

YASKAWA

MACHINE CONTROLLER MPiec Series

EN

DE



MP2000iec Series

MP3000iec Series

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Experience and Innovation

Since 1915 YASKAWA has manufactured and supplied products for machine building and industrial automation. Our standard products as well as tailor-made solutions are well known and have a high reputation for outstanding quality and reliability.

YASKAWA is the leading global manufacturer of inverter drives, servo drives, machine controllers, medium voltage inverters, and industrial robots.

We have always been a pioneer in motion control and drive technology, launching product innovations, which optimise the productivity and efficiency of both machines and systems.



YASKAWA Eschborn, Germany

Today we produce more than 1.8 million inverters per year. Considering this, YASKAWA is probably the biggest inverter manufacturer in the world.



YASKAWA Motoman Robots

Furthermore, with a yearly production of more than 800,000 servo motors and 20,000 robots we offer a wide range of products for drive automation processes in many different industries. YASKAWA technology is used in all fields of machine building and industrial automation.

Wherever You Are – Our Local Support is Near.



Employing more than 14,600 people worldwide

More than 1,350 employees in worldwide service network

More than 1,250 employees in Europe

Easy for You. Consistent for Everyone.

Today's customers need to keep a finger on the pulse of their machines at all times. Success means maintaining peak productivity, total reliability and endless freedom to interact with the systems they control. With easy-to-learn MotionWorks IEC software, your engineers start programming faster and stay connected more easily. The result? Faster machine commissioning and more rapid machine delivery to market.



A FAMILIAR PROGRAMMING STANDARD

MotionWorks IEC complies with IEC 61131-3, and provides five globally recognized standard programming languages. It includes motion function blocks that adhere to the PLCopen standard. Experienced control engineers will find this software comfortably familiar, and learning to program with MotionWorks IEC has never been easier.



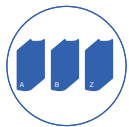
BUILT-IN YASKAWA TOOLBOXES

YASKAWA toolboxes make programming common functions so easy, it's like having a YASKAWA engineer working by your side. Development time is reduced because standard code elements are already written and ready for use.



EASY CONNECTIVITY, WORLDWIDE

An MPiec controller is your gateway to full control of a machine at any remote location with internet access. Keep a constant finger on the pulse of machine operation, from your own factory floor or anywhere worldwide.



A REUSABLE CODE LIBRARY

Import and re-use previously developed logic to speed up new projects. Re-use your own work or draw on logic created by others.



WEB SERVER UPDATES

MPiec controllers allow loading of programs and updating of firmware from any web browser, with no other software required. Browser-based controller status data helps reduce maintenance time and cost.



SCALABILITY

All our single-axis to multi-axis MPiec controllers utilize the same MotionWorks IEC software platform, making programming and maintenance consistent for all machine sizes.

MPiec Machine Controller Hardware

MPiec Machine Controllers offer a wide range of hardware for applications ranging from 1 to 62 axes. All controllers are equipped with the reliable MECHATROLINK motion network.

MP2600iec

- ▶ Processor Speed: 200 MHz
- ▶ Motion Network: Dual Port RAM access
- ▶ Motion Networks Speed: As fast as 1 ms
- ▶ Network Capability: OPC, EtherNet/IP, Modbus TCP
- ▶ Axis Count: 1.5
- ▶ Option Card Slots: None (On board I/O)



MP2300Siec / MP2310iec

- ▶ Processor Speed: 240 MHz
- ▶ Motion Network: MECHATROLINK-II
- ▶ Motion Networks Speed: As fast as 0.5 ms
- ▶ Network Capability: OPC, EtherNet/IP, Modbus TCP
- ▶ Axis Count: 4, 8 or 16
- ▶ Option Card Slots: 1 or 3



MP3300iec

- ▶ Processor Speed: 400 MHz
- ▶ Motion Network: MECHATROLINK-III
- ▶ Motion Networks Speed: As fast as 0.25 ms
- ▶ Network Capability: OPC, EtherNet/IP, Modbus TCP
- ▶ Axis Count: 4, 8 or 20
- ▶ Option Card Slots: 1 or 3



MP3200iec

- ▶ Processor Speed: 1 GHz
- ▶ Motion Network: MECHATROLINK-III
- ▶ Motion Networks Speed: As fast as 0.25 ms
- ▶ Network Capability: OPC, EtherNet/IP, Modbus TCP
- ▶ Axis Count: 8, 16, 32 or 62
- ▶ Option Card Slots: 3, 5 or 8



VIPA SLIO I/O

If you've wished that Input/Output could be **FASTER** and **EASIER**, VIPA SLIO is for you. The new YASKAWA decentralized I/O system is full of features that make connection simpler and I/O functions more efficient.

