

This FB can amplify an analog input signal and then add an offset to it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via FB inputs.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal • Scaling: 16384 \equiv 100 %
nGain_a	INT	Gain factor • Scaling: 16384 \equiv 100 % • 199.99 % \approx 2
nOffset_a	INT	Offset • Scaling: 16384 \equiv 100 %

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to $\pm 199.99\%$

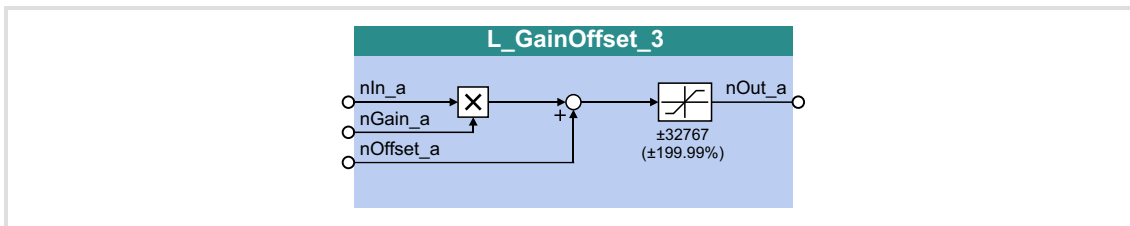
Function

$$nOut_a = (nIn_a \cdot \text{Gain factor}) + \text{Offset}$$

18.1.88 L_GainOffset_3

This FB can amplify an analog input signal and then add an offset to it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via FB inputs.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %
nGain_a	INT	Gain factor <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % • 199.99 % \approx 2
nOffset_a	INT	Offset <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199.99\%$

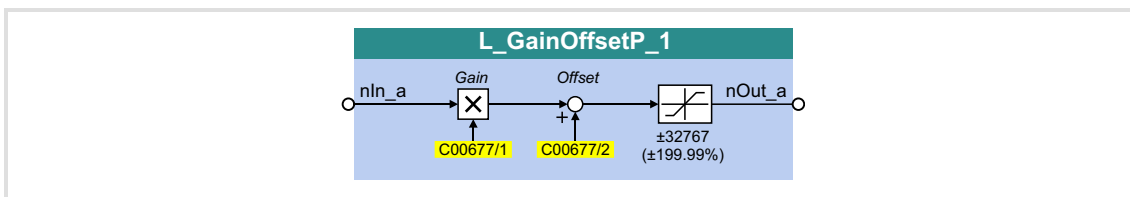
Function

$$nOut_a = (nIn_a \cdot \text{Gain factor}) + \text{Offset}$$

18.1.89 L_GainOffsetP_1

This FB can amplify an analog input signal and then add an offset to it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via parameters.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal • Scaling: 16384 \equiv 100 %

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to $\pm 199.99\%$

Parameter

Parameter	Possible settings			Info
C00677/1	-199.99	%	199.99	Gain factor • Lenze setting: 100.00 % • 199.99 % \approx 2
C00677/2	-199.99	%	199.99	Offset • Lenze setting: 0.00 %

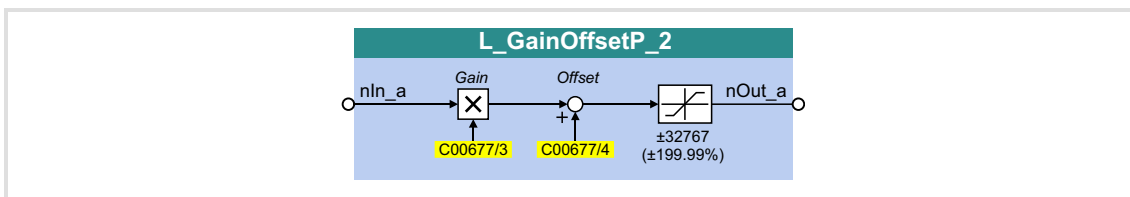
Function

$$nOut_a = (nIn_a \cdot \text{Gain factor}) + \text{Offset}$$

18.1.90 L_GainOffsetP_2

This FB can amplify an analog input signal and then add an offset to it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via parameters.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
<i>nIn_a</i>	INT	Input signal <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %

Outputs

Identifier	Data type	Value/meaning
<i>nOut_a</i>	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199.99\%$

Parameter

Parameter	Possible settings			Info
C00677/3	-199.99	%	199.99	Gain factor <ul style="list-style-type: none"> • Lenze setting: 100.00 % • 199.99 % \approx 2
C00677/4	-199.99	%	199.99	Offset <ul style="list-style-type: none"> • Lenze setting: 0.00 %

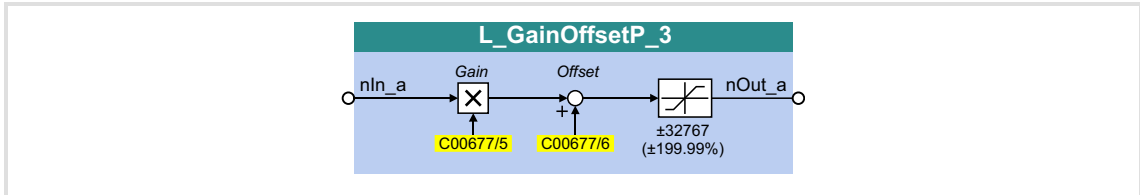
Function

$$nOut_a = (nIn_a \cdot \text{Gain factor}) + \text{Offset}$$

18.1.91 L_GainOffsetP_3

This FB can amplify an analog input signal and then add an offset to it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via parameters.
- ▶ The value provided at the *nOut_a* output is internally limited to ±199.99 %.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal • Scaling: 16384 ≙ 100 %

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to ±199.99 %

Parameter

Parameter	Possible settings			Info
C00677/5	-199.99	%	199.99	Gain factor • Lenze setting: 100.00 % • 199.99 % ≈ 2
C00677/6	-199.99	%	199.99	Offset • Lenze setting: 0.00 %

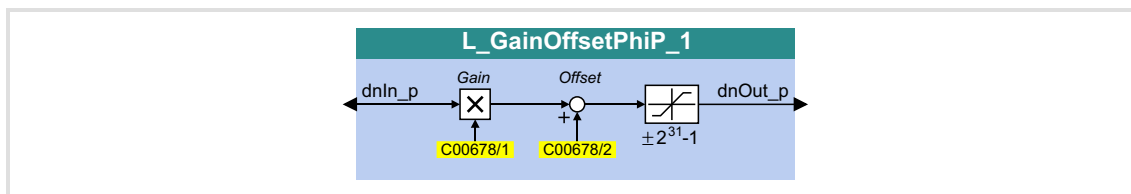
Function

$$nOut_a = (nIn_a \cdot \text{Gain factor}) + \text{Offset}$$

18.1.92 L_GainOffsetPhiP_1

This FB can amplify an angle signal and add an offset to it afterwards.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via parameters.
- ▶ The value provided at the *dnOut_p* output is internally limited to $\pm 2^{31}-1$.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

Parameter

Parameter	Possible settings			Info
C00678/1	-2147483647	Incr.	2147483647	Offset • Lenze setting: 0 incr.
C00678/2	-2147483647		2147483647	Gain factor • Lenze setting: 65536

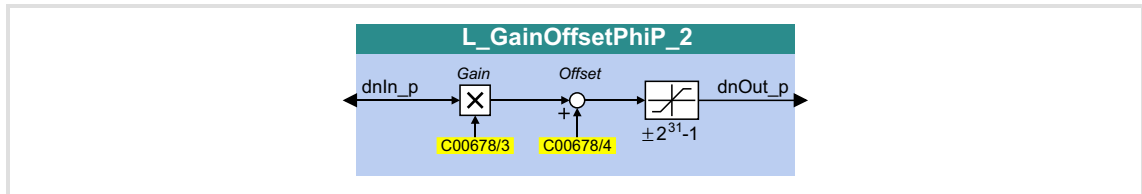
Function

$$dnOut_p = (dnIn_p \cdot \text{Gain factor}) + \text{Offset}$$

18.1.93 L_GainOffsetPhiP_2

This FB can amplify an angle signal and add an offset to it afterwards.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Gain and offset are selected via parameters.
- ▶ The value provided at the *dnOut_p* output is internally limited to $\pm 2^{31}-1$.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

Parameter

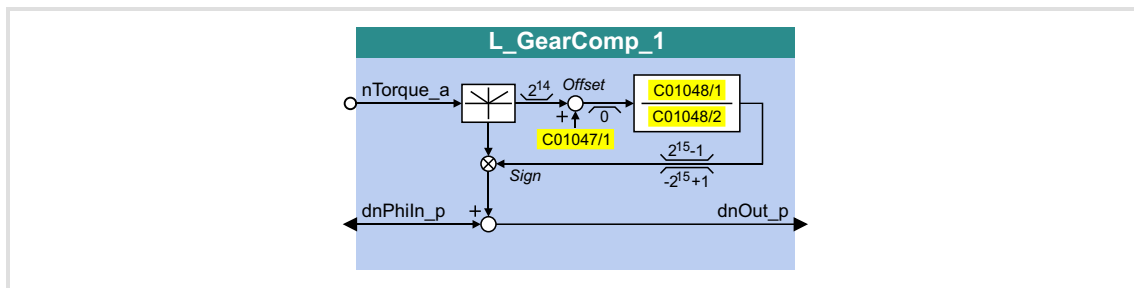
Parameter	Possible settings	Info
C00678/3	-2147483647 Incr. 2147483647	Offset • Lenze setting: 0 incr.
C00678/4	-2147483647 2147483647	Gain factor • Lenze setting: 65536

Function

$$dnOut_p = (dnIn_p \cdot \text{Gain factor}) + \text{Offset}$$

18.1.94 L_GearComp_1

This FB is used for dynamic compensation of elasticities in the drive train that arise, e.g. by elastic coupling of speed reduction gearboxes or long transmission shafts.



Inputs

Identifier	Data type	Information/possible settings
nTorque_a	INT	Torque setpoint • 16384 ≙ 100 %
dnPhiln_p	DINT	Angle setpoint • 65536 increments ≙ 1 motor revolution

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Corrected angle setpoint • 65536 increments ≙ 1 motor revolution

Parameter

Parameter	Possible settings	Info
C01047/1	-16383	16383 Offset • Static torque offset • Lenze setting: 0
C01048/1	-32767	32767 Numerator • Elastic constant • Lenze setting: 1
C01048/2	1	32767 Denominator • Elastic constant • Lenze setting: 1

Function

Elasticity is a measure of how far the load have moved from the ideal setpoint position at motor standstill due to mechanical force effect.

- ▶ Example: "Hoist":
Due to elasticity of the mechanical transmission elements, the real position of the "hook" varies in loaded and unloaded status.
- ▶ In order to compensate errors caused by elasticity, the actual torque at the *nTorque_a* input is applied. This torque is a measure for the current load.
- ▶ The multiplication by an elasticity factor results in an angle compensation value which is added to the setpoint angle correctly signed depending on the direction of the torque. This serves to correct the false position of the load.
- ▶ The elasticity factor is selected in the form of numerator and denominator via [C01048/1](#) and [C01048/2](#).
- ▶ [C01047/1](#) serves to select a static correction value (offset).

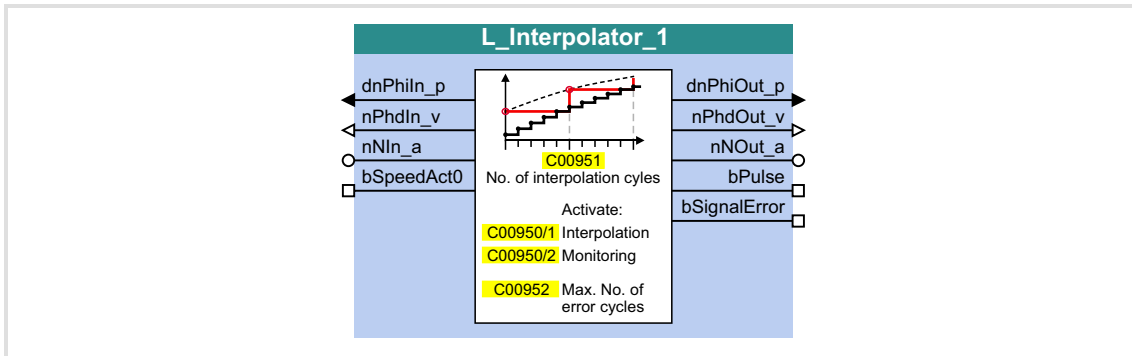


Note!

Please note that the compensation may be reversed in case of a signed numerator/denominator selection of the elasticity factor!

18.1.95 L_Interpolator_1

This FB interpolates a position setpoint and/or an analog value e.g. to compensate for larger bus transmission cycles or to continue signal characteristics if data telegrams are missing.



Inputs

Identifier	Data type	Information/possible settings
dnPhIn_p	DINT	Position setpoint • Is interpolated and completed when signal interpolation is activated.
nPhdIn_v	INT	Angular velocity • Is only passed through to the nPhdOut_v output.
nNIn_a	INT	Analog value • Is interpolated when signal interpolation is activated.
bSpeedAct0	BOOL	Input for detecting the "Current speed is zero" status • This status signal needs to be transmitted by the setpoint source to ensure trouble-free operation.
		TRUE Current speed is zero.

Outputs

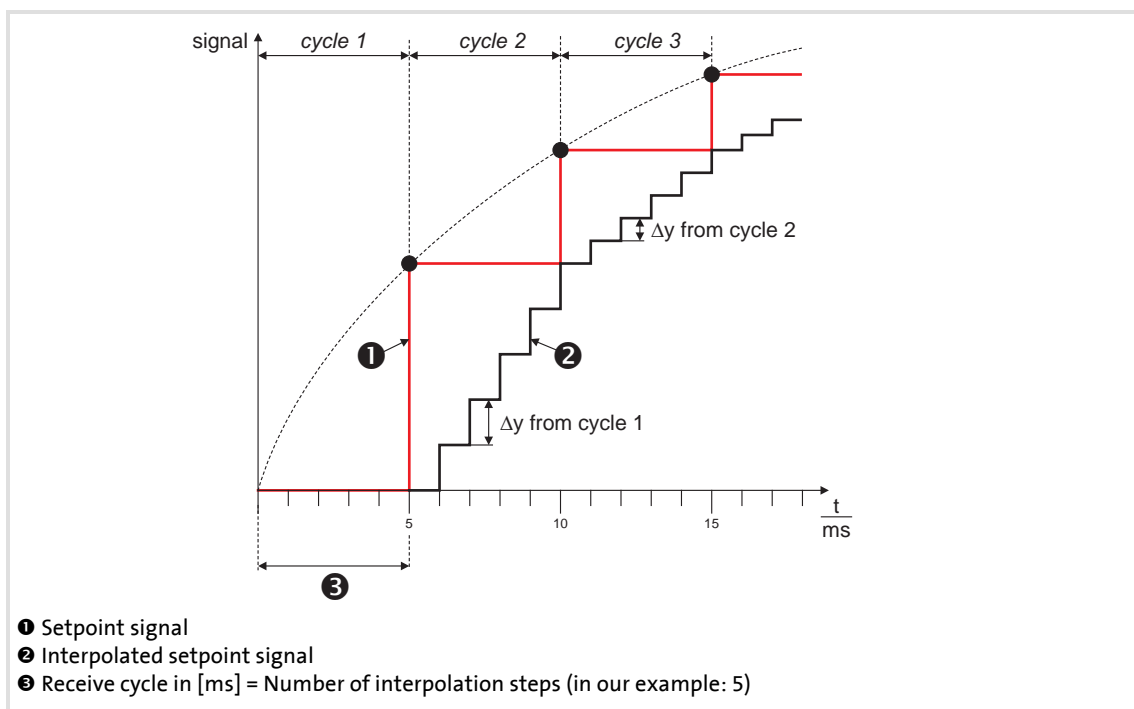
Identifier	Data type	Value/meaning
dnPhiOut_p	DINT	Output of the dnPhIn_p position setpoint which, if applicable, has been interpolated and completed
nPhdOut_v	INT	Output of the nPhdIn_v angular velocity
nNOut_a	INT	Output of the nNIn_a analog value which, if applicable, has been interpolated
bPulse	BOOL	"Input values have been accepted" status signal TRUE The input values have been accepted during this cycle.
bSignalError	BOOL	"Signal error" status signal • Only if signal monitoring is active (C00950/2 = "1: On"). TRUE The number of missing data telegrams has exceeded the limit value parameterised in C00952.

Parameter

Parameter	Possible settings	Info				
C00950/1	<table border="1"> <tr> <td>0</td> <td>Off</td> </tr> <tr> <td>1</td> <td>On</td> </tr> </table>	0	Off	1	On	Signal interpolation of the <i>dnPhIn_p</i> and <i>nNIn_a</i> input signals • Lenze setting: Off ▶ Signal interpolation (📖 1260)
0	Off					
1	On					
C00950/2	<table border="1"> <tr> <td>0</td> <td>Off</td> </tr> <tr> <td>1</td> <td>On</td> </tr> </table>	0	Off	1	On	Signal monitoring of the <i>dnPhIn_p</i> input signal • Lenze setting: Off ▶ Signal monitoring (📖 1261)
0	Off					
1	On					
C00951	1	65535 Number of interpolation steps • Corresponds to the receive cycle of the data telegrams in [ms]. • Lenze setting: 1				
C00952	0	65535 Limit value for missing data telegrams • Lenze setting: 5 ▶ Signal monitoring (📖 1261)				
C00953	0	100 Speed-up In preparation!				

18.1.95.1 Signal interpolation

If signal interpolation is active ([C00950/1](#) = 1), the output signal will not reach the level of the corresponding input signal until all interpolation steps parameterised in [C00951](#) have been performed:



[18-40] Signal characteristic

**Note!**

Do not change the number of interpolation steps during operation. Otherwise the interpolation becomes inaccurate.

18.1.95.2 Signal monitoring

If signal monitoring is active ([C00950/2](#) = 1), the signal characteristic of the *dnPhIn_p* input signal is continued even if the data telegram is missing (setpoint selection via CAN).

Monitoring is performed on the basis of the *dnPhIn_p* position setpoint and the *bSpeedAct0* status signal:

- ▶ If the *dnPhIn_p* position setpoint remains the same in the next device cycle, it is either because the speed is zero or because no data telegram has been received.
- ▶ The evaluation of the *bSpeedAct0* status signal gives information about which reason applies. This status signal needs to be transmitted by the setpoint source to ensure trouble-free operation:
 - *bSpeedAct0* = FALSE means that the speed is not zero, so an error is assumed: The signal characteristic of the *dnPhIn_p* input signal is completed (the current slope is retained).
 - *bSpeedAct0* = TRUE means that the speed is zero, so the unchanged position setpoint is not treated as an error.
- ▶ If the number of missing data telegrams exceeds the limit value parameterised in [C00952](#), the *bSignalError* output is set to TRUE.
 - The *bSignalError* output is automatically reset to FALSE if correct signals are detected at *dnPhIn_p* and *bSpeedAct0* again.

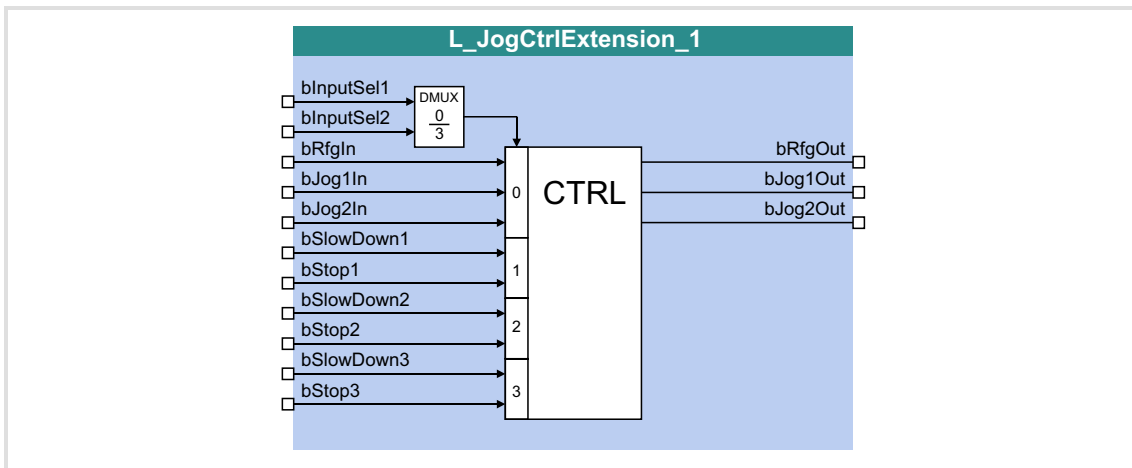
**Note!**

The *nNIn_a* analog value is not monitored!

18.1.96 L_JogCtrlExtension_1

This FB can be connected upstream to the [L_NSet](#) ramp function generator/setpoint generator to implement a switch-off positioning at limit switch.

- Detailed information on this operating mode can be found in the description of the "Switch-off positioning" TA.



Inputs

Identifier	Data type	Information/possible settings
bInputSel1 bInputSel2	BOOL	Activation of the <i>bSlowDown1/bStop1</i> , <i>bSlowDown2/bStop2</i> and <i>bSlowDown3/bStop3</i> signal pairs according to the Truth table
bRfgIn	BOOL	Ramping down of the setpoint generator in the downstream L_NSet FB according to the Truth table
bJog1In bJog2In	BOOL	Selection inputs for setting fixed speeds in the setpoint generator <ul style="list-style-type: none"> • If the pre-switch off is inactive (<i>bInputSel1</i> and <i>bInputSel2</i> are both set to FALSE), the two control signals are output one-to-one at the <i>bJog1Out</i> and <i>bJog2Out</i> outputs. • To achieve the desired behaviour (starting at high speed, pre-switch off at low speed), both inputs must be set to TRUE. • Fixed setpoint 2 must be less than fixed setpoint 3! Otherwise, the drive will start at a low speed and accelerate after the pre-switch off. • If, in addition to the <i>bJog1In</i> and <i>bJog2In</i> inputs, other jog signals are set at the L_NSet FB, new fixed setpoints are reached, and the drive traverses at speeds that differ from the selection via <i>bJog1In</i> and <i>bJog2In</i>.
bSlowDown1 bSlowDown2 bSlowDown3	BOOL	Activation of fixed setpoint 2 in the downstream L_NSet FB <ul style="list-style-type: none"> • These inputs only fulfil a function if they have been activated via <i>bInputSel1</i> and <i>bInputSel2</i> previously (see Truth table).
bStop1 bStop2 bStop3	BOOL	Ramping down of the ramp function generator in the downstream L_NSet FB <ul style="list-style-type: none"> • These inputs only fulfil a function if they have been activated via <i>bInputSel1</i> and <i>bInputSel2</i> previously (see Truth table).

Outputs

Identifier	Data type	Value/meaning
bRfgOut	BOOL	Control signal for ramping down the setpoint generator <ul style="list-style-type: none"> Connect this output to the <i>bRfg0</i> input of the L_NSet FB.
bJog1Out	BOOL	Control signal for setting fixed speeds in the setpoint generator <ul style="list-style-type: none"> Connect this output to the <i>bJog1</i> input of the L_NSet FB.
bJog2Out	BOOL	Control signal for setting fixed speeds in the setpoint generator <ul style="list-style-type: none"> Connect this output to the <i>bJog2</i> input of the L_NSet FB.

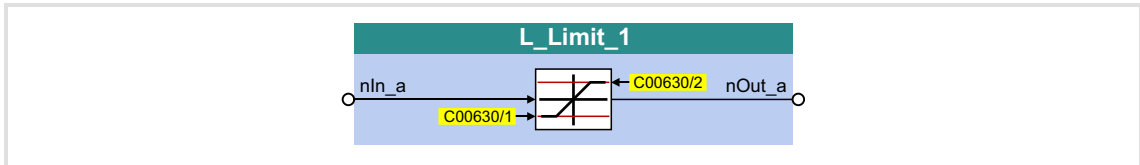
Truth table

Input		Function	Response in the L_NSet FB
bInputSel1	bInputSel2		
FALSE	FALSE	Pre-switch off inactive	No response <ul style="list-style-type: none"> The <i>bRfgIn</i> input signal is directly output at the <i>bRfgOut</i> output. The <i>bJogIn1</i> and <i>bJogIn2</i> input signals are directly output at the <i>bJog1Out</i> and <i>bJog2Out</i> outputs.
TRUE	FALSE	The <i>bSlowDown1</i> and <i>bStop1</i> inputs are evaluated.	Pre-switch off can be activated <ul style="list-style-type: none"> If the SlowDown function is activated via the selected <i>bSlowDown</i> input, fixed setpoint 2 in the setpoint generator is activated via the <i>bJog1Out</i> and <i>bJog2Out</i> outputs. If the Stop function is activated via the selected <i>bStop</i> input, the <i>bRfgOut</i> output is set to TRUE and hence the setpoint generator is deactivated.
FALSE	TRUE	The <i>bSlowDown2</i> and <i>bStop2</i> inputs are evaluated.	
TRUE	TRUE	The <i>bSlowDown3</i> and <i>bStop3</i> inputs are evaluated.	

[18-1] Truth table for activating the pre-switch off

18.1.97 L_Limit_1

This FB limits an analog input signal to a value range whose upper and lower limit can be set via parameters.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal • Scaling: 16384 ≙ 100 %

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Scaling: 16384 ≙ 100 %

Parameter

Parameter	Possible settings			Info
C00630/1	-199.99	%	199.99	Lower limit • Lenze setting: -100.00 %
C00630/2	-199.99	%	199.99	Upper limit • Lenze setting: 100.00 %

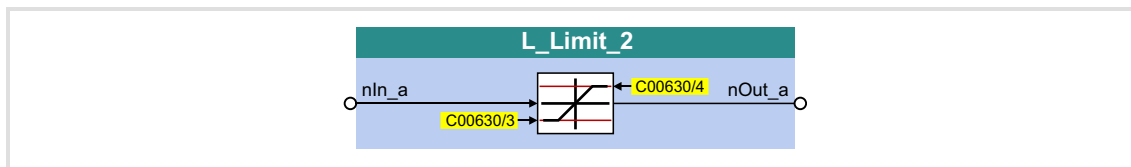


Tip!

Always set the lower limit lower than the upper limit, otherwise value "0" is provided at the *nOut_a* output.

18.1.98 L_Limit_2

This FB limits an analog input signal to a value range whose upper and lower limit can be set via parameters.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal • Scaling: 16384 \equiv 100 %

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Scaling: 16384 \equiv 100 %

Parameter

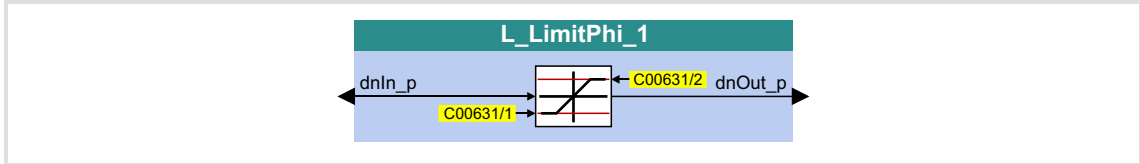
Parameter	Possible settings			Info
C00630/3	-199.99	%	199.99	Lower limit • Lenze setting: -100.00 %
C00630/4	-199.99	%	199.99	Upper limit • Lenze setting: 100.00 %

**Tip!**

Always set the lower limit lower than the upper limit, otherwise value "0" is provided at the *nOut_a* output.

18.1.99 L_LimitPhi_1

This FB limits an angle signal to a value range whose upper and lower value range can be set via parameters.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	INT	Output signal

Parameter

Parameter	Possible settings			Info
C00631/1	-2147483647	Incr.	2147483647	Lower limit • Lenze setting: -2147483647 incr.
C00631/2	-2147483647	Incr.	2147483647	Upper limit • Lenze setting: 2147483647 incr.

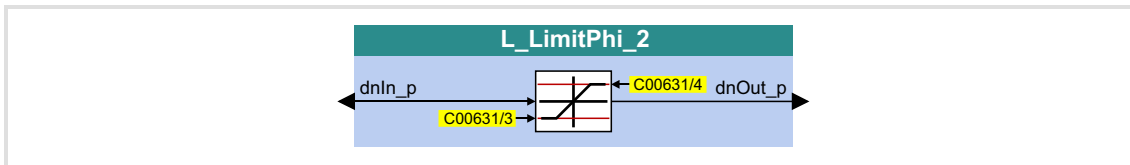


Tip!

Always set the lower limit lower than the upper limit, otherwise value "0" is provided at the *dnOut_p* output.

18.1.100 L_LimitPhi_2

This FB limits an angle signal to a value range whose upper and lower value range can be set via parameters.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	INT	Output signal

Parameter

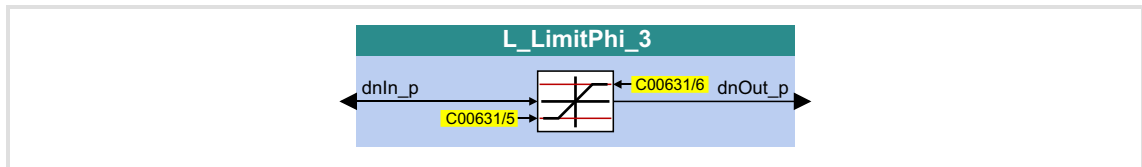
Parameter	Possible settings			Info
C00631/3	-2147483647	Incr.	2147483647	Lower limit • Lenze setting: -2147483647 incr.
C00631/4	-2147483647	Incr.	2147483647	Upper limit • Lenze setting: 2147483647 incr.

**Tip!**

Always set the lower limit lower than the upper limit, otherwise value "0" is provided at the *dnOut_p* output.

18.1.101 L_LimitPhi_3

This FB limits an angle signal to a value range whose upper and lower value range can be set via parameters.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	INT	Output signal

Parameter

Parameter	Possible settings			Info
C00631/5	-2147483647	Incr.	2147483647	Lower limit • Lenze setting: -2147483647 incr.
C00631/6	-2147483647	Incr.	2147483647	Upper limit • Lenze setting: 2147483647 incr.



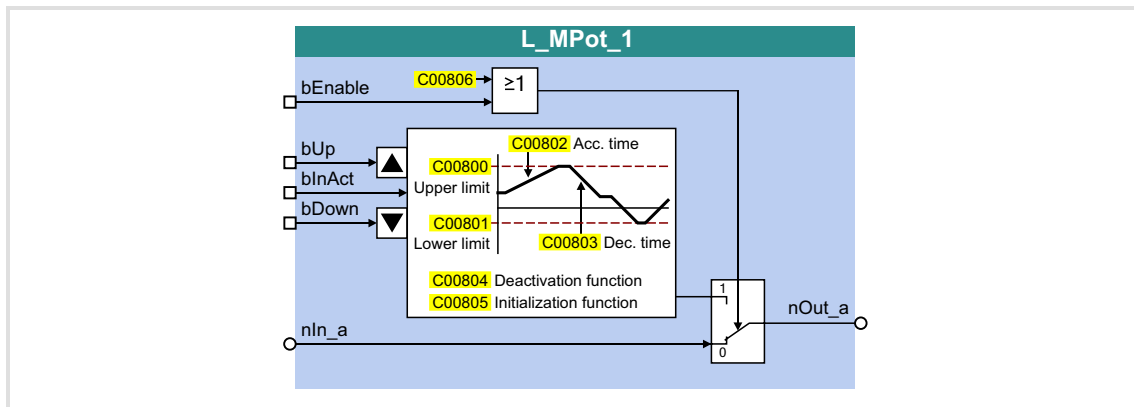
Tip!

Always set the lower limit lower than the upper limit, otherwise value "0" is provided at the *dnOut_p* output.

18.1.102 L_MPot_1

This FB replaces a hardware motor potentiometer and can be used as an alternative setpoint source which is controlled via two inputs.

- ▶ The signal is output via a ramp function generator with linear ramps.
- ▶ The acceleration and deceleration times are set via parameters.
- ▶ Constant ramping even with speed limit values changed online.
- ▶ The motor potentiometer function can be switched on/off online.



Inputs

Identifier	Data type	Information/possible settings
bEnable	BOOL	Switch over motor potentiometer function <i>bEnable</i> input and C00806 code are ORed.
		TRUE Motor potentiometer function is active, setpoint can be changed via <i>bUp</i> and <i>bDown</i> . • With switching to TRUE, the value applied to <i>nIn_a</i> is automatically transferred to the motor potentiometer.
		FALSE The value applied to <i>nIn_a</i> is output at <i>nOut_a</i> .
nIn_a	INT	When <i>bEnable</i> = FALSE, the analog input signal <i>nIn_a</i> is switched to the <i>nOut_a</i> output.
bUp	BOOL	Approaching of the upper speed limit value set in C00800 .
		TRUE The <i>nOut_a</i> output signal runs to its upper limit value (<i>nHighLimit</i>). • If the <i>bDown</i> input is simultaneously set to TRUE, the <i>nOut_a</i> output signal is not changed.
bDown	BOOL	Approaching of the lower speed limit value set in C00801 .
		TRUE The <i>nOut_a</i> output signal runs to its lower limit value (<i>nLowLimit</i>). • If the <i>bUp</i> input is simultaneously set to TRUE, the <i>nOut_a</i> output signal is not changed.
bInAct	BOOL	Deactivate motor potentiometer function • This input has the highest priority. • When the motor potentiometer is deactivated, the <i>nOut_a</i> output signal follows the function set with code C00804 .
		TRUE Motor potentiometer function is deactivated.

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

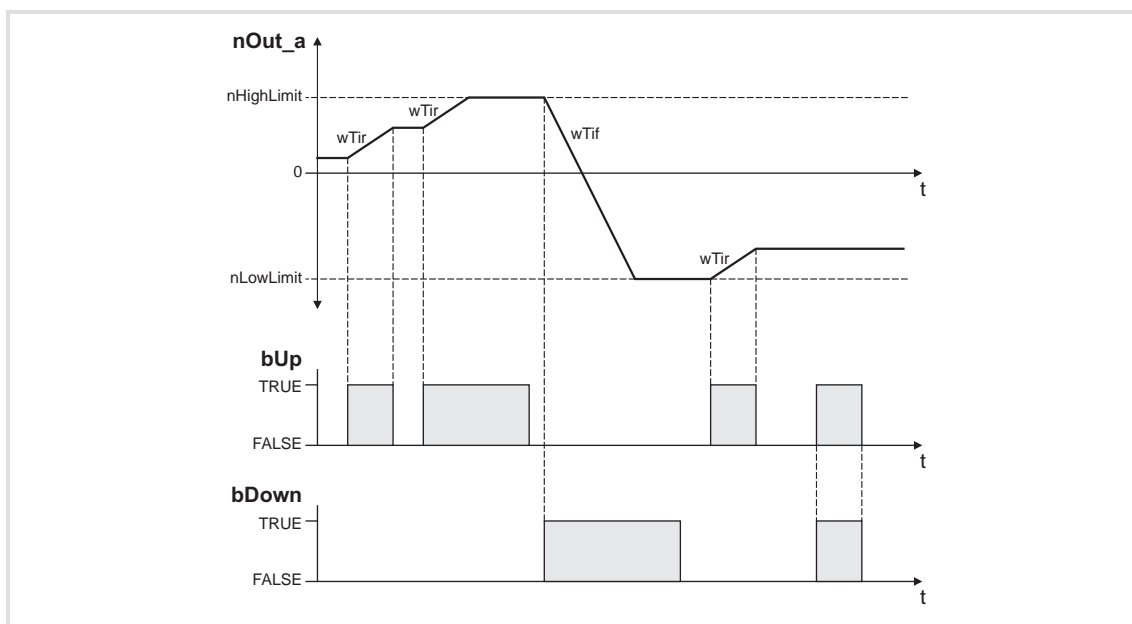
Parameter

Parameter	Possible settings			Info
C00800	-199.99	%	199.99	Upper limit • Lenze setting: 100.00 %
C00801	-199.99	%	199.99	Lower limit • Lenze setting: -100.00 %
C00802	0.1	s	6000.0	Acceleration time • Lenze setting: 10.0 s
C00803	0.1	s	6000.0	Deceleration time • Lenze setting: 10.0 s
C00804				Inactive function • Selection of response when deactivating the motor potentiometer via the input <i>blnAct</i> . • Lenze setting: 0
	0	No further action; <i>nOut_a</i> retains its value.		
	1	The motor potentiometer returns to 0 % within the deceleration time T_{if}		
	2	The motor potentiometer runs to the lower limit value (C00801) within the deceleration time T_{if}		
	3	The motor potentiometer output immediately changes to 0 %		Important for the emergency stop function
	4	The motor potentiometer output immediately changes to the lower limit value (C00801)		
	5	The motor potentiometer runs to the upper limit value (C00800) within the acceleration time T_{ir}		
C00805				Init function • Selection of response when switching on the device. • Lenze setting: 0
	0	The output value being output during mains power-off is saved non-volatilely in the internal memory of the controller. It will be reloaded during mains power-on.		
	1	The lower limit value (C00801) is loaded during mains power-on.		
	2	An output value = 0 % is loaded during mains power-on.		
C00806				Use of the motor potentiometer • When switching to 1: YES, the value applied to <i>nIn_a</i> is automatically transferred to the motor potentiometer. • Lenze setting: 0
	0	No		
	1	Yes		

18.1.102.1 Activate & control motor potentiometer

When *bInAct* is set to FALSE, the motor potentiometer is activated.

- ▶ The currently active function depends on the current output signal *nOut_a*, the limit values set and the control signals at *bUp* and *bDown*.
- ▶ When the *nOut_a* output signal is outside the limits set, the output signal runs to the next limit with the *Ti* times set. This process is independent of the control signals at *bUp* and *bDown*.
- ▶ When the *nOut_a* output signal is inside the limits set, the output signal changes according to the control signals at *bUp* and *bDown*.

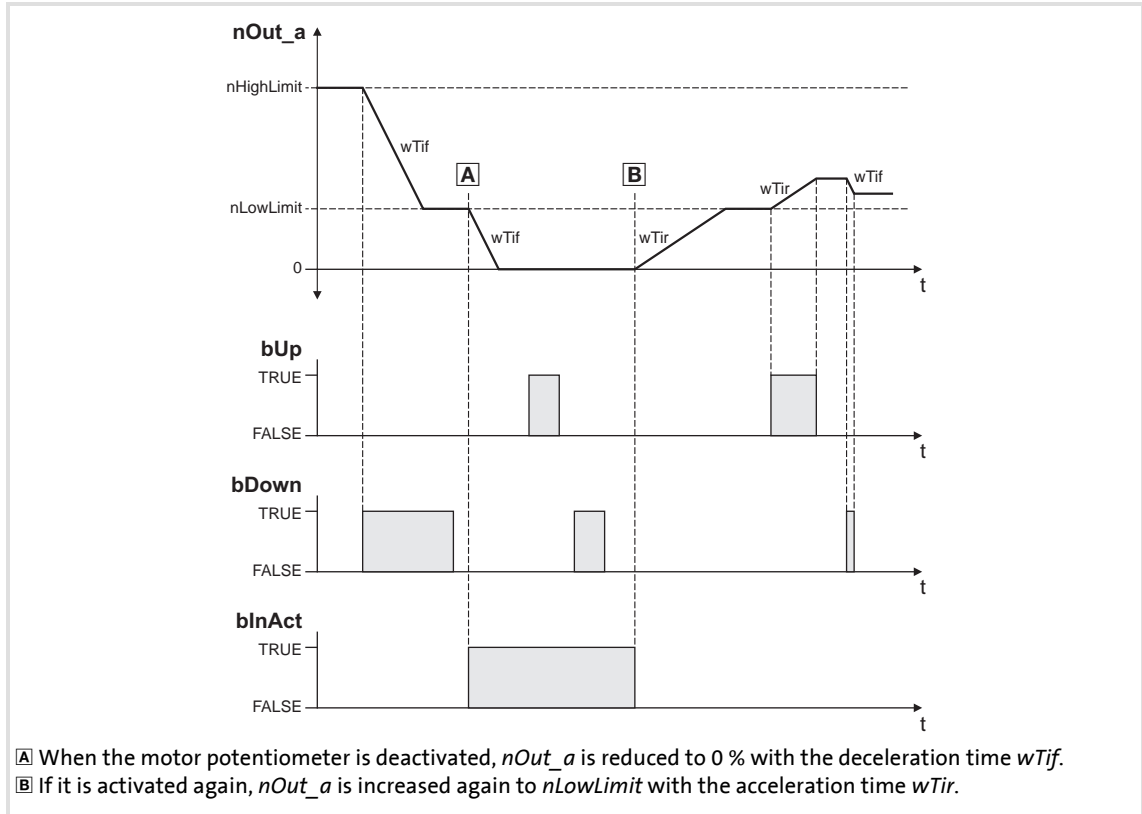


[18-41] Example: Control of the motor potentiometer

bUp	bDown	bInact	Function
FALSE	FALSE	FALSE	The <i>nOut_a</i> output signal remains unchanged.
TRUE	FALSE		The <i>nOut_a</i> output signal runs to its upper limit value (<i>nHighLimit</i>).
FALSE	TRUE		The <i>nOut_a</i> output signal runs to its lower limit value (<i>nLowLimit</i>).
TRUE	TRUE		The <i>nOut_a</i> output signal remains unchanged.
-	-	TRUE	The motor potentiometer function is deactivated. The <i>nOut_a</i> output signal responds according to the function selected via <i>Function</i> .

18.1.102.2 Deactivate motor potentiometer

When the motor potentiometer is deactivated by setting *blnAct* to TRUE, the *nOut_a* output signal responds according to the function selected via *Function*.

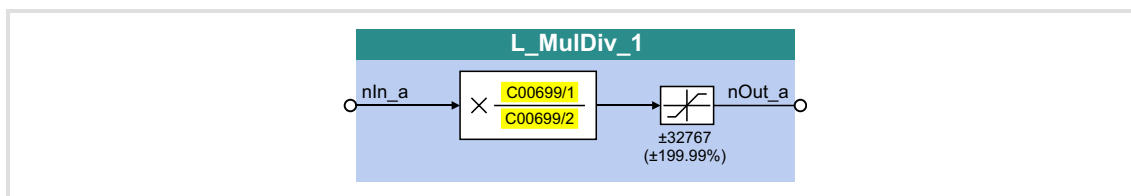


[18-42] Example: Deactivation of the motor potentiometer when the *Function* = 1 has been selected

18.1.103 L_MulDiv_1

This FB multiplies the analog input signal with a parameterisable factor.

- ▶ The value of the factor is determined by a quotient consisting of numerator and denominator .
- ▶ The value output at $nOut_a$ is limited to $\pm 199.99\%$.
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
nIn1	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Product value (result of the multiplication) <ul style="list-style-type: none"> • Internal limitation to ± 32767

Parameter

Parameter	Possible settings	Info
C00699/1	-32767	32767 Numerator
C00699/2	-32767	32767 Denominator

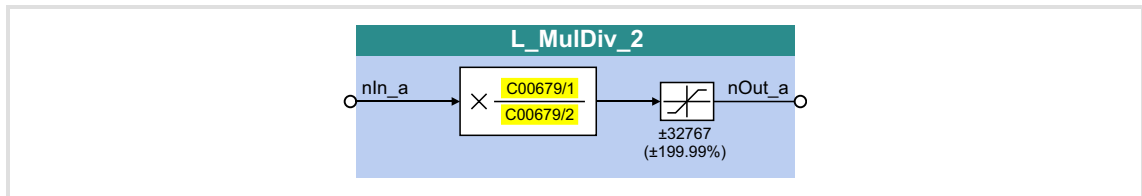
Function

$$nOut_a = nIn_a \times \frac{C00699/1}{C00699/2}$$

18.1.104 L_MulDiv_2

This FB multiplies the analog input signal with a parameterisable factor.

- ▶ The value of the factor is determined by a quotient consisting of numerator and denominator .
- ▶ The value output at *nOut_a* is limited to ±199.99 %.
- ▶ Division is not remainder considered.



Inputs

Identifier	Data type	Information/possible settings
nIn1	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Product value (result of the multiplication) • Internal limitation to ± 32767

Parameter

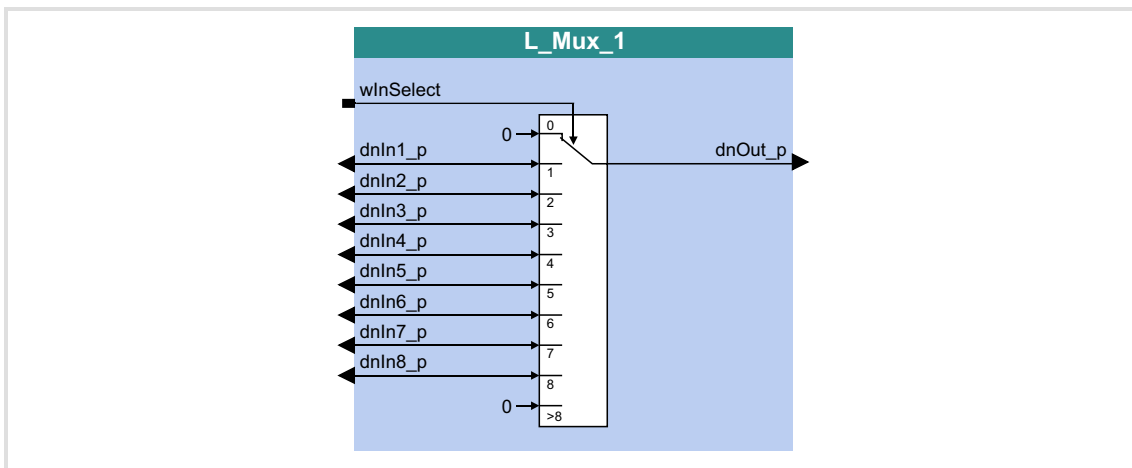
Parameter	Possible settings	Info
C00679/1	-32767	32767 Numerator
C00679/2	-32767	32767 Denominator

Function

$$nOut_a = nIn_a \times \frac{C00679/1}{C00679/2}$$

18.1.105 L_Mux_1

This FB provides one of the eight input signals *dnIn1_p* ... *dnIn8_p* at the output *dnOut_p*. The selection is made by means of the signal at the input *wInSelect*.



Inputs

Identifier	Data type	Information/possible settings
wInSelect	WORD	Input signal 1 ... 8 <ul style="list-style-type: none"> The values "1" ... "8" select the input signal to be applied to the output. Values from "1" ... "8" set the <i>dnOut_p</i> output to "0".
dnIn1_p	DINT	Input signal
...		
dnIn8_p	DINT	

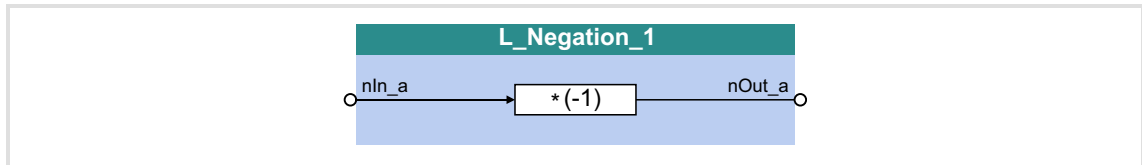
Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

18.1.106 L_Negation_1

This FB converts the sign of the input signal, i.e. the input signal is multiplied by the value -1 and is then output.

- ▶ With the value - 32768 at the *nIn_a* input, the value + 32767 is provided at the *nOut_a* output.



Inputs

Identifier	Data type	Value/meaning
nIn_a	INT	Input signal

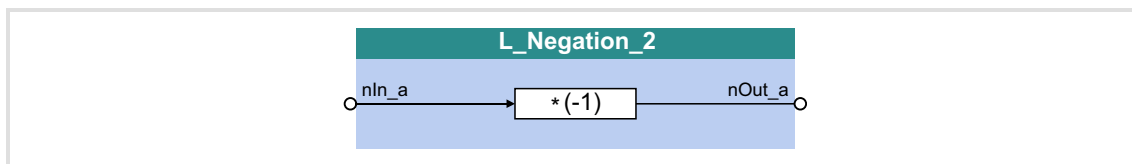
Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

18.1.107 L_Negation_2

This FB converts the sign of the input signal, i.e. the input signal is multiplied by the value -1 and is then output.

- ▶ With the value - 32768 at the *nIn_a* input, the value + 32767 is provided at the *nOut_a* output.



Inputs

Identifier	Data type	Value/meaning
nIn_a	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal

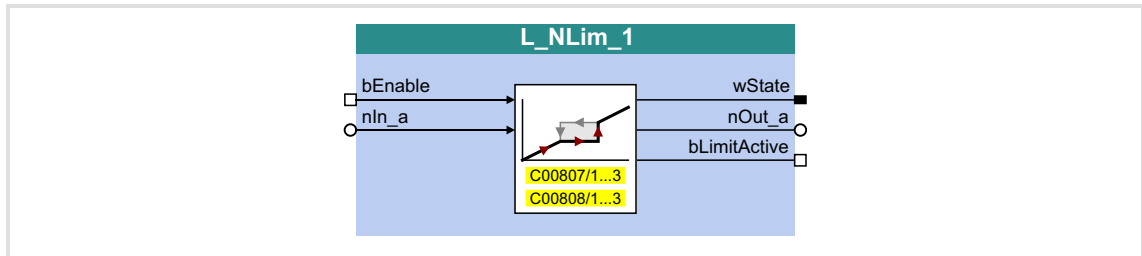
18.1.108 L_NLim_1

This FB can mask out up to three parameterisable blocking zones within a continuous signal characteristic.



Note!

A value of "0" cannot be masked out if the *nIn_a* input signal changes signs.



Inputs

Identifier	Data type	Information/possible settings		
bEnable	BOOL	Activate zone masking		
		<table border="1"> <tr> <td>FALSE</td> <td>The FB has been deactivated. <ul style="list-style-type: none"> The input signal is output one-to-one at the <i>nOut_a</i> output. </td> </tr> <tr> <td>TRUE</td> <td>The FB has been activated. <ul style="list-style-type: none"> Zone masking of the input signal is carried out according to the parameterised blocking zones. </td> </tr> </table>	FALSE	The FB has been deactivated. <ul style="list-style-type: none"> The input signal is output one-to-one at the <i>nOut_a</i> output.
FALSE	The FB has been deactivated. <ul style="list-style-type: none"> The input signal is output one-to-one at the <i>nOut_a</i> output. 			
TRUE	The FB has been activated. <ul style="list-style-type: none"> Zone masking of the input signal is carried out according to the parameterised blocking zones. 			
nIn_a	INT	Input signal		

Outputs

Identifier/data type	Value/meaning	
wState	WORD	Bit-coded status word <ul style="list-style-type: none"> Bits that are not listed are reserved for future extensions.
		Bit 0 No blocking zone active
		Bit 1 Blocking zone 1 active
		Bit 2 Blocking zone 2 active
		Bit 3 Blocking zone 3 active
nOut_a	INT	Output signal <ul style="list-style-type: none"> If the FB has been activated, the output signal is outside the blocking zones.
bLimitActive	BOOL	"Limitation active" status signal
		<table border="1"> <tr> <td>TRUE</td> <td>The input signal is inside a blocking zones and is limited to the respective boundary value of the blocking zone.</td> </tr> </table>
TRUE	The input signal is inside a blocking zones and is limited to the respective boundary value of the blocking zone.	

