MITSUBISHI ELECTRIC

Changes for the Better

for a greener tomorrow eco Changes

Programmable Controllers
MELSEC-L series

Little on size, Large on performance

The new L series has a small footprint and is loaded with features.

Simple!

MELSEC *L series*

Simple

MELSEC L series

Convenience that fits in the palm of your hand.

The L series is the latest in a long line of MELSEC products renowned for exceptional performance and rock solid reliability.
Get the performance, functions, and capabilities required for today's most demanding applications in an incredibly small package.
MELSEC-L series greatly expands the range of functionality traditionally associated with compact programmable controllers and through user-centric design, pushes the limits of ease of use.

Maximum Functionality

The CPU module contains a diverse range of control functions.

A large variety of I/O types and features are built-in for convenience.
Due to an abundance of advanced functionality, L series CPUs are flexible enough to meet a wide variety of needs.

Maximum Performance

High speed, large memory capacity CPU

The CPU has a basic operation processing speed of 9.5ns*4 and 260K steps*5 of program capacity are available for complex programs and equipment control.

Maximum Capabilities

Advanced capabilities focused on improving efficiency

The user-friendly display unit enables routine operations to be made without a computer. An SD memory card slot*3 is included as standard for data logging and program storage.
Write programs and manage L series controllers using GX Works2 and iQ Works, the most advanced and effective software for Mitsubishi controllers yet.

*1: Option (sold separately)
*2: Included with L26CPU-(P)BT
*3: Included with L02CPU(-P), L06CPU(-P), L26CPU(-P), L26CPU-(P)BT
*4: For L06CPU(-P), L26CPU(-P), L26CPU-(P)BT
*5: For L26CPU(-P), L26CPU-(P)BT

Built-in I/O Features ➡ P.5

Positioning	High-speed Counter	Pulse Catch
Interrupt Input	General-purpose I/O	

Every L series CPU module comes with 24 points of built-in I/O that support advanced features to meet challenges head on.

Built-in Connectivity ➡ P.7

Ethernet	USB	SD Memory Card*3
CC-Link Ver.2.0*2		

Convenient communication options and memory card storage are included with every CPU.

High-speed CPU ➡P.15

Program Memory 260 K steps*5	Maximum number of I/O points 8192 points	
Basic operation processing speed 9.5 ns*4	Floating-point operation 0.057 µs	MOV instruction 19 ns

L series raises the bar for performance specifications in a compact programmable controller with 260K steps of program memory and a basic operation processing time of just 9.5 nanoseconds.

Display unit ➡P.13

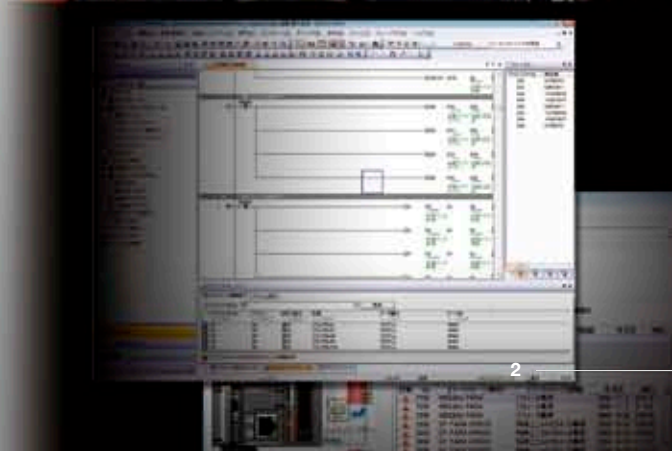
Multi-lingual Display English/Japanese	
Display Size 16 characters x 4 lines	Multi-color Backlight Green(Normal), Red(Error)

The display unit allows for quick troubleshooting and diagnostic operations of the CPU and connected modules.

Software ➡ P.57

GX Works2	iQ Works	GX LogViewer

L series is compatible with the latest and most advanced programmable controller engineering software from Mitsubishi.



MELSEC L series

Compact Design ➡P.9

Integrated backplane	Mount on standard DIN rail	For extension system

By eliminating the need for a separate backplane base unit, system design flexibility has been improved and overall size has been reduced.

Simple Motion Modules ➡P.41

Positioning	Speed Control	Torque Control
16-Axis Interpolation	Synchronous Control	Auto cam generation function

Control sophisticated motion applications with ease using proven and innovative features.

Analog Modules ➡P.27

Conversion Speed	Precision
20 µs/Channel	±0.05%

Shorten cyde times using high-speed analog conversion modules that operate at 20µs per channel.

Temperature Control Modules ➡P.37

Heating-cooling control	Peak current suppression function	Self-tuning function
Simultaneous temperature rise function	Selectable sampling cycle	Temperature input mode

Temperature control module with highly stable regulation performance.

CC-Link IE Field
CC-Link V2
CC-Link/LT
SSCNETIII/H
SERVO SYSTEM CONTROLLER NETWORK

Network Modules ➡P.47

CC-Link IE Field	CC-Link Ver.2.0	CC-Link/LT
SSCNET Ⅲ/H	Ethernet	Serial communication

Supports the FA network standard.
*: The L26CPU-BT and L26CPU-PBT have CC-Link built-in.

GOT2000
Graphic Operation Terminal

GOT2000 Series ➡P.67

MELSEC-L Troubleshooting	Intelligent Module Monitor	Backup / Restore
Log Viewer	Sequence Program Monitor	Device Monitor

New GOT models have been designed with connection to L series in mind. When used together, several template screens are available to enhance their combined operational functionality.

Flexible

The L series has the ability to flex to meet your application's requirements.

MELSEC L series has been designed with three key concepts in mind.
The first key is reliability.
Mitsubishi Electric products are world renowned for quality.
The second is ease of use.
We are committed enabling engineers and programmers to do their job as efficiently as possible to reduce costs.
The third key is flexibility.
L series systems expand to meet the application requirements without wasting money or space.
Save on total costs by designing the system that is a perfect fit.

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L series Built-in I/O Features

Every L series CPU comes with 24 points of built-in I/O standard. These I/O points are capable of many functions usually reserved for separate modules. Save on system costs by using the built-in functions rather than relying exclusively on additional modules.
The built-in I/O*1 comes in sink or source type format and may be chosen based on the application.

■ **L series CPU Built-in I/O Functions**

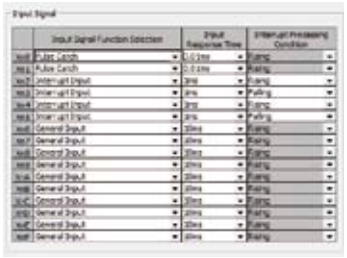
Positioning (Built-in control of 2 axes) | **High-Speed Counter** (Two channels built-in) | **Pulse Catch** | **Interrupt Input** | **General-purpose Input/Output**

Function		Features
Positioning*2	Number of axes: Maximum 2 axes	Maximum speed: 200K pulses/s High-speed activation: 30μs (Shortest activation time) S-curve acceleration and deceleration are supported.
High-Speed Counter*2	Number of channels: Maximum 2 channels	Maximum counting speed: 200K pulses/s Open collector, Differential line driver input High accuracy ON/OFF measurements with a resolution of 5μs High precision PWM control up to 200kHz (High speed pulse output)
Pulse Catch	Number of input points: 16 points	Minimum input response time: 10μs Pulse signals whose ON time is shorter than the scan time can be detected.
Interrupt Input	Number of interrupt points: 16 points	Built-in CPU provides high-speed processing. All input points support interrupt inputs.
General-purpose Input	Number of high-speed inputs: 6 points Number of standard inputs: 10 points	Minimum input response time of high-speed input: 10μs Minimum input response time of standard input: 100μs
General-purpose Output	Number of output points: 8 points	Output response time: 1μs or less

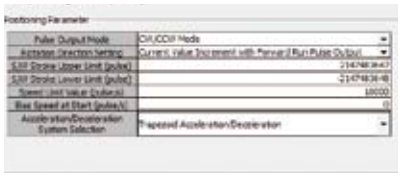
*1: The L02SCPU, L02CPU, L06CPU, L26CPU and L26CPU-BT are sink type, and the L02SCPU-P, L02CPU-P, L06CPU-P, L26CPU-P and L26CPU-PBT are source type.
*2: Points used by the positioning and high speed counting functions are fixed (as in A phase, B phase, near-point dog). Custom points for these functions may not be assigned.

Easy setup of built-in I/O functions

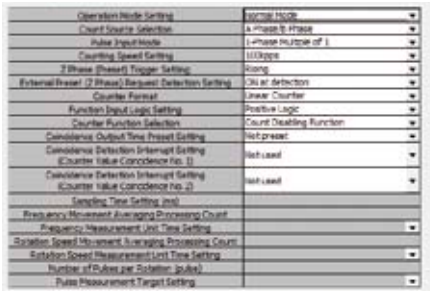
Configuring built-in I/O functions can be done easily by setting parameters using the programming tool.



Built-in I/O function example parameter settings
Pulse Catch: 0.01ms (response time)
Interrupt Input: 1ms (response time)



Positioning function example parameter settings
Pulse Output Mode: CW/CCW mode
Rotation Direction Setting:
Current Value Increment with Forward Run Pulse Output



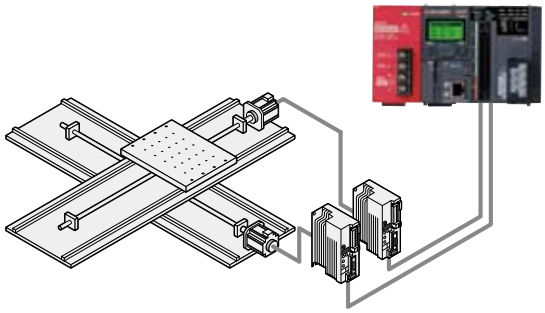
High-speed counter function example parameter settings
Pulse Input Mode: 1-Phase Multiple of 1
Counting Speed Setting: 100kpps

Built-in CPU positioning control function

Positioning | **High-Speed Counter**

Positioning Function

The built-in positioning function has a start time of just 30μs with a maximum high speed output of 200K pulses per second.
Furthermore, it supports S-curve acceleration and deceleration for applications that require minimal machine vibration.



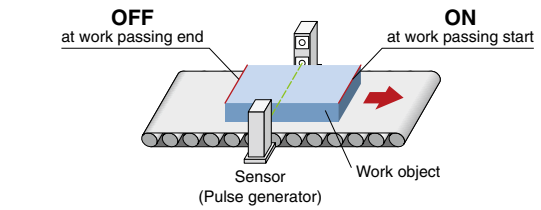
High-Speed Counter Function

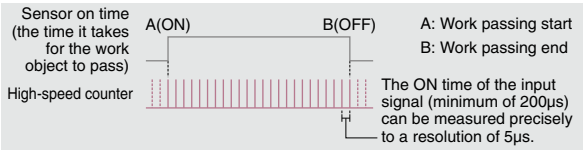
Two channels support the high speed counting function. The differential line driver inputs support counting speeds up to 200K pulses per second.

Make highly accurate measurements with a resolution of 5µs

High-Speed Counter

Using pulse measurement mode, where the input signal ON/OFF time is 200µs or greater, highly accurate measurements in units of 5µs or greater are possible.
For example it is possible to calculate length by knowing the "work object passing speed" and measuring the ON time of the sensor.





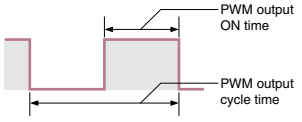
High precision PWM control up to 200 kHz

High-Speed Counter

Using the pulse width modulation control function of the high speed outputs, cycle times as fast as 5µs can be created. Simply input the ON time and cycle time to drive a wide range of devices from lighting dimmer control, motors, and heaters to precision inspection equipment requiring high resolution performance.

Setting item	Setting Range	Description
PWM output ON time*1	0 or 10 to 10000000*1 (0.1µs)	Set the ON time of output pulse
PWM output cycle time*1	50 to 10000000*1 (0.1µs)	Set the cycle time of output pulse

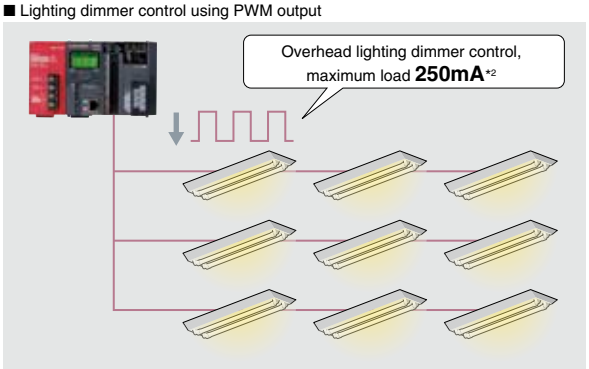
*1: The PWM output ON time must be ≤ the PWM output cycle time.



$$D = \frac{\tau}{T}$$

D : Duty Cycle
τ : ON time
T : Cycle time

■ Lighting dimmer control using PWM output

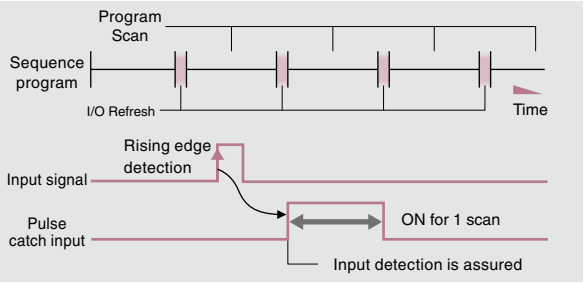


*2: In cases where the first six digits of the serial number are "120722" or later. Previous serial numbers of the CPU module are applied to 100mA.

Guaranteed input pulse detection

Pulse Catch

Typical programmable controller input devices are unable to detect pulse signals whose ON time is shorter than the scan time or do not occur during I/O refresh periods. The pulse catch function allows these signals to be reliably detected and passed to the sequence program. This function is different from the interrupt input function in that it does not require any special programming. Pulse catch inputs may be used in programs exactly the same as traditional input (X) signals.

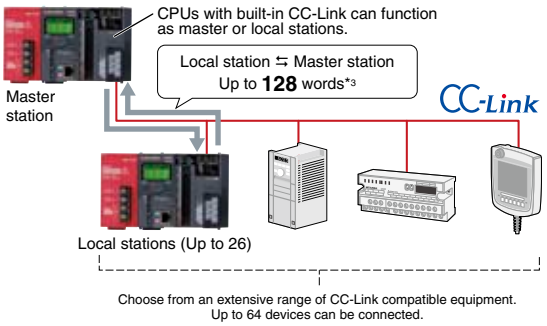


CPU with built-in CC-Link network connectivity

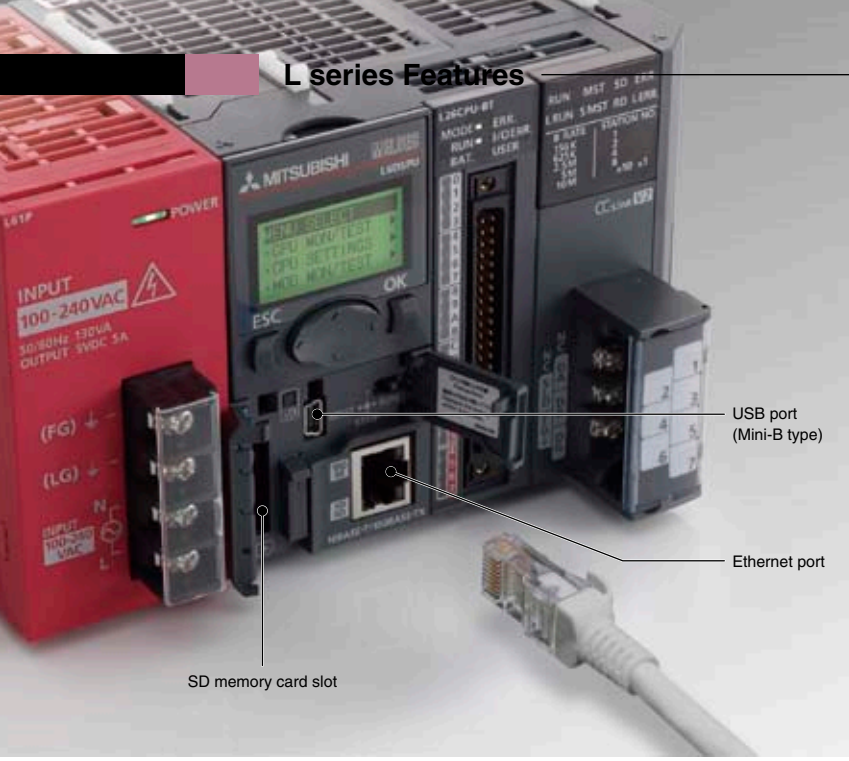
L26CPU-(P)BT

L series CC-Link ready CPUs are compatible with the latest generation of CC-Link devices and support connections with over 1,000 different product types. Without adding a module, these CPUs can perform high-speed communication with a maximum of 128 words*3 between a master station and a local station. CC-Link is the dominate FA network standard in Asia and continues to gain support worldwide.

CC-Link V2



*3: When the number of occupied stations is 4 and the extended cyclic setting is octuple in the Remote net Ver.2 mode.



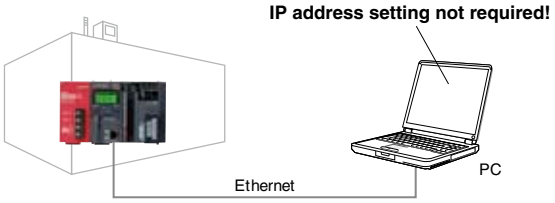
Convenient communication and storage options come as standard

Program, configure, and perform diagnostics on L series systems using either the USB 2.0 or Ethernet connections. The SD Memory Card slot has many uses including the easy backup and restore of programs and parameters.

L02CPU(-P) L06CPU(-P) L26CPU(-P) L26CPU-(P)BT

USB and Ethernet connections standard

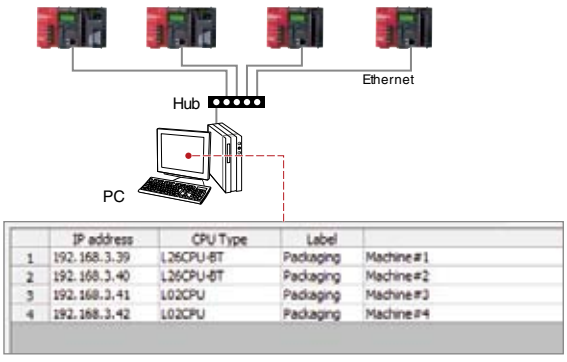
Use the USB 2.0 interface or Ethernet to connect directly at the instillation site. The Ethernet interface supports direct connection with either a cross or straight LAN cable and does not require any configuration of the programmable controller or PC to operate.



Direct connection with straight or cross cable.

Easy connection through hub

All CPUs connected to the same hub can be searched and displayed in a list.
By selecting the access target CPU from the list, it can be connected to even if the IP address is unknown.

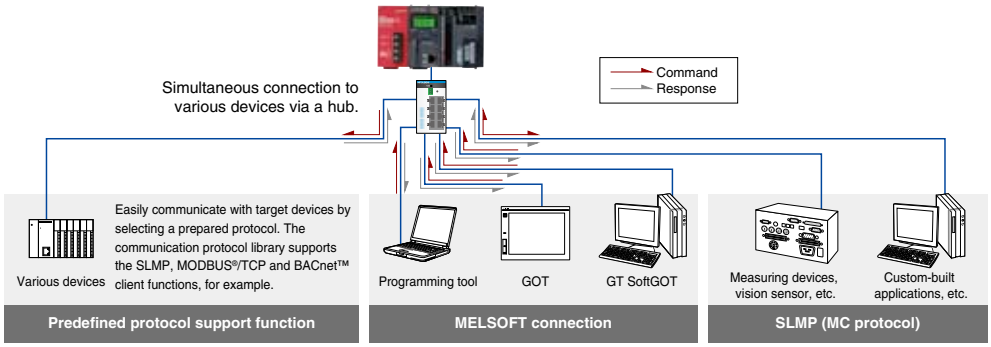


	IP address	CPU Type	Label	
1	192.168.3.39	L26CPU-BT	Packaging	Machine#1
2	192.168.3.40	L26CPU-BT	Packaging	Machine#2
3	192.168.3.41	L02CPU	Packaging	Machine#3
4	192.168.3.42	L02CPU	Packaging	Machine#4

Use GX Works2 to retrieve a list of all CPUs connected to the network.

Easily connect to BACnet™ and MODBUS®/TCP Improved function

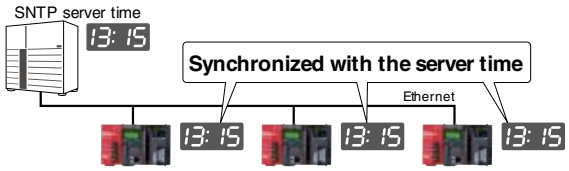
Ethernet realizes a high-speed connection, such as communication with external devices.
By using the predefined protocol support function, various devices that require open network protocol support, such as BACnet™ and MODBUS®/TCP are supported.



Network timestamp

Synchronize systems on an Ethernet network using an SNTP*1 server. Time synchronization can be achieved to enable simultaneous operations, quality control, or error tracking.

*1: SNTP: Simple Network Time Protocol



Program-less device data transfer

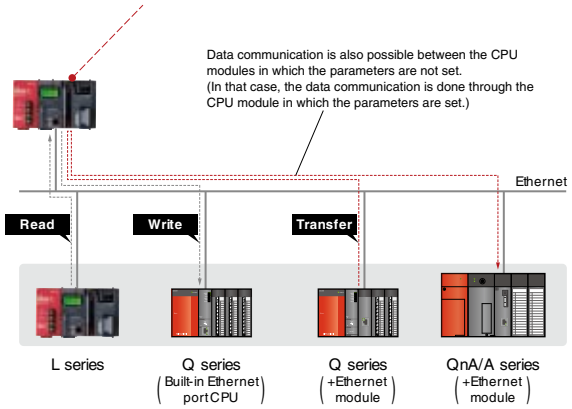
Simple PLC communication function*2

Using the programming tool, a simple parameter setting is all that is needed to transfer device data such as production information with no programming required.
This function makes it possible to easily establish communications not only with L series, but also Q series and QnA/A series controllers.

*2: CPU module whose first five serial number digits are "13042" or later is required.

Item		Description
Communication Pattern	Read	Read the data of the specified destination device (transmission source) to the specified device of the host station (transmission destination).
	Write	Write the data of the specified device of the host station (transmission source) to the specified destination device (transmission destination).
	Transfer	Read the data of the specified destination device (transmission source) and write it to another specified destination device (transmission destination).
Communication Setting:	Execution Interval	Set between 10ms and 65535ms (1ms unit)
	Request Contact	Data send/receive is executed at the rising edge (OFF to ON) of the specified device (X, M, B).
Available devices	Setting No.	Set between 1 and 64.
	Device points	The maximum number that can be set for each setting No. is 512 words. (Maximum points of a word device: 256 points + Maximum points of a bit device: 4096 points) The total of setting No. 1 to 64 is maximum 4096 words.

■ Simple PLC Communication Setting



SD Memory Card special features

Use the SD/SDHC compatible memory card to quickly and easily back-up the CPU programs and parameters. The backups can then be just as easily restored or used to program other CPUs. The memory card can also be used to hold data captured with the data logging function*3.

*3: For details about the data logging function, refer to page 11.

Save/load programs directly into the Programmable Controller

Multiple project save/load function*4

Parameters, program files, etc., can be saved/read onto a SD memory card by simply using the onboard display unit, without having to connect to a separate PC. Once saved on the SD memory card, files can be sent via e-mail, for example, when requiring off-site editing of the files.

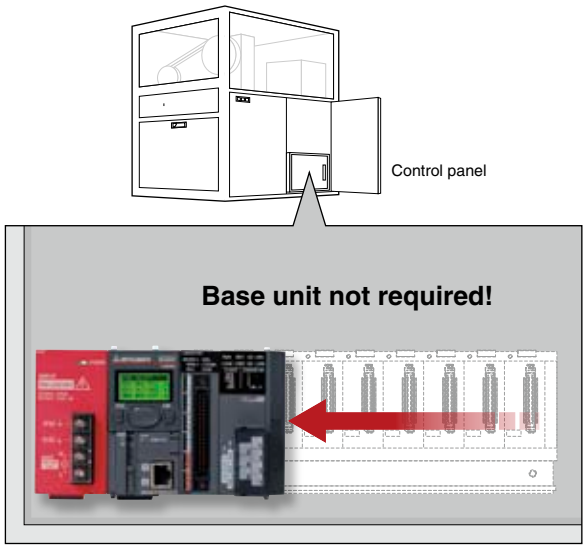
*4: Supported by CPU module whose first five serial number digits are “14042” or later.

Gain more flexibility with an integrated system bus structure

Save space in control panels by utilizing the integrated system bus structure. Flexibility in system design is made possible by choosing only the required expansion modules for the application.

Expand L series systems with no base unit restrictions

L series modules do not require a base unit. The installation space is not restricted by base size, and the system can be installed with minimal required space.
Furthermore, the addition of modules to the system is not restricted by the number of available base unit slots and costs may be reduced due to the elimination of expansion base units.

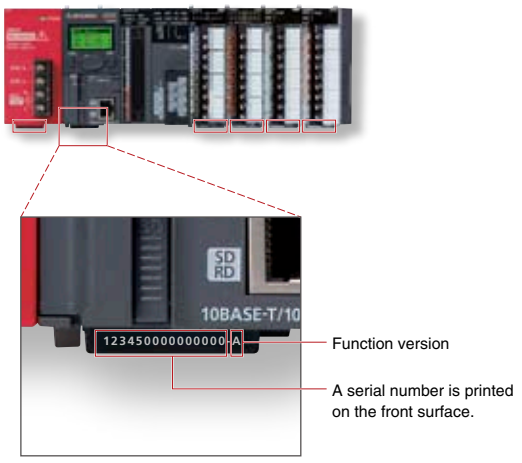


Installation space is reduced in the control panel

Identify important information easily

Every L series module has the serial number printed on the front surface of the module to allow viewing even during system operation (modules do not need to be removed).

*: Serial numbers can also be checked using GX Works2.



System expandable according to production equipment scale

Up to three extension blocks connectable to the main block using branch and extension modules. A maximum of 40 modules*1 caters a wide range of production equipment and line scale.

CPU module*2	Number of extension blocks	Number of connectable modules*3
L02SCPU(-P) L02CPU(-P)	Up to 2 blocks	Main block: 10 modules Extension block: 11 modules
L06CPU(-P) L26CPU(-P) L26CPU-(P)BT	Up to 3 blocks	

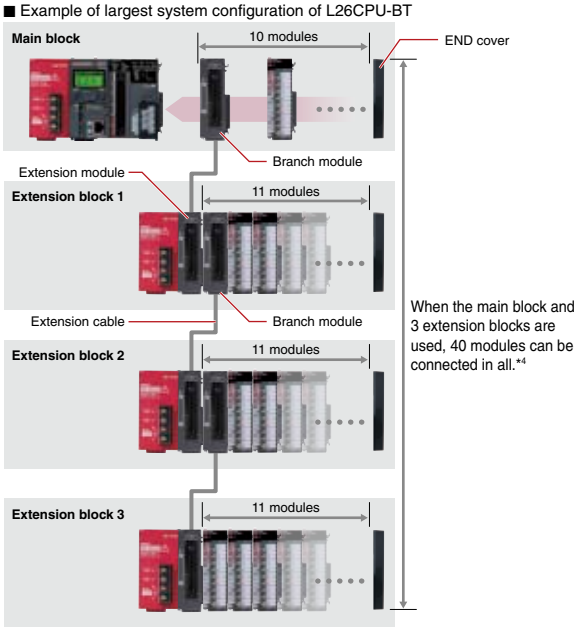
*1: In the case of L06CPU(-P), L26CPU(-P), and L26CPU-(P)BT.

*2: CPU modules whose first five serial number digits are 13072 or later.

*3: Total number of I/O modules, intelligent function modules, network modules and branch modules.
This does not include the following: Power supply, CPU, display units, extension modules, RS-232 adapter, RS-422/485 adapter, and END covers.

When adding a branch module to a fully occupied block, relocate one of the other modules to a new block to give way to the branch module.

■ Example of largest system configuration of L26CPU-BT



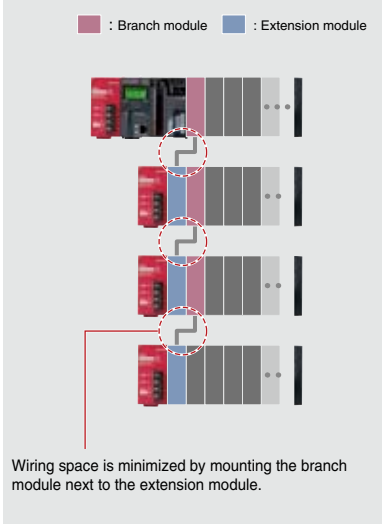
*4: Total number of I/O modules, intelligent function modules and network modules, excluding branch modules.

Well-organized control panel with minimum wiring

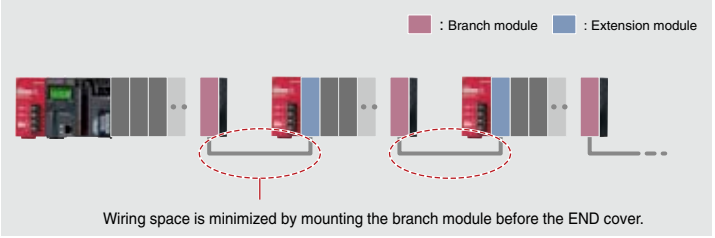
Branch module can be strategically placed in a block to minimize wiring space. Extension cables are available in 0.6-, 1.0- and 3.0-m. The maximum extension length is 3.0 m*5.
The extension cable is a one-touch type which can be easily connected and disconnected.

*5: The total length of extension cables should be within 3.0 m.

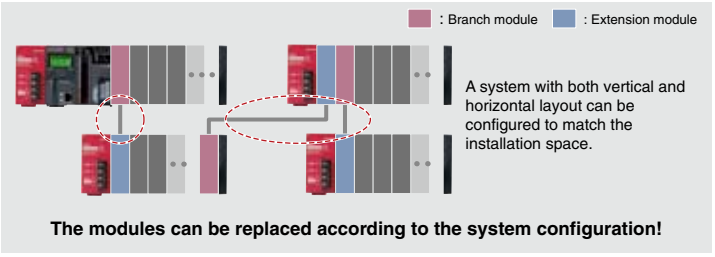
■ Example of vertical system configuration



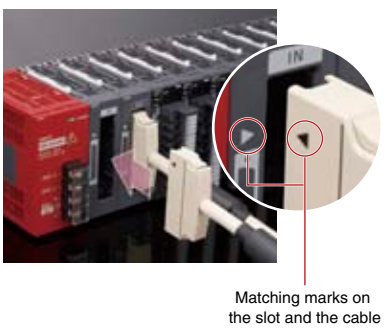
■ Example of horizontal system configuration



■ Example of vertical and horizontal mixed system



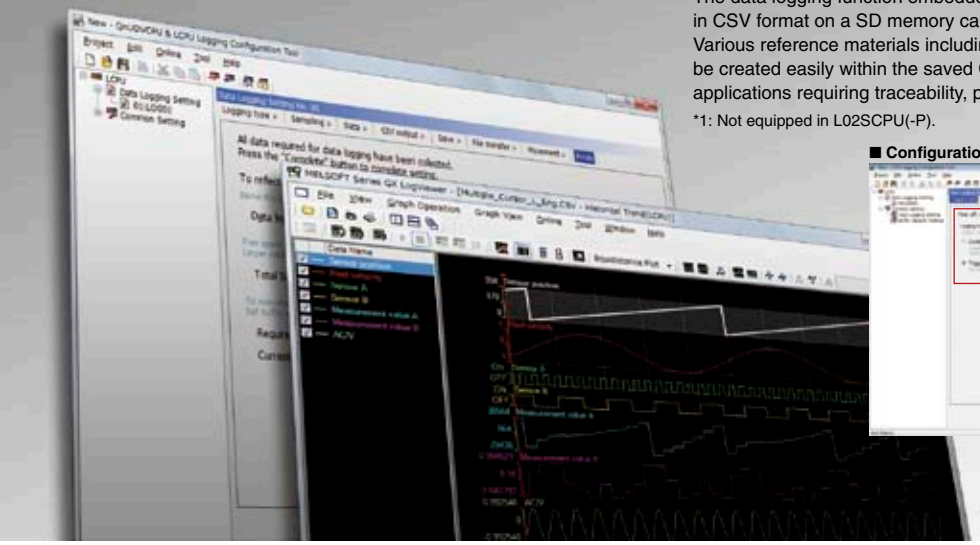
The modules can be replaced according to the system configuration!



Matching marks on the slot and the cable

■ Mounting position when branch or extension module is used

Modules	Mounted block	Possible mounting position
Branch module	Main block	Right side of CPU module or left side of END cover
	Extension block	Right side of extension module or left side of END cover
Extension module	Main block	Impossible
	Extension block	Right side of power supply module

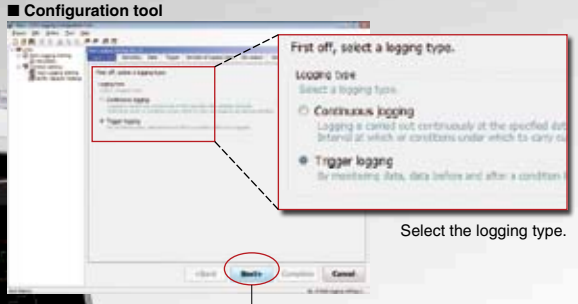


Data logging function*1

The data logging function embedded in the CPU module allows collected data to be saved in CSV format on a SD memory card simply by using the dedicated setting tool wizard. Various reference materials including daily reports, form creation and general reports can be created easily within the saved CSV file. This data can be used for a wide variety of applications requiring traceability, production data, etc.

*1: Not equipped in L02SCPU(-P).

■ Configuration tool



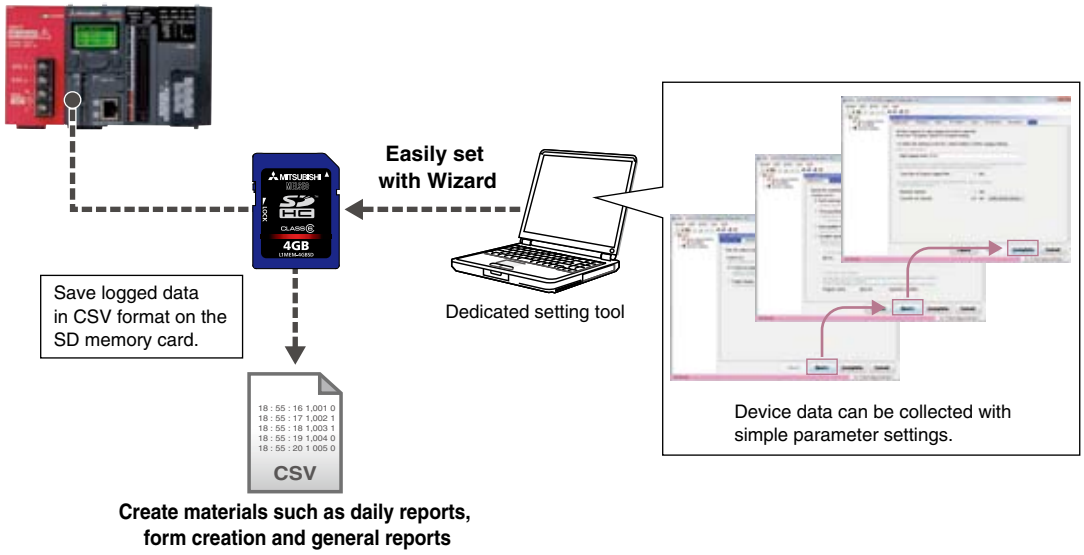
Select the logging type.

Make the desired settings on each screen and click the [Next] button until all settings are complete.

L02CPU(-P) L06CPU(-P) L26CPU(-P) L26CPU-(P)BT

Easy logging without a program

Logging of device data just by configuring the parameters.
The results can be saved in CSV format on a SD memory card.

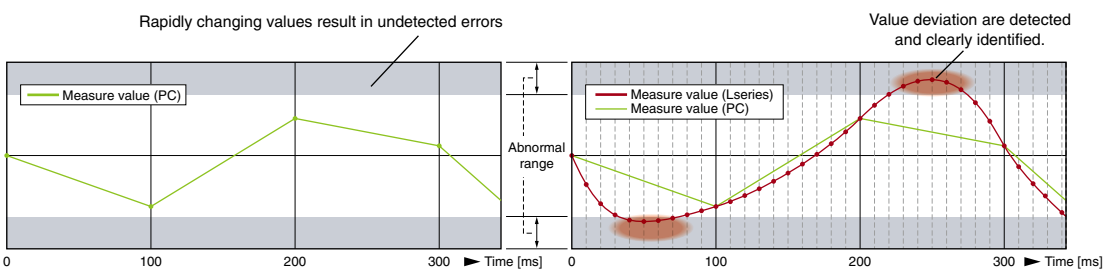


Logging of control data variances

Data is collected during each scan or within millisecond intervals allowing detection of control deviation even at very high speeds. Therefore, identification of errors can be conducted faster and in more detail.

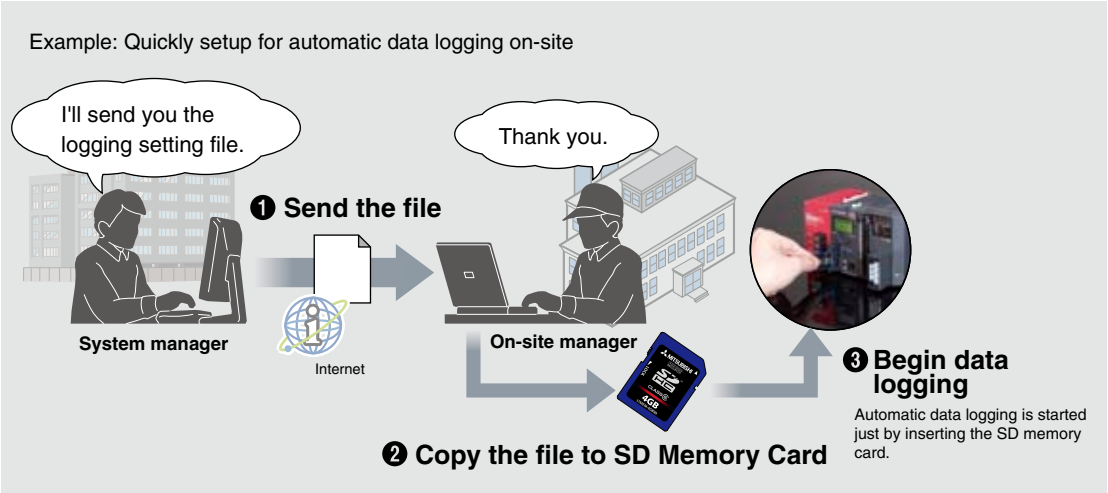
■ Generic sample data from a PC or external device at 100ms intervals

■ L series data logging function is capable of sampling data at much higher intervals as to detect fast changing values.



Auto logging function

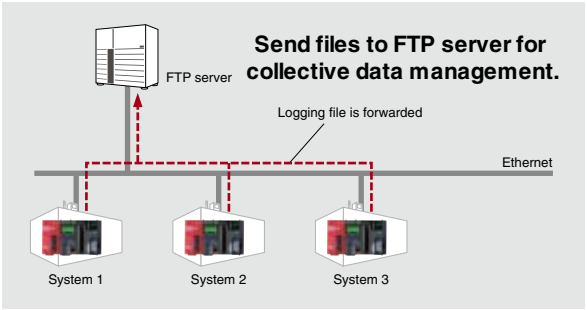
Automatic data logging realized just by inserting the SD memory card into the CPU, which is achieved as the memory card includes the logging configuration file. Instructing data logging remotely is also realized just by sending the configuration file by e-mail and copying onto the SD memory card.



Automatically send logging files to FTP server

Data logging files saved on the SD memory card can be sent to the FTP server just by making a simple setting with the logging configuration tool. As the logging server can handle multiple files, management and maintenance tasks can be reduced.

