New!

OMRON

SYSMAC CS/CJ-series
Programmable Controllers

Motion Control Unit
CS1W-MCH71
CJ1W-MCH71 *NEW*

New OMNUC W-series AC Servo Driver Supporting MECHATROLINK-II Communications
Use position, synchronized, speed, and torque control.
Achieve a wide variety of applications for multiple axes with less wiring.

MECHATROLINK-II

A Single Unit Supports Position, Speed, To
Servo Communications Enable Motion C on

A long-awaited multi-axis, high-performance Motion Control Unit for multi-axis, high-speed, highly distributed equipment control.
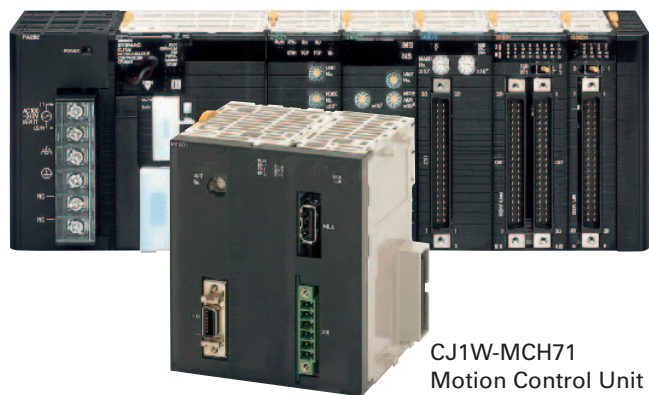
- High-precision motion control with less wiring using MECHATROLINK-II Servo communications with superior concurrency.
- Many synchronization and control commands are supported to aid existing applications and improve motion control tact time.
- Program control commands (such as branching commands) and various arithmetic operations are supported for maximum programming efficiency.
- Equipment design efficiency is enhanced and tact time is shortened.
- Combine the CJ1W-MCH71 with a Servo Driver equipped with MECHATROLINK-II communications to achieve more compact machine designs.
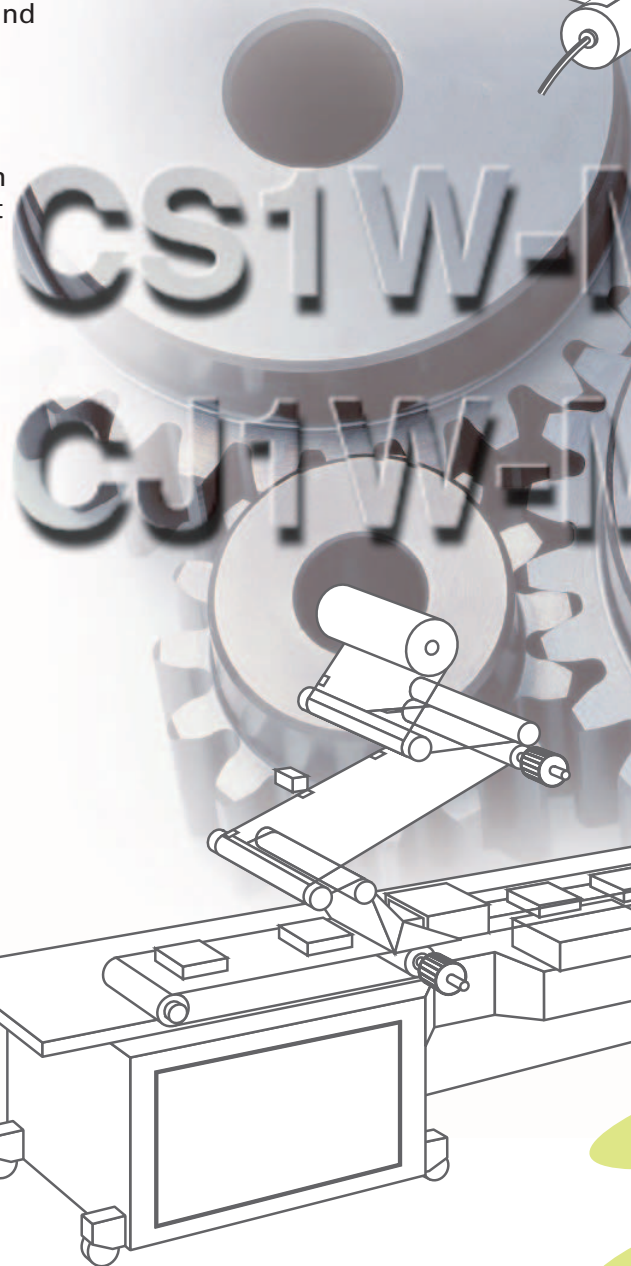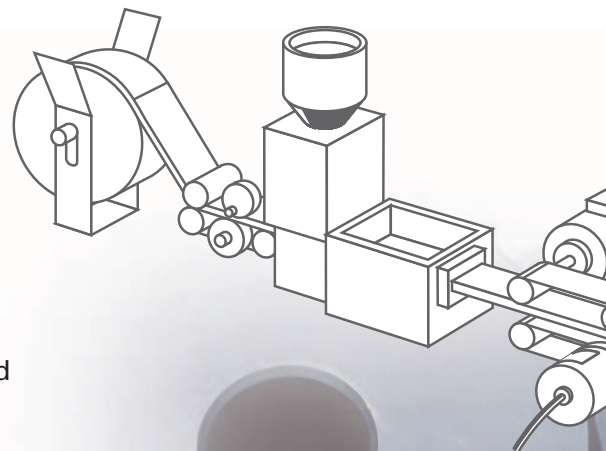
SYSMAC CS-series
Programmable Controller

