OMRON

Machine Automation Controller

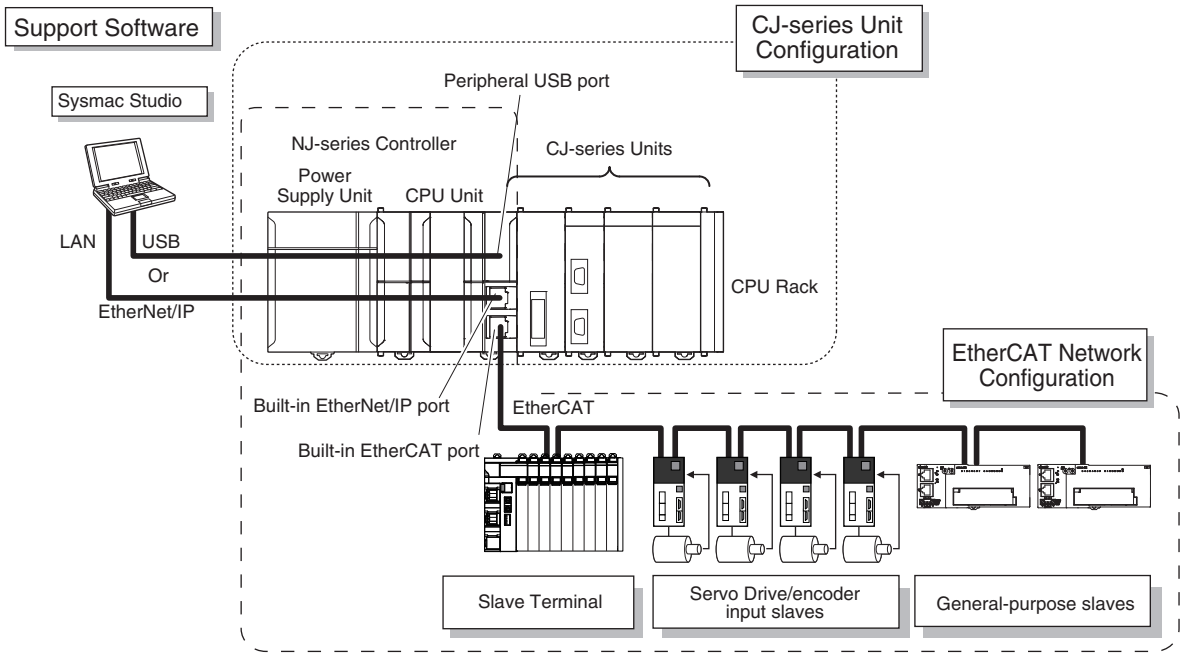
NJ-Series

Controller that covers functions and high-speed processing required for machine control and safety, reliability and maintainability

Features

- Implemented OPC UA as standard feature. OPC UA (NJ501-1□00)
- Integration of Logic and Motion in one CPU.
- Conforms to IEC 61131-3 (JIS B 3503) standard programming and PLCopen function blocks for Motion Control. Programming with variables allows users to create complex programs efficiently.
- Fast and accurate control by synchronizing all EtherCAT devices, such as vision sensors, servo drives, and field devices, with the PLC and Motion Engines.
- Offers speed without compromising on reliability and robustness expected from PLCs.
- Complete RAS functions: Transmission frame error check, timeout, bus diagnosis, Watchdog (WDT), memory check, and topology check, etc.
- Ideal for small-scale control with up to 8 axes. (NJ301-□□□□)
- Ideal for simple machines. (NJ101-□□□□)
- Linear and circular interpolation.
- Electronic gear and cam synchronization.
- The Controller can be directly connected to a database. No special Unit, software, nor middleware is required. (NJ501-□□20/NJ101-□020)
- The NJ501 SECS/GEM CPU Unit has built-in the SECS/GEM communications functions which are the standards in the semiconductor industry. (NJ501-1340)
- Control function of parallel link robots, cartesian robots and serial link robots. (NJ501-4□□0)
- Integration of Logic, Motion, OMRON Robot and Kinematics in one CPU. (NJ501-R□□0)
- Realize high-accuracy synchronization motion control (MC) and numerical control (NC) functions by ONE controller. G-Code available. (NJ501-5300)

System Configuration

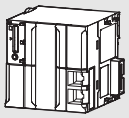
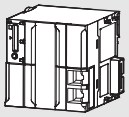
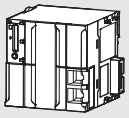


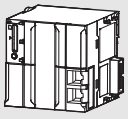
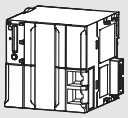
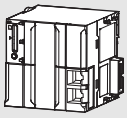
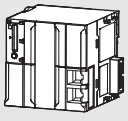
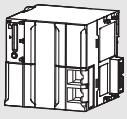
Ordering Information

Applicable standards

Refer to the OMRON website (www.ia.omron.com) or ask your OMRON representative for the most recent applicable standards for each model.

CPU Units

Product name	Specifications				Model
	I/O capacity / maximum number of configuration Units (Expansion Racks)	Program capacity	Memory capacity for variables	Number of motion axes	
NJ501 CPU Units OPC UA Support 	2,560 points / 40 Units (3 Expansion Racks)	20 MB	2 MB: Retained during power interruption 4 MB: Not retained during power interruption	64	**NJ501-1500**
				32	**NJ501-1400**
				16	**NJ501-1300**
NJ301 CPU Units 		5 MB	0.5 MB: Retained during power interruption 2 MB: Not retained during power interruption	8	**NJ301-1200**
				4	**NJ301-1100**
NJ101 CPU Units 		3 MB		2	**NJ101-1000**
				0	**NJ101-9000**

Product name	Specifications									Model
	I/O capacity / maximum number of configuration Units (Expansion Racks)	Program capacity	Memory capacity for variables	Number of motion axes	Database Connection function	SECS/GEM Communication function	Number of controlled robots	Number of controlled OMRON robots	Numerical Control Functions	
Database Connection CPU Units 	2,560 points / 40 Units (3 Expansion Racks)	20 MB	2 MB: Retained during power interruption 4 MB: Not retained during power interruption	64	Yes	No	---	---	No	**NJ501-1520**
				32						**NJ501-1420**
				16						**NJ501-1320**
		3 MB	0.5 MB: Retained during power interruption 2 MB: Not retained during power interruption	2						**NJ101-1020**
				0						**NJ101-9020**
SECS/GEM CPU Unit 	2,560 points / 40 Units (3 Expansion Racks)	20 MB	2 MB: Retained during power interruption 4 MB: Not retained during power interruption	16	No	Yes	---	---	No	**NJ501-1340**
NJ Robotics CPU Units 				64		No	8 max. *1			**NJ501-4500**
				32						**NJ501-4400**
				16						**NJ501-4300**
							1			**NJ501-4310**
					Yes		8 max. *1			**NJ501-4320**
Robot Integrated CPU Units 				64	No			8 max.		**NJ501-R500**
					Yes					**NJ501-R520**
				32	No					**NJ501-R400**
					Yes					**NJ501-R420**
				16	No					**NJ501-R300**
					Yes					**NJ501-R320**
NC Integrated Controller 				16 *2	No		---	---	Yes *3	**NJ501-5300**

*1. The number of controlled robots varies according to the number of axes used for the system.
*2. The number of controlled axes of the MC Control Function Module is included.
*3. One CNC Operator License (SYSMAC-RTNC0001L) is attached with the CPU Unit.

Accessories

The following accessories come with the CPU Unit.

Product name	Model
Battery	CJ1W-BAT01
End Cover	CJ1W-TER01 (must be attached to the right end of the CPU Rack)
End Plate	PFP-M (2 required)
SD Memory Card (Flash Memory)	NJ501-□□20, NJ501-1340, NJ501-R□□□: HMC-SD492 NJ101-□□20: HMC-SD292

Power Supply Units

One Power Supply Unit is required for each Rack.

Product name	Power supply voltage	Output current		Output capacity	Options			Model
		5-VDC output capacity	24-VDC output capacity	Total power consumption	24-VDC service power supply	RUN output	Maintenance forecast monitor	
AC Power Supply Unit	100 to 240 VAC	6.0 A	1.0 A	30 W	No	Yes	No	**NJ-PA3001**
DC Power Supply Unit	24 VDC							**NJ-PD3001**

Note: Power supply units for the CJ-Series cannot be used as a power supply for a CPU rack of the NJ system or as a power supply for an expansion rack.

Expansion Racks

Select the I/O Control Unit, I/O Interface Unit, Expansion Connecting Cable, and Power Supply Unit.

CJ-Series I/O Control Unit (Mounted on CPU Rack when Connecting Expansion Racks)

Product name	Specifications	Current consumption (A)		Model
		5 V	24 V	
CJ-Series I/O Control Unit 	Mount one I/O Control Unit on the CJ-Series CPU Rack when connecting one NJ-Series Expansion Racks. Connecting Cable: CS1W-CN□□3 Expansion Connecting Cable Connected Unit: CJ1W-II101 I/O Interface Unit Mount to the right of the CPU Unit.	0.02	---	**CJ1W-IC101**

Note: Mounting the I/O Control Unit in any other location may cause faulty operation.

