

Motion controllers

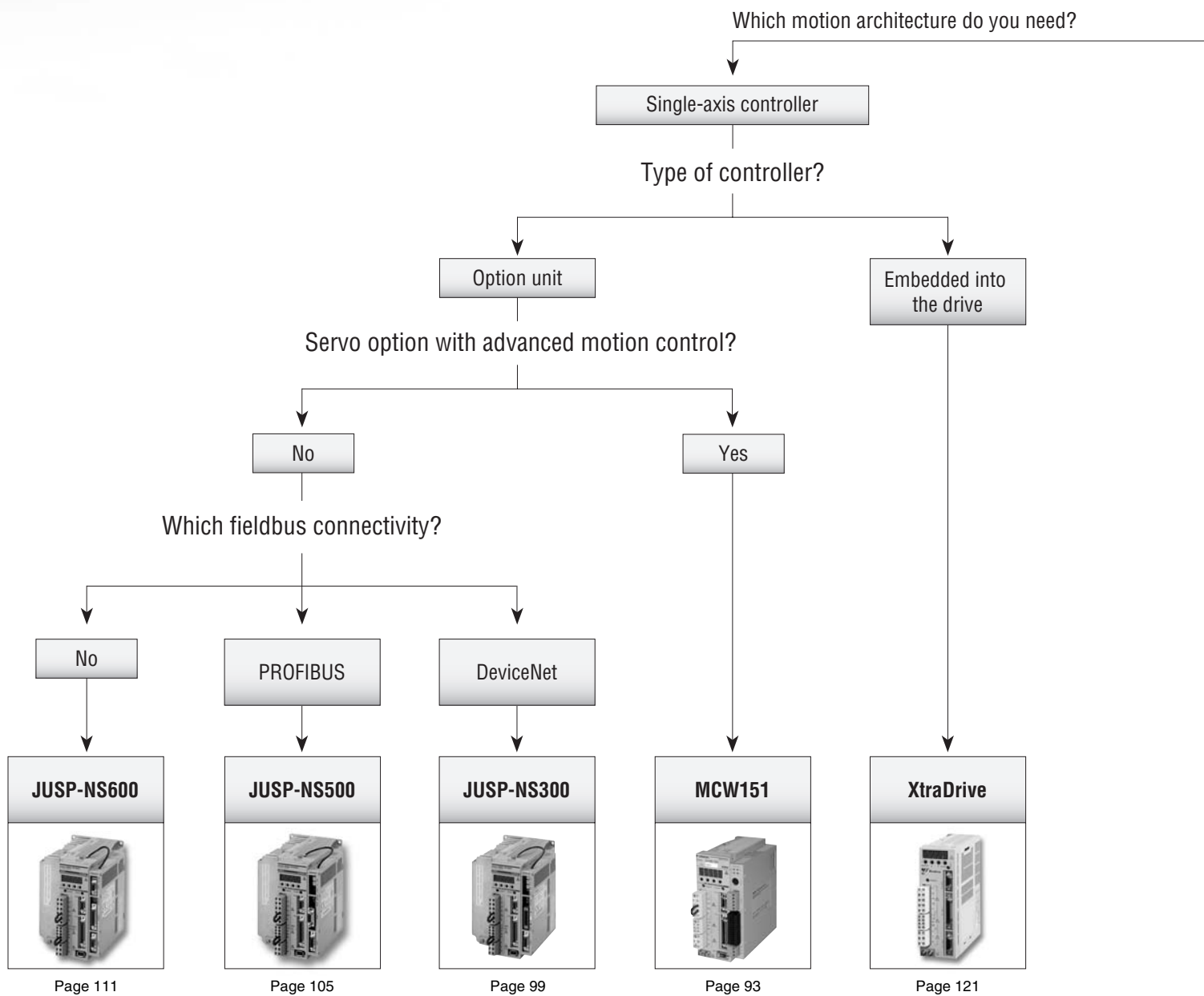
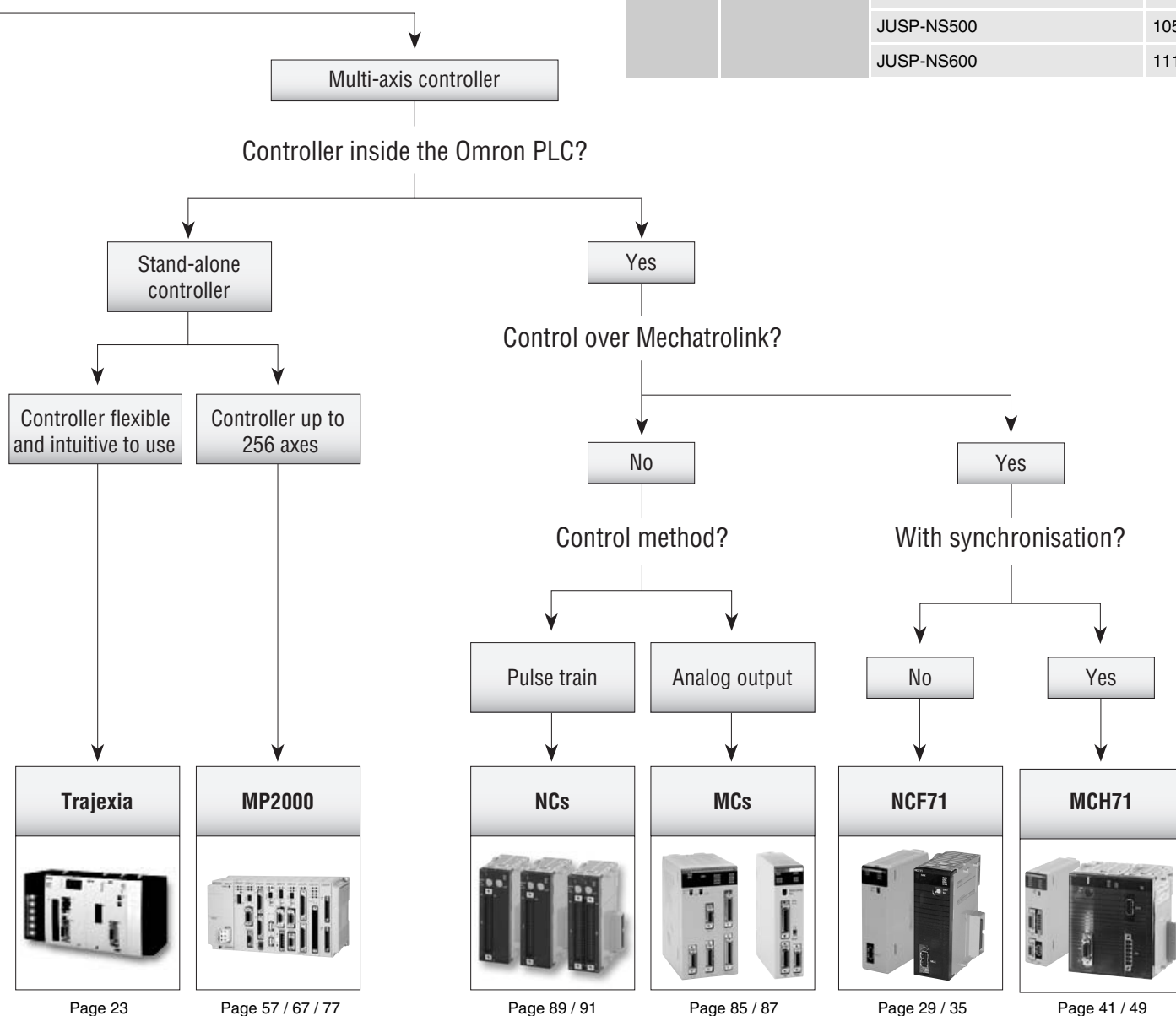







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Selection table

Multi-axes motion controllers			
			
Model	Trajexia	C1W-MCH71	C1W-NCF71
	Flexible concept of advanced motion control over MECHATROLINK-II motion bus and traditional interfaces	Advanced motion controller over MECHATROLINK-II motion bus	Point-to-point positioning controller over MECHATROLINK-II motion bus
Axes control method	MECHATROLINK-II motion bus, analogue output and pulse-train	MECHATROLINK-II motion bus	MECHATROLINK-II motion bus
Number of axes	16 servos + 8 inverters	30 real and 2 virtual axes	16
Applicable servo drive	Sigma II	Sigma II	Sigma II
Application	Advanced motion, e-cam, e-gearbox, phase shift, registration	Advanced motion, e-cam, ELS, phase shift, registration	From simple PTP to multi axis PTP coordinated systems.
Servo control mode	Position, speed and torque	Position, speed and torque	Position, speed and torque
PLC series	Stand alone motion solution. Ethernet, PROFIBUS-DP and DeviceNet connectivity	Advanced motion controller over MECHATROLINK-II motion bus	CJ1 and CS1 PLCs
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Servo-based motion controllers		
		
Model	MCW151	XtraDrive
	Advanced motion in a compact package	All in one! Servo drive and motion controller integrated
Axes control method	Direct connection to servo drive	Integrated into the servo drive
Connectivity	DeviceNet, PROFIBUS, Hostlink	PROFIBUS
Digital I/O	8 DI, 6 DO, 2 registration inputs, 1 encoder IN 1 pulse OUT + Servo IOs	Servo inputs + expansion available
Application	Advanced motion, e-cam, e-gearbox, phase shift, registration	Advanced motion
Servo control mode	Position, speed and torque. Open loop pulse train for additional axis	Position, speed and torque.
Applicable servo drive	Sigma-II	XtraDrive
Page	93	121

Multi-axes motion controllers			
			
Model	MCs	NCs	MP2000
	CS1 solution for advanced motion control	Point-to-point positioning controller	High performance motion controller for a wide array of applications
Axes control method	Analogue output	Pulse train output	MECHATROLINK-II motion bus, analogue output, and pulse-train
Number of axes	4	1, 2, 4	up to 256
Applicable servo drive	Sigma II	SmartStep, Sigma II	Sigma-II
Application	Advanced motion, e-cam, ELS, phase shift, registration	Point-to-point applications	Advanced motion, e-cam, ELS, phase shift, registration
Servo control mode	Close loop position and speed	Open loop position with linear interpolation	Position, speed and torque
PLC series	CS1	CJ1 and CS1 PLCs	Stand-alone and PC-based controllers
Page	85 / 87	89 / 91	57 / 67 / 77

Servo-based motion controllers			
			
Model	JUSP-NS300	JUSP-NS500	JUSP-NS600
	Position controller over DeviceNet	Position controller over PROFIBUS-DP	Position controller over serial link
Axes control method	Direct connection to servo drive	Direct connection to servo drive	Direct connection to servo drive
Connectivity	DeviceNet	PRIFIBUS	RS-485/RS-422
Digital I/O	Uses the servo I/O and adds 2 additional DO and 1 DI	Uses the servo I/O and adds 2 additional DO and 1 DI	Uses the servo I/O and adds 8 additional DI and 6 DO
Application	Point-to-point with registration capability	Poin- to-point with registration capability	Point-to-point with registration capability
Servo control mode	Position, speed	Position, speed	Position, speed
Applicable servo drive	Sigma-II	Sigma-II	Sigma-II
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TJ1-

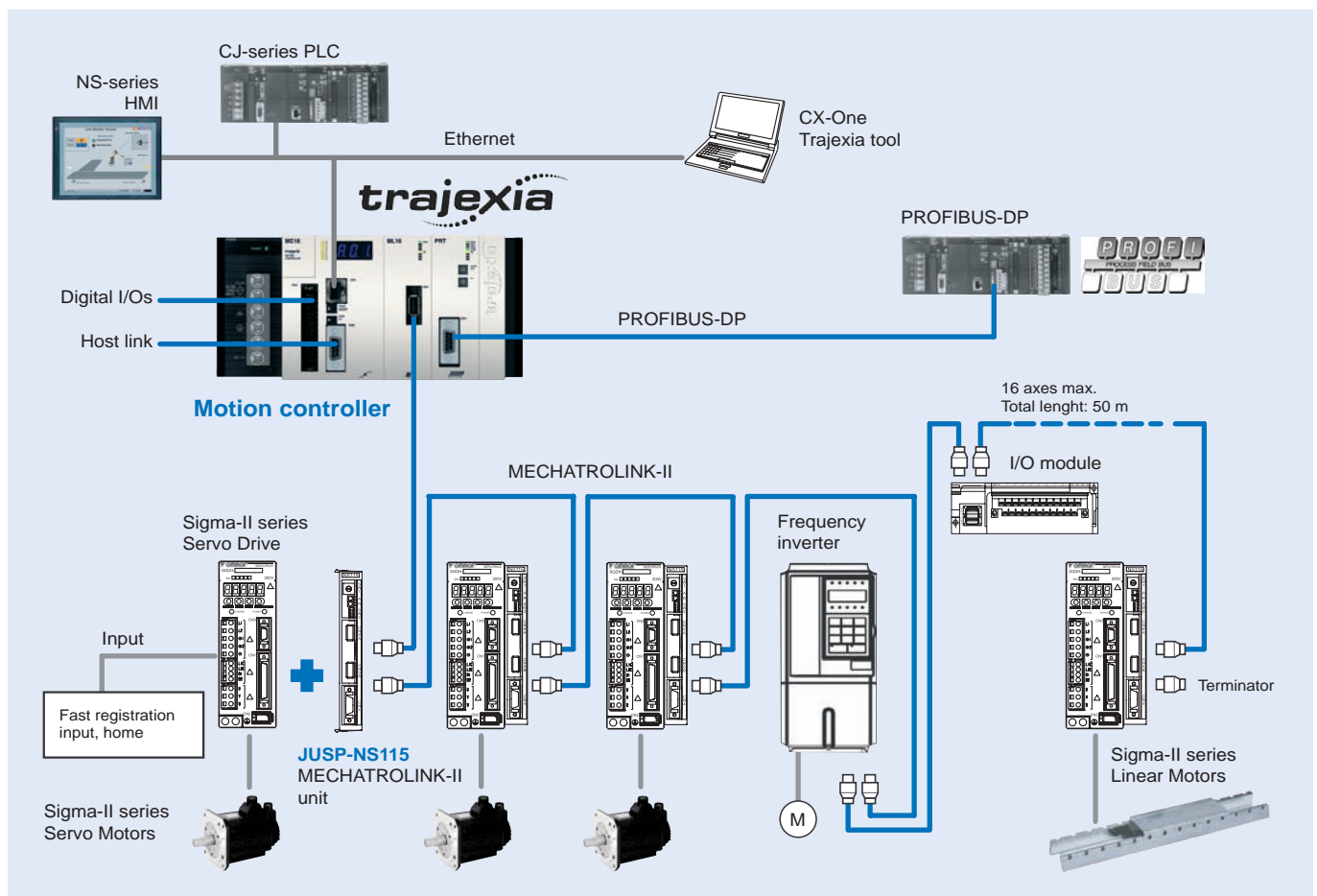
Trajexia motion controller

Stand-alone advanced motion controller using MECHATROLINK-II motion bus

- 16 axes advanced motion controller over a robust and fast motion link MECHATROLINK-II
- Supports position, speed and torque control
- Each axis can run complex interpolation moves, e-cams and e-gearboxes
- Advanced debugging tools including trace and oscilloscope functions
- Hardware registration input for each servo axis
- Control of servos, inverters and I/Os over a single motion network
- Multi-tasking controller capable of running up to 14 tasks simultaneously
- Open communication - ethernet built-in, PROFIBUS-DP and DeviceNet as options



System configuration



Specifications

General specifications

Item	Details
Model	TJ1-□
Ambient operating temperature	0 to 55 °C
Ambient operating humidity	10 to 90% RH
Ambient storage temperature	-20 to 70 °C
Ambient storage humidity	90% max. (with no condensation)
Atmosphere	No corrosive gases
Vibration resistance	10 to 57 Hz: (0.075 mm amplitude) 57 to 100 Hz acceleration: 9.8 m/s ² , in X, Y and Z directions for 80 minutes.
Shock resistance	143 m/s ² , 3 times each X, Y and Z directions.
Insulation resistance	20 MΩ
Dielectric strength	500 Volt
Protective structure	IP20
International standards	CE, EN 61131-2 and RO (approval pending for cULus and Lloyds)

Motion control unit

Item		Details		
Model		TJ1-MC16		
Number of axes		16		
Number of inverters and I/O modules		8 maximum		
Number of MECHATROLINK-II master units		Up to 4 MECHATROLINK-II master units (TJ1-ML16, see below) can be connected		
Cycle time		Selectable 0.5 ms, 1 ms or 2 ms		
Programming language		BASIC-like motion language		
Multi-tasking		Up to 14 tasks running simultaneously		
Digital I/O		16 inputs and 8 outputs freely configurable		
Measurement units		User definable		
Available memory for user programs		500 KB		
Data storage capacity		Up to 2 MB flash data storage		
Saving program data, motion controller		SRAM with battery backup and Flash-ROM		
Saving program data, personal computer		Trajexia motion perfect software manages a backup on the hard disk of the personal computer.		
Communication ports		1 ethernet port and 2 serial ports		
Firmware update		Via Trajexia tools software		
Ethernet port	Electrical characteristics	Conform to IEEE 802.3 (100BaseT)		
	Connector	RJ45 ethernet connector		
Serial port	Electrical characteristics	Conform 1 port to RS232C and 1 port to RS485/RS422A (selectable by switch)		
	Connector	SUB-D9 connector (counterpart included in the package)		
	Synchronization	Start-stop synchronization (asynchronous)		
	Baud rate	1200 / 2400 / 4800 / 9600 / 19200 / 38400 bps		
	Transmission format	Databit length	7 or 8 bit	
		Stop bit	1 or 2 bit	
		Parity bit	Even/odd/none	
	Transmission mode	Point-to-multipoint (1:N)		
	Transmission protocol	RS-232C (1:1)	Host link master protocol, Host link slave protocol, ASCII general-purpose	
		RS-422A (1:N)	Host link master protocol, Host link slave protocol, ASCII general-purpose	
		RS-485 (1:N)	Hostlink master protocol, Hostlink slave protocol, ASCII general-purpose	
	Galvanic isolation	RS422A port		
	Communication buffers	254 bytes		
	Flow control	None		
	Terminator	Yes, selectable by switch		
	Cable length	15 m for RS232 and 500 meter for RS422/485		

MECHATROLINK-II master unit

Item	Specifications
Model	TJ1-ML16
Controlled devices with MECHATROLINK-II interface	Sigma-2 and Sigma-3 servo drives, various I/O units and V7, F7 and G7 frequency inverters
Electrical characteristics	Conform to MECHATROLINK standard
Communication ports	1 MECHATROLINK-II master
Transmission speed	10 Mbps
Communication cycle	0.5 ms, 1 ms or 2 ms
Stations slave types	Axes or servo drives
	Frequency inverters
	I/O modules
Number of stations per master/cycle time	Max.16 stations / 2 ms
	Max.8 stations / 1 ms
	Max. 4 stations / 0.5 ms (only Sigma-3 servo drives)
Transmission distance	Max. 50 meters without using repeater

PROFIBUS slave unit

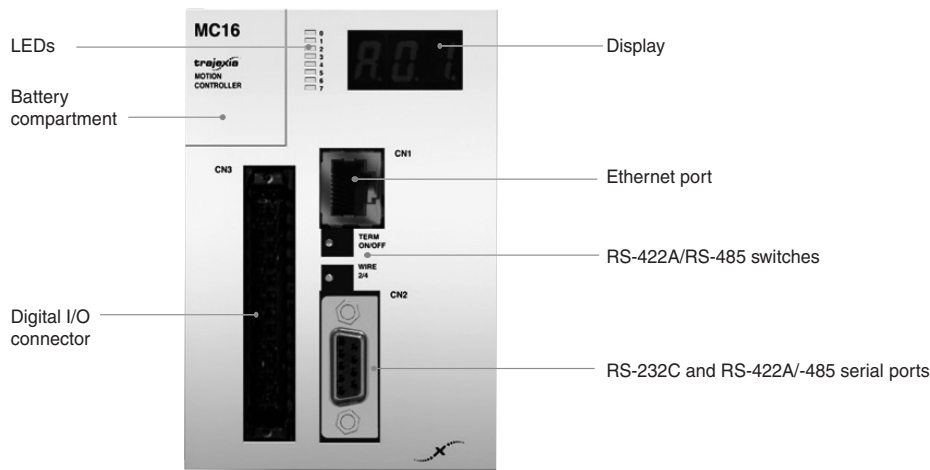
Items	Specifications
Model	TJ1-PRT
PROFIBUS standard	Conform to PROFIBUS-DP standard EN50170 (DP-V0)
Communication ports	1 PROFIBUS-DP slave
Transmission speed	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000 and 12000 kbits/s
Node numbers	0 to 99
I/O size	For both directions a configurable size of 0 to 122 words(16 bit)
Galvanic isolation	Yes

Flexible axis unit

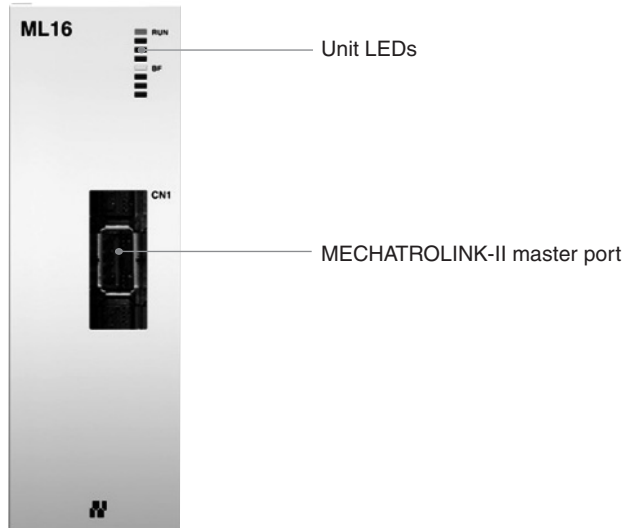
Items		Specifications
Model		TJ1-FL02
Number of axes		2
Control method		±10 V analogue output in closed loop or pulse train output in open loop
Encoder	Position/speed feedback	2 incremental and absolute encoders
	Absolute encoder standards supported	SSI, EnDat and Tamagawa
	Encoder input maximum frequency	6 MHz
	Encoder/pulse output max. frequency	2 MHz
Auxiliary I/Os		2 fast registration inputs per axis, 2 definable inputs, 1 enable output, 4 configurable outputs
Galvanic isolation		Yes

Nomenclature

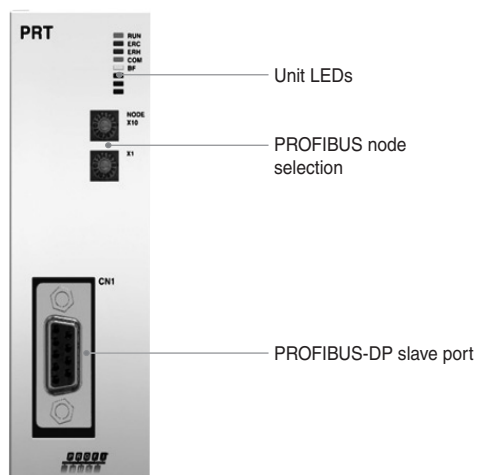
Trajexia motion controller unit - TJ1-MC16



Trajexia MECHATROLINK-II master unit - TJ1-ML16

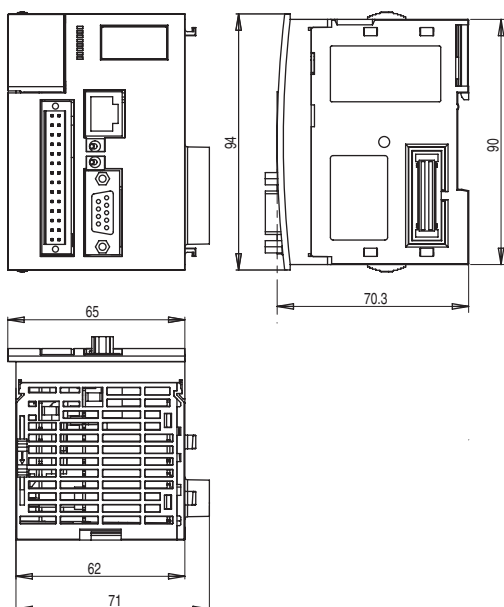


Trajexia PROFIBUS-DP slave unit - TJ1-PRT

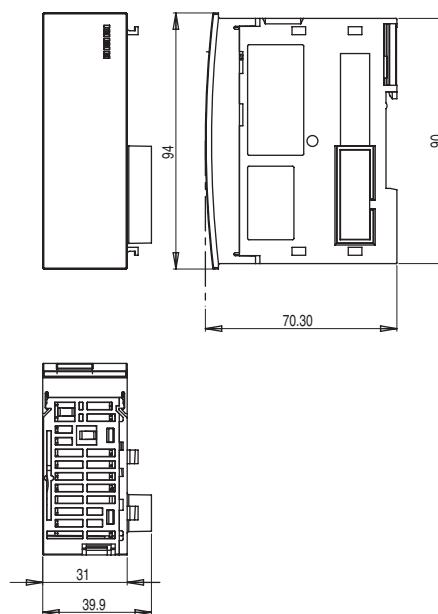


Dimensions

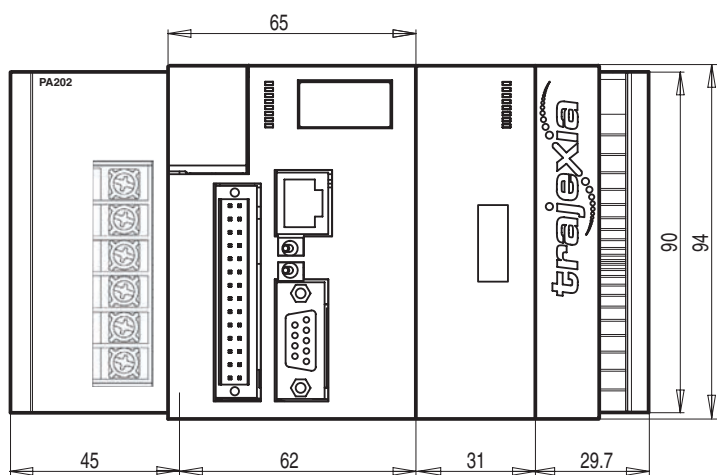
Trajexia motion controller - TJ1-MC16



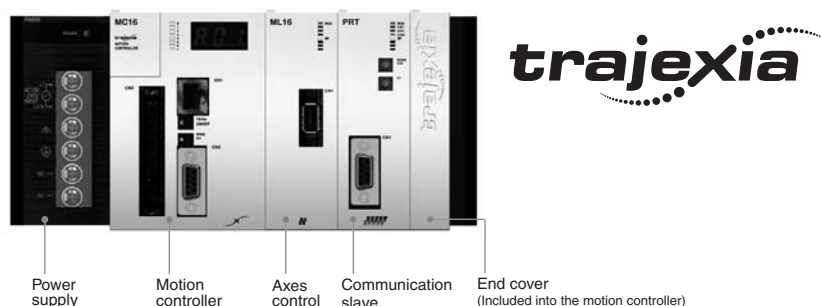
Trajexia modules - TJ1-ML16, TJ1-PRT, TJ1-FL02



Trajexia system - CJ1W-PA202 + TJ1-MC16 + one module + TJ1-TER



Ordering information



Trajexia motion controller

Name	Model
Trajexia motion controller unit. (Trajexia end cover unit TJ1-TER is included)	TJ1-MC16
Power supply for Trajexia system, 100-240 VAC	CJ1W-PA202
Power supply for Trajexia system, 24 VDC	CJ1W-PD022

Trajexia - axes control modules

Name	Model
Trajexia MECHATROLINK-II master unit (up to 16 axes)	TJ1-ML16
Trajexia flexible axis unit (for 2 axes)	TJ1-FL02

Trajexia - communication modules

Name	Model
Trajexia PROFIBUS-DP slave unit	TJ1-PRT

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64-point digital input and 64-point digital output (24 VDC)	JEPMC-IO2310
	Analogue input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analogue output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 39 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T

I/O cables

	Remarks	Length m	Model
I/O cable for JEPMC-IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Servo system & frequency inverters

Note: Refer to motion & drives catalogue for detailed specs and ordering information

Computer software

Specifications	Model
Trajexia motion perfect and CX-drive V1.2 or higher	TJ1-tools

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

CJ1W-NCF71 - MECHATROLINK-II

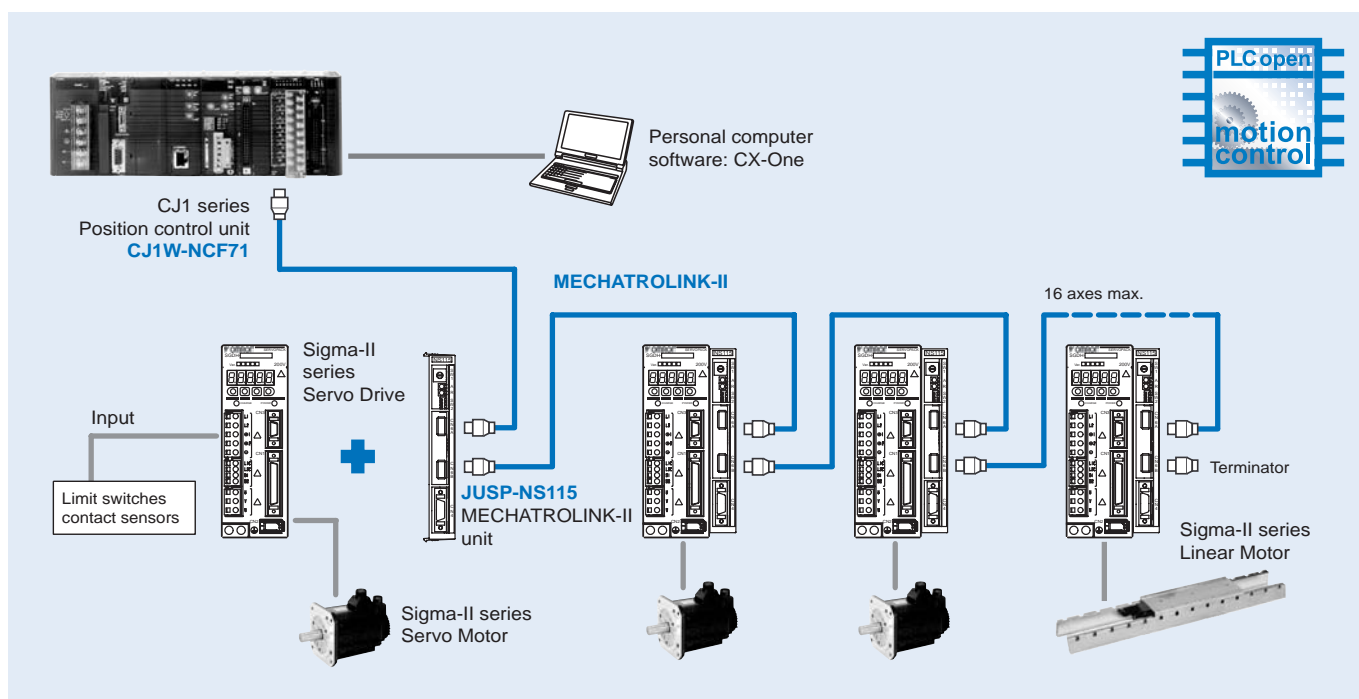
Position control unit

Multi-axes position controller via high-speed MECHATROLINK-II

- Up to 16 axes controlled with minimum wiring. Only one cable between devices is needed.
- High-speed bus MECHATROLINK-II is specially designed for motion control
- Supports position, speed and torque control.
- Programming languages: ladder, function blocks.
- Smart active parts for OMRON HMI's terminals reduce engineering time.
- Access to the complete system from one point. Network setup, servo drives configuring and monitoring, and PLC programming.