CS1W-MCH71
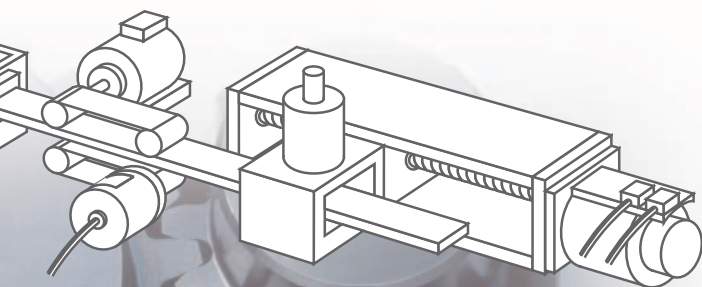Motion Control Unit

SYSMAC CJ-series
Programmable Controller

CJ1W-MCH71
Motion Control Unit *NEW*

l, Torque, and Synchronized Control.
Control for Up to 30 Axes with Less Wiring.

Equipment networking
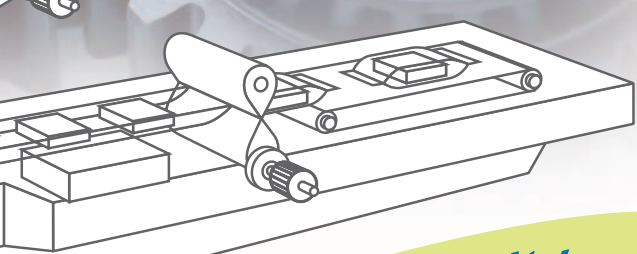
Features

Easy System Configuration

● Multi-axis 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. A wide variety of motion control operations are supported, from independent axis control to interpolation and synchronized operation.

● High-speed MECHATROLINK-II Servo communications (a registered trademark of Yaskawa Corporation) are used between the servo driver and Distribution Modules, enabling multi-axis control with less wiring. The limit switches and origin sensors required for servo control are input to the servo driver, further enhancing distributed control in the multi-axis system.
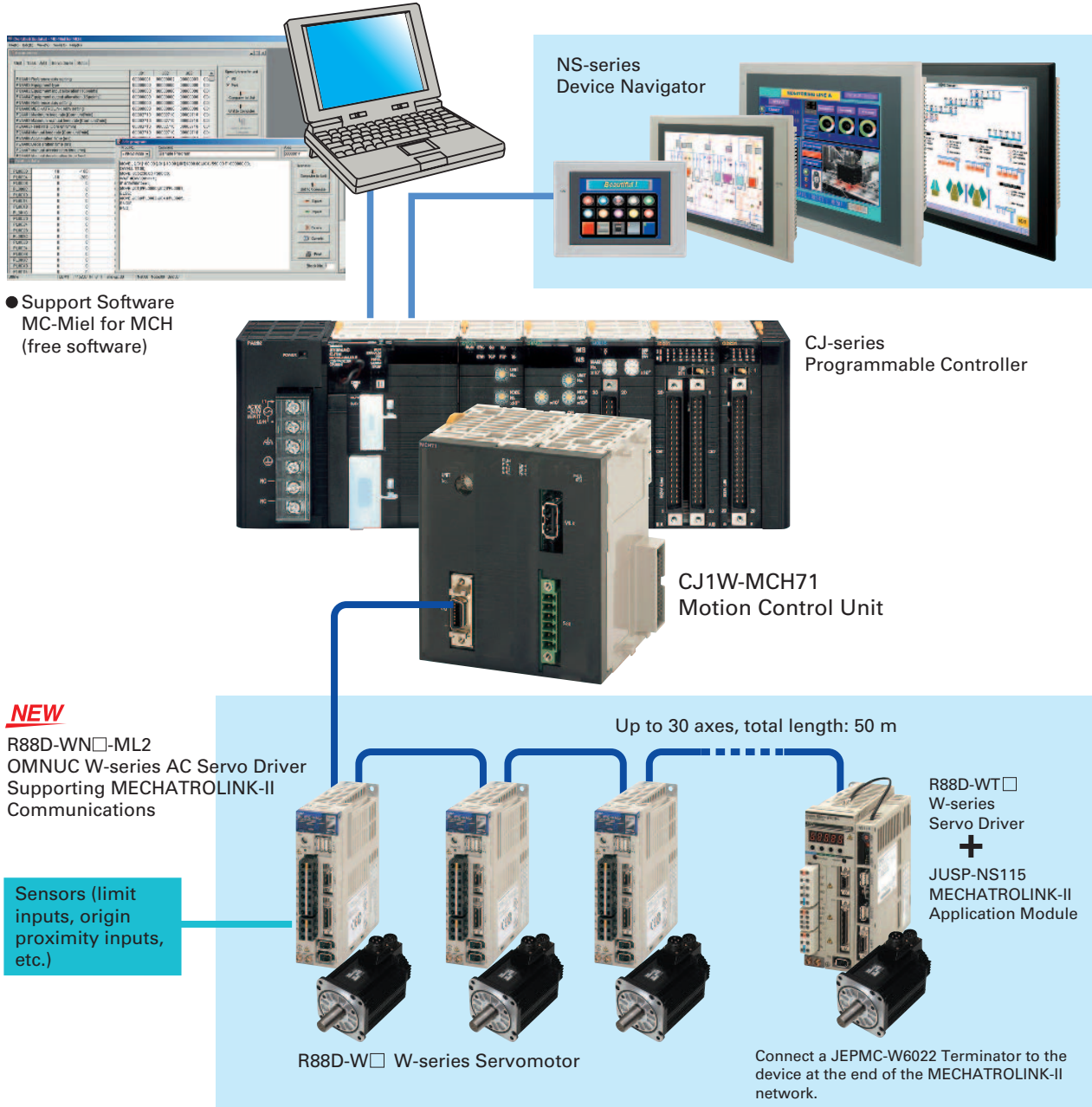
Easy Information Processing

● By using high-speed servo communications, motion programs, system parameters, system data, and servo driver parameters can be set and read from a Support Software running on a personal computer.