Parameter

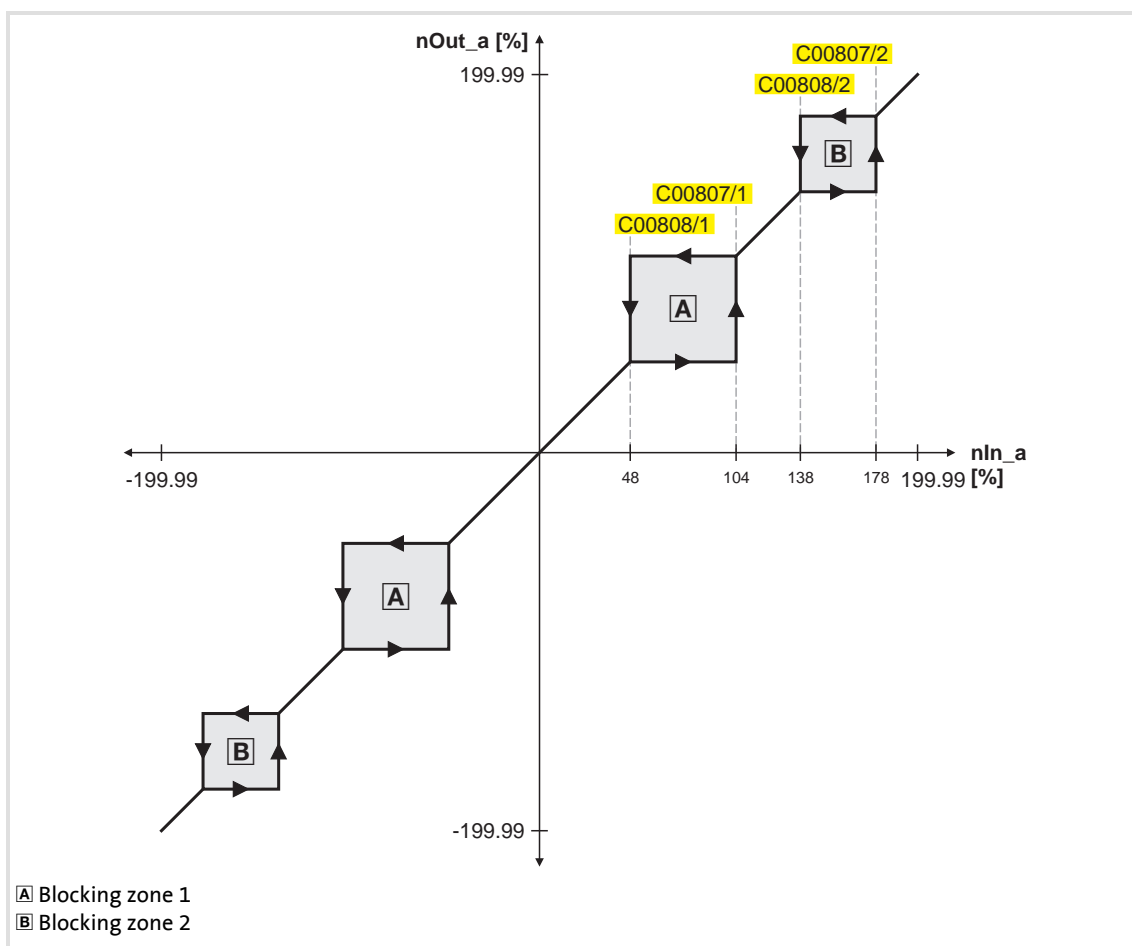
Parameter	Possible settings			Info
C00807/1...3	0.00	%	199.99	Maximum blocking frequency 1 ... 3 • Lenze setting: 0.00 %
C00808/1...3	0.00	%	199.99	Minimum blocking frequency 1 ... 3 • Lenze setting: 0.00 %

Definition of the blocking zones

Up to three zones can be parameterised which are to be skipped by the *nOut_a* output signal.

The example below shows the parameter setting of two blocking zones for the L_NLim_1 FB:

Parameter	Blocking zone 1		Blocking zone 2		Blocking zone 3	
Minimum limit value	C00808/1:	48 %	C00808/2:	138 %	C00808/3:	0 %
Maximum limit value	C00807/1:	104 %	C00807/2:	178 %	C00807/3:	0 %



[18-43] Zone masking by means of parameterisable blocking zones (in our example: L_NLim_1)

- ▶ The parameterised blocking zones have the same effect on negative input signals.
- ▶ A blocking zone is deactivated by entering identical limit values (in our example: Blocking zone 3).

Overlapping of blocking zones

If blocking zones overlap, the lowest and highest value of the overlapping zones form a new zone.

In this case, the status display (*wState* output) will also just display one zone (the lower one of the two original zones).

Abutting blocking zones

If two blocking zones abut (e.g. 20 ... 30 % and 30 ... 40 %), the limit value between the two zones (in this example 30 %) is also passed through.

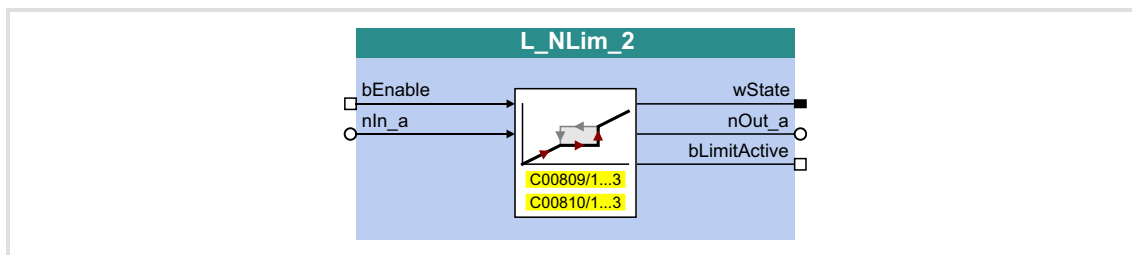
The same applies to a limit range of 0 ... xx %. At the zero crossing of the *nIn_a* input signal, a value of "0" is also output at the *nOut_a* output. Value "0" cannot be excluded. If the *nIn_a* input signal drops back to "0", the *nOut_a* output will retain the upper limit value.

18.1.109 L_NLim_2

This FB can mask out up to three parameterisable blocking zones within a continuous signal characteristic.

**Note!**

A value of "0" cannot be masked out if the *nIn_a* input signal changes signs.

**Inputs**

Identifier	Data type	Information/possible settings
bEnable	BOOL	Activate zone masking FALSE The FB has been deactivated. <ul style="list-style-type: none"> The input signal is output one-to-one at the <i>nOut_a</i> output. TRUE The FB has been activated. <ul style="list-style-type: none"> Zone masking of the input signal is carried out according to the parameterised blocking zones.
nIn_a	INT	Input signal

Outputs

Identifier/data type	Value/meaning
wState	WORD Bit-coded status word <ul style="list-style-type: none"> Bits that are not listed are reserved for future extensions. Bit 0 No blocking zone active Bit 1 Blocking zone 1 active Bit 2 Blocking zone 2 active Bit 3 Blocking zone 3 active
nOut_a	INT Output signal <ul style="list-style-type: none"> If the FB has been activated, the output signal is outside the blocking zones.
bLimitActive	BOOL "Limitation active" status signal TRUE The input signal is inside a blocking zones and is limited to the respective boundary value of the blocking zone.

Parameter

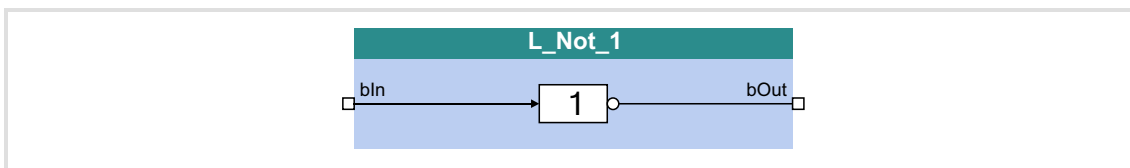
Parameter	Possible settings			Info
C00809/1...3	0.00	%	199.99	Maximum blocking frequency 1 ... 3 • Lenze setting: 0.00 %
C00810/1...3	0.00	%	199.99	Minimum blocking frequency 1 ... 3 • Lenze setting: 0.00 %



For a detailed functional description see [L_NLim_1](#).

18.1.110 L_Not_1

This FB negates a signal of BOOL data type.

**Inputs**

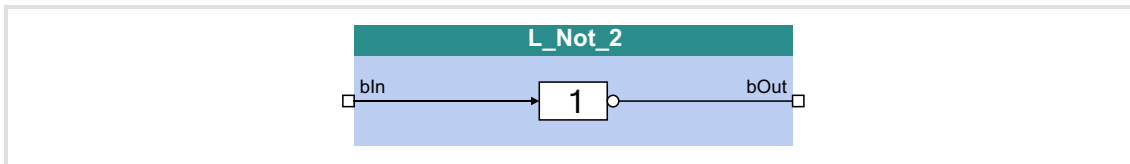
Identifier	Data type	Value/meaning
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Result of the NOT operation (negated input signal)

18.1.111 L_Not_2

This FB negates a signal of BOOL data type.

**Inputs**

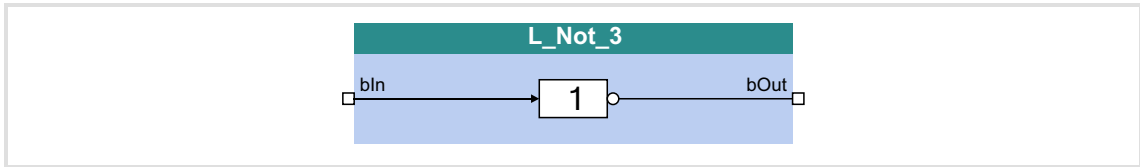
Identifier	Data type	Value/meaning
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Result of the NOT operation (negated input signal)

18.1.112 L_Not_3

This FB negates a signal of BOOL data type.



Inputs

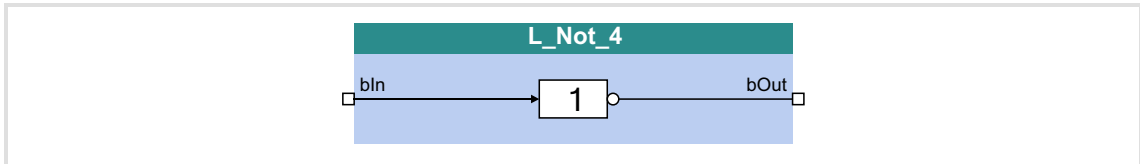
Identifier	Data type	Value/meaning
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Result of the NOT operation (negated input signal)

18.1.113 L_Not_4

This FB negates a signal of BOOL data type.



Inputs

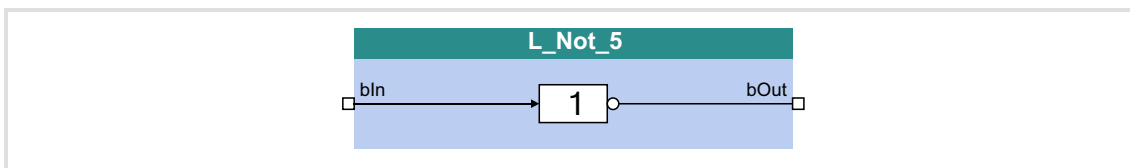
Identifier	Data type	Value/meaning
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Result of the NOT operation (negated input signal)

18.1.114 L_Not_5

This FB negates a signal of BOOL data type.

**Inputs**

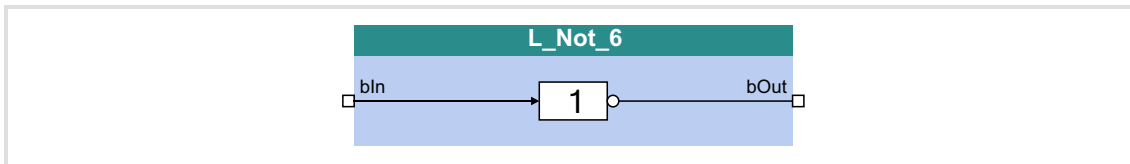
Identifier	Data type	Value/meaning
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Result of the NOT operation (negated input signal)

18.1.115 L_Not_6

This FB negates a signal of BOOL data type.

**Inputs**

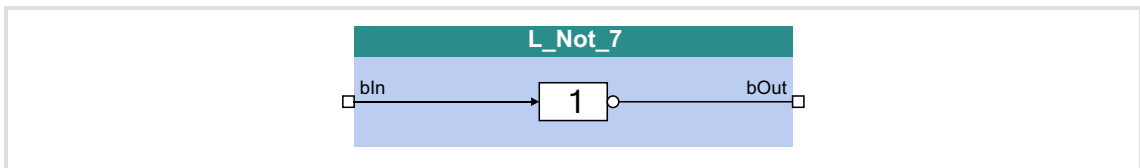
Identifier	Data type	Value/meaning
bIn	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Result of the NOT operation (negated input signal)

18.1.116 L_Not_7

This FB negates a signal of BOOL data type.



Inputs

Identifier	Data type	Value/meaning
bIn	BOOL	Input signal

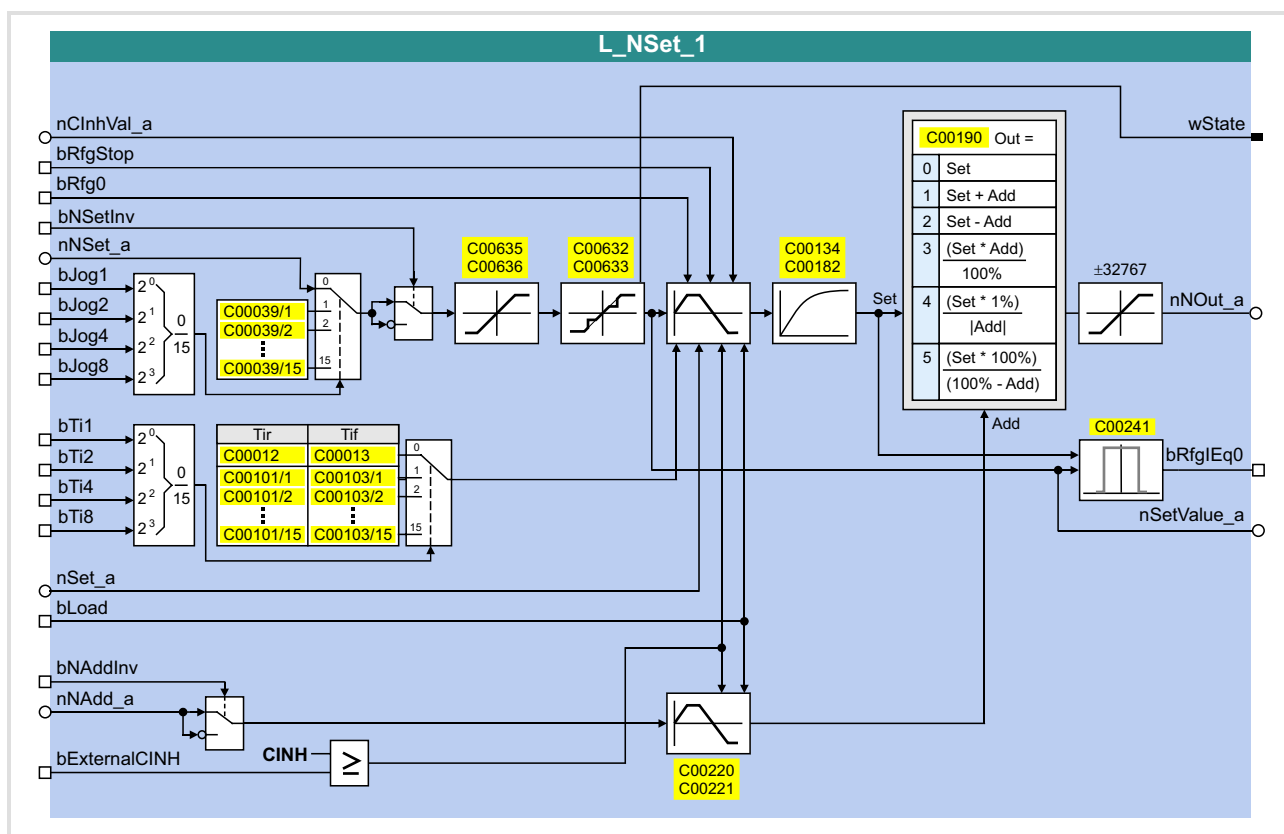
Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Result of the NOT operation (negated input signal)

18.1.117 L_NSet_1

This FB is used for general signal processing of process values and is provided with the following functions:

- ▶ Ramp function generator
 - With linear ramps for main and additional setpoint path
 - With S-shaped ramp (PT1 rounding)
 - Setting and holding
- ▶ Internal limitation of the input signal
- ▶ 3 adjustable blocking zones
- ▶ Arithmetic function
- ▶ 15 fixed setpoints (JOG setpoints)
- ▶ 15 acceleration and deceleration times



Inputs

Identifier	Data type	Information/possible settings		
nClnhVal_a	INT	Main setpoint signal which is to be accepted by the main setpoint integrator when the controller is inhibited.		
bRfgStop	BOOL	Holding (freezing) of the current value of the main setpoint integrator <table border="1"> <tr> <td>TRUE</td> <td>The current value of the main setpoint integrator is held.</td> </tr> </table>	TRUE	The current value of the main setpoint integrator is held.
TRUE	The current value of the main setpoint integrator is held.			
bRfg0	BOOL	Leading the main setpoint integrator to 0 within the current Ti times <table border="1"> <tr> <td>TRUE</td> <td>The current value of the main setpoint integrator is led to "0" within the Ti time set.</td> </tr> </table>	TRUE	The current value of the main setpoint integrator is led to "0" within the Ti time set.
TRUE	The current value of the main setpoint integrator is led to "0" within the Ti time set.			
bNSetInv	BOOL	Signal inversion for the main setpoint <table border="1"> <tr> <td>TRUE</td> <td>Main setpoint signal is inverted.</td> </tr> </table>	TRUE	Main setpoint signal is inverted.
TRUE	Main setpoint signal is inverted.			
nNset_a	INT	Main setpoint signal <ul style="list-style-type: none"> Other signals are also permitted 		
bJog1 ... bJog8	BOOL	Selection inputs for fixed changeover setpoints (JOG setpoints) for the main setpoint <ul style="list-style-type: none"> Selection inputs are binary coded. 		
bTl1 ... bTl8	BOOL	Selection inputs for alternative acceleration/deceleration times for the main setpoint <ul style="list-style-type: none"> Selection inputs are binary coded. 		
nSet_a	INT	Starting value which is loaded into the main setpoint integrator by setting <i>bLoad</i> to TRUE.		
bLoad	BOOL	Control of both ramp function generators in special situations, e.g. QSP <table border="1"> <tr> <td>TRUE</td> <td>The <i>nSet_a</i> input signal is loaded into the main setpoint integrator and the additional setpoint integrator is set to "0".</td> </tr> </table>	TRUE	The <i>nSet_a</i> input signal is loaded into the main setpoint integrator and the additional setpoint integrator is set to "0".
TRUE	The <i>nSet_a</i> input signal is loaded into the main setpoint integrator and the additional setpoint integrator is set to "0".			
bAddInv	BOOL	Signal inversion for the additional setpoint <table border="1"> <tr> <td>TRUE</td> <td>Additional setpoint signal is inverted.</td> </tr> </table>	TRUE	Additional setpoint signal is inverted.
TRUE	Additional setpoint signal is inverted.			
nNAdd_a	INT	Additional setpoint signal <ul style="list-style-type: none"> Other signals are also permitted 		
bExternalCINH	BOOL	Additional load input for the main setpoint integrator and the additional setpoint integrator <table border="1"> <tr> <td>TRUE</td> <td>The main setpoint integrator is set to the value applied at <i>nClnhVal_a</i>. The additional setpoint integrator is set to "0". ▶ Application example for the additional load function (1297) </td> </tr> </table>	TRUE	The main setpoint integrator is set to the value applied at <i>nClnhVal_a</i> . The additional setpoint integrator is set to "0". ▶ Application example for the additional load function (1297)
TRUE	The main setpoint integrator is set to the value applied at <i>nClnhVal_a</i> . The additional setpoint integrator is set to "0". ▶ Application example for the additional load function (1297)			

Outputs

Identifier	Data type	Value/meaning
nNOut_a	INT	Speed setpoint output signal <ul style="list-style-type: none"> Scaling: 16384 ≙ 100 %
bRfgIEqO	BOOL	Status signal "setpoint = 0"

Identifier	Data type	Value/meaning														
wState	WORD	Bit-coded status word <ul style="list-style-type: none"> Bits that are not listed are reserved for future extensions. <table border="1"> <tr><td>Bit 0</td><td>No blocking zone active</td></tr> <tr><td>Bit 1</td><td>Blocking zone 1 active</td></tr> <tr><td>Bit 2</td><td>Blocking zone 2 active</td></tr> <tr><td>Bit 3</td><td>Blocking zone 3 active</td></tr> <tr><td>Bit 4</td><td>Jog in blocking zone</td></tr> <tr><td>Bit 5</td><td>MaxLimit active</td></tr> <tr><td>Bit 6</td><td>MinLimit active</td></tr> </table>	Bit 0	No blocking zone active	Bit 1	Blocking zone 1 active	Bit 2	Blocking zone 2 active	Bit 3	Blocking zone 3 active	Bit 4	Jog in blocking zone	Bit 5	MaxLimit active	Bit 6	MinLimit active
Bit 0	No blocking zone active															
Bit 1	Blocking zone 1 active															
Bit 2	Blocking zone 2 active															
Bit 3	Blocking zone 3 active															
Bit 4	Jog in blocking zone															
Bit 5	MaxLimit active															
Bit 6	MinLimit active															
nSetValue_a	INT	Speed-setpoint input signal of the ramp function generator <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 % 														

Parameter

Parameter	Possible settings			Info												
C00012	0.000	s	999.900	Acceleration time T_{ir} for the main setpoint <ul style="list-style-type: none"> Lenze setting: 0.000 s 												
C00013	0.000	s	999.900	Deceleration time T_{if} for the main setpoint <ul style="list-style-type: none"> Lenze setting: 0.000 s 												
C00039/1..15	-199.99	%	199.99	Fixed setpoints (JOG setpoints) <ul style="list-style-type: none"> Lenze setting: 0.00 % 												
C00101/1..15	0.000	s	999.900	Alternative acceleration times (T_{ir}) for the main setpoint <ul style="list-style-type: none"> Lenze setting: 0.000 s 												
C00103/1..15	0.000	s	999.900	Alternative deceleration times (T_{if}) for the main setpoint <ul style="list-style-type: none"> Lenze setting: 0.000 s 												
C00134	<table border="1"> <tr><td>0</td><td>Off</td></tr> <tr><td>1</td><td>PT1 behaviour</td></tr> </table>			0	Off	1	PT1 behaviour	Activates ramp rounding with PT1 behaviour for the main setpoint <ul style="list-style-type: none"> The corresponding S-ramp time must be set in C00182. Lenze setting: 0 (deactivated) 								
0	Off															
1	PT1 behaviour															
C00182	0.01	s	50.00	S-ramp time PT1 <ul style="list-style-type: none"> Lenze setting: 20.00 s 												
C00190	<table border="1"> <tr><td>0</td><td>NOut = NSet</td></tr> <tr><td>1</td><td>NOut = NSet + NAdd</td></tr> <tr><td>2</td><td>NOut = NSet - NAdd</td></tr> <tr><td>3</td><td>NOut = (NSet * NAdd) / 100%</td></tr> <tr><td>4</td><td>NOut = (NSet * 1%) / NAdd </td></tr> <tr><td>5</td><td>NOut = (NSet * 100%) / (100% - NAdd)</td></tr> </table>			0	NOut = NSet	1	NOut = NSet + NAdd	2	NOut = NSet - NAdd	3	NOut = (NSet * NAdd) / 100%	4	NOut = (NSet * 1%) / NAdd	5	NOut = (NSet * 100%) / (100% - NAdd)	Selection of the arithmetic function for combining main and additional setpoint <ul style="list-style-type: none"> Lenze setting <ul style="list-style-type: none"> The additional setpoint is not processed.
0	NOut = NSet															
1	NOut = NSet + NAdd															
2	NOut = NSet - NAdd															
3	NOut = (NSet * NAdd) / 100%															
4	NOut = (NSet * 1%) / NAdd															
5	NOut = (NSet * 100%) / (100% - NAdd)															
C00220	0.000	s	999.900	Acceleration time T_{ir} for the additional setpoint <ul style="list-style-type: none"> Lenze setting: 0.000 s 												

Parameter	Possible settings			Info
C00221	0.000	s	999.900	Deceleration time T_{if} for the additional setpoint <ul style="list-style-type: none"> Lenze setting: 0.000 s
C00241	0.00	%	100.00	Hysteresis window for zero detection of speed output setpoint (output $bRfgIEqO$) <ul style="list-style-type: none"> Lenze setting: 0.50 %
C00632/1...3	0.00	%	199.99	Maximum limit values for the speed blocking zones <ul style="list-style-type: none"> Selection of the maximum limit values for the blocking zones in which the speed must not be constant. Lenze setting: 0.00 %
C00633/1...3	0.00	%	199.99	Minimum limit values for the speed blocking zones <ul style="list-style-type: none"> Selection of the minimum limit values for the blocking zones in which the speed must not be constant. Lenze setting: 0.00 %
C00634				Status (bit-coded) <ul style="list-style-type: none"> Bits that are not listed are reserved for future extensions.
	Bit 0	No blocking zone active		
	Bit 1	Blocking zone 1 active		
	Bit 2	Blocking zone 2 active		
	Bit 3	Blocking zone 3 active		
	Bit 4	Jog in blocking zone		
	Bit 5	MaxLimit active		
	Bit 6	MinLimit active		
C00635	-199.99	%	199.99	nMaxLimit <ul style="list-style-type: none"> Maximum speed setpoint for speed setpoint limitation Lenze setting: 199.99 %
C00636	-199.99	%	199.99	nMinLimit <ul style="list-style-type: none"> Minimum speed setpoint for speed setpoint limitation Lenze setting: -199.99 %

18.1.117.1 Main setpoint path

- ▶ The signals in the main setpoint path are limited to a value range of ± 32767 .
- ▶ The signal at $nNSet_a$ is first led via the JOG selection function.
- ▶ A selected JOG value switches the $nNSet_a$ input inactive. Then, the subsequent signal conditioning operates with the JOG value.

18.1.117.2 JOG setpoints

In addition to the direct main setpoint selection via the *nNSet_a* input, so-called JOG setpoints can be preset in [C00039/1...15](#).

- ▶ The JOG setpoints are binary-coded and can be called using the *bJog1 ... bJog8* selection inputs so that 15 options are available:

Selection inputs				Main setpoint Main setpoint
bJog8	bJog4	bJog2	bJog1	
FALSE	FALSE	FALSE	FALSE	<i>nNset_a</i>
FALSE	FALSE	FALSE	TRUE	C00039/1
FALSE	FALSE	TRUE	FALSE	C00039/2
FALSE	FALSE	TRUE	TRUE	C00039/3
FALSE	TRUE	FALSE	FALSE	C00039/4
FALSE	TRUE	FALSE	TRUE	C00039/5
FALSE	TRUE	TRUE	FALSE	C00039/6
FALSE	TRUE	TRUE	TRUE	C00039/7
TRUE	FALSE	FALSE	FALSE	C00039/8
TRUE	FALSE	FALSE	TRUE	C00039/9
TRUE	FALSE	TRUE	FALSE	C00039/10
TRUE	FALSE	TRUE	TRUE	C00039/11
TRUE	TRUE	FALSE	FALSE	C00039/12
TRUE	TRUE	FALSE	TRUE	C00039/13
TRUE	TRUE	TRUE	FALSE	C00039/14
TRUE	TRUE	TRUE	TRUE	C00039/15

- ▶ The number of selection inputs to be assigned depends on the number of JOG setpoints required:

Number of JOG setpoints required	Number of selection inputs to be assigned (bJog1 ... bJog8)
1	At least 1
2 ... 3	at least 2
4 ... 7	at least 3
8 ... 15	4

18.1.117.3 Setpoint inversion

The output signal of the JOG function is led via an inverter.

The sign of the setpoint changes if *bNSetInv* is set to TRUE.

18.1.117.4 Value range of the input signal

The value range of the input signal can be limited by using the following parameters:

- ▶ [C00635](#): MaxLimit (default setting: +199.99 %)
- ▶ [C00636](#): MinLimit (default setting: -199.99 %)

18.1.117.5 Skip frequency function

If the speed setpoints in speed-variable drives are linearly increasing, for instance, the frequency/speed range is divided into a number of equal time segments. Therefore, there may be speeds during acceleration time which must be bridged very fast (e.g. natural resonant frequencies).

The skip frequency function offers the opportunity to select a range in which the initial speed is maintained. If the speed setpoint leaves that range, the drive will be accelerated to reach the desired speed.



Note!

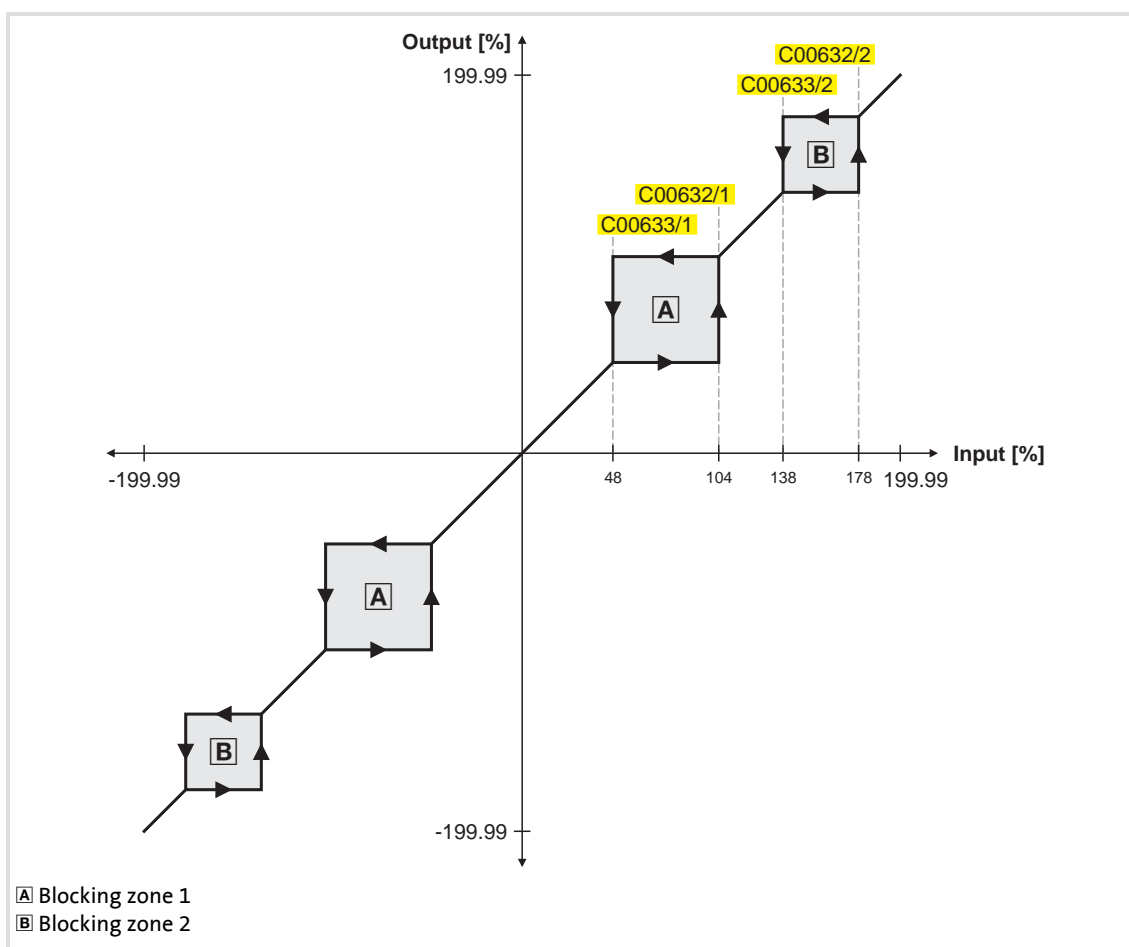
- Skip frequencies only affect main setpoints.
- It is not possible to exclude "0" speed if there is a sign reversal of the speed setpoint.

Definition of the blocking zones

The subcodes of codes [C00632](#) and [C00633](#) can be used to define three zones which are to be skipped by the output setpoint and which are to be passed as fast as possible by the ramp function generator.

The example below shows the parameter setting of two blocking zones:

Parameter	Blocking zone 1	Blocking zone 2	Blocking zone 3
Minimum limit value	C00633/1: 48 %	C00633/2: 138 %	C00633/3: 0 %
Maximum limit value	C00632/1: 104 %	C00632/2: 178 %	C00632/3: 0 %



[18-44] Zone masking by means of parameterisable blocking zones

- ▶ The parameterised blocking zones have the same effect on negative input signals.
- ▶ A blocking zone is deactivated by entering identical limit values (in our example: Blocking zone 3).

Overlapping of blocking zones

If blocking zones overlap, the lowest and highest value of the overlapping zones form a new zone.

In this case, the status display (output *wState* or display parameter [C00634](#)) only indicates one zone (the lower of the two original zones).

Abutting blocking zones

If two blocking zones abut (e.g. 20 ... 30 % and 30 ... 40 %), the limit value between the two zones (in this example 30 %) is also passed through.

The same applies to a limit range of 0 ... xx %. During zero crossing of the speed setpoint, "0" speed is output as setpoint. It is possible to exclude "0" speed. However, in this case, the output speed will remain on the upper limit value when the input setpoint becomes "0".

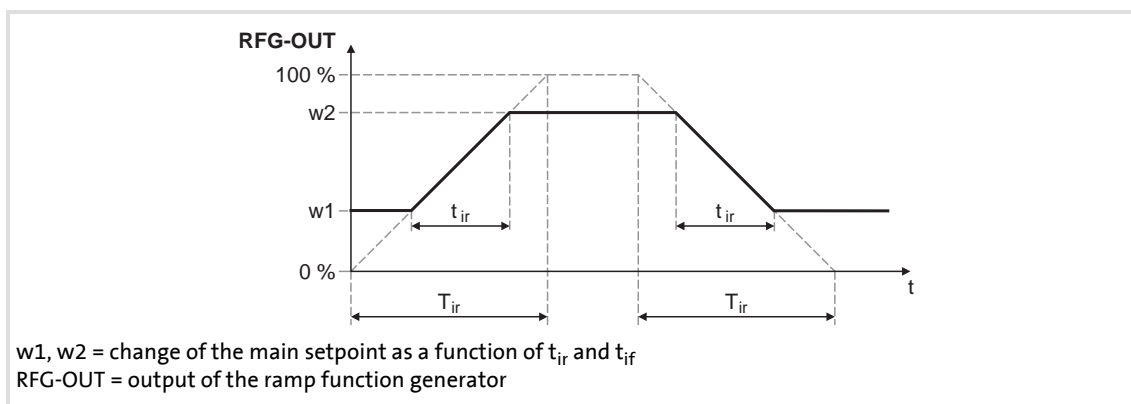


Tip!

As described above, the acceleration phase starts after the blocking zones have been passed through. The ramp function generator integrated in the **L_Nset** function block limits the progression of the speed. For this reason, the time values set for the integrated ramp function generator should be as low as possible whereas the setpoint for the **L_Nset** function block should be generated by a ramp function generator with higher time values (e.g. [L_MPot](#) function block).

18.1.117.6 Ramp function generator for the main setpoint

The setpoint is now led via a ramp function generator with linear characteristic. The ramp function generator converts setpoint step-changes at the input into a ramp.



[18-45] Acceleration and deceleration times

- ▶ t_{ir} and t_{if} are the desired times for changing between $w1$ and $w2$.
- ▶ S-ramps are possible by selecting S-ramp times.
- ▶ The t_{ir}/t_{if} values are converted into the required T_i times according to the following formula:

$$T_{ir} = t_{ir} \cdot \frac{100\%}{w2 - w1}$$

$$T_{if} = t_{if} \cdot \frac{100\%}{w2 - w1}$$

Setting and selection of T_i times

Via parameters, you can select 16 different T_{ir} and T_{if} times each for the ramp function generator.

- ▶ The selection is made via the binary coded selection inputs $bT11 \dots bT18$:

Selection inputs				Used Acceleration time	Used Deceleration time
bT18	bT14	bT12	bT11		
FALSE	FALSE	FALSE	FALSE	C00012	C00013
FALSE	FALSE	FALSE	TRUE	C00101/1	C00103/1
FALSE	FALSE	TRUE	FALSE	C00101/2	C00103/2
FALSE	FALSE	TRUE	TRUE	C00101/3	C00103/3
FALSE	TRUE	FALSE	FALSE	C00101/4	C00103/4
FALSE	TRUE	FALSE	TRUE	C00101/5	C00103/5
FALSE	TRUE	TRUE	FALSE	C00101/6	C00103/6
FALSE	TRUE	TRUE	TRUE	C00101/7	C00103/7
TRUE	FALSE	FALSE	FALSE	C00101/8	C00103/8
TRUE	FALSE	FALSE	TRUE	C00101/9	C00103/9
TRUE	FALSE	TRUE	FALSE	C00101/10	C00103/10
TRUE	FALSE	TRUE	TRUE	C00101/11	C00103/11
TRUE	TRUE	FALSE	FALSE	C00101/12	C00103/12
TRUE	TRUE	FALSE	TRUE	C00101/13	C00103/13

bTI8	Selection inputs			Used Acceleration time	Used Deceleration time
	bTI4	bTI2	bTI1		
TRUE	TRUE	TRUE	FALSE	C00101/14	C00103/14
TRUE	TRUE	TRUE	TRUE	C00101/15	C00103/15

Function

- ▶ When the controller is inhibited (CINH), the ramp function generator accepts the value applied at *nClnhVal_a* and transfers it to the downstream function. This function has priority over all other functions.
- ▶ *bRfgStop* = TRUE
 - The ramp function generator is stopped. Changes at the input of the ramp function generator have no effect on the output signal.
- ▶ *bRfg0* = TRUE
 - The ramp function generator runs to 0 along its deceleration ramp.
- ▶ Furthermore it is possible to load the ramp function generator online with a defined value. For this purpose, *bLoad* must be set to TRUE. As long as this input is set, the value at *nSet_a* is transferred to the ramp function generator and provided at the output.

Priorities:

CINH	bLoad	bRfg0	bRfgStop	Function
FALSE	FALSE	FALSE	FALSE	The ramp function generator follows the input value via the set ramps.
FALSE	FALSE	FALSE	TRUE	Stop the ramp function generator: The value at the output of the ramp function generator is held.
FALSE	FALSE	TRUE	FALSE	Ramp down the ramp function generator: The ramp function generator runs to 0 within the set deceleration time.
FALSE	FALSE	TRUE	TRUE	
FALSE	TRUE	FALSE	FALSE	Load ramp function generator online: The ramp function generator accepts the value at <i>nSet_a</i> and provides it at its output.
FALSE	TRUE	FALSE	TRUE	
FALSE	TRUE	TRUE	FALSE	
FALSE	TRUE	TRUE	TRUE	
TRUE	FALSE	FALSE	FALSE	Controller inhibit: The ramp function generator accepts the value at <i>nClnhVal_a</i> and provides it at its output.
TRUE	FALSE	FALSE	TRUE	
TRUE	FALSE	TRUE	FALSE	
TRUE	FALSE	TRUE	TRUE	
TRUE	TRUE	FALSE	FALSE	
TRUE	TRUE	FALSE	TRUE	
TRUE	TRUE	TRUE	FALSE	
TRUE	TRUE	TRUE	TRUE	

18.1.117.7 S-shaped ramp

A PT1 element is connected downstream of the linear ramp function generator. This arrangement implements an S-shaped ramp for a nearly jerk-free acceleration and deceleration.

- ▶ The PT1 element can be switched on/off via the *bSShapeActive* input.
- ▶ The corresponding S-ramp time can be set under [C00182](#).

18.1.117.8 Additional setpoint

Use the *nNAdd_a* input to define an additional value (e.g. a correcting signal) and combine it arithmetically with the main setpoint *nNSet_a*.

- ▶ First, the additional setpoint is led via a ramp function generator with linear characteristic. Its Ti times can be set in [C00220](#) (acceleration time) and [C00221](#) (deceleration time).
- ▶ When the input *bNAddInv* is set to TRUE, the additional setpoint can be inverted before having an effect on the ramp function generator.
- ▶ When the input *bLoad* is set to TRUE, the ramp function generator is set to zero for the additional setpoint and held there without considering the Ti times. The same applies when the controller is inhibited.
- ▶ The following arithmetic combination of main setpoint and additional setpoint can be selected in [C00190](#):

Value in C00190	Function	Info
0	$nNOut_a = nNSet_a$	The additional setpoint <i>nNAdd_a</i> is not processed.
1	$nNOut_a = nNSet_a + nNAdd_a$	
2	$nNOut_a = nNSet_a - nNAdd_a$	
3	$nNOut_a = (nNSet_a * nNAdd_a) / 100 \%$	Internal scaling:
4	$nNOut_a = (nNSet_a * 1 \%) / nNAdd_a $	• 100 % ≙ 16384
5	$nNOut_a = (nNSet_a * 100 \%) / (100 \% - nNAdd_a)$	• 1 % ≙ 164

18.1.117.9 Application example for the additional load function

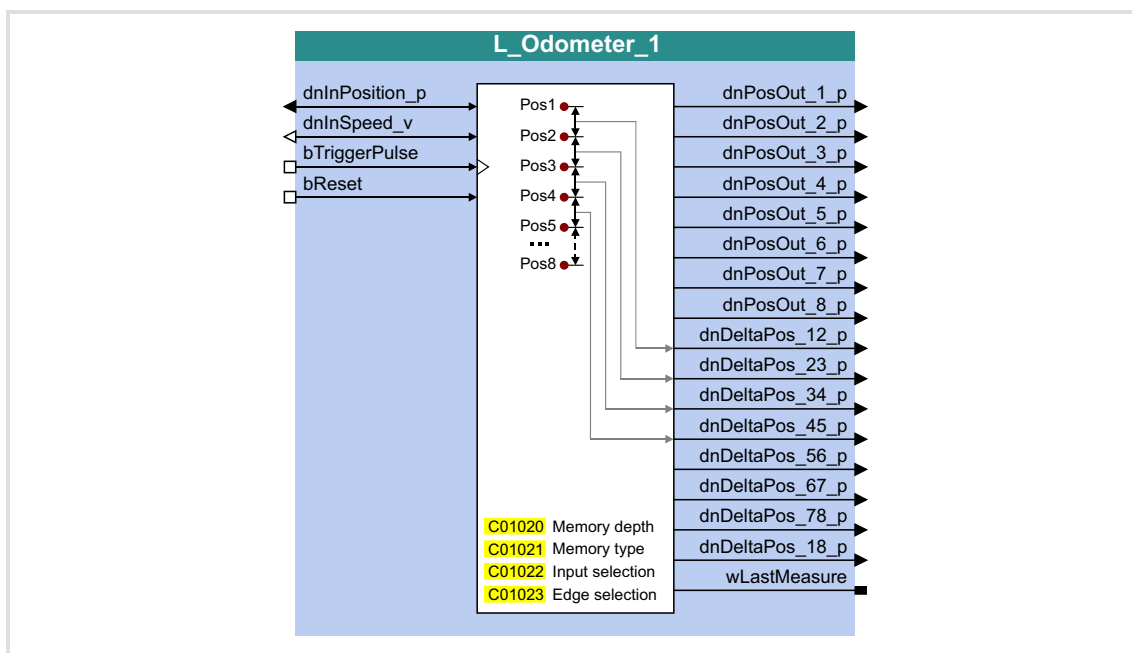
The motor control of the drive is provided with a function for automatically carrying along ramp function generators for "jerk-free" setpoint connection. For speed-controlled drive tasks, the [LS MotorInterface](#) SB outputs the current actual speed value via the *nHlgSetValue_a* output (e.g. in case of a pulse inhibit, flying restart, controller inhibit).

- ▶ In case of a pulse inhibit, the main setpoint generator must be carried along with the current actual speed value to ensure jerk-free setpoint transfer.
- ▶ The actual speed value is carried along automatically if the following wiring is provided:
 - [LS MotorInterface.nHlgSetValue_a](#) → [L_NSet_1.nClnhValue_a](#)
 - [LS MotorInterface.bHlgLoad](#) → [L_NSet_1.bExternalCINH](#)

18.1.118 L_Odometer_1

This FB is used to detect positions and calculate distances.

- ▶ Depending on the input selection set in [C01022](#), a position signal can be detected at the *dnInPosition_p* input or a speed can be detected at the *nInSpeed_v* input.
- ▶ The position is detected/accepted via the edge selected in [C01023](#) at the *bTriggerPulse* input.
- ▶ If "Ring buffer" is selected in [C01021](#), the measurement will start all over again after the number of measurements selected in [C01020](#) has been performed and the old values will be overwritten. Otherwise, the measurement will stop.



Inputs

Identifier	Data type	Information/possible settings
<i>dnInPosition_p</i>	DINT	Position measurement input <ul style="list-style-type: none"> • Input is only evaluated if C01022 = "0: Pos input" has been set.
<i>nInSpeed_v</i>	INT	Speed measurement input <ul style="list-style-type: none"> • The speed is internally integrated into a position. • Input is only evaluated if C01022 = "1: V input" has been set.
<i>bTriggerPulse</i>	BOOL	Detect position/speed <ul style="list-style-type: none"> • The tripping edge can be parameterised in C01023.
<i>bReset</i>	BOOL	Reset measurement results and internal integrator
		TRUE Reset measurement results and internal integrator.

