

**YASKAWA**

# **iCUBE CONTROL™**

A TOTAL SYSTEM FOR TOTAL CONTROL



Automation Technology Built for You

iCUBE CONTROL™

# THE AUTOMATION TECHNOLOGY THAT PUTS YOU IN TOTAL CONTROL

iCube Control is the open automation machine control technology solution that gives everyone, including engineers, application developers, machine builders and designers, total control over their systems, delivering:

## FLEXIBILITY

Program in IEC61131-3, along with other high-level languages

Collaborate securely across teams and geographies

Choose from a wide variety of Yaskawa servo technology matched to your application

## SCALABILITY

One machine controller and one software engineering tool for Motion, Logic, Safety, HMI and Robotics

Scale controller features to meet your specific application requirements

Easily integrate additional components with open network communications

## CERTAINTY

Engineered to ensure the highest quality and long-term product life cycle

Integrated FailSafe over EtherCAT for a complete machine safety solution

Secure controller communications and web-based management

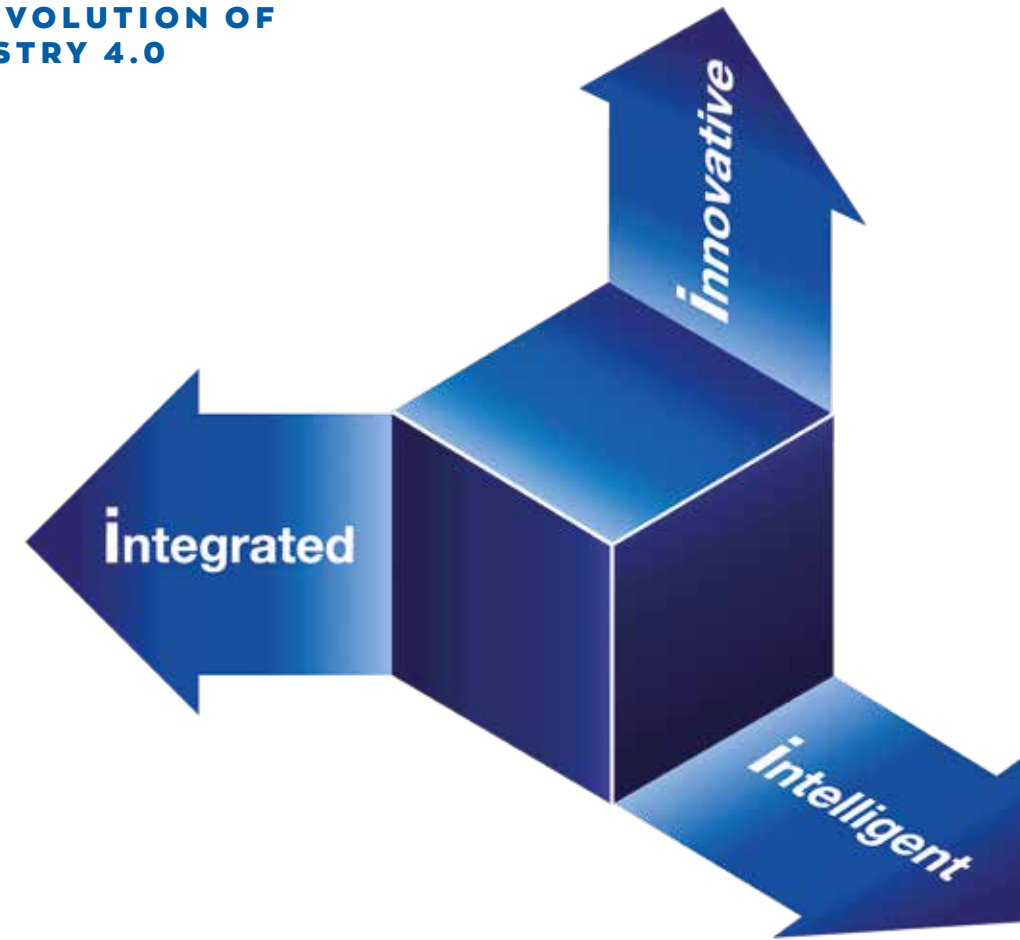
## EXPERT SUPPORT

Expert engineering resources, from design to development

Quick, nimble and thorough response, from concept to implementation

Delivered by Yaskawa, the world's largest manufacturer of robotics and automation systems

