



MOTION ADAPTER SERIES

MA100

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Content

- ▶ 02 About YASKAWA
- ▶ 03 Five Steps Towards an Easy System
- ▶ 04 Easy-to-use Software Tools
 - Program Positioning by Creating Time Charts
 - MA-Manager Functions
- ▶ 06 Specifications

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.



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



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.

Positioning Systems Made Easy

To operate several servo axes programming skills are necessary. This requires learning programming languages, setting the addresses for each axis and setting the variables. The MA100 helps you to simplify this process and applies the system configuration as shown on the next page.



Five Steps Towards an Easy System

From setup to programming and debugging - the MA100 provides easy to use tools to get your job successfully done in an easier way and in less time.

1 Programming

The time chart simplifies programming. There is no need for specialized knowledge in motion programming to easily create positioning instructions using the time chart.

2 Debugging

Check the wiring, I/O assignment, interface assignment, axis and system errors. Operate the axes with MA-Manager like you would do when using a Touch Panel.

3 Connectivity

Connect the MA100 with an existing PLC via ethernet (Modbus TCP) or use it stand-alone with a touch panel. Use a hub to use the ethernet interface for programming while the HMI is still connected. The I/Os and the servo motors are connected via the motion bus Mechatrolink-II.

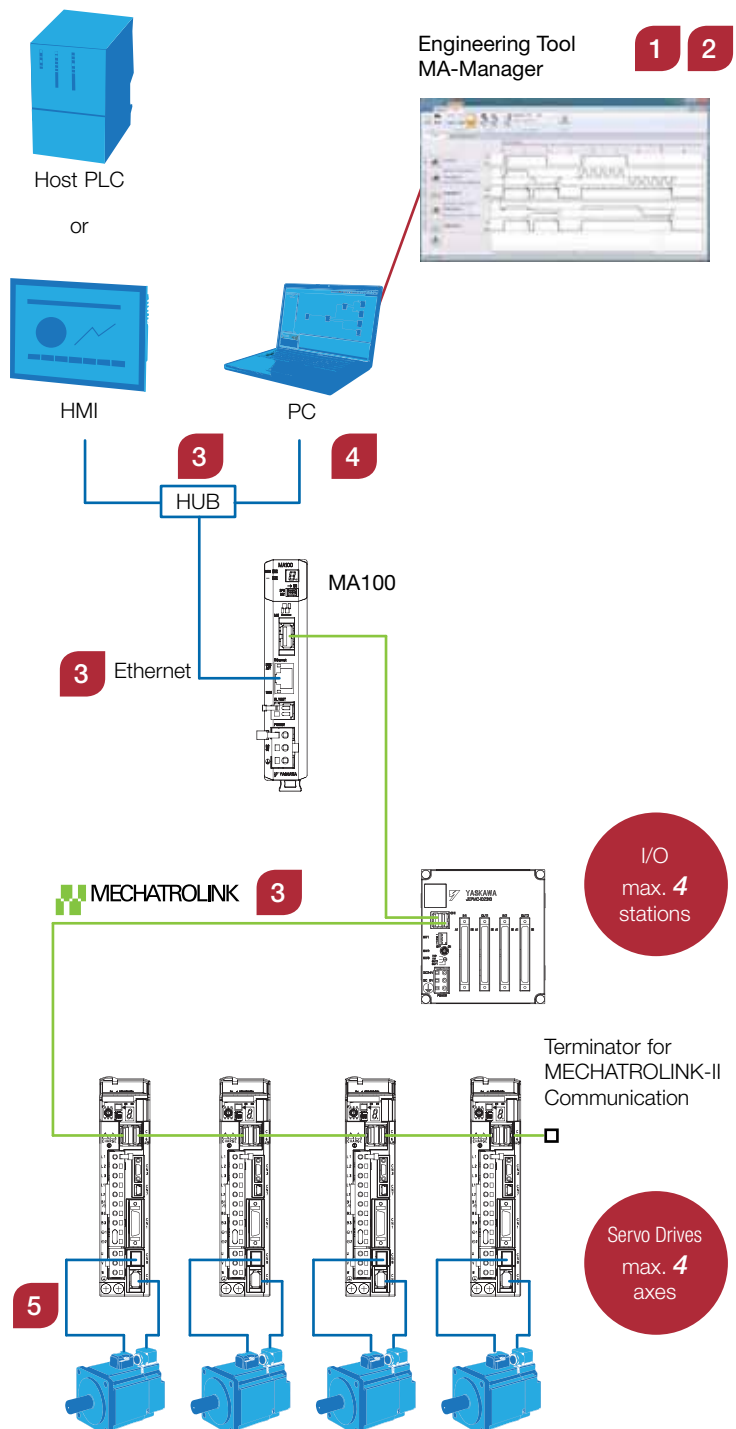
4 Network Settings

When connecting the MA100 to a computer the network settings are automatically adapted.

