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PLC Selection Table

Flexible, Fast & Efficient Solutions

Flexibility, efficiency and speed are vital factors for staying competitive in the machine building industry. Omron's Control Systems give you this competitive edge. Omron's reputation for product quality, reliability and advanced technology is inherent in all of its control systems, from the smart remote I/O and the compact CPM to the high-performance modular CJ1 and the backplane-based CS1 series. These control systems are designed for processing speed and transparency. They provide seamless data exchange inside machines, between machines, between machines and hosts, and between machines and remote locations.

		Compact PLC series				
			Compact			
		CPM1A	CPM2A	CPM2B	CPM2C	
Page		40	65	82	86	
Built-in	Digital I/O	10 - 40	20 - 60	32 - 40	10 - 32	
	Interrupt inputs	2 - 4	2 - 4	4	2 - 4	
	Counter Inputs	1 (5 kHz)		1 (20 kHz) + 2 to 4 (2 kHz)		
	Pulse Outputs	1 (2 kHz)		2 (10 kHz)		
CPU featu option bo	ires / ards	Built-in AC or DC power supply 2 analog settings	Built-in AC or DC power supply 2 analog settings Removable terminal blocks Standard 2nd serial port	Optional RS-232C port / clock / battery. 12/24 V DC versions. Customised versions on demand.	DC power supply 2nd serial port via converter unit	
Max. digit	al I/O points	10 - 100	80 - 120	168	106 - 192	
Execution	time	0.72 - 1.72 us		0.26 - 0.64 us		
(bit instru	ction)	p-		p-		
Program I	memory	2 kWords		4 kWords		
Data mem	nory	1 kWords		2 kWords		
CompactF	lash memory		n.	a.		
Analog I/C	,)	Up to 6 inputs	and 3 outputs	Up to 8 inputs and 4 outputs.	Up to 4 x (2 in + 1 out)	
, i g i i		8-bit, 12-bi U, I, TC	8-bit, 12-bit resolution U, I, TC, Pt100		12-bit resolution U, I, TC, Pt100	
Special fu	inction units		n.	a.		
Industrial	networks	Serial Communications				
Fieldbus I	master	n.	n.a.		oBus/S	
Fieldbus I	/O link	DeviceNet CompoBusS PROFIBUS-DP		DeviceNet	DeviceNet CompoBus/S	

Compact PLC series Modular PLC series Rack PLC series 1.1 100000 25 No. 2 ----냃 177 CP1H CJ1M 154 **CJ1G/H** 154 **CS1G/H** 274 **CS1D** 261

	104	10-	217	201
40	16		n.a.	
8	4		n.a.	
4 (100 kHz)	2 (100 kHz)			
2 (100kHz) + 2 (30kHz)	2 (100 kHz)		n.a.	
Built-in AC or DC power supply 4 analog in / 2 analog out (XA model) 2 serial communication board plug-ins 1 simple analog input	Choice of models with and without built-in I/O Ethernet CPU (3 models)	Loop control CPU (4 models)	2 Serial Ports Loop Control Board	Loop Control Board Duplex CPU, Power Supply and Communications
1 analog setting Removable terminal blocks USB programming port				
320	160 - 640	960 - 2560	960 - 5120	5120
0.1 µs	0.1 µs	0.04/0.02 μs	0.04/0.02 µs	0.02 µs
20 kSteps	5 - 20 kSteps	10 - 250 kSteps	10 - 250 kSteps	60 - 250 kSteps
32 kWords	32 kWords	64 - 448 kWords	64 - 448 kWords	128 - 448 kWords
n.a.	Up to	64 MB	Up to 64 MB	
Up to approx. 30 inputs/outputs (8, 13, 14-bit resolution U, I, TC, PT100)	Up to 20 x 8 points 12 bit resolution U, I 15 bit resolution TC, Pt100, Pt1000 inputs	Up to 36 x 8 points 13-bit resolution U, I, 15-bit resolution TC, Pt100, PT1000 inputs	Up to 80 x 8 points, 13 bit resolution or 80 x 4 points, 16 bit resolution U, I, TC, Pt100, process I/O	Up to 75 x 8 points, 13 bit resolution or 75 x 4 points, 16 bit resolution U, I, TC, Pt100, process I/O
Temperature Control Protocol Macro RFID Sensor Unit	Temperature Control High-speed counters (500 kHz) SSI encoder input Position Control Protocol Macro RFID sensor Unit		Temperatu SSI enco High-speed cou Position Motion Process Protoco	ire Control der input nters (500 kHz) Control Control Control I Macro
Ethernet (100 BASE-Tx) Controller Link Serial Communications	Ethernet (100 BASE-Tx) Controller Link Serial communications		Ethernet (100 BASE-Tx) Controller Link Serial communications	
DeviceNet CAN PROFIBUS-DP CompoBus/S	DeviceNet CAN PROFIBUS-DP CompoBus/S		DeviceNet PROFIBUS-DP CAN / CANopen CompoBus/S	
DeviceNet PROFIBUS-DP CAN	DeviceNet PROFIBUS-DP CAN		Devic PROFIE CAN / C	eNet 3US-DP ANopen

Compact PLCs

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Compact PLC series

Ultracompact and Economical ... For a Wide Range of Uses AC or DC power, relay or transistor outputs, sourcing or sinking, etc.

SYSMAC CPM1A



Setting a standard for micro PLCs, the CPM1A packs all basic functions into a compact size. Four CPU sizes are available, each with a choice of AC or DC power, relay or transistor outputs. Select any combination of power supply, output, and the number of I/O points to meet your needs.



Space-saving Integration for Compact machines and Small-scale Control cabinets



Ultracompact Size

Ten-I/O-point AC models measure only 90 mm x 66 mm x 70 mm (H x W x D), and contain all basic PLC functions.

- A Wide Variety of Models Handling from 10 to 100 I/O Points By combining CPU Units having from 10 to 40 I/O points with 20-I/O-point Expansion I/O Units, CPM1A PLCs can be configured for 10 to 100 I/O points.
- Programming by Programmable Terminal

Use of the optional Communications Adapter (RS-232C or RS-422 conversion) enables fast Host Link or NT Link communications with an OMRON Programmable Terminal. This makes it possible to program the CPM1A on the PT screen, greatly simplifying maintenance tasks.

• High-speed Processing

Processing is fast, e.g., 0.7- μ s AND LD / OR LD and 16.3- μ s MOV instructions, allowing high-speed execution of even lengthy programs. Integrated interrupt and pulse catch inputs also handle high-speed pulses that occur within one program cycle.

· Versatile Functions in a Compact Body

A large program capacity and instruction list handle even complicated control tasks with ease.

- User memory: 2,048 words
- Data memory: 1,024 words
- Timer/counter: 128 points
- Basic instructions: 14 types
- Application instructions: 79 types
- Analog setting dials: 2 points (built-in)
- · Pulse Output

CPM1A CPU models with transistor outputs can output pulses with a maximum frequency of 2 kHz. Combining these models with a Stepping Motor Driver or Servo Driver enables easy positioning operation.

Application Example

Changing the speed of a stepping motor.



Functions

Input Interrupts

There are two input interrupts in the CPM1A 10-point I/O CPU and four in the 20-, 30-, and 40-point I/O CPUs. Input interrupts are available in two modes.

10-point I/O CPU

20-, 30- and 40-point I/O CPU

Application Example:





Cutting Metal Sheets to Specified Lengths The proximity sensor detects the edge of a metal plate to operate the cutter. Metal sheets can be cut continuously to the specified lengths at a high speed.



Input Interrupt Mode

If an input interrupt occurs, the regular program shuts down irrelevant of the cycle time, and the interrupt processing program is executed immediately.



Counter Mode

When the number of external signals counted at high speed reaches a specified number of counts, the regular program shuts down, and the interrupt processing program is executed at fixed counts. The count can be set between 0 and 65535.



Quick-response Inputs

There are two quick-response inputs for the CPM1A 10-point I/O CPU and four for the 20-, 30-, and 40-point I/O CPU (shared with the interrupt inputs). Since an internal buffer is provided, the quick-response input function can even detect signals modified within one cycle.



High-speed Counter

The CPM1A has a high-speed counter function that can be used in the incrementing and up/down mode. Using this function together with the input interrupts enables zone comparison control or target value control irrelevant of the cycle time.

Item		Incrementing mode	Up/Down mode	
Input no. 00000		Count input	A-phase input	
00001			B-phase input	
00002 Reset in		Reset input	Z-phase input	
Input method		Single-phase input	Phase-difference, 4 x inputs	
Count frequency		5.0 kHz	2.5 kHz	
Count range		0 to 65535	-32767 t0 32767	

Note: When using in the incrementing mode, the input 00001 can be used as an input contact.



Count input

Interval Timer Interrupts

The CPM1A has one interval timer. The interval timer shuts down the regular program irrelevant of the point in the cycle once the time is up, and immediately executes an interrupt processing program. Interval timers are used in the following two modes.

Item	One-shot mode	Scheduled interrupt mode
Operation	An interrupt is executed only once when the time is up.	Interrupts are executed repeatedly at fixed periods.
Setting time	0.5 ms to 319,968 ms (0.1-ms units)	

Normal program



Application example

Computing the Sheet Speed The number of pulse inputs is computed in the interrupt mode at a fixed time to calculate the speed.



Analog Setting

The CPM1A contains two analog setting controls that can be used for a broad range of analog timer and counter settings. Turning the setting control stores values of 0 to 200 (BCD data) in the SR area.

Analog setting	Storage area	Setting value (BCD)
Analog setting 0	SR 250	0000 to 0200
Analog setting 1	SR 251	



Application Example:

Tact Operation Control of Conveyor Lines

A conveyor can be stopped temporarily as required for assembly processes. When the timer function and limit switches are used in a combination, conveyors can be stopped for a fixed time or can be run at a constant speed for a fixed distance. Fine adjustment of the stopping time can be easily done by using the analog setting controls.



Program Example

1. Analog timer for 0.0 to 20.0 seconds



2. Analog timer for 0.0 to 60.0 seconds



Pulse Output Function

The CPM1A with transistor output has a function that is capable of outputting a pulse of up to 2 kHz.

When used in combination with a Stepping Driver or Servodriver, positioning can be easily performed.

Application Example

Changing the speed of the Stepping Motor.



1 scan turns ON. 25315 MOV(21) #5000 DM 0000 MOV(21) #0002 DM 0001 MOV(21) #0200 DM 0100 25315 ┥┠ PULS(65) 000 1 scan turns ON. 000 DM 0000 00200 ┨┠ @SPED(64) 000 15000 000 ┨┠ DM 0100 Speed change limit switch 00001 MOV(2 MOV(21) #0020 DM 0100 . 1500

Program Example

Sets the number of output pulses as 25,000 (times) in the data memory area.

DM 0001			DM 0000				
0	0	0	2	5	0	0	0

Sets the initial frequency to 2,000 pulses/second.

Pulse rate setting

_

_

Pulse rate (BCD 8 digits)

Frequency conversion: Output port (output point 01000) Output mode (single) Frequency data (x 10 Hz)

Changes to 200 Hz when the limit switch is turned ON.

Communications

Host Link Communications

CPM1A host link communications consist of interactive procedures whereby the CPM1A returns a response to a command sent from the IBM PC/AT or compatible computer. These communications allow the IBM PC/AT or compatible computer to read and write in the CPM1A's I/O Areas and Data Memory Areas as well as in areas containing the status of various settings.

1:1 Host Link Communications



1:n Host Link Communications



1:1 Links

With a 1:1 link, two CPM1As or a CPM1A and CQM1 or C200H are connected 1:1 with one side as the Master and the other as the Slave to provide an I/O link of a maximum of 256 points (LR 0000 to LR 1515).

Example of a 1:1 Link between CPM1As



Limitations of the CPM1A 1:1 Link

CPM1A I/O links are limited to 16 words (LR 00 to LR 15). Therefore, use these 16 words (LR 00 to LR 15) on the CQM1 or C200H side when forming 1:1 links with a CQM1 or C200HD.

NT Links

High-speed communications can be achieved by providing a direct access through the use of the NT Link between the CPM1A and Programmable Terminal.

Programmable Terminal



System Configuration





Both AC and DC power supplies. Expansion 30-point CPU and 40-point CPU only. May be expanded up to a maximum of 3 Units.

















Model	W (mm)
CPM1A-10CD -A-V1	66
CPM1A-10CD D-V1	
CPM1A-20CD -A-V1	86
CPM1A-20CD D-V1	
CPM1A-30CD -A-V1	130
CPM1A-30CD D-V1	
CPM1A-40CD -A-V1	150
CPM1A-40CD D-V1	
CPM1A-20ED	86 (depth: 50 mm)
CPM1A-8E /SRT21	66 (depth: 50 mm)
CPM1A-MAD01/TS101-DA	66 (depth: 50 mm)
CPM1A-TS	86 (depth: 50 mm)
CPM1A-DRT21/PRT21	66 (depth: 50 mm)
CPM1A-AD041/DA041	86 (depth: 50 mm)

Programmable Controllers

Programmable Controllers

CPM1A System Configuration Example

A maximum of three Expansion I/O Units can be connected to the CPU Unit. Note that each 4-Channel Analog I/O Unit is counted as two Expansion Units (Group 2 Units, see Table 2).



Connection Groups for Expansion Units

Group 1 (G1)	Group 2 (G2)
Expansion I/O Units,	CPM1A-TS002/102
Analog I/O Unit,	CPM1A-AD041/DA041
CompoBus/S I/O LInk Unit	
PROFIBUS-DP I/O Link Unit	
DeviceNet I/O Link Unit	
CPM1A-TS001/101(-DA)	

In addition to the CPU Unit, Expansion Units from the groups indicated in the above table can be combined as shown below.

Possible Expansion Unit Combinations

Expansion Unit 1	Expansion Unit 2	Expansion Unit 3
G1	G1	G1
G2	G1	

Note: 1. Expansion Units 1, 2, and 3 can be mounted in any order.

2. Only one Expansion Unit can be mounted if an NT-AL001 is connected to the RS-232C port.

DC Power Supply-type CPM1A Power Consumption

Use the list below for calculating CPM1A power capacity. The CPM2C-PA201 AC Power Supply Unit provides 15 watts of power, so the remainder of the PLC power can be used as service power for sensors or other components.

CPM1A CPU Unit	Power Con- sumption (W)	Expandability
CPM1A-10CDR-D-V1	3.5	Not possible
CPM1A-20CDR-D-V1	4.5	Not possible
CPM1A-30CDR-D-V1	5.5	
CPM1A-40CDR-D-V1	6.5	
CPM1A-10CDT/T1-D-V1	3	Not possible
CPM1A-20CDT/T1-D-V1	3.5	Not possible
CPM1A-30CDT/T1-D-V1	4	
CPM1A-40CDT/T1-D-V1	4.5	

Add the following power consumption when using Expansion Units.

CPM1A CPU Unit	Power Consumption (W)
CPM1A-20EDR1	2.5
CPM1A-20EDT/T1	1.5
CPM1A-8ED	1
CPM1A-8ER	2
CPM1A-8ET/T1	1
CPM1A-SRT21/DRT21/PRT21	1
CPM1A-MAD01/MAD11	3.5
CPM1A-TS001/TS101(-DA)	3
CPM1A-TS002/TS102	3
CPM1A-AD041	3
CPM1A-DA041	3.3

The power consumption for the CPU Unit includes that of the Programming Console, RS-232C Adaptor, etc.

Specifications

General Specifications

Item		10-point I/O	20-point I/O	30-point I/O	40-point I/O		
Power supply vol tage/fre-	AC power supply	100 to 240 V AC, 50/60 Hz					
quency	DC power supply	24 V DC					
Operating voltage range	AC power supply	85 to 264 V AC					
	DC power supply	20.4 to 26.4 V DC					
Power consumption	AC power supply	30 V AC max.		60 V AC max.			
	DC power supply	(See below.)		÷			
Inrush current		30 A max.		60 A max.			
External power supply	Power supply voltage	24 V DC		÷			
(AC only)	Power supply output ca- pacity	200 mA		300 mA			
Insulation resistance	•	20 MΩ min. at 500 V	DC between the AC ter	minals and the protective earth	n terminal.		
Dielectric strength		2,300 V AC at 50/60 terminals and the pro	Hz for one minute with a tective earth terminal.	a leakage current of 10 mA ma	x. between all the external AC		
Noise resistance		Conforms to IEC610	00-4-4, 2 kV (power line	es)			
Vibration resistance		10 to 57 Hz with an a and Z directions for 8	amplitude of 0.075 mm, a 30 minutes each (i.e. sw	and 57 to 150 Hz with an acce ept for 8 minutes, 10 times).	leration of 9.8 m/s ² in the X, Y,		
Shock resistance		147 m/s ² in the X, Y and Z directions 3 times each.					
Ambient temperature (opera	ating)	0° to 55°C					
Ambient humidity (operating	g)	10% to 90% (no condensation)					
Ambient environment (oper-	ating)	With no corrosive gas					
Ambient temperature (stora	ge)	–20° to 75°C					
Terminal screw size		M3					
Power supply holding time		10 ms min. for AC models, and 2 ms min. for DC models					
Weight		AC model: 400 g ma DC model: 300 g ma	x. AC model: 500 g x. DC model: 400 g	max. AC model: 600 g ma max. DC model: 500 g ma	x. AC model: 700 g max. x. DC model: 600 g max.		

Note: The specifications of the Expansion I/O Unit are the same as for the CPU except that the power is supplied from the CPU and the weight is 300 g.

Performance Specifications

Item		10-point I/O	20-point I/O	30-point I/O	40-point I/O			
Control method		Stored program method						
I/O control method		Combination of the cyclic scan and immediate refresh processing methods.						
Programming language		Ladder diagram						
Instruction word		1 step per instruction 1 to 5 words per instruction						
Types of	Basic instructions	14 types	p					
instructions	Special instructions	79 types, 139 instructions						
Instruction execution time	Basic instructions	0.72 to 16.2 μs						
	Special instructions	MOV instruction = 16.3 µs						
Program capacity		2,048 words						
Maximum I/O points	CPU only	10 points (6 input/4 output points)	20 points (12 input/8 out- put points)	30 points (18 input/12 output points)	40 points (24 input/16 output points)			
	With Expansion I/O Unit			90 points (54 input/36 output points)	100 points (60 input/40 output points)			
Input bits		00000 to 00915 (Words 0 to 9)						
Output bits		01000 to 01915 (Words 10 to 19	9)					
Work bits (IR Area)		512: IR 20000 to IR 23115 (IR 2	200 to IR 231)					
System bits (SR Area)		384: SR 23200 to SR 25515 (SF	R 232 to SR 255)					
Temporary bits (TR Area)		8: TR 0 to TR 7						
Holding bits (HR Area)		320: HR 0000 to HR 1915 (HR 00 to HR 19)						
Auxiliary bits (AR Area)		256: AR 0000 to AR 1515 (AR 00 to AR 15)						
Link bits (LR Area)		256: LR 0000 to LR 1515 (LR 00 to LR 15)						
Timers/Counters		128:TIM/CNT 000 to 127 100-ms timer: TIM 000 to TIM 127 10-ms timer: TIM 000 to TIM 127						
Data memory	Read/Write	1,024 words (DM 0000 to DM 1023)						
	Read only	512 words (DM 6144 to DM 6655)						
Interrupt processing: Extern	nal interrupt	2 points (Response time of 0.3 4 points (Response time of 0.3 ms max.)						
Memory protection		Maintains the contents of the HR, AR, Counter and Data Memory Areas.						
Memory backup		Flash memory:User program, data memory (Read only) (Non-battery powered storage) Super capacitor:Data memory (Read/Write), holding bits, auxiliary memory bits, counter (20-day storage at an ambient temperature of 25°C)						
Self-diagnostic function		CPU error (watchdog timer), memory errors. I/O bus errors						
Program check		No END instruction, programming errors (constantly checked during operation)						
Pulse output		1 point: 2 kHz						
High-speed counter		1 point:Single phase at 5 kHz or two-phase at 2.5 kHz (linear counting method) Incremental mode: 0 to 65535 (16-bit) Decremental mode:-32767 to 32767 (16-bit) 1 point:Single phase at 5 kHz or two-phase at 2.5 kHz (linear counting method) Incremental mode: 0 to 65535 (16-bit)						
Quick-response inputs		Decremental mode.=52/0/ to 52/0/ (10-00)						
Input time constant		Con be set at 1 ms. 2 ms. 4 ms. 9 ms. 16 ms. 20 ms. 64 ms. or 109 ms.						
Analog settings		2 pointe: (0 to 200)						

Note: Bits that are not used for the I/O bits can be used as work bits.

Programmable Controllers

I/O Specifications

Input Circuit

CPU

Item	Specifications	Circuit				
Input voltage	24 V DC +10%/-15%					
Input impedance	IN00000 to IN00002: 2 kΩ Others: 4.7 kΩ					
Input current (typical)	IN00000 to IN00002: 12 mA Others: 5 mA	$= \frac{1}{1}$				
ON voltage	14.4 V DC min.					
OFF voltage	5.0 V DC max.					
ON delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	Note: The polarity of the input power supply can be either positive or negative.				
OFF delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	IN00000 to IN00002.				

Note: 1. The actual ON/OFF delay includes a digital filter with a time constant of 1, 2, 4, 8, 16, 32, 64, or 128 ms (default: 8 ms).
2. The delays for IN00000 to IN00002 are as follows when used for the high-speed counter.

Input	Increment mode	Differential phase mode
IN00000 (A-phase)	5 kHz	2.5 kHz
IN00001 (B-phase)	Normal input	
IN00002 (Z-phase)	ON: 100 μs max. OFF: 500 μs max.	

 $\textbf{3.} \ \ \text{The delays for IN00003 to IN00006 are as follows when used for the high-speed counter.}$

0.3 ms max. (From the time of input ON until the interrupt subroutine is executed.)^{*1}

^{*1} For detailed specifications of expansion I/O units, see page 68.

Expansion I/O Unit

Delay

Item	Specifications	Circuit
Input voltage	24 V DC +10%/-15%	
Input impedance	4.7 kΩ	
Input current (typical)	5 mA	
ON voltage	14.4 V DC min.	<u>IN</u> 4.7 kΩ
OFF voltage	5.0 V DC max.	
ON delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	$1 \div 1$ 820 $\Omega \stackrel{>}{>} (\downarrow \downarrow \sim \bigcirc)$ Internal Circuits
OFF delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	
		Y I I I I I I I I I I I I I I I I I I I
		·
		Note: The polarity of the input power supply can be either
		positive or negative.

Note: The actual ON/OFF delay includes an input constant of 1, 2, 4, 8, 16, 32, 64, or 128 ms (default: 8 ms).

Output Circuit

CPU and Expansion I/O Unit Relay Output

Item			Specifications	Circuit				
Maximum switching capacity		ing capacity	250 V AC/2 A (cosφ =1) 24 V DC/2 A (4 A/common)					
Minimum	Minimum switching capacity		5 V DC, 10 mA					
Relay service	Elec- trical	Resistive load	150,000 times (at 24 V DC)					
life		Inductive load	100,000 times (at 200 V AC, cos∳ =0.4)					
	Mechanical		20 million times					
ON delay			15 ms max.					
OFF delay			15 ms max.	250 VAC: 2 A 24 VDC: 2 A 24 VDC: 2 A				

Transistor Output (Sink Type/Source Type) (CPU/Expansion I/O Unit)

Item	Specifications	Circuit
Maximum switching capacity	24 V DC +10%/-15%, 300 mA (see note 1)	Sink Type Output LED Source Type Output LED
Leakage current	0.1 mA max.	
Residual voltage	1.5 V max.	
ON delay	0.1 ms max.	
OFF delay	1 ms max. (see note 2)	

Note: 1. The maximum switching capacity of the CPM1A with transistor outputs (sink type and source type) is limited to the currents shown in the following table for the common and for the Unit.

Item	10CDT-V1/ 10CDT1-A-V1/D-V1	20CDT-D-V1/ 20CDT1-A-V1/D-V1	30CDT-D-V1/ 30CDT1-A-V1/D-V1	40CDT-D-V1/ 40CDT1-A-V1/D-V1	20EDT/20EDT1	CPM1A-8ET/8ET1
Max. switching capacity	0.9 A/Unit	0.9 A/common 1.8 A/Unit	0.9 A/common 2.7 A/Unit	0.9 A/common 3.6 A/Unit	0.9 A/common 1.8 A/Unit	

2. When using the pulse output function of the CPM1A with transistor outputs (sink type and source type): The output current must be between 100 to 200 mA when using the output 01000 or 01001 as a pulse output with the maximum frequency of 2 kHz. The off-delay of outpus 01000 and 01001 will vary depending on the output current.

Load current	OFF delay
100 to 200 mA	0.2 ms max.
0 to 300 mA except for the above range	0.5 ms max.

Analog I/O Unit

Item		CPM1A-MAD01		CPM1A-MAD11		CPM1A-AD041		CPM1A-DA041	
		Voltage I/O	Current I/O	Voltage I/O	Current I/O	Voltage I/O	Current I/O	Voltage I/O	Current I/O
Analog inputs	Number of inputs	2		2 (allocated 2 words)		4 (allocated 4 words in + 2 words out)			
	Input signal ranges	0 to 10 V or 1 to 5 V	4 to 20 mA	0 to 5 V, 1 to 5 V, 0 to 10 V, – 10 to 10 V	0 to 20 mA, 4 to 20 mA	0 to 5 V, 1 to 5 V, 0 to 10 V, – 10 to 10 V	0 to 20 mA, 4 to 20 mA		
	Maximum rated input	±15 V	±30 mA	±15 V	±30 mA	±15 V	±30 mA		
	External input impedance	1 MΩ min.	250 Ω rated	1 MΩ min.	250 Ω	1 M Ω min.	250 Ω		
	Resolution	1/256		1/6,000 (full sc	ale)	1/6,000 (full sc	ale)		
	Overall precision	1.0% of full sca	ale	25°C:±0.3% of full scale	25°C:±0.4% of full scale	25°C:±0.3% of full scale	25°C:±0.4% of full scale		
				0 to 55°C:±0.6% of full scale	0 to 55°C:±0.8% of full scale	0 to 55°C:±0.6% of full scale	0 to 55°C:±0.8% of full scale		
	Converted A/D data	8-bit binary data Full scale = 0000 to 00FF Hex		Binary data (4-digit hexadeci- mal) -10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale		Binary data (4-digit hexadeci- mal) -10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale			
	Averaging			Supported (set for each input with DIP switch)		Supported (set for each input with DIP switch)			
	Disconnection detection			Supported		Supported			
Analog	Number of outputs	1		1 (1 word alloc	ated)			4 (4 words allo	cated)
output (See note 1.)	Output signal ranges	0 to 10 V or – 10 to 10 V	4 to 20 mA	1 to 5 V, 0 to 10 V, –10 to 10 V	0 to 20 mA, 4 to 20 mA			1 to 5 V, 0 to 10 V, –10 to 10 V	0 to 20 mA, 4 to 20 mA
	External output allowed load resistance	2 kΩ min.	350 Ω max.	1 kΩ min.	600 Ω max.			1 kΩ min.	600 Ω max.
	External output impedance			0.5 Ω max.				0.5 Ω max.	
	Resolution	1/256 (1/512 w signal range is	hen the output -10 to 10 V.)	1/6,000 (full scale)				1/6,000 (full scale)	
	Overall precision	1.0% of full sca	ale	25°C:±0.4% of	full scale			25°C:±0.4% of	full scale
				0 to 55°C:±0.8	% of full scale			0 to 55°C:±0.8% of full scale	
	D/A data setting	8-bit plus sign binary data -10 to 10 V output range: Full scale = 80FF to 00FF Hex 4 to 20 mA output range: Full scale = 0000 to 00FF Hex		Binary data (hexadecimal, 4- digit) -10 to 10 V output range: Full scale = F448 to 0B88 Hex Other output ranges: Full scale = 0000 to 1770 Hex				Binary data (hexadecimal, 4- digit) -10 to 10 V output range: Full scale = F448 to 0BB8 Hex Other output ranges: Full scale = 0000 to 1770 Hex	
Conversion	n time	10 ms/Unit ma	x. (See note 2.)	2 ms/point		2 ms/point		2 ms/point	
Isolation method		Photocoupler isolation be- tween I/O terminals and PC (There is no isolation between the analog I/O signals.)		Photocoupler isolation be- tween analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)		Photocoupler isolation be- tween analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)		Photocoupler isolation be- tween analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)	

Note: 1. The voltage output and current output can be used at the same time, but the total output current cannot exceed 21 mA.

2. The conversion time is the total time for 2 analog inputs and 1 analog output.

Temperature Sensor Units

By mounting a Temperature Sensor Unit (CPM1A-TS001/TS002/TS101/TS102) to the PLC, input can be obtained from a thermocouple or platinum resistance thermometer, and temperature measurements can be converted to binary data (4-digit hexadecimal) and cyclically updated in the input area of the CPU Unit.

Specifications

Item	Specifications					
Model	CPM1A-TS001/002	CPM1A-TS101/102				
Number of inputs	2 (TS001), 4 (TS002)	2 (TS101), 4 (TS102)				
Input types	Thermocouple K, J switchable	Pt100, JPt100 switchable				
	(Note: Same type for all input points.)	(Note: Same type for all input points.)				
Indication accuracy	The larger of $\pm 0.5\%$ of the indicated value and $\pm 2^{\circ}C \pm 1$ digit max.	[The larger of $\pm 0.5\%$ of the indicated value and $\pm 1\degree$ C]				
		±1 digit max.				
Conversion time	250 ms/2 points (TS001, TS101); 250 ms/4 points (TS002, TS102)					
Converted temperature data	Binary (4-digit hexadecimal)					
Isolation method	Photocoupler isolation between the temperature input signals.					

Note: The indication accuracy when using a K-type thermocouple for temperatures less than -100°C is ±4°C ±1 digit max.

Input Temperature Ranges for CPM1A-TS001/002

The rotary switch can be used to make of the following range and input type settings for CPM1A-TS001/002 models.

Input type	Range (°C)	Range (°F)
к	-200 to 1300	-300 to 2300
	0.0 to 500.0	0.0 to 900.0
J	-100 to 850	-100 to 1500
	0.0 to 400.0	0.0 to 750.0

Input Temperature Ranges for CPM1A-TS101/102

The rotary switch can be used to make of the following range and input type settings for CPM1A-TS101/102 models.

Input type	Range (°C)	Range (°F)
Pt100	-200.0 to 650.0	-300 to 1200.0
JPt100	-200.0 to 650.0	-300 to 1200.0

Specifications CPM1A-TS101-DA

Item	Specifications
Model	CPM1A-TS101-DA
Number of inputs	2
Input types	Pt100
Temperature range	-40 to 250°C
Converted temperature data	16-bit, 2's complement, 0.1°C resolution
Indication accuracy	1.0% of full scale max.
Number of outputs	1
Output type	0 to 10 V, -10 to 10 V, 4 to 20 mA
Load resistance	$2 \text{ k}\Omega$ min. (voltage output), 500 Ω max. (current output)
Output resolution	8 bit + sign (1/256, 1/512 for -10 to 10 V)
Output accuracy	1.0% of full scale max.
Conversion time	60 ms (all channels)
Isolation method	Photocoupler isolation between I/O signals and PLC

DeviceNet I/O Link Unit - CPM1A-DRT21

By connecting the DeviceNet I/O Link Unit (CPM1A-DRT21), the CPM1A can function as the slave of a DeviceNet Master Unit. In this configuration, 32 input- and 32 output bits are exchanged with the Master Unit.

Specifications

Item	Specification
Master/slave	DeviceNet Slave
Number of I/O points allocated to Master	Input: 32 points / Output: 32 points
Number of words allocated from CPM1A's I/O memory	Input: 2 words / Output: 2 words (Allocated in the same way as other Expansion Units).
Node address setting method	Set using DIP switch.

PROFIBUS-DP I/O Link Unit - CPM1A-PRT21

By connecting the PROFIBUS-DP I/O Link Unit (CPM1A-PRT21), the CPM1A can function as the slave of any PROFIBUS-DP Master Unit. In this configuration, 16 input- and 16 output bits are exchanged with the Master unit.

Specifications

Item	Specification
Master/slave	PROFIBUS-DP slave (OC_0658.GSD)
Number of I/O points allocated to Master	Input: 16 points / Output: 16 points (Intel/Motorola format selectable by DIP switch)
Number of words allocated from CPM1A's I/O memory	Input: 1 word / Output: 1 word
	(Allocated in the same way as other Expansion Units).
Node address setting method	0-99 using 2 rotary switches

CompoBus/S I/O Link Unit - CPM1A-SRT21

Specifications

Item	Specification
Master/Slave	CompoBus/S Slave
Number of I/O bits	8 input bits, 8 output bits
Number of words occupied in CPM2A I/O memory	1 input word, 1 output word
	(Allocated in the same way as other Expansion Units).
Node number setting	Set using the DIP switch. (Set before turning ON power for the CPU Unit.)

Communications Adapter Specifications CPM1-CIF01/CIF11

RS-232C Adapter and RS-422 Adapter

Item	Specifications				
	CPM1-CIF01	CPM1-CIF11			
Functions	Level conversion between the CMOS level (CPU side) and the RS-232C level (peripheral device side)	Level conversion between the CMOS level (CPU side) and the RS-422 level (peripheral device side)			
Isolation (all in this line)	The RS-232C (peripheral device side) is insulated by a DC/DC converter and photocoupler.	The RS-422 (peripheral device side) is insulated by a DC/DC converter and photocoupler.			
Power supply	Power is supplied by the CPU.				
Weight	200 g max.				

Expansion Memory Unit CPM1A-EMU01-V1

The CPM1-EMU01-V1 offers simple onsite transfer of user programs and data memory.

Item	Specifications
Supported PLCs	CPM1, CPM1A, CPM2A, CPM2C, SRM1(-V2), CQM1, CQM1H
Read/write memory areas	User Program: 15.2 kWords max. Data memory: DM 6144 to DM 6655
Espansion instructions	18 instructions
EEPROM	256-Kbit EEPROM, ATMEL: AT28C256, OMRON: EEROM-JD
Current consumption	130 mA max.
Dimensions (not including cables or connectors)	57 x 92 x 38 mm (W x H x D)
Weight	200 g max. (not including EEPROM)

Specifications

CPM2C-PA201 AC Power Supply Unit

• The CPM2C-PA201 is a slim and compact AC Power Supply Unit of the same shape as the CPM2C's CPU Unit. It can be connected simply using the connecting cable (23 cm) provided. It can also be used for CPM1A and CPM2A CPU Units and as display power supply (wired by the user).



Service power supply for external devices such as sensors (24 V).



AC Power Supply Unit



Attached connecting cable

Item			Specification	
Rated output			15 W	
Output voltage			24 V	
Output current			600 mA	
Efficiency			75% min. (at rated output)	
Input conditions	Rated voltage		100 to 240 V AC	
	Allowable voltage ran	ge	85 to 264 V AC	
	Frequency		47 to 63 Hz	
	Current	100 V	0.4 A	
		200 V	0.2 A	
	Leakage current	100 V	0.5 mA max. (at rated output)	
		200 V	1 mA max. (at rated output)	
	Inrush current	100 V	15 A max. (at 25°C cold start)	
	200 V		30 A max. (at 25°C cold start)	

C -					
Item		Specification			
Output Output voltage accuracy		10%/-15% (including input, load, and temperature fluctuations)			
characteristics	Minimum output current	30 mA			
	Ripple noise voltage	2% (p-p) max.			
	Input fluctuation	0.75% max.			
	Load fluctuation	4% max.			
	Temperature fluctuation	0.05%/°C max.			
	Startup time	300 ms max. (at input voltage of 100 V AC or 200 V AC and the rated output)			
	Output hold time	10 ms (at input voltage of 100 V AC or 200 V AC and the rated output)			
Overcurrent protect	tion	Self-resetting, operates at 105% to 335% of the rated current, suspended and independent opera-			
		tion			
Overvoltage protec	tion	None			
Ambient operating	temperature	0° to 55°C			
Ambient storage te	mperature	-20° to 75°C (no condensation or icing)			
Ambient operating	humidity	10% to 90% (no condensation)			
Dielectric strength		2,000 V for 1 min between all inputs and GR			
		Leakage current: 10 mA			
		3,000 V for 1 min between all inputs and all outputs			
		Leakage current: 10 mA			
		1,000 V for 1 min between all outputs and GR			
		Leakage current: 10 mA			
Insulation resistance	ce	100 M Ω min. at 500 V DC between all outputs and any input, and between all outputs and GR			
Vibration resistance	e	10 to 57 Hz, amplitude, 57 to 150 Hz, acceleration: 9.8 m/s ² in X, Y, and Z directions for 80 minutes			
		according			
		(Time coefficient: 8 minutes \times coefficient factor 10 = total time 80 min.)			
Shock resistance		147 m/s ² 3 times each in X, Y, and Z directions			
Noise terminal voltage		FCC class A			
Weight		250 g max.			

Peripheral Devices



CPM1A Ordering Information

International Standards

The products shown in the attached tables are those that conform to the UL, CSA, cULus, cUL, NK, Lloyd's Register, and EC Directives as of September 2003.

