

**Programmable Controllers** 

# **CJ2 FAMILY**

New PLCs with a proven track record

» Flexibility in communication
» Faster machine development

» Innovation through evolution

realizing

# Innovation without growing pains

As a modern machine manufacturer you need to continuously increase the intelligence and flexibility of your product to remain competitive. But you also need to be absolutely certain that it all works perfectly, first time, every time.

The CJ2 is the result of years of experience as market leader in the field of modular controllers and represents a logical next step in controller design. It offers greater performance and faster I/O response as well as extreme scalability - so you will only need one family. In addition, programming, debugging and networking are faster and easier. Welcome to the new CJ2 Family: built to give you innovation without growing pains. Although CJ2 is a can directly replace any CJ1 CPU, it offers the following additional significant advantages:

#### Open to the world

Data communication is via standard Ethernet port with EtherNet/IP Data Link function.

#### Advanced motion control

CJ2 units offer multi-axes synchronous control, and can replace expensive motion controllers.

#### **High-speed**

Faster program execution and immediate I/O refreshing enables flexible machine control.

#### Learn one, know them all

Thanks to the wide variety of CPUs with consistent architecture across all PLC families, you only need to learn one, and you will know them all.

#### **Highly flexible**

Adapt the PLC to your needs with the wide variety of compatible CJ1 Family I/O units (nearly 100).



F-3

The wide range of CPUs means you need only to get familiar with one PLC family for use in everything from simple stand-alone applications up to networked, high-speed machines.

# Inspired by proven technology



#### Proved track record

The CJ2 Family is based on the highly popular CJ1, which after its launch in 2001 is operating in an extraordinary variety of applications all over the world. Now, as the natural successor, the CJ2 combines that field-proven technology with a wider choice of CPUs, more speed and memory, and a wider variety of communication interfaces.

EtherNet/IP->>>

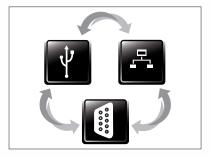


#### **Faster development**

DeviceNet >>>

Tag-based communications technology will simplify the interfacing of the PLC to the outside world. On-line debugging improvements also help to accelerate software development so you can change the code and test the results quickly. The added function block memory will allow you improve to program structure and reuse of code even in the the entry-level models.

EtherCAT.



#### Talks to all

MODBUS

The CJ2 Family supports major open networking technologies including:

- Ethernet-based communication based on open industrial standards
- Serial communications over RS-232 C,
- RS-422, RS-485 and USB
- The major open Fieldbus standards
- Fast and accurate motion control networks.



 $\bigcirc$ 

MECHATROLINK-II

# Built to answer your needs

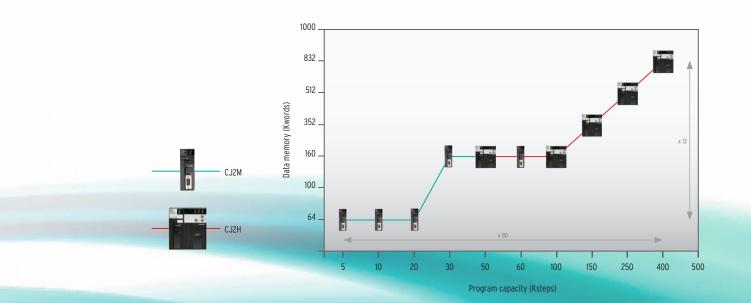
Omron has used its long experience as a specialist machine automation supplier to develop CJ2. The result is an extremely reliable PLC that is also a powerful example of our commitment to continuous improvement. The CJ2 Family is a major opportunity to innovate and simultaneously reduce cost now and in the future. It's the obvious choice for modern machine builders.

#### Power supply Pulse I/O

CPUs

#### Wide range CPU capacity

To stay ahead in the machine-building business, you need to grow with your end-user's needs. Faster production, better quality control and better traceability require more speed and more memory. That's why the CJ2 Family offers a wide range of CPUsto suit any task. From 5 Ksteps program capacity and 64 Kwords memory, right up to 500 Ksteps capacity and 832 Kwords.





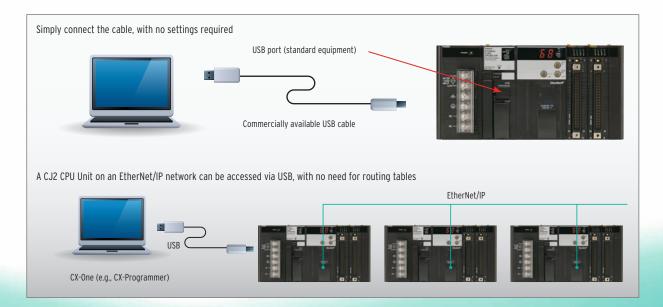
#### Higher precision

In addition to the greater CPU processing performance, Omron has also added new high-speed I/O units, such as analog input units with 20  $\mu$ s conversion time, while new PLC instructions provide immediate access to fast I/O data. The result is even more real-time reliability.

#### Select what you need

With CJ2 you can also still connect to the existing CJ1 I/O units. You can benefit from CJ2's improvements without redesigning the entire system.

#### Easy connection by USB



# One family - two performance classes

# CJ2M for basic machine automation

The CJ2M Series is ideal for packaging and general machine automation needs. Connectivity is assured thanks to the built-in USB port and the choice of Ethernet and RS-232C/422/485 interfaces on the CPU.

Always accessible through standard USB port Standard Ethernet port with EtherNet/IP Data Link function Wide range of program capacities, from 5 Ksteps to 60 Ksteps

Pulse I/O add-on modules have a special connection to the CPU and are controlled by convenient positioning instructions

Serial option board for CJ2M-CPU3\*

Dedicated function block memory ensures efficient execution of function block software modules





#### Pulse I/O modules

By mounting optional pulse I/O modules, you can extend the functionality of any CJ2M CPU with:

- interrupt inputs
- quick-response inputs
- high-speed counters
- incremental encoder inputs
- pulse frequency control outputs
- pulse width control outputs

Up to two modules can be mounted per CPU, allowing direct control of four motion axes. Using dedicated instructions, these axes can be controlled directly by the PLC program, without communication delays.

\* Supported by the CJ2M CPU Unit with version 2.0 or later.

# CJ2H for high speed, high capacity

The CJ2H Series is ideal for advanced machine automation needs such as those required in image processing inspection of electrical components and high speed sorting on conveyors.

#### Advanced motion control - made simple

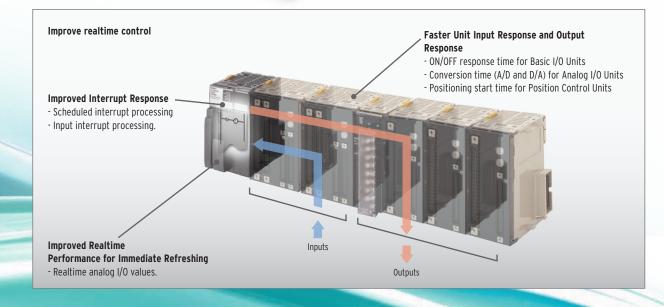
The CJ2H's advanced motion control avoids the use of expensive motion controllers. Synchronized control is possible on up to 20 axes by using just five Position Control units (High-speed type). And, programming is easy – simply paste an electronic cam function block into a synchronized interrupt task.



Always accessible through standard USB port Standard Ethernet port with EtherNet/IP Data Link function High program capacity of up to 400K Steps Higher precision for machine operation and processing quality

Immediate refreshing of basic I/O ensures real-time processing Faster response means higher precision and better quality

High data memory capacity of up to 832 Kwords



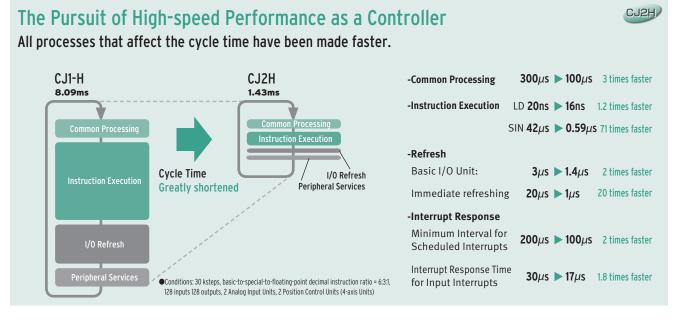
# The CJ2 Provides a Complete Lineup

The complete lineup provides high-performance features from machine control to information processing.

Units		CJ	2M	CJ	2H
Туре		Simple Types	Standard Types	High - end Types	Flagship Types
Models		CJ2M-CPU1□	CJ2M-CPU3□	CJ2H-CPU6□	CJ2H-CPU6□-EIP
Appeara	ance				
Program	n Capacity	Up to 6	0 Ksteps	Up to 40	00 Ksteps
Data Me	emory Capacity	Up to 16	0 Kwords	Up to 83	32 Kwords
I/O Bits			2,!	560	
Basic In	structions(LD)	40	Ons	16	ns
Special	al instruction (MOV)		Ons	48	Bns
Floating instruct	g-point decimal tions (SIN)	0.8	0.86µs		9µs
System	overhead time	160µs	270µs	100µs	200µs
FB Prog	ıram Area		ES :o 20K steps.)	-	_
Comm	USB Port		Ŷ	ES	
Communications Port	Serial Port	YES (RS-232C)	One Serial Option Board can be mounted (RS-232C or RS-422A/485)		ES 232C)
ns Port	EtherNet/IP Port	—	YES	_	YES
Serial P	LC Links	YES	YES (A Serial Option Board is required)		_
High-sp	eed Interrupt Function		— YES		ES
Synchro	onous Unit Operation	-	_		ES NC□□4 Position Control Unit)
Pulse I/	O Modules*		ES odules can be mounted)	-	_

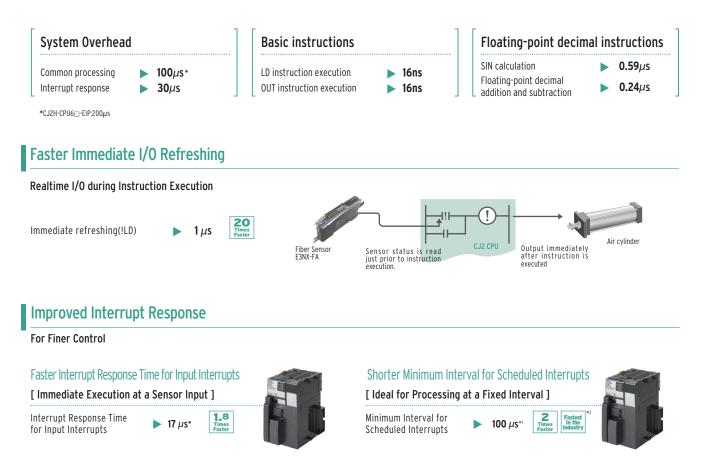
\*A Pulse I/O Module must be mounted for CJ2M CPU Units with unit version 2.0 or later.

\* With the High-speed Interrupt Function



#### Ample Instruction Execution Performance for Machine Control.

The CJ2 Series fully responds to customer requests for improved tact time and increased information.



CJ2H CPU Unit with

unit version 1.1 or

later is used.

\*1 Supported only for one scheduled interrupt task. The peripheral (USB) port or serial port of the CPU Unit can not be used at the same time.

 $^{\ast 2}$  According to February 2010 OMRON survey in Japan.

CJ2H CPU Unit with unit version 1.1 or later is used.

# Pulse I/O Modules expand the applicable positioning applications

CHs

Module

Easily execute the position control of up to four axes

Either one or two Pulse I/O Modules can be connected to a CJ2M CPU Unit. The programming is as easy as pasting OMRON Function Blocks for positioning, or special instructions.

Pulse I/O Functions (for Two Pulse I/O Modules)

Input interrupts High-speed	8 points
counter inputs:	Single-phase, 100 kHz, 4 CHs or Phase-different input, 50 kHz, 4 CH
Pulse outputs:	100 kHz, 4 axes or four PWM outputs

Pulse I/O C.J2M Pulse I/O Pulse I/O

CPU Unit

C.12M Module

Built-in EtherNet/IP CPU Unit

CJ2M

Note. A Pulse I/O Module must be mounted for CJ2M CPU Units with unit version 2.0 or later.

Module

### Input Interrupts

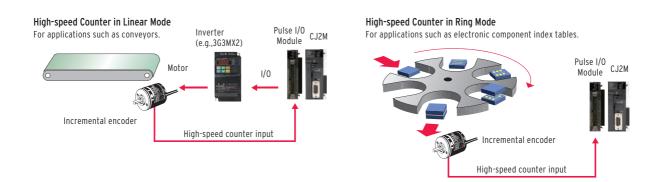
Up to eight interrupt inputs or quick-response inputs can be used.

- Pulse width as short as 30µs can be input with quick-response inputs.
- High-speed processing and interrupt response time of 33µs (in Direct Mode).
- Interrupts can be created for both of rising and falling edges.

**High-speed Counters** 

Up to four high-speed counter inputs can be used by connecting rotary encoders to Pulse inputs.

•High-speed counting at 100 kHz for single-phase and 50 kHz for phase-different input.



•The ring counter maximum value of a high-speed counter can be changed temporarily during operation.

• Start Interrupt Tasks using Target Value Comparison or Range Comparison for high-speed processing.

•The frequency (speed) can be easily measured by executing HIGH-SPEED COUNTER PV READ (PRV(881)) instruction. Ideal for applications such as measuring the speed of rotating bodies for inspections or detecting conveyer speeds. Can also be used for monitoring accumulated motor rotations.

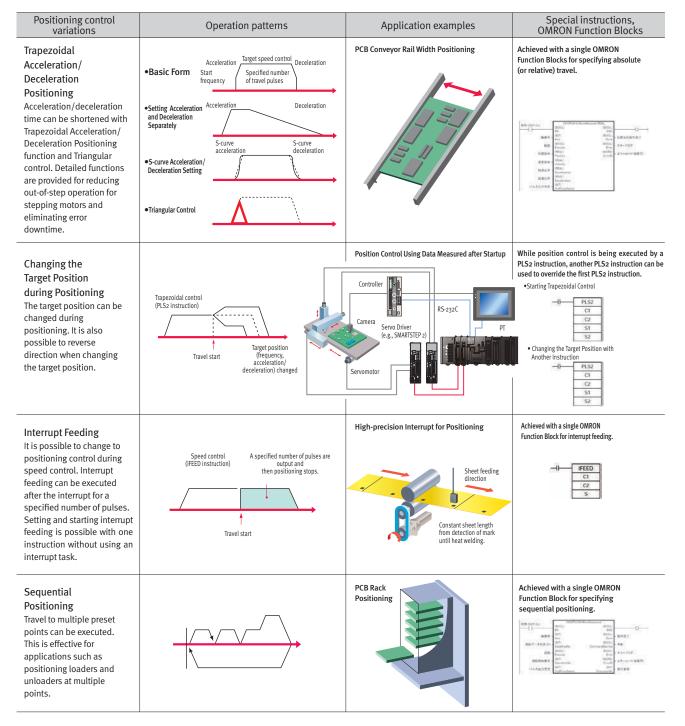
#### Pulse Outputs

From stepping motors to servos, positioning control can be easily achieved using pulse outputs for up to four axes.

#### Faster and easier

- $\bullet$  Pulse control cycle of 1 ms (1/4 of OMRON's CJ1M). Achieve smoother acceleration and deceleration.
- •Faster starting of position control (twice as fast as OMRON's CJ1M). Helps reduce machine takt time.
- •INTERRUPT FEED instruction (IFEED(892)). Execute high-precision feeding from interrupt inputs with just one instruction.
- •Close integration with the data trace function of the CX-Programmer for easy monitoring of positioning operations.

#### Complete positioning functions



#### CJ2H/ Flexible Machine Control with Refined I/O Perform Improve realtime control. CJ2M Faster Unit Input Response Improved Realtime Performance and Output Response for Immediate Refreshing Basic I/O Units, Position Control Units, Analog I/O Units, Direct Processing with analog I/O In addition to the greater processing performance Serial Communication Units of the CPU Unit, OMRON has also improved the response performance of each Unit. Faster throughput from inputs and processing to outputs helps to improve equipment tact time and work processing quality. Input Output Faster Unit I/O Response

#### Lineup of High-speed Units

#### Faster ON/OFF response time **High-speed Positioning** [Improved Basic Response] [ High-speed All the Way to Pulse Output ] Positioning start time **0.1 ms\*** ON response time **15** μs **90** μs OFF response time Basic I/O Units: High-speed type CJ1W- 1D212 ID233 High-speed Analog I/O

[Improved Basic Response]

A/D, D/A conversion period  $\ge$  20  $\mu$ s / 1 point ~ to 35  $\mu$ s / 4 point

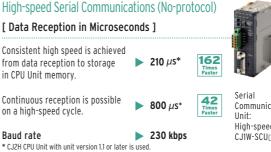
\* According to February 2010 OMRON survey in Japan



Analog Input/ Output Unit:

\* Starting time for first axis when all axes are stopped.

Position Control Units: High-speed type CJ1W-NC



230kbps,10bytes,The DRXDU instruction is used in an interrupt task.

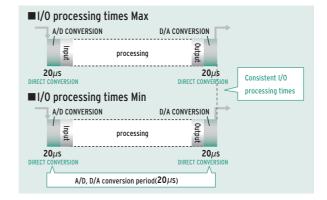
Communication High-speed type CJ1W-SCU□2

**Direct Processing with Enhanced Immediate Refreshing** 

#### Analog Input and Output with no jitter

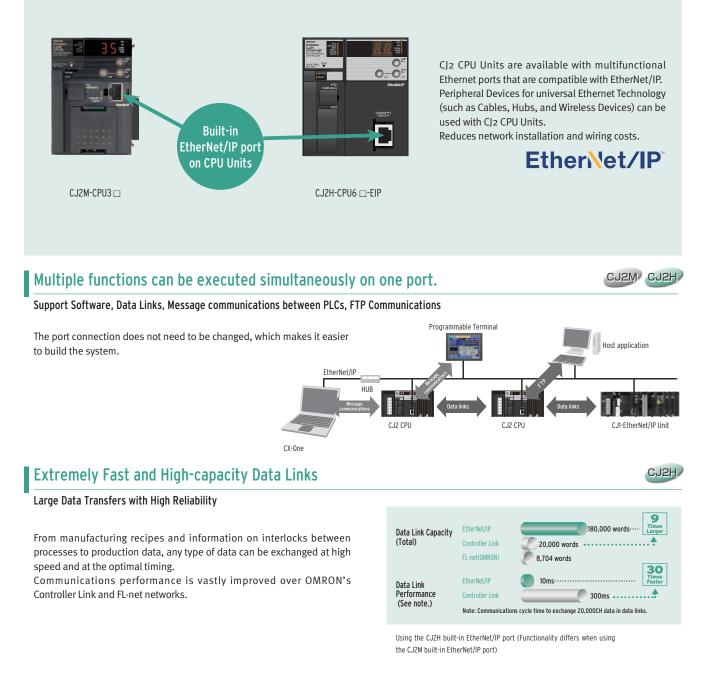
Consistency is achieved from input to processing and output with direct conversion functions for High-speed Units.\*

\* The analog-digital or digital-analog conversion and refreshing of converted values and set values are performed when the Direct Conversion Instruction (AIDC/APDC) is executed. Supported only by the CJ2H CPU Units with unit version 1.1 or later and CJ2M CPU Units.



### EtherNet/IP Is User Friendly in Three Ways

An open industrial network that implements a control protocol on general-purpose Ethernet technology.

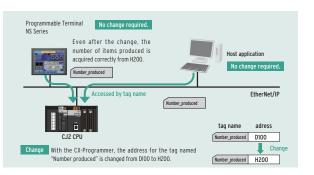


#### Efficient Programming with Tag Symbols

There Is Little Effect on Address Changes.

Previously, when data was exchanged by specifying address and addresses were changed, the program had to be changed at other Controllers and various operations, such as memory checks, had to be performed. Now, tag names reduce the dependence on a memory map and the need for checking items affected by changes. This allows equipment to be easily added or upgraded.

CJ2H-CPU6 □ -EIP: 20,000 max., CJ2M-CPU3 □ : 2,000 max.



CJ2M/ CJ2H/

# Network Solutions for Control Automation Technology

#### Simplified system on the integration of network

Expanding applications, not limited for motion control.

Flexible communication specification allows a wide variety of devices to join the same network. The connectable devices involve drive devices such as Servo Drives and Inverters, I/O devices, and other intelligent devices, including Vision Sensors.

# Analog I/O Digital I/O

Servo Drives

Position Control Unit

CJ1W-NCD81/NCD82

with EtherCAT interface

You Get Both the Easy Startup of Networks and the High-speed Starting

#### Superior Performance and Easy Operation

#### 100Mbps

#### [ High-speed communications ]

With EtherCAT, you can improve the performance of overall system from PLCs to servo system, as well as stand-alone Servo performance.

#### 0.4ms (when starting 4 axes)

#### [ High-speed starting ]

High-speed starting and control performance equivalent to those of pulse-train systems are achieved through network connections.

Control cycle **0.5 ms** 

Starting time **0.4 ms** 

\* A CJ2H CPU Unit with unit version 1.3 or higher or a CJ2M CPU Unit is required.

#### Share the Same Programming

#### Common programming enables easy introduction into existing systems

The Position Control Units with EtherCAT interface use the same positioning functions\* as High-speed Pulse-train Position Control Units, and the programming interface is also the same. You can easily switch the unit type between the Position Control Units depending on the application.

\* Except Synchronized control function

#### 1 connection [Simple wiring]

Vision Sensor

EtherCAT devices can be easily connected with Ethernet cables, which reduces wiring works.

Ether**CAT** 

Ether**CAT** 

Tool

Inverte

CX-Programme

CX-Drive

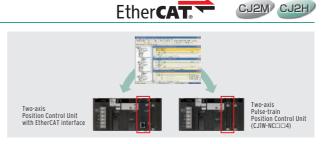
Encoder Input

CJ2M/ CJ2H

#### 1 port

#### [ Simple startup ]

Without reconnecting the computer, you can configure both the Position Control Units and EtherCAT communications setting via CPU unit. You can also directly connect the CX-Drive to set the Servo Drives.



#### Achieve High-speed, Low-cost Synchronized Multi-axis Control with Pulse Outputs (CJIW-NCDD4) CJ2H/

Building Synchronized Systems Using Only Ladder Programming and No Special Controllers Position Control Units: High-speed type CJ1W-NC\*\*4 Synchronous unit operation between Special I/O Units and the CPU Unit ensures concurrency from input to processing and output. A consistent, high-speed synchronous control cycle of 1 ms makes it easy to ensure application performance. CJ2H Perfect input CPU Unit Synchronous timina pulse outputs interrupt ŽÖ tasks CPU Bus Unit o CPU Bus Unit or CPU Bus Unit CPU Unit ecial I/O Unit Special I/O Unit Special I/O Uni Pulse outputs Internal processir Cyclic tasks Servomotor/ Servo Drive synchronized Perfect output Electronic cam operation for eight axes is supported using two Position Control Units. Up to ten Units Fully synchronized operation between CPU Supported only by the CJ2H CPU Units with unit version 1.1 or later. Unit and CPU Bus Units/Special I/O Units

Note: EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH,

## More Flexible Programming, Easier Debugging

CJ2M/ CJ2H/

Suggested

displayed

instructions

Changes to specifications can be handled easily and total lead time is reduced for system startup and troubleshooting.

#### A Smart Input Function greatly reduces the work required to input programs 50%

#### Easy, Intuitive Programming Software

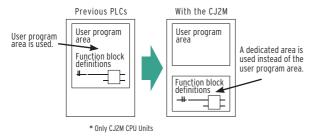
A complete range of intuitive programming functions is provided, including instruction and address input assistance, address incrementing, and address incremental copy. These functions enable waste-free programming with minimal effort.

\* In comparison to CX-Programmer version 8.

### Highly Readable Programming

#### The Greatest Program Diversity in the Industry.

-Bit Addresses can be used in the DM Area and EM Area. -BCD and Binary Timer instructions can be used Together. -Function blocks make units of processing easy to understand. -Function block definitions do not take up user program memory capacity.\*

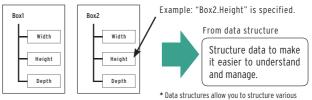


#### -Address offsets can be specified

MUV MLR MLR MUV HOV

-Array variables are supported, A symbol can be used for an array variable subscript.

-Structure symbols\* make it easier to create data structures and data bases.



Long Move

MOV MILC MILH MILR MLPX MOVE MOVE MOVE MOVE MOVE MSKS MTR MVN

types of data and define them as a new data type.

\* CJ2M: 2,000 data structures max., CJ2H: 4,000 data structures max

#### Stress-free Online Debugging

Effects on Machinery Operation Are Reduced.

-The additional cycle time due to online editing has been reduced to approx. 1 ms -Unlimited ST and SFC online editing

#### Greatly Improved Debugging Efficiency Through Superior Data Tracing

High-speed, High-capacity Data Tracing Is Now Possible.

#### **Ample Trigger Conditions**

One, two, or four words of data and comparison conditions can be specified. For example, a trigger can be set for when double-precision data is larger than a specified value.

#### CX-One Data Trace Is Also Upgraded.

The improved CJ2 trace function is fully utilized. -A function has been added for superimposing trace waveforms -Trace results can be printed or saved as bit maps. -The measurement times for two selected points can be checked.



Data Trace

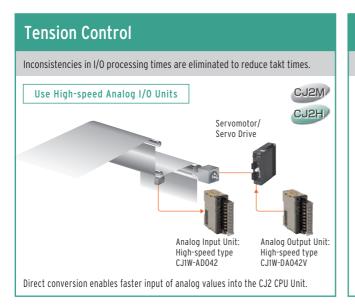
#### **High-capacity Data Tracing**

Maximum 32 Kwords (CJ2H) of data can be traced, and the EM Area can also be used as trace memory.

