

YASKAWA

IEC Robot Control™

Familiar programming opens up future possibilities



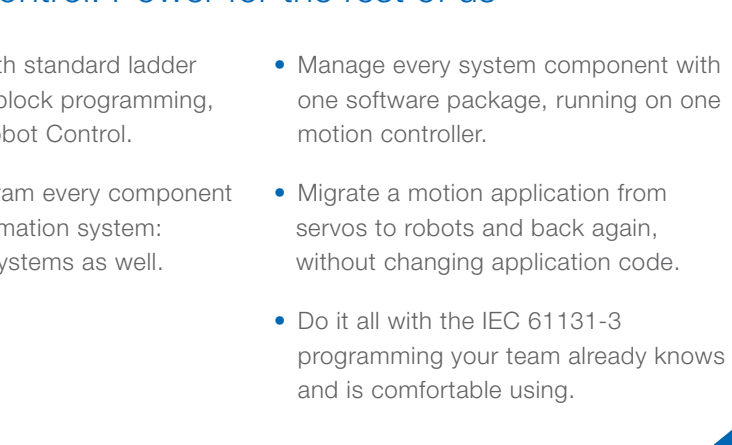
One Software. One Controller.

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.



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.



FOR EVERYTHING
IN MOTION:

- ROBOTS
- SERVO SYSTEMS
- LOGIC 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.

<p>25 Countries with Yaskawa Sales, Service & Manufacturing Locations</p>		<p>100 YEARS OF MANUFACTURING EXCELLENCE</p> <p>Since 1915, Yaskawa has produced:</p>	
<p>10M Servo Amplifiers</p>	<p>18M Variable Frequency Drives</p>	<p>300K Robots</p>	<p>20,000 ROBOTS PER YEAR</p>
<p>14,500+ WORLDWIDE ASSOCIATES</p>		<p>\$4.0 BILLION IN GLOBAL SALES</p>	<p>800,000 SERVO AMPLIFIERS</p>
		<p>1 MILLION SERVO MOTORS</p>	<p>1.8 MILLION AC DRIVES</p>