Easy Web Interface

SLIO diagnostic and status information is accessible through a web interface, delivering complete system status data from any EtherNet/IP or Modbus TCP fieldbus module into a standard browser. Remote access via Internet is also available.



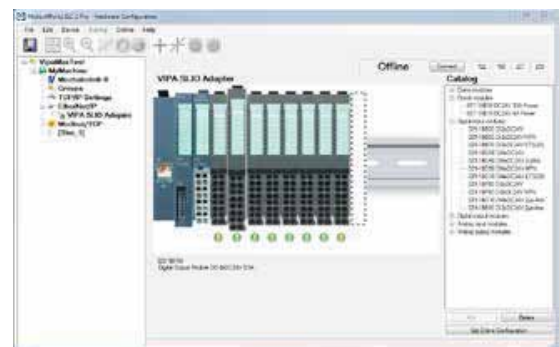
High Speed Backplane Bus

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



One-touch Hardware Configurator

VIPA SLIO puts an end to hours of tedious manual I/O configuration. The MotionWorks IEC VIPA SLIO Hardware Configurator sets up a complete I/O system with the touch of a single button.



Getting Connected

Easily connect all parts of your machine without a hassle - from MP3300iec machine controllers, parameter and monitor software, inverter drives, servo drives, VIPA HMIs, SLIO I/Os, to Motoman robots.



A controller that gets you to the position you want, when you want it:

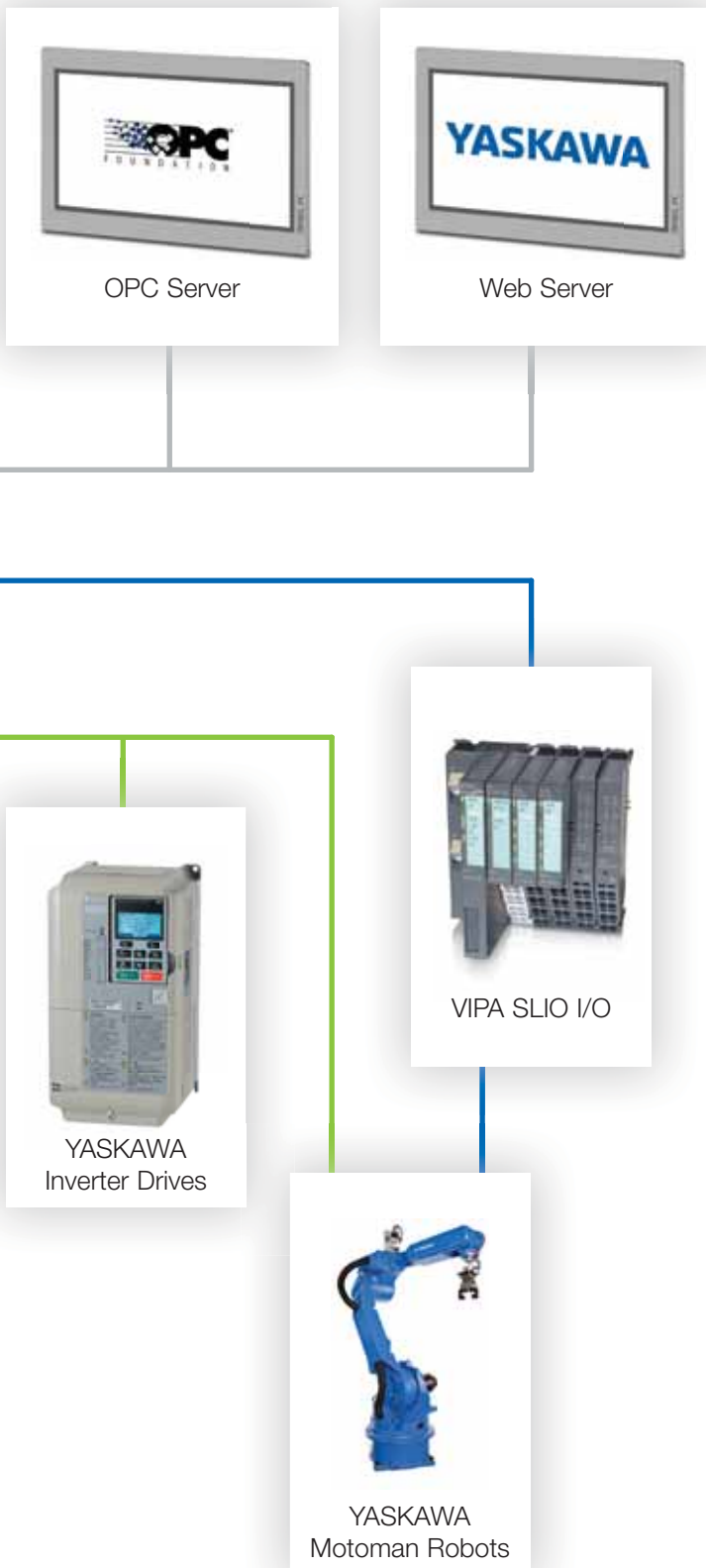
- ▶ Deterministic high speed MECHATROLINK network
- ▶ MECHATROLINK retry function
- ▶ Dedicated CPU for your motion needs
- ▶ High CPU scan rate