#### **Continuous Data Tracing**

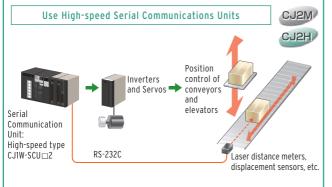
Sampled data in the trace memory of the CPU Unit can be regularly collected at the personal computer to enable sampling for long periods or time. Data can be saved in the CSV files in personal computer.

#### Ideal for Applications Requiring High Speed, Synchronization, and Multiple Axes Helps Improve Machine I/O Throughput



#### High-speed Serial Input from Laser Distance Meters

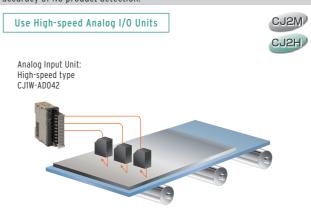
Achieve high-speed data input from high-speed measurement sensors, such as laser distance meters and displacement sensors.



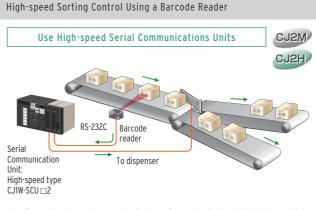
Transfer position data to the CPU Unit from laser distance meters with short measurement cycles without missing data to achieve precise control of inverters for conveyors and elevators.

#### Synchronized Control An electronic cam enables high-precision synchronized control. CJ2H/ Use CJ2H CPU Unit and Position Control Unit Crimping Equipment **Position Control** Units: Encoder High-speed type CJ1W-NC □□4 AC Servomotor R88M-K AC Servodriver R88D-KT R7D-BP

#### Inline Measurement Analog quantities are input in ultra-high speed (20µs) to improve the accuracy of NG product detection.

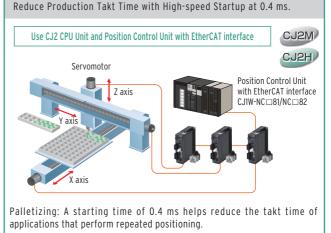


### High-speed Serial Input from Barcode Readers



Data from the barcode reader is transferred quickly to the CPU Unit to recognize the code and output pulses at high speed.

# Multi-axis Position Control through EtherCAT

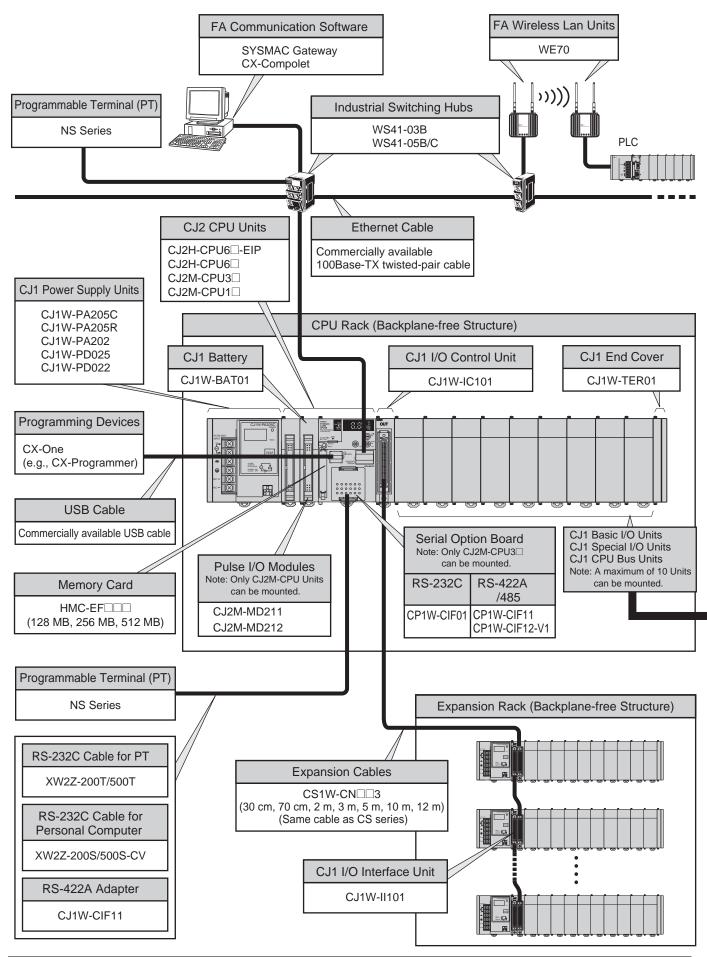


# System Design Guide

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#### **System Configuration**

#### Basic System



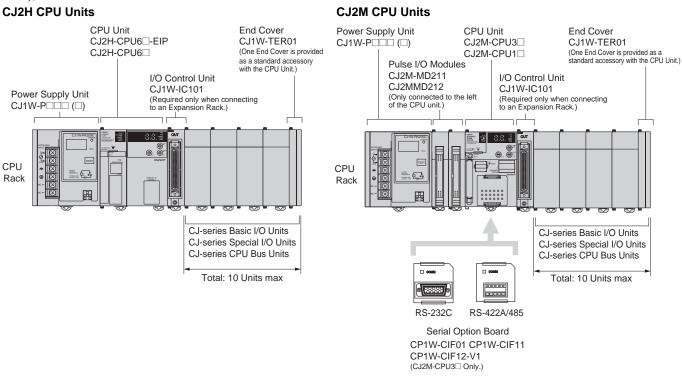
#### ■ Configuration Units

8-point Units	16-point Units	c I/O Units 32-point Units	64-point Units
8-point Units	-	-	64-point Units
	-	Units	
DC Input Unit CJ1W-ID201	<ul> <li>DC Input Unit</li> <li>CJ1W-ID211</li> </ul>	<ul> <li>DC Input Unit</li> <li>CJ1W-ID231</li> </ul>	<ul> <li>DC Input Unit</li> <li>CJ1W-ID261</li> </ul>
AC Input Unit	CJ1W-ID211 High-speed type	CJ1W-ID231 CJ1W-ID232	CJ1W-ID261 CJ1W-ID262
CJ1W-IA201	• AC Input Unit	CJ1W-ID233 High-speed type	0011111202
	CJ1W-IA111		
	Outpu	it Units	
Relay Contact Output Unit	Relay Contact Output Unit	Transistor Output Units	Transistor Output Units
(independent commons)	CJ1W-OC211	CJ1W-OD231	CJ1W-OD261
CJ1W-OC201 ● Triac Output Unit	<ul> <li>Transistor Output Units</li> <li>CJ1W-OD211</li> </ul>	CJ1W-OD233 CJ1W-OD234 High-speed type	CJ1W-OD263 CJ1W-OD262
CJ1W-OA201	CJ1W-OD213 High-speed type	CJ1W-OD232	03110-00202
Transistor Output Units	CJ1W-OD212	00111 00202	
CJ1W-OD201			
CJ1W-OD203			
CJ1W-OD202			
J1W-OD204			
	I/O	Units	
		<ul> <li>(16 inputs, 16 outputs)</li> <li>● DC Input/Transistor Output Units</li> </ul>	<ul> <li>32 inputs, 32 outputs</li> <li>● DC Input/Transistor Output Units</li> </ul>
		CJ1W-MD231	CJ1W-MD261
		CJ1W-MD233	CJ1W-MD263
		CJ1W-MD232	32 inputs, 32 outputs
			● TTL I/O Unit
			CJ1W-MD563
		r Units	B7A Interface Units
	<ul> <li>Interrupt Input Unit</li> <li>CJ1W-INT01</li> </ul>		(64 inputs)
			CJ1W-B7A14
			(64 outputs)
	Quick-response Input Unit		CJ1W-B7A04
	CJ1W-IDP01		(32 inputs, 32 outputs)
			CJ1W-B7A22
	CJ1 Special I/O Unit	s and CPU Bus Units	
Process I/O Units	High-speed Counter Units	Serial Communications Units	■ ID Sensor Units
Isolated-type Units with Universal Inputs CJ1W-PH41U	CJ1W-CT021	CJ1W-SCU22 High-speed type	CJ1W-V680C11
CJ1W-AD04U	Position Control Units	CJ1W-SCU32 High-speed type	CJ1W-V680C12
	CJ1W-NC214 High-speed type	CJ1W-SCU42 High-speed type	CJ1W-V600C11
Isolated-type Thermocouple Input Units CJ1W-PTS15	CJ1W-NC414 High-speed type	CJ1W-SCU21-V1	CJ1W-V600C12
CJ1W-PTS51	CJ1W-NC234 High-speed type	CJ1W-SCU31-V1	
	CJ1W-NC434 High-speed type	CJ1W-SCU41-V1	
Isolated-type Resistance Thermometer Input Units	CJ1W-NC113	■ EtherNet/IP Unit	
CJ1W-PTS16	CJ1W-NC213	CJ1W-EIP21	
CJ1W-PTS52	CJ1W-NC413	Ethernet Unit	
Isolated-type DC Input Unit	CJ1W-NC133	CJ1W-ETN21	
CJ1W-PDC15	CJ1W-NC233	Controller Link Units	
Analog I/O Units	CJ1W-NC433	CJ1W-CLK23	
Analog Input Units	Position Control Unit with EtherCAT interface	■ FL-net Unit	
CJ1W-AD042 High-speed type	interface	CJ1W-FLN22	
CJ1W-AD081-V1	CJ1W-NC281 CJ1W-NC481	DeviceNet Unit	Elliph and a Data Of the State
CJ1W-AD041-V1	CJ1W-NC481 CJ1W-NC881	CJ1W-DRM21	High-speed Data Storage Unit CJ1W-SPU01-V2
Analog Output Units	CJ1W-NCF81	CompoNet Master Unit	001W-0F 001-V2
CJ1W-DA042V High-speed type	CJ1W-NC482	CJ1W-CRM21	
CJ1W-DA08V	CJ1W-NC882	■ CompoBus/S Master Unit	
CJ1W-DA08C	CJ1W-NCF82	CJ1W-SRM21	
J1W-DA041	Position Control Unit with	■ EtherCAT Slave Unit	
CJ1W-DA021	MECHATROLINK-II interface	CJ1W-ECT21	
Analog I/O Units	CJ1W-NC271		
J1W-MAD42	CJ1W-NC471		
Temperature Control Units	CJ1W-NCF71		
CJ1W-TC001, CJ1W-TC002	CJ1W-NCF71-MA		
CJ1W-TC003, CJ1W-TC004	Motion Control Unit with		
CJ1W-TC101, CJ1W-TC102	MECHATROLINK-II interface		
CJ1W-TC103, CJ1W-TC104	CJ1W-MCH71		
J1W-TC103, CJ1W-TC104	CJ1W-MCH71 sual Studio and Windows are either registered	trademarks or trademarks of Microsoft Corpo	pration in the United States and/or other cou

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#### ■ CJ-series CPU Racks

A CJ-series CPU Rack consists of a CPU Unit, Power Supply Unit, Configuration Units (Basic I/O Units, Special I/O Units, and CPU Bus Units), and an End Cover.



#### Required Units

Rack	Unit name	Required number of Units
	Power Supply Unit	1
	CPU Unit	1
	Pulse I/O Modules	Required only for using Pulse I/O. Up to two Pulse I/O Modules can be connected to a CJ2M CPU Unit. They must be connected immediately to the left of the CPU Unit.
CPU Rack	Serial Option Board	One Serial Option Board can be mounted in the CJ2M-CPU3.
	I/O Control Unit	Required only for mounting to an Expansion Rack. Mount the I/O Control Unit immediately to the right of the CPU Unit.
	Number of Configuration Units	10 max. (Same for all models of CPU Unit.) (The number of Basic I/O Units, Special I/O Units, and CPU Bus Units can be varied. The number does not include the I/O Control Unit.)
	End Cover	1 (Included with CPU Unit.)

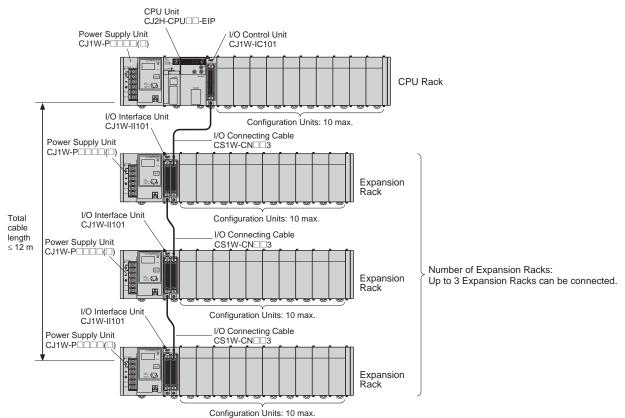
#### • Types of Units

In the CJ Series, Units are classified into the following three types. The number of Racks differs depending on the type.

Туре	Appearance (example)	Description	Unit recognition method	Max. Units mountable per CPU Unit
Basic I/O Units		Units with contact inputs and contact outputs.	Recognized by the CPU Unit accord- ing to the position of the Rack and slot.	A maximum of 40 Units can be mounted.
Special I/O Units		Special I/O Units provide more advanced functions than do Basic I/O Units, including I/O other than contact inputs and contact outputs. Examples of Special I/O Units are Analog I/O Units and High-speed Counter Units. They differ from CPU Bus Units (including Network Communi- cations Units) in having a smaller area for exchanging data with the CPU Unit.	Recognized by the CPU Unit accord- ing to the unit number (0 to 95) set with the rotary switches on the front panel.	A maximum of 40 Units can be connected. (Multi- ple unit numbers are allo- cated per Unit, depending on the model and settings.)
CPU Bus Units		CPU Bus Units exchange data with the CPU Unit via the CPU Bus. Examples of CPU Bus Units are Network Commu- nications Units and Serial Communications Units. They differ from Special I/O Units in having a larger area for exchanging data with the CPU Unit.	Recognized by the CPU Unit accord- ing to the unit number (0 to F) set with the rotary switch on the front panel.	A maximum of 16 Units can be mounted.

#### ■ CJ-series Expansion Racks

A CJ-series Expansion Rack consists of a Power Supply Unit, an I/O Interface Unit, Configuration Units (Basic I/O Units, Special I/O Units, and CPU Bus Units), and an End Cover.



#### Required Units

Rack	Unit name	Required number of Units
CPU Rack		One Unit. Required only when an Expansion Rack is used. Mount the I/O Control Unit immediately to the right of the CPU Unit. (See note 1.)
	Power Supply Unit	One Unit
Expansion	I/O Interface Unit	One Unit. Mount the I/O Interface Unit immediately to the right of the Power Supply Unit. (See note 2.)
Rack	Number of Configuration Units	Ten Units max. (The number of Basic I/O Units, Special I/O Units, and CPU Bus Units can be varied. This number does not include the I/O Interface Unit.)
	End Cover	One (Included with the I/O Interface Unit.)

Note 1. Mounting the I/O Control Unit in any other location may cause faulty operation.

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

#### Maximum Number of Configuration Units That Can Be Mounted

CPU Unit	Model	Total Units	No. of Units on CPU Rack	No. of Expansion Racks
CJ2H	CJ2H-CPU68 (-EIP)	40	10 per Rack	3 Racks x 10 Units
	CJ2H-CPU67 (-EIP)			
	CJ2H-CPU66 (-EIP)			
	CJ2H-CPU65 (-EIP)			
	CJ2H-CPU64 (-EIP)			
CJ2M	CJ2M-CPU35			
	CJ2M-CPU34			
	CJ2M-CPU33			
	CJ2M-CPU32			
	CJ2M-CPU31			
	CJ2M-CPU15			
	CJ2M-CPU14			
	CJ2M-CPU13			
	CJ2M-CPU12	1		
	CJ2M-CPU11	1		

Note: It may not be possible to mount the maximum number of configuration Units depending on the specific Units that are mounted. Refer to the next page for details.

#### Configuration Units

CJ-series Special I/O Units

Туре	Name	Specifications	Model	Number of words allocated (CIO 2000 to	Number of words allocated (D20000 to	Unit No.	Number of mountable	consu	rrent mption A)	Weight
				CIO 2959)	D29599)		Units	5 VDC	24 VDC	
Special I/O Units	General- purpose Universal Analog Input Unit	4 inputs, fully universal	CJ1W-AD04U	10 words	100 words	0 to 95	40 Units	0.32		150 g max.
	Analog Input Units	8 inputs (4 to 20 mA, 1 to 5 V, etc.)	CJ1W-AD081-V1	10 words	100 words	0 to 95	40 Units	0.42		140 g max.
		4 inputs (4 to 20 mA, 1 to 5 V, etc.)	CJ1W-AD041-V1	10 words	100 words	0 to 95	40 Units	0.42		140 g max.
		4 inputs (4 to 20 mA, 1 to 5 V, etc.)	CJ1W-AD042	10 words	100 words	0 to 95	40 Units	0.52		150 g max.
	Analog Output Units	4 outputs (1 to 5 V, 4 to 20 mA, etc.)	CJ1W-DA041	10 words	100 words	0 to 95	40 Units	0.12		150 g max.
		2 outputs (1 to 5 V, 4 to 20 mA, etc.)	CJ1W-DA021	10 words	100 words	0 to 95	40 Units	0.12		150 g max.
		8 outputs (1 to 5 V, 0 to 10 V, etc.)	CJ1W-DA08V	10 words	100 words	0 to 95	40 Units	0.14		150 g max.
		8 outputs (4 to 20 mA)	CJ1W-DA08C	10 words	100 words	0 to 95	40 Units	0.14		150 g max.
		4 outputs (1 to 5 V, 0 to 10 V, etc.)	CJ1W-DA042V	10 words	100 words	0 to 95	40 Units	0.40		150 g max.
	Analog I/O Unit	4 inputs (1 to 5 V, 4 to 20 mA, etc.) 2 outputs (1 to 5 V, 4 to 20 mA, etc.)	CJ1W-MAD42	10 words	100 words	0 to 95	40 Units	0.58		150 g max.
	Isolated-type High-resolution Universal Input Unit	4 inputs, fully universal Resolution: 1/256,000, 1/64,000, 1/16,000	CJ1W-PH41U	10 words	100 words	0 to 95	40 Units	0.30		150 g max.
	Isolated-type Thermocouple Input Units	4 thermocouple inputs 2 thermocouple inputs	CJ1W-PTS51 CJ1W-PTS15	10 words 10 words	100 words 100 words	0 to 95 0 to 95	40 Units 40 Units	0.25 0.18		150 g max. 150 g max.
	Isolated-type Resistance	4 resistance thermometer inputs	CJ1W-PTS52	10 words	100 words	0 to 95	40 Units	0.25		150 g max.
	Thermometer Input Units	2 resistance thermometer inputs	CJ1W-PTS16	10 words	100 words	0 to 95	40 Units	0.18		150 g max.
	Direct Current Input Unit	DC voltage or DC current, 2 inputs	CJ1W-PDC15	10 words	100 words	0 to 95	40 Units	0.18		150 g max.
	Temperature Control Units	4 control loops, thermocouple inputs, NPN outputs	CJ1W-TC001	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.
		4 control loops, thermocouple inputs, PNP outputs	CJ1W-TC002	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.
		2 control loops, thermocouple inputs, NPN outputs, heater burnout detection	CJ1W-TC003	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.
		2 control loops, thermocouple inputs, PNP outputs, heater burnout detection	CJ1W-TC004	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.
		4 control loops, temperature- resistance thermometer inputs, NPN outputs	CJ1W-TC101	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.
		4 control loops, temperature- resistance thermometer inputs, PNP outputs	CJ1W-TC102	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.
		2 control loops, temperature-resistance thermometer inputs, NPN outputs, heater burnout detection	CJ1W-TC103	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.
		2 control loops, temperature-resistance thermometer inputs, PNP outputs, heater burnout detection	CJ1W-TC104	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.25		150 g max.

Note: Including models whose production are discontinued.

Туре	Name	Specifications	Model	Number of words allocated (CIO 2000 to	(D20000 to	Unit No.	Number of mountable Units	consu (	rrent mption A)	Weight
<u></u>				CIO 2959)	D29599)		Units	5 VDC	24 VDC	
Special I/O Units	Position Control Units	1 axis, pulse output; open collector output	CJ1W-NC113	10 words	100 words	0 to 95	40 Units	0.25		100 g max.
		2 axes, pulse outputs;	CJ1W-NC213	10 words	100 words	0 to 95	40 Units	0.25		100 g max.
		open collector outputs	CJ1W-NC214 *1, *2	18 words *3	None	0 to 94 (uses words for 2 unit numbers)	5 Units/ Rack	0.27		170 g max.
		4 axes, pulse outputs; open collector outputs	CJ1W-NC413	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.36		150 g max.
			CJ1W-NC414 *1, *2	18 words *3	None	0 to 94 (uses words for 2 unit numbers)	5 Units/ Rack	0.31		220 g max.
		1 axis, pulse output; line driver output	CJ1W-NC133	10 words	100 words	0 to 95	40 Units	0.25		100 g max.
		2 axes, pulse outputs; line driver outputs 4 axes, pulse outputs; line driver outputs	CJ1W-NC233	10 words	100 words	0 to 95	40 Units	0.25		100 g max.
			CJ1W-NC234 *1, *2	18 words *3	None	0 to 94 (uses words for 2 unit numbers)	5 Units/ Rack	0.27		170 g max.
			CJ1W-NC433	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.36		150 g max.
			CJ1W-NC434 *1, *2	18 words *3	None	0 to 94 (uses words for 2 unit numbers)	5 Units/ Rack	0.31		220 g max.
		Space Unit *4	CJ1W-SP001	None	None					50 g max.
	ID Sensor Units	V600-series single- head type	CJ1W-V600C11	10 words	100 words	0 to 95	40 Units	0.26	0.12	120 g max.
		V600-series two-head type	CJ1W-V600C12	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.32	0.24	130 g max.
		V680-series single- head type	CJ1W-V680C11	10 words	100 words	0 to 95	40 Units	0.26	0.13	120 g max.
		V680-series two-head type	CJ1W-V680C12	20 words	200 words	0 to 94 (uses words for 2 unit numbers)	40 Units	0.32	0.26	130 g max.
	High-speed Counter Unit	Number of counter channels: 2, Maximum input frequency: 500 kHz, line driver compatible *5	CJ1W-CT021 *7	40 words	400 words	0 to 92 (uses words for 4 unit numbers)	24 Units	0.28		100 g max.
	CompoBus/S Master Units	CompoBus/S remote I/O, 256 bits max.	CJ1W-SRM21	10 words or 20 words	None	0 to 95 or 0 to 94	40 Units	0.15		66 g max. <b>*</b> 6

\*1. With a CJ2 CPU Unit, up to 10 Configuration Units can be connected in the CPU Rack and in each Expansion Rack. The CJ1W-NC□□4, however, must be counted as two Units. Configure the Units to satisfy the following formula. Number of CJ1W-NC□□4 Units × 2 + Number of other Units ≤ 10

For example, if five CJ1W-NC 4 Units are connected to one Rack, no other Units can be connected.

**\*2.** The Units must be mounted on the CPU Rack to use synchronous unit operation.

\*3. In addition to the words allocated in the Special I/O Unit Area, up to 144 words are allocated according to the number of axes and functions uses. Word allocations are set using the CX-Programmer.

**\*4.** The Space Unit is for Position Control Units.

\*5. If interrupts to the CPU Unit are used, mount the Interrupt Input Unit in one of the following slots on the CPU Rack.

CJ2H-CPU6□-EIP: Slots 0 to 3

• CJ2H-CPU6 or CJ2M-CPU : Slots 0 to 4

**\*6.** Includes the weight of accessory connectors.

\*7. Use Lot No. 030121 or later (Unit Version 1.06) of CJ1W-CT021 when using with CJ2 CPU Units.