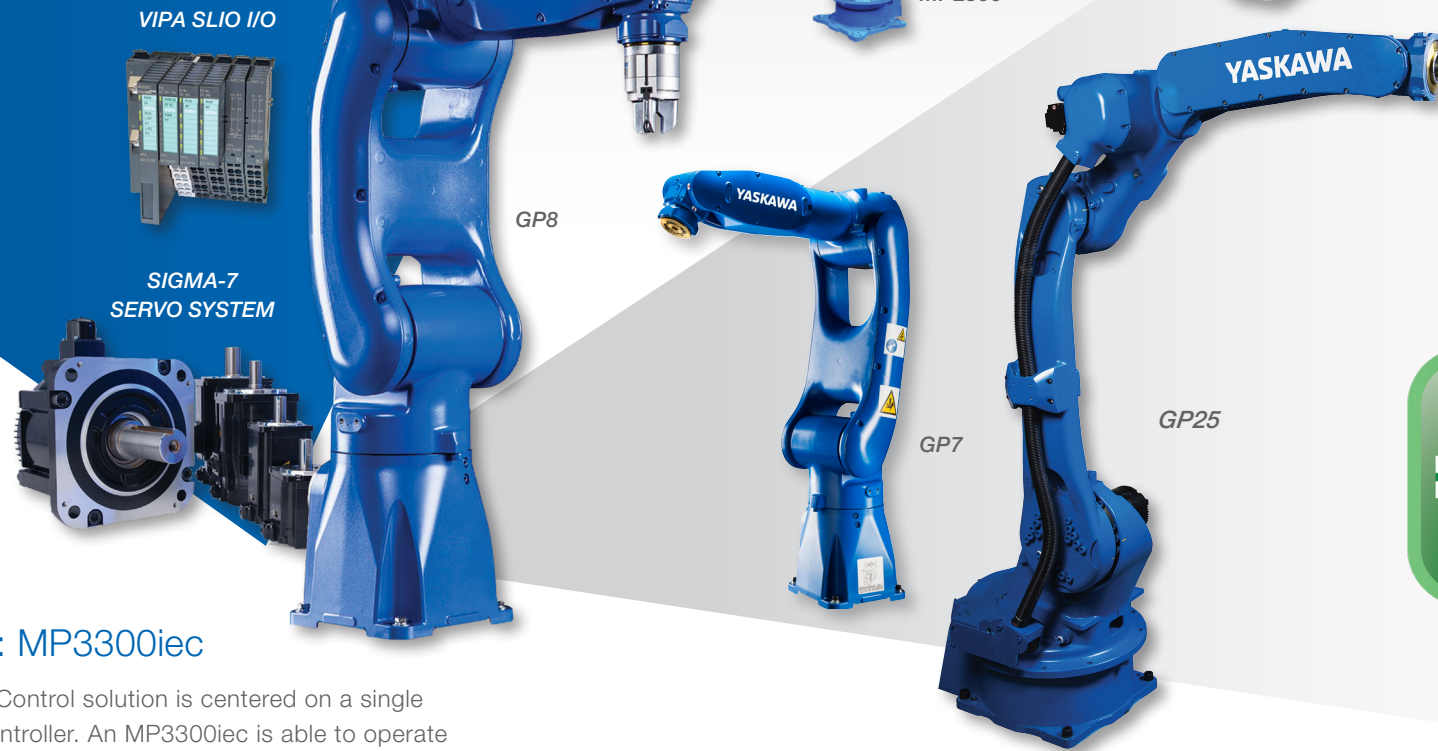
Hardware and Software Building Blocks



One Controller: MP3300iec

The entire IEC Robot Control solution is centered on a single MP3300iec motion controller. An MP3300iec is able to 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 32 axes of motion
- 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



Control Multiple Types of Motion

- A complete family of picking, packing and palletizing robots:
 - MPP3S Delta robots: 3 kg payload (pick)
 - 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 50+ years of service and support expertise.

One Software: *MotionWorks*® IEC PROFESSIONAL

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)



Shortcuts to Success

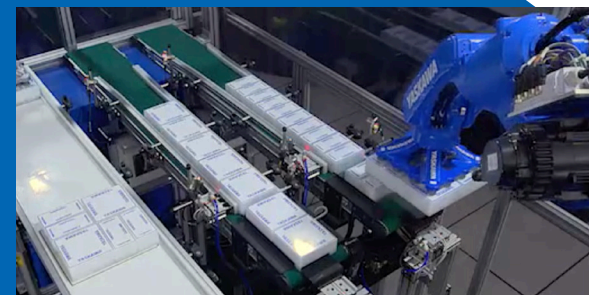
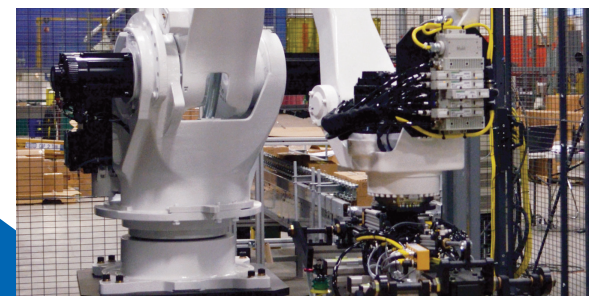
The Yaskawa Application Code Toolboxes



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.

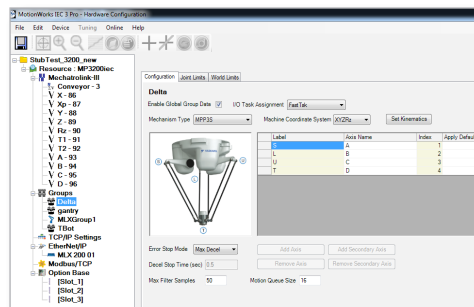
Toolboxes may be imported into user programs as a User Library, serving as the foundation for a complete customized solution. Each Toolbox was authored and tested by Yaskawa experts in robot and motion programming, working in cooperation with some of the world's most sophisticated automation users.