THE EVOLUTION OF INDUSTRY 4.0



## iCUBE MECHATRONICS™

Yaskawa is a pioneer in developing connected devices that enhance productivity and production flexibility. iCube Mechatronics stands for:

### INTEGRATED

Smart products that enable the collection and analysis of real-time data

### INTELLIGENT

Big Data analysis and AI learning deliver new ways of optimizing the production process at every level

### INNOVATIVE

Insights gained from the production process trigger improvements to production and quality

# BUILT FOR YOU

Whether you want the flexibility of open system design, the scalability of modular system integration or the certainty of security and safety—you get it all with the iCube Control platform. With one controller, built to perform impeccably over the life of your system.



iCube Control is the adaptable, powerful platform that adapts to your personal needs, working methods and ideas. It combines these four separate systems into one:

## MACHINE CONTROL

EtherCAT master for all motion control and logic functions. Program using IEC61131-3 or other high-level languages.

## MACHINE SAFETY

Integrated FailSafe over EtherCAT master meeting SIL3 requirements. Program machine control and safety in a single software engineering tool.

## ROBOTICS

The Singular Control architecture allows for programming of articulated robots and standard mechanisms with the same PLCopen function blocks.

## HMI

Integrated HMI development for HMI applications running with remote panels via OPC UA or running locally on the controller via a web server.

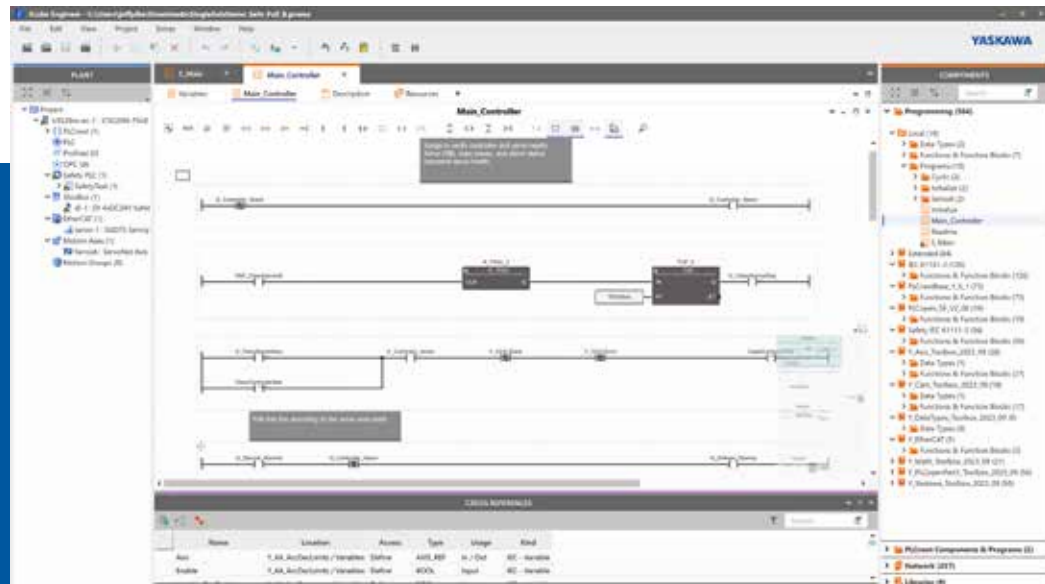




iCUBE ENGINEER

# ENGINEERED FOR YOUR OPPORTUNITIES

Open up your possibilities and develop more efficient solutions. Designed for collaborative working, iCube Engineer gives developers the freedom to program function modules in the language of their choice.