Туре	Name	Specifications	Model	(CIO 2000 to	Number of words allocated (D20000 to	Unit No.	Number of mountable Units	(A)		Weight
				CIO 2959)	D29599)			5 VDC	24 VDC	
Special I/O Units	CompoNet Master Unit	CompoNet remote I/O Communications mode No. 0: 128 inputs/ 128 outputs for Word Slaves	_	20 words	None	0 to 94 (uses words for 2 unit numbers)	40 Units	0.40		130 g max.
		Communications mode No. 1: 256 inputs/ 256 outputs for Word Slaves		40 words	None	0 to 92 (uses words for 4 unit numbers)	24 Units	0.40		
		Communications mode No. 2: 512 inputs/ 512 outputs for Word Slaves CJ1W	mode No. 2: 512 inputs/ 512 outputs for Word	80 words	None	0 to 88 (uses words for 8 unit numbers)	12 Units	0.40		
	Com mod 256 256 Slave input 128	Communications mode No. 3: 256 inputs/ 256 outputs for Word Slaves and 128 inputs/ 128 outputs for Bit Slaves	ode No. 3: 56 inputs/ 56 outputs for Word aves and 128 puts/ 28 outputs for Bit aves	12 Units	0.40					
		Communications mode No. 8: 1,024 inputs/1,024 outputs for Word Slaves and 256 inputs/ 256 outputs for Bit Slaves maximum		10 words	Depends on setting	0 to 95 uses words for 1 unit number)	40 Units	0.40		

#### CJ-series CPU Bus Units

Туре	Name	Specifications	Model	Number of words allocated (CIO 1500	Unit No.	Maximum number of		rent ption (A)	Weight						
		·		to CIO 1899)		Units *1	5 VDC	24 VDC	Ĩ						
CPU Bus Jnits <b>%</b> 1	High-speed Analog Input Unit	4 inputs: 80 μs/2 inputs, 160 μs/4 inputs	CJ1W-ADG41 *2	25 words	0 to F	16 Units *3	0.65		150 g max						
	Controller Link Units	Wired data links	CJ1W-CLK23	25 words	0 to F	8 Units	0.35		110 g max						
	Serial Communications	One RS-232C port and one RS-422A/485 port	CJ1W-SCU41-V1	25 words	0 to F	16 Units <b>*</b> 3	0.38 *4		110 g max						
	Units	Two RS-232C ports	CJ1W-SCU21-V1				0.28 *4								
		Two RS-422A/485 ports	CJ1W-SCU31-V1				0.38		-	_		-	-	-	
		Two RS-232C ports High-speed models	CJ1W-SCU22			16 Units <b>*</b> 3	0.28 *4								_
		Two RS-422A/485 ports High-speed models	CJ1W-SCU32				0.4		120 g max						
		One RS-232C port and one RS-422A/485 port High- speed models	CJ1W-SCU42				0.36 *4		140 g max						
	Ethernet Units	100Base-TX, FINS communications, socket service, FTP server, and mail communications	CJ1W-ETN21	25 words	0 to F	4 Units	0.37		100 g max						
	EtherNet/IP Unit	Tag data links, FINS communications, CIP message communications, FTP server, etc.	CJ1W-EIP21	25 words	0 to F	*5	0.41		94 g max.						
	FL-net Unit	100Base-TX cyclic transmissions and message transmissions	CJ1W-FLN22	25 words	0 to F	4 Units	0.37		100 g max						
	DeviceNet Unit	DeviceNet remote I/O, 2,048 points; Both Master and Slave functions, Automatic allocation possible without Configurator	CJ1W-DRM21	25 words *6	0 to F	16 Units ≉3	0.29		118 g max *7						
	Position Control	2 servo axes	CJ1W-NC281	25 words	0 to F	16 Units	0.46		110 g max						
	Units with	4 servo axes	CJ1W-NC481			*3									
	EtherCAT interface	8 servo axes	CJ1W-NC881												
	*0	16 servo axes	CJ1W-NCF81												
		4 servo axes and 64 I/O slaves	CJ1W-NC482												
		8 servo axes and 64 I/O slaves	CJ1W-NC882												
		16 servo axes and 64 I/O slaves	CJ1W-NCF82												
	EtherCAT Slave Unit	EtherCAT REMORT I/O DATA Input: 400 bytes Output: 400 bytes	CJ1W-ECT21	25 words	0 to F	16 Units	0.34		97g max.						
	Position Control MECHATROLINK-II, Units supporting 16 axes max. MECHATROLINK-II communications		CJ1W-NCF71(-MA)	25 words	0 to F	16 Units ¥3	0.36		95 g max.						
	Motion Control Units supporting MECHATROLINK-II communications	MECHATROLINK-II, Real axes: 30 max., Virtual axes: 2 max., Special motion control language	CJ1W-MCH71	25 words	0 to F	3 Units/ Rack <b>*</b> 9	0.60		210 g ma:						
	SPU Unit (High- speed Storage and Processing Unit)	One CF card type I/II slot (used with OMRON HMC- EF . Memory Card), one Ethernet port	CJ1W-SPU01-V2 *10	Not used.	0 to F	16 Units <b>*</b> 3	0.56		180 g max						

Note: Including models whose production are discontinued.

\*1. Some CJ-series CPU Bus Units are allocated words in the CPU Bus Unit Setup Area. The system must be designed so that the number of words allocated in the CPU Bus Unit Setup Area does not exceed its capacity. Refer to 4-6-2 CPU Bus Unit Setup Area in CJ2 CPU Unit Software User's Manual (Cat. No. W473). There may also be limits due to the capacity of the Power Supply Unit that you are using or the maximum number of Units to which memory can be allocated in the CPU But Unit Setup Area.

\*2. If interrupts to the CPU Unit are used, mount the Interrupt Input Unit in one of the following slots on the CPU Rack.
 CJ2H-CPU6□-EIP: Slots 0 to 3

- CJ2H-CPU6 or CJ2M-CPU :: Slots 0 to 4
- \*3. Up to 15 Units can be connected for a CJ2H-CPU6 -EIP or CJ2M-CPU3 CPU Unit.
- \*4. Increases by 0.15 A/Unit when an NT-AL001 RS-232C/RS-422A Link Adapter is used. Increases by 0.04 A/Unit when a CJ1W-CIF11 RS-422A Converter is used. Increases by 0.20 A/Unit when an NV3W-M□20L(-V1) Programmable Terminal is used.

\*5. Up to seven Units can be connected for a CJ2H-CPU6 -EIP CPU Unit, up to eight Units can be connected for a CJ2H-CPU6 CPU Unit, and up to two Units can be connected for a CJ2M CPU Unit.

**\*6.** Slave I/O are allocated in DeviceNet Area (CIO 3200 to CIO 3799).

**\*7.** Includes the weight of accessory connectors.

**\*8.** Only G5-series Servo Drives with Built-in EtherCAT can be connected.

\*9. When mounting to a CJ-series CPU Rack or a CJ-series Expansion Rack, one of these Units uses the space of three Units.

\*10. Use version 2 or higher of the SPU Unit with a CJ2 CPU Unit.

#### **Checking Current Consumption and Power Consumption**

After selecting a Power Supply Unit based on considerations such as the power supply voltage, calculate the current and power requirements for each Rack.

Condition 1: Current Requirements There are two voltage groups for internal power consumption: 5 V and 24 V. Current consumption at 5 V (internal logic power supply) Current consumption at 24 V (relay driving power supply) Condition 2: Power Requirements

For each Rack, the upper limits are determined for the current and power that can be provided to the mounted Units. Design the system so that the total current consumption for all the mounted Units does not exceed the maximum total power or the maximum current supplied for the voltage groups shown in the following tables.

The maximum current and total power supplied for CPU Racks and Expansion Racks according to the Power Supply Unit model are shown below.

Note 1. For CPU Racks, include the CPU Unit current and power consumption in the calculations. When expanding, also include the current and power consumption of the I/O Control Unit in the calculations.

2. For Expansion Racks, include the I/O Interface Unit current and power consumption in the calculations.

	Max. cur	Max. total		
Power Supply Units	5 V	24 V (relay driving current)       0.8 A       0.8 A       0.4 A	power sup- plied	
CJ1W-PA205C	5.0 A	0.8 A	25 W	
CJ1W-PA205R	5.0 A	0.8 A	25 W	
CJ1W-PA202	2.8 A	0.4 A	14 W	
CJ1W-PD025	5.0 A	0.8 A	25 W	
CJ1W-PD022	2.0 A	0.4 A	19.6 W	

Conditions 1 and 2 below must be satisfied.

Condition 1: Maximum Current

(1) Total Unit current consumption at 5 V  $\leq$  (A) value

(2) Total Unit current consumption at 24 V  $\leq$  (B) value

Condition 2: Maximum Power

 $(1) \times 5 V + (2) \times 24 V \le (C)$  value

#### ■ Example: Calculating Total Current and Power Consumption

Example: When the Following Units are Mounted to a CJ-series CPU Rack Using a CJ1W-PA205R Power Supply Unit

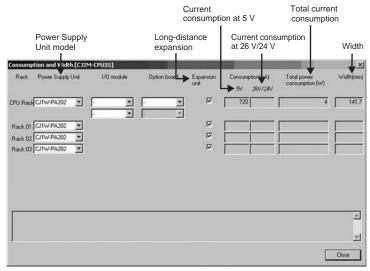
	Model	Quantity	Voltage group		
Unit type	woder	Quantity	5 V	24 V	
CPU Unit	CJ2H-CPU68-EIP	1	0.820 A		
I/O Control Unit	CJ1W-IC101	1	0.020 A		
Basic I/O Units (Input Units)	CJ1W-ID211	2	0.080 A		
	CJ1W-ID231	2	0.090 A		
Basic I/O Units (Output Units) CJ1W-OC201		2	0.090 A	0.048 A	
Special I/O Unit	CJ1W-DA041	1	0.120 A		
CPU Bus Unit	CJ1W-CLK23	1	0.350 A		
Current consumption	Total		0.820 + 0.020 + 0.080 × 2 + 0.090 × 2 + 0.090 × 2 + 0.120 + 0.350	0.048 A× 2	
-	Result		1.83 A (≤ 5.0 A)	0.120 A            0.350 A $0.020 + 0.080 \times 2 + 0.090 \times$ 0.048 A × 2           0.090 × 2 + 0.120 + 0.350         0.048 A × 2           1.83 A ( $\leq 5.0$ A)         0.096 A ( $\leq 0.8$ A)	
Power consumption	Total		1.83 × 5 V = 9.15 W	$0.096 \text{ A} \times 24 \text{ V} = 2.30 \text{ W}$	
-	Result		9.15 + 2.30 = 11.45 W (≤ 25 W)		

Note: For details on Unit current consumption, refer to Ordering Information.

#### ■ Using the CX-Programer to Display Current Consumption and Width

CPU Rack and Expansion Rack current consumption and width can be displayed by selecting Current Consumption and Width from the Options Menu in the CJ2 Table Window. If the capacity of the Power Supply Unit is exceeded, it will be displayed in red characters.

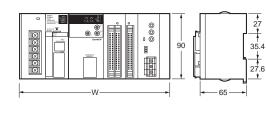
#### Example:



#### Dimensions

Note: Units are in mm unless specified otherwise.

#### Product Dimensions



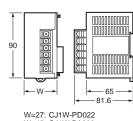
	-					
No. of Units	Rack width (mm)					
mounted with	With	With	With	With		
31-mm width	CJ2H-CPU6□-EIP	CJ2H-CPU6	CJ2M-CPU3	CJ2M-CPU1		
1	170.5	139.5	152.7	121.7		
2	201.5	170.5	183.7	152.7		
3	232.5	201.5	214.7	183.7		
4	263.5	232.5	245.7	214.7		
5	294.5	263.5	276.7	245.7		
6	325.5	294.5	307.7	276.7		
7	356.5	325.5	338.7	307.7		
8	387.5	356.5	369.7	338.7		
9	418.5	387.5	400.7	369.7		
10	449.5	418.5	431.7	400.7		

Example Rack Widths using CJ1WPA202 Power Supply Unit (AC, 14 W)

#### • Power Supply Units, CPU Units, and End Covers

Unit/product	Model	Width
	CJ1W-PA205C	80
	CJ1W-PA205R	80
Power Supply Unit	CJ1W-PA202	45
	CJ1W-PD025	60
	CJ1W-PD022	27
	CJ2H-CPU6□-EIP	79.8
CPU Unit	CJ2H-CPU6	48.8
CF0 0m	CJ2M-CPU3	62
	CJ2M-CPU1	31
End Cover	CJ1W-TER01	14.7

Power Supply Units



W=27: CJ1W-PD022 W=45: CJ1W-PA202 W=80: CJ1W-PA205R CJ1W-PA205C W=60: CJ1W-PD025

76.2

75

84.5

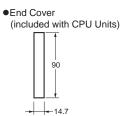
CJ2M-CPU3□

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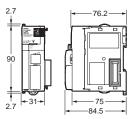
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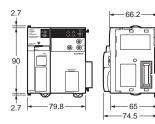


RS-422A Adapter
 CJ1W-CIF11

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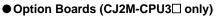


#### •CPU Units CJ2H-CPU6 -EIP

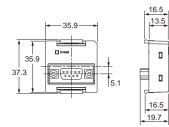


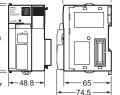
#### CJ2H-CPU6□





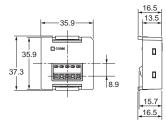
#### Serial Option Boards CP1W-CIF01







#### CP1W-CIF11/CP1W-CIF12-V1

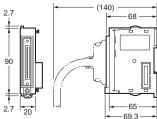


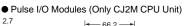
.8 CJ2M-CPU1□

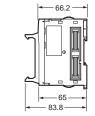
#### • Units of Width 20 mm

Unit/product	Model	Width	
I/O Control Unit	CJ1W-IC101		
Pulse I/O Modules	CJ2M-MD211/212		
32-point Basic I/O Units	CJ1W-ID231/232/233		
32-point Basic I/O Units	CJ1W-OD231/232/233/234		
B7A Interface Unit	CJ1W-B7A22 CJ1W-B7A14 CJ1W-B7A04	20	
CompoBus/S Master Unit	CJ1W-SRM21		
Space Unit	CJ1W-SP001		

#### I/O Control Unit

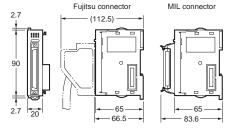






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#### ● 32-Point I/O Units (CJ1W-ID223□/OD23□)



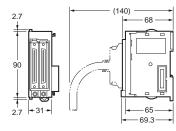
#### • Units of Width 31 mm

Unit	Model	Width
I/O Interface Unit	CJ1W-II101	
8/16-point Basic I/O Units	CJ1W-ID201 CJ1W-ID211/212 CJ1W-IA111/201 CJ1W-OD200 CJ1W-OD211/212/213 CJ1W-OC201/211 CJ1W-OA201	
32-point Basic I/O Units	CJ1W-MD231 CJ1W-MD232/233	
64-point Basic I/O Units	CJ1W-ID261 CJ1W-OD261 CJ1W-ID262 CJ1W-ID262 CJ1W-OD262/263 CJ1W-MD263 CJ1W-MD563	-
Interrupt Input Unit	CJ1W-INT01	
Quick-response Input Unit	CJ1W-IDP01	
Analog I/O Units	CJ1W-AD (-V1) CJ1W-DA () CJ1W-MAD42	
Process Input Units	CJ1W-PH41U CJ1W-AD04U CJ1W-PTS51/52/15/16 CJ1W-PDC15	31
Temperature Control Units	CJ1W-TC	]
Position Control Units	CJ1W-NC113/133 CJ1W-NC213/233 CJ1W-NC413/433	
Position Control Unit with EtherCAT interface	CJ1W-NC281 CJ1W-NC481 CJ1W-NC881 CJ1W-NC781 CJ1W-NC482 CJ1W-NC882 CJ1W-NC782	
EtherCAT Slave Unit	CJ1W-ECT21	
Position Control Unit with MECHATROLINK-II interface	CJ1W-NCF71	
High-speed Counter Unit	CJ1W-CT021	
ID Sensor Units	CJ1W-V680C11 CJ1W-V680C12 CJ1W-V600C11 CJ1W-V600C12	

Unit	Model	Width	
Controller Link Units	CJ1W-CLK23		
Serial Communications Units	CJ1W-SCU22 CJ1W-SCU32 CJ1W-SCU42 CJ1W-SCU41-V1 CJ1W-SCU21-V1 CJ1W-SCU31-V1		
EtherNet/IP Unit	CJ1W-EIP21		
Ethernet Unit	CJ1W-ETN21		
DeviceNet Unit	CJ1W-DRM21	31	
CompoNet Master Unit	CJ1W-CRM21		
FL-net Unit	CJ1W-FLN22		
● I/O Interface Unit	● 8/6-point Basic I/O Units,		

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Interrupt Input Unit, and High-speed Input Unit

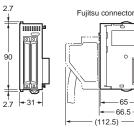


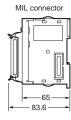
**∢**31 ► - 65 -- 89

● 64-point Basic I/O Units and 32-point Basic I/O Units (CJ1W-MD23□)

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- 65

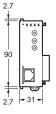




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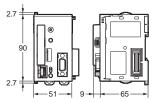
• Special I/O Units and CPU Bus Units



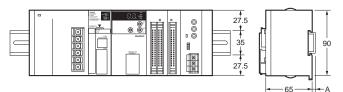
#### • Units of Width 51 mm

Unit	Model	Width			
SPU Unit (High-speed Data Storage Unit)	CJ1W-SPU01-V2	51			
Position Control Units (High-speed type)	CJ1W-NC214/234				

 SPU Unit (High-speed Data Storage Unit) CJ1W-SPU01-V2



#### Mounting Dimensions

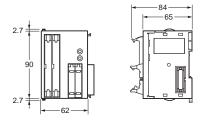


DIN Track model number	Α
PFP-100N2	16 mm
PFP-100N	7.3 mm
FPP-50N	7.3 mm

#### • Unit of Width 62 mm

Unit	Model	Width
Position Control Units (High-speed type)	CJ1W-NC414/434	62

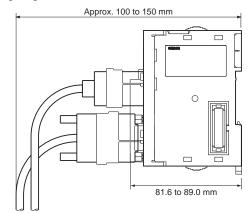
 Position Contorol Unit (High-speed model) CJ1W-NC414/434



#### Mounting Height

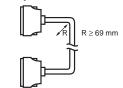
The mounting height of CJ-series CPU Racks and Expansion Racks is from 81.6 to 89.0 mm depending on the Units that are mounted.

Additional height is required to connect Programming Devices (e.g., CX-Programmer) and Cables. Be sure to allow sufficient mounting height.



Note: Consider the following points when expanding the configuration: The total length of I/O Connecting Cable must not exceed 12 m. I/O Connecting Cables require the bending radius indicated below.

#### • Expansion Cable



Note: Outer diameter of cable: 8.6 mm.

# **General Specifications**

ltem		CJ2H- CJ					J2M-		
	tem	CPU64 (-EIP)	CPU65 (-EIP)	CPU66 (-EIP)	CPU67 (-EIP)	CPU68 (-EIP)	CPU1	CPU3	
Enclosure		Mounted in a pane	el		•	•			
Grounding		Less than 100 $\Omega$							
CPU Unit Dim $(H \times D \times W)$	ensions	CJ2H-CPU6□-EIF CJ2H-CPU6□ :	P: 90 mm × 65 mr 90 mm × 65 mr				90 mm × 75 mm × 31 mm	90 mm × 75 mm × 62 mm	
Weight *1		CJ2H-CPU6□-EIF CJ2H-CPU6□ :	280 g or less 190 g or less				130 g or less	190 g or less *2	
Current Cons	umption	CJ2H-CPU6□-EIF CJ2H-CPU6□ :	2 : 5 VDC, 0.82 A 5 VDC, 0.42 A				5 VDC, 0.5 A	5 VDC, 0.7 A	
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 70°C (excluding battery)							
	Altitude	2,000 m or less	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	EC 61010-2-201						
	EMC Immunity Level	Zone B							
	Vibration Resistance	Conforms to IEC60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz Acceleration of 9.8 m/s <sup>2</sup> for 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)							
	Shock Resistance	Conforms to IEC60068-2-27. 147 m/s², 3 times in X, Y, and Z directions (100 m/s² for Relay Output Units)							
Battery	Life	5 years at 25°C							
	Weight	Approx. 10 g							
	Model	CJ1W-BAT01							
Applicable Sta	andards	Conforms to cULu	s, NK, LR and EC	Directives.					

\*1. Includes the weight of end covers and battery.\*2. Without a Serial Option Board.

# OMRO

#### **Performance Specifications**

			CJ2H-					CJ2M-					
Item			CPU64	CPU65	CPU66	CPU67	CPU68	CPU	CPU	CPU	CPU	CPU	
	(-EIP)	(-EIP)	(-EIP)	(-EIP)	(-EIP)	11/31	12/32	13/33	14/34	15/35			
User Memory	50K	100K	150K	250K	400K	5K	10K	20K	30K steps	60K steps			
I/O Bits	steps 2,560 bits	steps	steps	steps	steps	steps	steps	steps	Sieps	sieps			
Processing	Overhead D	rocessing Time *1			-CPU6□-E	IP: 200 μ	•	Normal M	lode: CJ2N		270 µ	0	
Speed				CJ2H	-CPU6🗆 :	100 μ			CJ2N	∕I-CPU1□:	160 µ		
	Execution T	ime			.016 μs mir 0.048 μs n				tructions: 0 structions:				
	Interrupts	I/O Interrupts and	Interrupt ta	ask startup f		<b>*</b> 2 or 26 μ		Interrupt	task startup	o time: 31 µ	IS		
		External Interrupts	Return tim	es to cyclic	tasks: 8 µs	s for unit ve *2 or 11 μ μs for unit v	s	Return tir	nes to cycli	ic tasks: 10	μs		
		Scheduled Interrupts	-	time interva -ms increm	al: 0.2 ms ¥ ients)	<b>\$</b> 2			time interv I-ms incren				
			Interrupt t	ask startup	time: 13 μ	s *2 or 22	μs	Interrupt	task startur	o time: 30 μ	IS		
			(27 μs for Return tim	unit version nes to cyclion	n 1.0) c tasks: 8 µ	ıs <b>*</b> 2 or 11	•		ne to cyclic				
Maximum Nur	nber of Conne	ectable Units	Total per (	unit version CPU Rack PLC: 40 Un	or Expansi	on Rack: 10	) Units max	.;					
	Basic I/O Ur	vito		-LC. 40 UI	iits max.								
			No limit However, a maximum of two CJ1W-INT01 Interrupt Input Units can be mounted.										
	Special I/O	Units	Units for up to 96 unit numbers can be mounted. (Unit numbers run from 0 to 95. Units are allocated between 1 and 8 unit numbers.)										
	CPU Bus Ur	nits	CJ2M-CPU3⊡: 15 Units max. CJ2M-CPU1⊡: 16 Units max.										
	Pulse I/O M	odules	2 Units max. *3										
	Slots for whi	ch interrupts can be used	Slots 0 to	4 on CPU	Rack								
Maximum Nur	nber of Expar	ision Racks	3 max.										
CIO Area	I/O Area		2,560 bits (160 words): Words CIO 0000 to CIO 0159										
	Link Area		3,200 bits (200 words): Words CIO 1000 to CIO 1199										
	Synchronou	s Data Refresh Area	1,536 bits (96 words): Words CIO 1200 to CIO 1295										
	CPU Bus Ur	nit Area	6,400 bits (400 words): Words CIO 1500 to CIO 1899										
	Special I/O	Unit Area	15,360 bit	s (960 wor	ds): Words	CIO 2000	to CIO 295	Э					
	Pulse I/O Ar	ea						20 inputs	, 12 outputs	s (CIO 296	0 to CIO 29	63) *3	
	Serial PLC L	ink Words						1,440 bits	s (90 words	): Words C	IO 3100 to	CIO 3189	
	DeviceNet A	rea	9,600 bits (600 words): Words CIO 3200 to CIO 3799										
	Internal I/O	Area	3,200 bits (200 words): Words CIO 1300 to CIO 1499 (Cannot be used for external I/O.) 37,504 bits (2,344 words): Words CIO 3800 to CIO 6143 (Cannot be used for external I/O.)										
Work Area	1		8,192 bits (512 words): Words W000 to W511 (Cannot be used for external I/O.)										
Holding Area	8,192 bits (512 words): Words H000 to H511 Bits in this area maintain their ON/OFF status when PLC is turned OFF or operating mode is changed. Words H512 to H1535: These words can be used only for function blocks. They can be used only for function block instances (i.e., they are allocated only for internal variables in function blocks).												
Auxiliary Area	Read-only: 31,744 bits (1,984 words) • 7,168 bits (448 words): Words A0 to A447 • 24,576 bits (1,536 words): Words A10000 to A11535 *4 Read/write: 16,384 bits (1,024 words) in words A448 to A1471 *4												
Temporary Are		16 bits: TR0 to TR15											
Timer Area			4,096 timer numbers (T0000 to T4095 (separate from counters))										
Counter Area	4,096 counter numbers (C0000 to C4095 (separate from timers))												
DM Area			32k words	<b>*</b> 5									
			DM Area words for Special I/O Units: D20000 to D29599 (100 words × 96 Units) DM Area words for CPU Bus Units: D30000 to D31599 (100 words × 16 Units)										
EM Area			32k words	/bank × 25	banks ma 32767 max	x.:		32k words/bank × 4 banks max.: E00_00000 to E3_32767 max. <b>*</b> 5					
			32K words ×	32K words ×	32K words ×	32K words ×	$32K$ words $\times$	_	s×1 bank		1	s×4 bank	

The following times are added if EtherNet/IP data tag links are used for the CJ2H-CPU6 $\Box$ -EIP.Normal operation:100  $\mu$ s + Number of transfer words x 0.33  $\mu$ s \*1.

High-speed interrupt enabled:  $100 \,\mu\text{s}$  + Number of transfer words x 0.87  $\mu\text{s}$ 

The following time must be added when using EtherNet/IP tag data links for the CJ2M-CPU3 ...

\*2.

\*3.

The following time must be added when using Pulse I/O Modules with a CJ2M CPU Unit: 10 μs x Number of Pulse I/O Modules. This applies when High-speed interrupt function is used. Supported only by CJ2M CPU Units with unit version 2.0 or later. A Pulse I/O Module must be mounted. A960 to A1471 and A10000 to A11535 cannot be accessed by CPU Bus Units, Special I/O Units, PTs, and Support Software that do not specifically support the \*4. CJ2 CPU Units.

Bits in the EM Area can be addressed either by bit or by word. These bits cannot be addressed by CPU Bus Units, Special I/O Units, PTs, and Support Software \*5. that do not specifically support the CJ2 CPU Units. \*6. EM banks D to 18 cannot be accessed by CPU Bus Units, Special I/O Units, PTs, and Support Software that do not specifically support the CJ2 CPU Units.