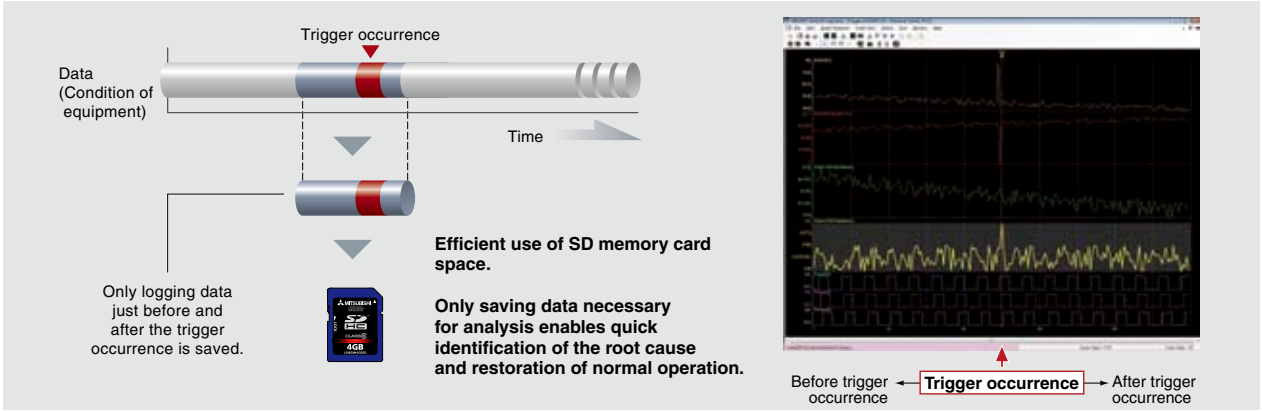
■ File transfer feature*1



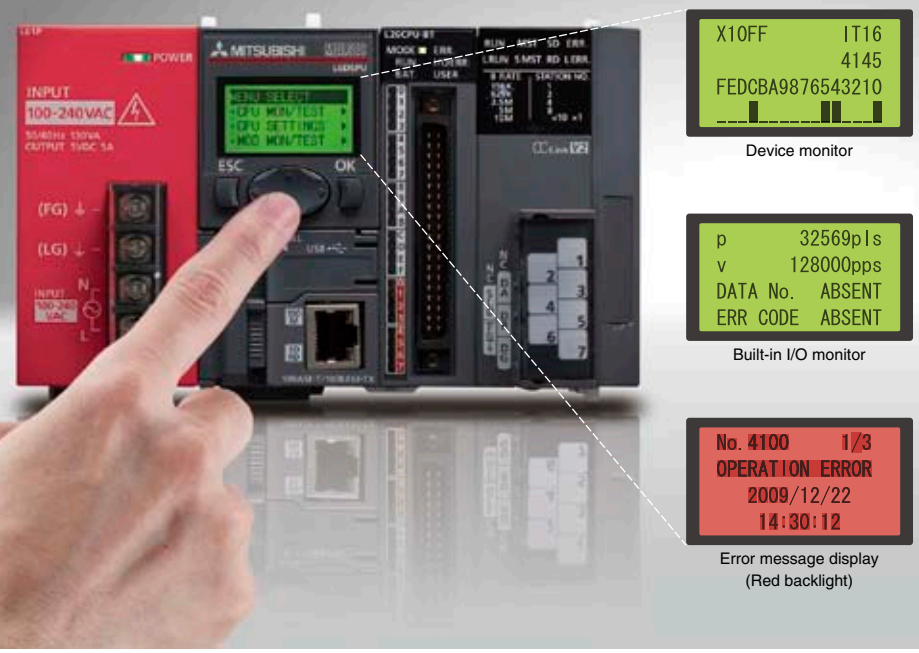
*1: Using a CPU module with the first 5 digits of the serial number "12112" or later.

Trigger logging function

Error causes and solutions can be quickly done as only the required data related to the problem is extracted, without having to spend time on filtering large volumes of diagnostic data.



To receive a copy of GX LogViewer, contact your local Mitsubishi Electric representative.



Feature rich and easy to use display

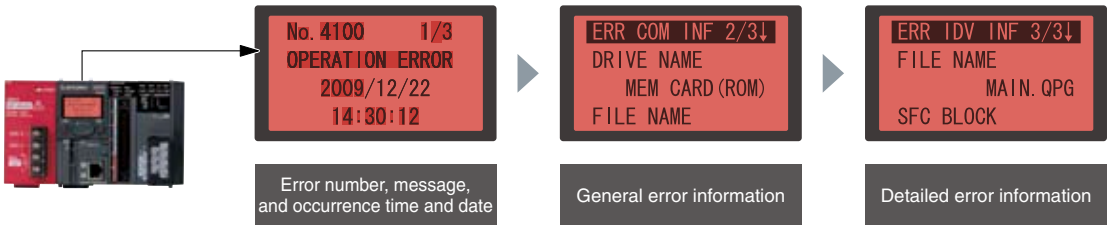
Check the system status and make setting changes directly from the display. Error status is clearly identified and troubleshooting and error investigation can be performed all without the need for any connections or engineering software.

*: Not available for L02SCPU(-P).

L02CPU(-P) L06CPU(-P) L26CPU(-P) L26CPU-(P)BT

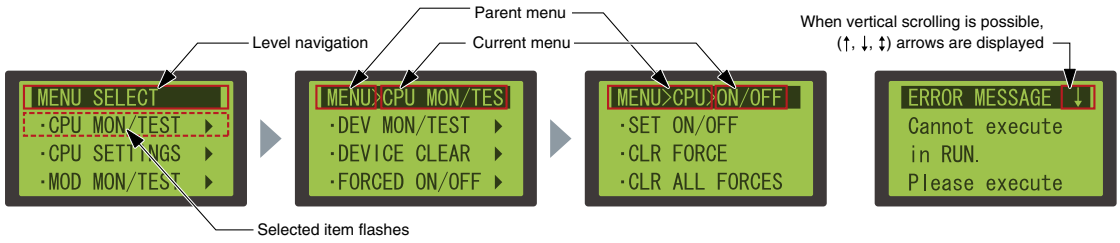
Instant error information check

Error history and detailed error information is available directly from the display unit.



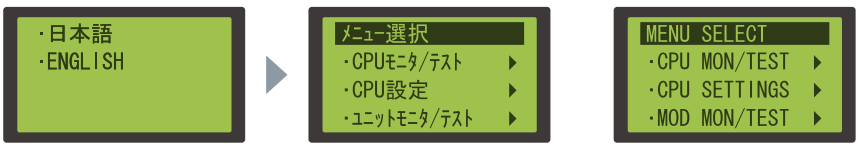
Intuitive menu navigation

The menu navigation guide shows the current menu tree location and an arrow to indicate the scroll direction at the top of the display.



Multilingual operation

The display unit language can be selected (Japanese or English).



Universal Design

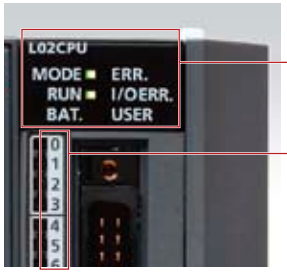
The L series has been designed from the ground up to be easy to use

The L series module labeling design has been created to ensure clear legibility and identification of information at glance to avoid mistakes.

Universal design

Adopting a universal font

A high visibility font has been chosen for characters printed on system modules.



■ Regular Gothic font

0 1 2 3 4
5 6 7 8 9
A B C D E

The characters are thick enough, however the numbers “3, 6, 8, 9” and the alphabet “C” are not clearly distinguishable because the spacing indicated with a red circle is not large enough.

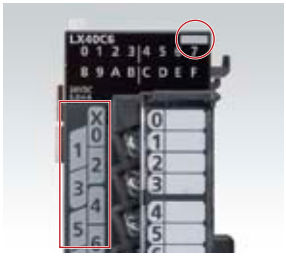
■ Font for L series

0 1 2 3 4
5 6 7 8 9
A B C D E

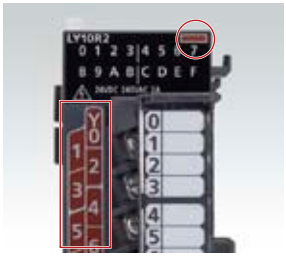
The space indicated with a red circle has been enlarged.
The numbers “3, 6, 8, 9” and the alphabet “C” are clearly distinguishable.
Characters are legible even in small print.

Module design

White and red are used to distinguish inputs from outputs respectively to allow for easy identification of terminal connection type.



White for input module



Red for output module

Easily identify module status

LEDs display the current status of modules including run and error states.

LEDs are located on the top front surface of the modules.

CPU Modules

Communication interface: RS-232

L02SCPU

General-purpose output: Sink type
Program capacity: 20K steps
Basic operation processing speed: 60ns

L02SCPU-P

General-purpose output: Source type
Program capacity: 20K steps
Basic operation processing speed: 60ns

*: End cover is enclosed.
Cannot be mounted on display unit (L6DSPU), RS-232 adapter, RS-422/485 adapter.

Communication interface: Ethernet

L02CPU

General-purpose output: Sink type
Program capacity: 20K steps
Basic operation processing speed: 40ns

L02CPU-P

General-purpose output: Source type
Program capacity: 20K steps
Basic operation processing speed: 40ns

*: END cover is included.

L06CPU

General-purpose output: Sink type
Program capacity: 60K steps
Basic operation processing speed: 9.5ns

L06CPU-P

General-purpose output: Source type
Program capacity: 60K steps
Basic operation processing speed: 9.5ns

*: END cover is included.

L26CPU

General-purpose output: Sink type
Program capacity: 260K steps
Basic operation processing speed: 9.5ns

L26CPU-P

General-purpose output: Source type
Program capacity: 260K steps
Basic operation processing speed: 9.5ns

*: END cover is included.

Communication interface: Ethernet (with CC-Link function)

L26CPU-BT

General-purpose output: Sink type
Program capacity: 260K steps
Basic operation processing speed: 9.5ns

L26CPU-PBT

General-purpose output: Source type
Program capacity: 260K steps
Basic operation processing speed: 9.5ns

*: END cover is included.

Model	General-purpose output	Number of I/O points	Program capacity	Basic operation processing speed (LD instruction)	Peripheral connection ports	Built-in CC-Link
L02SCPU	Sink type	1024 points	20K steps	60ns	USB/RS-232	—
L02CPU				40ns	USB/Ethernet	—
L06CPU		4096 points	60K steps	9.5ns		—
L26CPU			260K steps			—
L26CPU-BT						CC-Link
L02SCPU-P	Source type	1024 points	20K steps	60ns	USB/RS-232	—
L02CPU-P				40ns	USB/Ethernet	—
L06CPU-P		4096 points	60K steps	9.5ns		—
L26CPU-P			260K steps			—
L26CPU-PBT						CC-Link

CPU packages

■L02CPU-SET
Includes CPU (L02CPU), power supply module (L61P), and display unit (L6DSPU).
■L02CPU-P-SET
Includes CPU (L02CPU-P), power supply module (L61P), and display unit (L6DSPU).

■L06CPU-SET
Includes CPU (L06CPU), power supply module (L61P), and display unit (L6DSPU).
■L06CPU-P-SET
Includes CPU (L06CPU-P), power supply module (L61P), and display unit (L6DSPU).

■L26CPU-SET
Includes CPU (L26CPU), power supply module (L61P), and display unit (L6DSPU).
■L26CPU-P-SET
Includes CPU (L26CPU-P), power supply module (L61P), and display unit (L6DSPU).

■L26CPU-BT-SET
Includes CPU (L26CPU-BT), power supply module (L61P), and display unit (L6DSPU).
■L26CPU-PBT-SET
Includes CPU (L26CPU-PBT), power supply module (L61P), and display unit (L6DSPU).

■ General specifications

General specifications indicate the environmental specifications in which this product can be installed and operated. Unless otherwise specified, these general specifications apply to all L series products.
*: General specifications of jointly developed products are different from those of MELSEC products. For more information, please refer to the product manuals or contact your local Mitsubishi Electric representative.

Item	Specification					
Operating ambient temperature	0 to 55°C					
Storage ambient temperature	-25 to 75°C					
Ambient humidity (operating)	5 to 95%RH, non-condensing					
Ambient humidity (storage)						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		Frequency	Constant accelration	Half amplitude	Sweep count
		Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y, and Z directions
			8.4 to 150Hz	9.8m/s²	—	
		Under continuous vibration	5 to 8.4Hz	—	1.75mm	—
			8.4 to 150Hz	4.9m/s²	—	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s², 3 times each in X, Y, and Z directions)					
Operating atmosphere	No corrosive gases					
Operating altitude*1	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category*2	Ⅱ or less					
Pollution degree*3	2 or less					
Equipment class	Class Ⅰ					

*1: Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m.
Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.
*2: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
*3: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

■ CPU module specifications

Item			L02SCPU L02SCPU-P	L02CPU L02CPU-P	L06CPU L06CPU-P	L26CPU L26CPU-P	L26CPU-BT L26CPU-PBT
Control method			Stored program repeat operation				
I/O control mode			Refresh mode (Direct mode is available by specifying the direct access input/output (DX, DY).)				
Programming language (sequence control language)			Function block, relay symbol language, MELSAP3 (SFC), MELSAP-L, structured text (ST), logic symbolic language				
Processing speed*4 (sequence instruction)	LD X0		60ns	40ns	9.5ns		
	MOV D0 D1		120ns	80ns	19ns		
Constant scan			0.5 to 2000ms (Setting is available in increments of 0.5ms by parameter.)				
Program size			20K steps (80K bytes)		60K steps (240K bytes)	260K steps (1040K bytes)	
Memory capacity	Program memory (drive 0)		80K bytes		240K bytes	1040K bytes	
	Memory card (RAM) (drive 1)		—				
	Memory card (ROM) (drive 2)		—	Depends on the SD/SDHC memory card used.*5			
	Standard RAM (drive 3)		128K bytes		768K bytes		
	Standard ROM (drive 4)		512K bytes		1024K bytes	2048K bytes	
Maximum number of files stored	Program memory		64 files		124 files	252 files	
	Memory card (RAM)		—				
	Memory card (ROM)	SD	—	Root directory: 511 files (maximum) Subdirectory: 65533 files (maximum)			
		SDHC	—	Root directory: 65534 files (maximum) Subdirectory: 65533 files (maximum)			
	Standard RAM		4 files (each one of the following files: file register file, local device file, sampling trace file, and module error collection file)				
	Standard ROM		128 files		256 files		
Maximum number of intelligent function module parameters	Initial setting		2048 parameters		4096 parameters		
	Refresh		1024 parameters		2048 parameters		
Maximum number of modules specification*6			30		40		
Built-in I/O function			Refer to the built-in I/O specifications ➡ P.18 to P.19				
Data Logging function			—	Refer to the Data Logging function specifications ➡ P.19			
Built-in Ethernet function			—	Refer to the built-in Ethernet specifications ➡ P.20			
Built-in Serial Communication function			Refer to the Built-in Serial Communication specifications ➡ P.20	—			
Built-in CC-Link function			—				Refer to the CC-Link Master/Local Module specifications. ➡ P.51
Clock function	Displayed information		Year, month, date, hour, minute, second, and day of the week (automatic leap year detection)				
	Accuracy		0°C: -2.96 to +3.74s (TYP. +1.42s) per day 25°C: -3.18 to +3.74s (TYP. +1.50s) per day 55°C: -13.20 to +2.12s (TYP. -3.54s) per day				
5V DC internal current consumption	CPU	With display unit	—	1.00A	1.06A		1.43A
		Without display unit	0.75A	0.94A	1.00A		1.37A
	END cover (Accessory)*7		0.04A				
Weight	CPU	With display unit	—	0.40kg			0.50kg
		Without display unit	0.32kg	0.37kg			0.47kg
	END cover (Accessory)*7		0.06kg				

*4: Indexing devices does not delay processing time.
*5: The operation of devices that are not manufactured or recommended as compatible products by Mitsubishi Electric cannot be guaranteed.
*6: The total number of modules that can be mounted to a CPU. Refer to the "Maximum number of modules specification" for each module.
(Power supply modules, CPU module, Display unit, Extension module, RS-232 adapter, RS-422/485 adapter, END cover, and END cover with error terminal are not included. Note that only one CPU or head module per system is possible.)
*7: The END cover is included with the CPU module and must be placed on the right end of the last module in the system.

■ CPU module device specifications

Item		L02SCPU L02SCPU-P	L02CPU L02CPU-P	L06CPU L06CPU-P	L26CPU L26CPU-P	L26CPU-BT L26CPU-PBT
Number of I/O device points (number of points available on a program)		8192 points (X/Y0 to X/Y1FFF)				
Number of I/O points		1024 points (X/Y0 to X/Y3FF)		4096 points (X/Y0 to X/YFFF)		
Internal relay (M)		8192 points (M0 to M8191) by default (changeable)				
Latch relay (L)		8192 points (L0 to L8191) by default (changeable)				
Link relay (B)		8192 points (B0 to B1FFF) by default (changeable)				
Timer (T)		2048 points (T0 to T2047) by default (changeable) (Low-speed and high-speed timers available) (Low-speed timer: 1 to 1000ms (in increments of 1ms), default: 100ms) (High-speed timer: 0.1 to 100ms (in increments of 0.1ms), default: 10ms)				
Retentive timer (ST)		0 points by default (changeable)(Low-speed and high-speed retentive timers available) (Low-speed retentive timer: 1 to 1000ms (in increments of 1ms), default: 100ms) (High-speed retentive timer: 0.1 to 100ms (in increments of 0.1ms), default: 10ms)				
Counter (C)		Normal counter 1024 points (C0 to C1023) by default (changeable)				
Data register (D)		12288 points (D0 to D12287) by default (changeable)				
Extended data register (D)		32768 points (D12288 to D45055) by default (changeable)		131072 points (D12288 to D143359) by default (changeable)		
Link register (W)		8192 points (W0 to W1FFF) by default (changeable)				
Extended link register (W)		0 points by default (changeable)				
Annunciator (F)		2048 points (F0 to F2047) by default (changeable)				
Edge relay (V)		2048 points (V0 to V2047) by default (changeable)				
Link special relay (SB)		2048 points (SB0 to SB7FF) by default (changeable)				
Link special register (SW)		2048 points (SW0 to SW7FF) by default (changeable)				
File register	(R)	32768 points (R0 to R32767) (Maximum 65536 points are available by switching blocks.)		32768 points (R0 to R32767) (Maximum 393216 points are available by switching blocks.)		
	(ZR)	65536 points (ZR0 to ZR65535) (Blocks do not need to be switched.)		393216 points (ZR0 to ZR393215) (Blocks do not need to be switched.)		
Step relay (S)		8192 points (S0 to S8191) by default				
Index register/standard device register (Z)		20 points (Z0 to Z19) (maximum)				
Index register (Z) (32-bit index modification of ZR device)		10 points (Z0 to Z18) (maximum) (The index register is used as a double-word device.)				
Pointer (P)		4096 points (P0 to P4095) (The local pointer range and the common pointer range can be set by parameter.)				
Interrupt pointer (I)		256 points (I0 to I255) (The fixed scan interval for the system interrupt pointer I28 to I31 can be set by parameter.) 0.5 to 1000ms (in increments of 0.5ms) Default I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms				
Special relay (SM)		2048 points (SM0 to SM2047) (The number of device points is fixed.)				
Special register (SD)		2048 points (SD0 to SD2047) (The number of device points is fixed.)				
Function input (FX)		16 points (FX0 to FX F) (The number of device points is fixed.)				
Function output (FY)		16 points (FY0 to FY F) (The number of device points is fixed.)				
Function register (FD)		5 points (FD0 to FD4) (The number of device points is fixed.)				
Intelligent function module device		Device that directly accesses the buffer memory of an intelligent function module Specification format: U□□/G□□				
Latch (data retention during power failure) range		8192 points (L0 to L8191) by default (The latch range can be set for the devices, B, F, V, T, ST, C, D, W, and R by parameter.)				

■ CPU built-in I/O function - input specifications (general-purpose input/interrupt input/pulse catch function)

Item			Description
Standard input	Points		10
	Input voltage/current		24V DC 4.1mA (TYP.)
	The minimum input response time		100μs
	Input response time setting		0.1ms, 1ms, 5ms, 10ms, 20ms, 70ms
	Common terminal arrangement		10 points/common (Positive or negative common)
High-speed input	Points		6
	Input voltage/current	DC input	24V DC 6.0mA (TYP.)
		Differential input	EIA Standard RS-422-A Differential line driver level AM26L31 (manufactured by Texas Instruments Incorporated) or equivalent
	The minimum input response time		10μs
	Input response time setting		0.01ms/0.1ms/0.2ms/0.4ms/0.6ms/1ms
	Common terminal arrangement		Independent

■ CPU built-in I/O function - output specifications (general-purpose output function)

Item		Description
Points		8
Output voltage/current		5 to 24V DC 0.1A
Response time	OFF to ON	1μs or less (rated load, resistance load)
	ON to OFF	
Common terminal arrangement		L02SCPU, L02CPU, L06CPU, L26CPU, L26CPU-BT: 8 points/common (Sink type) L02SCPU-P, L02CPU-P, L06CPU-P, L26CPU-P, L26CPU-PBT: 8 points/common (Source type)

■ CPU built-in I/O function - positioning function specifications

Item			Description
Number of controlled axes			2
Control unit			pulse
Operation pattern		PTP*1 control	Available
		Path control	Not usable
Number of positioning data			10 data/axis
Positioning control	Positioning control method	PTP*1 control	ABS/INC
		Speed/position switching control	INC
	Positioning range	PTP*1 control	-2147483648 to 2147483647 pulses
		Speed/position switching control	0 to 2147483647 pulses
	Speed command		0 to 200K pulses/s
	Acceleration/deceleration system selection		Automatic trapezoid acceleration/deceleration and S-curve acceleration/deceleration
	Acceleration/deceleration time		0 to 32767 ms
OPR method			6 types
Starting time (1-axis linear control)			Trapezoid acceleration/deceleration (single-axis start): 30 μs/axis S-curve acceleration/deceleration (single-axis start): 35 μs/axis
Command pulse output	Pulse output method		L02SCPU, L02CPU, L06CPU, L26CPU, L26CPU-BT: 5 to 24V DC (Sink type) L02SCPU-P, L02CPU-P, L06CPU-P, L26CPU-P, L26CPU-PBT: 5 to 24V DC (Source type)
	Pulse output mode		4 types
	Maximum output pulse		200K pulses/s
	Maximum connection distance with drive unit		2 m
External input	Zero signal	DC input	24V DC 6.0 mA (TYP.)
		Differential input	EIA RS-422-A differential line driver level AM26L31 (manufactured by Texas Instruments Incorporated) or equivalent
	Speed/position switching signal		24V DC 4.1 mA (TYP.)
	Near-point dog signal		
	Upper and lower limit signal		
	Drive unit ready signal		
	Input response time		Zero signal: 10 μs Speed/position switching control, near-point dog signal: 100 μs Upper and lower limit signal, drive unit ready signal: 2 ms
External output	Deviation counter clear signal		L02SCPU, L02CPU, L06CPU, L26CPU, L26CPU-BT: 5 to 24V DC 0.1A (Sink type) L02SCPU-P, L02CPU-P, L06CPU-P, L26CPU-P, L26CPU-PBT: 5 to 24V DC 0.1A (Source type)
	Response time	OFF to ON	1 μs or less (rated load, resistive load)
		ON to OFF	

*1: Abbreviation for "Point to Point." This is a type of position control.

■ CPU built-in I/O function - high-speed counter specifications

Item			Description
Number of channels			2
Count input signal	Phase		1-phase input (1 multiple/2 multiples) CW/CCW, 2-phase input (1 multiple/2 multiples/4 multiples)
	Signal level	DC input	24V DC 6.0mA (TYP.)
		Differential input	EIA Standard RS-422-A Differential line driver level AM26L31 (manufactured by Texas Instruments Incorporated) or equivalent
Counter	Maximum counting speed		200K pulses/s (for 2 multiples of 1 phase and 4 multiples of 2 phases)
	Counting range		-2147483648 to 2147483647
	Model		UP/DOWN preset counter (with ring counter function)
	Minimum count pulse width (Duty ratio 50%)	1 phase	5µs
		2 phases	10µs
	Min. phase differential for 2-phase input		5µs
External input	Phase Z (preset)	DC input	24V DC 6.0mA (TYP.)
		Differential input	EIA Standard RS-422-A Differential line driver level AM26L31 (manufactured by Texas Instruments Incorporated) or equivalent
	Function start		24V DC 4.1mA (TYP.)
	Latch		
	Input response time		Phase Z: 10µs Function start, latch: 100µs
External output	Output format		L02SCPU, L02CPU, L06CPU , L26CPU, L26CPU-BT: Sink type L02SCPU-P, L02CPU-P, L06CPU-P, L26CPU-P, L26CPU-PBT: Source type
	Output voltage/current	Coincidence output No. 1 / PWM output	5 to 24 V DC/0.25 A*1
		Coincidence output No. 2	5 to 24 V DC/0.1 A
	Response time	OFF to ON	1µs or less (Rated load, resistance load)
		ON to OFF	
Coincidence output	Comparison range		-2147483648 to 2147483647
	Comparison result		Set value < Counted value Set value = Counted value Set value > Counted value
	I/O points		2 points/channel
PWM output	Output frequency range		DC to 200kHz
	ON width		1µs
	Duty ratio		On width can be set in increments of 0.1µs.
	I/O points		1 point/channel
Pulse width measurement	Measurement item		Pulse width (On width: 200µs or more, Off width: 200µs or more)
	Measurement resolution		5µs
	Measurement points		1 point/channel

*1: For units where the first six digits of the serial number are "120722" or later. The specification for previous serial numbers is 5 to 24 V DC/0.1 A.

■ CPU Data logging function specifications

Item			L02CPU L02CPU-P	L06CPU L06CPU-P	L26CPU L26CPU-P	L26CPU-BT L26CPU-PBT
Number of data logging settings			10			
Data logging buffer capacity			For each setting, any of 32 to 4832K bytes (in units of 1K byte) can be specified. The total value of settings No.1 to No.10 is up to 5120K bytes.			
Data storage location			Standard ROM (configuration files only), SD Memory Card			
Logging type			• Continuous logging • Trigger logging			
Data sampling	Sampling interval		• Each scanning cycle • Time specification • Condition specification (Device specification, Step No. specification)			
	No. of data sampling points		Up to 1280 (128 points per setting)			
	AND conjunction		In the Sampling interval setting, Device and Step No. under "Condition specification" can be specified in combination (AND conjunction).			
Data processing	Trigger logging	Trigger condition	• Condition specification (Device change specification, Step No. specification) • When trigger instruction executed • When data logging trigger activated			
		AND conjunction	In the Trigger setting, Device data change and Step No. under "Condition specification" can be specified in combination (AND conjunction).			
		Trigger logging range	Data of the specified number of records are logged before and after a trigger.			
		Number of triggers	1			
		Number of trigger logging records	Up to 1000000			
File output	File Name		Up to 48 one-byte characters can be used for the following. • File number (serial number)*2 • Character string (name)*3 • Date and time*3			
	File format		CSV file			
	Data type		• Bit • Word (unsigned) • Word (signed) • Double word (unsigned) • Double word (signed) • FLOAT [single precision] • FLOAT [double precision] • Character string: 1 to 256 characters • Numeric string: 1 to 256 bytes			
	Data output format (CSV file)		• Decimal format • Hexadecimal format • Exponential format			
Handling of output files	File switching	File switching timing	• No. of records • File size			
		Number of saved files	1 to 65535			

*2: Part of the saved file name, this number is automatically assigned.
*3: Optional data to be appended to the saved file name.

■ CPU built-in Ethernet function specifications

Item			L02CPU L02CPU-P	L06CPU L06CPU-P	L26CPU L26CPU-P	L26CPU-BT L26CPU-PBT
Transmission specifications	Data transfer speed		100 or 10 Mbps			
	Communication mode		Full-duplex or half-duplex			
	Transmission method		Base band			
	Maximum distance between hub and node		100 m			
	Maximum number of nodes/connection	10BASE-T	Cascade connection: Up to four			
		100BASE-TX	Cascade connection: Up to two			
Number of connections	TCP/IP		Total of 16 for socket communications, MELSOFT connections, and MC protocol.*1			
	UDP/IP		One for FTP			
Connection cable*2	10BASE-T		Ethernet cable of category 3 or higher (STP/UTP cable)*3			
	100BASE-TX		Ethernet cable of category 5 or higher (STP cable)			

*1: Only the QnA-compatible 3E frame may be used.
*2: Straight through cable. Also, when the CPU is connected directly with a GOT, a cross cable (category 5e or less) may be used.
*3: The use of STP (Shielded Twisted Pair) cables is recommended in noisy environments.

■ Communication Performance Comparison (Comparison of LCPU with built-in Ethernet port and Ethernet interface module)

Function/performance	LCPU with built-in Ethernet port	Ethernet Interface Module
Communication speed	100 Mbps	100 Mbps
MC protocol communication	●*4	●
Socket communication	●*5	● (Fixed buffer communication)
Communications using a random access buffer	—	●
E-mail function	—	●
Communications using data link instructions	—	●
File transfer (FTP server) function	●*6	●
Web function	—	●
MELSOFT products and GOT connection	●	●

*4: QnA compatible 3E frame device memory access commands only. Refer to the relevant manual for details.
*5: There are some differences regarding the fixed buffer communications function. Refer to the relevant manual for details.
*6: The "quote cpuchg" command is not supported.

■ CPU built-in serial communication function specifications

Item	L02SCPU L02SCPU-P
Communication mode	Full duplex
Synchronization method	Start-stop synchronization method
Transmission speed	9.6kbps, 19.2kbps, 38.4kbps, 57.6kbps, 115.2kbps
Data format	• Start bits: 1 • Data bits: 8 • Parity bits: Odd number • Stop bits: 1
MC protocol format *7 (automatic judgment)	• Formats 4 (ASCII) • Formats 5 (Binary)
Frame *7	• QnA compatible 3C frame • QnA compatible 4C frame
Transmission control	DTR/DSR control
Transmission distance (Overall distance)	Maximum 15m

*7: Information relevant to the MC protocol format and frame are shown below.

●: Supported —: Not supported

Function		Formats 4	Formats 5
Communication with ASCII code	QnA compatible 3C frame	●	—
	QnA compatible 4C frame	●	—
Communication with binary code	QnA compatible 4C frame	●	●

■ How to read the product code

L 26 □ CPU - P BT - SET
① ② ③ ④ ⑤ ⑥

Number	Item	Code	Specification
①	Program memory capacity	02	20K steps
		06	60K steps
		26	260K steps

Number	Item	Code	Specification
②	Communication interface	Blank	Built-in Ethernet model
		S	Built-in RS-232 model

Number	Item	Code	Specification
③	Type of module	CPU	CPU module

Number	Item	Code	Specification
④	Built-in I/O output format	Blank	Sink type
		P	Source type

Number	Item	Code	Specification
⑤	Built-in CC-Link function	Blank	—
		BT	●

Number	Item	Code	Specification
⑥	Product set	Blank	—
		SET	Set includes a power supply module (L61P) and display unit (L6DSPU)

Branch/Extension Module

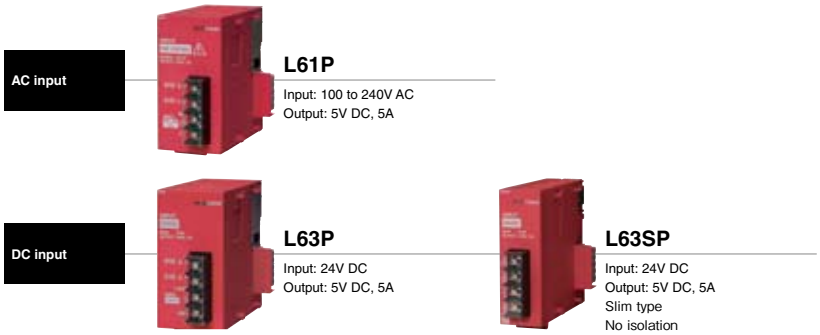
■ Specifications for branch and extension modules

Item	L6EXB [Branch module]	L6EXE [Extension module]
5V DC internal current consumption	0.08A	0.08A
Weight	0.12kg	0.13kg

■ Specifications for extension cables

Item	LC06E	LC10E	LC30E
Cable length	0.6m	1.0m	3.0m
Weight	0.19kg	0.23kg	0.45kg

Power Supply Modules



■ Power supply module specifications

Item	L61P	L63P	L63SP NEW
Input power supply	100 to 240V AC (-15% to +10%)	24V DC (-35% to +30%)	
Input frequency	50/60Hz (-5% to +5%)	—	
Input voltage distortion	Within 5%	—	
Maximum input apparent power	130VA	—	
Maximum input power	—	45W	
Inrush current	20A, within 8ms	100A, within 1ms (24V DC input)	
Rated output current (5V DC)	5A		
Overcurrent protection (5V DC)	5.5A or more		
Overvoltage protection	5.5 to 6.5V		
Efficiency	70% or more		
Allowable momentary power failure time	Within 10ms	Within 10ms (24V DC input)	
Withstand voltage	2300V AC per minute (altitude 0 to 2000m) Between the combined "line input/LG terminals" and the "FG terminal and output".	510V AC per minute (altitude 0 to 2000m) Between the combined "line input/LG terminals" and the "FG terminal and output".	—*1
Insulation resistance	10MΩ or higher by 500V DC insulation resistance tester • Between the combined "line input/LG terminals" and the "FG terminal and output". • The line input and LG terminals. • The FG terminal and output.		—*1
Weight	0.32kg	0.29kg	0.19kg

*1: There is no isolation between the primary side 24V DC and secondary side 5V DC.

RS-232 Adapter

RS-232 Adapter

L6ADP-R2

Transmission speed: 115.2kbps
GOT connection
MELSOFT*1 connection

Predefined protocol support function
Serial Communication function

*1: Refer to each MELSOFT product manual for details on the supported software.

■ RS-232 adapter specifications

Item	Specification
Maximum data transmission speed	115.2kbps
5V DC internal current consumption	0.02A
Weight	0.10kg

RS-422/485 Adapter

RS-422/485 Adapter

L6ADP-R4 NEW

Transmission speed: 115.2kbps
GOT connection

Predefined protocol support function
Serial Communication function

■ RS-422/485 adapter specifications

Item	Specification
Maximum data transmission speed	115.2kbps
5V DC internal current consumption	0.15A
Weight	0.12kg

END Cover with Error Terminal

END Cover with Error Terminal

L6EC-ET

Error output Relay

■ END cover with error terminal specifications

Item			Specification
ERR. terminal	Rated switching voltage, current		24V DC 0.5A
	Minimum switching load		5V DC, 1mA
	Response time	OFF to ON	10ms or less
		ON to OFF	12ms or less
	Life	Mechanical	20 million times or more
		Electrical	Rated switching voltage/current: 10 million times or more
	Surge suppressor		—
	Fuse		—
Applicable wire size			0.3 to 2.0mm^2 (AWG22 to 14) (Twisted wire/Solid wire)
External connections			Spring clamp terminal block
5V DC internal current consumption			0.06A
Weight			0.11kg

Display Unit

Display Unit

L6DSPU

■ Display Unit specifications

Item	Specification
Number of displayed characters	16 one-byte characters × 4 lines
Displayed characters	• Alphanumeric (two-byte/one-byte character) • Japanese character Katakana (two-byte/one-byte character) • Japanese character Hiragana (two-byte character) • Chinese character (two-byte character) • Symbol (two-byte/one-byte character)
Language	Japanese/English
Backlight	Green (normal), red (error)
Weight	0.03kg

Input Modules

AC input

LX10
Number of inputs: 16 points
100 to 120V AC
18-point terminal block

LX28
Number of inputs: 8 points
100 to 240V AC
18-point terminal block

DC input

LX40C6
Number of inputs: 16 points
24V DC
18-point terminal block

LX41C4
Number of inputs: 32 points
24V DC
40-pin connector

LX42C4
Number of inputs: 64 points
24V DC
40-pin connector ×2

Output Modules

Contact output

LY10R2
Number of outputs: 16 points
24V DC/240V AC
Rated switching current: 2A/point
18-point terminal block

Triac output

LY20S6
Number of outputs: 16 points
100 to 240V AC
Max. load current: 0.6A/point
18-point terminal block

Transistor output (Sink type)

LY40NT5P
Number of outputs: 16 points
12 to 24V DC
Max. load current: 0.5A/point
Protection Function
18-point terminal block

LY41NT1P
Number of outputs: 32 points
12 to 24V DC
Max. load current: 0.1A/point
Protection Function
40-pin connector

LY42NT1P
Number of outputs: 64 points
12 to 24V DC
Max. load current: 0.1A/point
Protection Function
40-pin connector ×2

Transistor output (Source type)

LY40PT5P
Number of outputs: 16 points
12 to 24V DC
Max. load current: 0.5A/point
Protection Function
18-point terminal block

LY41PT1P
Number of outputs: 32 points
12 to 24V DC
Max. load current: 0.1A/point
Protection Function
40-pin connector

LY42PT1P
Number of outputs: 64 points
12 to 24V DC
Max. load current: 0.1A/point
Protection Function
40-pin connector ×2

I/O Combined Module

DC input / Transistor output (Sink type)

LH42C4NT1P

Input specifications
Number of inputs: 32 points
24V DC
40-pin connector

Output specifications
Number of outputs: 32 points
12 to 24V DC
Max. load current: 0.1A/point
Protection Function
40-pin connector

DC input / Transistor output (Source type)

LH42C4PT1P

Input specifications
Number of inputs: 32 points
24V DC
40-pin connector

Output specifications
Number of outputs: 32 points
12 to 24V DC
Max. load current: 0.1A/point
Protection Function
40-pin connector

■ Input module specifications

AC input module

Item		LX10	LX28
Number of input points		16 points	8 points
Rated input voltage, frequency		100 to 120V AC (+10%/-15%), 50/60Hz (±3Hz)	100 to 240V AC (+10%/-15%), 50/60Hz(±3Hz)
Input voltage distortion		Within 5%	
Rated input current		8.2mA (100V AC, 60Hz), 6.8mA (100V AC, 50Hz)	16.4mA (200V AC, 60Hz), 13.7mA (200V AC, 50Hz), 8.2mA (100V AC, 60Hz), 6.8mA (100V AC, 50Hz)
Inrush current		Max. 200mA within 1ms	Max. 950mA within 1ms
ON voltage/ON current		80V AC or higher/5mA or higher (50Hz, 60Hz)	
OFF voltage/OFF current		30V AC or lower/1.7mA or lower (50Hz, 60Hz)	
Input resistance		12.2kΩ (60Hz), 14.6kΩ (50Hz)	
Response time	OFF to ON	15ms or less (100V AC 50Hz, 60Hz)	15ms or less (100V AC 50Hz, 60Hz) 10ms or less (200V AC 50Hz, 60Hz)
	ON to OFF	20ms or less (100V AC 50Hz, 60Hz)	20ms or less (100/200V AC 50Hz, 60Hz)
Common terminal arrangement		16 points/common	8 points/common
Maximum number of modules specification		Counts as 1 module	
Number of occupied I/O points		16 points (I/O assignment: input 16 points)	
External connections		18-point terminal block	
5V DC internal current consumption		90mA (TYP. all points ON)	80mA (TYP. all points ON)
Weight		0.17kg	0.15kg

DC input module

Item		LX40C6	LX41C4	LX42C4
Number of input points		16 points	32 points	64 points
Rated input voltage		24V DC (ripple rate: 5% or less) (allowable voltage range: 20.4 to 28.8VDC)		
Rated input current		6.0mA TYP. (at 24V DC)	4.0mA TYP. (at 24V DC)	
ON voltage/ON current		15V DC or higher/4mA or higher	19V DC or higher/3mA or higher	
OFF voltage/OFF current		8V DC or lower/2mA or lower	9V DC or lower/1.7mA or lower	
Input resistance		3.8kΩ	5.7kΩ	
Response time	OFF to ON	1ms, 5ms, 10ms, 20ms, 70ms or less Initial setting is 10ms.		
	ON to OFF			
Common terminal arrangement		16 points/common	32 points/common	
Maximum number of modules specification		Counts as 1 module		
Number of occupied I/O points		16 points (I/O allocation: input 16 points)	32 points (I/O assignment: input 32 points)	64 points (I/O allocation: input 64 points)
External connections		18-point terminal block	40-pin connector	40-pin connector ×2
5V DC internal current consumption		90mA (TYP. all points ON)	100mA (TYP. all points ON)	120mA (TYP. all points ON)
Weight		0.15kg	0.11kg	0.12kg

■ Output module specifications

Contact output module

Item		LY10R2
Number of output points		16 points
Rated switching voltage, current		24V DC 2A (resistive load)/point, 8A/common 240V AC 2A (COSϕ=1)/point, 8A/common
Minimum switching load		5V DC 1mA
Maximum switching load		264V AC 125V DC
Response time	OFF to ON	10ms or less
	ON to OFF	12ms or less
Life	Mechanical	20 million times or more
	Electrical	Usage environment / Switching life: Rated switching voltage/current, rated load — 100 thousand times 200V AC 1.5A, 240V AC 1A (COSϕ = 0.7) — 100 thousand times 200V AC 0.4A, 240V AC 0.3A (COSϕ = 0.7) — 300 thousand times 200V AC 1A, 240V AC 0.5A (COSϕ = 0.35) — 100 thousand times 200V AC 0.3A, 240V AC 0.15A (COSϕ = 0.35) — 300 thousand times 24V DC 1A, 100V DC 0.1A (L/R = 7ms) — 100 thousand times 24V DC 0.3A, 100V DC 0.03A (L/R = 7ms) — 300 thousand times
Maximum switching frequency		3600 times/hour
Surge suppressor		—
Fuse		—
Common terminal arrangement		16 points/common
Maximum number of modules specification		Counts as 1 module
Number of occupied I/O points		16 points (I/O assignment: 16 input points)
External connections		18-point terminal block
5V DC internal current consumption		460mA (TYP. all points ON)
Weight		0.21kg

