

# YASKAWA

# IEC ROBOT CONTROL

FAMILIAR PROGRAMMING OPENS UP FUTURE POSSIBILITIES



# ONE SOFTWARE. ONE CONTROLLER.

# ONE

FOR EVERYTHING IN MOTION:

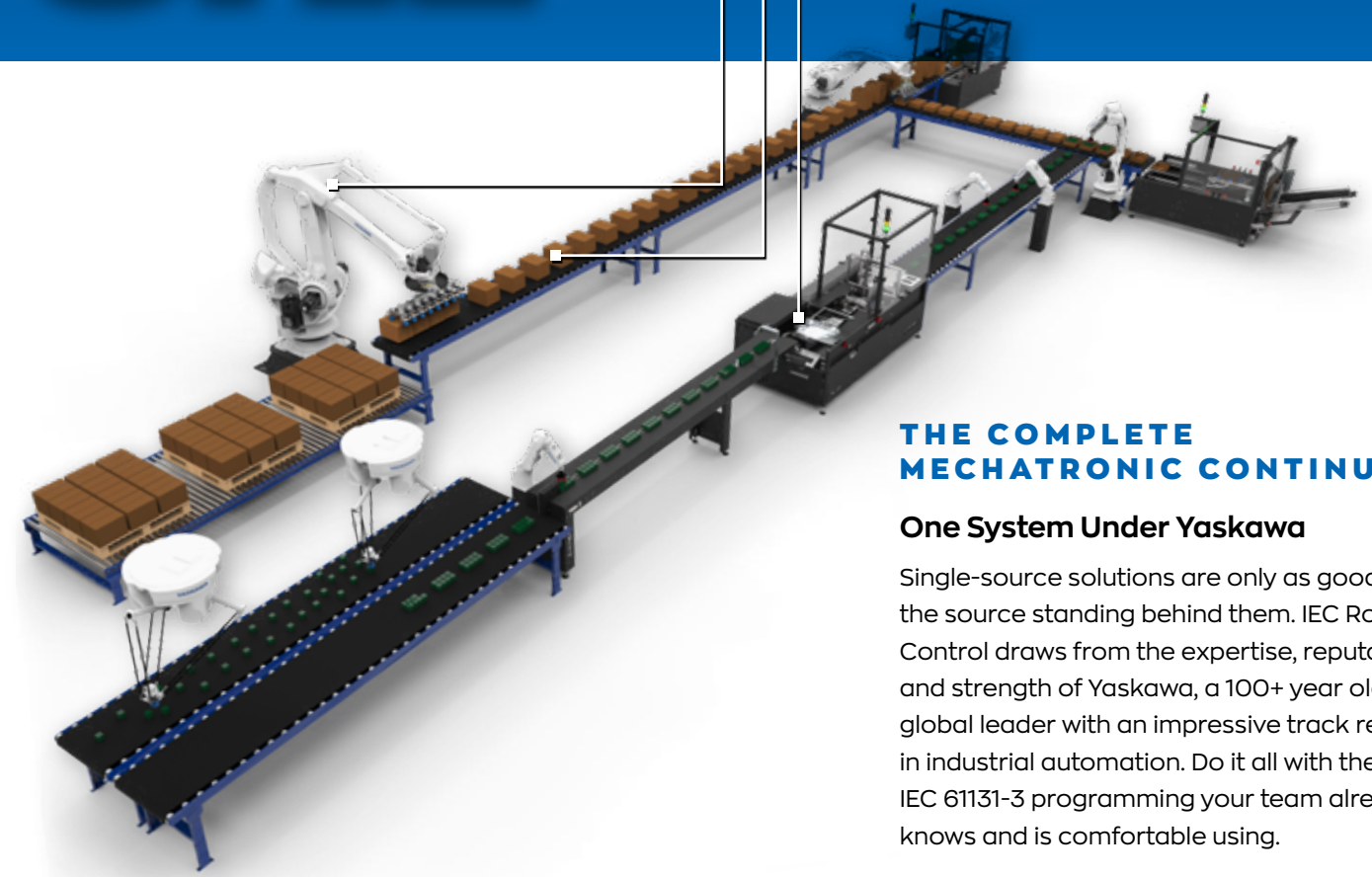
- ROBOTS
- SERVO SYSTEMS
- LOGIC CONTROL

## A New Way to Control Automated Motion

Tired of hiring expensive programming experts to implement a robot, or of rewriting machine code every time you integrate a new mechanism?