				CJ2H-		CJ2M-						
	Item		CPU65 (-EIP)	CPU66 (-EIP)	CPU67 (-EIP)	CPU68 (-EIP)	CPU 11/31	CPU 12/32	CPU 13/33	CPU 14/34	CPU 15/35	
Banks for which bits	Using EM Area force-setting/resetting	Banks 0 to 3 hex	Banks 0 to 3 hex	Banks 0 to 9 hex	Banks 0 to E hex	Banks 0 to 18 hex	Bank 0 he	х		Banks 0 to	o 3 hex	
can be force- set/reset <b>%</b> 7	Using automatic address allocation specifications	Bank 3 hex	Bank 3 hex	Banks 6 to 9 hex	Banks 7 to E hex	Banks 11 to 18 hex						
Index Registe	's		e special re				ddresses fo hey are sha			(Index Reg	isters ca	
Cyclic Task Fl	ag Area	128 flags										
Memory Card		128 MB, 2	256 MB, or	512 MB								
Operating Mo	des		ti R Mode: F P	nis mode. Programs ar resent valu	e executed es in I/O m	, and some emory, are		, such as c his mode.	nline editir	orogram exe		
Execution Mo	de	Normal M						j				
Programming		Ladder Lo Sequentia Structured Instruction	ogic (LD), al Function d Text (ST)	Charts (SF , and	°C),							
Function	Maximum number of definitions	2,048					256			2,048		
Blocks	Maximum number of instances	2,048					256			2,048		
FB Program A Tasks	rea Type of Tasks	20K steps Cyclic tasks Interrupt tasks (Power OFF interrupt tasks, scheduled interrupt tasks, I/O interrupt tasks, and external interrupt tasks, and input interrupt tasks *3)										
	Number of Tasks	Cyclic tasks: 128 Interrupt tasks: 256 (Interrupt tasks can be defined as cyclic tasks to create extra cyclic tasks. Therefore, the total number of cyclic tasks is actually 384 max.)										
Symbols (Variables)	Type of Symbols	<ul> <li>Local symbols: Can be used only within a single task in the PLC.</li> <li>Global symbols: Can be used in all tasks in the PLC.</li> <li>Network symbols (tags) *8: I/O memory in the CPU Unit can be externally accessed using symbols, depending on parameter settings.</li> </ul>										
	Data Type of Symbols	UDINT     ULINT     ULINT     ULINT     INT     (on     DINT     (t     UINT     UINT     UINT     UUINT     ULINT     ULINT     ULINT     ULINT     ULINT     ULINT     ULINT     UUNT     UUNT	ne-word u (two-word si bur-word si bur-word si bur-word si CD (one-w BCD (two- BCD (two- BCD (four- two-word fi (four-word JEL (word) ER (consta (one-word D (two-wor O (four-wor G (1 to 255 *10 FR *10	nsigned bir unsigned b unsigned b ned binary) gned binary ord unsign word unsign word unsign word unsign oating-point floating-po *9 nt or numbe hexadecim d hexadecim d hexadecin ASCII cha	inary) inary) y) ed BCD) *6 ned BCD) *6 ned BCD) * ned	k9 k9						
	Maximum Size of Symbol	32k words	6									
	Array Symbols (Array Variables)	One-dimensional arrays										
	Number of Array Elements	32,000 elements max.										
	Number of Registrable Network Symbols (Tags) *8	20,000 max. 2,000 max.										
	Length of Network Symbol (Tag) Name *8	255 bytes max.										
	Encoding of Network Symbols (Tags)	UTF-8										

\*7. With CJ2H CPU Units with unit version 1.2 or later, force-setting/resetting bits in the EM Area is possible either for banks that have been specified for automatic address assignment or for banks specified for the EM Area force-set/reset function. With CJ2M CPU Units, force-setting/resetting bits in the EM Area is possible only for banks specified for the EM Area force-set/reset function. With CJ2M CPU Units, force-setting/resetting bits in the EM Area is possible only for banks specified for the EM Area force-set/reset function.
\*8. Supported only by the CJ2H-CPU6□-EIP and CJ2M-CPU3□.
\*9. This data type cannot be used in Function blocks.

\*10. This data type can be used only in Function blocks.

\*11. Supported only when CX-Programmer version 9.0 or later is used.

						CJ2H-			CJ2M-						
		Ite	m	CPU64 (-EIP)	CPU65 (-EIP)	CPU66 (-EIP)	CPU67 (-EIP)	CPU68 (-EIP)	CPU 11/31	CPU 12/32	CPU 13/33	CPU 14/34	CPU 15/35		
Data Tracing Memory Capacity			8,000 wor	ds	16,000 words	32,000 wo	ords	8,000 wo	rds						
					The EM Area can be specified from the CX-Programmer to use up to 32K words multiplied by the number of banks supported by the CPU Unit model.										
		Number	of Samplings	Bits = 31, one-word data = 16, two-word data = 8, four-word data = 4											
		Sampling	g Cycle	1 to 2,550	ms (Unit:	1 ms)									
Trigger Conditions			ON/OFF of specified bit Data comparison of specified word Data size: 1 word, 2 words, 4 words Comparison Method: Equals (=), Greater Than (>), Greater Than or Equals (≥), Less Than (<), Less Than or Equals (≤), Not Equal (≠)												
		Delay Va	llue	-32,768 t	+32,767	ms									
File Me	mory			Memory Card (128, 256, or 512 Mbytes) (Use the Memory Cards provided by OMRON.) EM file memory (Part of the EM Area can be converted for use as file memory.)											
Source/ Comme Memory	comment comment file		block program memory, t file, program index file, ables	Capacity: 3.5 Mbytes				Capacity: 1 Mbytes							
Comm	Logica	al Ports for	Logical Ports	8 ports (Used for SEND, RECV, CMND, PMCR, TXDU, and RXDU instructions.)											
unicati	Comm	Communications Extended Logical		64 ports (Used for SEND2, RECV2, CMND2, and PMCR2 instructions.)											
ons	CIP Comm	CIP Class 3 Communications (Connection Type)		Number of connections: 128											
	Specif	Specification UCMM (Non-connection Type)			Maximum number of clients that can communicate at the same time: 32 Maximum number of servers that can communicate at the same time: 32					Maximum number of clients that can communicate a the same time: 16 Maximum number of servers that can communicate at the same time: 16					
	Peripheral (USB) Port			USB 2.0-compliant B-type connector											
	В	aud Rate		12 Mbps max.											
	Т	ransmission	Distance	5 m max.											
	Serial Port			Interface: Conforms to EIA RS-232C. • CJ2M-CPU1□ interface: Conforms • CJ2M-CPU3□: No serial ports w One of the following Serial Option E mounted. • CP1W-CIF01 RS-232C Option B • CP1W-CIF11 RS-422A/485 Option (not isolated, max. transmission of • CP1W-CIF12-V1 RS-422A/485				n Board Option Board Option Boar on distance	ult system can be d e: 50 m)						
		ommunicati	ons Method	(isolated, max. transmission distance: 500 m)											
	-	ommunicati ynchronizat		Half-duple Start-stop											
		aud Rate				06 10 0	38.4, 57.6,	or 115 0 /	(hnc)						
			Distance	, ,	, ,	, 9.0, 19.2,	30.4, 57.6,	01 1 15.2 (1	(uha)						
		ransmission	Distance	15 m max	•										

							CJ2H-					CJ2M-		
				Item	CPU64 (-EIP)	CPU65 (-EIP)	CPU66 (-EIP)	CPU67 (-EIP)	CPU68 (-EIP)	CPU 11/31	CPU 12/32	CPU 13/33	CPU 14/34	CPU 15/35
Comm	Ethe	rNe	t/IP I	Port *12										
inicati Ins		ns	Mee	dia Access Method	CSMA/CE	)								
115		Specifications	Мо	dulation	Baseband	ł								
		cific	Trar	nsmission Paths	Star									
		Spe	Bai	ud Rate	100 Mbps	(100Base	-TX)							
							r (STP) cab	le: Catego	ies: 5 50					
		Transmission	Transmission Media				( )	, 0	,					
		nsu		nsmission Distance			ernet switch	-						
		Tra	Number of Cascade Connections		No restric	tions if ethe	ernet switch	is used.						
			CIP Communications: Tag Data Links											
				Number of Connections	256					32				
				Packet Interval (Refresh		000 ms (Uni						-ms increm		
				period)			onnection. ( ardless of th						Data will be he number o	
				Maximum allowed					,					Ji noues.
				communications bandwidth per Unit	6,000 to 12,000 packets per second *13 *14 3,000 packets per second *13									
				Number of Tag Sets	256					32				
				Type of Tags	CIO, DM, EM, HR, WR, and network symbols									
				Number of Tags per Connection	8 (Seven tags if PLC status is included in the segmen				t.)					
				Maximum Link Data Size per Node (total size of all tags)	184,832 words				640 words					
				Maximum Data Size per Connection	252 or 722 words *15 (Data is synchronized within each co				on.)	640 words <b>*</b> 16 (Data is synchronized within each connection.)				
				Number of Registrable Tag Set	256 (1 connection = 1 segment)					nection = 1				
		ions		Maximum Tag Set Size	722 words (One word is used when PLC status is included in the segment.)				640 words <b>*</b> 16 (One word is used when PLC statu is included in the segment.)					
		Communications Specifications		Maximum Number of Tags Refreshable in a Single Cycle of CPU Unit <b>*</b> 17	Output/send (CPU Unit to EtherNet/IP): 256 Input/receive (EtherNet/IP to CPU Unit): 256				Output/send (CPU Unit to EtherNet/IP): 32 Input/receive (EtherNet/IP to CPU Unit): 32					
		ions S		Data Size Refreshable in a Single Cycle of CPU Unit <b>*</b> 17	Output/send (CPU to EtherNet/IP): 6,432 words Input/receive (EtherNet/IP to CPU): 6,432 words				Output/send (CPU Unit to EtherNet/IP): 640 words Input/receive (EtherNet/IP to CPU Unit): 640 words					
		municati		Change of Tag Data Link Parameter Settings during Operation	OK *18									
		Con		Multi-cast Packet Filter *19	ОК									
			CIP Communications: Explicit Messages											
				Class 3 (Connection Type)	Number of connections: 128									
				UCMM (Non-connection Type)	the same Maximum	Maximum number of clients that can communicate at the same time: 32 Maximum number of servers that can communicate			the same Maximum	time: 16	servers the	t can comm at can com		
				CIP Routing	OK (CIP routing is enabled for the following remote Units: CJ								, CJ2M-CP	U3⊡ an
		Ī	FIN	S Communications										
				FINS/UDP	OK									
				FINS/TCP	16 connec	ctions max.								
		[		erNet/IP Conformance Test	Conforms									
			Eth	erNet/IP Interface		/100Base-								

**\*12.** The EtherNet/IP port is built into the CJ2H-CPU6 - EIP and CJ2M-CPU3 only.

**\*13.** "Packets per second" is the number of communications packets that can be processed per second.

\*14. When using the EtherNet/IP Unit with version 3.0 or later. When using the EtherNet/IP Unit with version 2.1 or earlier, the maximum allowed communications bandwidth per Unit is 6,000 pps. When using the EtherNet/IP Unit with version 3.0 or later, the Network Configurator with version 3.57 or higher is required.
\*15. Large Forward Open (CIP optional specification) must be supported in order for 505 to 1,444 bytes to be used as the data size. Application is supported between CS/CJ-series PLCs. When connecting to devices from other manufacturers, make sure that the devices support the Large Forward Open specification.
\*16. Unit version 2.0 of built-in EtherNet/IP section: 20 words.

\*17. If the maximum number is exceeded, refreshing will require more than one CPU Unit cycle.

**\*18.** When changing parameters, however, the EtherNet/IP port where the change is made will be restarted. In addition, a timeout will temporarily occur at the other node that was communicating with that port, and it will then recover automatically.

\*19. The EtherNet/IP port supports an IGMP client, so unnecessary multicast packets are filtered by using an ethernet switch that supports IGMP snooping.

### **Function Specifications**

	F	unctions		Description				
Cycle Time Management	Minimum Cycle Tir	ne		A minimum cycle time can be set. (0.2 to 32,000 ms; Unit: 0.1 ms) The minimum cycle time setting can be changed in MONITOR mode. <b>*1</b>				
	Cycle Time Monito	ring		The cycle time is monitored. (0.01 to 40,000 ms; Unit: 0.01 ms)				
	Background Proce	ssing		Instructions with long execution times can be executed over multiple cycles to prevent fluctuations in the cycle time.				
Unit (I/O)	Basic I/O Units,	I/O Refreshing	Cyclic Refreshing	Cyclic refreshing of Basic I/O Units, Special I/O Units, and CPU Bus Units				
Management	Special I/O Units,		Immediate Refreshing	I/O refreshing by immediate refreshing instructions				
	and CPU Bus Units		Refreshing by IORF	I/O refreshing by IORF instruction				
	onno	Unit Recognition at	Startup	The number of units recognized when the power is turned ON is displayed.				
	Basic I/O Units	Input Response Tin	ne Setting	The input response times can be set for Basic I/O Units. The response time can be increased to reduce the effects of chattering and noise at input contacts. The response time can be decreased to enable detecting shorter input pulses.				
		Load OFF Function		All of the outputs on Basic I/O Units can be turned OFF when an error occurs RUN or MONITOR mode.				
		Basic I/O Unit Statu	s Monitoring	Alarm information can be read from Basic I/O Units and the number of Unit recognized can be read.				
		Reading/writing data specific Units *1	a using instructions for	Special instructions can be used to read/write required data for specific Units high speed.				
	Special I/O Units	Unit Restart Bits to	Restart Units	A Special I/O Unit or CPU Bus Unit can be restarted.				
	and CPU Bus Units	Synchronous Unit C	)peration <b>*</b> 2	The start of processing for all the specified Units can be synchronized at a fixed interval. Maximum number of Units: 10 Units (Only Units that support Synchronous Operation Mode can be used.) Synchronous operation cycle: 0.5 to 10 ms (default: 2 ms) Maximum number of words for synchronous data refreshing: 96 words (total of a Units)				
	Configuration Management	Automatic I/O Alloca	ation at Startup	I/O words can be automatically allocated to the Basic I/O Units that are connected in the PLC to start operation automatically without registering Units into I/O tables.				
		I/O Table Creation		The current unit configuration can be registered in I/O tables to prevent it from being changed, to reserve words, and to set words.				
		Rack/Slot First Wor	d Settings	The first words allocated to a Units on the Racks can be set.				
Memory Management	Holding I/O Memor	ry when Changing Op	erating Modes	The status of I/O memory can be held when the operating mode is change power is turned ON. The forced-set/reset status can be held when the ope mode is changed or power is turned ON.				
	File Memory			Files (such as program files, data files, and symbol table files) can be stored in Memory Card, EM File Memory, or Comment Memory.				
	Built-in Flash Mem	ory		The user program and Parameter Area can be backed up to an internal flash memory when they are transferred to the CPU Unit.				
	EM File Function			Parts of the EM Area can be treated as file memory.				
	Storing Comments			I/O comments can be stored as symbol table files in a Memory Card, EM file memory, or comment memory.				
	EM Configuration			EM Area can be set as trace memory or EM file memory.				
Memory Cards	Automatic File Tran	nsfer at Startup		A program file and parameter files can be read from a Memory Card when the power is turned ON.				
	Program Replacen	nent during PLC Oper	ation	User programs can be transferred from a Memory Card to CPU Unit during operation.				
	Function for Reading	ng and Writing Data fi	om a Memory Card	Data in I/O memory in the CPU Unit can be written to a Memory Card in CSV. TXT format. Data in CSV/TXT format in the Memory Card can be read to I/O memory in the CPU Unit.				

\*1. \*2.

Supported only by the CJ2H CPU Units with unit version 1.1 or later and CJ2M CPU Units. Position Control Units (High-speed type) CJ1W-NC□□4 supported by the CJ2H CPU Units with unit version 1.1 or later. Position Control Units with EtherCAT interface CJ1W-NC□82 are supported by the CJ2H CPU Units with unit version 1.4 or later.

	Fu	unctions	Description					
Communicati	ons							
	Peripheral (USB) Port	Peripheral Bus	Bus for communications with various kinds of Support Software running on a personal computer. High-speed communications are supported.					
	Serial Port *3							
	Host Link (SYS	WAY) Communications	Host Link commands or FINS commands placed between Host Link headers and terminators can be sent from a host computer or PT to read/write I/O memory, read/control the operating mode, and perform other operations for PLC.					
	No-protocol Co	mmunications	I/O instructions for communications ports (such as TXD/RXD instructions) can be used for data transfer with peripheral devices such as bar code readers and printers.					
	NT Link Communications Peripheral Bus		I/O memory in the PLC can be allocated and directly linked to various PT functions, including status control areas, status notification areas, touch switches, lamps, memory tables, and other objects.					
			Bus for communications with various kinds of Support Software running on a personal computer. High-speed communications are supported.					
	Serial Gateway		This gateway enables receiving and automatically converting FINS to the CompoWay/F.					
	Serial PLC Link	s *4	Data is exchanged between CPU Units using serial ports without communications programming. PTs set to the 1:N NT Link protocol can be included in the network.					
	EtherNet/IP Port *	5	100Base-TX/10Base-T Protocols: TCP/IP, UDP, ARP, ICMP (ping only), BOOTP Applications: FINS, CIP, SNTP, DNS (Client), FTP (Server)					
	CIP	Tag Data Links	Programless cyclic data exchanges with the devices on the EtherNet/IP network.					
	Communicatio ns Service	Message Communications	Any CIP commands can be received from the devices on the EtherNet/IP network.					
	FINS Communicatio ns Service	Message Communications	Any FINS commands can be transferred with the devices on the EtherNet/IP network.					
Interrupt	Scheduled Interrup	ts	Tasks can be executed at a specified interval					
	Resetting and r	estarting with MSKS(690) *6	When MSKS(690) is executed, the internal timer is restarted and the time to first interrupt is set to a fixed value.					
	Reading preser *6	nt value of internal timer with MSKS(690)	MSKS(690) can be used to read the time that has elapsed until the schedule interrupt is started or since the previous scheduled interrupt.					
	Power OFF Interrup	pts	A task can be executed when CPU Unit's power turns OFF.					
	I/O Interrupt Tasks		A task can be executed when an input signal is input to an Interrupt Input Unit.					
	External Interrupt T	-asks	A task can be executed when interrupts are requested from a Special I/O Unit or a CPU Bus Unit.					
	High-speed Interru	pt Function *7	Improves performance for executing interrupt tasks with certain restrictions.					
Clock	Clock Function		Clock data is stored in memory. Accuracy (Accuracy depends on the temperature.) Ambient temperature of 55°C: -3.5 to +0.5 min error per month Ambient temperature of 25°C: -1.5 to +1.5 min error per month Ambient temperature of 0°C: -3 to +1 min error per month					
	Operation Start Tin	ne Storage	The time when operating mode was last changed to RUN mode or MONITOR mode is stored.					
	Operation Stop Tim	ne Storage	The last time a fatal error occurred or the last time the operating mode was changed to PROGRAM mode is stored.					
	Startup Time Stora	ge	The time when the power was turned ON is stored.					
	Power Interruption	Time Storage	The time when the power is turned OFF is stored.					
	Total Power ON Tin		The total time that the PLC has been ON is stored in increments of 10 hours.					
	Power ON Clock Da	ata Storage	A history of the times when the power was turned ON is stored.					
	User Program Over	rwritten Time Storage	The time that the user program was last overwritten is stored.					
	Parameter Date Sto	-	The time when the Parameter Area was overwritten is stored.					

\*3. A Serial Option Board is required to use a serial port for the CJ2M-CPU3 CJ2M CPU Unit.
\*4. A Serial Option Board is required to use the CJ2M-CPU3 CJ2M CPU Unit in Serial PLC Links.
\*5. Supported only by the CJ2H-CPU6-EIP and CJ2M-CPU3.
\*6. Supported only by the CJ2M CPU Units.
\*7. Supported only by the CJ2H CPU Units with unit version 1.1 or later.

Dowor Supply	Functions		Description Holding Area data, DM Area data, EM Area data, Counter Completion Flags, and					
Power Supply Management	Memory Protection		counter present values are held even when power is turned OFF. CIO Area, Work Area, some Auxiliary Area data, and Timer Completion Flags, timer present values, index registers, and data registers can be protected by turning ON the IOM Hold Bit in the Auxiliary Area, and by also setting the IOM Hold Bit to "Hold" in the PLC Setup.					
	Power OFF Detection Time	Setting	The detection time for power interruptions can be set. AC power supply: 10 to 25 ms (variable) DC power supply: 2 to 5 ms (CJ1W-PD022) or 2 to 20 ms (CJ1W-PD025)					
	Power OFF Detection Dela	y Time	The detection of power interruptions can be delayed: 0 to 10 ms (Not supported by the CJ1W-PD022.)					
	Number of Power Interrupti	ons Counter	The number of times power has been interrupted is counted.					
Function Blocks	Languages in Function Blo	ck Definitions	Standard programming can be encapsulated as function blocks. Ladder programming or structured text					
Debugging	Online Editing Force-Set/Reset		The program can be changed during operation (in MONITOR or PROGRAM mode), except for block programming areas. Specified bits can be set or reset.					
			A parameter can be set to enable force-setting/resetting bits in EM Area banks. Force-setting/resetting is enabled for the specified bank and all the banks after it. *8					
	Differentiate Monitoring		ON/OFF changes in specified bits can be monitored.					
	Data Tracing		The specified I/O memory data can be stored in the trace memory in the CPU Unit. The triggers can be set.					
	Continuous Tracing		The trace data can be uploaded during data tracing using CX-Programmer, which enables continuously logging the data by constantly uploading the trace data (trace data uploading during tracing).					
	Automatically starting tr	acing when operation starts	Data tracing can be automatically started when operation is started (i.e., when the operating mode is changed from PROGRAM mode to MONITOR or RUN mode).					
	Storing Location of Error w	hen an Error Occurs	The location and task number where execution stopped for a program error is recorded.					
	Program Check		The programs can be checked for items such as no END instruction and FALS/ FAL errors at startup.					
Self-diagnosis and Restoration	Error Log		A function is provided to store predefined error codes in CPU Unit, error information, and time at which the error occurred.					
	CPU Error Detection		CPU Unit WDT errors are detected.					
	User-defined Failure Diagn	osis	Errors can be generated for user-specified conditions: Non-fatal errors (FAL) and fatal errors (FALS). Program section time diagnosis and program section logic diagnosis are supported (FPD instruction).					
	Load OFF Function		This function turns OFF all outputs from Output Units when an error occurs.					
	RUN Output		The RUN output from the CJ1W-PA205R turns ON while CPU Unit is in RUN mode or MONITOR mode.					
	Basic I/O Load Short-circui	t Detection	This function provides alarm information from Basic I/O Units that have load short-circuit protection.					
	Failure Point Detection		The time and logic of an instruction block can be analyzes using the FPD instruction.					
	CPU Standby Detection		This function indicates when the CPU Unit is on standby because all Special I/C Units and CPU Bus Units have not been recognized at the startup in RUN or MONITOR mode.					
	Non-fatal Error Detection	System FAL Error Detection (User-defined non-fatal error)	This function generates a non-fatal (FAL) error when the user-defined conditions are met in program.					
		Duplicated Refreshing Error Detection	This function detects an error when an immediate refreshing Instruction in an interrupt task is competing with I/O refreshing of a cyclic task.					
		Basic I/O Unit Error Detection	This function detects the errors in Basic I/O Units.					
		Backup Memory Error Detection	This function detects errors in the memory backup of the user programs and parameter area (backup memory).					
		PLC Setup Error Detection	This function detects setting errors in the PLC Setup.					
		CPU Bus Unit Error Detection	This function detects an error when there is an error in data exchange between the CPU Unit and a CPU Bus Unit.					
		Special I/O Unit Error Detection	This function detects an error when there is an error in data exchange between the CPU Unit and a Special I/O Unit.					
		Tag Memory Error Detection *9	This function detects errors in tag memory.					
		Battery Error Detection	This function detects an error when a battery is not connected to the CPU Unit or when the battery voltage drops.					
		CPU Bus Unit Setting Error Detection	This function detects an error when the model of a CPU Bus Unit in the registered I/O tables does not agree with the model that is actually mounted in the PLC.					
		Special I/O Unit Setting Error Detection	This function detects an error when the model of a Special I/O Unit in the registered I/O tables does not agree with the model of Unit that is actually mounted.					

\*8. Supported only by CJ2H CPU Units with unit version 1.2 or later and CJ2M CPU Units.
\*9. Supported only by CJ2H-CPU6 -EIP and CJ2H-CPU3 .
\*10. Supported only by CJ2M-CPU3 .

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	Functions			Description					
Self-diagnosis	Fatal Error Detection		rror Detection	This function detects errors that occur in memory of the CPU Unit.					
and Restoration (Continued from previous page)		I/O Bus Er	ror Detection	This function detects when an error occurs in data transfers between the Units mounted in Rack slots and the CPU Unit and detects when the End Cover is not connected to the CPU Rack or an Expansion Rack.					
		Unit/Rack Error	Number Duplication	This function detects an error when the same unit number is set for two or mor Units, the same word is allocated to two or more Basic I/O Units, or the same rack number is set for two or more Racks. This function detects an error when the total number of I/O points set in the I/C tables or the number of Units per Rack exceeds the specified range.					
		Too Many Detection	I/O Points Error						
		I/O Setting	Error Detection	The registered I/O tables are used to detect errors if the number of Units in the registered I/O tables does not agree with the actual number of Units that are connected or an Interrupt Unit has been connected in the wrong position, i.e., no in the following slots. • CJ2H-CPU6—EIP: Slots 0 to 3 • CJ2H-CPU6[: Slots 0 to 4 • CJ2M-CPU3]: Slots 0 to 4 • CJ2M-CPU1[: Slots 0 to 4					
		Program E	Fror Detection	This function detects errors in programs.					
			Instruction Processing Error Detection	This function detects an error when the given data value is invalid when executing an instruction, or execution of instruction between tasks was attempted.					
			Indirect DM/EM BCD Error Detection	This function detects an error when an indirect DM/EM address in BCD mode is not BCD.					
			Illegal Area Access Error Detection No END Error	This function detects an error when an attempt is made to access an illegal area with an instruction operand.					
			Detection Task Error Detection	cycle, there is no program for a task, or the execution condition for an intern					
			Differentiation Overflow Error Detection	task was met but there is no interrupt task with the specified number. This function detects an error when too many differentiated instructions are entered or deleted during online editing (131,072 times or more).					
			Invalid Instruction Error Detection	This function detects an error when an attempt is made to execute an instructio that is not defined in the system.					
			User Program Area Overflow Error Detection	This function detects an error when instruction data is stored after the last address in user program area.					
		Cycle Tim Detection	e Exceeded Error	This function monitors the cycle time (10 to 40,000 ms) and stops the operation when the set value is exceeded.					
		(User-defi	ALS Error Detection ned Fatal Error)	This function generates a fatal (FALS) error when the user-defined conditions a met in program.					
		Version Error Detection Memory Card Transfer Error Detection		This function detects an error when a user program includes a function that is r supported by the current unit version. This function detects an error when the automatic file transfer from Memory Ca fails at startup.					
	Memory Self-restoration Fur	nction		This function performs a parity check on the user program area and self- restoration data. *11					
Maintenance	Simple Backup Function	_		This function collectively backs up the data in CPU Unit (user programs, parameters, and I/O memory) and internal backup data in the I/O Units.					
	Remote Programming and M			A function that allows the PLC to use Network Communications Instruction to send required FINS commands to a computer connected via a Host Link Host Link communications can be used for remote programming and remote					
	Remote i rogramming and i	vonitoring		monitoring through a Controller Link, Ethernet, DeviceNet, or SYSMAC LINK Network. Communications across network layers can be performed.					
				Controller Link or Ethernet: 8 layers DeviceNet or SYSMAC LINK: 3 layers					
	Automatic Online Connectio Network	n via	Direct Serial Connection	This function enables automatically connecting to the PLC online when the CX- Programmer is directly connected by a serial connection (peripheral (USB) port or serial port).					
			Via Networks	This function enables connecting the CX-Programmer online to a PLC that is connected via an EtherNet/IP network.					
Security	Read Protection using Pass	word		This function protects reading and displaying programs and tasks using passwords. Write protection: Set using the DIP switch.					
				Read protection: Set a password using the CX-Programmer.					
	FINS Write Protection Unit Name Function			This function prohibits writing by using FINS commands sent over the network. This function allows the users to give any names to the Units. Names are verified					
	Hardware ID Using Lot Num	bers		at online connection to prevent wrong connection This function sets operation protection by identifying hardware using the user					
				programs according to lot numbers stored in the Auxiliary Area.					