(U: UL, C: CSA, UC: cULus, CU: cUL, N: NK, L: Lloyd, CE: EC Directives) Please contact OMRON representative for application conditions.

CPU Units

Name	Power supply	Output method	Input points	Output points	Model	Standards
10-point	AC power supply	Relay output	6 points	4 points	CPM1A-10CDR-A-V1	U, C, N, L, CE
I/O		Transistor output (sink type)			CPM1A-10CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-10CDT1-A-V1	
	DC power supply	Relay output			CPM1A-10CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-10CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-10CDT1-D-V1	
20-point	AC power supply	Relay output	12 points	8 points	CPM1A-20CDR-A-V1	U, C, N, L, CE
I/O		Transistor output (sink type)			CPM1A-20CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-20CDT1-A-V1	
	DC power supply	Relay output			CPM1A-20CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-20CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-20CDT1-D-V1	
30-point	AC power supply	Relay output	18 points	12 points	CPM1A-30CDR-A-V1	U, C, N, L, CE
I/O		Transistor output (sink type)			CPM1A-30CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-30CDT1-A-V1	
	DC power supply	Relay output			CPM1A-30CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-30CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-30CDT1-D-V1	
40-point I/O	AC power supply	Relay output	24 points	16 points	CPM1A-40CDR-A-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-40CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-40CDT1-A-V1	
	DC power supply	Relay output			CPM1A-40CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-40CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-40CDT1-D-V1]

Expansion Units and Expansion I/O Units

Unit	Input/Output type	Inputs	Outputs	Model	Standards
Expansion I/O Units	Relay	24	16	CPM1A-40EDR	CE, N
	Transistor (sinking)			CPM1A-40EDT	CE, N
	Transistor (sourcing)			CPM1A-40EDT1	CE, N
	Relay	12	8	CPM1A-20EDR1	U, C, CE, N
	Transistor (sinking)			CPM1A-20EDT	U, C, CE, N
	Transistor (sourcing)			CPM1A-20EDT1	U, C, CE, N
		8		CPM1A-8ED	U, C, CE, N
	Relay		8	CPM1A-8ER	U, C, CE, N
	Transistor (sinking)		8	CPM1A-8ET	U, C, CE, N
	Transistor (sourcing)			CPM1A-8ET1	U, C, L, CE, N
Analog I/O Unit	Analog (resolution: 1/256)	2	1	CPM1A-MAD01	U, C, CE, N
	Analog (resolution: 1/6000)	2	1	CPM1A-MAD11	U, C, CE, N
	Analog (resolution: 1/6000)	4		CPM1A-AD041	U, C, CE
	Analog (resolution: 1/6000)		4	CPM1A-DA041	U, C, CE
DeviceNet I/O Link Unit		I/O Link of 32 i	nput bits and 32 output bits	CPM1A-DRT21	U, C, CE, N
PROFIBUS-DP I/O Link Unit		I/O Link of 16 in	I/O Link of 16 input bits and 16 output bits		CE
CompoBus/S I/O Link Unit		I/O Link of 8 in	put bits and 8 output bits	CPM1A-SRT21	U, C, CE, N
Temperature Sensor Units	2 thermocouple inputs	CPM1A-TS001	U, C, CE, N		
	4 thermocouple inputs	CPM1A-TS002	U, C, CE, N		
	2 platinum resistance thermometer inputs	CPM1A-TS101	U, C, CE, N		
	4 platinum resistance thermometer inputs	CPM1A-TS102	U, C, CE, N		
	2 Platinum resistance thermometer input (-40 to 250 °C) and one output (-10 to 10	CPM1A-TS101-DA	U, C, L, CE		

RS-232C Adapter, RS-422 Adapter, Connecting Cable, Link Adapter

Name	Function	Model	Standards
RS-232C Adapter	Converts peripheral port levels.	CPM1-CIF01	N, L, CE
RS-422 Adapter		CPM1-CIF11	
Connecting Cable	3.3-m cable used to connect IBM PC/AT or compatible personal com-	CQM1-CIF02	U, C, N, L, CE
	puters.		
Link Adapter	Converts RS-232C and RS-422 levels.	3G2A9-AL004-E	

Programming Consoles and Cables

Product		Model	Standards
Programming Console (2-m cable attached)		CQM1-PRO01-E	U, C, N, CE
Programming Console (Requires separate cable. See below.)		C200H-PRO27-E	U, C, N, CE
Connecting Cable for C200H-PRO27-E	2-m cable	C200H-CN222	N
	4-m cable	C200H-CN422	

Support Software

Product	Functions	Model	Standards
CX-One	Omron's integrated software for programming and configuration of all control system components,	CX-ONE-AL□□C-E ^{*1}	
	including PLCs, HMI, drives, temperature controllers and advanced sensors.		

Product	Model	Standards
Expansion Memory Unit	CPM1-EMU01-V1	
EEPROM (256 K)	EEROM-JD	

Power Supply Unit

Unit	Input	Output	Model	Standards
Power Supply	100 to 240 V AC	24 V DC/600 mA	CPM2C-PA201	U, C, CE

Compact PLC series

CPM2A/CPM2B/CPM2C

Advanced functions and high performance in a compact shape. Ideal for automation of packaging and conveyor systems. Provides increased performance and added value to any compact machine.

High Performance

Versatile Functions for More Advanced Systems

- · High-speed counter inputs for position sensing or object counting.
- · Synchronous control simplifies timing adjustment.
- High-speed processing with an interrupt function for immediate response.
- · Supports both stand-alone and distributed control.

Compact block-type PLCs

SYSMAC CPM2A

AC Power Supply







DC Power Supply









Efficient and effective

Highly Economical

The combination of advanced functions and high performance in an economical PLC range will add value to your machines.

Compact

Fits into your available space

A choice of three different compact form factors means you can more easily fit the functions you need in the space you have available in your control cabinet or machine.

Modular Board PLCs

SYSMAC CPM2B

Proven CPM2 technology to fit in the tightest spaces. And if the standard models do not fit, we'll make the exact shape and I/O combination you need.



Compact slim-line PLCs SYSMAC CPM2C

10 I/O Points

20 I/O Points

32 I/O Points













Power Supply



Expansion I/O: Digital, Analog







Temperature Sensor





A full line-up to fit your needs

A wide range of models is available to achieve the machine or line controller that you require. Select from 16 CPU types, for AC power, DC power, relay output, transistor output, etc. Match the power supply, output, number of I/O points, and size to your particular needs. Expansion I/O Units can also be easily added to increase I/O points.

Removable Terminal Blocks for Easy Maintenance

Removable terminal blocks* simplify installation, troubleshooting and machine maintenence. (*CPU Unit only)



Expandable up to 140 I/O Points

Even with its ultracompact size, the CPM2C features a wide range of models for efficient machine control. Ten CPU types, all with DC power supply, allow selection of relay output or transistor output, terminal block or connector wiring, clock function, and other functions. Choose the output type, number of I/O points and other features to meet your needs. Expansion I/O Units (8, 10, 16, or 24 I/O points) are also available to provide control for a maximum of 140 I/O points.

Easy-to-Read LED Display

The LED display on the upper part of the CPM2C is easy to read, even when cables are connected.



Built-in RS-232C Port

The built-in RS-232C port enables connection with a variety of equipment. The communication port can be used for configuration, maintenance, troubleshooting, visualisation or general-purpose serial communication.

PT Connection

Compatible with the OMRON Programmable Terminal's Programming Console functions. Maintenance is simplified with the on-screen programming operations.



Host Link

Host Link allows reading and writing of the I/O memory and operation modes of the CPM2A or CPM2C by a personal computer. The following RS422/RS-232C Communications Adapters also provide 1:n communications.

CPM2A: CPM1-CIF11 CPM2C: CPM2C-CIF11



One-to-one Link

A 1:1 PLC Link connection can be established with another CPM2C, or a CQM1(H), CPM1, CPM1A, CPM2A, SRM1(-V2), C200HS, or C200HX/HG/HE PLC.

Windows-based Programming Support

The Windows-based CX-One Support Software is available for programming all OMRON PLC's, including the CPM2A or CPM2C. Being able to program in the Windows environment reduces programming steps, and gives you access to a large number of display monitor and debugging functions. It also means that you can use existing Windows applications to help with CPM2A or CPM2C programming, which adds up to a highly advanced programming environment.

CPM2-series Features

The illustrations in this section show CPM2A PLCs, but the same functions are available in CPM2B/CPM2C PLCs unless otherwise stated.

Interrupts

The CPM2-series PLCs provide the following kinds of interrupt processing.

Interrupt Inputs

Interrupt programs are executed when inputs to the CPU Unit's built-in input points (00003 to 00006) are turned from OFF to ON. Interrupt subroutine numbers 000 to 003 are allocated to input points 00003 to 00006.

Interval Timer Interrupts

Interval timer interrupt programs are executed with a precision of 0.1 ms. Interrupt subroutine numbers 000 to 049 are allocated by instructions.

Count-up Interrupts

Input signals to the CPU Unit's built-in input points (00003 to 00006) are counted at high speed (up to 2 kHz), and the normal program is stopped and an interrupt program is executed when the count reaches the SV. Interrupt subroutine numbers 000 to 003 are allocated to input points 00003 to 00006.

Count-check Interrupts Using the High-speed Counter

Pulse inputs to the CPU Unit's built-in input points (00000 to 00002) are counted at high speed (up to 20 kHz or 5 kHz), and an interrupt program is executed when the present value matches the target value or falls within a given range. Interrupt subroutine numbers 000 to 049 are allocated by instructions.

Interval Timer Interrupts

The CPM2 has one interval timer (precision: 0.1 ms) that can be set from 0.5 ms to 319,968 ms. There are two interrupt modes: the single-interrupt mode, in which a single interrupt is executed when the time is up, and the scheduled-interrupt mode, in which interrupts are executed at regular intervals.



Item	Single-interrupt mode	Scheduled-interrupt mode	
Operation	Interrupt is executed once when time has elapsed.	Interrupts are executed at regular intervals.	
Set time	0.5 to 319,968 ms (Unit: 0.1 ms)		
Interrupt response time).3 ms (from when time has elapsed until execution of interrupt program)		

High-speed Counters

The CPM2 CPU Unit has a built-in high-speed counter that can count input pulses at up to 20 kHz. When combined with the interrupt function, the high-speed counter can be used for target-value comparison or range comparison control that is unaffected by the cycle time.



Input	Response fre- quency	Input mode (count value)	Counter PV Storage	Control method
00000	5 kHz	Differential phase input mode (-8,388,608 to 8,388,607)	SR 248 and SR 249	Target value comparison
00001 00002	20 kHz	Pulse + direction input mode (-8,388,608 to 8,388,607) Up/down pulse input mode (-8,388,608 to 8,388,607) Increment mode (0 to 16,777,215)		interrupts Range comparison inter- rupts

Interrupt Inputs (Counter Mode)

The four built-in interrupt inputs in the CPM2 CPU Unit can be used in counter mode to count inputs of up to 2 kHz. These inputs can be used as either incrementing counters or decrementing counters and can trigger an interrupt (i.e., execute an interrupt subroutine) when the count matches the set value.



Input	Counter number	Set value location	Present value loca- tion	Response frequency	Input mode (count value)	Control method
00003	Counter 0	SR 240	SR 244	2 kHz	Incrementing counter (0000 to FFFF)	Count-up inter-
00004	Counter 1	SR 241	SR 245		Decrementing counter (0000 to FFFF)	rupts
00005	Counter 2	SR 242	SR 246			
00006	Counter 3	SR 243	SR 247			

Pulse Outputs

The CPM2 has two pulse outputs. The PLC Setup can be set to use these outputs as two single-phase outputs without acceleration and deceleration, two variable duty-ratio pulse outputs, or pulse outputs with trapezoidal acceleration/deceleration (one pulse + direction output and one up/ down pulse output). The pulse output's PV coordinate system can also be specified in the PC Setup as either relative or absolute.



Item Single-phase pulse out- \ put without accel/decel o		Variable duty-ratio pulse	Single-phase pulse output with trapezoidal acceleration/deceleration				
		put without accel/decel output		Pulse + direc	tion output	Up/down puls	se output
Controlling instr	uction(s)	PULS(65) and SPED(64)	PWM(—)	PULS(65) and ACC()			
Output	01000	Pulse output 0 (See note.)	Pulse output 0 (See note.)	Pulse output	Pulse output	Pulse output	CW pulse output
number	01001	Pulse output 1 (See note.)	Pulse output 1 (See note.)	0	Direction output	0	CCW pulse output
Output frequence	y range	10 Hz to 10 kHz	0.1 Hz to 999.9 Hz	10 Hz to 10 kH	Hz	10 Hz to 10 kH	lz
	Pitch	10 Hz	0.1 Hz	10 Hz		10 Hz	
Duty ratio		50%	0 to 100%	50% 50%			

Note: With single-phase pulse outputs, pulse outputs 0 and 1 can each be output independently.

Synchronized Pulse Control

The CPM2's high-speed counter function can be combined with the pulse output function to generate an output pulse at a specified multiple of the input pulse frequency.



Item		Input mode				
		Phase differential input mode	Pulse + direction input mode	Up/down pulse input mode	Increment mode	
Input number	00000	A-phase input	Count input	CW input	Count input	
	00001	B-phase input	Direction input	CCW input	See note 1.	
Input method		Phase differential quadruple input	Single-phase input	Single-phase input	Single-phase input	
Input frequency rang	put frequency range 10 Hz to 500 Hz (accuracy ±1 Hz) 20 Hz to 1 kHz (accuracy ±1 Hz) 300 Hz to 20 kHz (accuracy ±25 Hz) (See note 2.)					
Output frequency ra	it frequency range 10 Hz to 10 kHz (accuracy 10 Hz)					
Frequency ratio (sca	aling factor)	1 % to 1,000% (Can be specified in units of 1%.)				
Synchronized control	ol cycle	10 ms				

Note: 1. Can be used as an ordinary input.

2. The accuracy is ± 10 Hz when the input frequency is 10 kHz or less.

Quick-response Inputs

The CPM2A/CPM2B CPU Units and CPM2C CPU Units with 20 I/O points have four inputs that can be used for quick-response inputs. The CPM2C CPU Units with 10 I/O points have two inputs that can be used for quick response inputs. These inputs are shared with interrupt inputs and 2-kHz high-speed counter inputs. Quick-response inputs are received into an internal buffer, so signals that change status within a cycle can be received.



Input number	Min. input signal
00003	50 μs
00004	
00005	
00006	

Inputs 00003 through 00006 can be used as interrupt inputs, 2-kHz high-speed counter inputs, or quick-response inputs. These inputs can be used as ordinary inputs if they are not used as interrupt inputs, 2-kHz high-speed counter inputs, or quick-response inputs. Inputs 00005 and 00006 cannot be used with the CPM2C CPU Unit with 10 I/O points.

Analog Controls (CPM2A Only)

The CPM2A CPU Unit has two analog controls that can be used for a wide range of timer and counter analog settings. As these controls are turned, values from 0 to 200 (BCD) are stored in the SR Area.

Control	Storage area	Set value (BCD)
Analog control 0	SR 250	0000 to 0200
Analog control 1	SR 251	0000 to 0200

Clock Function

The CPM2A and some CPM2B/2Cs have a built-in clock (accuracy: ± 1 minute/month) that allows the date and time to be read from the ladder program. The time can be overwritten from a Programming Console or other Programming Device, but the CPM2A is also equipped with a 30-second Compensation Bit. The time will be rounded off to the nearest minute when this bit is turned ON, so the time can be set very accurately by turning ON this bit when the "time tone" is heard on the radio.

(The CPM2B/CPM2C CPU Units have models with the clock function and models without.)

1	58	7 0		
AR17	Hour	Minute		_
AR18	Minute	Second		2 digits BCD each.
AR19	Date	Hour		the vear are displayed.)
AR20	Year	Month		
AR21		Day of week	-	00 to 06: Sunday to Saturday
	<u> </u>			, , , , , , , , , , , , , , , , , , ,

AR2115	Clock Set Bit
AR2114	Clock Stop Bit
AR2113	30-second Adjustment B

Additional Timer Functions

VERY HIGH-SPEED TIMER (Units: 1 ms)	Starts a very high-speed decrementing ON-delay timer with the specified timer number. The set value can be 0 to 9,999 ms. (Set in 1-ms units.)
LONG TIMER (Units: 1 s or 10 s)	Starts a long-term decrementing ON-delay timer with the specified timer number. The set value can be 0 to 9,999 s (when set in 1-s units) or 0 to 99,990 s (when set in 10-s units).

NT Links

The CPM2 can be connected to an OMRON PT (Programmable Terminal) in NT Link mode (1:1). A communications program is not required in the CPM2. The RS-232C port can be used for the NT Link.



Compact PLC series

An extensive line-up lets you easily configure machines and production lines to meet your needs

SYSMAC CPM2A



Every CPM2A CPU comes equipped with an RS-232C interface as standard, e.g. to provide easy connection with a Programmable Terminal for fast and easy machine monitoring, temperature setting, etc. Simple positioning with the pulse I/O function is another example of the many advanced functions and high added value that the CPM2A brings to compact machines. Removable terminal blocks ensure easy maintenance, and the CPM2A uses the same Expansion I/O Units as the CPM1A for easy and economical sharing of system components.



Specifications

General

Item		CPU Units with 20 I/O points	CPU Units with 30 I/O points	CPU Units with 40 I/O points	CPU Units with 60 I/O points			
Supply voltage	AC power	100 to 240 V AC, 50/60 Hz						
	DC power	24 V DC						
Operating voltage range	AC power	85 to 264 V AC						
	DC power	20.4 to 26.4 V DC						
Power consumption	AC power	60 VA max.						
	DC power	20 W max. (See separate table following this one for details.)						
Inrush current	AC power	60 A max.						
	DC power	20 A max.						
External power supply	Supply voltage	24 V DC						
(AC power supplies only)	Output capacity	300 mA (See note)						
Insulation resistance		20 MΩ min. (at 500 V DC)	between the external AC ter	minals and protective earth t	erminals			
Dielectric strength		2,300 V AC 50/60 Hz for 1 max.	min between the external AC	C and protective earth termin	nals, leakage current: 10 mA			
Noise immunity		Conforms to IEC61000-4-4	, 2 kV (power lines)					
Vibration resistance		10 to 57 Hz, 0.075-mm am each (Time coefficient; 8 minutes	10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s ² in X, Y, and Z directions for 80 minutes each (Time coefficient; 8 minutes × coefficient factor 10 = total time 80 minutes)					
Shock resistance		147 m/s ² three times each in X, Y, and Z directions						
Ambient temperature		Operating: 0° to 55°C Storage: -20° to 75°C						
Humidity		10% to 90% (with no condensation)						
Atmosphere		Must be free from corrosive gas						
Terminal screw size		M3						
Power interrupt time		AC power supply: 10 ms min. DC power supply: 2 ms min.						
CPU Unit weight	AC power	650 g max.	700 g max.	800 g max.	1,000 g max.			
	DC power	550 g max.	600 g max.	700 g max.	900 g max.			
Expansion Unit weight		Units with 20 I/O Points: Units with 8 Output Points: Units with 8 Input Points: MAD01 Analog I/O Unit: AD041/DA041 Analog I/O U Temperature Sensor Units CompoBus/S I/O Link Units DeviceNet I/O Link Unit: PROFIBUS-DP I/O Link Ur	300 g max. 250 g max. 200 g max. 150 g max. 250 g max. 250 g max. 250 g max. 250 g max. 300 g max. 200 g max. 200 g max. 150 g max.					

Note: Use the external power supply as the power supply for input devices only. (It cannot be used as to drive output devices.) If the external power supply current exceeds the rated current, or there is a short-circuit, the external power supply voltage will drop and PC operation will stop. If there are 3 CPM1A-MAD11 Units mounted to a CPM2A-60CDR-A, the current for the external power supply must not exceed 200 mA.

Power Consumption for CPM2A CPU Units with DC Power Supplies

Use the following information when computing CPM2A power capacities.

CPM2A CPU Unit	Power consumption (W)
CPM2A-20CDR-D	4
CPM2A-30CDR-D	4.5
CPM2A-40CDR-D	6
CPM2A-60CDR-D	7.5
CPM2A-20CDT/T1-D	3.5
CPM2A-30CDT/T1-D	4
CPM2A-40CDT/T1-D	4.5
CPM2A-60CDT/T1-D	5

CPM1A Expansion I/O Unit or Expansion Unit	Power consumption (W)
CPM1A-20EDR1	2.5
CPM1A-20EDT/T1	1.5
CPM1A-8ED	1
CPM1A-8ER	2
CPM1A-8ET/T1	1
CPM1A-DRT21	1
CPM1A-SRT21	1
CPM1A-MAD01/MAD11	3.5
CPM1A-TS001/TS101	3
CPM1A-TS002/TS102	3
CPM1A-PRT21	1
CPM1A-TS101-DA	1.5
CPM1A-AD041	3
CPM1A-DA041	3.3

Note: When calculating the total power consumption, it is also necessary to include the power consumption of Programming Consoles, RS-232C Adapter Units, and other devices.

Programmable Controllers

CPM2A Characteristics

Item		Specification					
Control method		Stored program method					
	od	Silved program method Cyclic scan with direct output (Immediate refreshing can be performed with IOPE(07).)					
Dregramming language		Cyclic scan with direct output (Immediate refreshing can be performed with IORF(97).)					
Programming language		Ladder diagram					
Instruction lengt	n	1 step per instruction, 1 to 5 wor	ds per instruction				
Instructions		Basic instructions: 14	and 195 variations				
Everytion time		Special Instructions, 105 Instruct	ons, 165 variations				
Execution time		Basic Instructions: 0.64 µs (LD I	(instruction)				
Brogram concei	ħ.	A 006 words					
Flogram capaci	ODU Unit only		00	10 int-	00		
1/O capacity					60 points		
	With Expansion I/O	80 points max.	90 points max.	100 points max.	120 points max.		
lana et la ita	UTIILS						
Input bits		IR 00000 to IR 00915 (Words no	it used for input bits can be used	a lor work bits.)			
		IR 01000 to IR 01915 (Wolds he	I used for output bits can be use				
WORK DIts		928 bits: IR 02000 to IR 04915 (words IR 020 to IR 049) and IR	20000 to IR 22715 (Words	S IR 200 to IR 227)		
Special bits (SH	area)	448 bits: SR 22800 to SR 25515	(Words IR 228 to IR 255)				
Temporary bits	(TR area)	8 bits (TR0 to TR7)					
Holding bits (HF	Rarea)	320 bits: HR 0000 to HR 1915 (Words HR 00 to HR 19)				
Auxiliary bits (A	R area)	384 bits: AR 0000 to AR 2315 (\	Vords AR 00 to AR 23)				
Link bits (LR are	ea)	256 bits: LR 0000 to LR 1515 (V	/ords LR 00 to LR 15)				
Timers/Counters	S	256 timers/counters (TIM/CNT 0	00 to TIM/CNT 255)				
		1-ms timers: TMHH()					
		10-ms timers: TIMH(15)					
		1 c/10 c timore: TIML()					
		Decrementing counters: CNT					
		Reversible counters: CNTR(12)					
Data memory		Read/Write: 2 048 words (DM 0000 to DM 2047)*					
Data monory		Read-only: 456 words (DM 6144 to DM 6599)					
		PC Setup: 56 words (DM 6600 to DM 6655)					
		*The Error Log is contained in DM 2000 to DM 2021.					
Basic	Interrupt process-	External interrupts: 4					
interrupts	ing	(Shared by the external interrupt inputs (counter mode) and the quick-response inputs.)					
	Interval timer inter- rupts	ner inter- 1 (Scheduled Interrupt Mode or Single Interrupt Mode)					
High- speed counter	High-speed counter	One high-speed counter: 20 kHz Counter interrupt: 1 (set value c	single-phase or 5 kHz two-pha omparison or set-value range co	se (linear count method) omparison)			
Interrupt Inputs Four inputs (Shared with external interrupt inputs (counter mode) and quick-response inputs.)			ts.)				
Bulae output	(counter mode)	Two points with po cooplaration	deceleration 10 Hz to 10 kHz o	a quick-response inputs.)			
Fuise output		I we points with no acceleration/deceleration, 10 Hz to 10 KHz each, and no direction control.					
		Two points with variable duty-ratio outputs using PWM()					
		(Pulse outputs can be used with transistor outputs only, they cannot be used with relay outputs.)					
Synchronized p	ulse control	One point:					
		A pulse output can be created by combining the high-speed counter with the pulse output and multiplying the frequency of the input					
		pulses from the high-speed counter by a fixed factor.					
		(This output is possible with transistor outputs only, it cannot be used with relay outputs.)					
Quick-response	inputs	Four points (Min. input pulse width: 50 μs min.)					
Analog controls		2 controls, setting range: 0 to 200					
Input time const	ant	Can be set for all input points.					
		(1 ms, 2 ms, 3 ms, 5 ms, 10 ms, 20 ms, 40 ms, or 80 ms; default setting: 10 ms)					
Clock function		Shows the year, month, day of the week, day, hour, minute, and second. (Battery backup)					
Communication	s functions	Built-in peripheral port:					
		Supports host link, peripheral bu	is, no-protocol, or Programming	Console connections.			
		Supports host link no-protocol	1.1 Slave Unit link 1.1 Master II	Init link or 1:1 NT Link con	nections		
Eurotions provid	had by Expansion	Analog I/O I Init: Brovidos 2 anal	og inputs and 1 analog output				
Linits	Led by Expansion	CompoBus/S I/O Link Unit: Prov	ides 8 inputs and 8 outputs as a	CompoBus/S Slave			
onno		Temperature Sensor Units: Provide 2 or 4 thermocounte inputs or 2 or 4 temperature-resistance thermometer inputs					
Memory protect	ion	HB area AB area program con	tents read/write DM area conter	nts and counter values ma	intained during power interruptions		
Memory backup		Flash memory:					
		Program, read-only DM area. ar	d PC Setup				
		Battery backup:	·				
		The read/write DM area, HR are	a, AR area, and counter values	are backed up by a battery	. (Battery life is approximately 5 years		
		at an ambient temperature of 25	°C.)				
Self-diagnostic f	unctions	CPU Unit failure (watchdog time	r), I/O bus error, and memory fa	ilure, battery error			
Program checks	6	No END instruction and program	ming errors are checked at the	start of operation.			

CPM2A I/O Specifications

1. CPU Unit Input Specifications

Item	Inputs	Specification	Circuit configuration
Input voltage	All	24 V DC ^{+10%} / _{-15%}	
Input impedance	IN00000 to IN00001	2.7 kΩ	
	IN00002 to IN00006	3.9 kΩ	Сигсинтя сом 2.7 кΩ 680 Ω
	IN00007 and up	4.7 kΩ	
Input current	IN00000 to IN00001	8 mA	
	IN00002 to IN00006	6 mA	
	IN00007 and up	5 mA	COM 3.9 kΩ
ON voltage/current	IN00000 to IN00001	17 V DC min., 5 mA	
	IN00002 and up	14.4 V DC min., 3 mA	
OFF voltage/current	All	5.0 V DC max., 1 mA	
ON delay	All	1 to 80 ms max. Default: 10 ms (See note.)	COM 4.7 kΩ
OFF delay	All	1 to 80 ms max. Default: 10 ms (See note.)	

Note: The input time constant can be set to 1, 2, 3, 5, 10, 20, 40, or 80 ms in the PC Setup.

High-speed Counter Inputs Inputs IN00000 through IN00002 can be used as high-speed counter inputs, as shown in the following table. The maximum count frequency is 5 kHz in differential phase mode and 20 kHz in the other modes.

Ľ	nput	Function						
		Differential phase mode	Pulse + direction input mode	Up/down input mode	Increment mode			
I	N00000	A-phase pulse input	Pulse input	Increment pulse input	Increment pulse input			
I	N00001	B-phase pulse input	Direction input	Decrement pulse input	Normal input			
Π	N00002	Z-phase pulse input/Hardware reset input (IN00002 can be used as a normal input when it is not used as a high-speed counter input)						

Interrupt Inputs Inputs IN00003 through IN00006 can be used as interrupt inputs (interrupt input mode or counter mode) and quick-response inputs. The minimum pulse width for these inputs is 0.05 ms.

2. Expansion I/O Unit Input Specifications

Item	Specification	Circuit configuration
Input voltage	24 V DC ^{+10%} / _{-15%}	
Input impedance	4.7 kΩ	
Input current	5 mA	
ON voltage	14.4 V DC min.	$ \begin{array}{c c} \uparrow & \uparrow & IN \\ \hline \uparrow & \uparrow & IN \\ \hline & & 750 \ \Omega \end{array} \right\} \begin{array}{c} \left(\begin{array}{c} \uparrow & \uparrow & \frown \\ \uparrow & \uparrow & \frown \\ \hline & & \uparrow & \uparrow \\ \end{array} \right) \begin{array}{c} Circuits \\ Circuits \end{array} $
OFF voltage	5.0 V DC max.	сом ! 4.7 kΩ
ON delay	1 to 80 ms max. Default: 10 ms (See note.)	
OFF delay	1 to 80 ms max. Default: 10 ms (See note.)	

Note: The input time constant can be set to 1, 2, 3, 5, 10, 20, 40, or 80 ms in the PC Setup.

Programmable Controllers

3. CPM2A Output Specifications (CPU Units and Expansion I/O Unit)

Relay Output

Item	Specification	Circuit configuration
Max. switching capacity	2 A, 250 V AC (cosφ = 1) 2 A, 24 V DC (4 A/common)	
Min. switching capacity	10 mA, 5 V DC	
Service life of relay	Electrical:150,000 operations (24- V DC resistive load) 100,000 operations (240- V AC inductive load, cos\u00e9 = 4) Mechanical:20,000,000 operations	
ON delay	15 ms max.	250 VAC: 2 A
OFF delay	15 ms max.	24 VDC: 2 A

Transistor Output (Sinking)

Item	Specification						
	CPM2A-20CDT-D	CPM2A-30CDT-D	CPM2A-40CDT-D	CPM2A-60CDT-D	CPM1A-8ET	CPM1A-20EDT	
Max. switching capacity	OUT01000, 01001: 4.5 to 30 V DC, 0.2 A/output OUT01002 and up: 4.5 to 30 V DC, 0.3 A/output					24 V DC ^{+10%} / _{-5%,} 0.3 A/output	
	0.8 A/common 1.6 A/Unit	0.8 A/common 2.4 A/Unit	0.8 A/common 3.2 A/Unit	0.8 A/common 4.8 A/Unit	0.9 A/common 1.8 A/Unit	0.9 A/common 1.8 A/Unit	
Leakage current	0.1 mA max.						
Residual voltage	1.5 V max.						
ON delay	OUT01000 and OL OUT01002 and up	OUT01000 and OUT01001:20 μs max. OUT01002 and up:0.1 ms max.				0.1 ms max.	
OFF delay	OUT01000 and OUT01001:40 μs max. (4.5 to 26.4 V, 10 to 100 mA) 0.1 ms max. (4.5 to 30 V, 10 to 200 mA) OUT01002 and up:1 ms max. (4.5 to 30 V, 10 to 300 mA)					1 ms max. (24 V DC ^{+10%} / _{-5%,} 5 to 300 mA)	
Fuse (see note)	1 fuse/output					1 fuse/common	
Circuit configuration	4.5 to 30 VDC, 0.3	3 A/output	Internal Circuits		OUT S OUT OUT COM (-)		

Note: Cannot be replaced by the user.

Transistor Output (Sourcing)

Item	Specification							
	CPM2A-20CDT1-D	CPM2A-30CDT1-D	CPM2A-40CDT1-	CPM2A-60CDT1-D	CPM1A-8ET1	CPM1A-20DET1		
Max. switching capacity	OUT01000, 01001:	24 V DC ^{+10%} /_5%,						
	OUT01002 and up: 4.5 to 30 V DC, 0.3 A/output					0.3 A/output		
	0.8 A/common 1.6 A/Unit	0.8 A/common 2.4 A/Unit	0.8 A/common 3.2 A/Unit	0.8 A/common 4.8 A/Unit	0.9 A/common 1.8 A/Unit	0.9 A/common 1.8 A/Unit		
Leakage current	0.1 mA max.							
Residual voltage	1.5 V max.							
ON delay	OUT01000 and OU OUT01002 and up:	OUT01000 and OUT01001:20 μs max. OUT01002 and up:0.1 ms max.						
OFF delay	OUT01000 and OU 0.1 ms max. (4.5 to OUT01002 and up:	1 ms max. (24 V DC ^{+10%} / _{-5%,} 5 to 300 mA)						
Fuse (see note)	1 fuse/output					1 fuse/common		
Circuit configuration	4.5 to 30 VDC, 0.3	A/output	Internal Circuits		COM (+) OUT 24 VDC			

Note: Cannot be replaced by the user.

Analog I/O units

Handles 2 Analog Inputs and 1 Analog Output

- Resolution: up to 1/6000
- · Conversion time: up to 2 ms per point



Specifications

General

Item		CPM1A-MAD01		CPM1A-MAD11		
		Voltage I/O	Current I/O	Voltage I/O	Current I/O	
Analog in-	Number of inputs	2		2 (allocated 2 words)		
puts	Input signal ranges	0 to 10 V or 1 to 5 V	4 to 20 mA	0 to 5 V, 1 to 5 V, 0 to 10 V, - 10 to 10 V	0 to 20 mA, 4 to 20 mA	
	Maximum rated input	±15 V	±30 mA	±15 V	±30 mA	
	External input impedance	1 MΩ min.	250 Ω rated	1 MΩ min.	250 Ω	
	Resolution	1/256		1/6,000 (full scale)		
	Overall precision	1.0% of full scale		25°C:±0.3% of full scale	25°C:±0.4% of full scale	
				0 to 55°C:±0.6% of full scale	0 to 55°C:±0.8% of full scale	
	Converted A/D data	8-bit binary		Binary data (4-digit hexadecimal) –10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale		
	Averaging			Supported (set for each input with DIP switch)		
	Disconnected line detection			Supported		
Analog out- put (See note 1.)	Number of outputs	1		1 (allocated 1 word)		
	Output signal ranges	0 to 10 V or -10 to 10 V	4 to 20 mA	1 to 5 V, 0 to 10 V, -10 to 10 V	/ 0 to 20 mA, 4 to 20 mA	
	External output max. current	5 mA				
	External output allowed load resistance		350 Ω	1 kΩ min.	600 Ω max.	
	External output impedance			0.5 Ω max.		
	Resolution	1/256 (1/512 when the output signal range is -10 to 10 V.)		1/6,000 (full scale)		
	Overall precision	1.0% of full scale		25°C:±0.4% of full scale		
				0 to 55°C:±0.8% of full scale		
	Data setting	8-bit binary with sign bit				
	D/A data setting			Binary data (4-digit hexadecimal) –10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale		
Conversion time (See note 2.)		10 ms/Unit max.		2 ms/point (6 ms/all analog I/O)		
Isolation method		Photocoupler isolation between I/O terminals and PC (There is no isolation between the analog I/O signals.)		Photocoupler isolation between analog I/O and internal cir- cuits. (Individual analog I/O signals are not isolated.)		

Note: 1. The voltage output and current output can be used at the same time, but the total output current cannot exceed 21 mA.

2. The conversion time is the total time for 2 analog inputs and 1 analog output.
Programmable Controllers

CPM1A-AD041/DA041

Analog I/O units

Handles 4 Analog Inputs or 4 Analog Outputs

- Conversion time: 2ms per point
- Resolution : 1/6000
- Range selection per Input/Output
- Averaging function (Inputs)
- Open circuit detection (Inputs)



Specifications

General

Item		CPM1A-AD041		CPM1A-DA041			
		Voltage I/O	Current I/O	Voltage I/O	Current I/O		
Analog	Number of inputs	4 (allocated 4 words in + 2 words out)			-		
inputs	Input signal ranges	0 to 5 V, 1 to 5 V, 0 to 10 V, – 10 to 10 V	0 to 20 mA, 4 to 20 mA				
	Maximum rated input	±15 V	±30 mA				
	External input impedance	1 MΩ min.	250 Ω				
	Resolution	1/6,000 (full scale)					
	Overall precision	25°C:±0.3% of full scale	25°C:±0.4% of full scale				
		0 to 55°C:±0.6% of full scale	0 to 55°C:±0.8% of full scale				
	Converted A/D data	Binary data (4-digit hexadecimal) -10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale					
	Averaging	Supported (set for each input with DIP switch)					
	Disconnection detection	Supported					
Analog	Number of outputs			4 (4 words allocated)			
output	Output signal ranges			1 to 5 V, 0 to 10 V, -10 to 10 V	/ 0 to 20 mA, 4 to 20 mA		
(See note 1.)	External output allowed load resistance			1 kΩ min.	600 Ω max.		
	External output impedance			0.5 Ω max.			
	Resolution			1/6,000 (full scale)			
	Overall precision				25°C:±0.4% of full scale		
				0 to 55°C:±0.8% of full scale			
	D/A data setting			Binary data (hexadecimal, 4-c -10 to 10 V output range: Ful Other output ranges: Full sca	digit) I scale = F448 to 0BB8 Hex Ie = 0000 to 1770 Hex		
Conversion time		2 ms/point		2 ms/point			
Isolation method		Photocoupler isolation between analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)		Photocoupler isolation between analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)			

CPM1A-TS

Temperature Sensor Units

- By connecting a Temperature Sensor Unit (CPM1A-TS001/TS002/TS101/TS102, TS101-DA) to the CPM2A, inputs can be received from thermocouples or temperature-resistance thermometers.
- Inputs converted to binary data (4-digit hexadecimal) and stored in the IR area. Refer to page 76 for details on the maximum number of connectable Units.