Then you're ready for Singular Control™, one hardware platform, one software tool, one programming standard and one vendor for everything in motion automation. Yaskawa understands.

That's why we created Singular Control, and why we're putting it to work by delivering true IEC Robot Control.



## THE COMPLETE MECHATRONIC CONTINUUM

### One System Under Yaskawa

Single-source solutions are only as good as the source standing behind them. IEC Robot Control draws from the expertise, reputation and strength of Yaskawa, a 100+ year old global leader with an impressive track record in industrial automation. Do it all with the IEC 61131-3 programming your team already knows and is comfortable using.



## IEC ROBOT CONTROL

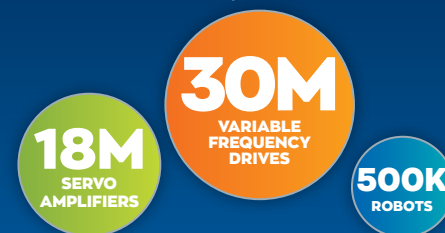
### Power for the Rest of Us

If you're familiar with standard ladder logic and function block programming, welcome to IEC Robot Control.

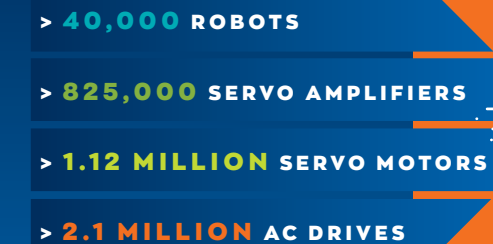
Now you can program every component in a complete automation system: robots and servo systems as well.

- Manage every system component with one software package, running on one motion controller.
- Migrate a motion application from servos to robots and back again, without changing application code.
- Do it all with the IEC 61131-3 programming your team already knows and is comfortable using.

Since 1915,  
Yaskawa has produced...



& in 2020...



**95%**  
ontime  
delivery

12,800+ EMPLOYEES  
WORLD WIDE



GLOBAL SALES  
**\$4.6B**

100+  
YEARS  
MANUFACTURING  
EXCELLENCE

# HARDWARE AND SOFTWARE BUILDING BLOCKS



GP8

GP25

GP7



SCARA

MPP3S

MotoMini



MPK50

MPL800



SIGMA-7  
SERVO SYSTEMS

SLIO I/O

## CONTROL MULTIPLE TYPES OF MOTION

- A complete family of picking, packing and palletizing robots:
  - SG Series SCARA: 3 or 6 kg payload (pick/pack)
  - MPP3S Delta robots: 3 kg payload (pick)
  - MotoMini: 0.5 kg payload (pick/pack)
  - GP7: 7 kg payload (pick/pack)
  - GP8: 8kg payload (pick/pack)
  - GP12: 12 kg payload (pack)
  - GP25: 25 kg payload (pack)
  - MPK50: 50 kg payload (pack/palletize)
  - MPL800: 80 kg payload (palletize)
- Any type of gantry, T-Bot and H-Bot robotic mechanisms
- SIGMA-7 Servo Systems: fast and precise rotary, direct drive and linear models, with advanced autotuning software

The list of compatible devices is growing constantly, and code is also available to add your own custom mechanism.

## PLUS: ENGINEERING HELP



Yaskawa's Engineered Systems Team of control engineering experts are ready to help with anything from simple servo indexing to specialized robotic mechanisms.

This capability is backed by more than 50 years of service and support expertise.

## ONE CONTROLLER

A single MP3300iec machine controller can operate gantries, robots, servo axes, G-code machining equipment—any motion device necessary to implement the latest advances in hybrid manufacturing. Also, it can operate articulated robots, robotic gantries and special robotic mechanisms, often without the need for a separate robot controller. It is possible to control all the robots and servo axes in an entire automation system from a single MP3300iec.

- Up to 62 axes of motion
- Multi-axis synchronization
- 5-axis simultaneous control
- Built-in web server lets you check status or run diagnostics through a standard web browser
- Networking options: Modbus TCP, EtherNet/IP, MECHATROLINK III and OPC
- Easy interface with HMI and I/O solutions

# MotionWorks® IEC PROFESSIONAL

## ONE SOFTWARE

MotionWorks IEC was created to be as fast as it is familiar, with time-saving features that speed up results.