Outputs

Identifier	Data type	Value/meaning
dnPosOut_1_p ... dnPosOut_8_p	DINT	Detected positions
dnDeltaPos_12_p dnDeltaPos_23_p dnDeltaPos_34_p ... dnDeltaPos_18_p	DINT	Calculated distances between the detected positions <ul style="list-style-type: none"> • <i>dnDeltaPos_12_p</i> = Distance between <i>dnPosOut_1_p</i> and <i>dnPosOut_2_p</i> • <i>dnDeltaPos_23_p</i> = Distance between <i>dnPosOut_2_p</i> and <i>dnPosOut_3_p</i> • <i>dnDeltaPos_34_p</i> = Distance between <i>dnPosOut_3_p</i> and <i>dnPosOut_4_p</i> • ... • <i>dnDeltaPos_18_p</i> = Distance between <i>dnPosOut_1_p</i> and <i>dnPosOut_8_p</i>
wLastMeasure	WORD	Memory location number (1 ... 8) of the last measurement

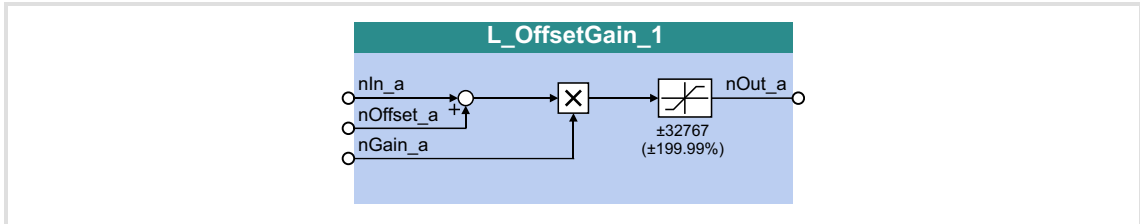
Parameter

Parameter	Possible settings	Info								
C01020	<table border="1"> <tr><td>1</td><td>1 measurement</td></tr> <tr><td>2</td><td>2 measurements</td></tr> <tr><td>...</td><td>...</td></tr> <tr><td>7</td><td>7 measurements</td></tr> </table>	1	1 measurement	2	2 measurements	7	7 measurements	Memory size <ul style="list-style-type: none"> • Lenze setting: 7 measurements
1	1 measurement									
2	2 measurements									
...	...									
7	7 measurements									
C01021	<table border="1"> <tr><td>0</td><td>No ring buffer</td></tr> <tr><td>1</td><td>Ring buffer</td></tr> </table>	0	No ring buffer	1	Ring buffer	Memory type <ul style="list-style-type: none"> • Lenze setting: No ring buffer 				
0	No ring buffer									
1	Ring buffer									
C01022	<table border="1"> <tr><td>0</td><td>Pos input</td></tr> <tr><td>1</td><td>V input</td></tr> </table>	0	Pos input	1	V input	Input selection <ul style="list-style-type: none"> • Lenze setting: Pos input 				
0	Pos input									
1	V input									
C01023	<table border="1"> <tr><td>0</td><td>High edge</td></tr> <tr><td>1</td><td>Low edge</td></tr> <tr><td>2</td><td>High and low edge</td></tr> </table>	0	High edge	1	Low edge	2	High and low edge	Edge selection <ul style="list-style-type: none"> • Lenze setting: HIGH edge 		
0	High edge									
1	Low edge									
2	High and low edge									

18.1.119 L_OffsetGain_1

This FB can add an offset to an analog input signal and then amplify it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via FB inputs.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %
nOffset_a	INT	Offset <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %
nGain_a	INT	Gain factor <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % • 199.99 % \approx 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199.99\%$

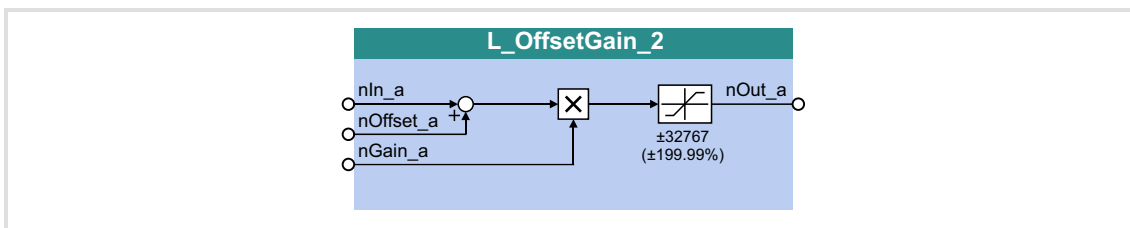
Function

$$nOut_a = (nIn_a + \text{Offset}) \cdot \text{Gain factor}$$

18.1.120 L_OffsetGain_2

This FB can add an offset to an analog input signal and then amplify it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via FB inputs.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %
nOffset_a	INT	Offset <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 %
nGain_a	INT	Gain factor <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % • 199.99 % \approx 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199.99\%$

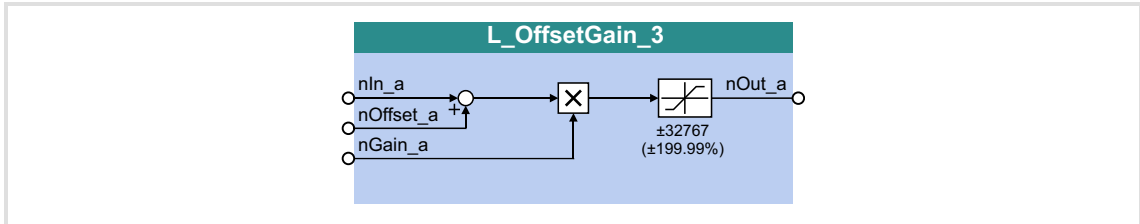
Function

$$nOut_a = (nIn_a + \text{Offset}) \cdot \text{Gain factor}$$

18.1.121 L_OffsetGain_3

This FB can add an offset to an analog input signal and then amplify it. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via FB inputs.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal • Scaling: 16384 \equiv 100 %
nOffset_a	INT	Offset • Scaling: 16384 \equiv 100 %
nGain_a	INT	Gain factor • Scaling: 16384 \equiv 100 % • 199.99 % \approx 2

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to $\pm 199.99\%$

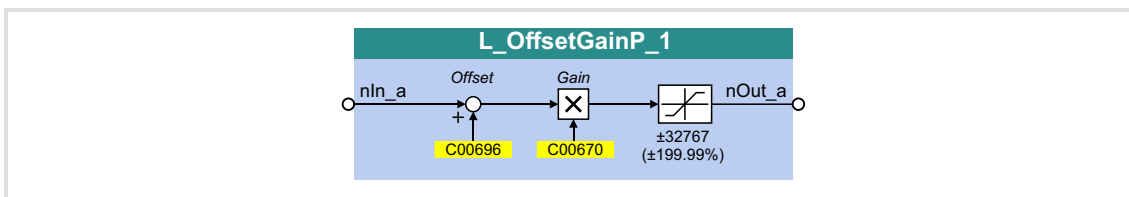
Function

$$nOut_a = (nIn_a + Offset) \cdot Gain\ factor$$

18.1.122 L_OffsetGainP_1

This FB can add an offset to an analog input signal and amplify it afterwards. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via parameters.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199.99\%$

Parameter

Parameter	Possible settings			Info
C00670	-100.0000		100.0000	Gain factor <ul style="list-style-type: none"> • High gain factor for further processing of smallest input signals. • Please observe the difference with regard to the gain factors of other blocks in percent ($\pm 199.99\% \approx 2$). • Lenze setting: 1.0000
C00696	-199.99	%	199.99	Offset <ul style="list-style-type: none"> • Lenze setting: 0.00 %

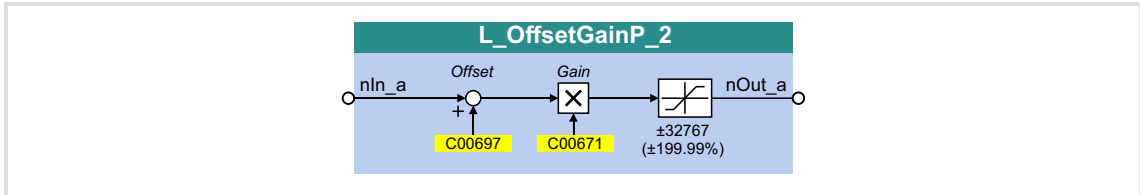
Function

$$nOut_a = (nIn_a + Offset) \cdot Gain\ factor$$

18.1.123 L_OffsetGainP_2

This FB can add an offset to an analog input signal and amplify it afterwards. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via parameters.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal • Internal limitation to $\pm 199.99\%$

Parameter

Parameter	Possible settings			Info
C00671	-100.0000		100.0000	Gain factor • High gain factor for further processing of smallest input signals. • Please observe the difference with regard to the gain factors of other blocks in percent ($\pm 199.99\% \approx 2$). • Lenze setting: 1.0000
C00697	-199.99	%	199.99	Offset • Lenze setting: 0.00 %

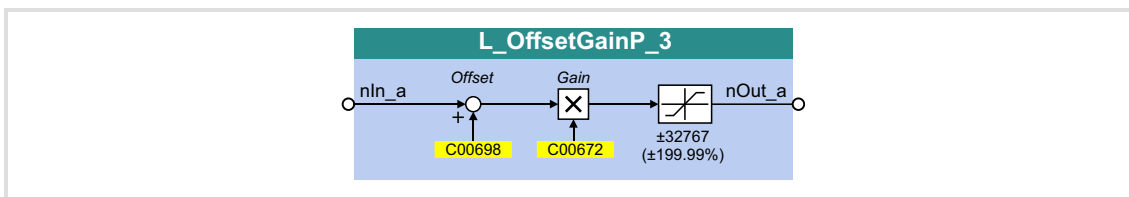
Function

$$nOut_a = (nIn_a + Offset) \cdot Gain\ factor$$

18.1.124 L_OffsetGainP_3

This FB can add an offset to an analog input signal and amplify it afterwards. Preferably to be interconnected directly after the analog input terminals.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via parameters.
- ▶ The value provided at the *nOut_a* output is internally limited to $\pm 199.99\%$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199.99\%$

Parameter

Parameter	Possible settings			Info
C00672	-100.0000		100.0000	Gain factor <ul style="list-style-type: none"> • High gain factor for further processing of smallest input signals. • Please observe the difference with regard to the gain factors of other blocks in percent ($\pm 199.99\% \approx 2$). • Lenze setting: 1.0000
C00698	-199.99	%	199.99	Offset <ul style="list-style-type: none"> • Lenze setting: 0.00 %

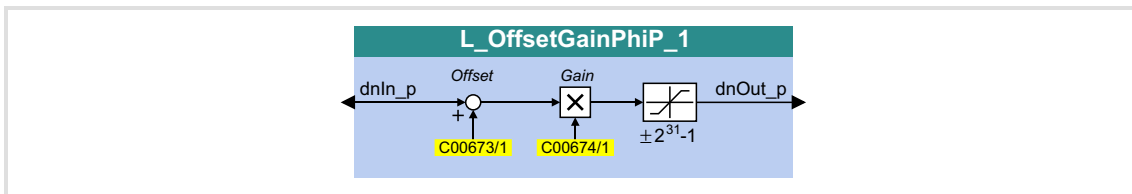
Function

$$nOut_a = (nIn_a + Offset) \cdot Gain\ factor$$

18.1.125 L_OffsetGainPhiP_1

This FB can add an offset to an angle signal and amplify it afterwards.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via parameters.
- ▶ The value provided at the *dnOut_p* output is internally limited to $\pm 2^{31}-1$.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

Parameter

Parameter	Possible settings			Info
C00673/1	-2147483647	Incr.	2147483647	Offset • Lenze setting: 0 incr.
C00674/1	-2147483647		2147483647	Gain factor • Lenze setting: 65536

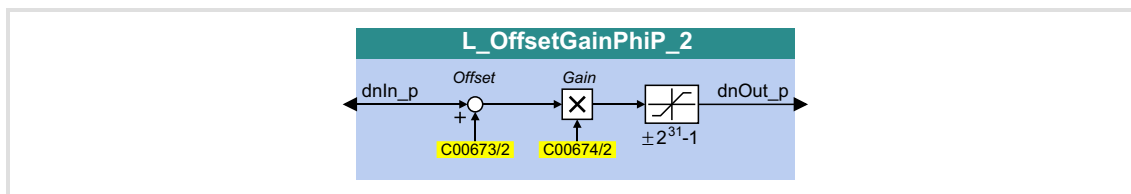
Function

$$dnOut_p = (dnIn_p + Offset) \cdot Gain\ factor$$

18.1.126 L_OffsetGainPhiP_2

This FB can add an offset to an angle signal and amplify it afterwards.

- ▶ The internal calculations (addition and subtraction) are carried out with 32 bits without overflow/underflow. Division is not remainder considered.
- ▶ Offset and gain are selected via parameters.
- ▶ The value provided at the *dnOut_p* output is internally limited to $\pm 2^{31}-1$.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal • Internal limitation to $\pm 2^{31}-1$ (± 2147483647)

Parameter

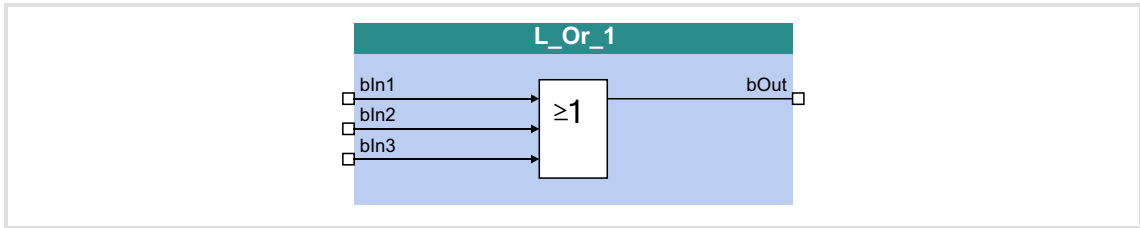
Parameter	Possible settings			Info
C00673/2	-2147483647	Incr.	2147483647	Offset • Lenze setting: 0 incr.
C00674/2	-2147483647		2147483647	Gain factor • Lenze setting: 65536

Function

$$dnOut_p = (dnIn_p + Offset) \cdot Gain\ factor$$

18.1.127 L_Or_1

This FB implements the ORing of the inputs signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 bIn2 bIn3	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

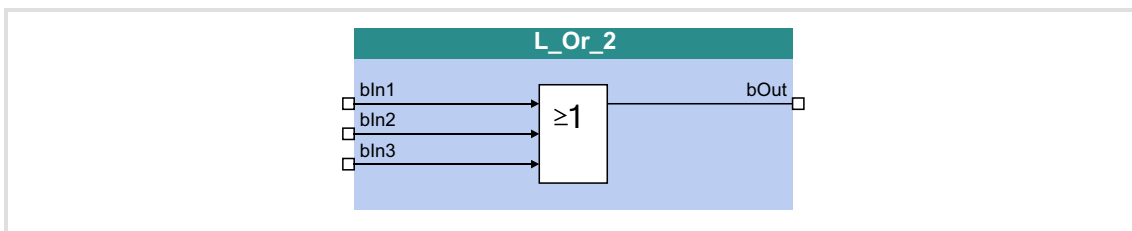
Function

Inputs			Output
bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	TRUE	TRUE
FALSE	TRUE	FALSE	TRUE
FALSE	TRUE	TRUE	TRUE
TRUE	FALSE	FALSE	TRUE
TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE

[18-46] Truth table of the FB L_Or_1

18.1.128 L_Or_2

This FB implements the ORing of the inputs signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 bIn2 bIn3	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

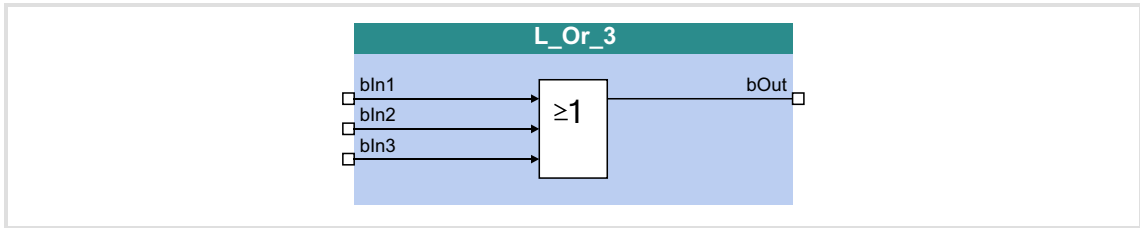
Function

Inputs			Output
bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	TRUE	TRUE
FALSE	TRUE	FALSE	TRUE
FALSE	TRUE	TRUE	TRUE
TRUE	FALSE	FALSE	TRUE
TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE

[18-47] Truth table of the FB L_Or_2

18.1.129 L_Or_3

This FB implements the ORing of the inputs signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 bIn2 bIn3	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

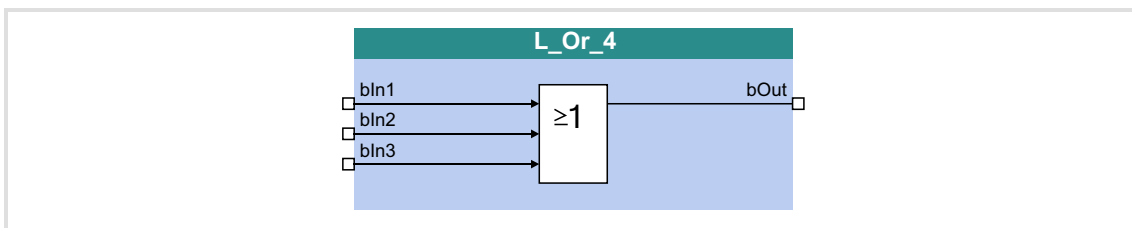
Function

Inputs			Output
bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	TRUE	TRUE
FALSE	TRUE	FALSE	TRUE
FALSE	TRUE	TRUE	TRUE
TRUE	FALSE	FALSE	TRUE
TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE

[18-48] Truth table of the L_Or_3 FB

18.1.130 L_Or_4

This FB implements the ORing of the inputs signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 bIn2 bIn3	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

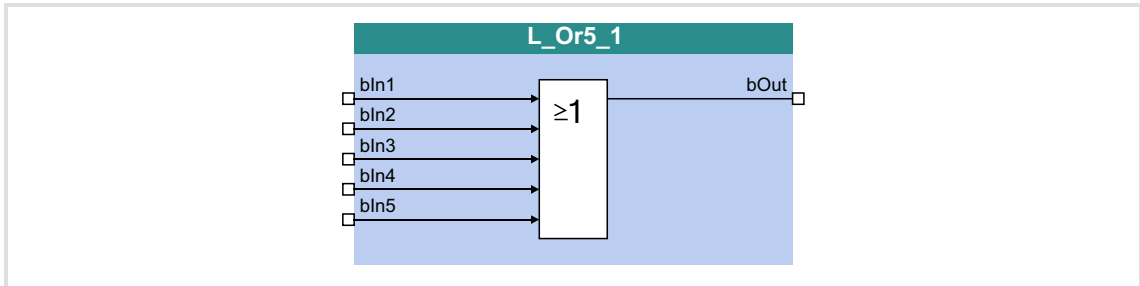
Function

Inputs			Output
bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	TRUE	TRUE
FALSE	TRUE	FALSE	TRUE
FALSE	TRUE	TRUE	TRUE
TRUE	FALSE	FALSE	TRUE
TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE

[18-49] Truth table of the L_Or_4 FB

18.1.131 L_Or5_1

This FB implements the ORing of the inputs signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 ... bIn5	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

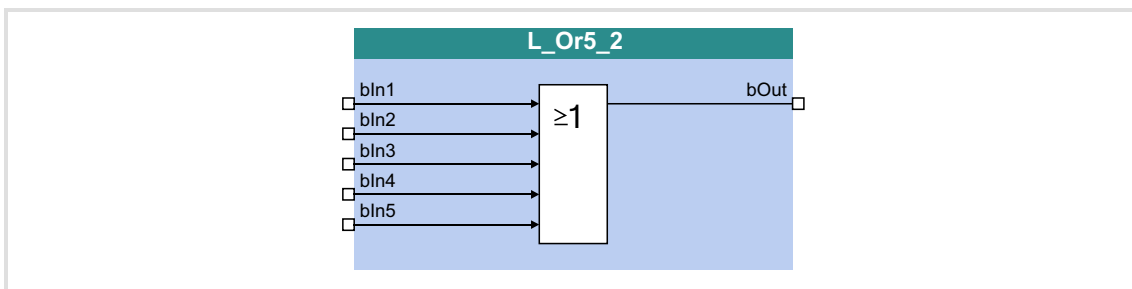
Function

Inputs					Output
bIn5	bIn4	bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	FALSE	FALSE	TRUE	TRUE
FALSE	FALSE	FALSE	TRUE	FALSE	TRUE
FALSE	FALSE	FALSE	TRUE	TRUE	TRUE
FALSE	FALSE	TRUE	FALSE	FALSE	TRUE
...					
TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

[18-50] Truth table of the FB L_Or5_1

18.1.132 L_Or5_2

This FB implements the ORing of the inputs signals.



Inputs

Identifier	Data type	Information/possible settings
bIn1 ... bIn5	BOOL	Input signal

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal

Function

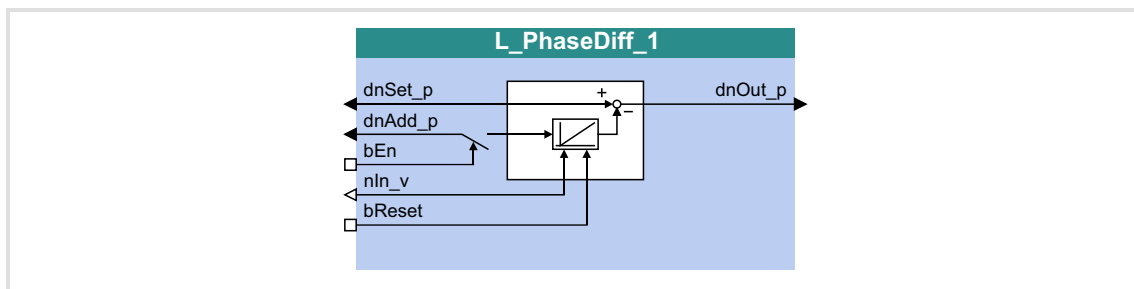
Inputs					Output
bIn5	bIn4	bIn3	bIn2	bIn1	bOut
FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
FALSE	FALSE	FALSE	FALSE	TRUE	TRUE
FALSE	FALSE	FALSE	TRUE	FALSE	TRUE
FALSE	FALSE	FALSE	TRUE	TRUE	TRUE
FALSE	FALSE	TRUE	FALSE	FALSE	TRUE
...					
TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

[18-51] Truth table of the FB L_Or5_2

18.1.133 L_PhaseDiff_1

This FB generates a position difference for the defined position setpoint from a position value and a speed signal.

- ▶ In an integrator, the *nIn_v* speed signal is integrated into a position value and subtracted from the *dnSet_p* position setpoint.
- ▶ In addition, the adaptive *dnAdd_p* position value can be added to the integrator content by setting *bEn* to TRUE.



Inputs

Identifier	Data type	Information/possible settings
dnSet_p	DINT	Selection of a position setpoint
dnAdd_p	DINT	Adaptive position value for the actual position
bEn	BOOL	Activate addition of the adaptive position value
	FALSE	1. The speed signal at <i>nIn_v</i> is integrated by the angle integrator. 2. The result of the angle integrator is subtracted from the angle signal at <i>dnSet_p</i> and output at <i>dnOut_p</i> afterwards.
	TRUE	The adaptive position value selected via <i>dnAdd_p</i> is added: 1. The speed signal at <i>nIn_v</i> is integrated by the angle integrator. 2. The angle signal at <i>dnAdd_p</i> is added to the integrated speed signal in every task cycle. 3. The result of the angle integrator is subtracted from the angle signal at <i>dnSet_p</i> and output at <i>dnOut_p</i> afterwards.
nIn_v	INT	Selection of the actual speed to be converted into the position value
bReset	BOOL	Reset actual angle integrator
	TRUE	Actual angle integrator is set to "0".

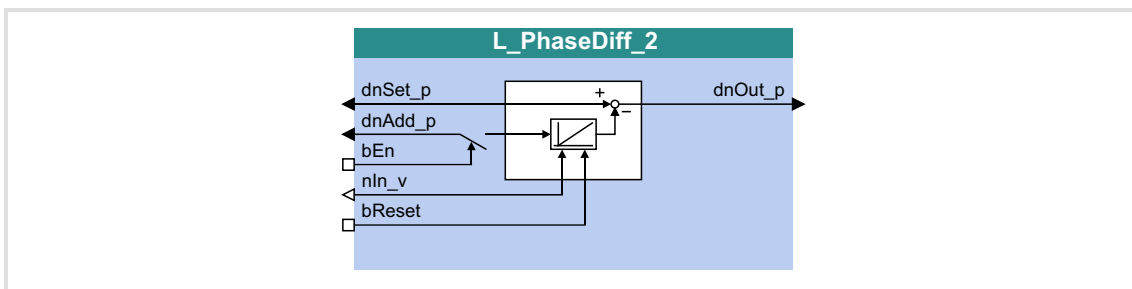
Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output angle signal (position difference) • Without limitation

18.1.134 L_PhaseDiff_2

This FB generates a position difference for the defined position setpoint from a position value and a speed signal.

- ▶ In an integrator, the *nIn_v* speed signal is integrated into a position value and subtracted from the *dnSet_p* position setpoint.
- ▶ In addition, the adaptive *dnAdd_p* position value can be added to the integrator content by setting *bEn* to TRUE.



Inputs

Identifier	Data type	Information/possible settings
dnSet_p	DINT	Selection of a position setpoint
dnAdd_p	DINT	Adaptive position value for the actual position
bEn	BOOL	Activate addition of the adaptive position value
	FALSE	1. The speed signal at <i>nIn_v</i> is integrated by the angle integrator. 2. The result of the angle integrator is subtracted from the angle signal at <i>dnSet_p</i> and output at <i>dnOut_p</i> afterwards.
	TRUE	The adaptive position value selected via <i>dnAdd_p</i> is added: 1. The speed signal at <i>nIn_v</i> is integrated by the angle integrator. 2. The angle signal at <i>dnAdd_p</i> is added to the integrated speed signal in every task cycle. 3. The result of the angle integrator is subtracted from the angle signal at <i>dnSet_p</i> and output at <i>dnOut_p</i> afterwards.
nIn_v	INT	Selection of the actual speed to be converted into the position value
bReset	BOOL	Reset actual angle integrator
	TRUE	Actual angle integrator is set to "0".

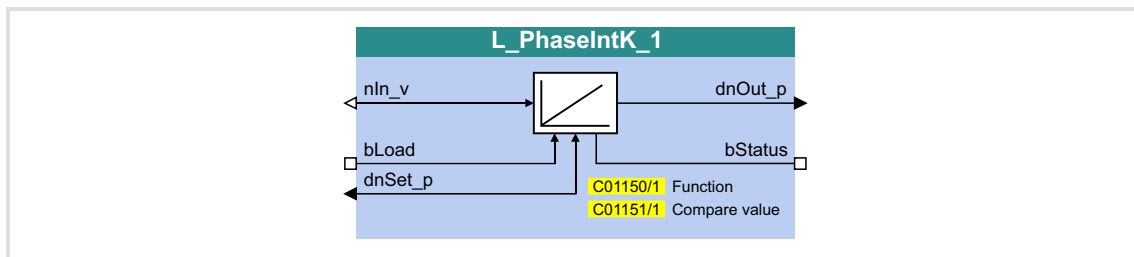
Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output angle signal (position difference) • Without limitation

18.1.135 L_PhaseIntK_1

The FB can integrate a speed or velocity to an angle (path). In addition, the FB can recognise a relatively covered distance.

- The integrator can take max. ± 32000 encoder revolutions.



Inputs

Identifier	Data type	Information/possible settings
nIn_v	INT	Selection of the actual speed • 16384 \equiv 15000 rpm
bLoad	BOOL	Load angle integrator with starting value and reset status signal TRUE Angle integrator is loaded with the value at <i>dnSet_p</i> and <i>bStatus</i> is reset to FALSE.
dnSet_p	DINT	Starting value for angle integrator

Outputs

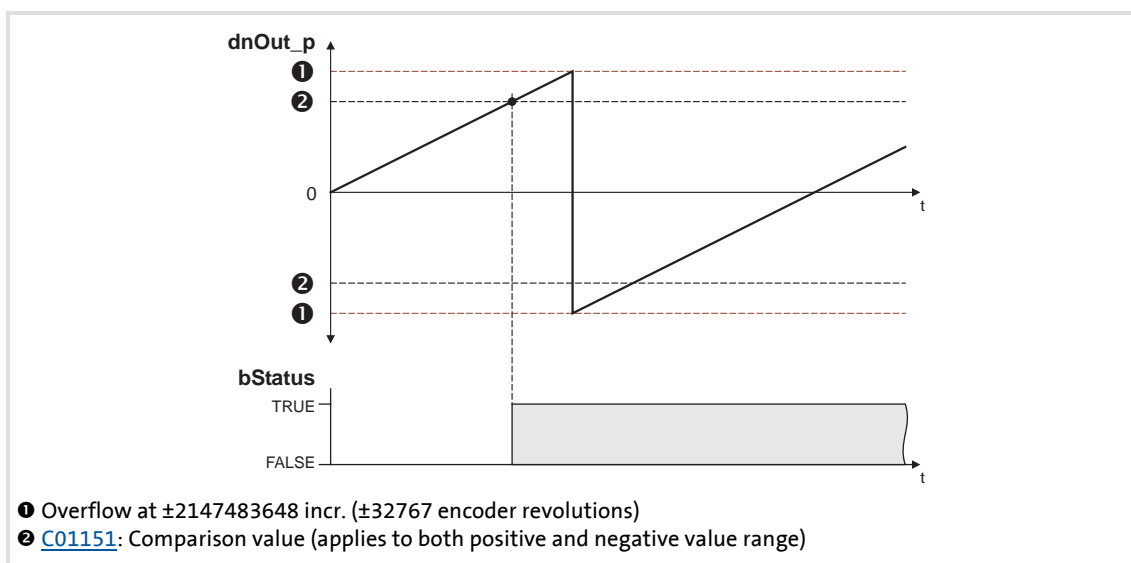
Identifier	Data type	Value/meaning
dnOut_p	DINT	Angle output signal • 65536 [incr.] \equiv 1 encoder revolution • Overflow is possible (display via <i>bStatus</i>)
bStatus	BOOL	Status signal "Overflow occurred/distance processed" • Status signal can be reset via <i>bLoad</i> . TRUE Overflow has occurred or distance is processed.

Parameter

Parameter	Possible settings	Info
C01150/1	0 Loading with level	Load integrator with TRUE level at the input <i>bLoad</i> (Lenze setting)
	1 Loading with edge	Load integrator with FALSE/TRUE edge at the input <i>bLoad</i> .
	2 Loading with level + reset	Load integrator when reaching the comparison value or with TRUE level at the input <i>bLoad</i> .
C01151/1	0	200000000 Comparison value • Is valid for both the positive and the negative value range. • Lenze setting: 0

18.1.135.1 Function at constant input value

Selection: [C01150](#) = "0: Loading with level" or "1: Loading with edge"

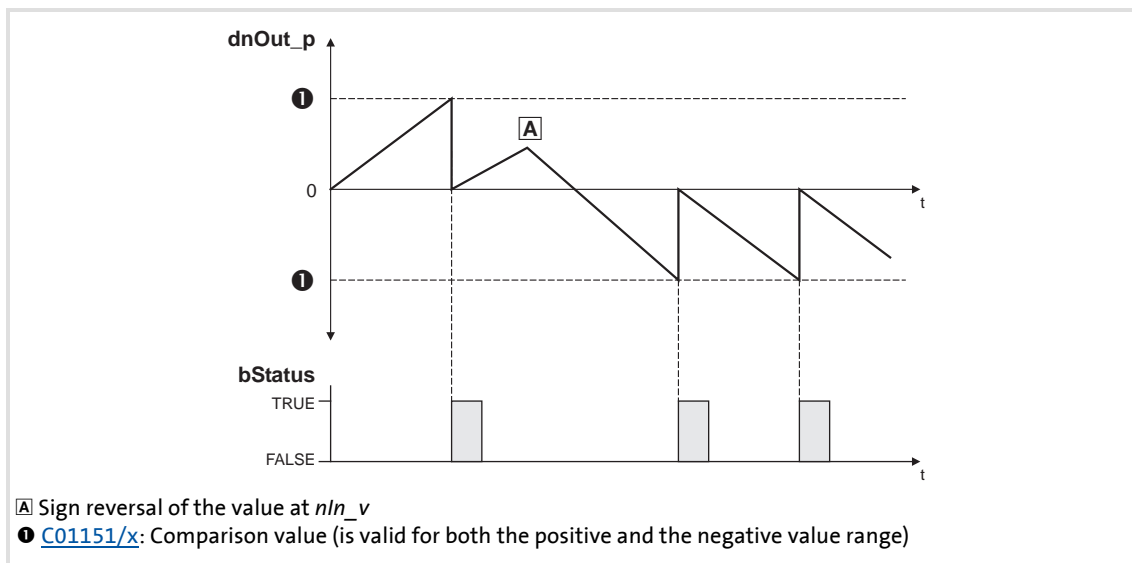


[18-52] Switching performance if the overflow is in the positive direction

- ▶ If "0: Loading with level" is selected in [C01150](#), the *bLoad* input is status-controlled: In case of a TRUE signal, the integrator is loaded with the value at *dnSet_p* and the *bStatus* output is set to FALSE.
- ▶ If "1: Loading with edge" is selected in [C01150](#), the *bLoad* input is edge-controlled: In case of a FALSE/TRUE edge, the integrator is loaded with the value at *dnSet_p* and then immediately continues to integrate, the *bStatus* output is set to FALSE.
- ▶ A positive signal at *nIn_v* is incremented (the counter content is increased with every function call).
- ▶ A negative signal at *nIn_v* is decremented (the counter content is reduced with every function call).
- ▶ *dnOut_p* outputs the counter content of the bipolar integrator.
 - If the counter content exceeds a value of +32767 encoder revolutions (corresponds to +2147483647 incr.), an overflow occurs and the counting process continues at a value of -32768 encoder revolutions.
 - If the counter content falls below a value of -32768 encoder revolutions (corresponds to -2147483648 incr.), an overflow occurs and the counting process starts at a value of +32767 encoder revolutions.
- ▶ *bStatus* will be set to TRUE if the comparison value set in [C01151/x](#) is reached.

18.1.135.2 Function at input value with sign reversal

Selection: [C01150](#) = "2: Loading with level + reset"



[18-53] Switching performance if the input signal changes signs

- ▶ If "2: Loading with level + reset" is selected in [C01150](#), the *bLoad* input is status-controlled: In case of a TRUE signal, the integrator is loaded with the value at *dnSet_p* and the *bStatus* output is set to FALSE.
- ▶ A positive signal at *n/n_v* is incremented (the counter content is increased with every function call).
- ▶ A negative signal at *n/n_v* is decremented (the counter content is reduced with every function call).
- ▶ *dnOut_p* outputs the counter content of the bipolar integrator.
 - If the positive counter content is higher than the comparison value set in [C01151/x](#), the comparison value will be subtracted from the counter content, and *bStatus* will be set to TRUE for one task cycle.
 - If the negative counter content is lower than the comparison value set in [C01151/x](#), the comparison value will be added to the counter content, and *bStatus* will be set to TRUE for one task cycle.

18.1.135.3 Calculation of the output signal

The output value at $dnOut_p$ can be detected according to the following formula:

$$dnOut_p [\text{incr.}] = nIn_v [\text{rpm}] \cdot t [\text{s}] \cdot 65535 [\text{incr./rev.}]$$

t = integration time
16384 \approx 15000 rpm
1 \approx 1 incr.

Example

You want to determine the counter content of the integrator at a certain speed at the input and a certain integration time t .

Given values:

- ▶ $nIn_v = 1000 \text{ rpm} \approx \text{integer value } 1092$
- ▶ Integration time $t = 10 \text{ s}$
- ▶ Starting value of the integrator = 0

Solution:

- ▶ Conversion of the input signal at nIn_v :

$$1000 \text{ rpm} = \frac{1000 \text{ rev.}}{60 \text{ s}}$$

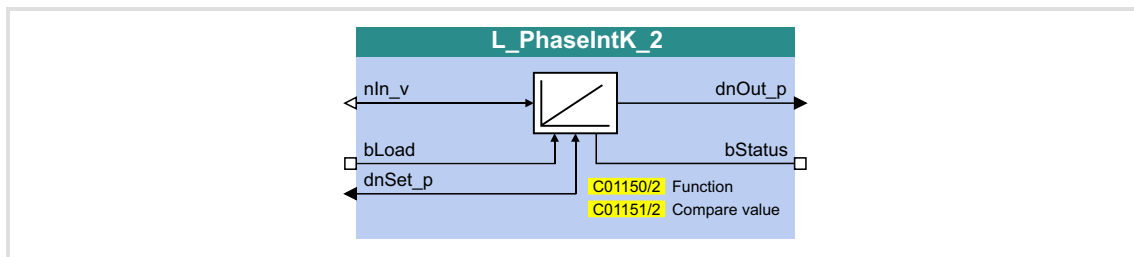
- ▶ Calculation of the output value:

$$dnOut_p = \frac{1000 \text{ rev.}}{60 \text{ s}} \cdot 10 \text{ s} \cdot \frac{65535 \text{ incr.}}{\text{Rev.}} = 10922666 \text{ incr.}$$

18.1.136 L_PhaseIntK_2

The FB can integrate a speed or velocity to an angle (path). In addition, the FB can recognise a relatively covered distance.

- The integrator can take max. ±32000 encoder revolutions.



Inputs

Identifier	Data type	Information/possible settings		
nIn_v	INT	Selection of the actual speed <ul style="list-style-type: none"> • 16384 ≙ 15000 rpm 		
bLoad	BOOL	Load angle integrator with starting value and reset status signal <table border="1"> <tr> <td>TRUE</td> <td>Angle integrator is loaded with the value at <i>dnSet_p</i> and <i>bStatus</i> is reset to FALSE.</td> </tr> </table>	TRUE	Angle integrator is loaded with the value at <i>dnSet_p</i> and <i>bStatus</i> is reset to FALSE.
TRUE	Angle integrator is loaded with the value at <i>dnSet_p</i> and <i>bStatus</i> is reset to FALSE.			
dnSet_p	DINT	Starting value for angle integrator		

Outputs

Identifier	Data type	Value/meaning		
dnOut_p	DINT	Angle output signal <ul style="list-style-type: none"> • 65536 [incr.] ≙ 1 encoder revolution • Overflow is possible (display via <i>bStatus</i>) 		
bStatus	BOOL	Status signal "Overflow occurred/distance processed" <ul style="list-style-type: none"> • Status signal can be reset via <i>bLoad</i>. <table border="1"> <tr> <td>TRUE</td> <td>Overflow has occurred or distance is processed.</td> </tr> </table>	TRUE	Overflow has occurred or distance is processed.
TRUE	Overflow has occurred or distance is processed.			

Parameter

Parameter	Possible settings	Info
C01150/2	0 Loading with level	Load integrator with TRUE level at the input <i>bLoad</i> (Lenze setting)
	1 Loading with edge	Load integrator with FALSE/TRUE edge at the input <i>bLoad</i> .
	2 Loading with level + reset	Load integrator when reaching the comparison value or with TRUE level at the input <i>bLoad</i> .
C01151/2	0	200000000 Comparison value <ul style="list-style-type: none"> • Is valid for both the positive and the negative value range. • Lenze setting: 0

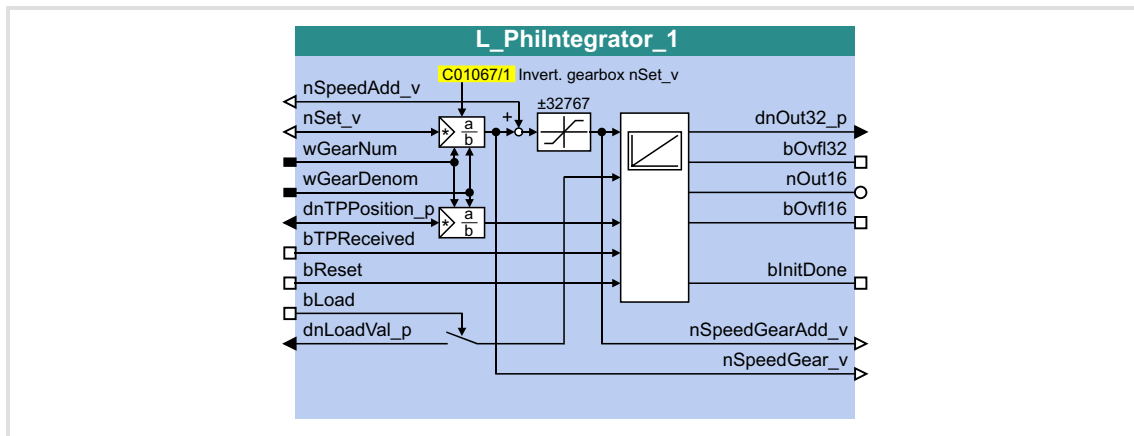


For a detailed functional description see [L_PhaseIntK_1](#).

18.1.137 L_PhilIntegrator_1

This FB evaluates a speed with a gearbox factor and adds them in an integrator.

- ▶ The integrator value is output as 16-bit value and 32-bit value.
- ▶ An overflow of the prevailing output is signalled.
- ▶ The integrator can be loaded and initialised (e.g. with a touch probe signal).



Inputs

Identifier	Data type	Information/possible settings
nSpeedAdd_v	INT	Additive speed
nSet_v	INT	Speed input (angular difference)
wGearNum	WORD	Gearbox factor (numerator)
wGearDenom	WORD	Gearbox factor (denominator) • When <i>wGearDenom</i> = 0, it is internally calculated with 1.
dnTPPosition_p	DINT	Initialisation value
bTPReceived	BOOL	Initialise integrator FALSE → TRUE Initialise integrator
bReset	BOOL	Reset integrator TRUE Reset integrator • The integrator is not integrated.
bLoad	BOOL	Load integrator TRUE Load integrator with <i>dnLoadVal_p</i> • The integrator is not integrated. • The <i>bInitDone</i> output is reset to FALSE with a delay of one call cycle after <i>bLoad</i> is reset to FALSE and a subsequent FALSE/TRUE edge to <i>bTPReceived</i> .
dnLoadVal_p	DINT	Value the integrator is to be loaded with.

Outputs

Identifier	Data type	Value/meaning
dnOut32_p	DINT	Integrator value (32 bits)
bOvfl32	BOOL	Status signal "overflow (32 bits)" TRUE Overflow
nOut16	INT	Integrator value (16 bits)
bOvfl16	BOOL	Status signal "overflow (16 bits)" TRUE Überlauf
blnitDone	BOOL	Status signal "Initialisation completed" TRUE Integrator is initialised
nSpeedGearAdd_v	INT	Resulting speed with additive speed ($nSet_v * gearbox\ factor + nSpeedAdd_v$)
nSpeedGear_v	INT	Resulting speed without additive speed ($nSet_v * gearbox\ factor$)

Parameter

Parameter	Possible settings	Info
C01067/1	0 not inverted 1 inverted 2 Automatically from MCK	Invert. gearbox nSet_v

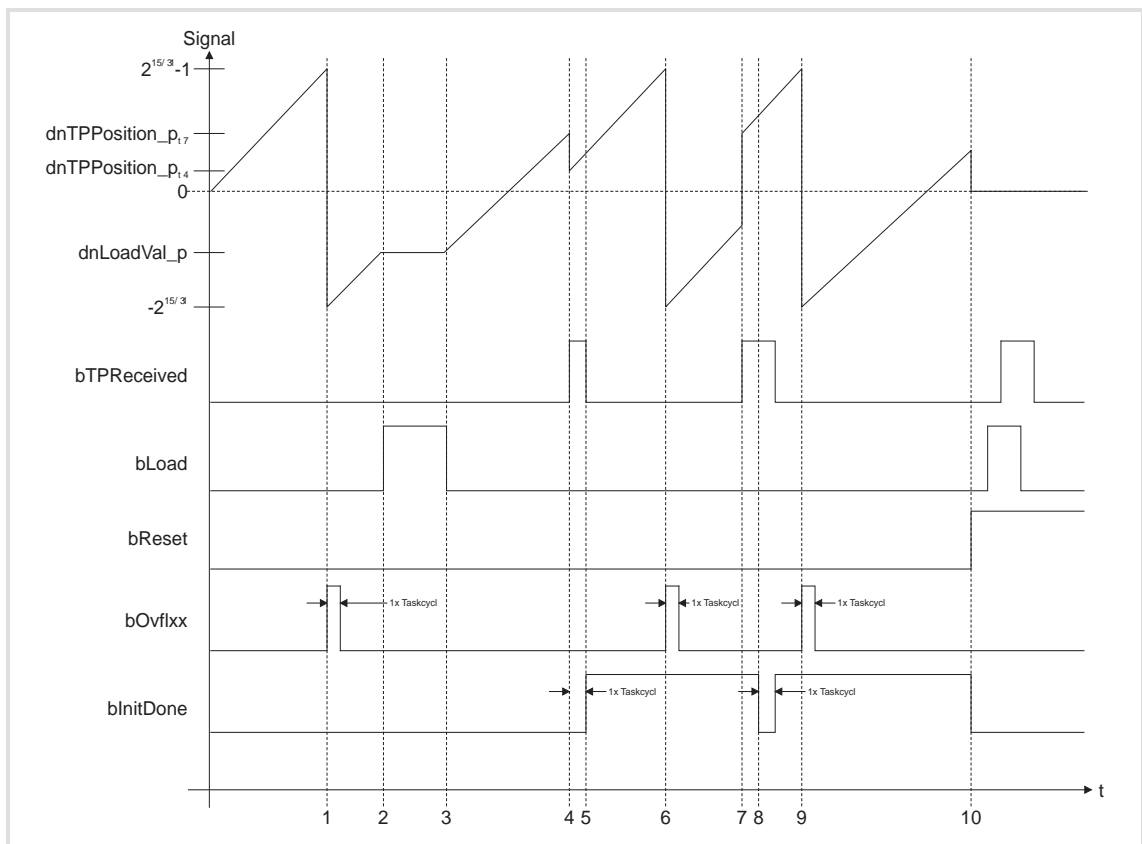
18.1.137.1 Function

The $nSet_v$ input value is evaluated, integrated and output as 16-bit value ($nOut16$) and 32-bit value $dnOut32_p$ with the gearbox factors $wGearNum$ and $wGearDenom$.

$$nOut16 = nOut16 + nSet_v \cdot \frac{wGearNum}{wGearDenom}$$

$$lnOut32_p = dnOut32_p + nSet_v \cdot \frac{wGearNum}{wGearDenom}$$

- ▶ Evaluation of the gearbox factor is remainder considered.
- ▶ A positive or negative overflow of the integrator is signalled by a TRUE signal (for a task cycle) at the $bOvfl16$ output for the $nOut16$ output or at the $bOvfl32$ output for the $dnOut32_p$ output.



[18-54] Signal characteristic

18.1.137.2 Example

The current speed at *nSet_v* and the gearbox factors serve to create a specific machine measuring system from the motor measuring system.

- ▶ 216 increments in the motor measuring system are to correspond to 1 motor revolution.
- ▶ 216 increments in the machine measuring system (*nOut16*) are to correspond to 1 machine shaft revolution.

Initialise integrator

A FALSE/TRUE edge at *bTPReceived* initialises the integrator, i.e. a calculation with *dnTPPosition_p* and *dnLoadVal_p* is made:

$$\begin{aligned} nOut16 &= (\text{INT})(dnLoadVal_p + dnTPPosition_p \cdot \text{Gearbox factor}) \\ dnOut32_p &= dnLoadVal_p + dnTPPosition_p \cdot \text{Gearbox factor} \end{aligned}$$

- ▶ After initialisation is completed, the *blnitDone* output is set to TRUE in the next call cycle.
- ▶ In case of a renewed initialisation without a previous reset (*bReset* = TRUE), the *blnitDone* output is set to FALSE for a task cycle.

Reset integrator

When *bReset* is set to TRUE, the integrator is set to 0. No calculations are made.

- ▶ The Boolean outputs are set to FALSE.
- ▶ The *bReset* input has the highest priority.

Load integrator

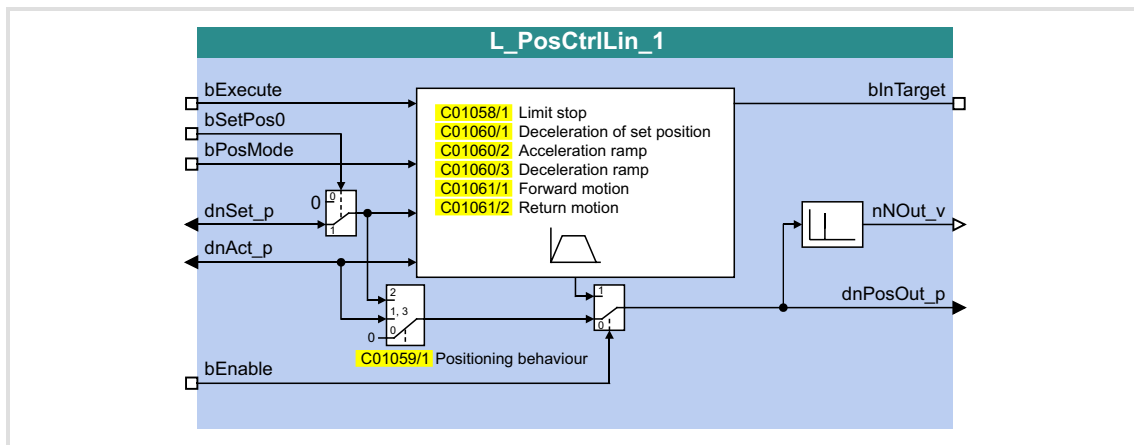
When *bLoad* is set to TRUE, the integrator is loaded with the value at *dnLoadVal_p* and the outputs are set.

- ▶ When *bLoad* is set to TRUE, the input is not integrated and no check for overflow is executed.
- ▶ When *bLoad* is reset to FALSE, the integrator continues from the loaded value. The *blnitDone* output is reset to FALSE after a FALSE/TRUE edge at *bTPReceived* with a delay of one call cycle.

18.1.138 L_PosCtrlLin_1

This FB serves to implement the following positioning functions:

- ▶ Bring drive to curve position (e.g. after mains connection, manual jog, homing)
- ▶ Release drive from curve and bring it to safe position (position override function)
- ▶ Positioning the X axis via X offset (higher-level positioning)
- ▶ Positioning the Y axis via Y offset (higher-level positioning)



Inputs

Identifier	Data type	Information/possible settings	
bExecute	BOOL	Execute positioning profile <ul style="list-style-type: none"> • Only possible if the <i>bEnable</i> input is set to TRUE. 	
		FALSE	No positioning/positioning is aborted. <ul style="list-style-type: none"> • The speed at the <i>nNOOut_v</i> output is braked to standstill via the deceleration ramp set in C01060/1 (<i>nNOOut_v</i> = 0). • At the same time, the <i>dnPosOut_p</i> output is stopped.
		FALSE → TRUE	Positioning is executed/continued. <ul style="list-style-type: none"> • In case of an activated limit stop (C01058/1 = TRUE), a renewed positive edge for a following positioning procedure is required.
bSetPos0	BOOL	Travel to zero position <ul style="list-style-type: none"> • Only possible if the <i>bEnable</i> input is set to TRUE. 	
		FALSE	The value at the <i>dnSet_p</i> input is used as setpoint position.
		TRUE	The value at the <i>dnSet_p</i> input is ignored. The setpoint position is internally set to "0" and the <i>dnPosOut_p</i> output can be travelled to zero position.

Identifier	Data type	Information/possible settings
bPosMode	BOOL	Positioning mode
		<p>FALSE Absolute positioning</p> <ul style="list-style-type: none"> The setpoint at <i>dnSet_p</i> is the absolute setpoint position (with regard to zero position): <p>TRUE Relative positioning</p> <ul style="list-style-type: none"> With a FALSE/TRUE edge at the <i>bExecute</i> input, the outputs of the current position (<i>dnAct_p</i>) are traversed by the <i>dnSet_p</i> value: <p>Note: Only to be used with activated limit stop (C01058/1 = TRUE)!</p>
dnSet_p	DINT	Setpoint for positioning in [increments] <ul style="list-style-type: none"> Scaling: a revolution is displayed with 65536 increments or steps.
dnAct_p	DINT	Actual position in [increments] <ul style="list-style-type: none"> Connect this input with e.g. <i>dnPosOut_p</i> of this FB or with another FB which outputs the actual position of the drive.
bEnable	BOOL	Activate/deactivate positioning function <ul style="list-style-type: none"> This input has the highest priority.
		FALSE Positioning function deactivated. <ul style="list-style-type: none"> For behaviour see C01059/1.
		TRUE Positioning function activated.

Outputs

Identifier	Data type	Value/meaning
bInTarget	BOOL	Status signal "Target position reached"
		TRUE Target position reached.
nNOut_v	INT	Speed output of the profile generator <ul style="list-style-type: none"> Scaling: 16384 ≙ 15000 rpm
dnPosOut_p	DINT	Output position of the profile generator in [increments] <ul style="list-style-type: none"> Scaling: a revolution is displayed with 65536 increments or steps.

Parameter

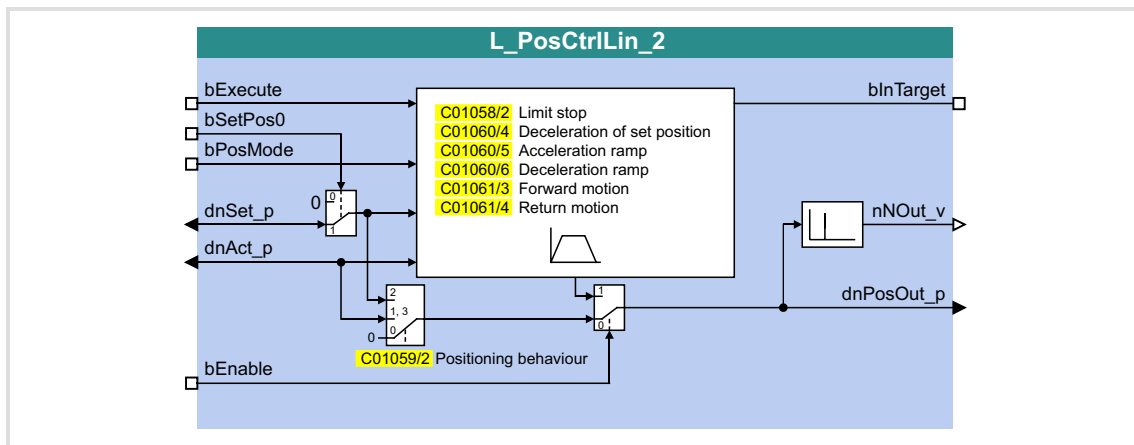
Parameter	Possible settings	Info
C01058/1		Limit stop
	0 deactivated (Lenze setting)	The outputs continuously follow the setpoint at <i>dnSet_p</i> .
	1 activated	The outputs follow the setpoint at <i>dnSet_p</i> once. <ul style="list-style-type: none"> If the setpoint position changes, a new FALSE/TRUE edge is required at the <i>bExecute</i> input for another positioning process.