■ Output module specifications

Triac output

Item		LY20S6
Number of output points		16 points
Rated load voltage, frequency		100 to 240V AC (+10%/-15%), 50/60Hz(±3Hz)
Maximum load current		0.6A/point, 4.8A/common
Load voltage distortion ratio		Within 5%
Maximum load voltage		264V AC
Minimum load voltage/current		24V AC/100mA, 100V AC/25mA, 240V AC/25mA
Maximum inrush current		20A/cycle or less
Leakage current at OFF		3mA or lower (at 240V, 60Hz), 1.5mA or lower (at 120V, 60Hz)
Maximum voltage drop at ON		1.5V or lower (at load current of 0.6A)
Response time	OFF to ON	Total of 1ms and 0.5 cycles or less
	ON to OFF	Total of 1ms and 0.5 cycles or less (rated load, resistive load)
Surge suppressor		CR absorber
Fuse		None (Attaching a fuse to each external wiring is recommended.)
Common terminal arrangement		16 points/common
Maximum number of modules specification		Counts as 1 module
Number of occupied I/O points		16 points (I/O assignment: output 16 points)
External connections		18-point terminal block
5V DC internal current consumption		300mA (TYP. all points ON)
Weight		0.22kg

Transistor output (Sink type)

Item		LY40NT5P	LY41NT1P	LY42NT1P
Number of output points		16 points	32 points	64 points
Rated load voltage		10.2 to 28.8V DC		
Maximum load current		0.5A/point, 5A/common	0.1A/point, 2A/common	
Maximum inrush current		Current is limited by the overload protection function.		
Leakage current at OFF		0.1mA or less		
Maximum voltage drop at ON		0.2V DC(TYP.)0.5A, 0.3V DC(MAX.)0.5A	0.1V DC (TYP.) 0.1A, 0.2V DC (MAX.) 0.1A	
Response time	OFF to ON	0.5ms or less		
	ON to OFF	1ms or less (rated load, resistance load)		
Surge suppressor		Zener diode		
Fuse		—		
Protection function	Overload protection	Limited current when detecting overcurrent (overload protection): 1.5 to 3.5A/point. Activated in increments of 1 point.	Overcurrent detection/overload protection limit current: 1 to 3A/point, Activated in increments of 1 point	
	Overheat protection	Activated in increments of 1 point		
External power supply	Voltage	12/24V DC (ripple rate: 5% or less) (allowable voltage range: 10.2 to 28.8VDC)		
	Current	9mA (at 24V DC)/common	13mA (at 24V DC)/common	9mA (at 24V DC)/common
Common terminal arrangement		16 points/common	32 points/common	
Maximum number of modules specification		Counts as 1 module		
Number of occupied I/O points		16 points (I/O assignment: 16 output points)	32 points (I/O assignment: 32 output points)	64 points (I/O assignment: 64 output points)
External connections		18-point terminal block	40-pin connector	40-pin connector ×2
5V DC internal current consumption		100mA (TYP. all points ON)	140mA (TYP. all points ON)	190mA (TYP. all points ON)
Weight		0.15kg	0.11kg	0.12kg

Transistor output (Source type)

Item		LY40PT5P	LY41PT1P	LY42PT1P
Number of output points		16 points	32 points	64 points
Rated load voltage		10.2 to 28.8V DC		
Maximum load current		0.5A/point, 5A/common	0.1A/point, 2A/common	
Maximum inrush current		Current is limited by the overload protection function.		
Leakage current at OFF		0.1mA or less		
Maximum voltage drop at ON		0.2V DC(TYP.)0.5A, 0.3V DC(MAX.)0.5A	0.1V DC (TYP.) 0.1A, 0.2V DC (MAX.) 0.1A	
Response time	OFF to ON	0.5ms or less		
	ON to OFF	1ms or less (rated load, resistance load)		
Surge suppressor		Zener diode		
Fuse		—		
Protection function	Overload protection	Overcurrent detection: 1.5A or more/point. Activated in increments of 1 point.	Limited current when detecting overcurrent (overload protection): 1 to 3A/point. Activated in increments of 1 point.	
	Overheat protection	Activated in increments of 1 point.	Activated in increments of 2 points.	
External power supply	Voltage	12/24V DC (ripple rate: 5% or less) (allowable voltage range: 10.2 to 28.8VDC)		
	Current	17mA (at 24V DC)/common	20mA (at 24V DC)/common	
Common terminal arrangement		16 points/common	32 points/common	
Maximum number of modules specification		Counts as 1 module		
Number of occupied I/O points		16 points (I/O assignment: 16 output points)	32 points (I/O assignment: 32 output points)	64 points (I/O assignment: 64 output points)
External connections		18-point terminal block	40-pin connector	40-pin connector ×2
5V DC internal current consumption		100mA (TYP. all points ON)	140mA (TYP. all points ON)	190mA (TYP. all points ON)
Weight		0.15kg	0.11kg	0.12kg

■ I/O combined module specifications
DC input/transistor output combined module

Item		LH42C4NT1P	LH42C4PT1P
■ Input specifications			
Number of input points		32 points	
Rated input voltage		24V DC (ripple rate: 5% or less) (allowable voltage range: 20.4 to 28.8V DC)	
Rated input current		4.0mA TYP. (at 24V DC)	
Input ON voltage/ON current		19V DC or higher/3mA or higher	
Input OFF voltage/OFF current		9V DC or lower/1.7mA or lower	
Input resistance		5.7kΩ	
Input response time	OFF to ON	1ms, 5ms, 10ms, 20ms, 70ms or less (Initial setting is 10ms)	
	ON to OFF		
Input common terminal arrangement		32 points/common	
■ Output specifications			
Output format		Transistor output combined module (Sink type)	Transistor output combined module (Source type)
Number of output points		32 points	
Rated load voltage		10.2 to 28.8V DC	
Maximum load current		0.1A/point, 2A/common	
Maximum inrush current		Current is limited by the overload protection function.	
Leakage current at OFF		0.1mA or less	
Maximum voltage drop at ON		0.1V DC (TYP.) 0.1A, 0.2V DC (MAX.) 0.1A	
Output response time	OFF to ON	0.5ms or less	
	ON to OFF	1ms or less (rated load, resistance load)	
Surge suppressor		Zener diode	
Fuse		—	
Protection function	Overload protection	Limited current when detecting overcurrent (overload protection): 1 to 3A/point, Activated in increments of 1 point.	
	Overheat protection	Activated in increments of 1 point	Activated in increments of 2 points.
Output common terminal arrangement		32 points/common	
■ Common specifications			
External power supply	Voltage	12/24V DC (ripple rate: 5% or less) (allowable voltage range: 10.2 to 28.8VDC)	
	Current	9mA (at 24V DC)/common	20mA (at 24V DC)/common
Maximum number of modules specification		Counts as 1 module	
Number of occupied I/O points		32 points (I/O assignment: input/output 32 points)	
External connections		40-pin connector ×2	
5V DC internal current consumption		160mA (TYP. all points ON)	150mA (TYP. all points ON)
Weight		0.12kg	

■ How to read the product code

• For input module or output module

L Y 4 0 NT 5 P

① ② ③ ④ ⑤ ⑥

• For I/O combined module

L H 4 2 C4 NT1 P

① ② ③ ④ ⑤ ④ ⑤ ⑥

Input type: ④ ⑤ — Output type: ④ ⑤

Number	Item	Code	Specification
①	Module type	X	Input
		Y	Output
		H	I/O combined

Number	Item	Code	Input specifications		Output specifications		
			AC input	DC input	Contact output	Triac output	Transistor output
②	Voltage specification	1	100 to 120V AC	—	24V DC/240V AC	—	—
		2	100 to 240V AC	—	—	100 to 240V AC	—
		4	—	24V DC	—	—	12 to 24V DC

Number	Item	Code	Specification
③	I/O points	0	16 points
		1	32 points
		2	64 points
		8	8 points

Number	Item	Code	Specification
④	I/O type	Blank	AC input
		C	DC input (positive/negative shared common)
		NT	Transistor output module (Sink type)
		PT	Transistor output module (Source type)
		R	Contact output
		S	Triac output

Number	Item	Code	Input specifications		Output specifications		
			AC input	DC input	Contact output	Triac output	Transistor output
⑤	Current specification	1	—	—	—	—	0.1A
		2	—	—	2A	—	—
		4	—	4mA	—	—	—
		5	—	—	—	—	0.5A
		6	—	6mA	—	0.6A	—

Number	Item	Code	Specification
⑥	Extra Specifications	P	Includes protection function

Analog Input Module

Analog Input

L60AD4

Number of inputs : 4 channels
Input voltage : -10 to 10V DC
Input current : 0 to 20mA DC
Conversion speed : 20μs/channel
Resolution : 1/20000
Accuracy : ±0.1%

Dual channel Isolation Analog Input

L60AD4-2GH

Number of inputs : 4 channels
Input voltage : -10 to 10V DC
Input current : 0 to 20mA DC
Conversion speed: 40μs/2 channels
Resolution : 1/32000
Accuracy : ±0.05%

Analog Output Module

Analog Output

L60DA4

Number of outputs: 4 channels
Output voltage : -10 to 10V DC
Output current : 0 to 20mA DC
Conversion speed : 20μs/channel
Resolution : 1/20000
Accuracy ±0.1%

Analog I/O module

Analog I/O

L60AD2DA2

Analog input specifications
Number of inputs : 2 channels
Input voltage : -10 to 10V DC
Input current : 0 to 20mA DC
Conversion speed : 80μs/channel
Resolution : 1/12000
Accuracy : ±0.2%

Analog output specifications
Number of outputs : 2 channels
Output voltage : -10 to 10V DC
Output current : 0 to 20mA DC
Conversion speed : 80μs/channel
Resolution : 1/12000
Accuracy : ±0.2%

Function		Analog Input Module		Analog Output Module	Analog I/O module	
		L60AD4	L60AD4-2GH	L60DA4	L60AD2DA2	
		A/D conversion	A/D conversion	D/A conversion	A/D conversion	D/A conversion
Shift function		●	●	—	—	—
Scaling function		●	●	●	●	—
Digital filtering function		—	●	—	—	—
Time lag filter function		—	●	—	—	—
Logging function		●	●	—	●	—
Difference conversion function		●	●	—	—	—
Input signal error detection function		●	●	—	●	—
Input signal error detection extension function		●	—	—	—	—
Input range extended mode function		●	●	—	●	—
Flow amount integration function		●	—	—	—	—
Conversion speed switch function		●	—	—	—	—
Warning output function	Process alarm	●	●	●	—	●
	Rate alarm	—	●	—	—	—
Trigger conversion function		—	●	—	—	—
Analog output HOLD/CLEAR function		—	—	●	—	●
Wave output function		—	—	●	—	●

Easily and finely adjust the system startup time with the shift function.

L60AD4 L60AD4-2GH

Shift function*1

Using this function, the set shifting amount to conversion value can be added (shifted) to the digital output value. When the shifting amount to conversion value is changed, it is reflected to the scaling value (digital operation value) in real time. Therefore, fine adjustment can be easily performed when the system starts.

*1: Compatible with L60AD4 analog input modules starting with serial No. "13041" or higher.

For L60AD4

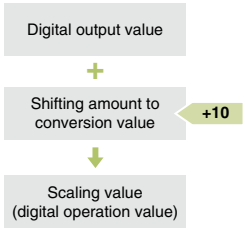
■ Before adjustment

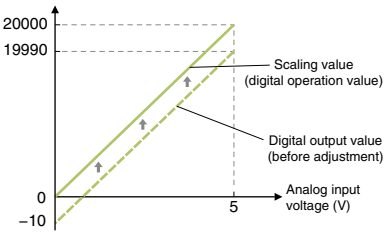
Input voltage (V)	Digital output value
0	-10
5	19990

Shifting amount to conversion value: +10

■ After adjustment

Input voltage (V)	Scaling value (digital operation value)
0	0
5	20000





Reduce the time taken for programming

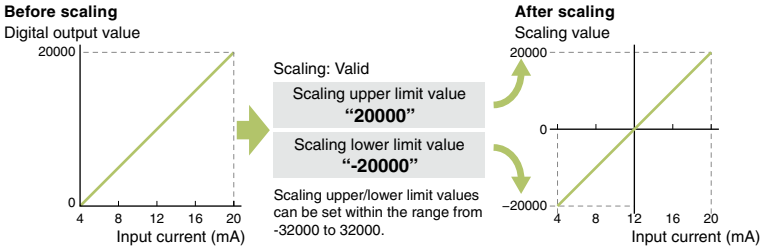
L60AD4 L60AD4-2GH L60DA4 L60AD2DA2

Scaling function

The scaling function converts values directly to easy-to-understand units without requiring any programming. Since a separate conversion program is not required, the number of overall programming steps can be reduced.

Scaling settings example (L60AD4)

Normally an analog input of 4 to 20mA is converted to a digital value from 0 to 20000. Using the scaling feature, the same input can result in a digital value of ±20000.



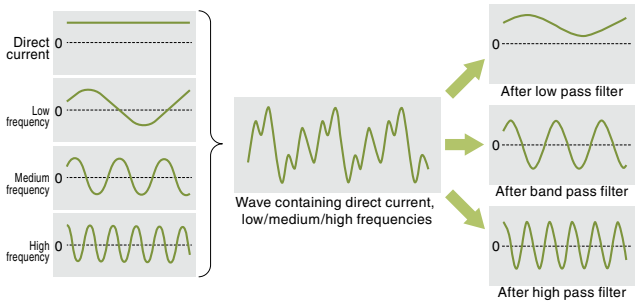
Input current (mA)	Digital output value	Scaling value
4	0	–20000
8	5000	–10000
12	10000	0
16	15000	10000
20	20000	20000

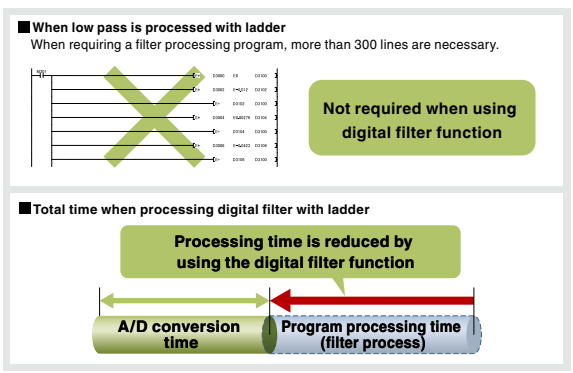
Digital filtering function*2

This function eliminates unnecessary frequency elements with simple parameter settings. Select from low pass filter, high pass filter or band pass filter.

Programming steps can be further reduced as extra ladder code is not required to achieve the filter processing.

The filtered A/D conversion program is available at the same time as conversion completion, reducing the overall conversion to filter process time.





Time lag filter function*2

The time lag filter function constant outputs a digital value which filters out (smooths) the excessive noise.

*2: Supported only with L60AD4-2GH.

Log data for up to 10,000 points

L60AD4 L60AD4-2GH L60AD2DA2

Logging function*1

Data is continuously collected at the set cycle and stored in the buffer memory.
Data stored in the buffer memory can be used for debugging, and to periodically confirm data variations.

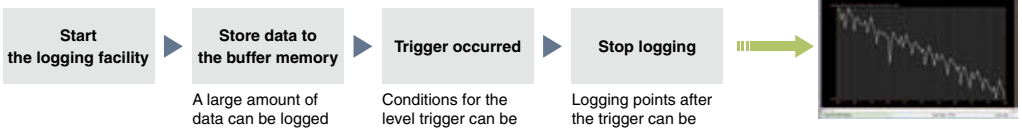
Item	Description		
	L60AD4	L60AD4-2GH	L60AD2DA2
Collectable points	10000 points/channel		
Collectable data	Digital output value or scaling value (digital operation value)		
Logging cycle*2	80 to 32767μs 1 to 32767ms 1 to 3600s	40 to 32767μs 1 to 32767ms 1 to 3600s	80 to 32767μs 1 to 32767ms 1 to 3600s
Conversion speed	80μs, or 1ms	40μs/2 channels	80μs
Level trigger condition	Above, Below, Pass Through		
Logging points after trigger	1 to 10000		

*1: Compatible with L60AD4 analog input modules starting with serial No. “13041” or higher.

*2: The actual logging cycle is "an integral multiple of the conversion cycle of each A/D conversion method".
Ex.) When using the sampling processing: Conversion cycle = conversion speed × number of channels in use.

The logging data can be analyzed with the GX LogViewer.

When an error is detected in the digital value:



A large amount of data can be logged at high speed.

Conditions for the level trigger can be set.

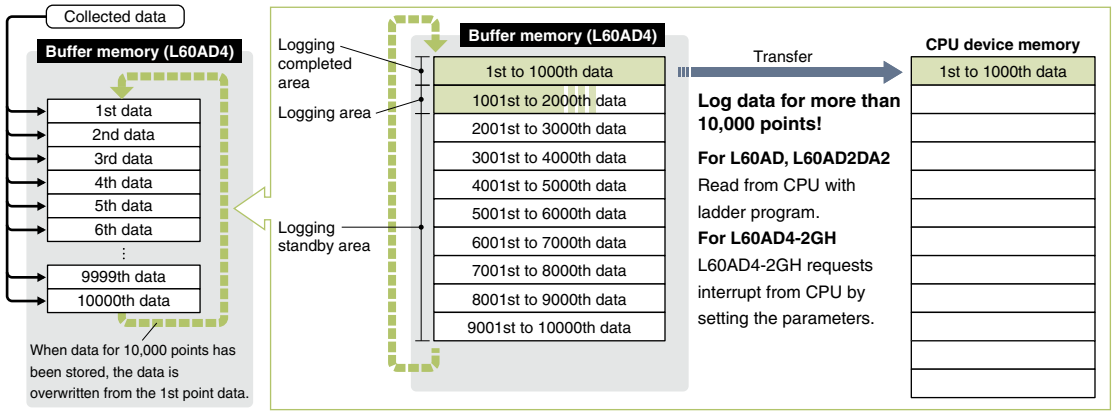
Logging points after the trigger can be set.

Display and analyze data with GX LogViewer

Logging data can be transferred to the CPU device memory while still logging.
Logging and data transmission can be executed simultaneously so the next logging session can be started right away.

Logging for 10,000 points and greater

When logging of 1001 - 2000 points of data commences, the first 1000 points (1 - 1000) are stored into the CPU device memory. By storing every 1000 points of data in the CPU, overall logging of total data larger than 1000 points can be logged.



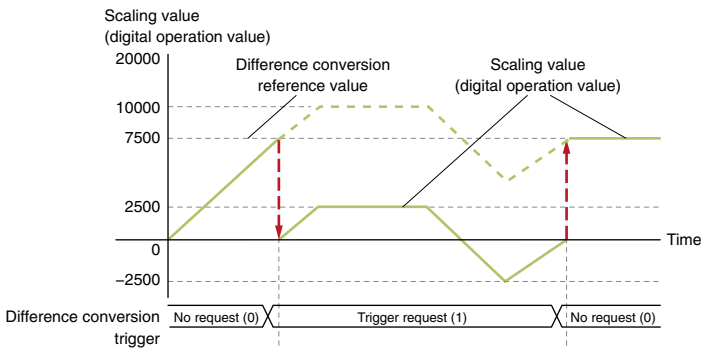
Easily measure part thicknesses!

L60AD4 L60AD4-2GH

Difference conversion function*3

When the difference conversion starts, the scaling value (digital operation value) at that time is determined as the difference conversion reference value. The value acquired by subtracting the difference conversion reference value from the scaling value (digital operation value) is stored as the scaling value (digital operation value) after difference conversion.

For L60AD4



Scaling value (digital operation value) after difference conversion	=	Scaling value (digital operation value)	–	Difference conversion reference value

*3: Compatible with L60AD4 analog input modules starting with serial No. “13041” or higher.

Extend the detection method according to applications

L60AD4 L60AD4-2GH L60AD2DA2

Input signal error detection extension function*1 *2

Using this function, the detection method of the input signal error detection function can be extended. Use this function to detect an input signal error only at the lower or upper limit, or to execute the disconnection detection.

Input range extension function*1

The input range can be extended. By combining this function with the input signal error detection function, simple disconnection detection can be executed.

*1: Compatible with the L60AD4 modules starting with serial No. "13041" or higher.
*2: Only the input signal error detection function can be used with the L60AD4-2GH and L60AD2DA2.

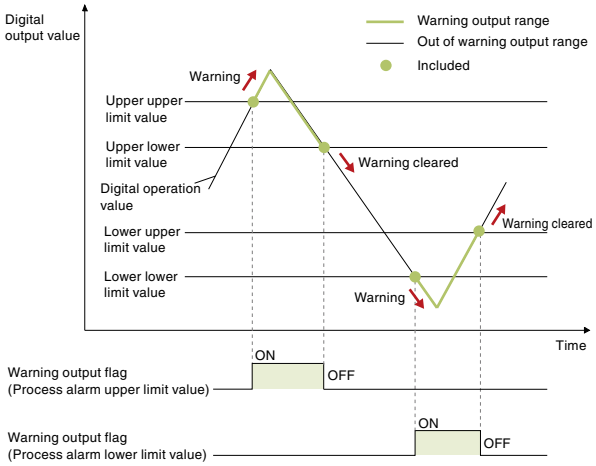
Connected devices monitoring alarm

L60AD4 L60AD4-2GH L60DA4 L60AD2DA2

Warning output function

■ Process Alarm

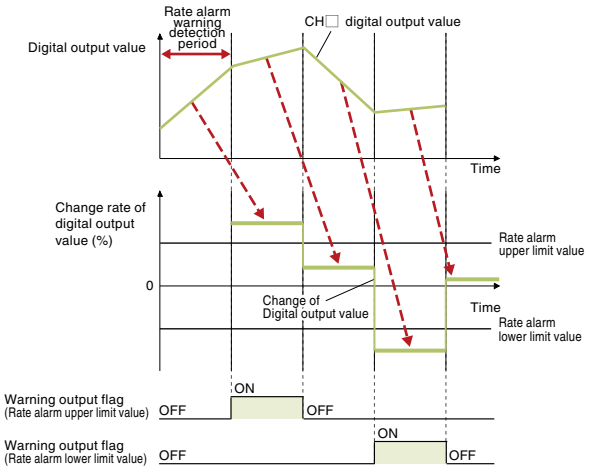
Outputs an alarm when the digital output value enters a preset alarm range.



■ Rate alarm*3

An alarm is generated if the digital output value's variation rate is larger than the rate alarm upper limit value, or if it is smaller than the rate alarm lower limit value.

*3: Supported only with L60AD4-2GH.

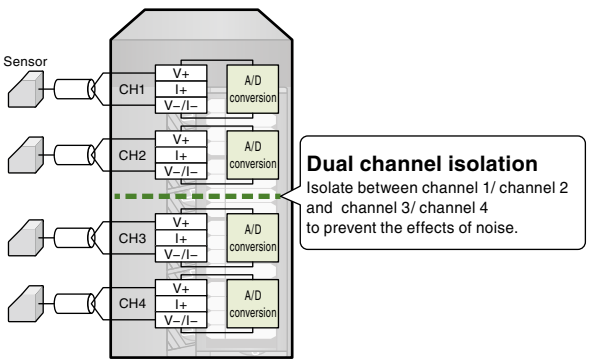


Noise isolation for smoother system operation

L60AD4-2GH

Dual channel isolation

Noise interference is prevented by isolating every two channels resulting in far more stable measurements.

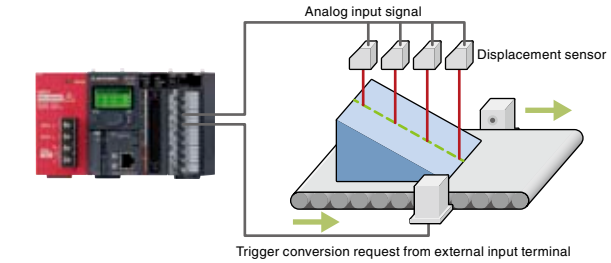


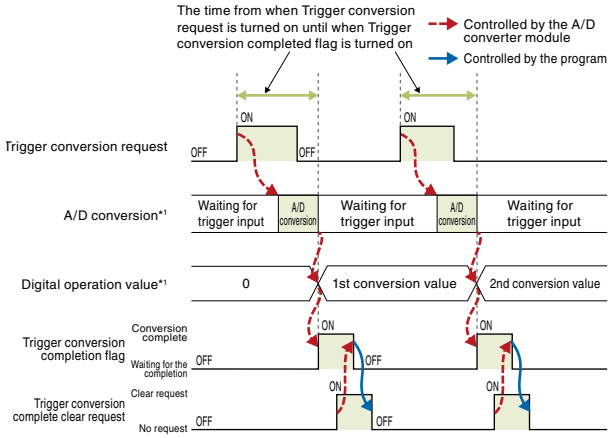
A/D variable conversion timing

L60AD4-2GH

Trigger conversion function

A/D conversion is processed at the rising edge of the trigger position timing.
This function enables easier use of the converter and enhances the overall program performance.
There are two types of trigger conversion request: “External trigger conversion request (external input terminal)” or “internal trigger conversion request (buffer memory)”.





*1: Carried out in order with combination of channel 1, channel 3 and channel 2, channel 4.

Quickly calculate and record flow amount

L60AD4

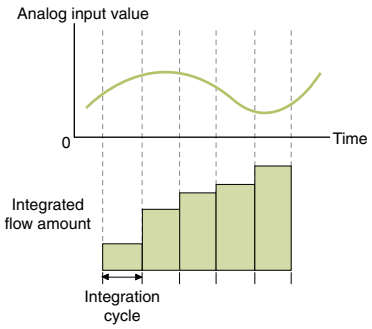
Flow amount integration function*2

This function performs the A/D conversion of analog input value (voltage or current) from a flow meter and others, and integrates the scaling value (digital operation value) by every integration cycle. In this function, integral processing is performed regarding the scaling value (digital operation value) as the instantaneous flow amount.

■ Concept of integral processing

With this function, integral processing is performed using the following formula.

$$\text{Integrated flow amount} = \left(\text{Instantaneous flow amount} \times \frac{\Delta T}{T} \times \text{Unit scaling} \right) + \text{Previous amount}$$



*2: This function is compatible with analog input modules starting with serial No. “13041” or higher.

Item	Description
Integrated flow amount	Result of integral processing
Instantaneous flow amount	Instantaneous flow amount value output in analog from flow meter
ΔT	Integration cycle (ms)
T	Conversion value to convert time unit of instantaneous flow amount to ms unit

Range of flow meter	Setting value to specify flow amount time unit	T (ms)
/s	0	1000
/min	1	60000
/h	2	3600000

Item	Description
Unit scaling	Unit scaling for integrated flow amount This is used when the value of instantaneous flow amount × ΔT/T is 0 to 1.

Setting value to specify unit scaling	Unit scaling
0	1
1	10
2	100
3	1000
4	10000

Item	Description
Previous amount	Stored integrated flow amount value before integral processing

Realize fast and smooth continuous analog output

L60DA4 L60AD2DA2

Wave output function*1

The industry's first*2 waveform output function is included.

This function enables control wave data that is faster than the program control to be directly registered in the D/A converter module and output the data at a set conversion cycle.

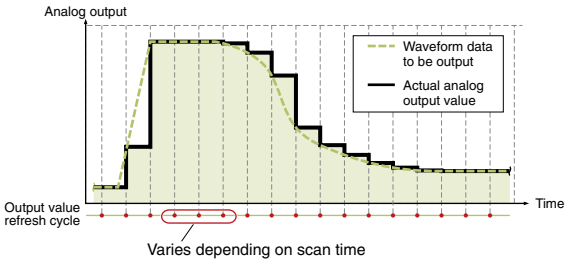
Therefore, the analog output value is not affected by the scan time of the CPU module resulting in faster and smoother analog control.

*1: Compatible with the L60DA4 modules with first five serial number digits are "14041" or later.

*2: Mitsubishi Electric survey dated April 2012.

Analog output from sequence program.

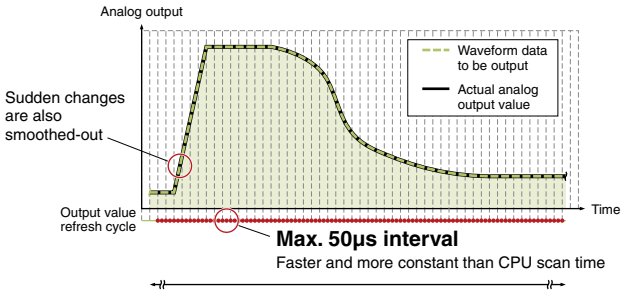
Analog values are output at each scan time.



The actual waveform and the output waveform deviate.

Analog output with waveform output function

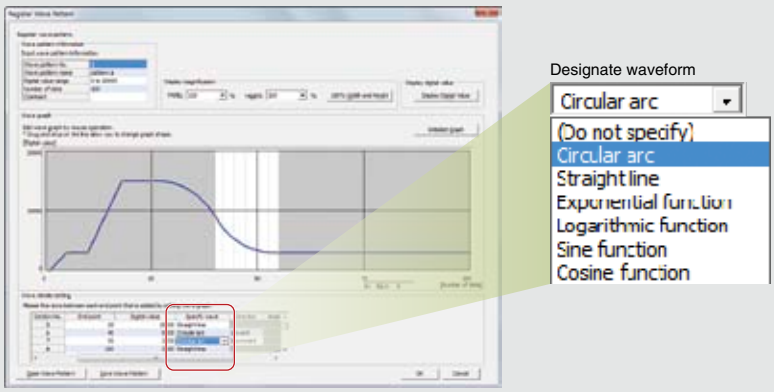
Analog values are output at set interval.



The output waveform is closer to the actual waveform (less deviation).

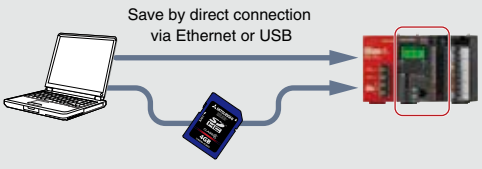
Register up to 50000 points of waveform output data

① **Using GX Works2 to create the waveform output data to be analog output**



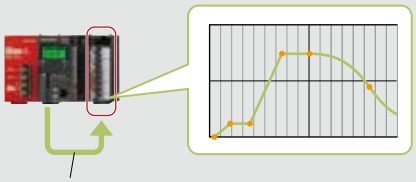
By registering the waveform patterns (multiple), they can be combined freely with the tool.

② **Save waveform output data into CPU module's file resister (or SD memory card)**



Save waveform output data onto SD memory card in situations with no access to a PC.

③ **Execute the function block (FB)*3 and register into analog output module**



Register to analog output module (analog input/output module) buffer memory

*3: Contact your local Mitsubishi Electric sales office or representative.

Easily adjust waveform output data

L60DA4 L60AD2DA2

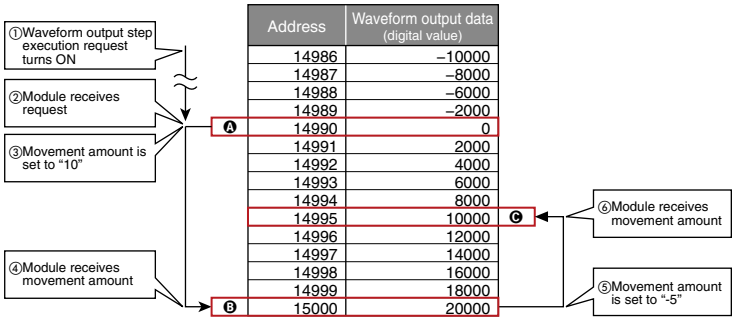
Wave output step action function*1

The waveform output data can be changed even when the analog output module is in conversion. This provides a good way of adjusting the waveform output while in operation.

*1: Compatible with the L60DA4 modules with first five serial number digits are “14041” or later.

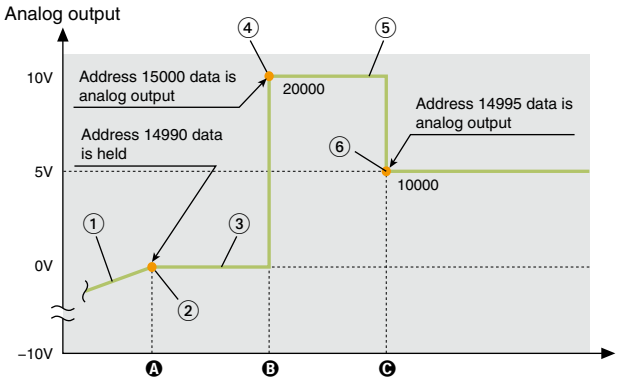
Analog output a designated buffer memory’s address value

If current address is “14990” (Ⓐ) the output range is set to -10 to 10V range and receives “waveform output step execution request”, the address 15000 (Ⓑ) and address 14995 (Ⓒ) data is executed.



The designated address value can be changed, so the waveform output data can also be adjusted.

Address	Waveform output data (digital value)	
14992	4000	
14993	6000	
14994	8000	→ 8200
14995	10000	
	12000	



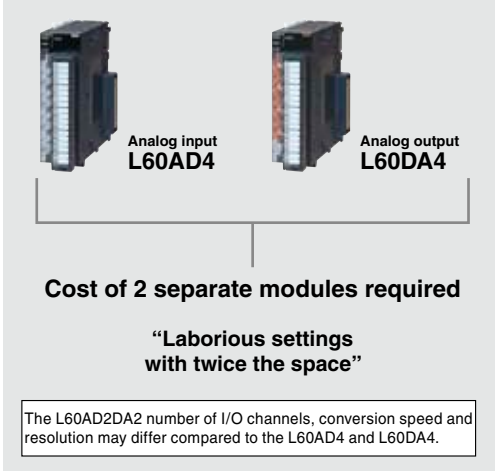
Address can be moved to data to be output and the output value can be output

Combining 2 separate modules into one

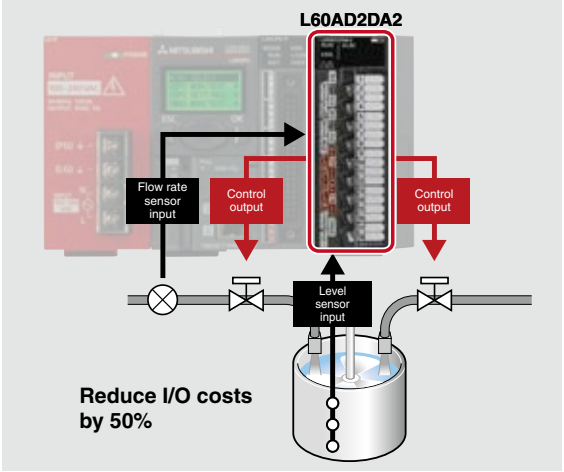
L60AD2DA2

The combined analog input/output module has 2 separate A/D and D/A channels, realizing a space and cost saving system as only one module is required to do the same functions as 2 single modules.

In the past …



From now on …



■ Analog input module specifications

Item		L60AD4
Number of analog input channels		4 channels
Analog input	Voltage	-10 to 10V DC (Input resistance value 1MΩ)
	Current	0 to 20mA DC (Input resistance value 250Ω)
Digital output		-20480 to 20479
	When using the scaling function	-32768 to 32767
I/O characteristics, resolution		See table below
Accuracy*2	Ambient temperature 25±5°C	Within ±0.1% (±20digit)
	Ambient temperature 0 to 55°C	Within ±0.2% (±40digit)
Conversion speed*3*4*5		High speed: 20μs/channel Medium speed: 80μs/channel Low speed: 1ms/channel
Absolute maximum input		Voltage: ±15V, Current: 30mA*6
Isolation method		Between I/O terminals and programmable controller power supply: photocoupler isolation Between input channels: no isolation
Maximum number of modules specification		Counts as 1 module
Number of occupied I/O points		16 points (I/O assignment: 16 points for intelligent)
External connections		18-point terminal block
5V DC internal current consumption		0.52A
Weight		0.19kg

	Analog input range	Digital output value	Resolution
Voltage	0 to 10V	0 to 20000	500μV
	0 to 5V		250μV
	1 to 5V		200μV
	-10 to 10V	-20000 to 20000	500μV
	1 to 5V (Extended mode)	-5000 to 22500	200μV
	Users range setting	-20000 to 20000	307μV*1
Current	0 to 20mA	0 to 20000	1000nA
	4 to 20mA		800nA
	4 to 20mA (Extended mode)	-5000 to 22500	800nA
	Users range setting	-20000 to 20000	1230nA*1

*1: Maximum resolution in the user range setting.
*2: Accuracy for the maximum value of the digital output value. Except when receiving noise influence.
*3: The default value is 80μs/channel.
*4: The logging function can be used only in the middle speed (80μs/channel) or low speed (1ms/channel).
*5: The flow amount integration function can be used only in the low speed (1ms/channel).
*6: This is a momentary current value which does not cause damage to internal resistors of the module. The maximum input current value for constant application is 24mA.

■ Dual channel isolation analog input module specifications

Item			L60AD4-2GH
Number of analog input channels			4 channels
Analog input	Voltage		-10 to 10V DC (Input resistance value 1MΩ)
	Current		0 to 20mA DC (Input resistance value 250Ω)
Digital output			-32000 to 32000
	When using the scaling function		-32768 to 32767
I/O characteristics, resolution			See table below
Accuracy*8	Reference accuracy*9		Within ±0.05% (±16digit)
	Temperature coefficient*10		±40.1ppm/°C or less
Conversion speed			40μs/2 channel
Absolute maximum input			Voltage: ±15V, Current: 30mA*11
Isolation method			Between I/O terminals and programmable controller power supply: photocoupler isolation Between analog input channels: dual channel transformer isolation
Maximum number of modules specification			Counts as 1 module
Number of occupied I/O points			16 points (I/O assignment: 16 points for intelligent)
External connections			18-point terminal block
5V DC internal current consumption			0.76A
Weight			0.20kg
External trigger input	Input points		1 point
	Rated input voltage		24V DC (+20%/-15%, ripple ratio: within 5%)
	Rated input current		6.0mA TYP. (at 24V DC)
	ON voltage/ON current		13V or more, 3mA or more
	OFF voltage/OFF current		8V or less, 1.6mA or less
	Input resistance		3.9kΩ
	Response time	OFF to ON	40μs
		ON to OFF	40μs

	Analog input range	Digital output value	Resolution
Voltage	0 to 10V	0 to 32000	312.5μV
	0 to 5V		156μV
	1 to 5V		125μV
	-10 to 10V	-32000 to 32000	312.5μV
	1 to 5V (Extended mode)	-8000 to 32000	125μV
	Users range setting (Bipolar: voltage)	-32000 to 32000	200μV*7
Current	0 to 20mA	0 to 32000	625nA
	4 to 20mA		500nA
	4 to 20mA (Extended mode)	-8000 to 32000	500nA
	Users range setting (Unipolar: Current)	0 to 32000	400nA*7

*7: Maximum resolution in the user range setting.
*8: Accuracy for the maximum value of the digital output value. Except when receiving noise influence.
*9: Accuracy under the ambient temperature when the offset/gain setting is performed.
*10: Accuracy when the temperature changes 1°C.
Example: Accuracy when the temperature changes from 25°C to 30°C
0.05% + 0.00401%/°C (temperature coefficient) × 5°C (temperature change) = 0.070%
*11: A momentary input current value which does not cause damage to internal resistors of the module. The maximum input current value for constant application is 24mA.

