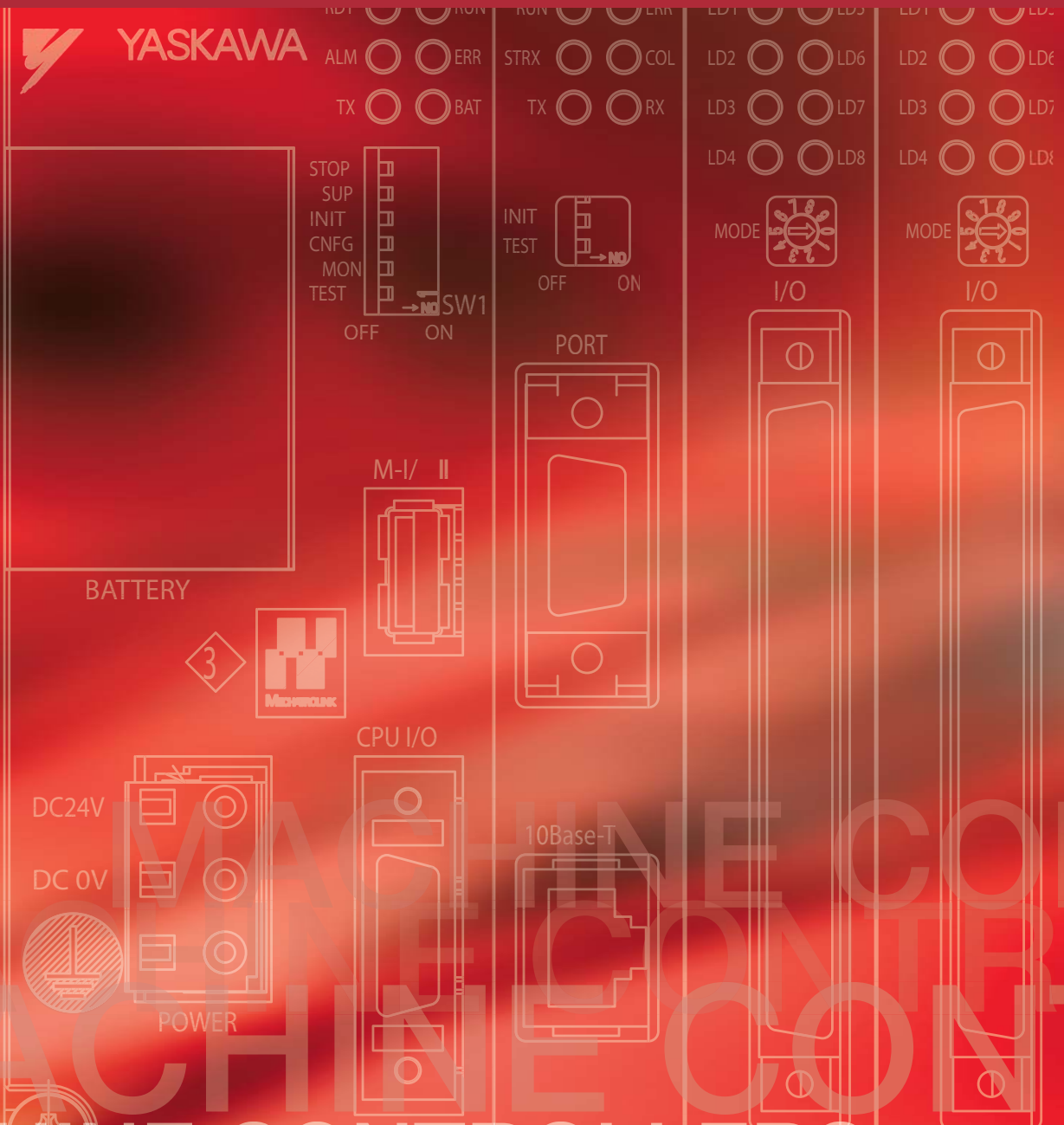




MACHINE CONTROLLERS PRODUCT RANGE

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MACHINE CONTROLLERS

About YASKAWA



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MECHATROLINK

For more than 90 years YASKAWA has been supplying mechatronic products and is one of the leading companies for Motion Control products worldwide. YASKAWA develops and manufactures Inverter Drives, Servo Drives and Motion Controllers and has introduced many

What we do

Electronic drive technology, Motion Control, system engineering – three essentials for efficient and resource-saving production systems.