- Re-usable motion code libraries to cut down the time and tedium of standard operations
- A built-in cam editor with ten powerful camming function blocks

Yaskawa Toolboxes use application code for higher level automation tasks, created by Yaskawa experts in application programming. For details, turn the page to see our Toolbox section.

If you are familiar with the conventions of IEC 61131-3 programming, you'll be instantly at home in MotionWorks IEC. Yaskawa's programming software is

built on the conventional tools that automation professionals already know and trust:

- PLCOpen Function Blocks, including Part 1, 2, 4 and 5
- Ladder Diagram (LD)
- Structured Text (ST)
- Function Block Diagram (FBD)
- Sequential Function Charts (SFC)



MP3300 IEC

# SHORTCUTS TO SUCCESS

Yaskawa Application Code Toolboxes



## Ready-Made and Reusable for Common Automation Functions

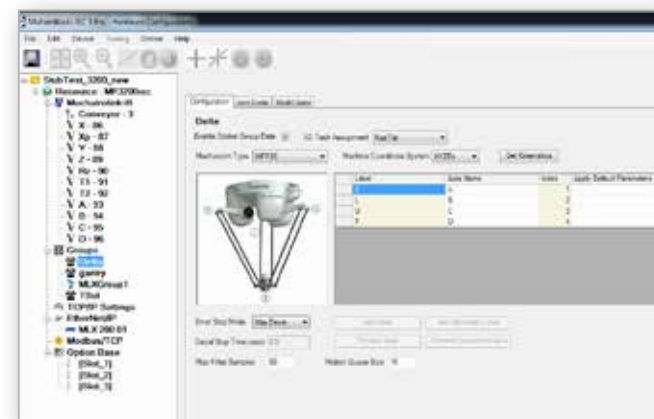
IEC61131-3 allows programmers to create libraries of reusable code. Yaskawa expands this capability with a set of powerful Application Code Toolboxes. The Toolboxes are in addition to a complete library of Yaskawa motion code elements for basic programming.

Toolboxes may be imported into user programs as a User Library, serving as the foundation for a complete customized solution. Each Toolbox was authored and tested by Yaskawa experts in robot and motion programming, working in cooperation with some of the world's most sophisticated automation users.

## THE GROUP CONCEPT

### Synchronizing multiple axes into one

Some of the most powerful toolboxes work in conjunction with the Group Toolbox, making it easier to coordinate the movement of multiple servo axes into a single coordinated robotic motion.