■ Analog output module specifications

<table>
<tr><th colspan="2">Item</th><th>L60DA4</th></tr>
<tr><td colspan="2">Number of analog output channels</td><td>4 channels</td></tr>
<tr><td rowspan="2">Digital input</td><td></td><td>-20480 to 20479</td></tr>
<tr><td>When using the scaling function</td><td>-32768 to 32767</td></tr>
<tr><td rowspan="2">Analog output</td><td>Voltage</td><td>-10 to 10V DC (External load resistance value 1kΩ to 1MΩ)</td></tr>
<tr><td>Current</td><td>0 to 20mA DC (External load resistance value 0Ω to 600Ω)</td></tr>
<tr><td colspan="2">I/O characteristics, resolution</td><td>
<table>
<tr><th colspan="2">Analog output range</th><th>Digital value</th><th>Resolution</th></tr>
<tr><td rowspan="4">Voltage</td><td>0 to 5V</td><td rowspan="2">0 to 20000</td><td>250μV</td></tr>
<tr><td>1 to 5V</td><td>200μV</td></tr>
<tr><td>-10 to 10V</td><td rowspan="2">-20000 to 20000</td><td>500μV</td></tr>
<tr><td>Users range setting</td><td>333μV*1</td></tr>
<tr><td rowspan="3">Current</td><td>0 to 20mA</td><td rowspan="2">0 to 20000</td><td>1000nA</td></tr>
<tr><td>4 to 20mA</td><td>800nA</td></tr>
<tr><td>Users range setting</td><td>-20000 to 20000</td><td>700nA*1</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">Accuracy*2</td><td>Ambient temperature 25±5°C</td><td>Within ±0.1% (voltage: ±10mV, current: ±20μA)</td></tr>
<tr><td>Ambient temperature 0 to 55°C</td><td>Within ±0.3% (voltage: ±30mV, current: ±60μA)</td></tr>
<tr><td rowspan="2">Conversion speed</td><td>Normal output mode</td><td>20μs/channel</td></tr>
<tr><td>Wave output mode</td><td>50μs/channel
80μs/channel</td></tr>
<tr><td colspan="2">Output short protection</td><td>Protected</td></tr>
<tr><td colspan="2">Isolation method</td><td>Between I/O terminals and programmable controller power supply: photocoupler isolation
Between output channels: no insulation
Between external power supply and analog output: transformer insulation</td></tr>
<tr><td colspan="2">Maximum number of modules specification</td><td>Counts as 1 module</td></tr>
<tr><td colspan="2">Number of occupied I/O points</td><td>16 points (I/O assignment: 16 points for intelligent)</td></tr>
<tr><td colspan="2">External connections</td><td>18-point terminal block</td></tr>
<tr><td colspan="2" rowspan="4">External power supply</td><td>24V DC (+20%/-15%)</td></tr>
<tr><td>Ripple, spike 500mV$_{P-P}$ or lower</td></tr>
<tr><td>Inrush current: 4.3A, 1000μs or shorter</td></tr>
<tr><td>Current consumption: 0.18A</td></tr>
<tr><td colspan="2">5V DC internal current consumption</td><td>0.16A</td></tr>
<tr><td colspan="2">Weight</td><td>0.20kg</td></tr>
</table>

*1: Maximum resolution in the user range setting.
*2: Accuracy for the maximum value of analog output value. Except when receiving noise influence. Warm up (power on) the module for 30 minutes to satisfy the accuracy shown in the table.

■ Analog input/output module specifications

Item		L60AD2DA2
■ A/D conversion part		
Number of analog input channels		2 channels
Analog input	Voltage	-10 to 10V DC (Input resistance value 1MΩ)
	Current	0 to 20mA DC (Input resistance value 250Ω)
Digital output		-16384 to 16383
	When using the scaling function	-32768 to 32767
I/O characteristics, resolution		See table below
Accuracy*2		See table below
Conversion speed		80μs/channel
Absolute maximum input		Voltage: ±15V, Current: 30mA*3
■ D/A conversion part		
Number of analog output channels		2 channels
Digital input		-16384 to 16383
	When using the scaling function	-32768 to 32767
Analog output	Voltage	-10 to 10V DC (External load resistance value 1kΩ to 1MΩ)
	Current	0 to 20mA DC (External load resistance value 0Ω to 600Ω)
I/O characteristics, resolution		See table below
Accuracy*4		See table below
Conversion speed	Normal output mode	80μs/channel
	Wave output mode	
Output short protection		Protected
■ Common part		
Isolation method		Between I/O terminals and programmable controller power supply: photocoupler isolation Between output channels: no insulation Between external power supply and analog output: transformer insulation
Maximum number of modules specification		Counts as 1 module
Number of occupied I/O points		16 points (I/O assignment: 16 points for intelligent)
External connections		18-point terminal block
External power supply		24V DC (+20%/-15%)
		Ripple, spike 500mV$_{P-P}$ or lower
		Inrush current: 3.5A, 1000μs or shorter
		Current consumption: 0.12A
5V DC internal current consumption		0.17A
Weight		0.22kg

I/O characteristics, resolution:

Analog input range		Digital output value	Resolution
Voltage	0 to 10V	0 to 16000	625μV
	0 to 5V	0 to 12000	416μV
	1 to 5V		333μV
	-10 to 10V	-16000 to 16000	625μV
	1 to 5V (Extended mode)	-3000 to 13500	333μV
	Users range setting	-12000 to 12000	321μV*1
Current	0 to 20mA	0 to 12000	1666nA
	4 to 20mA		1333nA
	4 to 20mA (Extended mode)	-3000 to 13500	1333nA
	Users range setting	-12000 to 12000	1287nA*1

Accuracy*2:

Analog input range		Ambient temperature	
		25±5°C	0 to 55°C
Voltage	0 to 10V	Within ±0.2% (±32digit)	Within ±0.3% (±48digit)
	-10 to 10V		
	0 to 5V	Within ±0.2% (±24digit)	Within ±0.3% (±36digit)
	1 to 5V		
	1 to 5V (Extended mode)		
Current	0 to 20mA		
	4 to 20mA		
	4 to 20mA (Extended mode)		

I/O characteristics, resolution:

Analog output range		Digital value	Resolution
Voltage	0 to 5V	0 to 12000	416μV
	1 to 5V		333μV
	-10 to 10V	-16000 to 16000	625μV
	Users range setting	-12000 to 12000	319μV*1
Current	0 to 20mA	0 to 12000	1666nA
	4 to 20mA		1333nA
	Users range setting	-12000 to 12000	696nA*1

Accuracy*4:

Analog output range		Ambient temperature	
		25±5°C	0 to 55°C
Voltage	0 to 5V	Within ±0.2% (±10mV)	Within ±0.4% (±20mV)
	1 to 5V		
	-10 to 10V	Within ±0.2% (±20mV)	Within ±0.4% (±40mV)
Current	0 to 20mA	Within ±0.2% (±40μA)	Within ±0.4% (±80μA)
	4 to 20mA		

*1: Maximum resolution in the user range setting.
*2: Accuracy for the maximum value of the digital output value. Except when receiving noise influence.
*3: A momentary current value which does not cause damage to internal resistors of the module. The maximum input current value for constant application is 24mA.
*4: Accuracy for the maximum value of the analog output value. Except when receiving noise influence.

Temperature Control Modules

Thermocouple input

L60TCTT4
Temperature inputs : 4 channels

L60TCTT4BW
Temperature inputs : 4 channels
Heater disconnection detection function

RTD input

L60TCRT4
Temperature inputs : 4 channels

L60TCRT4BW
Temperature inputs : 4 channels
Heater disconnection detection function

Function	L60TCTT4	L60TCTT4BW	L60TCRT4	L60TCRT4BW
	Thermocouple input		RTD input	
Standard control	●	●	●	●
Heating-cooling control	●	●	●	●
Self-tuning function	●	●	●	●
Peak current suppression function	●	●	●	●
Simultaneous temperature rise function	●	●	●	●
Selectable sampling cycle	●	●	●	●
Temperature input mode	●	●	●	●
Temperature control mode	●	●	●	●
Heater disconnection detection function	—	●	—	●

Highly stable temperature control

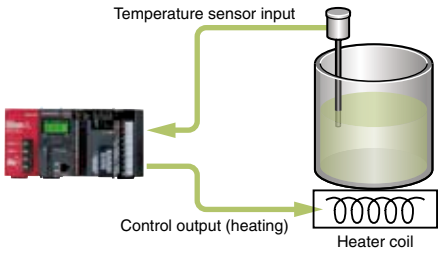
Standard control/heating and cooling control

Prevent overheating and overcooling in devices that require a high level of temperature stability, such as in an extrusion molding machine.

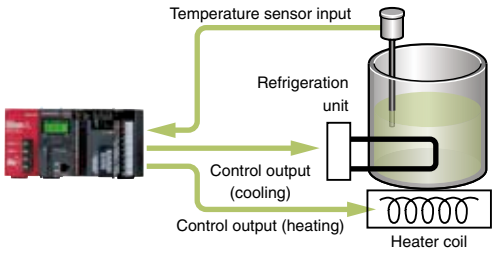
The following control methods can be selected according to the target device.

- Standard control (heating or cooling)
- Heating/cooling control (heating and cooling)
- Mix control (combination of standard control and heating-cooling control)

■ **Example: Standard control (heating only)**
The temperature of the object is controlled by adjusting the heater output based on the PID calculations resulting from the temperature sensor input.



■ **Example: Heating-cooling control**
(heating and cooling elements controlled simultaneously)
Heating is performed when the control object's temperature is lower than the target temperature, and cooling is performed when it is hotter or the humidity needs to be reduced.



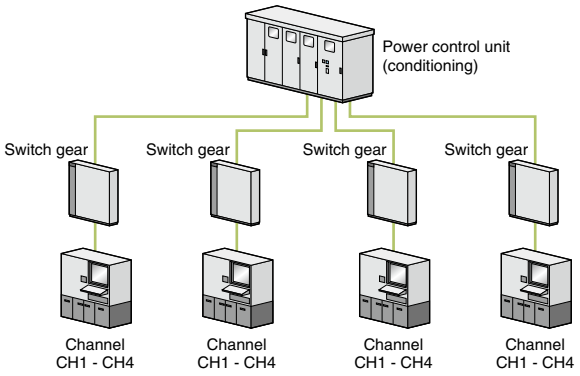
Reduce running costs by taking advantage of the energy-saving effect

Peak current control function

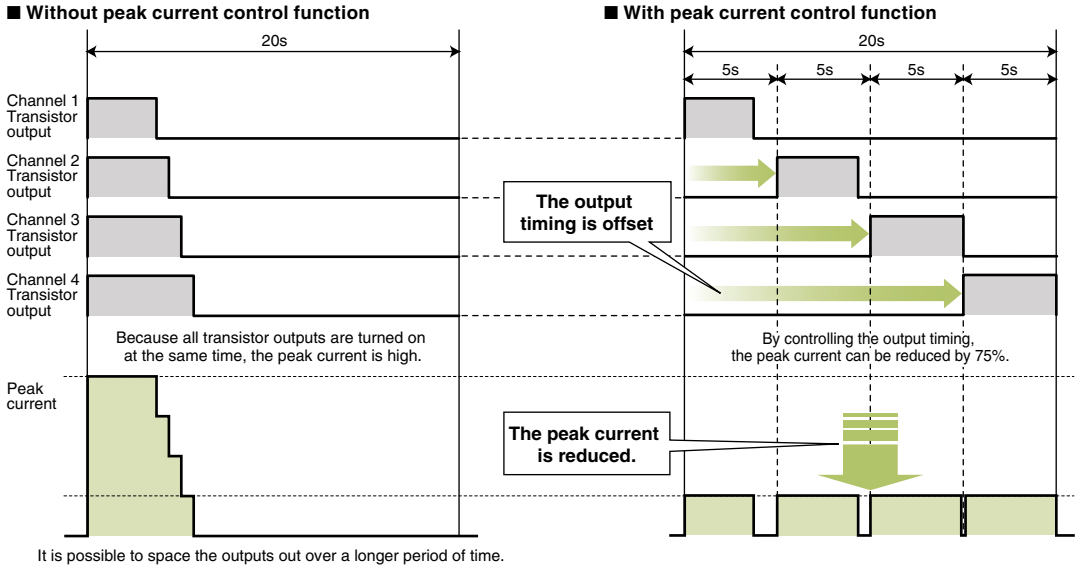
The peak current control function reduces the peak current by automatically changing the upper-output limit value for each channel, while dividing the transistor output timing*1. The energy conserved by reducing the peak current, such as a reduction in system power capacity and reduction in contracted power, can help to reduce running costs.

*1: The timing can be split between two to four outputs.

The maximum power supply capacity requirement is lowered.
We can save money on our electricity contract!



When two or more loads are being controlled, the peak current can be minimized by spreading the total load out over time.



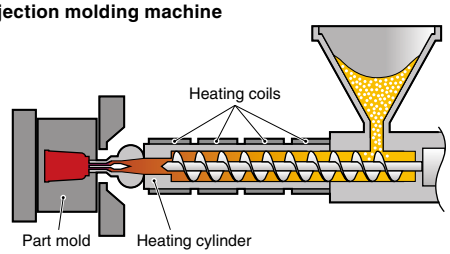
It is possible to space the outputs out over a longer period of time.

Ensures uniform temperature control

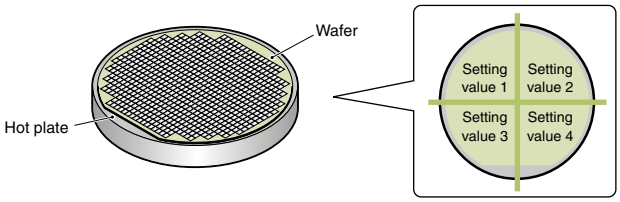
Simultaneous temperature rise function

Ensures uniform temperature control by synchronizing the temperature arrival times from multiple loops.
Perform a uniform temperature rise using two or more control loops without going over temperature or resulting in unexpected thermal expansion.
A "no idling" format increases energy efficiency and reduces running costs.

■ **Example: Temperature control of injection molding machine**

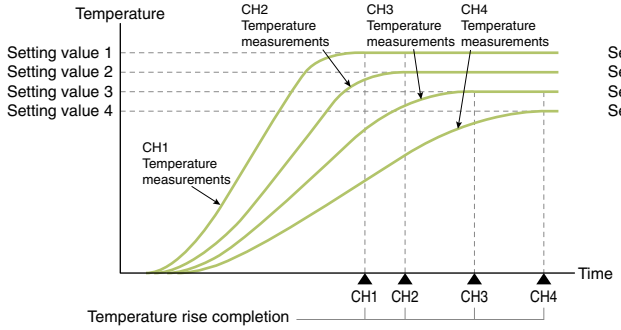


■ **Example: Wafer heating process for semiconductor manufacturing**

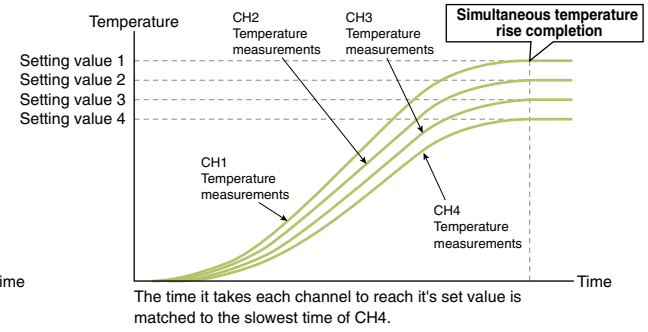


The running costs is reduced!

■ **Without the simultaneous temperature rise function**



■ **With the simultaneous temperature rise function**



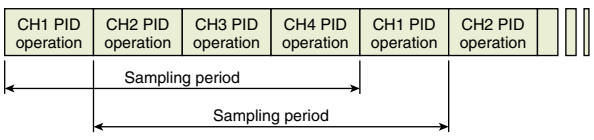
The time it takes each channel to reach it's set value is matched to the slowest time of CH4.

Using this function, it is possible to coordinate the control of two or more loops to reach their target values (SV) at the same time. Control the simultaneous rise in temperature of separate loops by setting a channel group (Max. 2 groups). This is an effective way to control applications where differing target temperature arrival times can result in undesirable temperature differentials.

Support a range of system requirements

Sampling cycle change function

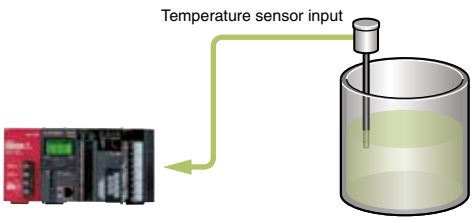
Choose a sampling cycle of 250 ms/4 channels or 500 ms/4 channels.



Sampling period: The time it takes to execute a PID operation for all channels (CHn) before beginning the PID operation of the present channel (CHn) again is called a sampling period.

Temperature input mode

This function allows the temperature control module to be used as a standard temperature input module.
Using the switch setting, it is possible to easily change the input mode.



■ Specifications

Item			L60TCTT4	L60TCTT4BW	L60TCRT4	L60TCRT4BW
Control output			Transistor output			
Number of temperature input channels			4 channels			
Applicable temperature sensors			Thermocouple		Resistive thermal device	
Accuracy*1	Indication accuracy	Ambient temperature: 25 ± 5°C	Full scale × (±0.3%)			
		Ambient temperature: 0 to 55°C	Full scale × (±0.7%)			
	Cold junction temperature compensation accuracy: (ambient temperature: 0 to 55°C)	Temperature process value (PV): -100°C or more	Within ± 1.0°C		—	
		Temperature process value (PV): -150 to -100°C	Within ± 2.0°C			
		Temperature process value (PV): -200 to -150°C	Within ± 3.0°C			
Sampling cycle			250ms/4 channels 500ms/4 channels			
Control output cycle			0.5 to 100.0s			
Input impedance			1MΩ			
Input filter			0 to 100s (0: Input filter OFF)			
Sensor correction value setting			-50.00 to 50.00%			
Operation at sensor input disconnection			Upscale processing			
Temperature control method			PID ON/OFF pulse or two-position control			
PID constants range		PID constants setting	Can be set by auto tuning.			
		Proportional band (P)	0.0 to 1000.0% (0: Two-position control)			
		Integral time (I)	0 to 3600s (set 0 for P control and PD control.)			
		Derivative time (D)	0 to 3600s (set 0 for P control and PI control.)			
Set value (SV) setting range			Within the temperature range set in the thermocouple/platinum resistance thermometer to be used			
Dead band setting range			0.1 to 10.0%			
Transistor output		Output signal	ON/OFF pulse			
		Rated load voltage	10 to 30V DC			
		Max. load current	0.1A/point, 0.4A/common			
		Max. inrush current	0.4A 10ms			
		Leakage current at OFF	0.1mA or less			
		Max. voltage drop at ON	1.0V DC (TYP) at 0.1A 2.5V DC (MAX) at 0.1A			
		Response time	OFF→ON: 2ms or less, ON→OFF: 2ms or less			
Number of accesses to non-volatile memory			Max. 10^{12} times			
Insulation method			Between input terminal and programmable controller power supply: Transformer insulation Between input channels: Transformer insulation			
Heater disconnection detection specifications		Current sensor	—	• CTL-12-S36-10 (0.0 to 100.0A)*2 • CTL-12-S56-10 (0.0 to 100.0A)*2 • CTL-6-P-H (0.00 to 20.00A)*2	—	• CTL-12-S36-10 (0.0 to 100.0A)*2 • CTL-12-S56-10 (0.0 to 100.0A)*2 • CTL-6-P-H (0.00 to 20.00A)*2
		Input accuracy		Full scale × (±1.0%)		Full scale × (±1.0%)
		Number of alert delay		3 to 255		3 to 255
Maximum number of modules specification			Counts as 1 module	Counts as 2 modules	Counts as 1 module	Counts as 2 modules
Number of occupied I/O points			16 points (I/O assignment: Intelligent 16 points)			
External connections			18-point terminal block	18-point terminal block × 2	18-point terminal block	18-point terminal block × 2
5V DC internal current consumption			0.30A	0.33A	0.31A	0.35A
Weight			0.18kg	0.33kg	0.18kg	0.33kg

*1: Calculate the accuracy in the following method (only when it is not affected by noise).
Accuracy (°C) = full scale × indication accuracy + cold junction temperature compensation accuracy
Ex.) Accuracy at the input range of 38 (-200.0 to 400.0°C), the operating ambient temperature of 35°C, and the temperature process value (PV) of 300°C
(Full scale) × (indication accuracy) + cold junction temperature compensation accuracy
= (400.0°C - (-200.0°C)) × (±0.007) + (±1.0°C)
= ± 5.2°C

*2: U.R.D.Co., LTD. For more information, visit http://www.u-rd.com/

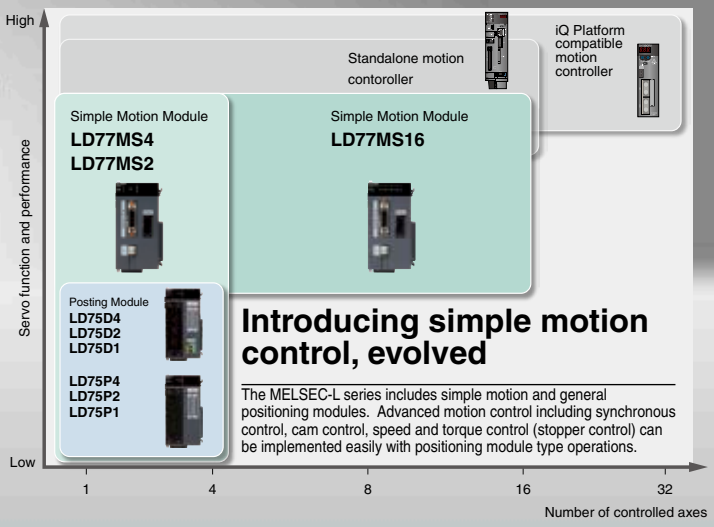
■ Control mode

Control mode	Contents	Number of controllable loops
Standard control	Performs the standard control of four channels.	Standard control 4 loops
Heating-cooling control (normal mode)	Performs the heating-cooling control. CH3 and CH4 cannot be used.	Heating-cooling control 2 loops
Heating-cooling control (expanded mode)	Performs the heating-cooling control. The number of loops is expanded using an output module and others in the system.	Heating-cooling control 4 loops
Mix control (normal mode)	Performs the standard control and the heating-cooling control. CH2 cannot be used.	Standard control 2 loops Heating-cooling control 1 loop
Mix control (expanded mode)	Performs the standard control and the heating-cooling control. The number of loops is expanded using an output module and others in the system.	Standard control 2 loops Heating-cooling control 2 loops

Control for each channel is as follows.

Channel	Standard control	Heating-cooling control		Mix control	
		Normal mode	Expanded mode	Normal mode	Expanded mode
CH1	Standard control	Heating-cooling control	Heating-cooling control	Heating-cooling control	Heating-cooling control
CH2	Standard control	Heating-cooling control	Heating-cooling control	—*3	Heating-cooling control*4
CH3	Standard control	—*3	Heating-cooling control*4	Standard control	Standard control
CH4	Standard control	—*3	Heating-cooling control*4	Standard control	Standard control

*3: Only temperature measurement using a temperature input terminal can be performed.
*4: Heating-cooling control is performed using an output module in the system.



Simple Motion Modules

SSCNET Ⅲ/H -compatible

LD77MS2

Number of control axes : 2 axes
Communication cycle : 150Mbps
Positioning data : 600 data/axis
Max. connection distance : 100m

LD77MS4

Number of control axes : 4 axes
Communication cycle : 150Mbps
Positioning data : 600 data/axis
Max. connection distance : 100m

LD77MS16

Number of control axes : 16 axes
Communication cycle : 150Mbps
Positioning data : 600 data/axis
Max. connection distance : 100m

*SSCNET(Servo System Controller NETwork)

Function		LD77MS2	LD77MS4	LD77MS16
Positioning control function		●	●	●
Speed/torque control function		●	●	●
Linear interpolation		2 axes	2/3/4 axes	2/3/4 axes
Circular interpolation		2 axes	2 axes	2 axes
Synchronous control function	External encoder	●	●	●
	Cam	●	●	●
	Phase compensation	●	●	●
Manual pulse generator operation function		●	●	●
OPR control function		●	●	●

Positioning Modules

Open collector output

LD75P1

Number of control axes : 1 axis
Max. output pulses : 200K pulses/s
Positioning data : 600 data/axis
Max. connection distance : 2m

LD75P2

Number of control axes : 2 axis
Max. output pulses : 200K pulses/s
Positioning data : 600 data/axis
Max. connection distance : 2m

LD75P4

Number of control axes : 4 axis
Max. output pulses : 200K pulses/s
Positioning data : 600 data/axis
Max. connection distance : 2m

Differential output

LD75D1

Number of control axes : 1 axis
Max. output pulses : 4M pulse/s
Positioning data : 600 data/axis
Max. connection distance : 10m

LD75D2

Number of control axes : 2 axis
Max. output pulses : 4M pulse/s
Positioning data : 600 data/axis
Max. connection distance : 10m

LD75D4

Number of control axes : 4 axis
Max. output pulses : 4M pulse/s
Positioning data : 600 data/axis
Max. connection distance : 10m

Function	LD75P1	LD75P2	LD75P4	LD75D1	LD75D2	LD75D4
	Open collector output			Differential output		
Positioning control function	●	●	●	●	●	●
Speed control function	●	●	●	●	●	●
Linear interpolation	—	2 axes	2/3/4 axes	—	2 axes	2/3/4 axes
Circular interpolation	—	2 axes	2 axes	—	2 axes	2 axes
OPR control function	●	●	●	●	●	●

Countless applications are possible

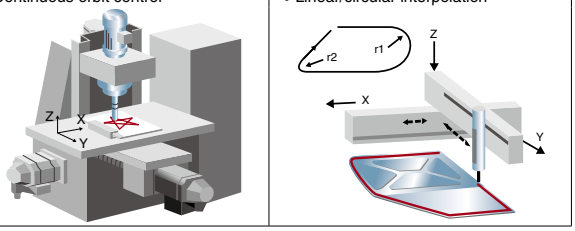
LD77MS□

A variety of control types including positioning control, speed control, torque control, cam control and synchronous control can be implemented easily with simple parameter settings and a sequence program.

Positioning control

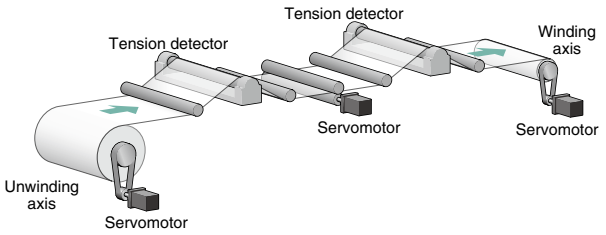
- Support for a multitude of applications thanks to a wide variety of control formats including linear interpolation control (up to 4 axes), 2-axis circular interpolation control, fixed feed control and continuous orbit control.
- Use a sequence program to set the positioning address, speed, etc. for easy automatic operation.
- Quickly implement powerful auxiliary functions such as step operation, target position change, M codes, and the skip function.

XY table	Sealant application
• 2-axis linear interpolation • 2-axis circular interpolation • 3-axis linear interpolation • Continuous orbit control	• Continuous orbit control • High-speed, high-accuracy orbit calculation • Linear/circular interpolation



Speed control and torque control

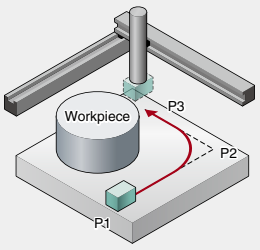
- Tension control applications such as winding and rewinding are supported.
- Switch from positioning control, to speed and torque control, and back to positioning control.
  Because the present location is tracked even in speed and torque control mode, it is possible to maintain the current absolute position when returning to positioning control.

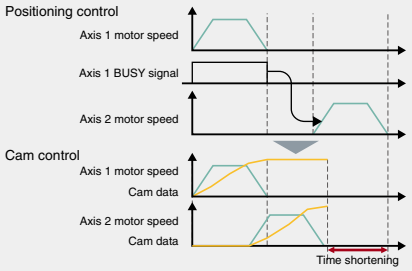


Cam control

- Cam control may be used alone or combined with synchronous control.

Example application for cam control:
To create a movement path around a workpiece using positioning control, axis 2 waits for axis 1 to complete the move from P1 to P2 before it begins moving from P2 to P3. By using cam control, axis 2 does not need to wait for axis 1 to complete its movement and the in position time can be shortened.



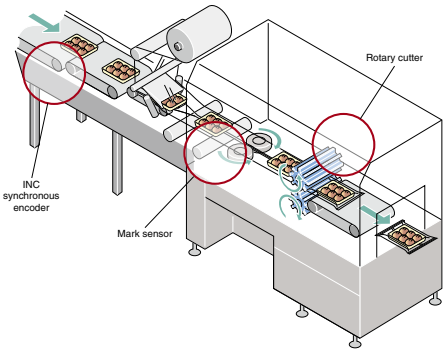


Many functions in a compact design

LD77MS□

Use a synchronous encoder with synchronous control

- Input pulses from a synchronous encoder can be used to perform synchronous control and cam control.
- The incremental synchronous encoder can be used by using the LD77MS built-in interface. An option unit is not required.
- To Further improve the synchronization accuracy, the phase compensation function, designed to compensate for synchronous encoder delays, can be used.

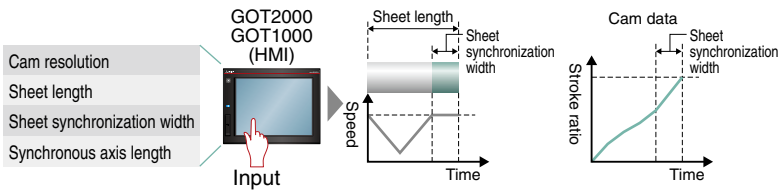


Standard mark detection function

- The built-in mark detection signal interface allows these units to be used in packaging systems for example, without additional option modules.

Automatic cam data generation for rotary cutter

- Complicated cam data for rotary cutters can be automatically generated just by specifying a few parameters like the sheet length and synchronization width.

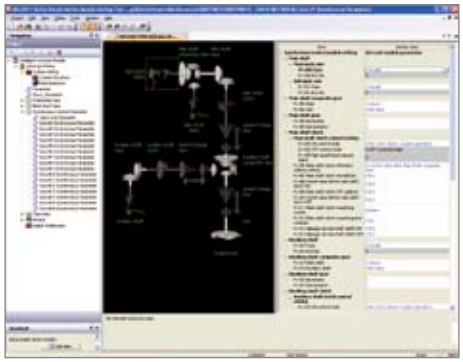


Perfect synchronous control is easy to achieve

LD77MS□

Replace mechanical gears, shafts, speed change gears, cams, etc. and generate synchronous control operations using software.

- Complicated programs are unnecessary for synchronous control because it can be implemented easily using parameter settings.
- Start and stop synchronous control for each axis. Use the synchronous control axis and positioning control axis together.
- Convey the travel value of main shaft to the output axis via the clutch.



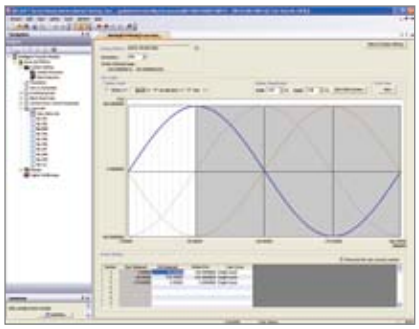
Synchronous Control Parameter Settings

Cam control made simple

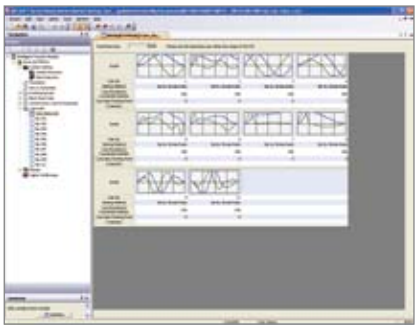
LD77MS□

Create cam data patterns easily.

- Create cam profiles unrestricted by existing concepts of electronic cam control.
- Change the acceleration, speed, stroke, and jerk while simultaneously seeing how it effects the profile.
- Easily check created cam data by viewing them as thumbnails.
- Import and export cam data in CSV format.



Cam Data



Cam Data List

Simplified debugging and commissioning

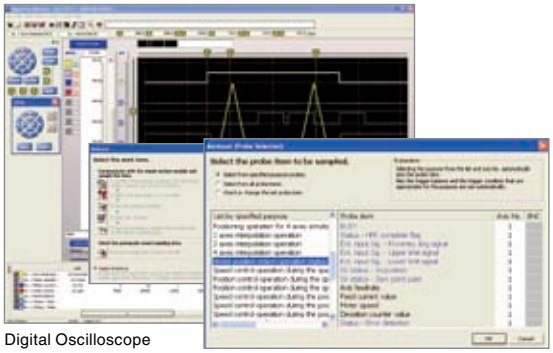
LD77MS□

Digital oscilloscope function

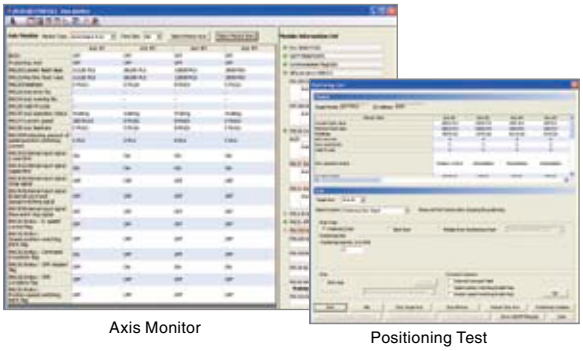
- Collection of data from the Simple Motion Module is synchronized with the operation cycle and waveform displays to facilitate an efficient start up.
- The assistant function explains each step.
- Use the purpose-based probe setting to easily set frequently-viewed data.
- Sample 16CH word and 16CH bit data and display 8CH words and 8CH bits in real time.

Monitor and test functions

- Complete the system installation and perform operational checks easily using powerful monitor and test functions.
- Select items to be displayed on the monitor using a wealth of information monitoring options.
- The test function can be used to check basic operations without a sequence program.



Digital Oscilloscope



Axis Monitor

Positioning Test

■ Specifications

Item			LD77MS2*1	LD77MS4	LD77MS16
Number of control axes			2 axes	4 axes	16 axes
Operation cycle			0.88ms/1.77ms*2		
Interpolation function			Linear interpolation(2 axes), Circular interpolation(2 axes)	2-axis/3-axis/4-axis linear interpolation, Circular interpolation(2 axes)	
Control system			PTP (Point To Point) control, path control (both linear and arc can be set), speed control, torque control, speed-position switching control, position-speed switching control		
Acceleration/deceleration process			Trapezoidal acceleration/deceleration, S-curve acceleration/deceleration		
Compensation function			Backlash compensation, Electronic gear, Near pass function		
Synchronous control			External encoder, Cam, Phase Compensation, Cam generated automatically		
Control unit			mm, inch, degree, pulse		
Positioning data			600 data (positioning data No. 1 to 600)/ axis (Can be set with GX Works2 or programmable controller program.)		
Backup			Parameters, positioning data, and block start data can be saved on flash ROM (battery-less backup)		
OPR control	Machine OPR control		Near-point dog method, Count method 1), Count method 2), Data set method, scale origin signal detection method		
	Fast OPR control		●		
	Sub functions		OPR retry, OP shift		
Position control	Position control	Linear control	1-axis linear control, 2-axis linear interpolation control, 3-axis linear interpolation control, 4-axis linear interpolation control*3 (Composite speed, Reference axis speed)		
		Fixed-feed control	1-axis fixed-feed control, 2-axis fixed-feed control, 3-axis fixed-feed control, 4-axis fixed-feed control		
		2-axis circular interpolation control	sub point designation, center point designation		
	Speed control		1-axis speed control, 2-axis speed control, 3-axis speed control, 4-axis speed control		
	Speed-position switching control		INC mode, ABS mode		
	Position-speed switching control		INC mode		
	Other control	Current value changing	Changing to a new current value using the positioning data , Changing to a new current value using the start No.		
		NOP instruction	●		
		JUMP instruction	Unconditional JUMP, Conditional JUMP		
		LOOP,LEND	●		
High-level positioning control			Block start, Condition start, Wait start, Simultaneous start, Repeated start		
Manual control	JOG operation		●		
	Inching operation		●		
	Manual pulse generator operation		Possible to connect 1 module (Incremental) Unit magnification (1 to 10000times)		
Expansion control	Speed-torque control		Speed control without positioning loops, Torque control without positioning loops		
Absolute position system			Connect a battery to the servo amplifier to ensure compatibility		
Synchronous encoder interface			Up to 4 channels (Total of the internal interface, interface via servo amplifier, and interface via the PLC CPU)		
	Internal interface		1 channel (Incremental)		
Functions that limit control	Speed limit function		Speed limit value, JOG speed limit value		
	Torque limit function		Torque limit value_same setting, torque limit value_individual setting		
	Forced stop function		valid/invalid setting		
	Software stroke limit function		Movable range check with current feed value, movable range check with machine feed value		
	Hardware stroke limit function		●		
Functions that change control details	Speed change function		●		
	Override function		●		
	Acceleration/deceleration time change function		●		
	Torque change function		●		
	Target position change function		Target position address and target position speed are changeable		
Other functions	M code output function		●		
	Step function		Deceleration unit step, Data No. unit step		
	Skip function		Via sequence CPU, Via external command signal		
	Teaching function		●		
Mark detection function			Mark detection mode (Continuous Detection mode, Specified Number of Detections mode, Ring Buffer mode)		
	Mark detection signal		2 points	4 points	
	Mark detection setting		4		16
Optional data monitor function			4 points/axis		
Master-slave operation function			●		
Amplifier-less operation function			●		
Digital oscilloscope function			Bit data :8 channels, Word data: 4 channels		Bit data: 16 channels, Word data: 16 channels *4
Starting time*5			1-axis linear control: 0.88ms 1-axis speed control: 0.88ms 2-axis linear interpolation control (Composite speed): 0.88ms 2-axis linear control (Reference axis speed): 0.88ms 2-axis circular interpolation control: 0.88ms 2-axis speed control: 0.88ms 3-axis linear interpolation control (Composite speed): 0.88ms 3-axis linear interpolation control (Reference axis speed): 0.88ms 3-axis speed control: 0.88ms 4-axis linear interpolation control: 0.88ms 4-axis speed control: 0.88ms		
Maximum distance between stations [m(ft.)]			100m		
Maximum number of modules specification			Counts as 2 modules		
Number of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)		
Servo amplifier connection system			SSCNET Ⅲ/H-compatible (1 system)		
5V DC internal current consumption			0.55A		0.7A
Weight			0.22kg		

*1: The maximum number of control axes for LD77MS2 is two axes. Use LD77MS4 or LD77MS16 to control three or more axes.
*2: Default value is 1.77 ms. If necessary, check the operation time and change to 0.88 ms.
*3: 4-axis linear interpolation control is enabled only at the reference axis speed.
*4: 8CH word data and 8CH bit data can be displayed in real time.
*5: The starting time varies with conditions. For details, refer to the manual.

■ Specifications

Item			LD75P1/LD75D1*1	LD75P2/LD75D2*1	LD75P4/LD75D4*1
Number of control axes			1 axis	2 axes	4 axes
Interpolation function			—	2-axis linear interpolation 2-axis circular interpolation	2-axis/3-axis/4-axis linear interpolation, 2-axis circular interpolation
Control system			PTP (Point To Point) control, path control (both linear and arc can be set), speed control, speed-position switching control, position-speed switching control		
Control unit			mm, inch, degree, pulse		
Positioning data			600 data (positioning data No.1 to 600)/axis (Can be set with peripheral device or sequence program.)		
Backup			Parameters, positioning data, and block start data can be saved on flash ROM (battery-less backup)		
Positioning control	Positioning control system	PTP*2 control	Increment system, absolute system		
		Speed-position switching control	Increment system, absolute system*3		
		Position-speed switching control	Increment system		
		Path control	Increment system, absolute system		
	Positioning control range	In absolute system	-214748364.8 to 214748364.7 (μm) -21474.83648 to 21474.83647 (inch) 0 to 359.99999 (degree) -2147483648 to 2147483647 (pulse)		
		In increment system	-214748364.8 to 214748364.7 (μm) -21474.83648 to 21474.83647 (inch) -21474.83648 to 21474.83647 (degree) -2147483648 to 2147483647 (pulse)		
		In speed-position switching control (INC mode)/ position-speed switching control	0 to 214748364.7 (μm) 0 to 21474.83647 (inch) 0 to 21474.83647 (degree) 0 to 2147483647 (pulse)		
		In speed-position switching control (ABS mode)*3	0 to 359.99999 (degree)		
	Speed command		0.01 to 20000000.00 (mm/min) 0.001 to 2000000.000 (inch/min) 0.001 to 2000000.000 (degree/min) 1 to 4000000 (pulse/s)		
	Acceleration/deceleration system selection		Trapezoidal acceleration/deceleration, S-curve acceleration/deceleration		
	Acceleration/deceleration time		1 to 8388608ms Four patterns can be set for each of acceleration time and deceleration time		
	Sudden stop deceleration time		1 to 8388608ms		
OPR method			6 types		
Starting time*4			1-axis linear control: 1.5ms 1-axis speed control: 1.5ms 2-axis linear interpolation control (Composite speed): 1.5ms 2-axis linear control (Reference axis speed): 1.5ms 2-axis circular interpolation control: 2.0ms 2-axis speed control: 1.5ms 3-axis linear interpolation control (Composite speed): 1.7ms 3-axis linear interpolation control (Reference axis speed): 1.7ms 3-axis speed control: 1.7ms 4-axis linear interpolation control: 1.8ms 4-axis speed control: 1.8ms		
Maximum output pulse		LD75P□	200kpulse/s		
		LD75D□	4Mpulse/s		
Maximum connection distance between drive units		LD75P□	2m		
		LD75D□	10m		
Maximum number of modules specification			Counts as 2 modules		
Number of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)		
External connections			40-pin connector		40-pin connector ×2
5V DC internal current consumption		LD75P□	0.44A	0.48A	0.55A
		LD75D□	0.51A	0.62A	0.76A
Weight			0.18kg		

*1: LD75P□ refers to the open collector output type, and LD75D□ refers to the differential driver output type.
*2: The abbreviation for Point To Point, referring to position control.
*3: In speed-position switching control (ABS mode), "degree" is the only control unit available.
*4: Starting times may vary depending on conditions. For details, refer to the manual.