5 Settings with Sigma-5

The use of Sigma-5 series servo drives enhances tuning functions.

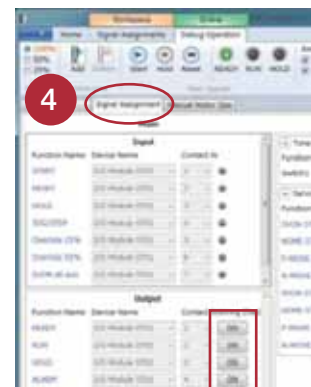
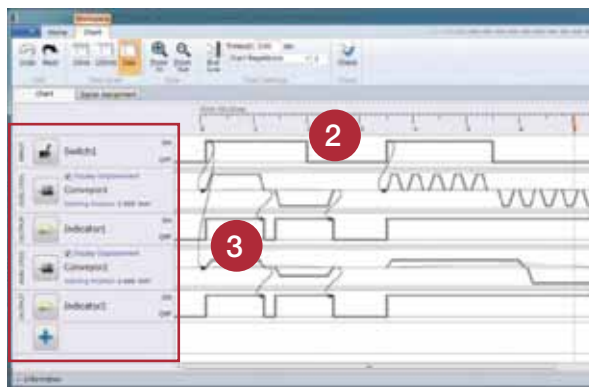
System Configuration



Program Positioning by Creating Time Charts

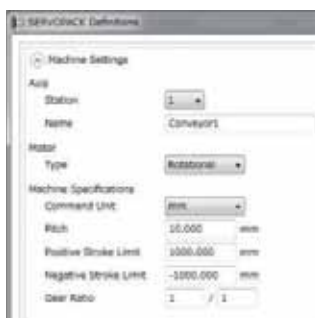
Give any name to each axis and use links to display the relation between axis operation and I/O. This simplifies programming and program changes.

User Interface



1 Displaying the defined axes

- ▶ SERVOPACK definitions
- ▶ Input signal definitions
- ▶ Output signal definitions



Help is displayed that provides a parameter description and the value range for each item.

2 Programming time charts

- ▶ Basic motion profiles are displayed in the time chart.
- ▶ Enter the parameters of the motion profiles in a dialog box.

3 Creating links

- ▶ Create links between motion profiles and I/Os by simple click-and-connect.
- ▶ Set the parameters for these links in a dialog box, e.g. for a delay.

4 Allocating signals

- ▶ Check the servo axes and I/O assignments. When online connection is established, a wiring check can be performed.

Download the Engineering Tool MA Manager

Supported OS: Microsoft Windows 7 (32 bit & 64 bit)

- ▶ Visit the YASKAWA Website:
<http://www.yaskawa.eu.com/dmsw>
- ▶ Use the inquiry form to request the MA-Manager Engineering Tool.



Enhanced Manual Operation

Click the icons on the software user interface that replace the switches (I/O) and touch panel (HMI) to perform operation.

- ▶ JOG operation
- ▶ Step operation (positive or negative direction)
- ▶ Absolute operation (Positioning by specifying absolute positions)
- ▶ Homing



Status messages at a glance.

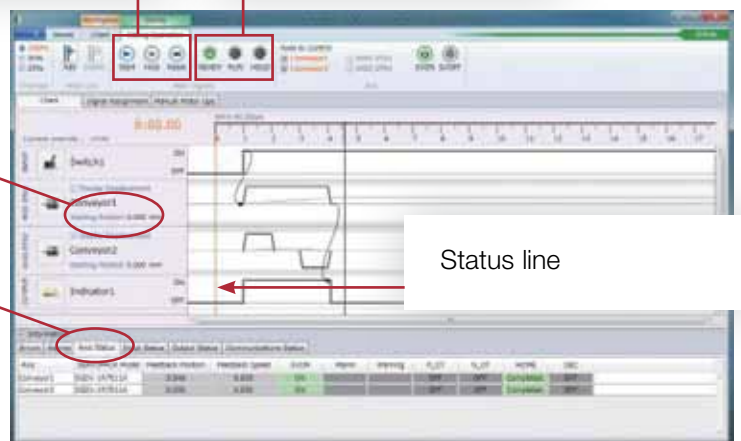
Start and stop a program with only one click. Easily check programs with the current execution line and monitor lamps. Dialog boxes guide you through any setting changes that are necessary to a program.