## INTEGRATED ENVIRONMENT

- Motion, Robot, Logic, and VFD
- Fully integrated SIL 3 safety programming
- Network configuration, diagnostics and security

## OPEN PROGRAMMING

- IEC61131-3 graphical, structured text or SFC programming
- Create libraries with C#, C++ and other high-level languages

## CONTROL SYSTEM SECURITY

Device certificates and multi-user password protection

## COLLABORATIVE

- Managed program access for multiple developers
- Online editing and version detection

ic9200

# THE MACHINE CONTROLLER FOR ALL

A single machine controller for motion, logic, kinematics, safety, security and more. The iC9200 is ready for any challenge you face today and that you will face tomorrow.



## YASKAWA TRITON PROCESSOR

- 3 core ARM Cortex-A17 1.26GHz processor for fast processing of synchronous motion tasks
- High-speed DDR4 memory and eMMC flash
- Integrated real-time Ethernet network support

## SAFETY OVER ETHERCAT

- Integrated EtherCAT machine controller and EtherCAT safety master
- FSoE network safety profile meeting SIL3 requirements

## CONTROL SYSTEM SECURITY

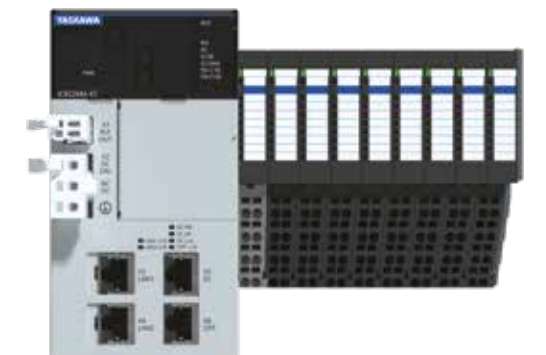
- Secure web-based management with multi-level password protection
- Secure OPC UA communications
- Designed for network security certification per ISA/IEC 62443

## NETWORK COMMUNICATIONS

OPC UA, EtherNet/IP, Modbus TCP, Profinet, I/O Link

## FLEXIBLE I/O

Expandable local I/O using standard SLIO Slice I/O



## SECURE WEB-BASED MANAGEMENT

# CONNECTIVITY DESIGNED FOR YOU

Built to provide real-time data acquisition, processing, communication and feedback.

### WORLDWIDE CONNECTIVITY

- Easy web-based access from any internet-connected location
- Remotely change settings or update firmware

### REDUCED MAINTENANCE COSTS

- Monitor variables, status, diagnostics, and alarms from any web browser
- Download new programs to the controller without any Yaskawa software
- Upgrade controller and amplifier firmware
- Monitor Servo axis position, velocity and torque
- Live display and setting of I/O values

### FLEXIBLE ACCESS

Connect via computer or mobile device

### SECURE ACCESS

HTTPS and password-based user logins with multiple levels of access



## SINGULAR CONTROL™

# THE INTEGRATION OF MOTION AND ROBOTICS



Delivering integrated control for Delta, SCARA, 6-axis, Gantry and customer-specific mechanisms.

### A COMPLETE MECHATRONIC CONTINUUM

Motion axes, standard mechanisms, robots, and custom mechanisms running interchangeably under the same controller and application code

### FAMILIAR PROGRAMMING

- Program robots with ladder logic and function blocks
- No proprietary robot programming language

### INTEGRATED CONTROL

Control all types of mechanisms with one software engineering tool using the same function blocks

### MACHINE FLEXIBILITY

Swap mechanism type with minimal changes to application code

### FUTURE ENABLED

- Easily upgrade to new mechanisms
- Migrate your machine IP as your technology progresses