High-Speed Counter Modules

DC input

LD62

Number of channels : 2 channels
5/12/24V DC input
Max. counting speed : 200K pulses/s

Differential input

LD62D

Number of channels : 2 channels
Differential driver input
Max. counting speed : 500K pulses/s

Function	LD62	LD62D
	DC input	Differential input
Linear counter function	●	●
Ring counter function	●	●
Coincidence output function	●	●
Preset function	●	●
Disable count function	●	●
Latch counter function	●	●
Sampling counter function	●	●
Periodic pulse counter function	●	●

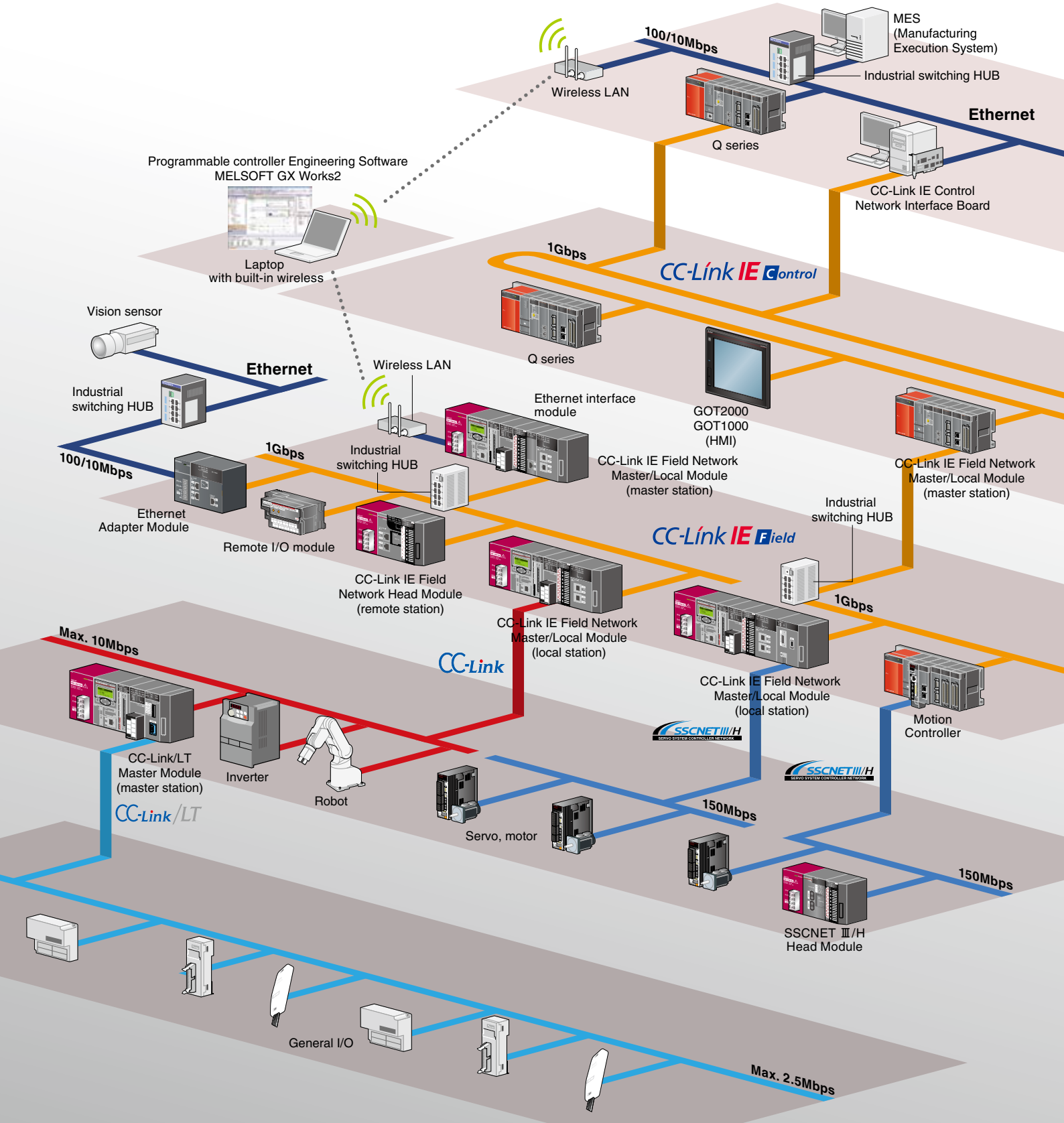
■ Specifications

Item			LD62 [DC input]	LD62D [Differential input]
Number of channels			2 channels	
Counting speed switch setting			10K pulses/s, 100K pulses/s, 200K pulses/s	10K pulses/s, 100K pulses/s, 200K pulses/s, 500K pulses/s
Count input signal	Phase		1-phase input (multiple of 1/2), CW/CCW, 2-phase input (multiple of 1/2/4)	
	Signal level (A, B)		5/12/24V DC 2 to 5mA	EIA Standard RS-422-A differential type line driver level (Equivalent with AM26LS31 (manufactured by Texas Instruments Japan Limited))
Counter	Maximum counting speed*1		200K pulses/s	500K pulses/s
	Counting range		-2147483648 to 2147483647	
	Type		UP/DOWN preset counter and ring counter functions	
	Minimum count pulse width (Duty ratio 50%)		10K pulses/s: 50µs 100K pulses/s: 5µs 200K pulses/s: 2.5µs	10K pulses/s: 50µs 100K pulses/s: 5µs 200K pulses/s: 2.5µs 500K pulses/s: 1µs
	Minimum phase differential for 2-phase input		10K pulses/s: 25µs 100K pulses/s: 2.5µs 200K pulses/s: 1.25µs	10K pulses/s: 25µs 100K pulses/s: 2.5µs 200K pulses/s: 1.25µs 500K pulses/s: 0.5µs
Coincidence output	Comparison range		Binary with 32-bit code (-2147483648 to 2147483647)	
	Comparison result		Set value < Count value Set value = Count value Set value > Count value	
External input	Preset		5/12/24V DC 2 to 5mA	5/12/24V DC 2 to 5mA (Differential type line drivers conforming to EIA standard RS-422-A are also applicable.)
	Function start			
	Minimum input response time	OFF to ON	Function start: 0.5ms	
		ON to OFF	Function start: 1ms	
External output	Coincidence output		2 points/channel	
	Output voltage/current		12 to 24V DC 0.5A	
	Output response time	OFF to ON	0.1ms or less (rated load, resistive load)	
		ON to OFF		
Maximum number of modules specification			Counts as 1 module	
Number of occupied I/O points			16 points (I/O assignment: Intelligent 16 points)	
External connections			40-pin connector	
5V DC internal current consumption			0.31A	0.36A
Weight			0.13kg	

*1: The counting speed is affected by the rising/falling pulse speed. For details, refer to the corresponding manual.

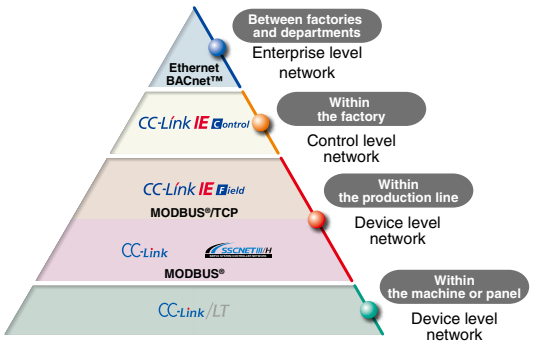
Seamless integration of multiple networks

Today there is an increasing demand from automation fields for high speed control, effective management of data, flexible wiring, easy parameter settings, and predictive maintenance. To answer these demands, Mitsubishi Electric has teamed up with the CC-Link Partner Association to provide reliable, open-standards networks that operate seamlessly with one another. Together, these and other Mitsubishi networks allow for flexible integration at any automation network level. The latest addition to the CC-Link portfolio is IE Field; an Ethernet based gigabit network designed to provide cost-effective, reliable connectivity to field devices.



Seamless communication

Seamless data communication through Ethernet, CC-Link IE Control, CC-Link IE Field, and CC-Link networks allow easy access to information, no matter where it resides on the network. Through this technology, it is possible to “drill down” from the Enterprise or IT layer through multiple networks accessing programming controllers using GX Works2 programming or other related software.
In addition, many devices supporting SLMP*1 such as vision sensors and RFID controllers may be connected to the CC-Link IE Field Network.
*1: SLMP (SeamLess Message Protocol) is a protocol advocated by the CC-Link Partner Association.



CC-Link IE Control

CC-Link IE Control is a high-reliability distributed control network designed to handle very large data communications (128 K word) over a high-speed (1Gbps) dual loop optical cable topology.
*: L series does not support the CC-Link IE Controller Network.

CC-Link IE Field

CC-Link IE Field is an all-round versatile gigabit Ethernet based network integrating controller, I/O control, safety control, and motion control in a flexible wiring topology supporting star, ring, and line configurations.
*: Compatible modules: LJ71GF11-T2, LJ72GF15-T2

CC-Link

CC-Link is a high-speed and high-reliable deterministic I/O control network which realizes reduced wiring whilst offering multi-vendor compatible products. This open field network is a global standard originating from Japan and Asia.
*: Compatible modules: L26CPU-BT, L26CPU-PBT, LJ61BT11

SSCNETIII/H

SERVO SYSTEM CONTROLLER NETWORK

SSCNETIII/H is a dedicated high-speed, high-performance, and highly reliable servo system control network which offers flexible long distance wiring capabilities based on optical fiber cable topology.
*: Compatible modules: LD77MS2, LD77MS4, LD77MS16, LJ72MS15

CC-Link/LT

CC-Link/LT is a wire-saving sensor level network which is designed for use in panels between simple discrete devices. Its wiring system is based on reducing incorrect wiring and is based on CC-Link realizing high-speed and robust noise resistance features.
*: Compatible module: LJ61CL12

MODBUS®

L-series is now supporting the open FA MODBUS® protocol network, realizing easy communication , with various MODBUS® slave devices compatible with Ethernet MODBUS®/TCP or RS-232/422/485 serial communication.
*: Module supporting MODBUS®/TCP : L02CPU(-P), L06CPU(-P), L26CPU(-P), L26CPU-(P)BT, LJ71E71-100 (master only)
*: Modules supporting MODBUS®: L6ADP(-R2/R4), LJ71C24(-R2) (master only)

BACnet™

This network supports the communication protocol standard BACnet™ client function. This network is mainly used to monitor and control air-conditioning, lighting and fire detection, etc. in building automation system applications.
*: Compatible modules: L02CPU(-P), L06CPU(-P), L26CPU(-P), L26CPU-(P)BT, LJ71E71-100 (client only)

Application / Network	Enterprise level network	Control level network	Device level network			Sensor level network
	Information communication	Controller distributed control	I/O control	Safety control	Motion control	Control
Ethernet	●					
CC-Link IE Control		●				
CC-Link IE Field		●	●	●	●	
CC-Link			●			
CC-Link/LT						●
SSCNET Ⅲ/H					●	
BACnet™	●					
MODBUS®/TCP		●				
MODBUS®			●			

CC-Link IE Field Network Master/Local Module

CC-Link IE Field

LJ71GF11-T2

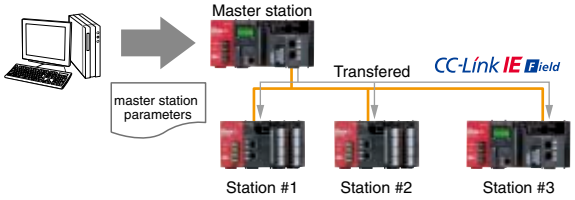
CC-Link IE Field Master/local station
Communication speed : 1Gbps
Remote I/O : 16384 points
Remote register : 8192 words
*: Supported by CPUs whose first five serial number digits are "13012" or later.

CC-Link IE Field

Easy to configure settings

Network parameters are configured using the engineering tool, GX Works2. Only the master station needs to be configured, thereby greatly simplifying the network setup. Updating the system configuration is a breeze.

Master station settings are all that is required!

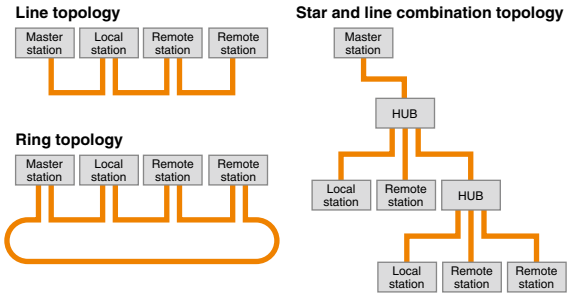


Flexible network topology

Various network topologies are supported including star, line, star and line combination, and ring. When hubs*1 are used, new equipment can be added and machine layouts can be changed easily.

*1: Hubs cannot be used in a ring configuration.

■ **Examples of network topologies**



■ Specifications

Item			LJ71GF11-T2
Transmission speed			1Gbps
Maximum overall cable distance (Maximum transmission distance)		Line topology	12000m (when cables are connected to 1 master station and 120 slave stations)
		Star topology	Depends on the system configuration
		Ring topology	12100m (when cables are connected to 1 master station and 120 slave stations)
Maximum number of connected stations		Master station	1 station (Up to 120 slave stations can be connected to the master station)
		Local station	120 stations
Maximum link points per station		Remote register (RWw)	8192 points, 16KB
		Remote register (RWr)	8192 points, 16KB
		Remote input (RX)	16384 points, 2KB
		Remote output (RY)	16384 points, 2KB
Maximum link points per station	Master station	Remote register (RWw)	8192 points, 16KB
		Remote register (RWr)	8192 points, 16KB
		Remote input (RX)	16384 points, 2KB
		Remote output (RY)	16384 points, 2KB
	Local station	Remote register (RWw)	8192 points, 16KB (also including the send range of own station)
		Remote register (RWr)	8192 points, 16KB
		Remote input (RX)	16384 points, 2KB
		Remote output (RY)	16384 points, 2KB (also including the send range of own station)
Network topology			Line topology, star topology (Coexistence of line topology and star topology is possible.), and ring topology
Communication method			Token passing method
Communication port			CC-Link IE Field Network port x 2
RAS function			Automatic return, Slave station disconnection, Loopback function
Connection cable*2			Ethernet cable of category 5e or higher (Double shielded cable) which satisfies 1000BASE-T standard
Maximum number of modules specification			Counts as 2 modules
Number of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)
5V DC internal current consumption			0.89A
Weight			0.27kg

*2: Straight through cable

CC-Link IE Field Network Head Module

CC-Link IE Field

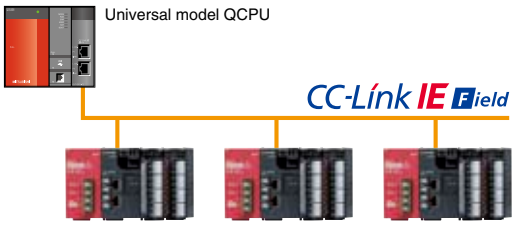
LJ72GF15-T2

CC-Link IE Field Intelligent device station
Communication speed : 1Gbps
Remote I/O: 2048 points
Remote register: 1024 words
RAS function
*: END cover is included.

CC-Link IE Field

CC-Link IE Field Network remote I/O station

L series I/O and intelligent function modules can be connected to the remote I/O head module without a dedicated CPU. There are many benefits to using intelligent device stations including reduced CPU and wiring costs, great flexibility in selecting I/O and intelligent function modules, and compact unit size.

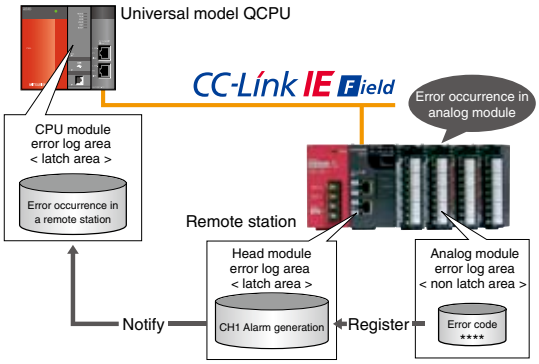


Modules compatible with the CC-Link IE Field Network head module

Item	
I/O module	Input, Output, I/O Combined
Analog module	Analog input, Analog output, Analog input/output
Temperature Control module	
Simple Motion Module	
Positioning Module	
High-speed counter module	
Network module	CC-Link, CC-Link/LT, Serial communication

RAS (Reliability, Availability, Serviceability) functions

One feature of RAS is to store all remote station error histories in the master station's latched memory. This preserves the error information in one place in the event of power loss and allows for easy troubleshooting. Other RAS features include network event logging, unit error logging, and testing and monitoring capabilities.



■ Specifications

Item		LJ72GF15-T2
Transmission speed		1Gbps
Maximum overall cable distance (Maximum transmission distance)	Line network topology	12000m (with 1 master and 120 slaves connected)
	Star network topology	Depends on the system configuration
	Ring network topology	12100m (with 1 master and 120 slaves connected)
Transmission path		Line, star, line and star mixed, or ring topology
Communication method		Deterministic (token passing)
Maximum number of modules specification*1		10
Communication port		CC-Link IE Field Network port x 2
RAS function		Network event logging, unit error logging, testing, monitoring, and error history preservation function
Connection cable*2		Ethernet cable of category 5e or higher (Double shielded cable) which satisfies 1000BASE-T standard
5V DC internal current consumption		1.00A
Weight		0.23kg

*1: The total number of modules that can be mounted to a CC-Link IE Field Network head module. (END cover and power supply module are not included.)
*2: Straight through cable

CC-Link Master/Local Module

CC-Link

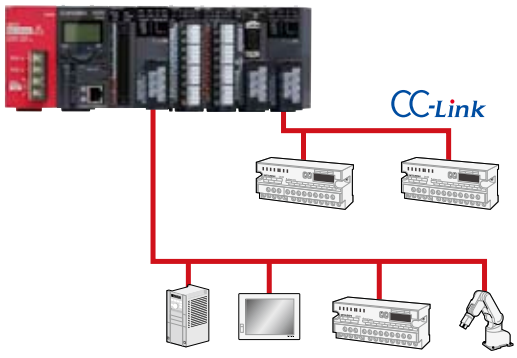
LJ61BT11

CC-Link Master/local station
Max. communication speed : 10Mbps
Remote I/O: 8192 points*1
Remote register : 2048 words*1
*1: Link points for CC-Link Ver.2.0 master station

CC-Link V2

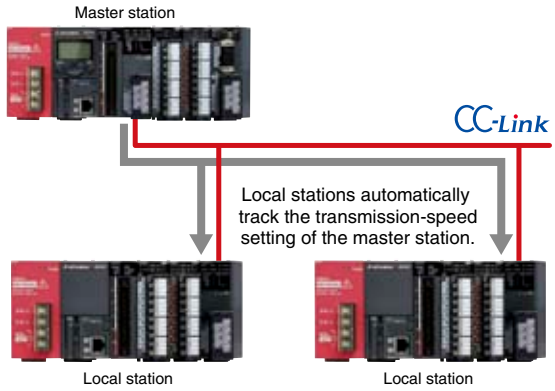
Connect with a huge selection of device types using CC-Link

With such a large selection of CC-Link open network compatible devices, constructing a control system is easy.
Even applications requiring vast amounts of data transmissions can be satisfied because CC-Link Ver.2.0 is supported.



Local stations do not require transmission speed settings

Transmission speed auto-tracking function
When used as a local station, no transmission speed setting is required; the setting is made through automatic detection of the master station setting.
The current transmission speed in is indicated by an LED on the front surface of the module.



■ Specifications

Item		LJ61BT11
Transmission speed		156kbps/625kbps/2.5Mbps/5Mbps/10Mbps
Maximum overall cable distance (Maximum transmission distance)		1200m (without repeater, varies according to the transmission speed)
Maximum number of connected stations (master station)		64
Number of occupied stations (local station)		1 to 4 stations (The number of stations can be switched using the GX Works2 parameter setting)
Maximum number of link points per system*2	Remote I/O (RX, RY)	2048 points
	Remote register (RWw)	256 points (master station → remote device station/local station/intelligent device station/standby master station)
	Remote register (RWr)	256 points (remote device station/local station/intelligent device station/standby master station → master station)
Number of link points per station*2	Remote I/O (RX, RY)	32 points (local station is 30 points)
	Remote register (RWw)	4 points (master station → remote device station/local station/intelligent device station/standby master station)
	Remote register (RWr)	4 points (remote device station/local station/intelligent device station/standby master station → master station)
Communication method		Broadcast polling method
Synchronous method		Frame synchronization method
Encoding method		NRZI method
Transmission path		Bus (RS-485)
Transmission format		Conforms to HDLC
Error control system		CRC ($X^{16}+X^{12}+X^{5}+1$)
RAS function		Automatic return function Slave station cut-off function Error detection via link special relay/register
Connection cable		CC-Link dedicated cables compatible with Ver.1.10
Maximum number of modules specification		Counts as 1 module
Number of occupied I/O points		32 points (I/O assignment: Intelligent 32 points)
5V DC internal current consumption		0.46A
Weight		0.15kg

*2: Indicates the number of link points for Remote net Ver.1 mode.

CC-Link/LT Master Module

CC-Link/LT

LJ61CL12

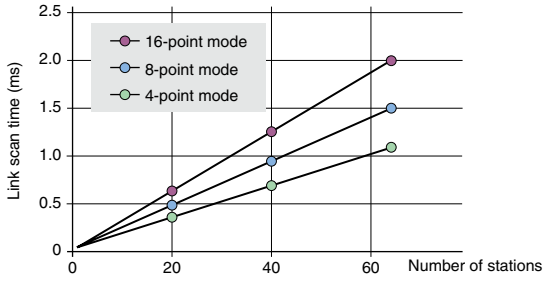
CC-Link/LT Master station
Max. communication speed : 2.5Mbps
Remote I/O : 1024 points*1
*1: When in 16-point mode

CC-Link/LT

High speed equipment response

CC-Link/LT has an excellent response time. With 64 stations and a transmission speed of 2.5Mbps, the maximum link scan time is just 1.2ms. According to the transmission distance required, it is possible to select speeds of 2.5Mbps, 625kbps, or 156kbps.

■ **CC-Link/LT link scan time (using a transmission speed of 2.5Mbps)**



Simple networking that 'just works'

There are no confusing parameters settings to make, and with remote I/O, only the master station needs to set the transmission speed.

■ Specifications

Item				LJ61CL12		
Point mode				4-point mode	8-point mode	16-point mode
Control specifications	Maximum link points (the same I/O address used)			256 points (512 points)	512 points (1024 points)	1024 points (2048 points)
	Link points per station (the same I/O address used)			4 points (8 points)	8 points (16 points)	16 points (32 points)
	Link scan time	32 stations connected	Points	128 points	256 points	512 points
			2.5Mbps	0.7ms	0.8ms	1.0ms
			625kbps	2.2ms	2.7ms	3.8ms
			156kbps	8.0ms	10.0ms	14.1ms
		64 stations connected	Points	256 points	512 points	1024 points
			2.5Mbps	1.2ms	1.5ms	2.0ms
			625kbps	4.3ms	5.4ms	7.4ms
			156kbps	15.6ms	20.0ms	27.8ms
Communication specifications	Transmission speed			2.5Mbps/625kbps/156kbps		
	Communication method			BITR method (Broadcastpolling + Interval Timed Response)		
	Network topology			T-branch type		
	Error control system			CRC		
	Number of connectable modules			64		
	Remote station number			1 to 64		
	Installation position of master station			End of a trunk line		
	RAS function			Network diagnostics, internal loopback diagnostics, slave station cutoff function, automatic return function		
	Connection cable*2			Dedicated flat cable (0.75mm^2 × 4)*3, VCTFcable*4, flexible cable*3		
Maximum number of modules specification				Counts as 1 module		
Number of occupied I/O points*5				16, 32, 48, 64, 128, 256, 512, or 1024 points (I/O assignment: Intelli.)		
5V DC internal current consumption				0.16A		
24V DC power supply*6		Voltage		20.4 to 28.8V DC		
		Current consumption		0.03A		
		Current on startup		0.07A		
Weight				0.12kg		

*2: When the cables other than dedicated flat cables, VCTF cables, and flexible cables are used, performance of CCLink/LT is not guaranteed.
*3: Use the dedicated flat cables and flexible cables accredited by CC-Link Partner Association. CC-Link Partner Association website: http://www.cc-link.org/
*4: Refer to the manual for details regarding VCTF cable specifications.
*5: Set the number of occupied I/O points using the operation setting switch. Refer to the manual for details.
*6: 24V DC power supply is supplied through the dedicated power supply or power supply adapter.

SSCNET Ⅲ/H Head Module

SSCNETⅢ/H

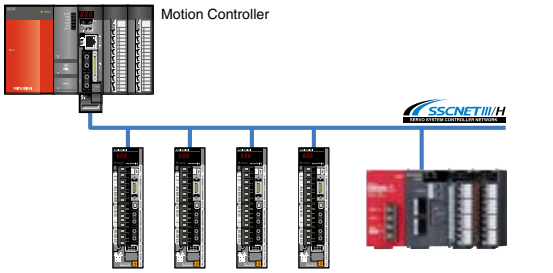
LJ72MS15

SSCNETⅢ/H Remote station
Communication speed : 150Mbps
*: END cover is included.

SSCNETIII/H
SERVO SYSTEM CONTROLLER NETWORK

SSCNET Ⅲ/H remote station

The SSCNET Ⅲ/H head module is used to connect the MELSEC-L Series I/O and intelligent function modules to the SSCNET Ⅲ/H network.
Functioning as the motion controller's remote station, flexible system configuration can be achieved while realizing reduced system wiring and a smaller footprint.
In addition, modules installed on the SSCNET Ⅲ/H head module can be used as a motion controller input/output using cyclic transmission.



■ SSCNET Ⅲ/H Head Module compatible modules

Product	
I/O module	Input, Output, I/O Combined
Analog module	Analog input, Analog output, Analog I/O combined
High-Speed Counter Modules	

■ Compatible motion controller

Category	Model
Motion CPU	Q172DSCPU
	Q173DSCPU
Standalone motion controller	Q170MSCPU

■ Specifications

Item		LJ72MS15
Maximum link points per network	RWr,RX	256 bytes
	RWw,RY	256 bytes
Maximum link points per station	RWr,RX	64 bytes
	RWw,RY	64 bytes
Communication speed		150Mbps
Maximum connectable stations per network*1	Communication cycle: 888μs	4
	Communication cycle: 444μs	2
	Communication cycle: 222μs	1
Maximum station-to-station distance		POF type: 20m, H-PCF type: 50m
Connection method		Daisy chain connection (Regenerative relay system with a servo amplifier)
Synchronous method		Synchronization of the control cycle and communication cycle that synchronize with the data transmission of the Motion controller
Communication cycle		222μs/444μs/888μs
Maximum number of modules specification*2		10
Communication port		SSCNET Ⅲ/H port 2x
Connection cable		SSCNET Ⅲ cable (optical fiber cable)
5V DC internal current consumption		0.55A
Weight		0.20kg

*1: This number includes only head modules. Servo amplifiers are not included.
*2: Total number of occupied modules that can be mounted on SSCNET III/H head module. (Does not include in END cover or power supply module.)

Ethernet Interface Module

LJ71E71-100

Communication speed : 100Mbps/10Mbps
MELSOFT connection
SLMP communication (MC protocol)
Predefined protocol support function
E-mail function
Web function

BACnet™
MODBUS®/TCP

Modify/collect CPU data from other devices

SLMP (MC protocol) communication *1

SLMP (Seamless Message Protocol) realizes seamless communication across devices on Ethernet that support the SLMP protocol.

*1: This function can be used with modules with first five serial number digits are “15042” or later.

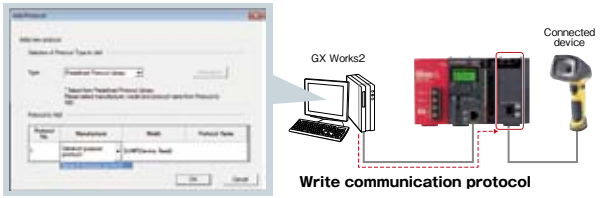
MELSOFT connection

The MELSOFT connection feature realizes the connection to various MELSOFT products including the GX Works2 programming tool. In addition, by using together with the MX Component communication support tool (optional product), custom communications programs can be created, without having to consider any dedicated protocol (send/receive procedure).

Easily connect to BACnet™ and MODBUS®/TCP

Predefined Protocol support function

Use the GX Works2 Predefined Protocol support function to easily set the required protocol for communicating with other devices.



► Selecting from the communication protocol library
Easily communicate with target devices by selecting a prepared protocol. The communication protocol library supports the SLMP, MODBUS®/TCP and BACnet™ client functions.

► Randomly preparing and editing a protocol
By creating a random protocol with the predefined protocol support function, data can be exchanged with a protocol that matches the target device.

■ Specifications

Item			LJ71E71-100	
Standard			100BASE-TX	10BASE-T
Transmission specifications	Data transmission speed		100Mbps	10Mbps
	Interface		RJ45 (AUTO MDI/MDI-X)	
	Communication mode		Full duplex/Half duplex	Half duplex
	Transmission method		Base band	
	Maximum segment length		100m (length between a hub and node)*2	
	Maximum number of cascade connections		Cascade connection (maximum of 2 levels)*3	Cascade connection (maximum of 4 levels)*3
Sending/ receiving data storage memory	Number of simultaneous open connections		16 connections (Connections usable on a program)	
	Fixed buffer		1K word × 16	
	Random access buffer		6K words × 1	
	E-mail	Attachment	6K words × 1	
		Main text	960 words × 1	
Maximum number of modules specification			Counts as 1 module	
Number of occupied I/O points			32 points (I/O assignment: Intelligent 32 points)	
5V DC internal current consumption			0.60A	
Weight			0.18kg	

*2: For the maximum segment length (a length between hubs), consult with the manufacturer of the switching hub used.
*3: This applies when a repeater hub is used. For the number of levels that can be constructed when a switching hub is used, consult with the manufacturer of the switching hub used.

Serial Communication Modules

RS-232, RS-422/485

LJ71C24

Max. communication speed : 230.4kbps*1
MC protocol communications
Predefined protocol support function
*1: Available for only channel 1

MODBUS®

RS-232

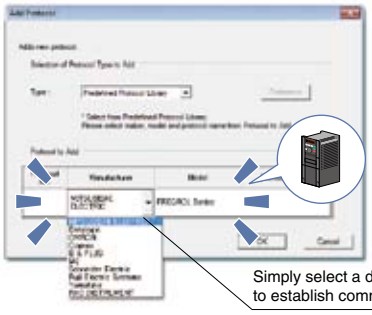
LJ71C24-R2

Max. communication speed : 230.4kbps*1
MC protocol communications
Predefined protocol support function
*1: Available for only channel 1

MODBUS®

Quick connection using predefined protocols

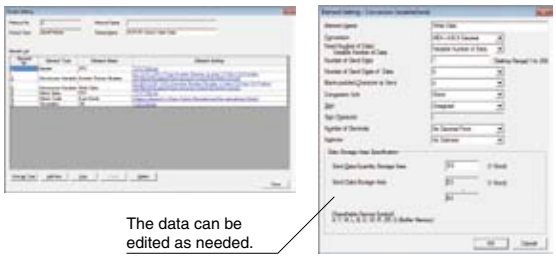
The predefined protocol enables easy setup of protocols to communicate with external devices using GX Works2. Connections are quickly setup by selecting the target device from the communications protocol library.



Simply select a device you want to establish communication with

Easy to create/edit of predefined protocols

Easily create or edit predefined protocols from within the communications library.
Even if the target device protocol is not listed, it can be added easily to the existing library.



The data can be edited as needed.

■ Specifications

Item		LJ71C24	LJ71C24-R2
Interface	CH 1	RS-232 compliant (D-Sub 9P female)	RS-232 compliant (D-Sub 9P female)
	CH 2	RS-422/485 compliant (2-piece terminal block)	RS-232 compliant (D-Sub 9P female)
Communication system	Line	Full-duplex/half-duplex communications	
	MC protocol	Half-duplex communications	
	Predefined protocol	Full-duplex/half-duplex communications	
	Nonprocedural protocol		
	Bidirectional protocol		
Synchronization method		Start-stop synchronization method	
Transmission speed		50bps/300bps/600bps/1200bps/2400bps/4800bps/9600bps/14.4kbps/ 19.2kbps/28.8kbps/38.4kbps/57.6kbps/115.2kbps/230.4kbps Transmission speed 230.4kbps is only available for channel 1. Total transmission speed of two interfaces is available up to 230.4kbps. Total transmission speed of two interfaces is available up to 115.2kbps when the communication data monitoring function is used.	
Data foramat	Start bits	1	
	Data bits	7 or 8	
	Parity bits	1 (vertical parity) or none	
	Stop bits	1 or 2	
Error detection	Parity check	All protocols and when ODD/EVEN is selected by parameter.	
	Sum check code	MC protocol/bidirectional protocol selected by parameter. For the predefined protocol, whether or not a sum check code is needed depends on the selected protocol. Nonprocedural protocol selected by user frame.	
Transmission control		See table below	
Maximum number of modules specification		Counts as 1 module	
Number of occupied I/O points		32 points (I/O assignment: Intelligent 32 points)	
5V DC internal current consumption		0.39A	0.26A
Weight		0.17kg	0.14kg

	RS-232	RS-422/485
DTR/DSR (ER/DR) control	Enabled	Disabled
RS/CS control	Enabled	Disabled
CD signal control	Enabled	Disabled
DC1/DC3 (Xon/Xoff) control DC2/DC4 control	Enabled	Enabled

• DTR/DSR signal control and DC code control are selected by the user.

Ethernet and CC-Link IE Field related products

Wireless LAN Adapter Ethernet

NZ2WL-US (U.S.A)*1*2, NZ2WL-EU (Europe)*1*2, NZ2WL-CN (China)*1*2, NZ2WL-KR (Korea)*1*2, NZ2WL-TW (Taiwan)*1*2

Features

- Wireless LAN (Ethernet) in the factory provides flexibility in installing new line or alteration layouts.Wireless saves your wiring costs.
- Simply installing wireless LAN adapters makes existing FA equipment wireless.
- Compatible with the latest security standards of WPA2/WPA. The security prevents unauthorized access from outside.

*1: Each product can be used only in the respective countries.
*2: Supported both Access point and Station. They can be used by changing the setting.

The wireless LAN adapters were developed and are produced with CONTEC Co., ltd.
Please note that the general specifications and guarantee conditions of these products are different from those of programmable controllers (such as MELSEC series) and CONTEC products.
Refer to the manual for details on the product.

Industrial Switching HUB CC-Link IE Field Ethernet

NZ2EHG-T8 / NZ2EHF-T8*3

Features

- NZ2EHG-T8 is compatible with transmission rates of 10 Mbps, 100 Mbps, and 1 Gbps.
- NZ2EHF-T8 is compatible with transmission rates of 10 Mbps and 100 Mbps.
- These switching hubs comply with IEEE802.3ab (1000 BASE-T), IEEE802.3u(100 BASE-TX), IEEE802.3 (10 BASE-T) standards.
- AutoMDI/MDI-X and auto-negotiation are available.
- The automatic power adjustment function can reduce power consumption by up to 80 percent.*4
- These hubs do not use cooling fans, and yet a wide ambient-temperature operating range is permissible (0 to 50°C).
- Quick detach mechanism allows easy DIN rail attachment and detachment.

*3: This model may not be connected directly to the CC-Link IE Field Network (1 Gbps). An Ethernet adapter module NZ2GF-ETB is required. For direct use with the CC-Link IE Field Network, please use NZ2EHG-T8.
*4: For comparison, power consumption was measured when all 8 ports were used and when none of them were used. This function is only available for NZ2EHG-T8.

This series was developed and is produced with Contec Co. Ltd. Please note that the specifications and guarantee conditions of these products are different from those of MELSEC products.
Please refer to the product manual for details.

1Gbps 100Mbps

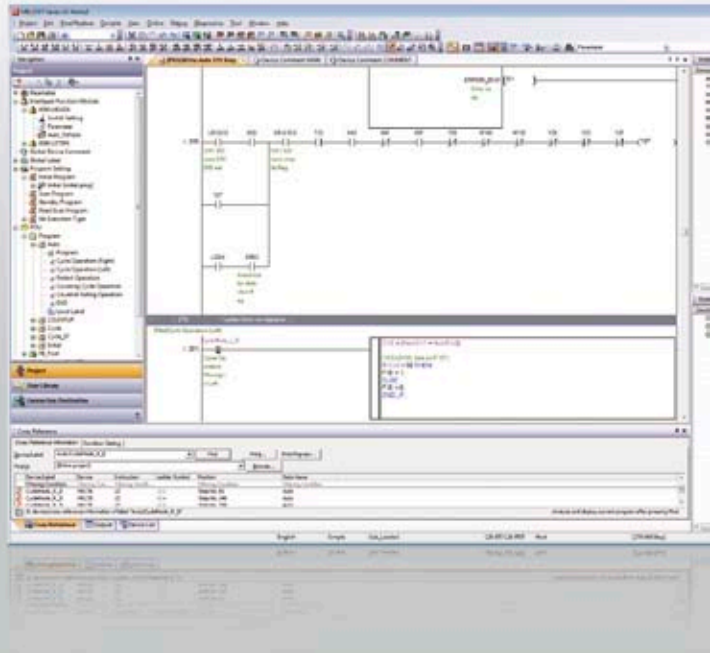
CC-Link IE Field Network Ethernet Adapter Module CC-Link IE Field Ethernet

NZ2GF-ETB

Features

- Using Seamless Message Protocol (SLMP*5), a variety of Ethernet devices such as vision sensors and RFID controllers can be connected to the CC-Link IE Field Network.
- Use a web browser to set station numbers, Ethernet options, and view error history.
- This Ethernet adapter module is compatible with transmission rates of 100 Mbps and 1 Gbps.

*5: SLMP (SeamLess Message Protocol) is a protocol advocated by the CC-Link Partner Association.



Increase productivity and lower the total cost of ownership.

Introducing the next generation of IA programming software:

GX Works2

GX Works2 focuses on driving down total cost by including features that speed up commissioning, reduce downtime, improve programming productivity, and provide strong security.

User interface that is "easy to use" by design

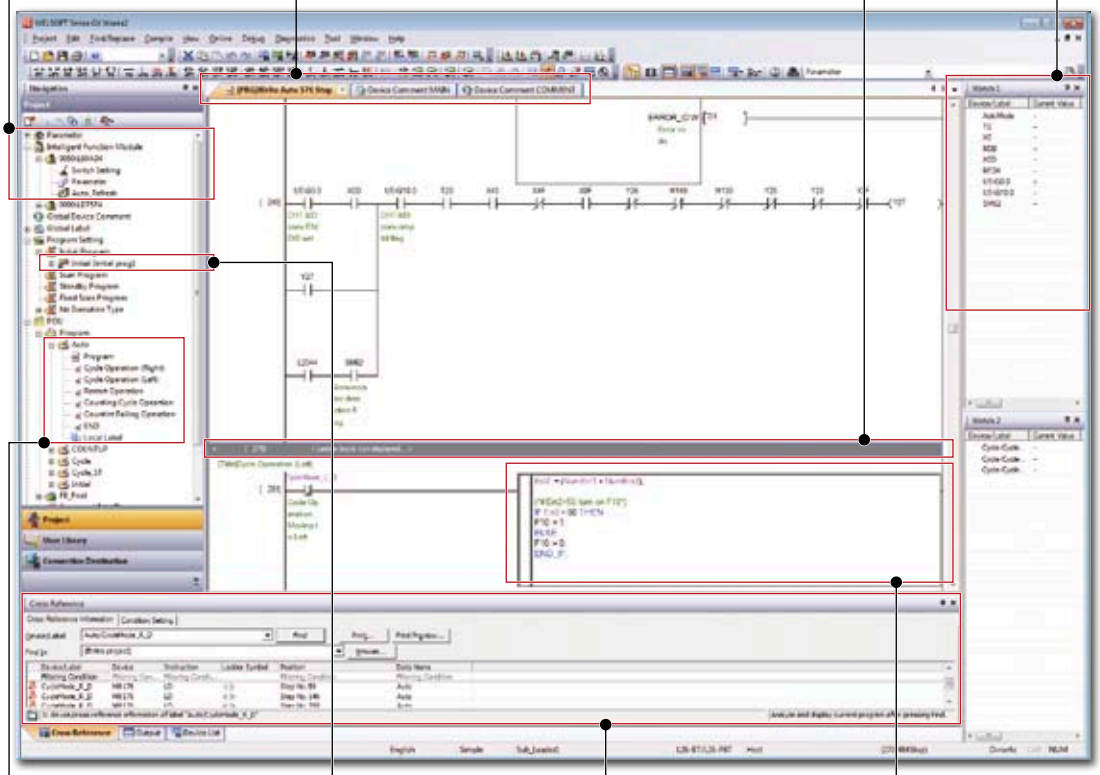
The programming tool GX Works2 has been developed from the ground up to be intuitive for all users and allow anyone to begin programming easily. The user interface and other functions provide a comfortable programming environment that enables improvements in design efficiency.