● Controller constants and variables, such as system constants, global variables, local variables, can all be read.

● Equipment control status and servo system operating conditions can be monitored.

● Programs and data can be backed up on CPU Unit Memory Cards.

Easy Motion Control

● Position control, synchronized control (electronic gear, electronic cam, follow-up), speed control, and torque control are all supported, enabling a wide range of applications.

● The servo communications cycle can be as short as 1 ms.

● Scheduled processing for Motion Controllers, servo drivers, and Distribution Modules enable consistent high-precision control.

● Eight motion tasks can be used to execute motion programs simultaneously. Branched execution is possible within programs, so both independent control and control involving multiple axes, such as interpolation and synchronization, can be achieved in one programming scheme.

● Global variables enable easily sharing data between tasks. Also, system variables can be used to monitor and use servo status within programs.

High flexibility

High precision

3

Highly Transparent Data Control with Communications Servo.

NS-series
Device Navigator

● Support Software
MC-Miel for MCH
(free software)

CJ-series
Programmable Controller

CJ1W-MCH71
Motion Control Unit

NEW

R88D-WN□-ML2
OMNUC W-series AC Servo Driver
Supporting MECHATROLINK-II
Communications

Sensors (limit inputs, origin proximity inputs, etc.)

Up to 30 axes, total length: 50 m

R88D-WT□
W-series
Servo Driver

+

JUSP-NS115
MECHATROLINK-II
Application Module

R88D-W□ W-series Servomotor

Connect a JEPMC-W6022 Terminator to the device at the end of the MECHATROLINK-II network.

Note:
MECHATROLINK-II is a registered trademark of Yaskawa Corporation. A Yaskawa JUSP-NS115 MECHATROLINK-II Interface Unit is required for an R88D-WT□ W-series Servo Driver. The versions listed below can be used. (The version is inscribed on the nameplate on the side.)
W-series Servo Driver: Ver. 39 or laterMECHATROLINK-II Interface Unit: Ver. □□□03 or laterThe devices listed in the table on the right can be connected to MECHATROLINK-II.
Up to 16 MECHATROLINK-II nodes (30 m max.) or 15 MECHATROLINK-II nodes (50 m max.) can be connected without a Repeater. Use a Repeater when connecting more than 16 (30 m max.) or 15 (50 m max.) MECHATROLINK-II nodes. (MECHATROLINK peripheral devices: Manufactured by Yaskawa)

Name	Specifications
MECHATROLINK-II Interface Unit	For W-series Servo Drivers
24-V DC I/O Module	64 inputs and 64 outputs
Counter Module	Reversible counters, 2 channels
Pulse Output Module	Pulse train positioning
MECHATROLINK-II Cable (for W Series; with ring core and USB connectors at both ends)	0.5, 1.0, 3.0, 5.0, 10.0, 20.0, or 30.0 m
MECHATROLINK-II Terminating Resistor	Terminating resistance
Repeater for MECHATROLINK-II	Repeater

4

Complex Control Operations Are Made Simple with Convenient Functions.

Functions

① Electronic Shaft (Electronic Gear) (CONNECT)

This function synchronizes with the main axis at the specified gear ratio. It allows for reductions in mechanical functions and labor requirements for machinery maintenance.

② Electronic Cam (CAM, CAMBOX)

An independent electronic cam can be positioned according to execution times specified in the cam data, and a synchronized electronic cam can be operated according to a cam table in synchronization with a specified main axis. A total of 16,000 points for all Units combined can be included for the cam data, and 32 cam tables can be set, enabling complex operations.

③ Virtual Axes

Any axis can be set as an axis performing an ideal movement. Setting it as the main axis for synchronized control simplifies design and debugging of programs and adjustment of synchronized operations. Also, when slippage occurs in motor operation and workpiece operation, the amount of compensation (for the amount of slippage) can be set as the target value for the virtual axis, and the compensation operation can be easily executed by means of the add axis travel function (below).

④ Add Axis Travel (ADDAX, ADDAXR)

This function adds the operation of a superimposed axis to a specified axis, making it easy to perform compensation in feeder and synchronization operations.

⑤ Follow-up Synchronization (SYNC, SYNCR)

From standby status, this function starts follow-up operation when the marker sensor turns ON and executes follow-up synchronization with the main axis. This is ideal for applications that process workpieces without stopping the line.

⑥ Electronic Links (SYNC)

This function enables the specified synchronized operation with acceleration at the start of synchronization, a ratio during synchronization, and deceleration at the end of synchronization. These specifications are specific for the actual application operation, enabling easy achievement of various types of synchronization operations.