**SAFETY**

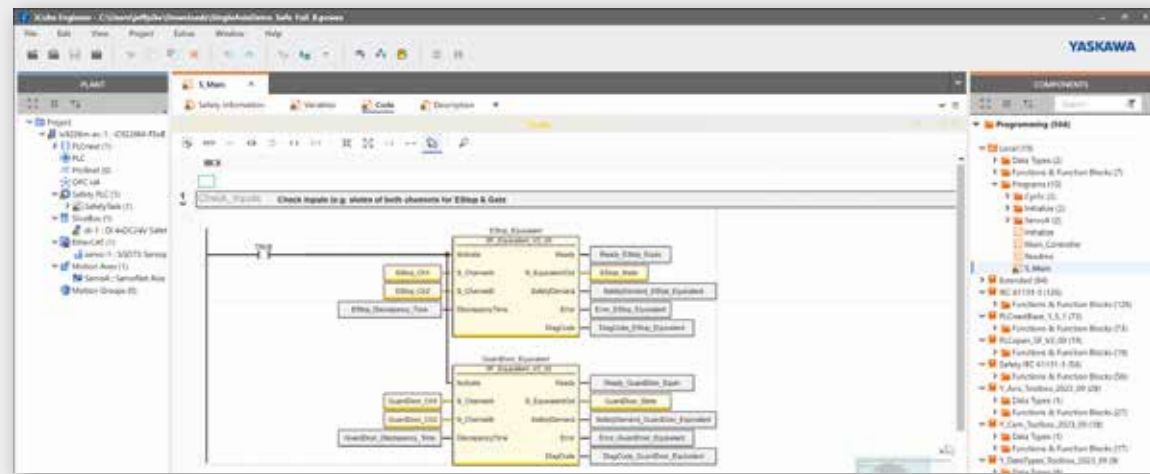
# GET THE CERTAINTY OF SAFETY, SECURITY AND SUPPLY

iCube Control combines automation technology with the certainty of machine safety you need to operate successfully, all in one fully integrated platform.



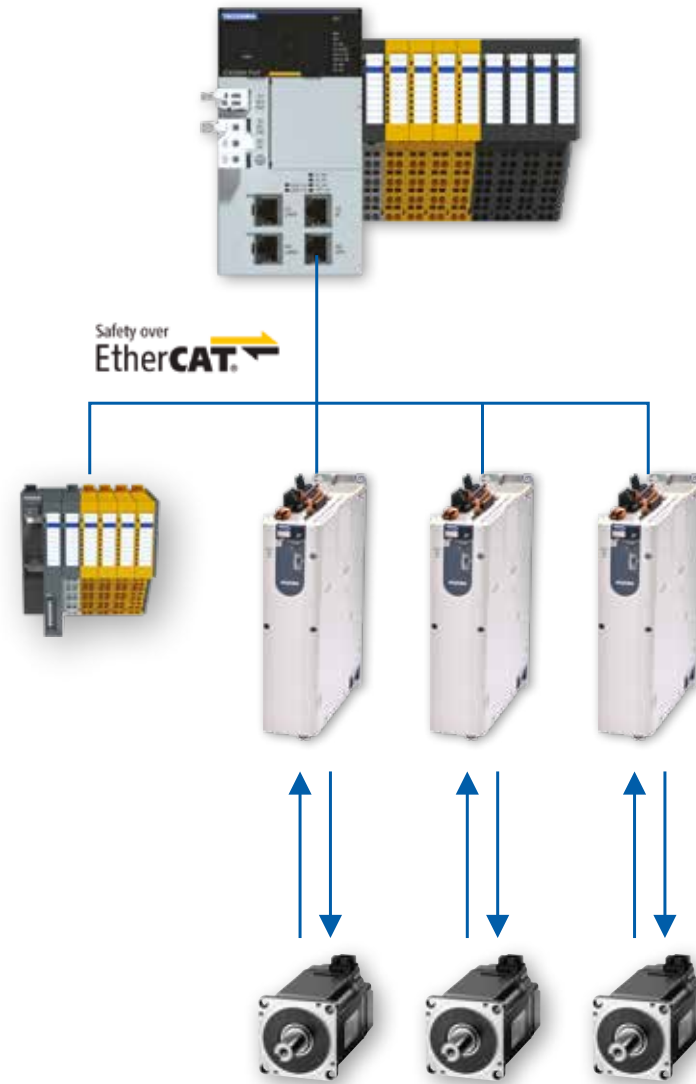
The iC9200 machine controllers are available with an integrated EtherCAT (FSoE) safety master, eliminating the need for an external safety PLC and allowing all safety and non-safety EtherCAT devices to be integrated onto a single network.