Specifications

General

Item	Specification			
Model	CPM1A-TS001/002	CPM1A-TS101/102	CPM1A-TS101-DA	
Number of inputs	TS001: 2; TS002: 4	TS101: 2; TS102: 4	2	
Input types	Input types K or J selectable (The same input type must be used for all inputs.) Pt100, JPt1100 selectable (The same input type must be used for all inputs.)		Pt100 only	
Accuracy	Accuracy ±0.5% or ±2 °C of the stored value whichever is larger (see note) ± 1 digit max. is larger (see note) ± 1 digit max.		1% of full scale	
Conversion cycle	Conversion cycle 250 ms/2 points (TS001 or TS101) or 250 ms/4 points (TS002 or TS102)		60 ms (for all points)	
Converted temperature Binary data (4-digit hexadecimal) data				
Isolation method	Photocoupler isolation between input signals			
Number of outputs		one point		
Output range	0 to 10 V, -10 to 10 V, 4 to 20 mA			
Accuracy	1% of full scale			

Note: Accuracy for K thermocouples at temperatures less than -100° C: $\pm 4^{\circ}$ C ± 1 digit max.

Input Temperature Ranges for CPM1A-TS001/002

The input type is selected with a rotary switch. The ranges for each of the input types are shown in the following table.

Item	Range in °C	Range in °F
К	-200 to 1,300	-300 to 2,300
	0.0 to 500.0	0.0 to 900.0
J	-100 to 850	-100 to 1,500
	0.0 to 400.0	0.0 to 750.0

Input Temperature Ranges for CPM1A-TS101/102

The input type is selected with a rotary switch. The ranges for each of the input types are shown in the following table.

Item	Range in °C	Range in °F
Pt100	-200.0 to 650.0	-300 to 1,200.0
JPt100	-200.0 to 650.0	-300 to 1,200.0

Input Temperature Ranges for CPM1A-TS101-DA

The input type is selected with a rotary switch. The ranges for each of the input types are shown in the following table.

Item	Range in °C
Pt100	-40.0 to 250.0

CPM1A-DRT21

DeviceNet I/O Link Unit

I/O Link Unit for CPM2A/CPM1A PLCs

- Functions as a slave for DeviceNet.
- Provides 32 input points and 32 output points for I/O exchange with the master.
- International standards: UL, CSA, CE.



Specifications

Communications power supply voltage	11 to 25 V DC
Current consumption	10 mA max. at 24 V DC
Max. number of I/O points	Inputs: 32; Outputs: 32
Number of allocated words in CPM2A I/O mem-	Input: 2 words; Output: 2 words (Same allocation as for other Expansion Units.)
ory	
Node address setting method	Set using DIP switch.
Max. number of connectable Units	3 max.

Application Examples

Configuration Example



Note: Up to 3 DeviceNet I/O Link Units and other Expansion I/O Units can be mounted to CPM1A/CPM2A CPU Units.

Precautions

Refer to the relevant catalog for details on CPM1A and CPM2A PLCs (CPM1: Cat. No. P035; CPM2A/CPM2C: Cat. No. P049).

CPM1A-PRT21

PROFIBUS-DP I/O Link Unit

I/O Link Unit for CPM2A/CPM1A PLCs

- Functions as a slave for PROFIBUS-DP.
- Provides 16 input points and 16 output points for I/O exchange with the PROFIBUS-DP master.



Specifications

Item	Specification
Model number	CPM1A-PRT21
Master/slave	PROFIBUS-DP slave (OC_0658.GSD)
I/O capacity to master	16 input und 16 output points (no consistency), Intel/Motorola format selectable by DIP switch.
I/O memory allocated in CPM2A	1 input word and 1 output word (allocated in the same as other Expansion Units)
Node address setting	2 rotary switches (00-99)
Maximum number of nodes per PROFIBUS net- work	C200H master, CS1 / CJ1 master: 125 nodes

Application Examples

Configuration Example



Note: Up to 3 PROFIBUS DP I/O Link Units and other Expansion I/O Units can be mounted to CPM1A/CPM2A CPU Units.

Precautions

Refer to the relevant catalog for details on CPM1A and CPM2A PLCs (CPM1: Cat. No. P035; CPM2A/CPM2C: Cat. No. P049).

I/O Link Unit CPM1A-SRT21

CompoBus/S I/O Link Unit

I/O Link Unit for CPM2A/CPM1A PLCs

- Operates as a Slave of the CompoBus/S Master Unit.
- Exchanges eight inputs and eight outputs with the Master.
- Approved by UL and CSA standards, and bears the CE marking.



Specifications

Master/Slave	CompoBus/S Slave
Number of I/O points	8 inputs and 8 outputs
Number of words occupied in CPM2A's I/O	1 input word and 1 output word (allocated in the same way as for other Expansion Units)
memory	
Node address setting	DIP switch

Note: For details of CPM1A PLCs, refer to the CPM1A catalog (Cat. No. P039). For details of CPM2A PLCs, refer to the CPM2A catalog (Cat. No. P049)

Installation

Connection Examples



Note: A single CompoBus/S I/O Link Unit together with a maximum of two other Expansion I/O Units can be connected to the CPM1A or CPM2A CPU Unit.



CPM2A General Information

System Configuration

Up to three Expansion I/O Units or Expansion Units can be connected to a CPM2A CPU Unit. Group 2 Units are counted as 2 Expansion Units; therefore only one Group 2 Unit can be connected per CPU.



Expansion Unit Connection Groups

Group 1 (G1)	Group 2 (G2)
Expansion I/O Units	CPM1A-TS002/TS102 Temperature Sensor Units
Analog I/O Units	CPM1A-AD041/DA041 Analog I/O Units
CompoBus/S I/O Link Units	
CPM1A-TS001/TS101(-DA) Temperature Sensor Units	
DeviceNet I/O Link Unit	
PROFIBUS-DP I/O Link Unit	

The sequences in which Units in the above groups can be connected to the CPU Unit are shown in the following table.

Expansion Unit Group Combinations

Expansion sequence 1	Expansion sequence 2	Expansion sequence 3
G1	G1	G1
G2	G1	G2 Units cannot be connected after a G1 Unit.

Note: 1. The mounting sequence does not affect the number of Units that can be mounted.

2. If the NT-AL001 RS-422 Adapter is connected to the RS-232C port, only one Expansion Unit or Expansion I/O Unit can be added.

3. If three CPM1A-MAD11/MAD01 Analog I/O Units are connected to a CPM2A-60CDR-A CPU Unit, keep the output capacity of the external power supply (24 V DC) to 200 mA or less.

Dimensions



CPM2A-40CD --- CPU Units







CPU Units with AC Power



CPU Units with DC Power

CPU Units with AC Power









Note: All dimensions are in mm.

CPM1A-20ED Expansion I/O Units



CPM1A-DRT21 DeviceNet I/O Link Unit CPM1A-PRT21 PROFIBUS-DP I/O Link Unit



CPM1A-MAD01 Analog I/O Unit



Note: All dimensions are in mm.

CPM1A-8 C Expansion I/O Units



CPM1A-SRT21 CompoBus/S I/O Link Unit

110

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CPM2A Ordering Information

International Standards

The products shown in the attached tables are those that conform to the UL, CSA, cULus, cUL, NK, Lloyd's Register, and EC Directives as of September 2003.

(U: UL, C: CSA, UC: cULus, CU: cUL, N: NK, L: Lloyd, CE: EC Directives) Please contact OMRON representative for application conditions.

CPM2A CPU Units

CPU Unit	Power supply	Output type	Inputs	Outputs	Model	Standards
20 I/O points	AC	Relay	12	8	CPM2A-20CDR-A	U, C, CE, N, L
	DC	Relay			CPM2A-20CDR-D	U, C, CE, N, L
		Transistor (sinking)			CPM2A-20CDT-D	U, C, CE, N, L
		Transistor (sourcing)			CPM2A-20CDT1-D	U, C, CE, N, L
30 I/O points	AC	Relay	18	12	CPM2A-30CDR-A	U, C, CE, N, L
	DC	Relay			CPM2A-30CDR-D	U, C, CE, N, L
		Transistor (sinking)			CPM2A-30CDT-D	U, C, CE, N, L
		Transistor (sourcing)			CPM2A-30CDT1-D	U, C, CE, N, L
40 I/O points	AC	Relay	24	16	CPM2A-40CDR-A	U, C, CE, N, L
	DC	Relay			CPM2A-40CDR-D	U, C, CE, N, L
		Transistor (sinking)	-		CPM2A-40CDT-D	U, C, CE, N, L
		Transistor (sourcing)			CPM2A-40CDT1-D	U, C, CE, N, L
60 I/O points	AC	Relay	36	24	CPM2A-60CDR-A	U, C, CE, N, L
	DC	Relay			CPM2A-60CDR-D	U, C, CE, N, L
		Transistor (sinking)			CPM2A-60CDT-D	U, C, CE, N, L
		Transistor (sourcing)			CPM2A-60CDT1-D	U, C, CE, N, L

Expansion Units and Expansion I/O Units

Unit	Input/Output type	Inputs	Outputs	Model	Standards
Expansion I/O Units	Relay	24	16	CPM1A-40EDR	CE, N
	Transistor (sinking)			CPM1A-40EDT	CE, N
	Transistor (sourcing)			CPM1A-40EDT1	CE, N
	Relay	12	8	CPM1A-20EDR1	U, C, CE, N, L
	Transistor (sinking)			CPM1A-20EDT	U, C, CE, N, L
	Transistor (sourcing)			CPM1A-20EDT1	U, C, CE, N, L
		8		CPM1A-8ED	U, C, CE, N, L
	Relay		8	CPM1A-8ER	U, C, CE, N, L
	Transistor (sinking)		8	CPM1A-8ET	U, C, CE, N, L
	Transistor (sourcing)			CPM1A-8ET1	U, C, CE, N, L
Analog I/O Unit	Analog (resolution: 1/256)	2	1	CPM1A-MAD01	U, C, CE
	Analog (resolution: 1/6,000)	2	1	CPM1A-MAD11	U, C, CE
	Analog (resolution 1/6000)	4		CPM1A-AD041	U, C, CE
	Analog (resolution 1/6000)		4	CPM1A-DA041	U, C, CE
DeviceNet I/O Link Unit		I/O Link of 32 output b	32 input bits and bits	CPM1A-DRT21	U, C, CE
PROFIBUS-DP I/O Link Unit		I/O Link of 16 output b	16 input bits and bits	CPM1A-PRT21	CE
CompoBus/S I/O Link Unit		I/O Link of 8 output bit	8 input bits and ts	CPM1A-SRT21	U, C, CE, N, L
Temperature Sensor Units	2 thermocouple inputs			CPM1A-TS001	U, C, CE, N, L
	4 thermocouple inputs	CPM1A-TS002	U, C, CE, N, L		
	2 platinum resistance thermo	CPM1A-TS101	U, C, CE, N, L		
	4 platinum resistance thermo	CPM1A-TS102	U, C, CE, N, L		
	2 Platinum resistance thermometer inputs (-40 to 250 °C) and one output (-10 to 10V, 4 to 20 mA)			CPM1A-TS101-DA	U, C, CE, N, L

Programmable Controllers

Programming Consoles and Cables

Product	Model	Standards	
Programming Console (2-m cable attached)	CQM1H-PRO01-E	U, C, N, CE	
Programming Console (Requires separate cable. See below.)	C200H-PRO27-E	U, C, N, CE	
Connecting Cable for C200H-PRO27-E	2-m cable	C200H-CN222	N
	4-m cable	C200H-CN422	

Support Software

Product	Functions	Model	Standards
CX-One	Omron's integrated software for programming and config- uration of all control system components, including PLCs, HMI, drives, temperature controllers and advanced sen- sors.	CX-ONE-AL□□C-E ^{*1}	

^{*1} □□ = Number of licenses (01, 03, 10)

Product	Model	Standards
Expansion Memory Unit	CPM1-EMU01-V1	
EEPROM (256 K)	EEROM-JD	

Personal Computer Connecting Cables

CPM2A port	Computer port	Specifications	Cable length	Model	Standards
Peripheral	For a D-sub 9-pin port		3.3 m	CQM1-CIF02	U, C, N, L, CE
RS-232C	For a D-sub 9-pin port		2 m	XW2Z-200S-V	
			5 m	XW2Z-500S-V	
		Can be used with a pe-	2 m	XW2Z-200S-CV	
		ripheral bus or Host Link. Uses connector that prevents ESD (electrostatic dis- charge.)	5 m	XW2Z-500S-CV	
	For a D-sub 25-pin port		2 m	XW2Z-200S	
			5 m	XW2Z-500S	
	For a half-pitch 14-pin port		2 m + 0.15 m	XW2Z-200S	
				XW2Z-S001	
			5 m + 0.15 m	XW2Z-500S	
				XW2Z-S001	

Adapters

Product	Function		Model	Standards
RS-232C Adapter	Peripheral port lev	Peripheral port level conversion		N, L, CE
RS-422 Adapter			CPM1-CIF11	N, L, CE
Link Adapter	RS-232C to RS- 422A conversion	For personal computer connection (Can also be connected to the CPM2A.)	3G2A9-AL004-E	
RS-232C to RS422A Conversion Adapter		For CPM2A connection (Can also be connected to a personal computer, but requires an external 5-V power supply.)	NT-AL001	

Battery

Product	Function	Model	Standards
Backup Battery (See note.)	Backs up memory in the CPM2A CPU Unit.	CPM2A-BAT01	

Note: One internal Backup Battery is provided as standard.

Board PLC CPM2B

Proven PLC technology, made to fit anywhere.

Fits into the narrowest slots.

Requiring only 45-mm height, the CPM2B easily fits into narrow spaces.





Full integration into your machine

The case-free board format of the CPM2B can be used like an in-house controller.



12-V Power Supply

Lineup includes Board PLCs that support a 12-V power supply, allowing battery-powered applications, such as notification of power failures via wireless error information transmissions.

- 32-point CPU Board (transistor outputs)
- 32-point Expansion I/O Board (transistor outputs)

Use with Devices Requiring Analog I/O

- Lineup includes Analog I/O Expansion Boards (Resolution: 6,000)
- Use to set speed and other settings for Pressure Sensors and Inverters.

Provides Machine Control Functions

Includes Two High-speed Counter Functions

One high-speed counter input can be used in any one of the four input modes: Differential phase pulse mode (5 kHz), pulse plus direction input mode (20 kHz), up/down pulse input mode (20 kHz), and increment mode (20 kHz). The four interrupt inputs in counter mode can be used for incrementing counters or decrementing counters (2 kHz).



Reliably Reads Short Pulses of 50 µs

Quick-response input allows short ON-time pulse input. Four inputs are used for quick-response inputs (shared with interrupt inputs and interrupt inputs in counter mode) that can reliably read inputs with a minimum input signal width as short as 50 μ s, regardless of the cycle time.

Analog Settings

Two controls on the CPU Board can be turned to change the analog settings. The rotation angle is stored as BCD data (0 to 200 BCD) in IR 250 and IR 251. These controls can be used to easily change or fine-tune machine settings such as a conveyor belt's pause time or feed rate.

Calendar/Clock

CPU Boards that have a built-in clock (accuracy: 1 minute/month), can read from the program to show the current year, month, day, day of the week, and time (hour, minute, second).

Easy Position Control with Pulse Outputs

(Transistor Outputs Only)

CPM2B PLCs with transistor outputs have two outputs that can produce 10-Hz to 10-kHz pulses (single-phase outputs).

• When used as single-phase pulse outputs, there can be two outputs. When used as pulse plus direction or up/down pulse outputs, there can be just one output. Output of 0.1 to 999.9 Hz with a variable duty ratio (0 to 100% duty ratio) is also possible.



Indispensable interrupt Functions for Machine Control

When an interrupt input goes ON, the main program is stopped and the interrupt program is executed. The interrupt functions can be used as high-speed counters and for quick response, in addition to timer functions.

High-speed Communications with the PT Using a 1:1 NT Link

With a 1:1 NT Link, an OMRON Programmable Terminal (PT) can be connected directly to the CPM2B.



CPM2B (with RS-232C port)

Device Connections and System Configuration



CPU Boards

Board type		Inputs	Outputs	Battery	Clock	RS-232C port	Model
32 I/O points Terminal block 16 inputs, 24 V DC 16 relay outputs		16 relay outputs				CPM2B-32C1DR-D	
(16 inputs, 16 outputs)	outputs	7		•	•	•	CPM2B-32C2DR-D
	Connector outputs 16 inputs, 24 V DC 16 sinking transistor					CPM2B-32C1DT-D	
	outputs	•	•	•	CPM2B-32C2DT-D		
	Connector outputs 16 inputs, 12	16 inputs, 12 V DC	2 V DC 16 sinking transistor outputs				CPM2B-32C1D1T-D12
				•	•	•	CPM2B-32C2D1T-D12
40 I/O points	0 I/O points Terminal block 24 inputs, 24 V DC 16 relay outputs	•	•	•	CPM2B-32C2D1T-D12		
(24 inputs, 26 outputs)	outputs			•	•	•	CPM2B-40C2DR-D

Expansion I/O Boards

Board type		Inputs	Outputs	Model
32 I/O points (16 inputs, 16 outputs)	Terminal block outputs	16 inputs, 24 V DC	16 relay outputs	CPM2B-32EDR
	Connector outputs	16 inputs, 24 V DC	16 sinking transistor outputs	CPM2B-32EDT
		16 inputs, 12 V DC	16 sinking transistor outputs	CPM2B-32ED1T
40 I/O points (24 inputs, 26 outputs)	Terminal block outputs	24 inputs, 24 V DC	16 relay outputs	CPM2B-40EDR
64 I/O points (32 inputs, 32 outputs)	Connector output	32 inputs, 24 V DC	32 sinking transistor outputs	CPM2B-64EDT

Note: 1. A maximum of two CPM2B-64EDT 64-point Expansion I/O Boards can be connected, due to the current consumption.

2. Only one Expansion I/O Board can be connected if connecting an NT-AL001 to the RS-232C port.

General Specifications

	CPU Board		Expansion Board			
Item	32 or 40 I/O points	32 I/O points	32 or 64 I/O points	32 or 64 I/O points		
	(relay output)	(transistor output)	(relay output)	(transistor output)		
Supply voltage	24 V DC		Supplied from the CPU Board			
Allowable supply voltage	20.4 to 26.4 V DC					
Power consumption	20 W max.					
Inrush current	20 A max.					
Insulation resistance	20 MW min. (at 500 V DC) betwee	en the external DC terminals and	and non-current carrying metal parts			
Dielectric strength	1,000 V AC for 1 min between th	1,000 V AC for 1 min between the external DC terminals and non-current carrying metal parts				
Noise immunity	Conforms to IEC61000-4-4; 2 kV	(power lines)				
Vibration resistance	Conforms to JIS C0040. 10 to 57 each (8 minutes of vibration x 10	Hz, 0.075 mm amplitude, 57 to 15 repetitions = total time 80 minute	50 Hz, 9.8 m/s ² acceleration in X, es)	Y and Z directions for 80 minutes		
Shock resistance	Conforme to JIS C0041, 147 m/s	2 three times each in X, Y and Z	directions			
Ambient operating temperature	0 to 55 °C					
Ambient operating humidity	10% to 90% (with no condensation	on)				
Ambient operating atmosphere	Must be free from corrosive gas.					
Ambient storage temperature	20 to 75 °C (excluding the battery)					
Power supply retention time	2 ms min.					

Programmable Controllers

Performance Specifications

		CPU Board			
Item		32 I/O points (relay outputs) 32 I/O points (transistor outputs) 40 I/O points (relay outputs)			
Control method		Stored program method			
I/O control method		Cyclic scan (immediate refreshing can	be performed	with IORF/97).)	
Programming language		Ladder diagram			
Instruction length		1 step per instruction, 1 to 5 words pe	r instrucon		
Instructions Basic instructions		14 instructions			
	Special instructions	105 instructions, 185 variations			
Execution time	Basic instructions 0.64 ms (LD instruction)				
	Special instructions	7.8 ms (MOV instruction)			
Program capacity		4,096 words			
Max. I/O capacity CPU Board only		32 points/40 points			
With Expansion I/O Boards		168 points max.			
Input bits		IR 00000 to IR 00915	(W	ords not used	
Output bits		IR 01000 to IR 01915	for	input bits can be used for work bits).	
Work bits		928 bits: IR 02000 to IR 04915 (words IR 020 to IR 049) and IR 20000 to IR 22715 (words IR 200 to IR 227)			
Special bits (SR Area)		448 bits: IR 22800 to IR 25515 (words IR 228 to 256)			
Temporary bits (TR Area)		8 bits (TR0 to TR7)			
Holding bits (HR Area)		320 bits: HR 0000 to HR 1915 (words	HR 00 or HR 1	9)	
Auxiliary bits (AR Area)		384 bits: AR 0000 to AR 2315 (words	AR 00 to AR 23	3)	
Link bits (LR Area)		256 bits: LR 0000 to LR 1515 (words I	LR 00 to LR 15)		
Timers/Counters		256 bits: TIM/CNT 000 to TIM/CNT 255 1-ms timers: TMH 10-ms timers: TIMH 100-ms timers: TIM 1-s/10-s timers: TIML Decrementing timers: CNT Reversible counters: CNTB			
Data memory	Read/Write	2,048 words (DM 0000 to DM 2047).	The Error Log is	contained in DM 2000 to DM 2021.	
	Read only	456 words (DM 6144 to DM 6599)			
	PLC Setup	54 words (DM 6600 to DM 6655)			

Assembly Dimensions

32 or 64 I/O points • Front View



• Height (When Stacked Vertically)



	Boards	Boards
£1	28 mm	24 mm

Compact PLC series

A versatile controller for up to 192 I/O points in an ultra-compact package

SYSMAC CPM2C



An extensive range of models assures efficient machine control in an ultracompact package. CPU Units (DC power supply only) are available with relay or transistor output, terminal block or various connector options, and an optional real-time clock function. Select the output type, number of I/O points and other specifications to meet your needs. Expansion I/O Units with 8 to 32 I/O points make it possible to configure a control system with a maximum of 192 I/O points.

CPU Units Depth: 65 mm 10 I/O Points 20 I/O Points 32 I/O Points ■Relay Output CPU Units ■Relay Output CPU Units (Terminal-block type) (Terminal-block type) CPM2C-10CDR-D (No clock) CPM2C-20CDR-D (No clock) CPM2C-10C1DR-D (Clock) CPM2C-20C1DR-D (Clock) Input points: 6, DC input Input points: 12, DC input Output points: 4 Output points: 8 Transistor Output (Sink) CPU Units Transistor Output (Sink) CPU Units Transistor Output (Sink) CPU Units (Connector type) (Connector type) (Connector type) CPM2C-10CDTC-D (No clock) CPM2C-20CDTC-D (No clock) CPM2C-32CDTC-D (No clock) CPM2C-10C1DTC-D (Clock) CPM2C-20C1DTC-D (Clock) (MIL-connector type) CPM2C-32CDTM-D (No clock) (MIL-connector type) (MIL-connector type) CPM2C-10CDTM-D (No clock) CPM2C-20CDTM-D (No clock) ■Transistor Output (Source) CPU Units CPM2C-10C1DTM-D (Clock) CPM2C-20C1DTM-D (Clock) (Connector type) CPM2C-32CDT1C-D (No clock) Transistor Output (Source) CPU Units Transistor Output (Source) CPU Units (Connector type) (Connector type) (MIL-connector type) CPM2C-10CDT1C-D (No clock) CPM2C-20CDT1C-D (No clock) CPM2C-32CDT1M-D (No clock) CPM2C-10C1DT1C-D (Clock) CPM2C-20C1DT1C-D (Clock) Input points: 16, DC input (MIL-connector type) (MIL-connector type) Output points: 16 CPM2C-20CDT1M-D (No clock) CPM2C-10CDT1M-D (No clock) CPM2C-10C1DT1M-D (Clock) CPM2C-20C1DT1M-D (Clock) Input points: 6, DC input Input points: 12, DC input Output points: 4 Output points: 8 CPU Units with CompoBus/S Master Function Programmable DeviceNet Slaves AC Power Supply Unit Transistor Output (Sink) Transistor Output (Sink) CPU Unit CPU Unit (Connector type) (Connector type) CPM2C-PA201 CPM2C-S100C-DRT (Clock) CPM2C-S100C (Clock) Transistor Output (Source) ●100- to 240-V AC input Transistor Output (Source) ●24-V AC/600-mA output CPU Unit CPU Unit (Connector type) (Connector type) CPM2C-S110C-DRT (Clock) CPM2C-S110C (Clock) Input points: 6, DC input Input points: 6, DC input

Output points: 4

Output points: 4



Programmable Controllers

Specifications

General

Item	CPU Unit Specification							
	CPU Units with 10 I/O points (relay outputs)	CPU Units with 10 I/O points (transistor outputs)	CPU Units with 20 I/O points (relay outputs)	CPU Units 20 I/O poin (transistor	with ts outputs)	CPU Units with 32 I/O points (transistor outputs)	CPM2C-S CPU Unit with 10 I/O points (transistor outputs)	
Supply voltage	24 V DC							
Operating voltage range	20.4 to 26.4 V DC							
Power consumption (Add Ex- pansion Unit consumption from following tables.)	4 W	3 W	4 W	3 W		3 W	3 W	
Inrush current	25 A max.							
Insulation resistance	20 MΩ min. (at 500 \	/ DC) between isolated	d circuits					
Dielectric strength	2,300 V AC for 1 min	(between isolated circ	cuits)					
Noise immunity	Conforms to IEC610	00-4-4, 2 kV (power lin	ies)					
Vibration resistance	Conforming to IEC 60 tions for 80 minutes 6	0068-2-6, JIS C0040: 1 each (Time coefficient;	10 to 57 Hz, 0.075-mr 8 minutes \times coefficie	m amplitude, 5 ent factor 10 =	57 to 150 H total time	lz, acceleration: 9.8 m/s 80 minutes)	s ² in X, Y, and Z direc-	
Shock resistance	Conforming to IEC 6	phorming to IEC 60068-2-27, JIS C0041: 147 m/s ² three times each in X, Y, and Z directions						
Ambient temperature	Operating: 0° to 55°C Storage: -20° to 75°C	perating: 0° to 55°C torage: –20° to 75°C (except for the battery)						
Humidity	10% to 90% (with no	10% to 90% (with no condensation)						
Atmosphere	Must be free from co	rrosive gas						
I/O interface	Terminal block	Connector	Terminal block	Connector				
Power interrupt time	2 ms min.							
Weight	200 g max.	200 g max.	250 g max.	200 g max.		200 g max.	160 g max.	
	Expansion I/O Unit w	ith 10 I/O points (relay	outputs)		200 g max	(.		
	Expansion I/O Unit w	rith 20 I/O points (relay	outputs)		200 g max	ζ.		
	Expansion I/O Units with 24 I/O points (transistor outputs)				200 g max.			
	Expansion I/O Unit w	ith 32 I/O points (trans	sistor outputs)		200 g max.			
	Expansion I/O Unit w	rith 8 input points			150 g max.			
	Expansion I/O Unit with 16 input points				150 g max.			
	Expansion I/O Units	with 8 output points (tr	ansistor outputs)		150 g max.			
	Expansion I/O Units	with 16 output points (transistor outputs)		150 g max.			
	Expansion I/O Unit w	ith 8 output points (rel	ay outputs)		200 g max	ζ.		
	Simple Communicati	ons Unit			150 g max	ί.		
	Peripheral/RS232C A	Adapter Unit			150 g max.			
	RS422/RS232C Ada	pter Unit			150 g max	ζ.		
	AC Power Supply Ur	nit			250 g max	(.		
	Analog I/O Unit				200 g max	ζ.		
	Temperature Sensor	Unit			200 g max	(.		
	CompoBus/S I/O Link Unit				150 g max	(

CPM2C Power Consumption

Use the following power consumption tables to calculate the total power capacity required when using a CPM2C PLC. The rated output for the CPM2C-PA201 AC Power Supply Unit is 15 W. Any surplus power not required for the PLC directly can be used as service power supply for sensors and other devices.

CPU Unit	Power consumption (W)
CPM2C-10C(1)DR-D	4
CPM2C-20C(1)DR-D	4
CPM2C-S1□0C-DRT1	3
CPM2C-S1□0C	3
CPM2C-10C(1)DT(1)□-D	3
CPM2C-20C(1)DT(1)□-D	3
CPM2C-32C(1)DT(1)□-D	3

The power consumption of the CPU Unit includes power for the Programming Consoles and Adapter Units.

Add the following consumptions when using Expansion I/O Units.

Expansion I/O Unit	Power consumption (W)
CPM2C-10EDR	1
CPM2C-20EDR	2
CPM2C-24EDT(1)	1
CPM2C-32EDT(1)	1
CPM2C-MAD11	3.5
CPM2C-SRT21	1
CPM2C-TS001/002	1.5
CPM2C-8ED // 16ED	1
CPM2C-8ER	2
CPM2C-8ET(1)□/16ET(1)□	1

Programmable Controllers

CPM2C Characteristics

Item		CPU Unit Specification							
		CPU Units with 10 I/O points (relay outputs) CPU Units with 10 I/O points (transistor out- puts) CPU Units with 20 I/O points (relay outputs) CPU Units with 20 I/O points (transistor out- puts) CPU Units with 20 I/O points (transistor out- puts) CPU Units with 32 I/O points (transistor out- puts) CPM2C-S CPU U (transistor out- puts)			CPM2C-S CPU Unit with 10 I/O points (transistor outputs) and CompoBus/S Master function				
Control metho	d	Stored program method							
I/O control me	thod	Cyclic scan with	direct output (Imm	nediate refreshing	can be performed	with IORF(97).)			
Programming	language	Ladder diagram			· · · · · · · · · · · · · · · · · · ·				
Instruction len	nth	1 step per instruc	tion 1 to 5 words	s per instruction					
Instructions	Basic instructions: 14								
		Special instructio	ns:105 instruction	ns, 185 variations			-		
Execution time		Special instructions	s: 0.64 μs (LD ins ns:7.8 μs (MOV i	nstruction)					
Program capa	city	4,096 words		1					
I/O capacity	CPU Unit only	10 points		20 points		32 points	10 points		
	With Expansion I/O Units	170 points max.		180 points max.		192 points max.	362 points max. (106 local + 256 remote)		
Input bits		IR 00000 to IR 00	0915 (Words not i	used for input bits	can be used for w	ork bits.)			
Output bits		IR 01000 to IR 0	1915 (Words not i	used for output bits	s can be used for v	work bits.)			
CompoBus/S i	nput bits					,	128 inputs: IB 02000 I/O bits not used for I/		
CompoBus/S	output bits						to IR 02715 O be used as work 128 outputs: bits.		
Work bits		928 bits:IR 02000) to IR 04915 (Wo	ords IR 020 to IR 0	49) and		IR 03000 to IR 03715 672 bits: IR 02800 to IR 02915 (Words IR		
		IR 20000 to IR 22	2715 (Words IR 2	00 to IR 227)			028 to IR 029), IR 03800 to IR 04915 (Words IR 038 to IR 049)and IR 20000 to IR 22715 (Words IR 200 to IR 227		
Special bits (S	R area)	448 bits: SR 228	00 to SR 25515 (\	Words SR 228 to S	SR 255)				
Temporary bits	s (TR area)	8 bits (TR0 to TR	7)						
Holding bits (H	IR area)	320 bits: HR 000	0 to HR 1915 (Wo	ords HR 00 to HR	19)				
Auxiliary bits (AB area)	384 bits: AB 000	0 to AB 2315 (Wo	ords AB 00 to AB	23)				
Link hits (LB a	(n + a.ea)	256 bite: I B 000	to I B 1515 (Wo	rds I B 00 to I B 1	5)				
LINK DILS (LH a		250 Dits. LH 0000)				
1-ms timers: TMHH(—) 10-ms timers: TIMH(15) 100-ms timers: TIM 1-s/10-s timers: TIML(—) Decrementing counters: CNT									
Data memory		Read/Write: 2,048 words (DM 0000 to DM 2047)* Read-only: 456 words (DM 6144 to DM 6599) PC Setup: 56 words (DM 6600 to DM 6655) *The Error Log is contained in DM 2000 to DM 2021							
CompoBus/S master functions							Connects to up to 32 slaves with up to 256 I/O link points		
DeviceNet slave functions							DeviceNet remote I/O link (DRT model only) Up to 1,024 I/O link points Explicit messages Read/write of specified areas from PLC with Master Unit		
Basic inter-	Interrupt pro-	2 interrupts	2 interrupts	4 interrupts	4 interrupts	4 interrupts	2 interrupts		
rupts	cessing	Shared by the ex	ternal interrupt in	puts (counter mod	e) and the guick-re	esponse inputs.			
	Interval timer in- terrupts	1 (Scheduled Inte	errupt Mode or Si	ngle Interrupt Mod	e)	· ·			
High- speed counter	High-speed counter	One high-speed Counter interrupt	counter: 20 kHz s : 1 (set value com	ingle-phase or 5 k nparison or set-val	Hz two-phase (line ue range comparis	ear count method) son)			
High-	Interrupt inputs	2 inputs	2 inputs	4 inputs	4 inputs	4 inputs	2 inputs		
speed	(Counter mode)	Shared by the ex	ternal interrupt in	puts and the quick	-response inputs.				
counter	Counter inter-	2 inputs	2 inputs	4 inputs	4 inputs	4 inputs	2 inputs		
	rupts	Shared by the ex	ternal interrunt in	nuts and the quick	-response inputs		L		
Pulco output		Two points with r	o accoloration/do	poloration 10 Hz		ad no direction co	ntrol		
r uise output	se output Two points with no acceleration/deceleration, 10 Hz to 10 kHz each, and no direction control. One point with trapezoid acceleration/deceleration, 10 Hz to 10 kHz, and direction control. Two points with variable duty-ratio outputs (using PWM(—)). (Pulse outputs can be used with transistor outputs only. they cannot be used with relay outputs.)			butputs.)					
Synchronized	pulse control	One point: A pulse output can be created by combining the high-speed counter with pulse outputs and multiplying the frequency of the input puls- es from the high-speed counter by a fixed factor.							
Quick response inpute		2 inputs	2 inputs	4 inputs	4 innuts	4 innuts	/ 2 inputs		
Sulon-lespons	inputo	Shared by the ex Min. input pulse	ternal interrupt in width: 50 us max.	puts and the interr	upt inputs (counte	r mode).			
Input time con (ON response OFF response	stant time = time)	Can be set for all (1 ms, 2 ms, 3 m	input points. s, 5 ms, 10 ms, 2	0 ms, 40 ms, or 80) ms)				
Clock function	,	Shows the year.	month. dav of the	week. dav. hour.	minute. and secor	d. (Batterv backu	(q		

Item	CPU Unit Specif	ication				
	CPU Units with 10 I/O points (relay outputs)	CPU Units with 10 I/O points (transistor out- puts)	CPU Units with 20 I/O points (relay outputs)	CPU Units with 20 I/O points (transistor out- puts)	CPU Units with 32 I/O points (transistor out- puts)	CPM2C-S CPU Unit with 10 I/O points (transistor outputs) and CompoBus/S Master function
Communications functions	Peripheral port: Supports Host Link, peripheral bus, no-protocol, or Programming Console connections. RS-232C port: Supports Host Link, no-protocol, 1:1 Slave Unit Link, 1:1 Master Unit Link, or 1:1 NT Link connections. A CPM2C-CN111, CS1W-CN114, or CS1W-CN118 Connecting Cable, or an Interface Unit (CPM2C-CIF01-V1 or CPM2C-CIF11) is required to connect to the CPM2C's communications port.					
Memory protection	HR area, AR area	a, program conter	nts, read/write DM	area contents, an	d counter values	are maintained during power interruptions.
Memory backup	Flash memory: Program, read-only DM area, and PC Setup Memory backup: The read/write DM area, HR area, AR area, and counter values are backed up. With CPU Units that are equipped with a clock, the battery will backup memory for 2 years at 25°C. With CPU Units that are not equipped with a clock, if a battery is not installed, the internal capacitor will backup memory for 10 days at 25°C. If a battery (optional CPM2C-BAT01 Battery) is installed, it will backup memory for 5 years at 25°C.					
Self-diagnostic functions	CPU Unit failure	(watchdog timer),	I/O bus error, batt	tery error, and me	mory failure	
Program checks	No END instruction	on, programming	errors (checked w	hen operation is s	started)	

CPM2C I/O Specifications

1. CPU Unit Input Specifications

Item	Specifications			Circuit configuration
	Units with 10 I/O points	Units with 20 I/O points	Units with 32 I/O points	
Input volt- age	24 V DC ^{+10%} / _{-15%}			Input numbers: 00000 to 00001
Input impedance	IN00000 to IN00001: 2.7 kΩ IN00002 to IN00004: 3.9 kΩ IN00005: 4.7 kΩ	IN00000 to IN00001: 2.7 kΩ IN00002 to IN00006: 3.9 kΩ IN00007 and up: 4.7 kΩ	IN00000 to IN00001: 2.7 kΩ IN00002 to IN00006: 3.9 kΩ IN00007: 4.7 kΩ IN00100 to IN00107: 4.7 kΩ	
Input current	IN00000 to IN00001: 8 mA IN00002 to IN00004: 6 mA IN00005: 5 mA	IN00000 to IN00001: 8 mA IN00002 to IN00006: 6 mA IN00007 and up: 5 mA	IN00000 to IN00001: 8 mA IN00002 to IN00006: 6 mA IN00007: 5 mA IN00100 to IN00107: 5 mA	Units with 10 I/O points: 00002 to 00004 Units with 20/32 I/O points: 00002 to 00006 IN O
ON voltage/ current	IN00000 to IN00001:17 V DC IN00002 and up:14.4 V DC m	min., 5 mA iin., 3.5 mA		
OFF voltage/ current	5.0 V DC max., 1.1 mA			Input LED S
ON delay	1 to 80 ms max. Default: 10 n	ns (See note.)		Units with 20 I/O points: 00007 to 00011
OFF delay	1 to 80 ms max. Default: 10 n	ns (See note.)		