● Other Operations

Various applications are made possible by means of a wide range of commands, such as MOVE TIME (MOVET), CHANGE TARGET (MOVEMODI), LATCH (LATCH: With hardware latch and window functions), TRAVERSE (MOVETRAV), TORQUE (TORQUE, TORQUER), SPEED (SPEED, SPEEDR).
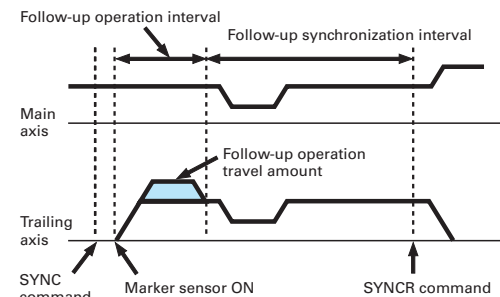
Support Software

MC-Miel for MCH (Free Software)
Makes it possible to create and access parameters and position data, to read, edit, and access cam data, to create and access motion programs, to monitor the present position and status, and to monitor and change variables.
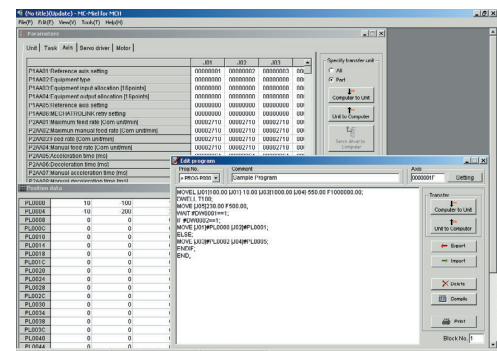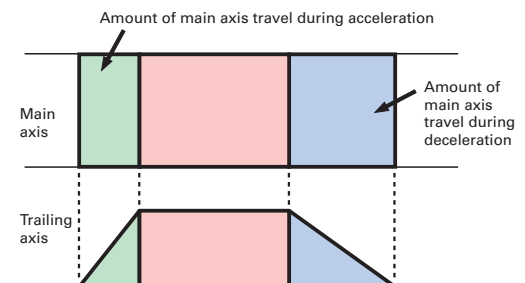
④ Add Axis Travel Function
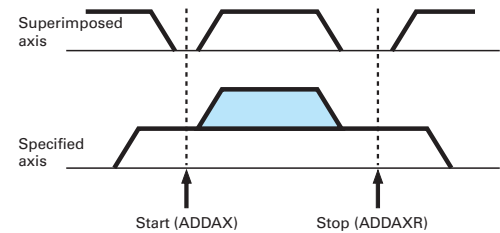
⑤ Follow-up Synchronization Function

⑥ Electronic Link Function

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Commands

Classification	Name	Command	Function
Axis movement	MOVE, LINEAR INTERPOLATION, CIRCULAR INTERPOLATION	MOVE, MCVEL MOVEC	Moves axes individually, or using linear or circular interpolation.
	ORIGIN SEARCH	DATUM	Finds the machine origin according to input signals.
	INTERRUPT INCHING	MOVEI	Changes the position by inching according to input signals.
	MOVE TIME	MOVET	Positions according to a specified time.
	TRAVERSE	MOVETRAV	Executes a winding operation.
	INDEPENDENT ELECTRONIC CAM	CAM	Executes cam operations according to a table.
Starting and stopping axis operations	LINK	MOVELINK	Synchronizes with the main axis with acceleration and deceleration.
	SYNCHRONIZED ELECTRONIC CAM	CAMBOX	Executes a cam operation according to a table and main axis.
	ELECTRONIC SHAFT	CONNECT	Synchronizes at fixed rate to main axis.
	FOLLOW-UP SYNCHRONIZATION	SYNC	Follows and synchronizes with the main axis.
	STOP SYNCHRONIZATION	SYNCR	Stops MOVELINK, CAMBOX, CONNECT, and SYNC.
	ADD AXIS TRAVEL	ADDAX, ADDAXR	Starts and stops the accumulation of travel amounts between axes.
	START SPEED, END SPEED	SPEED, SPEEDR	Outputs and stops a speed reference.
	START TORQUE, END TORQUE	TORQUE, TORQUER	Outputs and stops a torque reference.
Settings	CHANGE TARGET	MOVEMODI	Changes the target position for the axis that is travelling.
	ABSOLUTE SPECIFICATION, INCREMENTAL SPECIFICATION	ABL, INC	Handles coordinates as absolute or incremental values.
	CHANGE PARAMETER	PARAM	Changes parameter values at one time.
	PASS MODE	PASSMODE	Specifies operations with interpolation blocks connected.
	STOP MODE	STOPMODE	Waits for the interpolation block to be in position.
	SELECT MACHINE COORDINATE SYSTEM, SELECT WORKPIECE COORDINATE SYSTEM	ORIGIN, WORK	Selects either the machine coordinate system or the workpiece coordinate system.
	CHANGE WORKPIECE ORIGIN OFFSET	OFFPOS	Changes the offset of the workpiece coordinate system.
	LATCH	LATCH	Latches the present position.
	IGNORE SINGLE BLOCK	NSTOP	Ignores single block mode.
Controls	PROGRAM START, PROGRAM END	PROG, END	Marks the beginning or end of a program.
	SUBPROGRAM CALL, SUBPROGRAM END	GOSUB, RETURN	Calls a subprogram or ends a subprogram and returns to the source of the call.
	DWELL, WAIT	DWELL, WAIT	Waits for a specified length of time or for a specified condition to be met and then executes the next block.
	OPTIONAL END	STOPOP	Stops the block being executed when a specified condition is met.
	Conditional Branching	IF, ELS, ENDIF	Branches according to conditions.
	WHILE Repeat Commands	WHILE, WEND	Repeats until any specified condition is met.
	FOR Repeat Commands	FOR, NEXT	Repeats until specified count (constant, variable, or immediate) is met.
	Parallel Execution	PARALLEL, JOINT, JWAIT	Executes in parallel for the specified interval.
	Selected Execution	SWITCH, CASE, BREAK, DEFAULT, SEND	Switches and executes the specified section according to conditions.
	NO OPERATION SINGLE, NO OPERATION MULTIPLE	NOPS, NOPM	Nothing is executed. (Single or multiple execution command)
Simple operations	SUBSTITUTION	=	Substitutes values for variables.
	Arithmetic Operations	+, −, *, /, ^	Performs addition, subtraction, multiplication, division, and power operations.
	REMAINDER	%	Finds the remainder in division operations.
Logical operations	OR/ XOR/ AND/ NOT	:, ~, &, !	Performs logical OR, XOR, AND, and NOT operations.
Functions	ABSOLUTE	ABS	Finds the absolute value.
	SINE, COSINE, ASINE, ACOSINE	SIN, COS, ASIN, ACOS	Finds the sine, cosine, arcsine, or arccosine.
	TANGENT, ATANGENT	TAN, ATAN	Finds the tangent or arctangent.
	SQUARE ROOT, EXPONENT, LOGARITHM	SQR, EXP, LOG	Finds the square root, exponent, or logarithm.
	FRACTION	FRAC	Finds the decimal portion.
	SIGN	SGN	1 if greater than 0, and −1 if negative.
Bit operations	BIT ON, BIT OFF	SET, RESET	Turns a specified bit ON or OFF.
	RIGHT SHIFT, LEFT SHIFT	SFTR, SFTL	Shifts right or left for the specified number of bits.
Data operations	BCD → BIN/ BIN → BCD	BIN, BCD	Converts from BCD to binary, or from binary to BCD.
	BLOCK TRANSFER, BLOCK CLEAR	XFER, CLEAR	Transfers or clears a block of data.