YASKAWA offers dedicated mechatronic solutions for industries such as packaging, lifting & handling, semiconductors, cranes & hoists, textiles, HVAC/fans & pumps, lifts & escalators, machine tools, woodworking, food & beverages and the automotive industry.

Since it was founded about 100 years ago YASKAWA has shaped technological innovation and the industrial development of our times. Today YASKAWA is one of the leading worldwide manufacturers of motors and drives, factory automation products and robots. Standard products as well as customised solutions from YASKAWA have gained broad acceptance and recognition in global markets.

Since 1963 YASKAWA has continuously developed its European business and expanded its market share. In 1998, the company completed its global production network for localised market supply by establishing a European factory in Cumbernauld, Scotland.

ground-breaking innovations over the past decades. YASKAWA products are used in all fields of machine building and industrial automation and have a high reputation for their outstanding quality and durability.

Well known for outstanding quality standards, YASKAWA serves and supports customers all over the world as a competent and qualified partner. Together with subsidiaries and partners, YASKAWA provides international distribution networks including offices and production facilities in 25 countries to react instantly within 24 hours to customer demands.

YASKAWA key competences:

- ▶ Leading edge technologies in the fields of electric motors and drives, factory automation control products, mechatronics and robots

- ▶ Business network includes offices in 24 countries & production facilities in 6 countries

- ▶ Technology research & development to pursue innovation in mechatronics and automation technology as well as information technologies



About YASKAWA Controller

YASKAWA Motion Controller MP2000 Series

Ideal Motions with the MP2000 Series. The MP2000 Series Machine Controllers are based on three essentials, from which ideal Motion Control can be achieved on a wide variety of machines.

Maximizes speed with accurate motion control

High speeds in program processing and network communication are essential to maximize the output of intricate machines. The high-speed CPU used in the MP2000 Series shortens the execution time of commands. Also, with the MECHATROLINK motion network used in the MP2000 Series, high-accuracy and high-speed Motion Control on multiple axes is realized.

Widens application range with perfect control

Excellent synchronization of the controller is important in applications that require synchronous control on multiple axes. The MP2000 Series can meet such requirements in various applications and improve machine precision.

Increases efficiency with easier programming and maintenance

For high-level control, greater efficiency in programming and maintenance is necessary. The easy-to-use Windows-based editing techniques of the MPE720 engineering tool enable efficient creation and editing of ladder programs. To shorten the time required for design and maintenance, the efficiency of the methods used for system settings, program management, and displays has been improved.

The controller series utilizes advantages derived from three key areas:

- ▶ **The ability to process large-capacity programs at high speed**
- ▶ **To carry out complete synchronous control of multiple axes**
- ▶ **Improved efficiency in simplified portable programming**

MOTION CONTROLLERS

Machine Controller

For General Industries

- ▶ Cartesian Coordinate Robots
- ▶ Cutter
- ▶ Burring Machines
- ▶ Wood Working Machines
- ▶ Painting Machines

- ▶ Linear Interpolation
- ▶ Circular Interpolation
- ▶ Constant Speed Control
- ▶ Passing Point Signal Output

- ▶ Winding Machines
- ▶ Printing Machines
- ▶ Glass Cutters
- ▶ Food Processors
- ▶ Injection Molding Machines

- ▶ Electronic Cam
- ▶ Electronic Shafts
- ▶ Phase Control
- ▶ Speed Synchronization

For Semiconductors and Electronic Parts

- ▶ Electronic Parts Assembling Machines
- ▶ Loaders, Unloaders
- ▶ Chip Bonding Machines
- ▶ Probes
- ▶ Liquid Crystal Manufacturing Equipment

- ▶ Independent Multi-axis Control
- ▶ External Positioning
- ▶ Indefinite Length Positioning
- ▶ High-speed Positioning

Panel Machine Controller MP2500

Multi-axis high-performance Machine Controller
MP2100, MP2200, MP2300, MP2310, MP2300S, MP2300Sic, MP2400