**\*11.** Supported only by CJ2H CPU Units.

### ■ Unit Versions

Units	Models	Unit Version
CJ2H CPU Unit	CJ2H-CPU6□-EIP	Unit version 1.0 (Built-in EtherNet/IP section: Unit version 2.0)
		Unit version 1.1 (Built-in EtherNet/IP section: Unit version 2.0)
		Unit version 1.2 (Built-in EtherNet/IP section: Unit version 2.0)
		Unit version 1.3 (Built-in EtherNet/IP section: Unit version 2.0)
		Unit version 1.4 (Built-in EtherNet/IP section: Unit version 2. // Unit version 3.0)
	CJ2H-CPU6	Unit version 1.1
		Unit version 1.2
		Unit version 1.3
		Unit version 1.4
CJ2M CPU Unit	CJ2M-CPU3	Unit version 1.0 (Built-in EtherNet/IP section: Unit version 2.0) Unit version 2.0 (Built-in EtherNet/IP section: Unit version 2.0) Unit version 2.0 (Built-in EtherNet/IP section: Unit version 2.1)
	CJ2M-CPU1	Unit version 1.0 Unit version 2.0

# Unit Versions and Programming Devices

The following tables show the relationship between unit versions and CX-Programmer versions.

						R	equired P	rogrammi	ng Device				
	CPU Unit	Fun	ctions		CX-Programmer								
			Ver.7.1 or lower	Ver.8.0	Ver.8.2	Ver.9.0	Ver.9.1	Ver.9.12	Ver.9.3 or higher	Programming Console			
CJ2H	CJ2H-CPU6 -EIP Unit version 1.0	Functions for unit ve		OK	OK	OK	OK	ОК	OK	*3			
	CJ2H-CPU6 -EIP	Functions added	Using new functions			OK *2	OK	OK	OK	OK			
	Unit version 1.1	for unit version 1.1	Not using new functions		OK *1	OK	OK	OK	OK	OK			
	CJ2H-CPU6	Functions added	Using new functions			OK *2	OK	OK	OK	OK			
	Unit version 1.1	for unit version 1.1	Not using new functions			OK	OK	OK	OK	OK			
	CJ2H-CPU6 -EIP	Functions added	Using new functions				OK	OK	OK	OK			
	Unit version 1.2	for unit version 1.2	Not using new functions		OK *1	OK *1	OK	OK	OK	OK			
	CJ2H-CPU6	Functions added	Using new functions				OK	OK	OK	OK			
	Unit version 1.2	for unit version 1.2	Not using new functions		OK *1	OK *1	OK	OK	OK	OK			
	CJ2H-CPU6 -EIP	Functions added for unit version 1.3	Using new functions					OK	OK	OK			
	Unit version 1.3		Not using new functions		OK *1	OK *1	OK	OK	OK	OK			
	CJ2H-CPU6	Functions added	Using new functions					OK	OK	OK			
	Unit version 1.3	for unit version 1.3	Not using new functions		OK *1	OK *1	OK	OK	OK	OK			
	CJ2H-CPU6 -EIP	Functions added	Using new functions							OK			
	Unit version 1.4	for unit version 1.4	Not using new functions		OK *1	OK *1	OK	OK	OK	OK			
	CJ2H-CPU6	Functions added	Using new functions							OK			
	Unit version 1.4	for unit version 1.4	Not using new functions		OK *1	OK *1	OK	OK	OK	OK			
CJ2M	CJ2M-CPU	Functions for unit ve	ersion 1.0					ОК	ОК	ОК	-		
	CJ2M-CPU	Functions added	Using new functions						ОК	OK			
	Unit version 2.0	for unit version 2.0	Not using new functions					OK *1	ОК	ОК			

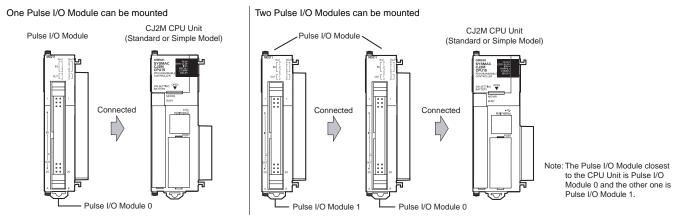
It is not necessary to upgrade the version of the CX-Programmer if functionality that was enhanced for the upgrade of the CPU Unit will not be used.
 CX-Programmer version 8.2 or higher is required to use the functions added for unit version 1.1. The high-speed interrupt function and changing the minimum cycle time setting in MONITOR mode, however, are also supported by CX-Programmer version 8.02.

**\*3.** A Programming Console cannot be used with a CJ2 CPU Unit.

# **Specifications for Pulse I/O Functions**

The following functions of CJ2M can be used by installing one or two Pulse I/O Module. Each module has 10 high-speed inputs and 6 high-speed outputs. Pulse I/O Modules can be installed on CJ2M CPU Units with Unit Version 2.0 or Later.

- The inputs can be used as general-purpose inputs, interrupt inputs, quick-response inputs, high-speed counters, or origin search inputs.
- The outputs can be used as general-purpose outputs, pulse outputs, origin search outputs, or PWM outputs.



### ■Performance Specifications

	Item	Description							
	Model of Pulse I/O Modules	CJ2M-MD211 (Sinking-type) CJ2M-MD212 (Sourcing-type)							
	External interface	40-pin MIL connector							
	Pulse Inputs	Can be used as normal inputs, interrupt inputs, quick-response inputs, or high-speed counter inputs. (Function of each input must be selected in the PLC Setup.) Input method: Line-driver input or 24-VDC input (selected by via wiring)							
	Normal Inputs	20 max. (10 per Pulse I/O Module) Input constants: Set in the PLC Setup (0, 0.5, 1, 2, 4, 8, 16, or 32 ms). Default: 8 ms							
	Interrupt inputs and quick-response inputs	8 max. (4 per Pulse I/O Module) Input signal minimum ON pulse width: 30 μs							
Pulse I/O	High-speed counter inputs	4 max. (2 per Pulse I/O Module) Input method: Differential-phase (×4) pulses, pulse + direction, up/down pulses, or increment pulse Maximum response frequency: 50 kHz for differential phases or 100 kHz for single phase Counting mode: Linear mode or circular (ring) mode Count value: 32 bits Counter reset: Phase Z + software reset or software reset Control method: Target-value comparison or range comparison Gate function: Supported							
	Pulse Outputs	Can be used as normal outputs, pulse outputs, or PWM outputs. (Function of each output must be selected in the PLC Setup.) Output method: Sinking or sourcing transistor outputs (The method is determined by Pulse I/O Module model.)							
	Normal Outputs	12 max. (6 per Pulse I/O Module)							
	Pulse Outputs	4 max. (2 per Pulse I/O Module) Output method: CW/CCW or pulse + direction (The method is determined by the I/O wiring and the instructions used in the ladder program.) Output frequency: 1 pps to 100 kpps (in increments of 1 pps) Output Mode: Continuous mode (for speed control) or independent mode (for position control) Output pulses: Relative coordinates: 0000 0000 to 7FFF FFFF hex (0 to 2,147,483,647 pulses) Absolute coordinates: 8000 0000 to 7FFF FFFF hex (-2,147,483,648 to 2,147,483,647) Acceleration/deceleration curves: Linear or S-curve Origin search function: Supported							
	PWM Outputs	4 max. (2 per Pulse I/O Module) Output frequency: 0.1 to 6,553.5 Hz (in 0.1-Hz increments) or 1 to 32,800 Hz (in 1-Hz increments) Duty ratio: 0.0% to 100.0% (in 0.1% increments)							

# ■Function Specifications

	Func	tions	Description						
		Normal Inputs	Input signals are read during I/O refreshing and stored in I/O memory.						
	Pulse Input	Interrupt Inputs	An interrupt task can be started when an input signal turns ON or turns OFF.						
	Functions	Quick-response Inputs	Input signals that are shorter than the cycle time are read and stored in I/O memory.						
Pulse I/O		High-speed Counter Inputs	High-speed pulse signals are counted. Interrupt tasks can also be started.						
Functions	Pulse	Normal Outputs	The status of I/O memory is output during I/O refreshing.						
	Output	Pulse Outputs	pulse signal is output with the specified frequency and number of pulses at a fixed duty ratio (50%).						
	Functions	PWM Outputs	A pulse signal is output at the specified duty ratio.						
	Origin Searc	hes	The origin point of the machine is determined according to the specified origin search parameters while actually outputting pulses and using the origin and origin proximity input signals as conditions. (Pulse inputs and outputs are also used for this function.)						
	Input Interru	pt Function	A task is started for an interrupt input from a Pulse I/O Module or for a high-speed counter input.						
Interrupt	Interrupt High-speed Counter Interrupts		Interrupt tasks are executed when the interrupt input turns ON or turns OFF. Direct Mode: An interrupt task is executed each time an input signal changes. Counter Mode: Changes in the input signal are counted up or down and the interrupt task is executed when the counter counts out. (The maximum response frequency is 3 kHz.)						
			An interrupt task is executed when preset comparison conditions for a high-speed counter are met. Target-value comparison: The interrupt task is executed when the count matches a specified value. Range comparison: The interrupt task is executed when the count enters or leaves a specified range of values.						

# ■Allocating Functions to I/O signals Pulse I/O Module 0 (on the right)

Ter	minal s	ymbol	IN 00	IN 01	IN 02	IN 03	IN 04	IN 05	IN 06	IN 07	IN 08	IN 09	OUT 00	OUT 01	OUT 02	OUT 03	<b>OUT 04</b>	OUT 05
Address 2960						2961												
Bit			0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
	Norma	al inputs	Normal input 0	Normal input 1	Normal input 2	Normal input 3	Normal input 4	Normal input 5	Normal input 6	Normal input 7	Normal input 8	Normal input 9						
	(Direct	ipt inputs t Mode/ er Mode)	Interrupt input 0	Interrupt input 1	Interrupt input 2	Interrupt input 3												
Inputs	Quick inputs	response	Quick response input 0	Quick response input 1	Quick response input 2	Quick response input 3												
	High-s counte				High- speed counter 1 (phase- Z/reset)	High- speed counter 0 (phase- Z/reset)			High- speed counter 1 (phase-A, incre- ment, or count input)	High- speed counter 1 (phase-B, decre- ment, or direction input)	High- speed counter 0 (phase-A, incre- ment, or count input)	High- speed counter 0 (phase-B, decre- ment, or direction input)						
	Norma	al outputs											Normal output 0	Normal output 1	Normal output 2	Normal output 3	Normal output 4	Normal output 5
		CW/CCW outputs											Pulse output 0 (CW)	Pulse output 0 (CCW)	Pulse output 1 (CW)	Pulse output 1 (CCW)		
Out- puts	Pulse out- puts	Pulse + direction outputs											Pulse output 0 pulse)	Pulse output 1 (pulse)	Pulse output 0 (direction)	Pulse output 1 (direction)		
	pulo	Variable duty ratio outputs															PWM output 0	PWM output 1
Origin s	search		Origin search 0 (Origin Input Signal)	Origin search 0 (Origin Proxim- ity Input Signal)	Origin search 1 (Origin Input Signal)	Origin search 1 (Origin Proxim- ity Input Signal)	Origin search 0 (Posi- tioning Com- pleted Signal)	Origin search 1 (Posi- tioning Com- pleted Signal)									Pulse output 0 error counter reset output (operatio n modes 1 and 2)	Pulse output 1 error counter reset output (operatio n modes 1 and 2)

# Pulse I/O Module 1 (on the left)

Ter	minal s	symbol	IN 10	IN 11	IN 12	IN 13	IN 14	IN 15	IN 16	IN 17	IN 18	IN 19	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15
Addres	s		2962										2963					
Bit			0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
	Norma	al inputs	Normal input 10	Normal input 11	Normal input 12	Normal input 13	Normal input 14	Normal input 15	Normal input 16	Normal input 17	Normal input 18	Normal input 19						
	(Direct	upt inputs t Mode/ ter Mode)	Interrupt input 4	Interrupt input 5	Interrupt input 6	Interrupt input 7												
Inputs	Quick inputs	response	Quick response input 4	Quick response input 5	Quick response input 6	Quick response input 7												
	High-s counte				High- speed counter 3 (phase- Z/reset)	High- speed counter 2 (phase- Z/reset)			High- speed counter 3 (phase-A, incre- ment, or count input)	High- speed counter 3 (phase-B, decre- ment, or direction input)	High- speed counter 2 (phase-A, incre- ment, or count input)	High- speed counter 2 (phase-B, decre- ment, or direction input)						
	Norma	al outputs											Normal output 6	Normal output 7	Normal output 8	Normal output 9	Normal output 10	Normal output 11
		CW/CCW outputs											Pulse output 2 (CW)	Pulse output 2 (CCW)	Pulse output 3 (CW)	Pulse output 3 (CCW)		
Out- puts	Pulse out- puts	Pulse + direction outputs											Pulse output 2 pulse)	Pulse output 3 (pulse)	Pulse output 2 (direction)	Pulse output 3 (direction)		
	pulo	Variable duty ratio outputs															PWM output 2	PWM output 3
Origin	search		Origin search 2 (Origin Input Signal)	Origin search 2 (Origin Proxim- ity Input Signal)	Origin search 3 (Origin Input Signal)	Origin search 3 (Origin Proxim- ity Input Signal)	Origin search 2 (Posi- tioning Com- pleted Signal)	Origin search 3 (Posi- tioning Com- pleted Signal)									Pulse output 2 error counter reset output (operatio n modes 1 and 2)	Pulse output 3 error counter reset output (operatio n modes 1 and 2)

# Specifications of Pulse Input Functions

# Interrupt Inputs

Item	Direct Mode	Counter Mode
Number of interrupt inputs	Max. 8 inputs	
Allocated bit	CIO 2960 and CIO 2962, bits 00 to 03	
Interrupt detection method	ON-to-OFF or OFF-to-ON transitions	
Interrupt task numbers	140 to 147 (fixed)	
Counting method		Incrimenting or decrementing (Set with the MSKS(690) instruction.)
Counting range		0001 to FFFF hex (16 bits) (Set in A532 to A535 and A544 to A547.)
Response frequency		Single-phase: 3 kHz x 8 inputs
Storage locations for PVs for interrupt inputs in Counter Mode		A536 to A539 and A548 to A551

### • Quick-response inputs

Item	Specifications
Number of Quick-response inputs	Max. 8 inputs
Quick-response inputs	Signals that are shorter than the cycle time are latched for one PLC cycle, so they can be detected in the PLC program. Minimum detectable pulse width is $30 \ \mu s$ .

# High-speed Counter Inputs

	ltem	Description							
Number of High-	speed Counter Inputs	Max. 4 inputs							
Pulse input meth	od (counting mode)	Incremental pulse inputs	Incremental pulse inputs Differential phase input (4×) Up/down inputs						
Input signals		Increment pulse	Phase A	Up pulse	Pulse				
			Phase B	Down pulse	Direction				
			Phase Z	Reset	Reset				
Frequency and n counters	umber of high-speed	100 kHz, 2 inputs × 2 I/O Modules	50 kHz, 2 inputs × 2 I/O Modules	100 kHz, 2 inputs × 2 I/O Modules					
Counting mode		Linear mode or ring mode							
Count value		Linear mode: 8000 0000 to 7FFF FFFF hex 0000 0000 to FFFF FFFF hex Ring mode: 0000 0000 to Max. ring value							
High-speed coun	ter PV storage locations	High-speed counter 0: A271 (upper 4 digits) and A270 (lower 4 digits) High-speed counter 1: A273 (upper 4 digits) and A272 (lower 4 digits) High-speed counter 2: A317 (upper 4 digits) and A316 (lower 4 digits) High-speed counter 3: A319 (upper 4 digits) and A318 (lower 4 digits) Refreshed during overseeing processing. Use PRV(881) to read the most recent PVs.							
		Data format: 8 digit hexadecimal         • Linear mode:       8000 0000 to 7FFF FFFF hex         0000 0000 to FFFF FFFF hex (for increment pulse)         • Ring mode:       0000 0000 to Max. ring value							
Control method	Target value comparison	Up to 48 target values and corresponding interrupt task numbers can be registered.							
	Range Comparison	Up to 8 or up to 32 ranges can be registered, with a separate upper limit, lower limit, and interrupt task number for each range.							
Counter reset me	thod	<ul> <li>Phase-Z + Software reset         The counter is reset when the phase-Z input goes ON while the Reset Bit (A531.00 to A531.03) is ON.     </li> <li>Software reset         The counter is reset when the Reset Bit (A531.00 to A531.03) is turned ON.         Operation can be set to stop or continue the comparison operation when the high-speed counter is reset.     </li> </ul>							

# ■Specifications of Pulse Output Functions ● Position Control and Speed Control

Item	Specifications
Number of Pulse Outputs	Max. 4 outputs (Pulse Output 00 to 03)
Output mode	Continuous mode (for speed control) or independent mode (for position control)
Positioning (independent mode) instructions	PULS (886) and SPED (885), PULS (886) and ACC (888), or PULS2 (887) instruction
Speed control (continuous mode) instructions	SPED( 885) and ACC (888) instructions
Origin (origin search and origin return) instructions	ORG (889) instruction
Interrupt feeding instruction	IFEED (892) instruction
Output frequency	1 pps to 100 kpps (1 pps units), two pulse outputs $\times$ 2 Pulse I/O Modules
Frequency acceleration and deceleration rates	Set in increments of 1 pps for acceleration/deceleration rates from 1 to 65,535 pps (every 4 ms). The acceleration and deceleration rates can be set independently only with the PLS2 (887) instruction.
Changing SVs during instruction execution	The target frequency, acceleration/deceleration rate, and target position can be changed.
Pulse output method	CW/CCW or pulse + direction
Number of output pulses	Relative coordinates: 0000 0000 to 7FFF FFFF hex (Accelerating or decelerating in either direction: 2,147,483,647) Absolute coordinates: 8000 0000 to 7FFF FFFF hex (-2,147,483,648 to 2,147,483,647)
Relative/absolute coordinate specifications for pulse output PVs	Absolute coordinates are specified automatically when the origin location has been defined by changing the pulse output PV with the INI (880) instruction or performing an origin search with the ORG(889) instruction. Relative coordinates must be used when the origin is undefined.
Relative pulse/absolute pulse specifications	The pulse type can be specified with an operand in the PULS (886) or PLS2 (887) instruction. Absolute pulses can be used when absolute coordinates are specified for the pulse output PV, i.e. the origin location has been defined. Absolute pulse cannot be used when relative coordinates are specified, i.e., when the origin location is undefined. An instruction error will occur.
Pulse output PV's storage location	The following Auxiliary Area words contain the pulse output PVs Pulse output 0: A277 (leftmost 4 digits) and A276 (rightmost 4 digits) Pulse output 1: A279 (leftmost 4 digits) and A278 (rightmost 4 digits) Pulse output 2: A323 (leftmost 4 digits) and A322 (rightmost 4 digits) Pulse output 3: A325 (leftmost 4 digits) and A324 (rightmost 4 digits) The PVs are refreshed during regular I/O refreshing.

# • Variable-duty Pulse Outputs (PWM)

Item	Specifications
Number of PWM Outputs	Max. 4 outputs (PWM Output 00 to 03)
Duty ratio	0.0% to 100.0% in 0.1% increments
Frequency	0.1 Hz to 6,553.5 Hz (Set in 0.1-Hz increments.) 1 Hz to 32,800 Hz (Set in 1-Hz increments.)
Output mode	Continuous Mode
Instruction	PWM (891) instruction

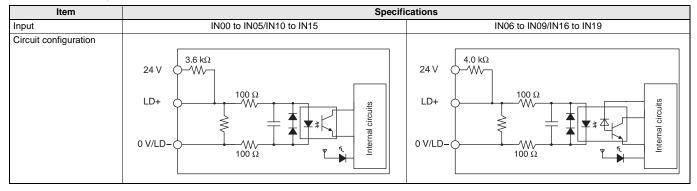
# Specifications of Pulse I/O Modules

# ● Input Specifications (IN00 to IN09/IN10 to IN19)

Normal Inputs

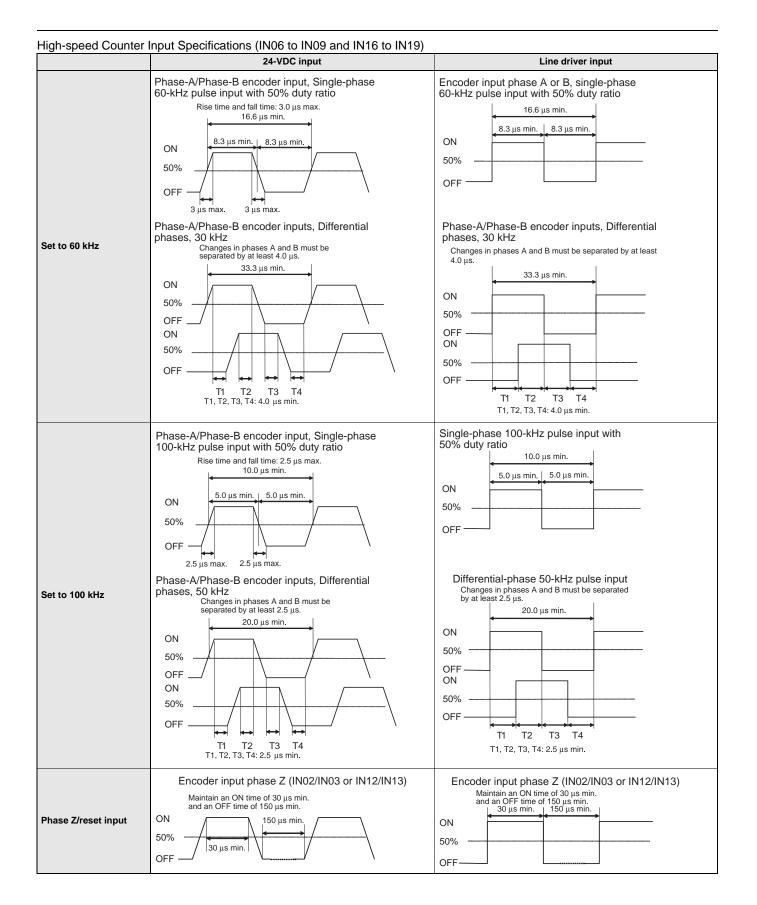
Inputs	puts IN00 to IN05 and IN06 to IN09 and IN10 to IN15 IN16 to IN19		IN00 to IN05 and IN10 to IN15	IN06 to IN09 and IN16 to IN19			
Input form	24-VDC inputs		Line driver inputs				
Input current	6.0 mA typical	5.5 mA typical	13 mA typical	10 mA typical			
Input voltage range	24 VDC +10%/-15%		RS-422A or RS-422 line driver (conforming to AM26LS31), Power supply voltage of 5 V ± 5%				
Input impedance	3.6 kΩ	4.0 kΩ					
Number of circuits	1 common, 1 circuit	1					
ON voltage/current	17.4 VDC min., 3 mA min						
OFF voltage/current	1 mA max. at 5 VDC max						
ON response time	8 ms max. (The input time constant can be set to 0, 0.5, 1, 2, 4, 8, 16, or 32 ms in the PLC Setup.)						
OFF response time	8 ms max. (The input time constant can be set to 0, 0.5, 1, 2, 4, 8, 16, or 32 ms in the PLC Setup.)						