Safety applications are programmed using certified safety function blocks in iCube Engineer, allowing you to use a single software engineering tool for programming safety and non-safety logic and motion.



SLIO safety input and output modules can be mounted directly to the iC9200 controller or remotely on an EtherCAT fieldbus module.

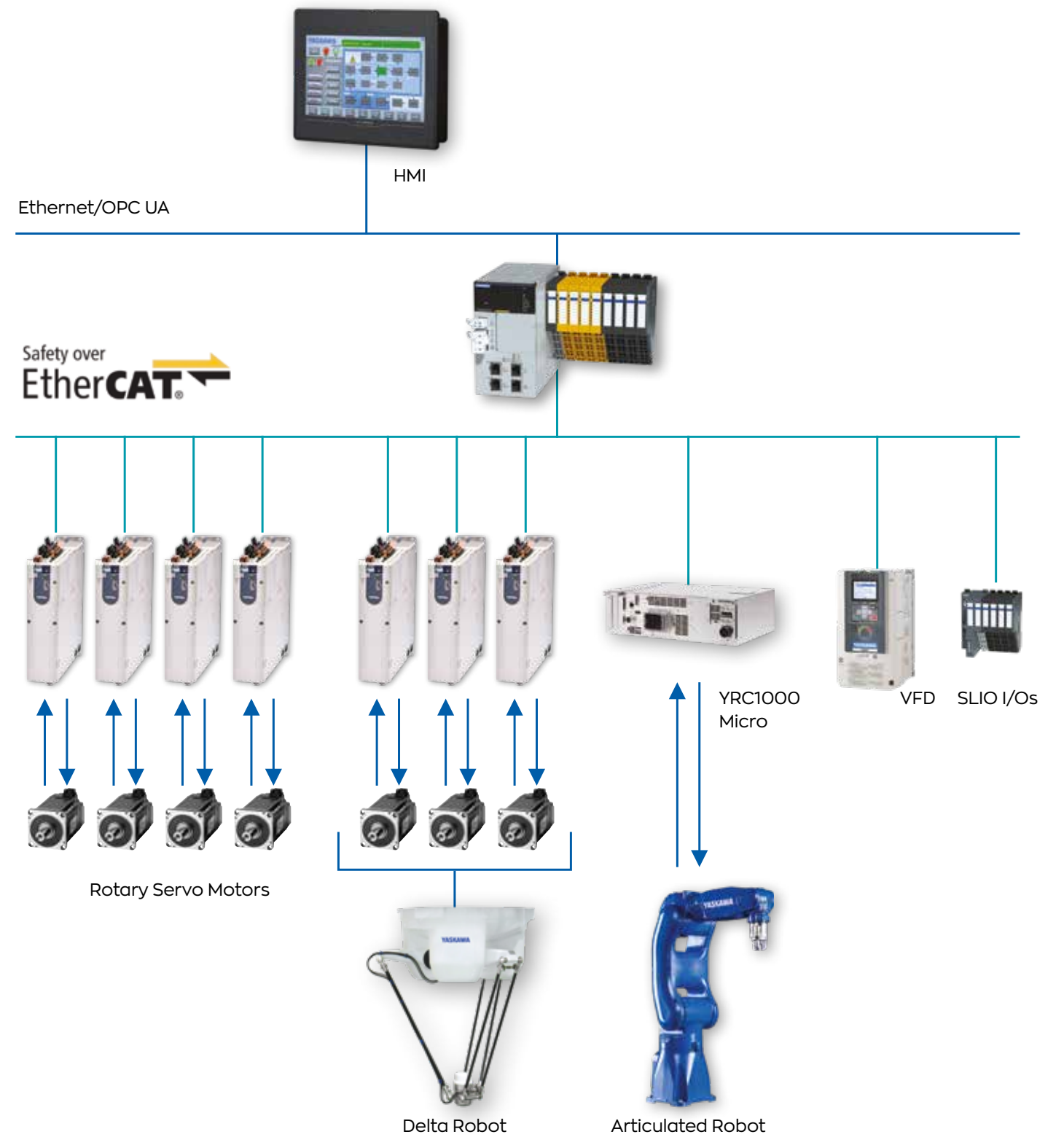
Yaskawa Servopacks featuring the Advanced Safety Module provide safe motion, meeting SIL 3 requirements.