CJ-Series I/O Interface Unit (Mounted on Expansion Rack)

Product Name	Specifications	Current consumption (A)		Model
		5 V	24 V	
CJ-Series I/O Interface Unit 	One I/O Interface Unit is required on each Expansion Rack. Connecting Cable: CS1W-CN□□3 Expansion Connecting Cable Mount to the right of the Power Supply Unit.	0.13	---	**CJ1W-II101**

Note: Mounting the I/O Interface Unit in any other location may cause faulty operation.

I/O Connecting Cables

Product name	Specifications		Model
I/O Connecting Cable 	• Connects an I/O Control Unit on NJ-Series CPU Rack to an I/O Interface Unit on a NJ-Series Expansion Rack. or • Connects an I/O Interface Unit on NJ-Series Expansion Rack to an I/O Interface Unit on another NJ-Series Expansion Rack.	Cable length: 0.3 m	**CS1W-CN313**
		Cable length: 0.7 m	**CS1W-CN713**
		Cable length: 2 m	**CS1W-CN223**
		Cable length: 3 m	**CS1W-CN323**
		Cable length: 5 m	**CS1W-CN523**
		Cable length: 10 m	**CS1W-CN133**
		Cable length: 12 m	**CS1W-CN133-B2**

Automation Software Sysmac Studio

The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX-series CPU Units, NY-series Industrial PC, EtherCAT Slave, and the HMI.

For details, refer to your local OMRON website and Sysmac Studio Catalog (Cat. No. P138).

Collection of software functional components Sysmac Library

Please download it from following URL and install to Sysmac Studio.
https://www.ia.omron.com/sysmac_library/

Typical Models

Product	Features	Model
Vibration Suppression Library	The Vibration Suppression Library is used to suppress residual vibration caused by the operation of machines.	**SYSMAC-XR006**
Device Operation Monitor Library	The Device Operation Monitor Library is used to monitor the operation of devices such as air cylinders, sensors, motors, and other devices.	**SYSMAC-XR008**
Dimension Measurement Library	The Dimension Measurement Library is used to dimension measurement with ZW-8000/7000/5000 Confocal Fiber Displacement Sensor, or E9NC-TA0 Contact-Type Smart Sensor.	**SYSMAC-XR014**

SECS/GEM Configurator (For NJ-series SECS/GEM CPU Unit NJ501-1340)

Please purchase the required number of SECS/GEM Configurator licenses and a Sysmac Studio Standard Edition DVD the first time you purchase the SECS/GEM Configurator.
The Sysmac Studio Standard Edition DVD includes the SECS/GEM Configurator. The license does not include the DVD.

Product Name	Specifications			Model
		Number of licenses	Media	
SECS/GEM Configurator Ver.1.□□	The SECS/GEM Configurator is the software to make HSMS, SECSII and GEM settings for NJ501 SECS/GEM CPU Units. The software is included in the Sysmac Studio Standard Edition DVD.	1 license	---	**WS02-GCTL1**

Operation Software CNC Operator (For NJ-series NC Integrated Controller NJ501-5300)

Please purchase a DVD or download it from following URL.
http://www.ia.omron.com/cnc-operator/
One CNC Operator License (SYSMAC-RTNC0001L) is attached with the CPU Unit.

Product Name	Specifications			Model
		Number of licenses	Media	
CNC Operator	The CNC Operator is the software that provides a operation interface for NC programming, debugging and maintenance of CNC machine.	--- (Installer only)	--- (Download)	**SYSMAC-RTNC0000**
		--- (Media only)	DVD	**SYSMAC-RTNC0000D**
CNC Operator License	The one license key (hardware key, USB dongle). The CNC Operator needs license key.	1 license	---	**SYSMAC-RTNC0001L**
CNC Operator Software Development Kit	The CNC Operator Software Development Kit provides a environment for customization of CNC Operator. Supported execution environment: NET Framework (4.6.1) Development environment: Visual Studio 2013/2015 Development languages: C#	---	DVD	**SYSMAC-RTNC0101D**

Recommended EtherCAT and EtherNet/IP Communications Cables

Use a straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (aluminum tape and braiding) for EtherCAT.
For EtherNet/IP, required specification for the communications cables varies depending on the baud rate.
For 100BASE-TX/10BASE-T, use a straight or cross STP (shielded twisted-pair) cable of category 5 or higher.
For 1000BASE-T, use a straight or cross STP cable of category 5e or higher with double shielding (aluminum tape and braiding).

Cable with Connectors

Item		Recommended manufacturer	Cable length (m)	Model
Wire Gauge and Number of Pairs: AWG26, 4-pair Cable Cable Sheath material: PUR	Cable with Connectors on Both Ends (RJ45/RJ45) Standard RJ45 plug type *1 Cable color: Yellow *2 	OMRON	0.3	**XS6W-6PUR8SS30CM-YF**
			0.5	**XS6W-6PUR8SS50CM-YF**
			1	**XS6W-6PUR8SS100CM-YF**
			2	**XS6W-6PUR8SS200CM-YF**
			3	**XS6W-6PUR8SS300CM-YF**
			5	**XS6W-6PUR8SS500CM-YF**
Wire Gauge and Number of Pairs: AWG22, 2-pair cable	Cable with Connectors on Both Ends (RJ45/RJ45) Rugged RJ45 plug type *1 Cable color: Light blue 	OMRON	0.3	**XS5W-T421-AMD-K**
			0.5	**XS5W-T421-BMD-K**
			1	**XS5W-T421-CMD-K**
			2	**XS5W-T421-DMD-K**
			5	**XS5W-T421-GMD-K**
			10	**XS5W-T421-JMD-K**
	Cable with Connectors on Both Ends (M12 Straight/M12 Straight) Shield Strengthening Connector cable *3 M12/Smartclick Connectors Cable color: Black 	OMRON	0.5	**XS5W-T421-BM2-SS**
			1	**XS5W-T421-CM2-SS**
			2	**XS5W-T421-DM2-SS**
			3	**XS5W-T421-EM2-SS**
			5	**XS5W-T421-GM2-SS**
			10	**XS5W-T421-JM2-SS**
	Cable with Connectors on Both Ends (M12 Straight/RJ45) Shield Strengthening Connector cable *3 M12/Smartclick Connectors Rugged RJ45 plug type Cable color: Black 	OMRON	0.5	**XS5W-T421-BMC-SS**
			1	**XS5W-T421-CMC-SS**
			2	**XS5W-T421-DMC-SS**
			3	**XS5W-T421-EMC-SS**
			5	**XS5W-T421-GMC-SS**
			10	**XS5W-T421-JMC-SS**

*1. Cables with standard RJ45 plugs are available in the following lengths: 0.2 m, 0.3 m, 0.5 m, 1 m, 1.5 m, 2 m, 3 m, 5 m, 7.5 m, 10 m, 15 m, 20 m. Cables with rugged RJ45 plugs are available in the following lengths: 0.3 m, 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m, 15 m. For details, refer to the *Industrial Ethernet Connectors Catalog* (Cat. No. G019).
*2. Cable colors are available in yellow, green, and blue.
*3. For details, contact your OMRON representative.

Cables / Connectors

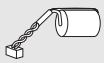
Item			Recommended manufacturer	Model
Products for EtherCAT or EtherNet/IP (1000BASE-T*2/100BASE-TX)	Wire Gauge and Number of Pairs: AWG24, 4-pair Cable	Cables	Hitachi Metals, Ltd.	NETSTAR-C5E SAB 0.5 × 4P CP *1
			Kuramo Electric Co.	KETH-SB *1
		RJ45 Connectors	Panduit Corporation	MPS588-C *1
Products for EtherCAT or EtherNet/IP (100BASE-TX/10BASE-T)	Wire Gauge and Number of Pairs: AWG22, 2-pair Cable	Cables	Kuramo Electric Co.	KETH-PSB-OMR *3
			JMACS Japan Co., Ltd.	PNET/B *3
		RJ45 Assembly Connector 	OMRON	XS6G-T421-1 *3

*1. We recommend you to use the above Cable and RJ45 Connector together.
*2. The products can be used only with the NX701.
*3. We recommend you to use the above Cable and RJ45 Assembly Connector together.

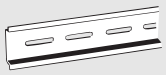
Optional Products and Maintenance Products

Product name	Specifications	Model
Memory Cards	SD memory card, 2GB	HMC-SD292
	SDHC memory card, 4GB	HMC-SD492
	SDHC memory card, 16GB	HMC-SD1A2 *1

*1. 16 GB memory card can be used for the NJ□01-□□00 version 1.21 or later.