Specifications

Item		Specifications	
Model		CS1W-MCH71	CJ1W-MCH71
Applicable PLCs		CS Series, new version (CS1□-CPU□□H)	CJ1H/CJ1M, unit version 2.0 or later
Unit Classification		CS-series CPU Bus Unit	CJ-series CPU Bus Unit
Backplanes on which MC Unit can be mounted		CPU Backplane or CS-series Expansion I/O Backplane	CPU Rack or CJ-series Expansion Rack
Data exchange with CPU Unit	Words allocated to Unit in CIO Area	Uses one unit number (25 words). Used for Unit and tasks: 11 to 25 words (depending on the number of tasks)	
	Words allocated to Unit in DM Area	Uses one unit number (100 words). Used for Unit and tasks: 32 to 74 words (depending on the number of tasks)	
	Any area (bits)	Axes: 0 to 64 words (depending on the maximum axis number used)	
	Any area (data)	Axes: 0 to 128 words (depending on the maximum axis number used)	
	Any area (data)	General I/O: 0 to 1,280 words (depending on the settings)	
Controlled devices		MECHATROLINK-II-compatible W-series Servo Driver (OMRON) + MECHATROLINK-II Interface Unit (Yaskawa), and various I/O Units (Yaskawa), 30 nodes max. **Note:** Up to 16 MECHATROLINK-II nodes (30 m max.) or 15 MECHATROLINK-II nodes (50 m max.) can be connected without a Repeater. Use a Repeater when connecting more than 16 (30 m max.) or 15 (50 m max.) MECHATROLINK-II nodes.	
Built-in programming language		Special motion control language	
Controls	Control method	MECHATROLINK-II (position, speed, and torque references)	
	Number of controlled axes	32 max., including 30 physical or virtual axes and 2 virtual axes (The 30 physical or virtual axes can be set individually.)	
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 the speed system parameter times the override.	
	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 (parallel branches with tasks: 8/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	
	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.	
	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.	
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 (free software)		Microsoft Windows 2000, XP, or NT 4.0 (Processor: Pentium, 100 MHz min., with at least 64 MB	
External power supply voltage		24 V DC (21.6 to 26.4 V DC)	
Internal current consumption		0.8 A or less for 5 VDC; 0.3 A or less for 24 VDC	0.6 A or less for 5 VDC; 0.3 A or less for 24 VDC
Weight (not including connectors)		300 g max.	210 g max.

Note: 1. Take the following factors into account when mounting Motion Control Units under a single CPU Unit:
   1) The maximum number of CPU Bus Units that can be allocated words in the CPU Unit
   2) The capacity of the Power Supply Unit on each CPU Rack or Expansion I/O Rack and the current consumption of the Units mounted on the Rack (For details, refer to the *Operation Manual* for the CPU Unit.)
2. The required power supply must be provided by the user.
3. The CJ1W(-MCH71) requires the space used for three standard Units.

7

AC Servo Driver and Servomotor Selection

●The following combinations of Servo Drivers and Servomotors can be connected to Motion Controllers.

Combination	Servo Driver	AC Servomotor
①	R88D-WN□□□-ML2 OMNUC W-series AC Servo Driver supporting MECHATROLINK-II communications	OMNUC W-series AC Servomotor Use a 200-V AC Servomotor for both 100-V and 200-V Servo Drivers.
②	R88D-WT□□□ OMNUC W-series AC Servo Driver with MECHATROLINK-II Interface Unit	OMNUC W-series AC Servomotor