Profiles

MP2100/MP2100M

Board-type Machine Controller

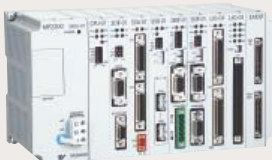


Features

- ▶ Motion programs can be easily made on your personal computer with 51 motion application program interfaces (APIs)
- ▶ Motion APIs are available to realize motion control using your industrial personal computer (IPC)
- ▶ Motion network MECHATROLINK (10 Mbps) as a standard feature

MP2200

Flexible Machine Controller



Features

- ▶ Optimal system can be created with a variety of optional modules for motion control, communications and I/O
- ▶ Expanded capability with 4 additional racks with 9 slots per rack
- ▶ Motion control up to 256 axes
- ▶ CPU module (CPU-01/CPU-02) for the MP2200 can be used to realize a high-speed motion control cycle of 0.5 ms

MP2300

All-in-one Machine Controller



Features

- ▶ Three slots for optional modules and one basic module including standard functions of CPU, MECHATROLINK communications and I/Os
- ▶ Multitasking function provides advanced Motion Control with up to 48 axes (when two SVB-01 modules are mounted)
- ▶ Optional modules for expansion

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130

All-in-one Machine Controller

MP2310

Features

- ▶ Three slots for optional modules and one basic module including standard functions of CPU, MECHATROLINK communications and Ethernet (100 Mbps)
- ▶ Multitasking function provides advanced Motion Control with up to 64 axes (when three SVB-01 modules are mounted)
- ▶ Optional modules for expansion



All-in-one Machine Controller

MP2300S

Features

- ▶ One slot for optional modules and one basic module including standard functions of CPU, MECHATROLINK communications and Ethernet (100 Mbps)
- ▶ Distributed system can be constructed with the CPU synchronous functions of MECHATROLINK slaves
- ▶ Motion control of 32 axes (when one SVB-01 module is mounted)



Compact Simplified Machine Controller

MP2400

Features

- ▶ MECHATROLINK and Ethernet (100 Mbps) communications are available
- ▶ Sequence and motion control with easy programming (no ladder program)
- ▶ Tool designed for use with the MP2400 (MPE720 Ver. 6 Lite) is provided at no charge
- ▶ Motion control of 16 axes



Profiles

MP2500

Panel Machine Controller



Features

- ▶ Machine Controller with integrated touch panel for improved usability
- ▶ High-speed field network MECHATROLINK (10 Mbps) as a standard feature
- ▶ MotionScreen, a graphic tool, for advanced programming in human-machine Interface (HMI) development
- ▶ Motion APIs are available to realize motion control by using the built-in PC
- ▶ Remote maintenance
- ▶ Model with vision system MYVIS YV250P available

MYVIS YV250

Network Machine Vision System



Features

- ▶ High-speed image processing with YASKAWA original ASIC, high-speed cameras and high-performance CPU
- ▶ High-accuracy positioning realized by image processing based on real-time X-Y- Θ position data of workpiece
- ▶ Applicable for Ethernet and MECHATROLINK
- ▶ PCI-bus model is also available

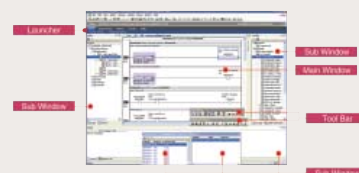
Engineering Tool for Machine Controllers in MP2000 Series

MPE720 Ver. 6

Features

- ▶ Quickened response and enhanced operability with new design
- ▶ Displays are arranged in your choice of layouts
- ▶ Easy program management of both conventional ladder programs and those made with the ladder works editor
- ▶ Easy programming with auto-generation function of I/O variables and servo-axis variables

Note: for machine controllers in the MP900 series, use the MPE720 Ver. 5 engineering tool

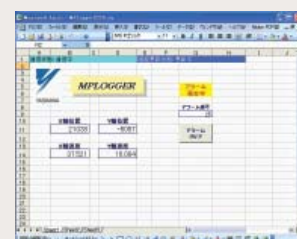


Simplified Data Logger Software Package for Machine Controllers

MPLOGGER

Features

- ▶ Display controller data in an MS Excel sheet
- ▶ Easy-to-make HMI
- ▶ Display table format and historical trend graph
- ▶ Real-time monitor