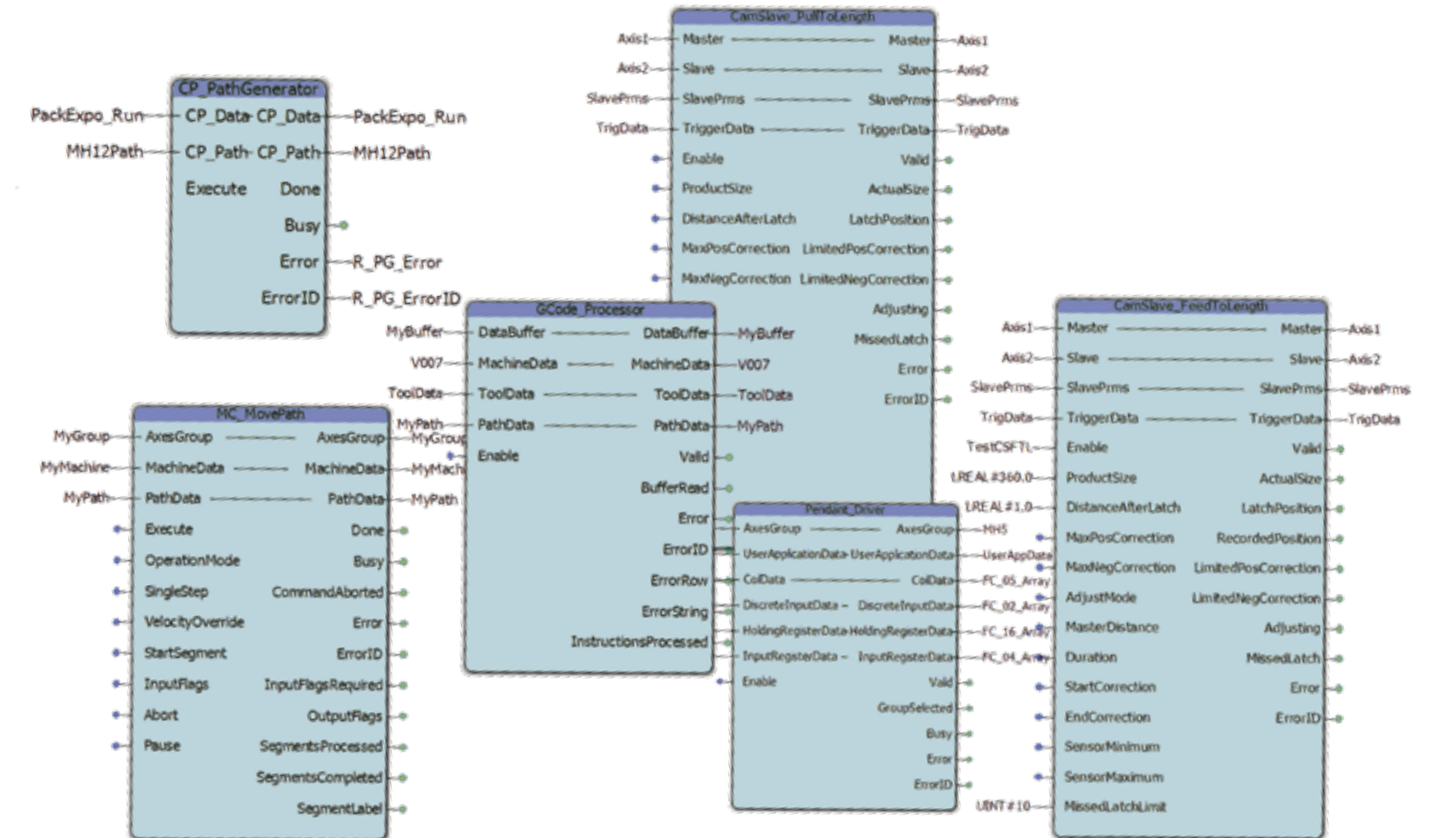
A Group solves the kinematics of the mechanism and calculates each axis of motion in the controller's firmware, freeing the application programmer to focus on moving the tool or workpiece without complicated mathematics. your company's existing software assets.

## TOMORROW

### Sharper Tools

Don't see a toolbox to meet your specific automation need? Stay tuned. Yaskawa is constantly updating and improving, adding new applications and fine tuning existing toolboxes.

This continual evolution keeps automation professionals like you always on the leading edge of advances in motion automation.



Vision and conveyor tracking capability can be used with any of the Toolboxes

## WIDE VARIETY OF TOOLBOXES AND FUNCTION BLOCKS

**Group:** toolbox that supports the PLCopen Part 4 library for group motion, enhancing basic PLCopen function blocks to help users start and test applications faster.

**Cam:** provides enhanced camming capabilities for profile generation, registration, and E-Stop recovery.

**PackML:** implements the PackML state machine along with functions for error handling and OEE calculations. An editable template project demonstrates a PackML implementation and can be used as a starter for your application.

**MotoPack IEC:** generates and executes optimum paths for a pick and place routine. Users can enter parameters (layers, locations, patterns to pick and place, etc.) which automatically generate a path.

**MotoPick:** scheduling and load sharing for your pick and place application

**Conveyor Tracking:** integrate with any sensor or vision system to easily track the position of parts on your conveyor system.

**Pendant:** performs all manual operations of a robot teach pendant, for use with robots or any other motion automation mechanism. Manual operations include:

- Add and modify teach points
- Jogging in various coordinate frames, including MCS, PCS, TCS and ACS, and jog to teach points
- Assign up to 4 preset speeds for quick and precise teaching
- Teach part frames
- View and modify tool offsets
- Display errors and messages
- Store and retrieve teach points and part frames into the MPiec controller flash memory

The pendant driver supports any pendant that can communicate with the MPiec using Modbus TCP.

YASKAWA.COM



Yaskawa is the leading global manufacturer of low and medium voltage variable frequency drives, servo systems, machine controllers and industrial robots. Our standard products, as well as tailor-made solutions, are well known and have a high reputation for outstanding quality and reliability.

**YASKAWA**

**Yaskawa America, Inc.** | Drives & Motion Division

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