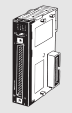
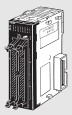
Product name	Specifications		Model
Battery Set 	Battery for NX701-□□□□/NJ501-□□□□/ NJ301-□□□□/NJ101-□□□□ NJ/NX-Series CPU Unit maintenance	Note: 1. The battery is included as a standard accessory with the CPU Unit. 2. The battery service life is 5 years at 25°C. (The service life depends on the ambient operating temperature and the power conditions.) 3. Use batteries within two years of manufacture.	CJ1W-BAT01
End Cover 	Mounted to the right-hand side of NJ-Series CPU Racks or Expansion Racks.	One End Cover is provided as a standard accessory with each CPU Unit and I/O Interface Unit.	CJ1W-TER01

DIN Track Accessories

Product name	Specifications	Model
DIN Track 	Length: 0.5 m; Height: 7.3 mm	PFP-50N
	Length: 1 m; Height: 7.3 mm	PFP-100N
	Length: 1 m; Height: 16 mm	PFP-100N2
End Plate 	There are 2 stoppers provided with CPU Units and I/O Interface Units as standard accessories to secure the Units on the DIN Track.	PFP-M

Basic I/O Units

Input Units

Unit classification	Product name	Specifications				Number of bits allocated	Response time *1		Current consumption (A)		Model
		I/O points	Input voltage and current	Commons	External connection		ON	OFF	5 V	24 V	
CJ1 Basic I/O Units	DC Input Units 	8 inputs	12 to 24 VDC, 10 mA	Independent contacts	Removable terminal block	16	20 μs max.	400 μs max.	0.08	---	**CJ1W-ID201**
		16 inputs	24 VDC, 7 mA	16 points, 1 common	Removable terminal block	16	20 μs max.	400 μs max.	0.08	---	**CJ1W-ID211**
		16 inputs High-speed type	24 VDC, 7 mA	16 points, 1 common	Removable terminal block	16	15 μs max.	90 μs max.	0.13	---	**CJ1W-ID212**
		32 inputs	24 VDC, 4.1 mA	16 points, 1 common	Fujitsu/OTAX connector	32	20 μs max.	400 μs max.	0.09	---	**CJ1W-ID231 *2**
		32 inputs	24 VDC, 4.1 mA	16 points, 1 common	MIL connector	32	20 μs max.	400 μs max.	0.09	---	**CJ1W-ID232 *2**
		32 inputs High-speed type	24 VDC, 4.1 mA	16 points, 1 common	MIL connector	32	15 μs max.	90 μs max.	0.20	---	**CJ1W-ID233 *2**
		64 inputs	24 VDC, 4.1 mA	16 points, 1 common	Fujitsu/OTAX connector	64	120 μs max.	400 μs max.	0.09	---	**CJ1W-ID261 *2**
		64 inputs	24 VDC, 4.1 mA	16 points, 1 common	MIL connector	64	120 μs max.	400 μs max.	0.09	---	**CJ1W-ID262 *2**
	AC Input Units 	8 inputs	200 to 24 VAC, 10 mA (200 V, 50 Hz)	8 points, 1 common	Removable Terminal Block	16	10 μs max.	40 μs max.	0.08	---	**CJ1W-IA201**
		16 inputs	100 to 120 VAC, 7 mA (100 V, 50 Hz)	16 points, 1 common	Removable Terminal Block	16	10 μs max.	40 μs max.	0.09	---	**CJ1W-IA111**

*1 This is the input response time when no filter (i.e., 0 ms) is set.
*2 The cable-side connector is not provided with Units equipped with cables. Purchase the 40-pin connector separately (Refer to page 11), or use an OMRON *XW2K Series Datasheet* (Cat. No. G152) and *XW2R Datasheet* or a G7□ I/O Relay Terminal.

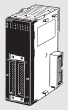
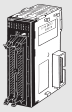
Output Units

Unit classification	Product name	Specifications					Number of bits allocated	Current consumption (A)		Model
		Output type	I/O points	Maximum switching capacity	Commons	External connection		5 V	24 V	
CJ1 Basic I/O Units	Relay Contact Output Units 	–	8 outputs	250 VAC/24 VDC, 2 A	Independent contacts	Removable terminal block	16	0.09	0.048 max.	**CJ1W-OC201**
		–	16 outputs	250 VAC/24 VDC, 2 A	16 points, 1 common	Removable terminal block	16	0.11	0.096 max.	**CJ1W-OC211**
	Triac Output Unit 	–	8 outputs	250 VAC, 0.6 A	8 points, 1 common	Removable terminal block	16	0.22	–	**CJ1W-OA201**
	Transistor Output Units   	Sinking	8 outputs	12 to 24 VDC, 2 A	4 points, 1 common	Removable terminal block	16	0.09	–	**CJ1W-OD201**
		Sinking	8 outputs	12 to 24 VDC, 0.5 A	8 points, 1 common	Removable terminal block	16	0.10	–	**CJ1W-OD203**
		Sinking	16 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common	Removable terminal block	16	0.10	–	**CJ1W-OD211 *1**
		Sinking	16 outputs High-speed type	24 VDC, 0.5 A	16 points, 1 common	Removable terminal block	16	0.15	–	**CJ1W-OD213 *1**
		Sinking	32 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common	Fujitsu/OTAX connector	32	0.14	–	**CJ1W-OD231 *2**
		Sinking	32 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common	MIL connector	32	0.14	–	**CJ1W-OD233 *1, *2**
		Sinking	32 outputs High-speed type	24 VDC, 0.5 A	16 points, 1 common	MIL connector	32	0.22	–	**CJ1W-OD234 *1, *2**
		Sinking	64 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common	Fujitsu/OTAX connector	64	0.17	–	**CJ1W-OD261 *2**
		Sinking	64 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common	MIL connector	64	0.17	–	**CJ1W-OD263 *2**
		Sourcing	8 outputs	24 VDC, 2 A Short-circuit protection	4 points, 1 common	Removable terminal block	16 *1	0.11	–	**CJ1W-OD202**
		Sourcing	8 outputs	24 VDC, 0.5 A Short-circuit protection	8 points, 1 common	Removable terminal block	16 *1	0.10	–	**CJ1W-OD204**
		Sourcing	16 outputs	24 VDC, 0.5 A Short-circuit protection	16 points, 1 common	Removable terminal block	16	0.10	–	**CJ1W-OD212**
		Sourcing	32outputs	24 VDC, 0.5 A Short-circuit protection	16 points, 1 common	MIL connector	32	0.15	–	**CJ1W-OD232 *2**
		Sourcing	64 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common	MIL connector	64	0.17	–	CJ1W-OD262 *2

*1 The ON/OFF response time for the CJ1W-OD213/CJ1W-OD234 is shorter than for the CJ1W-OD211/CJ1WOD233, as shown below.
- ON response time: 0.1 ms improved to 0.015 ms
- OFF response time: 0.8 ms improved to 0.08 ms

*2 Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON *XW2K Series Datasheet* (Cat. No. G152) and *XW2R Datasheet* or a G7□ I/O Relay Terminal.

I/O Units

Unit classification	Product name	Specifications					Number of bits allocated	Current consumption (A)		Model
		Output type	I/O points	Input voltage, Input current / Maximum switching capacity	Commons	External connection		5 V	24 V	
CJ1 Basic I/O Units	DC Input/ Transistor Output Units 	Sinking	16 inputs	24 VDC, 7 mA	16 points, 1 common	Fujitsu/OTAX connector	32	0.13	---	**CJ1W-MD231 *2**
			16 outputs	250 VAC/24 VDC, 0.5 A	16 points, 1 common					
		Sinking	16 inputs	24 VDC, 7 mA	16 points, 1 common	MIL connector	64	0.13	---	**CJ1W-MD233 *2**
			16 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common					
		Sinking	32 inputs	24 VDC, 4.1 mA	16 points, 1 common	Fujitsu/OTAX connector	32	0.14	---	**CJ1W-MD261 *1**
			32 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common					
		Sinking	32 inputs	24 VDC, 4.1 mA	16 points, 1 common	MIL connector	64	0.14	---	**CJ1W-MD263 *1**
			32 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common					
		Sourcing	16 inputs	24 VDC, 7 mA	16 points, 1 common	MIL connector	32	0.13	---	**CJ1W-MD232 *2**
			16 outputs	24 VDC, 0.5 A Short-circuit protection	16 points, 1 common					
	TTL I/O Units 	---	32 inputs	5 VDC, 35 mA	16 points, 1 common	MIL connector	64	0.19	---	**CJ1W-MD563 *1**
			32 outputs	5 VDC, 35 mA	16 points, 1 common					

*1 Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON *XW2K Series Datasheet* (Cat. No. G152) and *XW2R Datasheet* or a G7□ I/O Relay Terminal.
*2 Connectors are not provided with these connector models. Either purchase one of the following 20-pin or 24-pin Connectors, or use an OMRON *XW2K Series Datasheet* (Cat. No. G152) and *XW2R Datasheet* or a G7□ I/O Relay Terminal.