Note: The input time constant can be set to 1, 2, 3, 5, 10, 20, 40, or 80 ms in the PC Setup.

High-speed Counter Inputs The following CPU Unit input bits can be used as high-speed counter inputs. The maximum count frequency is 5 kHz in differential phase mode and 20 kHz in the other modes.

Input	unction					
	Differential phase mode	Pulse plus direction input mode	Up/down input mode	Increment mode		
IN00000	A-phase pulse input	Pulse input	Increment pulse input	Increment pulse input		
IN00001	B-phase pulse input	Direction input	Decrement pulse input	Normal input		
IN00002	Z-phase pulse input or hardware res	phase pulse input or hardware reset input (IN00002 can be used as a normal input when it is not used as a high-speed counter input.)				

Interrupt Inputs CPM2C PCs have inputs that can be used as interrupt inputs (interrupt input mode or counter mode) and quick-response inputs. The minimum

pulse width for these inputs is 50 μ s. In CPU Units with 10 I/O points, inputs IN00003 and IN00004 can be used as interrupt inputs. In CPU Units with 20 or 32 I/O points, inputs IN00003 through IN00006 can be used as interrupt inputs.

2. Expansion I/O Unit Input Specifications



Note: The input time constant can be set to 1, 2, 3, 5, 10, 20, 40, or 80 ms in the PC Setup.

3. CPM2C Output Specifications (CPU Units and Expansion I/O Units)

Relay Output

Item	Specification		
Max. switching capacity	2 A, 250 V AC (cos\u00f6 = 1) 2 A, 24 V DC (4 A/common)		
Min. switching capacity	10 mA, 5 V DC		
Service life of relay	Electrical:150,000 operations (24- V DC resistive load) I00,000 operations (240- V AC inductive load, cosφ = 0.4) Vechanical:20,000,000 operations		
ON delay	15 ms max.		
OFF delay	15 ms max.		
Circuit configuration	Internal Circuits		

Transistor Outputs (Sinking or Sourcing) for CPU Units and Expansion I/O Units

Item	Specification
Max. switching capacity	CPU Units with 10 or 20 I/O Points
	01000 to 01007: 40 mA at 4.5 V DC to 300 mA at 20.4 V DC, 300 mA (20.4 to 26.4 V)
	CPU Units with 32 I/O Points
	01000 to 01007: 40 mA at 4.5 V DC to 300 mA at 20.4 V DC, 300 mA (20.4 to 26.4 V)
	01100 to 01107: 40 mA at 4.5 V DC to 100 mA at 20.4 V DC, 100 mA (20.4 to 26.4 V) (See note.)
	Expansion I/O Units
	01□00 to 01□07: 40 mA at 4.5 V DC to 300 mA at 20.4 V DC, 300 mA (20.4 to 26.4 V)
	01□08 to 01□15: 40 mA at 4.5 V DC to 100 mA at 20.4 V DC, 100 mA (20.4 to 26.4 V) (See note.)
Min. switching capacity	0.5 mA
Max. inrush current	0.9 A for 10 ms (charging and discharging waveform)
Leakage current	0.1 mA max.
Residual voltage	0.8 V max.
ON delay	OUT01000 and OUT01001:20 μs max.
	OUT01002 and up:0.1 ms max.
OFF delay	OUT01000 and OUT01001:40 µs max. for 4.5 to 26.5 V, 10 to 300 mA
	0.1 ms max. for 4.5 to 30 V, 0.5 to 10 mA
	OUT01002 and up:1 ms max.
Fuse	1 fuse for each 2 outputs (The fuse cannot be replaced by the user.)

Item	Specification
Circuit configuration	Sinking Outputs
Item Circuit configuration	Specification Sinking Outputs Understand Sourcing Outputs Sourcing Outputs

Note: Connect dummy resistance as required and maintain the load current between 10 and 150 mA when using 01000 and 01001 for pulse outputs. The ON/OFF response time will increase if the load current is below 10 mA, preventing outputting high-speed pulses. The transistors will heat if the output current is greater than 150 mA, possibly destroying the elements.

CPM2C-S1 0C **CPU Units with CompoBus/S Master**

Ultra-compact CPM2C CPU unit with CompoBus/S master offering high speed remote I/O communication.

- The compact design makes this unit ideal for local control applications. At 40 x 90 x 65 mm (W x H x D) with 10 I/O points and CompoBus/S master offering versatile expandability it is possible to fullfill constrol systems needs.
- A large number of expansion I/O points reduces system construction cost. Up to three Expansion Up to three expansion terminals can be connected to the CPU unit. Furthermore, CompoBus/S remote I/O terminals can be used for expansion I/O points. Not only in-panel wiring but also external wiring is simplified. The miniaturization of the control panel reduces cable, terminal block, and wiring cost.
- Easy system designing, modification, and expansion by CompoBus/S remote I/O terminals. With this high-speed communication bus and no complicated wiring they can be used as expansion terminal blocks with minimal modifications to the system layout as long as room for expansion is reserved at the first designing stage.
- A calendar/clock ensures timed machine control. including data collection and error logs with date and time stamps.





Ordering Information

Unit		Inputs	Outputs	Clock	Model
10 points (6 inputs/4 out-	Connector model	6 points at 24 V DC	4 transistor sinking outputs	Yes	CPM2C-S100C
puts)			4 transistor sourcing outputs	Yes	CPM2C-S110C

Specifications

General Specifications

Item		Specification	
Control method		Stored program method	
I/O control method		Cvclic scan method	
		(Immediate refreshing can be performed with IORF(97).)	
Programming language	ge	Ladder diagram	
Instruction length		1 step per instruction	
5		1 to 5 words per instruction	
Instructions	Basic instructions	14	
	Special instructions	105 instructions, 185 variations	
Execution time	Basic instructions	0.64 μs (LD instruction)	
	Special instructions	7.8 µs (MOV instruction)	
Program capacity		4.096 words	
Max. I/O capacity		CPU Unit only: 10 points	
		Expansion I/Ó Unit: 96 points (32-point Expansion I/O Unit x 3)	
		(Up to 3 Expansion Units can be connected.)	
		CompoBus/S: 256 points (362 points in total)	
Input bits		IR 00000 to IR 00915	
0		(Bits not used for input bits can be used for work bits.)	
Output bits		IR 01000 to IR 01915	
		(bits not used for output bits can be used for work bits.)	
CompoBus/S input bi	IS	128 bits: IH 02000 to IH 02/15 (Words IH 020 to IH 02/)	
CompoBus/S output t	DITS	128 bits: IH 03000 to IH 03/15 (words IH 030 to IH 03/)	
WORK DITS		6/2 Dits: IR U2800 to IR 02915 (words IR 028 to IR 029)	
		III B 2000 to IB 22715 (words IB 200 to IB 227)	
Special bits (SR area))	440 bits: SB 22800 to SB 25507 (words SB 228 to SB 255)	
Temporary bits (TR a	rea)	8 bits: (TB 0 to TB 7)	
Holding bits (HB area)	320 bits: HB 0000 to HB 1915 (words HB 00 to HB 19)	
Auxiliary bits (AB area	a)	384 bits: AB 0000 to AB 2315 (words AB 00 to AB 23)	
	~)	These include CompoBus/S slave status flags (words AR 04 to AR 07).	
Link bits (LR area)		256 points: LR 0000 to LR 1515 (words LR 00 to LR 15)	
Timers/Counters		256 timers/counters: TIM/CNT 000 to TIM/CNT 255	
		1-ms timers: TMHH ()	
		10-ms timers: TIMH (15)	
		100-ms timers TIM	
		1-s/10-s timers: I IML ()	
		Decrementing counters: CNI	
Data momon/	Pood/Mrito		
Data memory	neau/ winte	The Error Log is contained in DM 2000 to DM 2021	
	Bead only	456 words (DM 6144 to DM 6599)	
	PC Setun	56 words (DM 6600 to DM 6655)	
Basic interrunt func-	Interrunt inputs	20 interrupts (I lead for both counter mode interrupts inputs and quick-response inputs	
tions	Scheduled interrunts	L'interrupto (occurror bour counter mode interrupto inputo and quick response inputo.	
High-speed counter	High-speed counters	i counter (sinde phase at 20 kHz or 2 phases at 5 kHz)	
functions	Counter interrunts	i intervini (set value comparison or setvalue range comparison)	
		2 interrupt (Seed for both external interrupt inputs and quick response inputs)	
	(counter mode)		
	Count-up interrupts	2 interrupts (Used for both external interrupts inputs and quick-response inputs)	
Quick-response input	s	2 points (closed for both external interrupts inputs and counter mode interrupt inputs)	
adion rooponoo mpat	•	Min. input pulse width: 50 µs max.	
Pulse output		2 points with no acceleration/deceleration.	
		10 Hz to 10 kHz each, and no direction control: 1 point with trapezoid acceleration/deceleration,	
		10 Hz to 10 kHz with direction control: or 2 points with variable duty-ratio outputs	
Synchronized pulse c	ontrol	1 point	
Input time constant		Can be set for CPU Unit inputs and Expansion Unit inputs only	
(ON response time = OFF response time)		(1, 2, 3, 5, 10, 20, 40, or 80 ms)	
Clock		Equipped with clock (built-in RTC)	
Communications func	tions	Peripheral port: Supports Host Link, peripheral bus, no-protocol communications, and Programming Console connec-	
		juons. DS 2220 parti Supporte Heat Link, no protocol communications, d.te.d.Link, e.d.te.d.NT Link, communications,	
Dowor foilure boolure	function	Data is HP. A.P. Counter (CNT) and Data Memory (DN) across is held.	
Momentu hardware	TUTICUOT	Data III IIIn, AID, OUUITIET (UNT), and Data METHOTY (DM) areas is field.	
метогу раскир		Inon-volaure (liash) memory: Program, read-only Divi area, and PC Setup	
Colf diagonatia for ti		Internory backup (intrium battery: 2 years inetime): Divi area, HH area, AH area, and counter values	
Self-diagnostic function	ons	bus errors, battery errors, and expansion I/O	
Program chools		No END instruction, programming errors (checked when operation is started)	
r iogiani check			

Programmable Controllers

Item		Specification
Programming devic-	Programming	C200H-PRO27, CQM1-PRO01, or CQM1H-PRO01
es	Console	
	CX-One	Windows 2000 / XP

Note: Connecting Cable (CPM2C-CN111, CS1W-CN114, or CS1W-CN118) is required to connect to the communications peripheral /RS-232C port.

Communications Specifications

Communications method		Special CompoBus/S protocol		
Coding method		Manchester coding		
Connection form		Combination of multi-drop method and T-branch connections (see note 1)		
Baud rate		High-speed Communications Mode: 750 kbps Long-distance Communications Mode: 93.75 kbps (see note 2)		
Communications cycle	High-speed	0.5 ms (with 8 input and 8 output slaves connected)		
time	Communications Mode	0.8 ms (with 16 input and 16 output slaves connected)		
	Long-distance Commu-	4.0 ms (with 8 input and 8 output slaves connected)		
	nications Mode	6.0 ms (with 16 input and 16 output slaves connected)		
Communications media		2-conductor cable (VCTF 0.75 x 2), 4-conductor cable (VCTF 0.75 x 4), or Special Flat Cable		
Communications dis- tance High-speed Communications Mode		2-conductor VCTF cable: Main line length:100 m max. Branch line length:3 m max. Total branch line length:50 m max. Special Flat Cable, 4-conductor VCTF cable: Main line length:30 m max. Branch line length:3 m max. Total branch line length:30 m max. (When Special Flat Cable is used to connect fewer than 16 Slaves, the main line can be up to 100 m long and the total branch line length can be up to 50 m.)		
	Long-distance Commu- nications Mode	2-conductor VCTF cable: Main line length:500 m max. Branch line length:6 m max. Total branch line length:120 m max. Special Flat Cable, 4-conductor VCTF cable: Variable branch wiring (total cable length 200 m max.) (There are no limits on the branching format or main, branch, or total line lengths. The terminator must be connected to the point in the system farthest from the master.)		
Maximum number of no	des	32		
Error control checks		Manchester code check, frame length check, and parity check		

Note: 1. A terminator must be connected to the point in the system farthest from the Master.

2. The baud rate is switched using DM settings (default setting is 750 kbps).

Dimensions

Note: All units are in millimeters unless otherwise indicated.



Note: Refer to CPM2C-S Programmable Controller Operation Manual (W377) for detailed specifications.

CPM2C-S100C-DRT

Programmable Slave PLC

Multi-functional programmable slave for distributed control

A part of an installation consisting of sensors, actuators and control is handled as one DeviceNet slave.

The distribution of device control enables the production of standard units with standardized programs and decreasing the load on the system master PLC. Conventional distributed I/O control networks do not allow I/O checks or operation checks until all devices on the networks are assembled and connected. Programmable slaves, however, allow I/O and operation checks

on any distributed unit independently.

- DeviceNet slave functionality Supports multi-word I/O links and explicit message communication, making it possible for the master to control the data of all the slaves on the network. Data that does not need immediate transmission, such as log data, can be transmitted in blocks using
- explicit message communication.
 CompoBus/S master functionality Connects to remote signal lights, pushbutton switches, terminal blocks, and pneumatic valves from other companies over VCTF or easy-to-branch flat cable.
- RS-232C Communications Barcodereaders and PTs can be connected to serial port. The data then will be processed locally and thus reduces the load on the central controlling PLC.
- Expansion unit (Up to three units) A wide variaty of different expansion units is available to fit the application needs.





Ordering Information

Unit		Inputs	Outputs	Clock	Model
10 points (6 inputs/4 out-	Connector model	6 points at 24 V DC	4 transistor sinking outputs	Yes	CPM2C-S100C-DRT
puts)			4 transistor sourcing outputs	Yes	CPM2C-S110C-DRT
puts)		•	4 transistor sourcing outputs	Yes	CPM2C-S110C-DRT

Specifications

General Specifications

Item		Specification			
Control method		Stored program method			
I/O control method		Cyclic scan method (Immediate refreshing can be performed with IORF(97).)			
Programming language	ge	Ladder diagram			
Instruction length		1 step per instruction			
	•	1 to 5 words per instruction			
Instructions	Basic instructions	14			
	Special instructions	105 instructions, 185 variations			
Execution time	Basic instructions	0.64 µs (LD instruction)			
	Special instructions	7.8 μs (MOV instruction)			
Program capacity		4,096 words			
Max. I/O capacity		CPU Unit only: 10 points Expansion I/O Unit: 96 points (32-point Expansion I/O Unit x 3) (Up to 3 Expansion Units can be connected.) CompoBus/S: 256 points (362 points in total)			
Input bits		R 00000 to IR 00915 Bits not used for input bits can be used for work bits.)			
Output bits		its not used for input bits can be used for work bits.) 1 01000 to IR 01915 bits not used for output bits can be used for work bits.)			
CompoBus/S input bi	ts	128 bits: IR 02000 to IR 02715 (words IR 020 to IR 027)			
CompoBus/S output I	bits	128 bits: IR 03000 to IR 03715 (words IR 030 to IR 037)			
Work bits		672 bits:IR 02800 to IR 02915 (words IR 028 to IR 029) IR 03800 to IR 03915 (words IR 038 to IR 039) IR 04000 to IR 04915 (words IR 040 to IR 049) IR 20000 to IR 22715 (words IR 200 to IR 227)			
Special bits (SR area)	440 bits: SR 22800 to SR 25507 (words SR 228 to SR 255)			
Temporary bits (TR a	rea)	8 bits: (TR 0 to TR 7)			
Holding bits (HR area	ı)	320 bits: HR 0000 to HR 1915 (words HR 00 to HR 19)			
Auxiliary bits (AR are	a)	384 bits: AR 0000 to AR 2315 (words AR 00 to AR 23) These include CompoBus/S slave status flags (words AR 04 to AR 07).			
Link bits (LR area)		256 points: LR 0000 to LR 1515 (words LR 00 to LR 15)			
Timers/Counters		256 timers/counters: TIM/CNT 000 to TIM/CNT 255 1-ms timers: TIMH (-) 10-ms timers: TIMH (15) 100-ms timers: TIM 1-s/10-s timers: TIML () Decrementing counters: CNT Reversible counters: CNTR (12)			
Data memory	Read/Write	2,048 words (DM 0000 to DM 2047) The Error Log is contained in DM 2000 to DM 2021.			
	Read only	456 words (DM 6144 to DM 6599)			
	PC Setup	56 words (DM 6600 to DM 6655)			
DeviceNet slave functions		DeviceNet Remote I/O Link No. of I/O Link points: 1,024 max. Explicit message communications Any PC data area can be accessed from the master.			
Basic interrupt func-	Interrupt inputs	2 interrupts (Used for both counter mode interrupts inputs and quick-response inputs.			
tions	Scheduled interrupts	1 interrupt			

Item		Specification		
High-speed counter	High-speed counters	1 counter (single phase at 20 kHz or 2 phases at 5 kHz)		
functions	Counter interrupts	1 interrupt (set value comparison or set-value range comparison)		
	Interrupt inputs (counter mode)	2 interrupts (Used for both external interrupts inputs and quick-response inputs.)		
	Count-up interrupts	2 interrupts (Used for both external interrupts inputs and quick-response inputs.)		
Quick-response inpu	ts	2 points (Used for both external interrupts inputs and counter mode interrupt inputs.) /in. input pulse width: 50 μs max.		
Pulse output		2 points with no acceleration/deceleration, 10 Hz to 10 kHz each, and no direction control: 1 point with trapezoid acceleration/deceleration, 10 Hz and 10 kHz with no direction control: or 2 points with variable duty-ratio outputs		
Synchronized pulse control		1 point		
Input time constant (ON response time = OFF response time)		Can be set for CPU Unit inputs and Expansion Unit inputs only (1, 2, 3, 5, 10, 20, 40, or 80 ms)		
Clock		Equipped with clock (built-in RTC)		
Communications fun	ctions	Peripheral port: Supports Host Link, peripheral bus, no-protocol communications, and Programming Console connec- tions. RS-232C port: Supports Host Link, no-protocol communications, 1-to-1 Link, or 1-to-1 NT Link connections.		
Power failure backup	function	Data in HR, AR, Counter (CNT), and Data Memory (DM) areas is held.		
Memory backup		Non-volatile (flash) memory: Program, read-only DM area, and PC Setup		
		Memory backup (lithium battery: 2 years lifetime): DM area, HR area, AR area, and counter values		
Self-diagnostic functions		CPU error (watchdog timer), memory errors, communications errors, setting errors, battery errors, and expansion I/O bus errors		
Program check		No END instruction, programming errors (checked when operation is started)		
Programming devices	Programming Console	C200H-PRO27, CQM1-PRO01, or CQM1H-PRO01		
	CX-One	Windows 2000 / XP		

Note: Connecting Cable (CPM2C-CN111, CS1W-CN114, or CS1W-CN118) is required to connect to the communications peripheral /RS-232C port.

Communications Specifications

DeviceNet

Communications protocol		DeviceNet		
Connection form		Combination of multi-drop and T-branch connections (see note 1)		
Baud rate 500, 250, or 125 kbps (switchable)		500, 250, or 125 kbps (switchable)		
Communications media		Special 5-conductor cable (2 signal lines, 2 power supply lines, and 1 shield line)		
Communications dis- tance	Baud rate	500 kbps: Max. network length (see note 2):100 m max. (see note 3) Main line length:6 m max. Total branch line length:39 m max. 250 kbps: Max. network length (see note 2):250 m max. (see note 3) Main line length:6 m max. Total branch line length:78 m max. 125 kbps: Max. network length (see note 2):500 m max. (see note 3) Main line length:6 m max. Total branch line length:156 m max.		
Max. number of connecting nodes		64 (63 slaves and 1 master)		
Error control checks		CRC error, node address duplication check, and scan list verification		

Note: 1. A terminator must be connected to both ends of the trunk line.

2. The maximum network length is the lenght of the trunk line.

3. When Thin Cable is used for the main line, the main line must be 100 m or less in length.

CompoBus/S

Communications method		Special CompoBus/S protocol			
Coding method		Manchester coding			
Connection form		Combination of multi-drop method and T-branch connections (see note 1)			
Baud rate		High-speed Communications Mode: 750 kbps Long-distance Communications Mode: 93.75 kbps (see note 2)			
Communications cycle	High-speed Communi-	0.5 ms (with 8 input and 8 output slaves connected)			
time	cations Mode	0.8 ms (with 16 input and 16 output slaves connected)			
	Long-distance Commu-	4.0 ms (with 8 input and 8 output slaves connected)			
	nications Mode	6.0 ms (with 16 input and 16 output slaves connected)			
Communications media		2-conductor cable (VCTF 0.75 x 2), 4-conductor cable (VCTF 0.75 x 4), or Special Flat Cable			
Communications dis- tance	High-speed Communications Mode	2-conductor VCTF cable: Main line length:100 m max. Branch line length:3 m max. Total branch line length:50 m max. Special Flat Cable, 4-conductor VCTF cable: Main line length:30 m max. Branch line length:3 m max. Total branch line length:30 m max. (When Special Flat Cable is used to connect fewer than 16 Slaves, the main line can be up to 100 m long and the total branch line length can be up to 50 m.)			
	Long-distance Commu- nications Mode	2-conductor VCTF cable: Main line length:500 m max. Branch line length:6 m max. Total branch line length:120 m max. Special Flat Cable, 4-conductor VCTF cable: Variable branch wiring (total cable length 200 m max.) (There are no limits on the branching format or main, branch, or total line lengths. The terminator must be connected to the point in the system farthest from the master.)			
Maximum number of nodes		32			
Error control checks		Manchester code check, frame length check, and parity check			

Note: 1. A terminator must be connected to the point in the system farthest from the Master.

2. The baud rate is switched using DM settings (default setting is 750 kbps).

Dimensions

Note: All units are in millimeters unless otherwise indicated.



Note: Refer to CPM2C-S Programmable Controller Operation Manual (W377) for detailed specifications.

AC Power Supply Unit

• The CPM2C-PA201 is a slim and compact AC Power Supply Unit of the same shape as the CPM2C's CPU Unit. It can be connected simply using the connecting cable (23 cm) provided. It can also be used for CPM1A and CPM2A CPU Units and as display power supply (wired by the user).



Service power supply for external devices such as sensors (24 V).





Specifications

Item			Specification	
Rated output			15 W	
Output voltage			24 V	
Output current			600 mA	
Efficiency			75% min. (at rated output)	
Input conditions	Rated voltage		100 to 240 V AC	
	Allowable voltage range		85 to 264 V AC	
	Frequency		47 to 63 Hz	
	Current	100 V	0.4 A	
		200 V	0.2 A	
	Leakage current	100 V	0.5 mA max. (at rated output)	
		200 V	1 mA max. (at rated output)	
	Inrush current	100 V	15 A max. (at 25°C cold start)	
		200 V	30 A max. (at 25°C cold start)	
Output	Output voltage accura	су	10%/–15% (including input, load, and temperature fluctuations)	
characteristics	Minimum output curre	nt	30 mA	
	Ripple noise voltage		2% (p-p) max.	
	Input fluctuation		0.75% max.	
	Load fluctuation		4% max.	
	Temperature fluctuation		0.05%/°C max.	
	Startup time		300 ms max. (at input voltage of 100 V AC or 200 V AC and the rated output)	
	Output hold time		10 ms (at input voltage of 100 V AC or 200 V AC and the rated output)	
Overcurrent protection			Self-resetting, operates at 105% to 335% of the rated current, suspended and independent operation	
Overvoltage protection			None	
Ambient operating temp	perature		0° to 55°C	
Ambient storage tempe	rature		-20° to 70°C (no condensation or icing)	
Ambient operating hum	idity		10% to 90% (no condensation)	
Dielectric strength			2,000 V for 1 min between all inputs and GR Leakage current: 10 mA 3,000 V for 1 min between all inputs and all outputs Leakage current: 10 mA 1,000 V for 1 min between all outputs and GR Leakage current: 10 mA	
Insulation resistance			100 M Ω min. at 500 V DC between all outputs and any input, and between all outputs and GR	
Vibration resistance			10 to 57 Hz, amplitude, 57 to 150 Hz, acceleration: 9.8 m/s ² in X, Y, and Z directions for 80 minutes according (Time coefficient: 8 minutes × coefficient factor 10 = total time 80 min.)	
Shock resistance			147 m/s ² 3 times each in X, Y, and Z directions	
Noise terminal voltage			FCC class A	
Weight			250 g max.	

Analog I/O Unit

- Up to four CPM2C-MAD11 Analog I/O Units can be connected to the CPM2C. Each Unit provides 2 analog inputs and 1 analog output, i.e., up to 8 analog inputs and 4 analog outputs can be supported by one CPM2C.
- Example Application: Packaging Machines



Specifications

ltem		Voltage I/O	Current I/O		
Analog	Number of inputs	2 (allocated 2 words)	ouncill vo		
inputs	Input signal ranges	0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V	0 to 20 mA, 4 to 20 mA		
	Maximum rated input	±15 V	±30 mA		
	External input impedance	1 MΩ min.	Approx. 250 Ω		
	Resolution	1/6,000 (full scale)			
	Overall precision	25°C:±0.3% of full scale	25°C:±0.4% of full scale		
		0 to 55°C:±0.6% of full scale	0 to 55°C:±0.8% of full scale		
	Converted A/D data	Binary data (4-digit hexadecimal) –10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale	•		
	Averaging	Supported (set for each input with DIP switch)			
	Disconnected line detection	Supported			
Analog	Number of outputs	1 (allocated 1 word)			
output	Output signal ranges	1 to 5 V, 0 to 10 V, -10 to 10 V	0 to 20 mA, 4 to 20 mA		
	External output allowed load resistance	1 kΩ min.	600 Ω max.		
	External output impedance	0.5 Ω max.			
	Resolution	1/6,000 (full scale)			
	Overall precision	25°C:±0.4% of full scale			
		0 to 55°C:±0.8% of full scale			
	D/A data setting	Binary data (4-digit hexadecimal) -10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale			
Conversio	n time	2 ms/point (6 ms/all analog I/O)	2 ms/point (6 ms/all analog I/O)		
Isolation method		Photocoupler isolation between analog I/O and isolated.)	Photocoupler isolation between analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)		
Power cor	nsumption	3.5 W	3.5 W		
Weight		200 g max.			

CPM2C-TS001/-TS101

Temperature Sensor Units

- Up to four CPM2C-TS001/TS101 Temperature Sensor Units can be connected to the CPM2C. Each Unit provides 2 input points for temperature sensors, including thermocouples or temperature resistance thermometers, i.e., up to 8 temperature sensors can be input to one CPM2C.
- Application Examples: Foodstuff Equipment and Packaging Machines



Specifications

General

Item	CPM2C-TS001	CPM2C-TS101	
Temperature sensor	Thermocouple	Temperature resistance thermometer	
Input types	K or J selectable (The same input type must be used for all inputs.) Pt100, JPt1100 selectable (The same input type must all inputs.)		
Number of inputs	2 (2 words allocated)	•	
Accuracy	$\pm 0.5\%$ or $\pm 2^\circ C$ of the stored value whichever is larger \pm 1 digit max. (see note)	. ±0.5% or ±1°C of the stored value whichever is larger (see note 1 digit max.	
Conversion cycle	250 ms/2 inputs	•	
Converted temperature data	Binary data (4-digit hexadecimal)		
Isolation method	Photocoupler isolation between input signals		
Power consumption	1.5 W		
Weight	200 g max.		

Note: Accuracy for K thermocouples at temperatures less than $-100^{\circ}C$: $\pm 4^{\circ}C \pm 1$ digit max.

Input Temperature Ranges for CPM2C-TS001

The input type is selected with a rotary switch. The ranges for each of the input types are shown in the following table.

Item	Range in °C	Range in °F
К	-200 to 1,300	-300 to 2,300
	0.0 to 500.0	0.0 to 900.0
J	-100 to 850	-100 to 1,500
	0.0 to 400.0	0.0 to 750.0

Input Temperature Ranges for CPM2C-TS101

The input type is selected with a rotary switch. The ranges for each of the input types are shown in the following table.

Item	Range in °C	Range in °F
Pt100	-200.0 to 650.0	-300 to 1,200.0
JPt100	-200.0 to 650.0	-300 to 1,200.0

Simple Communications Unit

Easy initial settings enable data exchange between the CPM2C and components.

System Configuration



E5GN Temperature Controller K3GN Digital Panel Meter H8GN Electronic Timer/Counter

Connectable Devices

A Wide Range of Devices Supporting CompoWay/F or SYSWAY Communications

Classification	Product	Model	SYSWAY	SYSWAY		Remarks
				Segments		
Controllers	Temperature Controllers	E5GN	Yes	1	Yes	
		E5CN	Yes	1	Yes	
		E5EN	Yes	1	Yes	
		E5AN	Yes	1	Yes	
	Modular Temperature Controller	E5ZN	No		Yes	
	Digital Controllers	E5CK	Yes	1	No	
		E5EK	Yes	1	No	
		E5AK	Yes	1	No	
	Digital Controllers for control valves	E5EK	Yes	1	No	Valve system com-
		E5AK	Yes	1	No	munications not supported.
	Digital Controller, basic type	E5CK-T	No		No	
		E5EK-T	No		No	
		E5AK-T	No		No	
	Digital Controllers for control valves, programmable	E5EK-T	No		No	
		E5AK-T	No		No	
	Temperature Controllers	E5EJ	Yes	1	No	
		E5AJ	Yes	1	No	
	Fuzzy Temperature Controller	E5AF	Yes	1	No	
Timers	Electronic Timer/Counter	H8GN	No		Yes	

Classification	Product	Model	SYSWAY	SYSWAY		Remarks
				Segments		
Digital Panels	Digital Panel Meter	K3GN	No		Yes	
	Process Meter	K3NX	Yes	2	Limited	Some commands cannot be used with some models (op- tions). Only the Com- poWay/F variable area can be read.
	Weighing Meter	K3NV	Yes	2	Limited	
	Frequency/Rate Meter	K3NR	Yes	2	Limited	
	Period Meter	K3NP	Yes	2	Limited	
	Up/Down Counter Meter	K3NC	Yes	2	Limited	
	Temperature Meter	K3NH	Yes	2	Limited	
	Intelligent Signal Processor	КЗТЅ	Yes	2	No	SYSWAY communi- cations only (See note 2.)

Limited: Connection possible for limited functions.

- Note: 1. SYSWAY segment 1 and SYSWAY segment 2 can be combined.
 - 2. When a K3TS is connected, connect the other components via SYSWAY as well.

Component Parameters Supported for Communications

The communications protocol for components can be set in the CPM2C's DM Area to CompoWay/F or SYSWAY. The data that can be read and written depends on the protocol that is set.

CompoWay/F

Reading and writing is possible for all component data (except for some Digital Panel Meters). The amount of data that can be read/written in one operation per component is limited to 12 data items for reading and 12 data items for writing. Reading and writing is enabled by setting the address for each parameter in DM.

SYSWAY

Reading and writing is possible for the data shown in the following table.

Segment	Read/write	Item	Command group				
			1	2	3	4	5
1: Controllers	Read	Present temperature	Yes	Yes	Yes	Yes	Yes
		Status	Yes	Yes	Yes	Yes	Yes
		Temperature set value	Yes	Yes	Yes	Yes	Yes
		Alarm 1 set value			Yes	Yes	Yes
		Alarm 2 set value			Yes	Yes	Yes
		Proportional band				Yes	Yes
		Integral time				Yes	Yes
		Derivative time				Yes	Yes
		Heater current					Yes
		Heater current status					Yes
	Write	Temperature set value	Yes	Yes	Yes	Yes	Yes
		Operation command		Yes	Yes	Yes	Yes
		Alarm 1 set value			Yes	Yes	Yes
		Alarm 2 set value			Yes	Yes	Yes
		Proportional band				Yes	Yes
		Integral time				Yes	Yes
		Derivative time				Yes	Yes
		Heater burnout detection val-					Yes
		ue					
2: Digital Meters	Read	Display value	Yes	Yes	Yes	Yes	Yes
		Display status	Yes	Yes	Yes	Yes	Yes
		Peak hold		Yes	Yes		Yes
		Peak hold status		Yes	Yes		Yes
		Bottom hold		Yes	Yes		Yes
		Bottom hold status		Yes	Yes		Yes
		HH comparison value				Yes	Yes
		H comparison value				Yes	Yes
		L comparison value				Yes	Yes
		LL comparison value				Yes	Yes
	Write	Operation command			Yes		Yes
		HH comparison value				Yes	Yes
		H comparison value				Yes	Yes
		L comparison value				Yes	Yes
		LL comparison value				Yes	Yes

The command groups for which reading or writing is performed are determined by settings in the DM area.

Programmable Controllers

Specifications

General

Item		Specification			
Applicable PLC		CPM2C			
RS-485/422 (top port)	Maximum number of connectable compo- nents	32			
	Component connection port	Components connected to RS-485/422 terminal block. Connected to CPM2C CPU Unit via peripheral port (see diagram below).			
	Baud rate for connection to components	9.6, 19.2, 38.4, or 57.6 kbps			
	Baud rate for connection to CPU Unit	9.6 or 19.2 kbps			
RS-232C (bottom port)	Signal conversion	Output from CPU Unit's RS-232C interface with no conversion			
	Communications functions	One of the following: Host Link, no-protocol, 1:1 Link, 1:1 NT Link			
Power supply		From CPU Unit			
Power consumption		1 W			
Weight		150 g max.			

System Configuration

Internal



СРМ2С-СІF 1(-V1) RS-232C / RS-422 / RS-485 Adapter Units

System Configuration

External Configuration



Internal Configuration



Note: When using the CS1W-CN226/CN626 Connecting Cable for personal computer connection, turn ON the switch.



CPM2C-CIF11

Note: A Programming Console cannot be connected to the RS-422 port.

Specifications

General

Item		Specification					
		CPM2C-CIF01-V1	CPM2C-CIF11				
Upper port	Signal con- version	Outputs signals from the CPU Unit's CMOS interface without conver- sion, or converts CMOS level (CPU Unit side) to RS-232C (connected device side).	Converts CMOS level (CPU Unit side) to RS-422 or RS-485 (connected device side). The externally connected device is insulated				
	Function	Host Link, peripheral bus, no-protocol, or Programming Console connections.	Host Link, peripheral bus, or no-protocol connections.				
Lower	Signal con-	Outputs signals from the CPU Unit's CMOS interface without conver-	Outputs signals from the CPU Unit's CMOS interface without conver-				
port	version	sion.	sion.				
	Function	Host Link, no-protocol, 1:1 Link, or 1:1 NT Link connections.	Host Link, no-protocol, 1:1 Link, or 1:1 NT Link connections.				
Power su	ipply	Power supplied from CPU Unit.					
Current consumption		0.3 A max. at 5 V					
Weight		150 g max.					

Note: Neither the CPM2C-CIF01-V1 nor the CPM2C-CIF11 can be used with any PLC other than the CPM2C. A CPM2C-CIF11 or another CPM2C-CIF01-V1 cannot be connected to the CPM2C if a CPM2C-CIF01-V1 is already connected to it.
CPM2C-SRT21

CompoBus/S I/O Link Unit

I/O Link Unit for CPM2C

- Operates as a Slave of the CompoBus/S Master Unit.
- Exchanges eight inputs and eight outputs with the Master.



Ordering Information

CompoBus I/O Link Unit

Name	Specifications	Model
CompoBus/S I/O Link Unit	Number of points for I/O links: 8 inputs and 8 outputs	CPM2C-SRT21

Application Examples

Conveyor Line

Processing speed can be increased and system setup labor reduced by creating a distributed system with a CPM2C at each conveyor.