Operation controls

Monitor lamps

To confirm the starting positions.

To monitor the feedback positions, feedback speeds, servo ON status, alarm status, servo signal status and other data.



MA-Manager Functions

Mode	Function
Offline	Create time chart
	Define configurations
	Allocate I/O signals
Online	Transfer projects
	Servo ON/OFF (single axis/all axes)
	Monitor alarms

Mode	Function
Online	Reset alarms
	Debugging operation (START/HOLD/STOP)
	Manual operation (JOG operation, step operation, homing, absolute operation, home position setting)
	Monitor status
	Check I/O wiring

MA100-compatible Devices



Rotary Servomotors



Direct Drive Servomotors



Linear Servomotors



Linear Sliders



SERVOPACK



I/O Modules

	Motor Type	Applicable SERVOPACK Model	Motor Model	Features	Capacity
Servomotor and SERVOPACK	Rotary Servomotor	SGDV-□□□E11	SGMMV	Low inertia, ultra-small capacity (Sigma-5 Mini)	Rated output 3.3 to 30 W
			SGMJV	Medium inertia, small capacity	Rated output 50 to 750 W
			SGMAV	Low inertia, small capacity	Rated output 50 to 1,000 W
		SGDV-□□□A11	SGMPS	Medium inertia, small capacity, flat type	Rated output 100 to 1,500 W
			SGMSV	Medium inertia, small capacity	Rated output 1,000 to 7,000 W
			SGMGV	Medium inertia, medium capacity	Rated output 300 to 15,000 W
			SGMCS	Direct drive type*	Instantaneous peak torque 6.0 to 600 Nm
	Linear Servomotor	SGDV-□□□A15	SGLGW	Coreless type	Peak force 40 to 3,000 N
			SGLFW	With F-type iron core	Peak force 86 to 2,400 N
			SGLTW	With F-type iron core	Peak force 380 to 7,500 N
			SGLC	Cylinder type	Peak force 60 to 840 N

* Precaution is required in using a direct drive servomotor. For details, refer to User's Manual. For detailed product information, refer to the AC Servo Drives Sigma-5 Series Product Catalog.

	Type	Model	I/O Signal	Capacity
I/O Modules	I/O	JEPMC-IO2310-E	64 inputs, 24 VDC, 5 mA, sink/source mode input 64 outputs, 24 VDC, 50 mA, sink mode output	24 VDC (20.4 to 28.8 V), 0.5 A
		JEPMC-IO2330-E	64 inputs, 24 VDC, 5 mA, sink/source mode input 64 outputs, 24 VDC, 50 mA, source mode output	24 VDC (20.4 to 28.8 V), 0.5 A
		JAMSC-IO2920-E	8 inputs, 12/24 VDC, 2 mA/5 mA, sink/source mode input 8 outputs, 12/24 VDC, 0.3 A, sink mode output	24 VDC (20.4 to 28.8 V), 90 mA
	Input	JAMSC-IO2900-E	16 inputs, 12/24 VDC, 2 mA/5 mA, sink/source mode input	24 VDC (20.4 to 28.8 V), 90 mA
		JAMSC-IO2910-E	16 outputs, 12/24 VDC, 0.3 A, sink mode output	24 VDC (20.4 to 28.8 V), 110 mA
		JAMSC-IO2950-E	8 outputs, 12/24 VDC, 100/200 VAC, 1.0 A, contact output	24 VDC (20.4 to 28.8 V), 150 mA

Note: In addition to the above modules, you can also connect simple I/O modules that support 32-byte MECHATROLINK-II.

Installation and Operating Conditions

	Item	Specification
Environmental Conditions	Ambient Operating Temperature	0 to +55 °C
	Ambient Storage Temperature	-25 to +85 °C
	Ambient Operating Humidity	10 to 95% RH (non-condensing)
	Ambient Storage Humidity	5 to 95% RH (non-condensing)
	Pollution Level	Conforms to JIS B 3502 Pollution Level 2.
	Corrosive Gas	There must be no combustible or corrosive gas.
	Operating Altitude	2,000 m max.
Electrical Operating Conditions	Noise Resistance	Conforms to EN 61000-6-2 and EN 55011 (Group 1, ClassA). Power supply noise (FT noise): ±2 kV min. for one minute. Radiation noise (FT noise): ±1 kV min. for one minute.
	Vibration Resistance	Conforms to JIS B 3502. ▶ Continuous vibration: 5 to 8.4 Hz with single-amplitude of 1.75 mm 8.4 to 150 Hz with fixed acceleration of 4.9 m/s ² ▶ Intermittent vibration: 5 to 8.4 Hz with single-amplitude of 3.5 mm 8.4 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		Conforms to JIS B 3502. Size of shock: Peak acceleration of 147 m/s ² (15 G) Duration: 11 ms, 3 times each in X, Y, and Z directions
Installation Conditions	Ground	Ground to 100 Ω max.
	Cooling Method	Natural air cooling