Fully integrated intelligent function module management tools.

Use tabs to easily switch between programs, parameters, and other screens.

Improve readability by hiding ladder rungs not relevant to the current operation.

Use "Watch windows" to conveniently monitor pertinent values.



Project tree gives compressive look at flow of information in program and structure.

Program titles help to identify the content of each program.

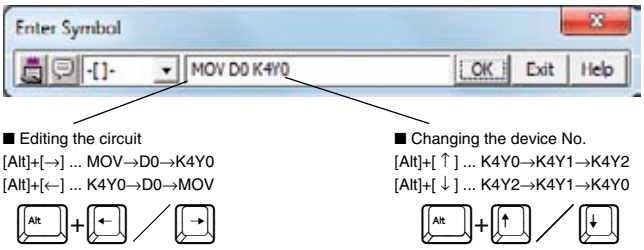
Cross reference devices and labels with ease.

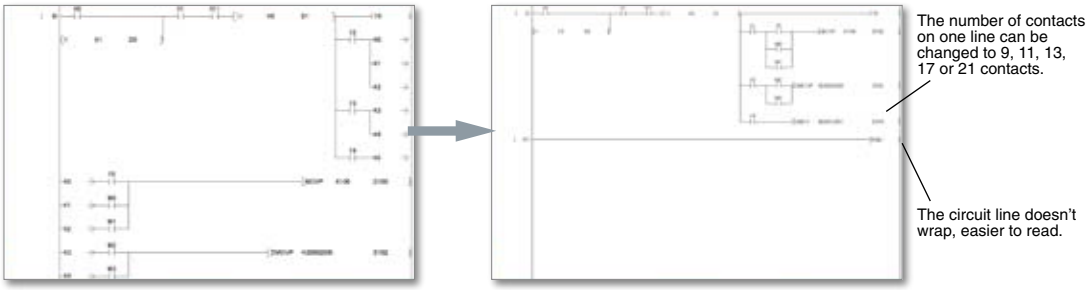
Use the Inline-ST*1 feature to quickly write complex expressions in ladder programs.

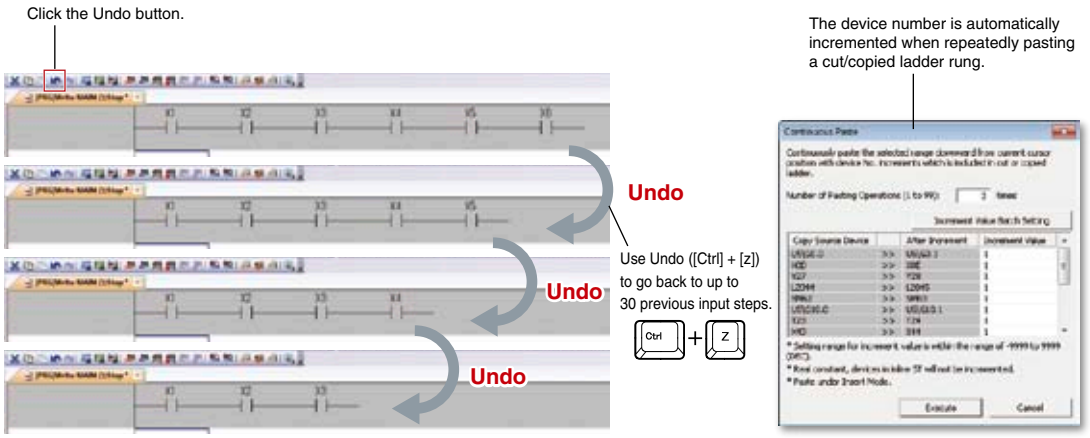
*1: In-line ST can be only be created in projects that use labels.

Easily create circuits with few key inputs

The program can be easily modified using the keyboard shortcut [Alt] + [←] / [→] or [Alt] + [↑] / [↓] keys.

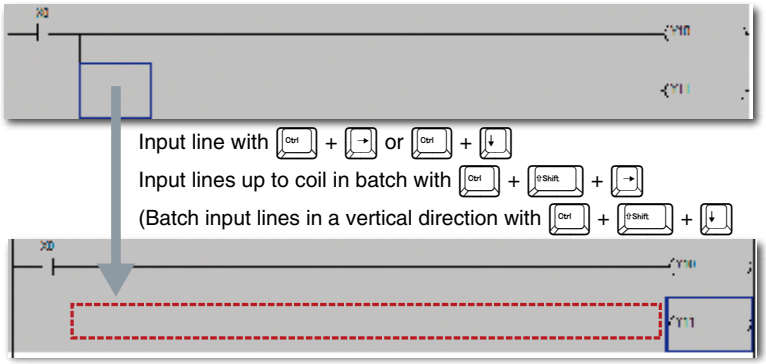






Efficiently edit lines with keyboard

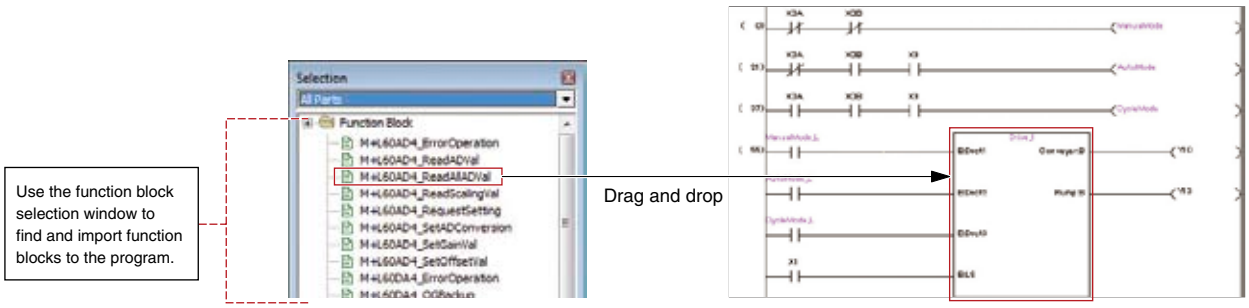
Ladder rungs can be easily modified just by using the various keyboard shortcut keys, eliminating the need to switch to editing mode.



■ How to input a line
Press [Ctrl] + [→] or [Ctrl] + [↓] at an empty spot.
Press [Ctrl] + [→] or [Ctrl] + [↓] on top of a line to delete it.

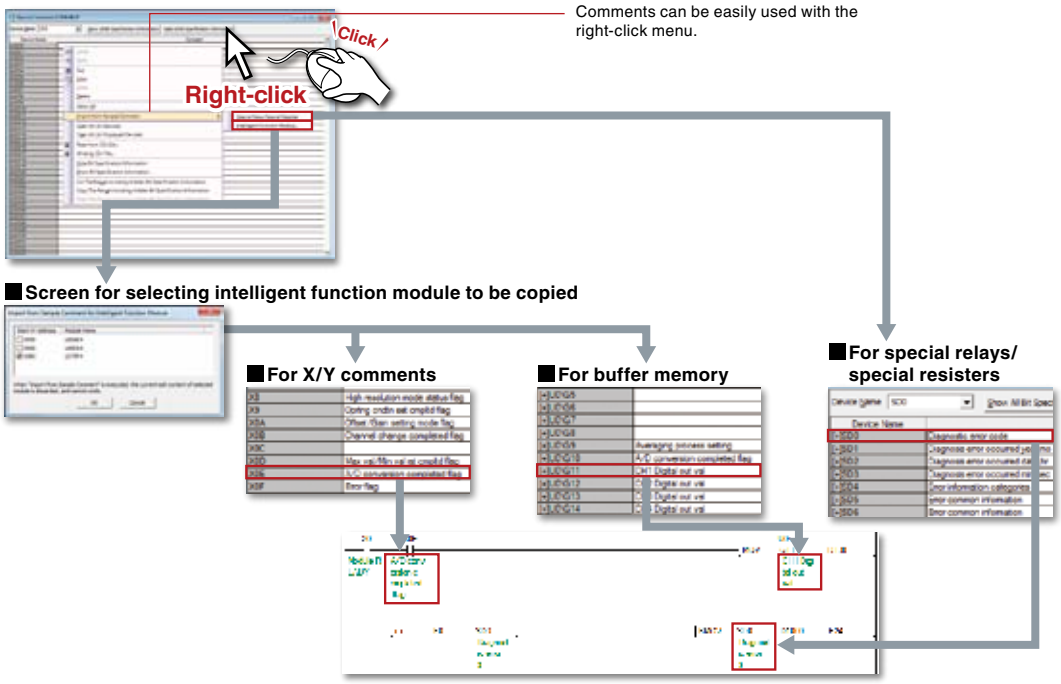
Use function blocks for common operations

Function blocks allow selections of commonly used code to be easily reused and shared among projects. Shared or created function blocks can be added to a program using simple drag and drop operation. Using function blocks effectively results in faster development times with fewer programming mistakes.



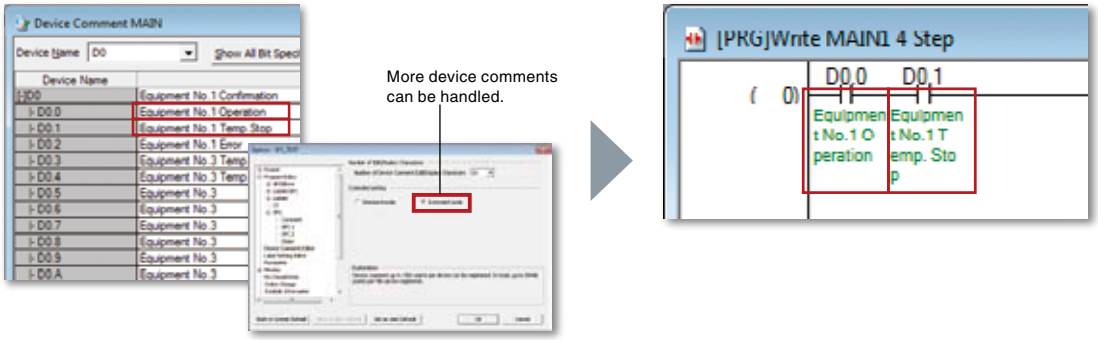
Use sample comments to eliminate the need to input comments

Sample comments are provided for the CPU's special relays/registers and the intelligent function module's buffer memory/XY signals. These can be copied into the project's comments thus greatly reducing the time required for entering device comments.



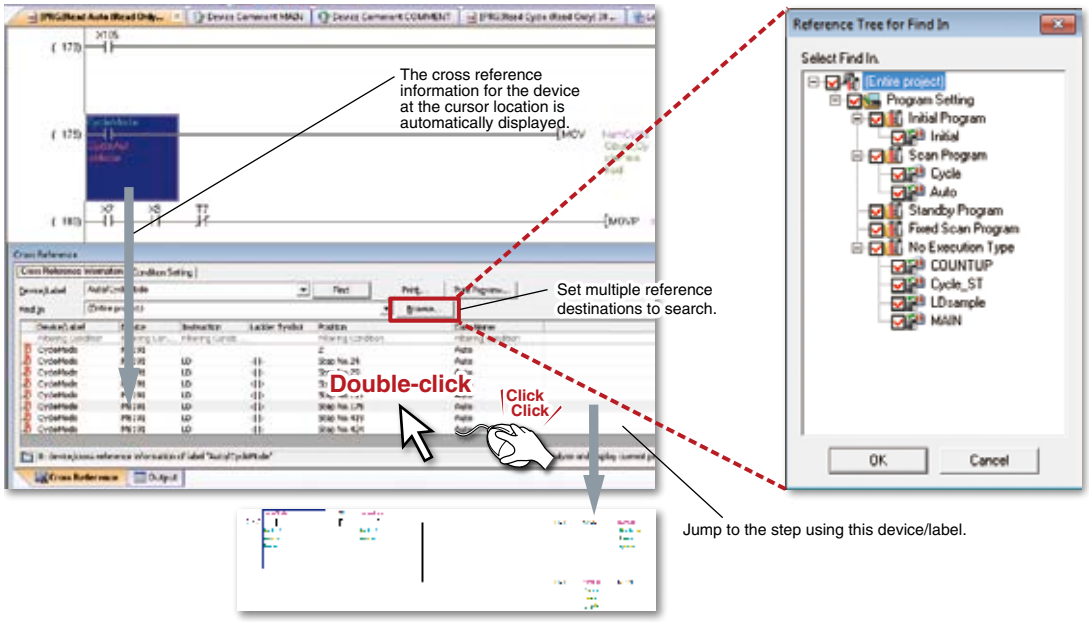
Quickly identify similar devices

Word device comments can be registered per bit with the contents displayed directly on the ladder rung.



Cross referencing interlinked with circuit displays

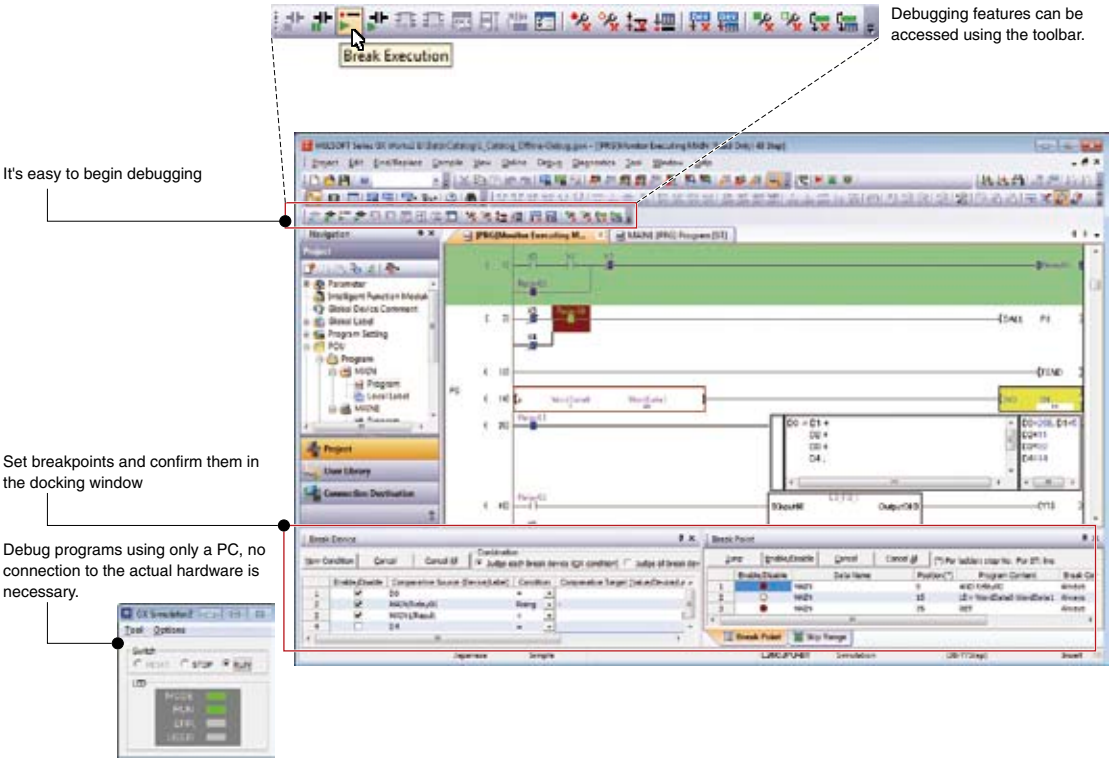
Relevant devices and labels can be searched within the contents of the program by using the cross reference tool. The results are immediately displayed in the cross reference dialog box conveniently besides the actual program view screen. It is then very easy to check where the relevant device is actually used within the program, just by double clicking on the target device.



Offline debug without physical hardware

GX Simulator Function

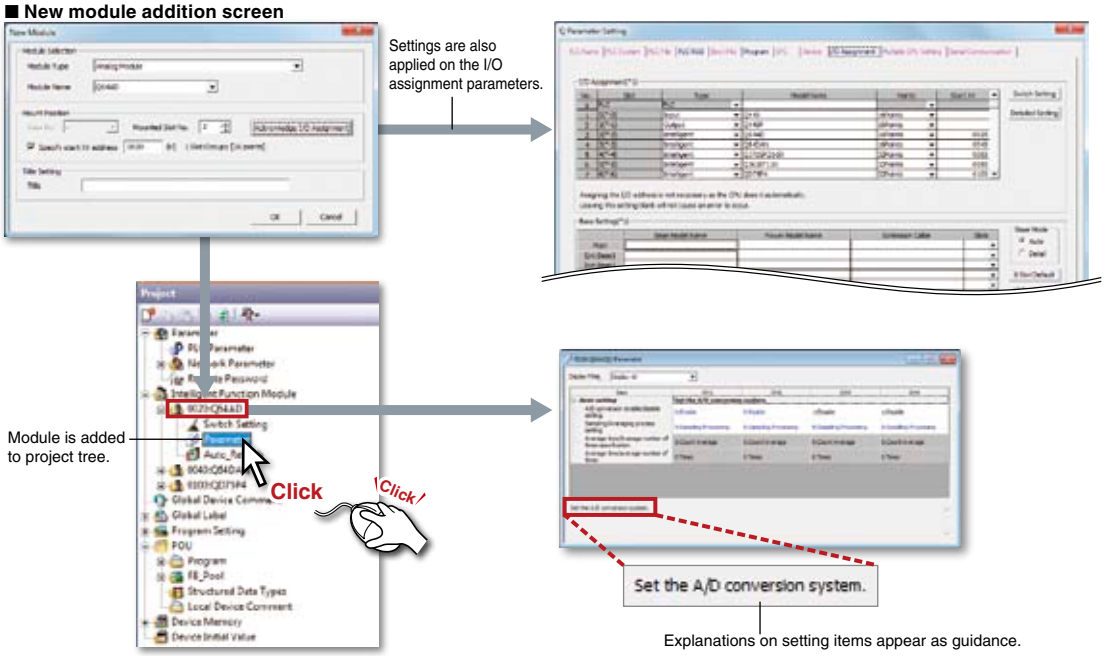
The simulation function is now integrated. The program can be executed in a step-by-step method, finding program errors more easily.



Integrating the intelligent function module setting tool (GX Configurator)

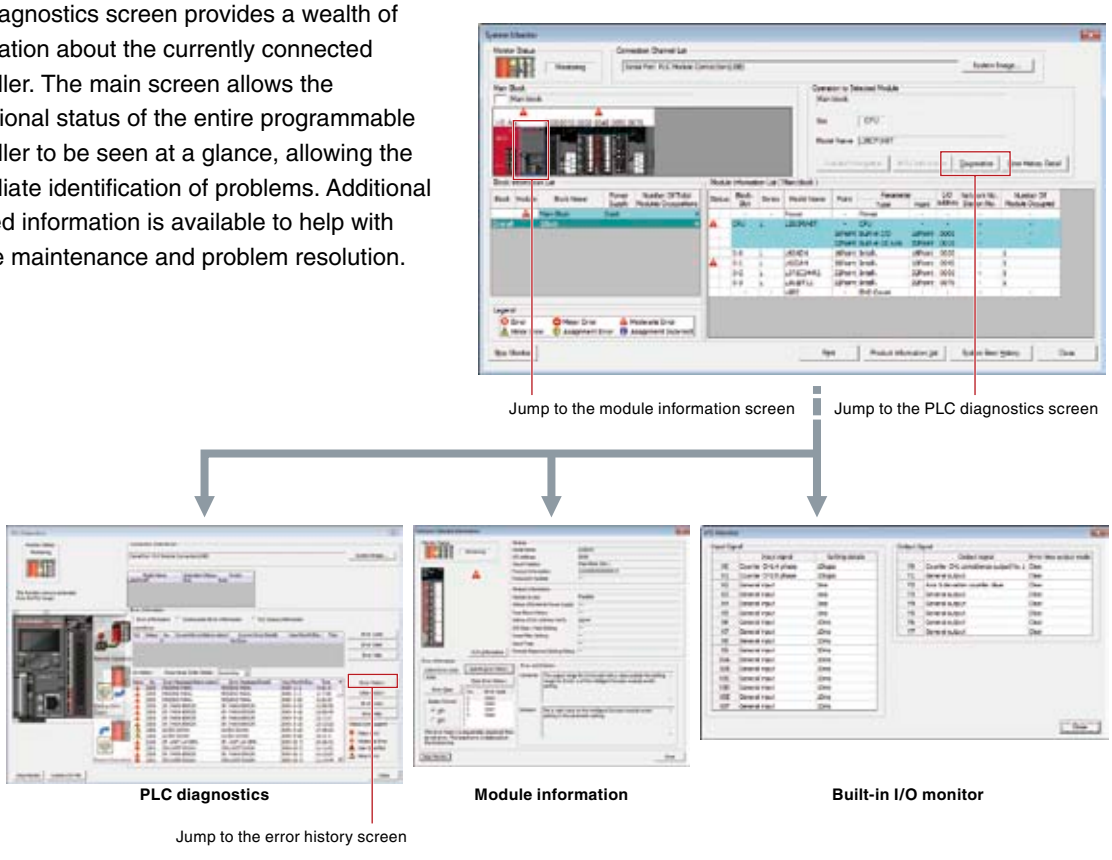
The intelligent function module's setting functions have been unified with GX Works2.
Manage the intelligent function module's setting with a GX Works2 project.

■ New module addition screen



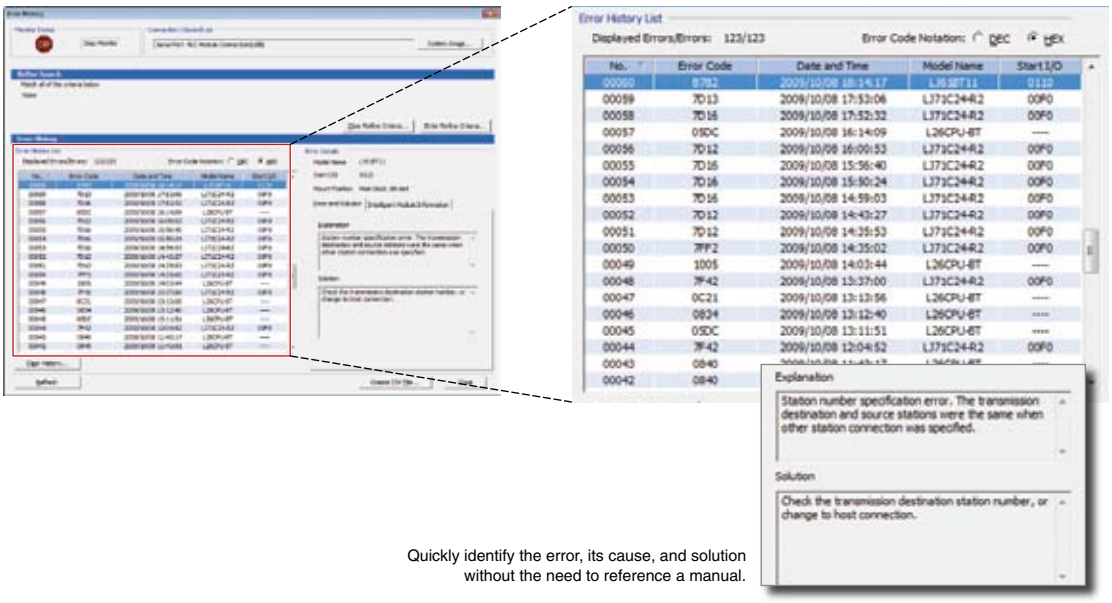
Advanced PLC diagnostics

The diagnostics screen provides a wealth of information about the currently connected controller. The main screen allows the operational status of the entire programmable controller to be seen at a glance, allowing the immediate identification of problems. Additional detailed information is available to help with routine maintenance and problem resolution.



Time-stamped error history list

Simplify troubleshooting with a combined, time-stamped, error history list for the CPU and all expansion modules. The details section provides explanations of error codes and suggested solutions.



Quickly identify the error, its cause, and solution without the need to reference a manual.

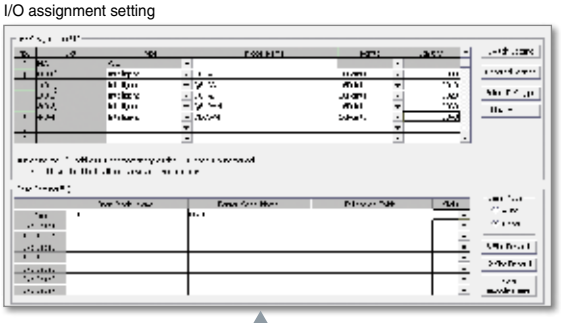
Save and edit labels and parameters with Excel®

Various program data can be exported in CSV file format.
Exporting to CSV format has various advantages, as shown below:

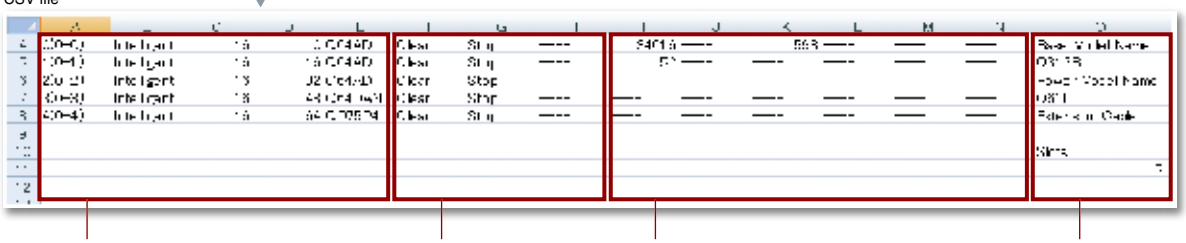
- Data can be utilized on a PC even if GX Works2 is not installed
- Data can be saved directly on the PC
- Data can be sent and utilized off-site
- Utilization of data for creating documents and graphs are possible using Excel®
- Can use in other software that support CSV format

■ Example of I/O assignment setting CSV file

I/O assignment setting

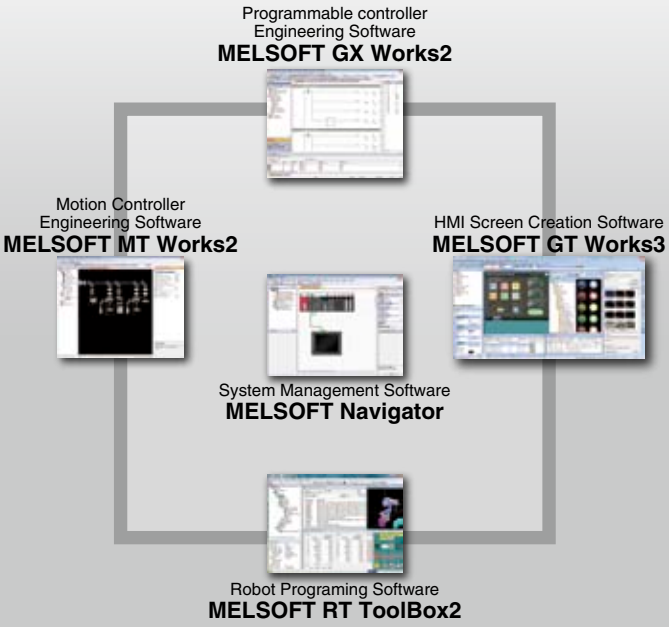


CSV file



I/O assignment | Advanced setting | Switch setting | Basic setting

» Ladder program ..... Write/Read
» Label setting ..... Write/Read
» Parameter (I/O assignment setting, X/Y assignment confirmation) ... Write
» Verification results ..... Write
» Sampling trace function ..... Read
(CSV file format that can be read with GX LogViewer)
» Watch window device/label list ..... Write/Read
» System monitor diagnostics, product information, PC diagnostics, Module error history ..... Write
» Device memory ..... Write/Read



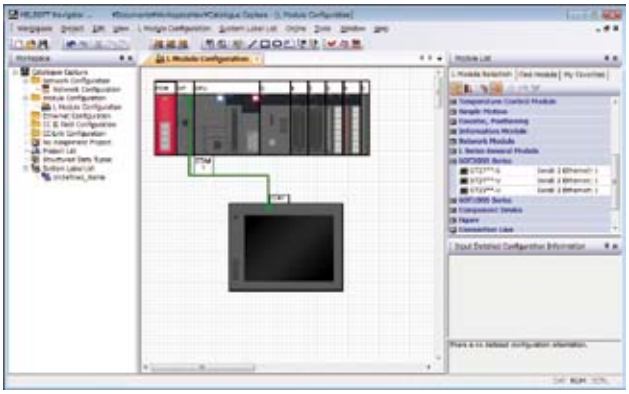
MELSOFT iQ Works

Next Generation Seamless Engineering Environment

iQ Works is the combination of Mitsubishi engineering software (GX Works2, MT Works2, GT Works 3, RT ToolBox2) that allows for the sharing of design information to improve programming efficiency and reduce TCO.

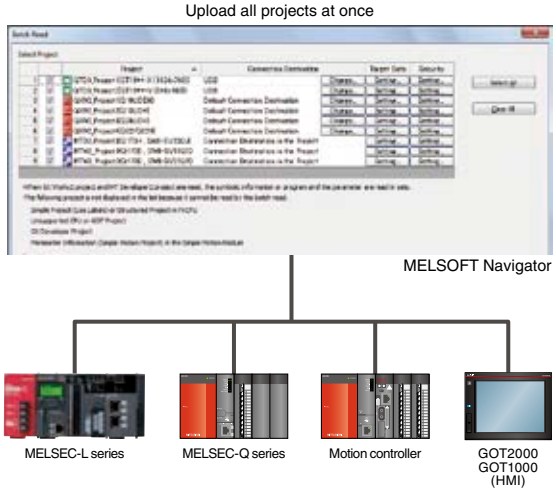
Graphical Project Management

The entire control system is represented using the "Network Configuration" and "Module Configuration" windows.
System components are easily added using a drag & drop interface and the validity of the system can be confirmed using the check function to ensure parameters are configured correctly, the power supply is sufficient, etc.
Different project types can be grouped together (for example by factory, line, and cell) for central management.



Read project data for multiple devices in a batch

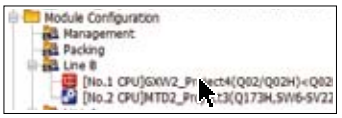
Multiple projects can be read as a block just by having one connection to the programmable controller. If there are multiple devices such as other CPU or GOT on the same network as the target master programmable controller, it is possible to upload all projects to each target device without having to individually connect to each device.



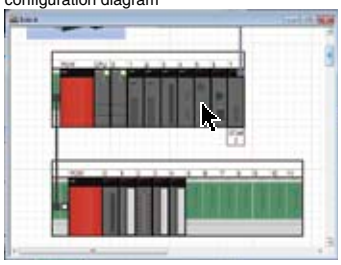
Automatically startup the relevant maintenance software with a single click

Just click on the corresponding project in the system configuration diagram or workspace tree to automatically startup the software relevant for that device. Maintenance can be efficiently performed without having to know and startup each relevant software manually.

Click on corresponding project in workspace tree



Click on corresponding device in system configuration diagram

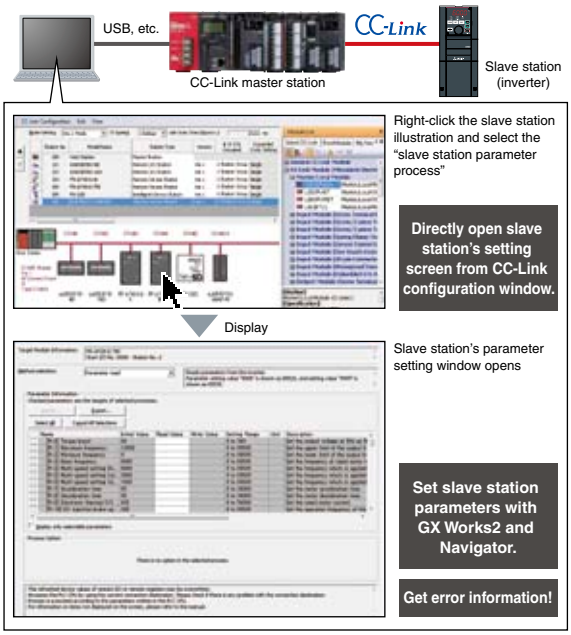


Software for corresponding device automatically startup

- GX Works2
- MT Works2
- GT Works3
- RT ToolBox2

Setup CC-Link slave stations

There's no need to prepare a dedicated tool to check or change the parameter settings for the CC-Link slave station on-site.
The latest version of iQ Works includes CC-Link slave station setting utility. Therefore, it is possible to directly confirm the inverter parameters or change the settings for changing the speed directly from the CC-Link configuration window, for example.
In addition, error information can also be read easily.



Prepare a device from the system configuration diagram with no manual inputs

A list of modules used can be exported as a CSV file from the system configuration diagram.
This is particularly useful when utilizing data for creating a bill of materials (BOM) in Excel®, etc.

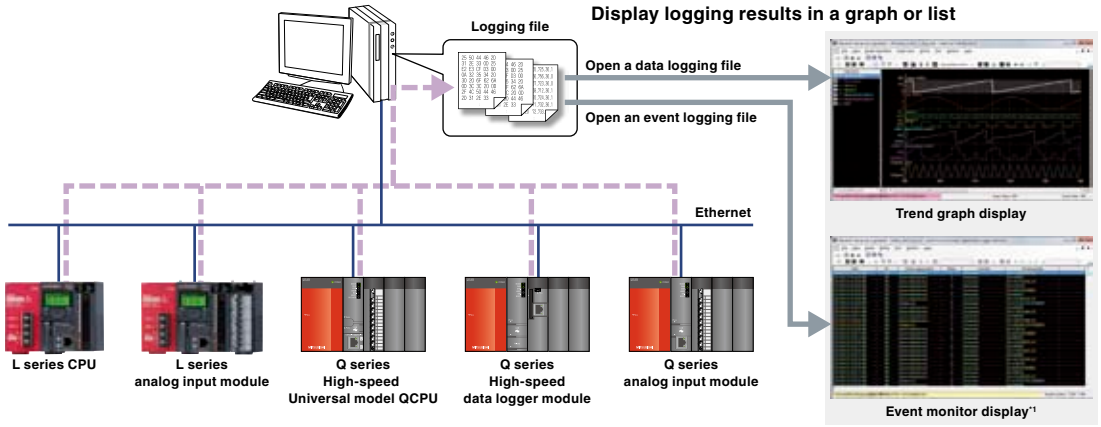
GX LogViewer

Visualizing the production process

Within modern manufacturing needs, data collection has become more important for fully optimizing the production process.
GX LogVewer is a software tool that realizes visualization of large amounts of production data in a simple to use format.
Utilizing this functionality to identify root error causes and improving the production rate.

Easily display and analyze large amounts of collected logging data

This tool is used when large amounts of data need to be visualized and collected from the MELSEC-Q series or MELSEC-L series.
The connection settings and checking of log files are the same as GX Works2 enabling individual connections to each module.

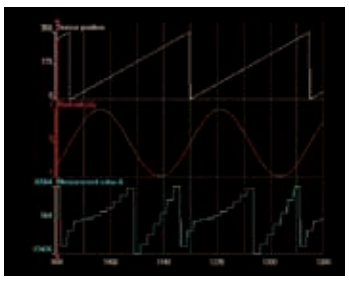


*1: The event monitor display is supported only with the Q series high-speed logger module.

Easily adjust graphs without referring to the setup manual

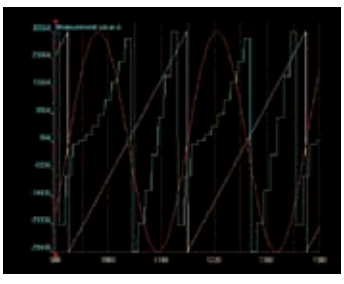
Arranging graphs

Able to arrange each graph so as not to overlap each other. It is easier to display the graphs as each graph is evenly spaced out.



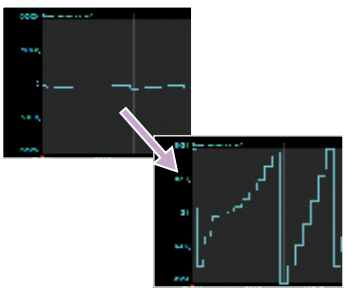
Overlapping graphs

With this it is possible to overlap each graph over one another. Multiple graphs can be compared enabling easier data analysis and comparison.



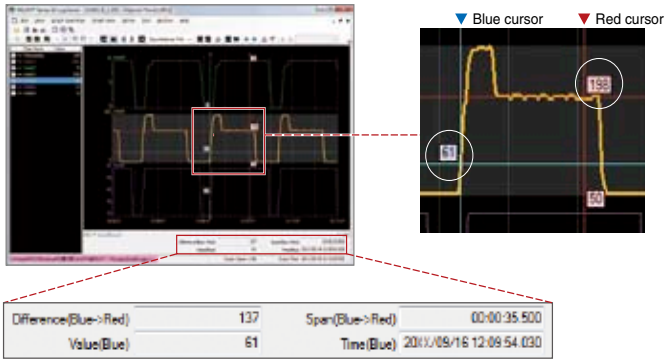
Automatically adjusting graphs

Various attributes of the graph are automatically adjusted (max/min values) as to display the upper and lower limit values better.



Easily confirm changes in data with dual cursors

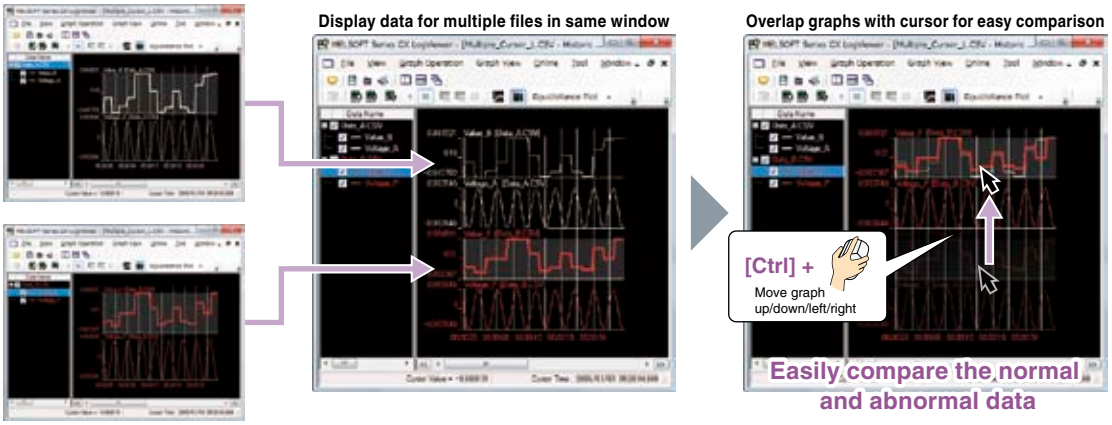
Data changes within a designated time frame can be quickly checked with user-friendly dual cursors (multi-cursors). When the cursors are moved to the point at which changes are to be confirmed, the difference in time and value between those points will appear.



The difference in time and value between the cursors is automatically calculated and displayed.

Display data for multiple files within one graph area for easy comparison

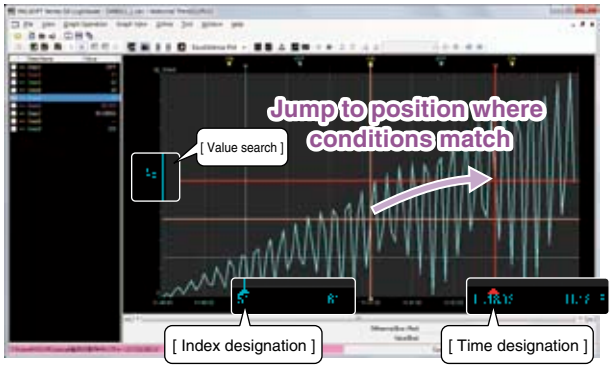
Data for multiple files are displayed with the same time units in the same graph area. The display position within a file can be moved easily. This allows the differences of data within multiple files to be confirmed easily.



Quickly jump cursor to designated position

Cursor jump

Confirm data values by quickly moving the cursor to a designated value, time or index position in the trend graph.



Value search
Values are searched, and the cursor jumps to the position where the conditions match.

Time designation
The cursor jumps to the designated time.

Index designation
The cursor jumps to the designated index.

HMI

Combination with GOT for all scenes from startup to maintenance

The GOT2000 boasts advanced functionality, acts as a seamless gateway to other industrial automation devices, all while increasing productivity and efficiency.
The high quality display is designed to optimize operator control and monitoring of device and line statuses. If you are looking for an intuitive operation terminal, the new tablet-like operability and the higher functionality of operation terminal makes the GOT2000 the ideal choice.
Incorporate the GOT2000 to bring forth flexibility, productivity, and quality on a global scale.

For details, refer to the "Mitsubishi Graphic Operation Terminal GOT2000 Series Catalog" catalog.