System configuration



Specifications

Position control unit

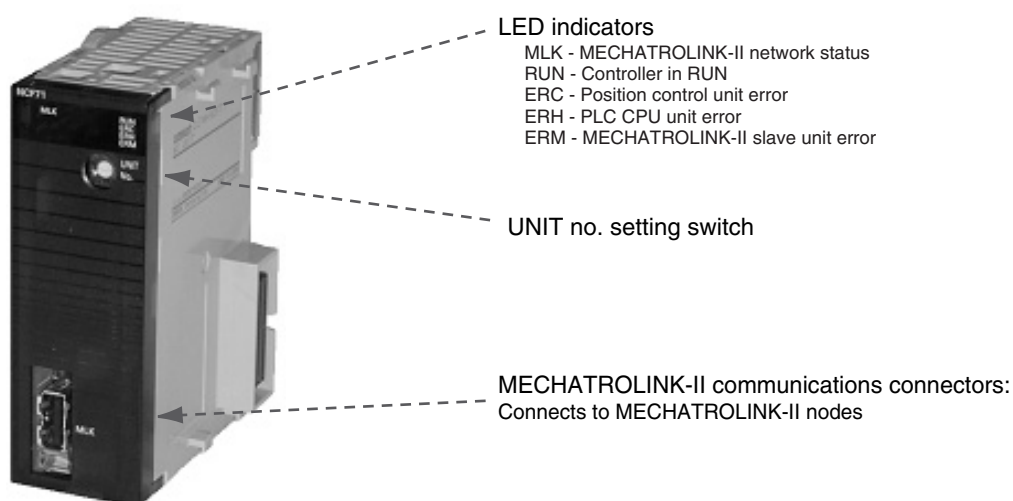
Model		CJ1W-NCF71
Classification		CJ-series CPU bus unit
Applicable PLCs		CJ-series
		CJ-series V. 3.0 or later in order to use function blocks (recommended CJ1G-CPU45 or CJ1H-CPU□)
Possible unit number settings		0 to F
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II interface
Controlled axes		16 maximum
I/O allocations	Common operating memory area	Words allocated in CPU bus unit area: 25 words (15 output words, 10 input words)
	Axis operating memory area	Allocated in one of the following areas (user-specified): CIO, work, auxiliary, holding, DM, or EM area. Number of words allocated: 50 words (25 output words, 25 input words) × highest axis No. used
Control units	Position command unit	Command unit: depends on the electronic gear setting in the servo parameters. Default setting: pulses
	Speed command unit for position control	Command units/s
	Acceleration/deceleration speeds for position control	10,000 command units/s ²
	Speed command unit for speed control	0.001% of the motor's maximum speed
	Torque command unit for torque control	0.001% of the motor's maximum torque
Control command range	Position command range	-2,147,483,648 to 2,147,483,647 (command units)
	Speed command range for position control	0 to 2,147,483,647 (command units/s)
	Acceleration/deceleration speeds for position control	1 to 65,535 (10,000 command units/s ²)
	Speed command range for speed control	-199.999% to 199.999% The upper limit is restricted by the maximum speed of the servo motor.
	Torque command range for torque control	-199.999% to 199.999% The upper limit is restricted by the maximum torque of the servo motor.
Control functions	Servo lock/unlock	Locks and unlocks the servo driver.
	Position control	Positions to an absolute position or relative position according to the specified target position and target speed specified from the ladder program.
	Origin determination	<ul style="list-style-type: none"> • Origin search: establishes the origin using the specified search method. • Present position preset: changes the present position to a specified position to establish the origin. • Origin return: returns the axis from any position to the established origin. • Absolute encoder origin: establishes the origin using a servo motor that has an absolute encoder, without having to use an origin search.
	Jogging	Outputs a fixed speed in the CW or CCW direction.
	Interrupt feeding	Performs positioning by moving the axis a fixed amount when an external interrupt input is received while the axis is moving.
	Speed control	Performs speed control by sending a command to the servo driver speed loop.
	Torque control	Performs torque control by sending a command to the servo driver current loop.
	Stop functions	<ul style="list-style-type: none"> • Deceleration stop: decelerates the moving axis to a stop. • Emergency stop: positions the moving axis for the number of pulses remaining in the deviation counter and then stops the axis.
	Linear interpolation	Up to 8 axes can be interpolated by using two interpolators (4 axes per interpolator) Available in unit version 1.1 or higher
Auxiliary functions	Acceleration/deceleration curves	Sets either a trapezoidal (linear) curve, an exponential curve, or an S-curve (moving average).
	Torque limit	Restricts the torque upper limit during position control.
	Override	Multiplies the axis command speed by a specified ratio. Override: 0.01% to 327.67%
	Servo parameter transfer	Reads and writes the servo driver parameters from the ladder program in the CPU unit.
	Monitoring function	Monitors the control status of the servo driver's command coordinate positions, feedback position, current speed, torque, etc.
	Software limits	Limits software operation for controlling positioning.
External I/O	Backlash compensation	Compensates for the amount of play in the mechanical system according to a set value.
Programming methods	Position control unit	One MECHATROLINK-II interface port
	Servo driver I/O	CW/CCW limit inputs, origin proximity inputs, external interrupt inputs 1 to 3 (can be used as external origin inputs)
Smart active parts	Standard ladder	Directly over NCF unit memory area
	Function blocks	Using standard PLC open function blocks
		
Internal current consumption		360 mA or less for 5 VDC
Weight		95 g

JUSP-NS115 - MECHATROLINK-II interface unit

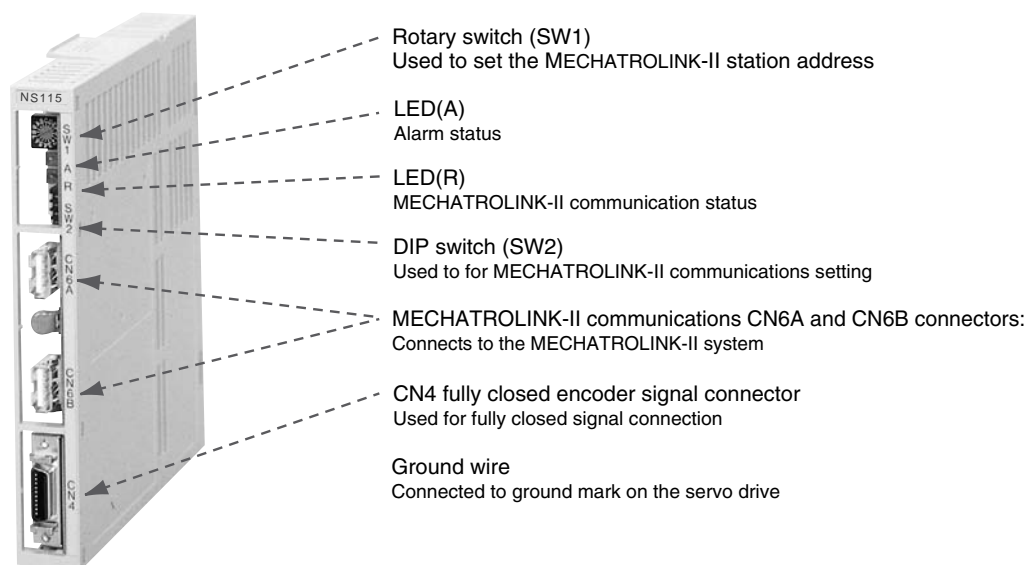
Item	Details
Type	JUSP-NS115
Applicable servo drive	SGDH-□□□E models (version 38 or later)
Installation method	Mounted on the SGDh servo drive side: CN10.
Basic specifications	Power supply method
	Supplied from the servo drive control power supply.
Power consumption	2 W
MECHATROLINK-II communications	Baud rate/transmission cycle
	10 MHz / 0.5 ms or more. MECHATROLINK-II communications
Command format	Operation specification
	Positioning using MECHATROLINK-I/II communications.
Reference input	MECHATROLINK-I/II communications
	Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method
	Linear first/second-step, asymmetric, exponential, S-curve
Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive
	5 V differential line-driver output (complies with EIA standard RS-422A)
	Fully closed encoder pulse signal
	A quad B line-driver
Maximum receivable frequency for servo drive	1 Mpps
Power supply for fully closed encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible
	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
Internal functions	Position data latch function
	Position data latching is possible using phase C, and external signals 1, 2, 3
	Protection
	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection
LED indicators	A: alarm, R: MECHATROLINK-I/II communicating

Nomenclature

CJ1W-NCF71 - position control unit

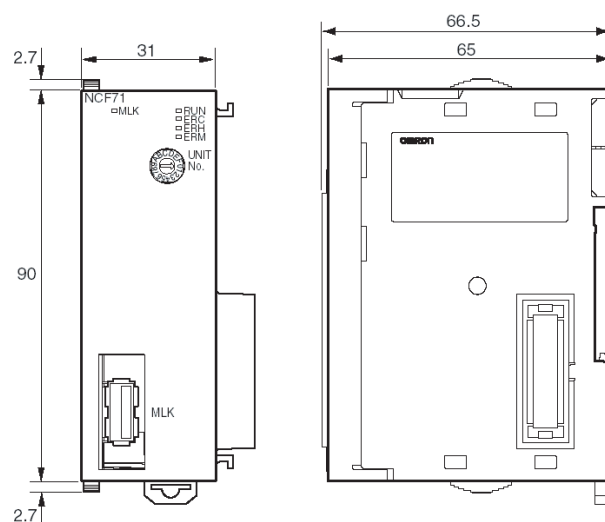


JUSP-NS115 - MECHATROLINK-II interface unit

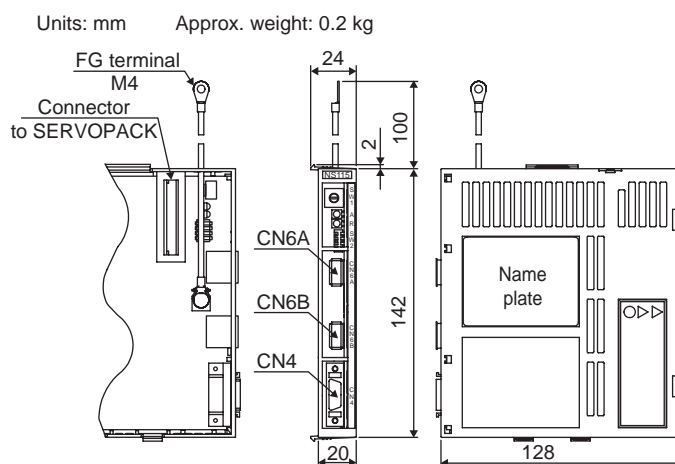


Dimensions

CJ1W-NCF71 - position control unit

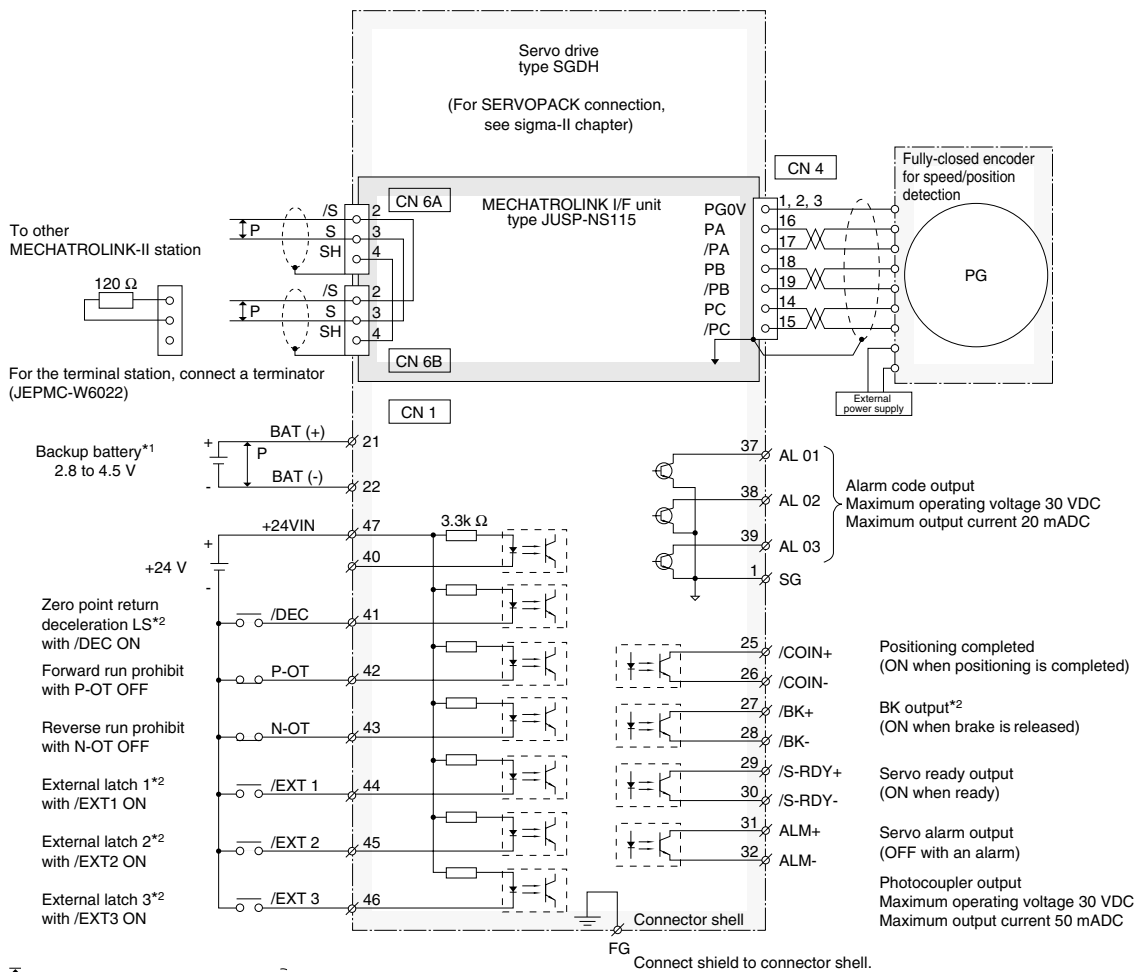


JUSP-NS115 - MECHATROLINK-II interface unit



Installation

MECHATROLINK-II interface connections



*1 Connect when using an absolute encoder and when the battery is not connected to CN8.
*2 Set the signal assignment with the user constants.

Ordering information

Position controller unit

Name	Model
MECHATROLINK-II position controller unit	CJ1W-NCF71

MECHATROLINK-II related devices

Name	Remarks	Model
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30

Servo system

Note: Refer to servo systems section for more information

Computer software

Specifications	Model
CX-One version 1.1 or higher	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

CS1W-NCF71 - MECHATROLINK-II

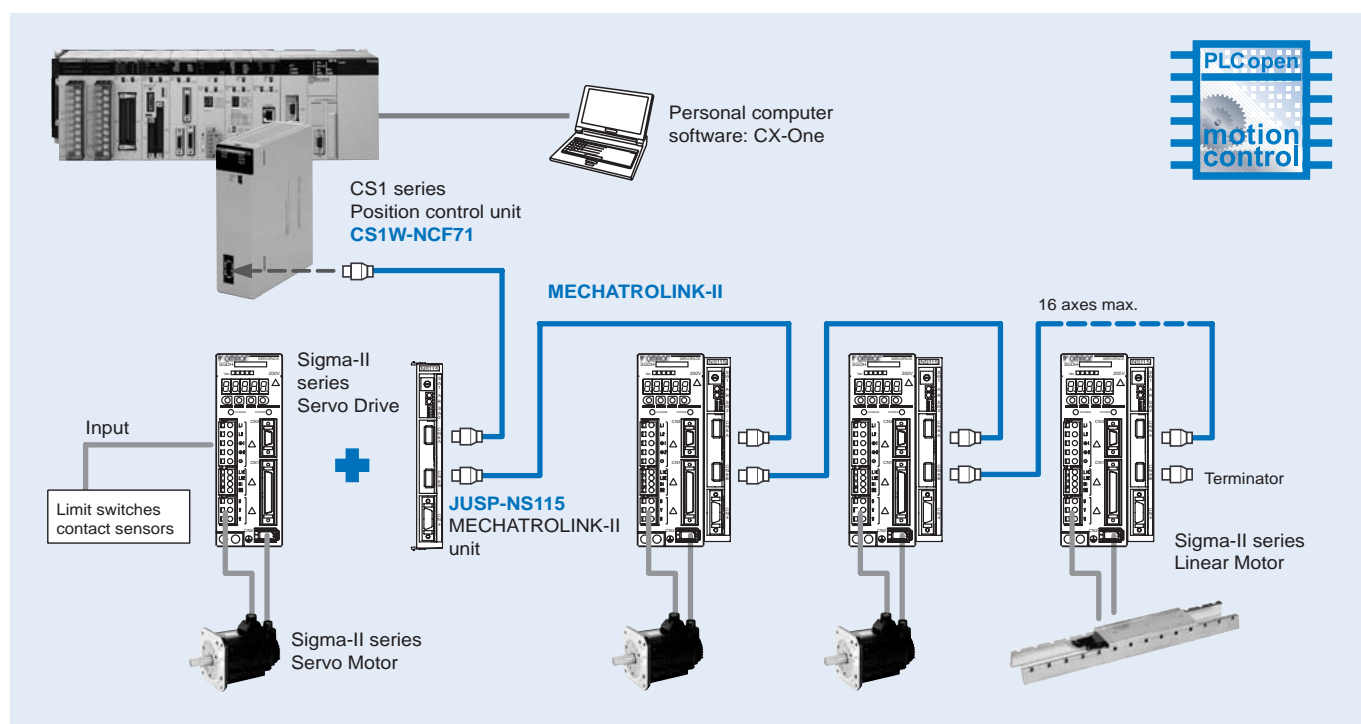
Position control unit

Multi-axes position controller over high-speed MECHATROLINK-II

- Up to 16 axes controlled with minimum wiring. Only one cable between devices is needed.
- High-speed bus MECHATROLINK-II is specially designed for motion control.
- Supports position, speed and torque control.
- Programming languages: ladder, function blocks.
- Smart active parts for OMRON HMI's terminals reduce engineering time.
- Access to the complete system from one point. Network setup, servo drives configuring and monitoring, and PLC programming.



System configuration



Specifications

Position control unit

Model		CS1W-NCF71
Classification		CS-series CPU bus unit
Applicable PLCs		CS-series
		CS-series (V. 3.0 or later if use of function blocks is needed)
Possible unit number settings		0 to F
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II interface
Controlled axes		16 maximum
I/O allocations	Common operating memory area	Words allocated in CPU bus unit area: 25 words (15 output words, 10 input words)
	Axis operating memory area	Allocated in one of the following areas (user-specified): CIO, Work, Auxiliary, Holding, DM, or EM Area. Number of words allocated: 50 words (25 output words, 25 input words) × highest axis No. used
Control units	Position command unit	Command unit: Depends on the electronic gear setting in the servo parameters. Default setting: Pulses
	Speed command unit for position control	Command units/s
	Acceleration/deceleration speeds for position control	10,000 command units/s ²
	Speed command unit for speed control	0.001% of the motor's maximum speed
	Torque command unit for torque control	0.001% of the motor's maximum torque
Control command range	Position command range	-2,147,483,648 to 2,147,483,647 (command units)
	Speed command range for position control	0 to 2,147,483,647 (command units/s)
	Acceleration/deceleration speeds for position control	1 to 65,535 (10,000 command units/s ²)
	Speed command range for speed control	-199.999% to 199.999% The upper limit is restricted by the maximum speed of the servo motor.
	Torque command range for torque control	-199.999% to 199.999% The upper limit is restricted by the maximum torque of the servo motor.
Control functions	Servo lock/unlock	Locks and unlocks the servo driver.
	Position control	Positions to an absolute position or relative position according to the specified target position and target speed specified from the ladder program.
	Origin determination	<ul style="list-style-type: none"> • Origin search: Establishes the origin using the specified search method. • Present position preset: Changes the present position to a specified position to establish the origin. • Origin return: Returns the axis from any position to the established origin. • Absolute encoder origin: Establishes the origin using a Servomotor that has an absolute encoder, without having to use an origin search.
	Jogging	Outputs a fixed speed in the CW or CCW direction.
	Interrupt feeding	Performs positioning by moving the axis a fixed amount when an external interrupt input is received while the axis is moving.
	Speed control	Performs speed control by sending a command to the servo driver speed loop.
	Torque control	Performs torque control by sending a command to the servo driver current loop.
	Stop functions	<ul style="list-style-type: none"> • Deceleration stop: Decelerates the moving axis to a stop. • Emergency stop: Positions the moving axis for the number of pulses remaining in the deviation counter and then stops the axis.
	Linear interpolation	Up to 8 axes can be interpolated by using two interpolators (4 axes per interpolator) Available in unit version 1.1 or higher
Auxiliary functions	Acceleration/deceleration curves	Sets either a trapezoidal (linear) curve, an exponential curve, or an S-curve (moving average).
	Torque limit	Restricts the torque upper limit during position control.
	Override	Multiplies the axis command speed by a specified ratio. Override: 0.01% to 327.67%
	Servo parameter transfer	Reads and writes the servo driver parameters from the ladder program in the CPU unit.
	Monitoring function	Monitors the control status of the servo driver's command coordinate positions, feedback position, current speed, torque, etc.
	Software limits	Limits software operation for controlling positioning.
External I/O	Backlash compensation	Compensates for the amount of play in the mechanical system according to a set value.
Programming methods	Position control unit	One MECHATROLINK-II interface port
	Servo driver I/O	CW/CCW limit inputs, origin proximity inputs, external interrupt inputs 1 to 3 (can be used as external origin inputs)
Programming methods	Standard ladder	Directly over NCF unit memory area
	Function blocks	Using standard PLC open function blocks
Programming methods		
	Smart active parts	Use of OMRON HMI's smart active parts optimizes CPU usage and engineering time
Internal current consumption		360 mA or less for 5 VDC
Weight		188 g

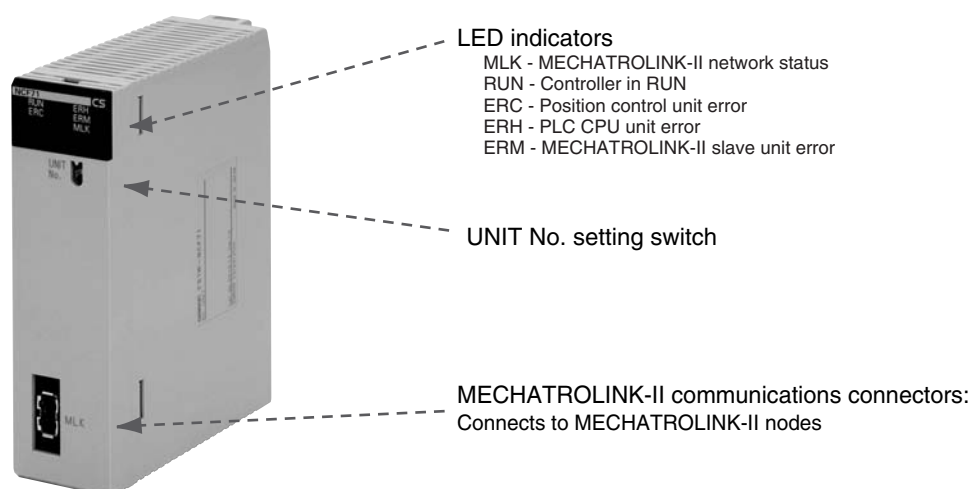


JUSP-NS115 - MECHATROLINK-II interface unit

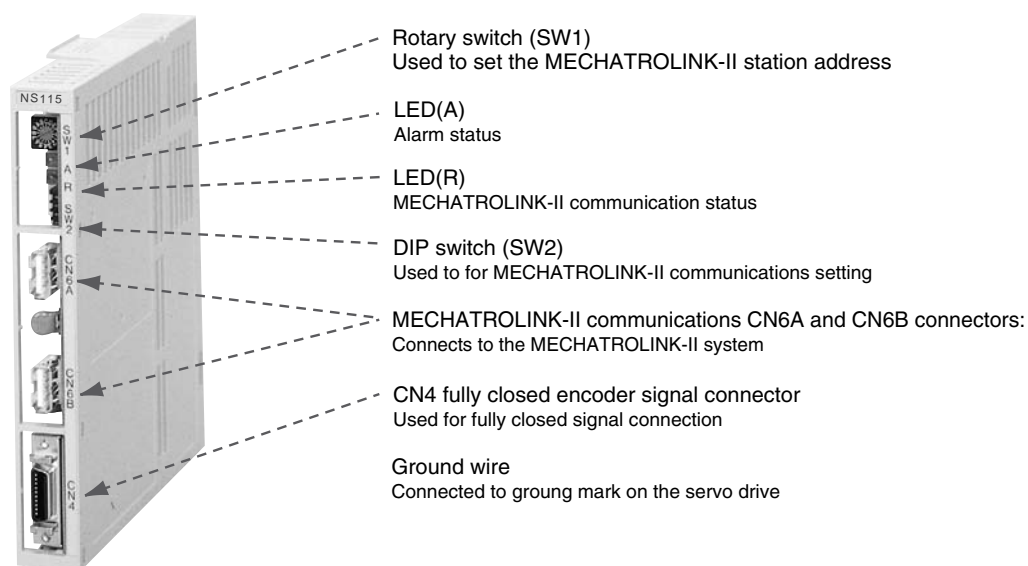
Item	Details
Type	JUSP-NS115
Applicable servo drive	SGDH-□□□□E models (version 38 or later)
Installation method	Mounted on the SGDh servo drive side: CN10.
Basic specifications	Power supply method
	Power consumption
MECHATROLINK-II communications	Baud rate / transmission cycle
Command format	Operation specification
	Reference input
Position control functions	Acceleration/deceleration method
	Fully closed control
Fully closed system specifications	Encoder pulse output in the servo drive
	Fully closed encoder pulse signal
	Maximum receivable frequency for servo drive
	Power supply for fully closed encoder
Input signals in the servo drive	Signal allocation changes possible
Internal functions	Position data latch function
	Protection
	LED indicators

Nomenclature

CJ1W-NCF71 - position control unit

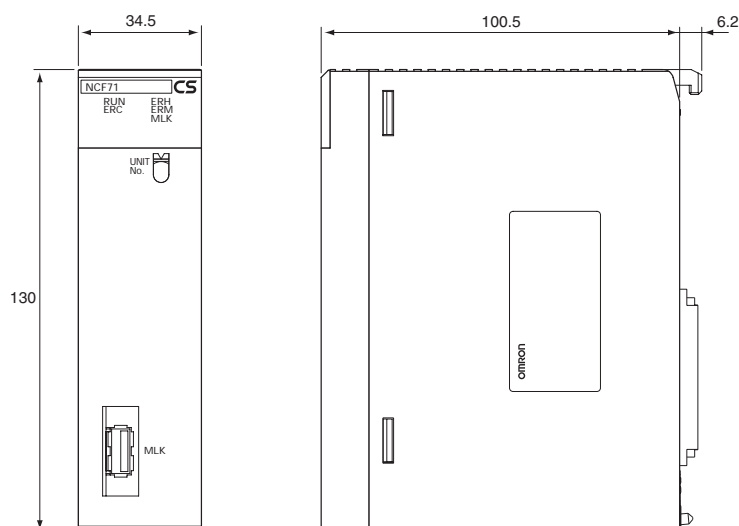


JUSP-NS115 - MECHATROLINK-II interface unit

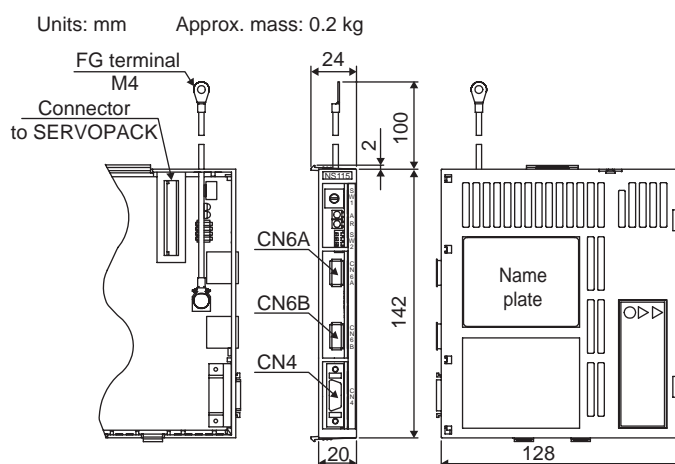


Dimensions

CS1W-NCF71 - position control unit



JUSP-NS115 - MECHATROLINK-II interface unit



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

CJ1W-MCH71 - MECHATROLINK-II

Motion control unit

Multi-axes motion control via high-speed MECHATROLINK-II

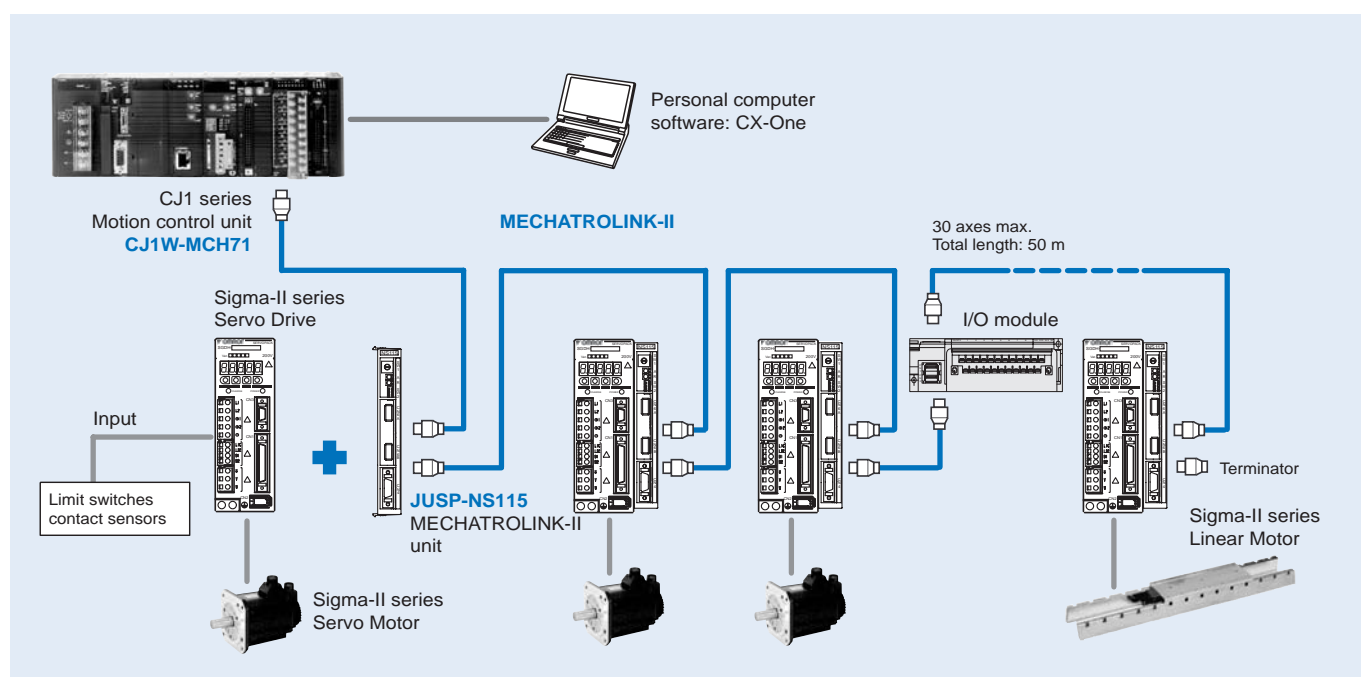
- Up to 30 axes controlled with minimum wiring
- High-speed bus MECHATROLINK-II is specially designed for motion control
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- Hardware registration input for every axis
- Program control commands, like multi-task, parallel programming and various arithmetic operations for maximum program efficiency
- Smart active parts for OMRON HMIs
- Access to the complete system from one point



Function

Multi-axes control is made easy by freely combining control axes. Up to 32 axes can be used, including 30 physical axes and two virtual axes, and each axis can be set individually. Position control, synchronized control (electronic gear, electronic cam, follow-up), speed control, and torque control are all supported, enabling a wide range of applications. By using the high-speed servo communications MECHATROLINK-II, motion programs, system parameters, system data, and servo drive parameters can be set and read from the software tool.

System configuration



Specifications

Motion control unit


Model		CJ1W-MCH71
Classification		CJ-series CPU bus unit
Applicable PLCs		CJ-series V. 2.0 or later
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II interface, various I/O units and inverters V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)
Programming language		BASIC type motion control language
Controlled axes		32 max, including 30 physical or virtual axes and 2 virtual axes
Automatic/manual mode		Automatic mode: mode for executing programs in the unit Manual Mode: mode for executing commands from the CPU unit (via allocated words)
Minimum setting unit		1, 0.1, 0.01, 0.001, 0.0001 (unit: mm, inch, degree, pulse)
Maximum command value		-2,147,483,648 to 2,147,483,647 pulses (32 bits with sign); infinite axis feed mode supported. Example: 16,384 pulses/rev after multiplication, a minimum setting unit of 0.001 mm and 1 mm/rev would result in -1,310,720,000 to 1,310,719,999 command units.
Control functions by command from CPU unit	Servo lock/unlock	Locks and unlocks the servo driver.
	Jogging	Executes continuous feeding for each axis independently at selectable speed.
	Origin search	Determines the machine origin in the direction set in the system parameters. Can be executed with an absolute encoder.
	Absolute origin setting	Sets the origin for when an absolute encoder is used. (Offset value: 32 bits [pulses] with sign)
	Machine lock	Stops the output of move commands to axes.
	Single block	Executes motion programs one block at a time.
Control functions by motion program	Positioning (PTP)	Executes positioning independently for each axis at a specified speed or the speed system parameter. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/unit)
	Linear interpolation	Executes linear interpolation for up to eight axes at a time at the specified interpolation feed speed. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/system)
	Circular interpolation	Executes circular interpolation for two axes in either clockwise or counterclockwise at the specified interpolation feed speed. Helical circular interpolation is also possible with single-axis linear interpolation added. (Simultaneous specification: two or three axes/block, simultaneous execution: up to 16 blocks/system)
	Other functions	Origin searches, interrupt feeding, timed positioning, traverse positioning, independent electronic CAM, synchronized electronic CAM, link operation, electronic gear, follow-up synchronization, speed reference, torque reference
Acceleration/deceleration curve, acceleration/deceleration time		Trapezoidal or S-curve, 60,000 ms max. (S-curve: constant 30,000 ms max.)
External I/O		One port for MECHATROLINK-II servo communications, one deceleration stop input, two general inputs, two general outputs
Feed rate		Rapid, interpolation feed rate: 1 to 2,147,483,647 (command units/min)
Override		0.00% to 327.67% (setting unit: 0.01%; Can be set for each axis or task.)
Motion programs	Number of tasks, number of programs	Up to 8 tasks and 256 programs/unit (8 parallel branches per task max.)
	Program numbers	0000 to 0499 for main program; 0500 to 0999 for subroutine
	Program capacity	In motion program conversion, 8,000 blocks/unit max. (2 Mbytes); number of blocks: 800 per program
	Data capacity	Position data: 10,240 points/unit; cam data: 32 max.; 16,000 points/unit
	Subroutine nesting	Five levels max.
	Start	Programs in other tasks can be started from a program or from the PLC
	Deceleration stop	Decelerates to a stop regardless of the block.
	Block stop	Decelerates to a stop after the block being executed is ended.
	Single block	Executes the program one block at a time.
Data exchange with CPU unit	Unit BIT area	Uses one unit number (25 words). Used for unit and tasks: 11 to 25 words (depending on the number of tasks)
	Unit data area	Uses one unit number (100 words). Used for unit and tasks: 32 to 74 words (depending on the number of tasks)
	Axes BIT area	Axes: 0 to 64 words (depending on the maximum axis number used). User configurable.
	Axes data area	Axes: 0 to 128 words (depending on the maximum axis number used). User configurable.
	General purpose	General I/O: 0 to 1,280 words (depending on the settings). User configurable.
Saving programs and data		Memory card backup (in CPU unit, 100,000 times max.)
Self-diagnostic functions		Watchdog, RAM check, etc.
Error detection functions		Deceleration stop inputs, unit number errors, CPU errors, software limit errors, etc.
Error log function		Read by IORD instruction from CPU unit.
Support software		Microsoft Windows 2000 or NT 4.0 (Processor: Pentium, 100 MHz min., with at least 64 MB of memory)
External power supply voltage		24 VDC (21.6 to 26.4 VDC)
Internal current consumption		0.6 A or less for 5 VDC
Weight (not including connectors)		300 g max.