Program all of your controllers the same way every time:

- ▶ Standard IEC 61131-3 programming languages
- ▶ Reusable PLCopen function blocks
- ▶ Reusable standard Yaskawa toolboxes
- ▶ Decades of high quality motion experience

Your entire machine at your fingertips with YASKAWA controllers:

- ▶ Sigma-5 servos via MECHATROLINK
- ▶ Built in web server
- ▶ OPC server
- ▶ EtherNet/IP
- ▶ Modbus TCP
- ▶ Wide range of HMIs and I/Os



IEC-based Motion Programming

Only a few programming languages provide an environment for simply coding all of the functionality of a modern automated machinery. MotionWorks® IEC encourages the programmer to take advantage of the best of several programming languages within one development package.

Reusable Code and YASKAWA Application-specific Toolboxes

Drawing on decades of motion experience, YASKAWA created toolboxes with pre-developed code for specific applications.

Leverage YASKAWA expertise to minimize programming time and effort. Libraries also enable importing and re-use of logic you've previously developed, saving even more time on subsequent projects.

MotionWorks IEC 3

- ▶ 10 different CAM function blocks available
- ▶ Open standards like PackML for packaging
- ▶ Supports implementation according FDA 21FR Part 11

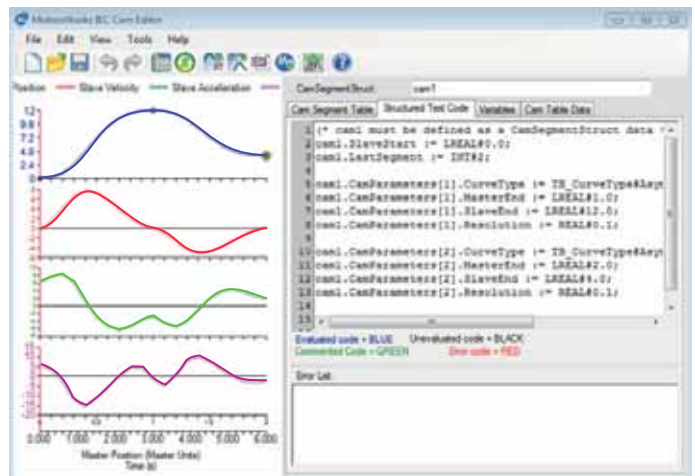
Benefits:

- ▶ Rapid realisation of machine functions
- ▶ Reliability by validated function blocks
- ▶ Toolkit function blocks enable import and reuse of previously developed logic

CAM Editor

- ▶ Supports 11 cam curve types
- ▶ Can read and write IEC 61131-3 code to generate cam tables at run time
- ▶ Supports multi step blended Cams and Cam in and out