Specifications

literes	
item	CPM2C-SR121
Master/Slave	CompoBus/S Slave
Number of I/O points	8 inputs and 8 outputs
Number of words occupied in CPM2C's I/O	1 input word and 1 output word (allocated in the same way as for other Expansion Units)
memory	
Node address setting	DIP switch
Power consumption	1 W
Weight	150 g

Note: For details of CPM2C PLCs, refer to the CPM2C catalog (Cat. No. P049).

CPM2C General Information

System Configuration



Unit Model number Inputs Outputs CPU Unit CPM2C-20CDTC-D IR 000 IR 010 CPM2C-24EDTC Expansion I/O Unit IR 001 IR 011 CPM2C-16ETC Expansion Output Unit IR 012 Analog I/O Unit CPM2C-MAD11 IR 002 IR 013 IR 003 Temperature Sensor Unit CPM2C-TS001 IR 004 IR 005 CompoBus/S I/O Link Unit CPM2C-SRT21 IR 014 IR 006

CPU Unit

Number of Connectable Units

Up to 5 Units can be connected to a CPM2C CPU Unit except for the CPM2C-S1 OC-DRT Programmable Slave and CPM2C-S1 OC CompoBus/S Master Unit, which are limited to 3 Units. The number of words that can be used by Expansion Units, however, is limited, and these limits must not be exceeded.

Model	Max. No. of Units	Applicable I/O words
CPU Units except those listed below	5	Inputs: IR 001 to IR 009 (CPU Unit uses IR 000) Outputs: IR 011 to IR 019 (CPU Unit uses IR 010)
CPU Units with 32 I/O points (CMP2C-32CDT□C-D)	5	Inputs: IR 002 to IR 009 (CPU Unit uses IR 000 and IR 001) Outputs: IR 012 to IR 019 (CPU Unit uses IR 010 and IR 011)
CPM2C-S1□OC-DRT Pro- grammable Slave and CPM2C-S1□OC CompoBus/ S Master Unit	3	Inputs: IR 001 to IR 009 (CPU Unit uses IR 000) Outputs: IR 011 to IR 019 (CPU Unit uses IR 010)

Number of I/O Words Allocated to Expansion Units

Unit	Model number	Input words	Output words
Expansion Input Units	CPM2C-8ED	1	
	CPM2C-16ED	1	
Expansion Output Units	CPM2C-8ER		1
	CPM2C-8ET(1)		1
	CPM2C-16ET(1)		1
Expansion I/O Units	CPM2C-10EDR	1	1
	CPM2C-24EDT(1)	1	1
Expansion I/O Units	CPM2C-20EDR	1	1
	CPM2C-32EDT(1)	1	1
Analog I/O Unit	CPM2C-MAD11	2	1
Temperature Sensor Units	CPM2C-TS001	2	
	CPM2C-TS101	2	
CompoBus/S I/O Link Unit	CPM2C-SRT21	1	1

Note: 1. An AC Power Supply Unit can be used for the CPU Units.

2. The CPM2C-CIF01-V1/CIF11/CIF21 can be used with the CPU Units

CPM2C Power Consumption

Use the following power consumption tables to calculate the total power capacity required when using a CPM2C PC. The rated output for the CPM2C-PA201 AC Power Supply Unit is 15 W. Any surplus power not required for the PC directly can be used as service power supply for sensors and other devices.

CPM2C Power Supplies

CPU Unit	Power consumption (W)	
CPM2C-10C(1)DR-D	4	
CPM2C-20C(1)DR-D	4	
CPM2C-S1D0C-DRT1	3	
CPM2C-S1D0C	3	
CPM2C-10C(1)DT(1)□-D	3	
CPM2C-20C(1)DT(1)□-D	3	
CPM2C-32C(1)DT(1)□-D	3	

The power consumption of the CPU Unit includes power for the Programming Consoles and Adapter Units.

Add the following consumptions when using Expansion I/O Units.

Expansion I/O Unit	Power consumption (W)
CPM2C-10EDR	1
CPM2C-20EDR	2
CPM2C-24EDT(1)	1
CPM2C-32EDT(1)	1
CPM2C-MAD11	3.5
CPM2C-SRT21	1
CPM2C-TS001/002	1.5
CPM2C-8ED / 16ED	1
CPM2C-8ER	2
CPM2C-8ET(1)□/16ET(1)□	1

Dimensions

CPU Units

CPU Units with Relay Outputs (CPM2C-10C(1)DR-D, CPM2C-20C(1)DR-D)



CPU Units with Relay Outputs (CPM2C-S1□0C)





Note: All dimensions are in mm.

CPU Units with Transistor Outputs (CPM2C-10C(1)DT(1)C-D, CPM2C-10C(1)DT(1)M-D, CPM2C-20C(1)DT(1)C-D, CPM2C-20C(1)DT(1)M-D, CPM2C-32CDT(1)C-D, CPM2C-32CDT(1)M-D)





CPU Units with Transistor Outputs (CPM2C-S1□0C-DRT)





I/O Expansion Units

Units with Relay Outputs (CPM2C-8ER, CPM2C-10EDR, CPM2C-20EDR)







Units with Transistor Outputs

(CPM2C-24EDT(1)C, CPM2C-24EDT(1)M, CPM2C-32EDT(1)C, CPM2C-32EDT(1)M)



Units with Transistor Outputs Only and Units with Inputs Only (CPM2C-8ED(1), CPM2C-8ET(1)C, CPM2C-8ET(1)M, CPM2C-16ED(1), CPM2C-16ET(1)C, CPM2C-16ET(1)M)

65



Note: All dimensions are in mm.

AC Power Supply Unit (CPM2C-PA201)



Analog I/O Unit (CPM2C-MAD11)







Peripheral/RS-232C Adapter Unit (CPM2C-CIF01-V1)





RS-422/RS-485/RS-232C Adapter Unit (CPM2C-CIF11)



CompoBus/S I/O Link Unit (CPM2C-SRT21)

Temperature Sensor Unit (CPM2C-TS001, CPM2C-TS101)

90

0

33

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0



CPM2C Ordering Information

International Standards

The products shown in the attached tables are those that conform to the UL, CSA, cULus, cUL, NK, Lloyd's Register, and EC Directives as of September 2003.

(U: UL, C: CSA, UC: cULus, CU: cUL, N: NK, L: Lloyd, CE: EC Directives) Please contact OMRON representative for application conditions.

CPM2C CPU Units

CPU Unit		Inputs	Outputs	Internal clock	Model	Standards	
Units with 10 I/O points	I/O terminal	6 inputs	4 relay outputs		CPM2C-10CDR-D	U, C, CE	
	block	(24 V DC)		Yes	CPM2C-10C1DR-D	U, C, CE	
Inputs: 6							
Units with 10 1/0 points	2 Euliteu con-	6 inpute	A sinking transistor outputs				
	nectors	(24 V DC)		Voc			
Inputs: 6		(2.120)	4 sourcing transistor outputs	165			
Outputs: 4				Ves			
	2 Mill connoc	6 inpute	4 sinking transistor outputs	165	CPM2C 10CDTM D		
	tors	(24 V DC)	4 sinking transistor outputs	Voc		0, 0, 0E	
	1010	(211000)		Tes	CPM2C-10CTDTM-D	-	
			4 sourcing transistor outputs			-	
	O to marking a l	10 in muta	4 sourcing transistor outputs	Yes			
Units with 20 1/O points	2 terminal		8 relays		CPM2C-20CDR-D	U, C, CE	
Inputs: 12	DIOCKS	(24 V DC)		Yes	CPM2C-20C1DR-D		
Outputs: 8	2 Fujitsu con-		8 sinking transistor outputs		CPM2C-20CDTC-D	U, C, CE	
	nectors				Yes	CPM2C-20C1DTC-D	U, C, CE
			8 sourcing transistor outputs		CPM2C-20CDT1C-D	U, C, CE	
				Yes	CPM2C-20C1DT1C-D	U, C, CE	
	2 MIL connec-	ec- 12 inputs (24 V DC)	8 sinking transistor outputs		CPM2C-20CDTM-D	U, C, CE	
	tors		8 sinking transistor outputs	Yes	CPM2C-20C1DTM-D		
			8 sourcing transistor outputs		CPM2C-20CDT1M-D		
			8 sourcing transistor outputs	Yes	CPM2C-20C1DT1M-D		
Units with 32 I/O points	2 Fujitsu con-	16 inputs	16 sinking transistor outputs		CPM2C-32CDTC-D	U, C, CE	
	nectors	(24 V DC)	16 sourcing transistor outputs		CPM2C-32CDT1C-D		
Inputs: 16	2 MIL connec-	16 inputs	16 sinking transistor outputs		CPM2C-32CDTM-D	U, C, CE	
	tors	(24 V DC)	16 sourcing transistor outputs		CPM2C-32CDT1M-D		
Programmable Slave with De-	1 Fujitsu con-	6 inputs	4 sinking transistor outputs	Yes	CPM2C-S100C-DRT	U, C, CE	
viceNet slave and CompoBus/S	nector	(24 V DC)	4 sourcing transistor outputs	Yes	CPM2C-S110C-DRT		
Master, 10 I/O points							
Inpute: 6							
Outputs: 4							
Units with CompoBus/S Master	1 Eujitsu con-	6 inputs	4 sinking transistor outputs	Yes	CPM2C-S100C	U.C.CE	
10 I/O points	nector	(24 V DC)	4 sourcing transistor outputs	Ves	CPM2C-S110C	0, 0, 02	
,		/		100			
Inputs: 6							
Outputs: 4							

Power Supply Unit

Unit	Input	Output	Model	Standards
AC Power Supply Unit	100 to 240 V AC	24 V DC/600 mA	CPM2C-PA201	U, C, CE

Expansion I/O Units

Expansion I/O Unit		Inputs	Outputs	Model	Standards
Units with inputs only	1 Fujitsu connector	8 inputs (24 V DC)		CPM2C-8EDC	U, C, CE
Inputs: 8	1 MIL connector	8 inputs (24 V DC)		CPM2C-8EDM	U, C, CE
Units with inputs only	1Fujitsu connector	16 inputs (24 V DC)		CPM2C-16EDC	U, C, CE
Inputs: 16	1 MIL connector	16 inputs (24 V DC)		CPM2C-16EDM	U, C, CE
Units with relay outputs only	I/O terminal block		8 relay outputs	CPM2C-8ER	U, C, CE
	1 Fujitsu connector		8 sinking transistor outputs	CPM2C-8ETC	U, C, CE
Outputs: 8			8 sourcing transistor outputs	CPM2C-8ET1C	U, C, CE
	1 MIL connector		8 sinking transistor outputs	CPM2C-8ETM	U, C, CE
			8 sourcing transistor outputs	CPM2C-8ET1M	U, C, CE
Units with transistor outputs only	1 Fujitsu connector		16 sinking transistor outputs	CPM2C-16ETC	U, C, CE
			16 sourcing transistor outputs	CPM2C-16ET1C	U, C, CE
Outputs: 8	1 MIL connector		16 sinking transistor outputs	CPM2C-16ETM	U, C, CE
			16 sourcing transistor outputs	CPM2C-16ET1M	U, C, CE
Units with 10 I/O points	1 I/O terminal block	6 inputs (24 V DC)	4 relay outputs	CPM2C-10EDR	U, C, CE
Inputs: 6 Outputs: 4					

Programmable Controllers

Expansion I/O Unit		Inputs	Outputs	Model	Standards
Units with 20 I/O points	1 I/O terminal block	12 inputs (24 V DC)	8 relay outputs	CPM2C-20EDR	U, C, CE
Inputs: 12 Outputs: 8					
Units with 24 I/O points	2 Fujitsu connectors	16 inputs (24 V DC)	8 sinking transistor outputs	CPM2C-24EDTC	U, C, CE
		8 sourcing transistor outputs	CPM2C-24EDT1	U, C, CE	
Inputs: 16	2 MIL connectors	16 inputs (24 V DC)	8 sinking transistor outputs	CPM2C-24EDTM	U, C, CE
Oulpuis: 8			8 sourcing transistor outputs	CPM2C-24EDT1M	U, C, CE
Units with 32 I/O points	2 Fujitsu connectors	16 inputs (24 V DC)	16 sinking transistor outputs	CPM2C-32EDTC	U, C, CE
			16 sourcing transistor outputs	CPM2C-32EDT1C	U, C, CE
Inputs: 16	2 MIL connectors	16 inputs (24 V DC)	16 sinking transistor outputs	CPM2C-32EDTM	U, C, CE
Outputs: 16			16 sourcing transistor outputs	CPM2C-32EDT1M	U, C, CE

Analog I/O Units

Product	Specifications	Model	Standards
Analog I/O Unit	2 analog inputs and 1 analog output	CPM2C-MAD11	CE

Temperature Sensor Unit

Product	Specifications	Model	Standards
Temperature Sensor Unit	2 inputs for thermocouples	CPM2C-TS001	CE
	2 inputs for temperature resistance thermometers	CPM2C-TS101	

CompoBus/S I/O Link Units

Product	Specifications	Model	Standards
CompoBus/S I/O Link Units	I/O Links: 8 inputs, 8 outputs	CPM2C-SRT21	CE

I/O Connectors

(Connectors are not provided with CPU Unit. Select the appropriate ones from the following table. One CPU Unit requires two sets of Connectors.)

Fujitsu Connectors

Connection method	From OMRON		From Fujitsu
Soldered	C500-CE241	1 set	FCN-361J024-AUConnector FCN-360C024-J2Connector Cover
Crimped	C500-CE242		FCN-363J024Housing FCN-363J-AUContacts FCN-360C024-J2Connector Cover
Pressure-welded	C500-CE243		FCN-367J024-AU/F

MIL Connectors

Connection method	Model	Number in box	Specifications
Pressure-welded	XG4M-2030-T	100	Poles: 20

Note: Any commercially available 20-pole (IDC) connectors, according to MIL-C-83503, DIN 41651 or IEC 60603-1 specification, can be used.

Programming Consoles and Cables

Product		Model	Standards
Programming Console (2-m cable attached)		CQM1-PRO01-E	U, C, CE, N
Programming Console (Requires separate cable. See below.)		C200H-PRO27-E	U, C, N, CE
Connecting Cable for connecting CQM1-PRO01-E to a peripheral port		CS1W-CN114	CE
Connecting Cable for C200H-PRO27-E 2-m cable		C200H-CN222	Ν
	4-m cable	C200H-CN422	
Connecting Cable for C200H-PRO27-E allowing direct connection to the CPM2C	2-m cable	CS1W-CN224	CE
CPU Unit	6-m cable	CS1W-CN624	CE

Support Software

Product	Functions	Model	Standards
CX-One	Omron's integrated software for programming and configuration of all control system components, in- cluding PLCs, HMI, drives, temperature controllers and advanced sensors.	CX-ONE-AL□□C-E ^{*1}	

*1 \square = Number of licenses (01, 03, 10)

Product	Model	Standards
Expansion Memory Unit	CPM1-EMU01-V1	
EEPROM (256 K)	EEROM-JD	

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Peripheral Port Adapters and Connecting Cables

Description		Computer port	Length	Model	Standards
Personal Com-		For a D-sub 9-pin port	2 m	CS1W-CN226	CE
puter Connect-			6 m	CS1W-CN626	CE
ing Cables			3.3 m	CQM1-CIF02	U, C, N, L, CE
	Peripheral Port Cable		0.05 m	CS1W-CN114	CE

RS-232C Cables

Product	Computer port	Specifications	Length	Model	Standards
RS-232C Cable	For a D-sub 9-pin port		2 m	XW2Z-200S-V	
			5 m	XW2Z-500S-V	
		Can be used with a periph-	2 m	XW2Z-200S-CV	
	eral bus or Host Link. Use: connector that prevents ESD (electrostatic dis- charge.)	5 m	XW2Z-500S-CV		

Communications Port Connecting Cables

Description	Cable length	Model	Standards
Converts to a Peripheral port and RS-232C port.	0.1 m (about 4")	CPM2C-CN111	CE
Converts to a Peripheral port only.	0.05 m (about 2")	CS1W-CN114	CE
Converts to an RS-232C port only.	0.1 m (about 4")	CS1W-CN118	CE

Simple Communications Unit

Product	Specifications	Model	Standards
Simple Communications Unit	RS-485/RS-232C ports for connection to components	CPM2C-CIF21	U, C, CE

Adapters

Product	Function		Model	Standards
Peripheral/RS 232C Adapter Unit	Peripheral port level conversion		CPM2C-CIF01-V1	
RS-422/RS-485/RS-232C Adapter Unit			CPM2C-CIF11	U, C, CE
Link Adapter	RS-232C to RS-422A	For personal computer connection (Can also be connected to the CPM2A.)	3G2A9-AL004-E	
RS-422A Adapter	conversion	For CPM2A connection (Can also be connected to a personal computer, but re- quires an external 5-V power supply.)	NT-AL001	

Battery

Product	Function	Model	Standards
Battery	Backs up memory in the CPM2C CPU Unit.	CPM2C-BAT01	CE

I/O Terminal Blocks and Connecting Cables

Product	Description	No. of inputs/ outputs	Model	Comments
I/O Terminal Blocks	Slim type with M3 slotted screw ter- minal block	20	XW2D-20G6	For more information refer to "Wiring Systems" on
	Flat cable connector with M2.5 slot- ted screw terminal block	20	XW2B-20G4	page 384
Common terminals (3-tier inputs)			XW2E-20G5-IN16	
Common terminals (2-tier outputs)			XW2C-20G6-IO16	

Product	Cable length		Model	Comments
Special Connecting Cable	With Fujitsu connector	0.5 m	XW2Z-050A	For more information refer to "Wiring Systems" on page 384
		1 m	XW2Z-100A	
	1.5 2 m	1.5 m	XW2Z-150A	
		2 m	XW2Z-200A	
		3 m	XW2Z-300A	
		5 m	XW2Z-500A	
	With MIL connector	2.5 m	G79-025C	
		5 m	G79-050C	

Programmable Controllers

Relay I/O Terminals and Connecting Cables

Product	Mounted relay	I/O points	Processing	Rated voltage	Model	Standards	Output	Fujitsu con- nector	MIL connector								
Relay I/O terminals	G7TC	16 inputs	NPN (– common)	24 V DC	G7TC-ID16			G79-□00C	G79-O□00C								
				100 (110) V AC	G7TC-IA16			G79-□00C	G79-O□00C								
				200 (220) V AC				G79-□00C	G79-O□00C								
		16 outputs	NPN (+ common, sinking output)	24 V DC	G7TC-OC16		Sink	G79-□00C	G79-O□00C								
		16 outputs	PNP (– common, sourcing output)	24 V DC	G7TC-OC16-1		Source	G79-□00C	G79-O□00C								
G6D G3DZ (Power MOS F		8 outputs	NPN (+ common, sinking output)	24 V DC	G7TC-OC08		Sink	G79-□00C	G79-O□00C								
	G6D	16 outputs	NPN (+ common, sinking output)	24 V DC	G70D-SOC16		Sink	G79-□00C	G79-O□00C								
			PNP (– common, sourcing output)	24 V DC	G70D-SOC16-1		Source		G79-I□00C								
	G3DZ (Power MOS FET		NPN (+ common, sinking output)	24 V DC	G70D-FOM16		Sink	G79-□00C	G79-O□00C								
	Relay)		PNP (– common, sourcing output)	24 V DC	G70D-FOM16-1		Source		G79-I□00C								
	G6D						NPN (+ common, sinking output)	24 V DC	G70D-VSOC16		Sink	G79-□00C	G79-O□00C				
	G3DZ (Power MOS FET Relay)								l							NPN (+ common, sinking output)	24 V DC
	(Sold separately) G2R		NPN (+ common, sinking output)	24 V DC	G70A-ZOC16-3		Sink	G79-□00C	G79-O□00C								
	G3R G3RN H3RN		PNP (– common, sourcing output)]	G70A-ZOC16-4		Source		G79-I□00C								

Product	Cable length Model		Model	Comments	
Connecting Cable with connector (1:1)	With Fujitsu connector	1 m	G79-100C	For more information refer	
		1.5 m	G79-150C	to "Wiring Systems" on	
		2 m	G79-200C	page 384	
		3 m	G79-300C		
		5 m	G79-500C		
	With MIL connector	0.25 m	G79-O25C		
		5 m	G79-O50C		
		0.25 m	G79-I25C		
		0.5 m	G79-I50C		

DC Power Supplies

Product	Output voltage/current	Input voltage	Model	Standards
DC Power Supply (3 W)	24 V DC, 0.13 A	85 V AC to 264 V AC	S82K-00324	U, C
DC Power Supply (7.5 W)	24 V DC, 0.3 A	85 V AC to 264 V AC	S82K-00724	U, C
DC Power Supply (15 W)	24 V DC, 0.6 A	85 V AC to 264 V AC	S82K-01524	U, C
DC Power Supply (30 W)	24 V DC, 1.3 A	85 V AC to 264 V AC	S82K-03024	U, C
DC Power Supply (50 W)	24 V DC, 2.1 A	85 V AC to 264 V AC	S82K-05024	U, C

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

In the interest of product improvement, specifications are subject to change without notice.

Compact PLC series

The All-in-One Controller



Combining the processing power and data capacity of the CJ1M series and the built-in digital I/O functionality of the CPM2A series in a compact PLC outline, the CP1H CPU series sets new standards.

With 4 high-speed encoder inputs up to 1 MHz (single phase) and 4 pulse outputs up to 1 MHz (line driver), CP1H CPUs are ideal for positioning and speed control.

Their optional 4 analogue inputs and 2 analogue outputs plus advanced PID control with auto-tuning also make them ideal for continuous control applications.

What's more, expandable with CPM1A I/O units (up to 320 I/O points) and up to two CJ1 Special I/O units or CPU bus units, CP1H CPUs offer a wide range of communication interfaces and advanced I/O units.

Equipped with a USB interface as standard for programming and monitoring, the new CPUs allows up to two serial ports to be plugged in for communication with HMI or field devices. And, of course, they provide 'Smart Platform' communication routing over multiple network layers.

Using CX-One, programs can be created that enable the user to build, configure and program networks, PLCs, HMIs, motion-control systems, drives, temperature controllers and sensors.

The CP1H CPU series has the same architecture as the CS/CJ PLC series, which means programs are compatible for memory allocations and instructions and also support Function Blocks and Structured Text.

High-speed counter / encoder input



Eight Interrupt Inputs

Eight inputs be used as:

- \bullet 50 μs pulse catch inputs
- interrupt inputs
- simple counter inputs (<5 kHz)

Program execution speed

Fast I/O requires fast response, the CJ1M core provides classleading program execution speed.





4 Pulse outputs for precise positioning



- Single-instruction Origin Search Function
- · Positioning with Trapezoidal Acceleration and Deceleration (PLS2 Instruction)



Interrupt Feeding (ACC and PLS2 Instructions)





CP1H-Y CPU Units offer built-in 1-MHz line-driver I/O.

- · Line-driver outputs: Two each for CW and CCW.
- . Line-driver inputs: Two each for phases A, B, and Z. CP1H-Y CPU Units also have 20 normal I/O points (12 inputs and 8 outputs), and can provide 100-kHz high-speed counter inputs for two axes and 100 kHz pulse outputs for two axes.







Serial communications

Two Option Boards can be mounted for RS-232C or RS-422A/485 communications making it easy to simultaneously connect to a PT, and other devices such as Inverters, Temperature controllers, Smart Sensors or Serial PLC link. The standard USB port is used for connection to a personal computer.



Modbus-RTU Easy Master

The Modbus-RTU Easy Master makes it easy to control Modbus slaves (such as Inverters). Serial communications can be executed independently of the program simply by setting a Modbus command in a fixed memory area and turning ON software switches.



Serial PLC Links

Up to 10 Words/Unit of data can be exchanged between up to nine CP1H (or CJ1M) CPU units.



NS/NT-series PTs can also be incorporated as slaves (1:N NT Link connections) to exchange data using the NT Links with only the master CP1H. Each is treated as one slave node.

rogrammable Controllers

Reduce development time with efficient tools

• Plug-and-play USB Connection

Just install the CX-Programmer (Ver. 6.1 or higher) and connect the USB cable to the CP1H. The driver will be installed automatically.



A Wealth of Instructions

• PID Instruction with Autotuning

PID constants can be automatically tuned for the PID instruction. The limit cycle method is used for tuning, allowing tuning to be completed quickly

• Floating-point Decimal Instructions, Trigonometric Instructions, and More.

Just like the CS/CJ-series PLCs, the CP1H has approximately 400 instructions for ladder programming.

The Structured Text (ST) language makes arithmetic operations even easier.

In addition to ladder programming, function block logic can be written in ST language, which conforms to IEC 61131-3. Arithmetic processing is also possible with ST, including processing of absolute values, square roots, logarithms, and trigonometric functions (SIN, COS, and TAN). Processing that is difficult to write in ladder programming becomes easy using structured text.

• A Built-in USB Port (USB 1.1, Type B) Enables a Personal Computer to Be Connected using a standard USB cable.

Standard A-type male to B-type male USB cables can be used.



Note: Programming Consoles (e.g., CQM1H-PRO01 and C200H-PRO27) cannot be used with the CP1H.



Communications programs are provided by the Function Block library.

OMRONs Function Block Libraries drastically reduce the amount of programming needed to communicate with field devices. Just drag and drop a pre-tested function block in your program and set the parameters. You'll be up and running within one minute.

• A FB Library for Pulse Outputs.

Function blocks are also provided for pulse outputs to make it easy to write programs for positioning in addition to communications function blocks. These function blocks will reduce the time required for developing programs for applications such as for OMRON's Smartstep Servo System.



Security

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Programs can be protected by setting a password from the CX-Programmer (with the PLC online).

Password setting: Up to 8 alphanumeric characters (A-Z, a–z, 0-9)

CX-Cne

CX-One is a single programming and configuration environment that enables the user to build, configure and program networks, PLCs, HMIs, Motion Control systems, Drives, Temperature Controllers and Sensors. The result of a single software is to reduce complexity of the configuration, allowing automation systems to be programmed or configured with minimal training.

• CX-Integrator

Settings and configurations for devices can be made from any PLC in the network.

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CX-Designer

The CX-Designer can be started from the CX-Integrator. Settings such as the PLC and Unit information are passed to the CXDesigner, so you can start developing screens immediately after CX-Designer starts.



1 Network Software	CX-Integrator CX-Protocol CX-FLnet
2 PLC Software	CX-Programmer CX-Simulator SwitchBox
3 HMI Software	CX-Designer
4 Motion Controller Software	CX-Motion CX-Motion-NCF CX-Motion-MCH CX-Position CX-Drive
PLC-based Process Control Software	CX-Process Tool NS-series Face Plate Auto-Builder
6 Component Software	CX-Thermo
CX-Simulator	

Online CPU Unit operations, such as program monitoring, I/O memory manipulation, PV monitoring, forced setting/resetting memory bits, differential monitoring, data tracing, and online editing, can be executed without the actual PLC.



The Support Software for Temperature Controllers (CX-Thermo) can be started from the CX-Integrator's Serial Communications (CompoWay/F) network.

Parameters can be created, edited, and transferred at the computer. The time required to make settings can be reduced when setting the same parameters in multiple devices.



Handy built-in functions make maintenance easier



Analogue Inputs Are Made Simple

An analogue control setting and an analogue input are provided.



Analogue setting

The analogue control setting has a resolution of 256 steps. When the value is changed it is displayed (hexadecimal) for three seconds on the 7-segment display.



Analogue Input

This input has a resolution of 256 steps and is used for an analogue input set of 0 to 10 V. Each CP1H CPU Unit has one of these connectors built in. (The built-in analogue I/O for CP1HXA CPU Units is separate.) A device, such as a potentiometer, can be connected to enable direct manual operation and control from a control panel. The maximum cable length is 3 meters. A connecting cable (1 m) is included with the CPU Unit.

4 Battery-free Operation

• The values in the DM Area (32 Kwords) are saved in the CPU Unit's

built-in flash memory as initial

• Battery-free operation is also

next production run.

values, and can be read at startup.

possible when saving production

using the same data again for the

data and machine parameters in the

DM Area, turning OFF the power, and

Memory Cassette

- Data, such as programs and initial memory values, can be stored on a Memory Cassette (optional) and copied to other systems.
- The Memory Cassette can also be used when installing new versions of application programs.



7-segment Status Display

- The 7-segment Display provides two display digits.
- In addition to displaying error codes for errors detected by the PLC, codes can be displayed on the display from the ladder program.
- The 7-segment display is useful for maintenance as well, allowing problems that arise during system operation to be grasped without using any Support Software.



Note: A battery is required for the clock function and to retain the status of HR A rea bits and counter values A battery is provided as a standard feature with the CPU Unit. The user program (ladder program) is stored in built-in flash memory, so no battery is required to back it up.

Programmable Controllers

Expansion I/O units Expand as needed



CPU unit overview

CP1H-XA40D - Built-in Analogue I/O



CP1H-XA40DR-A AC power supply, 24 DC inputs, 16 relay outputs, 4 analogue inputs, 2 analogue outputs



CP1H-XA40DT-D DC power supply, 24 DC inputs, 16 transistor (sinking) outputs, 4 analogue inputs, 2 analogue outputs

CP1H-XA40DT1-D

DC power supply, 24 DC inputs, 16 transistor (sourcing) outputs, 4 analogue inputs, 2 analogue outputs

CP1H-X40D Basic Model



CP1H-X40DR-A AC power supply, 24 DC inputs, 16 relay outputs



CP1H-X40DT-D DC power supply, 24 DC inputs, 16 transistor (sinking) outputs

CP1H-X40DT1-D DC power supply, 24 DC inputs, 16 transistor (sourcing) outputs

CP1H-Y20D - High-speed Positioning (To be released soon)



CP1H-Y20DT-D DC power supply, 12 DC inputs, 8 transistor (sinking) outputs

Two 1-MHz line-driver inputs (phases A, B, and Z) and two 1-MHz line-driver outputs (CW and CCW) are provided separately.

	CP1H-XA CPU Units	CP1H-X CPU Units	CP1H-Y CPU Unit			
I/O capacity	24 inputs, 16 outputs		12 inputs, 8 outputs Line-driver inputs: Phases A, B, and Z for 2 axes Line-driver outputs: CW and CCW for 2 axes			
High-speed counter	100 kHz (single phase), 50 kHz (di	fferential phases), 4 axes	1 MHz (single phase), 500 kHz (differential phases) for 2 axes (line-driver input), 100 kHz (single phase), 50 kHz (differential phas- es) for 2 axes (4 axes total)			
Pulse output function (Models with Transistor Outputs only)	100 kHz for 2 axes and 30 kHz for	2 axes (4 axes total)	1 MHz for 2 axes (line-driver output), 100 kHz for 2 axes (4 axes total)			
Serial communications	USB port (peripheral port) and 2 of	otional serial ports (either RS-232	C or RS-422A/485 Option Boards)			
Analogue I/O	4 analogue inputs and 2 analogue outputs	-	-			
Interrupt inputs Quick-response inputs (50-ms width min.)	8 inputs		6 inputs			
User program capacity	20 kstep					
DM capacity	32 kwords	32 kwords				
Maximum number of CPM1A Expansion I/O Units	7 (Refer to page16 for Unit restrict	7 (Refer to page16 for Unit restrictions.)				
Maximum number of CJ-series Units	2 (CJ-series Special I/O Units and	CPU Bus Units only. Refer to pag	e 14 for information on Units that can be used.)			

• Options



CP1W-ME05M Memory Cassette



CP1W-CIF01 RS-232C Option Board



CP1W-CIF11 RS-422A/485 Option Board

rogrammab Controllers

CP-series expansion units







System configuration

A maximum of seven CPM1A Expansion I/O Units can be connected.



Group A

	Unit type	Model
Expansion I/O Units	40 I/O points	CPM1A-40EDR
		CPM1A-40EDT
		CPM1A-40EDT1
	20 I/O points	CPM1A-20EDR1
		CPM1A-20EDT
		CPM1A-20EDT1
	8 inputs	CPM1A-8ED
	8 outputs	CPM1A-8ER
		CPM1A-8ET
		CPM1A-8ET1
Analogue Unit	2 analogue inputs, 1 analogue output	CPM1A-MAD01
		CPM1A-MAD11
Temperature Sensor Units	2 thermocouple inputs	CPM1A-TS001
	2 platinum resistance thermometer inputs	CPM1A-TS101
	2 platinum resistance thermometer inputs, 1 analogue output	CPM1A-TS101-DA
CompoBus/S I/O Link Unit	8 inputs, 8 outputs	CPM1A-SRT21
DeviceNet I/O Link Unit	32 inputs, 32 outputs	CPM1A-DRT21
PROFIBUS-DP I/O Link Unit	16 inputs, 16 outputs	CPM1A-PRT21

Group B Units that each count as two units

	Model	
Analogue Units	4 analogue inputs	CPM1A-AD041
	4 analogue outputs	CPM1A-DA041
Temperature Sensor Units	4 thermocouple inputs	CPM1A-TS002
	4 platinum resistance thermometer inputs	CPM1A-TS102

CJ-series Special I/O Units and CPU Bus Units

A maximum of two CJ-series Special I/O Units or CPU Bus Units can be connected by using a CP1W-EXT01 CJ Unit Adapter.