MECHATROLINK-II, Servo drive interface unit (JUSP-NS115)


Item		Details
Type		JUSP-NS115
Applicable servo drive		SGDH-□□□□E models (version 38 or later)
Installation Method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	2 W
MECHATROLINK-II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA standard RS-422A)
	Fully closed encoder pulse signal	A quad B line-driver
	Maximum receivable frequency for servo drive	1 Mpps
	Power supply for fully closed encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3
Internal functions	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection
	LED indicators	A: alarm, R: MECHATROLINK-I/II communicating




MECHATROLINK-II, 64 Point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5mA, sink/source mode input Output: 64 points, 24 VDC, 50mA when all points ON, (the max. rating is 100mA per point) sink mode output (NPN) Signal connection method: connector (FCN360 series)	
Module power supply	24VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	


MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2 (1 can be used with MCH)	
Functions	Pulse counter, notch output	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (x 4 multiplier)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	24 VDC, 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5VDC, 10mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II Repeater

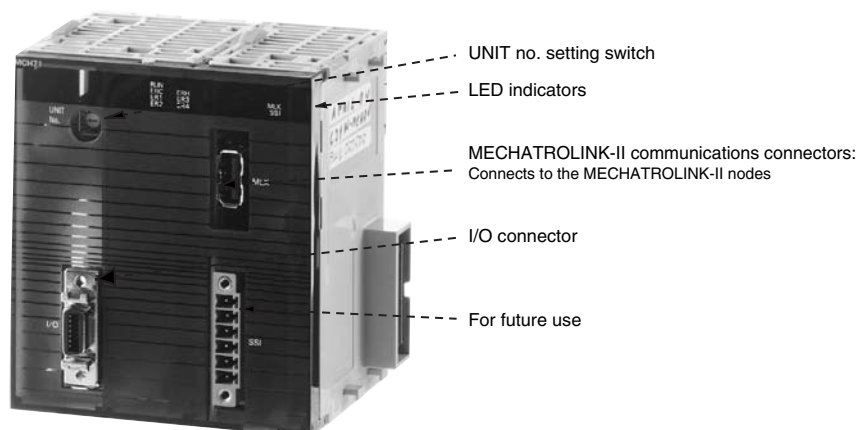
Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 30 stations for the CJ1W-MCH71))	
Restrictions	Between controller and repeater - Total cable length ≤ 30m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 15 stations max. including I/O and servo, etc.	
Power supply	24 VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II, frequency inverter interface units

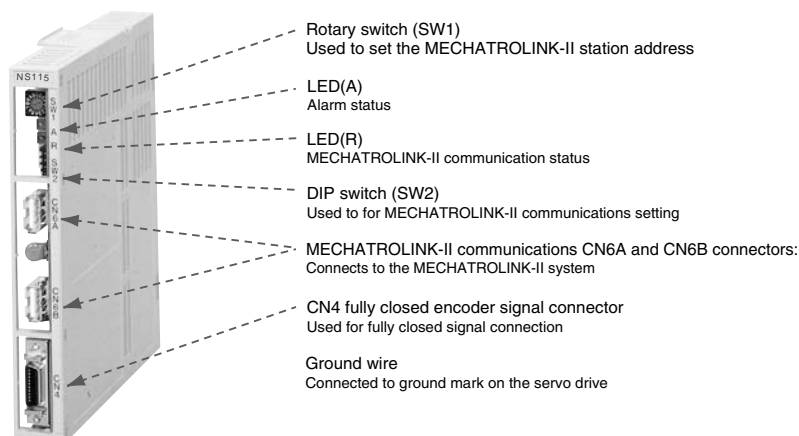
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Nomenclature

CJ1W-MCH71 - motion control unit

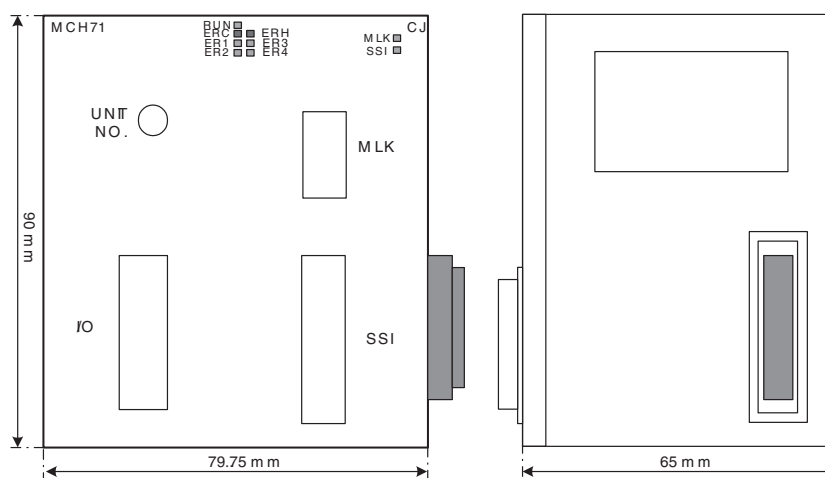


JUSP-NS115 - MECHATROLINK-II interface unit

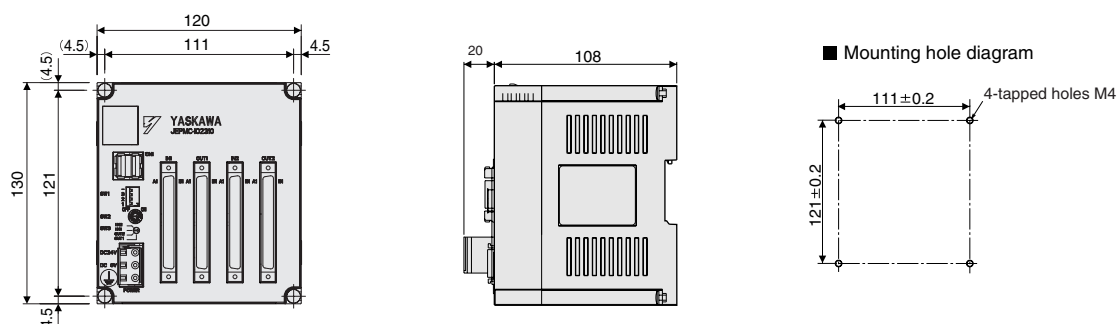


Dimensions

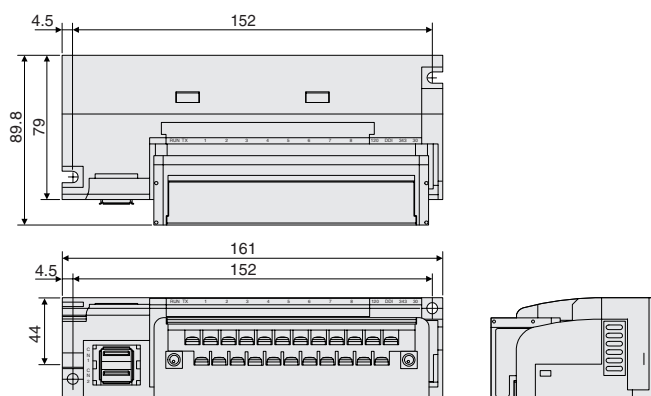
CJ1W-MCH71 - motion control unit



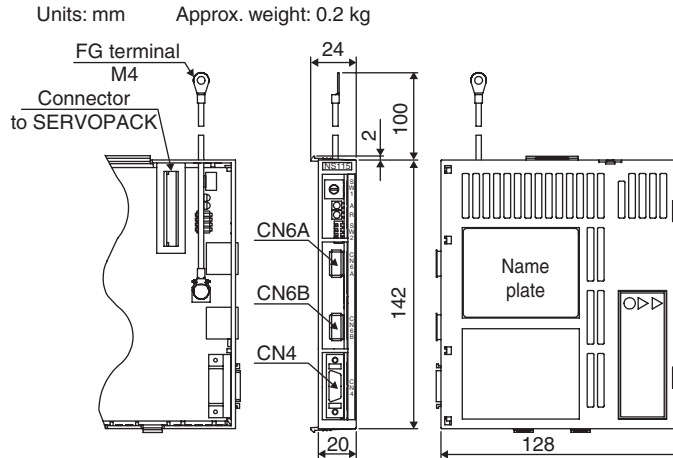
IO2310 I/O module



I/O modules PL2900, PL2910

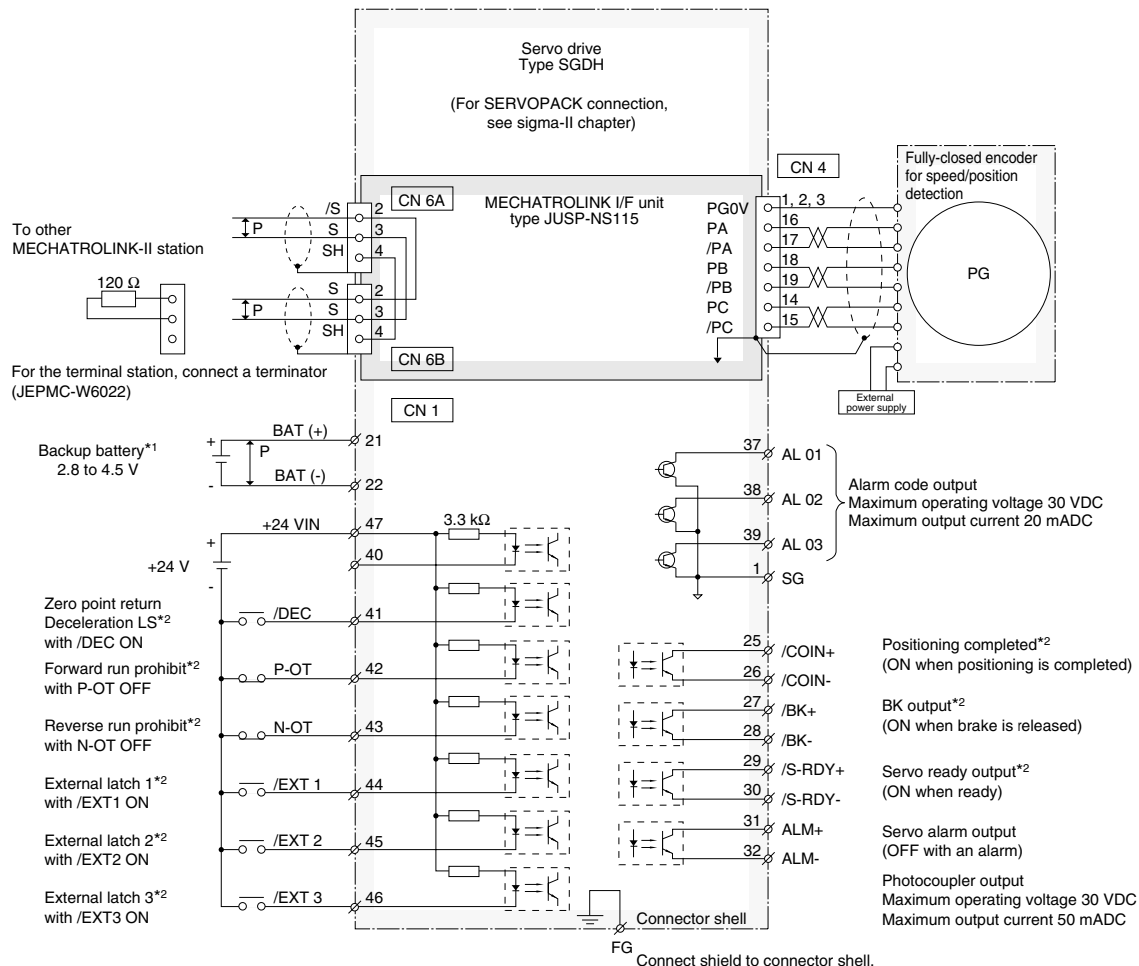


JUSP-NS115 - MECHATROLINK-II interface unit



Installation

MECHATROLINK-II interface connections



*1 Connect when using an absolute encoder and when the battery is not connected to CN8.

*2 Set the signal assignment with the user constants.

Ordering information

Motion controller

Name	Model
MECHATROLINK-II motion control unit	CJ1W-MCH71

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64 point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface units	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	When 17 or more axes are connected to the MECHATROLINK-II the repeater is required	JEPMC-REP2000

I/O cables

	Remarks	Length m	Model
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

Computer software

Specifications	Model
CX-One version 1.1 or higher	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

CS1W-MCH71 - MECHATROLINK-II

Motion control unit

Multi-axes motion control via high-speed MECHATROLINK-II

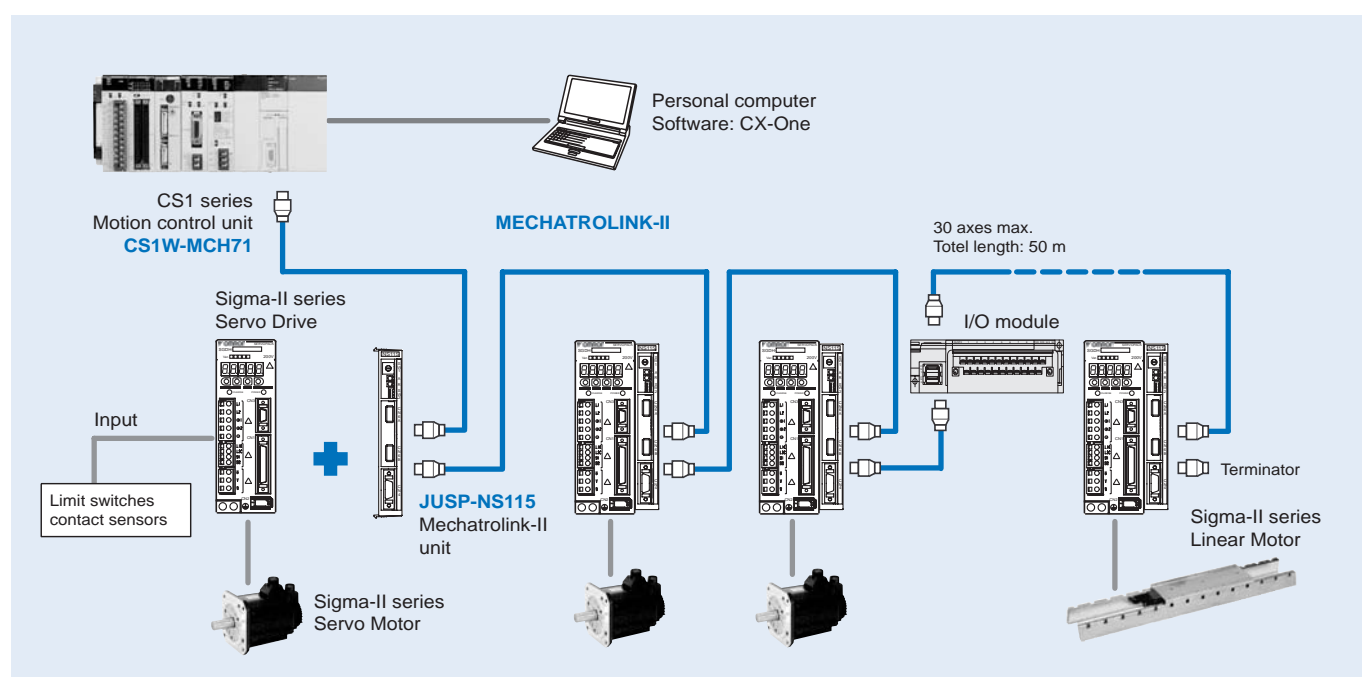
- Up to 30 axes controlled with minimum wiring
- High-speed bus MECHATROLINK-II is specially designed for motion control
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- Hardware registration input for every axis
- Program control commands, like multi-task, parallel programming and various arithmetic operations for maximum program efficiency
- Smart active parts for OMRON HMIs
- Access to the complete system from one point



Function

Multi-axes control is made easy by freely combining control axes. Up to 32 axes can be used, including 30 physical axes and two virtual axes, and each axis can be set individually. Position control, synchronized control (electronic gear, electronic cam, follow-up), speed control, and torque control are all supported, enabling a wide range of applications. By using the high-speed servo communications MECHATROLINK-II, motion programs, system parameters, system data, and servo drive parameters can be set and read from the software tool.

System configuration



Specifications

Motion control unit

Model		CS1W-MCH71
Classification		CS-series CPU bus unit
Applicable PLCs		CS-series, (CS1□-CPU□□H)
Backplanes on which MC unit can be mounted		CPU backplane or CS-series expansion I/O backplane
Control method		MECHATROLINK-II (position, speed and torque control)
Controlled devices		Sigma-II series servo drives (ver. 38 or later) with MECHATROLINK-II Interface, various I/O units and inverters V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)
Programming language		BASIC type motion control language
Controlled axes		32 max, including 30 physical or virtual axes and 2 virtual axes
Operating modes		RUN mode, CPU mode, Tool mode/system (depending on tool)
Automatic/manual mode		Automatic mode: mode for executing programs in the unit Manual mode: mode for executing commands from the CPU unit (via allocated words)
Minimum setting unit		1, 0.1, 0.01, 0.001, 0.0001 (unit: mm, inch, degree, pulse)
Maximum command value		-2,147,483,648 to 2,147,483,647 pulses (32 bits with sign); infinite axis feed mode supported. Example: 16,384 pulses/rev after multiplication, a minimum setting unit of 0.001 mm and 1 mm/rev would result in -1,310,720,000 to 1,310,719,999 command units.
Control functions by command from CPU unit	Servo lock/unlock	Locks and unlocks the servo driver.
	Jogging	Executes continuous feeding for each axis independently at selectable speed.
	Origin search	Determines the machine origin in the direction set in the system parameters. Can be executed with an absolute encoder.
	Absolute origin setting	Sets the origin for when an absolute encoder is used. (Offset value: 32 bits [pulses] with sign)
	Machine lock	Stops the output of move commands to axes.
	Single block	Executes motion programs one block at a time.
Control functions by motion program	Positioning (PTP)	Executes positioning independently for each axis at a specified speed or the speed system parameter. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/unit)
	Linear interpolation	Executes linear interpolation for up to eight axes at a time at the specified interpolation feed speed. (Simultaneous specification: up to eight axes/block, simultaneous execution: up to 32 blocks/system)
	Circular interpolation	Executes circular interpolation for two axes in either clockwise or counterclockwise at the specified interpolation feed speed. Helical circular interpolation is also possible with single-axis linear interpolation added. (Simultaneous specification: two or three axes/block, simultaneous execution: up to 16 blocks/system)
	Other functions	Origin searches, interrupt feeding, timed positioning, traverse positioning, independent electronic CAM, synchronized electronic CAM, link operation, electronic gear, follow-up synchronization, speed reference, torque reference
Acceleration/deceleration curve, acceleration/deceleration time		Trapezoidal or S-curve, 60,000 ms max. (S-curve: constant 30,000 ms max.)
External I/O		One port for MECHATROLINK-II servo communications, one deceleration stop input, two general inputs, two general outputs
Feed rate		Rapid, interpolation feed rate: 1 to 2,147,483,647 (command units/min)
Override		0.00% to 327.67% (setting unit: 0.01%; can be set for each axis or task.)
Motion programs	Number of tasks, number of programs	Up to 8 tasks and 256 programs/unit (8 parallel branches per task max.)
	Program numbers	0000 to 0499 for main program; 0500 to 0999 for subroutine
	Program capacity	In motion program conversion, 8,000 blocks/unit max. (2 Mbytes); number of blocks: 800 per program
	Data capacity	Position data: 10,240 points/unit; cam data: 32 max.; 16,000 points/unit
	Subroutine nesting	Five levels max.
	Start	Programs in other tasks can be started from a program or from the PLC
	Deceleration stop	Decelerates to a stop regardless of the block.
	Block stop	Decelerates to a stop after the block being executed is ended.
	Single block	Executes the program one block at a time.
Data exchange with CPU unit	Unit BIT area	Uses one unit number (25 words). Used for unit and tasks: 11 to 25 words (depending on the number of tasks)
	Unit data area	Uses one unit number (100 words). Used for unit and tasks: 32 to 74 words (depending on the number of tasks)
	Axes BIT area	Axes: 0 to 64 words (depending on the maximum axis number used). User configurable.
	Axes data area	Axes: 0 to 128 words (depending on the maximum axis number used). User configurable.
	General purpose	General I/O: 0 to 1,280 words (depending on the settings). User configurable.
Saving programs and data		Memory card backup (in CPU unit, 100,000 times max.)
Self-diagnostic functions		Watchdog, RAM check, etc.
Error detection functions		Deceleration stop inputs, unit number errors, CPU errors, software limit errors, etc.
Error log function		Read by IORD instruction from CPU unit.
Support software		Microsoft Windows 2000 or NT 4.0 (Processor: Pentium, 100 MHz min., with at least 64 MB of memory)
External power supply voltage		24 VDC (21.6 to 26.4 VDC)
Internal current consumption		0.8 A or less for 5 VDC; 0.3 A or less for 24 VDC
Weight (not including connectors)		300 g max.

MECHATROLINK-II, servo drive interface unit (JUSP-NS115)

Item		Details
Type		JUSP-NS115
Applicable servo drive		SGDH-□□□E models (version 38 or later)
Installation method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	2 W
MECHATROLINK-II communications	Baud rate / transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA standard RS-422A)
	Fully Closed Encoder Pulse Signal	A quad B line-driver
	Maximum Receivable Frequency for Servo Drive	1 Mpps
	Power Supply for Fully Closed Encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3
Internal functions	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection
	LED indicators	A: alarm, R: MECHATROLINK-I/II communicating



MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5 mA, sink/source mode input Output: 64 points, 24 VDC, 50 mA when all points ON, (the max. rating is 100 mA per point) sink mode output (NPN) Signal connection method: connector (FCN360 series)	
Module power supply	24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	


MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2 (1 can be used with MCH)	
Functions	Pulse counter, notch output	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (x 4 multiplier)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	24 VDC, 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5 VDC, 10 mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II repeater

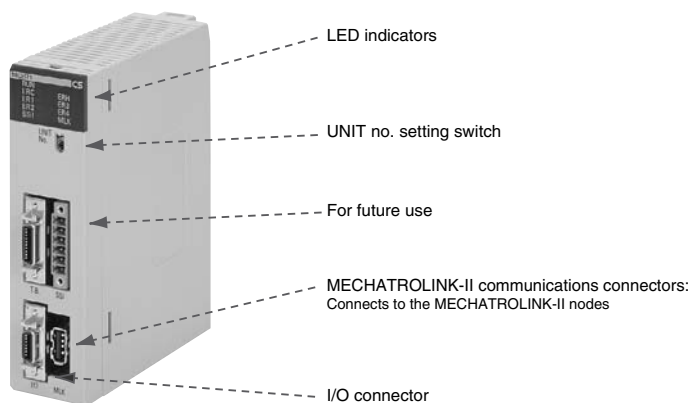
Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 30 stations for the CJ1W-MCH71))	
Restrictions	Between controller and repeater - Total cable length ≤ 30m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50m: 15 stations max. including I/O and servo, etc.	
Power supply	24VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II, frequency inverter interface units

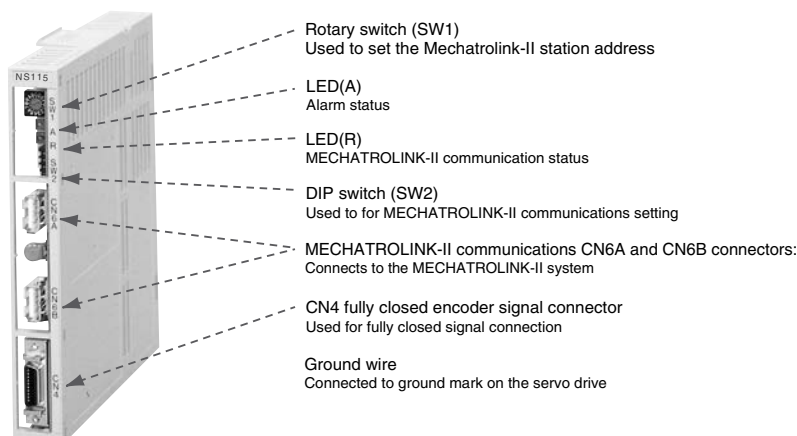
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer) Contact your OMRON sales office for information about firmware compatibility	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10MHz, 0.5ms to 8ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Nomenclature

CS1W-MCH71 - motion control unit

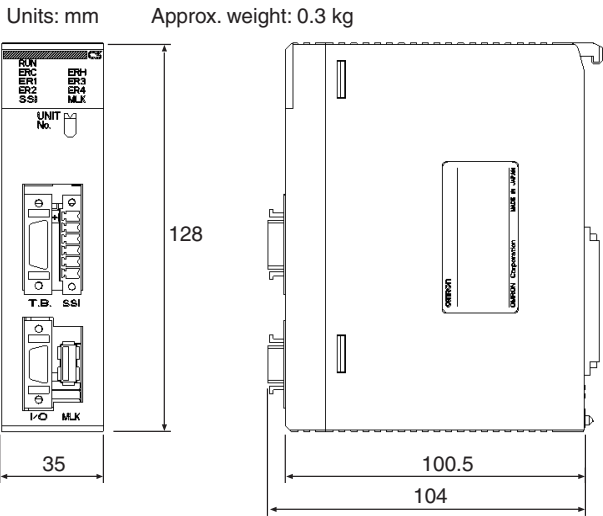


JUSP-NS115 - MECHATROLINK-II interface unit

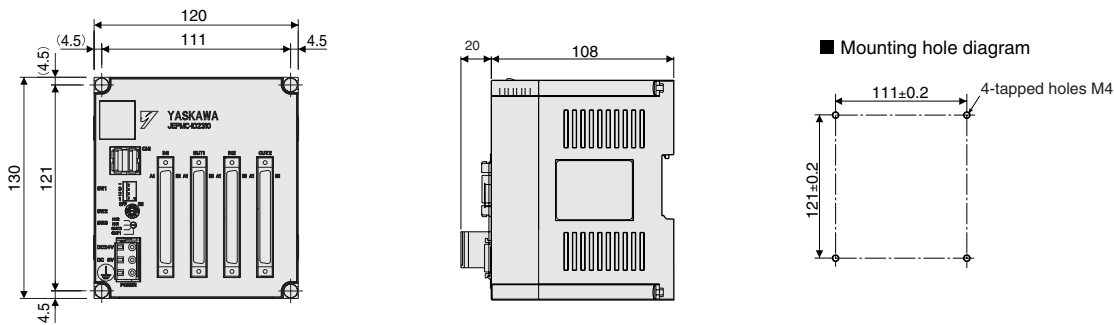


Dimensions

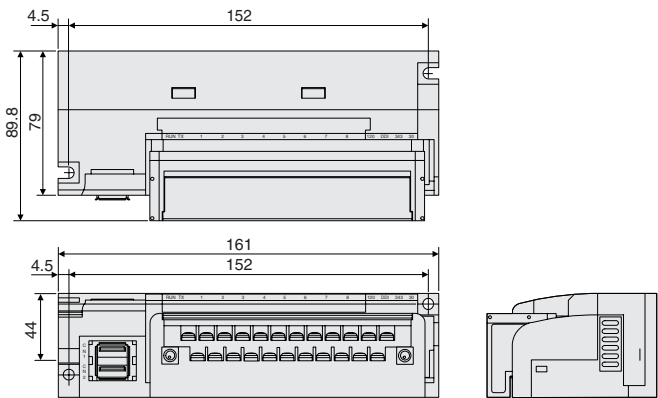
CS1W-MCH71 - motion control unit



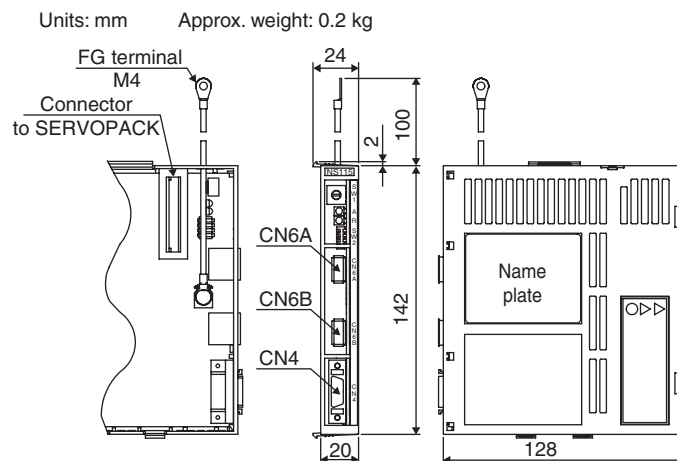
O2310 I/O module



I/O modules PL2900, PL2910

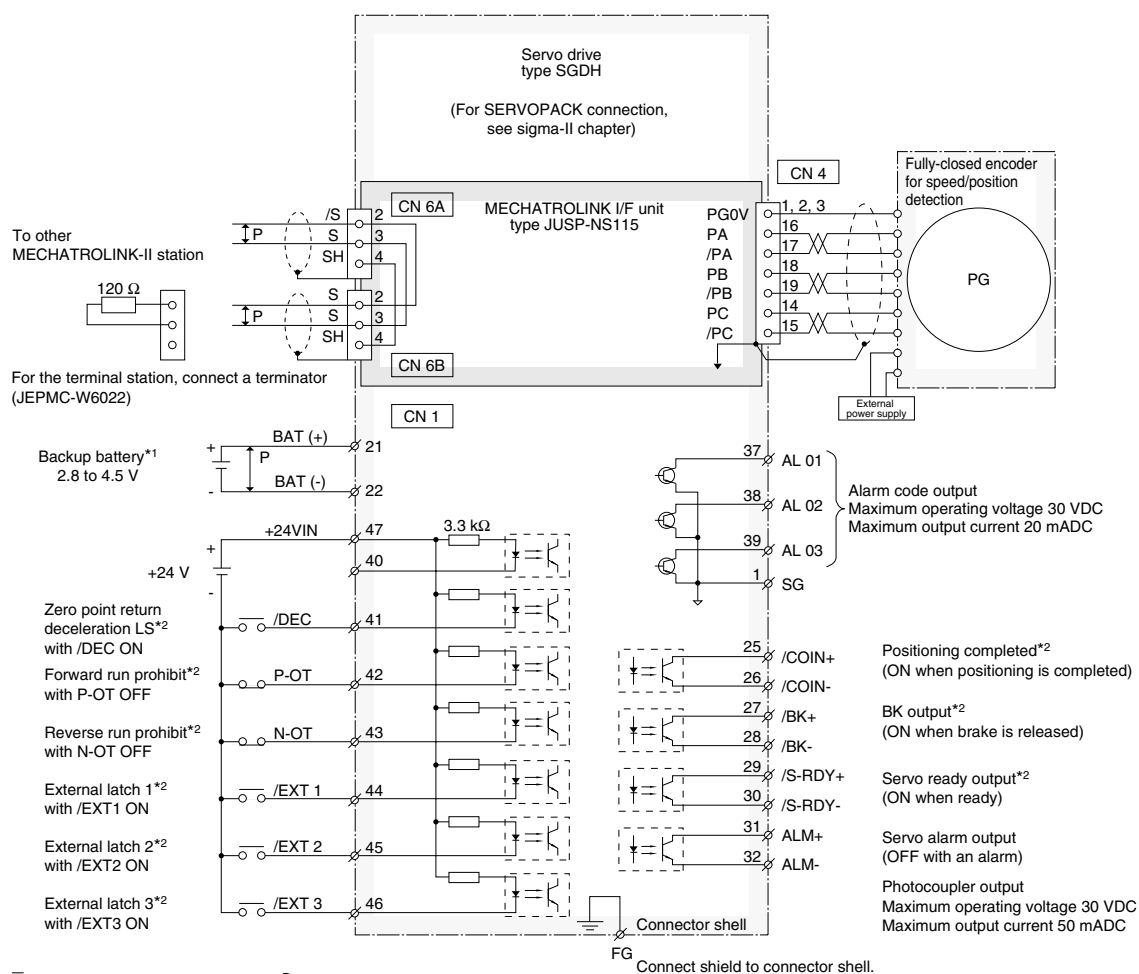


JUSP-NS115 - MECHATROLINK-II interface unit



Installation

MECHATROLINK-II interface connections



*1 Connect when using an absolute encoder and when the battery is not connected to CN8.