●R88D-□-ML2 Servo Drivers with MECHATROLINK-II Communications

						① R88D-□-ML2 Servo Drivers with MECHATROLINK-II Communications			② Servo Drivers R88D-			Application
Type	Rated speed (maximum number of rotations)	Capacity	International standards CE, UL/cUL	Shaft end (not using decelerator)	Enclosure rating	100 V	200 V single phase	200 V three phase	100 V	200 V single phase	200 V three phase	
Cylinder	3000 r/min (5000 r/min)	30 W	Approved	Straight / With key / With key and tap / Straight with tap	IP55 (excluding shaft opening)	—	—	—	WTA3HL	WTA3H	—	●Low-inertia machines ●Machines with fast tact time — Robots — Assembly machines — Conveyors
		50 W				WNA5L	WNA5H	—	WTA5HL	WTA5H	—	
		100 W				WN01L	WN01H	—	WT01HL	WT01H	—	
		200 W				WN02L	WN02H	—	WT02HL	WT02H	—	
		400 W				WN04L	WN04H	—	—	WT04H	—	
		750 W				—	WN08H	—	—	WT08H*	WT08H	
		1 KW		With key and tap / Straight	IP67 (excluding shaft opening)	—	—	WN10H	—	—	WT10H	
		1.5 KW				—	—	WN15H	—	—	WT15H	
		2 KW				—	—	WN20H	—	—	WT20H	
		3KW				—	—	WN30H	—	—	WT30H	
		4 KW				—	—	—	—	—	WT50H	
		5 KW				—	—	—	—	—	WT50H	
	1500 r/min (3000 r/min)	450 W	Approved	With key and tap / Straight	IP67 (excluding shaft opening)	—	—	WN05H	—	—	WT05H	●Machines requiring high torque — Simple processing machines — Assembly machines — Transfer machines
		850 W				—	—	WN10H	—	—	WT10H	
		1.3 KW				—	—	WN15H	—	—	WT15H	
		1.8 KW				—	—	WN20H	—	—	WT20H	
		2.9 KW				—	—	—	—	—	WT30H	
		4.4 KW				—	—	—	—	—	WT50H	
		5.5 KW				—	—	—	—	—	WT60H	
		7.5 KW				—	—	—	—	—	WT75H	
	1500 r/min (2000 r/min)	11 KW				—	—	—	—	—	WT150H	
		15 KW				—	—	—	—	—	WT150H	
	1000 r/min (2000 r/min)	300 W	Approved	With key and tap / Straight	IP67 (excluding shaft opening)	—	—	WN05H	—	—	WT05H	●Machines requiring high torque — Simple processing machines — Assembly machines — Transfer machines
		600 W				—	—	WN10H	—	—	WT08H	
		900 W				—	—	WN10H	—	—	WT10H	
		1.2 KW				—	—	WN15H	—	—	WT15H	
		2 KW				—	—	WN20H	—	—	WT20H	
		3 KW				—	—	—	—	—	WT30H	
		4 KW				—	—	—	—	—	WT50H	
		5.5 KW				—	—	—	—	—	WT60H	
Slim profile	3000 r/min (5000 r/min)	100 W	Approved	Straight / With key / With key and tap / Straight with tap	IP55 (excluding shaft opening) IP67	WN01L	WN01H	—	WT01HL	WT01H	—	●Machines with limited motor depth ●Machines requiring water-resistant motors — Semiconductor manufacturing machines — Food-processing machines — AGVs
		200 W				WN02L	WN02H	—	WT02HL	WT02H	—	
		400 W				WN04L	WN04H	—	—	WT04H	—	
		750 W				—	WN08H	—	—	WT08H*	WT08H	
		1.5 KW				—	—	WN15H	—	—	WT15H	

✱Power supply wiring must be partly changed when using 200-V single-phase Servo Drivers.
The power supply input specifications are 220 to 230 VAC (+10% to −15%).

Motion Controller Unit Dimensions

● Standard Models

Name	Model
Motion Control Unit	CS1W-MCH71
Support Software for CS1W-MCH71	MC-Miel for MCH Unit (free of charge)

● Software

| Specifications	Model	Catalog number
Support Software for CS1W-MCH71/CJ1W-MCH71 (Japanese)	MC-Miel for MCH	SBCE-023
Support Software for CS1W-MCH71/CJ1W-MCH71 (English)	MC-Miel for MCH	I809-E1

● MECHATROLINK-related Devices and Cables

| Name	Yaskawa model number	OMRON model number	Remarks
MECHATROLINK-II Interface Unit	JUSP-NS115	FNY-NS115	For W-series Servo Drivers
24-V DC I/O Module	JEPMC-IO2310	FNY-IO2310	64 inputs, 64 outputs
Counter Module	JEPMC-PL2900	FNY-PL2900	Reversible counters, 2 channels
Pulse Output Module	JEPMC-PL2910	FNY-PL2910	Pulse train positioning, 2 channels
MECHATROLINK-II Cables (For W Series, with ring core and USB connectors at both ends)	JEPMC-W6003-A5	FNY-W6003-A5	0.5m
	JEPMC-W6003-01	FNY-W6003-01	1.0m
	JEPMC-W6003-03	FNY-W6003-03	3.0m
	JEPMC-W6003-05	FNY-W6003-05	5.0m
	JEPMC-W6003-10	FNY-W6003-10	10.0m
	JEPMC-W6003-20	FNY-W6003-20	20.0m
	JEPMC-W6003-30	FNY-W6003-30	30.0m
MECHATROLINK-II Terminating Resistor	JEPMC-W6022	FNY-W6022	Terminating resistance
Repeater for MECHATROLINK-II	JEPMC-REP2000	FNY-REP2000	Communications repeater

MECHATROLINK-related devices and cables are made by Yaskawa Corporation, but they can be ordered through OMRON as well.
When ordering Yaskawa products through OMRON, please use the OMRON model numbers.
(The brand name is still Yaskawa, even though the order is placed through OMRON.)
Please check with your OMRON representative for prices.