	CJ-series Special I/O Units			CJ-series CPU	Bus Units
Unit name	Model	Unit name	Model	Unit name	Model
Analogue Input Units	CJ1W-AD081-V1	Process Input Units	CJ1W-PDC15	Serial Communications Units	CJ1W-SCU41-V1
	CJ1W-AD041-V1	Temperature Control Units	CJ1W-TC001		CJ1W-SCU21-V1
Analogue Output Units	CJ1W-DA08V		CJ1W-TC002	Ethernet Unit	CJ1W-ETN21
	CJ1W-DA08C		CJ1W-TC003	DeviceNet Unit	CJ1W-DRM21
	CJ1W-DA041		CJ1W-TC004	Controller Link Unit	CJ1W-CLK21-V1
	CJ1W-DA021		CJ1W-TC101	PROFIBUS-DP Master Unit	CJ1W-PRM21
Analogue I/O Unit	CJ1W-MAD42		CJ1W-TC102	CAN Unit	CJ1W-CORT21
Process Input Units	CJ1W-PTS51		CJ1W-TC103		
	CJ1W-PTS52		CJ1W-TC104		
	CJ1W-PTS15	CompoBus/S Master Unit	CJ1W-SRM21		
	CJ1W-PTS16	PROFIBUS-DP Slave Unit	CJ1W-PRT21		

Specifications

CPU Unit Specifications

	Item AC power supply models: CP1H-00-A		DC power supply models: CP1H-DD-D		
Power S	Supply	100 to 240 VAC 50/60 Hz	24 VDC		
Operatir	ng voltage range	85 to 264 VAC	20.4 to 26.4 VDC		
•	0 0 0		(21.6 to 26.4 VDC with four or more Expansion Units.)		
Power c	onsumption	Can be used for backing up programs or auto-booting.	50 W max.		
Inrush c	urrent	100 to 120 VAC inputs: 20 A max. 8 ms max./200 to 240 \	AC in- 30 A max. 20 ms max.		
		puts: 40 A max. 8 ms max.			
External	power supply	300 mA at 24 VDC	None		
Insulatio	n resistance	$20 \text{ M}\Omega$ min. (at 500 VDC) between the external AC termina	is and $20 \text{ M}\Omega$ min. (at 500 VDC) between the external DC terminals and		
-		GR terminals	GR terminals		
Dielectri	c strength	2,300 VAC at 50/60 Hz for 1 min between the external AC	and 1,000 VAC at 50/60 Hz for 1 min between the external DC and		
		GR terminals, leakage current: 5 mA max.	GR terminals, leakage current: 5 mA max.		
Noise in	imunity	Conforming to IEC 61000-4-4. 2 kV (power supply line)			
Vibration	n resistance	10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, accelera	ion: 9.8 m/s2 in X, Y, and Z directions for 80 minutes each		
Shock r	sistanco	(3 weep time. 0 minutes x to sweeps = 10 at time 0 minutes x to sw	=======================================		
Ambiont					
Ambient		10% to 90% (with no condensation)			
Ambient		No corresivo das			
Ambient		20 to 75°C (Evoluting botton)			
Amplem Bower b		-20 to 73 C (Excluding ballery.)	0 ma min		
Dimensi		10 IIS IIII.	2 115 11111.		
Dimensi	ons		E00 a mov		
weight		740 g max.	590 g max.		
0	Item				
Control	method	Stored program method			
I/O cont	rol method	Cyclic scan with immediate refreshing			
Program	language	Ladder diagram			
Function	1 blocks	Maximum number of function block definitions: 128 Maximum data definitions and the second data definition of the second data data data data data data data da	num number of instances: 256 Languages usable in function block		
la star st	I the	den nitions: Ladder diagrams, structured text (ST)			
Instructi	on length	1 to 7 steps per instruction			
Instructi	ons	Approx. 400 (function codes: 3 digits)			
Instruction	on execution time	Basic instructions: 0.10 is min. Special instructions: 0.15 is min.			
Commo	n processing time	0./ ms			
Program	capacity	20 Ksteps			
Number	of tasks	rupt task No. 140 to 147, fi xed), 6 for Y CPU Units High-s	errupt tasks: 1 (interrupt task No. 2, fi xed) Input interrupt tasks: 8 (inter- beed counter interrupt tasks: 256 (interrupt task No. 0 to 255)		
Maximu	m subroutine number	256			
Maximu	m jump number	256			
I/O	Input bits	1,600 bits (100 words): CIO 0.00 to CIO 99.15			
areas	Output bits	(1 he 24 built-in inputs are allocated in CIO 0.00 to CIO 0. 1 600 bits (100 words): CIO 100 00 to CIO 199 15			
		(The 16 built-in outputs are allocated in CIO 100.00 to CIO	100.07 and CIO 101.00 to CIO 101.07.)		
	Built-in Analog Inputs	CIO 200 to CIO 203			
	Built-in Analog Outputs	IO 210 to CIO 211			
	Serial PLC Link Area	1,440 bits (90 words): CIO 3100.00 to CIO 3189.15 (CIO	100 to CIO 3189)		
Work bit	S	8,192 bits (512 words): W000.00 to W511.15 (W0 to W51) 37,504 bits (2,344 words): CIO 3800.00 to CIO 6143.15		
TR Area		16 bits: TR0 to TR15			
Holding	Area	[8,192 bits (512 words): H0.00 to H511.15 (H0 to H511)			
AR Area	l	Read-only (Write-prohibited): 7168 bits (448 words): A0.0	0 to A447.15 (A0 to A447)		
T:		Read/Write: 8192 bits (512 Words): A448.00 to A959.15 (/	448 10 A959)		
Timers	_	4,096 bits: 10 to 14095			
Counter	S (Occ. acto.)	4,096 Dits: C0 to C4095			
DIVI Area	a (See note.)	32 KWords: D0 to D32767			
Data Re	gister Area	16 registers (16 bits): DRU to DR15			
Index R	egister Area	6 registers (16 bits): IR0 to IR15			
Task Fla	ig Area	32 flags (32 bits): 1K0000 to 1K0031			
Trace M	emory	4,000 words (500 samples for the trace data maximum of 31 bits and 6 words.)			
Memory	Cassette	A special Memory Cassette (CP1W-ME05M) can be mounted. Note: Can be used for program backups and auto-booting.			
Clock fu	nction	Supported. Accuracy (monthly deviation): -3.5 min to -0.5 min (ambient temperature: 55°C), -1.5 min to +1.5 min (ambient temperature: 25°C), -3 min to +1 min (ambient temperature: 0°C)			
Communications functions		One built-in peripheral port (USB1.1): For connecting Support Software only.			
		A maximum of two Serial Communications Option Boards	can be mounted.		
Memory	backup	Flash memory: User programs, parameters (such as the P	C Setup), comment data, and the entire DM Area can be saved to fl ash		
Dett		memory as initial values. Battery backup: The Holding Are	a, DIVI Area, and counter values (11 ags, PV) are backed up by a battery.		
Battery	service life	5 years at 25 °C. (Use the replacement battery within two	years of manufacture.)		
Built-in input terminals		40 (24 inputs, 16 outputs)	20 (12 inputs, 8 outputs) Line-driver inputs: Two axes for phases A, B, and Z Line-driver outputs: Two axes for CW and CCW		
Number	of connectable	CPM1A Expansion I/O Units: 7 max : C Learing Special I/	Units or CPU Bus Units: 2 may		
Expansi	on (I/O) Units				
Max. nu	mber of I/O points	320 (40 built in + 40 per Expansion (I/O) Unit x 7 Units)	300		
			(20 built in + 40 per Expansion (I/O) Unit x 7 Units)		

Item	XA CPU Units: CP1H-XA	X CPU Units: CP1H-X	Y CPU Units: CP1H-Y
Interrupt inputs	8 inputs (Shared by the external interring uick-response inputs.)	upt inputs (counter mode) and the	6 inputs (Shared by the external interrupt inputs (counter mode) and the guick-response inputs.)
Interrupt inputs counter mode	8 inputs (Response frequency: 5 kHz i	max. for all interrupt inputs), 16 bits	6 inputs (Response frequency: 5 kHz max. for all interrupt inputs), 16 bits
Quick-response inputs	8 points (Min. input pulse width: 50 is	max.)	6 points (Min. input pulse width: 50 is max.)
Scheduled interrupts	1		·
High-speed counters	4 inputs: Differential phases (4x), 50 k single phase (pulse plus direction, up/ Value range: 32 bits, Linear mode or r Interrupts: Target value comparison or	Hz or down, increment), ing mode r range comparison	2 inputs: Differential phases (4x), 500 kHz or single phase, 1 MHz and 2 inputs: Differential phases (4x), 50 kHz or single phase (pulse plus direction, up/down, increment), 100 kHz Value range: 32 bits, Linear mode or ring mode Interrupts: Target value comparison or range com- parison
Pulse outputs (models with	Trapezoidal or S-curve acceleration ar	nd deceleration (Duty ratio: 50% fi xed)	Trapezoidal or S-curve acceleration and deceleration
transistor outputs only)	2 outputs, 1 Hz to 100 kHz (CCW/CW 2 outputs, 1 Hz to 30 kHz (CCW/CW o PWM outputs :(Duty ratio: 0.0% to 100 2 outputs, 0.1 to 1 kHz (Accuracy: ±5%	or pulse plus direction) or pulse plus direction) 0.0% (Unit: 0.1%)) % at 1 kHz)	(Duty ratio: 50% fi xed) 2 outputs, 1 Hz to 1 MHz (CCW/CW or pulse plus direction) 2 outputs, 1 Hz to 100 kHz (CCW/CW or pulse plus direction) PWM outputs :(Duty ratio: 0.0% to 100.0% (Unit: 0.1%)) 2 outputs, 0.1 to 1 kHz (Accuracy: ±5% at 1 kHz)
Built-in analog I/O terminals	4 analogue inputs and 2 analogue outputs (Refer to separate detailed specifi cations.)	None	
Analogue control	1 (Setting range: 0 to 255)		
External analogue input	1 input (Resolution: 1/256, Input range	e: 0 to 10 V)	

Serial Communications Specifications

Item	Function	Interface
Peripheral USB port	For connecting Peripheral Device.	Conforms to USB 1.1, B-type connector
Serial port 1	Host Link, No-protocol, NT Link (1: N), Serial PLC Link (See note.), Serial Gateway (CompoWay/F master, Modbus-RTU master), Modbus-RTU easy master function	The CP1W-CIF01 RS-232C Option Board
Serial port 2	Host Link, No-protocol, NT Link (1: N), Serial PLC Link (See note.), Serial Gateway (CompoWay/F master, Modbus-RTU master), Modbus-RTU easy master function	or the CP1W-CIF11 RS-422A/485 Option Board
		can be used with either port.

Analogue I/O Specifications (CP1H-XA CPU Units Only)

	Item	Voltage I/O	Current I/O				
Analogue	Number of analog inputs	4					
Input	Input signal range	0 to 5 V, 1 to 5 V, 0 to 10 V, or -10 to 10 V	0 to 20 mA or 4 to 20 mA				
Section	Max. rated input	±15 V	±30 mA				
	External input impedance	1 M Ω min.	Approx. 250				
	Resolution	1/6,000 or 1/12,000 (full scale)	3,000 or 1/12,000 (full scale)				
	Overall accuracy	25 °C: ±0.3% full scale/0 to 55 °C: ±0.6% full scale	25°C: ±0.4% full scale/0 to 55°C: ±0.8% full scale				
	A/D conversion data	ull scale for -10 to 10 V: F448 (E890) to 0BB8 (1770) Hex ull scale for other ranges: 0000 to 1770 (2EE0) Hex					
	Averaging	Supported (Set for individual inputs in the PLC Setup.)					
	Open-circuit detection	Supported (Value when disconnected: 8000 Hex)	upported (Value when disconnected: 8000 Hex)				
Analogue	Number of outputs	2 outputs					
Output	Output signal range	0 to 5 V, 1 to 5 V, 0 to 10 V, or -10 to 10 V	0 to 20 mA or 4 to 20 mA				
Section	Allowable external output load resistance	1 kΩ min.	600 Ω max.				
	External output impedance	0.5 max.					
	Resolution	1/6,000 or 1/12,000 (full scale)					
	Overall accuracy	25 °C: ±0.4% full scale/0 to 55 °C: ±0.8% full scale					
	D/A conversion data	Full scale for -10 to 10 V: F448 (E890) to 0BB8 (1770) hex					
		Full scale for other ranges: 0000 to 1770 (2EE0) hex					
Conversio	n time	1 ms/point					
Isolation m	nethod	Photocoupler isolation between analogue I/O terminals and internal circuits. No isolation between analogue I/O signals.					

Dimensions CP1H CPU Units



Ordering Information

CPU Units

CPU Unit		Specifications			Model	Standards
	Power Supply	Output method	Inputs	Outputs		
CP1H-X CPU Units	AC	Relay	24	16	CP1H-X40DR-A	CE, N
Memory capacity: 20 Ksteps	DC DC	Transistor (sinking)			CP1H-X40DT-D	CE, N
Hign-speed counters: 100 kHz, 4 axes Pulse outputs: 100 kHz, 2 axes 30 kHz, 2 axes	ij.	Transistor (sourcing)			CP1H-X40DT1-D	CE, N
CP1H-XA CPU Units	AC	Relay	24	16	CP1H-XA40DR-A	CE, N
Memory capacity: 20 Ksteps	DC	Transistor (sinking)			CP1H-XA40DT-D	CE, N
High-speed counters: 100 kHz, 4 axes Pulse outputs: 100 Hz, 2 axes 30 kHz, 2 axes Analogue inputs: 4 Analogue outputs: 2		Transistor(sourcing)			CP1H-XA40DT1-D	CE, N
CP1H-Y CPU Units Memory capacity: 20 Ksteps High-speed counters:1 MHz, 2 axes 100 kHz, 2 axes Pulse outputs: 1 MHz, 2 axes 30 kHz, 2 axes	DC	Transistor (sinking)	12+line-driver input, 2 axes	8 +line-driver input, 2 axes	CP1H-Y20DT-D (To be released soon.)	-

Options (for CPU Units)

Name	Specifications	Model	Standards
RS-232C Option Board	For CPU Unit option port.	CP1W-CIF01	CE, N
RS-422A/485 Option Board	For CPU Unit option port.	CP1W-CIF11	CE, N
Memory Cassette	Can be used for backing up programs or auto-booting.	CP1W-ME05M	CE, N

Maintenance Products

Name	Specifications	Model	Standards
Battery Set	For CP1H CPU Units (Use batteries within two years of manufacture.)	CJ1W-BAT01	CE
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	PFP-M	
End Fiate	accessories to secure the Units on the DIN Track.		

I/O Connecting Cable

Name	Specifications	Model	Standards
I/O Connecting Cable	80 cm (for CPM1A Expansion Units)	CP1W-CN811	CE, N

Programming Devices

Name	Specifications		Model	Standards
CX-One	CX-One is a package that integrates the Support Software for	One license	CXONE-AL01C-E	-
FA Integrated Tool	OMRON PLCs and components. CX-One runson the following OS.	Three licenses	CXONE-AL03C-E	-
Package	US: Windows 98SE, Me, NT 4.0 (Service Pack 6a), 2000 (Service Pack 3 or higher), or XP CX-One Includes CX-Programmer Ver.6.® and CX-Simulator Ver.1.®.For details, refer to the CX-One catalog (Cat. No. R134). For CPU Unit option port. Can be used for backing up programs or auto-booting.	Ten licenses	CXONE-AL10C-E	-
Computer Connecting Cable for	D-Sub 9-pin (Length: 2.0 m)	For anti-static	XW2Z-200S-CV	-
CP1W-CIF01 RS-232C	D-Sub 9-pin (Length: 5.0 m)	connectors	XW2Z-500S-CV	-
Option Board (See note.)	D-Sub 9-pin (Length: 2.0 m)		XW2Z-200S-V	-
	D-Sub 9-pin (Length: 5.0 m)		XW2Z-500S-V	-
USB-Serial Conversion Cable *1	USB-RS-232C Conversion Cable (Length: 0.5 m) and PC Complies with USB Specifi cation 1.1 On personal computer side: USB (A plug connector, male) On PLC side: RS-232C (D-sub 9-pin, male) Driver: Supported by Windows 98, Me, 2000, and XP		CS1W-CIF31	-

*1 Cannot be used with a peripheral USB port. To connect to a personal computer via a peripheral USB port, use commercially-available USB cable (A to B type, male).

Technical Documentation

Name	Standards
CP1H CPU Unit Operation Manual	W450-E1
CP1H CPU Unit Programming Manual	W451-E1

Expansion Units

Name	Output method	Input	Output	Model	Standard
Expansion I/O Units	Relay	24	16	CPM1A-40EDR	CE, N
	Transistor (sinking)			CPM1A-40EDT	CE, N
	Transistor output (sourcing)			CPM1A-40EDT1	CE, N
	elay	12	8	CPM1A-20EDR1	U, C, CE
	Transistor (sinking)			CPM1A-20EDT	U, C, N, CE
	Transistor output (sourcing)			CPM1A-20EDT1	U, C, N, CE
	-	8	-	CPM1A-8ED	U, C, N, CE
	Relay	-	8	CPM1A-8ER	U, C, N, CE
	Transistor (sinking)	-	8	CPM1A-8ET	U, C, N, CE
	Transistor output (sourcing)			CPM1A-8ET1	U, C, N, CE
Analogue Input Unit	Analogue (resolution: 1/6000)	4	-	CPM1A-AD041	U, C, N, CE
Analogue Output Unit	Analogue (resolution: 1/6000)	-	4	CPM1A-DA041	UC1, CE
Analogue I/O Units	Analogue (resolution: 1/256)	2	1	CPM1A-MAD01	UC1, CE
	Analogue (resolution: 1/6000)	2	1	CPM1A-MAD11	U, C, N, CE
DeviceNet I/O Link Unit	-	32 (I/O link bits)	32 (I/O link bits)	CPM1A-DRT21	U, C, CE
CompoBus/S I/O Link Unit	-	8 (I/O link bits)	8 (I/O link bits)	CPM1A-SRT21	U, C, N, CE
PROFIBUS-DP I/O Link Unit		16 (I/O link bits)	16 (I/O link bits)	CPM1A-PRT21	CE
Temperature Sensor Units	2 thermocouple inputs			CPM1A-TS001	U, C, N, CE
4 thermocouple inputs 2 platinum resistance thermometer inputs				CPM1A-TS002	U, C, N, CE
		CPM1A-TS101	U, C, N, CE		
	4 platinum resistance thermometer inputs		CPM1A-TS102	U, C, N, CE	
	2 platinum resistance thermom	eter inputs, 1 Analogue	output (resolution: 256)	CPM1A-TS101-DA	U, C, L, CE

^orogrammable Controllers

CJ-series Special I/O Units and CPU Bus Units

Category	Name	Specifications	Model	Standard
CP1H CPU	CJ Unit Adapter	Adapter for connecting CJ-series Special I/O Units and CPU Bus	CP1W-EXT01	UC1, CE, N, L
Unit options		Units (includes CJ-series End Cover)		
CJ-series	Analogue Input Units	8 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA)	CJ1W-AD081-V1	
Special I/O		Resolution: 1/8,000; Conversion speed: 250 is/input max.		
Units		(Can be set to $1/4,000$ resolution and T ms/input.)		
		Resolution: 1/8 000: Conversion speed: 250 is/input max	CJ1W-AD041-V1	
		(Can be set to 1/4,000 resolution and 1 ms/input.)		
	Analogue Output Units	8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V)	CJ1W-DA08V	
		Resolution: 1/4,000; Conversion speed: 1 ms/output max.		
		(Can be set to 1/8000, 250 is/output)		
		8 outputs (4 to 20 mA)	CJ1W-DA08C	UC1, CE, N
		(Can be set to 1/8,000, 250 is/ output)		
		$4 \text{ outputs} (1 \text{ to } 5 \text{ V} \ 0 \text{ to } 5 \text{ V} \ 0 \text{ to } 10 \text{ V} \ -10 \text{ to } 10 \text{ V} \ 4 \text{ to } 20 \text{ mA})$	C.11W-DA041	LIC1 CE N I
		Resolution: 1/4.000. Conversion speed: 1 ms/point max.	COTTO DAOFT	001, 02, 14, 2
		2 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA)	CJ1W-DA021	
		Resolution: 1/4,000; Conversion speed: 1 ms/output max.		
	Analogue I/O Unit	4 inputs, 2 outputs	CJ1W-MAD42	
		(1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA)		
		Resolution: 1/4000; Conversion speed: 1 ms/point max.		
	Broocco Input Lipito	(Can be set to 1/8,000, 250 is/point)		
	Fibeess input offits	4 inputs Pt100 LL (IIS IEC) IPt100 LL Conversion speed: 250 ms/	C 11W-PTS52	
		4 inputs	00100-11002	
		2 inputs. B. E. J. K. L. N. R. S. T. U. W. Re5-26. PL ±100 mV.	CJ1W-PTS15	
		Resolution: 1/64,000; Conversion speed: 10 ms/2 inputs		
		2 inputs, Pt100, JPt100, Pt50, Ni508.4;	CJ1W-PTS16	
		Resolution: 1/64,000; Conversion speed: 10 ms/2 inputs		
		2 inputs, 0 to 1.25 V, -1.25 to 1.25 V, 0 to 5 V, 1 to 5 V, -5 to 5 V,	CJ1W-PDC15	
	To your a weath way O a water of the lite	0 to 10 V, -10 to 10V, ±10 V selectable range, 0 to 20 mA, 4 to 20 mA		
	Temperature Control Units	4 loops, thermocouple input, NPN output		UCT, CE, N, L
		4 loops, thermocouple input, PNP output		
		function	CJ1W-1C003	
		2 loops thermocouple input PNP output heater burnout detection	C.I1W-TC004	
		function		
		4 loops, platinum resistance thermometer input, NPN output	CJ1W-TC101	
		4 loops, platinum resistance thermometer input, PNP output	CJ1W-TC102	
		22 loops, platinum resistance thermometer input, NPN output,	CJ1W-TC103	
		heater burnout detection function		
		2 loops, platinum resistance thermometer input, PNP output, heater burnout detection function	CJ1W-TC104	
	CompoBus/S Master Unit	CompoBus/S remote I/O, 256 points max.	CJ1W-SRM21	
	PROFIBUS-DP Slave Unit	Exchanges up to 180 words in any memory area with a	CJ1W-PRT21	UC, CE
		PROFIBUS-DP Master Unit		
CJ-series CPU	Controller Link Units	Wired (Shielded twisted-pair cable)	CJ1W-CLK21-V1	UC1, CE, N, L
Bus Units	Serial Communications	1 RS-232C port and 1 RS-422A/485 port	CJ1W-SCU41-V1	
	Units	2 RS-232C ports	CJ1W-SCU21-V1	
	Ethernet Unit	100Base-TX	CJ1W-ETN21	
	DeviceNet Unit	Functions as master and/or slave; allows control of 32,000 points max. per master.	CJ1W-DRM21	
	PROFIBUS-DP Master Unit	Controls up to 7000 words of remote I/O data over PROFIBUS-DP	CJ1W-PRM21	UC, CE
	CAN Unit	Can send and/or receive any CAN-Message	CJ1W-CORT21	CE

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

Cat. No. P16E-EN-03A

In the interest of product improvement, specifications are subject to change without notice.

Programmable Controllers

Modular PLC series

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Sliceable Solutions

Modular PLC series

CJ1

The family of CJ1 CPUs range from very small CPUs for simple sequence control to powerful and fast models that offer total machine control which can handle up to 2560 I/O points.

This enables yout to modularize or 'slice' your machine into logical sections without changing PLC series.

You don't even need to consider where to slice the machine: any I/O units can be mounted on any CPU, enabling you to distribute all the function you need to, wherever you need them. This reduces the number of different modules you have to keep in stock. And no matter how complex your machine becomes, there's always a CPU and a combination of I/Os to match your needs. It's the ultimate in machine sliceability and scalability!

New features in this edition

• All CPUs (Ver.3.0)	Function Block programming in IEC 61131-3 Structured Text, and pre-tested Omron Function Block Libraries to reduce machine development time.
CJ1H-CPU67H	The ultimate high-capacity CPU in the CJ1 range
• CJ1M-CPU1D-ETN	CPUs with integrated Ethernet port
• CJ1W-PD022	Low-end DC power supply unit
• CJ1W-000 (SL)	Digital and analog I/O units with screwless terminal blocks.
 CJ1W-(P)TS 	Temperature input units, from simple non-isolated to fast high-resolution models.
	Option function for each linking of various communication activates

- CJ1W-SCU 1-V1 Gateway function for easy linking of various communication networks.
- CJ1W-CORT21 CAN communication unit, fully configurable to support any protocol.

Compact, fast and flexible. The CJ1-series offers the ultimate in scaleability and seamless communication. A wide variation of models to handle essentially any type of machine control. Build the perfect CJ1-series PLC for your application.







rogrammable Controllers




rogrammable Controllers

Scalable Distribute functionality to where you need it.



Any unit fits any CPU.

Eliminating the backplane enables more flexible combinations. Configurable memory allocation allows for easy machine variations. Adding or removing units does not mean you need to change your PLC program.



Easier Maintenance with Memory Cards

Memory Cards

Easily change programs using Memory Cards. Compact flash cards are used, enabling the Memory Cards to be shipped or mailed for speedy action even with offshore sites.



Handle as Windows Files from a Personal Computer.

User programs, parameters, I/O memory, names (including I/O comments), and rung comments can be handled as files, enabling standardization of programs and initial setting data for each system.

• Advantages in Using Windows Files

The Memory Card contains a compact flash card enabling programs to be written without a PLC. A PC card slot, available on many notebook computers, can be used instead of a Programming Device.



Log production conditions, inspection data, and other valuable information.

Eliminates the need for an onsite computer for a low-cost system that requires little space.



Data can be saved on the Memory Card in CSV or text format for reading from Microsoft Excel, other spreadsheet software, or other programs.



FILE READ and FILE WRITE instructions can be used during program execution to transfer I/O memory data from the CPU Unit to files in a Memory Card or in EM file memory. This function enables data, such as trend data and quality data, to be saved to a Memory Card during operation

Backup is Simple.

Backup data for the entire PLC, including DeviceNet Units, Serial Communications Units, and other CPU Bus Units can be saved or read to a Memory Card. As a result, the same operation as that using ROM can be achieved using a Memory Card.



PLC Operation Can Be Switched by Changing the Memory Card.

When the power is turned ON, the file in the Memory Card can be automatically transferred to the CPU Unit. As a result, the same operation as that using ROM can be achieved using a Memory Card.



Built-in Flash Memory (Standard Feature)

Battery-free Operation Using Flash Memory

When the user program or parameter area data is transferred to the CPU Unit, it is automatically backed up in flash memory in the CPU Unit. (The flash memory data is automatically restored to the working memory in the CPU Unit when the power supply is turned ON.) This enables battery-free

operation without using a Memory Card.



Reduce Maintenance Unit Stocks

The CJ1-series PLCs can be used for anything from small-scale to large-scale applications, helping to reduce the quantity of maintenance Units stocked for unexpected troubles or system expansion.



Software Compatibility with CS1-series PLCs

CJ-series architecture is 100% compatible with the CS-Series. User programs and other software resources can be shared to make standardizing software easier for all levels of the system.



Built-in Comment Memory (Unit version 3.0 or later and CX-Programmer Ver. 5.0 or higher are required.)

Comment memory is now provided in the CPU Unit. This enables comments for the CJ1M and other PLCs to be stored without a Memory Card.



When downloading projects, the Memory Card, EM file memory, or comment memory (in the CPU Unit's flash memory) can be selected as the transfer destination for I/O comments, symbol names, rung comments, and other data. This enables data such as I/O comments, symbol names, and rung comments to be stored in the CPU Unit's internal comment memory when a Memory Card or EM file memory are both not available.

64 KB: Equivalent to the contents of EM bank 1

Comment memory capacity		CJ1M		CJ1G				CJ1H			
	CPU⊡1	CPU⊟2	CPUD3	CPU42H	CPU43H	CPU44H	CPU45H	CPU65H	CPU66H	CPU67H	
Program indices	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	128 KB	128 KB	
Comments	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	128 KB	128 KB	
Symbol tables	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	128 KB	128 KB	128 KB	128 KB	

The comments can be stored in either of three locations: a) Memory Card, b) EM file memory, or c) Comment memory (added with this unit version). Select the location to store the comments in the user settings.

Greater Connectability with Component Products, with FB Compatibility (Ladder Programming/Structured Text) More Attractive to Use with Greater Development Efficiency and Maintainability

FFUNCTION BLOCK (Unit version 3.0 or later, and CX-Programmer Ver. 5.0 or higher are required.)

FB (Ladder Programming/Structured Text) Compatibility with all CS/CJ-series Models



Ladder Programming Language Example

Structured Text Example

OMRON FB Library

The OMRON FB library provides function blocks for setting SPs, reading PVs, and reading/writing RUN/STOP status and other Temperature Controller parameters. The programmer simply pastes function blocks from the OMRON FB Library into the ladder program. The desired functions can be utilized simply by inputting the Temperature Controller unit number and address.

What Is the OMRON FB Library?

The OMRON FB Library is a set of functional objects for ladder programming for OMRON CS/CJ-series PLCs. By incorporating the OMRON function blocks provided by OMRON into a ladder program, the program interface for different control devices is easily completed. This reduces the number of working hours required for program development and, at the same time, improves product quality through standardization.



The Structured Text (ST) Language Enables Trigonometric Functions and Other Arithmetic Processes

In addition to ladder programming, function block logic can be written in ST, which conforms to IEC61131-3. With ST, arithmetic processing is also possible, including processing of absolute values, square roots, logarithms, and trigonometric functions (SIN, COS, and TAN). Processing difficult to achieve in ladder programs becomes easy to write.

Name	Data Type	AT	Initial Value	Retained	Comment	
EN	BOOL		FALSE		Controls exe	cution of the Function Block
r	REAL	1	0.0		Radius	
theta	REAL		0.0		Angle	
P	REAL		0.0		center coord	inate: p
q	REAL		0.0		Center coord	dinate :q
4		1		1		
Inter	nals In	puts	Output	s E	xternals	
(* x-coord x := r * cc y := r * sin	dinate: x, y-coordii os(theta)+p; n(theta)+q;	nate: y	*)			

Recovery Possible by Uploading Function Blocks from Working PLC

Programs with function blocks can be uploaded from CPU Units, just like normal programs, without the need for additional memory such as a Memory Card.



Truly Seamless Incorporation of OMRON Components and Other Devices into Networks



Serial Gateway <u>NEW</u> CPU Units with Ver. 3.0 or later Serial Communications Units with Ver. 1.2 or later

When the CPU Unit (Ver. 3.0 or later) or Serial Communications Board or Serial

Communications Unit (Ver. 1.2 or later) receives a FINS command containing a CompoWay/F command (See note 1.) via network or serial communications, the command is automatically converted to a protocol suitable for the message and forwarded using serial communications.

- CompoWay/F (See note 2.)
- Host Link FINS (Possible only with Serial Communications Boards or Serial Communications Units Ver. 1.2 or later)

FINS network



Note 1: FINS

Abbreviation for Factory Interface Network Service. A command system for message services common to OMRON networks. FINS commands can be sent across up to 8 network levels. including serial communications paths using a serial gateway. (Possible only with CS/CJ-series CPU Unit Ver. 2.0 or later.)

Note 2: CompoWay/F

CompoWay/F is an integrated communications protocol used for OMRON general-purpose serial communications. It is used by Temperature Controllers, Digital Panel Meters Timer/Counters, Smart Sensors, Cam Positioners, Safety Controllers, etc. (as of July 2004).

Serial Gateway System (Reference)

When CompoWay/F commands are enclosed in FINS commands and sent to Serial Communications Boards or Serial Communications Units (Ver. 1.2) or serial ports on CPU Unit Ver. 3.0, the enclosed CompoWay/F command is retrieved using a Serial Gateway Function and sent as a CompoWay/F command.





Setting Parameters and Monitoring CompoWay/Fcompatible OMRON Temperature Controllers in a Furnace System





Use the Serial Gateway with a Serial Communications Now **Board or Serial Communications Unit**



Remote Maintenance and Monitoring of a PLC on Example a Trolley in an Automated Warehouse







Note: Supported by Serial Communications Units only.

Serial PLC Links

(Connecting Built-in RS-232C Ports on CJ1M CPU Units)

Use PLC Links for exclusive control on PCB carrier loaders and unloaders, or to exchange temperature and time information on conveyor ovens.

Data links can be created between up to nine CJ1M PLCs with up to 10 words each using the built-in RS-232C ports. RS-422A Adapters (CJ1W-CIF11) can be used to easily convert between RS-232C and RS-422A.



Achieve More Flexible, More Precise Machines with Pulse I/O Control

Built-in Pulse I/O



Pulse Outputs (CJ1M-CPU21/22/23)

Two Pulse Outputs at 100 kHz

Origin Searches (ORG Instruction)

- Origin searches are possible with one ORG instruction.
- Even with servomotors, a differential-phase counter reset output minimizes position deviations for origin searches.

Positioning with Trapezoidal Acceleration/Deceleration (PLS2 Instruction)



 Fast startup times (the time from instruction execution to start of pulse output): 46 µs minimum, 70 µs for trapezoidal acceleration/deceleration.

■ Interrupt Feeding (ACC and PLS2 Instructions)



Changing Target Position during Positioning (PLS2 and PLS2 Instructions)



Position Control Using Length Measured at Startup



High-precision Variable Duty Ratio (PWM output) Specify a duty ratio in 0.1% units. (Unit Ver. 2.0 or later)

Duty ratio:	Duty ratio: 50.3%		
	$\rightarrow \leftarrow$		
			Fine-tune the opening/closing times of the valve.

High-speed Counter Inputs (CJ1M-CPU21/22/23)

Two counter inputs, either single-phase, 100 kHz, or differential phases, 50 kHz

High-speed Counter in Linear Mode

High-speed Counter in Ring Mode

High-speed line-driver inputs for either single-phase, 100 kHz, or differential phases, 50 kHz, can be input. (For 24 V DC: Single-phase, 60 kHz, or differential phases, 30 kHz)



■ High-speed Counter Frequency (Speed) Measurements

For example, in rotational speed measurements in inspection applications or tact-time speed displays for conveyors, the speed can be monitored by counting pulses without using a special speed calculation device. The present value can be monitored during high-speed counter input by using the PRV instruction.



Measure Revolution Data (Unit Ver. 2.0 or later) High-speed counter input pulses can be converted to rotational speed (or total number of revolutions) using the new PRV2(883) instruction.



Interrupt Inputs (CJ1M-CPU21/22/23)

Use these inputs for either four interrupt inputs or four high-speed inputs (with a minimum pulse width of 30 μ s).



Use Five or More Interrupt Inputs, or Use High-speed Inputs for CPU Units Other Than the CJ1M-CPU21/22/23

Interrupt Input Units with 16 points and High-speed Input Units with 16 points can be used with any of the CJ1-series CPU Units to add high-speed input or interrupt input capabilities to CPU Units that do not support built-in pulse I/O. High-speed Input Units read pulse signals with a minimum pulse width of 50 μ s, and Interrupt Input Units feature an interrupt response time of 370 μ s.



A Complete Lineup to mix-and-match for your application.



Note: HMC-172/372/672 Memory Cards cannot be used with CS1G-CPU H, CS1H-CPU H, CJ1G-CPU H, or CJ1H-CPU H CPU Units prior to Lot No. 02108 (manufactured prior to January 8, 2002, nor with NS-7-series PTs prior to Lot. No. 0852 (manufactured prior to May 8, 2002). Check lot numbers before ordering.



Note: Most units with 18-point front connector are available with screw terminals, or with screwless terminal block. Units with screwless terminal block have (SL) added to the model code.

CJ1H-, CJ1G-CPU H, CJ1M-CPU

Slider

CJ1 series CPU Units

CJ1H-CPU6 H CJ1G-CPU4 H

Memory Card Indicators MCPWR (green): Lit when power is supplied to the Memory Card. BUSY (orange): Lit when Memory Card is being accessed.

Memory Card Power Supply Switch

Press the power supply switch to disconnect power before removing the Memory Card. Also, press the Memory Card Power Supply Switch to perform an easy backup operation.

Memory Card

Secures the neighboring Unit.

Indicators

Peripheral Port

Connector

or Programmable Terminals.

Connect to neighboring Unit by joining Connectors.

CJ1-CPU

Loop Controller Element Indicators Show the EXECUTING status



Other components are the same as the CJ1H-CPU6 H and CJ1G-CPU4 H CPU Units

Memory Card Eject Button Press the eject button to remove the Memory Card from the CPU Unit.

Memory Card Connector

CJ1M-CPU1

CJ1M-CPU1 -ETN

1



Components are the same as the CJ1H-CPU6 H and CJ1G-CPU4 H CPU Units.





I/O Indicators Show the status of the built-in I/O. Built-in I/O Connector MIL connector (40-pin)

CJ1M-CPU2

Other components are the same as the CJ1H-CPU6 H and CJ1G-CPU4 H CPU Units

CPU Units							
Model	I/O bits	Program capacity	Data memory capacity (See note.)	LD instruction processing speed	Built-in ports	Options	Built-in I/O
CJ1H-CPU67H	2,560 bits (Up to 3 Expansion Racks)	250 kSteps	448 kWords (DM: 32 kWords, EM: 32 kWords x 13 banks)	0.02 µs	Peripheral port and RS-232C portETN	Memory Cards	CPU⊡P models include
CJ1H-CPU66H		120 kSteps	256 kWords (DM: 32 kWords, EM: 32 kWords x 7 banks)		models include a 100Base-Tx Ethernet port.		Process Control Engine
CJ1H-CPU65H		60 kSteps	128 kWords				
CJ1G-CPU45H CJ1G-CPU45P	1,280 bits (Up to 3 Expansion Racks)		(DM: 32 kWords, EM: 32 kWords x 3 banks)	0.04 µs			l.
CJ1G-CPU44H CJ1G-CPU44P		30 kSteps	64 kWords (DM: 32 kWords,				
CJ1G-CPU43H CJ1G-CPU43P	960 bits (Up to 2 Expansion Racks)	20 kSteps	EM: 32 kWords x 1 bank)				
CJ1G-CPU42H CJ1G-CPU42P		10 kSteps					
CJ1M-CPU13 CJ1M-CPU13-ETN	640 bits (Only 1 Expansion Rack)	20 kSteps	32 kWords (DM: 32 kWords,	0.10 µs			
CJ1M-CPU12 CJ1M-CPU12-ETN	320 bits (No Expansion Rack)	10 kSteps	EM: None)				
CJ1M-CPU11 CJ1M-CPU11-ETN	160 bits (No Expansion Rack)	5 kSteps					
CJ1M-CPU23	640 bits (Only 1 Expansion Rack)	20 kSteps					Inputs: 10 Outputs: 6
CJ1M-CPU22	320 bits (No Expansion Rack)	10 kSteps	1				
CJ1M-CPU21	160 bits (No Expansion Rack)	5 kSteps]				

Note: The available data memory capacity is the sum of the Data Memory (DM) and the Extended Data Memory (EM).

Common Specifications

Item	Specification
Control method	Stored program
I/O control method	Cyclic scan and immediate processing are both possible.
Programming	Ladder diagram
Instruction length	1 to 7 steps per instruction
Ladder instructions	Approx. 400 (3-digit function codes)
Execution time	Basic instructions: 0.02 μs min.; Special instructions: 0.04 μs min.
Overhead time	CJ1G/H-CPU H: 0.3 ms CJ1G-CPU P: 0.3ms CJ1M-CPU (-ETN): 0.5 ms CJ1M-CPU 1(-ETN): 0.7 ms
Unit connection method	No backplane (Units joined together with connectors.)
Mounting method	DIN rail mounting (screw mounting not supported)
Maximum number of connectable Units	Per CPU or Expansion Rack: 10 Units max. (Basic I/O Units, Special I/O Units, or CPU Bus Units) Total per PLC: 10 Units on CPU Rack and 10 Units each on 3 Expansion Racks = 40 Units max. (See note.)
Maximum number of Expansion Racks	3 max. (A CJ-series I/O Control Unit is required on the CPU Rack and a CJ-series I/O Interface Unit is required on each Expansion Rack.) (See note.)
Number of tasks	288 (cyclic tasks: 32, interrupt tasks: 256) Interrupt tasks can be defined as cyclic tasks to create cyclic interrupt tasks.
	 Note: 1. Cyclic tasks are executed each cycle and are controlled with TKON(820) and TKOF(821) instructions. 2. The following 4 types of interrupt tasks are supported: Power OFF interrupt tasks: 1 max. Scheduled interrupt tasks: 2 max. I/O interrupt tasks: 32 max. External interrupt tasks: 256 max.
Interrupt types	Scheduled Interrupts:Interrupts generated at a time scheduled by CPU Unit's built-in timer (Interval: 1 to 9,999 ms or 10 to 99,990 ms; also 0.5 to 999.9 ms with CJ1M) I/O interrupt tasks:Interrupts from Interrupt Input Units or, with CJ1M, built-in I/O Power OFF Interrupts:Interrupts executed when CPU Unit's power is turned OFF External interrupt tasks:Interrupts from Special I/O Units and CPU Bus Units
Calling subroutines from multiple tasks	Supported using global subroutines.
Functions Blocks (CPU Ver. 3.0 or higher)	Languages supported for use in function block programming: Ladder program language and IEC 61131-3 Structured Text.