Applicable Connectors

Fujitsu/OTAX Connectors for 32-input, 32-output, 64-input, 64-output, 32-input/32-output, and 16-input/16-output Units

Name	Connection	Remarks	Applicable Units	Model
40-pin Connectors	Soldered	Connector Fujitsu FCN-361J040-AU Connector Cover Fujitsu FCN-360C040-J2 OTAX N360C040J2	Fujitsu/OTAX Connectors: CJ1W-ID231(32 inputs): 1 per Unit CJ1W-ID261 (64 inputs) 2 per Unit CJ1W-OD231 (32 outputs):1 per Unit CJ1W-OD261 (64 outputs): 2 per Unit CJ1W-MD261 (32 inputs, 32 outputs): 2 per Unit	**C500-CE404**
	Crimped	Housing Fujitsu FCN-363J040 OTAX N363J040 Contactor Fujitsu FCN-363J-AU OTAX N363JAU Connector Cover Fujitsu FCN-360C040-J2 OTAX N360C040J2		**C500-CE405**
	Pressure welded	Fujitsu FCN-367J040-AU/F		**C500-CE403**
24-pin Connectors	Soldered	Connector Fujitsu FCN-361J024-AU Connector Cover Fujitsu FCN-360C024-J2 OTAX N360C024J2	Fujitsu/OTAX Connectors: CJ1W-MD231 (16 inputs, 16 outputs): 2 per Unit	**C500-CE241**
	Crimped	Housing Fujitsu FCN-363J024 OTAX N363J024 Contactor Fujitsu FCN-363J-AU OTAX N363JAU Connector Cover Fujitsu FCN-360C024-J2 OTAX N360C024J2		**C500-CE242**
	Pressure welded	Fujitsu FCN-367J024-AU/F OTAX N367J024AUF		**C500-CE243**

MIL Connectors for 32-input, 32-output, 64-input, 64-output, 32-input/32-output, and 16-input/16-output Units

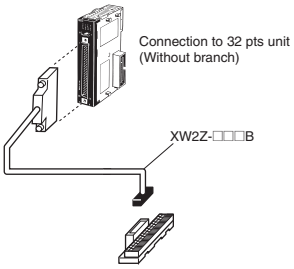
Name	Connection	Remarks	Applicable Units	Model
40-pin Connectors	Pressure welded	FRC5-AO40-3TOS	MIL Connectors: CJ1W-ID232/233 (32 inputs): 1 per Unit CJ1W-OD232/233/234 (32 outputs):1 per Unit CJ1W-ID262 (64 inputs): 2 per Unit CJ1W-OD262/263 (64 outputs): 2 per Unit CJ1W-MD263/563 (32 inputs, 32 outputs): 2 per Unit	**XG4M-4030-T**
20-pin Connectors	Pressure welded	FRC5-AO20-3TOS	MIL Connectors: CJ1W-MD232/233 (16 inputs, 16 outputs): 2 per Unit	**XG4M-2030-T**

Applicable Connector-terminal block conversion unit

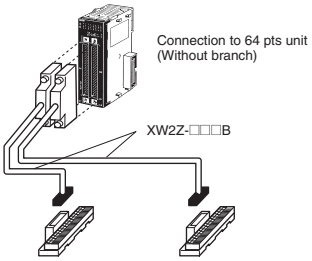
Example: With OMRON Connector-terminal block conversion unit

Only main products are shown here.
More detail informations are shown in *XW2K Series Datasheet* (Cat. No. G152) and *XW2R Datasheet*.

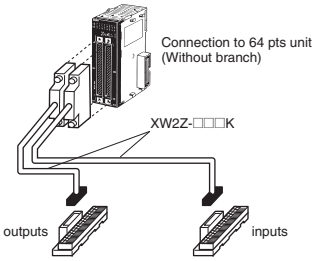
32-point Input Unit or Output Unit
CJ1W-ID231 32-point



64-point Input Unit or Output Unit
CJ1W-ID261 64-point



64-point Output Unit
CJ1W-MD563 IN 32 Points, OUT 32 Points



Choose the wiring method.
Choose □□ from a following combination table PLC type.

Wiring method	Model
Models with Push-In Plus	**XW2K-40G-O32□**
Models with Phillips screw	**XW2R-J34GD-C□**
Models with Slotted screw (rise up)	**XW2R-E34GD-C□**

Combination table

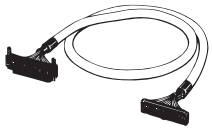
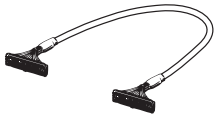
PLC Type (Connector-terminal block)		PLC			Connecting cables
XW2K	XW2R	I/O	I/O Points	I/O unit model	
O32A	C1	Input	32	CJ1W-ID231	XW2Z-□□□B 32-point Unit: 1 Cable 64-point Unit: 2 Cables
			64	CJ1W-ID261	
		Input/Output	32	CJ1W-MD261 (inputs)	
O32C	C2	Input	32	CJ1W-ID232	XW2Z-□□□K 32-point Unit: 1 Cable 64-point Unit: 2 Cables
				CJ1W-ID233	
			64	CJ1W-ID262	
		Input/Output	32	CJ1W-MD263 (inputs)	
				CJ1W-MD563 (inputs)	
O32B	C3	Input	32	CJ1W-OD231	XW2Z-□□□B 32-point Unit: 1 Cable 64-point Unit: 2 Cables
			64	CJ1W-OD261	
		Input/Output	32	CJ1W-MD261 (outputs)	
O32C	C4	Output	32	CJ1W-OD232	XW2Z-□□□K 32-point Unit: 1 Cable 64-point Unit: 2 Cables
				CJ1W-OD233	
				CJ1W-OD234	
			64	CJ1W-OD262	
				CJ1W-OD263	
		Input/Output	32	CJ1W-MD263 (outputs)	
				CJ1W-MD563 (outputs)	

Note: 1. □□□ is replaced by the cable length.
2. There is one common for each 32 points.

Connector-terminal block conversion unit

Product name	Specifications	I/O Points (number of poles)	Model
Connector-Terminal Block Conversion Unit	Push-In Plus 	32 (36)	**XW2K-40G-O32A**
		32 (36)	**XW2K-40G-O32B**
		32 (36)	**XW2K-40G-O32C**
	Phillips screw 	32 (34)	**XW2R-J34GD-C1**
		32 (34)	**XW2R-J34GD-C2**
		32 (34)	**XW2R-J34GD-C3**
		32 (34)	**XW2R-J34GD-C4**
	Slotted screw (rise up) 	32 (34)	**XW2R-E34GD-C1**
		32 (34)	**XW2R-E34GD-C2**
		32 (34)	**XW2R-E34GD-C3**
		32 (34)	**XW2R-E34GD-C4**

Connecting cables

Product name	Appearance	Connectors	Model	Cable length (m)
For I/O Unit Connecting Cable	XW2Z-□□□B 	One 40-pin FCN Connector to One 40-pin MIL Connector	**XW2Z-050B**	0.5
			XW2Z-100B	1
			XW2Z-150B	1.5
			XW2Z-200B	2
			XW2Z-300B	3
			XW2Z-500B	5
	XW2Z-□□□K 	One 40-pin MIL Connector to One 40-pin MIL Connector	**XW2Z-C50K**	0.5
			XW2Z-100K	1
			XW2Z-150K	1.5
			XW2Z-200K	2
			XW2Z-300K	3
			XW2Z-500K	5

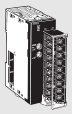
Quick-response Input Units

Unit classification	Product name	Specifications				Number of bits allocated	Response time		Current consumption (A)		Model
		I/O points	Input voltage, Input current	Commons	External connection		ON	OFF	5 V	24 V	
CJ1 Basic I/O Units	**Quick-response Input Unit** 	16 inputs	24 VDC, 7 mA	16 points, 1 common	Removable terminal block	16	0.05 ms max.	0.5 ms max.	0.08	---	**CJ1W-IDP01**

Special I/O Units and CPU Bus Units

Process I/O Units

Isolated-type Units with Universal Inputs

Unit classification	Product name	Input points	Signal range selection	Signal range	Conversion speed (resolution)	Accuracy (at ambient temperature of 25°C)	External connection	No. of unit numbers allocated	Current consumption (A)		Model
									5 V	24 V	
CJ1 Special I/O Units	Process Input Units (Isolated-type Units with Universal Inputs) 	4 inputs	Set separately for each input	Universal inputs: Pt100 (3-wire), JPt100 (3-wire), Pt1000 (3-wire), Pt100 (4-wire), K, J, T, E, L, U, N, R, S, B, WRe5-26, PL II, 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 1.25 V, 0 to 5 V, 0 to 10 V, ±100 mV selectable range –1.25 to 1.25 V, –5 to 5 V, –10 to 10 V, ±10 V selectable range, potentiometer	Resolution (conversion speed): 1/256,000 (conversion cycle: 60 ms/ 4 inputs) 1/64,000 (conversion cycle: 10 ms/ 4 inputs) 1/16,000 (conversion cycle: 5 ms/ 4 inputs)	Standard accuracy: ±0.05% of F.S.	Removable terminal block	1	0.30	---	**CJ1W-PH41U *1**
		4 inputs	Set separately for each input	Universal inputs: Pt100, JPt100, Pt1000, K, J, T, L, R, S, B, 4 to 20 mA, 0 to 20 mA, 1 to 5 V, 0 to 5 V, 0 to 10 V	Conversion speed: 250 ms/ 4 inputs	Accuracy: Platinum resistance thermometer input: (±0.3% of PV or ±0.8°C, whichever is larger) ±1 digit max. Thermocouple input: (±0.3% of PV or ±1.5°C, whichever is larger) ±1 digit max. *2 Voltage or current input: ±0.3% of F.S. ±1 digit max.			0.32	---	**CJ1W-AD04U**

*1 Do not connect a Relay Output Unit to the same CPU Rack or to the same Expansion Rack as the CJ1W-PH41U.
*2 L and –100°C or less for K and T are ±2°C±1 digit max., and 200°C or less for R and S is ±3°C±1 digit max. No accuracy is specified for 400°C or less for B.