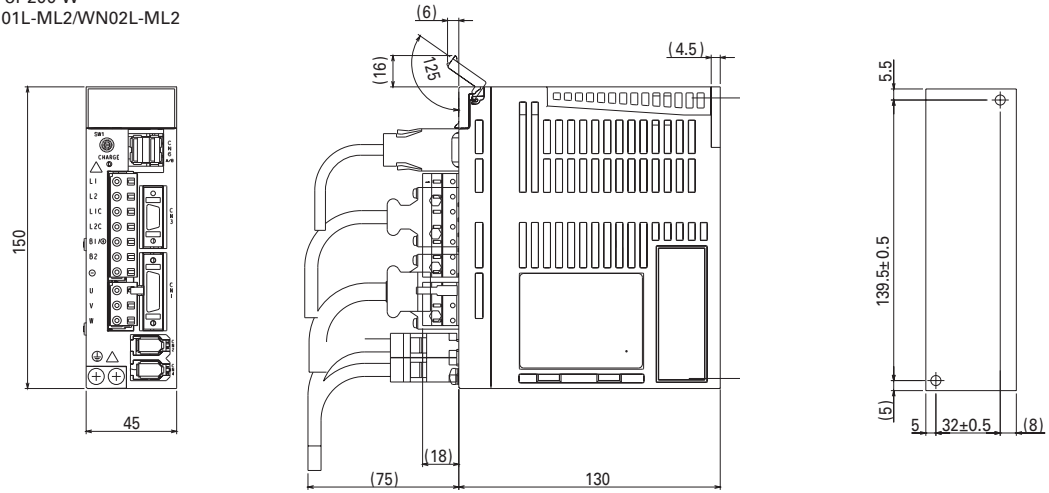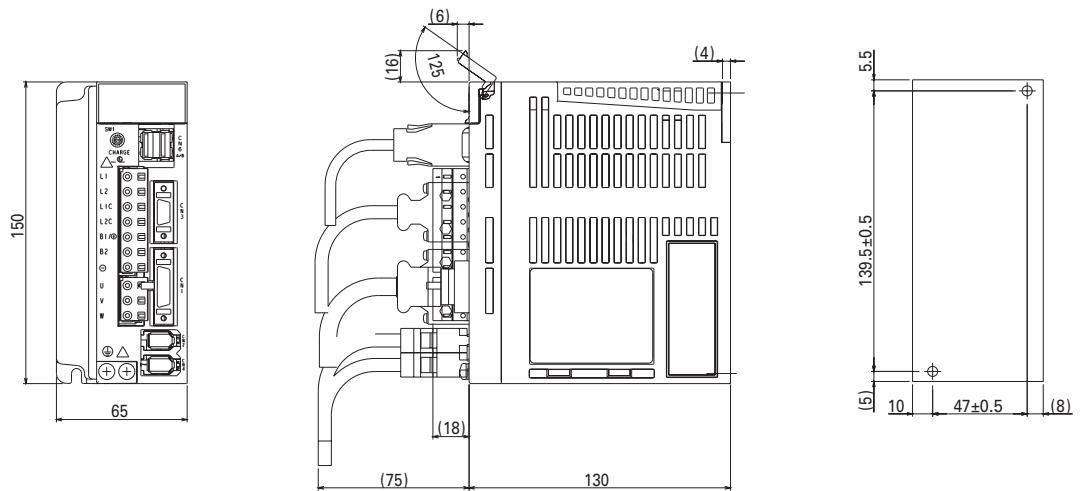## ● Dimensions (Unit: mm)
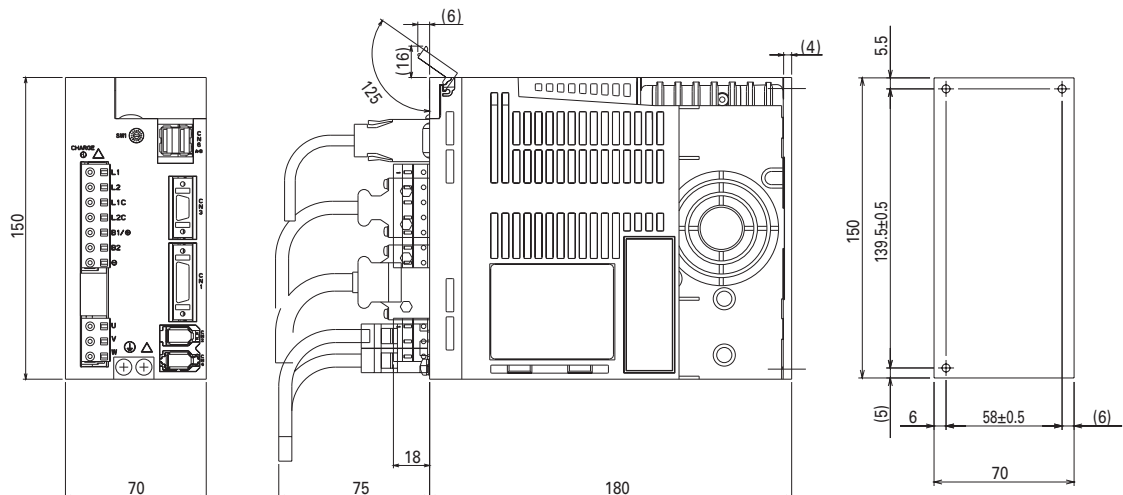
CS1W-MCH71
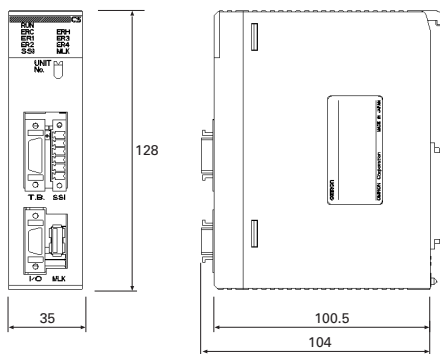
CJ1W-MCH71
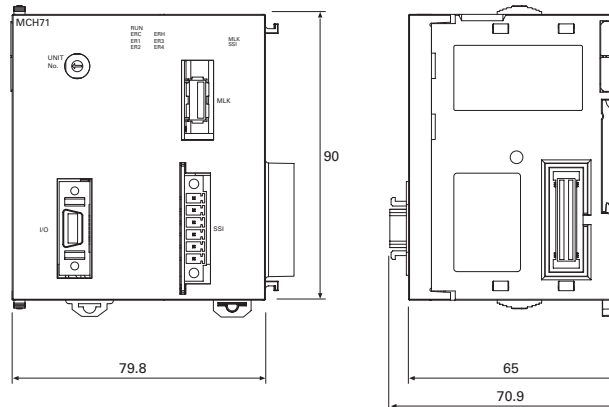
● **AC Servo Drivers**