Specifications



Classification	Machine Controllers for general industrial machines, semiconductors and electrical components			
Model	Board-type Machine Controller	Flexible Machine Controller	All-in-one Machine Controller	Compact All-in-one Machine Controller
	MP2100, MP2100M	MP2200	MP2300, MP2310	MP2300S
Features	<ul style="list-style-type: none"> ▶ Half-size PCI card ▶ High-speed, simple communications and controls with PC ▶ Reduced wiring 	<ul style="list-style-type: none"> ▶ All-in-one machine controller ▶ Nine open slots for the optional modules for various communication protocols, servo IF and I/O ▶ Reduced cycle time with the synchronized processing of the sequence and motion controls 	<ul style="list-style-type: none"> ▶ All-in-one machine controller ▶ Three open slots for the optional modules ▶ Reduced wiring ▶ Multitasking and high-performance motion control ▶ Optional modules for expansion 	<ul style="list-style-type: none"> ▶ All-in-one machine controller ▶ MECHATROLINK and Ethernet (100 Mbps) communications available ▶ One open slot for the optional modules ▶ Easy programming ▶ Distributed system constructed with CPU synchronous functions of MECHATROLINK slaves
Program capacity	<ul style="list-style-type: none"> ▶ Sequence: 100k steps ▶ Motion: 800k characters 	<ul style="list-style-type: none"> ▶ Sequence: 220k steps ▶ Motion: 1.6M characters 	<ul style="list-style-type: none"> ▶ MP2300 Sequence: 100k steps Motion: 800k characters ▶ MP2310 Sequence: 140k steps Motion: 1.2M characters 	<ul style="list-style-type: none"> ▶ Sequence: 100k steps ▶ Motion: 800k characters
Number of controlled axes	▶ Up to 16/32 axes	▶ Up to 256 axes	<ul style="list-style-type: none"> ▶ MP2300: up to 48 axes ▶ MP2310: up to 64 axes 	▶ Up to 32 axes
Control functions	<ul style="list-style-type: none"> ▶ Position control (positioning, linear interpolation, circular interpolation, helical interpolation), synchronized phase control, speed control, torque control ▶ Electronic CAM/Shaft 	<ul style="list-style-type: none"> ▶ Position control (positioning, linear interpolation, circular interpolation, helical interpolation), synchronized phase control, speed control, torque control ▶ Electronic CAM/Shaft 	<ul style="list-style-type: none"> ▶ Position control (positioning, linear interpolation, circular interpolation, helical interpolation), synchronized phase control, speed control, torque control ▶ Electronic CAM/Shaft 	<ul style="list-style-type: none"> ▶ Position control (positioning, linear interpolation, circular interpolation, helical interpolation), synchronized phase control, speed control, torque control ▶ Electronic CAM/Shaft
Accel/decel processing	▶ Linear, multi-stage linear, non-symmetric, S-curve	▶ Linear, multi-stage linear, non-symmetric, S-curve	▶ Linear, multi-stage linear, non-symmetric, S-curve	▶ Linear, multi-stage linear, non-symmetric, S-curve
Program language	<ul style="list-style-type: none"> ▶ Ladder diagram ▶ Textual language (numerical operations, logic operations, etc.) 	<ul style="list-style-type: none"> ▶ Ladder diagram ▶ Textual language (numerical operations, logic operations, etc.) 	<ul style="list-style-type: none"> ▶ Ladder diagram ▶ Textual language (numerical operations, logic operations, etc.) 	<ul style="list-style-type: none"> ▶ Ladder diagram ▶ Textual language (motion, sequence)
I/O	<ul style="list-style-type: none"> ▶ DI: 5 points, DO: 4 points (can be extended by distributed I/O) ▶ MP2100: can be extended by I/O module 	▶ Can be extended by I/O module	▶ DI: 8 points, DO: 4 points ^{*1} (can be extended by I/O module)	▶ Can be extended by I/O module and distributed I/O
Communication	<ul style="list-style-type: none"> ▶ MECHATROLINK MP2100: 1 line MP2100M: 2 lines 	<ul style="list-style-type: none"> ▶ MECHATROLINK ▶ General-purpose serial communications (RS-232C, RS-422/485), Ethernet, DeviceNet, PROFIBUS and MP-Link with optional communications module 	<ul style="list-style-type: none"> ▶ MECHATROLINK ▶ Ethernet (100 Mbps)^{*2} ▶ General-purpose serial communications (RS-232C, RS-422/485), Ethernet, DeviceNet, PROFIBUS and MP-Link with optional communications module 	<ul style="list-style-type: none"> ▶ MECHATROLINK ▶ Ethernet (100 Mbps) ▶ RS-232C, DeviceNet, PROFIBUS and MP-Link with optional communications module
International standard	UL, c-UL, CE (for further information, contact YASKAWA Electric Europe GmbH)			