Isolated-type DC Input Units

Unit classification	Product name	Input points	Signal range selection	Conversion speed (resolution)	Accuracy (at ambient temperature of 25°C)	External connection	No. of unit numbers allocated	Current consumption (A)		Model
								5 V	24 V	
CJ1 Special I/O Units	Isolated-type DC Input Units 	2 inputs	DC voltage: 0 to 1.25 V, –1.25 to 1.25 V, 0 to 5 V, 1 to 5 V, –5 to 5 V, 0 to 10 V, –10 to 10 V, ±10 V selectable range DC current: 0 to 20 mA, 4 to 20 mA	Conversion speed: 10 ms/ 2 inputs Resolution: 1/ 64,000	Standard accuracy: ±0.05% of F.S.	Removable terminal block	1	0.18	0.09 *	**CJ1W-PDC15**

* This is for an external power supply, and not for internal current consumption.

Analog I/O Units

Analog Input Units

Unit classification	Product name	Input points	Signal range selection	Signal range	Resolution	Conversion speed	Accuracy (at ambient temperature of 25°C)	External connection	No. of unit numbers allocated	Current consumption (A)		Model
										5 V	24 V	
CJ1 Special I/O Units	Analog Input Units High-speed type 	4 inputs	Set separately for each input	1 to 5 V (1/10,000), 0 to 10 V (1/20,000), −5 to 5 V (1/20,000), −10 to 10 V (1/40,000), and 4 to 20 mA (1/10,000)		20 μs/1 point, 25 μs/2 points, 30 μs/3 points, 35 μs/4 points	Voltage: ±0.2% of F.S. Current: ±0.4% of F.S.	Removable terminal block	1	0.52	---	CJ1W-AD042 *1
	Analog Input Units 	8 inputs		1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA	1/4000, (Settable to 1/8000) *2	1 ms/point max. (Settable to 250 μs/point) *2	Voltage: ±0.2% of F.S. Current: ±0.4% of F.S. *3			0.42	---	CJ1W-AD081-V1
		4 inputs								0.42	---	CJ1W-AD041-V1

*1 The direct conversion function using the AIDC instruction cannot be used.
*2 The resolution and conversion speed cannot be set independently. If the resolution is set to 1/4,000, then the conversion speed will be 1 ms/point.
*3 At 23 ±2°C

Analog Output Units

Unit classification	Product name	Output points	Signal range selection	Signal range	Resolution	Conversion speed	Accuracy (at ambient temperature of 25°C)	External connection	External power supply	No. of unit numbers allocated	Current consumption (A)		Model
											5 V	24 V	
CJ1 Special I/O Units	Analog Output Units High-speed type 	4 outputs	Set separately for each input	1 to 5 V (1/10,000), 0 to 10 V (1/20,000), and −10 to 10 V (1/40,000)		20 μs/ 1 point, 25 μs/ 2 points, 30 μs/ 3 points, 35 μs/ 4 points	±0.3% of F.S.	Removable terminal block	---	1	0.40	---	CJ1W-DA042V *1
	Analog Output Units 	8 outputs		1 to 5 V, 0 5 to 5 V, 0 to 10 V, −10 to 10 V	1/4,000 (Settable to 1/8,000)	1 ms/ point max. (Settable to 250 μs/point)			24 VDC +10% −15% , 140 mA max.		0.14	0.14 *2	CJ1W-DA08V
		8 outputs		4 to 20 mA					24 VDC +10% −15% , 170 mA max.		0.14	0.17 *2	CJ1W-DA08C
		4 outputs		1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA	1/4000	1 ms/ point max.	Voltage output: ±0.3% of F.S. Current output: ±0.5% of F.S.		24 VDC +10% −15% , 200 mA max.		0.12	0.2 *2	CJ1W-DA041
		2 outputs							24 VDC +10% −15% , 140 mA max.		0.12	0.14 *2	CJ1W-DA021

*1 The direct conversion function using the AODC instruction cannot be used.
*2 This is for an external power supply, and not for internal current consumption

Analog I/O Units

Unit classification	Product name	No. of points	Signal range selection	Signal range	Resolution (See note.)	Conversion speed (See note.)	Accuracy (at ambient temperature of 25°C)	External connection	No. of unit numbers allocated	Current consumption (A)		Model
										5 V	24 V	
CJ1 Special I/O Units	Analog I/O Units 	4 inputs	Set separately for each input	1 to 5 V, 0 to 5 V, 0 to 10 V, −10 to 10 V, 4 to 20 mA	1/4,000 (Settable to 1/8,000)	1 ms/point (Settable to 500 μs/ point max.)	Voltage input: ±0.2% of F.S. Current input: ±0.2% of F.S.	Removable terminal block	1	0.58	---	CJ1W-MAD42
		2 outputs					Voltage output: ±0.3% of F.S. Current output: ±0.3% of F.S.					

Note: The resolution and conversion speed cannot be set independently. If the resolution is set to 1/4,000, then the conversion speed will be 1 ms/point.

Temperature Control Units

Unit classification	Product name	Specifications			No. of unit numbers allocated	Current consumption (A)		Model
		No. of loops	Temperature sensor inputs	Control outputs		5 V	24 V	
CJ1 Special I/O Units	Temperature Control Units 	2 loops, heater burnout detection function	Thermocouple input (R, S, K, J, T, B, L)	Open collector NPN outputs (pulses)	2	0.25	---	CJ1W-TC003
				Open collector PNP outputs (pulses)		0.25	---	CJ1W-TC004
			Platinum resistance thermometer input (JPt100, Pt100)	Open collector NPN outputs (pulses)		0.25	---	CJ1W-TC103
				Open collector PNP outputs (pulses)		0.25	---	CJ1W-TC104

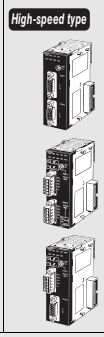
High-speed Counter Unit

Unit classification	Product name	Specifications			No. of unit numbers allocated	Current consumption (A)		Model
		Countable channels	Encoder A and B inputs, pulse input Z signals	Max. counting rate		5 V	24 V	
CJ1 Special I/O Units	High-speed Counter Unit 	2	Open collector Input voltage: 5 VDC, 12 V, or 24 V (5 V and 12 V are each for one axis only.)	50 kHz	4	0.28	---	CJ1W-CT021
			RS-422 line driver	500 kHz				

Note: The following functions become unavailable when it is used with the NJ-Series CPU unit.

- Counter value capture using allocation area(CIO)
- The capture, Stop/capture/continue, Stop/capture/reset/continue, and Capture/reset functions using External Control Input Function
- Pulse rate range control using Output Control Mode
- The pulse rate measurement function
- Because the NJ-Series has no power OFF interrupt task, operation cannot be restarted from the position at which the power was interrupted.
- Read or write the data using IORD/IOWR instruction
- Starting of External Interrupt Task by Output and External Control Input

Serial Communications Units

Unit classification	Product name	Specifications		No. of unit numbers allocated	Current consumption (A)		Model
		Communications Interface	Communications functions		5 V	24 V	
CJ1 CPU Bus Units	Serial Communications Units 	2 RS-232C ports	The following functions can be selected for each port: Protocol macro *1 Host Link NT Links (1:N mode) Serial Gateway No-protocol *3 Modbus-RTU Slave	1	0.29 *2	---	CJ1W-SCU22
		2 RS-422A/485 ports			0.46	---	CJ1W-SCU32
		1 RS-232C port and 1 RS-422A/485 port			0.38 *2	---	CJ1W-SCU42
RS-422A Converter 		Converts RS-233C to RS-422A/RS-485.					CJ1W-CIF11

Note: Simple Backup Function and Interrupt notification function cannot be used.

*1 You can activate protocol macro trace function when the CPU Unit is set to the RUN Mode. (MONITOR Mode is not available with the NJ-Series CPU Units.)

*2 When an NT-AL001 RS-232C/RS-422A Conversion Unit is used, this value increases by 0.15 A/Unit. Add 0.20A/Unit when using NV3W-M□20L Programmable Terminals. Add 0.04A/Unit when using CJ1W-CIF11 RS-422A Adapters.