#### Input Circuit Configuration



### Interrupt Input and Quick-response Input Specifications (IN00 to IN03 and IN10 to IN13)

Item	Specifications
ON response time	30 μs max.
OFF response time	150 μs max.
Response pulse	
	ON 430 μs min.
	OFF



### Output Specifications (OUT00 to OUT05 and OUT10 to OUT15)

Item	Specifications							
Output Specifications	Sinking-type (CJ2M-MD211) Sourcing-type (CJ2M-MD212)							
Rated voltage	5 to 24 VDC							
Allowable voltage range	4.75 to 26.4 VDC							
Maximum switching current	0.3 A/output, 1.8 A/Unit							
Number of circuits	6 outputs (6 outputs/common)	-						
Maximum inrush current	3.0 A/output, 10 ms max.         2.0 A/output, 10 ms max.	-						
Leakage current	0.1 mA max.	-						
Residual voltage	0.6 V max.	-						
ON response time	0.1 ms max.							
OFF response time	0.1 ms max.							
Fuse	None							
External supply power (power supply input for outputs)	10.2 to 26.4 VDC, 20 mA min.							
Circuit configuration	Rated voltage circuit sino io io icrcuit lsolation circuit Rated voltage COM	JT						

# Pulse Outputs (OUT00 to OUT03 and OUT10 to OUT13)

Item	Specific	cations
Output Specifications	Sinking-type (CJ2M-MD211)	Sourcing-type (CJ2M-MD212)
Rated voltage	5 to 24 VDC	
Allowable voltage range	4.75 to 26.4 VDC	
Maximum switching capacity	30 mA	
Minimum switching capacity	7 mA	
Maximum output frequency	100 kHz	
Output waveform	OFF 90% ON <u>10%</u> 2.5 μs min. <u>4 μs min.</u>	ON 90% OFF 10% 4 μs min.

# PWM Outputs (OUT04, OUT05, OUT14, and OUT15)

Item	Specifications							
Output Specifications	Sinking-type (CJ2M-MD211)	Sourcing-type (CJ2M-MD212)						
Rated voltage	5 to 24 VDC							
Allowable voltage range	4.75 to 26.4 VDC							
Maximum switching capacity	6.5535 kHz or less: 300 mA, 6.5535 to 32.8 kHz: 100 mA							
Maximum output frequency	32,800 Hz							
PWM output accuracy (for ON pulse width of 2 μs or longer)	ON duty at 6.5535 kHz or less: -0.2% to +1%, ON duty at 32.8 kHz: -1% to +5% (at switching current of 30 mA)	ON duty at 6.5535 kHz or less: ±0.5%, ON duty at 32.8 kHz: ±2.5% (at switching current of 30 mA)						
Output waveform	OFF 50% ON T $t_{ON}$ ON $duty = \frac{t_{ON}}{T} \times 100\%$	ON $\overline{}$ $\overline{$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $$						

# **Ordering Information**

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# International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK,
- L: Lloyd, CE: EC Directives, and KC: KC Registration.
  Contact your OMRON representative for further details and applicable conditions for these standards.

#### EC Directives

The EC Directives applicable to PLCs include the EMC Directives and the Low Voltage Directive. OMRON complies with these directives as described below.

- EMC Directives
- Applicable Standards
- EMI: EN61000-6-4, EN61131-2
- EMS: EN61000-6-2, EN61131-2

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked for conformity to EMC standards. Whether these

standards are satisfied for the actual system, however, must be checked by the customer.

EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

 Low Voltage Directive Applicable Standard:EN61131-2

VDC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges. These Units have been designed to conform to EN61131-2, which is the applicable standard for PLCs.

# **Basic Configuration Units**

# **CPU Units**

# ■ CJ2H (Built-in EtherNet/IP) CPU Units

		Spe	cifications			nsumption A)		
Product name	Product name I/O capacity/ Mountable Units (Expansion Racks) Program capacity		Data memory capacity	LD instruction execution time	5 V	24 V	Model	Standards
		400K steps	832K words (DM: 32K words, EM: 32K words × 25 banks)				CJ2H-CPU68-EIP	
CJ2H (Built-in EtherNet/IP) CPU		250K steps	512K words (DM: 32K words, EM: 32K words × 15 banks)	0.016 μs	0.82 (See note.)		CJ2H-CPU67-EIP	UC1, N, L, CE
Units	2,560 points/ 40 Units (3 Expansion Racks max.)	150K steps	352K words (DM: 32K words, EM: 32K words × 10 banks)				CJ2H-CPU66-EIP	
		100K steps	160K words (DM: 32K words, EM: 32K words × 4 bank)				CJ2H-CPU65-EIP	
		50K steps	160K words (DM: 32K words, EM: 32K words × 4 bank)				CJ2H-CPU64-EIP	

Note: Add 0.15 A per Adapter when using NT-AL001 RS-232C/RS-222A Adapters. Add 0.04 A per Adapter when using CJ1W-CIF11 RS-422A Adapters. Add 0.20A/Unit when using NV3W-M□20L(-V1) Programmable Terminals.

#### ■ CJ2H CPU Units

		Spe	cifications			nsumption A)		
Product name	I/O capacity/ Mountable Units (Expansion Racks)		Data memory capacity time		5V 24V		Model	Standards
		400K steps	832K words (DM: 32K words, EM: 32K words × 25 banks)				CJ2H-CPU68	
CJ2H CPU Units		250K steps	512K words (DM: 32K words, EM: 32K words × 15 banks)	0.016 μs			CJ2H-CPU67	UC1, N, L, CE
	2,560 points/ 40 Units (3 Expansion Racks max.)	150K steps	352K words (DM: 32K words, EM: 32K words × 10 banks)		0.42 (See note.)		CJ2H-CPU66	
		100K steps	160K words (DM: 32K words, EM: 32K words × 4 bank)				CJ2H-CPU65	
		50K steps	160K words (DM: 32K words, EM: 32K words × 4 bank)				CJ2H-CPU64	

Note: Add 0.15 A per Adapter when using NT-AL001 RS-232C/RS-222A Adapters. Add 0.04 A per Adapter when using CJ1W-CIF11 RS-422A Adapters. Add 0.20A/Unit when using NV3W-M□20L(-V1) Programmable Terminals.

# ■ CJ2M CPU Units (Built-in EtherNet/IP)

		Specifications						rent ption (A)		
Product name	I/O capacity/ Mountable Units (Expansion Racks)	Program capacity	Data memory capacity	LD instruction execution time	EtherNet/IP function	Option board slot	5 V	24 V	Model	Standards
CJ2M (Built-in		UUN SIEPS	160K words (DM: 32K words,	0.04 μs	YES	YES	0.7 (See note.)		CJ2M-CPU35	
EtherNet/IP)CPU Units	EtherNet/IP) CPU Units 2,560 points/ 40 Units 30K ste	30K steps	EM: 32K words × 4 banks)						CJ2M-CPU34	
		20K steps	64K words						CJ2M-CPU33	UC1, N, L, CE
F	Racks max.)	10K steps	(DM: 32K words, EM: 32K words ×				110101)		CJ2M-CPU32	
		5K steps	1 bank)						CJ2M-CPU31	

Note: Add 0.005A, 0.030A, and 0.075A when using Serial Communications Option Boards (CP1W-CIF01/CIF11/CIF12-V1), respectively. Add 0.15A/Unit when using NT-AL001 RS-232C/RS-422A Adapters.

Add 0.04A/Unit when using CJ1W-CIF11 RS-422A Adapters.

Add 0.20A/Unit when using NV3W-MD20L(-V1) Programmable Terminals.

# ■ CJ2M CPU Units

		Specifications						rent ption (A)							
Product name	I/O capacity/ Mountable Units (Expansion Racks)	Program capacity	Data memory capacity	LD instruction execution time	EtherNet/IP function	Option board slot	5 V	24 V	Model	Standards					
		60K steps	160K words (DM: 32K words,						CJ2M-CPU15						
CJ2M CPU Units	2,560 points/	30K steps	EM: 32K words V				0.5	5	CJ2M-CPU14						
	40 Units (3 Expansion	20K steps	64K words	64K words	64K words	64K words	64K words	64K words	64K words 0.04 μs			(See note.)		CJ2M-CPU13	UC1, N, L, CE
Racks max.)	10K steps	(DM: 32K words, EM: 32K words ×					,	CJ2M-CPU12	-						
		5K steps	1 bank)	1 bank)						CJ2M-CPU11					

Note: Add 0.15A/Unit when using NT-AL001 RS-232C/RS-422A Adapters. Add 0.04A/Unit when using CJ1W-CIF11 RS-422A Adapters. Add 0.20A/Unit when using NV3W-M□20L(-V1) Programmable Terminals.

#### The following accessories are included with the CPU Unit.

Item	Specifications
Battery	CJ1W-BAT01
End Cover	CJ1W-TER01 (The End Cover must be connected to the right end of the CPU Rack.)
End Plate	PFP-M (2 stoppers)

Note: A serial port (RS-232C) connector is not provided. Purchase a connector separately for serial port connection.

Plug : XM3A-0921 (manufactured by OMRON) or equivalent

Hood : XM2S-0911-E (manufactured by OMRON) or equivalent

# ■ Serial Communications Option Boards (Only CJ2M-CPU3□)

The serial communications port can be equipped by installing the serial communications option board to the option board slot in front of CPU unit.

Product name	Specifications	Serial communications mode	Current consumption (A)		Model	Standards	
		mode	5 V	24 V			
RS-232C Option Board	One RS-232C port Connector: D-Sub, 9 pin, female Maximum transmission distance: 15m		0.005		CP1W-CIF01		
RS-422A/485 Option Board	One RS-422A/485 port Terminal block: using ferrules Maximum transmission distance: 50m	Host Link, 1:N NT Link, Noprotocol, Serial PLC Link Slave, Serial PLC Link Master, Serial Gateway converted to CompoWay/F,	0.030		CP1W-CIF11	UC1, N, L, CE	
RS-422A/485 Isolated-type Option Board	One RS-422A/485 port (Isolated) Terminal block: using ferrules Maximum transmission distance: 500m	and Tool Bus <b>米</b>	0.075		CP1W-CIF12-V1		

Note: It is not possible to use a CP-series Ethernet Option Board (CP1W-CIF41), LCD Option Board (CP1W-DAM01) with a CJ2M CPU Unit. The following modes cannot be used: 1:1 NT Link, Serial Gateway converted to Host Link FINS, 1:1 Link Master, and 1:1 Link Slave. \*

# ■Pulse I/O Modules (Only CJ2M CPU Unit with Unit Version 2.0 or Later)

Optional Pulse I/O Modules can be mounted to enable pulse I/O. Up to two Pulse I/O Modules can be mounted to the left side of a CJ2M CPU Unit.

Product name	Specifications	Current consumption (A)		Model	Standards
			24 V	† 	
Pulse I/O Module	Sinking outputs, MIL connector 10 inputs (including four interrupt/quickresponse inputs and two high-speed counter inputs) 6 outputs (including two pulse outputs and two PWM outputs)	0.08		CJ2M-MD211	UC1, N, L,
	Sourcing outputs, MIL connector 10 inputs (including four interrupt/quickresponse inputs and two high-speed counter inputs) 6 outputs (including two pulse outputs and two PWM outputs)	0.08		CJ2M-MD212	CE

Note: Connectors are not provided with Pulse I/O Modules. Purchase the following Connector, an OMRON Cable with Connectors for Connector Terminal Block Conversion Units, or an OMRON Cable with Connectors for Servo Relay Units.

### Connecting to Pulse I/O Modules

On wiring, refer to Pulse I/O Modules Connector Wiring Methods.

Product name	Specifications	Model	Standards	
	MIL Flat Cable Connectors	40-pin Pressure-welded Connectors	XG4M-4030-T	
Applicable Connector	MIL Loose Wire Connectors	40-pin Crimped Connectors	XG5N-401 *4	
	Crimp Contacts for XG5N *3	Loose contacts	XG5W-0232	
		Reel contacts	XG5W-0232-R	
	Manual Crimping Tool for XG5N		XY2B-7007	
	Phillips screw (M3 screw terminals, 40-terminals)	XW2R-J40G-T		
Connector-Terminal Block Conversion Units	Slotted screw (M3 European type, 40-terminals)	XW2R-E40G-T		
	Push-in spring (Clamp 40-terminals)		XW2R-P40G-T	
		Cable length: 0.25 m	XW2Z-C25K	
		Cable length: 0.5 m	XW2Z-C50K	
		Cable length: 1 m	XW2Z-100K	
Cable for Connector-Terminal Block Conversion Unit		Cable length: 1.5 m	XW2Z-150K	
DIOCK COnversion Unit	a.	Cable length: 2 m	XW2Z-200K	
		Cable length: 3 m	XW2Z-300K	
		Cable length: 5 m	XW2Z-500K	_

Note: Minimum ordering quantity for loose contacts is 100 pieces and for reel contacts is 1 reel (10,000 pieces).

\*1. Socket and Strain Relief set

\*2. Crimp Contacts (XG5W-0232) are sold separately.

\*3. Applicable wire size is 28 to 24 AWG.

For applicable conductor construction and more information, visit the OMRON website at www.ia.omron.com.

\*4. Crimp Contacts are also required.

Product name		Model	Standards			
	Servo Relay Unit for 1 axis			XW2B-20J6-8A		
Servo Relay Units	Servo Relay Unit for 2 axe	Servo Relay Unit for 2 axes				
		Cable for Pulse I/O Modules	Cable length: 0.5 m	XW2Z-050J-A33		
	G5/G Series		Cable length: 1 m	XW2Z-100J-A33	-	
	G5/G Series	Servo Driver Connecting Cables	Cable length: 1 m	XW2Z-100J-B31		
Cables for Serve Below Units			Cable length: 2 m	XW2Z-200J-B31		
Cables for Servo Relay Units		Cable for Pulse I/O Modules	Cable length: 0.5 m	XW2Z-050J-A33		
	SMARTSTEP2		Cable length: 1 m	XW2Z-100J-A33		
	SWARISIEP2	Servo Driver Connecting Cables	Cable length: 1 m	XW2Z-100J-B32		
			Cable length: 2 m	XW2Z-200J-B32		

# Power Supply Units

One Power Supply Unit is required for each Rack.

			0	utput capaci	ity	Options					
Prod	uct name	Power supply voltage	5-VDC output capacity	24-VDC output capacity	Total power consump- tion	24-VDC service power supply	RUN output	Maintenance forecast monitor	Model	Standards	
			5 A	0.8 A	25 W		No	Yes	CJ1W-PA205C		
AC Power Supply Unit		100 to 240 VAC		5 A	0.8 A	25 W		Yes	No	CJ1W-PA205R	UC1, N, L,
	1 Januar		2.8 A	0.4 A	14 W	No	No	No	CJ1W-PA202	CE	
DC Power		24 VDC	5A	0.8 A	25 W		No	No	CJ1W-PD025		
Supply Unit		24 000	2 A	0.4 A	19.6 W		No	No	CJ1W-PD022	UC1, CE	

# Expansion Racks

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

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

Product name	Specifications	Cur consum		Model	Standards
		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 or more CJ-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	UC1, N, L, CE

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		rent ption (A)	Model	Standards
		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 2 Expansion Connecting Cable Mount to the right of the Power Supply Unit.	0.13		CJ1W-II101	UC1, N, L, CE

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

# ■ I/O Connecting Cables

Product name	Specifications	Model	Standards	
I/O Connecting Cable		Cable length: 0.3 m	CS1W-CN313	
		Cable length: 0.7 m	CS1W-CN713	
	or Cab	Cable length: 2 m	CS1W-CN223	
		Cable length: 3 m	CS1W-CN323	N, L, CE
	<ul> <li>Connects an I/O Interface Unit on CJ-series Expansion Rack to an I/O Interface Unit on another CJ-series Expansion Rack.</li> </ul>	Cable length: 5 m	CS1W-CN523	
~	an i/O intenace onit on another CJ-series Expansion Rack.	Cable length: 10 m	CS1W-CN133	
		Cable length: 12 m	CS1W-CN133-B2	

# **Programming Devices**

# Support Software

	Product name	Specifications	Number of licenses	Media	Model	Standards
		The CX-One is a comprehensive software package that integrates	- (Media only) *		CXONE-AL00D-V4	
		Windows 8.1(32-bit/64-bit version) / Windows 10(32-bit/64-bit version) CX-One Version 4. includes CX-Programmer and CX-Simulator. For details, refer to the CX-One catalog (Cat. No. B134).	1 license		CXONE-AL01D-V4	
	FA Integrated Tool Package CX-One		3 licenses		CXONE-AL03D-V4	
	Ver. 4.		10 licenses	DVD	CXONE-AL10D-V4	
			30 licenses		CXONE-AL30D-V4	
			50 licenses		CXONE-AL50D-V4	

Note: Site licenses are available for users who will run CX-One on multiple computers. Ask your OMRON sales representative for details.

\* The CXONE-AL00D-V4 contains only the DVD installation media for users who have purchased the CX-One Version 4. and does not include the license number. Enter the license number of the CX-One Version 4. when installing. (The license number of the CX-One Version 3. or lower cannot be used for installation.)

#### Support Software in CX-One Ver.4.□

The following tables lists the Support Software that can be installed from CX-One.

Support Software in CX-One	Outline
CX-Programmer	Application software to create and debug programs for CS/CJ/CP/NSJ-series, C-series, and CVM1/C-series CPU Units. Data can be created and monitored for high-speed-type Position Control Units and Position Control Units with EtherCAT interface.
CX-Integrator	Application software to build and set up FA networks, such as Controller Link, DeviceNet, CompoNet, CompoWay, and Ethernet networks. The Routing Table Component and Data Link Component can be started from here. DeviceNet Configuration functionality is also included.
Switch Box Utility	Utility software that helps you to debug PLCs. It helps you to monitor the I/O status and to monitor/change present values within the PLC you specify.
CX-Protocol	Application software to create protocols (communications sequences) between CS/CJ/CP/NSJ-series or C200HX/HG/ HE Serial Communications Boards/Units and general-purpose external devices.
CX-Simulator	Application software to simulate CS/CJ/CP/NSJ-series CPU Unit operation on the computer to debug PLC programs without a CPU Unit.
CX-Position	Application software to create and monitor data for CS/CJ-series Position Control Units. (except for High-speed type)
CX-Motion-NCF	Application software to create and monitor data for CS/CJ-series Position Control Units with MECHATROLINK-II interface (NC□71).
CX-Motion-MCH	Application software to create data and monitor program and monitor data CS/CJ-series Motion Control Units with MECHATROLINK-II interface (MCH71).
CX-Motion	Application software to create data for CS/CJ-series, C200HX/HG/HE, and CVM1/CV-series Motion Control Units, and to create and monitor motion control programs.
CX-Drive	Application software to set and control data for Inverters and Servos.
CX-Process Tool	Application software to create and debug function block programs for CS/CJ-series Loop Controllers (Loop Control Units/Boards, Process Control CPU Units, and Loop Control CPU Units).
Faceplate Auto-Builder for NS	Application software that automatically outputs screen data as project files for NS-series PTs from tag information in function block programs created with the CX-Process Tool.
CX-Designer	Application software to create screen data for NS-series PTs.
NV-Designer	Application software to create screen data for NV-series small PTs.
CX-Configurator FDT	Application software for setting various units by installing its DTM module.
CX-Thermo	Application software to set and control parameters in components such as Temperature Control Units.
CX-FLnet	Application software for system setting and monitoring of CS/CJ-series FL-net Units
Network Configurator	Application software for set up and monitor tag datalink for CJ2 (Built-in EtherNet/IP) CPU Units and EtherNet/IP Units.
CX-Server	Middleware necessary for CX-One applications to communicate with OMRON components, such as PLCs, Display Devices, and Temperature Control Units.
Communications Middleware	Middleware necessary to communicate with CP1L CPU Units with built-in Ethernet port.
PLC Tools	A group of components used with CX-One applications, such as the CX-Programmer and CX-Integrator. Includes the following: I/O tables, PLC memory, PLC Setup, Data Tracing/Time Chart Monitoring, PLC Error Logs, File Memory, PLC clock, Routing Tables, and Data Link Tables.

Note: If the complete CX-One package is installed, approximately 4.0 GB of Hard disk space will be required.

# **Programming Device Connecting Cable**

# Peripheral (USB) Port

Use commercially available USB cable.

Specifications: USB 1.1 or 2.0 cable (A connector - B connector), 5.0 m max.

# ■EtherNet/IP Port

Support Software can also be connected via the built-in EtherNet/IP port. Use commercially available 100Base-TX twisted-pair cable with the same specifications as for an EtherNet/IP Unit.

Specifications: Twisted-pair cable with RJ45 modular connectors at both ends. Connect between EtherNet/IP Unit or built-in EtherNet/IP port and switching hub. Use STP (shielded twisted-pair) cable of category 5 or 5e.

# Serial Port

	Specifications							
Product Name	Applicable computers	Connection configuration			Remarks	Model	Standards	
		IBM PC/AT or compatible computer + XW2Z-		2 m	Used for	XW2Z-200S-CV		
Programming Device Connecting Cables for RS-232C Port	Connects IBM PC/AT or compatible	XW2Z-500S-CV/V + RS-232C port of CPU L Communications Board or Unit	Init or Serial	5 m	Peripheral Bus or Host Link. Anti-static connectors	XW2Z-500S-CV		
	computers, D-Sub 9-pin	IBM PC/AT or XW2Z-2003-CV/V (211) /	Linit huilt in		Used for Host	XW2Z-200S-V		
	D-Sub 9-pin		232C port	5 m	Link only. Peripheral Bus not supported.	XW2Z-500S-V		
USB-Serial Conver- sion Cable and PC driver (on a CD-ROM disk)	IBM PC/AT or compatible	IBM PC/AT or compatible computer + CS1W-CIF31 + XW2Z-200S-CV/500S-CV + RS-232C port of CPU Unit or Serial Communications Unit	Connect USB Serial Conversion Cable to Serial	0.5 m	Used for Peripheral Bus or Host Link.	CS1W-CIF31	Ν	
Complies with USB Specification 2.0	computer (USB port)	IBM PC/AT or compatible computer + CS1W-CIF31 + XW2Z-200S-V/500S-V + RS-232C port of CPU Unit or Serial Communications Unit	PC/AT or compatible computer + W-CIF31 + XW2Z-200S-V/500S-V + 232C port of CPU Unit or Serial Connecting Cable, and connect to the PLC RS-232C port.		Used for Host Link only. Peripheral Bus not supported.	0310-01-31	IN	

# **FA Communications Software**

### SYSMAC Gateway (Communications Middleware)

	Specifications			
Product		Number of licenses	Media	Model
SYSMAC Gateway *1	Communications middleware for personal computers running Windows. Supports CIP communications and tag data links (EtherNet/IP) in addition to FinsGateway functions. (Fins Gateway functions are included.) Supported communications: RS-232C, USB, Controller Link, SYSMAC LINK, Ethernet, EtherNet/IP	1	CD-ROM	WS02-SGWC1
	Additional licenses (This product provides only additional licenses for WS02-SGWC1. Purchase of WS02-SGWC1 is required.)	10		WS02-SGWC1-L10
SYSMAC Gateway SDK	Software development kit for creating communications programs using SYSMAC Gateway. Development languages: C, C++	1 <b>*2</b>	CD-ROM	WS02-SGWC1S

\*1 One license is required per computer (execution environment).
 \*2 SYSMAC Gateway SDK doesn't include the license of SYSMAC Gateway. Purchase the WS02-SGWC1 separately if an execution environment is required.

#### ■CX-Compolet

		Specifications			
Product			Number of licenses	Media	Model
	Software components that can make it easy to create programs for communications between a computer and controllers.	Product includes CX-Compolet and SYSMAC Gateway functions.	1	CD-ROM	WS02-CPLC1
	Supported execution environment: .NET Framework (2.0, 3.0, 3.5, 4.0, 4.5.1 or	Additional licenses (This product provides only additional licenses for WS02-CPLC1. Purchase of	3		WS02-CPLC1-L3
CX-Compolet *	4.6) Development environment:		5		WS02-CPLC1-L5
	Visual Studio 2005/2008/2010/2012/2013/ 2015/2017	WS02-CPLC1 is required.)	10		WS02-CPLC1-L10
	Development languages: Visual Basic, C# Supported communications: Equal to SYSMAC Gateway.	CX-Compolet (standalone) (SYSMAC Gateway functions are not included.)	1	CD-ROM	WS02-CPLC2

\* One license is required per computer (execution environment). Refer to the CJ2 CPU Unit Catalog (Cat. No. V302) for details.

Note: When .NET Framework version1.1 (Visual Studio 2003) is used for development, only the specifications of CX-Compolet version 1.5 are available.