Function	Motion Works IEC	
	Express	Professional
Number of Tasks	1	16
Number of Resources	1	1
IEC 61131-3 Languages		
Ladder Diagram	●	●
Function Block	●	●
Structure Text	●	●
Sequential Function Chart	–	●
Instruction List	–	●
POU Grouping	–	●
Configurable Task Priority	–	●
Configurable I/O Assignment	–	●
Auto Save Setting	–	●
Debug PowerFlow	–	●
Password Protection	–	●
Project Comparison	–	●



MotionWorks® IEC CAMeditor

For a wide Range of Applications

Using the MP3000iec Series of machine controllers improves handling and performance in a broad range of applications. With up to 52 MB of memory for user-data and up to 1 GHz CPU speed, even very complex applications with up to 62 axes can be controlled.



System Components MP2300Siec

	Item	Description	Model Code	
Common Options MP2300Siec	▶ MP2300Siec Controller CPU	MECHATROLINK-II, EtherNet/IP and Modbus/TCP communications		
		4 axis, no option module	PMC-U-MP23S04	
		8 axis, no option module	PMC-U-MP23S08	
		16 axis, no option module	PMC-U-MP23S16	
		4 axis, LIO-01 module	PMC-U-MP23S04L1	
		8 axis, LIO-01 module	PMC-U-MP23S08L1	
		16 axis, LIO-01 module	PMC-U-MP23S16L1	
		4 axis, LIO-02 module	PMC-U-MP23S04L2	
		8 axis, LIO-02 module	PMC-U-MP23S08L2	
		16 axis, LIO-02 module	PMC-U-MP23S16L2	
	▶ Accessories	Replacement Battery	JZSP-BA01	
		DIN Rail Clips (2 per set)	JEPMC-OP300	
		Option Slot Cover	JEPMC-OP2300	
	Panel Mounting Bracket for screw mounting	JEPMC-OP2300S-E		
	Item	Description	Model Code	
Communication	▶ I/O Option Cards	Analog Inputs (AI-01)	JAPMC-AN2300	
		Analog Outputs (AO-01)	JAPMC-AN2310	
		Digital Output Module (DO-01)	JAPMC-DO2300	
		Digital I/O Module (LIO-01)	JAPMC-IO2300-E	
		Digital I/O Module (LIO-02)	JAPMC-IO2301-E	
		Digital I/O Module (LIO-04)	JAPMC-IO2303	
		Digital I/O Module (LIO-05)	JAPMC-IO2304	
		Multi-Function I/O Module (LIO-06)	JAPMC-IO2305-E	
	Item	Description	Model Code	
Cables	▶ MECHATROLINK-II Cables	0.5 m	JEPMC-W6003-A5-E-G5	
		1.0 m	JEPMC-W6003-01-E-G5	
		3.0 m	JEPMC-W6003-03-E-G5	
		5.0 m	JEPMC-W6003-05-E-G5	
		10.0 m	JEPMC-W6003-10-E-G5	
		20.0 m	JEPMC-W6003-20-E-G5	
	▶ Option Card Cables (Pigtail)	AI-01	□□: Cable Length	JEPMC-W6080-□□-E
		AO-01	A5: 0.5 m	JEPMC-W6090-□□-E
		LIO-01/02	01: 1.0 m	JEPMC-W2061-□□-E
		LIO-04/05	03: 3.0 m	JEPMC-W6060-□□-E
	LIO-06		JEPMC-W2064-□□-E	
	Item	Description	Model Code	
Network	▶ Network Termination Resistor	Two (2) required to terminate ends of network (one included with MP2300Siec)	JEPMC-W6022	