Parameter	Possible settings			Info
C01059/1				Positioning behaviour <ul style="list-style-type: none"> Behaviour with deactivated positioning function (<i>bEnable</i> = FALSE).
	0	<i>dnOut_p</i> = 0 (Lenze setting)		The <i>dnPosOut_p</i> output jumps to "0". <ul style="list-style-type: none"> The speed signal at the <i>nNOut_v</i> output maps this position step change as angle signal. Note: If the <i>nNOut_v</i> output has an impact on the setpoint generation for the drive, undefined motions (shocks, following errors) may occur.
	1	<i>dnOut_p/nNOut_v</i> follow <i>dnAct_p</i>		The outputs <i>dnPosOut_p</i> and <i>nNOut_v</i> follow the value at the <i>dnAct_p</i> input (actual position).
	2	<i>dnOut_p/nNOut_v</i> follow <i>dnSet_p</i>		The outputs <i>dnPosOut_p</i> and <i>nNOut_v</i> follow the value at the <i>dnSet_p</i> input (setpoint).
	3	<i>dnOut_p/nNOut_v</i> follow <i>dnAct_p</i> (without limitation)		The outputs <i>dnPosOut_p</i> and <i>nNOut_v</i> follow the value at the <i>dnAct_p</i> input (actual position), but without limitation.
C01060/1	0.010	s	130.000	Deceleration of set position <ul style="list-style-type: none"> Deceleration ramp for stop before reaching the setpoint position (<i>bExecute</i> = FALSE). Lenze setting: 1.000 s
C01060/2	0.010	s	130.000	Acceleration ramp <ul style="list-style-type: none"> Lenze setting: 1.000 s
C01060/3	0.010	s	130.000	Deceleration ramp <ul style="list-style-type: none"> Lenze setting: 1.000 s
C01061/1	-15000	rpm	15000	Forward motion <ul style="list-style-type: none"> Positive speed Lenze setting: 200 rpm
C01061/2	-15000	rpm	15000	Return motion <ul style="list-style-type: none"> Negative speed Lenze setting: 200 rpm

18.1.139 L_PosCtrlLin_2

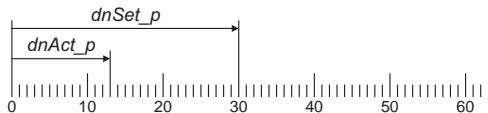
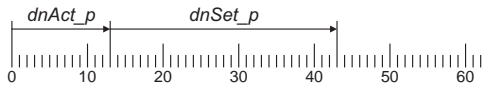
This FB serves to implement the following positioning functions:

- ▶ Bring drive to curve position (e.g. after mains connection, manual jog, homing)
- ▶ Release drive from curve and bring it to safe position (position override function)
- ▶ Positioning the X axis via X offset (higher-level positioning)
- ▶ Positioning the Y axis via Y offset (higher-level positioning)



Inputs

Identifier	Data type	Information/possible settings	
bExecute	BOOL	Execute positioning profile <ul style="list-style-type: none"> • Only possible if the <i>bEnable</i> input is set to TRUE. 	
		FALSE	No positioning/positioning is aborted. <ul style="list-style-type: none"> • The speed at the <i>nNOut_v</i> output is braked to standstill via the deceleration ramp set in C01060/4 (<i>nNOut_v</i> = 0). • At the same time, the <i>dnPosOut_p</i> output is stopped.
		FALSE → TRUE	Positioning is executed/continued. <ul style="list-style-type: none"> • In case of an activated limit stop (C01058/2 = TRUE), a renewed positive edge for a following positioning procedure is required.
bSetPos0	BOOL	Travel to zero position <ul style="list-style-type: none"> • Only possible if the <i>bEnable</i> input is set to TRUE. 	
		FALSE	The value at the <i>dnSet_p</i> input is used as setpoint position.
		TRUE	The value at the <i>dnSet_p</i> input is ignored. The setpoint position is internally set to "0" and the <i>dnPosOut_p</i> output can be travelled to zero position.

Identifier	Data type	Information/possible settings
bPosMode	BOOL	Positioning mode FALSE Absolute positioning <ul style="list-style-type: none"> The setpoint at <i>dnSet_p</i> is the absolute setpoint position (with regard to zero position): 
		TRUE Relative positioning <ul style="list-style-type: none"> With a FALSE/TRUE edge at the <i>bExecute</i> input, the outputs of the current position (<i>dnAct_p</i>) are traversed by the <i>dnSet_p</i> value:  <p>Note: Only to be used with activated limit stop (C01058/2 = TRUE)!</p>
dnSet_p	DINT	Setpoint for positioning in [increments] <ul style="list-style-type: none"> Scaling: a revolution is displayed with 65536 increments or steps.
dnAct_p	DINT	Actual position in [increments] <ul style="list-style-type: none"> Connect this input with e.g. <i>dnPosOut_p</i> of this FB or with another FB which outputs the actual position of the drive.
bEnable	BOOL	Activate/deactivate positioning function <ul style="list-style-type: none"> This input has the highest priority.
		FALSE Positioning function deactivated. <ul style="list-style-type: none"> For behaviour see C01059/2.
		TRUE Positioning function activated.

Outputs

Identifier	Data type	Value/meaning
blnTarget	BOOL	Status signal "Target position reached"
		TRUE Target position reached.
nNOut_v	INT	Speed output of the profile generator <ul style="list-style-type: none"> Scaling: 16384 ≙ 15000 rpm
dnPosOut_p	DINT	Output position of the profile generator in [increments] <ul style="list-style-type: none"> Scaling: a revolution is displayed with 65536 increments or steps.

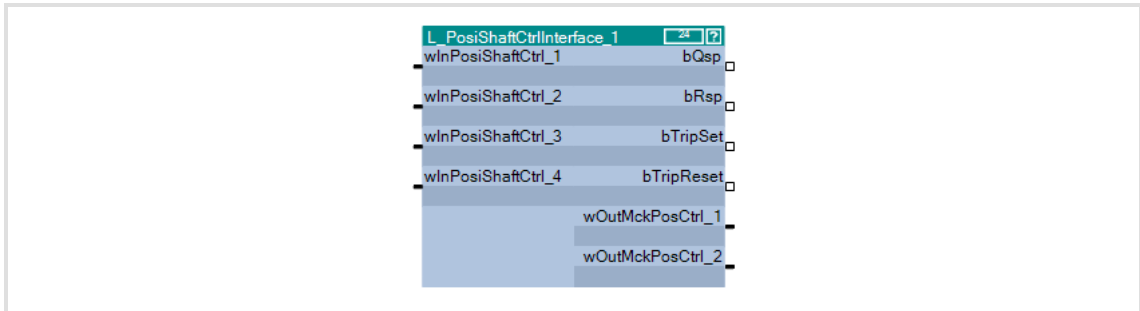
Parameter

Parameter	Possible settings	Info
C01058/2		Limit stop
	0 deactivated (Lenze setting)	The outputs continuously follow the setpoint at <i>dnSet_p</i> .
	1 activated	The outputs follow the setpoint at <i>dnSet_p</i> once. <ul style="list-style-type: none"> If the setpoint position changes, a new FALSE/TRUE edge is required at the <i>bExecute</i> input for another positioning process.

Parameter	Possible settings			Info
C01059/2				Positioning behaviour <ul style="list-style-type: none"> Behaviour with deactivated positioning function (<i>bEnable</i> = FALSE).
	0	<i>dnOut_p</i> = 0 (Lenze setting)		The <i>dnPosOut_p</i> output jumps to "0". <ul style="list-style-type: none"> The speed signal at the <i>nNOut_v</i> output maps this position step change as angle signal. Note: If the <i>nNOut_v</i> output has an impact on the setpoint generation for the drive, undefined motions (shocks, following errors) may occur.
	1	<i>dnOut_p/nNOut_v</i> follow <i>dnAct_p</i>		The outputs <i>dnPosOut_p</i> and <i>nNOut_v</i> follow the value at the <i>dnAct_p</i> input (actual position).
	2	<i>dnOut_p/nNOut_v</i> follow <i>dnSet_p</i>		The outputs <i>dnPosOut_p</i> and <i>nNOut_v</i> follow the value at the <i>dnSet_p</i> input (setpoint).
	3	<i>dnOut_p/nNOut_v</i> follow <i>dnAct_p</i> (without limitation)		The outputs <i>dnPosOut_p</i> and <i>nNOut_v</i> follow the value at the <i>dnAct_p</i> input (actual position), but without limitation.
C01060/4	0.010	s	130.000	Deceleration of set position <ul style="list-style-type: none"> Deceleration ramp for stop before reaching the setpoint position (<i>bExecute</i> = FALSE). Lenze setting: 1.000 s
C01060/5	0.010	s	130.000	Acceleration ramp <ul style="list-style-type: none"> Lenze setting: 1.000 s
C01060/6	0.010	s	130.000	Deceleration ramp <ul style="list-style-type: none"> Lenze setting: 1.000 s
C01061/3	-15000	rpm	15000	Forward motion <ul style="list-style-type: none"> Positive speed Lenze setting: 200 rpm
C01061/4	-15000	rpm	15000	Return motion <ul style="list-style-type: none"> Negative speed Lenze setting: 200 rpm

18.1.140 L_PosShaftCtrlInterface_1

FB in preparation!

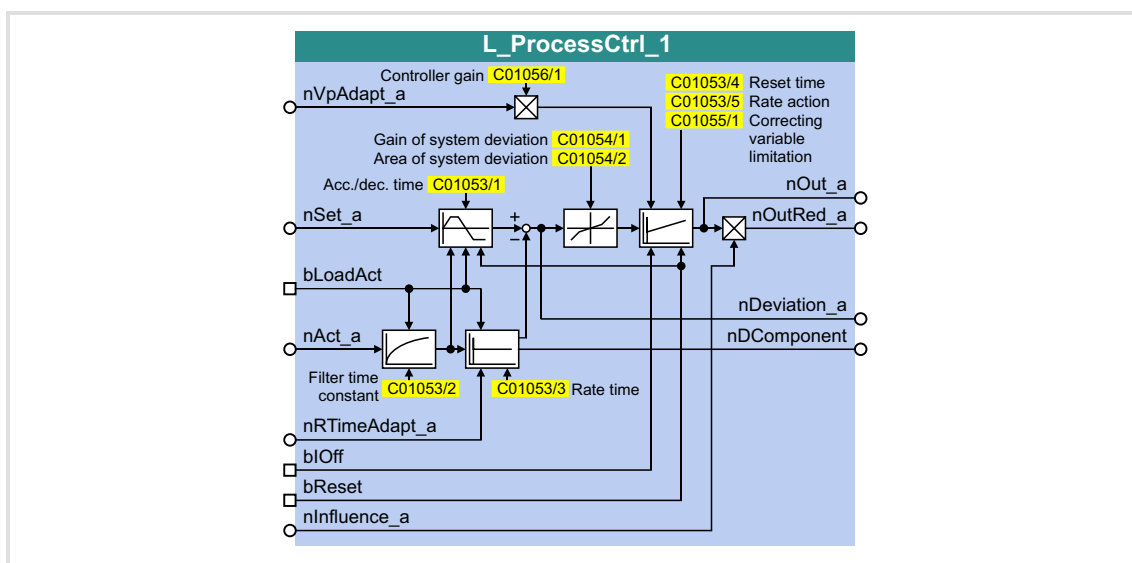


18.1.141 L_ProcessCtrl_1

This FB serves to implement a dancer position or tension control.

The FB is provides with the following functions:

- ▶ Adjustable control algorithm (P, PI, PID) with adaptable gain
- ▶ Reduced controller dynamics at low system deviation
- ▶ Setpoint ramp generator for preventing setpoint step-changes at the input
- ▶ Setpoint ramp generator can be loaded with actual value
- ▶ Low-pass filter and rate action in the actual value feedback
- ▶ Integral action component can be switched off
- ▶ Interruptible control



Inputs

Identifier	Data type	Information/possible settings		
nVpAdapt_a	INT	Proportional evaluation of the controller gain (Vp) <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % • Internal limitation to 0 ... 16384 (0 ... 100 %) 		
nSet_a	INT	Controller setpoint		
bLoadAct	BOOL	Accept actual controller value <table border="1" style="margin-left: 20px;"> <tr> <td>TRUE</td> <td>The actual controller value <i>nAct_a</i> is taken over into the ramp generator, the low pass and the rate action.</td> </tr> </table>	TRUE	The actual controller value <i>nAct_a</i> is taken over into the ramp generator, the low pass and the rate action.
TRUE	The actual controller value <i>nAct_a</i> is taken over into the ramp generator, the low pass and the rate action.			
nAct_a	INT	Actual controller value		
nRTimeAdapt_a	INT	Proportional evaluation of the rate time in the actual value path <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % rate time (C01053) • Internal limitation to 0 ... 16384 (0 ... 100 %) 		
bOff	BOOL	Reset controller I component <table border="1" style="margin-left: 20px;"> <tr> <td>TRUE</td> <td>The controller I component is reset.</td> </tr> </table>	TRUE	The controller I component is reset.
TRUE	The controller I component is reset.			

Identifier	Data type	Information/possible settings
bReset	BOOL	Reset entire control TRUE All outputs are reset to 0.
nInfluence_a	INT	Proportional evaluation of the controller correcting variable <i>nOutRed_a</i> • Scaling: 16384 = 100 % controller correcting variable (<i>nOut_a</i>)

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Controller correcting variable • Internal limitation to ±16384 (±100 %)
nOutRed_a	INT	Controller correcting variable (evaluated by <i>nInfluence_a</i>)
nDeviation_a	INT	System deviation • Internal limitation to ±32767 (±199.99 %)
nDComponent	INT	D component of the rate action • Internal limitation to ±16384 (±100 %)

Parameter

Parameter	Possible settings			Info
C01053/1	0.000	s	30.000	Acceleration/deceleration time of the setpoint ramp generator • Lenze setting: 0.000 s
C01053/2	0.000	s	30.000	Filter time constant for actual controller value • Lenze setting: 0.000 s
C01053/3	0.000	s	30.000	Rate time for actual controller value • Lenze setting: 0.000 s
C01053/4	0.000	s	30.000	Controller reset time • Lenze setting: 1.000 s
C01053/5	0.000	s	30.000	Controller rate action • Lenze setting: 0.000 s
C01054/1	0.00	%	199.99	Gain of the system deviation in the range of reduced sensitivity • Lenze setting: 100.00 %
C01054/2	0.00	%	199.99	Area of system deviation with reduced gain/sensitivity • Lenze setting: 0.00 %
C01055/1	False	Limitation not active. (Lenze setting)		Limitation of the controller correcting variable to the positive area
	True	Limitation active.		
C01056/1	0.00		100.00	Controller gain • Lenze setting: 0.10

18.1.141.1 Control characteristic

The dancer position or tension controller can be optionally operated as P, PI or PID controller. In the Lenze setting, the PI algorithm is active.

Gain (P component)

The input value is controlled by a linear characteristic. The slope of the characteristic is determined by the controller gain V_p .

The controller gain V_p is set in [C01056/1](#).

- ▶ The controller gain can be adapted via the $nVpAdapt_a$ input (also possible in online mode).
- ▶ The $nVpAdapt_a$ input value has a direct effect on the controller gain:

$$P = nVpAdapt_a \cdot C01056/1$$

Example: With the parameterised controller gain $V_p = 2.0$ and $nVpAdapt_a = 75\%$, the resulting gain factor is as follows:

$$P = \frac{75 [\%]}{100 [\%]} \cdot 2.0 = 1.5$$

Reset time T_n (I component)

The adjustment time T_n is set under [C01053/4](#).

- ▶ The I component of the controller can be deactivated by setting the input $biOff$ to TRUE.
- ▶ The I component can be switched on and off online.

Differential component K_d (D component)

The differential component K_d is set under [C01053/5](#).

- ▶ The setting "0.0 s" deactivates the D component (Lenze setting). In this way, the PID controller becomes a PI controller or P controller, if the I component has been deactivated as well.

Evaluation of the output signal (controller influence)

If the motor speed or motor torque is precontrolled, a low influence is sufficient for the controller to comply with the setpoint.

Use the $nInfluence_a$ input to select the influencing factor the controller correcting variable ($nOut_a$) is to be evaluated with. The evaluated controller correcting variable is output at $nOutRed_a$.



Note!

The controller influence evaluates the output signal multiplicatively. A change of the $nInfluence_a$ influencing factor also changes the dynamics of the controller!

Switching on/off the controller

By setting the *bReset* input to TRUE, the process controller can be switched off.

Loading the setpoint ramp generator with the actual value

If the actual value is loaded into the setpoint ramp generator in switched-off state, it has the advantage that in the moment of the renewed controller enable, the system deviation is zero first. Thus, compensation processes can be mostly prevented.

When the *bLoadAct* input is set to TRUE, the setpoint ramp generator can be loaded with the actual value. This keeps the system deviation equal to zero and I component of the controller.

Low pass and rate action in the actual value path

In order to filter signal interferences more effectively, you can activate a low pass in the actual value path.

- ▶ The filter time constant for the low pass is set in [C01053/2](#).
- ▶ The rate time constant in the feedback path can be set in [C01053/3](#). This serves to compensate interfering decelerations.

Reduced controller dynamics at low system deviation

Due to a reduced controller dynamics with low system deviations, the dampening behaviour of the control loop is mostly influenced favourably.

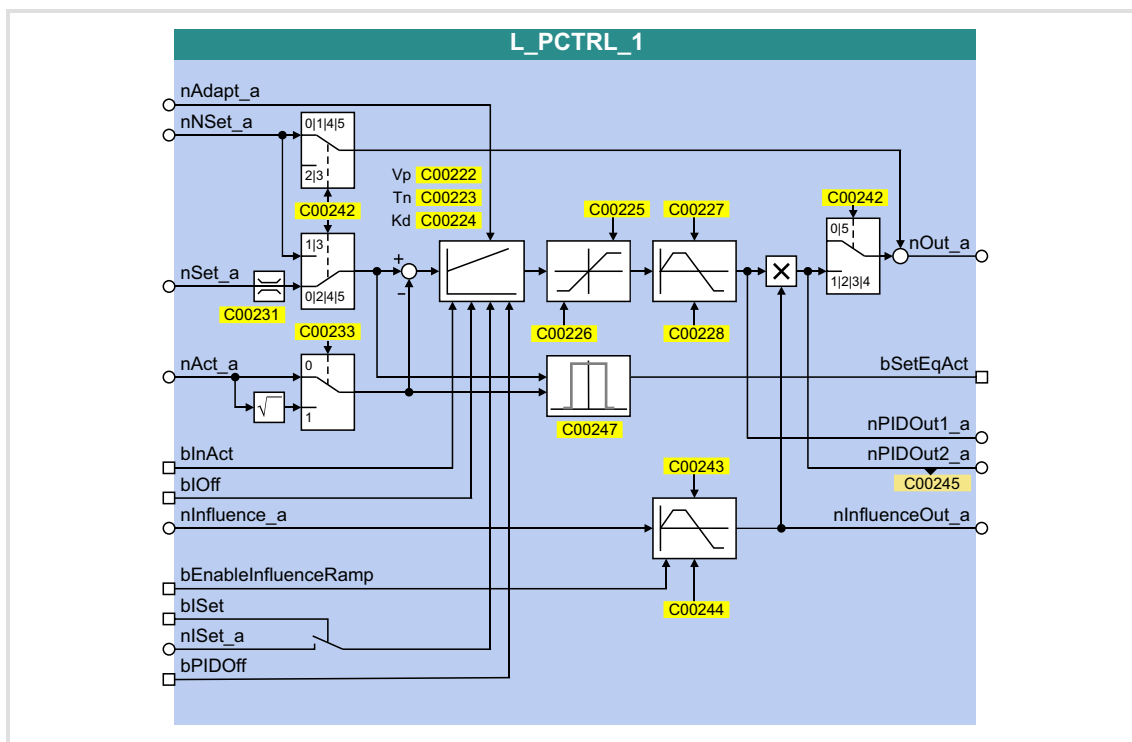
- ▶ [C01054/2](#) serves to determine the tolerance zone in which the system deviation is transmitted to the controller with a slight gain.
- ▶ [C01054/1](#) serves to determine the amount of percent the gain in the defined tolerance zone is to be reduced to.

18.1.142 L_PCTRL_1

This FB is a PID controller and can be used for various control tasks (e.g. as dancer position controller, tension controller, or pressure controller).

The FB provides with the following functions:

- ▶ Adjustable control algorithm (P, PI, PID)
- ▶ Ramp function generator for preventing setpoint step-changes at the input
- ▶ Limitation of the controller output
- ▶ Factorisation of the output signal
- ▶ Vp adaptation
- ▶ Integral action component can be switched off
- ▶ Comparison function "Actual value = setpoint"



Inputs

Identifier	Data type	Information/possible settings
nAdapt_a	INT	Adaptation of gain Vp set in C00222 in percent <ul style="list-style-type: none"> • Internal limitation to ± 199.99 % • Changes can be done online. • Display parameter: C00830/62
nNset_a	INT	Speed setpoint <ul style="list-style-type: none"> • Scaling: 16384 ≙ 100 % • Internal limitation to ± 199.99 % • Display parameter: C00830/89

Identifier	Data type	Information/possible settings
nSet_a	INT	Sensor and process setpoint for operating modes 2, 4 and 5 <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % • Internal limitation to \pm 199.99 % • Display parameter: C00830/63
nAct_a	INT	Speed or actual sensor value (actual process value) <ul style="list-style-type: none"> • Scaling: 16384 \equiv 100 % • Internal limitation to \pm 199.99 % • Display parameter: C00830/61
bInAct	BOOL	Deactivate process controller temporarily (stop) <ul style="list-style-type: none"> • Changes can be done online. • Display parameter: C00833/76 Note: This input is not interconnected in the LA_NCtrl application block.
		TRUE <ul style="list-style-type: none"> • The current output value is frozen. • The internal control algorithm is stopped. • However, a setpoint selected via input <i>nNSet_a</i> is still provided in operating modes 0/1/4/5.
bIOff	BOOL	Switch off I-component of process controller <ul style="list-style-type: none"> • Changes can be done online. • Display parameter: C00833/77
		TRUE <ul style="list-style-type: none"> • The I component of the process controller is set to zero.
nInfluence_a	INT	Limitation of the influencing factor in percent <ul style="list-style-type: none"> • <i>nInfluence_a</i> serves to limit the influencing factor of the PID controller contained in the FB to a required value (- 199.99 % ... + 199.99 %). • Scaling: 16384 \equiv 100 % • Internal limitation to \pm 199.99 % • Display parameter: C00830/64
bEnableInfluenceRamp	BOOL	Activate ramp for influencing factor <ul style="list-style-type: none"> • Display parameter: C00833/106
		TRUE <ul style="list-style-type: none"> • Influencing factor of the PID controller is ramped up to the <i>nInfluence_a</i> value.
		FALSE <ul style="list-style-type: none"> • Influencing factor of the PID controller is ramped down to "0".
bISet	BOOL	Accept I component <i>nISet_a</i> in PID controller
		TRUE <ul style="list-style-type: none"> • The value at the input <i>nISet_a</i> is accepted in the PID controller.
nISet_a	INT	Selection of I component of PID controller <ul style="list-style-type: none"> • With a TRUE signal at <i>bISet</i>, the assigned value is accepted in the PID controller. • Scaling: 16384 \equiv 100 % • Internal limitation to \pm 199.99 %
bPIDOff	BOOL	Reset the entire PID controller
		TRUE <ul style="list-style-type: none"> • The I component of the controller is set to zero. • The controller output is set to zero. • The internal control algorithm is stopped.

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to \pm32767 (\pm199.99 %) • Scaling: 16384 \equiv 100 %
bSetEqAct	INT	Status output "Setpoint and actual value are identical"
		TRUE <ul style="list-style-type: none"> • Setpoint and actual value are identical, i.e. no system deviation available.

Identifier	Data type	Value/meaning
nPIDOut1_a	INT	PID controller output <u>without</u> influencing factor <i>nInfluence_a</i> <ul style="list-style-type: none"> Inputs <i>bEnableInfluenceRamp</i> and <i>nInfluence_a</i> do not have any effect here, the limited PID output value influenced by the internal ramp times is output. There is no connection with the additive input <i>nNSet_a</i>. Scaling: 16384 \equiv 100 %
nPIDOut2_a	INT	PID controller output <u>with</u> influencing factor <i>nInfluence_a</i> . <ul style="list-style-type: none"> There is no connection with the additive input <i>nNSet_a</i>. Scaling: 16384 \equiv 100 % Display parameter: C00245
nInfluenceOut_a	INT	Current influencing factor ("ramp status") on the PID output value <ul style="list-style-type: none"> Scaling: 16384 \equiv 100 %

Parameter

Parameter	Possible settings			Info
C00222	0.1	0.1	500.0	Gain Vp <ul style="list-style-type: none"> Lenze setting: 1.0
C00223	20	ms	6000	Reset time Tn <ul style="list-style-type: none"> Lenze setting: 400 ms
C00224	0.0	0.1	5.0	Differential component Kd <ul style="list-style-type: none"> Lenze setting: 0.0
C00225	-199.99	%	+199.99	MaxLimit <ul style="list-style-type: none"> Maximum value of the PID operating range Lenze setting: 199.99 %
C00226	-199.99	%	+199.99	MinLimit <ul style="list-style-type: none"> Minimum value of the PID operating range Lenze setting: -199.99 %
C00227	0.000	s	999.999	Acceleration time for the ramp at the PID output (should be set as steep as possible) <ul style="list-style-type: none"> Lenze setting: 0.010 s
C00228	0.000	s	999.999	Deceleration time for the ramp at the PID output <ul style="list-style-type: none"> Lenze setting: 0.010 s
C00231/1 (Pos. Maximum) C00231/2 (Pos. Minimum) C00231/3 (Neg. Minimum) C00231/4 (Neg. Maximum)	0.00	%	199.99	Operating range <ul style="list-style-type: none"> Determination of the operating range for the PID process controller by limiting the input signal <i>nSet_a</i>. Lenze setting: No limitation (-199.99 % ... +199.99 %)
C00233				Root function <ul style="list-style-type: none"> Lenze setting: "0: Off"
	0	Off		The actual value at <i>nAct_a</i> is not changed for further processing.
	1	On		The square root of the actual value at <i>nAct_a</i> is taken for further processing.

Parameter	Possible settings			Info
C00242				Operating mode • Lenze setting: "0: Off"
	0	Off		The input setpoint <i>nNSet_a</i> is output without any changes at the output <i>nOut_a</i> .
	1	nNSet + nNSet_PID		<i>nNSet_a</i> and <i>nAct_a</i> are used as PID input values. The arriving <i>nNSet_a</i> is additively linked to the value output by the PID element.
	2	nSet_PID		<i>nSet_a</i> and <i>nAct_a</i> are used as PID input values. The input <i>nNSet_a</i> is not considered.
	3	nNSet_PID		<i>nNSet_a</i> and <i>nAct_a</i> are used as PID input values. The input <i>nSet_a</i> is not considered.
	4	nNSet + nSet_PID		<i>nSet_a</i> and <i>nAct_a</i> are used as PID input values. The arriving <i>nNSet_a</i> setpoint is additively linked to the value output by the PID element.
	5	nNSet nSet_PID		<i>nSet_a</i> and <i>nAct_a</i> are used as PID input values. The setpoint <i>nNSet_a</i> is output at the output <i>nOut_a</i> . The PID output value is output at the output <i>nPIDOut_a</i> .
C00243	0.000	s	999.999	Influence acceleration time • Acceleration time T_{ir} for the influencing factor. • Lenze setting: 5.000 s
C00244	0.000	s	999.999	Influence deceleration time • Deceleration time T_{if} for the influencing factor. • Lenze setting: 5.000 s
C00245	-199.99	%	+199.99	Display of PID output value <i>nPIDOut_a</i>
C00247	0	%	100	Window for comparison function "Actual value = setpoint" • Lenze setting: 2 % • Hysteresis: 1 % (fixed)

18.1.142.1 Control characteristic

The PI algorithm is active in the Lenze setting.

Gain (P component)

The input value is controlled by a linear characteristic. The slope of the characteristic is determined by the controller gain V_p .

The controller gain V_p is set under [C00222](#).

- ▶ The controller gain can be adapted via the input $nAdapt_a$ (also possible in online mode).
- ▶ The input value $nAdapt_a$ has a direct effect on the controller gain:

$$P = nAdapt_a \cdot C00222$$

Example: With the parameterised controller gain $V_p = 2.0$ and $nAdapt_a = 75\%$, the resulting gain factor is as follows:

$$P = \frac{75 [\%]}{100 [\%]} \cdot 2.0 = 1.5$$

Integral action component (I component)

The I component can be selected via the input $nISet_a$. With a TRUE signal at $bISet$, the assigned value is accepted in the PID controller.

- ▶ Setting the adjustment time T_n to the maximum value of "6000 ms" deactivates the I component.
- ▶ The I component of the controller can also be deactivated by setting the input $bIOff$ to TRUE.
- ▶ The I component can be switched on and off online.

Adjustment time

The adjustment time T_n is set under [C00223](#).

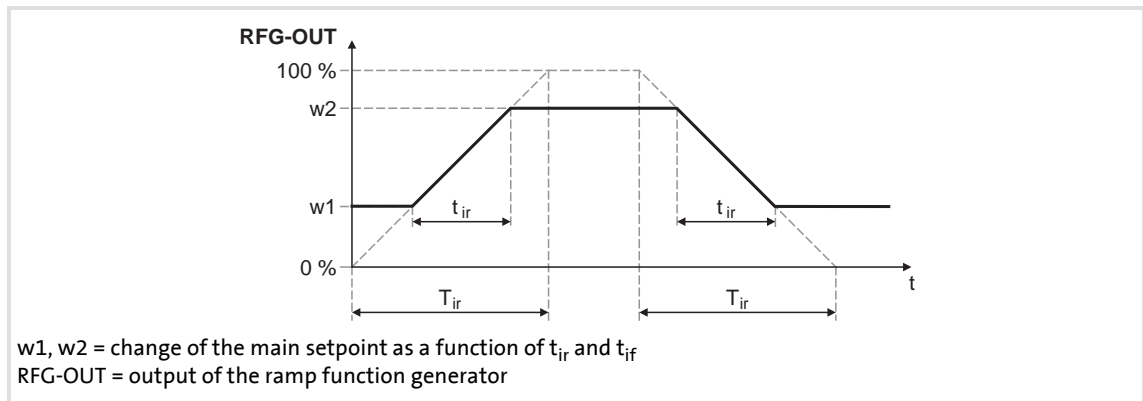
Differential component K_d (D component)

The differential component K_d is set under [C00224](#).

- ▶ The setting "0.0 s" deactivates the D component (Lenze setting). In this way, the PID controller becomes a PI controller or P controller, if the I component has been deactivated as well.

18.1.142.2 Ramp function generator

The PID output is led via a ramp function generator with linear characteristic. This serves to transfer setpoint step-changes at the PID output into a ramp which should be as steep as possible.



[18-55] Acceleration and deceleration times

- ▶ t_{ir} and t_{if} are the desired times for changing between $w1$ and $w2$.
- ▶ The ramps for acceleration and deceleration can be set individually.
 - [C00227](#): Acceleration time t_{ir}
 - [C00228](#): Deceleration time t_{if}
- ▶ The t_{ir}/t_{if} values are converted into the required T_i times according to the following formula:

$$T_{ir} = t_{ir} \cdot \frac{100\%}{w2 - w1} \qquad T_{if} = t_{if} \cdot \frac{100\%}{w2 - w1}$$

- ▶ The ramp function generator is immediately set to "0" by setting *blnAct* to TRUE.

18.1.142.3 Operating range of the PID process controller

The value range of the input signal *nSet_a* and thus the operating range of the PID process controller can be limited with the following parameters:

- ▶ [C00231/1](#): Pos. maximum (default setting: 199.99 %)
- ▶ [C00231/2](#): Pos. minimum (default setting: 0.00 %)
- ▶ [C00231/3](#): Neg. minimum (default setting: 0.00 %)
- ▶ [C00231/4](#): Neg. maximum (default setting: 199.99 %)

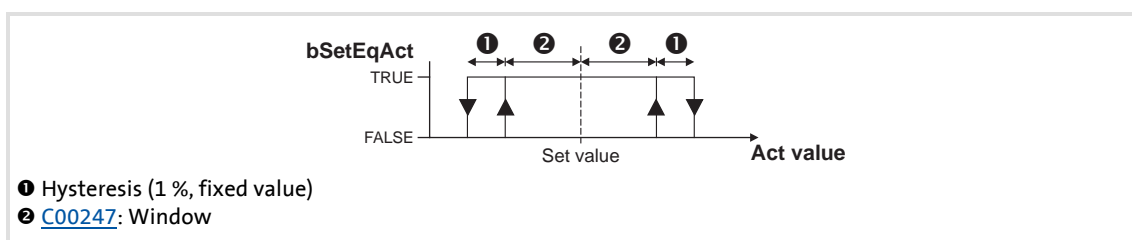
18.1.142.4 Evaluation of the output signal

After the limitation, the output signal is evaluated with the influencing factor *nInfluence_a*. The evaluation is activated/suppressed along a ramp when the *bEnableInfluenceRamp* input is set to TRUE. The ramp times are set with the parameters "Influence acceleration time" ([C00243](#)) and "Influence deceleration time" ([C00244](#)).

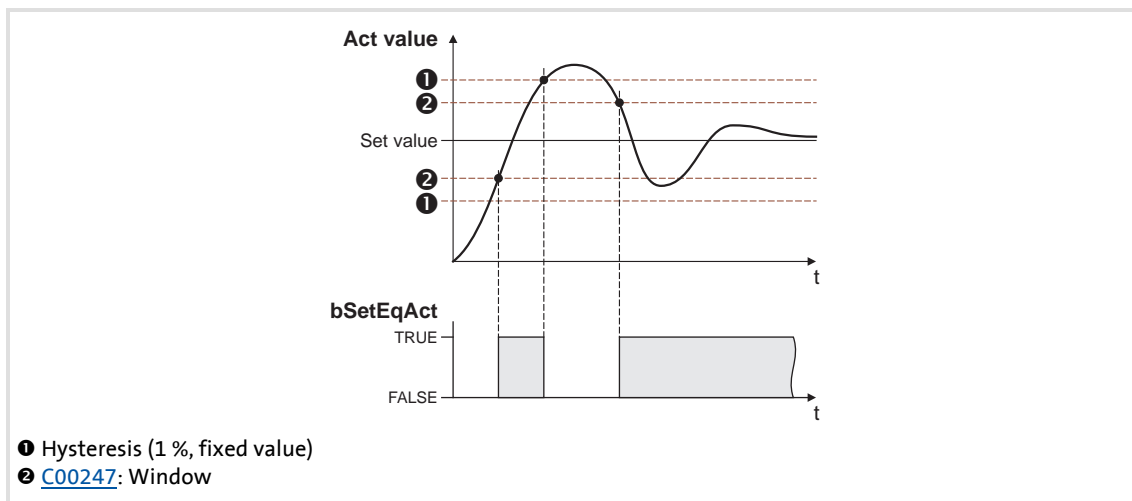
18.1.142.5 Comparison function "Actual value = setpoint"

If setpoint and actual value are identical and there is no system deviation, the *bSetEqAct* status output is set to TRUE.

- ▶ The hysteresis of the comparison function has a fixed value of 1 %.
- ▶ From V10.00.00 the symmetrical window around the setpoint for the comparison function can be set in [C00247](#) (Lenze setting: 2 %).



[18-56] Comparison function: Switching performance



[18-57] Comparison function: Example

18.1.142.6 Control functions

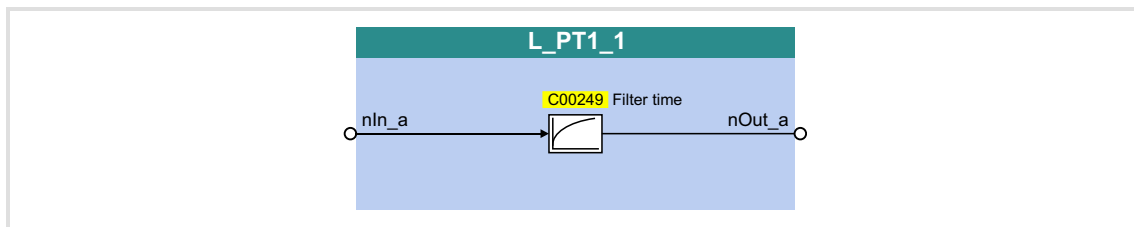
The process controller has various digital inputs for controlling the FB:

Identifier	Data type	Information/possible settings
bInAct	BOOL	Deactivate process controller temporarily (stop) <ul style="list-style-type: none"> • Changes can be done online. • Display parameter: C00833/76 Note: This input is not interconnected in the LA_NCtrl application block.
		TRUE <ul style="list-style-type: none"> • The current output value is frozen. • The internal control algorithm is stopped. • However, a setpoint selected via input <i>nNSet_a</i> is still provided in operating modes 0/1/4/5.
bIOff	BOOL	Switch off I-component of process controller <ul style="list-style-type: none"> • Changes can be done online. • Display parameter: C00833/77
		TRUE <ul style="list-style-type: none"> • The I component of the process controller is set to zero.
bPIDOff	BOOL	Reset the entire PID controller
		TRUE <ul style="list-style-type: none"> • The I component of the controller is set to zero. • The controller output is set to zero. • The internal control algorithm is stopped.

18.1.143 L_PT1_1

This FB filters and delays analog signals.

- ▶ The filter time constant T can be set under [C00249](#).
- ▶ The gain is defined with $V_p = 1$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

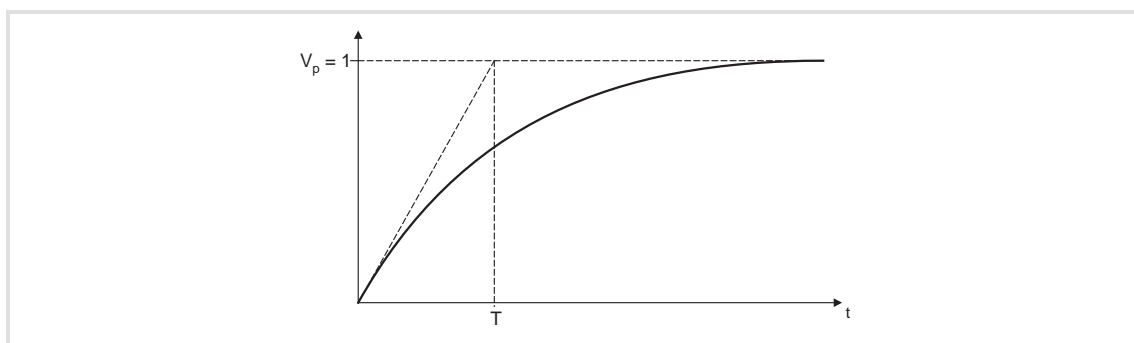
Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal

Parameter

Parameter	Possible settings			Info
C00249	0	ms	5000	Filter time constant <ul style="list-style-type: none"> The filter is not active with a setting of "0 ms". The input signal is passed through one-to-one to the output. Lenze setting: 2000 ms

Function

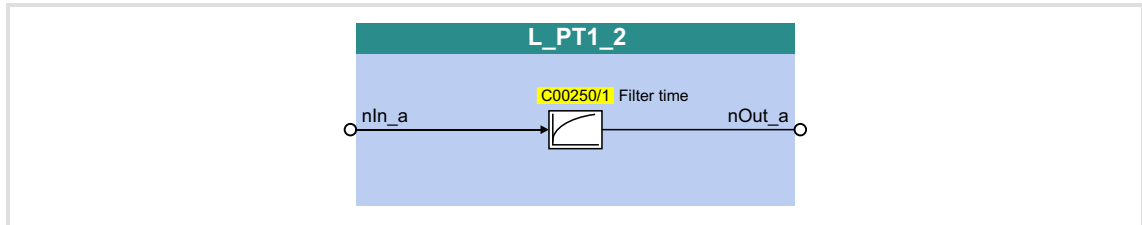


[18-58] Filter time constant T of the first-order delay element

18.1.144 L_PT1_2

This FB filters and delays analog signals.

- ▶ Filter time constant T can be set in [C00250/1](#).
- ▶ The gain is defined with $V_p = 1$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

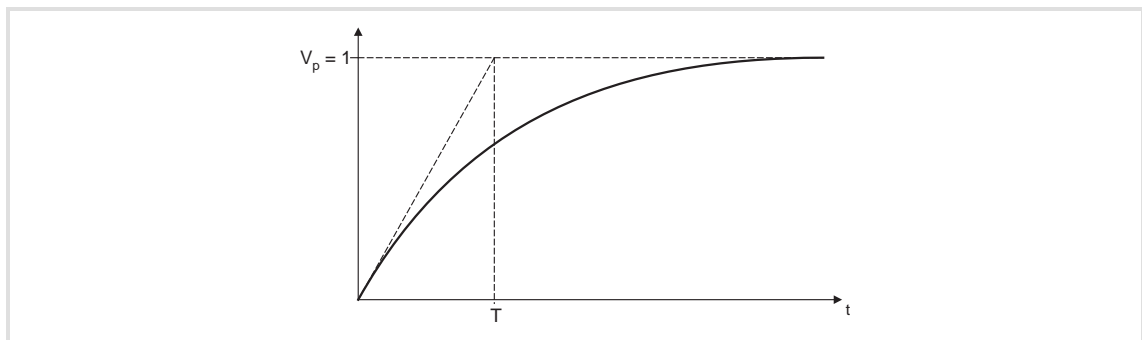
Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal

Parameter

Parameter	Possible settings			Info
C00250/1	0	ms	5000	Filter time constant <ul style="list-style-type: none"> The filter is not active with a setting of "0 ms". The input signal is passed through one-to-one to the output. Lenze setting: 2000 ms

Function

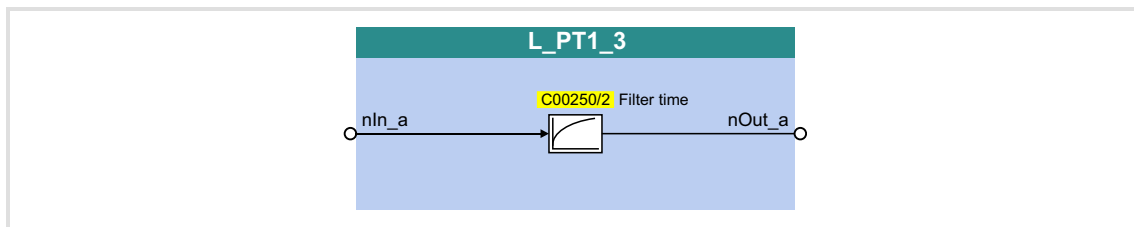


[18-59] Filter time constant T of the first-order delay element

18.1.145 L_PT1_3

This FB filters and delays analog signals.

- ▶ Filter time constant T can be set in [C00250/2](#).
- ▶ The gain is defined with $V_p = 1$.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal

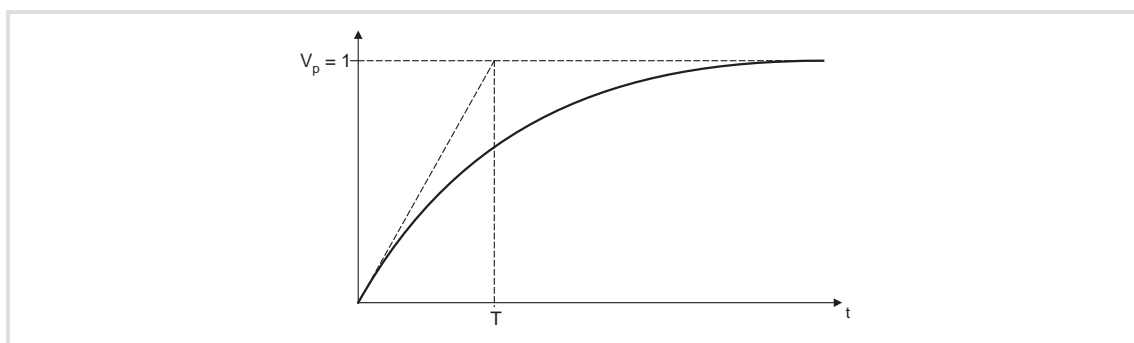
Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal

Parameter

Parameter	Possible settings			Info
C00250/2	0	ms	5000	Filter time constant <ul style="list-style-type: none"> The filter is not active with a setting of "0 ms". The input signal is passed through one-to-one to the output. Lenze setting: 2000 ms

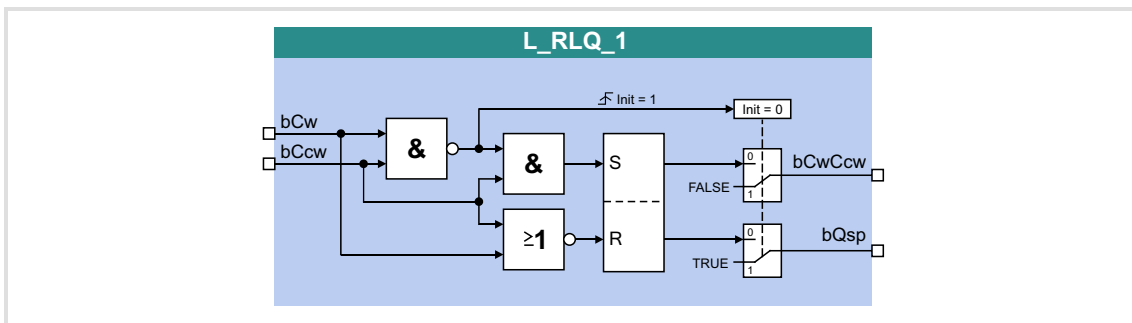
Function



[18-60] Filter time constant T of the first-order delay element

18.1.146 L_RLQ_1

This FB links a selected direction of rotation to the quick stop function with wire-break protection.



Inputs

Identifier	Data type	Information/possible settings
bCw	BOOL	Input • TRUE = CW rotation
bCCw	BOOL	Input • TRUE = CCW rotation

Outputs

Identifier	Data type	Value/meaning
bQSP	BOOL	Output signal for quick stop (QSP)
bCwCcw	BOOL	Output signal for CW/CCW rotation • TRUE = CCW rotation

Function

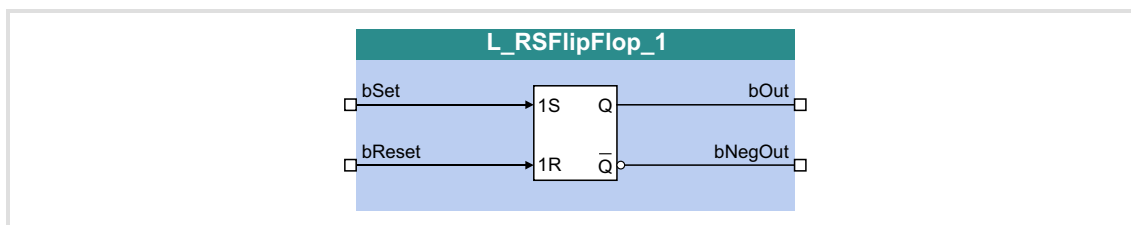
Inputs		Outputs		Notes
bCw	bCCw	bCwCcw	bQSP	
TRUE	TRUE	FALSE	TRUE	The inputs have this status only if a TRUE signal is being applied to <u>both</u> inputs at the moment of switch-on! See also FB illustration above, "Init" = 1.
If <i>one</i> of the inputs has the TRUE status, the following truth table applies:				
FALSE	FALSE	FALSE	TRUE	See also FB illustration above, "Init" = 0.
TRUE	FALSE	FALSE	FALSE	
FALSE	TRUE	TRUE	FALSE	
TRUE	TRUE	X (save)		

[18-61] Truth table of the FB L_RLQ, 0 = FALSE, 1 = TRUE

18.1.147 L_RSFlipFlop_1

The functionality of this FB corresponds to that of an RS flipflop:

- ▶ An input signal at *bSet* serves to set the *bOut* output permanently.
- ▶ An input signal at *bReset* serves to reset the output.
- ▶ Additional, inverted output *bNegOut*



Inputs

Identifier	Data type	Information/possible settings
bSet	BOOL	Setting input
		TRUE <ul style="list-style-type: none"> • The <i>bOut</i> output is set to TRUE. • The <i>bNegOut</i> output is set to FALSE.
bReset	BOOL	Reset input
		TRUE <ul style="list-style-type: none"> • The <i>bOut</i> output is set to FALSE. • The <i>bNegOut</i> output is set to TRUE.

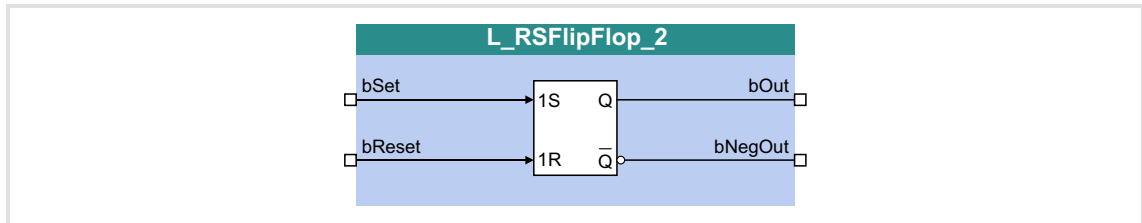
Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal
bNegOut	BOOL	Output signal, inverted

18.1.148 L_RSFlipFlop_2

The functionality of this FB corresponds to that of an RS flipflop:

- ▶ An input signal at *bSet* serves to set the *bOut* output permanently.
- ▶ An input signal at *bReset* serves to reset the output.
- ▶ Additional, inverted output *bNegOut*



Inputs

Identifier	Data type	Information/possible settings
bSet	BOOL	Setting input
		TRUE <ul style="list-style-type: none"> • The <i>bOut</i> output is set to TRUE. • The <i>bNegOut</i> output is set to FALSE.
bReset	BOOL	Reset input
		TRUE <ul style="list-style-type: none"> • The <i>bOut</i> output is set to FALSE. • The <i>bNegOut</i> output is set to TRUE.

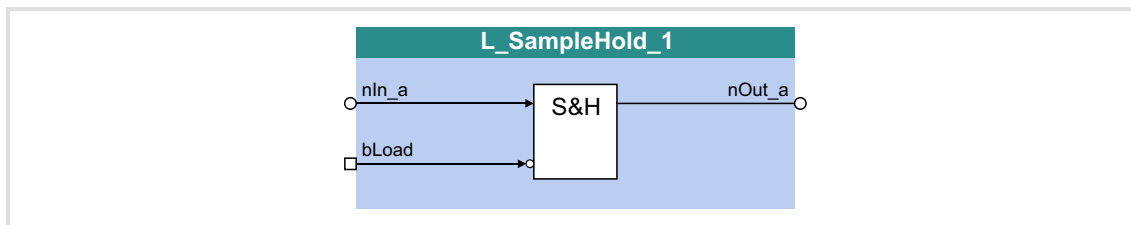
Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output signal
bNegOut	BOOL	Output signal, inverted

18.1.149 L_SampleHold_1

This FB can store a signal.

- ▶ The saved value is also available after mains switching.

**Inputs**

Identifier	Data type	Information/possible settings	
nIn_a	INT	Input signal	
bLoad	BOOL	Save input signal	
		FALSE	The last-valid value at <i>nIn</i> is saved and output to <i>nOut</i> . A signal change at <i>nIn</i> does not cause a change at <i>nOut</i> .
		TRUE	The <i>nOut</i> output provides <i>dnIn</i> .

Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal

Function

- ▶ When *bLoad* = TRUE, the *nIn_a* signal is switched to *nOut_a*.
- ▶ When *bLoad* = FALSE, the last-valid value is saved and output at *nOut_a*. A signal change at *nIn_a* does not cause a change at *nOut_a*.

Behaviour after mains switching

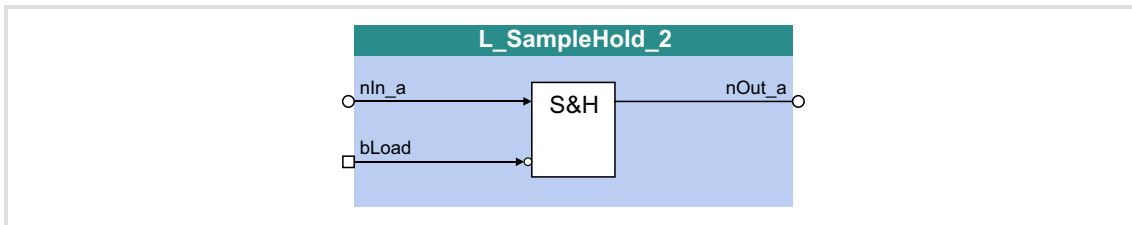
The last-loaded value is permanently stored after switching of the supply voltage and reloaded after restart.