*3 Supported only by the SerialRcvNoClear Instructions with Serial communication unit version 2.1 or later, CPU Units with unit version 1.03 or later and the Sysmac Studio version 1.04 or higher.

EtherNet/IP Unit

Unit classification	Product name	Specifications			No. of unit numbers allocated	Current consumption (A)		Model
		Communications cable	Communications functions	Max. Units mountable per CPU Unit		5 V	24 V	
CJ1 CPU Bus Unit	EtherNet/IP Unit 	STP (shielded twisted-pair) cable of category 5, 5e, or higher	Tag data link message service	4	1	0.41	---	CJ1W-EIP21 *

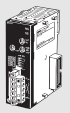
* Supported only by the EtherNet/IP Units with unit version 2.1 or later , CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

EtherCAT Slave Unit

Unit classification	Product name	Specifications	Communications type	No. of unit numbers allocated	Current consumption (A)		Model
					5 V	24 V	
CJ1 CPU Bus Units	EtherCAT Slave Unit 	STP (shielded twisted-pair) cable of category 5 or higher with double shielding	Refreshing methods: Free-Run Mode PDO DATA SIZE: TxPDO 400byte or less/RxPDO: 400byte or less	1	0.34	---	CJ1W-ECT21 *

* When using with the Machine Automation Controller NJ /NXSeries, use CPU Units with unit version 1.10 or later and the Sysmac Studio version 1.13 or higher.

DeviceNet Unit

Unit classification	Product name	Specifications	Communications type	No. of unit numbers allocated	Current consumption (A)		Model
					5 V	24 V	
CJ1 CPU Bus Units	DeviceNet Unit 	Functions as master and/or slave; allows control of 32,000 points max. per master.	• Remote I/O communications master (fixed or user-set allocations) • Remote I/O communications slave (fixed or user-set allocations) • Message communications	1	0.29	---	CJ1W-DRM21

Note: 1. Simple backup function cannot be used.
2. DeviceNet configurator cannot be used. Use CX-Integrator.

CompoNet Master Unit

Unit classification	Product name	Specifications		No. of unit numbers allocated	Current consumption (A)		Model
		Communications functions	No. of I/O points per Master Unit		5 V	24 V	
CJ1 Special I/O Units	CompoNet Master Unit 	Remote I/O communications Message communications	Word Slaves: 2,048 max. (1.024 inputs and 1,024 outputs) Bit Slaves: 512 max. (256 inputs and 256 outputs)	1, 2, 4, or 8	0.4	---	CJ1W-CRM21 *

Note: 1. Simple backup function cannot be used.
2. The FINS command to the CompoNet Master Unit cannot be issued.
* Supported only by the CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

ID Sensor Units

Unit classification	Product name	Specifications			No. of unit numbers allocated	Current consumption (A)		Model
		Connected ID Systems	No. of connected R/W heads	External power supply		5 V	24 V	
CJ1 CPU Bus Units	ID Sensor Units 	V680-Series RFID System	1	Not required.	1	0.26	0.13 *	CJ1W-V680C11
			2		2	0.32	0.26	CJ1W-V680C12

Note: The data transfer function using intelligent I/O commands can not be used.
* To use a V680-H01 Antenna, refer to the V680 Series RFID System Catalog (Cat. No. Q151).

Peripheral Devices

EtherCAT junction slaves

Product name		No. of ports	Power supply voltage	Current consumption (A)	Model
EtherCAT junction slaves		3	20.4 to 28.8 VDC (24 VDC -15 to +20%)	0.08	**GX-JC03**
		6		0.17	**GX-JC06**

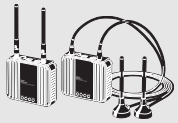
Note: 1. Please do not connect EtherCAT junction slaves with OMRON position control unit, Model CJ1W-NC□81/□82.
2. EtherCAT junction slaves cannot be used for EtherNet/IP and Ethernet.

Industrial Switching Hubs for EtherNet/IP and Ethernet

Product name	Appearance	Functions	No. of ports	Accessories	Current consumption (A)	Model
Industrial Switching Hubs		Quality of Service (QoS): EtherNet/IP control data priority 10/100BASE-TX, Auto-Negotiation	5	Power supply connector	0.07	**W4S1-05D**

Note: Industrial switching hubs cannot be used for EtherCAT.

WE70 FA WIRELESS LAN UNITS (Final order entry date: The end of June, 2020)

Product name	Applicable region	Type	Model
WE70 FA WIRELESS LAN UNITS 	Japan	Access Point (Master)	**WE70-AP**
		Client (Slave)	**WE70-CL**
	Europe	Access Point (Master)	**WE70-AP-EU**
		Client (Slave)	**WE70-CL-EU**
	U.S	Access Point (Master)	**WE70-AP-US ✱1**
		Client (Slave)	**WE70-CL-US ✱1**
	Canada	Access Point (Master)	**WE70-AP-CA ✱2**
		Client (Slave)	**WE70-CL-CA ✱2**
	China	Access Point (Master)	**WE70-AP-CN**
		Client (Slave)	**WE70-CL-CN**

Note: 1. A Pencil Antenna, mounting magnet, and screw mounting bracket are included as accessories.
2. Always use a model that is applicable in your region. Refer to the WE70 Catalog (Cat. No. N154).

*1. From December 2015, the WE70-AP-US and WE70-CL-US can be used in Mexico.
The Units will be sold in the USA until the end of May 2016.

*2. From January 2016, the WE70-AP-CA and WE70-CL-CA can be used in Singapore.

General Specifications

Item		Specification		
		NJ501-□□□□	NJ301-□□□□	NJ101-□□□□
Enclosure		Mounted in a panel		
Grounding Method		Ground to less than 100 Ω		
Dimensions (height×depth×width)		90 mm × 90 mm × 90 mm		
Weight		550 g (including the End Cover)		
Current Consumption		5 VDC, 1.90 A (including SD Memory Card and End Cover)		
Operation Environment	Ambient Operating Temperature	0 to 55°C		
	Ambient Operating Humidity	10% to 90% (with no condensation)		
	Atmosphere	Must be free from corrosive gases.		
	Ambient Storage Temperature	-20 to 75°C (excluding battery)		
	Altitude	2,000 m or less		
	Pollution Degree	2 or less: Meets IEC 61010-2-201.		
	Noise Immunity	2 kV on power supply line (Conforms to IEC 61000-4-4.)		
	Overvoltage Category	Category II: Meets IEC 61010-2-201.		
	EMC Immunity Level	Zone B		
	Vibration Resistance	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz Acceleration of 9.8 m/s^2 for 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)		
	Shock Resistance	Conforms to IEC 60068-2-27. 147 m/s^2, 3 times in X, Y, and Z directions (100 m/s^2 for Relay Output Units)		
Battery	Life *1	5 years at 25°C		
	Model	CJ1W-BAT01		
Applicable Standards *2		cULus, EU, UKCA, RCM, KC, NK, LR *3		

*1. This is the value when the power ON time rate is 0% (power OFF).
*2. Refer to the OMRON website (http://www.ia.omron.com/) or consult your OMRON representative for the most recent applicable standards for each model.
*3. Supported only by the CPU Units with unit version 1.01 or later.

Performance Specifications

Item				NJ501-			NJ301-		NJ101-	
				□5□0	□4□0	□3□0	1200	1100	1□□0	9□□0
Processing Time	Instruction Execution Times	LD instruction		1.1 ns (1.7 ns or less)			1.6 ns (2.5 ns or less) *2		3.0 ns (4.5 ns or less) *2	
		Math Instructions (for Long Real Data)		24 ns or more *1			35 ns or more *2		63 ns or more *2	
Programming	Program capacity *3	Size		20 MB (400 KS)			5 MB (100 KS)		3 MB (60 KS)	
		Number	POU definition	3,000			750		450	
			POU instance	Using Sysmac Studio Ver. 1.05 or lower : 6,000 Using Sysmac Studio Ver. 1.06 or higher : 9,000			Using Sysmac Studio Ver. 1.04 or lower : 1,500 Using Sysmac Studio Ver. 1.05 or higher : 3,000		1,800	
	Variables capacity	No Retain Attribute *4	Size	4 MB			2 MB			
			Number	180,000 *5			90,000 *6		22,500	
		Retain Attribute *7	Size	2 MB			0.5 MB			
			Number	10,000			Using Sysmac Studio Ver. 1.04 or lower : 2,500 Using Sysmac Studio Ver. 1.05 or higher : 5,000		5,000	
	Data type	Number		2,000			1,000			
	Memory for CJ-Series Units (Can be Specified with AT Specifications for Variables.)	CIO Area		6,144 words (CIO 0 to CIO 6143)						
		Work Area		512 words (W0 to W511)						
		Holding Area		1,536 words (H0 to H1535)						
		DM Area		32,768 words (D0 to D32767)						
		EM Area		32,768 words × 25 banks (E0_00000 to E18_32767) *8			32,768 words × 4 banks (E0_00000 to E3_32767) *8			
Unit Configuration	Maximum Number of Connectable Units	Maximum number of CJ unit per CPU Rack or Expansion Rack		10 Units						
		Maximum number of CJ unit on the system		40 Units						
		Maximum number of NX unit on the system		4,096 (on NX series EtherCAT slave terminal)					400 (on NX series EtherCAT slave terminal)	
	Maximum number of Expansion Racks			3 max.						
	I/O Capacity	Maximum number of I/O Points on CJ-series Units		2,560 points max.						
	Power Supply Unit for CPU Rack and Expansion Racks	Model		NJ-P□3001						
		Power OFF Detection Time	AC Power Supply	30 to 45 ms						
			DC Power Supply	22 to 25 ms						
Motion Control	Number of Controlled Axes	Maximum Number of Controlled Axes		Maximum number of axes which can be defined.						---
				64 axes	32 axes	16 axes	15 axes *9	15 axes *9	6 axes	
			Motion control axes	Maximum number of motion control axes which can be defined. All motion control function is available.						
				64 axes	32 axes	16 axes	15 axes	15 axes	6 axes	
		Maximum number of used real axes		Maximum number of used real axes. The Number of used real axes includes following servo axes and encoder axes.						
				64 axes	32 axes	16 axes	8 axes	4 axes	2 axes	
			Used motion control servo axes	Maximum number of servo axes which all motion control function is available.						
				64 axes	32 axes	16 axes	8 axes	4 axes	2 axes	
		Maximum number of axes for linear interpolation axis control		4 axes per axes group						
		Number of axes for circular interpolation axis control		2 axes per axes group						
	Maximum Number of Axes Groups			32 groups						
	Motion Control Period			The same control period as that is used for the process data communications cycle for EtherCAT.						