System Components MP3200iec & MP3300iec

	Item	Description	Model Code	
Common Options MP3300iec	▶ MP3300iec Controller CPU	MECHATROLINK-III, EtherNet/IP and Modbus/TCP communications	PMC-U-MP33004	
		CPU card with 4 axis capability	PMC-U-MP33008	
		CPU card with 8 axis capability	PMC-U-MP33020	
	▶ Power Supply & Base Unit Rack	24 VDC power supply with single slot base unit rack	JEPMC-BU3304-E	
		24 VDC power supply with three slot base unit rack	JEPMC-BU3303-E	
	▶ Accessories	Replacement Battery	JEPMC-BA3001	
		Replacement CPU Faceplate	JEPMC-OP3301-1-E	
		Option Slot Cover	JEPMC-OP3301-E	
	Common Options MP3200iec	▶ MP3200iec Controller CPU	MECHATROLINK-III, EtherNet/IP and Modbus/TCP communications	PMC-U-MP32004
			4 axis capability, no option module	PMC-U-MP32008
8 axis capability, no option module			PMC-U-MP32016	
16 axis capability, no option module			PMC-U-MP32032	
32 axis capability, no option module			PMC-U-MP32062	
62 axis capability, no option module			JEPMC-PSA3012-E	
▶ Power Supply		100-200 VAC Input	JEPMC-PSD3012-E	
▶ Base Unit Rack		24 VDC	JEPMC-BUB3003-E	
		3 Slot	JEPMC-BUB3005-E	
		5 Slot	JEPMC-BUB3008-E	
▶ Accessories	8 Slot	JEPMC-BA3001		
	Replacement Battery	JEPMC-OP3001		
	Replacement Power Supply Side Cover	JEPMC-OP3002		
	Replacement Base Unit Rack Side Cover	JEPMC-OP2300		
	Option Slot Cover			
	Item	Description	Model Code	
Communication	▶ I/O Option Cards	Analog Inputs (AI-01)	JAPMC-AN2300	
		Analog Outputs (AO-01)	JAPMC-AN2310	
		Digital Output Module (DO-01)	JAPMC-DO2300	
		Digital I/O Module (LIO-01)	JAPMC-IO2300-E	
		Digital I/O Module (LIO-02)	JAPMC-IO2301-E	
		Digital I/O Module (LIO-04)	JAPMC-IO2303	
		Digital I/O Module (LIO-05)	JAPMC-IO2304	
		Multi-Function I/O Module (LIO-06)	JAPMC-IO2305-E	
	Item	Description	Model Code	
Cables	▶ MECHATROLINK-III Cables	0.2 m	JEPMC-W6012-A2-E	
		0.5 m	JEPMC-W6012-A5-E	
		1.0 m	JEPMC-W6012-01-E	
		2.0 m	JEPMC-W6012-02-E	
		3.0 m	JEPMC-W6012-03-E	
		4.0 m	JEPMC-W6012-04-E	
		5.0 m	JEPMC-W6012-05-E	
	Item	Description	Model Code	
Network	▶ MECHATROLINK-III Network Accessories	Hub, 8 Slave Ports	JEPMC-MT2000-E	
		Adaptor, Ethernet to Mechatrolink	JEPMC-MT2020-E	
		I/O Module; 64 In 64 Out	JEPMC-MTD2310-E	
		Analog Module; 8 In *	JEPMC-MTA2900-E	
		Analog Module; 4 Out *	JEPMC-MTA2910-E	

* for MP3200iec only



Specifications MP2300Siec

	Item	Specification
Operating Environment	▶ Ambient Temperature	0 °C to 55 °C
	▶ Humidity	95% RH or less (non condensing)
	▶ Storage Temperature	-25 °C to 85 °C (short-term temperature during transportation)
	▶ Altitude	2,000 m above sea level or lower
	▶ Pollution Level	Conforms to JIS B 3502 Pollution Degree 1
	▶ Corrosive Gas	There must be no combustible or corrosive gas
Mechanical Conditions	▶ Vibration Resistance	Conforming to JIS B 3502: 10 to 57 Hz with single amplitude of 0.075 mm 57 to 150 Hz with fixed acceleration of 9.8 m/s ² 10 sweeps each in X, Y, and Z directions (sweep time: 1 octave/min.)
	▶ Shock Resistance	Size of shock: Peak acceleration of 147 m/s ² (15 G) Duration: 11 ms 3 times each in the X, Y, and Z directions
Electrical Conditions	▶ Noise Resistance	Conforming to EN 61000-6-2, EN 55011 (Group 1, Class A) Power supply noise (FT noise): 2 kV min., for one minute Radiation noise (FT noise): 1 kV min., for one minute
	▶ Ground	Ground to 100 Ω max.
	▶ Cooling Method	Natural cooling
Controller Details	▶ CPU Speed	240 MHz SH4
	▶ Number of option module slots	1
	▶ User Variable Memory	1.75 MB
	▶ Power Unit	Input Voltage: 24 Vdc (±20%) Input Current: 1.0 A max (at rated input/output) Current Consumption: 1.0 A max Battery: Battery for memory retention attachable
	▶ Motion Network	MECHATROLINK-II: 1 channel SERVOPACK and I/O for up to 20 slave nodes connectable (SERVOPACK for up to 16 axes) Baud rate: 10 Mbps (MECHATROLINK-II)
	▶ Communication Function	Ethernet: 10Base-T or 100Base-TX
	▶ Ethernet Protocols	Ethernet/IP and Modbus TCP/IP standard on all units
	▶ Software	MotionWorks IEC Express MotionWorks IEC Pro