• 200 VAC: 50 W, 100 W, or 200 W
  R88D-WNA5H-ML2/WN01H-ML2/WN02H-ML2
• 100 VAC: 50 W, 100 W, or 200 W
  R88D-WNA5L-ML2/WN01L-ML2/WN02L-ML2
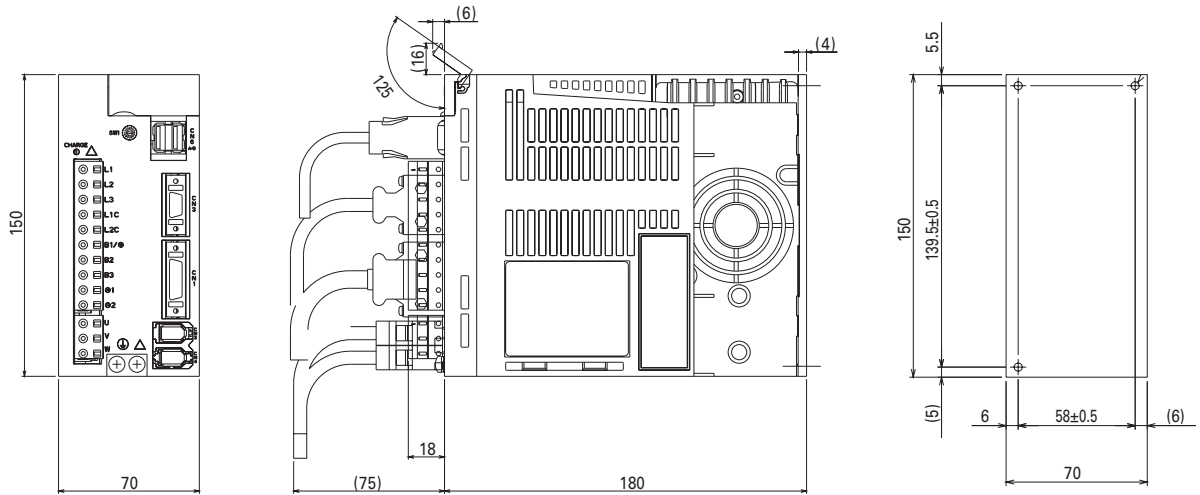
• 200 VAC: 400 W
  R88D-WN04H-ML2

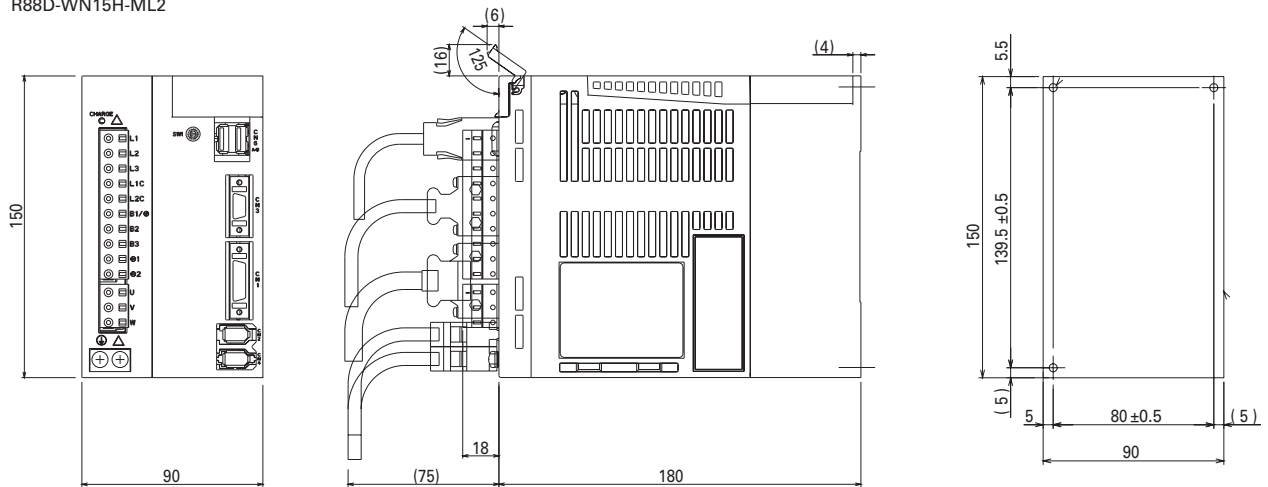• 100 VAC: 400 W
  R88D-WN04L-ML2

• 200 VAC: 500 W, 750 W, or 1 KW
R88D-WN05H-ML2/WN08H-ML2/WN10H-ML2

• 200 VAC: 1.5 KW
R88D-WN15H-ML2

• 200 VAC: 2 KW or 3 KW
R88D-WN20H-ML2/WN30H-ML2