*1. When the hardware revision for the Unit is A or B.
*2. When the hardware revision for the Unit is A.
*3. This is the capacity for the execution objects and variable tables (including variable names).
*4. Words for CJ-series Units in the Holding, DM, and EM Areas are not included.
*5. The number of variables of the CPU Unit version 1.19 or earlier is 90,000.
*6. The number of variables of the CPU Unit version 1.18 or earlier is 22,500.
*7. Words for CJ-series Units in the CIO and Work Areas are not included.
*8. When the Spool function of the NJ501-□□20 is enabled, the DB Connection Service uses E9_0 to E18_32767 (NJ501-1□20).
When the Spool function of the NJ101-□□20 is enabled, the DB Connection Service uses E1_0 to E3_32767 (NJ101-□□20).
*9. This number of axes is achieved in a combination of a CPU Unit with unit version 1.06 or later and Sysmac Studio version 1.07 or higher.
In other combinations, the maximum number of controlled axes is 8 axes (NJ301-1200) or 4 axes (NJ301-1100).

Item				NJ501-			NJ301-		NJ101	
				□5□0	□4□0	□3□0	1200	1100	1□□0	9□□0
Motion Control	Cams	Number of Cam Data Points	Maximum Points per Cam Table	65,535 points						---
			Maximum Points for All Cam Tables	1,048,560 points			262,140 points			
		Maximum Number of Cam Tables		640 tables			160 tables			
	Position Units			Pulses, millimeters, micrometers, nanometers, degrees or inches						
	Override Factors			0.00% or 0.01% to 500.00%						
Peripheral USB Port	Supported Services			Sysmac Studio connection						
	Physical Layer			USB 2.0-compliant B-type connector						
	Transmission Distance between Hub and Node			5 m max.						
Built-in EtherNet/IP Port	Number of port			1						
	Physical Layer			10Base-T or 100Base-TX						
	Frame length			1514 max.						
	Media Access Method			CSMA/CD						
	Modulation			Baseband						
	Topology			Star						
	Baud Rate			100 Mbps (100Base-TX)						
	Transmission Media			STP (shielded, twisted-pair) cable of Ethernet category 5, 5e or higher						
	Maximum Transmission Distance between Ethernet Switch and Node			100m						
	Maximum Number of Cascade Connections			There are no restrictions if Ethernet switch is used.						
	CIP service: Tag Data Links (Cyclic Communications)	Maximum Number of Connections		32						
		Packet interval *10		1 to 10,000 ms in 1.0-ms increments *11 Can be set for each connection. (Data will be refreshed at the set interval, regardless of the number of nodes.)						
		Permissible Communications Band		3,000 pps *12 *13 (including heartbeat)						
		Maximum Number of Tag Sets		32						
		Tag types		Network variables, CIO, Work, Holding, DM, and EM Areas						
		Number of tags per connection (i.e., per tag set)		8 (7 tags if Controller status is included in the tag set.)						
		Maximum Link Data Size per Node (total size for all tags)		256						
		Maximum number of tag		19,200 bytes						
		Maximum Data Size per Connection		600 bytes						
		Maximum Number of Registrable Tag Sets		32 (1 connection = 1 tag set)						
		Maximum Tag Set Size		600 bytes (Two bytes are used if Controller status is included in the tag set.)						
		Multi-cast Packet Filter *14		Supported.						
	Cip Message Service: Explicit Messages	Class 3 (number of connections)		32 (clients plus server)						
		UCMM (non-connection type)	Maximum Number of Clients that Can Communicate at One Time	32						
			Maximum Number of Servers that Can Communicate at One Time	32						
	Maximum number of TCP socket service			30 *15					30	

*10.Data is updated on the line in the specified interval regardless of the number of nodes.
*11.The Packet interval of the CPU Unit version 1.02 or earlier is 10 to 10,000 ms in 1.0-ms increments.
*12.Means packets per second, i.e., the number of communications packets that can be sent or received in one second.
*13.The Permissible Communications Band of the CPU Unit version 1.02 or earlier is 1,000 pps.
*14.An IGMP client is mounted for the EtherNet/IP port. If an ethernet switch that supports IGMP snooping is used, filtering of unnecessary multicast packets is performed.
*15.The Maximum number of TCP socket service of the CPU Unit version 1.02 or earlier is 16.

Item				NJ501-			NJ301-		NJ101	
				□5□0	□4□0	□3□0	1200	1100	1□□0	9□□0
Built-in EtherNet/IP Port	OPC UA Server (NJ501-1□00)	Support Profile/Model		Embedded 2017 UA Server Profile PLCopen Information Model 1.00			---		---	
		Default Endpoint/Port		opc.tcp://192.168.250.1:4840/			---		---	
		Maximum number of sessions (Client)		5			---		---	
		Maximum number of Monitored Items per server		2,000			---		---	
		Sampling rate of the Monitored Items (ms)		0, 50, 100, 250, 500, 1000,2000, 5000, 10000 if set to 0 (zero), it is assumed that is set to 50.			---		---	
		Maximum number of Subscriptions per server		100			---		---	
		Maximum number of variables that can be published		10,000			---		---	
		Maximum number of structure definitions that can be published		100			---		---	
		Restrictions on variables unable to be published		• Variable which size are over 60 KB • Double and over dimensional array of structures (global variables) • Structures includes double and over dimensional array (global variables) • Structures nested 4 and over Unions • Array which's index number don't start from 0 • Array which's element is over 2048 (global variables) • Structures which's members are over 100.			---		---	
		SecurityPolicy/Mode		• None • Sign - Basic128Rsa15 • Sign - Basic256 • Sign - Basic256Sha256 • Sign - Aes128Sha256RsaOaep • Sign - Aes256Sha256RsaPss • SignAndEncrypt - Basic128Rsa15 • SignAndEncrypt - Basic256 • SignAndEncrypt - Basic256Sha256 • SignAndEncrypt - Aes128Sha256RsaOaep • SignAndEncrypt - Aes256Sha256RsaPss			---		---	
		Application Authentication	Authentication	X.509			---		---	
			Maximum number of certification	Trusted certification: 32 Issuer certification: 32 Rejected certification: 32			---		---	
		User Authentication	Authentication	User name / Password / Role *16 Anonymous			---		---	
Built-in EtherCAT Port	Communications Standard			IEC 61158 Type12						
	EtherCAT Master Specifications			Class B (Feature Pack Motion Control compliant)						
	Physical Layer			100BASE-TX						
	Modulation			Baseband						
	Baud Rate			100 Mbps (100Base-TX)						
	Duplex mode			Auto						
	Topology			Line, daisy chain, branching and ring *17						
	Transmission Media			Twisted-pair cable of category 5 or higher (double-shielded straight cable with aluminum tape and braiding)						
	Maximum Transmission Distance between Nodes			100m						
	Maximum Number of Slaves			192					64	
	Range of node address			1-192						
	Maximum Process Data Size			Inputs: 5,736 bytes Outputs: 5,736 bytes *18						
	Maximum Process Data Size per Slave			Inputs: 1,434 bytes Outputs: 1,434 bytes						
	Communications Cycle			500/1,000/2,000/4,000 μs *19					1,000/2,000/4,000 μs	
	Sync Jitter			1 μs max.						
Internal Clock				At ambient temperature of 55°C: -4.5 to +4.5 min error per month At ambient temperature of 25°C: -3.5 to +3.5 min error per month At ambient temperature of 0°C: -4.5 to +4.5 min error per month						

*16.Roles can be set for the unit versions 1.62 or later of CPU Units.
*17.Ring topology is supported with the project version 1.40 or later of NJ□01-□□00.
Slaves on a ring topology should support a ring topology. If Omron slaves, please see the user's manual of slaves.
*18.For project unit version earlier than 1.40, the data must be within four frames.
*19.The Maximum Communications Cycle of the NJ301 CPU Unit version 1.02 or earlier and NJ501-R□□□ are 1,000/2,000/4,000 μs.
The EtherCAT communications cycle of NJ501-4□□0 for robot control is 1 ms or more.
Note: For robot control by NJ501-4□□0, use the G5 series/1S series AC Servo Drive with built-in EtherCAT communications, absolute encoder, and brake.