Specifications MP2600iec



	Item	Specification
Operating Environment	▶ Ambient Temperature	0 °C to 55 °C (forced cooling is required if 55°C is exceeded.)
	▶ Humidity	95% RH or less (non condensing)
	▶ Storage Temperature	-25 °C to 85 °C (short-term temperature during transportation)
	▶ Altitude	1,000 m above sea level or lower
	▶ Pollution Level	Conforms to JIS B 3502 Pollution Degree 2
	▶ Corrosive Gas	There must be no combustible or corrosive gas
Mechanical Conditions	▶ Vibration Resistance	Conforming to JIS B 3502: 4.9 m/s ²
	▶ Shock Resistance	19.6 m/s ²
Controller Details	▶ CPU Speed	200 MHz
	▶ User Variable Memory	4 MB
	▶ Inputs	8 programmable digital inputs 1 ch., +/- 10 V, 16 bit analog input
	▶ Outputs	8 programmable digital outputs 1 ch., +/- 10 V, 16 bit analog output
	▶ Pulse Counter	RS-422-compatible pulse counter input (quadrature, pulse and direction, and up/down counter modes) with 5, 12, and 24 V position latch inputs
	▶ Communication Function	Ethernet: 2× 100Base-TX
	▶ Ethernet Protocols	Ethernet/IP and Modbus TCP/IP; OPC (Client and Server required)
	▶ Software	MotionWorks IEC Express MotionWorks IEC Pro
Servo Details	▶ Sequence Input	Number of Inputs: 7 (1 registration input latches external encoder in 5 μs) Functions: The signal allocation and positive/negative logic can be modified. Forward run prohibited (P-OT), reverse run prohibited (N-OT), forward torque limit (/P-CL), reverse torque limit (/N-CL), general-purpose input signal (/SI0 to /SI6)
	▶ Sequence Output - Fixed	Servo Alarm (ALM)
	▶ Sequence Output - Allocated	Number of Outputs: 3 Functions: The signal allocation and positive/negative logic can be modified. Positioning completion (/COIN), speed coincidence detection(/V-CMP), servomotor rotation detection (/TGON), servo ready (/S-RDY), torque limit detection (/CLT), speed limit detection(/VLT), brake (/BK), warning (/WARN), near (/NEAR)