*2 Set the signal assignment with the user constants.

Ordering information

Motion controller

Name	Model
MECHATROLINK-II motion control unit	CS1W-MCH71

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64 point input and 64 point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface units	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	When 17 or more axes are connected to the MECHATROLINK-II the repeater is required	JEPMC-REP2000

I/O cables

	Remarks	Length m	Model
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

Computer software

Specifications	Model
CX-One version 1.1 or higher	CX-One

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

MP2200 - MECHATROLINK-II

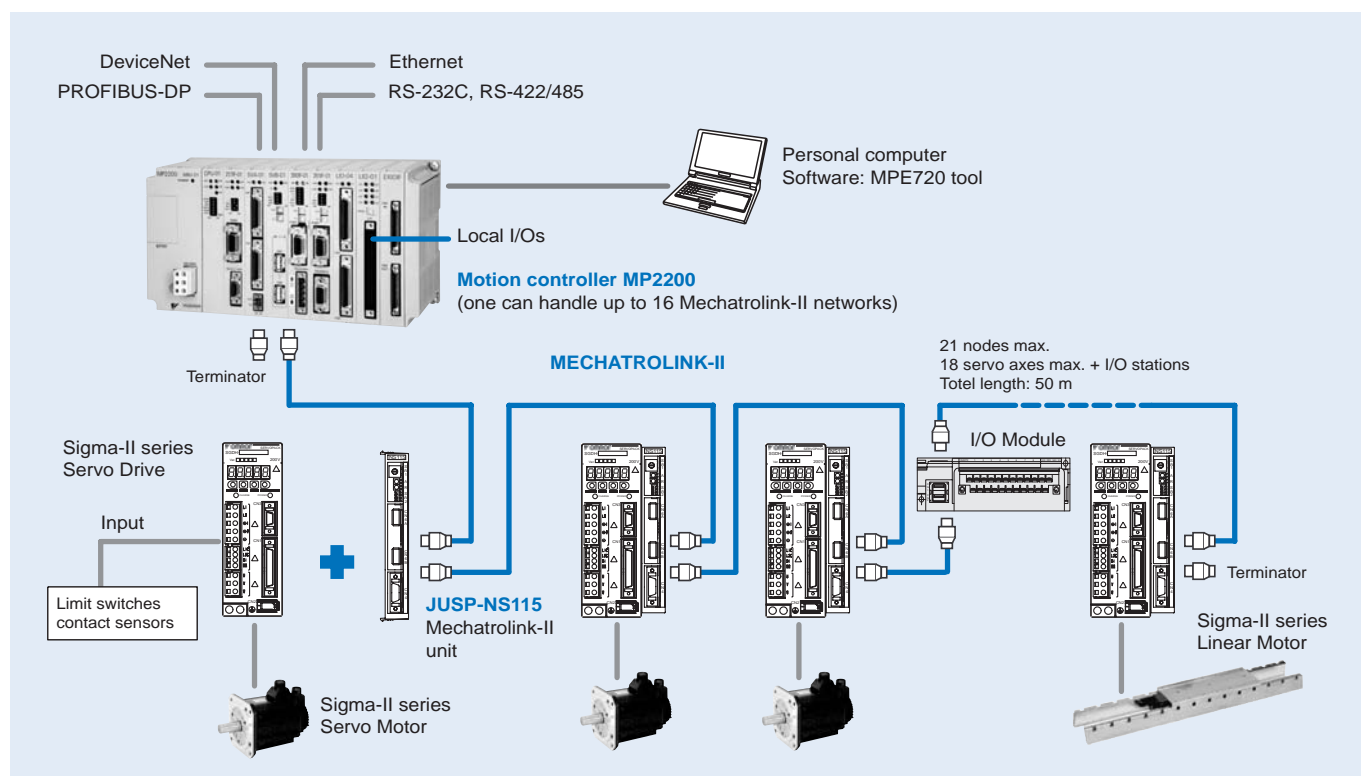
Motion controller

Stand-alone solution for advanced motion control

- Up to 256 axes controlled with minimum wiring
- Self configuration of nodes for an easy setup
- DeviceNet, PROFIBUS and ethernet network interfaces provide easy connectivity to any system
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- The high-speed bus MECHATROLINK-II is specially designed for motion control
- Support for I/Os and pulse inputs locally and over the network
- Access to the complete system from one point.



System configuration



Specifications

General specifications

Hardware specifications

Items	Specifications
Environmental conditions	Ambient operating temperature 0 to 55 °C
	Ambient storage temperature -25 to 85 °C
	Ambient operating humidity 30% to 95% (with no condensation)
	Ambient storage humidity 5% to 95% (with no condensation)
	Pollution level Pollution level 1 (conforming to JIS B 3501)
	Corrosive gas There must be no combustible or corrosive gas.
	Operating altitude 2,000 m above sea level or lower
Mechanical operating 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 1 G 10 sweeps each in X, Y, and Z directions (sweep time: 1 octave/min)
	Shock resistance Conforming to JIS B 3502: Peak acceleration of 147 m/s ² (15 G) twice for 11 ms each in the X, Y, and Z directions
Electrical operating conditions	Noise resistance Conforming to EN 61000-6-2, EN 55011 (Group 1, Class A)
Installation requirements	Ground Ground to 100 Ω max.
	Cooling method Natural cooling


Sequential function specifications

Items	Specifications
Control method	Sequence: High-speed and low-speed scan methods
Programming language	Ladder diagram: Relay circuit
	Text-type language: Numeric operations, logic operations, etc.
Scanning	Two scan levels: High-speed scan and low-speed scan High-speed scan time setting: 0.5 to 32 ms (integral multiple of MECHATROLINK communication cycle) Low-speed scan time setting: 2 to 300 ms (integral multiple of MECHATROLINK communication cycle)
User drawings, functions and motion programs	Startup drawings (DWG.A): 64 drawings max. up to three hierarchical drawing levels Interrupt processing drawings (DWG.I): 64 drawings max. up to three hierarchical drawing levels High-speed scan process drawings (DWG.H): 200 drawings max. up to three hierarchical drawing levels Low-speed scan process drawings (DWG.L): 500 drawings max. up to three hierarchical drawing levels Number of steps: Up to 1,000 steps per drawing User functions: Up to 500 functions Motion programs: Up to 256 Revision history of drawings and motion programs Security function for drawings and motion programs
Data memory	Common data (M) registers: 64 Kwords System (S) registers: 8 Kwords Drawing local (D) registers: Up to 16 Kwords per drawing Drawing constant (#) registers: Up to 16 Kwords per drawing Input (I) registers: 5 Kwords (including internal input registers) Output (O) registers: 5 Kwords (including internal output registers) Constant (C) registers: 16 Kwords
Trace memory	Data trace: 128 Kwords (32 Kwords, 4 groups), 16 points defined
Memory backup	Program memory: Flash memory: 8 MBytes (User area: 5.5 MBytes) definition files, ladder programs, motion programs, etc. Data memory: Battery backup: 256 Kbytes, M registers, S registers, alarm history, trace data
Data types	Bit (relay): ON/OFF Integer: -32768 to +32767 Double-length integer: -2147483648 to +2147483647 Real number: ± (1.175E-38 to 3.402E+38)
Register designation method	Register number: Direct designation of register number Symbolic designation: Up to 8 alphanumeric characters (up to 200 symbols per drawing) With automatic number or symbol assignment

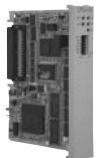
Motion control function specifications

Item		Specifications		
Interface		MECHATROLINK-I, MECHATROLINK-II		
Number of controlled axes/module		Up to 16 axes		
Control specifications	PTP control		Linear, rotary, and infinite-length	
	Interpolation		Up to 16 linear axes, 2 circular axes, and 3 helical axes	
	Speed reference output		Yes	
	Torque reference output		Yes	
	Phase control		Yes	
	Position control	Positioning		Yes
		External positioning		Yes
		Zero point return		Yes
		Interpolation		Yes
		Interpolation with position detection function		Yes
		JOG operation		Yes
STEP operation		Yes		
Parameter changes during motion command execution		Yes		
Reference unit		mm, inch, deg, or pulse		
Reference unit minimum setting		1, 0.1, 0.01, 0.001, 0.0001, 0.00001		
Maximum programmable value		-2147483648 to +2147483647 (signed 32-bit value)		
Speed reference unit		Reference unit/s designation: mm/s, inch/s, deg/s, pulse/s Reference unit/min. designation: mm/min, inch/ min, deg/min, pulse/min Percentage designation: Percentage of rated speed		
Acceleration/deceleration type		Linear, asymmetric, S-curve, exponent		
Acceleration/deceleration reference unit		Reference unit/s ² designation: mm/s ² , inch/s ² , deg/s ² , pulse/s ² Acceleration/deceleration time constant: Time from 0 to rated speed (ms)		
Override function		Positioning: 0.01% to 327.67% by axis		
Coordinate system		Rectangular coordinates		
Zero point re- turn	DEC1+ phase-C pulse		Yes	
	ZERO signal		Yes	
	DEC1+ ZERO signal		Yes	
	Phase-C pulse		Yes	
	Only phase-C pulse		Yes	
	POT and phase-C pulse		Yes	
	POT		Yes	
	Home limit switch and phase-C pulse		Yes	
	HOME		Yes	
	NOT and phase-C pulse		Yes	
	NOT		Yes	
INPUT and phase-C pulse		Yes		
INPUT		Yes		
Applicable servo drives		SGDH-□□□E-OY + NS115		
Applicable frequency inverters		Varispeed V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)		
Encoders		Incremental encoder Yaskawa absolute encoder		

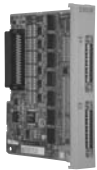
MP2200 base units

Items	Specifications		
Model	JEPMC-BU2200 (MBU-01)	JEPMC-BU2210 (MBU-02)	
Power supply	Input power voltage: 85 VAC to 276 VAC Current consumption: 1.5 A or less with I/O rating Inrush current: 10 A or less when completely discharged, 200 VAC input, output rating	Input power voltage: 24 VDC±20% Current consumption: 3.0 A or less with I/O rating Inrush current: 10 A or less when completely discharged, output rating	
Motion network	Not available for the base unit		
I/O signals	Not available for the base unit		
Slot for optional modules	9 slots		
Expansion configuration	Maximum of 4 base units can be connected using the EXIOIF.		
Dimensions (mm)	130x240x108 (HxWxD)		
Weight	665 g	640 g	


CPU module (CPU-01)

Items	Specifications	Appearance
Model	JAPMC-CP2200	
Max. number of controlled axes	256 axes	
High-speed scan	0.5 ms to 32 ms (in units of 0.5 ms)	
Low-speed scan	2.0 ms to 300.0 ms (in units of 0.5 ms)	
User memory capacity	8 MB	
Weight	80 g	


Connection module between racks (EXIOIF)

Items	Specifications	Appearance
Model	JAPMC-EX2200	
Number of expansion racks	4 racks max.	
Rack No.	Automatically identified	
Weight	70 g	


General-purpose serial communication module (217IF-01)

Items	Specifications	Appearance
Model	JAPMC-CM2310	
Port	For RS-232C communication	
Interface	One port	
Connector	D-sub 9 pins (female)	
Max. transmission distance	15 m	
Transmission speed	76.8 kbps	
Access mode	Asynchronous (start-stop synchronization)	
Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Media access control method	1:1	
Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	
	For RS-422/485 communication	
	One port (RS-422 or -485)	
	MDR 14 pins (female)	
	300 m	
	76.8 kbps	
	Asynchronous (start-stop synchronization)	
	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
	1:1 (RS-422), 1:N (RS-485)	
	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	


Ethernet communication module (218IF-01)

Items	Specifications	Appearance
Model	JAPMC-CM2300	
Port	For ethernet communication	
Interface	One port (10BaseT) (RJ-45 modular jack)	
Max. segment length	100m	
Transmission speed	10 Mbps	
Access mode	IEEE802.3	
Flame format	Ethernet ver.2 (conforming to DIX)	
Connections	TCP/UDP/IP/ARP	
Max. number of words in transmission	512 words (1024 bytes)	
Communication protocols	Extended MEMOBUS, MEMOBUS, MELSEC-A, non-protocol, or MODBUS/TCP	
Max. number of connections	20 stations	
	For RS-232C communication	
	One port	
	D-sub 9 pins (female)	
	15 m	
	76.8 kbps	
	Asynchronous (Start-stop synchronization)	
	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
	1:1	
	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: Even, odd, or none	


DeviceNet communication module (260IF-01)

Items	Specifications	Appearance
Model	JAPMC-CM2320	
Port	For DeviceNet communication	
Number of circuits	1	
Applicable communication	Conforms to DeviceNet master or slave - I/O transmission (polled I/O and bistrobbed I/O) - Explicit messaging	
I/O communication	Max. number of slaves Max. I/O bytes	
	63 Nodes 1024 bytes, 256 bytes per node	
Message Communication (only for master)	Max. number of nodes Max. message length Executed functions	
	63 Nodes (Synchronous communications possible: 8 nodes) 256 bytes MSG-SND function	
Switches on the front	Two rotary switches: Node address settings DIP switch: Settings for transmission speed and switching master or slave	
Indicators	2 LEDs: MS or NS	
Power voltage for communication	24 VDC±10% (Using the specially designed cable)	
Max. current consumption	Communication power: 45 mA (supplied by transmission connectors)	
	For RS-232C communication	
	One Port	
	D-sub 9 pins (female)	
	15m	
	76.8kbps	
	Asynchronous (start-stop synchronization)	
	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
	1:1	
	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: Even, odd, or none	

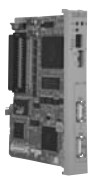
PROFIBUS communication module (261IF-01)

Items	Specifications			Appearance
Model	JAPMC-CM2330			
Port	For PROFIBUS communication	Port	For RS-232C communication	
Functions	DP slave	Interface	One port	
	Cyclic communication (DP standard function)	Connector	D-sub 9 pins (female)	
Transmission speed	12M/6M/4M/3M/1.5M/750k/500k/187.5k/93.75k/19.2k/9.6kbps (automatic detection)	Max. transmission distance	15 m	
Configuration	By PROFIBUS master	Transmission speed	76.8 kbps	
Slave address	1 to 64	Access mode	Asynchronous (start-stop synchronization)	
I/O processing	Total capacity of IW/OW registers: 64 words Max. I/O allocation (IN and OUT each): 64 words	Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
	Diagnostic functions Display for status and slave status using the EWS. I/O error display for SW registers	Media access control method	1:1	
		Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: Even, odd, or none	



Analogue reference motion control module (SVA-01)

Items	Specifications	Appearance
Model	JAPMC-MC2300	
Number of axes	2 axes (CN1 & CN2) analogue output and encoder input.	
Digital inputs (per axis)	6 inputs, PNP or NPN (including alarm, ready, zero and latch)	
Digital outputs (per axis)	6 outputs, (including servo_on, alarm_reset, control_mode_select and SEN)	
Encoder input (per axis)	Differential line-driver (A./A./B./B./Z./Z.). 4 Mpps (before multiplication).	
Analog outputs (per axis)	2 outputs ± 10 V 16 bits (typically speed and torque references)	
Analog inputs (per axis)	2 inputs ± 10 V 16 bits	
External supply	24 VDC (in CN3)	
LED's	RUN (green) ERR (red)	


MECHATROLINK-II motion control module (SVB-01)

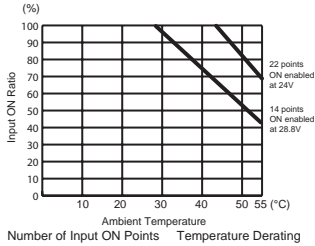
Items	Specifications	Appearance
Model	JAPMC-MC2310	
Communication circuits	1 circuit	
Communication ports	2 ports	
Terminator	External resistor (JEPMC-W6022 required)	
Transmission speed	10 Mbps	
Communication cycle	0.5 ms, 1 ms, 1.5 ms, 2 ms	
Number of connecting stations	21 stations (16 axes for servo drives and inverters) /2ms, 15 stations (15 axes for servo drives) /1.5 ms, 9 stations (9 axes for servo drives) /1 ms, 4 stations (4 axes for servo drives) /0.5 ms	
Retry function	Available with MECHATROLINK-II	
Slave function	Available with MECHATROLINK-II	
Transmission distance	See "MECHATROLINK-II repeater"	

I/O modules (LIO-01/-02)


Items	Specifications	Appearance
Models	JAPMC-IO2300 (NPN output), JAPMC-IO2301 (PNP output)	 
Digital I/O		
Input signals	16 points (all connected) and 24 VDC $\pm 20\%$, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15 V/1.6 mA Max. OFF voltage/current: 5 V/1.0 mA Max. response time: OFF \rightarrow ON 1 ms and ON \rightarrow OFF 1 ms Interruption (DI-00): DI-00 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00 is set to ON. Pulse latch (DI-01): DI-01 can be used for pulse latching. If pulse latching is enabled, the pulse counter is latched when DI-01 is set to ON.	
Output signals	16 points (all connected) and 24 VDC $\pm 20\%$, 100 mA max. Open collector: Sink mode output (LIO-01 module) Source mode output (LIO-02 module) Photocoupler isolation and max. OFF current: 0.1 mA Max. response time: OFF \rightarrow ON 1 ms and ON \rightarrow OFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short circuit occurred) If circuit protection is required, provide a fuse for each output circuit.	
Pulse input		
Number of channels	1 (phase A, B, or Z input)	
Input circuit	Phase A/B: 5 V differential inputs, no insulation, and max. frequency 4 MHz Phase Z: 5 V/12 V photocoupler inputs and max. frequency 500 kHz	
Input method	A/B (1, 2, or 4 multipliers), sign (1 or 2 multipliers), UP/DOWN (1 or 2 multipliers)	
Latch input	Pulse latch with phase Z or DI-01 Min. response time: 5 μ s when input with phase Z; 60 μ s when input with DI-01	
Others	Coincident detection; preset and clear functions for counter values	

I/O modules (LIO-04)


Items	Specifications	Appearance
Model	JAPMC-IO2303	
Input signals	<p>32 points (8 points common) and 24 VDC\pm20%, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15 V/1.6 mA Max. OFF voltage/current: 5 V/1.0 mA Max. response time: OFF\rightarrowON 0.5 ms and ON\rightarrowOFF 0.5 ms Interruption (DI-00, DI-01, DI-16, DI-17): DI-00, DI-01, DI-16, and DI-17 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00, DI-01, DI-16, or DI-17 is set to ON. Note: See right for the derating conditions</p>	
Output signals	<p>32 points (8 points common) and 24 VDC\pm20%, 100 mA max. Open collector: Sink mode output (NPN) and photocoupler isolation Max. OFF current: 0.1 mA Max. response time: OFF\rightarrowON 0.5 ms and ON\rightarrowOFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short-circuit occurred) If circuit protection is required, provide a fuse for each output circuit.</p>	




MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	<p>Input: 64 points, 24 VDC, 5mA, sink/source mode input Output: 64 points, 24 VDC, 50mA when all points ON, (The Max. rating is 100 mA per point) sink mode output (NPN) Signal connection method: Connector (FCN360 series)</p>	
Module power supply	<p>24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A</p>	
Weight	590 g	


MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2	
Functions	Pulse counter, notch output, registration input	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (4 multipliers)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	24 VDC, 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5 VDC, 10 mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II, analog input module (AN2900)

Items	Specifications	Appearance
Model	JEPMC-AN2900	
Number of input channels	4	
Input voltage range	-10 V to +10 V	
Input impedance	1 M Ω min.	
Data format	Binary, -32000 to +32000	
Input delay time	4ms max.	
Error	\pm 0.5% F.S. (at 25 °C), \pm 1.0% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, analog output module (AN2910)


Items	Specifications	Appearance
Model	JEPMC-AN2910	
Number of output channels	2	
Output voltage range	-10 V to +10 V	
Max. allowable load current	± 5 mA (2 kΩ)	
Data format	Binary, -32000 to +32000	
Output delay time	1 ms	
Error	± 0.2% F.S. (at 25 °C), ± 0.5% F.S. (at 0 °C to 60 °C)	
External power supply	24VDC (20.4 VDC to 26.4 VDC), 120mA max.	
Weight	300 g	

MECHATROLINK-II repeater

Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 21 stations for the MP2300 series))	
Restrictions	Between controller and repeater - Total cable length ≤ 30m: 15 stations max. including I/O and servo, etc. - 30m < total cable length ≤ 50m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30m: 16 stations max. including I/O and servo, etc. - 30m < total cable length ≤ 50m: 15 stations max. including I/O and servo, etc.	
Power supply	24VDC, 100mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II servo drive interface unit

Item		Details
Type		JUSP-NS115
Applicable servo drive		SGDH-□□□□E models (version 38 or later)
Installation method		Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	2 W
MECHATROLINK-II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA Standard RS-422A)
	Fully closed encoder pulse signal	A quad B line-driver
	Maximum receivable frequency for servo drive	1 Mpps
	Power supply for fully closed encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
Internal functions	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection
	LED indicators	A: Alarm, R: MECHATROLINK-I/II communicating

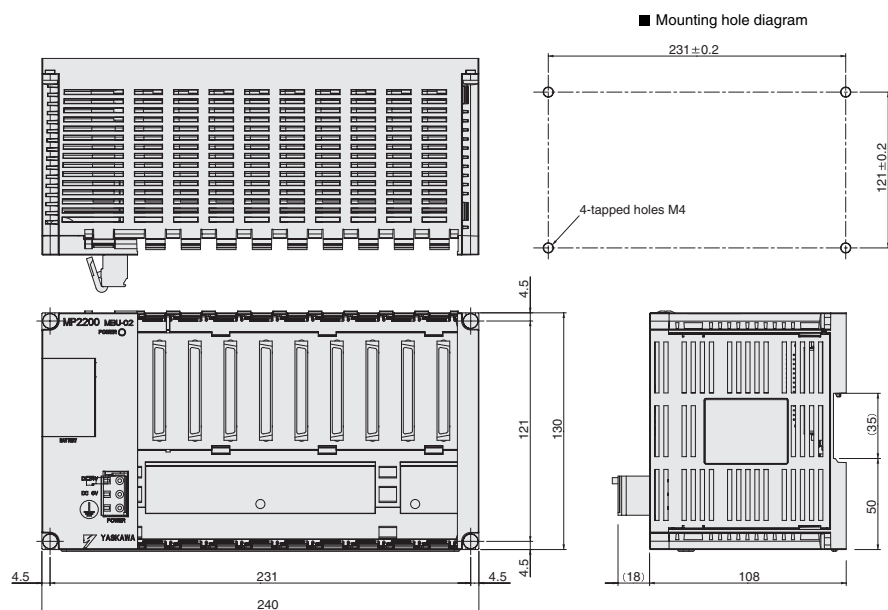


MECHATROLINK-II, frequency inverter interface units

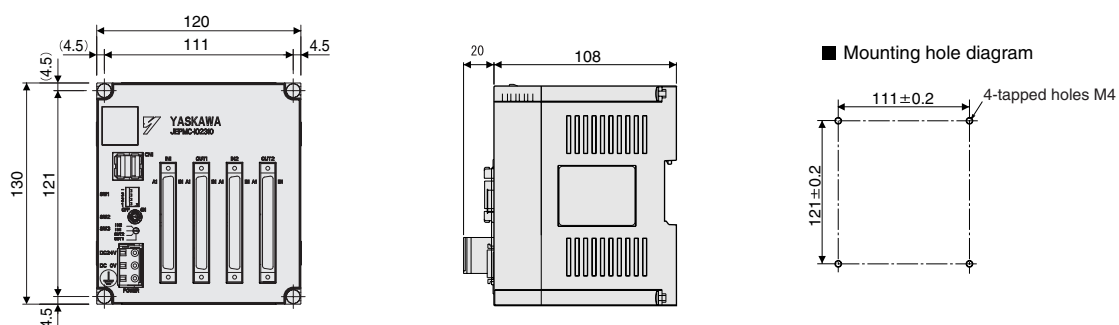
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte) Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Dimensions

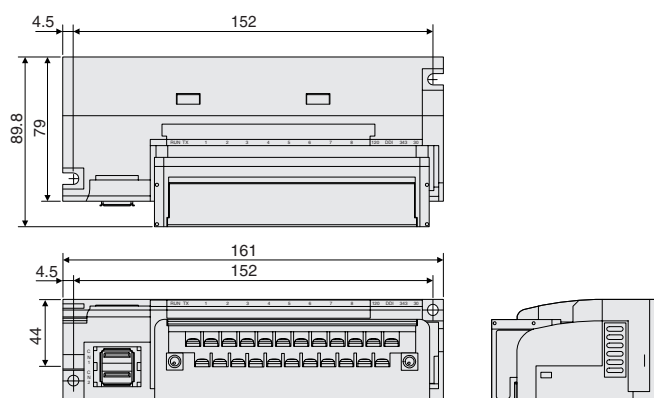
MP2200 basic unit



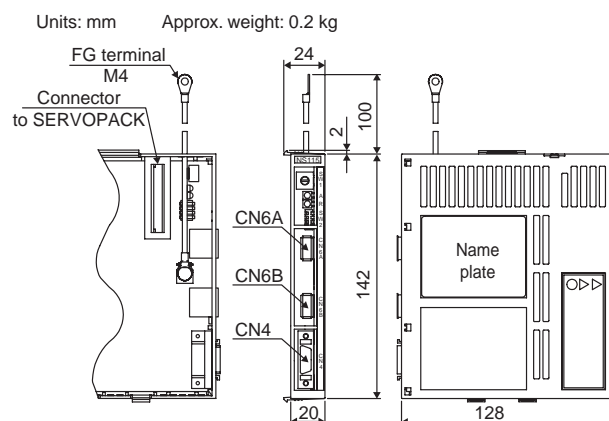
IO2310 I/O module



I/O modules PL2900, PL2910, AN2900, AN2910



MECHATROLINK-II servo drive interface unit



Ordering information

MP2200 - motion controller base unit

Name	Model name	Model
MP2200 base unit, 100 VAC/200 VAC input base unit	MBU-01	JEPMC-BU2200
MP2200 base unit, 24 VDC input base unit	MBU-02	JEPMC-BU2210

MP2200 - CPU module

Name	Model name	Model
CPU for MP2200	CPU-01	JAPMC-CP2200

MP2200 - motion control modules

Name	Model name	Model
Analogue reference motion control module (2 axes)	SVA-01	JAPMC-MC2300
1 channel for MECHATROLINK-II communication	SVB-01	JAPMC-MC2310

MP2200 - communication modules

Name	Model name	Model
General-purpose serial communication module (RS-232C / RS422 communication)	217IF-01	JAPMC-CM2310
Ethernet communication module (RS-232C / ethernet communication)	218IF-01	JAPMC-CM2300
DeviceNet communication module (RS-232C / DeviceNet communication)	260IF-01	JAPMC-CM2320
PROFIBUS communication module (RS-232C / PROFIBUS communication)	261IF-01	JAPMC-CM2330

MP2200 - I/O and expansion modules

Name	Model name	Model
16-point input, 16-point output (sink mode output / NPN), and 1-point pulse input	LIO-01	JAPMC-IO2300
16-point input, 16-point output (source mode output / PNP), and 1-point pulse input	LIO-02	JAPMC-IO2301
32-point input and 32-point output	LIO-04	JAPMC-IO2303
Expansion interface for MP2200	EXIOIF	JAPMC-EX2200

MECHATROLINK-II - elated devices

Name	Remarks	Model
Distributed I/O modules	64-point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
	Analog input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analog output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives (firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter's version supported contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	MECHATROLINK-II repeater	JEPMC-REP2000

I/O cables

	Remarks	Length m	Model
I/O cable for LIO-01, 02	With connector on the LIO-01, -02 side	0.5	JEPMC-W2061-A5
		1.0	JEPMC-W2061-01
		3.0	JEPMC-W2061-03
I/O cable for LIO-04	With connector on the LIO-04 side	0.5	JEPMC-W6060-05
		1.0	JEPMC-W6060-10
		3.0	JEPMC-W6060-30
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30
EXIOIF cable	With connector on both sides	0.5	JEPMC-W2091-A5
		1.0	JEPMC-W2091-01
		3.0	JEPMC-W2091-2A5

Accessories

Name	Model
Battery ER3V 3.6V	JZSP-BA01
Empty slot cover	JEPMC-OP2300
Brackets for DIN rail	JEPMC-OP300

Computer software

Specifications	Model
Programming software support from system design to maintenance. Intuitive ladder programming and editing functions. CAM data generation. Windows-based (Windows 95/98/NT4.0/2000/XP)	CPMC-MPE720

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

MP2300 - MECHATROLINK-II

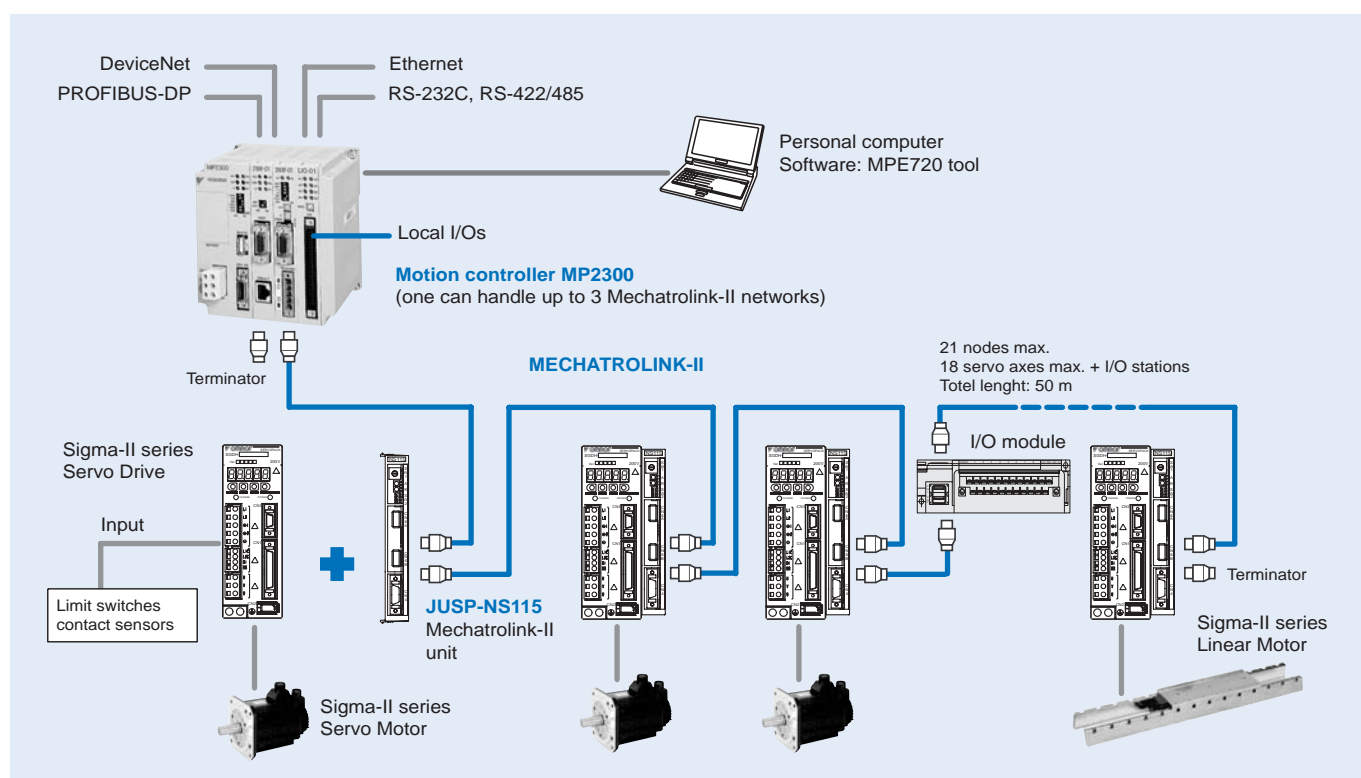
Motion controller

Stand-alone solution for advanced motion control

- Up to 48 axes controlled with minimum wiring
- Self configuration of nodes for an easy setup
- DeviceNet, PROFIBUS and ethernet network interfaces provide easy connectivity to any system
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- The high-speed bus MECHATROLINK-II is specially designed for motion control
- Support for I/Os and pulse inputs locally and over the network
- Access to the complete system from one point.