- ▶ In order that the saved value is not immediately overwritten with the current input signal at *nIn* after restart, *bLoad* must be set to FALSE at restart.

18.1.150 L_SampleHold_2

This FB can store a signal.

- ▶ The saved value is also available after mains switching.



Inputs

Identifier	Data type	Information/possible settings	
nIn_a	INT	Input signal	
bLoad	BOOL	Save input signal	
		FALSE	The last-valid value at <i>nIn</i> is saved and output to <i>nOut</i> . A signal change at <i>nIn</i> does not cause a change at <i>nOut</i> .
		TRUE	The <i>nOut</i> output provides <i>dnIn</i> .

Outputs

Identifier	Data type	Value/meaning
nOut	INT	Output signal

Function

- ▶ When *bLoad* = TRUE, the *nIn_a* signal is switched to *nOut_a*.
- ▶ When *bLoad* = FALSE, the last-valid value is saved and output at *nOut_a*. A signal change at *nIn_a* does not cause a change at *nOut_a*.

Behaviour after mains switching

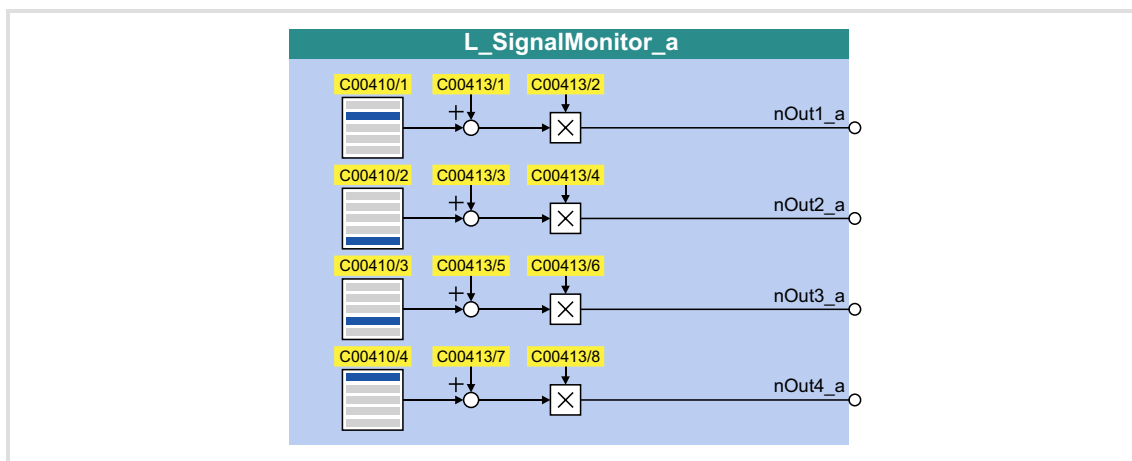
The last-loaded value is permanently stored after switching of the supply voltage and reloaded after restart.

- ▶ In order that the saved value is not immediately overwritten with the current input signal at *nIn* after restart, *bLoad* must be set to FALSE at restart.

18.1.151 L_SignalMonitor_a

This FB outputs four analog signals which can be selected from a list of analog output signals of all function blocks provided in the device.

- Offset and gain of the source signals are adjustable.



Outputs

Identifier	Data type	Value/meaning
nOut1_a	INT	Output signal • Internal limitation to ± 32767
nOut2_a	INT	Output signal • Internal limitation to ± 32767
nOut3_a	INT	Output signal • Internal limitation to ± 32767
nOut4_a	INT	Output signal • Internal limitation to ± 32767

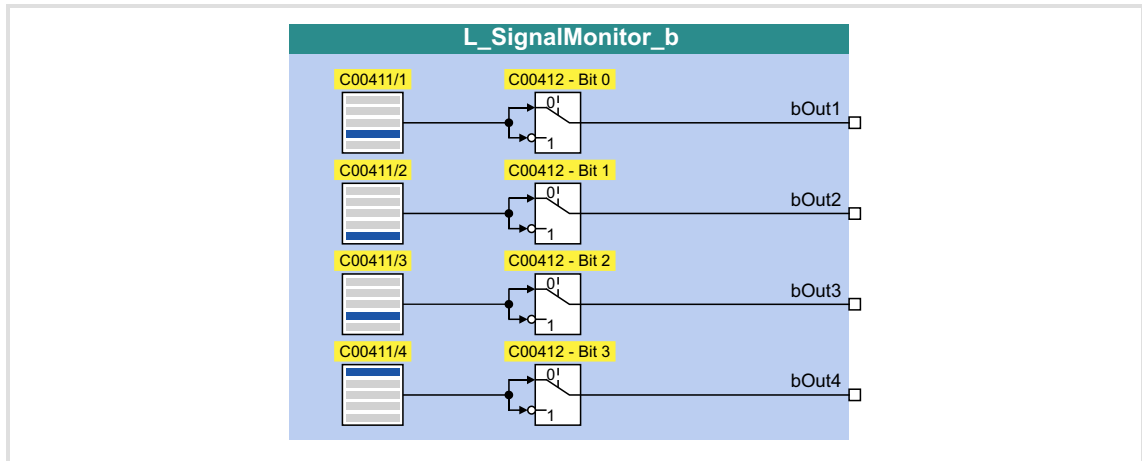
Parameter

Parameter	Possible settings	Info
C00410/1 ... C00410/4	0 Not connected 1000 LA_nCtrl_wDriveControlStatus 1001 LA_nCtrl_wFailNumber 1002 LA_nCtrl_nMotorCurrent_a ... 42017 LA_nCtrl_In_nPIDSerValue_a	Selection of the signal sources for nOut1_a ... nOut4_a
C00413/1 C00413/3 C00413/5 C00413/7	-199.99 % +199.99	Offset
C00413/2 C00413/4 C00413/6 C00413/8	-199.99 % +199.99	Gain

18.1.152 L_SignalMonitor_b

This FB outputs four binary signals which can be selected from a list of binary output signals of all function blocks provided in the device.

- Inversion of the output signals can be set.



Outputs

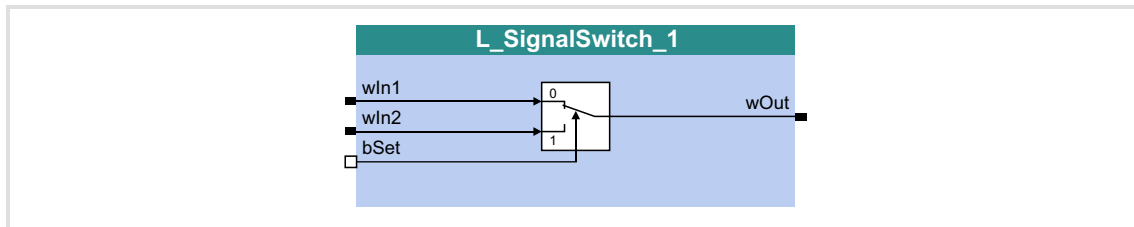
Identifier	Data type	Value/meaning
bOut1		Output signal
...		FALSE / TRUE
bOut4	BOOL	

Parameter

Parameter	Possible settings	Info
C00411/1		Selection of the signal sources for <i>bOut1 ... bOut4</i>
...	0 Not connected	
C00411/4	1000 LA_nCtrl_bDriveReady	
	1001 LA_nCtrl_bDriveFail	
	1002 LA_nCtrl_bClnhActive	
	
	42033 LA_NCtrl_bPIDIOff	
C00412		Inversion
	Bit 0 bOut1 inverted	• Bit set = inversion active
	Bit 1 bOut2 inverted	
	Bit 2 bOut3 inverted	
	Bit 3 bOut4 inverted	
	Bit 4 Reserved	
	Bit 5 Reserved	
	Bit 6 Reserved	
	Bit 7 Reserved	

18.1.153 L_SignalSwitch_1

This FB switches between two input signals of the "WORD" data type. The switch-over is controlled by means of a boolean input signal.



Inputs

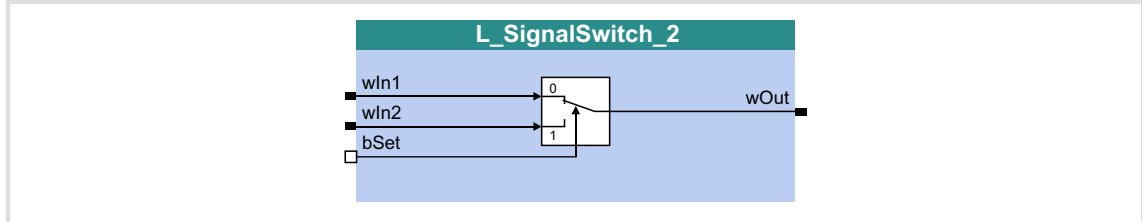
Identifier	Data type	Information/possible settings
wIn1	WORD	Input signal 1
wIn2	WORD	Input signal 2
bSet	BOOL	Selection of the input signal for the output at <i>wOut</i>
		FALSE <i>wIn1</i>
		TRUE <i>wIn2</i>

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

18.1.154 L_SignalSwitch_2

This FB switches between two input signals of the "WORD" data type. The switch-over is controlled by means of a boolean input signal.



Inputs

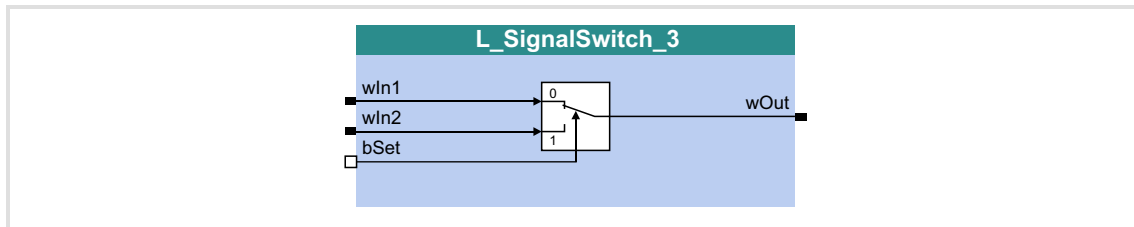
Identifier	Data type	Information/possible settings
wIn1	WORD	Input signal 1
wIn2	WORD	Input signal 2
bSet	BOOL	Selection of the input signal for the output at <i>wOut</i>
		FALSE <i>wIn1</i>
		TRUE <i>wIn2</i>

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

18.1.155 L_SignalSwitch_3

This FB switches between two input signals of the "WORD" data type. The switch-over is controlled by means of a boolean input signal.



Inputs

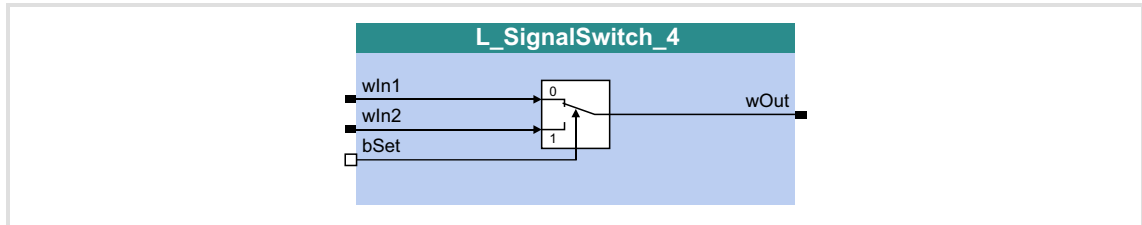
Identifier	Data type	Information/possible settings
wIn1	WORD	Input signal 1
wIn2	WORD	Input signal 2
bSet	BOOL	Selection of the input signal for the output at <i>wOut</i>
		FALSE <i>wIn1</i>
		TRUE <i>wIn2</i>

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

18.1.156 L_SignalSwitch_4

This FB switches between two input signals of the "WORD" data type. The switch-over is controlled by means of a boolean input signal.



Inputs

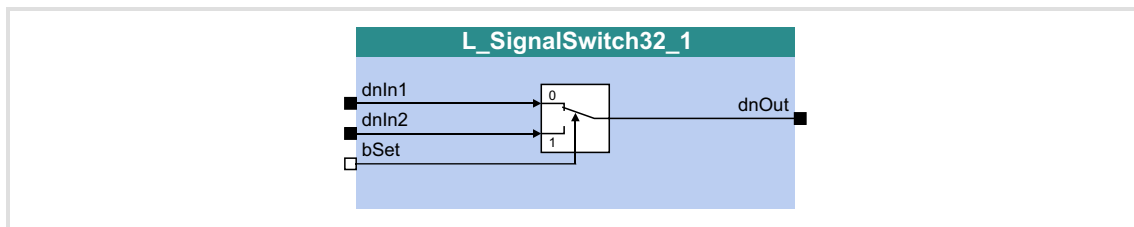
Identifier	Data type	Information/possible settings
wIn1	WORD	Input signal 1
wIn2	WORD	Input signal 2
bSet	BOOL	Selection of the input signal for the output at <i>wOut</i>
		FALSE <i>wIn1</i>
		TRUE <i>wIn2</i>

Outputs

Identifier	Data type	Value/meaning
wOut	WORD	Output signal

18.1.157 L_SignalSwitch32_1

This FB switches between two input signals of the "DINT" data type. The switch-over is controlled by means of a boolean input signal.



Inputs

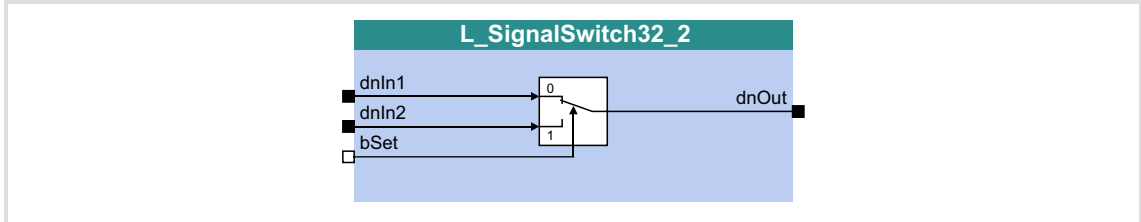
Identifier	Data type	Information/possible settings	
dnIn1	DINT	Input signal 1	
dnIn2	DINT	Input signal 2	
bSet	BOOL	Selection of the input signal for the output at <i>dnOut</i>	
		FALSE	<i>dnIn1</i>
		TRUE	<i>dnIn2</i>

Outputs

Identifier	Data type	Value/meaning
dnOut	DINT	Output signal

18.1.158 L_SignalSwitch32_2

This FB switches between two input signals of the "DINT" data type. The switch-over is controlled by means of a boolean input signal.



Inputs

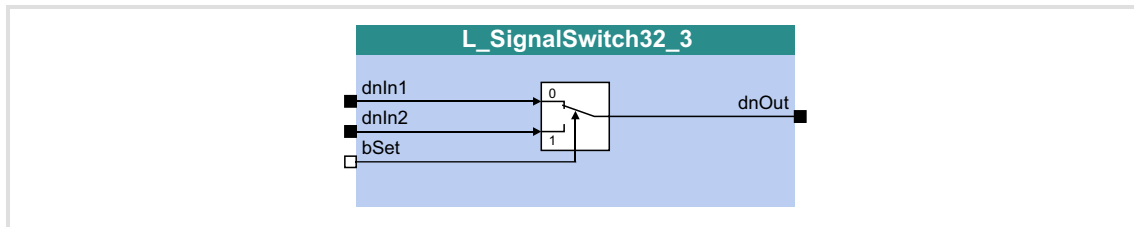
Identifier	Data type	Information/possible settings
dnIn1	DINT	Input signal 1
dnIn2	DINT	Input signal 2
bSet	BOOL	Selection of the input signal for the output at <i>dnOut</i>
		FALSE <i>dnIn1</i>
		TRUE <i>dnIn2</i>

Outputs

Identifier	Data type	Value/meaning
dnOut	DINT	Output signal

18.1.159 L_SignalSwitch32_3

This FB switches between two input signals of the "DINT" data type. The switch-over is controlled by means of a boolean input signal.



Inputs

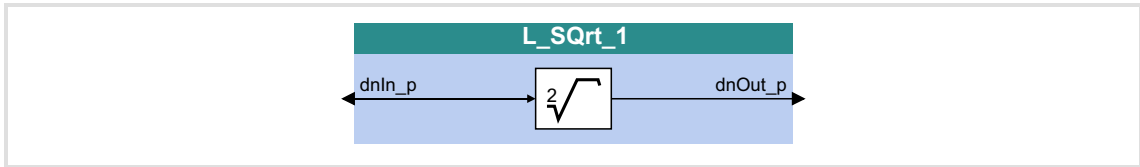
Identifier	Data type	Information/possible settings
dnIn1	DINT	Input signal 1
dnIn2	DINT	Input signal 2
bSet	BOOL	Selection of the input signal for the output at <i>dnOut</i>
		FALSE <i>dnIn1</i>
		TRUE <i>dnIn2</i>

Outputs

Identifier	Data type	Value/meaning
dnOut	DINT	Output signal

18.1.160 L_SQrt_1

This FB outputs the square root for the DINT input value.



Inputs

Identifier	Data type	Information/possible settings
dnIn_p	DINT	Input signal

Outputs

Identifier	Data type	Value/meaning
dnOut_p	DINT	Output signal

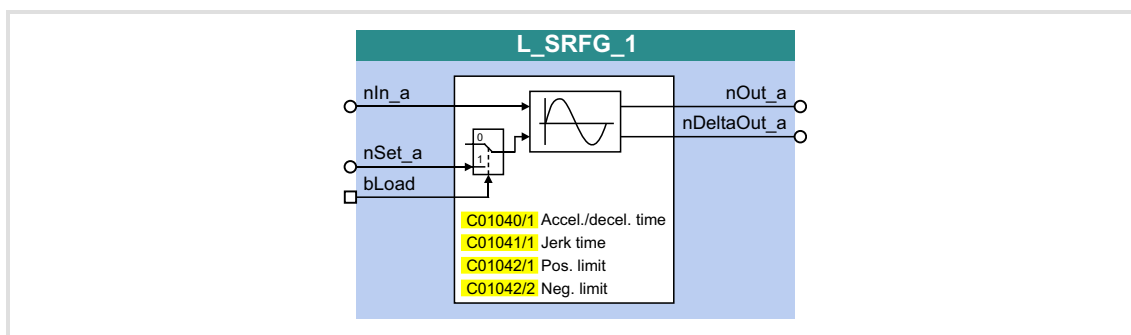
Function

$$dnOut_p = \sqrt{dnIn_p}$$

18.1.161 L_SRFG_1

This FB is a ramp function generator with S-shaped ramps for limiting the temporal rise of analog signals. The ramps are S-shaped due to trapezoidal acceleration.

- ▶ The ramp function generator is provided with a setting function so that a value can directly be loaded into the internal ramp generator.
- ▶ The balanced acceleration/deceleration time is set in [C01040](#).
- ▶ An S-ramp time can be set in [C01041](#) for jerk-free acceleration until maximum acceleration is reached.
- ▶ At the *nDeltaOut_a* output, the dy/dt slope of the *nOut_a* output signal is output.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal
nSet_a	INT	Starting value for the ramp function generator <ul style="list-style-type: none"> • Will be accepted if <i>bLoad</i> = TRUE
bLoad	BOOL	Initialise ramp function generator
		<p>FALSE</p> <p>With the set acceleration/deceleration time, the ramp function generator switches over from the value loaded via <i>nSet_a</i> to the value at <i>nIn_a</i>.</p> <p>TRUE</p> <p>At the <i>nOut_a</i> output, <i>nSet_a</i> is output.</p> <ul style="list-style-type: none"> • <i>nDeltaOut_a</i> remains at 0 %.

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199\%$ ($100\% \equiv 16384$)
nDeltaOut_a	INT	Acceleration of the ramp function generator <ul style="list-style-type: none"> • Internal limitation to $\pm 100\%$ ($100\% \equiv 16384$)

Parameter

Parameter	Possible settings			Info
C01040/1	0.001	s	999.999	Acceleration/Deceleration time • Initialisation: 100.000 s
C01041/1	0.001	s	50.000	S-ramp time • Initialisation: 0.200 s
C01042/1	-199.99	s	199.99	Pos. limit • Initialisation: 100.00 %
C01042/2	-199.99	s	199.99	Neg. limit • Initialisation: -100.00 %

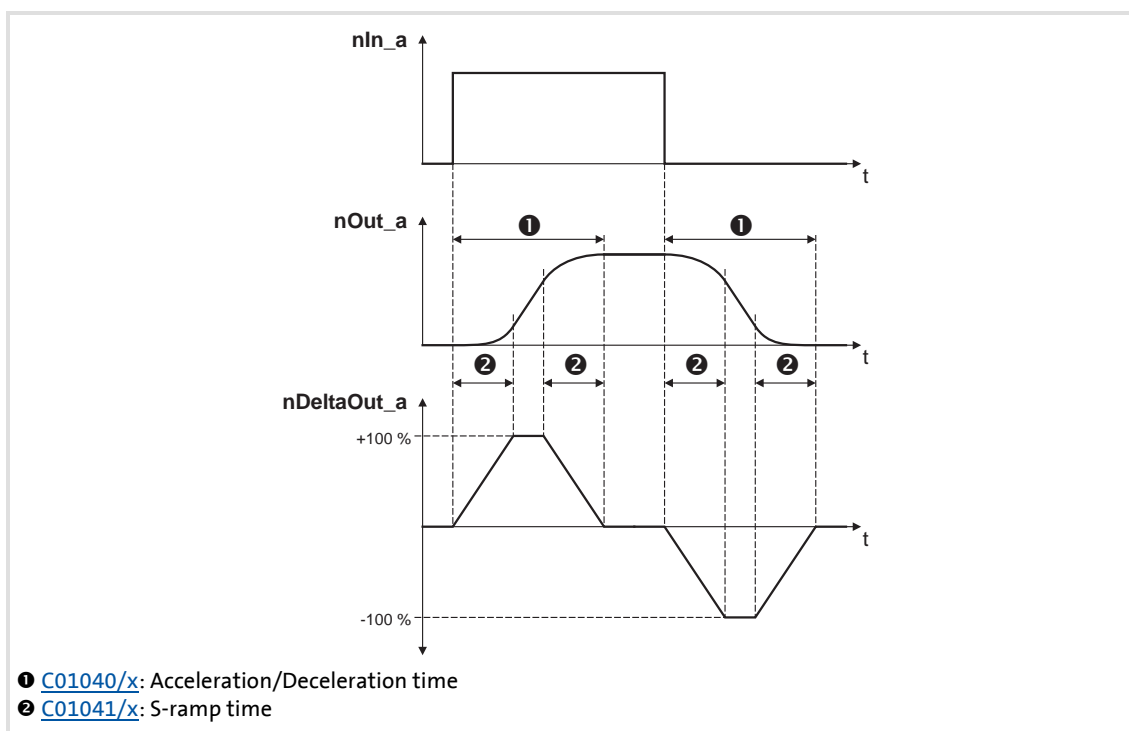
Loading the ramp function generator

When *bLoad* is set to TRUE, the ramp function generator is loaded with the signal at *nSet_a*. This value is accepted immediately and output at *nOut_a*. There is no acceleration or deceleration via an S shape. As long as *bLoad* = TRUE, the ramp function generator remains inhibited.

Acceleration/Deceleration time and S-ramp time

The acceleration/deceleration time and the S-ramp time for jerk-free acceleration can be set separately.

- ▶ Acceleration/Deceleration time = Time until the *nOut_a* output value has reached the *nIn_a* input value.
- ▶ S-ramp time = Time until the ramp function generator operates at maximum acceleration.

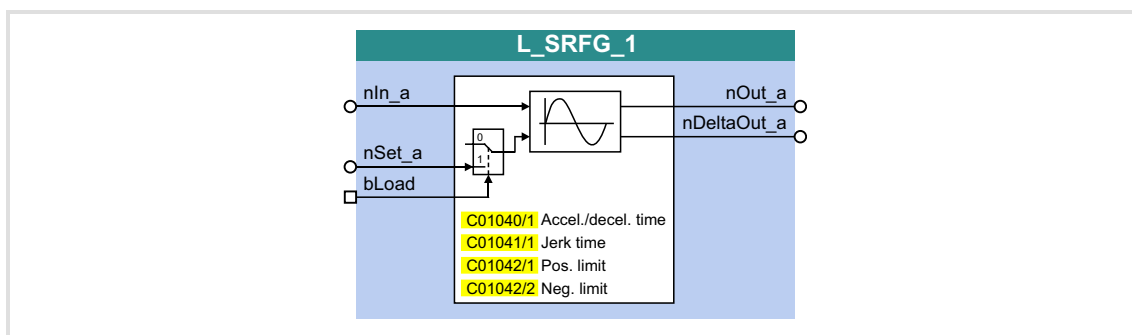


[18-62] Signal flow

18.1.162 L_SRFG_2

This FB is a ramp function generator with S-shaped ramps for limiting the temporal rise of analog signals. The ramps are S-shaped due to trapezoidal acceleration.

- ▶ The ramp function generator is provided with a setting function so that a value can directly be loaded into the internal ramp generator.
- ▶ The balanced acceleration/deceleration time is set in [C01040](#).
- ▶ An S-ramp time can be set in [C01041](#) for jerk-free acceleration until maximum acceleration is reached.
- ▶ At the *nDeltaOut_a* output, the dy/dt slope of the *nOut_a* output signal is output.



Inputs

Identifier	Data type	Information/possible settings
nIn_a	INT	Input signal
nSet_a	INT	Starting value for the ramp function generator <ul style="list-style-type: none"> • Will be accepted if <i>bLoad</i> = TRUE
bLoad	BOOL	Initialise ramp function generator
		<p>FALSE</p> <p>With the set acceleration/deceleration time, the ramp function generator switches over from the value loaded via <i>nSet_a</i> to the value at <i>nIn_a</i>.</p> <p>TRUE</p> <p>At the <i>nOut_a</i> output, <i>nSet_a</i> is output.</p> <ul style="list-style-type: none"> • <i>nDeltaOut_a</i> remains at 0 %.

Outputs

Identifier	Data type	Value/meaning
nOut_a	INT	Output signal <ul style="list-style-type: none"> • Internal limitation to $\pm 199\%$ ($100\% \equiv 16384$)
nDeltaOut_a	INT	Acceleration of the ramp function generator <ul style="list-style-type: none"> • Internal limitation to $\pm 100\%$ ($100\% \equiv 16384$)

Parameter

Parameter	Possible settings			Info
C01040/2	0.001	s	999.999	Acceleration/Deceleration time • Initialisation: 100.000 s
C01041/2	0.001	s	50.000	S-ramp time • Initialisation: 0.200 s
C01042/3	-199.99	s	199.99	Pos. limit • Initialisation: 100.00 %
C01042/4	-199.99	s	199.99	Neg. limit • Initialisation: -100.00 %

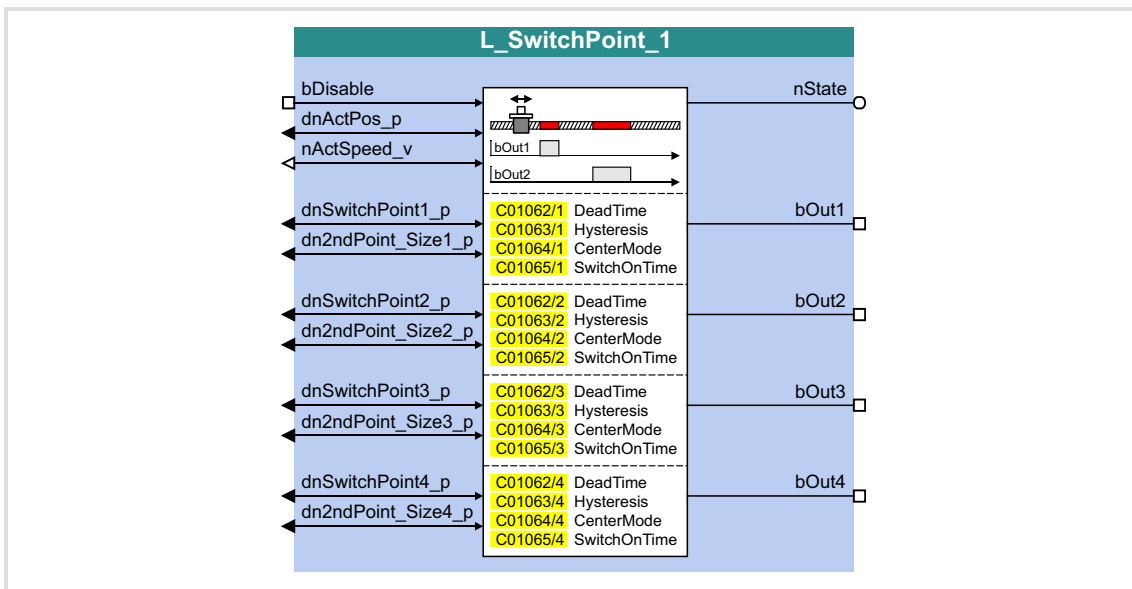


For a detailed functional description see [L_SRFG_1](#).

18.1.163 L_SwitchPoint_1

This FB provides four position switch points, i.e. digital switches the binary statuses (FALSE/TRUE) of which depend on the actual position.

- ▶ A position switch point serves to start peripherals as paint nozzles or knives depending on the tool position.
- ▶ Moreover the FB supports the compensation of delay times of external switching elements (dead time compensation).
- ▶ By setting a running time, position/time-based cams can be realised as well.



Inputs

Identifier	Data type	Information/possible settings
bDisable	BOOL	Deactivate position switch points <ul style="list-style-type: none"> • This input has the highest priority.
		TRUE Position switch points are deactivated. <ul style="list-style-type: none"> • Outputs bOut1 ... bOut4 = FALSE
dnActPos_p	DINT	Actual position in [increments]
nActSpeed_v	INT	Actual speed in [increments/ms] <ul style="list-style-type: none"> • Scaling: 16384 ≙ 15000 rpm
dnSwitchPointx_p	DINT	Position switch point x: Position of the first switching point in [increments]
dn2ndPoint_Sizex_p	DINT	Position switch point x: Position of the second switching point or size of the switching window depending on the CenterMode set in C01064/x : <ul style="list-style-type: none"> When CenterMode = FALSE: <ul style="list-style-type: none"> Position of the second switching point in [increments] <ul style="list-style-type: none"> • dn2ndPoint_Size_p must be higher than dnSwitchPoint_p. When CenterMode = TRUE: <ul style="list-style-type: none"> Size of the switching window in [increments] <ul style="list-style-type: none"> • Due to the symmetrical arrangement of the window around the first switching point, uneven values are rounded to even values. • Only positive values are permissible.

Outputs

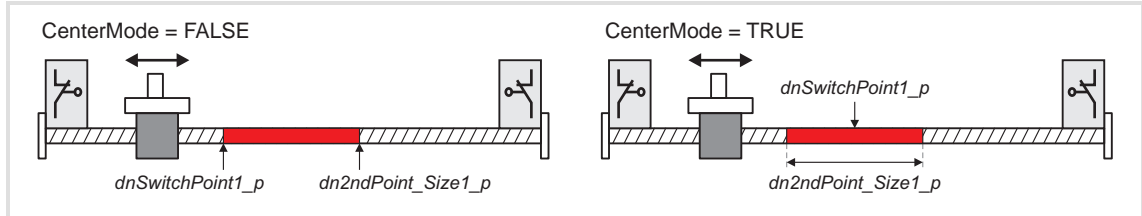
Identifier	Data type	Value/meaning
bOut1 ... bOut4	BOOL	Switching output 1 ... 4
		TRUE The actual position is inside the defined switching window.
nState	INT	Status
		1 FB is not active
		2 OK
		3 The data form resulting from the switching points are not plausible (<i>dnSwitchPoint_p</i> , <i>dn2ndPoint_Size_p</i> , parameterised hysteresis).

Parameter

Parameter	Possible settings			Info
C01062/1...4	0.00	ms	655.00	Dead time for dead time compensation <ul style="list-style-type: none"> The resulting switching position is not subject to a plausibility check. Lenze setting: 0.00 ms
C01063/1...4	0	Incr.	65535	Switching hysteresis <ul style="list-style-type: none"> Lenze setting: 0 incr.
C01064/1...4				CenterMode <ul style="list-style-type: none"> Definition how the <i>dn2ndPoint_Size_p</i> selection is interpreted.
	False	<i>dn2ndPoint_Size_p</i> defines the second switching point. (Lenze setting)		
	True	<i>dn2ndPoint_Size_p</i> defines the size of the switching window.		
C01065/1...4	0	ms	60000	Running time for position/time-based cams <ul style="list-style-type: none"> Lenze setting: 0 ms
	0 ms = position-based cam			

18.1.163.1 Definition of the switching range

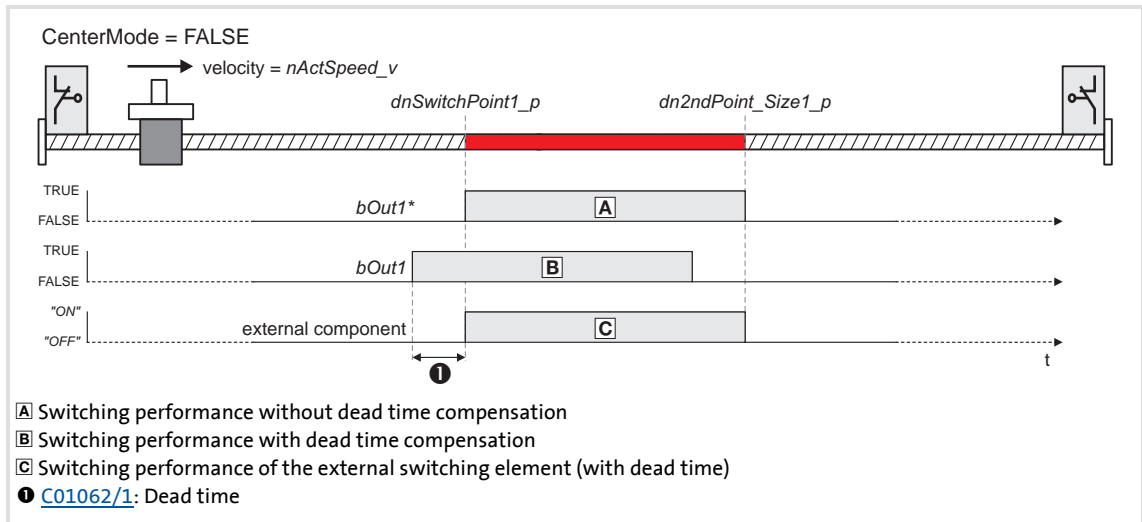
Depending on the setting of the CenterMode ([C01064/x](#)), the switching range can be defined via a start and end position or via the data of the center point/size of switching range:



[18-63] Definition of the switching range

18.1.163.2 Dead time compensation

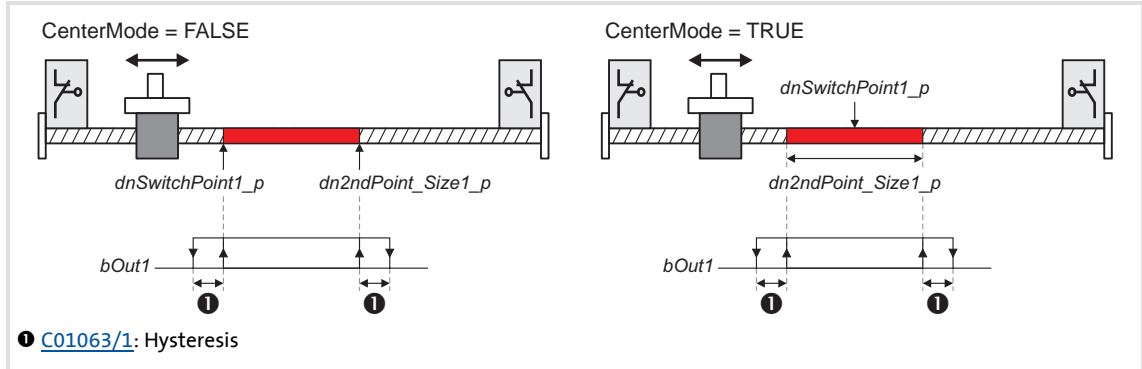
The delay time of external switching elements can be compensated by setting the corresponding delay time in [C01062/x](#). From this input and the current speed, the FB calculates a preliminary stop, i.e. the *bOut* switching output is set correspondingly earlier.



[18-64] Dead time compensation

18.1.163.3 Switching hysteresis

Setting a hysteresis in [C01063/x](#) serves to prevent a permanent state change of the *bOut* switching output that may be caused by actual position value changes due to a mechanical irregularity at the axis.



[18-65] Switching hysteresis

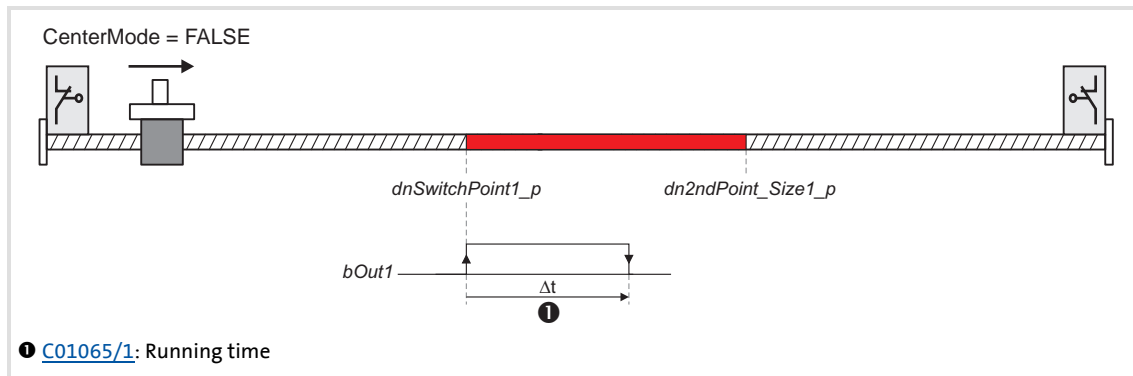


Tip!

Please note that a delay time set in [C01062/x](#) shifts the switching points including the hysteresis.

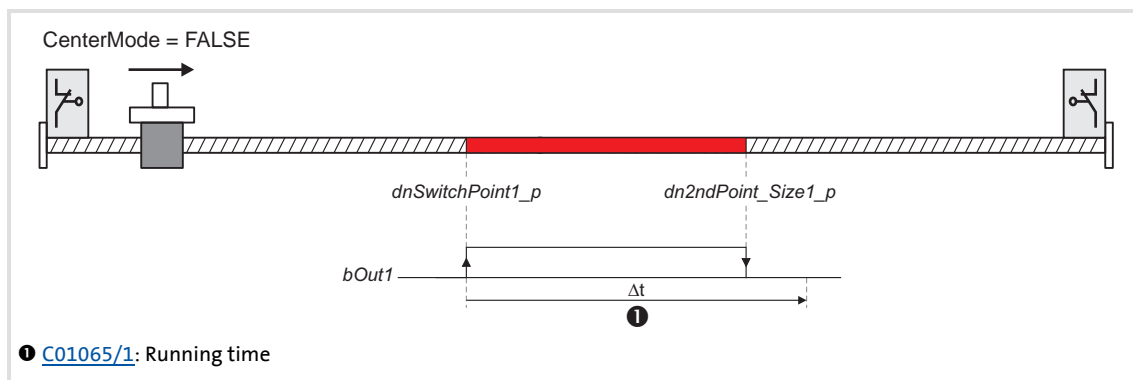
18.1.163.4 Position/time-based cams

The setting of a running time in [C01065/x](#) higher 0 ms serves to realise "position/time-based cams": If the drive reaches the switching range, the *bOut* switching output is set to TRUE and reset to FALSE after the set switching time has elapsed.



[18-66] Position/time-based cams (here without switching hysteresis and dead time compensation)

If the switching range is left before the running time has expired, the *bOut* switching output is reset to FALSE when the switching range is left:



[18-67] Position/time-based cams: Behaviour when the switching range is left before the running time has expired

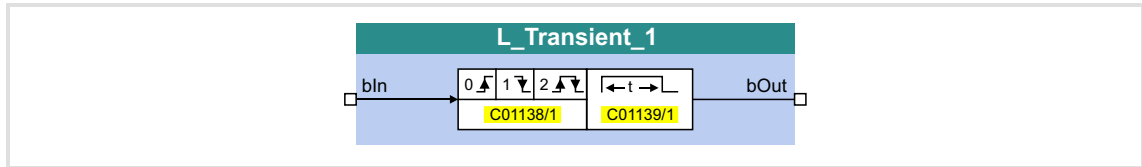


Tip!

Please note that for a resetting of the switching output the switching range must be left first.

18.1.164 L_Transient_1

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01138/1.

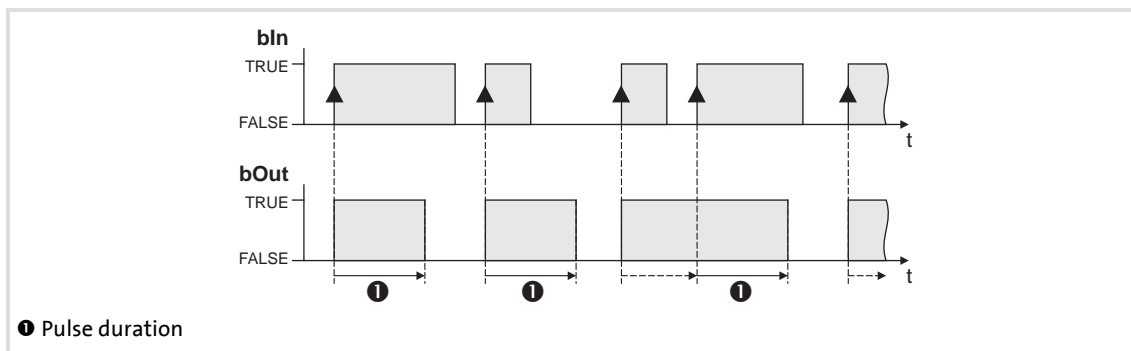
Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

Parameter	Possible settings	Info
C01138/1	0 High edge	Function <ul style="list-style-type: none"> Selection of edge evaluation Lenze setting
	1 Low edge	
	2 High and low edge	
C01139/1	0.001 s 60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s

18.1.164.1 Function 0: Evaluate rising signal edges

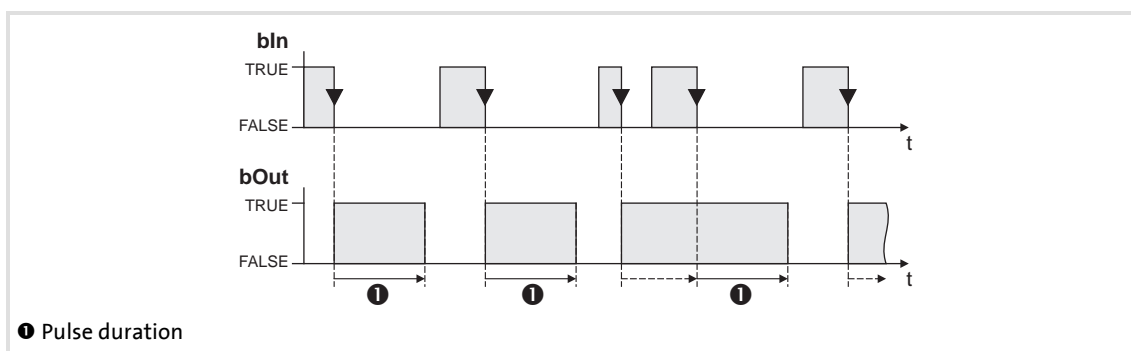


[18-68] Switching performance for function selection "0: High edge"

Functional sequence

1. A FALSE-TRUE edge at the *bIn* input sets the *bOut* output to TRUE.
2. After the parameterised pulse duration has elapsed, the *bOut* output is reset to FALSE unless another FALSE/TRUE edge has been set at the *bIn* input.
 - If an additional FALSE-TRUE edge occurs at the *bIn* input, the pulse duration starts again from the beginning, i.e. the *bOut* output can be retriggered.

18.1.164.2 Function 1: Evaluate falling signal edges

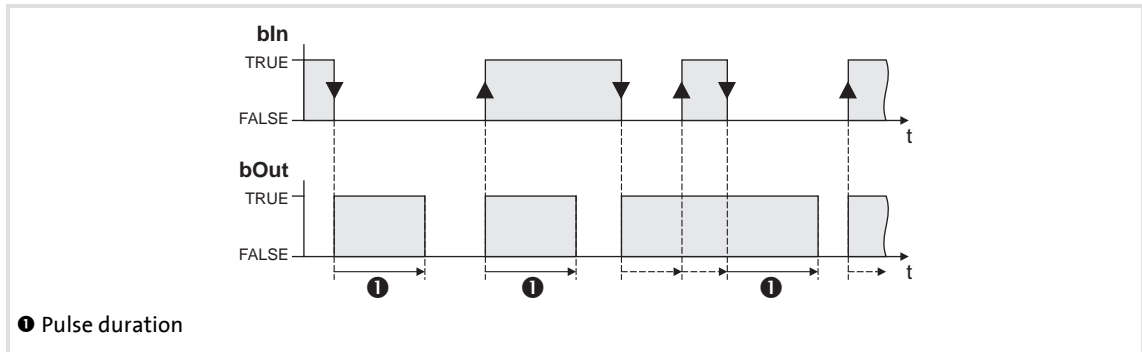


[18-69] Switching performance for function selection "1: Low edge"

Functional sequence

1. A TRUE-FALSE edge at the *bIn* inputs sets the *bOut* output to TRUE.
2. After the parameterised pulse duration has elapsed, the *bOut* output is reset to FALSE unless another TRUE/FALSE edge has been set at the *bIn* input.
 - If an additional TRUE-FALSE edge occurs at the *bIn* input, the pulse duration starts again from the beginning, i.e. the *bOut* output can be retriggered.

18.1.164.3 Function 2: Evaluate rising and falling signal edges



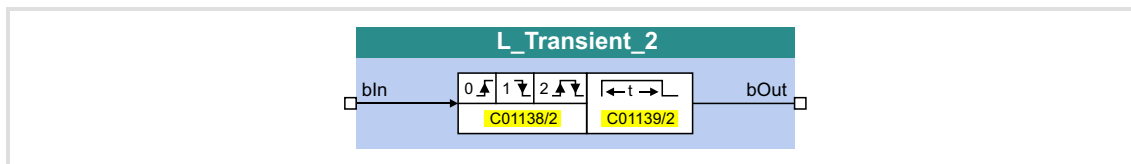
[18-70] Switching performance for function selection "2: High and low edge"

Functional sequence

1. A signal change (FALSE/TRUE edge or TRUE/FALSE edge) at the *bIn* input sets the *bOut* output to TRUE.
2. After the parameterised pulse duration has elapsed, the *bOut* output is reset to FALSE unless another signal change has taken place at the *bIn* input.
 - In case of another signal change at the input *bIn*, the pulse time restarts to elapse, i.e. the output *bOut* can be retriggered.

18.1.165 L_Transient_2

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01138/2.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

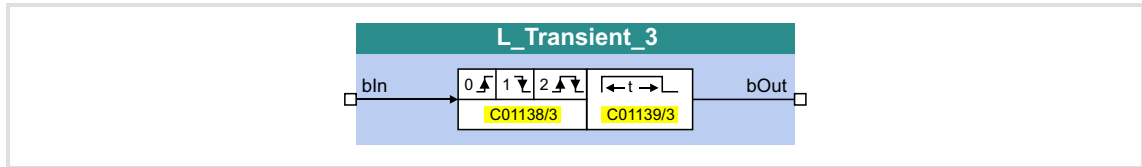
Parameter	Possible settings	Info
C01138/2	0 High edge	Function <ul style="list-style-type: none"> Selection of edge evaluation
	1 Low edge	Lenze setting
	2 High and low edge	
C01139/2	0.001 s 60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s



For a detailed functional description see [L_Transient_1](#).

18.1.166 L_Transient_3

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01138/3.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

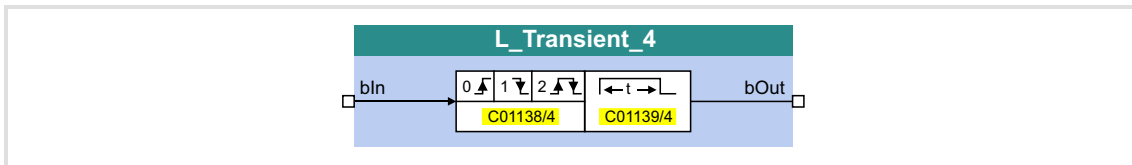
Parameter	Possible settings	Info
C01138/3	0 High edge	Function <ul style="list-style-type: none"> Selection of edge evaluation Lenze setting
	1 Low edge	
	2 High and low edge	
C01139/3	0.001 s 60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s



For a detailed functional description see [L_Transient_1](#).

18.1.167 L_Transient_4

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01138/4.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

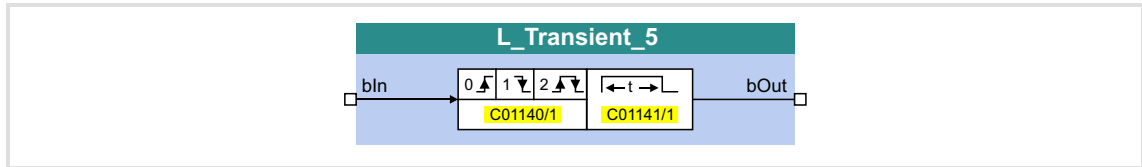
Parameter	Possible settings	Info
C01138/4	0 High edge	Function <ul style="list-style-type: none"> Selection of edge evaluation Lenze setting
	1 Low edge	
	2 High and low edge	
C01139/4	0.001 s 60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s



For a detailed functional description see [L_Transient_1](#).

18.1.168 L_Transient_5

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01140/1.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

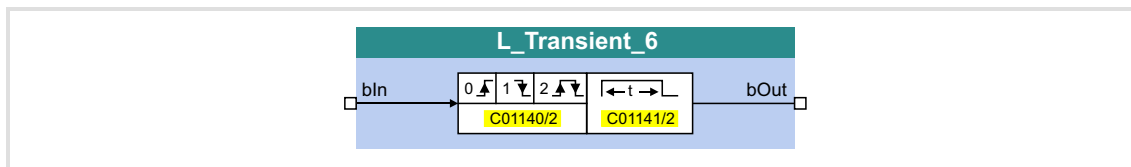
Parameter	Possible settings	Info
C01140/1	0 High edge	Function <ul style="list-style-type: none"> Selection of edge evaluation Lenze setting
	1 Low edge	
	2 High and low edge	
C01141/1	0.001 s 60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s



For a detailed functional description see [L_Transient_1](#).