The Group Concept: Synchronizing multiple axes into one motion

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.



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.

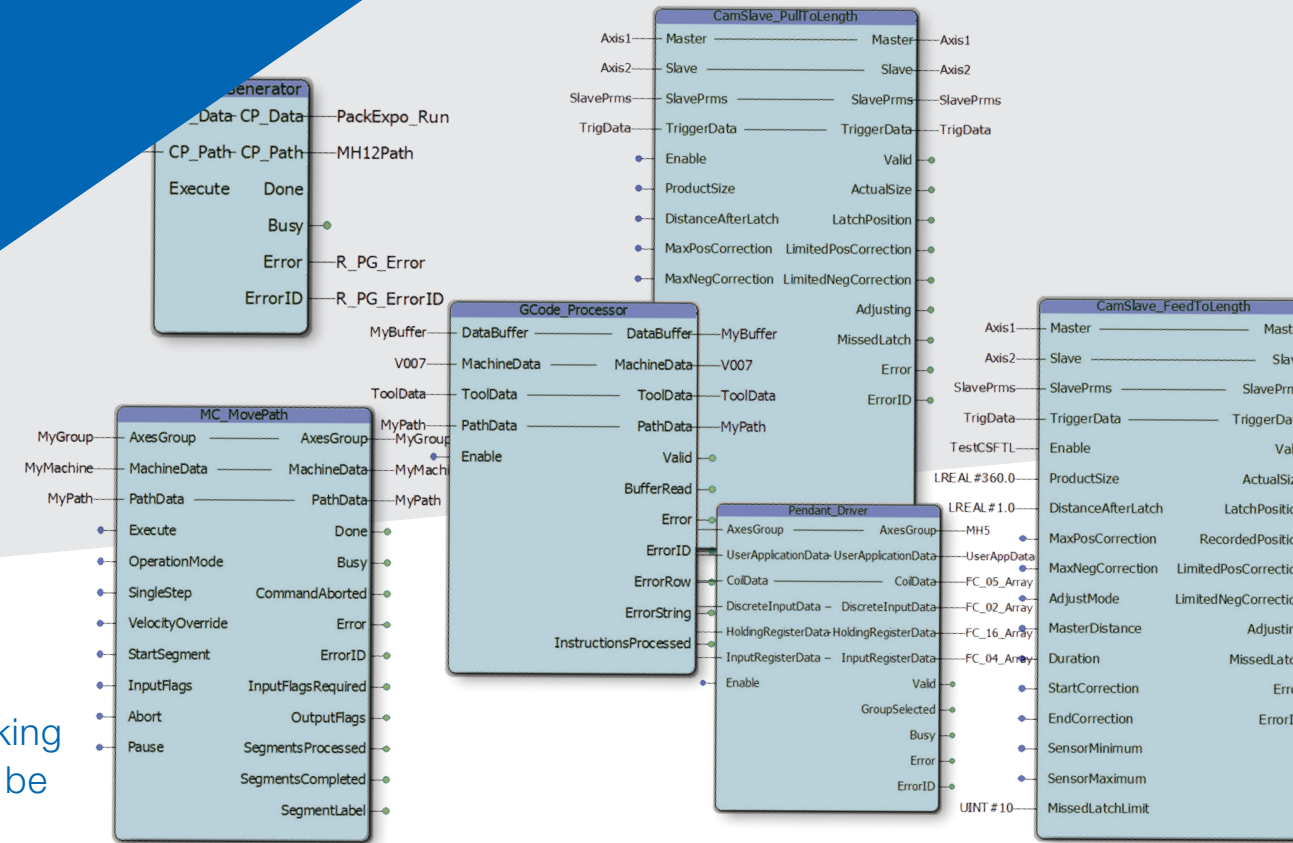
This continual evolution keeps automation professionals like you always on the leading edge of advances in motion automation.



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

Choose from a wide variety of toolboxes and function blocks, including:

- Group: a 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 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.