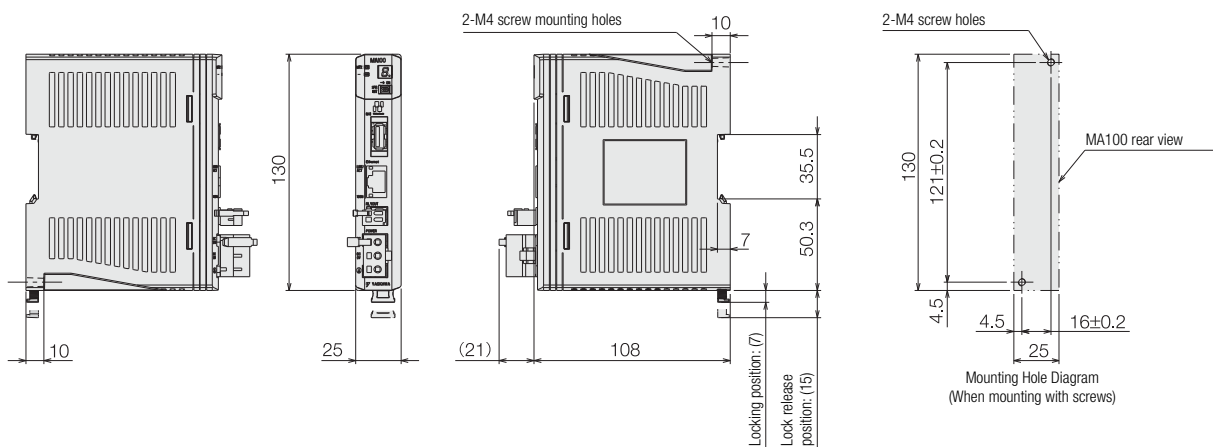
Hardware and Performance Functions

Item	Specification	Remarks	
Model	JEPMC-MA100-E		
Dimensions	W × H × D 25 × 130 × 108 mm		
Power Supply	Input Voltage	24 VDC (±20%)	
	Input Current	1 A max.	
	Inrush Current	40 A max.	
Number of Controlled Axes	Maximum Number of Controlled Axes	4 axes	
MECHATROLINK	Communications Method	MECHATROLINK-II (32-byte)	
	Communications Cycle	2 ms (fixed)	
	Max. Number of Connected Stations (M-II)	8 stations	Up to 4 servo stations. Up to 4 I/O stations.
	SigmaWin+ Connections through MA100	Supported	
	Servo Devices	Sigma-5 (for rotary or linear servomotor) Sigma-5 Mini	Sigma-5 is supported (excluding Sigma-5 Large Capacity servo drives). Station addresses: 1 to 4.
	I/O Devices	Simple I/O only	Station addresses: 1 to 4.
Inverter Devices	None		
Scan Time	Fixed-period Scan	10 ms	
Communication Interface	Ethernet	10Base-T/100Base-T	
I/O	Servo I/O	Sigma-5 only (no support for Sigma-5 Mini) 3 input points and 3 output points	Inputs: S10, EXT2, EXT3 Outputs: S01, S02, S03 Can be used from programs.
Memory Capacity	SDRAM	16 MB	
	FLASH	4 MB	
	Program Capacity	1 MB	
Programs	Programming Language	Timing charts	The MA-Manager engineering tool is used.
	Command Resolution	10 ms	
	Number of Charts	1	
	Maximum Chart Time	1 hour	
	Number of Chart Repetitions	Either 1 to 9,999 or infinite	

Programming Specifications

Item	Specification	Remarks
Axis Control	Number of Positioning Elements	400 max.
	Number of Axes	4 axes max.
	Type of Positioning	Simple Positioning
	Finite/Infinite Length Parameters	Finite length only
Positioning Parameters	Starting time (Can be set in increments of 10 ms.)	
	Travel distance	
	Speed	
	Acceleration time/rate	
	Deceleration time/rate	
Input Signals	Number of ON/OFF Operations in a Program	400 max.
	Number of Input Signals	64
Output Signals	Number of ON/OFF Operations in a Program	400 max.
	Number of Output Signals	64

Dimensions





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