# **Optional Products and Maintenance Products**

Product name	Specifications	Model	Standards
	Flash memory, 128 MB	HMC-EF183	
Memory Cards	Flash memory, 256 MB	HMC-EF283	
	Flash memory, 512 MB	HMC-EF583	•
	Memory Card Adapter (for computer PCMCIA slot)	HMC-AP001	CE

Product name	Sp	ecifications	Model	Standards
Battery Set	Battery for CJ2H-CPU (-EIP) and CJ2M- CPU CPU Unit maintenance	<ul> <li>Note 1.The battery is included as a standard accessory with the CPU Unit.</li> <li>2. The battery service life is 5 years at 25°C. (The service life depends on the ambient operating temperature and the power conditions.)</li> <li>3. Use batteries within two years of manufacture.</li> </ul>	CJ1W-BAT01	
End Cover	Mounted to the right-hand side of CJ-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	UC1, N, L, CE
RS-422A Converter	Converts RS-233C to RS-422A/RS-485. (Application example: With a CJ2M-CPU1 the built-in RS-232C port of the CPU Unit.)	CPU Unit, the Adapter is used for Serial PLC Link at	CJ1W-CIF11	UC1, N, L, CE

Product name	Specifications		Model	Standards
Flouter name	Connection configuration	Cable length	Model	Stanuarus
NS-series PT Connect- ing Cables	Cable for connecting between an NS-series PT and the RS-232C port on the CPU Unit or Serial Communications Board	2 m	XW2Z-200T	
4	XW2Z-200T (2 m) XW2Z-500T (5 m)         CPU Unit built-in RS-232C Cable	5 m	XW2Z-500T	

# DIN Track Accessories

Product name	Specifications	Model	Standards
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			Specif	fications				nt con- tion (A)		
classification	Product name	I/O points	Input voltage and current	Commons	External connection	No. of words allocated	5 V	24 V	Model	Standards
		8 inputs	12 to 24 VDC, 10 mA	Independent contacts	Removable terminal block	1 word	0.08		CJ1W-ID201	
	DC Input Units	16 inputs	24 VDC, 7 mA	16 points, 1 common	Removable terminal block	1 word	0.08		CJ1W-ID211	
		16 inputs High-speed type	24 VDC, 7 mA	16 points, 1 common	Removable terminal block	1 word	0.13		CJ1W-ID212	
		32 inputs	24 VDC, 4.1 mA	16 points, 1 common	Fujitsu connector	2 words	0.09		CJ1W-ID231 (See note.)	
CJ1		32 inputs	24 VDC, 4.1 mA	16 points, 1 common	MIL connector	2 words	0.09		CJ1W-ID232 (See note.)	UC1, N, L,
Basic I/O Units		32 inputs High-speed type	24 VDC, 4.1 mA	16 points, 1 common	MIL connector	2 words	0.20		CJ1W-ID233 (See note.)	CE
		64 inputs	24 VDC, 4.1 mA	16 points, 1 common	Fujitsu connector	4 words	0.09		CJ1W-ID261 (See note.)	
		64 inputs	24 VDC, 4.1 mA	16 points, 1 common	MIL connector	4 words	0.09		CJ1W-ID262 (See note.)	
	AC Input Units	8 inputs	200 to 24 VAC, 10 mA (200 V, 50 Hz)	8 points, 1 common	Removable Terminal Block	1 word	0.08		CJ1W-IA201	
		16 inputs	100 to 120 VAC, 7 mA (100 V, 50 Hz)	16 points, 1 common	Removable Terminal Block	1 word	0.09		CJ1W-IA111	

Note: Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON XW2R Connector-Terminal Block Conversion Unit (detail informations: XW2R series Connector-terminal block conversion unit Catalog (Catalog number: G077)) or a G7 I/O Relay Terminal.

Unit	Product name			Specifications			No. of words	consu	rrent imption A)	Model	Standard
classification		Output type	I/O points	Maximum switching capacity	Commons	External connection	allocated	5 V	24 V		
	Relay Con- tact Output Units	_	8 outputs	250 VAC/24 VDC, 2 A	Independent contacts	Removable terminal block	1 word	0.09	0.048 max.	CJ1W-OC201	
		_	16 outputs	250 VAC/24 VDC, 2 A	16 points, 1 common	Removable terminal block	1 word	0.11	0.096 max.	CJ1W-OC211	
	Triac Output Unit	-	8 outputs	250 VAC, 0.6 A	8 points, 1 common	Removable terminal block	1 word	0.22	-	CJ1W-OA201	
		Sinking	8 outputs	12 to 24 VDC, 2 A	4 points, 1 common	Removable terminal block	1 word	0.09	_	CJ1W-OD201	
		Sinking	8 outputs	12 to 24 VDC, 0.5 A	8 points, 1 common	Removable terminal block	1 word	0.10	-	CJ1W-OD203	
		Sinking	16 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common	Removable terminal block	1 word	0.10	-	CJ1W-OD211	
CJ1 Basic I/O Units	Transistor Output Units	Sinking	16 outputs High-speed type	24 VDC, 0.5 A	16 points, 1 common	Removable terminal block	1 word	0.15	-	CJ1W-OD213	UC1, N, L CE
io onits		Sinking	32 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common	Fujitsu connector	2 words	0.14	-	CJ1W-OD231 (See note.)	-
		Sinking	32 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common	MIL connector	2 words	0.14	-	CJ1W-OD233 (See note.)	-
		Sinking	32 outputs High-speed type	24 VDC, 0.5 A	16 points, 1 common	MIL connector	2 words	0.22	-	CJ1W-OD234 (See note.)	
		Sinking	64 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common	Fujitsu connector	4 words	0.17	-	CJ1W-OD261 (See note.)	-
		Sinking	64 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common	MIL connector	4 words	0.17	-	CJ1W-OD263 (See note.)	-
		Sourcing	8 outputs	24 VDC, 2 A Short-circuit protection	4 points, 1 common	Removable terminal block	1 word	0.11	-	CJ1W-OD202	
		Sourcing	8 outputs	24 VDC, 0.5 A Short-circuit protection	8 points, 1 common	Removable terminal block	1 word	0.10	-	CJ1W-OD204	
		Sourcing	16 outputs	24 VDC, 0.5 A Short-circuit protection	16 points, 1 common	Removable terminal block	1 word	0.10	-	CJ1W-OD212	
		Sourcing	32 outputs	24 VDC, 0.5 A Short-circuit protection	16 points, 1 common	MIL connector	2 words	0.15	-	CJ1W-OD232 (See note.)	
		Sourcing	64 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common	MIL connector	4 words	0.17	-	CJ1W-OD262 (See note.)	

Note: Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON XW2R Connector-Terminal Block Conversion Unit (detail informations: XW2R series Connector-terminal block conversion unit Catalog (Catalog number: G077)) or a G7 I/O Relay Terminal.

			Specifications						rrent mption A)		
Unit classification	Product name	Output		Input voltage, Input current	Commons	ons External connection	No. of words allocated	- 14		Model	Standards
		type	I/O points	Maximum switching capacity				5 V	24 V		
		Sinking	16 inputs	24 VDC, 7 mA	16 points, 1 common	Fujitsu	2 words	0.13		CJ1W-MD231	UC1, N,
		Sinking	16 outputs	250 VAC/24 VDC, 0.5 A	16 points, 1 common	n connector	0.13		(See note 2.)	CE	
	DC Input/ Transis-	Sinking	16 inputs	24 VDC, 7 mA	16 points, 1 common	on MIL 2 words (	0.13		CJ1W-MD233		
	tor Out- put Units	Siriking	16 outputs	12 to 24 VDC, 0.5 A	16 points, 1 common	connector	onnector	0.13		(See note 2.)	1
		Sinking	32 inputs	24 VDC, 4.1 mA	16 points, 1 common	Fujitsu connector 4 words	0.14		CJ1W-MD261 (See note 1.)	UC1, N, CE	
	i sh	Sinking	32 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common		0.14				
CJ1 Basic		Sinking	32 inputs	24 VDC, 4.1 mA	16 points, 1 common	MIL	4 words	0.14		CJ1W-MD263	_
I/O Units		Sirikirig	32 outputs	12 to 24 VDC, 0.3 A	16 points, 1 common	connector	4 Words	0.14		(See note 1.)	
		Sourcing	16 inputs	24 VDC, 7 mA	16 points, 1 common	MIL	2 words	0.13		CJ1W-MD232	UC1, N, L,
		Sourcing	16 outputs	24 VDC, 0.5 A Short-circuit protection	16 points, 1 common	connector	2 words	0.13		(See note 2.)	CE
	TTL I/O Units		32 inputs	5 VDC, 35 mA	16 points, 1 common	MIL	4 words	0.10		CJ1W-MD563	UC1, N,
			32 outputs	5 VDC, 35 mA	16 points, 1 common	connector 4 words	0.19 -		(See note 1.)	CE	

Terminal Block Conversion Unit (detail informations: XW2R series Connector-terminal block conversion unit Catalog (Catalog number: G077)) or a G7 I/O Relay Terminal.

#### Applicable Connectors

#### Fujitsu 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	Standards
40-pin Connectors	Soldered	FCN-361J040-AU Connector FCN-360C040-J2 Connector Cover	Fujitsu Connectors: CJ1W-ID231(32 inputs): 1 per Unit	C500-CE404	
	Crimped	FCN-363J040 Socket FCN-363J-AU Contactor FCN-360C040-J2 Connector Cover	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-CE405	
	Pressure welded	FCN-367J040-AU/F		C500-CE403	
24-pin Connectors	Soldered	FCN-361J024-AU Connector FCN-360C024-J2 Connector Cover	Fujitsu Connectors: CJ1W-MD231 (16 inputs, 16 outputs): 2 per Unit	C500-CE241	
	Crimped	FCN-363J024 Socket FCN-363J-AU Contactor FCN-360C024-J2 Connector Cover		C500-CE242	_
	Pressure welded	FCN-367J024-AU/F	1	C500-CE243	1

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

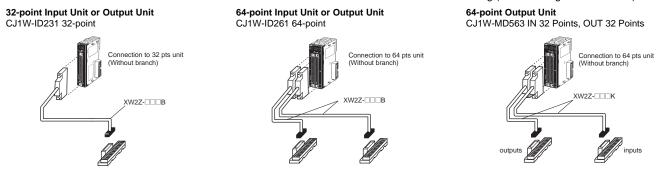
Name	Connection	Remarks	Applicable Units	Model	Standards
40-pin Connectors	Pressure welded	FRC5-AO40-3TOS	MIL Connectors: CJ1W-ID232/233 (32 inputs): 1 per Unit CJ1W-OD232/233/234 (32 outputs):1 per Unit CJ1W-ID262 (64 inputs): 2 per Unit CJ1W-OD262/263 (64 outputs): 2 per Unit CJ1W-MD263/563 (32 inputs, 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 XW2R series Connector-terminal block conversion unit Catalog (Web Catalog number: G077)



#### Choose the wiring method.

Choose  $\Box\Box$  from a following combination table PLC type.

Wiring method	Model
Models with Phillips screw	XW2R-J34GD-C
Models with Slotted screw (rise up)	XW2R-E34GD-C
Models with Push-in spring	XW2R-P34GD-C

#### **Combination table**

PLC Type	I/O	I/O Points	I/O unit model	Connecting cables
	laput	32	CJ1W-ID231	XW2Z-
C1	Input	64	CJ1W-ID261	32-point Unit: 1 Cable
	Input/Output	32	CJ1W-MD261 (inputs)	64-point Unit: 2 Cables
		32	CJ1W-ID232	
	Input	32	CJ1W-ID233	XW2Z-DDK
C2		64	CJ1W-ID262	32-point Unit: 1 Cable
	Input/Output	32	CJ1W-MD263 (inputs)	64-point Unit: 2 Cables
		32	CJ1W-MD563 (inputs)	
	Output -	32	CJ1W-OD231	XW2Z-DDB
C3		64	CJ1W-OD261	32-point Unit: 1 Cable
	Input/Output	32	CJ1W-MD261 (outputs)	64-point Unit: 2 Cables
			CJ1W-OD232	
		32	CJ1W-OD233	
	Output		CJ1W-OD234	XW2Z-DDK
C4		0.4	CJ1W-OD262	32-point Unit: 1 Cable
		64	CJ1W-OD263	64-point Unit: 2 Cables
	Input/Output		20	CJ1W-MD263 (outputs)
		32	CJ1W-MD563 (outputs)	

**Note: 1.**  $\Box \Box \Box$  is replaced by the cable length.

2. There is one common for each 32 points.

#### Connector-terminal block conversion unit

Product name	Wiring method	I/O Points (number of poles)	Model		
	Models with Phillips screw	32 (34)	XW2R-J34GD-C1		
		32 (34)	XW2R-J34GD-C2		
	Constanting of the second s	32 (34)	XW2R-J34GD-C3		
		32 (34)	XW2R-J34GD-C4		
	Models with Slotted screw (rise up)	32 (34)	XW2R-E34GD-C1		
Connector terminal block		32 (34)	XW2R-E34GD-C2		
conversion unit		32 (34)	XW2R-E34GD-C3		
	~	32 (34)	XW2R-E34GD-C4		
	Models with Push-in spring	32 (34)	XW2R-P34GD-C1		
		32 (34) XW2R-P34GD-C2			
		32 (34)	XW2R-P34GD-C3		
	V	32 (34)	XW2R-P34GD-C4		

# **Connecting cables**

Product name	Appearance	Connectors	Model	Cable length (m)
	XW2Z-		XW2Z-050B	0.5
			XW2Z-100B	1
		One 40-pin MIL Connector to One 40-pin Connector Made by	XW2Z-150B	1.5
		Fujitsu Component, Ltd.	XW2Z-200B	2
			XW2Z-300B	3
or I/O Unit Connecting			XW2Z-500B	5
able	XW2Z-□□□K		XW2Z-C50K	0.5
			XW2Z-100K	1
		One 40-pin MIL Connector to	XW2Z-150K	1.5
		One 40-pin MIL Connector	XW2Z-200K	2
			XW2Z-300K	3
			XW2Z-500K	5

# ■ Interrupt Input Units

Unit clas-	Product			S	pecifications			No. of	Currer sumpt	nt con- ion (A)		
sification	name	I/O points	Input voltage current	Commons	Input pulse width conditions	Max. Units mountable per Unit		all a safe d	5 V	24 V	Model	Standards
CJ1 Basic I/O Units	Interrupt Input Unit	16 inputs	24 VDC, 7 mA	16 points, 1 common	ON time: 0.05 ms max. OFF time: 0.5 ms max.	2	Remov- able termi- nal block	1 word	0.08		CJ1W-INT01	UC1, N, L, CE

Note 1. Can be used only on CPU Racks, and not on Expansion Racks.
2. The locations where the Units can be mounted depend on the CPU Rack and the CPU Unit model. CJ2H-CPU6□-EIP: From the slot next to the CPU Unit until the forth slot. CJ2H-CPU6□, CJ2M: From the slot next to the CPU Unit until the fifth slot.

# ■ Quick-response Input Units

				Spec	ifications		No. of		nt con- ion (A)		
Unit clas- sification	name	I/O points	Input voltage, Input current	Commons	Input pulse width conditions	External connection	words allocated	5 V	24 V	Model	Standards
CJ1 Basic I/O Units	Quick- response Input Unit	16 inputs	24 VDC, 7 mA	16 points, 1 common	ON time: 0.05 ms max. OFF time: 0.5 ms max.	Removable terminal block	1 word	0.08		CJ1W-IDP01	UC1, N, L, CE

Note: There are no restrictions on the mounting position or number of Units.

# ■ B7A Interface Units

Unit clas- sification	Product name	Specifications		No. of words allocated		nt con- ion (A)	Model	Standards
Sincation	name	I/O points	External connection		5 V	24 V		
	B7A Inter- face Units	64 inputs			0.07		CJ1W-B7A14	
CJ1 Basic I/O Units	P	64 outputs	Removable terminal block	4 words	0.07		CJ1W-B7A04	UC1, CE
		32 inputs/outputs			0.07		CJ1W-B7A22	

# Special I/O Units and CPU Bus Units

# Process I/O Units

### ● Isolated-type Units with Universal Inputs

			Signal		Conversion	Accuracy	External	No. of unit	Currer sumpt	nt con- ion (A)		
Unit clas- sification	Product name	Input points	range selection	Signal range	speed	(at ambient tem- perature of 25°C)	connec-	num- bers allo- cated	5 V	24 V	Model	Standards
CJ1 Special I/O	Process Input Units (Isolated- type Units with Uni- versal Inputs)	4 inputs	Set sepa- rately 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 1.25 V, 0 to 1.25 V, 0 to 5 V, 0 to 10 V, $\pm$ 100 mV select- able range -1.25 to 1.25 V, -5 to 5 V, -10 to 10 V, $\pm$ 10 V selectable range, potentiom- eter	Resolution (conver- sion speed): 1/256,000 (conver- sion cycle: 60 ms/ 4 inputs) 1/64,000 (conver- sion cycle: 10 ms/ 4 inputs) 1/16,000 (conver- sion cycle: 5 ms/ 4 inputs)	Standard accuracy: ±0.05% of F.S.	Remov- able ter- minal	1	0.30		CJ1W-PH41U (See note 1.)	UC1, CE
Units		4 inputs	Set sepa- rately 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. (See note 2.) Voltage or current input: ±0.3% of F.S. ±1 digit max.	block		0.32		CJ1W-AD04U	UC1, L, CE

Note 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 Thermocouple Input Units

Unit clas-		Input	Signal range	Signal range	Conversion speed	Accuracy (at ambient		No. of unit numbers	Currei sumpt	nt con- ion (A)	Model	Standards
sification	name	points	selection		(resolution)	temperature of 25°C)	connection	allocated	5 V	24 V		
CJ1 Special	Process Input Units (Isolated- type Ther- mocouple Input	2 inputs	Set sep- arately for each input	Thermocouple: B, E, J, K, L, N, R, S, T, U, WRe5-26, PLII DC voltage: ±100 mV	Conversion speed: 10 ms/ 2 inputs, Resolution: 1/64,000	Standard accuracy: ±0.05% of F.S. (See note 1.)	Removable		0.18	0.06 (See note 2.)	CJ1W- PTS15	UC1, CE
I/O Units	Units)	4 inputs		Thermocouple: R, S, K, J, T, L, B	Conversion speed: 250 ms/ 4 inputs	Accuracy: ( $\pm 0.3\%$ of PV or $\pm 1^{\circ}$ C, whichever is larger) $\pm 1$ digit max. (See note 3.)	block		0.25		CJ1W- PTS51	001, CE

Note 1. The accuracy depends on the sensors used and the measurement temperatures. For details, refer to the user's manual.

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

3. 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 Resistance Thermometer Input Units

			Signal		Conversion	Accuracy	External	No. of unit	Currei sumpt	nt con- ion (A)		
Unit clas- sification		Input points	range	Signal range	speed (resolution)	(at ambient temperature of 25°C)	connec- tion	num- bers allo- cated	5 V	24 V	Model	Standards
CJ1 Special I/O Units	Process Analog Input Units (Isolated- type Resis- tance Thermom- eter Input Units)	4 inputs	Com- mon inputs	Resistance ther- mometer: Pt100, JPt100	Conver- sion speed: 250 ms/ 4 inputs	Accuracy: ±0.3°C of PV or ±0.8°C, which- ever is larger, ±1 digit max.	Remov- able termi- nal block	1	0.25		CJ1W-PTS52	UC1, CE

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

### • Isolated-type DC Input Units

Unit clas-		Input	Signal range selection	Conversion speed	(at ambient	External connec-	No. of unit	Currei sumpt	nt con- ion (A)	Model	Standards
sification	name	points		(resolution)	temperature of 25°C)	tion	numbers allocated	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, $\pm 10$ 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.	Remov- able terminal block	1	0.18	0.09 (See note.)	CJ1W-PDC15	UC1, CE

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

# Analog I/O Units

# • Analog Input Units

Unit clas- sification		Input points	Signal range selec-	Signal range	Resolution	Conversion speed	Accuracy (at ambient temperature of	External connec- tion	numbers	cons tion	rent ump- (A)	Model	Standards
CJ1 Special I/O	Analog Input Units (High-speed type	4 inputs	Set sepa- rately for	–10 to 10 and		20 μs/1 point, 25 μs/2 points, 30 μs/3 points, 35 μs/4 points The Direct conversion is provided.	25°C) Voltage: ±0.2% of F.S. Current: ±0.4% of F.S.	Remov- able termi-	allocated	<b>5 V</b> 0.52	24 V	CJ1W-AD042	UC1, CE
Units	Analog Input Units	8 inputs 4 inputs	each input	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) (See note 1.)	1 ms/point max. (Settable to 250 µs/point) (See note 1.)	Voltage: ±0.2% of F.S. Current: ±0.4% of F.S. (See note 2.)	nal block		0.42		CJ1W-AD081-V1 CJ1W-AD041-V1	UC1, N, L, CE

Note 1. 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. 2. At 23 ±2°C

• Analo			Signal	0		Conver-	Accuracy	External	External	No. of unit		ent con- tion (A)				
Unit clas- sification	Product name	Output points	range selec- tion	Signal range	Resolu- tion	sion speed	(at ambient temperature of 25°C)	connec- tion	power supply	num- bers allo- cated	5 V	24 V	Model	Standards		
	Analog Output Units High-speed type	4 outputs		1 to 5 V (1/10 0 to 10 V (1/2 and –10 to 10 V (	20,000),	20 µs/ 1 point, 25 µs/ 2 points, 30 µs/ 3 points, 35 µs/ 4 points The Direct conver- sion is provided.	±0.3% of F.S.				0.40		CJ1W-DA042V	UC1, CE		
		8 outputs	Set sepa- rately for	1 to 5 V, 0 5 to 5 V, 0 to 10 V, –10 to 10 V	1/4,000 (Settable	1 ms/ point max.		Remov- able termi-	24 VDC <sup>+10%</sup> -15% , 140 mA max.	1	0.14	0.14 (See note.)	CJ1W-DA08V	UC1, N, L, CE		
	Analog 8 Output	Analog 8 Output	nalog 8 utput outputs	e ii	each input	4 to 20 mA	to 1/8,000)	(Settable to 250 μs/point)		nal block	24 VDC +10% -15% 170 mA max.		0.14	0.17 (See note.)	CJ1W-DA08C	UC1, N, CE
		4 outputs		1 to 5 V, 0 to 5 V,		1 ms/	Voltage output: ±0.3% of F.S.		24 VDC +10% -15% 200 mA max.		0.12	0.2 (See note.)	CJ1W-DA041	UC1, N, L,		
		2 outputs		0 to 10 V, -10 to 10 V, 4 to 20 mA	1/4000	point max.	Current output: ±0.5% of F.S.		24 VDC +10% -15% , 140 mA max.		0.12	0.14 (See note.)	CJ1W-DA021	CE		

Note: This is for an external power supply, and not for internal current consumption

# Analog I/O Units

Unit clas- sification		No. of points	Signal range selec-	Signal range	Resolu- tion (See	Conversion speed (See note.)	Accuracy (at ambient temperature	External connec- tion		cons	rent ump- n (A)	Model	Standards
			tion		note.)	(See note.)	of 25°C)		anocateu	5 V	24 V		
CJ1	Analog I/O Units	4 inputs	Set sepa-	1 to 5 V, 0 to 5 V.	1/4,000	1 ms/point	Voltage input: $\pm 0.2\%$ of F.S. Current input: $\pm 0.2\%$ of F.S.	Remov-					
Special I/O Units		2 outputs	rately for each input	0 to 3 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA	(Settable to 1/8,000)	(Settable to 500 μs/point max.)	Voltage output: ±0.3% of F.S. Current output: ±0.3% of F.S.	able termi- nal block	1	0.58		CJ1W-MAD42	UC1, N, L, CE

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 clas-	Product		Specificat	ions	No. of unit		nt con- ion (A)	Model	Standards
sification	name	No. of loops	Temperature sensor inputs	Control outputs	allocated	5 V	24 V	moder	otanuarus
		4 loops		Open collector NPN outputs (pulses)		0.25		CJ1W-TC001	
		4 loops	Thermocouple	Open collector PNP outputs (pulses)		0.25		CJ1W-TC002	
	Temper-	2 loops, heater burnout detection function	input (R, S, K, J, T, B, L)	Open collector NPN outputs (pulses)		0.25		CJ1W-TC003	
CJ1 Spe-	ature Control Units	2 loops, heater burnout detection function		Open collector PNP outputs (pulses)	2	0.25		CJ1W-TC004	UC1, N,
cial I/O Units		4 loops		Open collector NPN outputs (pulses)		0.25		CJ1W-TC101	L, CE
		4 loops	Platinum	Open collector PNP outputs (pulses)		0.25		CJ1W-TC102	-
	b fi 2 b	2 loops, heater burnout detection function	thermometer input (JPt100, Pt100)	Open collector NPN outputs (pulses)		0.25		CJ1W-TC103	
		2 loops, heater burnout detection function		Open collector PNP outputs (pulses)		0.25		CJ1W-TC104	

# ■ High-speed Counter Unit

Unit classifi-	Product	Specifications			No. of unit numbers allo-	Current con- sumption (A)		Model	Standards
cation	name	Countable channels	Encoder A and B inputs, pulse input Z signals	Max. counting rate		5 V	24 V	Woder	otandarda
CJ1 Spe-	High- speed Counter Unit		Open collector Input voltage: 5 VDC, 12 V, or 24 V (5 V and 12 V are each for one axis only.)	50 kHz					UC1, N,
cial I/O Units		2	RS-422 line driver	500 kHz	4	0.28		CJ1W-CT021 *	L, CE

\* Use Lot No.030121 or later (Unit Version 1.06) of CJ1W-CT021 when using with CJ2 CPU Units.