*1 Available with MP2300 only *2 Available with MP2310 only *3 Available soon



Machine Controllers for general industrial machines, semiconductors and electrical components			I/O	Vision Sensor
All-in-one Machine Controller	Compact simplified Machine Controller	Panel Machine Controller	General-purpose high-speed I/O, distributed I/O	Machine Vision System
MP2300Siec*3	MP2400	MP2500		MYVIS YV250
<ul style="list-style-type: none"> ▶ Standard programming languages IEC61131-3 ▶ PLCopen function blocks ▶ One open slot for the optional modules ▶ Webserver/OPC-server 	<ul style="list-style-type: none"> ▶ Small footprint and reduced wiring ▶ MECHATROLINK and Ethernet (100 Mbps) communications available ▶ Easy-to-program sequence program and motion program (no ladder logic program) ▶ Motion control of up to 16 axes 	<ul style="list-style-type: none"> ▶ Controller with integrated touch panel for improved usability ▶ Reduced wiring ▶ MotionScreen, a graphic tool, eliminates the need for complicated programming in human-machine interface (HMI) development ▶ Remote maintenance ▶ Built-in vision system model available 	<ul style="list-style-type: none"> ▶ High-speed data refreshing by high-speed communication ▶ Reduced wiring and cost ▶ High noise immunity and compact size for machine embedding 	<ul style="list-style-type: none"> ▶ For integrated image processing in servo systems ▶ Sub pixel function ▶ MECHATROLINK and Ethernet communications are available ▶ PCI-bus model is also available
	<ul style="list-style-type: none"> ▶ Motion: 800k characters 	<ul style="list-style-type: none"> ▶ Sequence: 100k steps ▶ Motion: 800k characters 		<ul style="list-style-type: none"> ▶ Program: 512k bytes ▶ Template: Compact Flash (CF) card ▶ Frame memory: 48 screens
<ul style="list-style-type: none"> ▶ 4-8-16 axes 	<ul style="list-style-type: none"> ▶ Up to 16 axes Control functions 	<ul style="list-style-type: none"> ▶ Up to 16 axes 		Number of cameras connected: 4
<ul style="list-style-type: none"> ▶ Position control, gearing, speed control, torque control 	<ul style="list-style-type: none"> ▶ Position control (positioning, linear interpolation, circular interpolation, helical interpolation), synchronized phase control, speed control, torque control 	<ul style="list-style-type: none"> ▶ PTP control, interpolation, speed control, torque control, position control, phase control ▶ Electronic CAM/Shaft 	<ul style="list-style-type: none"> ▶ 16-point IN/16-point OUT, 24 VDC ▶ 32-point IN/32-point OUT, 24 VDC ▶ 64-point IN/64-point OUT, 24 VDC ▶ 4 channels analog input ▶ 8 channels analog input ▶ 4 channels analog output ▶ 2 channels analog output ▶ 2 channels counter ▶ 2 channels pulse output 	Image processing functions: <ul style="list-style-type: none"> ▶ Gray-scale pattern matching ▶ Binary image analysis
<ul style="list-style-type: none"> ▶ Linear 	<ul style="list-style-type: none"> ▶ Linear, multi-stage linear, non-symmetric, S-curve 	<ul style="list-style-type: none"> ▶ Linear, multi-stage linear, non-symmetric, S-curve 		
<ul style="list-style-type: none"> ▶ IEC61131-3 languages ▶ LD, FBD, IL, ST, SFC ▶ Express: LD, ST 	<ul style="list-style-type: none"> ▶ Textual language (motion, sequence) 	<ul style="list-style-type: none"> ▶ Ladder logic program ▶ Textual language (numerical operations, logic operations, etc.) 		<ul style="list-style-type: none"> ▶ SH-C
<ul style="list-style-type: none"> ▶ Can be extended by I/O module and distributed I/O 	<ul style="list-style-type: none"> ▶ Can be extended by distributed I/O 	<ul style="list-style-type: none"> ▶ DI: 5 points, DO: 4 points (can be extended by distributed I/O) 		
<ul style="list-style-type: none"> ▶ MECHATROLINK ▶ Ethernet (100 Mbps) 	<ul style="list-style-type: none"> ▶ MECHATROLINK ▶ Ethernet (100 Mbps) 	<ul style="list-style-type: none"> ▶ MECHATROLINK ▶ RS-232C, RS-422/485 	<ul style="list-style-type: none"> ▶ MECHATROLINK 	<ul style="list-style-type: none"> ▶ RS-232C ▶ MECHATROLINK ▶ Ethernet