Specifications MP3200iec

	Item	Specification
Operating Environment	▶ Ambient Temperature	0 °C to 55 °C
	▶ Humidity	95% RH or less (non condensing)
	▶ Storage Temperature	-25 °C to 85 °C (short-term temperature during transportation)
	▶ Altitude	2,000 m above sea level or lower
	▶ Pollution Level	Conforms to JIS B 3502 Pollution Degree 1
	▶ Corrosive Gas	There must be no combustible or corrosive gas
Mechanical Conditions	▶ Vibration Resistance	Conforming to JIS B 3502: 10 to 57 Hz with single amplitude of 0.075 mm 57 to 150 Hz with fixed acceleration of 9.8 m/s ² 10 sweeps each in X, Y, and Z directions (sweep time: 1 octave/min.)
	▶ Shock Resistance	Size of shock: Peak acceleration of 147 m/s ² (15 G) Duration: 11 ms 3 times each in the X, Y, and Z directions
	▶ Noise Resistance	Conforming to EN 61000-6-2, EN 55011 (Group 1, Class A) Power supply noise (FT noise): 2 kV min., for one minute Radiation noise (FT noise): 1 kV min., for one minute
	▶ Ground	Ground to 100 Ω max.
Electrical Conditions	▶ Cooling Method	Natural cooling or forced-air cooling
	▶ Communication Function	Ethernet: 10Base-T or 100Base-TX Ethernet/IP and Modbus TCP/IP standard on all units, User specific protocols can be written using Y_DeviceComm firmware library
Controller Details	▶ CPU Speed	1 GHz PowerPC
	▶ Number of option module slots	0, 3, 5 or 8
	▶ User Variable Memory	52 MB
	▶ Power Unit	Input Voltage: Two options available: 24VDC or 100/200 VAC Input Current: DC power: 5.0A, AC power: 4.0A (at rated input/output fully loaded with option cards)
	▶ Motion Network	Battery: Battery for memory retention attachable at the bottom of the CPU unit MECHATROLINK-III: 1 channel, 2 connectors SERVOPACK and I/O for up to 62 slave nodes connectable (SERVOPACK for up to 62 axes) Baud rate: 100 Mbps (MECHATROLINK-III)
	▶ Ethernet Protocols	Ethernet/IP and Modbus TCP/IP standard on all units, User specific protocols can be written using Y_DeviceComm firmware library
	▶ Software	MotionWorks IEC Express MotionWorks IEC Pro
	▶ Communication Function	Ethernet: 10Base-T or 100Base-TX
	▶ Ethernet Protocols	Ethernet/IP and Modbus TCP/IP standard on all units, User specific protocols can be written using Y_DeviceComm firmware library
	▶ Software	MotionWorks IEC Express MotionWorks IEC Pro

Specifications MP3300



	Item	Specification
Operating Environment	▶ Ambient Temperature	0 °C to 60 °C (forced cooling is required if 55°C is exceeded.)
	▶ Humidity	95% RH or less (non condensing)
	▶ Storage Temperature	-25 °C to 85 °C (short-term temperature during transportation)
	▶ Altitude	2,000 m above sea level or lower
	▶ Pollution Level	Conforms to JIS B 3502 Pollution Degree 2
	▶ Corrosive Gas	There must be no combustible or corrosive gas
	Item	Specification
Mechanical Conditions	▶ Vibration Resistance	Conforming to JIS B 3502: Continuous vibration: 5 to 9 Hz with single amplitude of 1.75 mm 9 to 150 Hz with fixed acceleration of 4.9 m/s ² Intermittent vibration: 5 to 9 Hz with single-amplitude of 3.5 mm 9 to 150 Hz with fixed acceleration of 9.8 m/s ² 10 sweeps each in X, Y, and Z directions for both intermittent and continuous vibration
	▶ Shock Resistance	Size of shock: Peak acceleration of 147 m/s ² (15 G) Duration: 11 ms 3 times each in the X, Y, and Z directions
	Item	Specification
Electrical Conditions	▶ Noise Resistance	Conforming to EN 61000-6-2, EN 61000-6-4 and EN 55011 (Group 1, Class A) Power supply noise (FT noise): 2 kV min., for one minute Radiation noise (FT noise): 1 kV min., for one minute Ground noise (impulse noise): 1 kV min., for 10 minutes Electrostatic noise (contact discharge method): 6 kV or more, 10 times
	▶ Ground	Ground to 100 Ω max.
	▶ Cooling Method	Natural cooling or forced-air cooling
	Item	Specification
Controller Details	▶ CPU Speed	400 MHz
	▶ Number of option module slots	1 or 3
	▶ User Variable Memory	32 MB
	▶ Power Unit	Input Voltage: 24 Vdc Input Current: 1.0 A max (at rated input/output) for 1 slot module 1.5 A max (at rated input/output) for 3 slots module Battery: Battery for memory retention attachable at the bottom of the CPU unit
	▶ Motion Network	MECHATROLINK-III: 1 channel, 2 connectors SERVOPACK and I/O for up to 20 slave nodes connectable (SERVOPACK for up to 20 axes) Baud rate: 100 Mbps (MECHATROLINK-III)
	▶ Communication Function	Ethernet: 10Base-T or 100Base-TX
	▶ Ethernet Protocols	Ethernet/IP and Modbus TCP/IP standard on all units, User specific protocols can be written using Y_DeviceComm firmware library
▶ Software	MotionWorks IEC Express MotionWorks IEC Pro	



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