System configuration



Specifications

General specifications

Hardware specifications

Items	Specifications
Environmental conditions	Ambient operating temperature 0 to 55 °C
	Ambient storage temperature -25 to 85 °C
	Ambient operating humidity 30% to 95% (with no condensation)
	Ambient storage humidity 5% to 95% (with no condensation)
	Pollution level Pollution level 1 (conforming to JIS B 3501)
	Corrosive gas There must be no combustible or corrosive gas.
	Operating altitude 2,000 m above sea level or lower
Mechanical operating conditions	Vibration resistance Conforming to JIS B 3502: 10 to 57 Hz with single-amplitude of 0.075 mm 57 to 150 Hz with acceleration of 1G 10 sweeps each in X, Y, and Z directions (sweep time: 1 octave/min)
	Shock resistance Conforming to JIS B 3502: Peak acceleration of 147 m/s ² (15 G) twice for 11 ms each in the X, Y, and Z directions
Electrical operating conditions	Noise resistance Conforming to EN 61000-6-2, EN 55011 (Group 1, Class A)
Installation requirements	Ground Ground to 100 Ω max.
	Cooling method Natural cooling


Sequential function specifications

Items	Specifications
Control method	Sequence: High-speed and low-speed scan methods
Programming language	Ladder diagram: Relay circuit
	Text-type language: Numeric operations, logic operations, etc.
Scanning	Two scan levels: High-speed scan and low-speed scan
	High-speed scan time setting: 1 to 32 ms (Integral multiple of MECHATROLINK communication cycle)
	Low-speed scan time setting: 2 to 300 ms (Integral multiple of MECHATROLINK communication cycle)
User drawings, functions and motion programs	Startup drawings (DWG.A): 64 drawings max. up to three hierarchical drawing levels
	Interrupt processing drawings (DWG.I): 64 drawings max. up to three hierarchical drawing levels
	High-speed scan process drawings (DWG.H): 200 drawings max. up to three hierarchical drawing levels
	Low-speed scan process drawings (DWG.L): 500 drawings max. up to three hierarchical drawing levels
	Number of steps: Up to 1,000 steps per drawing
	User functions: Up to 500 functions
	Motion programs: Up to 256
Data memory	Revision history of drawings and motion programs
	Security function for drawings and motion programs
	Common data (M) registers: 64 Kwords
	System (S) registers: 8 Kwords
	Drawing local (D) registers: Up to 16 Kwords per drawing
	Drawing constant (#) registers: Up to 16 Kwords per drawing
	Input (I) registers: 5 Kwords (including internal input registers)
Trace memory	Output (O) registers: 5 Kwords (including internal output registers)
	Constant (C) registers: 16 Kwords
Memory backup	Data trace: 128 Kwords (32 Kwords, 4 groups), 16 points defined
Data types	Program memory: Flash memory: 8 MBytes (user area: 5.5 MBytes) definition files, ladder programs, motion programs, etc.
	Data memory: Battery backup: 256 Kbytes, M registers, S registers, alarm history, trace data
Register designation method	Bit (relay): ON/OFF
	Integer: -32768 to +32767
	Double-length integer: -2147483648 to +2147483647
	Real number: ± (1.175E-38 to 3.402E+38)
Register designation method	Register number: Direct designation of register number
	Symbolic designation: Up to 8 alphanumeric characters (up to 200 symbols per drawing) With automatic number or symbol assignment

Motion control function specifications

Item		Specifications		
Interface		MECHATROLINK-I, MECHATROLINK-II		
Number of controlled axes/module		Up to 16 axes		
Control specifications	PTP control		Linear, rotary, and infinite-length	
	Interpolation		Up to 16 linear axes, 2 circular axes, and 3 helical axes	
	Speed reference output		Yes	
	Torque reference output		Yes	
	Phase control		Yes	
	Position control	Positioning		Yes
		External positioning		Yes
		Zero point return		Yes
		Interpolation		Yes
		Interpolation with position detection function		Yes
		JOG operation		Yes
STEP operation		Yes		
Parameter changes during motion command execution		Yes		
Reference unit		mm, inch, deg, or pulse		
Reference unit minimum setting		1, 0.1, 0.01, 0.001, 0.0001, 0.00001		
Maximum programmable value		-2147483648 to +2147483647 (signed 32-bit value)		
Speed reference unit		Reference unit/s designation: mm/s, inch/s, deg/s, pulse/s Reference unit/min. designation: mm/min, inch/ min, deg/min, pulse/min Percentage designation: Percentage of rated speed		
Acceleration/deceleration type		Linear, asymmetric, S-curve, exponent		
Acceleration/deceleration reference unit		Reference unit/s ² designation: mm/s ² , inch/s ² , deg/s ² , pulse/s ² Acceleration/deceleration time constant: Time from 0 to rated speed (ms)		
Override function		Positioning: 0.01% to 327.67% by axis		
Coordinate system		Rectangular coordinates		
Zero point re- turn	DEC1+ phase-C pulse		Yes	
	ZERO signal		Yes	
	DEC1+ ZERO signal		Yes	
	Phase-C pulse		Yes	
	Only phase-C pulse		Yes	
	POT and phase-C pulse		Yes	
	POT		Yes	
	Home limit switch and phase-C pulse		Yes	
	HOME		Yes	
	NOT and phase-C pulse		Yes	
	NOT		Yes	
INPUT and phase-C pulse		Yes		
INPUT		Yes		
Applicable servo drives		SGDH-□□□E-OY + NS115		
Applicable frequency inverters		Varispeed V7, F7, G7 with MECHATROLINK-II interface (for inverter version support contact your OMRON sales office)		
Encoders		Incremental encoder Yaskawa absolute encoder		

MP2300 CPU (basic module)

Items	Specifications	Appearance
Model	JEPMC-MP2300	
Power supply	Input power voltage: 24 VDC±20% Current consumption: 1 A Inrush current: 40 A or less	
Motion network	One channel for MECHATROLINK-II: Twenty-one stations, including servo drives and I/O equipment, can be connected. (16 axes for servo drives and inverters) Transmission speed: 10Mbps (MECHATROLINK-II) Transmission distance: See "MECHATROLINK-II repeater"	
I/O signals	Digital input: 8 points (one point can be used for interrupts), 24 VDC, 4 mA, and source mode or sink mode input Digital output: 4 points, 24 VDC, 100 mA, open collector, and sink mode output (NPN)	
Slot for optional modules	3 slots	
Dimensions (mm)	130x120x108 (HxWxD)	
Weight	500 g	

General-purpose serial communication module (217IF-01)

Items	Specifications		Appearance
Model	JAPMC-CM2310		
Port	For RS-232C communication	For RS-422/485 communication	
Interface	One port	One port (RS-422 or -485)	
Connector	D-sub 9 pins (female)	MDR 14 pins (female)	
Max. transmission distance	15 m	300 m	
Transmission speed	76.8 kbps	76.8 kbps	
Access mode	Asynchronous (start-stop synchronization)	Asynchronous (start-stop synchronization)	
Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
Media access control method	1:1	1:1 (RS-422), 1:N (RS-485)	
Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	


Ethernet communication module (218IF-01)

Items	Specifications		Appearance
Model	JAPMC-CM2300		
Port	For ethernet communication	Port	
Interface	One port (10BaseT) (RJ-45 modular jack)	Interface	
Max. segment length	100 m	Connector	
Transmission speed	10 Mbps	Max. transmission distance	
Access mode	IEEE802.3	Transmission speed	
Flame format	Ethernet ver.2 (conforming to DIX)	Access mode	
Connections	TCP/UDP/IP/ARP	Communication protocols	
Max. number of words in transmission	512 words (1024 bytes)	Media access control method	
Communication protocols	Extended MEMOBUS, MEMOBUS, MELSEC-A, non-protocol, or MODBUS/TCP	Transmission format (can be set)	
Max. number of connections	20 stations		


DeviceNet communication module (260IF-01)

Items	Specifications		Appearance
Model	JAPMC-CM2320		
Port	For DeviceNet communication	Port	
Number of circuits	1	Interface	
Applicable communication	Conforms to DeviceNet master or slave - I/O transmission (polled I/O and bisstrobed I/O) - Explicit messaging	Connector	
I/O communication	Max. number of slaves Max. I/O bytes	Max. transmission distance	
Message communication (only for master)	Max. number of nodes Max. message length Executed functions	Transmission speed	
Switches on the front	Two rotary switches: Node address settings DIP switch: Settings for transmission speed and switching master or slave	Access mode	
Indicators	2 LEDs: MS or NS	Communication protocols	
Power voltage for communication	24 VDC±10% (using the specially designed cable)	Media access control method	
Max. current consumption	Communication power: 45 mA (supplied by transmission connectors)	Transmission format (can be set)	


PROFIBUS communication module (261IF-01)

Items	Specifications			Appearance
Model	JAPMC-CM2330			
Port	For PROFIBUS communication	Port	For RS-232C communication	
Functions	DP slave	Interface	One port	
	Cyclic communication (DP standard function)	Connector	D-sub 9 pins (female)	
Transmission speed	12M/6M/4M/3M/1.5M/750k/500k/187.5k/93.75k/19.2k/9.6kbps (automatic detection)	Max. transmission distance	15 m	
Configuration	By PROFIBUS master	Transmission speed	76.8 kbps	
Slave address	1 to 64	Access mode	Asynchronous (start-stop synchronization)	
I/O processing	Total capacity of IW/OW registers: 64 words Max. I/O allocation (IN and OUT each): 64 words	Communication protocols	MEMOBUS (master or slave) MELSEC, HostLink, or non-protocol	
	Diagnostic functions Display for status and slave status using the EWS. I/O error display for SW registers	Media access control method	1:1	
		Transmission format (can be set)	Data bit length: 7 or 8 bits Stop bits: 1 or 2 bits Parity bits: even, odd, or none	


Analogue reference motion control module (SVA-01)

Items	Specifications	Appearance
Model	JAPMC-MC2300	
Number of axes	2 axes (CN1 & CN2) analogue output and encoder input.	
Digital inputs (per axis)	6 inputs, PNP or NPN (including alarm, ready, zero and latch)	
Digital outputs (per axis)	6 outputs (including servo_on, alarm_reset, control_mode_select and SEN)	
Encoder input (per axis)	Differential line-driver (A./A.B./B./Z./Z.). 4 Mpps (before multiplication).	
Analog outputs (per axis)	2 outputs ± 10 V 16 bits (typically speed and torque references)	
Analog inputs (per axis)	2 inputs ± 10 V 16 bits	
External supply	24 VDC (in CN3)	
LED's	RUN (green) ERR (red)	


MECHATROLINK-II motion control module (SVB-01)

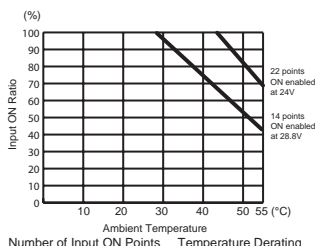
Items	Specifications	Appearance
Model	JAPMC-MC2310	
Communication circuits	1 circuit	
Communication ports	2 ports	
Terminator	External resistor (JEPMC-W6022 required)	
Transmission speed	10 Mbps	
Communication cycle	0.5ms, 1ms, 1.5ms, 2ms	
Number of connecting stations	21 stations (16 axes for servo drives and inverters) /2 ms, 15 stations (15 axes for servo drives) /1.5 ms, 9 stations (9 axes for servo drives) /1ms, 4 stations (4 axes for servo drives) /0.5 ms	
Retry function	Available with MECHATROLINK-II	
Slave function	Available with MECHATROLINK-II	
Transmission distance	See "MECHATROLINK-II repeater"	

I/O modules (LIO-01/02)


Items	Specifications	Appearance
Models	JAPMC-IO2300 (NPN output), JAPMC-IO2301 (PNP output)	
Digital I/O		
Input signals	16 points (all connected) and 24 VDC \pm 20%, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15V/1.6 mA Max. OFF voltage/current: 5V/1.0 mA Max. response time: OFF \rightarrow ON 1 ms and ON \rightarrow OFF 1 ms Interruption (DI-00): DI-00 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00 is set to ON. Pulse latch (DI-01): DI-01 can be used for pulse latching. If pulse latching is enabled, the pulse counter is latched when DI-01 is set to ON.	
Output signals	16 points (all connected) and 24 VDC \pm 20%, 100 mA max. Open collector: Sink mode output (LIO-01 module) Source mode output (LIO-02 module) Photocoupler isolation and max. OFF current: 0.1 mA Max. response time: OFF \rightarrow ON 1 ms and ON \rightarrow OFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short circuit occurred). If circuit protection is required, provide a fuse for each output circuit.	
Pulse input		
Number of channels	1 (Phase A, B, or Z input)	
Input circuit	Phase A/B: 5V differential inputs, no insulation, and max. frequency 4 MHz Phase Z: 5 V/12 V photocoupler inputs and max. frequency 500 kHz	
Input method	A/B (1, 2, or 4 multipliers), sign (1 or 2 multipliers), UP/DOWN (1 or 2 multipliers)	
Latch input	Pulse latch with phase Z or DI-01 Min. response time: 5 μ s when input with phase Z; 60 μ s when input with DI-01	
Others	Coincident detection; preset and clear functions for counter values.	

I/O modules (LIO-04)


Items	Specifications	Appearance
Model	JAPMC-IO2303	
Input signals	<p>32 points (8 points common) and 24 VDC\pm20%, 5 mA (TYP) Sink mode or source mode input and photocoupler isolation Min. ON voltage/current: 15 V/1.6 mA Max. OFF voltage/current: 5 V/1.0 mA Max. response time: OFF\rightarrowON 0.5 ms and ON\rightarrowOFF 0.5 ms Interruption (DI-00, DI-01, DI-16, DI-17): DI-00, DI-01, DI-16, and DI-17 can be used for interruptions. If an interruption is enabled, the interrupt drawing is started when DI-00, DI-01, DI-16, or DI-17 is set to ON. Note: See right for the derating conditions</p>	
Output signals	<p>32 points (8 points common) and 24 VDC\pm20%, 100 mA max. Open collector: Sink mode output (NPN) and photocoupler isolation Max. OFF current: 0.1 mA Max. response time: OFF\rightarrowON 0.5 ms and ON\rightarrowOFF 1 ms Output protection: Fuse (for protection against fires caused by an overcurrent when outputting after a short circuit occurred) If circuit protection is required, provide a fuse for each output circuit.</p>	




MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	<p>Input: 64 points, 24 VDC, 5 mA, sink/source mode input Output: 64 points, 24 VDC, 50 mA when all points ON, (the max. rating is 100 mA per point) sink mode output (NPN) Signal connection method: Connector (FCN360 series)</p>	
Module power supply	<p>24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A</p>	
Weight	590 g	


MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2	
Functions	Pulse counter, notch output, registration input	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (4 multipliers)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	For input signal: 24 VDC, For dividing load: 24 VDC, For module: 24 VDC (20.4 V to 26.4 V), 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	Appearance
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500kpps	
Pulse output voltage	5VDC	
Pulse interface circuit	Open collector output 5VDC, 10mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II, analog input module (AN2900)

Items	Specifications	Appearance
Model	JEPMC-AN2900	
Number of input channels	4	
Input voltage range	-10 V to +10 V	
Input impedance	1 M Ω min.	
Data format	Binary, -32000 to +32000	
Input delay time	4 ms max.	
Error	\pm 0.5% F.S. (at 25 °C), \pm 1.0% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, analog output module (AN2910)

Items	Specifications	Appearance
Model	JEPMC-AN2910	
Number of output channels	2	
Output voltage range	-10 V to +10 V	
Max. allowable load current	± 5 mA (2 kΩ)	
Data format	Binary, -32000 to +32000	
Output delay time	1 ms	
Error	± 0.2% F.S. (at 25 °C), ± 0.5% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, repeater

Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m., after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 21 stations for the MP2300 series))	
Restrictions	Between controller and repeater - Total cable length ≤ 30 m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30 m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 15 stations max. including I/O and servo, etc.	
Power supply	24 VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II, servo drive interface unit

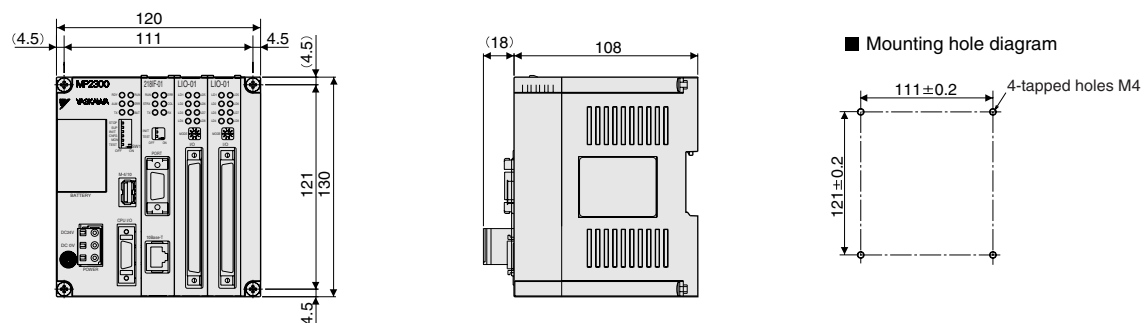
Item	Details	
Type	JUSP-NS115	
Applicable servo drive	SGDH-□□□E models (version 38 or later)	
Installation method	Mounted on the SGDH servo drive side: CN10.	
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	2 W
MECHATROLINK-II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA Standard RS-422A)
	Fully closed encoder pulse signal	A quad B line-driver
	Maximum receivable frequency for servo drive	1 Mpps
	Power supply for fully closed encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
	Internal functions	Position data latching is possible using phase C, and external signals 1, 2, 3
	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection
	LED indicators	A: alarm, R: MECHATROLINK-I/II communicating

MECHATROLINK-II, frequency inverter interface units

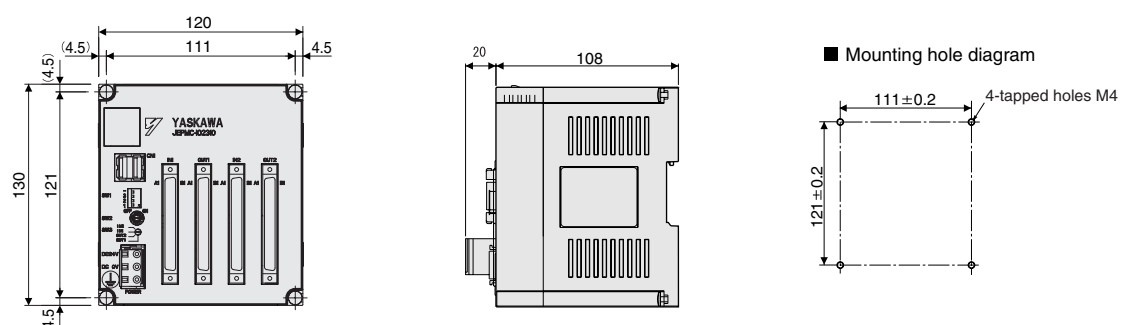
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte)	
	Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Dimensions

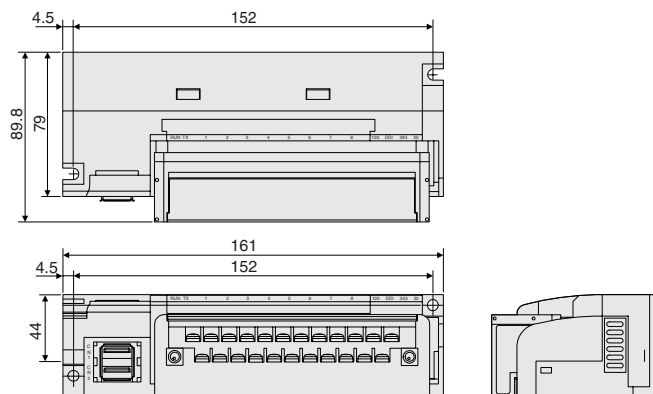
MP2300 basic module



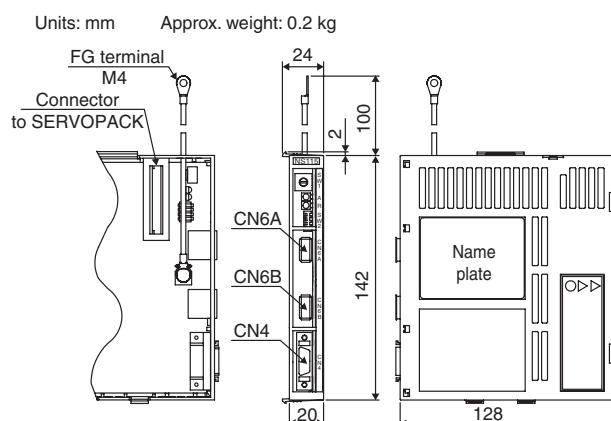
IO2310 I/O module



I/O modules PL2900, PL2910, AN2900, AN2910



MECHATROLINK-II servo drive interface unit



Ordering information

MP2300 - motion controller main unit

Name	Model name	Model
MP2300 basic module (CPU module included), 1 channel for MECHATROLINK-II, I/O	MP2300	JEPMC-MP2300

MP2300 - motion control modules

Name	Model name	Model
Analogue reference motion control module (2 axes)	SVA-01	JAPMC-MC2300
1 additional MECHATROLINK-II communication channel	SVB-01	JAPMC-MC2310

MP2300 - communication modules

Name	Model name	Model
General-purpose serial communication module (RS-232C / RS422 communication)	217IF-01	JAPMC-CM2310
Ethernet communication module (RS-232C / ethernet communication)	218IF-01	JAPMC-CM2300
DeviceNet communication module (RS-232C / DeviceNet communication)	260IF-01	JAPMC-CM2320
PROFIBUS communication module (RS-232C / PROFIBUS communication)	261IF-01	JAPMC-CM2330

MP2300 - I/O modules

Name	Model name	Model
16-point input, 16-point output (sink mode output / NPN), and 1-point pulse input	LIO-01	JAPMC-IO2300
16-point input, 16-point output (source mode output / PNP), and 1-point pulse input	LIO-02	JAPMC-IO2301
32-point input and 32-point output	LIO-04	JAPMC-IO2303

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64-point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
	Analog input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analog output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	MECHATROLINK-II repeater	JEPMC-REP2000

I/O cables

	Remarks	Length m	Model
I/O cable for LIO-01, 02	With connector on the LIO-01, -02 side	0.5	JEPMC-W2061-A5
		1.0	JEPMC-W2061-01
		3.0	JEPMC-W2061-03
I/O cable for LIO-04	With connector on the LIO-04 side	0.5	JEPMC-W6060-05
		1.0	JEPMC-W6060-10
		3.0	JEPMC-W6060-30
I/O cable for MP2300	With connector on the MP2300 side	0.5	JEPMC-W2060-A5
		1.0	JEPMC-W2060-01
		3.0	JEPMC-W2060-03
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Accessories

Name	Model
Battery ER3V 3.6V	JZSP-BA01
Empty slot cover	JEPMC-OP2300
Brackets for DIN rail	JEPMC-OP300

Computer software

Specifications	Model
Programming software to support from system design to maintenance. Intuitive ladder programming and editing functions. CAM data generation Windows-based (Windows 95/98/NT4.0/2000/XP)	CPMC-MPE720

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

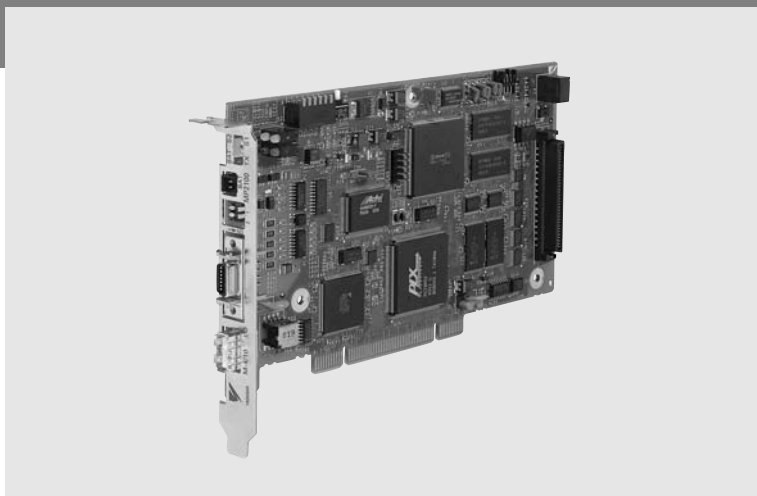
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

MP2100 - MECHATROLINK-II

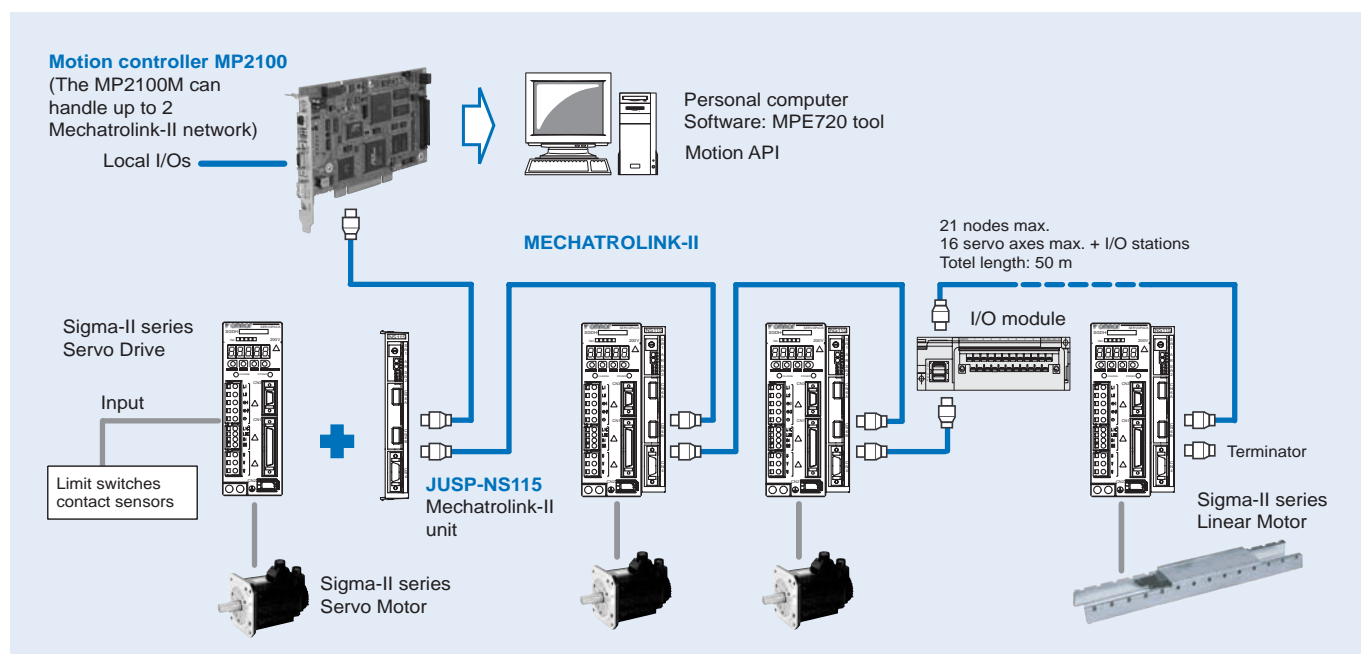
PC motion controller

PC based solution for advanced motion control

- Up to 32 axes controlled with minimum wiring
- Motion APIs are available for customised control applications. Motion commands can be input from either the PC application or the MP2100 program
- Self configuration of nodes for an easy setup
- Supports position, speed and torque control
- Electronic CAM profiles and axes synchronization
- The high-speed bus MECHATROLINK-II is specially designed for motion control
- Support for I/Os locally and over the network
- Access to the complete system from one point



System configuration



Specifications

General specifications

Hardware specifications

Items	Specifications
Environmental conditions	Ambient operating temperature
	Ambient storage temperature
	Ambient operating humidity
	Ambient storage humidity
	Pollution level
	Corrosive gas
	Operating altitude
Mechanical operating conditions	Vibration resistance
	Shock resistance
Electrical operating conditions	Noise resistance
Installation requirements	Ground
	Cooling method

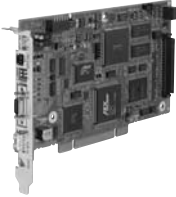
Sequential function specifications

Items	Specifications
Control method	Sequence: High-speed and low-speed scan methods
Programming language	Ladder diagram: Relay circuit
	Text-type language: Numeric operations, logic operations, etc.
Scanning	Two scan levels: High-speed scan and low-speed scan High-speed scan time setting: 1 to 32 ms (Integral multiple of MECHATROLINK communication cycle) Low-speed scan time setting: 2 to 300 ms (Integral multiple of MECHATROLINK communication cycle)
User drawings, functions and motion programs	Startup drawings (DWG.A): 64 drawings max. up to three hierarchical drawing levels Interrupt processing drawings (DWG.I): 64 drawings max. up to three hierarchical drawing levels High-speed scan process drawings (DWG.H): 200 drawings max. up to three hierarchical drawing levels Low-speed scan process drawings (DWG.L): 500 drawings max. up to three hierarchical drawing levels Number of steps: Up to 1,000 steps per drawing User functions: Up to 500 functions Motion programs: Up to 256 Revision history of drawings and motion programs Security function for drawings and motion programs
Data memory	Common data (M) registers: 64 Kwords System (S) registers: 8 Kwords Drawing local (D) registers: Up to 16 Kwords per drawing Drawing constant (#) registers: Up to 16 Kwords per drawing Input (I) registers: 5 Kwords (including internal input registers) Output (O) registers: 5 Kwords (including internal output registers) Constant (C) registers: 16 Kwords
Trace memory	Data trace: 128 Kwords (32 Kwords / 4 groups), 16 points defined
Memory backup	Program memory: Flash memory: 8 MBytes (User area: 5.5 MBytes) definition files, ladder programs, motion programs, etc. Data memory: Battery backup: 256 Kbytes, M registers, S registers, alarm history, trace data
Data types	Bit (relay): ON/OFF Integer: -32768 to +32767 Double-length integer: -2147483648 to +2147483647 Real number: $\pm (1.175\text{E}-38 \text{ to } 3.402\text{E}+38)$
Register designation method	Register number: Direct designation of register number Symbolic designation: Up to 8 alphanumeric characters (up to 200 symbols per drawing) With automatic number or symbol assignment

Motion control function specifications.

Item		Specifications		
Interface		MECHATROLINK-I, MECHATROLINK-II		
Number of controlled axes/module		Up to 16 axes		
Control specifications	PTP control		Linear, rotary, and infinite-length	
	Interpolation		Up to 16 linear axes, 2 circular axes, and 3 helical axes	
	Speed reference output		Yes	
	Torque reference output		Yes	
	Phase control		Yes	
	Position control	Positioning		Yes
		External positioning		Yes
		Zero point return		Yes
		Interpolation		Yes
		Interpolation with position detection function		Yes
		JOG operation		Yes
STEP operation		Yes		
Parameter changes during motion command execution		Yes		
Reference unit		mm, inch, deg, or pulse		
Reference unit minimum setting		1, 0.1, 0.01, 0.001, 0.0001, 0.00001		
Maximum programmable value		-2147483648 to +2147483647 (signed 32-bit value)		
Speed reference unit		Reference unit/s designation: mm/s, inch/s, deg/s, pulse/s Reference unit/min. designation: mm/min, inch/ min, deg/min, pulse/min Percentage designation: Percentage of rated speed		
Acceleration/deceleration type		Linear, asymmetric, S-curve, exponent		
Acceleration/deceleration reference unit		Reference unit/s ² designation: mm/s ² , inch/s ² , deg/s ² , pulse/s ² Acceleration/deceleration time constant: Time from 0 to rated speed (ms)		
Override function		Positioning: 0.01% to 327.67% by axis		
Coordinate system		Rectangular coordinates		
Zero point return	DEC1+ phase-C pulse		Yes	
	ZERO signal		Yes	
	DEC1+ ZERO signal		Yes	
	Phase-C pulse		Yes	
	Only phase-C pulse		Yes	
	POT and phase-C pulse		Yes	
	POT		Yes	
	Home limit switch and phase-C pulse		Yes	
	HOME		Yes	
	NOT and phase-C pulse		Yes	
	NOT		Yes	
INPUT and phase-C pulse		Yes		
INPUT		Yes		
Applicable servo drives		SGDH-□□□E-OY + NS115		
Applicable frequency inverters		Varispeed V7, F7, G7 with MECHATROLINK-II Interface (for inverter's version supported contact your OMRON sales office)		
Encoders		Incremental encoder Yaskawa absolute encoder		

MP2100, MP2100M boards


Items		Specifications	Appearance
Model		JAPMC-MC2100, JAPMC-MC2140	
Power supply		Input supply voltage: 5 VDC±5%	
Dimensions		106.68x174.63 mm half the size of a standard PCI	
Motion network		MECHATROLINK-II: One channel with MP2100, two channels with MP2100M Twenty-one stations, including servo drives, inverters and I/O equipment, can be connected. (16 axes for servo drives and inverters) Transmission speed: 10Mbps (MECHATROLINK-II) Transmission distance: See "MECHATROLINK-II repeater"	
I/O signals		Digital input: 5 points (one point can be used for interrupts), 24 VDC, 4 mA, and source mode or sink mode input Digital output: 4 points, 24 VDC, 100 mA, open collector, and sink mode output	
Electrical operating conditions	Noise resistance	Radiation noise (FT noise): 1 kV or more for 1 min. Static noise (contact discharging method): 6 kV or more for 10 times Other noise: Not specified	
Mechanical operating conditions	Vibration resistance	Not specified	
	Shock resistance	Not specified	
Installation requirements	Ground	Follows the personal computer's requirements	
Environmental conditions		Same as the general specifications	

Host computer specifications


Items	Specifications
Hardware	Model
	CPU
	Memory capacity
	Hard disk drive capacity
	Display resolution
	Expansion slot ¹
	Interrupts ¹
	I/O memory ¹
Software	OS
	Web browser
	Language

1. These specifications are applicable if using one MP2100s board. If using two or more boards in the same host personal computer, expansion slots, interrupts and I/O memory resources needs to be increased per each board.