18.1.169 L_Transient_6

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01140/2.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

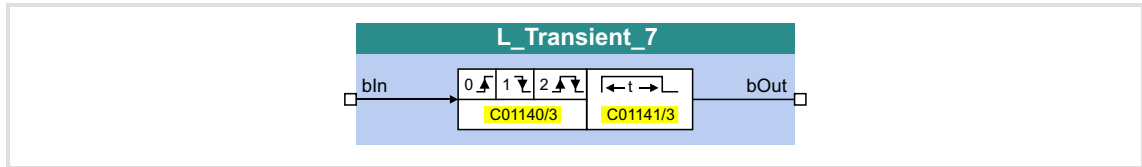
Parameter	Possible settings	Info						
C01140/2	<table border="1"> <tr> <td>0</td> <td>High edge</td> </tr> <tr> <td>1</td> <td>Low edge</td> </tr> <tr> <td>2</td> <td>High and low edge</td> </tr> </table>	0	High edge	1	Low edge	2	High and low edge	Function <ul style="list-style-type: none"> Selection of edge evaluation Lenze setting
0	High edge							
1	Low edge							
2	High and low edge							
C01141/2	<table border="1"> <tr> <td>0.001</td> <td>s</td> <td>60.000</td> </tr> </table>	0.001	s	60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s 			
0.001	s	60.000						



For a detailed functional description see [L_Transient_1](#).

18.1.170 L_Transient_7

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01140/3.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

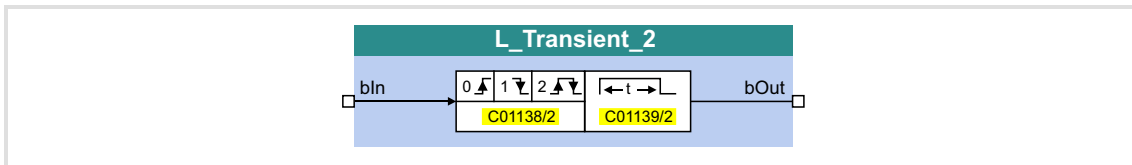
Parameter	Possible settings	Info
C01140/3	0 High edge	Function <ul style="list-style-type: none"> Selection of edge evaluation Lenze setting
	1 Low edge	
	2 High and low edge	
C01141/3	0.001 s 60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s



For a detailed functional description see [L_Transient_1](#).

18.1.171 L_Transient_8

This FB serves to evaluate digital signal edges and convert them into timed, retriggerable pulses. Rising signal edges, falling signal edges or both signal edges can be evaluated.



Inputs

Identifier	Data type	Information/possible settings
bIn	BOOL	Input for edge evaluation <ul style="list-style-type: none"> The function depends on the selection of edge evaluation in C01140/4.

Outputs

Identifier	Data type	Value/meaning
bOut	BOOL	Output (retriggerable)

Parameter

Parameter	Possible settings	Info
C01140/4	0 High edge	Function <ul style="list-style-type: none"> Selection of edge evaluation
	1 Low edge	Lenze setting
	2 High and low edge	
C01141/4	0.001 s 60.000	Pulse duration <ul style="list-style-type: none"> Lenze setting: 0.001 s



For a detailed functional description see [L_Transient_1](#).

18.2 System blocks

This chapter describes the system blocks which are available for the controller in the FB Editor.



The function blocks are described in the chapter "[Function blocks](#)". (☰ 1110)

Overview of system blocks available

System block	Function	can be inserted into level:	
		I/O	Appl.
LS_AnalogInput	Interface to the analog input terminals ▶ Analog terminals (☰ 352)	●	
LS_AnalogOutput	Interface to the analog output terminals ▶ Analog terminals (☰ 352)	●	
LS_AxisBusAux	Interface to the axis bus ▶ Axis bus (☰ 717)	●	●
LS_AxisBusIn		●	●
LS_AxisBusIO		●	●
LS_AxisBusOut		●	●
LS_CANManagement	Control of internal functions of the CAN driver and display of the "Operational" status as well as the node address ▶ System bus "CAN on board" (☰ 638)	●	●
LS_DataAccess	<i>Lenze internal only</i>		●
LS_DeviceMonitor	Motor control status signals ▶ Motor control (MCTRL) (☰ 120)		●
LS_DigitalInput	Interface to the digital input terminals ▶ Digital input terminals (☰ 329)	●	
LS_DigitalOutput	Interface to the digital output terminals ▶ Digital output terminals (☰ 349)	●	
LS_DisFree	Display of 8 arbitrary 16-bit signals of the application on display codes	●	●
LS_DisFree_a	Display of 8 arbitrary analog signals of the application on display codes	●	●
LS_DisFree_b	Display of 16 arbitrary digital signals of the application on a bit coded display code	●	●
LS_DisFree_p	Display of 8 arbitrary position signals of the application on display codes	●	●
LS_DriveInterface	Interface to drive control (DCTRL) ▶ Device control (DCTRL) (☰ 89)		●
LS_Keypad	Control via keypad	●	
LS_MotionControlKernel	Interface to the basic drive function implemented in the Motion Control Kernel (MCK) ▶ Basic drive functions (MCK) (☰ 473)		●
LS_MotorInterface	Interface to motor control (MCTRL) ▶ Motor control (MCTRL) (☰ 120)		●
LS_MultiEncoder	Interface to the Multi-Encoder ▶ Multi-Encoder at X8 (☰ 302)	●	●
LS_ParFix LS_ParFix_2	Output of frequently used constants (TRUE, FALSE, 100 %, etc.) to be used in the interconnection • LS_ParFix_2 is available from version 02.00.00.	●	●

System block	Function	can be inserted into level:	
		I/O	Appl.
LS_ParFree LS_ParFree_2	Output of 32 parameterisable 16-bit signals • LS_ParFree_2 is available from version 02.00.00.	●	●
LS_ParFree_a LS_ParFree_a_2	Output of 16 parameterisable analog signals • LS_ParFree_a_2 is available from version 02.00.00.	●	●
LS_ParFree_b	Output of 32 parameterisable digital signals	●	●
LS_ParFree_p	Output of 8 parameterisable position signals	●	●
LS_ParFree_v LS_ParFree_v_2	Output of 8 parameterisable speed signals • LS_ParFree_v_2 is available from version 02.00.00.	●	●
LS_ParFree32	Output of 8 parameterisable 32-bit signals • This SB is available from version 02.00.00.	●	●
LS_ParFreeUnit LS_ParFreeUnit_2	Output of 16 parameterisable position signals with internal conversion of [unit] in [increments] • These SBs are available from version 02.00.00.	●	●
LS_ParReadWrite_1 ... LS_ParReadWrite_6	Reading/Writing of local parameters	●	●
LS_PulseGenerator	Output of 9 fixed frequencies and 1 parameterisable frequency	●	●
LS_Resolver	Interface to the resolver ▶ Resolver at X7 (📖 298)	●	●
LS_RetainData	Selection and saving of retain data • This SB is available from version 02.00.00.	●	●
LS_SetError_1 LS_SetError_2	Parameterisable responses to user-defined events are tripped ▶ Diagnostics & error management (📖 581)	● ●	● ●
LS_SyncManagement	Output of status information for synchronising the internal time base ▶ Synchronisation of the internal time base (📖 731)	●	●
LS_TouchProbe	Interface for touch probe detection ▶ Touch probe detection (📖 362)	●	●
LS_WriteParamList	Interface to the basic "Parameter change-over" function ▶ Parameter change-over (📖 734)	●	

Related topics:

- ▶ [Overview of function blocks available](#) (📖 1110)
- ▶ [Working with the FB Editor](#) (📖 1058)

18.2.1 LS_AnalogInput

Interface to the analog input terminals.



For a detailed description see the main chapter "I/O terminals":

▶ [Internal interfaces | System block "LS_AnalogInput"](#) (📖 360)

18.2.2 LS_AnalogOutput

Interface to the analog output terminals.



For a detailed description see the main chapter "I/O terminals":

▶ [Internal interfaces | System block "LS_AnalogInput"](#) (📖 360)

18.2.3 LS_AxisBusAux

Interface to the axis bus.



For a detailed description see main chapter "Axis bus":

▶ [Internal interfaces | System block "LS_AxisBusAux"](#) (📖 724)

18.2.4 LS_AxisBusIn

Interface to the axis bus.



For a detailed description see main chapter "Axis bus":

▶ [Internal interfaces | System block "LS_AxisBusIn"](#) (📖 723)

18.2.5 LS_AxisBusIO

Interface to the axis bus.



For a detailed description see main chapter "Axis bus":

▶ [Internal interfaces | System block "LS_AxisBusIO"](#) (📖 730)

18.2.6 LS_AxisBusOut

Interface to the axis bus.



For a detailed description see main chapter "Axis bus":

▶ [Internal interfaces | System block "LS_AxisBusOut"](#) (☰ 722)

18.2.7 LS_CANManagement

Control of internal functions of the CAN driver and display of the "Operational" status as well as the node address.



For a detailed description see the main chapter "System bus CAN on board":

▶ [Internal interfaces | System block "LS_CANManagement"](#) (☰ 710)

18.2.8 LS_DataAccess

Only for Lenze-internal use.

18.2.9 LS_DeviceMonitor

Motor control status signals.



For a detailed description see the main chapter "Motor control (MCTRL)":

▶ [Internal status signals | system block "LS_DeviceMonitor"](#) (☰ 291)

18.2.10 LS_DigitalInput

Interface to the digital input terminals.



For a detailed description see the main chapter "I/O terminals":

▶ [Internal interfaces | System block "LS_DigitalInput"](#) (☰ 342)

18.2.11 LS_DigitalOutput

Interface to the digital output terminals.

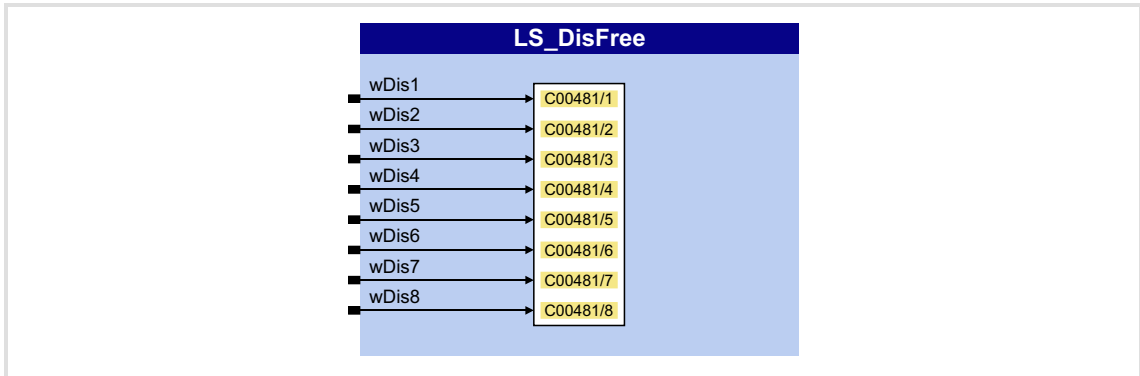


For a detailed description see the main chapter "I/O terminals":

▶ [Internal interfaces | System block "LS_DigitalOutput"](#) (☰ 351)

18.2.12 LS_DisFree

This system block displays 8 arbitrary 16-bit signals of the application on display codes.



Inputs

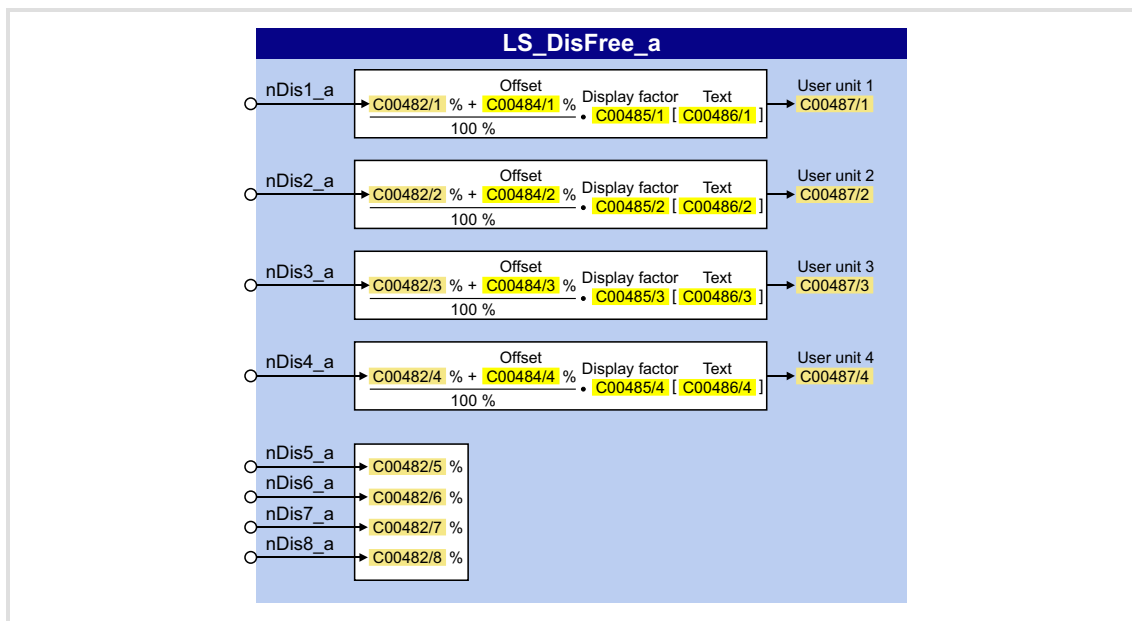
Identifier	Data type	Information/possible settings
wDis1 ... wDis8	WORD	Inputs for any 16-bit signal of the application

Parameter

Parameter	Possible settings	Info
C00481/1...8	0x0000	0xFFFF Display of the 16-bit signals which are applied at the <i>wDis1</i> ... <i>wDis8</i> inputs

18.2.13 LS_DisFree_a

This system block displays 8 arbitrary analog signals of the application on display codes.



Inputs

Identifier	Data type	Information/possible settings
nDis1_a ... nDis8_a	INT	Inputs for any analog signal of the application
From version 02.00.00: nC482_1_a ... nC482_8_a		Note: From version 02.00.00 the inputs are named according to the display parameter for an easier allocation.

Parameter

Parameter	Possible settings	Info
C00482/1...8	-199.99 % 199.99	Display of the analog signals which are applied at the nDis1_a ... nDis8_a inputs
C00484/1...4 ... C00487/1...4	▶ Display of internal process variables in application units	

18.2.13.1 Display of internal process variables in application units

In addition to the display in percent in [C00482/1...8](#), for the first four analog signals $nDis1_a \dots nDis4_a$ the configurable display parameters [C00487/1...4](#) are provided. Via these display parameters, internal process variables can be displayed, e.g. on the keypad, with an individual scaling and an individual unit.

Configuration of the display parameters ([C00487/1...4](#)):

Parameter	Possible settings			Info
C00484/1...4	-199.99	%	199.99	Offset 1 ... 4 <ul style="list-style-type: none"> See formula [18-71]. Lenze setting: 0.00 %
C00485/1...4	-65536.0000		65536.0000	Display factor 1 ... 4 <ul style="list-style-type: none"> Scaling of the input variable for the display. See formula [18-71]. Lenze setting: 1.0000
C00486/1...4	String of digits			Text 1 ... 4 <ul style="list-style-type: none"> For each display value, an individual unit (e.g. "bottles") can be set.

$$\text{Application unit 1} = \frac{nDis1_a [\%] + \text{Offset 1} [\%]}{100 [\%]} \cdot \text{Display factor 1} [\text{text 1}]$$

[18-71] Formula for scaling the display

Example 1:

- ▶ Input variable $nDis1_a = 100 \%$
- ▶ Offset 1 ([C00484/1](#)) = 0 %
- ▶ Display factor 1 ([C00485/1](#)) = 123.45
- ▶ Text 1 ([C00486/1](#)) = "bottles"

$$\text{Application unit 1} = \frac{100 [\%] + 0 [\%]}{100 [\%]} \cdot 123.45 [\text{bottles}] = 123.45 \text{ bottles}$$

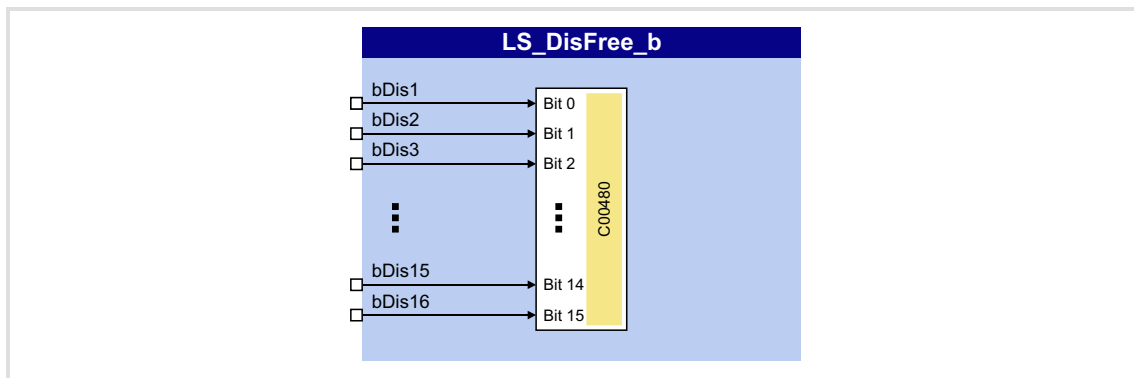
Example 2:

- ▶ Input variable $nDis2_a = 40 \%$
- ▶ Offset 2 ([C00484/2](#)) = 35 %
- ▶ Display factor 2 ([C00485/2](#)) = 20
- ▶ Text 2 ([C00486/2](#)) = "kg"

$$\text{Application unit 2} = \frac{40 [\%] + 35 [\%]}{100 [\%]} \cdot 20 [\text{kg}] = 15.00 \text{ kg}$$

18.2.14 LS_DisFree_b

This system block displays 16 arbitrary digital signals of the application on a bit coded display code.



Inputs

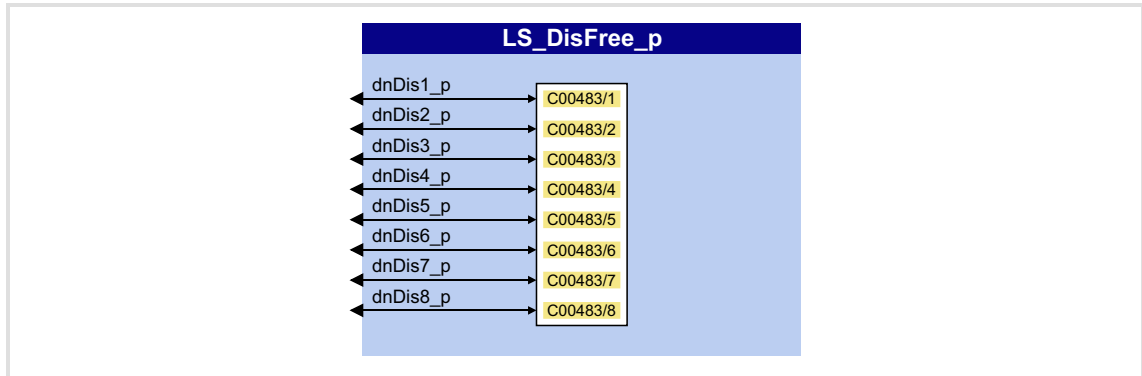
Identifier	Data type	Information/possible settings
bDis1 ... bDis16	BOOL	Inputs for any digital signal of the application

Parameter

Parameter	Possible settings	Info
C00480	0x0000	Display of the digital signals as hexadecimal values which are applied at the <i>bDis1</i> ... <i>bDis16</i> inputs
	0xFFFF	
	Bit 0 Signal level at the <i>bDis1</i> input	
	Bit 1 Signal level at the <i>bDis2</i> input	
	Bit 2 Signal level at the <i>bDis3</i> input	
	
	Bit 15 Signal level at the <i>bDis16</i> input	

18.2.15 LS_DisFree_p

This system block displays 8 arbitrary position signals of the application on display codes.



Inputs

Identifier	Data type	Information/possible settings
dnDis1_p ... dnDis8_p	DINT	Inputs for arbitrary position signals of the application

Parameter

Parameter	Possible settings	Info
C00483/1...8	-2147483647 Incr. 2147483647	Display of the position signals which are applied at the <i>dnDis1_p ... dnDis8_p</i> inputs

18.2.16 LS_DriveInterface

Interface to internal device control.



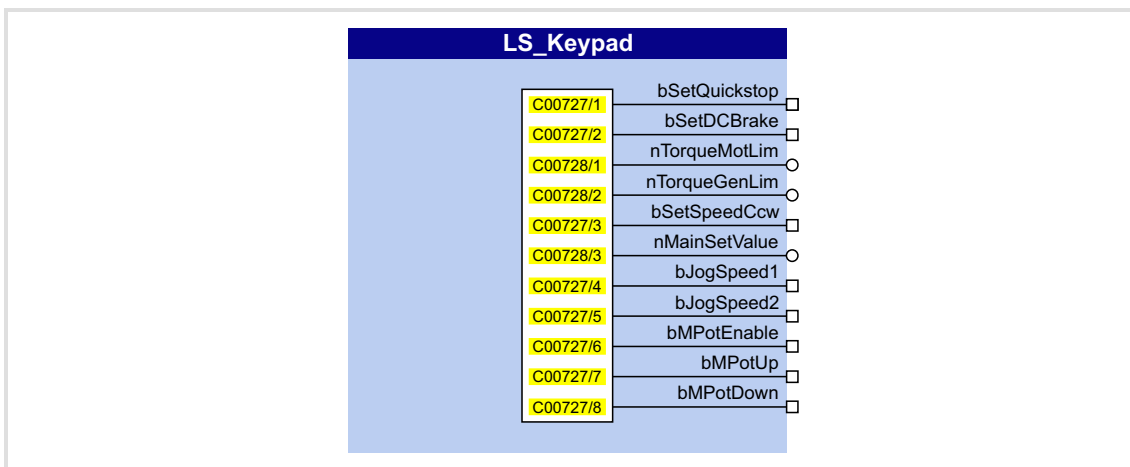
For a detailed description see main chapter "Device control (DCTRL)":

▶ [Internal interfaces | "LS_DriveInterface" system block](#) (115)

18.2.17 LS_Keypad

This system block is used on I/O interconnection level if the "Keypad" control mode has been selected in [C00007](#).

In the "Keypad" control mode, the **LS_Keypad** system block passes on various setpoints and control commands to the technology application which can be selected/activated via codes using the keypad.



Outputs

Identifier	Data type	Value/meaning
bSetQuickstop	BOOL	C00727/1 = "1" ≡ Request quick stop
bSetDCBrake	BOOL	C00727/2 = "1" ≡ Request DC-injection braking
nTorqueMotLim	INT	Torque limit in motor mode set in C00728/1 • Lenze setting: 100.00 %
nTorqueGenLim	INT	Torque limit in generator mode set in C00728/2 • Lenze setting: 100.00 %
bSetSpeedCcw	BOOL	C00727/3 = "1" ≡ Request reversal
nMainSetValue	INT	Setpoint speed set in C00728/3 • Lenze setting: 0.00 %
bJogSpeed1	BOOL	C00727/4 = "1" ≡ Request fixed speed setpoint 1
bJogSpeed2	BOOL	C00727/5 = "1" ≡ Request fixed speed setpoint 2
bMPotEnable	BOOL	C00727/6 = "1" ≡ Motor potentiometer: Request activation
bMPotUp	BOOL	C00727/7 = "1" ≡ Motor potentiometer: Request positive acceleration
bMPotDown	BOOL	C00727/8 = "1" ≡ Motor potentiometer: Request negative acceleration

Parameter

Parameter	Possible settings			Info
C00727/1...8	0		1	Keypad digital values <ul style="list-style-type: none"> • Execution of control commands for keypad operation • See the "Outputs" table for the meaning of the individual subcodes
C00728/1...3	-199.99	%	199.99	Analog values - keypad <ul style="list-style-type: none"> • Specification of various setpoints for keypad operation • See the "Outputs" table for the meaning of the individual subcodes

18.2.18 LS_MotionControlKernel

Interface to the basic drive functions implemented in **Motion Control Kernel (MCK)**.



For a detailed description see the main chapter "Basic drive functions":

▶ [Internal interfaces | System block "LS_MotionControlKernel"](#) (📖 475)

18.2.19 LS_MotorInterface

Interface to internal motor control.



For a detailed description see the main chapter "Motor control (MCTRL)":

▶ [Internal interfaces | system block "LS_MotorInterface"](#) (📖 285)

18.2.20 LS_MultiEncoder

Interface to the Multi-Encoder.



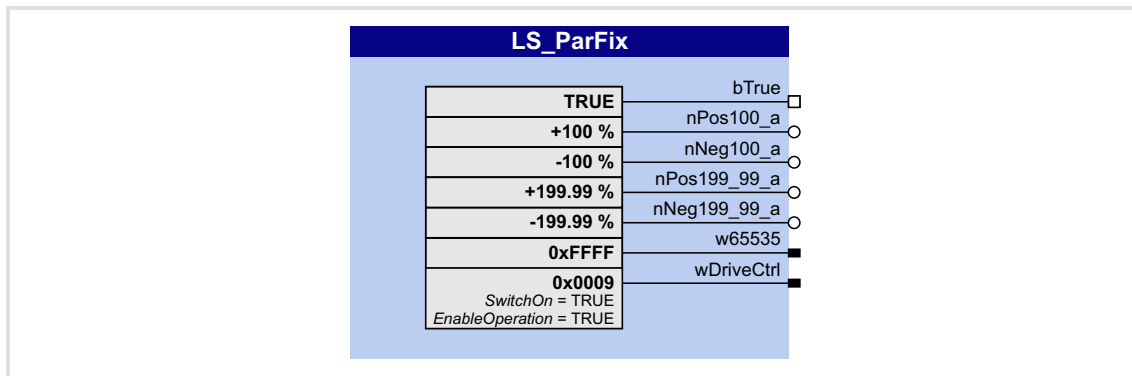
For detailed information please see the main chapter "Encoder/Feedback system":

▶ [Internal interfaces | "LS_MultiEncoder" system block](#) (📖 312)

18.2.21 LS_ParFix

This system block outputs various fixed values (constants) to be used in the interconnection.

- From version 02.00.00, another LS_ParFix_2 system block is available which can be used e.g. in the application level.

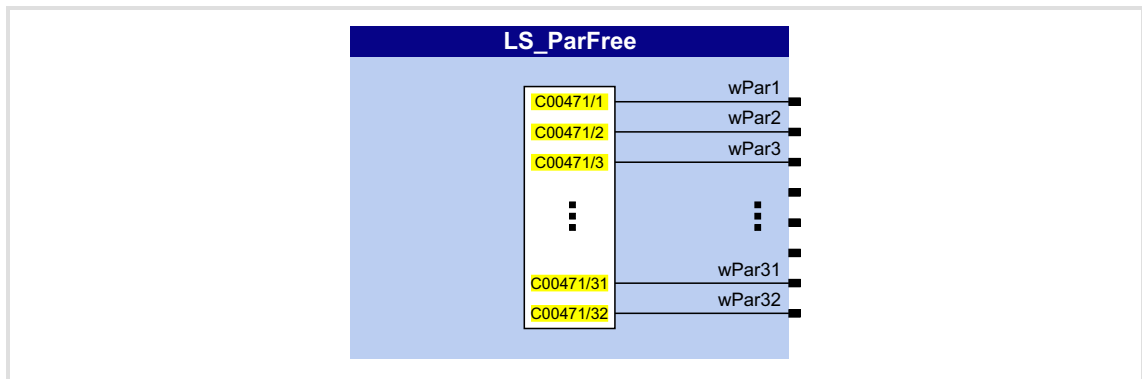


Outputs

Identifier	Data type	Value/meaning
bTrue	BOOL	1 ≙ TRUE
nPos100_a	INT	16384 ≙ + 100 %
nNeg100_a	INT	-16384 ≙ - 100 %
nPos199_99_a	INT	32767 ≙ + 199.99 %
nNeg199_99_a	INT	-32767 ≙ - 199.99 %
w65535	WORD	65535 ≙ 0xFFFF
wDriveCtrl	WORD	9 ≙ 0x0009 <ul style="list-style-type: none"> • Bit 0, SwitchOn = TRUE • Bit 3, EnableOperation = TRUE • All others: FALSE See also: wCANControl/wMCIControl control words (118)

18.2.22 LS_ParFree

This system block outputs 32 parameterisable 16-bit signals.



Outputs

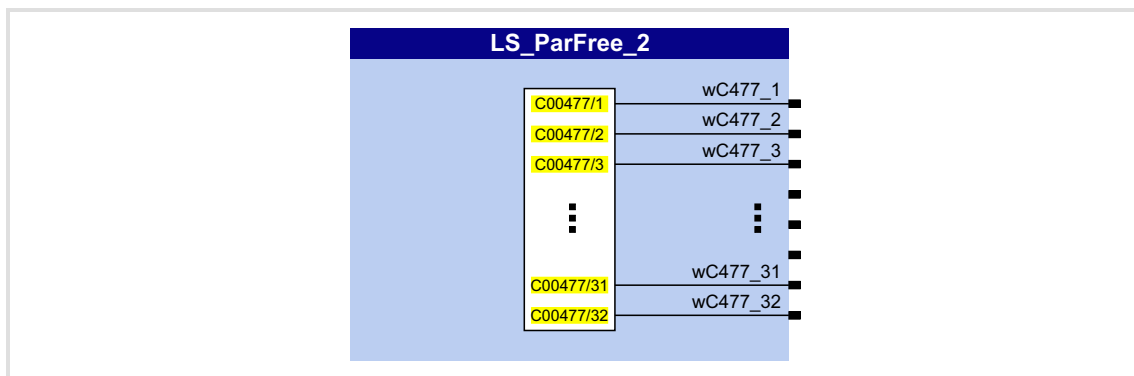
Identifier	Data type	Value/meaning
wPar1 ... wPar32	WORD	Output of the 16-bit signals parameterised in C00471/1...32
From version 02.00.00: wC471_1 ... wC471_32		Note: From version 02.00.00 the outputs are named according to the respective setting parameter for an easier allocation.

Parameter

Parameter	Possible settings	Info
C00471/1...32	0x0000	0xFFFF Setting of the 16-bit signals to be output

18.2.23 LS_ParFree_2

This system block outputs 32 parameterisable 16-bit signals.



Outputs

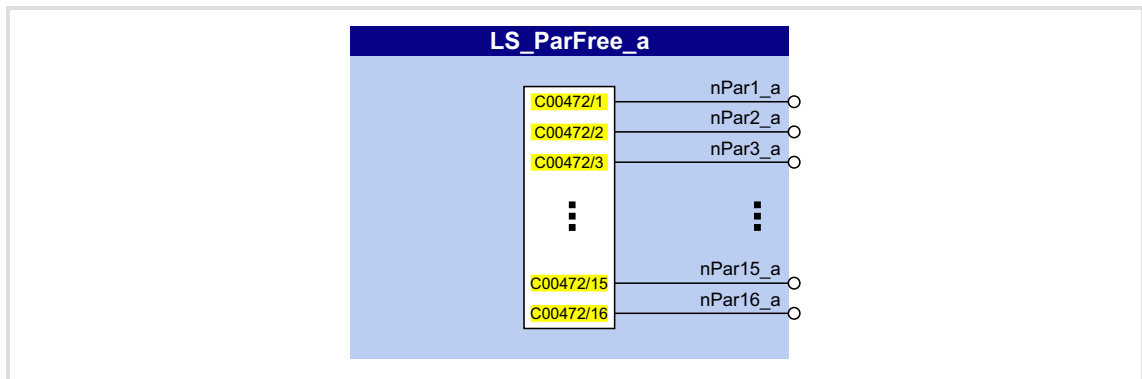
Identifier	Data type	Value/meaning
wC477_1 ... wC477_32	WORD	Output of the 16-bit signals parameterised in C00477/1...32

Parameter

Parameter	Possible settings	Info
C00477/1...32	0x0000	0xFFFF Setting of the 16-bit signals to be output

18.2.24 LS_ParFree_a

This system block outputs 16 parameterisable analog signals.



Outputs

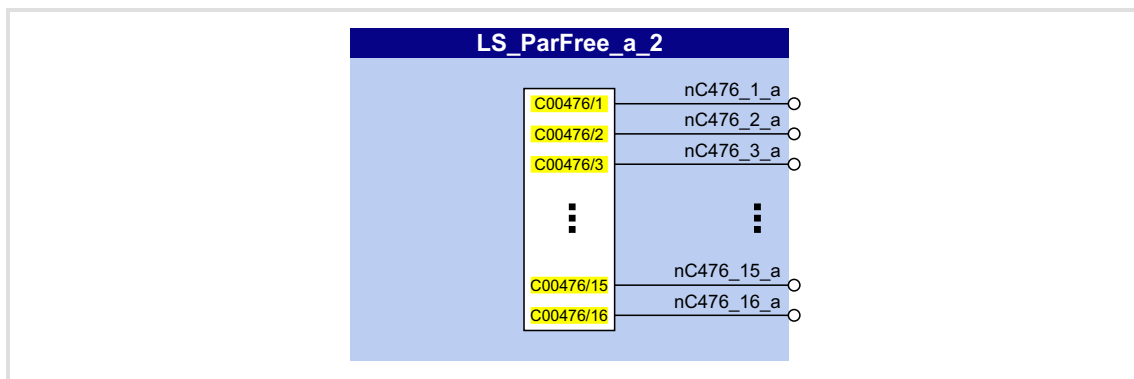
Identifier	Data type	Value/meaning
nPar1_a ... nPar16_a	INT	Output of the analog signals parameterised in C00472/1...16
From version 02.00.00: nC472_1_a ... nC472_16_a		Note: From version 02.00.00 the outputs are named according to the respective setting parameter for an easier allocation.

Parameter

Parameter	Possible settings			Info
C00472/1...16	-199.99	%	+199.99	Selection of analog signals to be output

18.2.25 LS_ParFree_a_2

This system block outputs 16 parameterisable analog signals.



Outputs

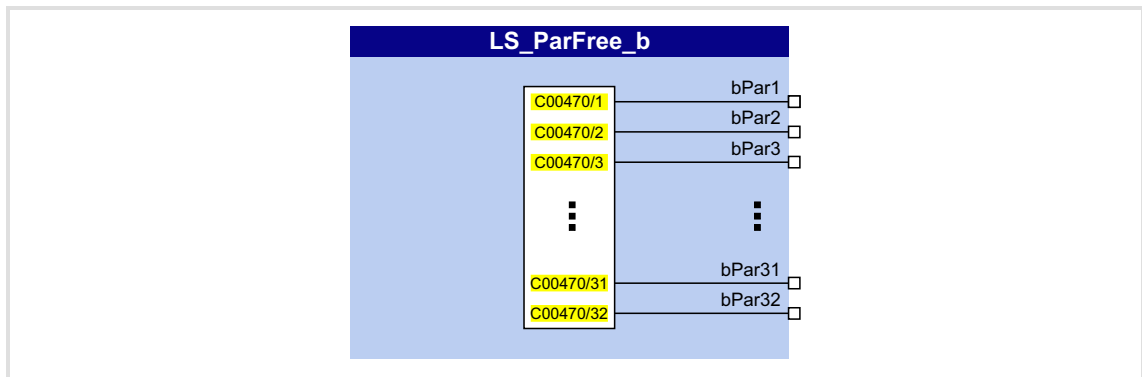
Identifier	Data type	Value/meaning
nC476_1_a ... nC476_16_a	INT	Output of the analog signals parameterised in C00476/1...16

Parameter

Parameter	Possible settings			Info
C00476/1...16	-199.99	%	+199.99	Selection of analog signals to be output

18.2.26 LS_ParFree_b

This system block outputs 32 parameterisable digital signals.



Outputs

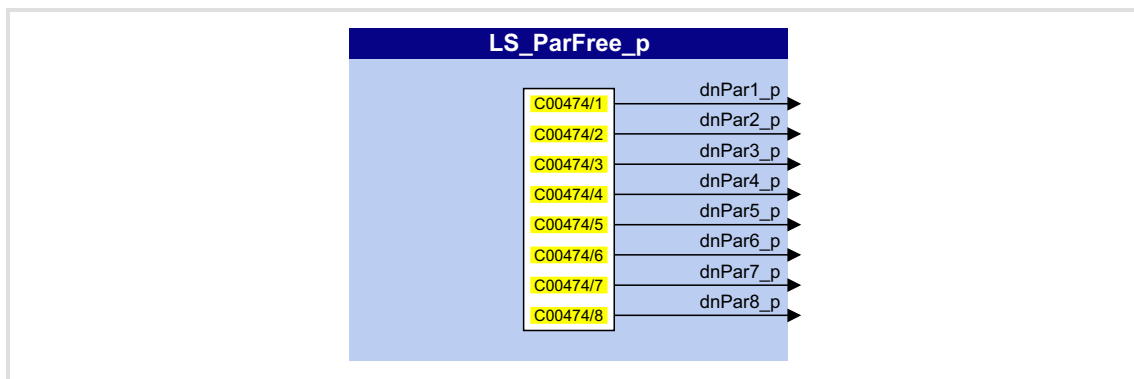
Identifier	Data type	Value/meaning
bPar1 ... bPar32	BOOL	Output of the signal levels (FALSE/TRUE) parameterised in C00470/1...32
From version 02.00.00: bC470_1 ... bC470_32		Note: From version 02.00.00 the outputs are named according to the respective setting parameter for an easier allocation.

Parameter

Parameter	Possible settings	Info				
C00470/1...32	<table border="1"> <tr> <td>0</td> <td>"FALSE" signal is output</td> </tr> <tr> <td>1</td> <td>"TRUE" signal is output</td> </tr> </table>	0	"FALSE" signal is output	1	"TRUE" signal is output	Selection of signal levels to be output • Bit 0 ... 31 = <i>bPar1</i> ... <i>bPar32</i>
0	"FALSE" signal is output					
1	"TRUE" signal is output					

18.2.27 LS_ParFree_p

This system block outputs 8 parameterisable position signals.



Outputs

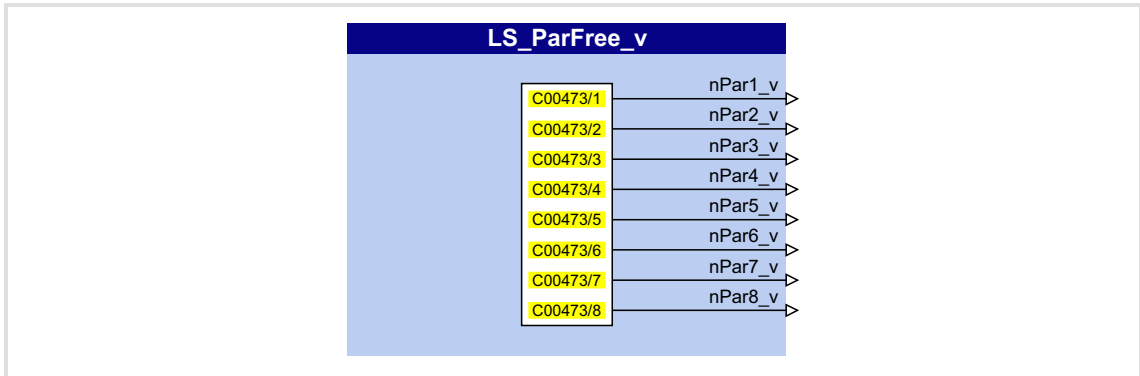
Identifier	Data type	Value/meaning
dnPar1_p ... dnPar8_p	DINT	Output of the position signals parameterised in C00474/1...8
From version 02.00.00: dnC474_1_p ... dnC474_8_p		Note: From version 02.00.00 the outputs are named according to the respective setting parameter for an easier allocation.

Parameter

Parameter	Possible settings			Info
C00474/1...8	-2147483647	Incr.	2147483647	Setting of the position signals to be output

18.2.28 LS_ParFree_v

This system block outputs 8 parameterisable speed signals.



Outputs

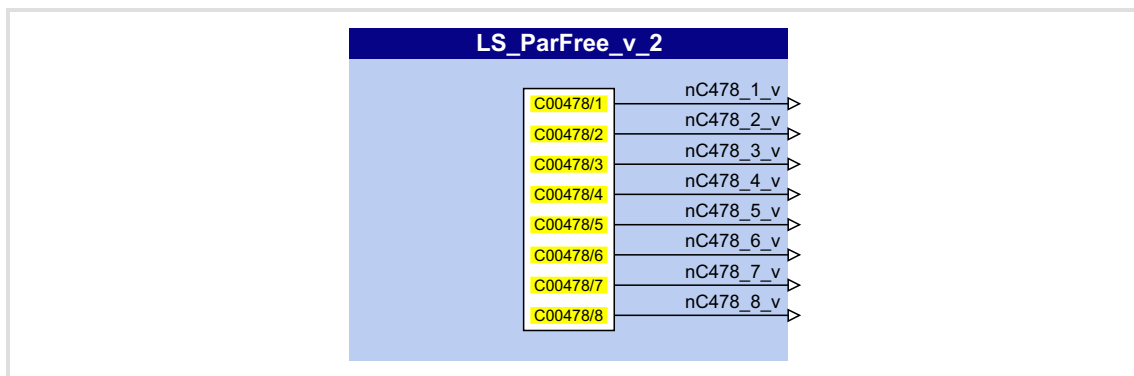
Identifier	Data type	Information/possible settings
nPar1_v ... nPar8_v	INT	Output of the speed signals parameterised in C00473/1...8
From version 02.00.00: nC473_1_v ... nC473_8_v		Note: From version 02.00.00 the outputs are named according to the respective setting parameter for an easier allocation.

Parameter

Parameter	Possible settings			Info
C00473/1...8	-32767	Incr/ms	+32767	Selection of speed signals to be output

18.2.29 LS_ParFree_v_2

This system block outputs 8 parameterisable speed signals.



Outputs

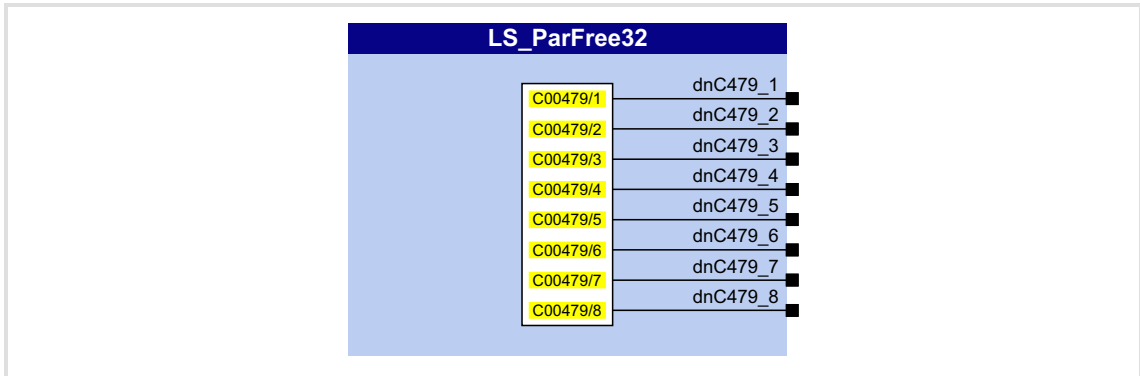
Identifier	Data type	Information/possible settings
nC478_1_v ... nC478_8_v	INT	Output of the speed signals parameterised in C00478/1...8

Parameter

Parameter	Possible settings			Info
C00478/1...8	-32767	Incr/ms	+32767	Selection of speed signals to be output

18.2.30 LS_ParFree32

This system block outputs 8 parameterisable 32-bit signals.



Outputs

Identifier	Data type	Value/meaning
dnC479_1 ... dnC479_8	DINT	Output of the 32-bit signals parameterised in C00479/1...8

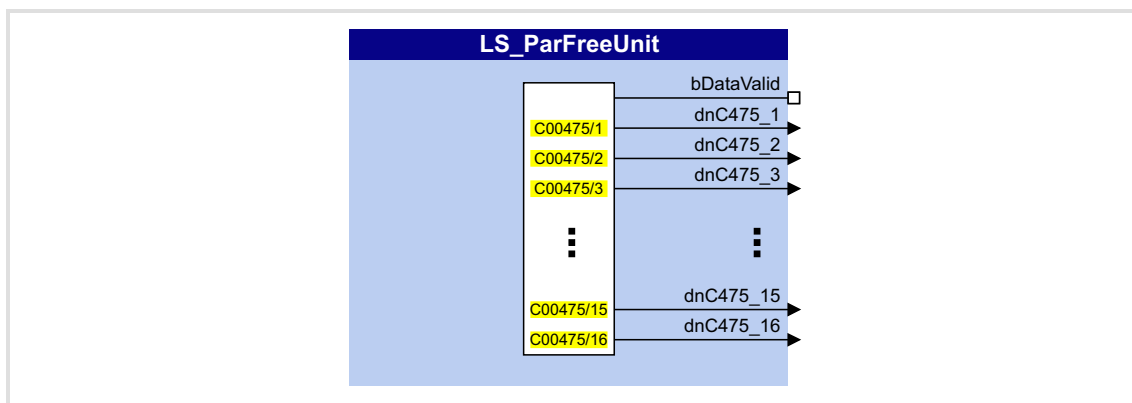
Parameter

Parameter	Possible settings	Info
C00479/1...8	-2147483647	2147483647 Setting of the 32-bit signals to be output

18.2.31 LS_ParFreeUnit

This system block outputs 16 parameterisable position signals.

- ▶ In contrast to the SB [LS_ParFree_p](#), the positions are set in the application unit [unit] instead of in [increments].
- ▶ The *bDataValid* status signal indicates that the internal position conversion is completed and the output data are consistent.



Outputs

Identifier	Data type	Value/meaning
bDataValid	BOOL	Status signal "Position conversion completed, data consistent"
		TRUE The conversion of the positions from [unit] to [increments] is completed.
dnC475_1 ... dnC475_16	DINT	Output of the position signals parameterised in C00475/1...16 in [increments] <ul style="list-style-type: none"> Observe <i>bDataValid</i> status signal!

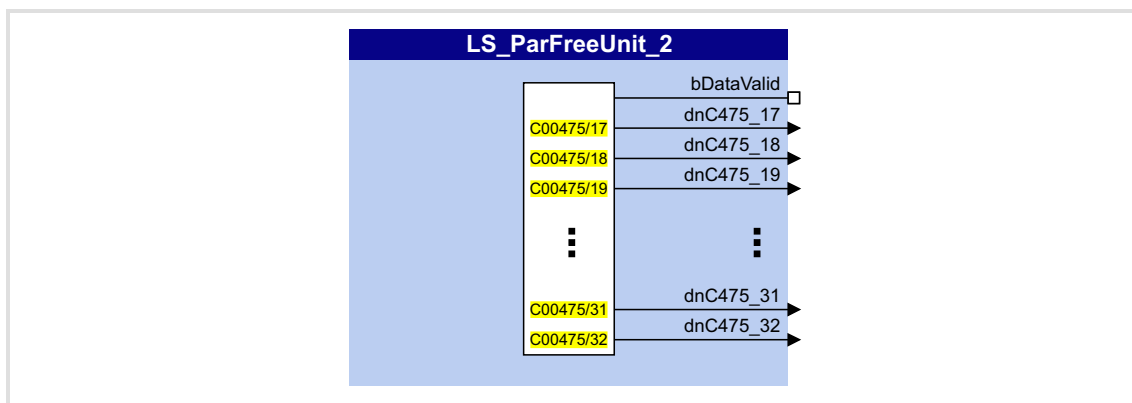
Parameter

Parameter	Possible settings	Info
C00475/1...16	-214748.3647 unit 214748.3647	Setting of the position signals to be output

18.2.32 LS_ParFreeUnit_2

This system block outputs 16 parameterisable position signals.

- ▶ In contrast to the SB [LS_ParFree_p](#), the positions are set in the application unit [unit] instead of in [increments].
- ▶ The *bDataValid* status signal indicates that the internal position conversion is completed and the output data are consistent.



Outputs

Identifier	Data type	Value/meaning
bDataValid	BOOL	Status signal "Position conversion completed, data consistent"
		TRUE The conversion of the positions from [unit] to [increments] is completed.
dnC475_17 ... dnC475_32	DINT	Output of the position signals parameterised in C00475/17...32 in [increments] <ul style="list-style-type: none"> • Observe <i>bDataValid</i> status signal!

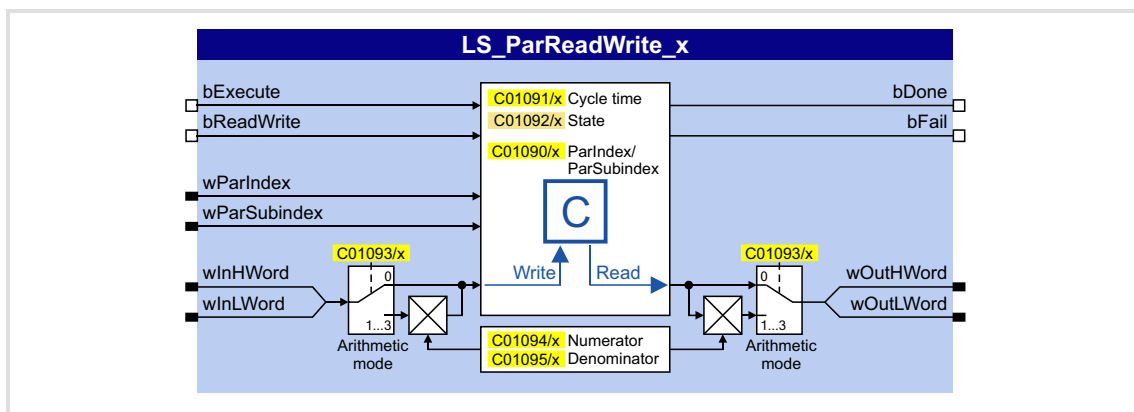
Parameter

Parameter	Possible settings	Info
C00475/17...32	-214748.3647 unit 214748.3647	Setting of the position signals to be output

18.2.33 LS_ParReadWrite_1-6

The LS_ParReadWrite_1 ... LS_ParReadWrite_6 system blocks are used for reading and writing local parameters.

- ▶ If several system blocks are activated at the same time, the blocks will be processed one at a time every time the main program is executed.
- ▶ The SB supports one-time and cyclic reading/writing in an adjustable time interval.