# iCUBE CONTROL ARCHITECTURE OVERVIEW

Your Total System for Total Control

- One machine controller and one software engineering tool for Motion, Logic, Safety, HMI and Robotics
- Integrated EtherCAT machine controller and EtherCAT (FSoE) Safety Master
- Compatible with a broad range of Yaskawa mechatronic technology



# THE BEGINNING OF A NEW ERA

The iC9200 machine controllers are powered by the Triton processor. They are designed by Yaskawa specifically for demanding machine control applications, including multi-axis synchronized motion. The controller supports multiple modern field buses and provides a feature set that can be tailored to meet your specific requirements.



## HARDWARE MODEL OPTIONS



Model	iC9226M-EC	iC9226M-FSoE
<b>Network Master</b>	EtherCAT (CoE, FoE, EoE)	EtherCAT (CoE, EoE, FoE) EtherCAT Safety (FSoE)
<b>Fieldbus Support</b>	OPC UA Client, Server, Pub/Sub EtherNet/IP Scanner and Adapter PROFINET IO RT PROFINET I-Device Modbus TCP Client/Server	
<b>Connections</b>	2 x Gigabit Ethernet 2 x 100 Megabit Network 24 VDC Power Supply (Input) SD Memory Card Slot Integrated Slice Bus for local SLIO Modules	
<b>Processor</b>	Triton ARM Cortex-A17 1.26 GHz, 3 Core Processor	
<b>Memory</b>	Flash Memory: 4 GB eMMC SDRAM: 2 GB DDR4 Program Memory: 12 MB Data Storage Memory: 32 MB Retained Data Storage: 3 MB MRAM	
<b>Synchronized Axis Count</b>	Up to 64 Real and 64 Virtual Axes	



# YASKAWA SLIO

Compact. Intelligent. Flexible.



The most effective decentralized I/O system available, SLIO is designed to help you modernize and standardize while retaining a sense of flexibility. SLIO can help reduce setup time and minimize user errors.

## EASY WEB INTERFACE

SLIO diagnostic and status information is accessible through a web interface, linking a standard browser to any fieldbus module.



## HIGH SPEED BACKPLANE BUS

Achieve reaction times as fast as 20 microseconds with SLIO's high speed backplane bus. Connect as many as 64 modules at a time, while maintaining speeds up to 48 Mbit/s.

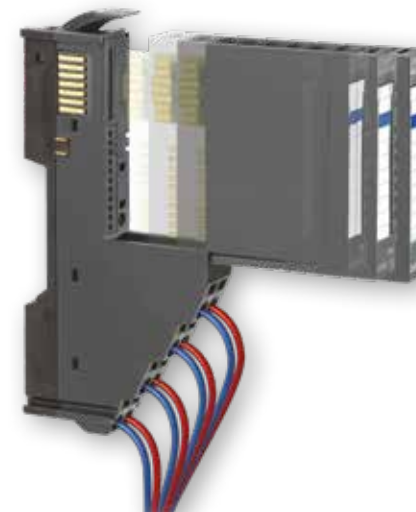
## INSTALLER-FRIENDLY DESIGN

Engineered for error-free installation, SLIO can be installed by an average technician without consulting a machine designer or installation engineer.