MECHATROLINK-II, 64 point I/O module (IO2310)

Items	Specifications	Appearance
Model	JEPMC-IO2310	
I/O signals	Input: 64 points, 24 VDC, 5 mA, sink/source mode input Output: 64 points, 24 VDC, 50 mA when all points ON, (The max. rating is 100 mA per point) sink mode output (NPN) Signal connection method: Connector (FCN360 series)	
Module power supply	24 VDC (20.4 V to 28.8 V) Rated current: 0.5 A Inrush current: 1 A	
Weight	590 g	


MECHATROLINK-II, counter module (PL2900)

Items	Specifications	Appearance
Model	JEPMC-PL2900	
Number of input channels	2	
Functions	Pulse counter, notch output, registration input	
Pulse input method	Sign (1/2 multipliers), A/B (1/2/4 multipliers), UP/DOWN (1/2 multipliers)	
Max. counter speed	1200 kpps (4 multipliers)	
Pulse input voltage	3/5/12/24 VDC	
External power supply	For input signal: 24 VDC, for dividing load: 24 VDC, for module: 24 VDC (20.4 V to 26.4 V), 120 mA or less	
Weight	300 g	

MECHATROLINK-II, pulse output module (PL2910)

Items	Specifications	<div>Appearance</div> 
Model	JEPMC-PL2910	
Number of output channels	2	
Functions	Pulse positioning, JOG run, zero-point return	
Pulse output method	CW, CCW pulse, sign	
Max. output speed	500 kpps	
Pulse output voltage	5 VDC	
Pulse interface circuit	Open collector output 5 VDC, 10 mA/circuit	
External control signal	Digital input: 8 points/module, 5 VDC x 4 points, 24 VDC x 4 points Digital output: 6 points/module, 5 VDC x 4 points, 24 VDC x 2 points	
Weight	300 g	

MECHATROLINK-II, analog input module (AN2900)

Items	Specifications	Appearance
Model	JEPMC-AN2900	
Number of input channels	4	
Input voltage range	-10 V to +10 V	
Input impedance	1 MΩ min.	
Data format	Binary, -32000 to +32000	
Input delay time	4 ms max.	
Error	± 0.5% F.S. (at 25 °C), ± 1.0% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II, analog output module (AN2910)


Items	Specifications	Appearance
Model	JEPMC-AN2910	
Number of output channels	2	
Output voltage range	-10 V to +10 V	
Max. allowable load current	± 5 mA (2 kΩ)	
Data format	Binary, -32000 to +32000	
Output delay time	1 ms	
Error	± 0.2% F.S. (at 25 °C), ± 0.5% F.S. (at 0 °C to 60 °C)	
External power supply	24 VDC (20.4 VDC to 26.4 VDC), 120 mA max.	
Weight	300 g	

MECHATROLINK-II repeater

Items	Specifications	Appearance
Model	JEPMC-REP2000	
Communication type	MECHATROLINK-II	
Cable length	Between controller and repeater: 50 m, after repeater: 50 m	
Max. connected stations	Total stations on both sides of repeater: 30 (limited to the max. number of connectable stations of the controller (e.g., 21 stations for the MP2300 series))	
Restrictions	Between controller and repeater - Total cable length ≤ 30 m: 15 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 14 stations max. including I/O and servo, etc. After repeater: - Total cable length ≤ 30 m: 16 stations max. including I/O and servo, etc. - 30 m < total cable length ≤ 50 m: 15 stations max. including I/O and servo, etc.	
Power supply	24 VDC, 100 mA	
Weight	340 g	
Dimensions (mm)	30x160x77 (HxWxD)	

MECHATROLINK-II servo drive interface unit

Item		Details
Type		JUSP-NS115
Applicable servo drive		SGDH-□□□□E models (version 38 or later)
Installation method		Mounted on the SGDh servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	2 W
MECHATROLINK-II communications	Baud rate/transmission cycle	10 Mbps / 1 ms or more. MECHATROLINK-II communications
Command format	Operation specification	Positioning using MECHATROLINK-I/II communications.
	Reference input	MECHATROLINK-I/II communications Commands: position, speed, torque, parameter read/write, monitor output
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully closed control	Position control with fully closed feedback is possible.
Fully closed system specifications	Encoder pulse output in the servo drive	5 V differential line-driver output (complies with EIA Standard RS-422A)
	Fully closed encoder pulse signal	A quad B line-driver
	Maximum receivable frequency for servo drive	1 Mpps
	Power supply for fully closed encoder	To be prepared by customer.
Input signals in the servo drive	Signal allocation changes possible	Forward/reverse run prohibited, zero point return deceleration LS External latch signals 1, 2, 3 Forward/reverse torque control
	Position data latch function	Position data latching is possible using phase C, and external signals 1, 2, 3
Internal functions	Protection	Parameters damage, parameter setting errors, communications errors, WDT errors, fully closed encoder detecting disconnection
	LED indicators	A: Alarm, R: MECHATROLINK-I/II communicating

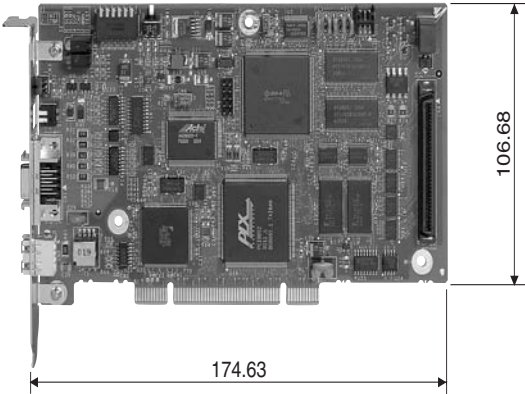


MECHATROLINK-II, frequency inverter interface units

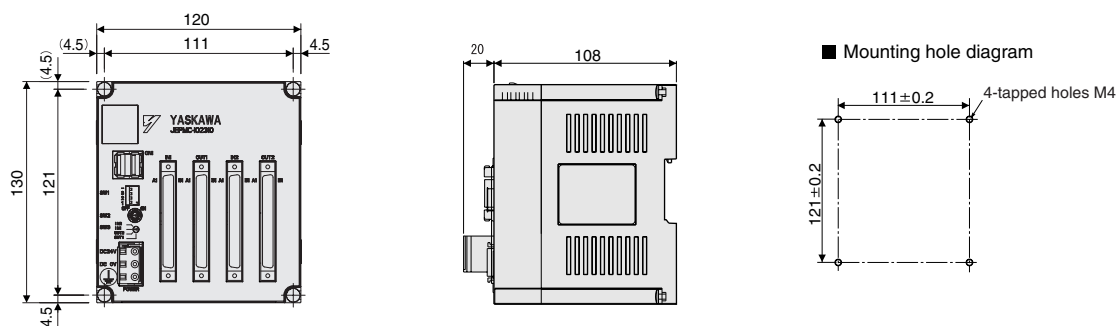
Item	Details	
Type	SI-T/V7	SI-T
Applicable inverter	CIMR-V7 / 3G3-MV (firmware 5740 or newer)	CIMR-G7 / CIMR-F7 (firmware 656x/for G7 / 4011 or newer for F7)
	Contact your OMRON sales office for information about firmware compatibility	
Installation method	Mounted on the inverter	
Power supply	Supplied from the inverter	
MECHATROLINK-II communications	10 MHz, 0.5 ms to 8 ms for MECHATROLINK-II	
Operation	Read and write registers, read monitors, inverter operation, speed reference, torque reference (G7/F7 only).	
Inputs and outputs	The inputs and outputs in the inverter can be read and set by the MLII master	
Connectors	ML-II bus connector. DPRAM connector for the inverter	
Switches	Rotary switch for ML-II address (low byte)	
	Dip switch for: ML-II address (high bit). ML-II/ML-I selection. 17 byte/32 byte data length selection.	

Dimensions

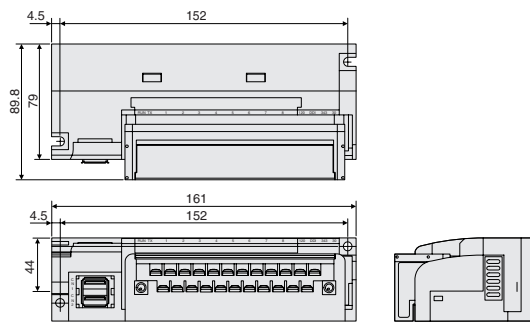
MP2100, MP2100M boards



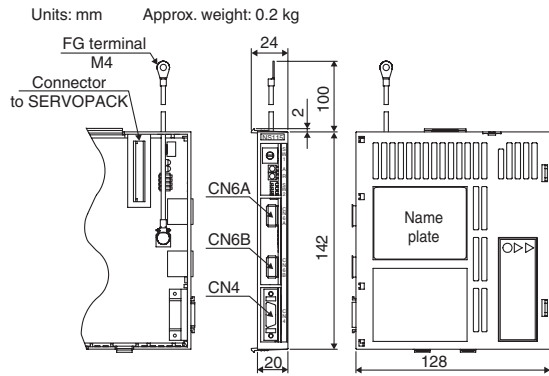
IO2310 I/O module



I/O modules PL2900, PL2910, AN2900, AN2910



MECHATROLINK-II servo drive interface unit



Ordering information

MP2100 - motion controller main units

Name	Model name	Model
MP2100 board, 1 channel for MECHATROLINK-II communication, 5-point input and 4-point output	MP2100	JAPMC-MC2100
MP2100M board, 2 channels for MECHATROLINK-II communication, 5-point input and 4-point output	MP2100M	JAPMC-MC2140

MECHATROLINK-II - related devices

Name	Remarks	Model
Distributed I/O modules	64-point input and 64-point output	JEPMC-IO2310
	Reversible counter: 2 channels	JEPMC-PL2900
	Pulse output: 2 channels	JEPMC-PL2910
	Analog input: -10 V to +10 V, 4 channels	JEPMC-AN2900
	Analog output: -10 V to +10 V, 2 channels	JEPMC-AN2910
MECHATROLINK-II cables	0.5 meter	JEPMC-W6003-A5
	1 meter	JEPMC-W6003-01
	3 meters	JEPMC-W6003-03
	5 meters	JEPMC-W6003-05
	10 meters	JEPMC-W6003-10
	20 meters	JEPMC-W6003-20
	30 meters	JEPMC-W6003-30
MECHATROLINK-II terminator	Terminating resistor	JEPMC-W6022
MECHATROLINK-II interface unit	For Sigma-II series servo drives. (Firmware version 38 or later)	JUSP-NS115
	For Varispeed V7 inverter (for inverter version support contact your OMRON sales office)	SI-T/V7
	For Varispeed F7, G7 inverter (for inverter version support contact your OMRON sales office)	SI-T
MECHATROLINK-II repeater	MECHATROLINK-II repeater	JEPMC-REP2000

I/O cables

Name	Remarks	Length m	Model
I/O cable for MP2100	With connector on the MP2100 side	0.5	JEPMC-W2062-A5
		1.0	JEPMC-W2062-01
		3.0	JEPMC-W2062-03
I/O cable for IO2310	With connector on the IO2310 side	0.5	JEPMC-W5410-05
		1.0	JEPMC-W5410-10
		3.0	JEPMC-W5410-30

Accessories

Name	Model
Battery ER3V 3.6V	JZSP-BA01
Extended cable for battery with connectors on both sides	JEPMC-W2090-01
Brackets for DIN rail	JEPMC-OP300

Computer software

Specifications	Model
Programming software to support from system design to maintenance. Intuitive ladder programming and editing functions. CAM data generation Windows-based (Windows 95/98/NT4.0/2000/XP)	CPMC-MPE720
Motion API. Header file, library, DLL, driver, and manual	CPMC-MPA70

Servo system

Note: Refer to servo systems section for detailed information

Frequency inverters

Note: Refer to frequency inverters section for detailed information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

C200HW-MC402-E

Motion control unit

Advanced multi-axes motion control made perfectly intuitive

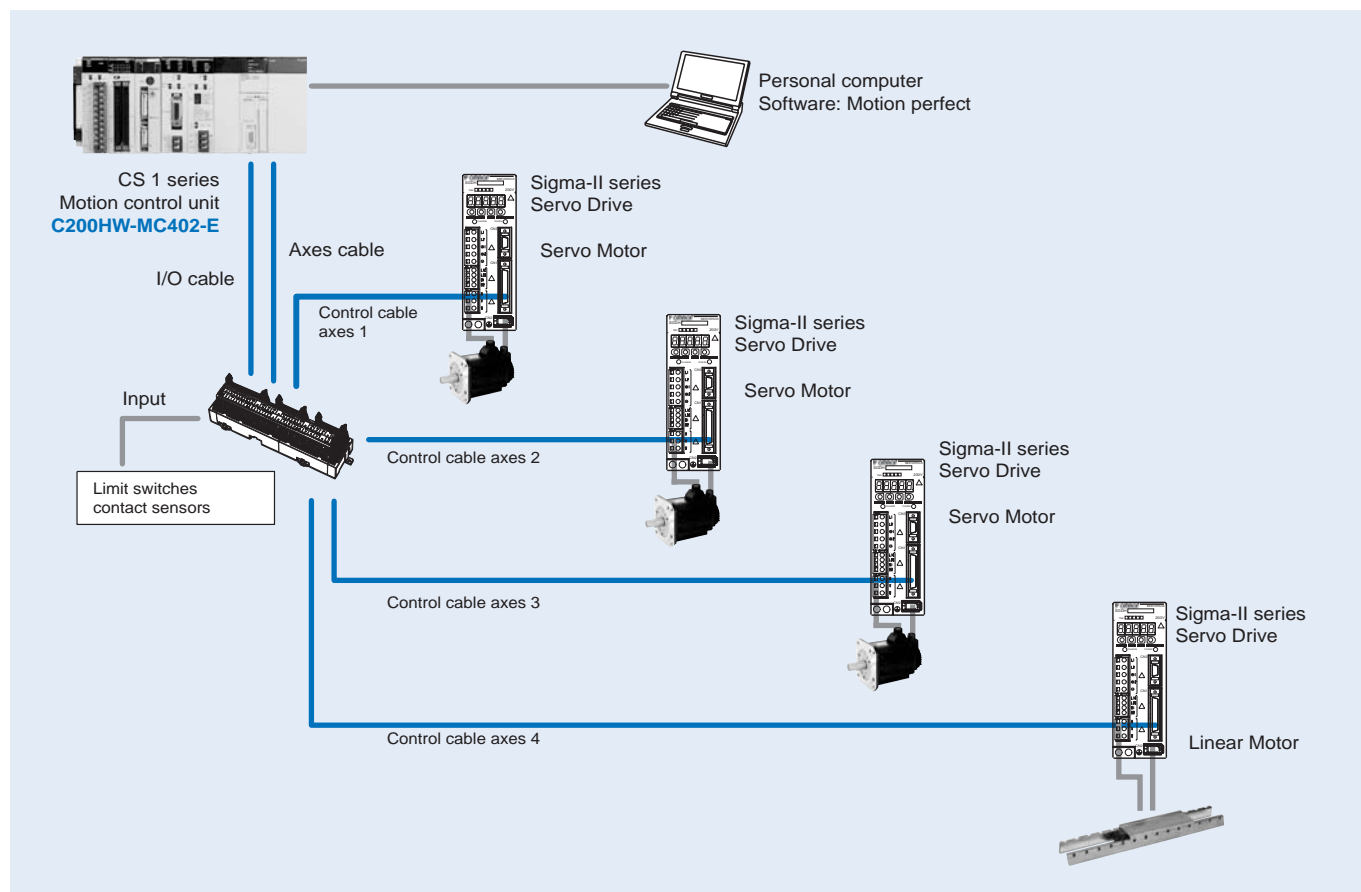
- Advanced motion control of 4 real axes and 4 virtual axes per unit. Up to 16 modules can be installed in one PLC
- Analogue outputs for close loop position and speed control
- Simple to develop and modify using BASIC
- Multi-tasking programing
- Hardware registration input for every axis
- Electronic CAM profiles and axes synchronization
- Friendly motion perfect Windows-based programming and debugging software. Provides versatile test and monitoring functions including a 4-channel software oscilloscope.



Function

The advanced motion control unit provides closed-loop control of up to 4 axes, it is programmed in a multi-task BASIC type language and supported by the powerful software tool. The unit provides a complete command set, allowing applications such as flying saws, rotating knives, any synchronization and electronic CAM profile to be easily programmed.

System configuration



Specifications

Model		C200HW-MC402-E
Classification		C200H special I/O unit
Control output signals		Analogue
Programming language		BASIC type motion control language
Basic specifications	Power supply voltage	5 VDC (supplied from backplane). 24 VDC (supplied from external power supply)
	Approx. mass	500 g
	External dimensions	130x34.5x100.5 mm (HxWxD)
Functional specifications	Controlled axes	4 real axes 4 virtual axes
	Control method	Closed loop with incremental encoder and with PID and speed command outputs
	Servo loop cycle	1.0 ms
	Speed control	Speed control of up to 4 axes. Up to 1 MHz pulse input frequency after quadrature
	Measurement units	User definable
Motion control	Linear interpolation	4 axes
	Circular interpolation	For any 2 axes
	Helical interpolation	For any 3 axes
	Axes synchronization	For any 2 axes
	Axes linked CAM profile	For any 2 axes
	Hardware registration interrupt	4 axes
	Acceleration/deceleration curves	Trapezoidal or S-curve
Task programming capacity	Number of tasks	Up to 5 tasks simultaneous plus interface task
	Number of programs	14
	Data storage capacity	251 (VR) + 16000 (table) max.
External I/O	Encoder input	Line driver receiver inputs for 4 axes (1 MHz after quadrature)
	Servo drive relationships	The following signals are provided per axis Inputs: Drive alarm signal Outputs: Drive enable (RUN or SERVO ON) Drive alarm reset SPEED command
	Digital inputs	Up to 16 digital inputs can be wired to control MC unit functions. These include limit switches, rapid stop switches and proximity inputs.
	Digital outputs	Total of 8 digital outputs can be wired and used for position dependent switching or other general purposes.
	Registration inputs	Each axis has a registration input that can be used to record the current position of the encoder feedback signals in hardware for use within the software environment
Serial communications	RS-232C	Connection to PC (motion perfect software)

Motion perfect software

Model	Motion perfect
Supported MC units	C200HW-MC402-E, R88A-MCW151-E, R88A-MCW151-DRT-E
Applicable computer	Windows 95/98/2000/NT4.0
Functions	Programming and debugging software tool. Test and monitoring functions including a 4-channel software oscilloscope.

Ordering information

Motion controller unit

Name	Model
4 axes advanced motion controller	C200HW-MC402-E

Serial cable

Name	Model
Programming cable	2 m R88A-CCM002P4-E

Terminal block and cables to motion controller unit

Description	Model
Terminal block for MC402 unit	- R88A-TC04-E
PLC unit control cable (I/O signals)	1 m R88A-CMX001S-E
PLC unit control cable (axes control)	1 m R88A-CMX001J1-E

Sigma-II series servo drive cables

Description	Model
Servo drive connecting cable, 1 axis. (It is required 1 cable for each servo drive)	1 m R88A-CMUK001J3-E2

Computer software

Specifications	Model
Motion perfect software	MOTION TOOLS CD

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

CS1W-MC421/-MC221

Motion control units

High-precision, motion controller with multi-tasking G-language programming

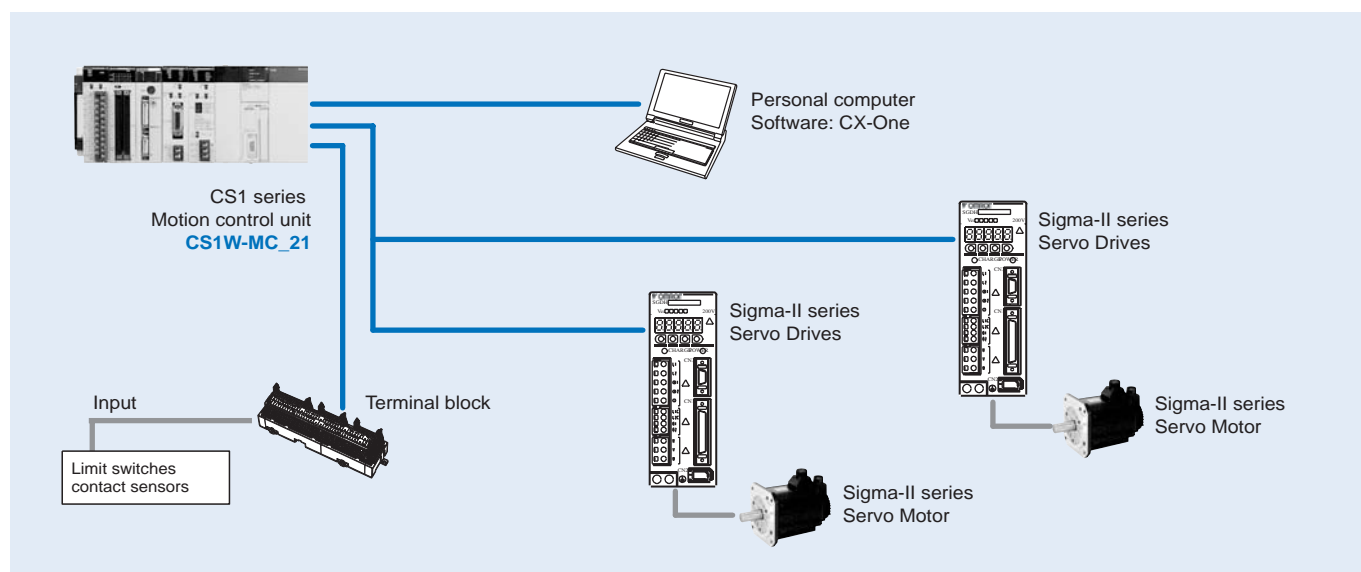
- High-speed control of up to 4 axes with one unit and up to 76 axes with one PLC (19 units x 4 axes) (assumes that power supply unit capacity is not exceeded).
- Winding operations easily controlled at high-speed using traverse positioning control.
- High-speed response to commands from CPU unit (8 ms for 2 axes, 13 ms for 4 axes).
- Encoder response of 2 Mpps possible with 4x frequency multiplication for applications with high-speed, high-precision servo motors.
- D interrupt code outputs to CPU unit at end of positioning or at specified positions (D code output time: 3.3 ms max.).
- CX-motion Windows-based support software define user mnemonics to use in place of G codes to simplify MC program development and analysis.
- Servo trace function from CX-motion to trace error counter changes or motor speeds.
- Automatic loading function
MC programs and positioning data can be automatically downloaded from computer memory when required by the MC unit.



Function

The motion controller provides closed-loop motion control via analog outputs for up to 4 axes, and supports the G language for advanced, high-speed, high-precision position control. Multi-tasking allows you to run the axes independently for a wider range of application.

System configuration



Specifications

General

Model		CS1W-MC421-V1	CS1W-MC221-V1
Classification		CS1 Special I/O unit	
Control method		Closed loop with automatic trapezoid or S-curve acceleration/deceleration	
Control output signals		Analog	
Internal programming language		G language (program started by command sent from CPU unit's ladder program.)	
Controlled axes		4 axes max.	2 axes max.
Maximum position value		-39,999,999 to 39,999,999 (for minimum setting unit of 1)	
Synchronous axis control		4 axes max.	2 axes max.
Positioning	Linear interpolation	4 axes max.	2 axes max.
	Arc interpolation	2 axes max. in a plane	
	Helical interpolation	2-axis arc interpolation in a plane + feed axis	---
	Traverse	2-axis traverse feeding	
	Infinite feed	Infinite feeding of one or more axes	
	Interrupt feed	Interrupt feeding for specified axes (positioning can be specified for when there is no interrupt.)	
Task programming capacity	Number of tasks	4 tasks max.	2 tasks max.
	Number of programs	25 programs when using 4 tasks	50 programs when using 2 tasks
	Program capacity	500 blocks per task when using 4 tasks	1,000 blocks per task when using 2 tasks

CX-Motion: Windows-based support software

Model	WS02-MCTC1-EV□
Supported MC units	CS1W-MC221/421, C200H-MC221, and CV500-MC221/421
Applicable computer	DOS, OS: Windows 95/98 or Windows NT Version 4.0
Functions	Functions required for MC unit control: creating/editing/saving/printing system parameters, positioning data, and MC programs; monitoring MC unit operation

Ordering information

Motion control unit

Name	Model
2 axes motion control unit.	CS1W-MC221-V1
4 axes motion control unit.	CS1W-MC421-V1

Sigma-II series servo drive cables

Description	Connect to		Model
Axis control cable (1 axis)	Motion control units CS1W-MC221 (1 cable needed) CS1W-MC421 (2 cables needed)	1 m	R88A-CPW001M1
		2 m	R88A-CPW002M1
		3 m	R88A-CPW003M1
		5 m	R88A-CPW005M1
Axes control cable (2 axis)	Motion control units CS1W-MC221 (1 cable needed) CS1W-MC421 (2 cables needed)	1 m	R88A-CPW001M2
		2 m	R88A-CPW002M2
		3 m	R88A-CPW003M2
		5 m	R88A-CPW005M2

I/O terminal block and cables

Description	Connect to motion control unit		Model
Terminal block	CS1W-MC221	-	XW2B-20J6-6
	CS1W-MC421	-	XW2B-40J6-7
Cable form PLC unit to terminal block.	CS1W-MC221 CS1W-MC421	1 m	XW2Z-100J-F1

Computer software

Specifications	Model
CX-One	CX-One

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CJ1W-NC□□

Position control units

High-speed, High-precision positioning with 1, 2, or 4 axes

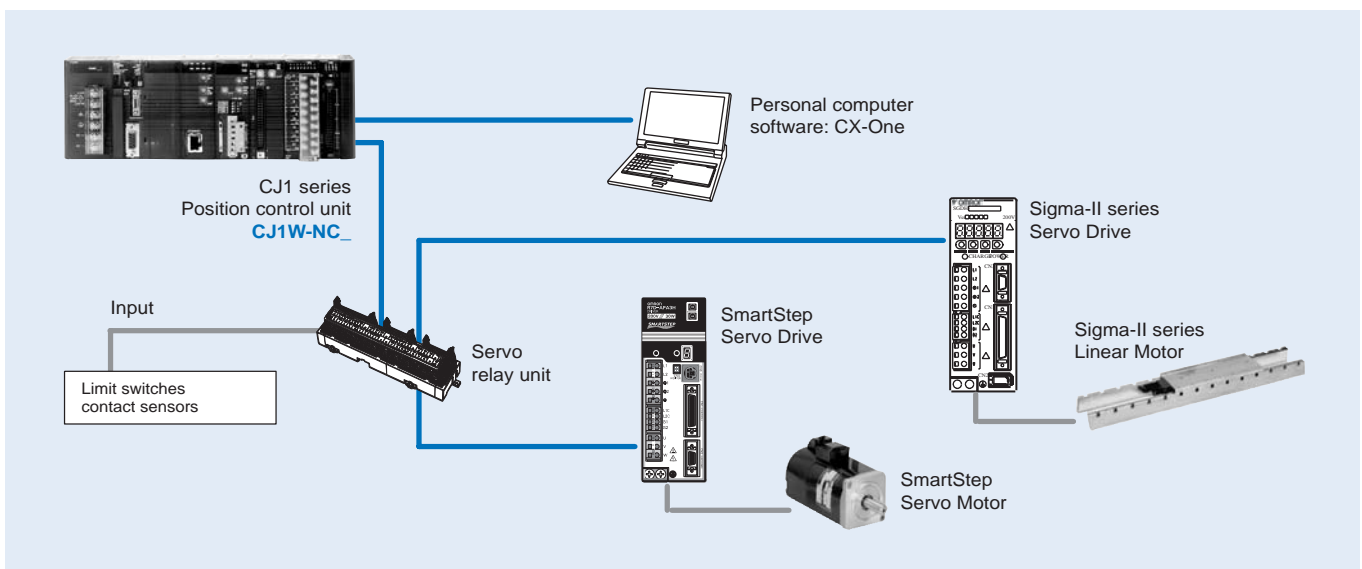
- Positioning can be done by direct ladder commands
- Position and speed control
- Linear interpolation
- Interrupt feeding function
- Positioning of 100 points done from memory
- S-curve acceleration/deceleration, origin search, backlash compensation, and other features are also supported.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based support software (CX-position) to easily create positioning data and store data and parameters in files.



Function

These position control units support positioning control via pulse-train outputs. Positioning is performed using trapezoidal or S-curve acceleration and deceleration. Models are available with 1, 2, or 4 axes control, and can be used in combination with servo drives or stepping motors that accept pulse-train control.

System configuration



Specifications

Model	CJ1W-NC113 CJ1W-NC133	CJ1W-NC213 CJ1W-NC233	CJ1W-NC413 CJ1W-NC433
Unit name	Position control unit		
Classification	Special I/O unit		
Unit numbers	0 to 95		0 to 94
Control method	Open-loop control by pulse train output		
Control output interface	CJ1W-NC□13: Open-collector output CJ1W-NC□33: Line-driver output		
Controlled axes	1	2	4
Operating modes	Direct operation or memory operation		
Data format	Binary (hexadecimal)		
Affect on scan time for end refresh	0.29 to 0.41 ms max./unit		
Affect on scan time for IOWR/IORD	0.6 to 0.7 ms max./instructions		
Startup time	2 ms max. (refer to operation manual for conditions)		
Position data	-1,073,741,823 to +1,073,741,823 pulses		
No. of positions	100 per axis		
Speed data	1 to 500 kpps (in 1 pps units)		
No. of speeds	100 per axis		
Acceleration/deceleration times	0 to 250 s (time to max. speed)		
Acceleration/deceleration curves	Trapezoidal or S-curve		
Saving data in CPU	Flash memory		
Windows-based support software	CX-position (WS02-NCTC1-E)		
Ambient operating temperature	0 to 55 °C		0 to 50 °C
External power supply	24 VDC ±10%, 5 VDC ±5% (line driver only)		24 VDC ±5%, 5 VDC ±5% (line driver only)

Ordering information

Position control unit

Name	Model
1 axis position control unit. Open-collector output.	CJ1W-NC113
2 axes position control unit. Open-collector output.	CJ1W-NC213
4 axes position control unit. Open-collector output.	CJ1W-NC413
1 axis position control unit. Line-driver output.	CJ1W-NC133
2 axes position control unit. Line-driver output.	CJ1W-NC233
4 axes position control unit. Line-driver output.	CJ1W-NC433

Servo drive cables

Note: Refer the selected servo systems section for cable and servo relay units information.

Computer software

Specifications	Model
CX-One	CX-One

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CS1W-NC□□□, C200HW-NC□□□

Position control units

High-speed, high-precision positioning with 1, 2, or 4 axes

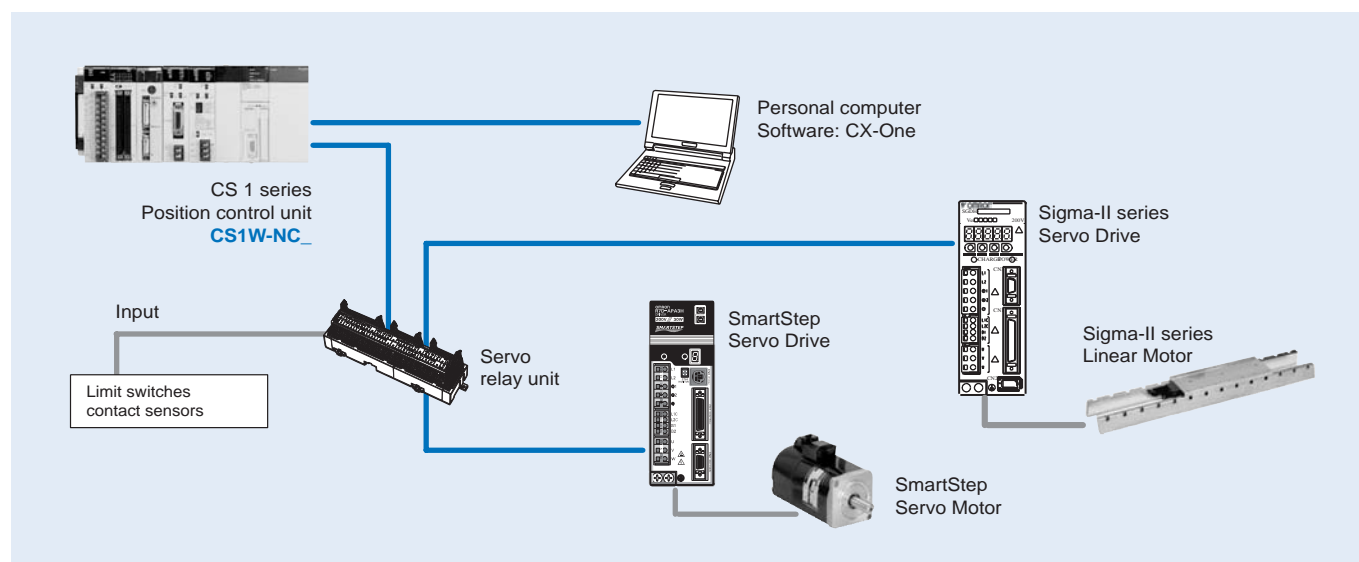
- Positioning can be done by direct ladder commands
- Position and speed control
- Linear interpolation
- Interrupt feeding function
- Positioning of 100 points done from memory
- S-curve acceleration/deceleration, origin search, backlash compensation, and other features are also supported.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based support software to easily create positioning data and store data and parameters in files.