Inputs

Identifier	Data type	Information/possible settings	
bExecute	BOOL	Trip read/write request	
		FALSE → TRUE	If cycle time (C01091) = "0 ms": One-time reading/writing of the parameter value which has been addressed via the wParIndex and wParSubindex inputs.
		TRUE → FALSE	If cycle time (C01091) > "0 ms": Cyclic reading/writing of the parameter value which has been addressed via the wParIndex and wParSubindex inputs.
		TRUE → FALSE	Deactivate cyclic reading/writing again.
bReadWrite	BOOL	Selection: Read or write request	
		FALSE	Read request
		TRUE	Write request
wParIndex	WORD	Code to be read or written. • As an alternative, this selection can be carried out via C01090.	
wParSubindex	WORD	Subcode to be read or written. • As an alternative, this selection can be carried out via C01090.	
wInHWord	WORD	Value to be written (DataHigh/DataLow portion)	
wInLWord			

Outputs

Identifier	Data type	Value/meaning	
bDone	BOOL	"Read/Write request successfully completed" status signal <ul style="list-style-type: none"> The output is automatically reset to FALSE if a new request is activated via <i>bExecute</i> or the cycle time (C01091) expires. 	
		TRUE	Read/Write request successfully completed.
		FALSE	The FALSE status can have the following meanings: <ol style="list-style-type: none"> There is no active read/write request. The read/write request has not been completed yet. An error has occurred (if <i>bFail</i> = TRUE).
bFail	BOOL	"Error" status	
		TRUE	An error has occurred (group signal). <ul style="list-style-type: none"> See display parameter (C01092) for details.
wOutHWord wOutLWord	WORD	Value which was read (DataHigh/DataLow portion) after read request	

Parameter

Parameter	Possible settings	Info
C01090/1...6	0,000 16000,000 Format: <code number>,<subcode number>	Parameter to be read or written. <ul style="list-style-type: none"> For a setting of "0,000", inputs <i>wParIndex</i> and <i>wParSubindex</i> are effective for addressing purposes instead. Lenze setting: 0,000
C01091/1...6	0 One-time reading/writing at <i>bExecute</i> in case of a FALSE/TRUE edge Cyclic reading/writing: 20 20 ms 50 50 ms 100 100 ms 200 200 ms 500 500 ms 1000 1 s 2000 2 s 5000 5 s 10000 10 s	Cycle time <ul style="list-style-type: none"> Subcode 1 = LS_ParReadWrite_1 Subcode 2 = LS_ParReadWrite_2 ... Subcode 6 = LS_ParReadWrite_6 Lenze setting: 0

Parameter	Possible settings	Info	
C01092/1...6		Error status	
	0 No error	• If <i>bFail</i> = TRUE: Error status is displayed.	
	33803 Invalid data type (e.g. STRING)	• Subcode 1 = LS_ParReadWrite_1	
	33804 Limit violation	• Subcode 2 = LS_ParReadWrite_2	
	33806 Invalid code	• ...	
	33813 No element in the selection list	• Subcode 6 = LS_ParReadWrite_6	
	33815 Writing of the parameter not permitted		
	33816 Writing of the parameter only permitted if controller is inhibited		
	33829 Invalid subcode		
33865 No parameter with subcodes			
C01093/1...6		Arithmetic mode	
	0 No arithmetic	• Lenze setting: "0: No arithmetic"	
	1 In16Bit: LW=+/-32767	▶ Arithmetic function	
	2 In16Bit: HW=+/-; LW=0..65535		
	3 In32Bit: HW_LW=+/-2147483647		
C01094/1...6	-32767	32767	Numerator
			• For internal conversion into arithmetic modes 1 ... 3. • Lenze setting: 1
C01095/1...6	1	32767	Denominator
			• For internal conversion into arithmetic modes 1 ... 3. • Lenze setting: 1

18.2.33.1 Arithmetic function

The integrated arithmetic function allows for easy arithmetic conversion of the process value to be written or which was read into the format of the target parameter via parameterisable factors and without the need for an additional arithmetic FB.

- ▶ In [C01093](#), the interpretation of the *wInHWord* and *wInLWord* inputs can be set to be able to write to parameters:

Arithmetic mode	wInHWord	wInLWord	Internal conversion
0 No arithmetic (Lenze setting)	INTEGER_32 (4 bytes with sign)		No (behaviour as before)
	DataHigh component	DataLow component	
1 In16Bit: LW=+/-32767	-	INTEGER_16 (2 bytes with sign)	Yes (see section below)
2 In16Bit: HW=+/-; LW=0..65535	Sign (0 ≡ positive value)	UNSIGNED_16 (2 bytes without sign)	
3 In32Bit: HW_LW= +/-2147483647	INTEGER_32 (4 bytes with sign)		
	DataHigh component	DataLow component	

Internal conversion

If arithmetic modes 1 ... 3 are selected in [C01093](#), the input value / read parameter value is internally converted via parameterisable factors.

- ▶ Division is not remainder considered.

$$\text{Parameter value to be written} = \text{Input value}_{[32]} \cdot \frac{\text{Numerator}_{[16]}}{\text{Denominator}_{[16]}}$$

[C01094](#): Numerator

[C01095](#): Denominator

[18-72] Internal conversion for write access

$$\text{Output value}_{[32]} = \text{Read parameter value} \cdot \frac{\text{Numerator}_{[16]}}{\text{Denominator}_{[16]}}$$

[C01094](#): Numerator

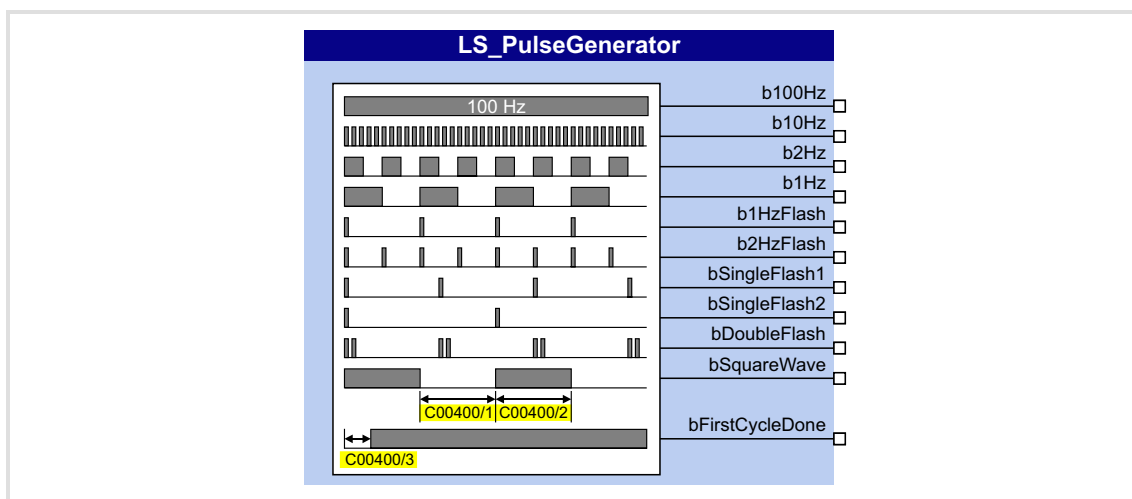
[C01095](#): Denominator

[18-73] Internal conversion for read access

18.2.34 LS_PulseGenerator

This system block outputs 9 different fixed frequencies and 1 frequency with parameterisable pulse/dead time.

The SB provides a TRUE signal at the *bFirstCycleDone* output when the first 1-ms processing cycle is completed and the time set in [C00400/3](#) has expired. This status signal can e.g. be used for the delayed enable of peripheral devices or motor control setpoints so that all required initial values are calculated first after the controller switch-on.



Outputs

Identifier	Data type	Value/meaning
b100Hz	BOOL	Rectangular signal 100 Hz
b10Hz	BOOL	Rectangular signal 10 Hz
b2Hz	BOOL	Rectangular signal 2 Hz
b1Hz	BOOL	Rectangular signal 1 Hz
b1HzFlash	BOOL	80 ms-pulse, repetition rate every second
b2HzFlash	BOOL	80 ms-pulse, repetition rate every 0.5 seconds
bSingleFlash1	BOOL	80 ms pulse, repetition rate every 1.25 seconds
bSingleFlash2	BOOL	80 ms pulse, repetition rate every 2 seconds
bDoubleFlash	BOOL	80 ms-double pulse, repetition rate every 1.25 seconds
bSquareWave	BOOL	Output frequency with pulse/dead time set in C00400/1...2
bFirstCycleDone	BOOL	Status signal "First processing cycle completed"
		TRUE The first 1-ms processing cycle has been completed and the time set in C00400/3 has expired (i.e. all FBs have been called at least once).

Parameter

Parameter	Possible settings			Info
C00400/1	0	ms	60000	Length of LOW level (break) <ul style="list-style-type: none">• For output <i>bSquareWave</i>• Lenze setting: 1000 ms
C00400/2	0	ms	60000	Length of HIGH level <ul style="list-style-type: none">• For output <i>bSquareWave</i>• Lenze setting: 1000 ms
C00400/3	0	ms	60000	Delay of the <i>bFirstCycleDone</i> status <ul style="list-style-type: none">• Lenze setting: 100 ms

18.2.35 LS_Resolver

Interface to the resolver.



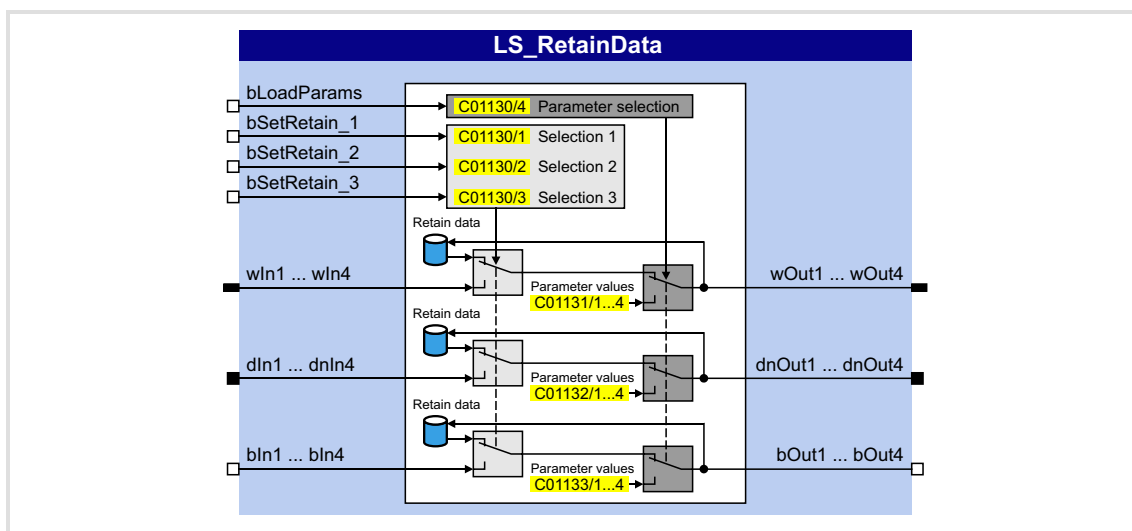
For detailed information please see the main chapter "Encoder/Feedback system":

▶ [Internal interfaces | "LS_Resolver" system block](#) (📖 301)

18.2.36 LS_RetainData

This system block serves to select and save retain data similar to the FBs [L_SampleHold_1](#) and [L_SampleHold_2](#).

- ▶ Retain data are values that are saved automatically at mains disconnection or disconnection of the 24-V supply in the controller and are restored when the 24-V supply is switched on again.
- ▶ A total of 12 retain data can be stored in the retain memory:
 - 4 WORD signals (16 bits, 0 ... 65535)
 - 4 DINT signals (32 bits, -2147483647 ... 2147483647)
 - 4 BOOL signals (FALSE or TRUE)



Inputs

Identifier	Data type	Information/possible settings	
bLoadParams	BOOL	Set selected outputs & retain values to parameter values. <ul style="list-style-type: none"> • This input has priority over the <i>bSetRetain</i> inputs. • Typical application: Initialisation of the outputs & retain values. 	
		FALSE	The input or retain values are output, depending on the <i>bSetRetain</i> input.
		TRUE	The outputs selected in C01130/4 and the respective retain values are set to the parameter values and held as long as <i>bLoadParams</i> is TRUE. If the parameter values change during this time, the respective outputs and retain values change as well.
bSetRetain_1...3	BOOL	Transfer selected input values to the retain memory ("latch")	
		FALSE	No transfer. Retain values or parameter values (when <i>bLoadParams</i> = TRUE) are provided at the outputs.
		TRUE	The input values selected in C01130/1...3 are stored in the retain memory and provided at the outputs.

Identifier	Data type	Information/possible settings
wIn1 ... wIn4	WORD	Input values
dnIn1 ... dnIn4	DINT	
bln1 ... bln4	BOOL	

Outputs

Identifier	Data type	Value/meaning
wOut1 ... wOut4	WORD	Output of the input or retain values, depending on the <i>bSetRetain</i> input
dnOut1 ... dnOut4	DINT	
bOut1 ... bOut4	BOOL	

Parameter

Parameter	Possible settings	Info																																																			
C01130/1...4	Setting is bit coded: <table border="1"> <thead> <tr> <th></th> <th>Subcodes 1 ... 3:</th> <th>Subcode 4:</th> </tr> </thead> <tbody> <tr><td>Bit 0</td><td>wIn1</td><td>C01131/1</td></tr> <tr><td>Bit 1</td><td>wIn2</td><td>C01131/2</td></tr> <tr><td>Bit 2</td><td>wIn3</td><td>C01131/3</td></tr> <tr><td>Bit 3</td><td>wIn4</td><td>C01131/4</td></tr> <tr><td>Bit 4</td><td>dnIn1</td><td>C01132/1</td></tr> <tr><td>Bit 5</td><td>dnIn2</td><td>C01132/2</td></tr> <tr><td>Bit 6</td><td>dnIn3</td><td>C01132/3</td></tr> <tr><td>Bit 7</td><td>dnIn4</td><td>C01132/4</td></tr> <tr><td>Bit 8</td><td>bln1</td><td>C01133/1</td></tr> <tr><td>Bit 9</td><td>bln2</td><td>C01133/2</td></tr> <tr><td>Bit 10</td><td>bln3</td><td>C01133/3</td></tr> <tr><td>Bit 11</td><td>bln4</td><td>C01133/4</td></tr> <tr><td>Bit 12</td><td colspan="2">Reserved</td></tr> <tr><td>Bit 13</td><td colspan="2"></td></tr> <tr><td>Bit 14</td><td colspan="2"></td></tr> <tr><td>Bit 15</td><td colspan="2"></td></tr> </tbody> </table>		Subcodes 1 ... 3:	Subcode 4:	Bit 0	wIn1	C01131/1	Bit 1	wIn2	C01131/2	Bit 2	wIn3	C01131/3	Bit 3	wIn4	C01131/4	Bit 4	dnIn1	C01132/1	Bit 5	dnIn2	C01132/2	Bit 6	dnIn3	C01132/3	Bit 7	dnIn4	C01132/4	Bit 8	bln1	C01133/1	Bit 9	bln2	C01133/2	Bit 10	bln3	C01133/3	Bit 11	bln4	C01133/4	Bit 12	Reserved		Bit 13			Bit 14			Bit 15			Subcodes 1 ... 3: Selection 1 ... 3 <ul style="list-style-type: none"> Select which input values are to be stored in the retain memory when setting the respective <i>bSetRetain</i>-input to TRUE. Lenze setting: 0x0000 Subcode 4: Parameter selection <ul style="list-style-type: none"> Select which parameter values are to be stored in the retain memory when setting <i>bLoadParams</i> to TRUE. Lenze setting: 0x0000
	Subcodes 1 ... 3:	Subcode 4:																																																			
Bit 0	wIn1	C01131/1																																																			
Bit 1	wIn2	C01131/2																																																			
Bit 2	wIn3	C01131/3																																																			
Bit 3	wIn4	C01131/4																																																			
Bit 4	dnIn1	C01132/1																																																			
Bit 5	dnIn2	C01132/2																																																			
Bit 6	dnIn3	C01132/3																																																			
Bit 7	dnIn4	C01132/4																																																			
Bit 8	bln1	C01133/1																																																			
Bit 9	bln2	C01133/2																																																			
Bit 10	bln3	C01133/3																																																			
Bit 11	bln4	C01133/4																																																			
Bit 12	Reserved																																																				
Bit 13																																																					
Bit 14																																																					
Bit 15																																																					
C01131/1...4	0	65536	Parameter value for retain memory (outputs <i>wOut1 ... wOut4</i>) <ul style="list-style-type: none"> Lenze setting: 0 																																																		
C01132/1...4	-2147483647	2147483647	Parameter values for retain memory (outputs <i>dnOut1 ... dnOut4</i>) <ul style="list-style-type: none"> Lenze setting: 0 																																																		
C01133/1...4	<table border="1"> <tbody> <tr><td>0</td><td>FALSE</td></tr> <tr><td>1</td><td>TRUE</td></tr> </tbody> </table>	0	FALSE	1	TRUE		Parameter values for retain memory (outputs <i>bOut1 ... bOut4</i>) <ul style="list-style-type: none"> Lenze setting: 0: FALSE 																																														
0	FALSE																																																				
1	TRUE																																																				

18.2.37 LS_SetError_1

Parameterisable responses to user-defined events are tripped.



For a detailed description see the main chapter "Diagnostics & error management":

▶ [System block "LS_SetError_1"](#) (📖 634)

18.2.38 LS_SetError_2

Parameterisable responses to user-defined events are tripped.



For a detailed description see the main chapter "Diagnostics & error management":

▶ [System block "LS_SetError_2"](#) (📖 636)

18.2.39 LS_SyncManagement

Output of status information for synchronising the internal time base.



For a detailed description see main chapter "Synchronisation of the internal time base of the controller":

▶ [Internal interfaces | System block "LS_SyncManagement"](#) (📖 733)

18.2.40 LS_TouchProbe

Interface for touch probe detection.



For a detailed description see the main chapter "I/O terminals":

▶ [Touch probe detection](#) (📖 362)

18.2.41 LS_WriteParamList

Writing to a configurable list which contains up to 32 local parameters.



For a detailed description see the main chapter "[Parameter change-over](#)". (📖 734)

19 Index

Symbole

"LA_NCtrl" application block [386](#)
 "LA_SwitchPos" application block [443](#)
 "LA_TabPos" application block [414](#)

0-9

120 % operation [243](#)
 16-bit inputs (C00831) [906](#)
 16-bit inputs (Set2) (C00836) [918](#)
 16-bit inputs [%] (C00830) [904](#)
 16-bit inputs [%] (Set2) (C00835) [915](#)
 16-bit inputs [rpm] (C00832) [909](#)
 16-bit inputs [rpm] (Set2) (C00837) [921](#)
 16-bit inputs I/O level (C00841) [933](#)
 16-bit inputs I/O level [%] (C00840) [932](#)
 24 V supply voltage (C00065) [766](#)
 32-bit inputs [incr] (C00834) [914](#)
 32-bit inputs [incr] (Set2) (C00839) [930](#)
 32-bit inputs I/O level [incr] (C00844) [940](#)
 87-Hz operation [155](#)

A

Accel. time - main setpoint (C00012) [758](#)
 Acceleration override [561](#)
 Access protection [37](#)
 Acknowledgement error [680](#)
 Activate resolver error comp. (C00417) [825](#)
 Activating the bus terminating resistor [642](#), [720](#)
 Active COBID (C00355) [816](#)
 Actual values (C00055) [764](#)
 Add. accel. time x (C00101) [773](#)
 Add. decel. time x (C00103) [773](#)
 Additive speed specification [264](#)
 AIN1
 Characteristic (C00010) [757](#)
 AIN2
 Characteristic (C00020) [760](#)
 AINx
 Configuration (C00034) [762](#)
 Gain (C00027) [761](#)
 Input current (C00029) [762](#)
 Input voltage (C00028) [761](#)
 Offset (C00026) [761](#)
 Output value (C00033) [762](#)
 An01
 AIN1_I < 4 mA (error message) [622](#)
 An02
 AIN2_I < 4 mA (error message) [622](#)
 Analog inputs [352](#)
 Angle controller [264](#)
 Angle controller overflow [1230](#)
 Angular drift monitoring (encoder) [326](#)

AOutx

 Decoupling value (C00442) [831](#)
 Appl.
 Reference frequency C11 (C00059) [765](#)
 Reference speed (C00011) [757](#)
 Application (C00005) [752](#)
 Application notes [29](#)
 Application units
 (C00486) [844](#)
 Configuration of the display parameters [1388](#)
 Offset (C00484) [844](#)
 Application units - display factor (C00485) [844](#)
 Application units (C00487) [845](#)
 Assigning digital inputs [881](#)
 Assigning signal sources [881](#)
 Assignment of the process data objects [654](#)
 Auto DCB [251](#)
 Hold time (C00106) [774](#)
 Threshold (C00019) [759](#)
 AutoFailReset configuration (C00188) [796](#)
 AutoFailReset function [598](#)
 AutoFailReset repetition time (C00184) [796](#)
 AutoFailReset residual runtime (C00185) [796](#)
 Automatic DC-injection braking (auto DCB) [251](#)
 Automatic motor data identification [126](#)
 Auto-start option [112](#)
 Auto-start option (C00142) [781](#)
 Axis bus [717](#)
 Axis bus address and no. of nodes (C02430) [1007](#)
 Axis bus error status (C02436) [1008](#)
 Axis bus MessageError (C02437) [1008](#)
 Axis bus status (C02435) [1008](#)
 Axis bus time settings (C02431) [1007](#)
 AxisBusIO slave/master (C02440) [1009](#)

B

Basic drive functions [473](#)
 Basic functions [473](#)
 Behaviour after mains connection [112](#)
 Binary inputs (C00833) [911](#)
 Binary inputs (Set2) (C00838) [925](#)
 Binary inputs I/O level (C00843) [935](#)
 Binding ID [40](#)
 Bit error [680](#)
 Blocks [1110](#)
 Brake chopper [265](#)
 Brake control [563](#)
 Brake energy management (C00175) [794](#)
 Brake resistance value (C00129) [777](#)
 Brake resistor [265](#)
 Brake resistor monitoring (I2xt) [279](#)
 Brake resistor overload threshold (C00572) [852](#)

Brake resistor utilisation (C00133) [778](#)

Braking operation/brake energy management [265](#)

Braking procedures [268](#)

C

C10 [757](#)

C100 [773](#)

C1000 [956](#)

C101 [773](#), [1289](#)

C1010 [956](#), [1137](#), [1138](#), [1139](#)

C1020 [957](#), [1299](#)

C1021 [957](#), [1299](#)

C1022 [957](#), [1299](#)

C1023 [957](#), [1299](#)

C1025 [958](#), [1205](#)

C1026 [958](#), [1205](#), [1206](#)

C1028 [958](#), [1206](#)

C1029 [958](#), [1206](#)

C103 [773](#), [1289](#)

C1030 [959](#), [1207](#)

C1031 [959](#), [1207](#), [1208](#)

C1033 [959](#), [1208](#)

C1034 [959](#), [1208](#)

C104 [774](#)

C1040 [960](#), [1364](#)

C1041 [960](#), [1364](#)

C1042 [960](#), [1364](#)

C1045 [960](#), [1163](#), [1164](#), [1165](#)

C1046 [961](#), [1172](#), [1173](#), [1174](#)

C1047 [961](#), [1257](#)

C1048 [961](#), [1257](#)

C1049 [961](#), [1141](#)

C105 [774](#)

C1050 [962](#), [1142](#), [1143](#)

C1051 [962](#), [1141](#), [1142](#), [1143](#)

C1052 [962](#), [1142](#), [1143](#)

C1053 [962](#), [1334](#)

C1054 [963](#), [1334](#)

C1055 [963](#), [1334](#)

C1056 [963](#), [1334](#)

C1057 [963](#), [1142](#)

C1058 [964](#), [1327](#), [1330](#)

C1059 [964](#), [1328](#), [1331](#)

C106 [774](#)

C1060 [964](#), [1328](#), [1331](#)

C1061 [965](#), [1328](#), [1331](#)

C1062 [965](#), [1368](#)

C1063 [965](#), [1368](#)

C1064 [966](#), [1368](#)

C1065 [966](#), [1368](#)

C1066 [966](#)

C1067 [967](#), [1142](#), [1222](#), [1323](#)

C1069 [967](#), [1222](#)

C107 [775](#)

C1070 [967](#), [1222](#)

C1071 [967](#), [1222](#)

C1072 [968](#), [1222](#)

C1073 [968](#)

C1074 [968](#), [1222](#)

C1075 [968](#), [1223](#)

C1076 [969](#), [1212](#)

C1077 [969](#), [1212](#)

C1078 [969](#), [1212](#)

C1079 [969](#), [1212](#)

C1080 [969](#), [1212](#)

C1081 [970](#), [1213](#)

C1082 [734](#), [970](#)

C1083 [970](#)

C1084 [970](#)

C1085 [971](#)

C1086 [971](#)

C1087 [971](#)

C1088 [971](#)

C1089 [972](#)

C1090 [972](#), [1406](#)

C1091 [973](#), [1406](#)

C1092 [973](#), [1407](#)

C1093 [974](#), [1407](#)

C1094 [974](#), [1407](#)

C1095 [974](#), [1407](#)

C11 [757](#)

C1100 [975](#), [1196](#), [1198](#), [1200](#)

C1101 [975](#), [1196](#), [1198](#), [1200](#)

C1110 [975](#)

C1111 [975](#)

C1112 [976](#)

C1119 [976](#)

C1120 [976](#)

C1121 [976](#)

C1122 [977](#)

C1123 [977](#)

C1124 [977](#)

C1130 [978](#), [1411](#), [1412](#)

C1131 [978](#), [1412](#)

C1132 [979](#), [1412](#)

C1133 [979](#), [1412](#)

C1138 [979](#), [1372](#), [1375](#), [1376](#), [1377](#)

C1139 [980](#), [1372](#), [1375](#), [1376](#), [1377](#)

C114 [775](#)

C1140 [980](#), [1378](#), [1379](#), [1380](#), [1381](#)

C1141 [980](#), [1378](#), [1379](#), [1380](#), [1381](#)

C115 [776](#)

C1150 [981](#), [1316](#), [1320](#)

C1151 [981](#), [1316](#), [1320](#)

C117 [776](#)

C118 [776](#)

C1190	981	C1297	999
C1191	982	C1298	552 , 1000
C1192	982	C1299	1000
C1193	982	C13	758 , 1289
C12	758 , 1289	C130	777
C120	777	C1300	1001
C1201	982	C1301	1002
C1202	983	C1302	1002
C1203	983	C1303	1002
C1204	983	C1304	1002
C1205	983	C1305	1003
C1206	984	C1306	1003
C121	777	C1307	1003
C1210	984	C1308	1004
C1211	984	C1309	1004
C1213	985	C131	778
C1215	985	C133	778
C1216	985	C134	778 , 1289
C1218	986	C136	779
C1219	986	C137	780
C1221	987	C138	781
C1222	987	C142	781
C1223	987	C144	782
C1224	988	C148	782
C1225	988	C15	758
C1226	988	C150	783
C1227	989	C1501	1004
C1228	989	C155	784
C1229	989	C158	785
C123	777	C159	786
C1230	990	C16	758
C1231	990	C160	786
C1232	990	C161	787
C1233	991	C163	787
C1234	991	C164	790
C1235	991	C165	791
C1236	991	C166	792
C1237	992	C167	792
C1238	992	C1670	1005 , 1154 , 1159 , 1160 , 1161 , 1162
C1239	992	C1671	1005 , 1154 , 1159 , 1160 , 1161 , 1162
C1240	992	C1672	1005 , 1154 , 1159 , 1160 , 1161 , 1162
C1241	994	C168	792
C1242	995	C169	793
C1243	996	C170	793
C1244	996	C171	793
C1245	997	C173	793
C1246	997	C174	794
C1251	997	C175	794
C1252	998	C1751	1006
C129	777	C1752	1006
C1295	998	C1755	1006
C1296	413 , 419 , 422 , 434 , 435 , 492 , 493 , 497 , 998	C176	794
		C1763	1006

C1764	1006	C2431	1007
C1765	1006	C2435	1008
C177	794	C2436	1008
C1770	1006	C2437	1008
C178	795	C244	802 , 1340
C179	795	C2440	1009
C18	759	C245	802 , 1340
C180	795	C246	802
C181	795	C247	803 , 1340
C182	795 , 1289	C249	803 , 1345
C184	796	C250	803 , 1346 , 1347
C185	796	C251	803 , 1245
C186	796	C252	803 , 1245
C187	796	C253	804 , 1245
C188	796	C254	804
C189	797	C2580	1009
C19	759	C2581	1010
C190	797 , 1289	C2582	1010
C1902	1006	C2589	1012
C1903	1007	C2593	1012
C1905	1007	C26	761
C199	797	C2607	1013
C2	749	C2610	1013
C20	760	C2611	1014
C200	797	C265	804
C201	798	C2652	1014
C203	798	C27	761
C204	798	C270	804
C205	799	C271	804
C206	799	C272	805
C21	760	C273	805
C210	799	C274	805
C22	760	C275	805
C220	799 , 1289	C276	805
C221	799 , 1290	C28	761
C222	799 , 1339	C280	805
C223	799 , 1339	C2810	1015
C224	799 , 1339	C2811	1015
C225	800 , 1339	C2812	1016
C226	800 , 1339	C2813	1016
C227	800 , 1339	C2814	1016
C228	800 , 1339	C2815	1017
C23	760	C2816	1017
C231	800 , 1339	C2817	1018
C233	801 , 1339	C2830	1019
C234	801	C2840	1020
C235	801	C2841	1020
C236	801	C2842	1020
C24	761	C2843	1020
C241	801 , 1290	C2844	346 , 1021
C242	802 , 1340	C2845	346 , 1021
C243	802 , 1340	C2853	1021
C2430	1007	C2855	1022

C2859	1022	C345	813
C2862	1022	C347	813
C2863	1022	C349	814
C2866	1022	C350	814
C2867	1023	C351	815
C2870	1023	C352	815
C2871	1023	C353	815
C2872	1024	C354	816
C2873	1024	C355	816
C2874	1024	C356	817
C2875	1025	C357	817
C2876	1025	C358	817
C2877	1025	C359	818
C2878	1026	C36	762
C2879	1027	C360	818
C29	762	C364	819
C290	806	C366	819
C291	806	C367	820
C296	806	C368	821
C297	806	C369	821
C2994	1027	C370	821
C2995	1027	C372	822
C2996	1027	C381	822
C3	751	C385	822
C301	806	C386	822
C302	806	C39	763 , 1289
C304	806	C400	823 , 1410
C305	806	C401	823
C306	806	C408	823
C307	806	C409	824
C308	806	C410	824 , 1353
C309	806	C411	824 , 1354
C310	807	C412	825 , 1354
C311	807	C413	825 , 1353
C312	807	C417	825
C313	807	C420	826
C314	807	C421	826
C315	807	C422	826
C316	807	C423	827
C317	807	C424	827
C320	807	C425	827
C321	808	C426	828
C322	808	C427	828
C323	808	C428	828
C324	809	C434	829
C33	762	C435	829
C338	809 , 1128	C436	829
C339	809 , 1130	C437	829
C34	762	C439	830
C341	810	C440	830
C342	811	C441	831
C343	812	C442	831
C344	812	C443	832

C444	833	C52	764
C445	833	C53	764
C446	834	C54	764
C447	834	C55	764
C448	835	C56	765
C449	835	C560	851
C455	835	C561	851
C456	835	C565	851
C458	835	C566	851
C459	836	C567	852
C461	836	C569	852
C462	836	C57	765
C463	837	C570	852
C464	838	C572	852
C465	838	C574	853
C466	838	C576	853
C467	838	C577	853
C468	838	C578	853
C469	838	C579	853
C470	839 , 1398	C58	765
C471	839 , 1394	C580	854
C472	840 , 1396	C581	854
C473	840 , 1400	C582	854
C474	840 , 1399	C583	855
C475	841 , 1403 , 1404	C585	855
C476	841 , 1397	C586	855
C477	842 , 1395	C588	856
C478	842 , 1401	C59	765
C479	842 , 1402	C590	856
C480	843 , 1389	C592	856
C481	843 , 1386	C593	857
C482	843 , 1387	C594	857
C483	843 , 1390	C595	858
C484	844 , 1388	C597	858
C485	844 , 1388	C598	859
C486	844 , 1388	C599	859
C487	845 , 1388	C6	752
C488	845	C60	765
C490	846	C600	859
C492	846	C601	859
C493	846	C602	860
C494	846	C603	860
C495	847	C604	860
C496	847	C606	860
C497	847	C607	861
C498	848	C608	861
C5	752	C609	861
C50	763	C61	765
C505	848	C610	861
C507	849	C611	861
C51	763	C612	861
C516	849	C613	861
C517	850	C615	861

C617	862	C7	754
C62	766	C70	767
C620	862	C700	880
C621	864	C701	881
C622	869	C705	883
C63	766	C706	883
C630	869 , 1264 , 1265	C71	767
C631	870 , 1266 , 1267 , 1268	C710	883
C632	870 , 1290	C711	885
C633	870 , 1290	C712	888
C634	871 , 1290	C715	888
C635	871 , 1290	C716	888
C636	871 , 1290	C717	888
C637	871	C72	767
C638	872	C720	888 , 1231
C639	872	C721	889 , 1233 , 1234
C64	766	C725	889
C640	872	C726	889
C643	872	C727	890 , 1392
C644	872	C728	890 , 1392
C645	873	C729	890
C646	873	C73	768
C647	873	C730	890
C65	766	C731	890
C650	873 , 1132 , 1134 , 1136	C732	890
C66	767	C734	891
C660	874 , 1246	C735	891
C661	874 , 1247	C736	891
C662	874 , 1248	C74	768
C670	874 , 1303	C740	891
C671	874 , 1304	C741	891
C672	875 , 1305	C742	891
C673	875 , 1306 , 1307	C743	891
C674	875 , 1306 , 1307	C744	891
C677	875 , 1252 , 1253 , 1254	C746	891
C678	876 , 1255 , 1256	C747	891
C679	876 , 1274	C748	891
C680	876 , 1145	C749	891
C681	876 , 1145	C75	768
C682	877 , 1145	C750	892
C685	877 , 1150	C751	892
C686	877 , 1150	C753	892
C687	877 , 1150	C76	768
C690	877 , 1151	C760	892
C691	878 , 1151	C761	893
C692	878 , 1151	C762	895
C693	878 , 1152 , 1153	C765	895
C694	878 , 1152 , 1153	C766	895
C695	879 , 1152 , 1153	C767	895
C696	879 , 1303	C77	769
C697	879 , 1304	C78	769
C698	879 , 1305	C79	769
C699	879 , 1273	C8	755

C80	769	C909	944
C800	896 , 1270	C91	771
C801	896 , 1270	C910	944
C802	896 , 1270	C915	944
C803	896 , 1270	C916	944
C804	896 , 1270	C917	945
C805	897	C918	945
C806	897 , 1270	C92	772
C807	897 , 1279	C922	945
C808	897 , 1279	C925	945
C809	898 , 1282	C926	945
C81	770	C927	945
C810	898 , 1282	C93	772
C811	898	C937	946
C812	899	C938	946
C82	770	C939	946
C820	899 , 1236	C940	946 , 1181 , 1183 , 1184 , 1185
C821	900 , 1236	C941	946 , 1181 , 1183 , 1184 , 1185
C822	900 , 1238	C942	947 , 1181 , 1183 , 1184 , 1185
C823	900 , 1238	C95	772
C824	901 , 1241	C950	947 , 1260
C825	901 , 1241	C951	947 , 1260
C826	902 , 1243	C952	947 , 1260
C827	902 , 1243	C953	947 , 1260
C828	903 , 1240	C959	948 , 1201 , 1205 , 1207
C829	903 , 1240	C960	948 , 1201
C83	770	C961	948 , 1201 , 1202
C830	904	C963	948 , 1202
C831	906	C964	949 , 1202
C832	909	C965	949
C833	911	C966	949
C834	914	C967	950
C835	915	C968	950
C836	918	C97	772
C837	921	C971	951
C838	925	C972	951
C839	930	C973	951
C84	770	C975	951
C840	932	C976	951
C841	933	C977	952
C843	935	C978	952
C844	940	C979	952
C85	770	C98	772
C866	940	C980	952
C868	941	C981	952
C87	771	C982	953
C876	942	C985	953
C877	943	C986	953
C88	771	C987	953
C89	771	C988	953
C890	943	C99	772
C90	771	C990	953
C905	944	C991	954

- C992 [954](#)
- C993 [954](#)
- C994 [954](#)
- C995 [955](#)
- C996 [955](#)
- C997 [955](#)
- C998 [955](#)
- C999 [955](#)
- CA06
 - CAN CRC error (error message) [623](#)
- CA07
 - CAN bus warning (error message) [623](#)
- CA08
 - CAN bus stopped (error message) [623](#)
- CA0b
 - CAN HeartBeatEvent (error message) [623](#)
- CA0F
 - CAN control word (error message) [623](#)
- Calculating mass inertia (SC) [229](#)
- Calculating mass inertia (SLVC) [194](#)
- CAN baud rate (C00351) [815](#)
- CAN data telegram [646](#)
- CAN decoupling PDOInOut (C00342) [811](#)
- CAN error status (C00345) [813](#)
- CAN HeartBeat ConsumerTime (C00386) [822](#)
- CAN Heartbeat producer time (C00381) [822](#)
- CAN IN/OUT COBID source (C00353) [815](#)
- CAN input words (C00866) [940](#)
- CAN management - error configuration (C00341) [810](#)
- CAN MessageError (C00364) [819](#)
- CAN monitoring times (C00357) [817](#)
- CAN node addr. HeartBeat producer (C00385) [822](#)
- CAN node address (C00350) [814](#)
- CAN on board [638](#)
- CAN output words (C00868) [941](#)
- CAN reset node [645](#)
- CAN setting - DIP switch (C00349) [814](#)
- CAN slave/master (C00352) [815](#)
- CAN start remote node [652](#)
- CAN status (C00359) [818](#)
- CAN status HeartBeat producer (C00347) [813](#)
- CAN sync transmission cycle time (C00369) [821](#)
- CAN Sync-Rx-Identifier (C00367) [820](#)
- CAN Sync-Tx-Identifier (C00368) [821](#)
- CAN telegram counter (C00360) [818](#)
- CAN time settings (C00356) [817](#)
- CAN transmission blocking time (C00324) [809](#)
- CAN_Tx_Rx_Error (C00372) [822](#)
- CANx_OUT data length (C00358) [817](#)
- CANxInOut
 - Inversion (C00401) [823](#)
- Cause of controller inhibit (C00158) [785](#)
- Cause of quick stop QSP (C00159) [786](#)
- CE04
 - MCI communication error (error message) [622](#)
- CE0F
 - MCI control word (error message) [622](#)
- CE1
 - CAN RPDO1 (error message) [624](#)
- CE2
 - CAN RPDO2 (error message) [624](#)
- CE3
 - CAN RPDO3 (error message) [624](#)
- CE4
 - CAN bus off (error message) [622](#)
- Change of the operating mode [485](#)
- Ck01
 - Pos. HW limit switch (error message) [628](#)
- Ck02
 - Neg. HW limit switch (error message) [629](#)
- Ck03
 - Pos. SW limit position (error message) [629](#)
- Ck04
 - Neg. SW limit position (error message) [629](#)
- Ck05
 - Following error 1 (error message) [630](#)
- Ck06
 - Following error 1 (error message) [630](#)
- Ck07
 - Travel range limit exceeded (error message) [630](#)
- Ck08
 - Home position unknown (error message) [630](#)
- Ck09
 - Positioning mode invalid (error message) [630](#)
- Ck10
 - Implausible profile data (error message) [631](#)
- Ck11
 - Invalid operating mode (error message) [631](#)
- Ck12
 - Invalid profile number (error message) [631](#)
- Ck13
 - Error - MCKCtrlInterface function block (error message) [631](#)
- Ck14
 - Target position outside SW limit position (error message) [629](#)
- Ck15
 - Error status sign. brake (error message) [629](#)
- Ck16
 - Time overflow manual operation (error message) [630](#)
- CI01
 - Module missing/incompatible (error message) [624](#)
- COB-ID [646](#)
- COBID (C00354) [816](#)
- COB-ID EMCY (I-1014) [693](#)
- COB-ID SYNC message (I-1005) [692](#)
- Communication control words (C00136) [779](#)
- Communication cycle period (I-1006) [693](#)

- Communication time [641](#)
- Comparing applications [1105](#)
- Comparing FB interconnections [1105](#)
- Comparing interconnections [1105](#)
- Comparison L_Counter 1-3 (C01101) [975](#)
- Configuring exception handling of the CAN PDOs [666](#)
- Configuring exception handling of the output terminals [369](#)
- Consumer heartbeat time (I-1016) [694](#)
- Control mode (C00007) [754](#)
- Control type [131](#)
- Control word (MCK) [481](#)
- Conventions used [26](#)
- Conventions used for variable identifiers [1063](#)
- Copying a complete interconnection [1108](#)
- Copying an FB interconnection [1108](#)
- Copying an interconnection [1108](#)
- Copying elements [1099](#)
- Copying interconnection elements [1099](#)
- Copying objects [1099](#)
- Correction of the leakage inductance [245](#)
- Cosine phi (C00979) [952](#)
- CountInx
 - Counter content (C02841) [1020](#)
 - Parameter (C02840) [1020](#)
- CP04
 - CAN RPDO4 (error message) [624](#)
- CRC error [680](#)
- Current AutoFailReset processes (C00187) [796](#)
- Current error (C00170) [793](#)
- Current password protection (C00507) [849](#)
- Current setpoint filter (band-stop filter) [231](#)
- Current switching frequency (C00725) [889](#)
- D**
- Data type [744](#)
- Data type entry [1063](#)
- DC braking
 - Current (C00036) [762](#)
 - Hold time (C00107) [775](#)
- DCB (DC-injection braking) [251](#)
- DC-bus voltage (C00053) [764](#)
- DC-injection braking [250](#)
- Decel. time - main setpoint (C00013) [758](#)
- Decel. time - quick stop (C00105) [774](#)
- Decoupling AnalogOut (C00441) [831](#)
- Defining a user-defined V/f characteristic [162](#)
- Defining the current limits [136](#)
- Defining the speed limits [136](#)
- Del.resp. to fault
 - DC-bus overvoltage (C00601) [859](#)
- Description data (C00199) [797](#)
- Device access protection [37](#)
- Device commands (C00002) [749](#)
- Device overload monitoring (Ixt) [275](#)
- Device personalisation [40](#)
- Device search function [100](#)
- Device status (C00137) [780](#)
- Device statuses (LED status display) [583](#)
- Device type (I-1000) [690](#)
- Device utilisat. threshold (Ixt) (C00123) [777](#)
- Device utilisation (Ixt) (C00064) [766](#)
- dF10
 - AutoTrip reset (error message) [628](#)
- dF14
 - SW-HW invalid (error message) [626](#)
- dF15
 - DCCOM CU2 error (error message) [627](#)
- dF18
 - BU RCOM error (error message) [627](#)
- dF21
 - BU watchdog (error message) [627](#)
- dF22
 - CU watchdog (error message) [627](#)
- dF25
 - CU RCOM error (error message) [627](#)
- dF26
 - Appl. watchdog (error message) [627](#)
- dF50
 - Retain error (error message) [628](#)
- dF51
 - CuCcr error (error message) [628](#)
- dF52
 - BuCcr error (error message) [628](#)
- dH09
 - EEPROM power section (error message) [631](#)
- dH10
 - Fan failure (error message) [631](#)
- dH68
 - Adjustment data error CU (error message) [632](#)
- dH69
 - Adjustment data error BU (error message) [632](#)
- DI 1/2 & 6/7
 - Function (C00115) [776](#)
- Diagnostics X6
 - Change baud rate (C01903) [1007](#)
 - Current baud rate (C01905) [1007](#)
 - Max. baud rate (C01902) [1006](#)
- DigInX
 - Inversion (C00114) [775](#)
- Digital inputs [329](#)
- Digital outputs [349](#)
- DigOut decoupling (C00447) [834](#)
- DigOut decoupling value (C00448) [835](#)
- DigOutX
 - Inversion (C00118) [776](#)
- DIP switch settings [642](#)
- Display of internal process factors in application units [1388](#)

Display process factors on the keypad 1388	xx.0123.00031 616
Dlx	xx.0123.00032 617
Debounce time (C02830) 1019	xx.0123.00033 617
Level (C00443) 832	xx.0123.00056 617
DOx	xx.0123.00057 617
Delay times (C00423) 827	xx.0123.00058 617
Level (C00444) 833	xx.0123.00059 618
DRIVE ERROR (LED) 583	xx.0123.00062 618
DRIVE ERROR-LED 583	xx.0123.00065 618
Drive interface 89	xx.0123.00071 618
DRIVE READY (LED) 583	xx.0123.00074 618
DRIVE READY-LED 583	xx.0123.00075 619
	xx.0123.00090 619
	xx.0123.00093 619
	xx.0123.00094 619
	xx.0123.00095 620
	xx.0123.00096 620
	xx.0123.00097 620
	xx.0123.00098 620
	xx.0123.00099 620
	xx.0123.00105 621
	xx.0123.00145 621
	xx.0123.00200 621
	xx.0123.00201 621
	xx.0123.00205 621
	xx.0125.00001 622
	xx.0125.00002 622
	xx.0127.00002 622
	xx.0127.00015 622
	xx.0131.00000 622
	xx.0131.00006 623
	xx.0131.00007 623
	xx.0131.00008 623
	xx.0131.00011 623
	xx.0131.00015 623
	xx.0135.00001 624
	xx.0135.00002 624
	xx.0135.00003 624
	xx.0135.00004 624
	xx.0140.00013 624
	xx.0144.00001 625
	xx.0144.00002 625
	xx.0144.00003 625
	xx.0144.00004 625
	xx.0144.00007 626
	xx.0144.00008 626
	xx.0144.00009 626
	xx.0144.00010 626
	xx.0145.00014 626
	xx.0145.00015 627
	xx.0145.00024 627
	xx.0145.00025 627
	xx.0145.00026 627
	xx.0145.00033 627
	xx.0145.00034 627
	xx.0145.00035 628
	xx.0145.00050 628
	xx.0145.00051 628
E	
Elapsed-hour meter (C00178) 795	
E-mail to Lenze 1438	
Emergency 686	
Encoder 317 , 319	
Encoder - angular drift monitoring 326	
Encoder evaluation method 316	
Encoder evaluation method DigIn12 (C00496) 847	
Encoder scanning time (C00425) 827	
Encoder/feedback system 293	
Energy display (C00981) 952	
Error detection 680	
Error ID 603 , 606	
Error information (C00165) 791	
Error information text (C00166) 792	
Error messages 602	
Error messages (short overview) 608	
Error messages (system bus) 673	
Error number 602 , 605	
xx.0111.00002 611	
xx.0111.00003 611	
xx.0111.00004 611	
xx.0111.00006 612	
xx.0119.00000 612	
xx.0119.00001 612	
xx.0119.00002 612	
xx.0119.00003 612	
xx.0119.00012 613	
xx.0119.00015 613	
xx.0119.00020 613	
xx.0119.00021 613	
xx.0119.00022 613	
xx.0119.00050 614	
xx.0123.00001 614	
xx.0123.00007 614	
xx.0123.00014 614	
xx.0123.00015 615	
xx.0123.00016 615	
xx.0123.00017 615	
xx.0123.00024 616	
xx.0123.00026 616	
xx.0123.00027 616	
xx.0123.00030 616	

- xx.0145.00052 [628](#)
- xx.0184.00001 [628](#)
- xx.0184.00002 [629](#)
- xx.0184.00005 [629](#)
- xx.0184.00007 [629](#)
- xx.0184.00008 [629](#)
- xx.0184.00015 [629](#)
- xx.0184.00064 [630](#)
- xx.0184.00153 [630](#)
- xx.0184.00154 [630](#)
- xx.0184.00155 [630](#)
- xx.0184.00156 [630](#)
- xx.0184.08005 [630](#)
- xx.0184.08007 [631](#)
- xx.0184.08009 [631](#)
- xx.0184.08014 [631](#)
- xx.0184.08015 [631](#)
- xx.0400.00009 [631](#)
- xx.0400.00016 [631](#)
- xx.0400.00104 [632](#)
- xx.0400.00105 [632](#)
- xx.0980.00001 [632](#)
- xx.0981.00002 [632](#)
- xx.0982.00003 [632](#)
- xx.0983.00004 [632](#)
- xx.0984.00001 [633](#)
- xx.0985.00002 [633](#)
- xx.0986.00003 [633](#)
- xx.0987.00004 [633](#)
- Error register (I-1001) [690](#)
- Error subject area [603](#), [605](#)
- Error type [602](#)
- Export error texts [607](#)
- Exporting logbook entries [593](#)
- Extended status word (C00155) [784](#)
- F**
- Failure indication (C00561) [851](#)
- FB Editor [1058](#)
- FC01
 - Switching frequency reduction (error message) [619](#)
- FC02
 - Maximum speed for Fchop (error message) [620](#)
- FC03
 - Field controller limitation (error message) [620](#)
- Feed constant [501](#)
- Feedback system motor temperature (C01193) [982](#)
- Feedback to Lenze [1438](#)
- FI brake [268](#)
- Field weakening for synchronous motors [260](#)
- Field weakening oscillation damping (C00236) [801](#)
- Fieldbus interface [711](#)
- Field-oriented motor currents (C00937) [946](#)
- Filter setpoint feedforward control (C00275) [805](#)
- Filter time - earth-fault detect. is running (C01770) [1006](#)
- Firmware (C00201) [798](#)
- Firmware product type (C00200) [797](#)
- Firmware update [102](#)
- Firmware version (C00099) [772](#)
- Firmware version (C00100) [773](#)
- Fixed setpoint x (L_NSet_1 n-Fix) (C00039) [763](#)
- Flying restart fct. [247](#)
 - Activation (C00990) [953](#)
 - Current (C00994) [954](#)
 - Integration time (C00993) [954](#)
 - Process (C00991) [954](#)
 - Start frequency (C00992) [954](#)
- Following error [513](#)
- Following error monitoring system [513](#)
- Format error [680](#)
- FreqIn12
 - Function (C02844) [1021](#)
 - PosIn comparison value (C02845) [1021](#)
- FreqInxx
 - Gain (C02843) [1020](#)
 - Offset (C02842) [1020](#)
- FreqInxx_dnOut_p (C00449) [835](#)
- FreqInxx_nOut_a (C00446) [834](#)
- FreqInxx_nOut_v (C00445) [833](#)
- Frequency limitation (C00910) [944](#)
- Function assignment [881](#)
- Function block editor [1058](#)
- Function blocks [1110](#)
- Function L_Counter 1-3 (C01100) [975](#)
- Function library [1110](#)
- G**
- Gearbox ratio [500](#)
- General data (CAN on board) [640](#)
- General purpose functions [467](#)
- GP functions (GeneralPurpose) [467](#)
- H**
- Hardware limit switch [508](#)
- Heartbeat protocol [682](#)
- Heatsink temperature (C00061) [765](#)
- Hiperface
 - Detected TypCode (C00492) [846](#)
 - Resolutions (C00494) [846](#)
 - TypCode (C00493) [846](#)
- Holding brake
 - Activation time (C02593) [1012](#)
 - Operating mode (C02580) [1009](#)
 - Setting (C02582) [1010](#)
 - Speed thresholds (C02581) [1010](#)
 - Status (C02607) [1013](#)
 - Time system (C02589) [1012](#)
- Holding brake control [563](#)
- Homing [517](#)
- Homing on the fly [532](#)