## SIDE MOUNTING

Mount SLIO I/O directly to an IC9200 series controller using the controller's integrated Slice Bus.



## RECONFIGURE WITHOUT WIRING

Updating or amending a SLIO system is as easy as removing an existing module and snapping in a new one. System functions can be changed without removing the wiring from the contact block.

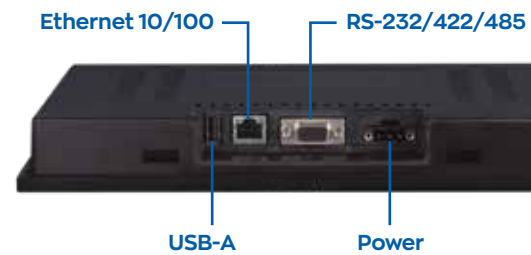
# SMARTPANEL

The smartest choice for usability, performance and connectivity.

The slim design and rugged resistive touch screen are ideal for everyday industrial applications.

## FEATURES

- ARM Cortex Processor
- Robust and durable-IP66 protection rating (front)
- Familiar Windows system environment



## MODELS AND SPECIFICATIONS

Model Number	H41-71A41-O	H71-71A41-O	HA1-71A41-O
Display Size [In]	4.3	7	10
Resolution [Pixel]	480x272	800x480	1024x600
Touch Screen	Resistive		
Processor	ARM Cortex-A8 1GHz		
Interfaces	1x RS232/422/485; 1x USB-A; 1x Ethernet		
int. RFID Reader	-		
Work Memory [MB]	512		
Load Memory [GB]	4		
Card Slot	-		
Housing	Plastic		
Protection	Front: IP66 / Rear: IP20		
Operating System	Windows Embedded Compact 7		
Runtime	Movicon 11		

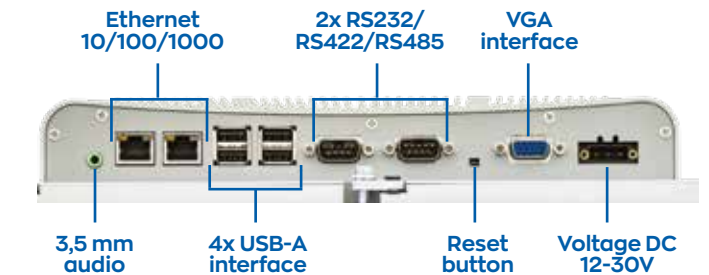
# PANEL PC

Intelligent control and monitoring with PC performance.

Equipped with the latest performance features and a precise, responsive capacitive touchscreen for outstanding usability in a small space.

## FEATURES

- Intel Atom processor
- Large integrated work memory
- Familiar Windows system environment
- Numerous interfaces for every application need
- Fanless construction and high-quality metal housing



## MODELS AND SPECIFICATIONS

Model Number	67K-RRJO-EB	67P-RRJO-EB	67S-RRJO-EB
Display Size [in]	10.1	15.6	21.5
Resolution [Pixel]	1280x800	1366x768	1920x1080
Touch Screen	Capacitive		
Processor	Intel Celeron J1900 4 x 2.0 GHz		
Interfaces	2x Ethernet; 2x RS232/422/485 (SUB-D)	2x USB 2.0; 1x USB 3.0;	1x VGA; 1x Audio out
Work Memory [MB]	2,048-4,096		
User Memory [MB]	2,048-16,384		
Card Slot	CFast		
Casing	Aluminium		
Protection	Front: IP65 / Rear: IP20		
Operating System	Windows Embedded Compact 7		
Runtime	Movicon 11		

ICUBECONTROL.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

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