# Position Control Units Position Control Units (High-speed type)

Unit classifi- cation	Product name		Spe	ecifications		No. of unit numbers	cons	rent ump- i (A)	Model	Standards
cation			Control outp	ut interface	No. of axes	allocated	5 V	24 V		
	Position Control		en-collector outp	ut with	2 axes	2	0.27		CJ1W-NC214	
	Units	Pulse Counter	Function		4 axes	2	0.31		CJ1W-NC414	UL1, CE
	High-speed type		e-driver output wi	th	2 axes	2	0.27		CJ1W-NC234	021, 02
		Pulse Counter	Function		4 axes	-	0.31		CJ1W-NC434	
	Position Control Unit Cables			Connecting Servo Drives: G Series R88D-GT G5 Series R88D-KT		Cable lengt	h: 1 m		XW2Z-100J-G13	
		Open-collector output		Connecting Servo Drives: SMARTSTEP2 R7D-BP	1 axis	Cable length: 3 m			XW2Z-300J-G13	
				Connecting Servo Drives: G Series R88D-GT G5 Series R88D-KT	1 4713	Cable length: 1 m			XW2Z-100J-G14	
			For CJ1W-NC214/ NC414	Connecting Servo Drives: SMARTSTEP2 R7D-BP		Cable length: 3 m			XW2Z-300J-G14	
				Connecting Servo Drives: G Series R88D-GT G5 Series R88D-KT	- 2 axes	Cable lengt	h: 1 m		XW2Z-100J-G5	
CJ1 Special				Connecting Servo Drives: SMARTSTEP2 R7D-BP		Cable lengt	h: 3 m		XW2Z-300J-G5	
I/O Units				Connecting Servo Drives: G Series R88D-GT G5 Series R88D-KT	– 2 axes	Cable length: 1 m			XW2Z-100J-G6	
				Connecting Servo Drives: SMARTSTEP2 R7D-BP		Cable lengt	e length: 3 m		XW2Z-300J-G6	
				Connecting Servo Drives:		Cable lengt	gth: 1 m		XW2Z-100J-G9	
				G Series R88D-GT		Cable lengt	h: 5 m		XW2Z-500J-G9	
				G5 Series R88D-KT	1 axis	Cable lengt	h: 10 n	n	XW2Z-10MJ-G9	
				Connecting Servo Drives:		Cable lengt			XW2Z-100J-G12	
			For	SMARTSTEP2 R7D-BP		Cable lengt			XW2Z-500J-G12	
		Line-driver	For CJ1W-NC234/			Cable lengt		n	XW2Z-10MJ-G12	
		output	NC434	Applicable Servo Drive:		Cable lengt			XW2Z-100J-G1	
				G Series R88D-GT G5 Series R88D-KT		Cable lengt			XW2Z-500J-G1	
					2 axes	Cable lengt		n	XW2Z-10MJ-G1	
				Applicable Servo Drive:	C	Cable length: 1 m		XW2Z-100J-G4		
				SMARTSTEP2 R7D-BP		Cable length: 5 m		XW2Z-500J-G4		
						Cable lengt	h: 10 n	n	XW2Z-10MJ-G4	

#### • Position Control Units

Unit classifi- cation	Product name		Spe	cifications		No. of unit numbers	s tion (A)			Standards
cation			Control outp	ut interface	No. of axes	allocated	5 V	24 V		
	Position Control	Pulse train, op	en collector outp	ut	1 axis	1	0.25		CJ1W-NC113	
	Units	Pulse train, open collector output					0.25		CJ1W-NC213	
	<b>F</b>	Pulse train, open collector output (See note.)			4 axes	2	0.36		CJ1W-NC413	
		Pulse train, line driver output				1	0.25		CJ1W-NC133	UC1, CE
		Pulse train, line	e driver output		2 axes		0.25		CJ1W-NC233	
		Pulse train, line	e driver output (S	See note.)	4 axes	2	0.36		CJ1W-NC433	
	Space Unit	Use a CJ1W-S	P001 Space Uni	it if the operating temperature	is 0 to 55°	°C.			CJ1W-SP001	UC1, CE
	Servo Relay Units	For 1-Axis Pos	ition Control Uni	t (without communications sup	port) (CJ	1W-CN113/1	33)		XW2B-20J6-1B	
		For 2- or 4-Axe	s Position Control	Unit (without communications s	support) (C	CJ1W-NC213/	233/41	3/433)	XW2B-40J6-2B	
		For 2- or 4-Axe	For 2- or 4-Axes Position Control Unit (with communications support) (CJ					/433)	XW2B-40J6-4A	
CJ1 Special			For	For G5/G Series.		Cable lengt	h: 0.5 r	n	XW2Z-050J-A14	
I/O Units		Open-collector	CJ1W-NC113	SMARTSTEP2	1 axis	Cable length: 1 m			XW2Z-100J-A14	
		output	For CJ1W-NC213/	Connecting Servo Drives: G5/G Series,	2 axes	Cable length: 0.5 m		XW2Z-050J-A15		
	Position Control		413	SMARTSTEP2	2 0,03	Cable lengt	h: 1 m		XW2Z-100J-A15	
	Unit Cables		For	Connecting Servo Drives: G5/G Series.	1 axis	Cable lengt	h: 0.5 r	n	XW2Z-050J-A18	
		Line-driver	CJ1W-NC133	SMARTSTEP2	1 9712	Cable length: 1 m			XW2Z-100J-A18	
		output	For CJ1W-NC233/	Connecting Servo Drives: G5/G Series,	2 axes	Cable lengt	h: 0.5 r	n	XW2Z-050J-A19	
			433	SMARTSTEP2	2 0762	Cable length: 1 m			XW2Z-100J-A19	

Note: The ambient operating temperature for 4-Axes Position Control Units is 0 to 50°C; the allowable voltage fluctuation on the external 24-VDC power supply is 22.8 to 25.2 VDC (24 V ±5%).

# Position Control Unit with EtherCAT interface

Unit classi-	Product name	Specifications		No. of unit numbers	Current con- sumption (A)		Model	Standards
fication	Product name	Control output interface	No. of axes	allocated	5 V	24 V	Model	Standalus
			2 axes				CJ1W-NC281	
	Position Control Unit with EtherCAT interface	Positioning functions: Memory operation, Direct operation by ladder programming Control commands executed by EtherCAT	4 axes		0.46		CJ1W-NC481	
			8 axes				CJ1W-NC881	
CJ1 CPU Bus Units	88		16 axes				CJ1W-NCF81	UC1, CE
			4 axes				CJ1W-NC482	
		<ul> <li>communications.</li> <li>Positioning functions: Memory operation,</li> <li>Direct operation by helder groups and the second se</li></ul>	8 axes	1	0.46		CJ1W-NC882	
		Direct operation by ladder programming • I/O communication : 64 nodes	16 axes	1			CJ1W-NCF82	

Note: Use Category 5 or higher cables with double shield of aluminium tape and braid shield for connection with EtherCAT Slaves. We also recommend you to use Category 5 or higher modular connectors.

# ■EtherCAT Slave Unit

Unit type	Product name	Specifications		No. of unit numbers	Current con- sumption (A)		Model	Standards
Unit type	Product name	Communications cable	Communications functions	allocated	5 V	24 V	Model	Standards
CJ1 CPU Bus Unit	EtherCAT Slave Unit	STP (shielded twisted-pair) cable of category 5 or higher with double shielding	Refreshing methods: Free-Run Mode PDO data sizes: TxPDO 400byte max./ RxPDO: 400byte max.	1	0.34		CJ1W-ECT21	UC1,CE,KC

### Recommended EtherCAT Communications Cables

Category 5 or higher (100BASE-TX) straight cable with double shielding (aluminum tape and braided shielding) is recommended. **Cabel with Connectors** 

Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Cable length(m)	Model
Cable with Connectors on Both Ends (RJ45/RJ45)		OMRON	0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
			1	XS5W-T421-CMD-K
	* ()		2	XS5W-T421-DMD-K
	<u> </u>		5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
Cable with Connectors on Both Ends (M12/RJ45)		OMRON	0.3	XS5W-T421-AMC-K
			0.5	XS5W-T421-BMC-K
			1	XS5W-T421-CMC-K
	-0		2	XS5W-T421-DMC-K
			5	XS5W-T421-GMC-K
			10	XS5W-T421-JMC-K

Note: The cable length 0.3, 0.5, 1, 2, 3, 5, 10 and 15m are available. For details, refer to Cat.No.G019.

#### **Cables / Connectors**

Wire Gauge and Number of Pairs: AWG24, 4-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables		Tonichi Kyosan Cable, Ltd.	NETSTAR-C5E SAB 0.5 × 4P CP
		Kuramo Electric Co.	KETH-SB
		SWCC Showa Cable Systems Co.	FAE-5004
RJ45 Connectors		Panduit Corporation	MPS588

### Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables		Kuramo Electric Co.	KETH-PSB-OMR *
RJ45 Assembly Connector		OMRON	XS6G-T421-1 *

\* We recommend you to use above cable and connector together.

Unit classi-	Product name	Specifications		No. of unit		nt con- ion (A)	Model	Standards
fication	Product name	Control output interface	No. of axes	allocated	5 V	24 V	Model	Standards
	Position Control Unit with MECHATROLINK-II	Control commands executed by	2 axes				CJ1W-NC271	
	interface	MECHATROLINK-II synchronous communications.	4 axes		0.36		CJ1W-NC471	
		Control mode: Position control, speed	16 axes	- 1			CJ1W-NCF71	UC1, CE
		control, or torque control	16 axes	-		CJ1W-NCF71-MA		
		MECHATROLINK-II Cables (without ring core and USB connector on both ends) Note: Can be connected to R88D-GN and R88D-KN only.	Cable length: 0.5 m				FNY-W6002-A5	
			Cable ler	ngth: 1 m			FNY-W6002-01	-
			Cable ler	ngth: 3 m			FNY-W6002-03	
CJ1 CPU			Cable length: 5 m				FNY-W6002-05	-
Bus Units			Cable length: 0.5 m				FNY-W6003-A5	
	MECHATROLINK-II Cables	MECHATROLINK-II Cables	Cable length: 1 m				FNY-W6003-01	
	Gables	(with ring core and USB connector on both	Cable length: 3 m				FNY-W6003-03	
		ends) (Yaskawa Electric Corporation)	Cable ler	ngth: 5 m			FNY-W6003-05	
		Use the model numbers provided in this	Cable ler	ngth: 10 m			FNY-W6003-10	_
		catalog when ordering from OMRON.	Cable ler	ngth: 20 m			FNY-W6003-20	
			Cable ler	ngth: 30 m			FNY-W6003-30	
	MECHATROLINK-II Terminating Resistors	Terminating Resistor for MECHATROLINK-II Use the model numbers provided in this cata				I.	FNY-W6022	
	MECHATROLINK-II Repeater	Repeater (Yaskawa Electric Corporation)			JEPMC-REP2000-E		JEPMC-REP2000-E	

# ■Position Control Unit with MECHATROLINK-II interface

# Serial Communications Units

Unit clas-	Product name	s	pecifications	No. of unit	Currer sumpt		Model	Standards
sification	Floudet hame	Communications Interface	Communications functions	allocated	5 V	24 V	Model	Stanuarus
	Serial Com- munications Units High-speed type	2 RS-232C ports	- The following functions can be		0.29 (See note 1.)		CJ1W-SCU22	
1		2 RS-422A/485 ports	selected for each port: Protocol macro Host Link NT Links (1:N mode) Serial Gateway	1	0.46		CJ1W-SCU32	
		1 RS-232C port and 1 RS-422A/485 port	No-protocol Modbus-RTU Slave		0.38 (See note 1.)		CJ1W-SCU42	UC1, N, L, CE
	Serial Com- munications Units	2 RS-232C ports	The following functions can be selected for each port: Protocol macro		0.28 (See note 1.)		CJ1W-SCU21-V1	
		2 RS-422A/485 ports	Host Link NT Links (1:N mode)	1	0.38		CJ1W-SCU31-V1	
		1 RS-232C port and 1 RS-422A/485 port	Serial Gateway (See note 2.) No-protocol (See note 3.) Modbus-RTU Slave (See note 4.)		0.38 (See note 1.)		CJ1W-SCU41-V1	

Note 1. 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(-V1) Programmable Terminals. Add 0.04A/Unit when using CJ1W-CIF11 RS-422A Adapters.

2. The Serial Gateway function is enabled only for Serial Communications Units of unit version 1.2 and later.

3. The no-protocol function is enabled only for Serial Communications Units of unit version 1.2 and later (and a CPU Unit of unit version 3.0 or later is also required).

4. The Modbus-RTU Slave function is enabled only for Serial Communications Units of unit version 1.3 and later.

# EtherNet/IP Unit

			Specifications		No. of unit		nt con- ion (A)		
Unit clas- sification		Communica- tions cable	Communications functions	Max.Units mountable per CPU Unit	numbers allocated	5 V	24 V	Model	Standards
CJ1 CPU Bus Unit	EtherNet/IP Unit	STP (shielded twisted-pair) cable of category 5, 5e, or higher.	Tag data link message service	8 (See note)	1	0.41		CJ1W-EIP21	UC1, N, L, CE

Note: Up to seven EtherNet/IP Units can be connected to a CJ2H-CPU -EIP. Up to two EtherNet/IP Units can be connected to a CJ2M CPU Unit.

# Ethernet Unit

		Specifications			No. of unit	Current con- sumption (A)		_	
Unit clas- sification		Communica- tions cable	Communications functions	Max.Units mountable per CPU Unit		5 V	24 V	Model	Standards
CJ1 CPU Bus Unit	Ethernet Unit	100Base-TX	FINS communications service (TCP/ IP, UDP/IP), FTP server functions, socket services, mail transmission service, mail reception (remote command receive), automatic adjustment of PLC's built-in clock, server/host name specifications	4	1	0.37		CJ1W-ETN21	UC1, N, L, CE

### Industrial Switching Hubs

		Specifications				Current		
Product name	Appearance	Functions	No. of ports	Failure detection	Accessories	consumption (A)	Model	Standards
		Image: System state sta	3	No	Power supply connector	0.22	W4S1-03B	UC, CE
Industrial Switching			5	No		0.22	W4S1-05B	
Switching Hubs			5	Yes	<ul> <li>Power supply connector</li> <li>Connector for informing error</li> </ul>	0.22	W4S1-05C	CE

#### • WE70 FA WIRELESS LAN UNITS

Product name	Applicable region	Туре	Model	Standards
	lenen	Access Point (Master)	WE70-AP	
	Japan	Client (Slave)	WE70-CL	
WE70 FA WIRELESS LAN UNITS	Europe	Access Point (Master)	WE70-AP-EU	05
		Client (Slave)	WE70-CL-EU	CE
	O an a da	Access Point (Master)	WE70-AP-CA *	110
	Canada	Client (Slave)	WE70-CL-CA *	
	Ohina	Access Point (Master)	WE70-AP-CN	
	China	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).

3. Final order entry date: The end of June, 2020.

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

# Controller Link Units

Controller Link Units

Unit clas-	Product	Specifications				No. of unit	Current consumption (A)			
sification		Communications cable	Communica- tions type	Duplex support	Max. Units mountable per CPU Unit	numbers allocated	5 V	24 V	Model	Standards
CJ1 CPU Bus Unit	Controller Link Unit	Wired shielded twisted-pair cable (See note.)	Data links and message service	No	8	1	0.35		CJ1W-CLK23	UC1, N, L, CE

Note: Use the following special cable for shielded, twisted-pair cable.

• ESVC0.5 × 2C-13262 (Bando Electric Wire: Japanese Company)

• ESNC0.5 × 2C-99-087B (JMACS Japan Co., Ltd.: Japanese Company)

 $\bullet$  ESPC 1P  $\times$  0.5 mm² (Nagaoka Electric Wire Co., Ltd.: Japanese Company)

• Li2Y-FCY2  $\times$  0.56qmm (Kromberg & Schubert, Komtec Department: German Company)

• 1  $\times$  2  $\times$  AWG-20PE+Tr.CUSN+PVC (Draka Cables Industrial: Spanish Company)

• #9207 (Belden: US Company)

#### Controller Link Support Boards

Unit	Specifi	cation	Accessories	Model	Standards
classification	Communications cable	Communications type	Accessories	woder	Standards
Controller Link Support Board for PCI Bus	Wired shielded twisted-pair cable	Data link and message service	CD-ROM × 1 (See note.)     INSTALLATION GUIDE (W467) × 1     Communications connector × 1	3G8F7-CLK23-E	CE, KC

Note: The CD-ROM contains FinsGateway Version 2003 (PCI-CLK Edition) and FinsGateway Version 3 (PCI-CLK Edition).

Install the software from CD Ver 3.10 or higher if the operating system is Windows 7 (32bit) or Windows Vista.

Install FinsGateway version 3 if the operating system is Windows NT 4.0 (Service pack 3 or higher), Windows ME, or Windows 98SE.

#### Repeater Units

Unit classification	Specifications	Model	Standards
Controller Link Repeater Unit	Wire-to-wire Model	CS1W-RPT01	
	Wire-to-Optical (H-PCF) Model (See note 2.)	CS1W-RPT02	UC1, CE
	Wire-to-Optical (GI) Model (See note 3.)	CS1W-RPT03	

Note 1. Using Repeater Units enables T-branches and long-distance wiring for Wired Controller Link networks. 62-node configurations, and converting part of the network to optical cable.

When using wire-to-optical (H-PCF) cable, use a H-PCF cable (for both Controller Link and SYSMAC LINK) or a H-PCF optical fiber cable with connector.
 When using wire-to-optical (GI) cable, use a GI optical cable (for Controller Link).

# Relay Terminal Block

Unit classification	Specifications	Model	Standards
Relay Terminal Block for Wired Controller Link Unit	Use for Wired Controller Link Units (set of 5).	CJ1W-TB101	

Note: Controller Link Units can be replaced without stopping the communications of the entire network if a Relay Terminal Block is installed in advance on the Unit in a Wired Controller Link network. Relay Blocks cannot be used on Controller Link Support Boards.

#### H-PCF Cables and Optical Connectors

Name	Арр	lication/construction	Spe	ecifications		Model	Standards
		(1)		Black	10 m	S3200-HCCB101	
			cable with tension member	Black	50 m	S3200-HCCB501	
				Black	100 m	S3200-HCCB102	
				Black	500 m	S3200-HCCB502	
Optical Fiber Cables	Controller Link, SYSMAC	<ol> <li>(1) Optical fiber single-core cord</li> <li>(2) Tension member (plastic- sheathed wire)</li> <li>(3) Filler (plastic)</li> <li>(4) Filler surrounding signal wires (plastic upp or fiber)</li> </ol>		Black	1,000 m	S3200-HCCB103	
Optical Fiber Cables	LINK, SYSBUS (3) Filler (plastic)			Orange	10 m	S3200-HCCO101	
				Orange	50 m	S3200-HCCO501	
				Orange	100 m	S3200-HCCO102	
			Orange	500 m	S3200-HCCO502		
		(6) Heat-resistant PV sheath		Orange	1,000 m	S3200-HCCO103	
Optical Connec-	CS1W-RPT02		Half lock Full lock			S3200-COCF2571	
tors (Crimp- cut)						S3200-COCF2071	

#### • H-PCF Optical Fiber Cables with Connectors (Black Composite Cables with Two-Optical Lines and Two Power Supply Lines)

Application	Appearance	Model	Stan- dards
	\$>	S3200-CN	
Controller Link, SYSMAC Link	£	S3200-CN	
		S3200-CN	

### Cable Length

The following cable lengths are available: 2 m, 5 m, 15 m, 20 m. For lengths of 21 m or more, contact your OMRON sales representative.

#### Model Numbers

Lengths of 2 m, 5 m, 10 m, 15 m, and 20 m Length of 21 m or more Example: S3200-CNDD-20-25 Example: S3200-CN-20-20 (3) Specify the cable length in meters. (1) (2) (3) (1) (1) Connectors at Both Ends (1)H-PCF optical fiber cable (2)Cable Length Length Number Connector appearance 201 2 m 501 5 m ≌⊳ 20 Full lock 102 10 m 層 152 15 m **:** D 25 202 20 m Cable length Half lock

#### Optical Connector Assembly Tool

Name	Applicable Unit	Model	Manufacturer	Stan- dards
Optical Fiber Assem- bly Tool (See note.)	This tool is used on site for mounting crimp-cut connectors and hard plastic-clad silica opti- cal fiber for optical transmission systems of C-series SYSBUS, SYSMAC LINK, and Controller Link.	CAK-0057	Sumitomo Electric Industries, Ltd.	

Note: There is a risk of quality problems when using cables assembled by typical users, so we recommend purchasing cables with preattached connectors or having a qualified technician assemble the cables. Optical connectors for H-PCF Optical Cables with Connectors are adhesive polished.

#### GI Optical Cables

A qualified technician must select, assemble, and install GI Optical Fiber Cable, so always let an optical cable specialist handle the GI cable.

Usable Optical Cables and Optical Connectors

- Optical fiber types: Graded, indexed, multi-mode, all quartz glass, fiber (GI-type AGF cable)
- Optical fiber construction (core diameter/clad diameter): 62.5/125 μm or 50/125 μm
- Optical fiber optical characteristics of optical fiber: Refer to the tables.
- Optical connector: ST connector (IEC-874-10)

#### • 50/125 $\mu m$ AGF Cable

Item	Minimum	Standard	Maximum	Rem	arks
Numerical Aperture (N.A)		0.21		-	
			3.0 Lf	0.5 km ≤ Lf	
Transmis- sion loss (dB)			3.0 Lf + 0.2	0.2 km ≤ Lf ≤ 0.5 km	λ = 0.8 μm Ta = 25°C
			3.0 Lf + 0.4	Lf ≤ 0.2 km	
Connection loss (dB)			1.0	$\lambda = 0.8 \ \mu m$ , one location	
Transmission bandwidth (MHz-km)	500			λ = 0.85μm	(LD)

Lf is fiber length in km, Ta is ambient temperature, and  $\lambda$ : is the peak wavelength of the test light source.

#### • 62.5/125 μm AGF Cable

ltem	Minimum	Standard	Maximum	Rem	arks
Numerical Aperture (N.A)		0.28			
			3.5 Lf	0.5 km ≤ Lf	
Transmis- sion loss (dB)			3.5 Lf + 0.2	0.2 km ≤ Lf ≤ 0.5 km	$\lambda = 0.8 \ \mu m$ Ta = 25°C
			3.5 Lf + 0.4	$Lf \le 0.2$ km	
Connection loss (dB)			1.0	$\lambda = 0.8 \ \mu m$ , one location	
Transmission bandwidth (MHz-km)	200			$\lambda$ = 0.85 $\mu$ m (LD)	

Lf is fiber length in km, Ta is ambient temperature, and  $\lambda$  is the peak wavelength of the test light source.

# FL-net Unit

Unit classifi- cation		Specifications			No. of unit	Current con- sumption (A)			
	Product name	Communica- tions interface	Communications functions	Max. Units mountable per CPU Units	numbers allocated	5 V	24 V	Model	Standards
CJ1 CPU Bus Units	FL-net Unit	100Base-TX	With FL-net Ver. 2.0 specifications (OPCN-2) Data links and message service	4	1	0.37		CJ1W-FLN22	UC1, CE

# DeviceNet Unit

Unit classifi- cation	Product name	Specifications	Communications type	No. of unit numbers		nt con- ion (A)	Model	Standards
cation				allocated	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	UC1, N, L, CE

# ■ CompoNet Master Unit

Unit classifi- cation	Product name		Specifications	No. of unit		nt con- ion (A)	Model	Standards
	Froduct name	Communications functions	No. of I/O points per Master Unit	allocated		Model	Standards	
CJ1 Special I/O Units	CompoNet Master Unit	<ul> <li>Remote I/O communications</li> <li>Message communications</li> </ul>	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	U, U1, N, L, CE

# ■ CompoBus/S Master Unit

Unit classifi- cation			Specifications		No. of unit	Currer sumpt			Standards
	Product name	Communications functions	No. of I/O points	Max. Units mountable per CPU Unit	numbers allocated		24 V	Model	
CJ1 Special I/O Units	CompoBus/S Master Unit	Remote I/O	256 max. (128 inputs and 128 outputs)	1 or 3	1 or 2		;	CJ1W-SRM21	UC1, N, L, CE
		communications	128 max. (64 inputs and 64 outputs)		(variable)	0.15			

# ■ ID Sensor Units

Unit clas- sification		Speci	fications		No. of unit		rent ption (A)		
	Product name	Connected ID Systems	No. of con- nected R/W heads	External power supply	numbers allocated	5 V	24 V	Model	Standards
	ID Sensor Units	V680 Series RFID System	1	Not required.	1	0.26	0.13 (See note.)	CJ1W-V680C11	UC, CE
CJ1 CPU Bus Units		System	2		2	0.32	0.26	CJ1W-V680C12	
		V600 Series RFID System	1	Not required.	1	0.26	0.12	CJ1W-V600C11	
			2	Not required.	2	0.32	0.24	CJ1W-V600C12	

Note: To use a V680-H01 Antenna, refer to the V680 Series RFID System Catalog (Cat. No. Q151).

# ■SPU Unit (High-speed Data Storage Unit)

Unit classification	Product name	Specifi	No. of unit numbers allocated	Current consumption (A)		Model	Standards		
		PC Card slot	Ethernet (LAN) port	anocateu	5 V	24 V			
	SPU Unit (High-speed Data Storage Unit)	CF Card Type I/II × 1 slot Use an OMRON HMC- EF⊡⊡ Memory Card.	1 port (10/100Base-TX)	1	0.56		CJ1W-SPU01-V2	UC1, CE	
CJ1 CPU Bus Units	SPU- Console	Functions: Unit settings, sampling settings, etc., for High-speed Data Collection Units (required for making settings for this Unit) OS: Microsoft Windows 10 (32 bit/64 bit) Microsoft Windows 8.1 (32 bit/64 bit) Microsoft Windows 8 (32 bit/64 bit) Microsoft Windows 7 (32 bit/64 bit)					WS02-SPTC1-V2		
		Function: Data files collected by SPU Unit Data Management Middleware are automatically acquired at the personal				se	WS02-EDMC1-V2		
	SPU Unit Data Man- agement Middleware Niddleware SPU Unit Data Man- agement Microsoft Windows 10 (32 bit/64 bit) Microsoft Windows 8.1 (32 bit/64 bit) Microsoft Windows 7 (32 bit/64 bit) Microsoft Windows 7 (32 bit/64 bit) Microsoft Windows Server 2012 Microsoft Windows Server 2008			5 licenses			WS02-EDMC1-V2L05		
	Memory Cards	Flash memory, 128 MB		Note: HMC-EF183					
		Flash memory, 256 MB			is requi		HMC-EF283		
		Flash memory, 512 MB				on.	HMC-EF583		

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#### **OMRON Corporation Industrial Automation Company** Tokyo, JAPAN

#### Contact: www.ia.omron.com

#### **Regional Headquarters**

OMRON EUROPE B.V. Wegalaan 67-69-2132 JD Hoofddorp The Netherlands Tel: (31)2356-81-300/Fax: (31)2356-81-388

#### OMRON ASIA PACIFIC PTE. LTD.

No. 438A Alexandra Road # 05-05/08 (Lobby 2), Alexandra Technopark, Singapore 119967 Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON ELECTRONICS LLC One Commerce Drive Schaumburg, IL 60173-5302 U.S.A. Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON (CHINA) CO., LTD. Room 2211, Bank of China Tower, 200 Yin Cheng Zhong Road, PuDong New Area, Shanghai, 200120, China Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200 Authorized Distributor:

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