L(NA)08270ENG

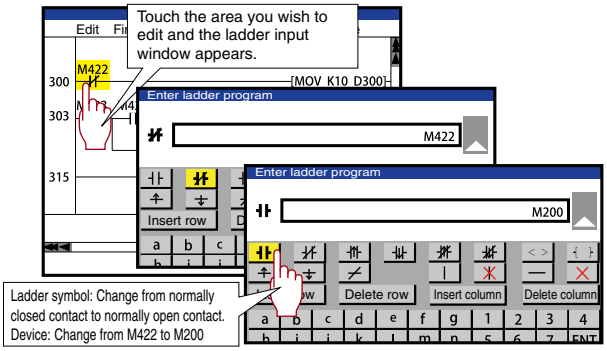
Graphic Operation Terminal

GOT2000 series/GOT1000 series

Ladder programs can easily be edited on the GOT

Sequence Program Monitor (Ladder Editor) ····· GT27/GT16/GT15

Sequence programs can be edited in a circuit diagram (ladder format). To quickly change contacts in an emergency, sequence programs can be edited in ladder format without using a personal computer.

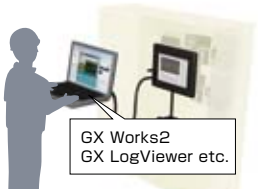


* Supported by XGA / SVGA / VGA models excluding the 5.7-inch type.
* GOT1000: L06CPU(-P), L26CPU(-P), L02SCPU-P are not supported.

Program debugging can be performed without opening the control panel

FA Transparent ····· All models

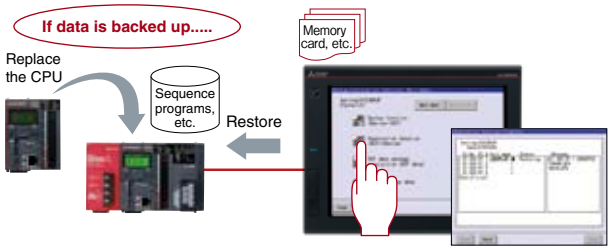
Connected with a PC, the GOT acts as a transparent gateway to enable programming, start up, and adjustment of equipment using GX Works2 or GX LogViewer. Users do not have to bother with opening the control panel or changing cable connections.
(On the GT10 series, the FA transparent function can be used via the interface on the rear side.)



Programmable Controller can be recovered promptly in case of emergency

Backup/Restore ····· GT27/GT23/GT16/GT15/GT14

Sequence programs and parameters can be backed up to the memory card or USB memory in the GOT. Users can perform batch operation to restore the data to the PLC CPU or motion controller. Make a data backup in case of a problem such as a dead battery in a PLC CPU to quickly replace the faulty device and restore the system without using a personal computer.



View logging data without a PC

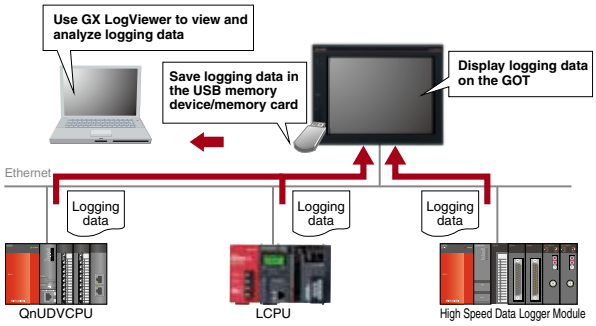
Log Viewer ····· GT27/GT16

Logging data can be confirmed with the GOT even if a PC is not available on-site, allowing problems to be troubleshooted quickly. Changes in the data can be quickly confirmed with the dual cursors (multi-cursors) that are displayed similar to GX LogViewer.

Logging data can be collected without opening the control panel

Log Viewer ····· GT27/GT16

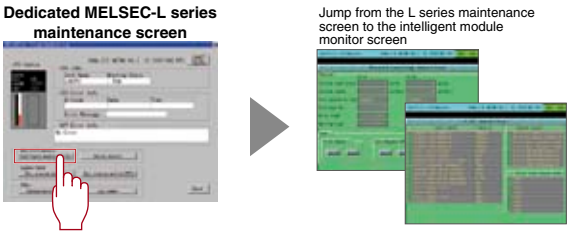
In a USB memory device attached to the USB interface on the front of the GOT, the logging data can be saved. The logging data can easily be collected without removing the SD card from the CPU inside of the control panel.

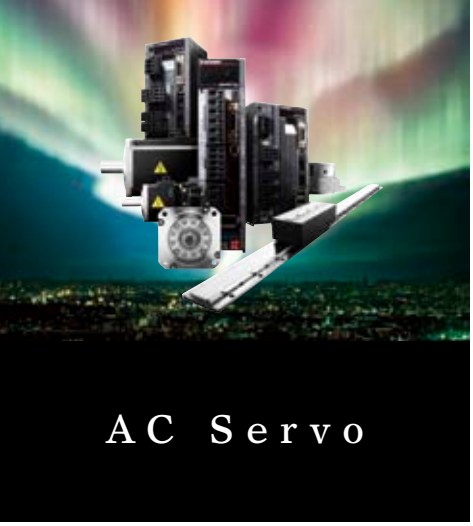


Various functions of GOT support your maintenance work

MELSEC-L Troubleshooting ····· GT27/GT16

Just one touch to jump to the functions such as the intelligent module monitor to quickly perform troubleshooting at the worksite.





Man, machine and environment in perfect harmony

MELSERVO-J4 — trusted technology makes an evolutionary leap forward.

Introducing the MELSERVO-J4 series. Offering more than just improved performance, these servos are designed to drive the industries of tomorrow. Backed by Mitsubishi leadership in all-digital technology, MELSERVO has become one of the most globally respected names in factory automation. And now — with the safety, ease of use, and energy-efficient design of the new MELSERVO-J4 series — man, machine and environment can at last work together in perfect harmony.

For details, refer to the "MELSERVO-J4" catalog.

L(NA)03058

MITSUBISHI SERVO AMPLIFIERS & MOTORS

MELSERVO-J4

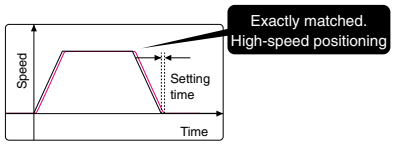
Machine

The leading edge in drive control

- Industry-leading level of basic performance
- High-resolution absolute position encoder
- Advanced one-touch tuning
- Advanced vibration suppression control Ⅱ
- Robust filter

[Advanced one-touch tuning]

Servo gains including vibration suppression control and robust filter are adjusted just by turning on the one-touch tuning function. Machine performance is utilized to the fullest using the advanced vibration suppression control function.



Man

Safety and convenience

- Equipped with the safety observation function(IEC/EN 61800-5-2)
- Tough drive function
- Large capacity drive recorder
- Machine diagnosis function
- MR Configurator2

[Large capacity drive recorder]

Servo data (motor current, etc) before and after the alarm occurrence are stored in non-volatile memory. Waveforms can be checked in graph. This enables quick and accurate identification of the cause of the alarm.

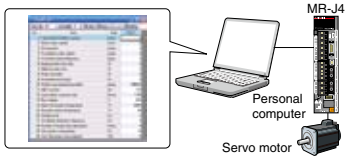
The Environment

Eco-friendly design that's winning acclaim worldwide

- Multi-axis servo amplifier
- Power monitor function
- Compatible with power regeneration common converter
- Energy-conservation achieved by improved performance

[Power monitor function]

Power consumption is calculated from the data in the servo amplifier such as speed and current, and then displayed, enabling energy-conserving system examination.



Lineup

Servo Amplifiers

SSCNET Ⅲ/H SERVO SYSTEM CONTROLLER NETWORK

MR-J4-B
SSCNET Ⅲ/H compatible servo amplifier

MR-J4W2-B
SSCNET Ⅲ/H compatible 2-axis servo amplifier

MR-J4W3-B
SSCNET Ⅲ/H compatible 3-axis servo amplifier

With the SSCNET Ⅲ/H compatible servo amplifier, a synchronous system can be configured using high-speed serial optical communication. Servo system performance and functions are utilized to the fullest when the servo amplifier is combined with the servo system controller.

CC-Link IE Field

MR-J4-B-RJ010 + MR-J3-T10
CC-Link IE Field Network servo amplifier with Motion

The CC-Link IE Field Network interface servo amplifier with Motion is compatible with the Motion control in the Ethernet-based open network.

MR-J4-A
General-purpose interface compatible servo amplifier

The general-purpose interface compatible servo amplifier enables position control by pulse train command and speed/torque control by analog voltage command.

Servo Motors

Rotary servo motor

Small capacity, low inertia
HG-KR Series
Capacity: 50 to 750 W

Small capacity, ultra-low inertia
HG-MR Series
Capacity: 50 to 750 W

Medium capacity, medium inertia
HG-SR Series
Capacity: 0.5 to 7 kW

Medium/large capacity, low inertia
HG-JR Series
Capacity: 0.5 to 22 kW

Medium capacity, ultra-low inertia
HG-RR Series
Capacity: 1 to 5 kW

Medium capacity, flat type
HG-UR Series
Capacity: 0.75 to 5 kW

Linear servo motor

Core type
LM-H3 Series
Rating: 70 to 960 N

Core type (natural/liquid cooling)
LM-F Series
Rating: 300 to 3000 N (natural cooling)
Rating: 600 to 6000 N (liquid cooling)

Core type with magnetic attraction counter-force
LM-K2 Series
Rating: 120 to 2400 N

Coreless type
LM-U2 Series
Rating: 50 to 800 N

Direct drive motor

TM-RFM Series
Rating: 2 to 240 N·m

Inverter

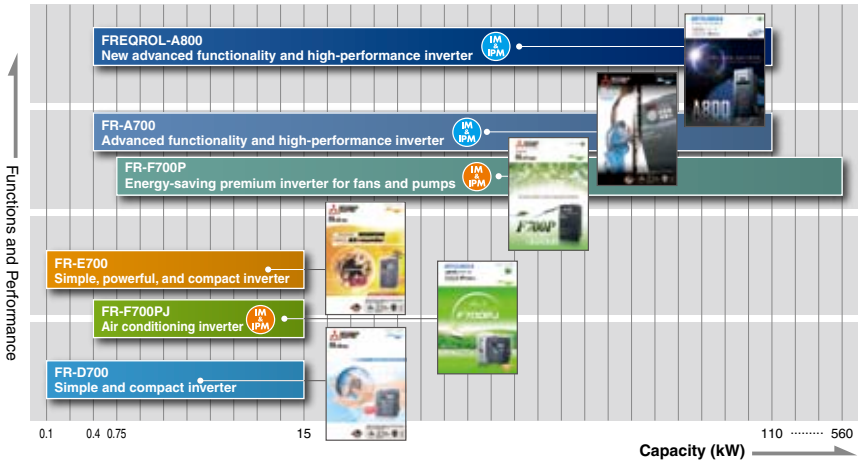
Achieving higher drive performance and energy conservation with inverters

The inverter is a variable frequency power device that can easily and freely change the speed of a 3-phase induction motor.
The Mitsubishi inverter is high-performance and environment-conscious, and complies with global standards.
Select a model from our diverse lineup to match your needs.

Answering various needs with the best choices
Frequency Inverter

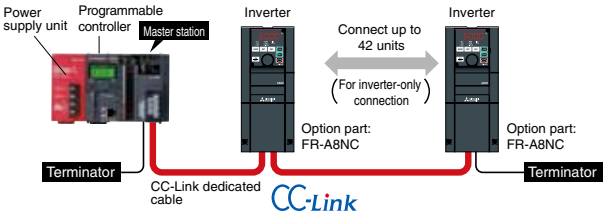
Inverter

●FREQROL800 Series A800
●FREQROL700 Series A700, F700P, E700, F700PJ, D700



Control inverter with CC-Link communication

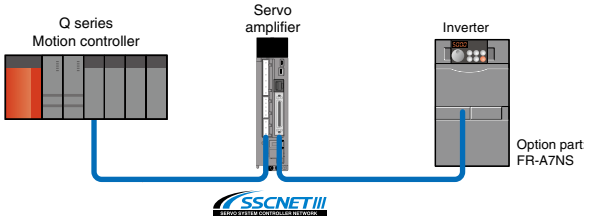
The inverter can be controlled to a programmable controller with CC-Link.*1
This function is supported with CC-Link Ver. 1.1 and Ver. 2.0.
The inverter can be operated and monitored, and the parameters set from the programmable controller.



*1: The inverter operation part (FR-A8NC) is required.
Please refer to the relevant catalog for additional information.

Easy synchronous operation with SSCNET Ⅲ connection

Connect to a motion controller with SSCNET Ⅲ*2.
SSCNET Ⅲ uses the high-speed synchronous serial communication method (high-speed, high-accuracy, high-reliability optical communication), and is perfect for synchronous operation.
(SSCNET: Servo System Controller Network)



*2: Supported only with MELSEC-Q series.
The inverter operation part (FR-A7NS) is required.
Please refer to the relevant catalog for additional information.

Contactors
and
Motor Starters

Diverse variations to respond to all situations

The Mitsubishi Electric Contactors and Motor Starters MS-T and MS-N series and DC interface contactor SD-Q series products are equipped with an environment and global compliance, compact size, ease-of-use and safety. Certification to various international standards, this highly reliable magnetic contactor is suitable for a variety of applications from panels to systems.

For details, refer to the "Contactors and Motor Starters MS-N series" catalog.

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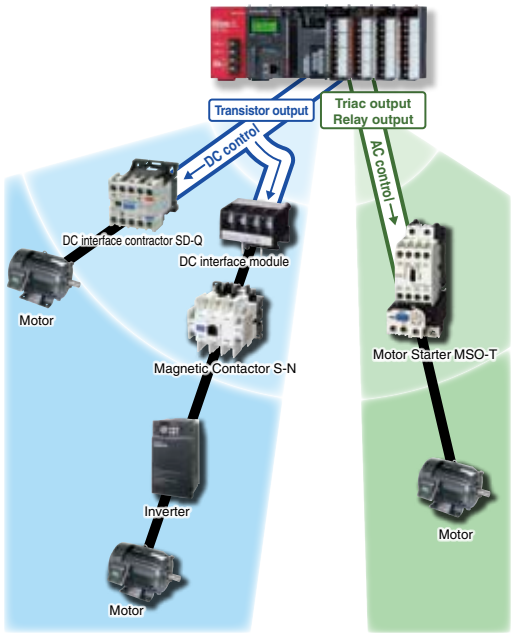


Direct drive with Programmable Controller

The SD-Q series has a small coil VA and can be driven by the programmable controller without adding an amplifying relay.
By adding the DC interface module, the MS-N series can be used with a wide range of motor capacities.

		Programmable controller output module type		
		Transistor output	Contact output	Triac output
DC interface contactor SD-Q series	DC operation	○	○	—
Magnetic contactor MS-N series	AC operation	○ (Using DC interface module)	○	○
	DC operation	○	×	—

*: This table shows the relation of the programmable controller output module type and operation interface. There may be restrictions according to the type of frame size, etc., that can be used.
Refer to the MS-N Series catalog, or contact a Mitsubishi dealer or Sales Office for details on the types of magnetic switches and models that can be used.

SD-Q series

Direct drive is possible with the programmable controller's transistor output. Since a relay and interface module are not required, the number of parts can be reduced, and space can be saved.

Standard surge absorber

Prevent adverse effects onto the peripheral equipment.

Standard terminal cover

A terminal cover with finger protection function is mounted as a standard.
This cover answers to user's needs for safety.

MS-T series

Environment-friendly Mitsubishi MS-N series ensures safety and conforms to various global standards.
This series greatly contributes to smaller panels, easier selection and compliance with international standards.

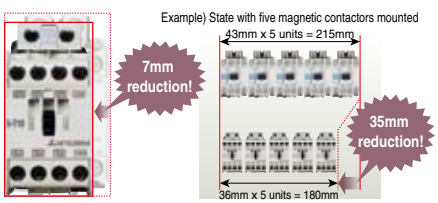
MS-T series(10A～32A)

Mitsubishi Electric's main series is equipped with a small size, ease-of-use, safety and international compliance.
This series greatly contributes to smaller panels, easier selection and compliance with international standards.

10A frame model is just 36mm wide!!

The industry's smallest width has been realized for the general-purpose magnetic contactor.
The other rated products have also been downsized to help you reduce your panel size.

*: 10A frame general-purpose magnetic contactor (Mitsubishi Electric survey as of Jan. 2014)



Wide range of operation coil ratings!!

The wider operation coil rating ranges allows us to consolidate the number of coil types from 14 types (N Series) to 7 types.
This helps reduce stock and makes it easier to select the required type.

Standard terminal cover!!

The standard terminal cover improves the safety in the panel, and simplifies ordering as a separate model no longer needs to be specified.

Vision Solution

COGNEX® machine vision system and Mitsubishi Electric FA Devices Innovating your production with this integral power.

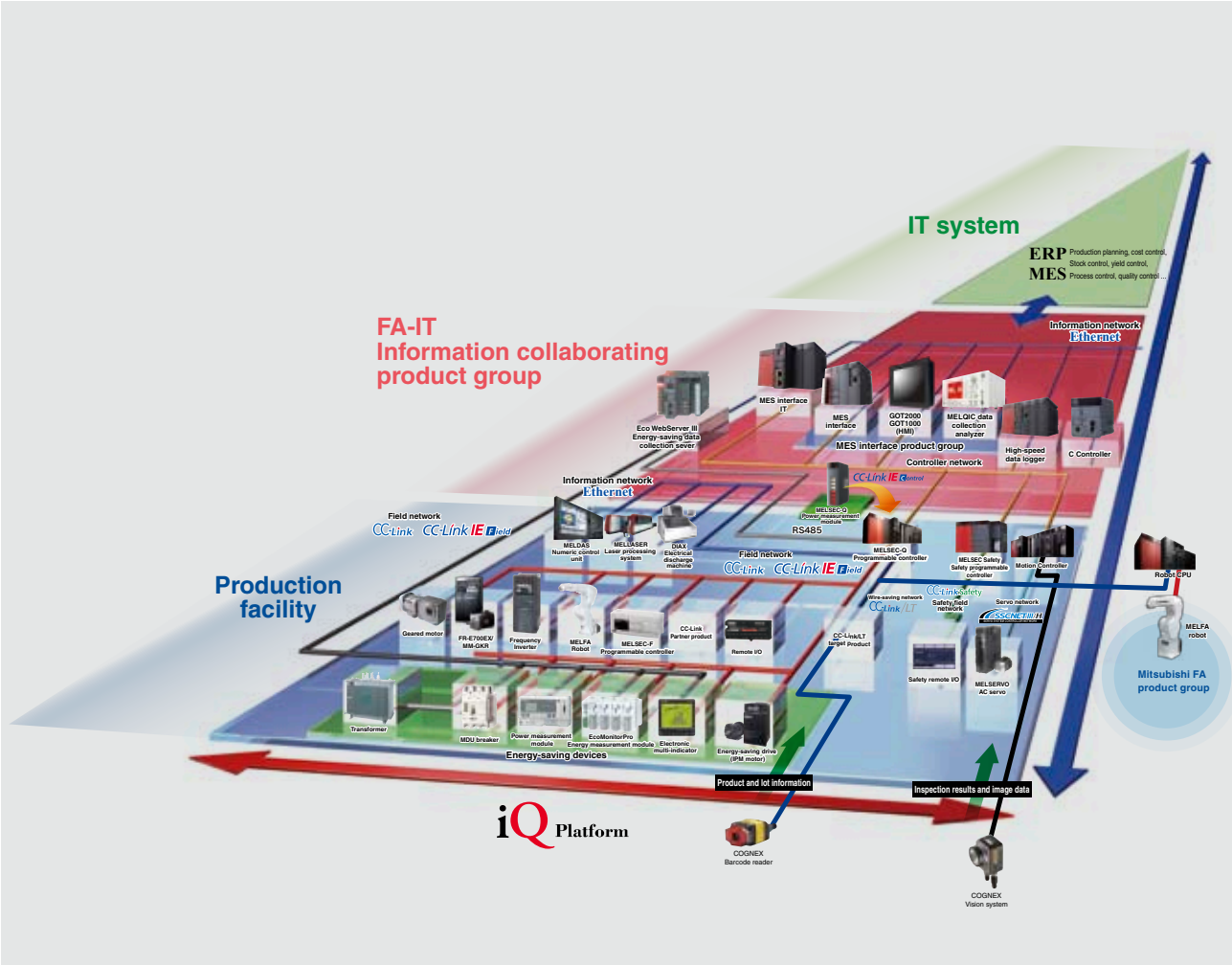
Functioning as devices that “watch” instead of human eyes, COGNEX machine vision systems have continued to reform automation of production lines. Mitsubishi Electric FA devices, such as programmable controllers, lead the tomorrow of FA control.
The possibilities of vision system solutions, created in the integration of this spirit of innovation, have continued to increase.
“In-Sight EZ”, developed exclusively for use with Mitsubishi Electric FA devices, enhances functions.
Affinity, including connectivity and ease of program development, has also been refined.
The key solution for enhancing efficiency of inspections and identification, etc., for improving product quality and for reducing total costs lies within the integrated power of COGNEX + MITSUBISHI.

L(NA)08230E
For details, refer to the "Vision System & Factory Automation Solution" catalog.

FA Integral Solutions

e-F@ctory + COGNEX Vision

“e-F@ctory” is an assimilation of solutions that integrate the “MES interface” enabling “visualization” with seamless information sharing and “iQ Platform” realizing flexible sharing within the production site.
Mitsubishi Electric collaborates with partners from various fields to supports general factory optimization through the “e-F@ctory” concept.
The latest achievement is the partnership of COGNEX Vision products and Mitsubishi Electric FA Devices.



COGNEX In-Sight EZ Series

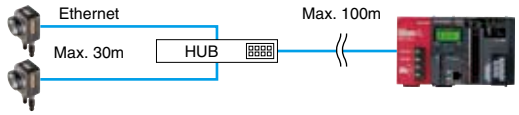
iQSS compatible | Partner Product

- Entry model EZ-700
- Standard model EZ-720
- High-speed processing model EZ-740
- High resolution model EZ-742

Simple connection

Directly connect with Ethernet

The “In-Sight EZ” can be directly connected to the Ethernet port provided on the “MELSEC-Q series universal model” and “MELSEC-L ” programmable controller, and to the Ethernet module on the MELSEC-F . By using a switching hub, a multi-unit vision system having units installed as far as 100m away can be created.



Connect with CC-Link

The expansion module option (CIO-MICRO-CC) supports the reliable open field network “CC-Link”. The impressive high-speed response, reaching up to 10Mbps, high reliability and max. 1.2km long distant transmission allows a highly reliable system to be designed freely. CC-Link settings can be completed easily with EasyBuilder.

Simple communication with SLMP

Now that “In-Sight EZ” supports SLMP (Seamless Message Protocol), data can be easily written from the vision system to the programmable controller. Communication is easily configured with “EasyBuilder”. Just select the connected device and SLMP, set the programmable controller device used for communication and select the communication data from the list. With the SLMP scanner mode, a trigger can be applied on the vision system via SLMP.

Simple control with control dedicated function blocks (FB)

The vision system control program can be created in a short time using the programmable controller programming tool “GX Works2” and rearranging labels by dragging and dropping the vision system control FB.

COGNEX DataMan® Barcode Reader

Partner Product

- Fixed DataMan ..... DataMan 100/200/300
- Hand-held DataMan ..... DataMan 8100/8500

Supporting a variety of barcode reading

Industrial Ethernet compatible barcode reader

This barcode reader with Ethernet can easily be connected to the programmable controller with SLMP, and can be used in a system with In-Sight EZ in the same Ethernet line.
With the Ethernet compatible DataMan, the read code can be adjusted with VisionView® in the same manner as In-Sight EZ.
In collaboration with e-F@ctory, the code reading results and images can be sent to the MES interface unit.

Reading various codes with simple adjustments

DataMan automatically optimizes the brightness of the image. The automatic focusing model adjusts the focal distance from the barcode reader and workpiece simultaneously, and greatly reduces the man-hours required from installation to operation.
The DataMan common setup tool is available for more detailed settings.

Amazing code reading algorithms IDMax®

2DMax+™: Provides an amazing two-dimensional code reading performance when directly marking parts with a laser or dot peen.
1DMax+™: The new HOTBARS™ technology allows weak codes and damaged large codes to be read at a high speed. Various situations not supported with conventional laser scanning methods are not supported.

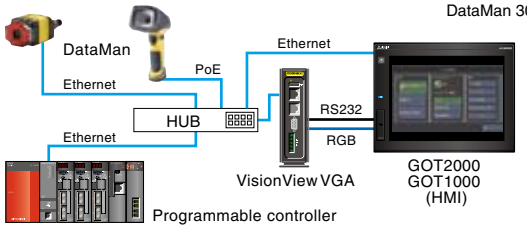
DataMan - active in various industries

In automobile part industries | At the US Department of Defense (DoD) | In aerospace industries | In medical device industries | In electronic part industries

●Fixed DataMan 300 Series

- ►Equipped with latest reading algorithm 1DMax+, 2DMax+
- ►Powerful in reading extra small markings with a high resolution of 1,300,000 pixels
- ►Reduce installation and maintenance man-hours with liquid lens (option) for automatic focus adjustment and the tuning function
- ►Support for MC protocol scanner simplifies communication settings

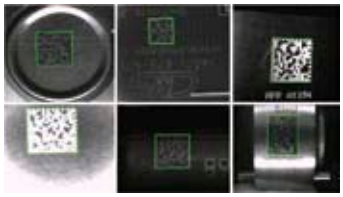
DataMan 300



●Hand-held DataMan 8100/8500 Series

- ►Newly developed body enhances sturdiness
- ►UltraLight®: Two types of lightning enable optimum reading*1
- ►Standard automatic focus adjustment function
- ►Wireless model (communication range: max. 30m) available

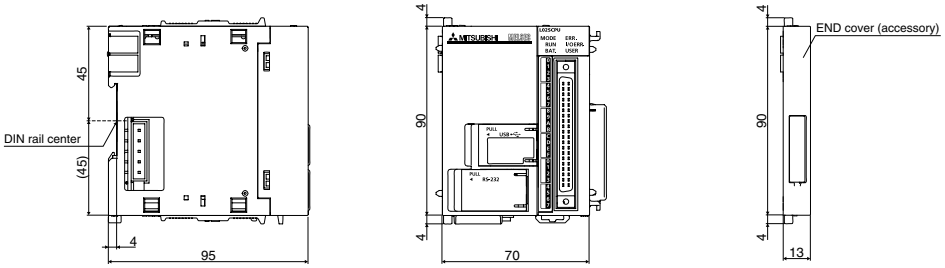
*1: Equipped on DataMan 8500



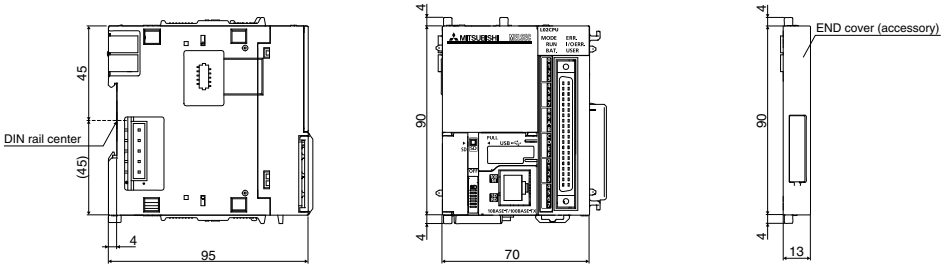
DataMan 8500

CPU Modules

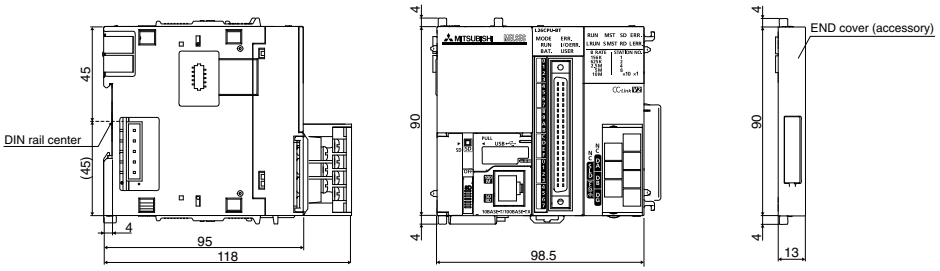
L02SCPU, L02SCPU-P



L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P

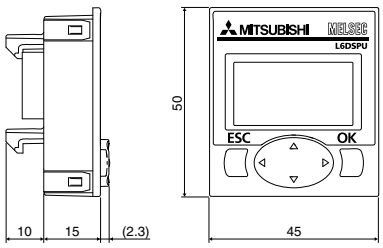


L26CPU-BT, L26CPU-PBT



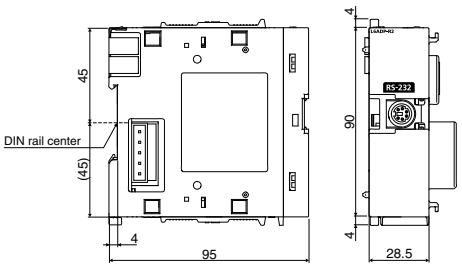
Display Unit

L6DSPU



RS-232 adapter

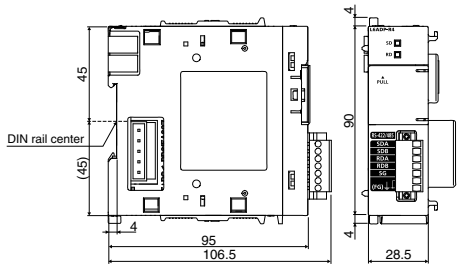
L6ADP-R2



Unit: mm

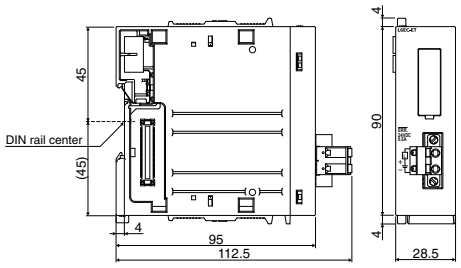
RS-422/485 adapter

L6ADP-R4 NEW



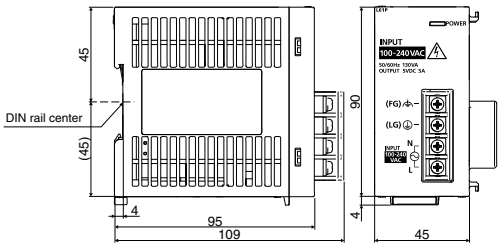
END cover with error terminal

L6EC-ET

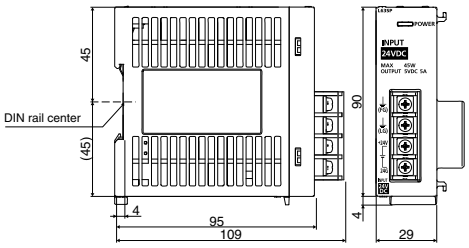


Power Supply Modules

L61P, L63P

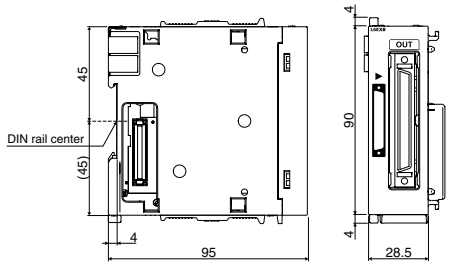


L63SP



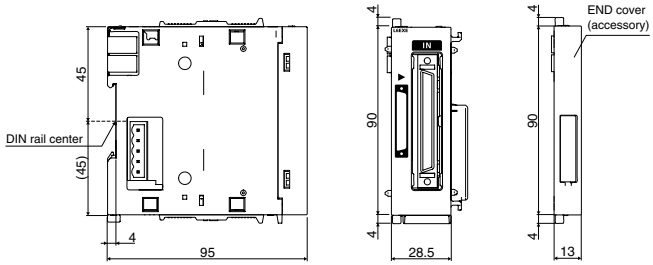
Branch Module

L6EXB



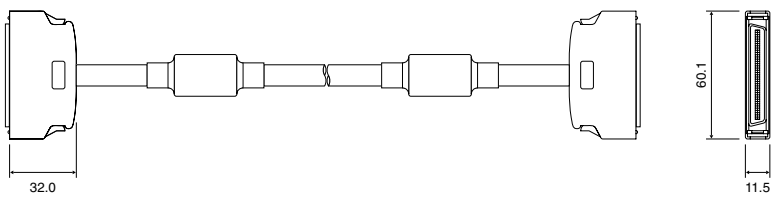
Extension Module

L6EXE



Extension Cable

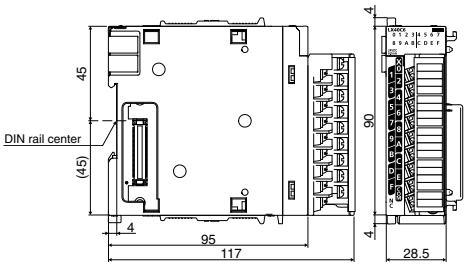
LC06E, LC10E, LC30E



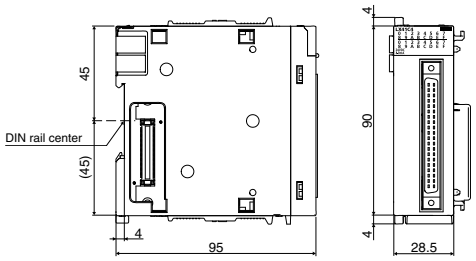
Unit: mm

Input/Output/I/O combined module

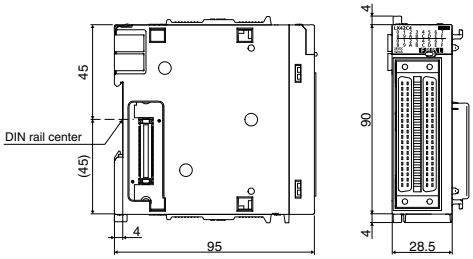
LX10, LX28, LX40C6,
LY10R2, LY20S6, LY40NT5P, LY40PT5P



LX41C4, LY41NT1P, LY41PT1P

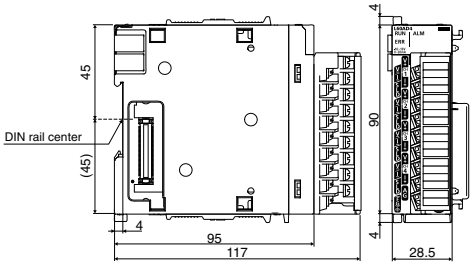


LX42C4, LY42NT1P, LY42PT1P
LH42C4NT1P, LH42C4PT1P



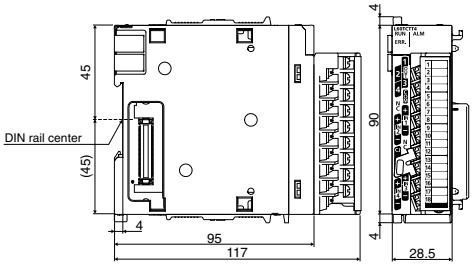
Analog Input/Output/I/O module

L60AD4, L60DA4, L60AD4-2GH, L60AD2DA2

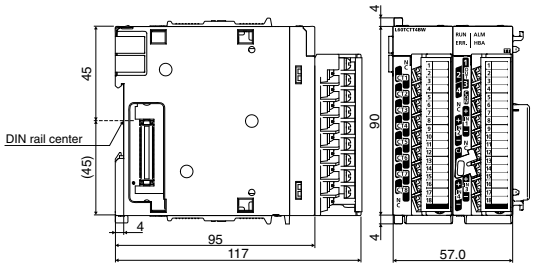


Temperature Control Modules

L60TCTT4, L60TCRT4



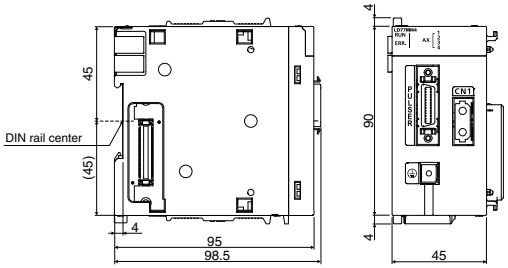
L60TCTT4BW, L60TCRT4BW



Unit: mm

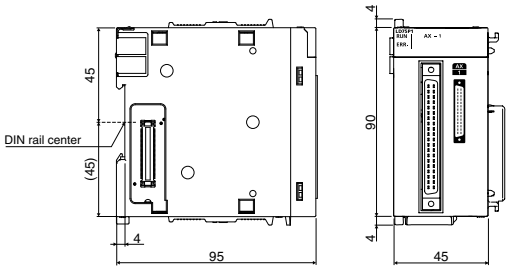
Simple Motion Module

LD77MS2, LD77MS4, LD77MS16,
LD77MH4, LD77MH16

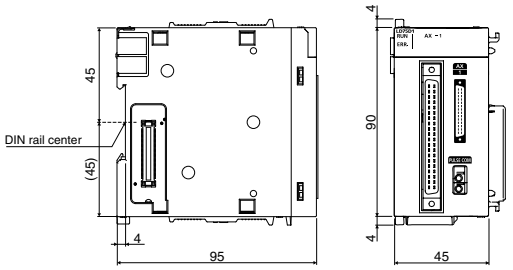


Positioning Modules

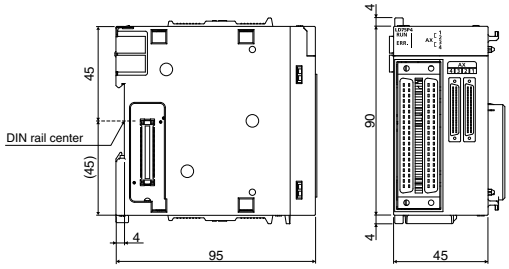
LD75P1, LD75P2



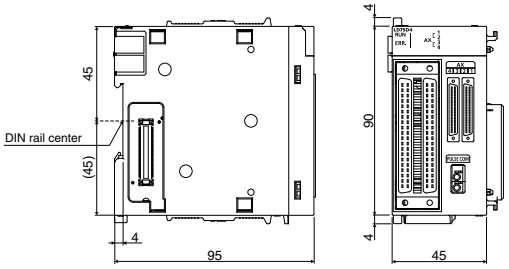
LD75D1, LD75D2



LD75P4

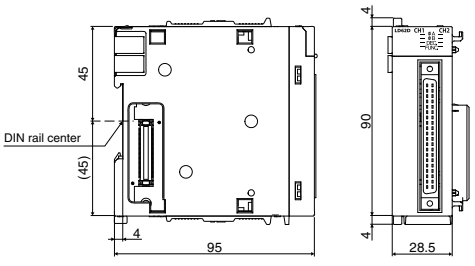


LD75D4



High-Speed Counter Module

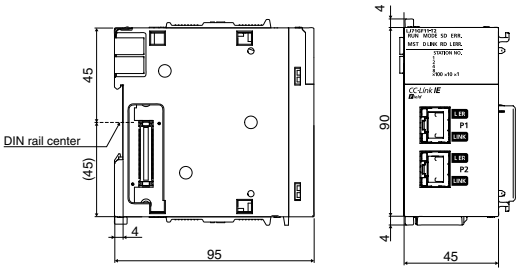
LD62, LD62D



Unit: mm

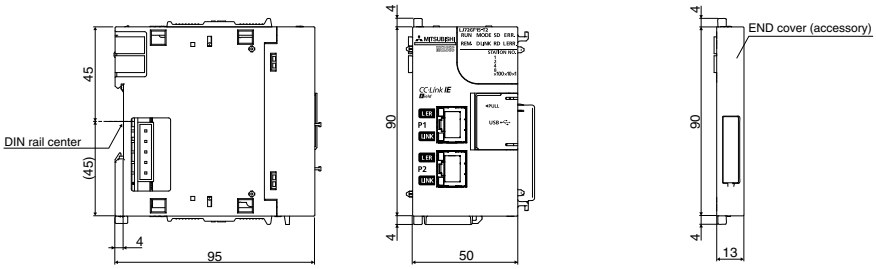
CC-Link IE Field Network Master/Local Module

LJ71GF11-T2



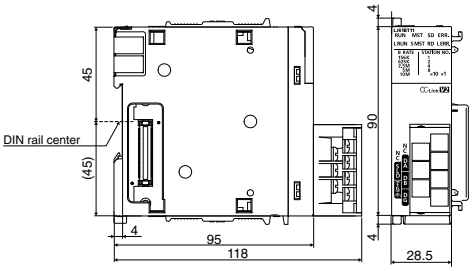
CC-Link IE Field Network Head Module

LJ72GF15-T2



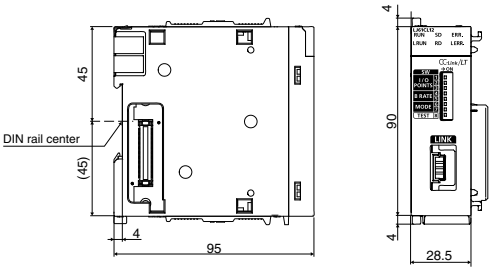
CC-Link Master/Local Module

LJ61BT11



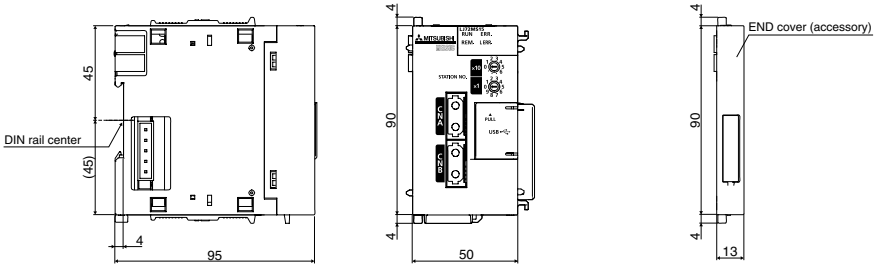
CC-Link/LT Master Module

LJ61CL12



SSCNET Ⅲ/H Head Module

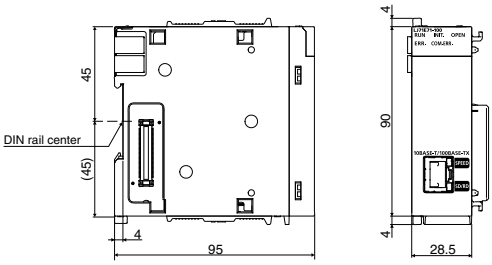
LJ72MS15



Unit: mm

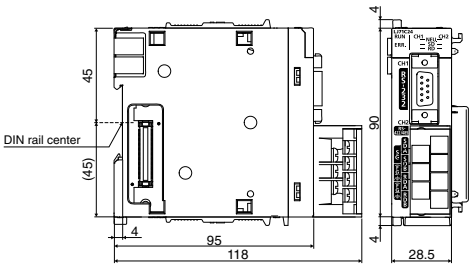
Ethernet interface module

LJ71E71-100

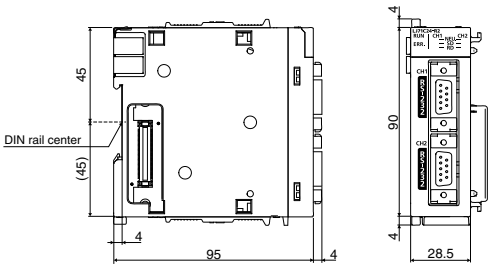


Serial Communication Modules

LJ71C24



LJ71C24-R2



Unit: mm

Extensive global support coverage providing expert

Global FA centers

"Mitsubishi Electric Global FA centers" have been established in various countries around the world to cover the Americas, Europe, and Asia. FA centers help to ensure compliance with the certifications and regulations of different regions, initiate product development in response to local demands, and provide full-time, professional customer service.