I

- I-1000 [690](#)
- I-1001 [690](#)
- I-1003 [691](#)
- I-1005 [692](#)
- I-1006 [693](#)
- I-1014 [693](#)
- I-1016 [694](#)
- I-1017 [695](#)
- I-1018 [695](#)
- I-1200 [696](#)
- I-1201 [697](#)
- I-1400 [699](#)
- I-1401 [700](#)
- I-1402 [701](#)
- I-1600 [702](#)
- I-1601 [702](#)
- I-1602 [703](#)
- I-1800 [704](#)
- I-1801 [706](#)
- I-1802 [707](#)
- I-1A00 [708](#)
- I-1A01 [708](#)
- I-1A02 [709](#)
- Id1
 - Motor data identification error (error message) [617](#)
- Id2
 - Motor data identification error (error message) [617](#)
- Id3
 - CINH motor data identification (error message) [617](#)
- Id4
 - Resistor identification error (error message) [618](#)
- Id5
 - Pole position identification error (error message) [618](#)
- Id6
 - Resolver ident. error (error message) [619](#)
- Identification procedure (C02867) [1023](#)
- Identifier (CAN) [646](#)
- Identifiers of the parameter data objects [669](#)
- Identifiers of the process data objects [661](#)
- Identity object (I-1018) [695](#)
- Imax controller [152](#)
- Imax in generator mode (C00023) [760](#)
- Imax in motor mode (C00022) [760](#)
- Imax/M controller gain (C00073) [768](#)
- Insert options for copied elements [1101](#)
- Inserting complete interconnection from reference project [1109](#)
- Inserting copied elements [1101](#)
- Inserting FB interconnection from reference project [1109](#)
- Integrated error detection [680](#)
- Integrated safety system [486](#)

- Internal control signals (C00138) [781](#)
- Inversion of gearbox stages (C01067) [967](#)
- Inverter motor brake [268](#)
 - nAdd (C00987) [953](#)
 - PT1 filter time (C00988) [953](#)

J

- Jerk limitation [550](#)
- Jogging mode [533](#)

K

- Keypad
 - Default parameter (C00466) [838](#)
 - Default welcome screen (C00467) [838](#)
 - Display of internal process factors [1388](#)
 - STOP key function (C00469) [838](#)
 - Timeout welcome screen (C00465) [838](#)
- Keypad analog values (C00728) [890](#)
- Keypad LCD display [587](#)
- Kp position controller (C00254) [804](#)
- KTY motor temperature compensation (C02878) [1026](#)

L

- L_Absolut [1115](#)
- L_Absolute_1 [1115](#)
- L_Absolute_2 [1115](#)
- L_AddSub [1116](#)
- L_AddSub_1 [1116](#)
- L_AnalogSwitch [1117](#)
- L_AnalogSwitch_1 [1117](#)
- L_AnalogSwitch_2 [1118](#)
- L_AnalogSwitch_3 [1119](#)
- L_AnalogSwitch_4 [1120](#)
- L_AnalogSwitch_5 [1121](#)
- L_And [1122](#)
- L_And_1 [1122](#)
- L_And_2 [1123](#)
- L_And_3 [1124](#)
- L_And5 [1125](#)
- L_And5_1 [1125](#)
- L_And5_2 [1126](#)
- L_Arithmetik [1127](#)
- L_Arithmetik 3-5
 - Function (C00650) [873](#)
- L_Arithmetik_1 [1127](#)
 - Function (C00338) [809](#)
- L_Arithmetik_2 [1129](#)
 - Function (C00339) [809](#)
- L_Arithmetik_3 [1131](#)
- L_Arithmetik_4 [1133](#)
- L_Arithmetik_5 [1135](#)
- L_ArithmetikPhi [1137](#)
- L_ArithmetikPhi 1-3
 - Function (C01010) [956](#)

- L_ArithmetikPhi_1 [1137](#)
- L_ArithmetikPhi_2 [1138](#)
- L_ArithmetikPhi_3 [1139](#)
- L_CalcDiameter [1140](#)
 - Current diameter (C01057) [963](#)
 - Filter time constant (C01051) [962](#)
 - Status (C01049) [961](#)
 - Web break monitoring (C01052) [962](#)
- L_CalcDiameter_1 [1140](#)
 - Diameter recalculation (C01050) [962](#)
- L_Compare [1145](#)
- L_Compare 4-5
 - Fct. (C00693) [878](#)
 - Hysteresis (C00694) [878](#)
 - Window (C00695) [879](#)
- L_Compare_1 [1145](#)
 - Fct. (C00680) [876](#)
 - Hysteresis (C00681) [876](#)
 - Window (C00682) [877](#)
- L_Compare_2 [1150](#)
 - Fct. (C00685) [877](#)
 - Hysteresis (C00686) [877](#)
 - Window (C00687) [877](#)
- L_Compare_3 [1151](#)
 - Fct. (C00690) [877](#)
 - Hysteresis (C00691) [878](#)
 - Window (C00692) [878](#)
- L_Compare_4 [1152](#)
- L_Compare_5 [1153](#)
- L_ComparePhi [1154](#)
- L_ComparePhi 1-5
 - Function (C01670) [1005](#)
 - Hysteresis (C01671) [1005](#)
 - Window (C01672) [1005](#)
- L_ComparePhi_1 [1154](#)
- L_ComparePhi_2 [1159](#)
- L_ComparePhi_3 [1160](#)
- L_ComparePhi_4 [1161](#)
- L_ComparePhi_5 [1162](#)
- L_ConvAP [1163](#)
- L_ConvAP 1-3
 - Numerator/denominator (C01045) [960](#)
- L_ConvAP_1 [1163](#)
- L_ConvAP_2 [1164](#)
- L_ConvAP_3 [1165](#)
- L_ConvBitsToWord [1166](#)
 - L_ConvBitsToWord_1 [1166](#)
 - L_ConvBitsToWord_2 [1167](#)
 - L_ConvBitsToWord_3 [1168](#)
- L_ConvDIntToWords [1169](#)
 - L_ConvDIntToWords_1 [1169](#)
 - L_ConvDIntToWords_2 [1170](#)
 - L_ConvDIntToWords_3 [1171](#)
- L_ConvPA [1172](#)
- L_ConvPA 1-3
 - byDivision (C01046) [961](#)
- L_ConvPA_1 [1172](#)
- L_ConvPA_2 [1173](#)
- L_ConvPA_3 [1174](#)
- L_ConvPP [1175](#)
 - L_ConvPP_1 [1175](#)
 - L_ConvPP_2 [1176](#)
 - L_ConvPP_3 [1177](#)
- L_ConvUnitsToIncr [1178](#)
 - L_ConvUnitsToIncr_1 [1178](#)
 - L_ConvUnitsToIncr_2 [1179](#)
 - L_ConvUnitsToIncr_3 [1180](#)
- L_ConvW [1181](#)
- L_ConvW conversion method (C00942) [947](#)
- L_ConvW denominator (C00941) [946](#)
- L_ConvW numerator (C00940) [946](#)
 - L_ConvW_1 [1181](#)
 - L_ConvW_2 [1183](#)
 - L_ConvW_3 [1184](#)
 - L_ConvW_4 [1185](#)
- L_ConvWordsToDInt [1186](#)
 - L_ConvWordsToDInt_1 [1186](#)
 - L_ConvWordsToDInt_2 [1187](#)
 - L_ConvWordsToDInt_3 [1188](#)
- L_ConvWordToBits [1189](#)
 - L_ConvWordToBits_1 [1189](#)
 - L_ConvWordToBits_2 [1190](#)
 - L_ConvWordToBits_3 [1191](#)
- L_ConvX [1192](#)
 - L_ConvX_1 [1192](#)
 - L_ConvX_2 [1193](#)
 - L_ConvX_3 [1194](#)
- L_Counter [1195](#)
 - L_Counter_1 [1195](#)
 - L_Counter_2 [1197](#)
 - L_Counter_3 [1199](#)
- L_Curve [1201](#)
 - Current output value (C00959) [948](#)
- L_Curve_1 [1201](#)
 - Input limitation (C00961) [948](#)
 - Selected curve type (C00960) [948](#)
 - Table X-values (C00963) [948](#)
 - Table Y-values (C00964) [949](#)
- L_Curve_2 [1205](#)
 - Input limitation (C01026) [958](#)
 - Selected curve type (C01025) [958](#)
 - Table X-values (C01028) [958](#)
 - Table Y-values (C01029) [958](#)
- L_Curve_3 [1207](#)
 - Input limitation (C01031) [959](#)
 - Selected curve type (C01030) [959](#)
 - Table X-values (C01033) [959](#)
 - Table Y-values (C01034) [959](#)

- L_DFlipFlop [1209](#)
- L_DFlipFlop_1 [1209](#)
- L_DFlipFlop_2 [1210](#)
- L_DFRFG [1211](#)
 - Following error (C01078) [969](#)
 - Max. speed-up (C01077) [969](#)
 - Offset (C01080) [969](#)
 - Sync. direction / TP function (C01081) [970](#)
 - Synchronisation window (C01079) [969](#)
 - Times (C01076) [969](#)
- L_DFRFG_1 [1211](#)
- L_DFSET [1220](#)
 - Angular trimming (C01070) [967](#)
 - Evaluation - setpoint angle integrator (C01073) [968](#)
 - Following error limit (C01071) [967](#)
 - Multiplier - angular trimming (C01072) [968](#)
 - Synchronisation mode (C01075) [968](#)
 - Zero pulse divider (C01074) [968](#)
- L_DFSet
 - Ramp settings (C01069) [967](#)
- L_DFSET_1 [1220](#)
- L_DigitalDelay [1231](#)
- L_DigitalDelay 2,3
 - Delay (C00721) [889](#)
- L_DigitalDelay_1 [1231](#)
 - Delay (C00720) [888](#)
- L_DigitalDelay_2 [1233](#)
- L_DigitalDelay_3 [1234](#)
- L_DigitalLogic [1235](#)
- L_DigitalLogic_1 [1235](#)
 - Function (C00820) [899](#)
 - Truth table (C00821) [900](#)
- L_DigitalLogic_2 [1237](#)
 - Function (C00822) [900](#)
 - Truth table (C00823) [900](#)
- L_DigitalLogic_3 [1239](#)
 - Function (C00828) [903](#)
 - Truth table (C00829) [903](#)
- L_DigitalLogic5 [1241](#)
- L_DigitalLogic5_1 [1241](#)
 - Function (C00824) [901](#)
 - Truth table (C00825) [901](#)
- L_DigitalLogic5_2 [1243](#)
 - Function (C00826) [902](#)
 - Truth table (C00827) [902](#)
- L_DT1 [1245](#)
- L_DT1_1 [1245](#)
 - Gain (C00252) [803](#)
 - Sensitivity (C00253) [804](#)
 - Time constant (C00251) [803](#)
- L_FixSet_a [1246](#)
- L_FixSet_a_1 [1246](#)
 - Analog values (C00660) [874](#)
- L_FixSet_w [1247](#)
- L_FixSet_w_1 [1247](#)
 - Fixed values (C00661) [874](#)
- L_FixSet_w_2 [1248](#)
 - Fixed values (C00662) [874](#)
- L_GainOffset [1249](#)
- L_GainOffset_1 [1249](#)
- L_GainOffset_2 [1250](#)
- L_GainOffset_3 [1251](#)
- L_GainOffsetP [1252](#)
- L_GainOffsetP 1-3
 - Parameter (C00677) [875](#)
- L_GainOffsetP_1 [1252](#)
- L_GainOffsetP_2 [1253](#)
- L_GainOffsetP_3 [1254](#)
- L_GainOffsetPhiP [1255](#)
- L_GainOffsetPhiP 1-2
 - Parameter (C00678) [876](#)
- L_GainOffsetPhiP_1 [1255](#)
- L_GainOffsetPhiP_2 [1256](#)
- L_GearComp [1257](#)
 - Num_Denom (C01048) [961](#)
 - Offset (C01047) [961](#)
- L_GearComp_1 [1257](#)
- L_Interpolator [1259](#)
- L_Interpolator_1 [1259](#)
 - Activation FB functions (C00950) [947](#)
 - Limit value - error cycles (C00952) [947](#)
 - No. of interpolation steps (C00951) [947](#)
 - Speed-up (C00953) [947](#)
- L_JogCtrlEdgeDetect_1 (C00488) [845](#)
- L_JogCtrlExtension [1262](#)
- L_JogCtrlExtension_1 [1262](#)
- L_Limit [1264](#)
- L_Limit 1-2
 - Min/Max (C00630) [869](#)
- L_Limit_1 [1264](#)
- L_Limit_2 [1265](#)
- L_LimitPhi [1266](#)
- L_LimitPhi 1-3
 - Min/Max (C00631) [870](#)
- L_LimitPhi_1 [1266](#)
- L_LimitPhi_2 [1267](#)
- L_LimitPhi_3 [1268](#)
- L_MckCtrlInterface [489](#)
- L_MckCtrlInterface_1 [489](#)
- L_MckStateInterface [496](#)
- L_MckStateInterface_1 [496](#)
 - Alternative function (C01297) [999](#)
 - Pos. selection (C01295) [998](#)
- L_MPot [1269](#)
- L_MPot_1 [1269](#)
 - Acceleration time (C00802) [896](#)
 - Deceleration time (C00803) [896](#)
 - Inactive fct. (C00804) [896](#)
 - Init fct. (C00805) [897](#)
 - Lower limit (C00801) [896](#)
 - Upper limit (C00800) [896](#)

- Use (C00806) [897](#)
- L_MulDiv [1273](#)
- L_MulDiv_1 [1273](#)
 - Parameter (C00699) [879](#)
- L_MulDiv_2 [1274](#)
 - Parameter (C00679) [876](#)
- L_Mux [1275](#)
- L_Mux_1 [1275](#)
- L_Negation [1276](#)
- L_Negation_1 [1276](#)
- L_Negation_2 [1277](#)
- L_NLim [1278](#)
 - Current status (C00812) [899](#)
- L_NLim_1 [1278](#)
 - Current output value (C00811) [898](#)
 - Max.SkipFrq. (C00807) [897](#)
 - Min.SkipFrq. (C00808) [897](#)
- L_NLim_2 [1281](#)
 - Max.SkipFrq. (C00809) [898](#)
 - Min.SkipFrq. (C00810) [898](#)
- L_Not [1283](#)
- L_Not_1 [1283](#)
- L_Not_2 [1283](#)
- L_Not_3 [1284](#)
- L_Not_4 [1284](#)
- L_Not_5 [1285](#)
- L_Not_6 [1285](#)
- L_Not_7 [1286](#)
- L_NSet [1287](#)
- L_NSet_1 [1287](#)
 - Accel. time - add. setpoint (C00220) [799](#)
 - Additional value output (C00639) [872](#)
 - Decel. time - add. setpoint (C00221) [799](#)
 - Hyst. NSet reached (C00241) [801](#)
 - Max.SkipFrq. (C00632) [870](#)
 - Min.SkipFrq. (C00633) [870](#)
 - nMaxLimit (C00635) [871](#)
 - nMinLimit (C00636) [871](#)
 - nNOut_a (C00640) [872](#)
 - Output blocking zones (C00637) [871](#)
 - Output ramp rounding (C00638) [872](#)
 - Ramp smoothing (C00134) [778](#)
 - Setpoint arithmetic (C00190) [797](#)
 - S-ramp time PT1 (C00182) [795](#)
 - wState (C00634) [871](#)
- L_Odometer [1298](#)
- L_Odometer_1 [1298](#)
 - Edge selection (C01023) [957](#)
 - Input selection (C01022) [957](#)
 - Memory length (C01020) [957](#)
 - Memory type (C01021) [957](#)
- L_OffsetGain [1300](#)
- L_OffsetGain_1 [1300](#)
- L_OffsetGain_2 [1301](#)
- L_OffsetGain_3 [1302](#)
- L_OffsetGainP [1303](#)
- L_OffsetGainP_1 [1303](#)
 - Gain (C00670) [874](#)
 - Offset (C00696) [879](#)
- L_OffsetGainP_2 [1304](#)
 - Gain (C00671) [874](#)
 - Offset (C00697) [879](#)
- L_OffsetGainP_3 [1305](#)
 - Gain (C00672) [875](#)
 - Offset (C00698) [879](#)
- L_OffsetGainPhiP [1306](#)
- L_OffsetGainPhiP 1-2
 - Gain (C00674) [875](#)
 - Offset (C00673) [875](#)
- L_OffsetGainPhiP_1 [1306](#)
- L_OffsetGainPhiP_2 [1307](#)
- L_Or [1308](#)
- L_Or_1 [1308](#)
- L_Or_2 [1309](#)
- L_Or_3 [1310](#)
- L_Or_4 [1311](#)
- L_Or5 [1312](#)
- L_Or5_1 [1312](#)
- L_Or5_2 [1313](#)
- L_PCTRL [1337](#)
- L_PCTRL_1 [1337](#)
 - Acceleration time (C00227) [800](#)
 - Acceleration time influence (C00243) [802](#)
 - Deceleration time (C00228) [800](#)
 - Deceleration time influence (C00244) [802](#)
 - Internal actual value nAct_a (C00246) [802](#)
 - Kd (C00224) [799](#)
 - MaxLimit (C00225) [800](#)
 - MinLimit (C00226) [800](#)
 - Operating mode (C00242) [802](#)
 - Operating range (C00231) [800](#)
 - PID output value (C00245) [802](#)
 - Root function (C00233) [801](#)
 - Tn (C00223) [799](#)
 - Vp (C00222) [799](#)
 - Window setpoint reached (C00247) [803](#)
- L_PhaseDiff [1314](#)
- L_PhaseDiff_1 [1314](#)
- L_PhaseDiff_2 [1315](#)
- L_PhaseIntK [1316](#)
 - Compare (C01151) [981](#)
 - Function (C01150) [981](#)
- L_PhaseIntK_1 [1316](#)
- L_PhaseIntK_2 [1320](#)
- L_PhiIntegrator [1322](#)
- L_PhiIntegrator_1 [1322](#)
- L_PosCtrlLin [1326](#)
- L_PosCtrlLin 1-2
 - Limit stop (C01058) [964](#)
 - Positioning behaviour (C01059) [964](#)
 - Ramps (C01060) [964](#)

- Traversing speeds (C01061) [965](#)
- L_PosCtrlLin_1 [1326](#)
- L_PosCtrlLin_2 [1329](#)
- L_PosShaftCtrlInterface [1332](#)
- L_PosShaftCtrlInterface_1 [1332](#)
- L_ProcessCtrl [1333](#)
 - Controller gain (C01056) [963](#)
 - Controller times (C01053) [962](#)
 - Correcting variable limitation (C01055) [963](#)
 - System deviation (C01054) [963](#)
- L_ProcessCtrl_1 [1333](#)
- L_PT1 [1345](#)
- L_PT1 2-3
 - Time constant (C00250) [803](#)
- L_PT1_1 [1345](#)
 - Time constant (C00249) [803](#)
- L_PT1_2 [1346](#)
- L_PT1_3 [1347](#)
- L_RLQ [1348](#)
- L_RLQ_1 [1348](#)
- L_RSFlipFlop [1349](#)
- L_RSFlipFlop_1 [1349](#)
- L_RSFlipFlop_2 [1350](#)
- L_SampleHold [1351](#)
- L_SampleHold_1 [1351](#)
- L_SampleHold_2 [1352](#)
- L_SignalMonitor_a [1353](#)
 - Offs./gain (C00413) [825](#)
 - Signal sources (C00410) [824](#)
- L_SignalMonitor_b [1354](#)
 - Inversion (C00412) [825](#)
 - Signal sources (C00411) [824](#)
- L_SignalSwitch [1355](#)
- L_SignalSwitch_1 [1355](#)
- L_SignalSwitch_2 [1356](#)
- L_SignalSwitch_3 [1357](#)
- L_SignalSwitch_4 [1358](#)
- L_SignalSwitch32 [1359](#)
- L_SignalSwitch32_1 [1359](#)
- L_SignalSwitch32_2 [1360](#)
- L_SignalSwitch32_3 [1361](#)
- L_SQrt [1362](#)
- L_SQrt_1 [1362](#)
- L_SRFG [1363](#)
- L_SRFG_1 [1363](#)
- L_SRFG_1..2 limitations of output values (C01042) [960](#)
- L_SRFG_1..2 linear ramp time (C01040) [960](#)
- L_SRFG_1..2 S-ramp time (C01041) [960](#)
- L_SRFG_2 [1365](#)
- L_SwitchPoint [1367](#)
 - CenterMode (C01064) [966](#)
 - Dead time (C01062) [965](#)
 - Hysteresis (C01063) [965](#)
 - Running time (C01065) [966](#)
 - Status (C01066) [966](#)
- L_SwitchPoint_1 [1367](#)
- L_Transient [1372](#)
- L_Transient 1-4
 - Function (C01138) [979](#)
 - Pulse duration (C01139) [980](#)
- L_Transient 5-8
 - Function (C01140) [980](#)
- L_Transient 5-8 pulse duration (C01141) [980](#)
- L_Transient_1 [1372](#)
- L_Transient_2 [1375](#)
- L_Transient_3 [1376](#)
- L_Transient_4 [1377](#)
- L_Transient_5 [1378](#)
- L_Transient_6 [1379](#)
- L_Transient_7 [1380](#)
- L_Transient_8 [1381](#)
- LA_NCtrl [386](#)
 - Analog connection list (C00700) [880](#)
 - Application block [386](#)
 - Digital connection list (C00701) [881](#)
- LA_NCtrl_In [386](#)
- LA_NCtrl_Out [386](#)
- LA_SwitchPos [443](#)
 - Analog connection list (C00760) [892](#)
 - Application block [443](#)
 - Digital connection list (C00761) [893](#)
- LA_SwitchPos_In [443](#)
- LA_SwitchPos_Out [443](#)
- LA_TabPos [414](#)
 - Analog connection list (C00710) [883](#)
 - Application block [414](#)
 - Digital connection list (C00711) [885](#)
 - phi connection list (C00712) [888](#)
- LA_TabPos_In [414](#)
- LA_TabPos_Out [414](#)
- Layout of the safety instructions [29](#)
- LCD display (keypad) [587](#)
- LED status displays [582](#)
- Library [1110](#)
- Limit position monitoring [506](#)
- Limit switch [508](#)
- Lock bFail at TroubleQSP [117](#)
- Logbook - analog elements (C00164) [790](#)
- Logbook - binary elements (C00163) [787](#)
- Logbook setting (C00169) [793](#)
- LP_CanIn decoupling value (C00343) [812](#)
- LP_CanIn mapping (C00409) [824](#)
- LP_CanIn mapping selection (C00408) [823](#)
- LP_CanIn1 [655](#)
- LP_CanIn2 [656](#)
- LP_CanIn3 [657](#)
- LP_CanOut decoupling value (C00344) [812](#)
- LP_CanOut1 [658](#)

- LP_CanOut2 [659](#)
 - LP_CanOut3 [660](#)
 - LP_MciIn [715](#)
 - LP_MciOut [716](#)
 - LP1
 - Motor phase failure (error message) [621](#)
 - LS_AnalogIn1
 - PT1 time constant (C00440) [830](#)
 - LS_AnalogInput [360](#)
 - LS_AnalogOutput [361](#)
 - LS_AxisBusAux [724](#)
 - LS_AxisBusIn [723](#)
 - LS_AxisBusIO [730](#)
 - LS_AxisBusOut [722](#)
 - LS_Brake [564](#)
 - LS_CANManagement [710](#)
 - LS_DeviceMonitor [291](#)
 - LS_DigitalInput [342](#)
 - LS_DigitalOutput [351](#)
 - LS_DisFree [1386](#)
 - LS_DisFree (C00481) [843](#)
 - LS_DisFree_a [1387](#)
 - LS_DisFree_a (C00482) [843](#)
 - LS_DisFree_b [1389](#)
 - LS_DisFree_b (C00480) [843](#)
 - LS_DisFree_p [1390](#)
 - LS_DisFree_p (C00483) [843](#)
 - LS_DriveInterface [115](#)
 - bNActCompare (C00024) [761](#)
 - Error message config. (C00148) [782](#)
 - LS_Keypad [1391](#)
 - LS_Keypad digital values(C00727) [890](#)
 - LS_MotionControlKernel [475](#)
 - LS_MotorInterface [285](#)
 - LS_Multi-Encoder
 - Encoder type (C00422) [826](#)
 - Supply voltage (C00421) [826](#)
 - LS_MultiEncoder [312](#)
 - Current position (C01119) [976](#)
 - PosValues (C01112) [976](#)
 - Solid measure (C01110) [975](#)
 - LS_ParFix [1393](#)
 - LS_ParFix_2 [1393](#)
 - LS_ParFree [1394](#)
 - LS_ParFree (C00471) [839](#)
 - LS_ParFree_2 [1395](#)
 - LS_ParFree_2 (C00477) [842](#)
 - LS_ParFree_a [1396](#)
 - LS_ParFree_a (C00472) [840](#)
 - LS_ParFree_a_2 [1397](#)
 - LS_ParFree_a_2 (C00476) [841](#)
 - LS_ParFree_b [1398](#)
 - LS_ParFree_b (C00470) [839](#)
 - LS_ParFree_p [1399](#)
 - LS_ParFree_p (C00474) [840](#)
 - LS_ParFree_v [1400](#)
 - LS_ParFree_v (C00473) [840](#)
 - LS_ParFree_v_2 [1401](#)
 - LS_ParFree_v_2 (C00478) [842](#)
 - LS_ParFree32 [1402](#)
 - LS_ParFree32 (C00479) [842](#)
 - LS_ParFreeUnit [1403](#)
 - LS_ParFreeUnit_1_2 (C00475) [841](#)
 - LS_ParFreeUnit_2 [1404](#)
 - LS_ParReadWrite [1405](#)
 - LS_ParReadWrite 1-6
 - Arithmetic mode (C01093) [974](#)
 - Cycle time (C01091) [973](#)
 - Denominator (C01095) [974](#)
 - FailState (C01092) [973](#)
 - Index (C01090) [972](#)
 - Numerator (C01094) [974](#)
 - LS_ParReadWrite_1 [1405](#)
 - LS_ParReadWrite_2 [1405](#)
 - LS_ParReadWrite_3 [1405](#)
 - LS_ParReadWrite_4 [1405](#)
 - LS_ParReadWrite_5 [1405](#)
 - LS_ParReadWrite_6 [1405](#)
 - LS_PulseGenerator [1409](#)
 - LS_PulseGenerator (C00400) [823](#)
 - LS_Resolver [301](#)
 - Number of pole pairs (C00925) [945](#)
 - LS_RetainData [1411](#)
 - 16Bit data (C01131) [978](#)
 - 32Bit data (C01132) [979](#)
 - Bool data (C01133) [979](#)
 - Selection (C01130) [978](#)
 - LS_SetError_1 [634](#)
 - LS_SetError_2 [636](#)
 - LS_SetError_x
 - Error number (C00161) [787](#)
 - LS_SyncManagement [733](#)
 - LS_TouchProbe [367](#)
 - LS_WriteParamList [734](#)
 - Error line (C01084) [970](#)
 - Error status (C01083) [970](#)
 - Execute Mode (C01082) [970](#)
 - Index (C01085) [971](#)
 - WriteValue_1 (C01086) [971](#)
 - WriteValue_2 (C01087) [971](#)
 - WriteValue_3 (C01088) [971](#)
 - WriteValue_4 (C01089) [972](#)
 - LU
 - DC bus undervoltage (error message) [615](#)
- ## M
- Machine parameters [498](#)
 - Main program runtime (C00321) [808](#)
 - Mains connection (behaviour) [112](#)

- Mains phase failure monitoring [283](#)
- Mains voltage (C00173) [793](#)
- Manual DC-injection braking (DCB) [251](#)
- Manual jog [533](#)
 - Setting (C01230) [990](#)
- Manual jog to software limit position [539](#)
- Master functionality (CAN) [652](#)
- MasterPin [42](#)
- Max. motor speed (C00965) [949](#)
- Max. number of AutoFailReset processes (C00186) [796](#)
- Maximum current monitoring [283](#)
- Maximum torque (C00057) [765](#)
- Maximum torque monitoring [284](#)
- Maximum travel distance [512](#)
- MCI input words (C00876) [942](#)
- MCI output words (C00877) [943](#)
- MCI_InOut
 - Inversion (C00890) [943](#)
- MCK [473](#)
 - Accel./decel. times (C02610) [1013](#)
 - Control word (C01240) [992](#)
 - Current operating mode (C01243) [996](#)
 - Current pos profile number (C01242) [995](#)
 - Current positions (C01210) [984](#)
 - Cycle (C01201) [982](#)
 - Feed constant (C01204) [983](#)
 - Follower accelerations (C01237) [992](#)
 - Follower speeds (C01236) [991](#)
 - Follower S-ramp times (C01238) [992](#)
 - Following error (C01215) [985](#)
 - iG motor/position encoder (C01203) [983](#)
 - iM motor/process (C01202) [983](#)
 - Limitations (C02611) [1014](#)
 - Manual jog accelerations (C01232) [990](#)
 - Manual jog breakpoints (C01234) [991](#)
 - Manual jog speeds (C01231) [990](#)
 - Manual jog S-ramp time (C01233) [991](#)
 - Manual jog waiting times (C01235) [991](#)
 - Max. travel distance [512](#)
 - Max. traversing distance (C01213) [985](#)
 - Mounting direction (C01206) [984](#)
 - Operating mode change at profile no. (C01298) [1000](#)
 - Position limiting values (C01229) [989](#)
 - Position resolution (C01205) [983](#)
 - Positioning setting (C01216) [985](#)
 - Ref speeds (C01224) [988](#)
 - Ref. accelerations (C01225) [988](#)
 - Ref. M limit mode 14/15 (C01222) [987](#)
 - Ref. mode (C01221) [987](#)
 - Ref. positions (C01227) [989](#)
 - Ref. sequence profile (C01228) [989](#)
 - Ref. S-ramp time (C01226) [988](#)
 - Ref. waiting time mode 14/15 (C01223) [987](#)
 - Resp. to MCK error (C00595) [858](#)
 - Select signal source (C01246) [997](#)
 - Speed (C01211) [984](#)
 - Speed follower setting (C01219) [986](#)
 - Status word (C01241) [994](#)
 - Stop accelerations (C01251) [997](#)
 - Stop S-ramp times (C01252) [998](#)
 - Target detection - positions (C01245) [997](#)
 - Target detection - times (C01244) [996](#)
- MCK control word [481](#)
- MCK interface [487](#)
- MCK state machine [485](#)
- MCK status word [483](#)
- MCKI
 - Status MCKInterface (C01299) [1000](#)
- MCTRL
 - Actual speed value (C00051) [763](#)
 - Special settings (C02866) [1022](#)
 - Speed setpoint (C00050) [763](#)
 - Status (C01000) [956](#)
- Memorise positions at power-off (C02652) [1014](#)
- Memory module
 - Binding ID [40](#)
- Min/max speed [505](#)
- Mode
 - Position calculation (C01296) [998](#)
- Modulo measuring system [502](#)
- Moment of inertia (C00273) [805](#)
- Monitoring [274](#), [595](#)
- Monitoring of the maximum travel distance [512](#)
- Motion Control Kernel (MCK) [473](#)
- Motor cable cross-section (C00916) [944](#)
- Motor cable length (C00915) [944](#)
- Motor cable resistance (C00917) [945](#)
- Motor catalogue [124](#)
- Motor control [120](#)
 - 87-Hz operation [155](#)
 - DC-injection braking [250](#)
 - Flying restart fct. [247](#)
 - Oscillation damping [256](#)
 - Selection help [135](#)
 - Selection of switching frequency [240](#)
 - Selection of the control type [131](#)
 - Sensorless vector control (SLVC) [182](#)
 - Servo control (SC) [214](#)
 - Slip compensation [255](#)
 - V/f characteristic control - energy-saving (VFCplusEco) [166](#)
 - V/f characteristic control (VFCplus) [147](#)
 - V/f control (VFCplus + encoder) [176](#)
- Motor control (C00006) [752](#)
- Motor cosine phi (C00091) [771](#)
- Motor current (C00054) [764](#)
- Motor data [121](#)
- Motor holding brake [563](#)
- Motor load monitoring (I2xt) [276](#)
- Motor magnetising current (C00095) [772](#)
- Motor magnetising inductance (C00092) [772](#)

- Motor parameter identification [126](#)
 - Motor parameter identification is active [104](#)
 - Motor phase direction of rotation (C00905) [944](#)
 - Motor phase error monitoring before operation [281](#)
 - Motor phase failure monitoring [281](#)
 - Motor phase failure threshold (C00599) [859](#)
 - Motor rotor position (C00060) [765](#)
 - Motor rotor position (C00927) [945](#)
 - Motor rotor resistance (C00082) [770](#)
 - Motor rotor time constant (C00083) [770](#)
 - Motor selection [121](#)
 - Motor speed monitoring [284](#)
 - Motor stator leakage inductance (C00085) [770](#)
 - Motor stator resistance (C00084) [770](#)
 - Motor temperature (C00063) [766](#)
 - Motor temperature monitoring (PTC) [278](#)
 - Motor thermal sensor (C01190) [981](#)
 - Motor voltage (C00052) [764](#)
- N**
- Nact filter time constant (C00497) [847](#)
 - Network management telegram (NMT) [651](#)
 - NMT (network management) [651](#)
 - Node address [647](#)
 - Node ID [647](#)
 - Number of CAN SDO channels (C00366) [819](#)
 - Number of encoder increments (C00420) [826](#)
- O**
- oC1
 - Power section - short circuit (error message) [615](#)
 - oC10
 - Maximum current reached (error message) [616](#)
 - oC11
 - Clamp operation active (error message) [618](#)
 - oC12
 - I2xt overload - brake resistor (error message) [618](#)
 - oC13
 - Maximum current for Fch exceeded (error message) [619](#)
 - oC14
 - Direct-axis current controller limitation (error message) [620](#)
 - oC15
 - Cross current controller limitation (error message) [620](#)
 - oC16
 - Torque controller limitation (error message) [620](#)
 - oC17
 - Clamp sets pulse inhibit (error message) [616](#)
 - oC2
 - Power section - earth fault (error message) [615](#)
 - oC5
 - Ixt overload (error message) [614](#)
 - oC6
 - I2xt overload - motor (error message) [621](#)
 - oC7
 - Motor overcurrent (error message) [614](#)
 - oH1
 - Heatsink overtemperature (error message) [612](#)
 - oH12
 - Motor overtemperature MultiEncoder (error message) [613](#)
 - oH3
 - Motor temperature (X106) triggered (error message) [613](#)
 - oH4
 - Heatsink temp. > shutdown temp. -5°C (error message) [612](#)
 - oH6
 - Motor temperature MultiEncoder > C121 (error message) [613](#)
 - oH7
 - Motor temperature resolver > C121 (error message) [612](#)
 - oH9
 - Motor overtemperature resolver (error message) [612](#)
 - Open-circuit monitoring
 - HTL encoder [322](#)
 - Open-circuit monitoring (C00498) [848](#)
 - Operating conditions (CAN on board) [640](#)
 - Operating mode
 - Homing [517](#)
 - Manual jog [533](#)
 - Position follower [557](#)
 - Positioning [541](#)
 - Speed follower [515](#)
 - Stop [556](#)
 - Operating mode change with profile number [495](#)
 - Operation with increased rated power [243](#)
 - Operation with safety module [486](#)
 - Optical location [100](#)
 - Optimising the response to setpoint changes (SC) [229](#)
 - Optimising the response to setpoint changes (SLVC) [194](#)
 - Option "Lock bFail at TroubleQSP" [117](#)
 - Original application|control source (C00008) [755](#)
 - oS1
 - Maximum speed limit reached (error message) [617](#)
 - oS2
 - Max. motor speed (error message) [617](#)
 - Oscillation damping [256](#)
 - Oscillation damping filter time (C00235) [801](#)
 - Oscillation damping influence (C00234) [801](#)
 - ot1
 - Maximum torque reached (error message) [614](#)
 - ot2
 - Speed controller output limited (error message) [619](#)

OU

- DC bus overvoltage (error message) [614](#)
- Output frequency (C00058) [765](#)
- Output power (C00980) [952](#)
- Overchange [547](#)
- Override [559](#)
- Override point of field weakening (C00080) [769](#)
- Oxl
 - Current (C00437) [829](#)
- OxU
 - Voltage (C00436) [829](#)
- OxU/I
 - Gain (C00434) [829](#)
 - Input value (C00439) [830](#)
 - Offset (C00435) [829](#)

P

- Parameter change-over [734](#)
- Parameterisable function blocks [1061](#)
- Password data (C00505) [848](#)
- Password protection [38](#)
- PC manual control [80](#)
- PDO mapping [655](#), [656](#), [657](#)
- PDO synchronisation [665](#)
- Peak current limitation [136](#)
- Phase sequence reversal [259](#)
- Plant parameters [125](#)
- PLI current amplitude (C00646) [873](#)
- PLI max. permissible deflection (C00645) [873](#)
- PLI ramp time (C00647) [873](#)
- PLI traversing direction (C00644) [872](#)
- PLI without motion
 - Adaptation of ident angle (C02875) [1025](#)
 - Adaptation of time duration (C02872) [1024](#)
 - Ident. el. rotor displ. angle (C02873) [1024](#)
 - Optimisation factor (C02870) [1023](#)
 - Running time (C02871) [1023](#)
- PLI without motion (C02874) [1024](#)
- Pole position (C00926) [945](#)
- Pole position identification [144](#)
- Port block "LP_CanIn1" [655](#)
- Port block "LP_CanIn2" [656](#)
- Port block "LP_CanIn3" [657](#)
- Port block "LP_CanOut1" [658](#)
- Port block "LP_CanOut2" [659](#)
- Port block "LP_CanOut3" [660](#)
- PosExecute (control bit) [494](#)
- PosExecute control bit [494](#)
- PosFollower
 - Setting (C01218) [986](#)
- Position control [264](#)
- Position control with quick stop (C00104) [774](#)
- Position encoder selection (C00490) [846](#)
- Position follower [557](#)

Position teaching [555](#)Positioning [541](#)Positioning modes [548](#)Power section ID (C00093) [772](#)Power-on time meter (C00179) [795](#)Pre-defined error field (I-1003) [691](#)Printing the interconnection [1104](#)Process data objects, identifiers [661](#)Processing time [641](#)Producer heartbeat time (I-1017) [695](#)Product type code (C00203) [798](#)

Profile data

Acceleration (C01303) [1002](#)Deceleration (C01304) [1002](#)Final speed (C01305) [1003](#)Position (C01301) [1002](#)Positioning mode (C01300) [1001](#)Sequence profile (C01307) [1003](#)Speed (C01302) [1002](#)S-ramp time (C01306) [1003](#)TP profile (C01308) [1004](#)TP signal source (C01309) [1004](#)Profile entry [545](#)Profile generator (L_DFRFG) [1211](#)Profile linkage with velocity changeover (overchange) [547](#)

PS01

No memory module (error message) [625](#)

PS02

Par. set invalid (error message) [625](#)

PS03

Par. set device invalid (error message) [625](#)

PS04

Par. set Mci invalid (error message) [625](#)

PS07

Par. memory module invalid (error message) [626](#)

PS08

Par. device invalid (error message) [626](#)

PS09

Par. format invalid (error message) [626](#)

PS10

Memory module binding invalid (error message) [626](#)

PSM

Activate Ppp saturation char. (C02859) [1022](#)Imax Lss saturation characteristic (C02855) [1022](#)Lss saturation characteristic (C02853) [1021](#)Max. motor temperature (C02876) [1025](#)Maximum motor current field weakening (C00938) [946](#)PSM temperature coefficient (C02877) [1025](#)PTC [278](#)

PTC characteristic

Resistance 1/2 (C01192) [982](#)Temperature 1/2 (C01191) [982](#)Pulse form TTL-Encoder (C00424) [827](#)

R

Ramp function generator (L_DFRFG) [1211](#)
 Rated device current (C00098) [772](#)
 Rated motor current (C00088) [771](#)
 Rated motor frequency (C00089) [771](#)
 Rated motor power (C00081) [770](#)
 Rated motor speed (C00087) [771](#)
 Rated motor torque (C00097) [772](#)
 Rated motor voltage (C00090) [771](#)
 Rated power - brake resistor (C00130) [777](#)
 Reduc. brake chopper threshold (C00174) [794](#)
 Reference project [1109](#)
 Reference setting [517](#)
 Referencing mode [519](#)
 Remote
 Acceleration/deceleration time (C00461) [836](#)
 Control (C00462) [836](#)
 MCK control (C00463) [837](#)
 Monitoring timeout (C00464) [838](#)
 Setpoint selection (C00729) [890](#)
 Reserved (C01239) [992](#)
 Reset error messages [606](#)
 Reset node (CAN) [645](#)
 Reset time I_{max}/M controller (C00074) [768](#)
 Resolver
 Phase error (C02863) [1022](#)
 Resolver gain (C02862) [1022](#)
 Resp. to brake resist. overtemp. (C00574) [853](#)
 Resp. to CAN bus connection (C00592) [856](#)
 Resp. to CANx_IN monitoring (C00593) [857](#)
 Resp. to communication error with MCI (C01501) [1004](#)
 Resp. to control word error (C00594) [857](#)
 Resp. to controller limitations (C00570) [852](#)
 Resp. to DC-bus voltage (C00600) [859](#)
 Resp. to device overload (I_{xt}) (C00604) [860](#)
 Resp. to earth fault (C00602) [860](#)
 Resp. to encoder open circuit HTL (C00586) [855](#)
 Resp. to fan failure (C00566) [851](#)
 Resp. to feedback (C00603) [860](#)
 Resp. to heatsink temp. > shutdown temp. -5°C (C00582) [854](#)
 Resp. to LS_SetError_x (C00581) [854](#)
 Resp. to mains phase failure (C00565) [851](#)
 Resp. to max. freq. feedb. DIG12/67 (C00607) [861](#)
 Resp. to max. speed at switching freq. (C00588) [856](#)
 Resp. to max. speed/output freq. reached (C00579) [853](#)
 Resp. to maximum current (C00609) [861](#)
 Resp. to maximum torque (C00608) [861](#)
 Resp. to motor overload (I_{xt}) (C00606) [860](#)
 Resp. to motor overtemp. PTC (C00585) [855](#)
 Resp. to motor phase failure (C00597) [858](#)
 Resp. to motor temperature KTY (C00583) [855](#)
 Resp. to open circuit AINx (C00598) [859](#)

Resp. to operating system error (C00580) [854](#)
 Resp. to peak current (C00569) [852](#)
 Resp. to PLI monitoring (C00643) [872](#)
 Resp. to speed controller limited (C00567) [852](#)
 Resp. to switching frequency reduction (C00590) [856](#)
 Resp. to too frequent AutoFailReset (C00189) [797](#)
 Retracting from limit switches [540](#)
 Reversing the phase sequence [259](#)
 Rotary table application [502](#)
 Rotor displacement angle detection after controller enable [144](#)
 RPDO1 communication parameter (I-1400) [699](#)
 RPDO1 mapping parameter (I-1600) [702](#)
 RPDO2 communication parameter (I-1401) [700](#)
 RPDO2 mapping parameter (I-1601) [702](#)
 RPDO3 communication parameter (I-1402) [701](#)
 RPDO3 mapping parameter (I-1602) [703](#)
 Running time (C00180) [795](#)

S

Safe stop 1 [486](#)
 Safety functions [486](#)
 Safety instructions [29](#)
 Safety module [486](#)
 Saturation characteristic [245](#)
 SC

 Depth of current setpoint filter (C00272) [805](#)
 Field feedforward control (C00576) [853](#)
 Filter time const. DC detection (C00280) [805](#)
 Freq. current setpoint filter (C00270) [804](#)
 Max. change in acceleration (C00274) [805](#)
 max. output voltage (C00276) [805](#)
 Settings (C00079) [769](#)
 Start motor magnetising current (C00918) [945](#)
 T_{dn} speed controller (C00072) [767](#)
 T_n field controller (C00078) [769](#)
 T_n field weakening controller (C00578) [853](#)
 V_p field controller (C00077) [769](#)
 V_p field weakening controller (C00577) [853](#)
 Width of current setpoint filter (C00271) [804](#)

Scaling of physical units [1064](#)

Sd10

 Speed limit - feedback system 12 (error message) [621](#)

Sd11

 Speed limit for feedback system 67 (error message) [621](#)

Sd12

 Error thermal detector MultiEncoder (error message) [613](#)

Sd2

 Open circuit resolver (error message) [616](#)

Sd3

 Open circuit - feedback system (error message) [621](#)

Sd4

 Open circuit MultiEncoder (error message) [616](#)

- Sd6
 - Error thermal detector resolver (error message) [613](#)
- Sd7
 - Encoder communication (error message) [616](#)
- Sd8
 - Encoder angular drift monit. (error message) [618](#)
- SDO1 server parameter (I-1200) [696](#)
- SDO2 server parameter (I-1201) [697](#)
- Selection help for motor control [135](#)
- Selection of switching frequency [240](#)
- Selection of the control type [131](#)
- Sensorless control for synchronous machines (SLPSM) [133](#)
- Sensorless vector control (SLVC) [133](#), [182](#)
- Serial number (C00204) [798](#)
- Servo control (SC) [133](#), [214](#)
- Setpoint synchronisation ramp [505](#)
- Setting of motor overload (I²t) (C00120) [777](#)
- Setting the baud rate [643](#)
- Setting the error response [597](#)
- Setting the node address [643](#)
- Short overview of error messages [608](#)
- Show details about the current error [586](#)
- Show error details [586](#)
- Signal flow
 - Sensorless vector control (SLVC) [184](#)
 - Servo control (SC) for ASM [218](#)
 - Servo control (SC) for PSM [216](#)
 - V/f characteristic control - energy-saving (VFCplusEco) [167](#), [200](#)
 - V/f characteristic control (VFCplus) [148](#), [149](#)
 - V/f control (VFCplus + encoder) [176](#), [177](#), [183](#)
- Signal type entry [1064](#)
- Slip calculation from equivalent circuit diagram (C02879) [1027](#)
- Slip comp. (C00021) [760](#)
- Slip compensation [255](#)
- Slip regulator [179](#)
- SLPSM
 - Controlled current setpoint (C00995) [955](#)
 - Filter cutoff frequency (C00997) [955](#)
 - Filter time rotor position (C00998) [955](#)
 - PLL gain (C00999) [955](#)
 - Switching speed (C00996) [955](#)
- SLVC
 - Cross current controller gain (C00986) [953](#)
 - Field current controller gain (C00985) [953](#)
- Software limit positions [506](#)
- Speed control with torque limitation (SC) [220](#)
- Speed control with torque limitation (SLVC) [185](#)
- Speed feedback [134](#)
- Speed follower [515](#)
- Speed limitation (C00909) [944](#)
- Speed override [560](#)
- Speed sensor selection (C00495) [847](#)
- Speed setpoint generation [505](#)
- S-ramp smoothing override [562](#)
- S-ramp time for jerk limitation [550](#)
- SS1 [486](#)
- SSI
 - Encoder constant (C01111) [975](#)
- SSI encoder
 - Bit rate (C00427) [828](#)
 - Coding (C00428) [828](#)
 - Data bits (C00426) [828](#)
- State machine (MCK) [485](#)
- Status "Drive in target" [510](#)
- Status determining error (16-bit) (C00160) [786](#)
- Status determining error (C00168) [792](#)
- Status displays [582](#)
- Status of brake output BD (C00117) [776](#)
- Status of last device command (C00003) [751](#)
- Status word (C00150) [783](#)
- Status word (MCK) [483](#)
- Stop [556](#)
- Stop of the ramp function generator [268](#)
- Stop the ramp function generator [268](#)
- Stuff-bit error [680](#)
- Su02
 - One mains phase is missing (error message) [611](#)
- Su03
 - Too frequent mains switching (error message) [611](#)
- Su04
 - CU insufficiently supplied (error message) [611](#)
- Su06
 - Mains input overload (error message) [612](#)
- Switching cycles (C00177) [794](#)
- Switching freq. reduct. (Temp.) (C00144) [782](#)
- Switching frequency [240](#)
- Switching frequency (C00018) [759](#)
- Switching status of the fans (C00560) [851](#)
- Switch-on inhibit [112](#)
- Sync correction width (C01124) [977](#)
- Sync cycle time setpoint (C01121) [976](#)
- Sync phase position (C01122) [977](#)
- Sync signal source (C01120) [976](#)
- Sync telegram [665](#)
- Sync window (C01123) [977](#)
- Synchronisation mode [1227](#)
- Synchronous motor
 - Field weakening [260](#)
- SyncTxRxTimes (C00370) [821](#)
- System blocks [1382](#)
- System bus [638](#)
- System connection list
 - 16-bit (C00620) [862](#)
 - Angle (C00622) [869](#)
 - Bool (C00621) [864](#)

System error messages [602](#)

System runtimes (C00312) [807](#)

T

Target position monitoring [510](#)

Task selection [1068](#)

Teaching of the position [555](#)

Temperature inside the controller (C00062) [766](#)

Thermal capacity - brake resistor (C00131) [778](#)

Thermal motor load (I²xt) (C00066) [767](#)

Ti current controller (C00076) [768](#)

Ti speed controller (C00071) [767](#)

Time settings (C00181) [795](#)

Torque (C00056) [765](#)

Torque control with speed limitation (SC) [221](#)

Torque control with speed limitation (SLVC) [186](#)

Torque feedforward control (SC) [229](#)

Torque feedforward control (SLVC) [194](#)

Torque limitation [160](#)

Touch probe detection [362](#)

TP

Edge selection (C02810) [1015](#)

Pos. window end (C02814) [1016](#)

Pos. window start (C02813) [1016](#)

Position offset (C02812) [1016](#)

Position source (C02815) [1017](#)

Sensor delay (C02811) [1015](#)

Signal counter (C02816) [1017](#)

TouchProbe position (C02817) [1018](#)

TP (touch probe) [362](#)

TPDO1 communication parameter (I-1800) [704](#)

TPDO1 mapping parameter (I-1A00) [708](#)

TPDO2 communication parameter (I-1801) [706](#)

TPDO2 mapping parameter (I-1A01) [708](#)

TPDO3 communication parameter (I-1802) [707](#)

TPDO3 mapping parameter (I-1A02) [709](#)

Transmission mode CAN Rx PDOs (C00323) [808](#)

Transmission mode CAN TxPDOs (C00322) [808](#)

Transmission type [662](#)

Travel range monitoring [508](#)

U

Ultimate motor current (C00939) [946](#)

US01

User error 1 (error message) [632](#)

US02

User error 2 (error message) [632](#)

US03

User error 3 (error message) [632](#)

US04

User error 4 (error message) [632](#)

US05

User error 5 (error message) [633](#)

US06

User error 6 (error message) [633](#)

US07

User error 7 (error message) [633](#)

US08

User error 8 (error message) [633](#)

User data [669](#)

User menu (C00517) [850](#)

User-definable V/f characteristic [162](#)

V

V/f base frequency [154](#)

V/f characteristic control - energy-saving (VFCplusEco) [166](#)

V/f characteristic control (VFCplus) [132](#), [147](#)

V/f control (VFCplus + encoder) [176](#)

VFC

Frequency interpol. point n (C00967) [950](#)

Limitation V/f + sensor (C00971) [951](#)

Ti V/f +sensor (C00973) [951](#)

Time const. slip comp. (C00966) [949](#)

V/f base frequency (C00015) [758](#)

Vmin boost (C00016) [758](#)

Voltage interpol. point n (C00968) [950](#)

Vp V/f +sensor (C00972) [951](#)

VFC-ECO

Minimum voltage V/f (C00977) [952](#)

Ti CosPhi controller (C00976) [951](#)

Voltage reduction (C00978) [952](#)

Voltage reduction ramp (C00982) [953](#)

Vp CosPhi controller (C00975) [951](#)

Vmin boost [156](#)

Vp current controller (C00075) [768](#)

Vp speed controller (C00070) [767](#)

W

Warning threshold motor temperature (C00121) [777](#)