Performance Specifications Supported by NC Integrated Controller

Item				NJ501-
				5300
Numerical Control	Task Period	Primary periodic cycle		500/1,000/2,000/4,000 μs
		CNC Planner Service period		500 μs to 16 ms
	Number of CNC motors	Maximum number of CNC motors *1		16
	CNC Coordinate system	Maximum number of CNC coordinate systems		4
		Maximum number of CNC motor configurations that are included in a CNC coordinate system (excluding spindle axes)		8
		Number of spindle axes that are included in a CNC coordinate system		1
	Number of simultaneous interpolation axes			4
	NC Program	Program buffer size *2		16 MB
		Maximum number of programs	Upper limit of main registrations	512
			Upper limit of sub registratioins	512
	NC program variables	P variable		Double-precision floating point 65536 *3
		Q variable		Double-precision floating point 8192 *3
		L variable		Double-precision floating point 256
	CNC motor compensation table	Maximum number of CNC motor compensation tables		32
		Maximum size of all compensation tables		1 MB

*1. The number of controlled axes of the MC Control Function Module is included.
*2. The number of programs and their capacities that can be loaded into the CPU Unit at the same time.
The program capacity is the maximum size available. As fragmentation will occur, the size that is actually available will be smaller than the maximum size.
*3. Some parts of the area are reserved by the system.

Function Specifications

Item				NJ501-□□□□	NJ301-□□□□	NJ101-□□□□
Tasks	Function			I/O refreshing and the user program are executed in units that are called tasks. Tasks are used to specify execution conditions and execution priority.		
		Periodically Executed Tasks	Maximum Number of Primary Periodic Tasks	1		
			Maximum Number of Periodic Tasks	3		
		Conditionally executed tasks *1	Maximum number of event tasks	32		
			Execution conditions	When Activate Event Task instruction is executed or when condition expression for variable is met.		
		System Service Tasks (NJ501-R□□□)	Maximum number of V+ Tasks	64	---	
	Setup	System Service Monitoring Settings		The execution interval and the percentage of the total user program execution time are monitored for the system services (processes that are executed by the CPU Unit separate from task execution).		
Programming	POU (program organization units)	Programs		POUs that are assigned to tasks.		
		Function Blocks		POUs that are used to create objects with specific conditions.		
		Functions		POUs that are used to create an object that determine unique outputs for the inputs, such as for data processing.		
	Programming Languages	Types		Ladder diagrams *2 Structured text (ST) V+ (NJ501-R□□□)		
	Namespaces *3			A concept that is used to group identifiers for POU definitions.		
	Variables	External Access of Variables	Network Variables	The function which allows access from the HMI, host computers, or other Controllers		
	Data Types	Data Types	Boolean	BOOL		
			Bit Strings	BYTE, WORD, DWORD, LWORD		
			Integers	INT, SINT, DINT,LINT, UINT, USINT, UDINT, ULINT		
			Real Numbers	REAL, LREAL		
			Durations	TIME		
			Dates	DATE		
			Times of Day	TIME_OF_DAY		
			Date and Time	DATE_AND_TIME		
			Text Strings	STRING		
		Derivative Data Types		Structures, unions, enumerations		
		Structures	Function	A derivative data type that groups together data with different variable types.		
			Maximum Number of Members	2048		
			Nesting Maximum Levels	8		
			Member Data Types	Basic data types, structures, unions, enumerations, array variables		
			Specifying Member Offsets	You can use member offsets to place structure members at any memory locations.*3		
		Unions	Function	A derivative data type that groups together data with different variable types.		
			Maximum Number of Members	4		
			Member Data Types	BOOL, BYTE, WORD, DWORD, LWORD		
		Enumerations	Function	A derivative data type that uses text strings called enumerators to express variable values.		
	Data Type Attributes	Array Specifications	Function	An array is a group of elements with the same data type. You specify the number (subscript) of the element from the first element to specify the element.		
			Maximum Number of Dimensions	3		
			Maximum Number of Elements	65535		
			Array Specifications for FB Instances	Supported.		
		Range Specifications		You can specify a range for a data type in advance. The data type can take only values that are in the specified range.		
		Libraries *3		User libraries		

*1. Supported only by the CPU Units with unit version 1.03 or later.
*2. Inline ST is supported. (Inline ST is ST that is written as an element in a ladder diagram.)
*3. Supported only by the CPU Units with unit version 1.01 or later.

Item				NJ501-□□□□	NJ301-□□□□	NJ101-□□□□
Motion Control	Control Modes			position control, velocity control, torque control		
	Axis Types			Servo axes, virtual servo axes, encoder axes, and virtual encoder axes		
	Positions that can be managed			Command positions and actual positions		
	Single-axis	Single-axis Position Control	Absolute Positioning	Positioning is performed for a target position that is specified with an absolute value.		
			Relative Positioning	Positioning is performed for a specified travel distance from the command current position.		
			Interrupt Feeding	Positioning is performed for a specified travel distance from the position where an interrupt input was received from an external input.		
			Cyclic synchronous absolute positioning *1	The function which outputs command positions in every control period in the position control mode.		
		Single-axis Velocity Control	Velocity Control	Velocity control is performed in Position Control Mode.		
			Cyclic Synchronous Velocity Control	A velocity command is output each control period in Velocity Control Mode.		
		Single-axis Torque Control	Torque Control	The torque of the motor is controlled.		
		Single-axis Synchronized Control	Starting Cam Operation	A cam motion is performed using the specified cam table.		
			Ending Cam Operation	The cam motion for the axis that is specified with the input parameter is ended.		
			Starting Gear Operation	A gear motion with the specified gear ratio is performed between a master axis and slave axis.		
			Positioning Gear Operation	A gear motion with the specified gear ratio and sync position is performed between a master axis and slave axis.		
			Ending Gear Operation	The specified gear motion or positioning gear motion is ended.		
			Synchronous Positioning	Positioning is performed in sync with a specified master axis.		
			Master Axis Phase Shift	The phase of a master axis in synchronized control is shifted.		
			Combining Axes	The command positions of two axes are added or subtracted and the result is output as the command position.		
		Single-axis Manual Operation	Powering the Servo	The Servo in the Servo Drive is turned ON to enable axis motion.		
			Jogging	An axis is jogged at a specified target velocity.		
		Auxiliary Functions for Single-axis Control	Resetting Axis Errors	Axes errors are cleared.		
			Homing	A motor is operated and the limit signals, home proximity signal, and home signal are used to define home.		
			Homing with parameter *1	Specifying the parameter, a motor is operated and the limit signals, home proximity signal, and home signal are used to define home.		
			High-speed Homing	Positioning is performed for an absolute target position of 0 to return to home.		
			Stopping	An axis is decelerated to a stop at the specified rate.		
			Immediately Stopping	An axis is stopped immediately.		
			Setting Override Factors	The target velocity of an axis can be changed.		
			Changing the Current Position	The command current position or actual current position of an axis can be changed to any position.		
			Enabling External Latches	The position of an axis is recorded when a trigger occurs.		
			Disabling External Latches	The current latch is disabled.		
			Zone Monitoring	You can monitor the command position or actual position of an axis to see when it is within a specified range (zone).		
			Enabling digital cam switches *4	You can turn a digital output ON and OFF according to the position of an axis.		
			Monitoring Axis Following Error	You can monitor whether the difference between the command positions or actual positions of two specified axes exceeds a threshold value.		
			Resetting the Following Error	The error between the command current position and actual current position is set to 0.		
			Torque Limit	The torque control function of the Servo Drive can be enabled or disabled and the torque limits can be set to control the output torque.		
			Slave Axis Position Compensation *5	This function compensates the position of the slave axis currently in synchronized control.		
			Cam monitor (NJ□01-□□00)	Outputs the specified offset position for the slave axis in synchronous control.		
			Start velocity *6	You can set the initial velocity when axis motion starts.		

*1. Supported only by the CPU Units with unit version 1.03 or later.
*4. Supported only by the CPU Units with unit version 1.06 or later.
*5. Supported only by the CPU Units with unit version 1.10 or later.
*6. Supported only by the CPU Units with unit version 1.05 or later.