Note: The CJ1G-CPU43H/42H support a maximum of 2 Expansion Racks with a total maximum of 30 Units. The CJ1M-CPU13/23 support only 1 Expansion Rack with a total maximum of 20 Units (19 Units for CJ1M-CPU13-ETN). The CJ1M-CPU11/12/21/22 do not support Expansion Racks and support a total maximum of 10 Units (9 Units for CJ1M-CPU11/CPU12-ETN).

Item	-	Specification							
CIO (Core I/O) Area	I/O Area	2,560 (160 words): CIO 000000 to CIO 015915 (words CIO 0000 to CIO 0159)	These bits can be used						
		Setting of first rack words can be changed from default (CIO 0000) so that CIO 0000 to CIO 0999	as work bits when not						
		can be used.	used for the applica-						
		I/O bits are allocated to Basic I/O Units.	tions described on the						
	Built-in I/O Area	10 points, Inputs: CIO 296000 to CIO 296009, Outputs: CIO 296100 to CIO 296105	left.						
		Used for built-in I/O, CJ1M-CPU22/23 only							
	Link Area	3,200 (200 words): CIO 100000 to CIO 119915 (words CIO 1000 to CIO 1199)							
		Link bits are used for data links and are allocated to Units in Controller Link Systems.							
	CPU Bus Unit	6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899)							
	Area	CPU Bus Unit bits store the operating status of CPU Bus Units. (25 words per Unit, 16 Units max.)							
	Special I/O Unit	5,360 (960 words): CIO 200000 to CIO 295915 (words CIO 2000 to CIO 2959)							
	Area	Special I/O Unit bits are allocated to Special I/O Units. (10 words per Unit, 96 Units max.)							
	Serial PLC Link	90 words. CIO 3100 to CIO 3189 (bits. CIO 310000 to CIO 318915)							
	Area	Used for data links in serial PLC links, CJ1M only							
	DeviceNet Area /	9 600 (600 words): CIO 320000 to CIO 379915 (words CIO3200 to CIO 3799)							
	PROFIBUS-DP	DeviceNet bits are allocated to Slaves for DeviceNet Unit remote I/O communications when the							
	Area	master function is used with fixed allocations.							
		Fixed allocation setting 1Outputs:CIO 3200 to CIO 3263							
	Note: Other	Inputs:CIO 3300 to CIO 3363							
	areas than	Fixed allocation setting 2Outputs:CIO 3400 to CIO 3463							
	these default	Inputs:CIO 3500 to CIO 3563							
	areas can be	Fixed allocation setting 30utputs:CIO 3600 to CIO 3663							
	allocated	Inputs:CIO 3700 to CIO 3763							
	anocatoa	The following words are allocated to the master function even when the DeviceNet Unit is used							
		as a slave.							
		Fixed anocation setting Toulpuis:CiO 3370 (master to slave)							
		Fixed allocation satisfies 20 utsuits: CIO 2570 (master to slave)							
		Index alocation setting 2 outputs to 3570 (master to slave)							
		Fixed allocation setting 3Outputs:CIO 3770 (master to slave)							
		Inputs:CIO 3670 (slave to master)							
	Internal I/O Area	4 800 (300 words);CIO 120000 to CIO 149915 (words CIO 1200 to CIO 1499)							
	(work hits)	37 504 (2 344 words):CIO 380000 to CIO 614315 (words CIO 3800 to CIO 6143)							
	(Wolly blo)	These bits in CIO Area are used as work bits in programming to control program execution. The	v cannot be used for ex-						
		ternal I/O.	,						
Work Area		8.192 bits (512 words): W00000 to W51115 (words W000 to W511)							
		Control programs only. (I/O from external I/O terminals is not possible.)							
		Note: When using work bits in programming, use bits in Work Area first before using	bits from other areas.						
Holding Area		8.192 bits (512 words): H00000 to H51115 (words H000 to H511)							
0		Holding bits are used to control execution of program, and maintain their ON/OFF status when PLC is turned OFF or							
		operating mode is changed. In CPU Ver.3.0 and higher, Words H512 to H1535 exist, but are inte	rnally allocated as Func-						
		tion Block Holding Area and cannot be used.							
Auxiliary Area		Read only: 7,168 bits (448 words): A00000 to A44715 (words A000 to A447)							
		Read/write: 8,192 bits (512 words): A44800 to A95915 (words A448 to A959)							
		Auxiliary bits are allocated specific functions.							
Temporary Area		16 bits (TR00 to TR15) Temporary bits are used to store ON/OFF execution conditions at progra	m branches.						
Timer Area		4,096: T0000 to T4095 (used for timers only)							
Counter Area		4,096: C0000 to C4095 (used for counters only)							
DM Area		32 kWords: D00000 to D32767							
		Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in	DM Area maintain their						
		status when PLC is turned OFF or operating mode is changed.							
		Internal Special I/O Unit DM Area: D20000 to D29599 (100 words × 96 Units). Used to set parameters	ters for Special I/O Units.						
		CPU Bus Unit DM Area: D30000 to D31599 (100 words \times 16 Units). Used to set parameters for	CPU Bus Units.						
EM Area		32 kWords per bank, 7 banks max.: E0_00000 to E6_32767 max. (Not supported by CJ1M CPU	Units.)						
		Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in	EM Area maintain their						
		status when PLC is turned OFF or operating mode is changed.							
		The EM Area is divided into banks, and addresses can be set by either of following methods.							
		Setting bank numbers and addresses directly							
		EM data can be stored in files by specifying number of first bank (EM file memory)							
Index Registers		IRO to IR15. Store PLC memory addresses for indirect addressing. Index registers can be used ind	enendently in each teak						
Index registers		One register is 32 bits (2 words)	oponuonity in each idSK.						
		Index registers can be specified as shared or independent for each task							
Task Flag Area		32 (TK0000 to TK0031). Task Flags are read-only flags that are ON when corresponding evolicit	ask is executable and						
Tusk Tiay Alea		OFF when corresponding task is not executable or in standby status	uon io eneculable allu						
Trace Memory		4 000 words (trace data: 31 bits, 6 words)							
File Memory		Memory Cards: OMBON Memory Cards with 15-MB_30-MB_or 64-MB capacities can be used a	MS-DOS format)						
		EM file memory: Part of EM Area can be converted to file memory (MS-DOS format).	me boo iomay.						

Programmable Controllers

Function Specifications

Item	Specification										
Constant cycle time	1 to 32,000 ms (Unit: 1 ms) Note: With the CJ1G/H-CPU H, using the Parallel Processing Mode will create a constant cycle time for program execution.										
Cycle time monitoring	Possible (Unit stops operating if cycle is too long): 1 to 40,000 ms (Unit: 10 ms) Note: When the Parallel Processing Mode is used for the CJ1G/H-CPU□□H, the program execution cycle is monitored. Also, a fatal error will occur in the CPU Unit if the peripheral servicing time exceeds 2 s.										
I/O refreshing	Cyclic refreshing, immediate refreshing, refreshing by IORF(097).										
Special refreshing for CPU Bus Units	Data links for Control Link Units, remote I/O communications for DeviceNet Units, and other special data for CPU Bus Units is refreshed at the following times.										
I/O memory holding when	Depends on ON/OFF status of IOM Hold Bit in Auxiliary Area.	Juring VO refresh period or when CPO BOS UNIT I/O REFRESH (ULNK) Instruction is executed.									
changing operating modes	······································	Sepondo di Chijor Fondudo di temi ridu bitin Auxinuty Atou.									
Load OFF	All outputs on Output Units can be turned OFF when the CPU U	Jnit is RUN, MONITOR, or PROGRAM mode.									
Input time constant setting	Time constants can be set for inputs from CJ-series Basic I/O Up of noise and chattering or it can be decreased to detect shorter	nits. The time constant can be increased to reduce influence pulses on inputs.									
Operating mode setting at power-up	Possible (By default, the CPU Unit will start in RUN mode if a P	Possible (By default, the CPU Unit will start in RUN mode if a Programming Console is not connected.)									
Built-in flash memory	 Always stores (automatically backs up/restores) the user prog. When downloading projects from the CX-Programmer Ver. 5. symbol names and I/O comments), comment files (CX-Progra and program index files (CX-Programmer section names, sec the flash memory's internal Comment Memory (See note 1). 	ram and parameter area data (PLC Setup, etc.) 0 or later, symbol table files (including CX-Programmer immer rung comments and annotations), tion comments, and program comments) are stored in									
Memory Card functions	Automatically reading programs (autoboot) from the Memory Card when the power is turned ON.	Possible									
	Program replacement during PLC operation	Possible									
	Memory Card storage data	User program: Program file format PLC Setup and other parameters: Data file format I/O memory: Data file format (binary), text format, CSV format CPU Bus Unit data: Special format									
	Memory Card read/write method	User program instructions, Programming Devices (including CX-Programmer and Programming Console), Host Link computers, AR Area control bits, easy backup operation									
Filing	Memory Card data and EM (Extended Data Memory) Area can	be handled as files.									
Debugging	Force-set/reset, differential monitoring, data tracing (scheduled	each cycle, or when instruction is executed)									
Online editing	One or more program blocks in user programs can be overwritt This function is not available for block programming areas. With edited at the same time.	en when CPU Unit is in PROGRAM or MONITOR mode. the CX-Programmer, more than one program block can be									
Program protection	Overwrite protection:Set using DIP switch. Copy protection: Password set using CX-Programmer.										
Error check	User-defined errors (i.e., user can define fatal errors and non-fa The FPD(269) instruction can be used to check execution time Error status can be simulated with the FAL and FALS instructio	tal errors) and logic of each programming block. ns.									
Error log	Up to 20 errors are stored in error log. Information includes error The system can be set so that user-defined FAL errors are not	or code, error details, and time error occurred. stored in the error log.									
Serial communications	Built-in peripheral port: Programming Device (e.g., CX-Program Built-in RS-232C port: Programming Device (e.g., CX-Program Serial PLC Links (CJ1M only)	mer or Programming Console), Host Links, NT Links ner), Host Links, no-protocol communications, NT Links,									
	Serial Communications Unit (sold separately): Protocol macros	Host Links, NT Links									
Clock	Provided on all models. Accuracy: \pm 1.5 min/mo. at 25°C (accuracy. Used to store time when power is turned ON and when	racy varies with the temperature) errors occur.									
Power OFF detection time	10 to 25 ms (not fixed)										
Power OFF detection delay time	0 to 10 ms (user-defined, default: 0 ms)										
Memory protection	Held Areas: Holding bits, user program, Data Memory, Extended present values. Note: If IOM Hold Bit in Auxiliary Area is turned ON, and PLC PLC is turned ON, contents of CIO Area, Work Area, pa Registers, and Data Registers will be saved for up to 20	Data Memory, and status of counter Completion Flags and Setup is set to maintain IOM Hold Bit status when power to rt of Auxiliary Area, timer Completion Flag and PVs, Index days.									
Sending commands to a Host Link computer	FINS commands can be sent to a computer connected via Host Instructions from PLC.	Link System by executing Network Communications									
Remote programming and monitoring	Host Link communications can be used for remote programming Ethernet network.	and remote monitoring through a Controller Link System or									
Eight-level communications	Host Link communications can be used for remote programmin	g and remote monitoring from devices on networks up to									
(See note 2.)	eight levels away (Controller Link Network, Ethernet Network, or up to three levels.	other network). CPU Ver. 2.0 or higher. Older CPUs support									
Storing comments in CPU Unit	I/O comments can be stored in Memory Cards, EM file memory (See note 3.) integrated in the CPU.	, or (Ver. 3.0 and higher) in the comment memory									
Program check	Program checks are performed for items such as no END instruused to check programs.	iction and instruction errors. CX-Programmer can also be									
Control output signals	RUN output: The internal contacts will turn ON (close) while the	CPU Unit is operating (CJ1W-PA205R).									
Battery life	5 years at 25 °C (The battery life depends on the ambient operat for CJ1M) (See note 4.)	ing temperature; 0.75 years min. for CJ1H/G, 1.5 years min.									
Self-diagnostics	CPU errors (watchdog timer), I/O bus errors, memory errors, ar	d battery errors									
Other functions	Storage of number of times power has been interrupted. (Store	d in A514.)									

Note: 1. Supported for CPU Unit Ver. 3.0 or later only.

- 2. Supported for CPU Unit Ver. 2.0 or later only (Three-level communications are supported for Pre-Ver. 2.0 CPU Units.)
- 3. Supported for CX-Programmer Ver. 5.0 and CPU Unit Ver. 3.0 or later only.

4. Use a Replacement Battery that is within two years of its date of manufacture.

Power Supply Unit Specifications

Power Supply Unit	CJ1W-PA205R	CJ1W-PA202	CJ1W-PD025	CJ1W-PD022
Supply voltage	100 to 240 V AC (wide-range), 5	0/60 Hz	24 V DC	24 V DC
Operating voltage and frequency ranges	85 to 264 V AC, 47 to 63 Hz		19.2 to 28.8 V DC	21.6 to 26.4 V DC
Power consumption	100 VA max.	50 VA max.	50 W max.	35 W max.
Inrush current (See note 1.)	At 100 to 120 V AC:	At 100 to 120 V AC:	At 24 V DC:	At 24 V DC:
	15 A/8 ms max. for cold start at	20 A/8 ms max. for cold start at	30 A/20 ms max. for cold start	30 A/20 ms max. for cold start
	room temperature	room temperature		
	At 200 to 240 V AC:	At 200 to 240 V AC:		
	30 A/8 ms max. for cold start at	40 A/8 ms max. for cold start at		
	room temperature	room temperature		
Output capacity	5.0 A, 5 V DC	2.8 A, 5 V DC	5.0 A, 5 V DC	2.0 A, 5 V DC
	(including supply to CPU Unit)	(including supply to CPU Unit)	(including supply to CPU Unit)	(including supply to CPU unit)
	0.8 A, 24 V DC	0.4 A, 24 V DC	0.8 A, 24 V DC	0.4 A 24 V DC.
	Total: 25 W max.	Total: 14 W max.	Total: 25 W max.	Total 16.6 W max.
Power supply output terminals	None			
RUN output	Contact configuration: SPST-NO	Not provided		Not provided
(See note 2.)	Switching capacity: 250 V AC, 2			
	A			
	(resistive load)			
	120 V AC, 0.5 A (inductive load),			
	24 V DC, 2 A (resistive load)			
	24 V DC, 2 A (inductive load)			
Insulation resistance	20 MW min. (at 500 V DC) betwee	en AC external and GR terminals	20 MW min. (at 500 V DC)	No Isolation
	(See note 3.)		between DC external and	
			GR terminals (See note 3.)	

Note: 1. The values for inrush current given above for AC power supplies are for a cold start at room temperature. The values given for DC power supplies are for a cold start. The inrush control circuit in AC power supplies uses a thermistor element with a low-temperature current control characteristic. If the ambient temperature is high or the PC is hot-started, the thermistor will not be sufficiently cool, and the inrush currents given in the table may be exceeded by up to twice the given values. The inrush control circuit in DC power supplies uses a capacitor-charging delay circuit. If the PC is hot-started, the capacitor will have not discharged, and the inrush currents given in the table may be exceeded by up to twice the given selecting fuses or breakers for external circuits, allow sufficient margin in shut-off performance.

- 2. Supported only when mounted to CPU Rack.
- 3. Disconnect the Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength. Testing the insulation and dielectric strength with the LG terminal and the GR terminals connected will damage internal circuits in the CPU Unit.

General	Spe	cific	ations
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Item	Specifications
Dielectric strength	2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals (See note 1.)
	Leakage current: 10 mA max.
	1,000 V AC 50/60 Hz for 1 min between AC external and GR terminals (See note 1.)
	Leakage current: 10 mA max.
Noise immunity	2 kV on power supply line (conforming to IEC61000-4-4)
Vibration resistance	10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s ² in X, Y, and Z directions for 80 minutes
	(Time coefficient: 8 minutes x coefficient factor 10 = total time 80 min.) (according to IEC 60068-2-6/JIS C0040)
Shock resistance	147 m/s ² , 3 times each in X, Y, and Z directions (Relay Output Unit: 100 m/s ²) (according to IEC 60068-2-27/JIS C0041)
Ambient operating temperature	0 to 55°C
Ambient operating humidity	10% to 90% (with no condensation)
Atmosphere	Must be free from corrosive gases.
Ambient storage temperature	-20 to 75°C (excluding battery)
Grounding	Less than 100 W
Enclosure	Mounted in a panel.
Safety measures	Conforms to cULus and EC Directives.

Note: 1. Disconnect the Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength. Testing the insulation and dielectric strength with the LG terminal and the GR terminals connected will damage internal circuits in the CPU Unit.

Additional CJ1M-CPU21/22/23 Specifications

Data Area Allocations for Built-in I/O

I/O	Code		IN0	IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8	IN9	OUT1	OUT2	OUT3	OUT4	OUT5	OUT6
		Address						CIO 2960							CI	O 2961		
		Bit	00	01	02	03	04	05	06	07	08	09	00	01	02	03	04	05
Inputs		General- purpose inputs	General- purpose input 0	General- purpose input 1	General- purpose input 2	General- purpose input 3	General- purpose input 4	General- purpose input 5	General-pur- pose input 6	General-pur- pose input 7	General-pur- pose input 8	General-pur- pose input 9						
		Interrupt inputs	Interrupt input 0	Interrupt input 1	Interrupt input 2	Interrupt input 3												
		Quick- response inputs	Quick- response input 0	Quick- response input 1	Quick- response input 2	Quick- response input 3												
		High- speed counters			High- speed counter 1 (phase-Z/ reset)	High- speed counter 0 (phase-Z/ reset)			High-speed counter 1 (phase-A, increment, or count input)	High-speed counter 1 (phase-B, decrement, or direction input)	High-speed counter 0 (phase-A, increment, or count input)	High-speed counter 0 (phase-B, decrement, or direction input)						
Out- puts	Genera outputs	I-purpose											General- purpose output 0	General- purpose output 1	General- purpose output 2	General- purpose output 3	General- purpose output 4	General- purpose output 5
	Pulse out- puts	CW/CCW outputs											Pulse out- put 0 (CW)	Pulse out- put 0 (CCW)	Pulse out- put 1 (CW)	Pulse out- put 1 (CCW)		
		Pulse + direction outputs											Pulse out- put 0 (pulse)	Pulse out- put 1 (pulse)	Pulse out- put 0 (direction)	Pulse out- put 1 (direction)		
		Variable duty ratio outputs															PWM(891) output 0	PWM(891) output 1 (See note.)
Origin	search		Origin search 0 (Origin Input Sig- nal)	Origin search 0 (Origin Proximity Input Sig- nal)	Origin search 1 (Origin Input Sig- nal)	Origin search 1 (Origin Proximity Input Sig- nal)	Origin search 0 (Position- ing Com- pleted Signal)	Origin search 1 (Position- ing Com- pleted Signal)									Origin search 0 (Error Counter Reset Out- put)	Origin search 1 (Error Counter Reset Out- put)

Note: 1. CJ1M-CPU21 CPU Units have one PWM output only and do not have PWM output 1.

Built-in Input Specifications

Interrupt Inputs and Quick-response Inputs

	Item	Specification
No. of interrupt inputs/quick-re- sponse inputs		4 total
Input inter- rupts	Direct (Input Inter- rupt) Mode	Execution of an interrupt task is started at the interrupt input's rising or falling edge. Interrupt numbers 140 to 143 are used (fixed). Response time from meeting input condition to start of interrupt task execution: 93 µs min.
	High-speed Counter Mode	Rising or falling edges of the interrupt are counted using either an incrementing or decrementing counter, and an interrupt task is started when the input count reaches the set value. Interrupt numbers 140 to 143 are used (fixed). I/O response frequency: 1 kHz
Quick-response inputs		Signals that are shorted than the cycle time (30 µs min.) can be read and treated the same as signals that are one for more than one cycle time.

High-speed Counter Inputs

Item		Specification					
Number of high-speed counters		2 (High-speed counters 0 and 1)					
Pulse input mode (Selected in PLC Setup)		Differential phase inputs (phase-A, phase-B, and phase-Z input)	Up/down inputs (up inputs, down inputs, reset inputs)	Pulse + direction inputs (pulse inputs, direction in- puts, reset inputs)	Increment inputs (increment inputs, reset inputs)		
Response fre-	Line-driver inputs	50 kHz	100 kHz	100 kHz	100 kHz		
quency	24-V DC inputs	30 kHz	60 kHz	60 kHz	60 kHz		
Counting mode	9	Linear mode or Ring mode	(Select in the PLC Setup.)	,			
Count value		Linear mode: 80000000 to 7FFFFFF hex Ring mode: 00000000 to Ring SV (The Ring SV is set in the PLC Setup and the setting range is 00000001 to FFFFFFF hex.)					
High-speed counter PV storage locations		High-speed counter 0: A271 (leftmost 4 digits) and A270 (rightmost 4 digits) High-speed counter 1: A273 (leftmost 4 digits) and A272 (rightmost 4 digits) Target value comparison interrupts or range comparison interrupts can be executed based on these PVs. The PVs are refreshed in the overseeing processes at the beginning of each cycle. Use the PRV(881) instruction to read the most recent PVs.					
Control Target value comparison		Up to 48 target values and corresponding interrupt task numbers can be registered.					
method	Range comparison	Up to 8 ranges can be regis	Up to 8 ranges can be registered, with an upper limit, lower limit, and interrupt task number for each.				
Counter reset method		Phase-Z + Software reset: Counter is reset when phase-Z input goes ON while Reset Bit is ON. Software reset: Counter is reset when Reset Bit goes ON. Reset Bits: High-speed Counter 0 Reset Bit is A53100, Counter 1 Reset Bit is A53101.					

Built-in Output Specifications

Position Control and Speed Control

Item	Specifications				
Output frequency	1 Hz to 100 kHz (1-Hz units from 1 to 100 Hz, 10-Hz units from 100 Hz to 4 kHz, and 100-Hz units from 4 to 100 kHz)				
Frequency acceleration and deceleration rates	Set in 1 Hz units for acceleration/deceleration rates from 1 Hz to 2 kHz (every 4 ms). The acceleration and decel- eration rates can be set separately only with PLS2(887).				
Changing SVs during instruc- tion execution	The target frequency, acceleration/deceleration rate, and target position can be changed. Changes to the target frequency and acceleration/deceleration rate must be made at constant speed.				
Pulse output method	CW/CCW inputs or Pulse + direction inputs				
Number of output pulses	Relative coordinates: 00000000 to 7FFFFFF hex (Each direction accelerating or decelerating: 2,147,483,647)				
	Absolute coordinates: 80000000 to 7FFFFFF hex (-2,147,483,648 to 2,147,483,647)				
Instruction used for origin searches and returns	ORIGIN SEARCH (ORG(889)): Origin search and origin return operations according to set parameters				
Instructions used for position	PULSE OUTPUT (PLS2(887): Trapezoidal output control with separate acceleration and deceleration rate				
and speed control	SET PULSES (PULS(886)): Setting the number of pulses for pulse output				
	SPEED OUTPUT ((SPED(885): Pulse output without acceleration or deceleration (Number of pulses must be set in advance with PULS(886) for position control.)				
	ACCELERATION CONTROL (ACC(888)): Changes frequency or pulse output with acceleration and deceleration				
	MODE CONTROL (INI(880)): Stopping pulse output				
Pulse output PV's storage loca-	The following Auxiliary Area words contain the pulse output PVs:				
tion	Pulse output 0: A277 (leftmost 4 digits) and A276 (rightmost 4 digits) Pulse output 1: A279 (leftmost 4 digits) and A278 (rightmost 4 digits)				
	The PVs are refreshed during regular I/O refreshing. PVs can be read to user-specified words with the PRV(881) instruction.				

Variable-duty Pulse Outputs (PWM)

Item	Specifications		
Duty ratio	0% to 100%, set in 0.1% units (See note.)		
Frequency	0.1 Hz to 999.9 Hz, Set in 0.1 Hz units.		
Instruction	PULSE WITH VARIABLE DUTY RATIO (PWM(891)): Sets duty ratio and outputs pulses.		

Note: CJ1M CPU Unit Ver. 2.0 or later only. (0% to 100%, set in 1% units for Pre-Ver. 2.0 CPU Units.)

Hardware Specifications

Input Specifications

Item		Specifications				
Number of inputs		10 inputs				
Input method		24-V DC inputs or line driver (wiring changed to select)				
Input voltage spe	ecifications	24 V DC		Line driver		
Terminals		IN0 to IN5	IN6 to IN9	IN0 to IN5	IN6 to IN9	
Input voltage		20.4 to 26.4 V DC		RS-422A or RS-422 line driver (conforming to AM26LS31), Power supply voltage of 5 V \pm 5%		
Input impedance		3.6 kΩ	4.0 kΩ			
Input current (typ	oical)	6.2 mA	4.1 mA	13 mA	10 mA	
Minimum ON vol	tage	17.4 V DC/3 mA min.				
Maximum OFF voltage		5.0 V DC/1 mA max.		7		
Response speed (for gen-	ON response time	Default setting: 8 ms max. or 32 ms in the PLC Setu	Default setting: 8 ms max. (The input time constant can be set to 0 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 or 32 ms in the PLC Setup.)			
eral-purpose in- puts)	OFF response time	Default setting: 8 ms max. (The input time constant can be set to 0 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 m or 32 ms in the PLC Setup.)				

Input Circuit Configuration

Item	Specification				
Input	IN0 to IN5	IN6 to IN9			
Circuit configuration	24 V LD+ 0 V/LD- 0 V/LD- 100 Ω 1,000 pF 1,000 pF 1,	24 V LD+ 0 V/LD- 0 V/LD- 1.5 kΩ \$1,000 pF 100 Ω 100 Ω			

General-purpose Output Specifications for Transistor Outputs (Sinking)

Item	Specification				
Output	OUT0 to OUT3 OUT	4 to OUT5			
Rated voltage	5 to 24 V DC				
Allowable voltage range	4.75 to 26.4 V DC				
Max. switching capacity	0.3 A/output; 1.8 A/Unit				
Number of circuits	6 outputs (6 outputs/common)				
Max. inrush current	3.0 A/output, 10 ms max.				
Leakage current	0.1 mA max.				
Residual voltage					
ON delay	0.1 ms max.				
OFF delay	0.1 ms max.				
Fuse	None				
External power supply	10.2 to 26.4 V DC 50 mA min.				
Circuit configuration	State S	Under the second secon			

Pulse Output Specifications (OUT0 to OUT3)

Item	Specifications			
Max. switching capacity	30 mA, 4.75 to 26.4 V DC			
Min. switching capacity	7 mA, 4.75 to 26.4 V DC			
Max. output frequency	100 kHz			
Output waveform	OFF 90% ON 10% 2 μs min. 4 μs min.			

CJ1G-CPU P (Loop-control CPU Units) Specifications

Providing Effective Solutions by Integrating Sequence Control and Loop Control into the Same Basic Functionality of the CJ Series

Overview

An engine for controlling analog quantities (e.g., temperature, pressure, flowrate) is built into the same CPU Unit as the engine for executing sequence control, delivering high-speed sequence control and high-speed, advanced analog quantity control in a single Unit.

Features

- Program graphically by pasting function blocks for PID control, square root calculations, or other functions in a window and then connect them with the mouse.
- More than 70 types of function blocks are provided, including Bank Selector and Split Converter (for heating and cooling control), supporting a wide array of control methods from basic PID control to cascade control and feed-forward control.
- Function blocks enable a control cycle speed of up to 10 ms. A range of control methods are supported from detailed flowrate control and pressure control to high-speed temperature control.
- The CX-Process Tool can be used to open the tuning window and change parameters while monitoring PVs, SPs, and MVs.
- The Face Plate Auto-builder for NS (order separately) can be used to automatically create touch panel adjustment windows, including control windows, tuning windows, and segment program parameter setting windows, from function block data.

Programming Example

Example: Program Control



Function Specifications

CPU Element (Sequence Control)

Name	I/O bits	Program capacity	DM words	EM words	Model
Loop-control CPU Unit	1,280 bits	60K steps	32K words	32K words × 3 banks E0_00000 to E2_32767	CJ1G-CPU45P
		30K steps		32K words \times 1 bank	CJ1G-CPU44P
	960 bits	20K steps		E0_00000 to E0_32767	CJ1G-CPU43P
		10K steps			CJ1G-CPU42P

Loop Controller Element (Loop Control)

	Item	Model	CJ1G-CPU42P CJ1G-CPU43P CJ1G-CPU44P CJ1G-CPU4				
Operation method			Function block method				
Operation cycle			0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block.				
Number of func-	Analog operations	Control and operation blocks	50 blocks max. 300 blocks max.				
tion blocks	Sequence con- trol	Step ladder program blocks	1 20 blocks max. 200 blocks max. 4,000 commands total				
	I/O blocks	Field terminal blocks	30 blocks max.		40 blocks max.		
		User link tables	2,400 data items max.				
		Batch allocation	HMI function, allocated 1 EM Area bank				
System Common block			Single block				
Method for creating and transferring function blocks			Created using CX-Proc	cess Tool (order separat	ely) and transferred to L	oop Controller.	

	Item	Model	CJ1G-CPU42P	CJ1G-CPU43P	CJ1G-CPU44P	CJ1G-CPU45P	
Control	PID control met	hod	PID with 2 degrees of freedom (with autotuning) Any of the following function blocks can be combined: Basic PID control, cascade control, feed-forward control, sample PI control, Smith dead time compensation control, PID control with differential gap, override control, program control, time proportional control, etc.				
method	Control combin	ations					
Alarms	PID block interr	nal alarms	4 PV alarms (upper upper-limit, upper limit, lower limit, lower lower-limit) and 1 deviation ala per PID block.) and 1 deviation alarm	
Alarm blocks High/low alarm blocks, deviation alarm blocks							

Task Programming

Better Design/Development Efficiency Structured Programming and Team Program Development Using Tasks

With CJ-series PLCs, programs can be divided into programming units called tasks. There are both cyclic tasks, which are executed each cycle in a specified order, and interrupt tasks, which are executed when an interrupt occurs.



With CJ1-series PLCs, up to 288 tasks can be executed as cyclic tasks.

Task Programming Example with CX-Programmer



Advantages

Program Standardization

Task programs are created in units divided by functionally by purpose. These functional units can be easily reused when programming new PLCs or systems with the same functionality.



Easier-to-understand Programs

With scroll-like programs, individual functional units are extremely difficult to find just by looking at the program.

Tasks are used to separate a program functionally and make the program much easier to understand.



Shorter Cycle Times

With a scroll-like program, many jump and similar instructions had to be used to avoid executing specific parts of the program. This not only slows down the programs, but makes them more difficult to understand. With task programming, special instructions enable controlling the execution of tasks so that only the require tasks are executed during any particular cycle.



Greater Efficiency in Team Program Development (Unit Ver. 2.0 or Later Only)

Checking Address Duplication between Tasks (CX-Programmer Ver. 4.0 or Higher)

The CX-Programmer automatically executes a cross-reference report that checks whether the same addresses have been used by two or more tasks (programs) created by two or more people.



List of duplicated addresses on CX-Programmer

Downloading in Task Units

(CX-Programmer Ver. 4.0 or Higher)

When a program has been created by two or more people, each person can use the CX-Programmer to download only the task (program) they have changed.



Monitoring Operating Status for Each Task (CX-Programmer Ver. 4.0 or Higher)

The execution status for each task can be monitored from the CX-Programmer, contributing to improved debugging efficiency.



Task Features

Standardization of Common Processing

Global subroutines are supported that can be called from different tasks. This enables removing standard programming sections from individual tasks for execution as global subroutines, greatly reducing the size of the overall program.



Faster Switching between Tasks

Switching between tasks is faster than ever before to ensure highspeed cycle times even with structured programming.



High-speed Processing

Ample Speed for Advanced Machine Interfaces, Communications, and Data Processing

High-speed Instructions and System Bus

Faster Execution Times (from 20 ns) and Faster Processing of Frequently Used Instructions

Faster instruction processing includes 0.02 μ s for LD and 0.18 μ s for MOV. A complete range of instructions (more than 400) is supported, more than 100 of which are frequently used special instructions that can be processed almost as fast as basic instructions, as fast as 0.18 μ s for some instructions.



Four Times the Peripheral Servicing and I/O Refresh Speed Increased efficiency in data transmission between the CPU Unit and Special I/O Units/CPU Bus Units further improves performance of the entire system.

- Refresh time for CJ-series 64-point Input Units:
- 0.011 ms (16 times faster)
- Refresh time for CJ-series 64-point Output Units: 0.011 ms (8 times faster)
- Refresh time for 256 words for Communications Unit: 0.45 ms (4 times faster)



30 Times the Overall Cycle Speed

Example 1: The following example is for 30-Kstep programs (basic instructions: 50%; MOV instructions: 30%; arithmetic operation instructions: 20%).



Example 2: The following example is for 10-Kstep programs (basic instructions: 50%; MOV instructions: 30%; arithmetic operation instructions: 20%).



High-speed Exchange with Communications Units and High-speed Data Processing

Response Time for both Instruction Execution and Peripheral Servicing Can Be Emphasized

With CJ1G and CJ1H CPU Units, a Parallel Processing Mode can be used to perform program execution and peripheral servicing in parallel. Parallel processing doubles the speed of peripheral serving time over previous PLCs, enabling the following types of application.

High-volume, high-speed data exchange is possible with a host without the speed being affected by the size of the program in the CPU Unit.

- Data can be exchanged with SCADA software with consistent timing for smooth data updates.
- The cycle time is not affected even if communications are increased or networks added in future system expansions.



Control Inconsistencies in the Cycle Time for Data Processing

Table data, text string, or other instructions requiring long execution times can be executed over multiple cycles to minimize the affect on the cycle time and maintain more consistent I/O response characteristics.



Background processing over multiple cycles can be used to mini-mize the affect on the cycle time and control inconsistencies.

Better Refresh Performance for Data Links, DeviceNet Remote I/O, and More

I/O refresh processing with CPU Bus Units, which was previously performed only during I/O refreshing after instruction execution, is now possible at any time using the DLNK instruction. The CPU Bus Unit's refresh response performance has been improved by enabling refresh processing specific to CPU Bus Units, such as data links and DeviceNet remote I/O communications, and refreshing of words allocated to the Units in the CIO Area and DM Area any time during instruction execution.



Unit	Refresh function
Controller Link Unit	Data links
DeviceNet Unit	Remote I/O
Serial Communications Unit	Protocol macros
Ethernet Unit	Socket servicing for spe- cific bit manipulations

Various Forms of Protection Provide Better Security

Conceal Intellectual Property Contained in Programs (Unit Ver. 2.0 or Later)

Password Read Protection for Tasks (CX-Programmer Ver. 4.0 or Higher)

Specific tasks (programs) can be set to prohibit reading unless the correct password is input.



This function enables concealment of intellectual property contained in programs. The overwrite prohibit function also protects programs concealing intellectual property from being carelessly overwritten.



Prevent Leakage of Intellectual Property (Unit Ver. 2.0 or Later)

Prohibit/Allow File Memory Program File Creation (CX-Programmer Ver. 4.0 or Higher)

In addition to UM read protection and task read protection, user programs can also be protected from being illegally transferred to a Memory Card. This function enables complete read protection of programs in the PLC and prevents leakage of intellectual property.



Write Protection from Specific Nodes through Networks (Unit Ver. 2.0 or Later)

CPU Unit FINS Write/Protection through Networks (CX-Programmer Ver. 4.0 or Higher)

Specific nodes can be prohibited from writing to other nodes on the network. Data transmissions through the network are monitored, preventing data being carelessly written to the PLC, and preventing problems in the system.



Instruction Features

High-volume Data Processing with One Instruction

The basic data format for specifying instruction operands has been changed from BCD to binary, enabling specification of more data for each instruction.

Example: BLOCK TRANSFER Instruction

Address type	C200HX/HG/HE PLCs	CJ-series PLCs
Direct	0 to 6,655 words	0 to 65,535 words
Indirect for DM Area	DM 0000 to DM 9999	D00000 to D32767

Binary Specifications for Timer/Counter Instructions

Either BCD or binary can be used to specify the set values for timer and counter instructions. Using a binary specification enables specifying longer periods of time and higher count values.