Function

These position control units support positioning control via pulse-train outputs. Positioning is performed using trapezoidal or S-curve acceleration and deceleration. Models are available with 1, 2, or 4 axes control, and can be used in combination with servo drives or stepping motors that accept pulse-train control.

System configuration



Specifications

Model	CS1W-NC113 CS1W-NC133	CS1W-NC213 CS1W-NC233	CS1W-NC413 CS1W-NC433	C200HW-NC113	C200HW-NC213	C200HW-NC413
Unit name	Position control unit					
Classification	CS1 special I/O units			C200H special I/O units		
Unit numbers	0 to 95			0 to 15 (0 to F)		
Control method	Open-loop, automatic trapezoid acceleration/deceleration					
Control output signals	CS1W-NC□13: Open-collector outputs CS1W-NC□33: Line-driver outputs			Open-collector		
Controlled axes	1	2	4	1	2	4
Operating modes	Direct operation or memory operation					
Data format	Binary (hexadecimal)			BCD		
Affect on scan time for end refresh	0.29 to 0.41 ms max./unit			2.6 to 4.5 ms max./unit		
Affect on scan time for IOWR/IORD	0.6 to 0.7 ms max./instructions			2.6 to 5.5 ms max./instructions		
Startup time	2 ms min. (Refer to operation manual for conditions.)			7.51 ms min. (Refer to operation manual for conditions.)		
Position data	-1,073,741,823 to +1,073,741,823 pulses			-9,999,999 to +9,999,999 pulses		
No. of positions	100 per axis					
Speed data	1 to 500 kpps (in 1 pps units)			1 to 500 kpps (specified as factor)		
No. of speeds	100 per axis					
Acceleration/deceleration times	0 to 250 s (time to max. speed)					
Acceleration/deceleration curves	Trapezoidal or S-curve					
Saving data in CPU	Flash memory					
Windows-based support software	CX-position			SYSMAC-NCT (WS01-NCTF1-E)		

Ordering information

Position control unit

Name	Model
1 axis position control unit. Open-collector output.	CS1W-NC113
2 axes position control unit. Open-collector output.	CS1W-NC213
4 axes position control unit. Open-collector output.	CS1W-NC413
1 axis position control unit. Line-driver output.	CS1W-NC133
2 axes position control unit. Line-driver output.	CS1W-NC233
4 axes position control unit. Line-driver output.	CS1W-NC433
1 axis position control unit. Open-collector output.	C200HW-NC113
2 axes position control unit. Open-collector output.	C200HW-NC213
4 axes position control unit. Open-collector output.	C200HW-NC413

Servo drive cables

Note: Refer to selected servo systems section for cable and servo relay units information.

Computer software

Specifications	Model
CX-One	CX-One

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To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

R88A-MCW151-□

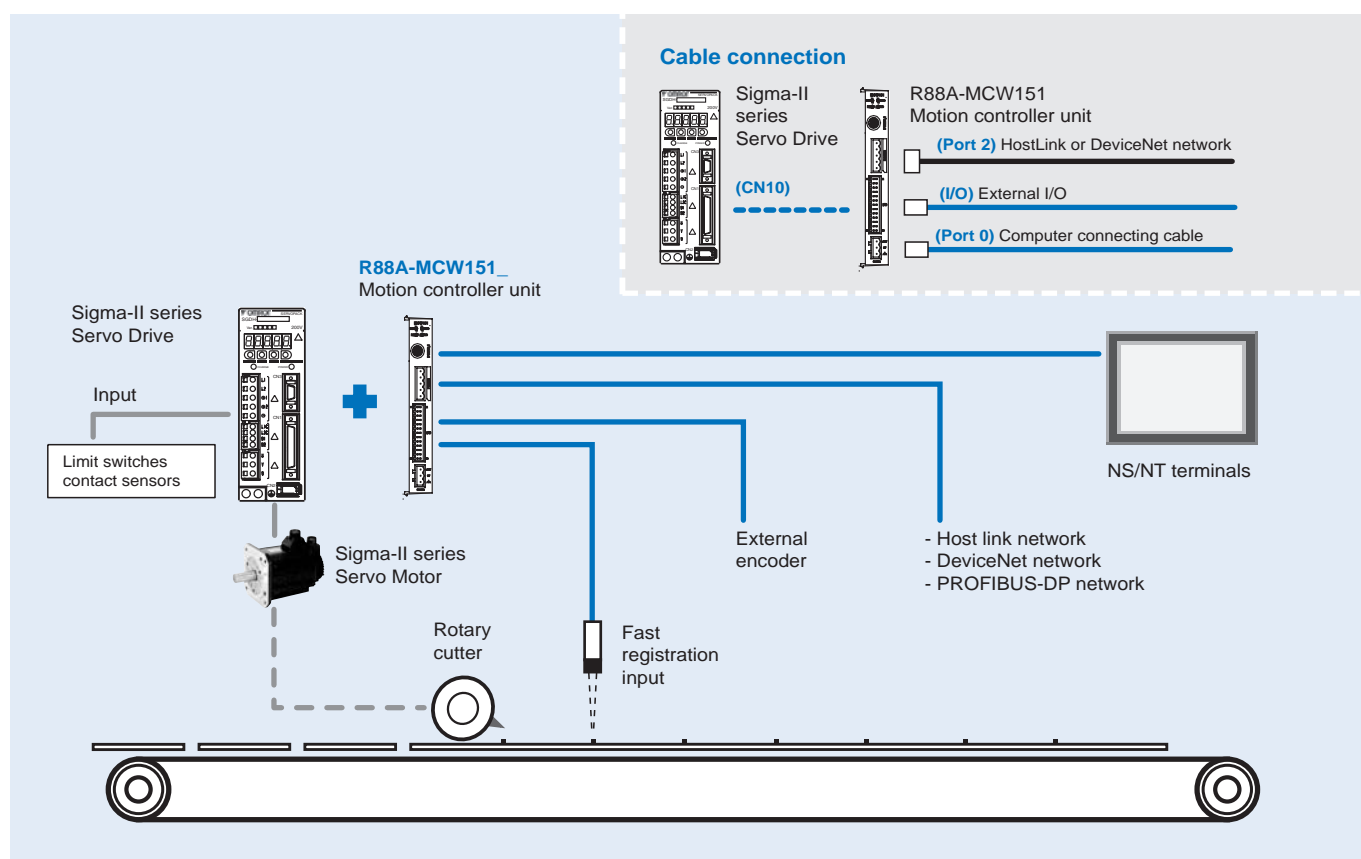
1.5 axis motion controller

Advanced motion made perfectly intuitive

- Connects directly to the Sigma-II series drive
- Controls 1 real axis, 1 virtual axis and a configurable third axis
- Provides an additional encoder input/output to the servo drive
- Simple to develop and modify using BASIC
- Built-in local I/O for easy operation
- Provides two additional hardware registration inputs to the drive
- Electronic CAM profiles and axes synchronization
- Multi-tasking functionality
- Friendly and powerful Windows-based software
- Network connectivity via HostLink or DeviceNet
- Supports HMI connection without the need of a PLC



System configuration



Specifications

General specifications

Item		Details
Type		R88A-MCW151-E, R88A-MCW151-DRT-E
Applicable servo drive		SGDH-□□□□E models (software version 14 or later)
Installation method		Mounted on the SGDh servo drive side: CN10.
Basic specifications	Power supply method	24 VDC (supplied from external power supply)
		5 VDC (supplied from the servo drive control power supply)
	Power consumption	4.0 W
	External dimensions	20x142x128 mm (HxWxD)
	Approx. mass	200 g
	Current consumption	170 mA for 24 VDC
	Output power supply	5 VDC, maximum 160 mA (to external encoder)
Environment	Operating temperature	0 ... +55 °C
	Storage temperature	-20 ... +75 °C
	Operating and storage humidity	90% RH max. (no condensation)
	Vibration resistance	0.5 G (4.9 m/s ²)
	Shock resistance	2 G (19.6 m/s ²)
Functional specifications	Number of axes	- 1 controlled servo drive axis - 1 master axis, encoder output axis or virtual axis - 1 virtual axis
	Servo loop cycle	Selectable to 0.5 ms or 1.0 ms.
	Registration inputs	2x MCW151 unit for encoder input axis 1x Sigma-II servo drive axis
	Measurement units	User definable
Programming	Programming language	BASIC
	Number of tasks	Up to 3 tasks running simultaneously plus the command line task
	Max. number of programs	14
	Available memory for user programs	128 KB
	Data storage capacity	251 (VR) + 8000 (table)
	Saving program data, motion controller	Random access memory (RAM) and flash memory backup.
Saving program data, personal computer	Motion perfect software manages a backup on the hard disk of the personal computer.	
Motion control	Speed control	Inferred closed loop with PID, output speed and speed feed forward gains Speed reference (open loop) Possible torque limit operation
	Torque control	Torque reference (open loop) Possible speed limit operation
	Control switch	Speed / torque control switching during operation
	Positioning operations	Linear interpolation Circular interpolation CAM profile movement Electronic gearbox link Linked CAM profile movement Linked move for any two axes Adding axes
	Acceleration/deceleration curves	Trapezoidal or S-curve
	Servo drive access	
Motion control		Speed control Torque control Position feedback Driver enable Driver print registration
	Monitoring	Driver alarm and warning status General driver status Driver digital input Driver analogue input Driver limit switches
	General control	Driver alarm reset Driver reset
	Parameter access	Read and write Pn parameters Read Un parameters
External I/O	Encoder input	Line receiver input; maximum response frequency: 1500 kHz pulses (before multiplication) Pulse multiplication: x4
	Encoder output	Line receive output; maximum frequency: 500 kHz pulses Internal counts to output pulse ratio: 64:1
	Digital inputs	Total of 8 digital inputs can be wired and used for instance for limit switches, emergency stop and proximity inputs. Two inputs can be used for registration of the encoder input/output axis.
	Digital outputs	Total of 6 digital outputs can be wired and used for position dependent switching or other general purposes.
	Registration inputs	Two registration inputs can be used (simultaneously) to capture the position in hardware.
Serial communications	RS-232C	Port 0: Connection to PC (motion perfect software) Port 1: Host link master protocol Host link slave protocol General-purpose

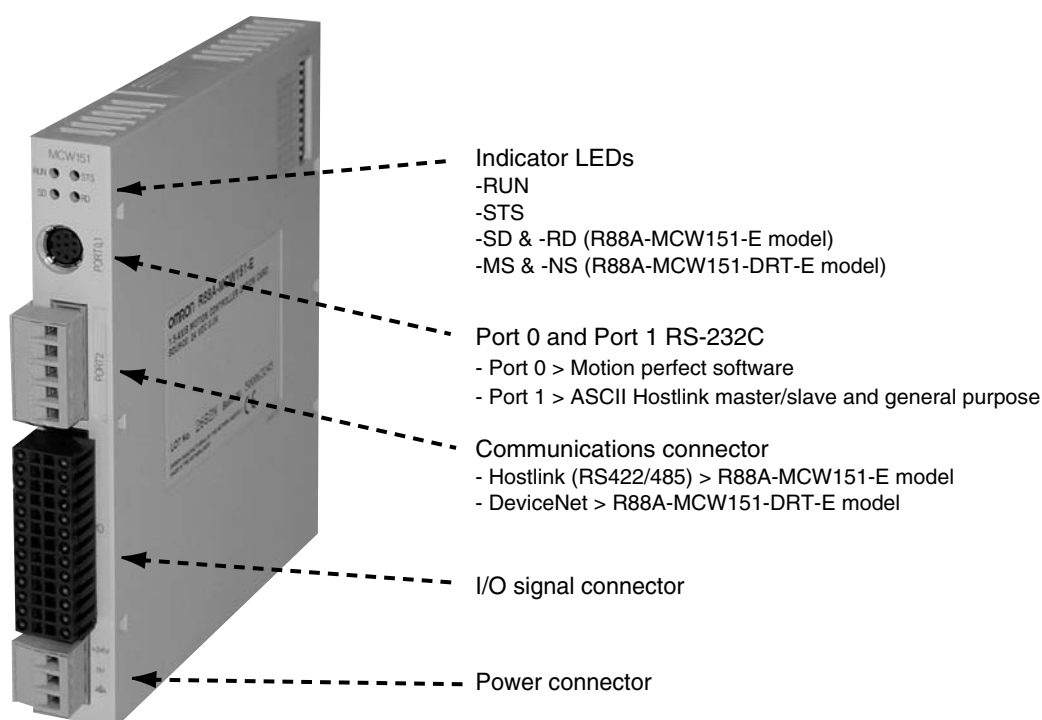
RS-422A/485 interface specifications (R88A-MCW151-E only)

Item	Details	
Electrical characteristics	Conform to EIA RS-422A/485	
Synchronization	Start-stop synchronization (asynchronous)	
Baud rate	1200 / 2400 / 4800 / 9600 / 19200 / 38400 bps	
Transmission format	Databit length	7 or 8 bit
	Stop bit	1 or 2 bit
	Parity bit	Even/odd/none
Transmission mode	Point-to-multipoint (1:N)	
Transmission protocol	RS-422A	Host link master protocol, Host link slave protocol, ASCII general-purpose
	RS-485	ASCII general-purpose
Galvanic isolation	Yes	
Connector type	Phoenix MSTB 2.5/5-ST-5.08 (included in package).	
Communication buffers	254 bytes	
Flow control	None	
Terminator	Yes, internal 220 Ω selectable by DIP-switch SW2	
Cable length	500 m max.	

DeviceNet specifications (R88A-MCW151-DRT-E only)

Item	Details
Communications protocol	DeviceNet
Supported connections (communications)	Remote I/O polling messages Explicit messages Both conform to DeviceNet specifications
Baud rate	500 kbps, 250 kbps, 125 kbps (switchable)
Communications media	Special 5-wire cables (2 signal lines, 2 power lines, 1 shield line)
Communications distances	
500 kbps	Network length: 100 m max. (thin cable: 100 m max.) Drop line length: 6 m max. Total drop line length: 39 m max.
250 kbps	Network length: 250 m max. (thin cable: 100 m max.) Drop line length: 6 m max. Total drop line length: 78 m max.
125 kbps	Network length: 500 m max. (thin cable: 100 m max.) Drop line length: 6 m max. Total drop line length: 156 m max.

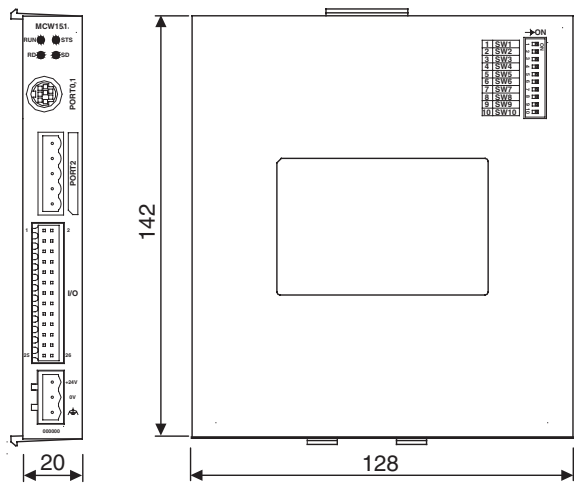
Nomenclature



Dimensions

R88A-MCW151-(DRT)-E - 1.5 axes motion controller unit

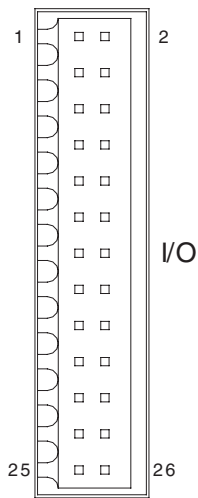
Units: mm Approx. weight: 0.2 kg



Installation

I/O connector

Connector pin arrangement



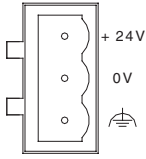
A+	1	2	A-
B+	3	4	B-
Z+	5	6	Z-
0V_ENC	7	8	5V_ENC
I0 / R0	9	10	FG
I2	11	12	I1 / R1
I4	13	14	I3
I6	15	16	I5
0V_IN	17	18	I7
O8	19	20	O9
O10	21	22	O11
O12	23	24	O13
0V_OP	25	26	24V_OP

I/O connector pin functions

Pin	Signal	
	Name	Function
1	A+	Encoder phase A+ (input / output)
2	A-	Encoder phase A- (input / output)
3	B+	Encoder phase B+ (input / output)
4	B-	Encoder phase B- (input / output)
5	Z+	Encoder phase Z+ (input / output)
6	Z-	Encoder phase Z- (input / output)
7	0V_ENC	Encoder 0V common
8	5V_ENC	Encoder 5 V power supply output
9	I0 / R0	(Registration) Input 0
10	FG	Frame ground
11	I2	Input 2
12	I1 / R1	(Registration) Input 1
13	I4	Input 4
14	I3	Input 3
15	I6	Input 6
16	I5	Input 5
17	0V_IN	Inputs 0 V common
18	I7	Input 7
19	O8	Output 8
20	O9	Output 9
21	O10	Output 10
22	O11	Output 11
23	O12	Output 12
24	O13	Output 13
25	0V_OP	Outputs 0 V common
26	24V_OP	Outputs 24 V power supply input

Power connector

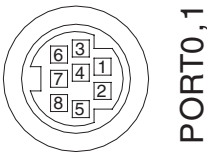
The power connector is used to connect the 24 V power supply to the controller unit



Pin	Name	Function
1	+24 V	Power supply 24 V
2	0 V	Power supply 0 V
3	FG	Frame ground

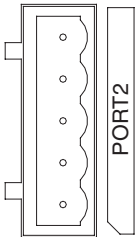
RS-232C connections (port 0 and port 1)

The controller unit has two serial RS-232C ports for communication with external devices.



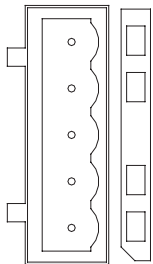
Pin	Symbol	Name	Port	Direction
1	-	Not used	-	
2	RS-1	Request to send	1	Output
3	SD-0	Send data	0	Output
4	SG-0	Signal ground	0	-
5	RD-0	Receive data	0	Input
6	SD-1	Send data	1	Output
7	SG-1	Signal ground	1	-
8	RD-1	Receive data	1	Input

RS-422A/485 connections (R88A-MCW151-E only)



Pin	Symbol	Name	Port	Direction
1	RD-	Receive data (-)	2	Input
2	RD+	Receive data (+)	2	Input
3	FG	Frame ground	2	-
4	SD-	Send data (-)	2	Output
5	SD+	Send data (+)	2	Output

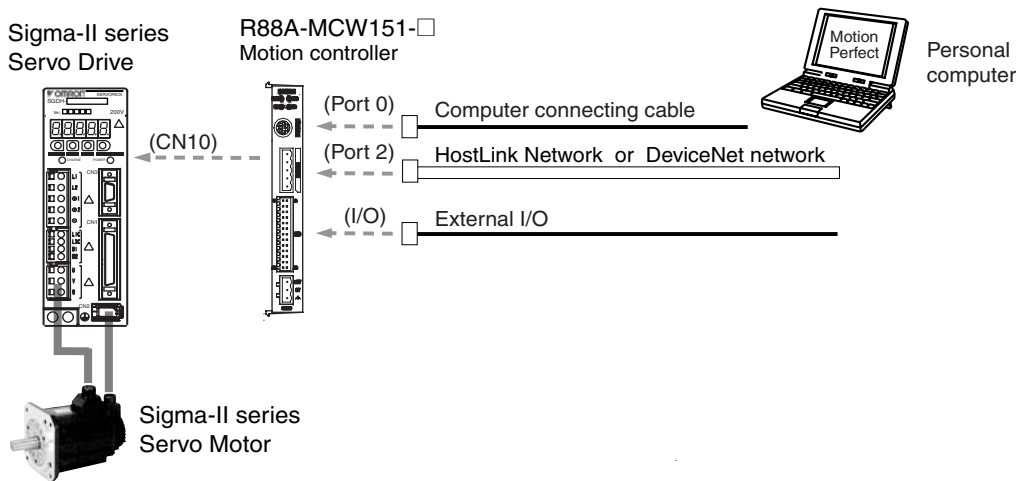
DeviceNet connections (R88A-MCW151-DRT-E only)



Pin	Symbol	Signal	Color of cable
1	V+	Power line, positive voltage	Red
2	CAN-H	Communications line, high	White
3	Shield	Shield	-
4	CAN-L	Communications line, low	Blue
5	V-	Power line, negative voltage	Black

Ordering information

System configuration



Motion controller unit

Name	Model
1.5 axis advanced motion controller with Host Link interface	R88A-MCW151-E
1.5 axis advanced motion controller with DeviceNet interface	R88A-MCW151-DRT-E

PROFIBUS connectivity

Name	Model
PROFIBUS-DP module interface for R88A-MCW151-E motion controllers	PRT1-SCU11

Serial cables (for port 0, 1)

Name	Model
Programing cable, 2 m. (Port 0)	R88A-CCM002P4-E
Splitter cable, 1 m (Port 0 & 1). Combined with R88A-CCM002P4-E cable allows using motion perfect and a general purpose application.(e.g. terminal)	R88A-CCM001P5-E

Connectors

Specification	Model
I/O connector (Included in package)	B2L 3.5/26 SN SW (Weidmüller)
Power connector (Included in package)	MSTB 2.5/3-ST-5.08 (Phoenix)
Port 2 connector (Included in package)	MSTB 2.5/5-ST-5.08 (Phoenix)

Note: For a complete view of DeviceNet network accessories, refer to automation systems catalogue or contact your OMRON representative.

Computer software

Specifications	Model
Motion perfect	MOTION TOOLS CD
EDS file	

Servo system

Note: Refer to the servo systems section for more information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

JUSP-NS300

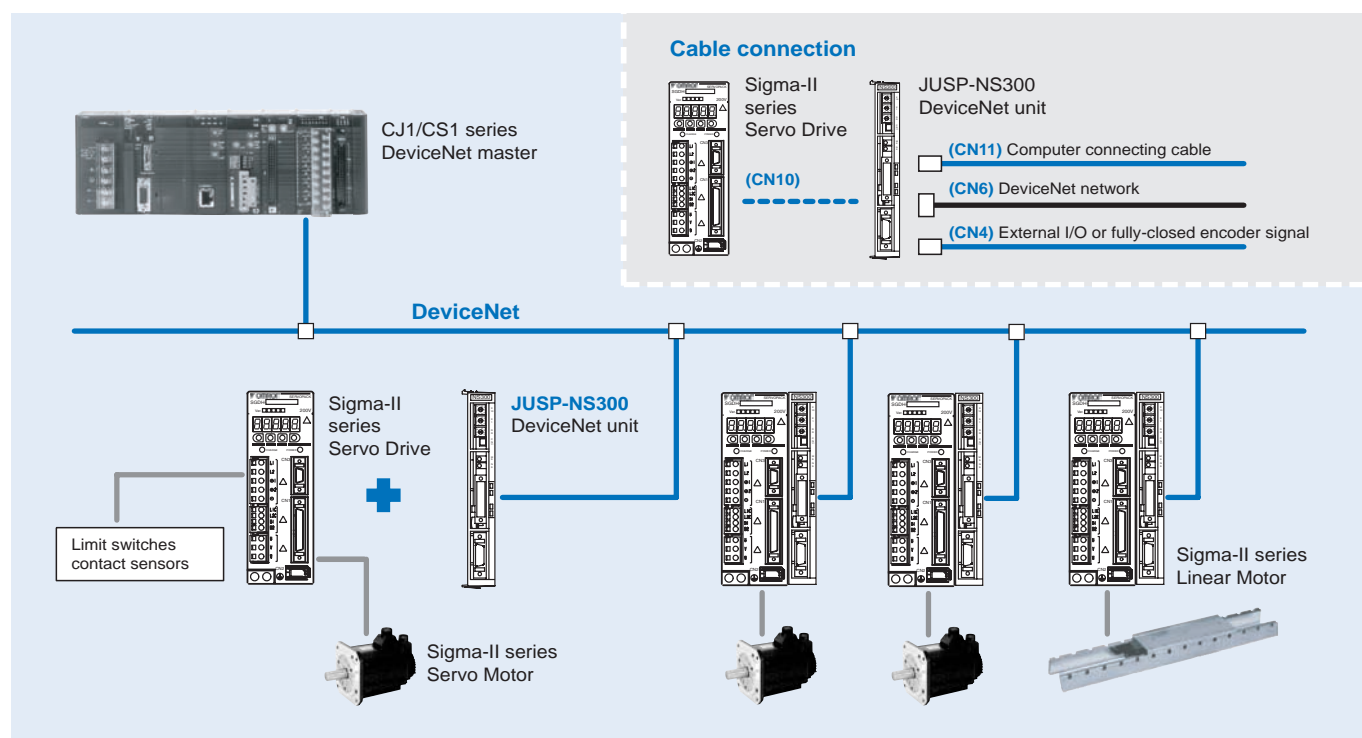
DeviceNet unit

DeviceNet connectivity with positioning functionality.

- Connects directly to the Sigma-II series drive
- Simplifies distributed control and information management
- No programming languages are required.
- Various positioning functions including point-to-point mode (with multi-step speed positioning available) and station number mode (indexing function)
- All parameters are set and maintained by a PLC or PC.
- Up to 63 servos can be connected to the DeviceNet network
- Supports polling I/O and explicit messages



System configuration



Specifications

JUSP-NS300 - DeviceNet interface unit

Item		Details
Type		JUSP-NS300
Applicable servo drive		All SGDh-□□□E models
Installation method		Mounted on the SGDh servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	1.3 W
DeviceNet communications	Baud rate setting	Select from 125 kbps, 250 kbps, or 500 kbps using a rotary switch.
	Node address setting	Select the address from 0 to 63 using the rotary switches.
Command format	Operation specifications	Positioning using DeviceNet communications.
	Reference input	DeviceNet communications Commands: motion commands (position, speed), and parameter read/write
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully-closed control	Possible
Input signals	Fixed allocation to servo drive CN1 connector	Forward/reverse run prohibited, zero point return deceleration LS, zero point signal, external positioning signal
	NS300 unit	Emergency stop signal
Output signals	Servo drive CN1 connector*	Servo alarm, brake interlock, servo ready, positioning completion
	NS300 unit	P1, P2 (area signals)
Internal functions	Position data latch function	Position data latching is possible using phase C, zero point signals, and external signals.
	Protection	Parameters damage, parameter setting errors, communications errors, etc.
	LED indicators	MS: Module status NS: Network status

Note: *The allocation of the output signals for brake interlock, servo ready, or positioning completion can be changed using parameter settings.

Transmission specifications

Item	Specifications			
Communication format	Multi-drop, T-branch (1:N)			
Transmission speed (kbps)	500, 250, 125 kbps			
Transmission media	5-wire cables			
Transmission distance	Speed	Max. network length	Branch length	Total branch length
	500 kbps	100 m or less	6 m or less	39 m or less
	250 kbps	250 m or less		78 m or less
	125 kbps	500 m or less		156 m or less
Number of nodes	Up to 64 units			
Error control	SRS error, node address double checking			

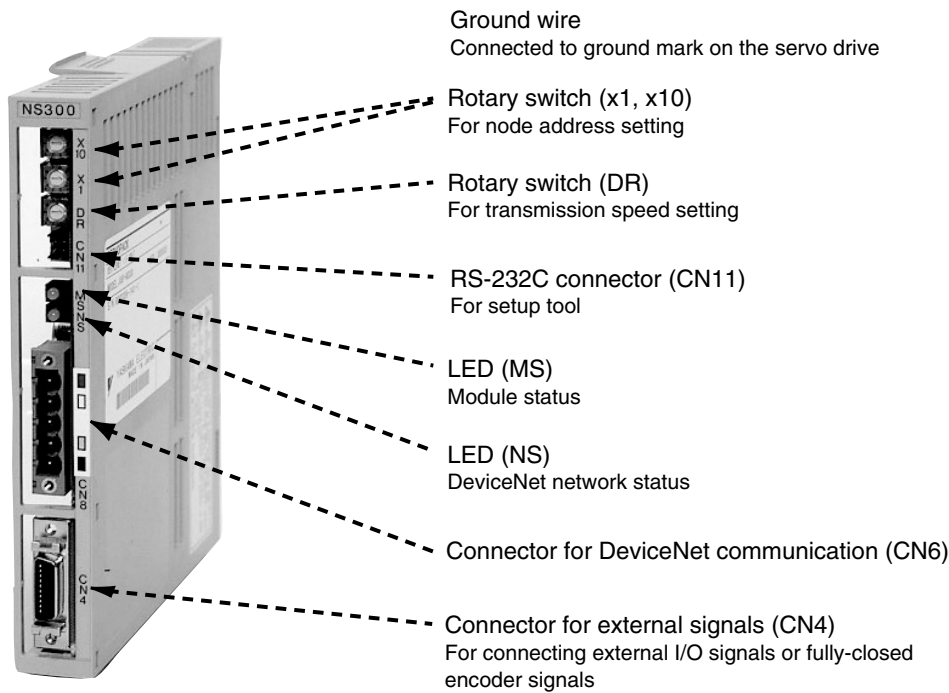
Cable

Item	Cable	
	Thick	Thin
Loss of signal	Little	Much
Transmission distance	Long	Short
Advantage/disadvantage	Hard (not easy to bend)	Soft (easy to bend)

The maximum network lengths differ in accordance with the cable type as shown below.

Transmission speed (kbps)	Max. network length (m)	
	Thick cable	Thin cable
500	100	100
250	250	100
125	500	100

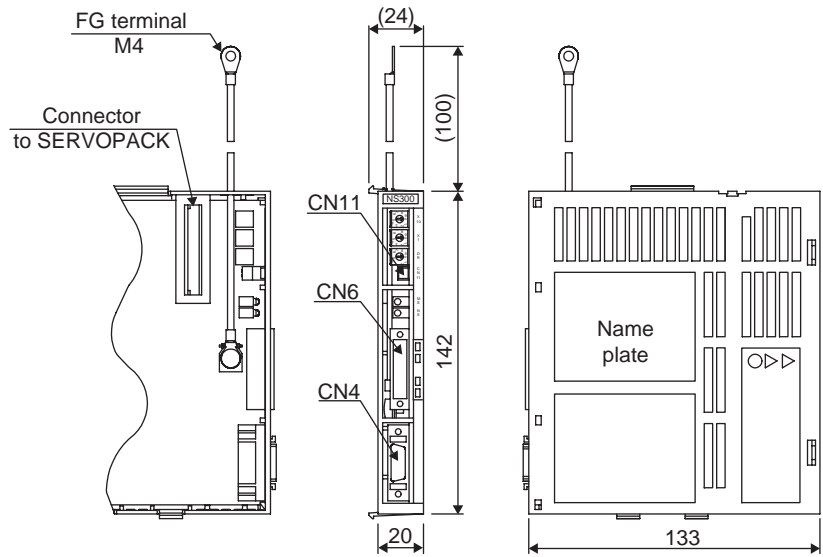
Nomenclature



Dimensions

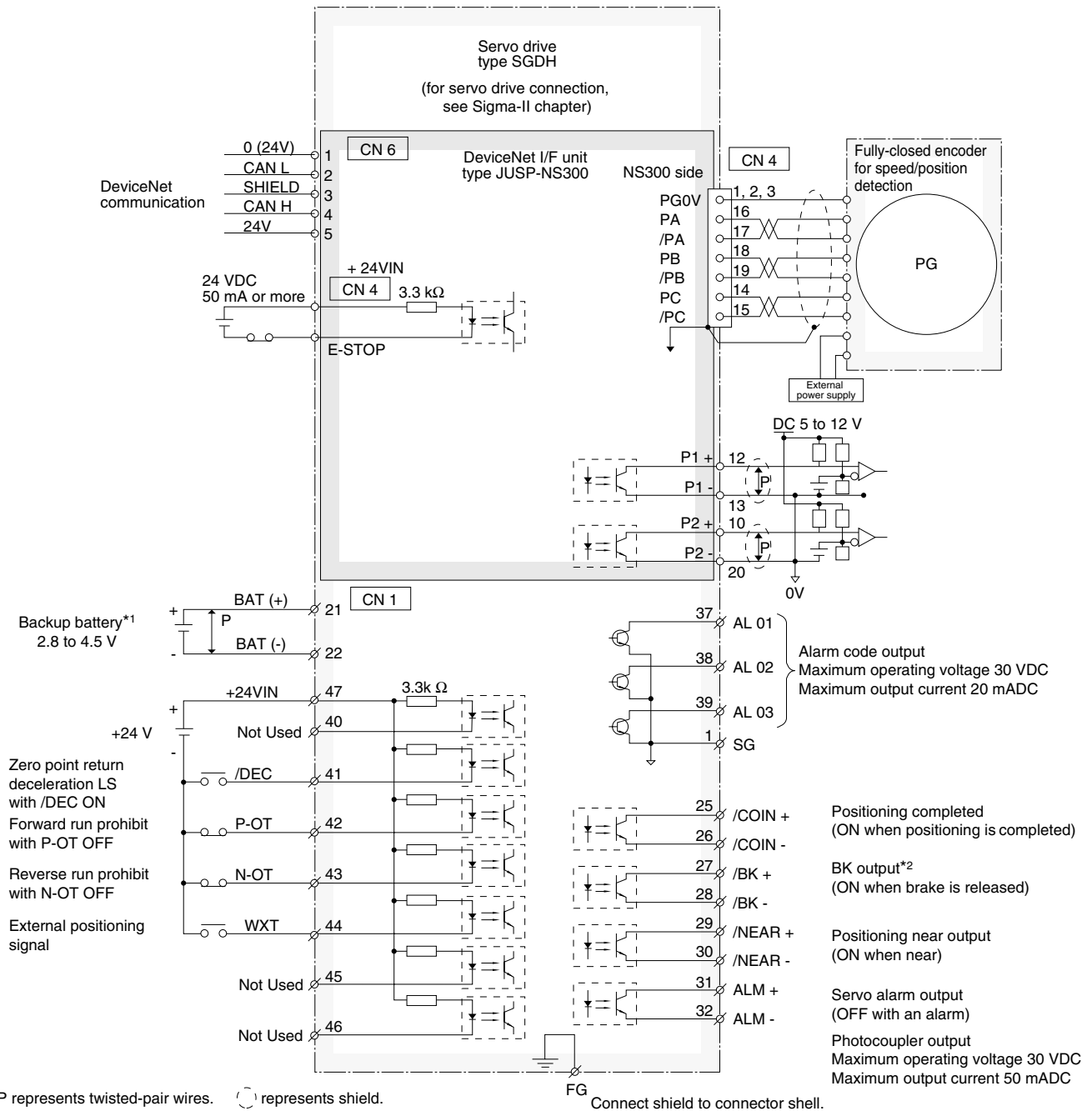
JUSP-NS300 - DeviceNet interface unit

Units: mm Approx. weight: 0.2 kg



Installation

Standard connections



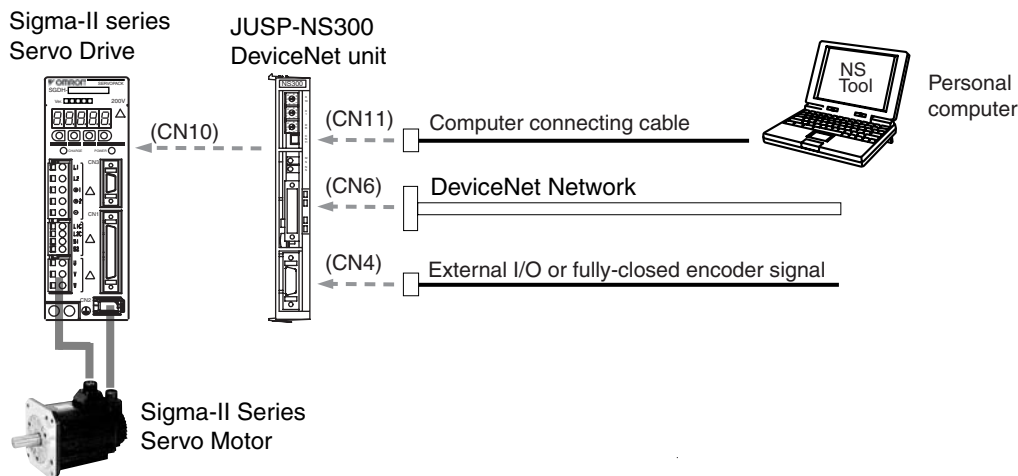
*1 Connect when using an absolute encoder and when the battery is not connected to CN8.