UL, c-UL, CE (for further information, contact YASKAWA Electric Europe GmbH)

Applications

YASKAWA meets your need

Requirements for industrial machinery are diversified and need features such as high speed and precision, compact design, excellent reliability, low maintenance, and applicability "many kinds of productions. To respond to these demands, YASKAWA manufactures an extensive selection of controllers to meet your needs.

We offer a wide range of controllers including machine controllers, general-purpose I/Os and vision systems. You can choose ladder diagram, SFC, or motion language for programming.

A wide range of interfaces is available for your motion control and range from simple, generic ones using analog signals to sophisticated networks. Systems can be designed to control from one to 256 axes.

	MP2100	MP2200	MP2300	MP2300S	MP2300Siec	MP2400
Printing	●	●	●	●	●	
Digital	●					
Food						
Processing	●	●	●			
Packaging	●	●	●	●	●	
Inspection & testing	●	●	●	●	●	
Semiconductor equipment	●	●	●	●		
Chip mounters	●	●				
PCB drilling stations	●	●	●	●	●	●
Electronic parts assembly	●	●	●	●	●	
Die bonders	●	●				
Transfer machines	●	●	●	●	●	
General handling			●	●	●	
Winding		●	●	●	●	
Textile	●	●	●	●	●	
Feeding			●	●	●	
Metal processing	●	●	●	●		




MECHATROLINK is the key technology for your system. Through total component integration, Mechatrolink reduces wiring. It enables the set-up of multi-function and high-performance systems while simplifying tuning and maintenance of the system. MECHATROLINK is used in a wide variety of applications to simplify work processes and to save time and money.

System efficiency

For MECHATROLINK, a vast variety of controllers, servo drives and stepper drives is available. This makes it an ideal choice for most machines in the market. The Mechatrolink logo on a product guarantees that it is interoperable with other MECHATROLINK products.

High-speed communication

High-speed communication provides high-performance and high-accuracy Motion Control because data for the actual position, speed, input/output status and other parameters are communicated in real-time.

Reduced cost

Just one communication line can connect up to 21 stations in a network. This can greatly reduce costs and wiring time. With connectors and cables used in the process and factory automation fields, MECHATROLINK makes the most reliable, versatile and economically efficient systems. It simplifies a Motion Control system so that it no longer requires the A/D converter for velocity/torque reference nor the pulse generator for position reference.

MECHATROLINK Members Association (MMA) Global Support and Product Development



To assist the development of new MECHATROLINK products, the MECHATROLINK Members Association (MMA) offers technical support to board, executive and regular members.

All members can download technical information on <http://www.mechatrolink.org>. MMA support enables the development of new compliant products without unnecessary complications.

MECHATROLINK Applications

MECHATROLINK can be used for the control of a variety of high precision machines. It is especially suitable for synchronous and interpolation motion controls. MECHATROLINK enables the user to perfectly control torque, velocity and positioning even in complex movements.

- ▶ Cutting machines
- ▶ Press brakes
- ▶ Plastic tape processors
- ▶ Laser welders
- ▶ X-Z processing systems
- ▶ Winding machines
- ▶ Labelling machines
- ▶ Chip mounters and handling robots
- ▶ Printing machines



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