German FA Center

Mitsubishi Electric Europe B.V. German Branch
Gothaer Strasse 8, D-40880 Ratingen, Germany
Tel: +49-2102-486-0 / Fax: +49-2102-486-1120
Area covered: Mainly Western Europe

UK FA Center

Mitsubishi Electric Europe B.V. UK Branch
Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, UK.
Tel: +44-1707-28-8780 / Fax: +44-1707-27-8695
Area covered: UK, Ireland

Czech republic FA Center

Mitsubishi Electric Europe B.V. Czech Branch
Avenir Business Park, Radicka 751/113e, 158 00 Praha5, Czech Republic
Tel: +420-251-551-470 / Fax: +420-251-551-471
Area covered: Czech, Slovakia

European FA Center

Mitsubishi Electric Europe B.V. Polish Branch
32-083 Balice ul. Krakowska 50, Poland
Tel: +48-12-630-47-00 / Fax: +48-12-630-47-01
Area covered: Central and Eastern Europe

Turkey FA Center

Mitsubishi Electric Turkey A.Ş
Ümraniye Branch
Serifali Mahallesi Nutuk Sokak No:5 TR-34775 Umraniye, Istanbul, Turkey
Tel: +90-216-526-3990 / Fax: +90-216-526-3995
Area covered: Turkey

India FA Center

Mitsubishi Electric India Pvt. Ltd.
India Factory Automation Centre
Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune, 411026, Maharastra State, India
Tel: +91-20-2710-2000 / Fax: +91-20-2710-2100
Area covered: India

Russian FA Center

Mitsubishi Electric Europe B.V. Russian Branch St.Petersburg office
Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720, 195027, St. Petersburg, Russia
Tel: +7-812-633-3497 / Fax: +7-812-633-3499
Area covered: Russia

Taiwan FA Center

L : Setsuyo Enterprise Co., Ltd.
6F., No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan, R.O.C.
Tel: +886-2-2299-2499 / Fax: +886-2-2299-2509
R : Mitsubishi Electric Taiwan Co.,Ltd.
No.8-1,Industrial 16th Road,Taichung Industrial Park ,Taichung, Taiwan 407, R.O.C.
Tel: +886-(0)4-2359-0688 / Fax: +886-(0)4-2359-0689
Area covered: Taiwan

Thailand FA Center

Mitsubishi Electric Automation (Thailand) Co., Ltd.
12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangpongpang, Khet Yannawa, Bangkok 10120, Thailand
Tel: +66-2682-6522 / Fax: +66-2682-6020
Area covered: Thailand

ASEAN FA Center

Mitsubishi Electric Asia Pte. Ltd.
ASEAN Factory Automation Centre
307 Alexandra Road #05-01/02,
Mitsubishi Electric Bulding, Singapore
Tel: +65-6470-2480 / Fax: +65-6476-7439
Area covered: Southeast Asia

Nagoya, Japan

China (including Hong Kong area)

Beijing FA Center

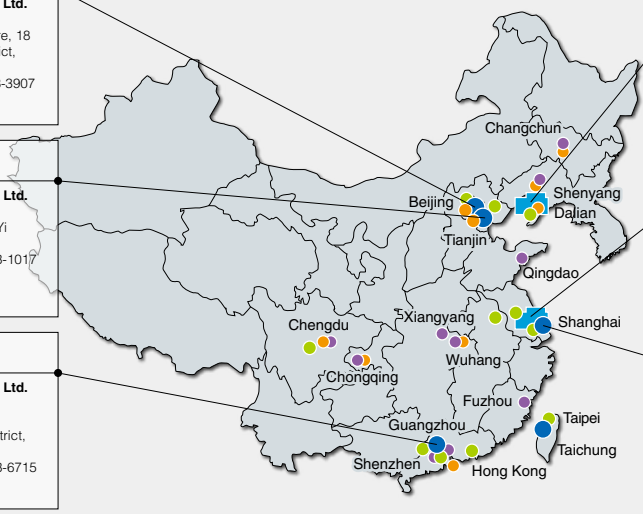
Mitsubishi Electric Automation (CHINA) Ltd.
Beijing Office
Unit 908, Office Tower 1, Henderson Centre, 18 Jianguomennei Avenue, Dongcheng District, Beijing, China
Tel: +86-10-6518-8830 / Fax: +86-10-6518-3907
Area covered: China

Tianjin FA Center

Mitsubishi Electric Automation (CHINA) Ltd.
Tianjin Office
Unit 2003, Tianjin City Tower, No.35, You Yi Road, Hexi District, Tianjin, China
Tel: +86-22-2813-1015 / Fax: +86-22-2813-1017
Area covered: China

Guangzhou FA Center

Mitsubishi Electric Automation (CHINA) Ltd.
Guangzhou Office
Rm.1609, North Tower, The Hub Center, No.1068, Xin Gang East Road, Haizhu District, Guangzhou, China
Tel: +86-20-8923-6730 / Fax: +86-20-8923-6715
Area covered: China



Local factory in China

Mitsubishi Electric Dalian Industrial Products Co., Ltd.

Local factory in China

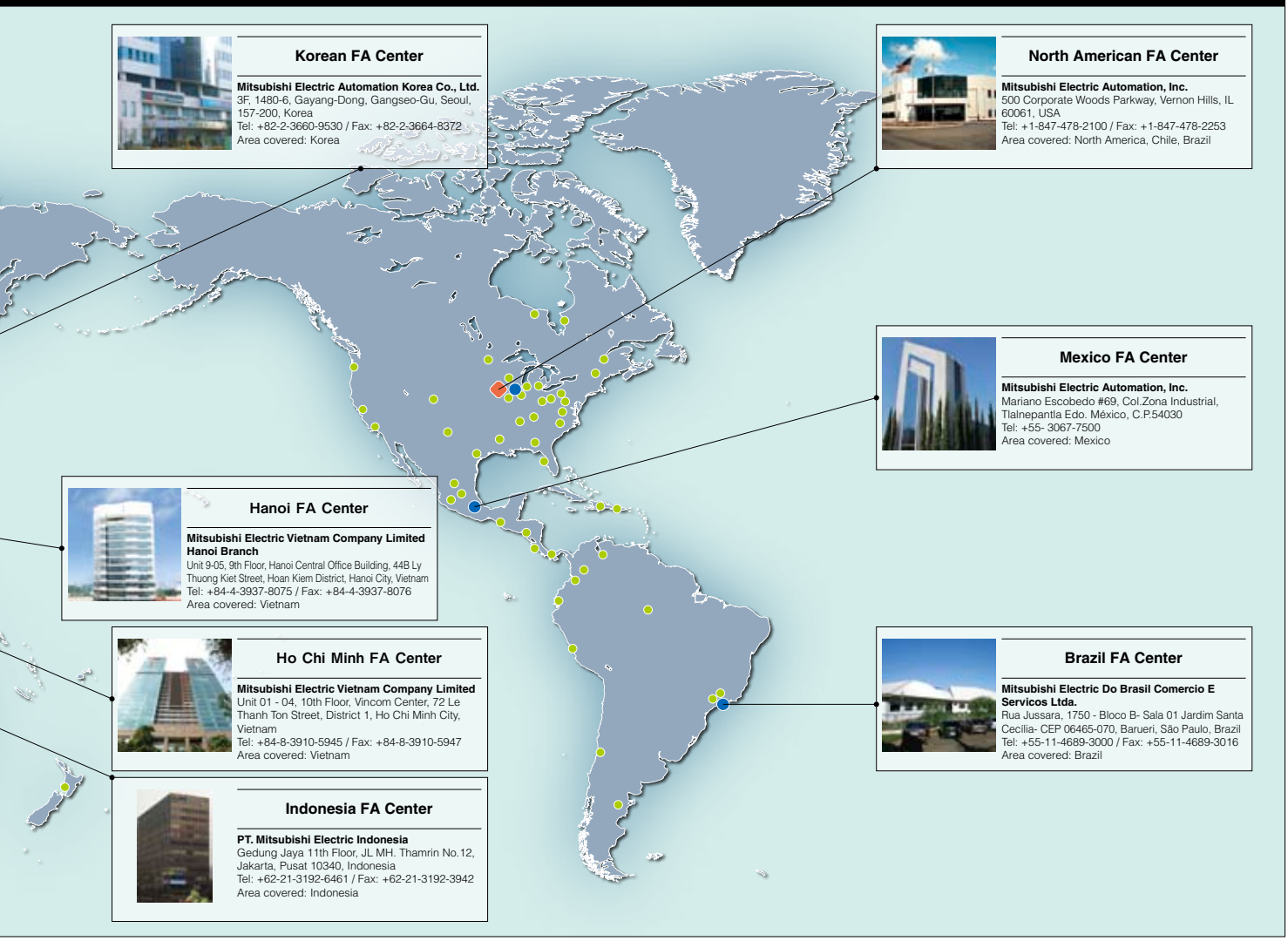
Mitsubishi Electric Automation Manufacturing (Changshu) Co., Ltd.
No.706 Southeast Building,Chengahu Southeast Economic Development Zone of Jiangsu,215500 China
Tel: 86-512-5213-3077 / Fax: 86-512-5213-3088

Shanghai FA Center

Mitsubishi Electric Automation (China) Ltd.
10F, Mitsubishi Electric Automation Center, No.1386 Hongqiao Road, Changning District, Shanghai, China
Tel: 86-21-2322-3030 / Fax: 86-21-2322-3000
Area covered: China

help whenever needed.

FA center | FA center satellite (China) | Mechatronics service center (China) | Sales and Service office | Factory location | Development center



Korean FA Center

Mitsubishi Electric Automation Korea Co., Ltd.
3F, 1480-6, Gayang-Dong, Gangseo-Gu, Seoul, 157-200, Korea
Tel: +82-2-3660-9530 / Fax: +82-2-3664-8372
Area covered: Korea

North American FA Center

Mitsubishi Electric Automation, Inc.
500 Corporate Woods Parkway, Vernon Hills, IL 60061, USA
Tel: +1-847-478-2100 / Fax: +1-847-478-2253
Area covered: North America, Chile, Brazil

Mexico FA Center

Mitsubishi Electric Automation, Inc.
Mariano Escobedo #69, Col.Zona Industrial, Tlalnepantla Edo. México, C.P.54030
Tel: +55- 3067-7500
Area covered: Mexico

Hanoi FA Center

Mitsubishi Electric Vietnam Company Limited
Hanoi Branch
Unit 9-05, 9th Floor, Hanoi Central Office Building, 44B Ly Thuong Kiet Street, Hoan Kiem District, Hanoi City, Vietnam
Tel: +84-4-3937-8075 / Fax: +84-4-3937-8076
Area covered: Vietnam

Ho Chi Minh FA Center

Mitsubishi Electric Vietnam Company Limited
Unit 01 - 04, 10th Floor, Vincom Center, 72 Le Thanh Ton Street, District 1, Ho Chi Minh City, Vietnam
Tel: +84-8-3910-5945 / Fax: +84-8-3910-5947
Area covered: Vietnam

Brazil FA Center

Mitsubishi Electric Do Brasil Comercio E Servicos Ltda.
Rua Jussara, 1750 - Bloco B- Sala 01 Jardim Santa Cecília- CEP 06465-070, Barueri, São Paulo, Brazil
Tel: +55-11-4689-3000 / Fax: +55-11-4689-3016
Area covered: Brazil

Indonesia FA Center

PT. Mitsubishi Electric Indonesia
Gedung Jaya 11th Floor, JL MH. Thamrin No.12, Jakarta, Pusat 10340, Indonesia
Tel: +62-21-3192-6461 / Fax: +62-21-3192-3942
Area covered: Indonesia

Compliance with international quality assurance standards.

All of Mitsubishi Electric's FA component products have acquired the international quality assurance "ISO9001" and environment management system standard "ISO14001" certification. Mitsubishi Electric's products also comply with various safety standards, including UL standards.
*For jointly developed and partner products, guaranteed quality standards may differ. Please refer to the product manuals for details.

Safety Standards

CE	CE : Council Directive of the European Communities
c UL us	UL : Underwriters Laboratories Listing

Product List

Refer to the product user manuals for information about compatible modules, restrictions, etc., before using the products.
Visit the Mitsubishi Electric FA site or contact your nearest branch for the latest information on the MELSOFT versions and compatible OS.

MELSEC-L series

[Legend] DB : Double brand product (Note) NEW : Recently released product SOON : Product available soon

Type		Model	Outline
CPU		L02SCPU	Number of I/O points: 1024 points, Number of I/O device points: 8192 points, Program capacity: 20K steps, Basic operation processing speed (LD instruction): 60ns, Program memory capacity: 80KB, Peripheral connection ports: USB and RS-232 (Predefined protocol support function), Memory card I/F: None, Built-in I/O functions (General-purpose input:16 points, General purpose output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L02SCPU-P	Number of I/O points: 1024 points, Number of I/O device points: 8192 points, Program capacity: 20K steps, Basic operation processing speed (LD instruction): 60ns, Program memory capacity: 80KB, Peripheral connection ports: USB and RS-232 (Predefined protocol support function), Memory card I/F: None, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Source type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L02CPU	Number of I/O points: 1024 points, Number of I/O device points: 8192 points, Program capacity: 20K steps, Basic operation processing speed (LD instruction): 40ns, Program memory capacity: 80KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L02CPU-P	Number of I/O points: 1024 points, Number of I/O device points: 8192 points, Program capacity: 20K steps, Basic operation processing speed (LD instruction): 40ns, Program memory capacity: 80KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Source type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L06CPU	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 60K steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 240KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L06CPU-P	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 60K steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 240KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Source type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L26CPU	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 260K steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 1040KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L26CPU-P	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 260K steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 1040KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Source type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), END cover included
		L26CPU-BT	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 260K steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 1040KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Sink type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), CC-Link master/local station function, END cover included
		L26CPU-PBT	Number of I/O points: 4096 points, Number of I/O device points: 8192 points, Program capacity: 260K steps, Basic operation processing speed (LD instruction): 9.5ns, Program memory capacity: 1040KB, Peripheral connection ports: USB and Ethernet (Predefined protocol support function), Memory card I/F: SD Memory Card, Built-in I/O functions (General-purpose input:16 points, General-purpose output (Source type):8 points, Interrupt input, Pulse catch, Positioning, High-speed counter), CC-Link master/local station function, END cover included
CPU packages		L02CPU-SET	CPU module (L02CPU), Display unit (L6DSPU), and Power supply module (L61P) set
		L02CPU-P-SET	CPU module (L02CPU-P), Display unit (L6DSPU), and Power supply module (L61P) set
		L06CPU-SET	CPU module (L06CPU), Display unit (L6DSPU), and Power supply module (L61P) set
		L06CPU-P-SET	CPU module (L06CPU-P), Display unit (L6DSPU), and Power supply module (L61P) set
		L26CPU-SET	CPU module (L26CPU), Display unit (L6DSPU), and Power supply module (L61P) set
		L26CPU-P-SET	CPU module (L26CPU-P), Display unit (L6DSPU), and Power supply module (L61P) set
		L26CPU-BT-SET	CPU module (L26CPU-BT), Display unit (L6DSPU), and Power supply module (L61P) set
		L26CPU-PBT-SET	CPU module (L26CPU-PBT), Display unit (L6DSPU), and Power supply module (L61P) set
CPU options	Display unit	L6DSPU	STN black-and-white LCD, 16 characters x4 lines
	Battery	Q6BAT	Replacement battery
		Q7BAT-SET	High capacity battery with a battery holder for CPU installation
		Q7BAT	High capacity replacement battery
	SD Memory Card	L1MEM-2GBSD*1	2GB SD Memory Card
		L1MEM-4GBSD*1	4GB SD Memory Card
	RS-232 adapter	L6ADP-R2	For GOT connection, 1 x RS-232 channel, maximum transmission speed: 115.2Kpbs, MELSOFT connectable MODBUS® RTU master function (using predefined protocol support function)
	RS-422/485 adapter	L6ADP-R4 NEW	For GOT connection, 1 x RS-422/485 channel, maximum transmission speed: 115.2Kpbs MODBUS® RTU master function (using predefined protocol support function)
END cover with error terminal		L6EC-ET	END cover with error terminal

*1: Mitsubishi Electric does not guarantee the operation of non-Mitsubishi Electric products.

Note: General specifications and product guarantee conditions of jointly developed products are different from those of MELSEC products.
For more information, please refer to the product manuals or contact your local Mitsubishi representative for details.

MELSEC-L series

[Legend] DB : Double brand product NEW : Recently released product SOON : Product available soon

Type			Model	Outline
Power supply			L61P	Input voltage: 100 to 240V AC, Output voltage: 5V DC, Output current: 5A
			L63P	Input voltage: 24V DC, Output voltage: 5V DC, Output current: 5A
	Slim type Power supply		L63SP	Input voltage: 24V DC, Output voltage: 5V DC, Output current: 5A, No isolation
Branch / Extension module			L6EXB	Branch module
			L6EXE	Extension module with END cover
	Extension cable		LC06E	0.6-m cable for connecting branch and extension modules
			LC10E	1.0-m cable for connecting branch and extension modules
			LC30E	3.0-m cable for connecting branch and extension modules
I/O module	Input	AC input	LX10	16 points, 100 to 120V AC, Response time:20ms or less, 16 points/common, 18-point terminal block
			LX28	8 points, 100 to 240V AC, Response time:20ms or less, 8 points/common, 18-point terminal block
		DC input	LX40C6	16 points, 24V DC, Response time: 1/5/10/20/70ms or less, 16 points/common, Positive/Negative common, 18-point terminal block
			LX41C4	32 points, 24V DC, Response time: 1/5/10/20/70ms or less, 32 points/common, Positive/Negative common, 40-pin connector
			LX42C4	64 points, 24V DC, Response time: 1/5/10/20/70ms or less, 32 points/common, Positive/Negative common, 40-pin connector x2
	Output	Relay	LY10R2	16 points, 24V DC/240V AC, 2A/point, 8A/common, Response time: 12ms or less, 16 points/common, 18-point terminal block
		Triac	LY20S6	16 points, 100 to 240V AC, 0.6A/point, 4.8A/common, Response time:1ms + 0.5 cycles or less, 16 points/common, 18-point terminal block
		Transistor (Sink)	LY40NT5P	16 points, 12 to 24V DC, 0.5A/point, 5A/common, Response time: 1ms or less, 16 points/common, 18-point terminal block, overload protection function, overheat protection function, surge suppression
			LY41NT1P	32 points, 12 to 24V DC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, Sink type, 40-pin connector, overload protection function, overheat protection function, surge suppression
			LY42NT1P	64 points, 12 to 24V DC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, Sink type, 40-pin connector x2, overload protection function, overheat protection function, surge suppression
		Transistor (Source)	LY40PT5P	16 points, 12 to 24V DC, 0.5A/point, 5A/common, Response time: 1ms or less, 16 points/common, 18-point terminal block, overload protection function, overheat protection function, surge suppression
			LY41PT1P	32 points, 12 to 24V DC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, 40-pin connector, overload protection function, overheat protection function, surge suppression
			LY42PT1P	64 points, 12 to 24V DC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, 40-pin connector x2, overload protection function, overheat protection function, surge suppression
	I/O combined	DC input/transistor output (sink)	LH42C4NT1P	Input specifications : 32 points, 24V DC, Response time: 1/5/10/20/70ms or less, 32 points/common, Positive/Negative common Output specifications : 32 points, 12 to 24V DC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, overload protection function, overheat protection function, surge suppression 40-pin connector x2
		DC input/transistor output (source)	LH42C4PT1P	Input specifications : 32 points, 24V DC, Response time: 1/5/10/20/70ms or less, 32 points/common, Positive/Negative common Output specifications : 32 points, 12 to 24V DC, 0.1A/point, 2A/common, Response time: 1ms or less, 32 points/common, overload protection function, overheat protection function, surge suppression 40-pin connector x2

MELSEC-L series

[Legend] DB : Double brand product NEW : Recently released product SOON : Product available soon

Type		Model	Outline
Analog I/O module	Analog input	L60AD4	4 channels, Input: -10 to 10V DC, 0 to 20mA DC, Output (resolution): 0 to 20000, -20000 to 20000, Conversion speed: 20μs, 80μs, 1ms/channel, 18-point terminal block
		L60AD4-2GH	4 channels, Input: -10 to 10V DC, 0 to 20mA DC, Output (resolution): 0 to 32000, -32000 to 32000, Conversion speed: 40μs/2 channels, 18-point terminal block, Dual channel isolation
	Analog output	L60DA4	4 channels, Input (resolution): 0 to 20000, -20000 to 20000, Output: -10 to 10V DC, 0 to 20mA DC, Conversion speed: 20μs/channel, 18-point terminal block
	Analog I/O	L60AD2DA2	Input specifications : 2 channels, Input: -10 to 10V DC, 0 to 20mA DC, Output (resolution): 0 to 12000, -16000 to 16000, Conversion speed: 80μs/channel, Output specifications : 2 channels, Input (resolution): 0 to 12000, -16000 to 16000, Output: -10 to 10V DC, 0 to 20mA DC, Conversion speed: 80μs/channel, 18-point terminal block
Temperature Control module	Thermocouple	L60TCTT4	4 channels (normal mode) /2 channels (heating-cooling control), Thermocouple (K,J,T,B,S,E,R,N,U,L,PLⅡ,W5Re/W26Re), No Heater disconnection detection function, sampling cycle: 250ms/4 channels, 500ms/4 channels, Channel isolated, 18 point terminal block
		L60TCTT4BW	4 channels (normal mode) /2 channels (heating-cooling control), Thermocouple (K,J,T,B,S,E,R,N,U,L,PLⅡ,W5Re/W26Re), Heater disconnection detection function, sampling cycle: 250ms/4 channels, 500ms/4 channels, Channel isolated, 18 point terminal block x2
	RTD	L60TCRT4	4 channels (normal mode) /2 channels (heating-cooling control), Platinum type resistive temperature device(Pt100, JPt100), No Heater disconnection detection function, Sampling cycle: 250ms/4 channels, 500ms/4 channels, Channel isolated, 18 point terminal block
		L60TCRT4BW	4 channels (normal mode) /2 channels (heating-cooling control), Platinum type resistive temperature device(Pt100, JPt100), Heater disconnection detection function, Sampling cycle: 250ms/4 channels, 500ms/4 channels, Channel isolated, 18 point terminal block x2
Simple motion module	SSCNET Ⅲ/H	LD77MS2	2 axes, 2-axis linear interpolation, 2-axis circular interpolation, synchronous control, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, SSCNET Ⅲ/H connectivity
		LD77MS4	4 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, synchronous control, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, SSCNET Ⅲ/H connectivity
		LD77MS16	16 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, synchronous control, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, SSCNET Ⅲ/H connectivity
	SSCNET Ⅲ	LD77MH4	4 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, synchronous control, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, SSCNET Ⅲ connectivity
		LD77MH16	16 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, synchronous control, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, SSCNET Ⅲ connectivity
Positioning module	Open collector	LD75P1	1 axis, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 200kpps, 40-pin connector
		LD75P2	2 axes, 2-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 200kpps, 40-pin connector
		LD75P4	4 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 200kpps, 40-pin connector x2
	Differential driver	LD75D1	1 axis, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 4Mpps, 40-pin connector
		LD75D2	2 axes, 2-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 4Mpps, 40-pin connector
		LD75D4	4 axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, Control unit: mm, inch, degree, pulse, Number of positioning data: 600 data/axis, Maximum output pulse: 4Mpps, 40-pin connector x2
High-speed counter module		LD62	2 channels, 200/100/10kpps, Count input signal: 5/12/24V DC, External input: 5/12/24V DC, Coincidence output: transistor (sink), 12/24V DC, 0.5A/point, 2A/common, 40-pin connector
		LD62D	2 channels, 500/200/100/10kpps, Count input signal: EIA standards RS-422-A (Differential line driver level), External input: 5/12/24V DC, Coincidence output: transistor (sink), 12/24V DC, 0.5A/point, 2A/common, 40-pin connector
Network module	CC-Link IE Field Network	LJ71GF11-T2	Master/Local station
		LJ72GF15-T2*1	Remote station (Head module with END cover)
	CC-Link	LJ61BT11	Master/Local station, CC-Link Ver.2.0 compatible
	CC-Link/LT	LJ61CL12	Master station, CC-Link/LT system compatible
	SSCNET Ⅲ/H	LJ72MS15*2	Remote station (Head module with END cover)
	Ethernet interface	LJ71E71-100	10BASE-T/100BASE-TX BACnet™ client function, MODBUS® TCP master function (using predefined protocol support function)
	Serial communication	LJ71C24	RS-232: 1 channel, RS-422/485: 1 channel, Total transmission speed of 2 channels: 230.4kbps MODBUS® RTU master function (using predefined protocol support function)
		LJ71C24-R2	RS-232: 2 channels, Total transmission speed of 2 channels: 230.4kbps MODBUS® RTU master function (using predefined protocol support function)

*1: The CPU module, branch and extension module, display unit, RS-232 adaptor, CC-Link IE Field Network master/local module and Ethernet interface module cannot be mounted on a system using LJ72GF-T2.
*2: The CPU module, branch and extension module, display unit, RS-232 adaptor, temperature control module, simple motion module, positioning module, CC-Link IE Field Network master/local module, CC-Link IE Field network head module, CC-Link master/local module, CC-Link/LT master module, Ethernet interface module and serial communication module cannot be mounted on a system using LJ72MS15.

Compatible module for each protocol

Compatible protocol	Compatible module	Model	Outline
SLMP (MC protcol)	CPU (Built-in Ethernet)	L02CPU(-P) L06CPU(-P) L26CPU(-P) L26CPU-(P)BT	SLMP server function (only MC protocol QnA compatible 3E frame) SLMP client function (using predefined protocol support function)
	Ethernet interface module	LJ71E71-100	SLMP server function (including MC protocol) SLMP client function (using predefined protocol support function)
BACnet™	CPU (Built-in Ethernet)	L02CPU(-P) L06CPU(-P) L26CPU(-P) L26CPU-(P)BT	Compatible BACnet™ object: Analog Input (AI), Binary Input (BI), Binary Output (BO), Accumulator (AC) (using predefined protocol support function)
	Ethernet interface module	LJ71E71-100	
MODBUS®/TCP	CPU (Built-in Ethernet)	L02CPU(-P) L06CPU(-P) L26CPU(-P) L26CPU-(P)BT	MODBUS®/TCP communication master function (using predefined protocol support function)
	Ethernet interface module	LJ71E71-100	
MODBUS®	CPU (Built-in RS-232)	L02SCPU(-P)	MODBUS®RTU communication master function (using predefined protocol support function)
	RS-232 adapter	L6ADP-R2	
	RS-422/485 adapter	L6ADP-R4	
	Serial Communication Modules	LJ71C24(-R2)	

Options

[Legend] DB : Double brand product NEW : Recently released product SOON : Product available soon

Type	Model	Outline
Connector	A6CON1*1 *2	Soldering type 32-point connector (40-pin connector)
	A6CON2*1 *2	Crimp contact type 32-point connector (40-pin connector)
	A6CON3*1 *3	Flat cable pressure welding type 32-point connector (40-pin connector)
	A6CON4*1 *2	Soldering type 32-point connector (40-pin connector, cable connectable in bidirection)
Connector/terminal block converter module	A6TBXY36*4 *5 *6	For positive common type input module and sink type output module (Standard type)
	A6TBXY54*4 *5 *6	For positive common type input module and sink type output module (2-wire type)
	A6TBX70*4 *7	For positive common type input module (3-wire type)

*1: Available for L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT, LX41C4, LX42C4, LY41NT1P, LY42NT1P, LY41PT1P, LY42PT1P, LH42C4NT1P and LH42C4PT1P.
*2: Available for LD75P1, LD75P2, LD75P4, LD75D1, LD75D2, LD75D4, LD62 and LD62D.
*3: When used with L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT, only when all points are general-purpose I/O.
*4: Available for LX41C4 and LX42C4. (Positive common only)
*5: Available for LY41NT1P, LY42NT1P, LY41PT1P and LY42PT1P.
*6: Available for LH42C4NT1P and LH42C4PT1P. (Input side only when using plus common.)
*7: Available for LH42C4NT1P and LH42C4PT1P. (Input side only when using plus common. Output side is not usable.)

Ethernet related products

[Legend] DB : Double brand product NEW : Recently released product SOON : Product available soon

Type		Model	Outline
Wireless LAN Adapter	U.S.A.	NZ2WL-US*8*9 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	Europe	NZ2WL-EU*8*9 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	China	NZ2WL-CN*8*9 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	Korea	NZ2WL-KR*8*9 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
	Taiwan	NZ2WL-TW*8*9 DB	Conforms to IEEE 802.11a, IEEE 802.11b, IEEE 802.11g standards
Industrial switching HUB		NZ2EHG-T8 DB	10Mbps/100Mbps/1Gbps AUTO-MDIX, DIN rail mountable, 8 ports
		NZ2EHF-T8 DB	10Mbps/100Mbps AUTO-MDIX, DIN rail mountable, 8 ports
CC-Link IE Field Network Ethernet Adapter		NZ2GF-ETB	100Mbps/1Gbps compatible station for expanding CC-Link IE Field Networks

*8: Each product is usable only in the respective country.
*9: Both access points and stations are supported, and can be switched with the settings.

MELSOFT*1 — Programming Tool

[Legend] DB : Double brand product NEW : Recently released product SOON : Product available soon

Type	Model	Outline
GX Works2	SW1DNC-GXW2-E	Programmable controller engineering software (Functions integrated software: Programming, simulation, module settings, and monitoring)
MELSOFT iQ Works	SW1DNC-IQWK-E (CD-ROM edition) SW1DND-IQWK-E (DVD-ROM edition)	FA engineering software*2 • System Management Software: MELSOFT Navigator MELSOFT Navigator is a comprehensive system configuration solution that serves as a launching pad for the other software packages. • Controller Programming Software: MELSOFT GX Works2 The next generation configuration, programming, and simulation software for FX, L, and Q series controllers. • Motion Programming Software: MELSOFT MT Works2 Design and maintenance tool for motion controllers. • HMI Programming Software: MELSOFT GT Works3 GOT configuration, screen design, and maintenance tool. • Robot Programing Software: MELSOFT RT ToolBox2 mini Programming and total engineering tool for robots
MX Component	SW4DNC-ACT-E	ActiveX® library for communication
MX Sheet *3	SW2DNC-SHEET-E	Excel® communication support tool

*1: For details on the software versions compatible with each module, refer to the manual for each product.
Please contact your local Mitsubishi Electric sales office or representative for the latest information about MELSOFT software versions and compatible operating systems.
*2: For detailed information about supported modules, refer to the manuals of the relevant software package.
*3: MX Component is required to use MX Sheet.

FA Products

HMI | Graphic Operation Terminal GOT2000 Series GT27 Model

To the top of HMIs with further user-friendly, satisfactory standard features.

◎Comfortable screen operation even if high-load processing (e.g. logging, device data transfer) is running. (Monitoring performance is twice faster than GT16)

◎Actual usable space without using an SD card is expanded to 128MB for more flexible screen design.

◎Multi-touch features, two-point press, and scroll operations for more user-friendliness.

◎Outline font and PNG images for clear, beautiful screen display.

Product Specifications

Screen size	12.1", 10.4", 8.4" (15" coming soon)
Resolution	SVGA, VGA (XGA coming soon)
Intensity adjustment	32-step adjustment
Touch panel type	Analog resistive film
Built-in interface	RS-232, RS-422/485, Ethernet, USB, SD card
Applicable software	GT Works3
Input power supply voltage	100 to 240VAC (+10%, −15%), 24VDC (+25%, −20%)

Inverter | FR-A800 Series

High-functionality, high-performance inverter

◎Realize even higher responsiveness during real sensor-less vector control or vector control, and achieve faster operating frequencies.

◎The latest automatic tuning function supports various induction motors and also sensor-less PM motors.

◎The standard model is compatible with EU Safety Standards STO (PLd, SIL2). Add options to support higher level safety standards.

◎A variety of useful functions provide USB memory support and customization with a PLC function.

Product Specifications

Inverter capacity	200V class: 0.4kW to 90kW, 400V class: 0.4kW to 500kW
Control method	High-carrier frequency PWM control (Select from V/F, advanced flux vector, real sensor-less vector or PM sensor-less vector control), vector control (when using options)
Output frequency range	0.2 to 590Hz (when using V/F control or advanced flux vector control)
Regenerative braking torque (Maximum tolerable usage rate)	200V class: 0.4K to 1.5K (150% at 3%ED) 2.2K/3.7K (100% at 3%ED) 5.5K/7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous), 400V class: 0.4K to 7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous)
Starting torque	200% 0.3Hz (3.7K or less), 150% 0.3Hz (5.5K or more) (when using real sensor-less vector, vector control)

AC Servo | Mitsubishi General-Purpose AC Servo MELSERVO-J4 Series

Industry-leading level of high performance servo

◎Industry-leading level of basic performance: Speed frequency response (2.5kHz), 4,000,000 (4,194,304p/rev) encoder

◎Advanced one-touch tuning function achieves the one-touch adjustment of advanced vibration suppression control Ⅱ, etc.

◎Equipped with large capacity drive recorder and machine diagnosis function for easy maintenance.

◎2-axis and 3-axis servo amplifiers are available for energy-conservative, space-saving, and low-cost machines.

Product Specifications

Power supply specifications	1-phase/3-phase 200V AC, 3-phase 400V AC
Command interface	SSCNET Ⅲ/H, SSCNET Ⅲ (compatible in J3 compatibility mode), CC-Link IE Field Network interface with Motion, pulse train, analog
Control mode	Position/Speed/Torque/Fully closed loop
Speed frequency response	2.5kHz
Tuning function	Advanced one-touch tuning, advanced vibration suppression control Ⅱ, robust filter, etc.
Safety function	STO, SS1 SS2, SOS, SLS, SBC, SSM (compatible when combined with motion controller)
Compatible servo motor	Rotary servo motor (rated output: 0.05 to 22kW), linear servo motor (continuous thrust 50 to 3000N), direct drive motor (rated torque: 2 to 240N•m)

Magnetic Starter | MS-T Series

Exceed your expectations.

◎10A frame model is over 16% smaller with a width of just 36mm!!
◎New integrated terminal covers.
◎Reduce your coil inventory by up to 50%.
◎Be certified to the highest international levels while work is ongoing to gain other country.

Product specifications

Frame	10 A to 32 A
Applicable standards	Certification to various standards including IEC, JIS, CE, UL, TÜV, CCC.
Terminal cover	Standard terminal cover improves safety, simplifies ordering, and reduces inventory, etc.
Improved wiring	Wiring and operability are improved with streamlining wiring terminal BC specifications.
Operation coil rating	Wide range of operation coil ratings reduces number of coil types from 14 (N Series) to 7 types and simplifies selection.
Option units	Diverse lineup includes Auxiliary Contact Block, Operation Coil Surge Absorber Unit, Mechanical Interlock Unit.

Low Voltage Circuit Breakers | Mitsubishi WS-V Series Molded Case Circuit Breakers, Earth Leakage Circuit Breakers

Technologies based on long year experience realize more improved performance.

◎The new electronic circuit breakers can display various measurement items.
◎Improvement of breaking performance with new breaking technology “Expanded ISTAC”.
◎Compliance with global standard for panel and machine export.
◎Commoditization of internal accessories for shorter delivery time and stock reduction.

Product Specifications.

Frame	32-250A Frame
Applicable standard	Applicable to IEC, GB, UL, CSA, JIS and etc.
Expansion of UL listed product line-up	New line-up of 480VAC type with high breaking performance for SCCR requirement
Commoditization of internal accessories	Reduction of internal accessory types from 3 to 1
Commoditization for AC and DC circuit use	Common use of 32/63A frame in both AC and DC circuit
Compact size for easy to use	Thermal adjustable and electronic circuit breakers are same size as 250AF fixed type
Measuring Display Unit (MDU) breakers	MDU breakers measure, display and transmit energy date to realize energy management.

Robot | MELFA F Series

High speed, high precision and high reliability industrial robot

◎Compact body and slim arm design, allowing operating area to be expanded and load capacity increased.
◎The fastest in its class using high performance motors and unique driver control technology.
◎Improved flexibility for robot layout design considerations.
◎Optimal motor control tuning set automatically based on operating position, posture, and load conditions.

Product Specifications

Degrees of freedom	Vertical:6 Horizontal:4
Installation	Vertical:Floor-mount, ceiling mount, wall mount (Range of motion for J1 is limited) Horizontal:Floor-mount
Maximum load capacity	Vertical:2-20kg Horizontal:3-20kg
Maximum reach radius	Vertical:504-1503mm Horizontal:350-1,000mm

A global standard model that offers both high speed and accuracy.

◎Permits commands in 0.1μm increments and internal interpolation control in 1nm increments for smooth, high-accuracy machining.

◎Intuitive operation and display of hierarchical screens, with an Ethernet I/F (standard feature) for easy program management.

◎Offers a more compact control panel by integrating the display and control.

◎A lineup that includes Type A for compound lathes, and Type B for tapping centers.

Product specifications

Maximum number of control axes (NC axes + spindles + PLC axes)	Type A: 11 axes Type B: 9 axes
Maximum number of part systems	Type A: 2 systems Type B: 1 system
Least command increment	0.1μm
Least control increment	1nm
Maximum program capacity	Type A: 2,000 KB (5,120 m) Type B: 500 KB (1,280 m)
Maximum PLC program capacity	Type A: 32,000 steps Type B: 20,000 steps
Main functions (for machining center)	OMR-DD control (high-speed synchronous tapping), High-speed & high-accuracy control,Tool center point control,Inclined surface machining, etc.
Main functions (for lathes)	Milling interpolation, 2-system simultaneous thread cutting, Control axis synchronization across part systems, Control axis superimposition, Mixed control, etc.

MEMO

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001(standards for quality assurance management systems)

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ISO 9001
BUREAU VERITAS
Certification

Mitsubishi Electric Programmable Controllers

Precautions before use

This publication explains the typical features and functions of the products herein and does not provide restrictions and other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; and to other duties.

⚠ For safe use

- To use the products given in this publication properly, always read the relevant manuals before use.
- The products have been manufactured as general-purpose parts for general industries, and have not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or fail-safe functions in the system.

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