*2 Set the signal assignment with the user constants.

Note: Connect the ground cable of the field bus I/F unit to the ground connector of the servo drive.

Ordering information

System configuration



DeviceNet interface unit

Name	Model
DeviceNet interface unit with point-to-point positioning functionality	JUSP-NS300

Serial cable (for CN11)

Name	Model
Computer connecting cable	2m R88A-CCW002P4

Connectors

Name	Model
Connector for CN4. For connecting external I/O signals or fully-closed encoder signals	R88A-CNU01R or DE9406973
Connector for CN6. DeviceNet connector with retaining screws	XW4B-05C1-H1-D
Connector for CN6. DeviceNet multi-branching Connector with retaining screws	XW4B-05C4-TF-D
Connector for CN6. DeviceNet multi-branching Connector (without retaining screws)	XW4B-05C4-T-D

Note: For a complete view of DeviceNet network accessories, refer to automation systems catalogue or contact your OMRON representative.

Computer software

Name	Model
NS tool	MOTION TOOLS CD
ESD file	

Servo system

Note: Refer to the servo systems section for more information

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

JUSP-NS500

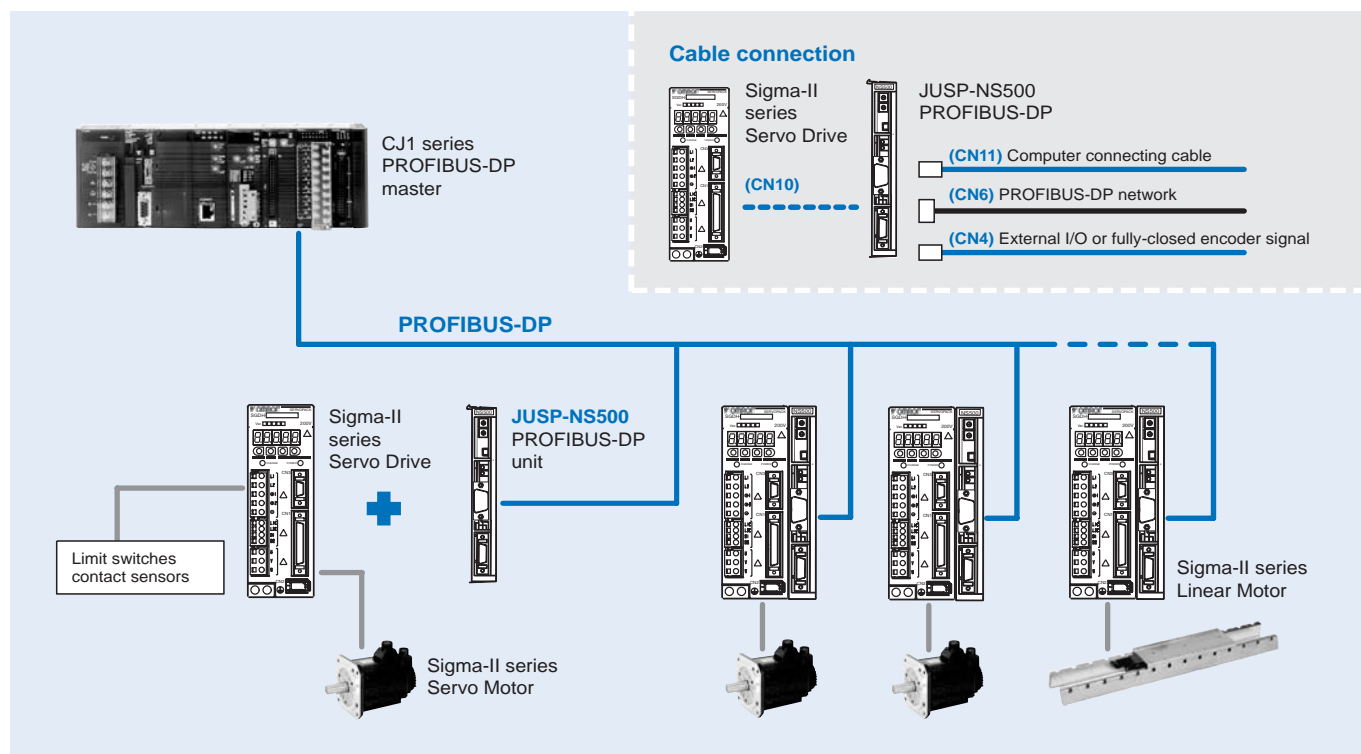
PROFIBUS-DP unit

PROFIBUS-DP connectivity with positioning functionality.

- Connects directly to the Sigma-II series drive
- Simplifies distributed control and information management
- No programming languages are required.
- Various positioning functions including point-to-point mode (with multi-step speed positioning available) and station number mode (indexing function)
- All parameters are set and maintained by a PLC or PC.
- Up to 126 servos can be connected to the PROFIBUS-DP network



System configuration



Specifications

JUSP-NS500 - PROFIBUS-DP interface unit

Item		Details
Type		JUSP-NS500
Applicable servo drive		All SGDh-□□□E models
Installation method		Mounted on the SGDh servo drive side: CN10.
Basic specifications	Power supply method	Supplied from the servo drive control power supply.
	Power consumption	1.3 W
PROFIBUS-DP communications	Baud rate setting	The baud rate is automatically set by the master between 9.6 kbps and 12 Mbps.
	Station address setting	Select the address from 0 to 7D (0 to 125) using the rotary switches.
Command format	Operation specifications	Positioning using PROFIBUS-DP communications
	Reference input	PROFIBUS-DP communications Commands: motion commands (position, speed), parameter read/write
Position control functions	Acceleration/deceleration method	Linear first/second-step, asymmetric, exponential, S-curve
	Fully-closed control	Possible
Input signals	Fixed allocation to SERVOPACK CN1 connector	Forward/reverse run prohibited, zero point return deceleration LS, zero point signal, external positioning signal
	NS500 unit	Emergency stop signal
Output signals	Servo drive CN1 connector*	Servo alarm, brake interlock, servo ready, positioning completion
	NS500 unit	P1, P2 (area signals)
Internal functions	Position data latch function	Position data latching is possible using phase C, zero point signals, and external signals.
	Protection	Parameters damage, parameter setting errors, communications errors, etc.
	LED indicators	ERR: Module error COMM: Communications status

Note: *The allocation of the output signals for brake interlock, servo ready, or positioning completion can be changed using parameter settings.

Transmission specifications

Item	Specifications						
Communication format	Conforms to PROFIBUS-DP						
Transmission speed (kbps)	9.6	19.2	93.75	187.5	500	1500	12000
Transmission distance (m)	1200			1000	400	200	100
Transmission media	STP cable						
Number of stations	32 stations (can be extended to 126 stations using repeater.)						

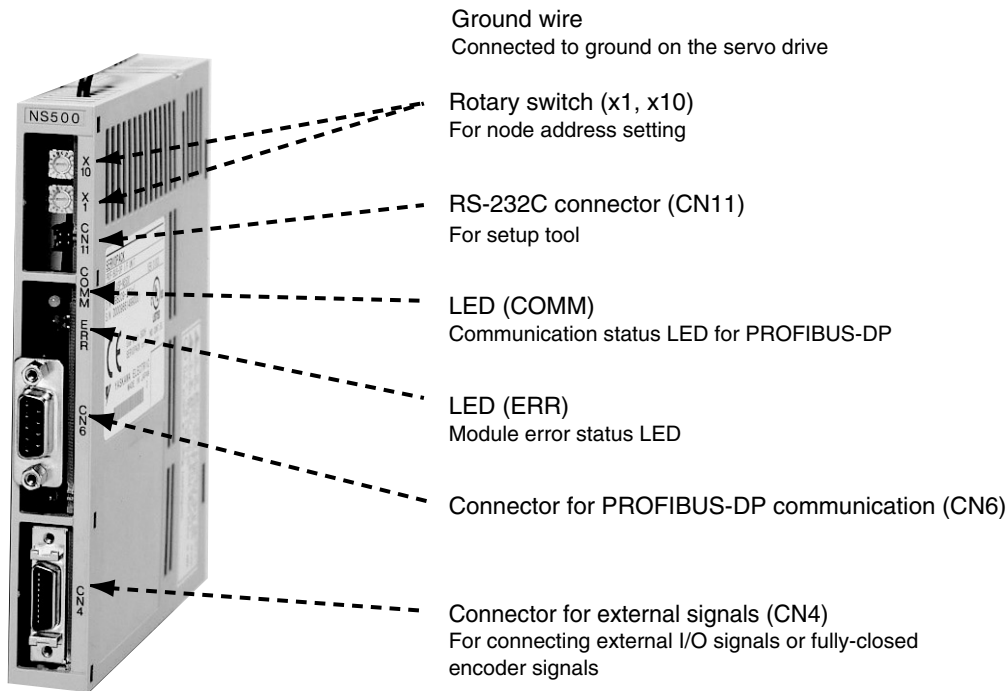
Cable

Item	Specifications
Cable type impedance	Shielded twisted-pair wire type A 135 to 165 Ω
Capacity	< 30 pF/m
Loop resistance	110 Ω/km
Wire gage	0.64 mm
Conductor area	> 0.34 mm ²

Connector

9-pin D-sub connectors are used.

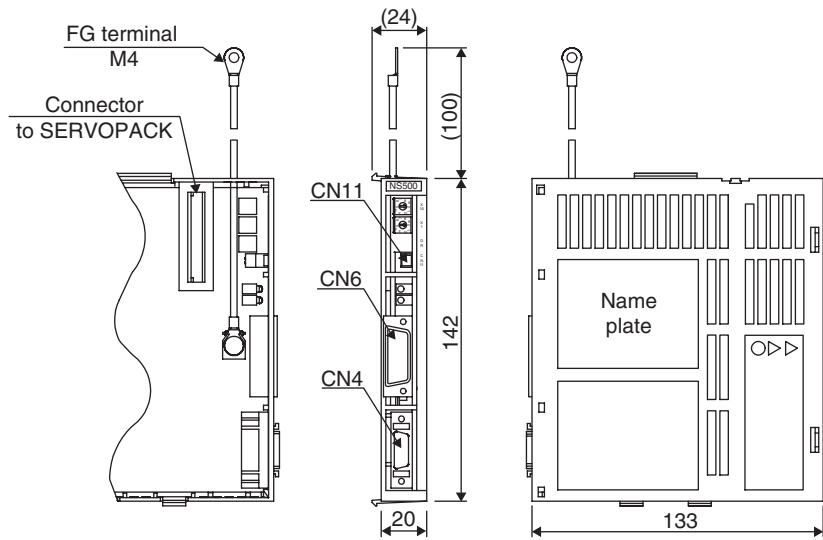
Nomenclature



Dimensions

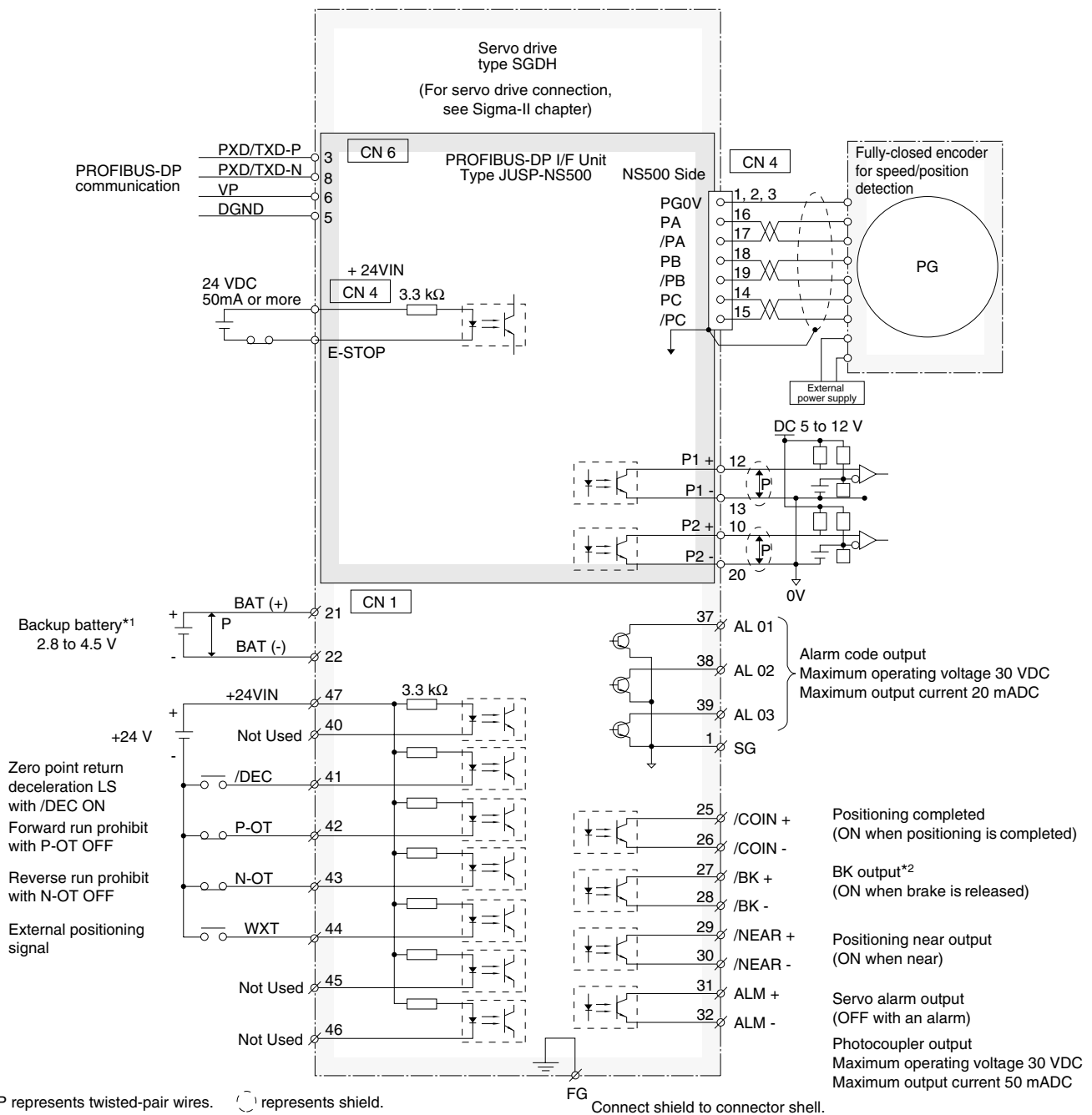
JUSP-NS500 - PROFIBUS-DP interface unit

Units: mm Approx. weight: 0.2 kg



Installation

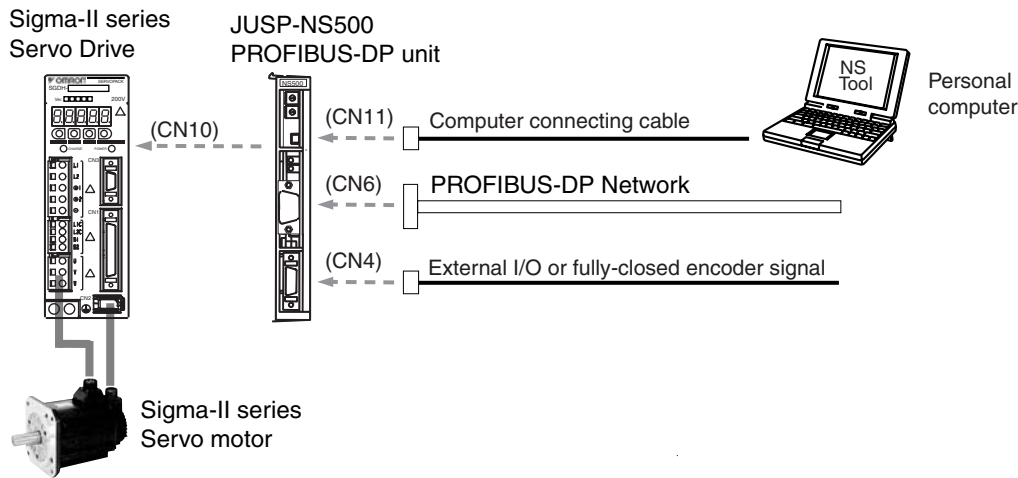
Standard connections



Note: Connect the ground cable of the field bus I/F unit to the ground connector of the servo drive.

Ordering information

System configuration



PROFIBUS-DP interface unit

Name	Model
PROFIBUS_DP interface unit with point-to-point positioning functionality	JUSP-NS500

Serial cable (for CN11)

Name	Model
Computer connecting cable	2 m R88A-CCW002P4

Connectors

Name	Model
Connector for CN4. For connecting external I/O signals or fully-closed encoder signals	R88A-CNU01R or DE9406973

Computer software

Name	Model
NS tool	MOTION TOOLS CD
GSD file	

Servo system

Note: Refer to the servo systems section for more information

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JUSP-NS600

Indexer unit

Smart and simple positioning solution.

- No programming languages are required. Connects directly to the Sigma-II series drive
- Allows serial network control and discrete I/O control
- Servo axis set-up, actuation and monitoring
- 128 indexing programmed moves
- Refined methods and functions for smart control like program tables or position and speed tables
- Up to 16 servos can be connected via serial network
- With SigmaWin+ the system can be easily configured



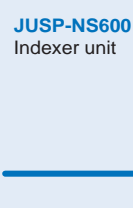
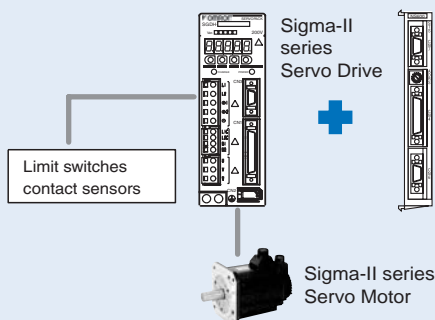
System configuration

Using serial communications

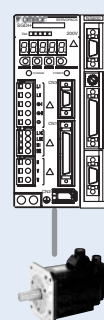
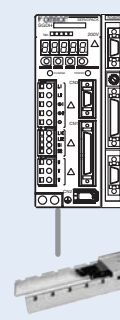
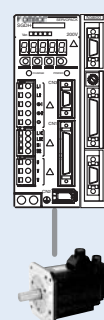


CJ1/CS1 series
Host controller

Controls 16 axes through RS-485/RS-422



Using digital I/O

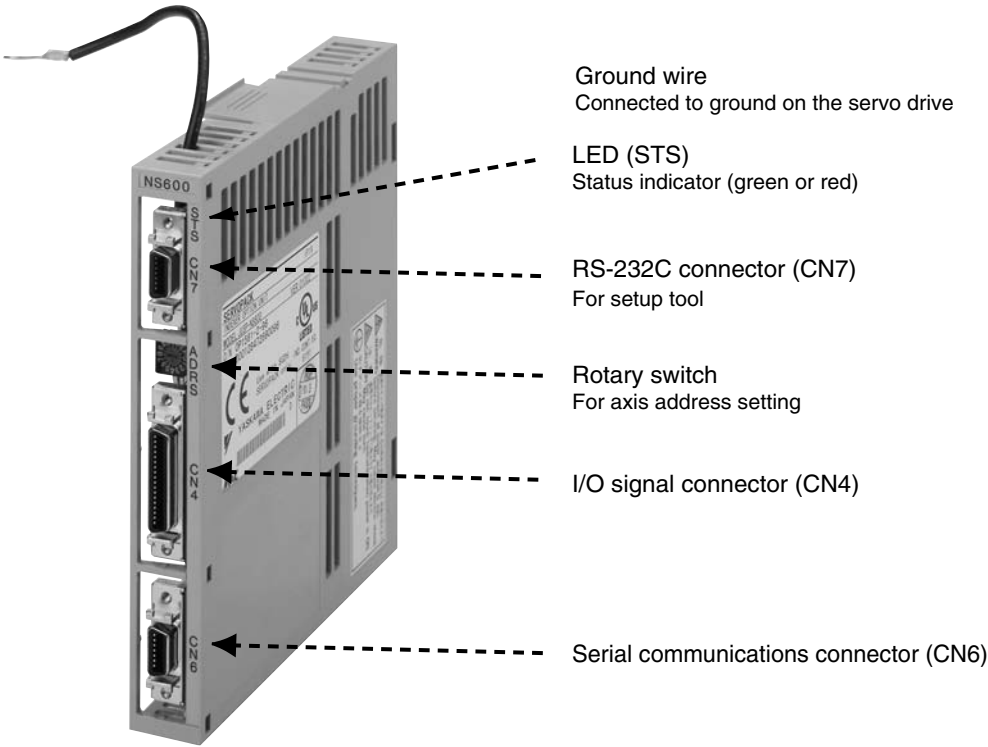


Specifications

JUSP-NS600 - indexer unit

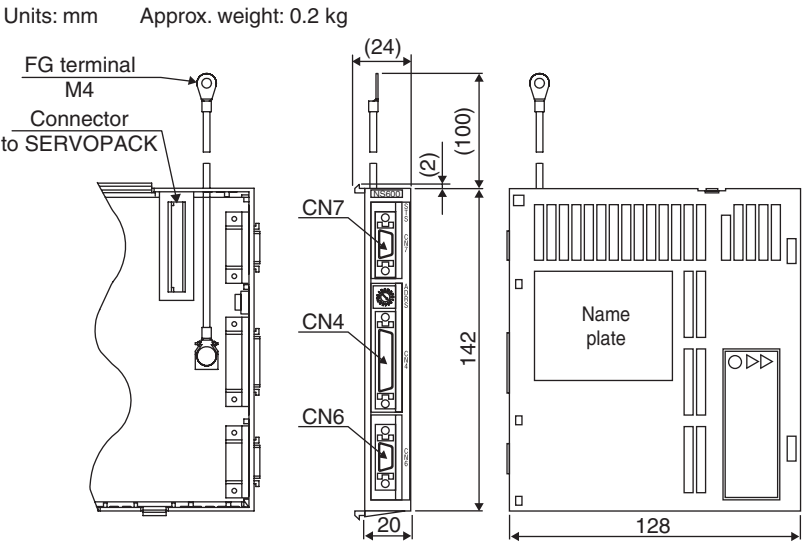
Item			Details
Type			JUSP-NS600
Applicable servo drive			All SGDH-□□□E SERVOPACKs
Installation method			Mounted on the SGDH servo drive side: CN10.
Basic specifications	Power supply method		Supplied from the servo drive control power supply
	Power consumption		2.6 W
Control specifications	Program table		Program table positioning by designating the starting step by the contact input (maximum 128 steps)
	Serial communications		Serial commands in ASCII codes Communications specifications: RS422 / RS485 (maximum 50 m (164.0 ft)) RS232C (maximum 3 m (9.84 ft)) Connection: Multi-drop method (maximum 16 axes) Baud rate: 9600, 19200, 38400bps
	Command table		Positioning by designating the command table by the contact input (maximum 128 points)
	Zero-point return		3 types
Other functions			External positioning, JOG speed table operation (maximum 16 speeds)
I/O signals	Input	Servo drive	S-ON (Servo ON) P-OT (forward run prohibited), N-OT (reverse run prohibited) DEC (zero-point return deceleration LS) RTRG (external positioning signal)
		INDEXER module	MODE0/1 (mode signal) START/HOME (start signal / zero-point return execution) PGMRES/JOGP (program reset / motor forward rotation) SEL0/JOGN (program starting step designation / motor reverse rotation) SEL1 to SEL4 / JOG0 to JOG3 (program starting table selection / JOG speed table selection)
	Output	Servo drive	ALM (servo alarm) WARN (warning) BK (brake interlock) S-RDY (servo ready) ALO1, ALO2, ALO3 (alarm codes)
		INDEXER module	INPOSITION (positioning completed) POUT0 to POUT4 (programmable outputs)

Nomenclature



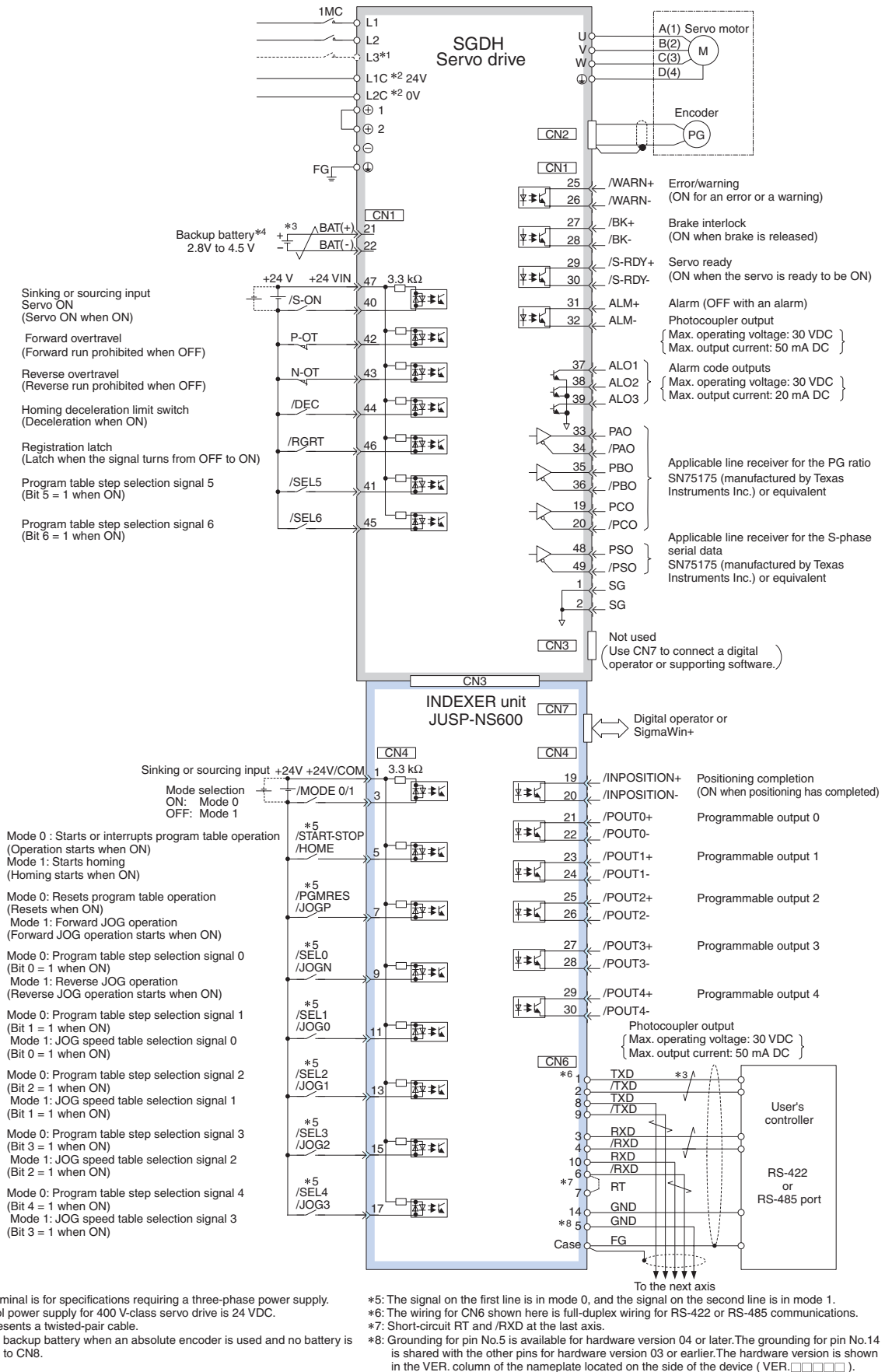
Dimensions

JUSP-NS600 - indexer unit



Installation

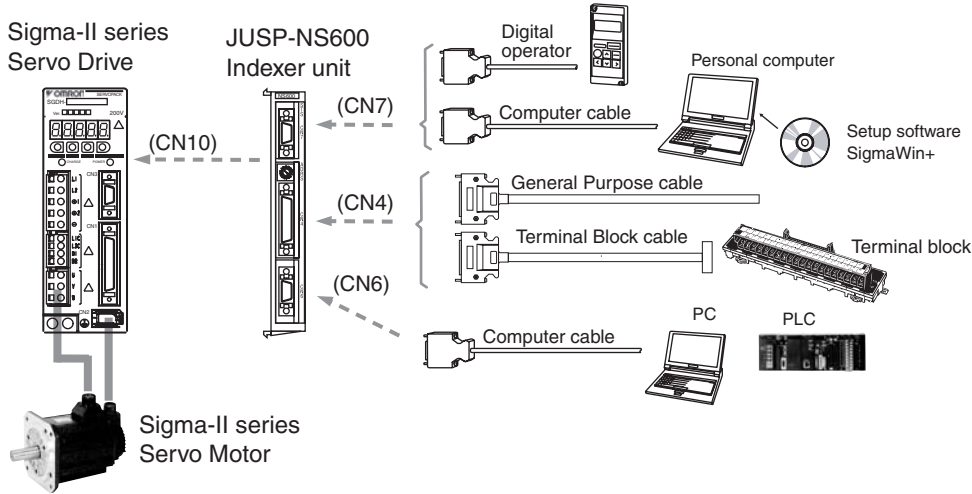
Standard connections



Note: Connect the ground cable of indexer unit to the ground connector of the servo drive.

Ordering information

System configuration



Indexer option unit

Name	Model
Indexer unit. Versatile point-to-point positioning	JUSP-NS600

Serial options (for CN7)

Name	Model
Computer connecting cable	2 m R88A-CCW002P2 or JZSP-CMS02
Parameter unit with 1 m cable	2 m JUSP-OP02A-2 or R88A-PR02W

Control cables (for CN4)

Name	Model
Relay terminal block	XW2B-40F5-P
Relay terminal block cables	1 m R88A-CTU001N 2 m R88A-CTU002N
General purpose I/O cable (with open end)	1 m FND-CCX001S 2 m FND-CCX002S

Serial cables (for CN6)

Name	Model
Computer connecting cable	2 m R88A-CCW002P2 or JZSP-CMS02

Connectors

Specification	Model
Connector for CN4	R88A-CNU01C
Connector for CN6 and CN7	R7A-CNA01R

Computer software

Specifications	Model
SigmaWin+	MOTION TOOLS CD

Servo system

Note: Refer to the servo systems section for more information.

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