Examples: TIM instruction (BCD): 0 to 999.9 s

TIMX instruction (binary) 0 to 6,553.5 s

CNT instruction (BCD): 0 to 9,999 counts CNTX instruction (binary): 0 to 65,535 counts

Applicable Instructions:

Binary Timer/Counter Instructions:

BINARY TIMER: TIMX(550) BINARY COUNTER: CNTX(546) BINARY HIGH-SPEED TIMER: TIMHX(551) BINARY ONE-MS TIMER: TMHHX(552) BINARY ACCUMULATIVE TIMER: TTIMX(555) BINARY LONG TIMER: TIMLX(553) BINARY MULTI-OUTPUT TIMER: MTIMX(554) BINARY REVERSIBLE COUNTER: CNTRX(548) BINARY RESET TIMER/COUNTER: CNRX(547)

Simplifier Ladder Programming

Programs using many basic instructions can be simplified greatly by using differentiated versions of the LD NOT, AND NOT, and OR NOT instructions, as well as bit access instructions for the DM and EM Areas.



Applicable Instructions: Bit Access Instructions: SINGLE BIT OUTPUT (OUTB(534))

Simplify Programs with Index Registers

Index registers can be used as memory pointers to enable easily changing the addresses specified for instructions. Using an index register can often enable one instruction to preform the processing previously performed by many instructions.



Previous



Simplification Using

Index Registers: IR00 to IR15

Easily Repeat Processing

Instructions are provided that let you easily repeat sections of the program. Repeat execution can also be ended for a specified condition.





Repeated n times.

Applicable Instructions:

Loop Control Instructions: START FOR-NEXT LOOPS (FOR(512)) END FOR-NEXT LOOPS (NEXT(513)) BREAK LOOP (BREAK(514))



Interlock Nesting (Unit Ver. 2.0 or Later Only)

(CX-Programmer Ver 4.0 or Higher)

The previous interlock instructions cannot be nested. In actual applications, however, the entire interlock condition is often combined with partial interlock conditions. Multi-interlock instructions can be nested to better handle real applications.



Applicable Instructions:

Sequence Control Instructions: MULTI-INTERLOCK DIFFERENTIATION HOLD (MILH(517)) MULTI-INTERLOCK DIFFERENTIATION RELEASE (MILR(518)) MULTI-INTERLOCK CLEAR (MILC(519))

Easily Program Cam Switch Control (Unit Ver. 2.0 or Later Only)

The EXPANDED BLOCK COMPARE (BCMP2(502)) instruction can be used to compare data converted from Gray binary code to binary data, BCD data, or an angle using the GRAY CODE CONVERT (GRY(474)) instruction. It can also compare data in ranges including 0, such as angle data.





If the comparison data (S) is within an of the 256 ranges, BCMP2(502) will turn ON the corresponding output bit in the results. If the upper limit is less than the lower limit, the comparison range will include 0.

the software.

Interlock status is easy to understand using

Example of Compare Data



Angle Data

Controlling a Machine that Adjusts Timing According to Angles (Cam Switch Control)

Repeatedly Starting a Timer

Controlling Machine Timing Directly (Rotary Timer Control) Applicable Instructions:

Conversion instructions:

GRAY CODE CONVERT (GRY(474))

Comparison instructions:

EXPANDED BLOCK COMPARE (BCMP2(502))

BCMP2(502) is supported by Pre-Ver. 2.0 CJ1M CPU Units or later.

PID Autotuning

PID constants can be automatically tuned for the PID instructions. The limit cycle method is used for tuning, allowing tuning to be completely quickly. This is particularly effective when there are many PID control loops



PID instructions can be combined with the TIME-PROPORTIONAL OUTPUT (TPO(685)) instruction to enable time-proportional output of a manipulated variable (MV).



Control instructions: PID CONTROL WITH AUTOTUNING (PIDAT(191)) TIME-PROPORTIONAL OUTPUT (TPO(685))

Easily Process Stacks: One-word Records for FIFO Processing

Stacks can be created in the DM Area or other areas for FIFO or other stack processing. The SET STACK (SSET(630)) instruction is used to create a stack.



FIRST IN FIRST OUT (FIFO(633)) LAST IN FIRST OUT (LIFO(634))

Simple Data Searches (Single Words)

Instructions are provided to find the maximum value, minimum value, and search values.



Applicable Instructions:

Search Instructions: DATA SEARCH (SRCH(181)) FIND MAXIMUM (MAX(182)) FIND MINIMUM (MIN(183))

Real-time Data Management for Conveyors and Other Applications

When workpieces are added and removed during processing, such as with conveyors, the CJ1-series PLCs enable stack data to be inserted or deleted as required to easily manage workpiece data in real-time.



Applicable Instructions:

Table Data Processing Instructions: SET STACK (SSET(630)) STACK SIZE READ (SNÚM(638)) STACK DATA READ (SREAD(639)) STACK DATA OVERWRITE (SWRIT(640)) STACK DATA INSERT (SINS(641)) STACK DATA DELETE (SDEL(642))

Process Data Tables: Multi-word Records

Areas of memory can be defined as tables with the specified record size (words). Index registers can be used with such tables to easily sort records, search for values, or otherwise process the records in the table

For example, the temperature, pressure, and other settings for each model of a product can be set in separate records and the data handled by record.



Applicable Instructions:

Table Data Instructions: DIMENSION RECORD TABLE (DIM(631)) SET RECORD LOCATION (SETR(635)) GET RECORD NUMBER (GETR(636))

High-precision Approximations

Converting a level meter reading in mm to tank capacity in liters according to the shape of the tank and other difficult linear extrapolations requiring high data resolution can be performed. (Linear data can be handled as 16-bit unsigned binary or BCD data, 16-bit or 32-bit signed binary data, or floating-point decimal data.)



Applicable Instructions: ARITHMETIC PROCESS (APR(069))

Convert between Floating-point and Text Data

Instructions are provided to easily convert floating-point decimal numbers (real numbers) to text strings (ASCII) for display on PTs. These are display as character display objects on the PT.



Character display object

You can also convert ASCII data (text strings) received from measurement devices to floating-point decimal data for use in calculations.



Applicable Instructions:

Floating-point Decimal Math instructions FLOATING- POINT TO ASCII (FSTR(448)) ASCII TO FLOATING-POINT (FVAL(449))

High-precision Positioning for XY Tables and Other Applications

Floating-point decimal and double-precision calculation instruction have been supported. These are essential for position control operations. Now more precise position control is possible than ever before.



Applicable Instructions:

Floating-point Decimal and Double-precision Math instructions

Easily Programmed Calendar Timers (Unit Ver. 2.0 or Later)

Two sets of calendar data can be compared. The calendar data to be compared can be restricted to the year, month, day, hour, minutes, or seconds.



Example: The calendar timer function can be easily set for a specific function to operate every day at 17:00:00 (H:M:S).

Applicable Instructions:

Comparison instructions

Time comparison: = DT(341) <> DT(342) < DT(343) <= DT(343) > DT(345) >= DT(346)

Simplified Execution of Subroutines with Different Operands

Macro instructions can be used to execute the same subroutine program with different operands from different locations in the programs.



Applicable Instructions:

Subroutine instruction: MACRO (MCRO(099))

Simulate Specific Error Statuses for Debugging

The FAL(006) and FALS(007) instructions can be used to simulate a desired error condition. This can be used, for example, to intentionally create error conditions in the CPU Unit while debugging to check to see if the correct error messages are displayed on a PT.

Example



Applicable Instructions:

Diagnostic Instructions FAILURE ALARM (FAL(006)) SEVERE FAILURE ALARM (FALS(007))

Easily Program Logic Flow Control with Block Programming Sections

A block of mnemonic programming instructions can be executed as a group based on a single execution condition. IF/THEN, WAIT, TIMER WAIT, and other instructions can be used inside the block programming section to easily program logic flow control that is difficult to program with ladder diagrams.



Block programming section

Easily Handle Text Strings

Manufacturing instruction can be obtained from a host computer or other external source, stored in memory, and then manipulated as text strings (ASCII data) as required by the applications. The text strings can be searched, fetched, reordered, or other processed in the CPU Unit of the PLC.



Applicable Instructions:

Text String Processing instructions

Read Maintenance Information Easily through DeviceNet (Unit Ver. 2.0 or Later) NEW!

Send user-set explicit messages easily without having to consider FINS commands. Data transmission between PLCs can also be achieved simply using explicit messages.



Network Instructions

EXPLICIT MESSAGE SEND (EXPLT(720)) EXPLICIT GET ATTRIBUTE (EGATR(721)) EXPLICIT SET ATTRIBUTE (ESATR(722)) EXPLICIT WORD READ (ECHRD(723)) EXPLICIT WORD WRITE (ECHWR(724))

Applicable Instructions: Block Programming instructions



Dimensions

Note: Units are in mm unless specified otherwise.

Product Dimensions



Unit/product	Model number	Width
Power Supply Unit	CJ1W-PA205R	80
	CJ1W-PA202	45
	CJ1W-PD025	60
	CJ1W-PD022	27
CPU Unit	CJ1M-CPU11/12/13	31
	CJ1M-CPU21/22/23	49
	CJ1H-CPU□□H CJ1G-CPU□□H	62
	CJ1G-CPU□□P	69
	CJ1M-CPU1□-ETN	62
End Cover	CJ1W-TER01	14.7

CPU Unit CJ1M-CPU11/12/13 CJ1M-CPU21/22/23 27 90 6 2.7 2.7 -31 49 73.9 Weight: 170 g Weight: 120 g End Plate RS-422A Converter



Width W (mm) When Used with a CJ1W-PA202 Power Supply Unit (AC, 14 W) Number of I/O Units with CJ1M-CPU11/12/13 CJ1M-CPU21/22/23

31-mm width		
1	121.7	139.7
2	152.7	170.7
3	183.7	201.7
4	214.7	232.7
5	245.7	263.7
6	276.7	294.7
7	307.7	325.7
8	338.7	356.7
9	369.7	387.7
10	400.7	418.7



CJ-series Units other than CPU Units and Power Supply Units have a width of either 20 mm or 31 mm, as shown in the tables below.

Units of Width 20 mm

Unit	Model number	Width
I/O Control Unit	CJ1W-IC101	20
32-point Basic I/O Units	CJ1W-ID231/232	
	CJ1W-OD231/232	
CompoBus/S Master Unit	CJ1W-SRM21	

Units of Width 80 mm

Unit	Model number	Width
Motion Control Unit	CJ1W-MCH71	80



32-point I/O Unit



65 -83.6

(Provided with the CPU Unit.)

|++| 14.7



Units of Width 31 mm

Unit	Model number	Width
I/O Interface Unit	CJ1W-II101	31
8/16-point Basic I/O Units	CJ1W-ID201/211	
	CJ1W-IA111/201	
	CJ1W-OD201/202/203/204	
	CJ1W-OD211/212	
	CJ1W-OC201/211	
22 point Basia I/O Linita	C 11W MD221/222/222	
64 point Basic I/O Units	C 11W ID261/262	
64-point Basic I/O Onits	C 11W-0D261/262/263	
	CJ1W-MD261/263/563	
Interrupt Input Unit	CJ1W-INT01	
High-Speed Input Unit	CJ1W-IDP01	
Analog I/O Unit	CJ1W-AD	
-	CJ1W-DA	
	CJ1W-MAD42	
Process Input Units	CJ1W-PDC15	
	CJ1W-PTS15/16	
	CJ1W-PTS51/52	
Temperature Input Units	CJ1W-TS561/562	
Temperature Control Units		
Position Control Units	CJ1W-NC113/133	
	CJ1W-NC213/233	
	CJ1W-NC413/433	
High-speed Counter Unit	CJ1W-CT021	
4-channel Counter Unit	CJ1W-CTL41-E	
SSI encoder Unit	CJ1W-CTS21-E	
Controller Link Unit	CJ1W-CLK21	
Serial Communications Unit	CJ1W-SCU21-V1	
	CJ1W-SCU41-V1	
Ethernet Unit	CJ1W-ETN11/21	
DeviceNet Unit	CJ1W-DRM21	
PROFIBUS-DP Units	CJ1W-PRM21	
	CJ1W-PRT21	
CAN Unit	CJ1W-CORT21	
RFID Sensor Units	CJ1W-V600C11	
	CJ1W-V600C12	
Position Control Unit	CJ1W-NCF71	

Mounting Dimensions



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





W, the total width is given by the following formula:

W = 80 (Power Supply Unit) + 62 (CPU Unit) + 20 x n + 31 x m + 14.7 (End Cover) (mm)

where n is the number of Units of width 20 mm and m is the number of Units of width 31 mm.

Example: For configurations with 2 32-point Basic I/O Units and 8 Units of width 31 mm:

W = 156.7 + 20 x 2 + 31 x 8 = 444.7 mm

Mounting Depth

The mounting depth of CJ-series CPU Racks and Expansion Racks is from 81.6 to 89.0 mm depending on the Units that are mounted. Additional depth is required to connect Programming Devices (e.g., CX-Programmer or Programming Console) and Cables. Be sure to allow sufficient mounting depth.



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.

CS/CJ-series Connecting Cable



Current Consumption

The amount of current/power that can be supplied to the Units mounted in a Rack is limited by the capacity of the Rack's Power Supply Unit. The system must be designed so that the total current consumption of the Units does not exceed the maximum current for each voltage group and the total power consumption does not exceed the maximum for the Power Supply Unit.

CPU Racks and Expansion Racks

The following table shows the maximum currents and power that can be supplied by Power Supply Units on CPU Racks and Expansion Racks.

- Note: 1. When calculating current/power consumption in a CPU Rack, be sure to include the power required by the CPU Unit itself. When expanding the configuration, be sure to include the power required by the I/O Control Unit.
 - 2. When calculating current/power consumption in an Expansion Rack, be sure to include the power required by the I/O Interface Unit itself.

Power Supply Unit	Maximum current consump	(C) Maximum total power		
	(A) 5-V group	(B) 24-V group relay driver power supply	24-V group service power supply	consumption
CJ1W-PA205R	5.0 A	0.8 A	None	25 W
CJ1W-PA202	2.8 A	0.4 A	None	14 W
CJ1W-PD025	5.0 A	0.8 A	None	25 W
CJ1W-PD022	2.0 A	0.4 A	None	19.6 W

Be sure that both conditions 1 and 2 below are met.

Condition 1: Maximum Current Supply

- 1. Current required at 5 V DC by all Units (A) ≤ Maximum current consumption shown in table
- 2. Current required at 24 V DC by all Units (B) ≤ Maximum current consumption shown in table

Condition 2: Maximum Total Power Supply A x 5 V DC + B x 24 V DC + C x 24 V DC ± Maximum total power consumption shown in table (C)

Example Calculations

In this example, the following Units are mounted to a CJ-series CPU Rack with a CJ1W-PA202 Power Supply Unit.

Unit	Model	Quantity	5- V DC	24- V DC
CPU Unit	CJ1G-CPU45H	1	0.910 A	
I/O Control Unit	CJ1W-IC101	1	0.020 A	
Input Units	CJ1W-ID211	2	0.080 A	
	CJ1W-ID231	2	0.090 A	
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-CLK21	1	0.350 A	
Current consumption	Calculation	·	0.910+0.020+0.080×2+0.090x2+ 0.090x2+0.120+0.350	0.048 Ax2
	Result		1.92 A (£5.0 A)	0.096 A (£0.8 A)
Power consumption	Calculation		1.92x5 V=9.60 W	0.096 Ax24 V=2.304 W
	Result		9.60+2.304=11.904 W (£25 W)	

Current Consumption Tables

CPU Units and Expansion Units

Name	Model	Current consump- tion at 5 V (A)
CPU Units	CJ1H-CPU67H/66H/65H	0.99 (See note.)
(These values include	CJ1G-CPU45P/44P/43P/42P	1.06 (See note.)
Current consumption for a	CJ1G-CPU45H/44H/43H/42H	0.91 (See note.)
CX-Programmer.)	CJ1M-CPU11/12/13	0.58 (See note.)
	CJ1M-CPU21/22/23	0.64 (See note.)
	CJ1M-CPU1□-ETN	0.95 (See note.)
Expansion Unit	CJ1W-IC101	0.02
	CJ1W-II101	0.13
End Cover	CJ1W-TER01	Included in CPU Unit or Expansion Unit.

Note: Add 0.15 A per Unit when the NT-AL001-E is connected and 0.04 A when the CJ1W-CIF11 RS-422A Adapter is connected.

CJ-series Basic I/O Units and Interrupt Input Unit

Category	Name	Model	Current consumption at 5 V (A)	Current consumption at 24 V (A)
Basic	DC Input	CJ1W-ID201	0.08	
Input Units	Units	CJ1W-ID211	0.08	
		CJ1W-ID231	0.09	
		CJ1W-ID232	0.09	
		CJ1W-ID261	0.09	
		CJ1W-ID262	0.09	
	AC Input	CJ1W-IA111	0.09	
	Units	CJ1W-IA201	0.08	
Basic	Transistor	CJ1W-OD201	0.09	
Output	Output	CJ1W-OD202	0.11	
Units	Units	CJ1W-OD203	0.10	
		CJ1W-OD204	0.10	
		CJ1W-OD211	0.10	
		CJ1W-OD212	0.10	
		CJ1W-OD231	0.14	
		CJ1W-OD232	0.15	
		CJ1W-OD233	0.14	
		CJ1W-OD261	0.17	
		CJ1W-OD262	0.17	
		CJ1W-OD263	0.17	
	Relay Output Units	CJ1W-OC201	0.09	0.048 (0.006 × No.of ON points)
		CJ1W-OC211	0.11	0.096 (0.006 × No.of ON points)
	Triac Out- put Unit	CJ1W-OA201	0.22	
Basic	DC Input/	CJ1W-MD231	0.13	
I/O Units	Transistor	CJ1W-MD233	0.13	
	Output	CJ1W-MD234	0.13	
	Units	CJ1W-MD261	0.14	
		CJ1W-MD263	0.14	
	TTL I/O Unit	CJ1W-MD563	0.19	
Interrupt Inp	out Unit	CJ1W-INT01	0.08	
High-speed	Input Unit	CJ1W-IDP01	0.08	1
B7A Interfa	ce Units	CJ1W-B7A22	0.07	1
		CJ1W-B7A14	0.07	1
		CJ1W-B7A04	0.07	7
Thermocou	ple Input Unit	CJ1W-TS561	0.22	1
BTD Input I	Jnit	C.11W-TS562	0.25	

CJ-series Special I/O Units

Name	Model	Current consumption at 5 V (A)	Current consumption at 24 V (A)
Analog Input	CJ1W-AD081-V1	0.42	
Units	CJ1W-AD041-V1	0.42	
Analog Output	CJ1W-DA041	0.12	
Units	CJ1W-DA021	0.12	
	CJ1W-DA08V/08C	0.14	
Analog I/O Unit	CJ1W-MAD42	0.58	
Process Input	CJ1W-PDC15	0.18	0.09 (external)
Untis	CJ1W-PTS15	0.18	0.06 (external)
	CJ1W-PTS16	0.18	0.07 (external)
	CJ1W-PTS51/52	0.25	
Temperature Control Units	CJ1W-TC	0.25	
Position Control	CJ1W-NC113/133	0.25	
Units	CJ1W-NC213/233		
	CJ1W-NC413/433	0.36	
High-speed Counter Unit	CJ1W-CT021	0.28	
Counter Unit	CJ1W-CTL41-E	0.32	
SSI encoder Unit	CJ1W-CTS21-E	0.30	
ID Sensor Units	CJ1W-V600C11	0.26	0.12
	CJ1W-V600C12	0.32	0.24
PROFIBUS-DP Slave Unit	CJ1W-PRT21	0.40	
CompoBus/S Master Unit	CJ1W-SRM21	0.15	

CJ-series CPU Bus Units

Name	Model	Current consumption at 5 V (A)
Controller Link Unit	CJ1W-CLK21-V1	0.35
Serial Communications Unit	CJ1W-SCU41	0.38 (See note.)
	CJ1W-SCU21	0.28 (See note.)
Position Control Unit	CJ1W-NCF71	0.36
Motion Control Unit	CJ1W-MCH71	0.60
CAN Unit	CJ1W-CORT21	0.33
Ethernet Unit	CJ1W-ETN11/21	0.38
DeviceNet Unit	CJ1W-DRM21	0.33
PROFIBUS-DP Master Unit	CJ1W-PRM21	0.40

Note: Add 0.15 A per Unit when the NT-AL001-E is connected and 0.04 A when the CJ1W-CIF11 RS-422A Adapter is connected.

I/O Allocations

I/O Allocations

In CJ-series PLCs, part of the I/O memory is allocated to each Unit. Units are divided into the following 3 groups for allocations.

- Basic I/O Units
- Special I/O Units

•CPU Bus Units

Basic I/O Units



Basic I/O Units

Special I/O Units



Special I/O Units

CJ1 CPU Bus Units



CJ1 CPU Bus Units



CIO Area: CIO 0000 to CIO 0079 (See note.) (Memory is allocated in word units based on mounting position in the Racks.)

Note: The Rack's first word setting can be changed from the default setting (CIO 0000) to any word from CIO 0000 to CIO 9999. The first word setting can be changed only with a Programming Device other than a Programming Console.

Allocations

Special I/O Unit Area: CIO 2000 to CIO 2959 (See note.) (Each Unit is allocated ten words based on its unit number.)

Note: A maximum of 40 Units can actually be mounted to a PLC because that is the maximum number of slots possible.

Allocations

CPU Bus Unit Area: CIO 1500 to CIO 1899 (Each Unit is allocated 25 words based on its unit number.)
Allocations to Basic I/O Unit Groups

Allocated words in the CIO Area: CIO 0000 to CIO 0079

Basic I/O Units can be mounted to the CPU Rack and Expansion Racks.

Allocation Methods

1. CPU Rack

Basic I/O Units on the CPU Rack are allocated words left to right (i.e., from the Unit nearest the CPU Unit) starting from CIO 0000. Units are allocated as many words as required in word units. Words can be reserved using the CX-Programmer.



Example Words allocated from the left



Note: Units with between 1 and 16 I/O points are allocated 1 word (16 bits) and Units with between 17 and 32 I/O points are allocated 2 words (32 bits). For example, 8-point Relay Units are allocated 1 word, with bits 00 to 07 actually allocated to the I/O points.

2. Allocations to Expansion Racks

I/O allocation to Basic I/O Units continues from the CPU Rack to the Expansion Racks. Words are allocated from left to right and each Unit is allocated as many words as it requires in word units, just like Units in the CPU Rack. A Rack's first word setting can be changed set to any word from CIO 0000 to CIO 9999 using a Programming Device.



Allocations to Special I/O Units

Each of these Units is allocated ten words in the Special I/O Unit Area (CIO 2000 to CIO 2959).

Special /O Units can be mounted to the CPU Rack and Expansion Racks.

Each Unit is allocated 10 words in the Special I/O Unit Area according to its unit number, as shown in the following table.

Unit number	Words allocated
0	CIO 2000 to CIO 2009
1	CIO 2010 to CIO 2019
2	CIO 2020 to CIO 2029
1	I
I I	I
15	CIO 2150 to CIO 2159
-	l.
1	I.
95	CIO 2950 to CIO 2959

Note: Special I/O Units are ignored during I/O allocation to Basic I/O Units. Slots containing Special I/O Units are treated as empty slots.

Allocations to CPU Bus Units

Each CPU Bus Unit is allocated 25 words in the CPU Bus Unit Area (CIO 1500 to CIO 1899).

CPU Bus Units can be mounted to the CPU Rack or Expansion Racks. Each Unit is allocated 25 words in the CPU Bus Unit Area according to its unit number, as shown in the following table.

Unit number	Words allocated
0	CIO 1500 to CIO 1524
1	CIO 1525 to CIO 1549
2	CIO 1550 to CIO 1574
1	
15	CIO 1875 to CIO 1899

Note: CPU Bus Units are ignored during I/O allocation to Basic I/O Units. The same unit numbers can be used for Special I/O Units and CPU Bus Units.

Programming Consoles

CQM1H-PRO01-E



Windows-based Programming Software: CX-One

Omron's integrated software for programming and configuration of all control system components, including PLCs, HMI, drives, temperature controllers and advanced sensors.

Name	Model	Specifications
CX-One	CX-ONE-AL	Windows 2000 / XP

^{*1} \square = Number of licences; 01, 03, 10

Note: CX-One includes the PLC programming tool CX-Programmer, previously released as a separate package. CX-Programmer Version 2.04 or higher is required to program CJ-series PLCs.

Connecting to the Peripheral Port



Peripheral Port Connecting Cables

500S-V

Cable	Length	Computer con- nector
CS1W-CN226	2.0 m	D-sub, 9-pin, male
CS1W-CN626	6.0 m	

The following cables can be used for an RS-232C connection from the computer to the peripheral port.

Mode	Connecting cables	Length	Computer connector	
Peripheral bus or Host Link	XW2Z-200S-CV or XW2Z-500S-CV	CS1W- CN118	2 or 5 m + 0.1 m	D-sub, 9-pir male
Host Link	XW2Z-200S-V or XW2Z-			



CS1W-CN118

Connecting to the RS-232C Port



RS-232C Port Connecting Cables

Mode	Cable	Length	Computer connector
Peripheral Bus or	XW2Z-200S-CV	2.0 m	D-sub, 9-pin
Host Link	XW2Z-500S-CV	5.0 m	

Note: Cables with model numbers ending in "CV" are anti-static. The following cables can be used for an RS-232C connection from the computer to an RS-232C port. (Unlike "CV" models, however, they do not support Peripheral Bus and do not use anti-static connectors.)

Mode	Cable	Length	Computer connector
Host Link	XW2Z-200S-V	2.0 m	D-sub, 9-pin
	XW2Z-500S-V	5.0 m	

The following serial communications modes can be used to connect a computer with the CX-Programmer to a CJ-series PLC.

Mode	Features
Peripheral Bus	The faster mode, peripheral bus is generally used for CX-Pro- grammer connections. Only 1:1 connections are possible. The baud rate is automatical- ly detected with the CJ1.
Host Link	A standard protocol for host computers. Slower than peripheral bus, but allows modem or optical adapter connections, or long-distance or 1:N connections via RS-422A/ 485.

Using a USB-Serial Conversion Cable to Connect to a Peripheral or RS-232C Port





IBM PC/AT or compatible with USB port

CS1W-CN226/CN626 XW2Z-200S-CV/500S-CV Peripheral or RS-232C port

General Specifications of USB-Serial Conversion Cable

XW2Z-200S-V/500S-V CQM1-CIF02

USB interface standard		Conforms to USB Specification 1.1.	
DTE speed		115.2 Kbits/s	
Connectors	On computer	USB (A plug connector, male)	
	On PLC	RS-232C (D-sub, 9-pin, female)	
Power supply		Bus power (supplied from upstream, 5 V DC)	

Current consumption 35 mA Operating Ambient temperature 0 to 55 °C environment Ambient humidity 10% to 90% (with no condensation) Ambient atmosphere No corrosive gases Weight 50 g

OS with Drivers for USB-Serial Conversion Cable Windows 98, ME, 2000, or XP

Applicable Software

CX-One is the integrated software for programming and configuration of all Omron control system components, including PLCs, HMI, drives, temperature controllers and advanced sensors.

It includes the functionality of previously released individual software tools like CX-Programmer, CX-Designer, CX-Simulator, CX-Protocol, and network configuration tools.

Peripheral Port Connecting Cables

Computer	Serial Communications Node	Connecting Cable model number			Length	Computer connector
IBM PC/AT	Tool bus or SYSMAC WAY	CS1W-CIF31	CS1W-CN226		0.5 m + 2.0 m	USB (A plug connector)
or compatible			CS1W-CN626		0.5 m + 6.0 m	
		CS1W-CIF31	XW2Z-200S-CV/ XW2Z-500S-CV	CS1W-CN118	0.5 m + (2.0 m or 5.0 m) + 0.1 m	
	SYSMAC WAY	CS1W-CIF31	XW2Z-200S-V/ XW2Z-500S-V		0.5 m + (2.0 m or 5.0 m) + 0.1 m	

RS-232C Port Connecting Cables

Computer	Serial Communications Node	Connecting Cable model	number	Length	Computer connector
IBM PC/AT	Tool bus or SYSMAC WAY	CS1W-CIF31	XW2Z-200S-CV	0.5 m + 2.0 m	USB (A plug connector)
or compatible			XW2Z-500S-CV	0.5 m + 5.0 m	
	SYSMAC WAY	CS1W-CIF31	XW2Z-200S-V (See note.)	0.5 m + 2.0 m	
			XW2Z-500S-V (See note.)	0.5 m + 5.0 m	

Connection in Tool Bus Mode is not possible. The connector does not have ESD measures.

CJ1 Unit Descriptions

Table of Units

Unit		Classification	Model	Page
I/O Units	Input Units	Basic I/O Unit		182
	Output Units			182
	I/O Units		CJ1W-MD	183
Interrupt Input Unit	-	Basic I/O Unit	CJ1W-INT01	194
High-speed Input Units		Basic I/O Unit	CJ1W-IDP01	195
Temperature Input Units		Basic I/O Unit	CJ1W-TS561/TS562	196
Analog I/O Units	Input Units	Special I/O Unit	CJ1W-AD	198
	Output Units		CJ1W-DA	199
	I/O Unit		CJ1W-MAD42	201
Process Input Units		Special I/O Unit	CJ1W-PTSD/PDC11	202
Temperature Control Units		Special I/O Unit	CJ1W-TC	205
Position Control Units		Special I/O Unit	CJ1W-NC	207
Motion Control Unit			CJ1W-MCH71 - MECHATROLINK-II	208
Position Control Unit			CJ1W-NCF71 - MECHATROLINK-II	210
High-speed Counter Unit		Special I/O Unit	CJ1W-CT021	213
Counter Unit		Special I/O Unit	CJ1W-CTL41E	214
SSI Input Unit		Special I/O Unit	CJ1W-CTS21-E	215
ID Sensor Units		Special I/O Unit	CJ1W-V600C1	222
Serial Communications U	nits	CPU Bus Unit	CJ1W-SCU□1	219
RS-232C/RS-422A Adapt	ter Units		NT-AL001	221
Communications Network	(S		· · · ·	224
Ethernet Units		CPU Bus Unit	CJ1W-ETN21	228
Controller Link Boards/	Controller Link Units	CPU Bus Unit	CJ1W-CLK21-V1	230
Units	Controller Link Boards	Personal computer board (for PCI bus)	3G8F7-CLK21-EV1	
	Repeater Units	Wired/Optical	CS1W-RPT0	231
DeviceNet Units	DeviceNet Units	CPU Bus Unit	CJ1W-DRM21	233
CAN Unit	User-specified CAN protocols	CPU Bus Unit	CJ1W-CORT21	235
PROFIBUS-DP Units	PROFIBUS-DP Master	CPU Bus Unit	CJ1W-PRM21	236
	PROFIBUS-DP Slave	Special I/O Unit	CJ1W-PRT21	237
CompoBus/S Units	Master Unit	Special I/O Unit	CJ1W-SRM21	238

I/O Terminal Blocks

Most I/O units that use a 18-point removable terminal block are available in two variations:

Conventional M3 Screw type connection

• Screwless clamp connection



This type requires wiring to be terminated by fork- or ring terminals



This type can be used with standard or solid wire up to 1.5 mm^2 , with or without ferrules. This option is designated by the suffix (SL).

CJ1W-ID/-IA/-OC/-OD/-OA/-MD

Basic I/O Units

I/O Units







Input Units (32 points) CJ1W-ID23 Output Units (32 points)CJ1W-OD23





Input Units (64 points) CJ1W-ID26□ Output Units (64 points) CJ1W-OD26□



Relay Contact Output Units (8 independent contacts) CJ1W-OC201 Relay Contact Output Units (16 points) CJ1W-OC211

DC Input Units

Classification	Inputs	Input Specifications	Connections	Model
Basic I/O Unit	8 pts	24 V DC, 10 mA	Removable terminal block	CJ1W-ID201
	16 pts	24 V DC, 7 mA	Removable terminal block	CJ1W-ID211(SL)
	32 pts	24 V DC, 4.1 mA	Fujitsu-compatible connector	CJ1W-ID231
	32 pts	24 V DC, 4.1 mA	MIL connector	CJ1W-ID232
	64 pts	24 V DC, 4.1 mA	Fujitsu-compatible connector	CJ1W-ID261
	64 pts	24 V DC, 4.1 mA	MIL connector	CJ1W-ID262

AC Input Units

Classification	Inputs	Input Specifications	Connections	Model
Basic I/O Unit	16 pts	100 to 120 V AC, 7 mA (100 V, 50 Hz)	Removable terminal block	CJ1W-IA111
	8 pts	200 to 240 V AC, 9 mA (200 V, 50 Hz)		CJ1W-IA201

Relay Contact Output Units

Classification	Outputs	Maximum switching capacity	Connections	Model
Basic I/O Unit	8 pts (independent contacts)	2 A 250 V AC per contact, max. 8A per common	Removable terminal block	CJ1W-OC201(SL)
	16 pts			CJ1W-OC211(SL)

Transistor Output Units

Classification	Outputs	Maximum switching capacity	Connections	Model
Basic I/O Unit	8 pts	12 to 24 V DC, 2 A/pt, 8 A/Unit sinking	Removable terminal block	CJ1W-OD201
		24 V DC, 2 A/pt, 8 A/Unit, sourcing, load short protection,		CJ1W-OD202
		disconnection detection, alarm		
		12 to 24 V DC, 0.5 A/pt, 4 A/Unit, sinking	Removable terminal block	CJ1W-OD203
		24 V DC, 0.5 A/pt, 4 A/Unit, sourcing, load short protection,	Removable terminal block	CJ1W-OD204
		disconnection detection, alarm		
	16 pts	12 to 24 V DC, 0.5 A/pt, 5 A/Unit sinking	Removable terminal block	CJ1W-OD211(SL)
		24 V DC, 0.5 A/pt, 5 A/Unit, sourcing, load short protection, alarm		CJ1W-OD212(SL)
	32 pts	12 to 24 V DC, 0.5 A/pt, 4 A/Unit, sinking	Fujitsu-compatible	CJ1W-OD231
			connector	
		24 V DC, 0.5 A/pt, 4 A/Unit, sourcing, load short protection, alarm	MIL connector	CJ1W-OD232
		12 to 24 V DC, 0.5 A/pt, 4 A/Unit, sinking		CJ1W-OD233
	64 pts	12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sinking	Fujitsu-compatible	CJ1W-OD261
			connector	
		12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sourcing	MIL connector	CJ1W-OD262
		12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sinking	MIL connector	CJ1W-OD263
	8 pts	250 V AC, 0.6 A/pt. 2.4 A/Unit, 50/60 Hz	Removable terminal block	CJ1W-OA201

Note: Units with a suffix "(SL)" are available with screwless terminal blocks as well as M3 screw terminals.

DC Input/Transistor Output Units

Classifica- tion	Inputs/ Outputs	Input voltage	Input current (typical)	Max. output switching capacity	Connections	Model
Basic I/O Unit	16 inputs/ 16 outputs	24 V DC	7 mA	12 to 24 V DC, 0.5 A/pt. 2.0 A/Unit, sinking outputs	Fujitsu-compatible connector	CJ1W-MD231
					MIL connector	CJ1W-MD233
				12 to 24 V DC inputs, 24 V DC outputs, 0.5 A/pt, 2 A/Unit, sourcing, load short circuit protection, alarm	MIL connector	CJ1W-MD232
	32 inputs/ 32 outputs		4.1 mA	12 to 24 V DC, 0.3 A/pt. 3.2 A/Unit, sinking outputs	Fujitsu-compatible connector	CJ1W-MD261
					MIL connector	CJ1W-MD263

TTL I/O Units

Classifica- tion	Inputs/ Outputs	Input voltage	Input current (typical)	Max. output switching capacity	Connections	Model
Basic I/O Unit	32 inputs/ 32 outputs	5 V DC	3.5 mA	5 V DC, 35 mA/pt. 1.12 A/Unit	MIL connector	CJ1W-MD563

Circuit Configuration and Terminal Arrangement

CJ1W-ID201



CJ1W-ID211(SL)



CJ1W-ID231



CJ1W-ID232



CJ1W-ID261



Programmable Controllers

CJ1W-ID262



CJ1W-IA111



CJ1W-IA201



CJ1W-OC201(SL)



CJ1W-OC211(SL)



CJ1W-OD201



CJ1W-OD202



CJ1W-OD203



CJ1W-OD204



CJ1W-OD211(SL)

Circuit configuration	Terminal arrangement
Output indicator	12 to 24 VDC 1

CJ1W-OD212(SL)



CJ1W-OD231



CJ1W-OD232



CJ1W-OD233



Programmable Controllers

CJ1W-OD261



CJ1W-OD262



Basic I/O Units

CJ1W-OD263



CJ1W-OA201







CJ1W-MD233





CJ1W-MD263





Interrupt Input Unit

High-speed Response for Interrupt Task Execution: 0.37 ms OFF to ON and 0.82 ms ON to OFF

• An input to the Interrupt Input Unit immediately interrupts CPU Unit processing to suspend execution of cyclic tasks (i.e., the normal programming) and execute an I/O interrupt task.

System Configuration



Input voltage	Inputs	Input signal pulse width	No. of mountable Units	Mounting location	External connections
24 V DC	16 inputs	ON: 0.05 ms min. OFF: 0.5 ms min.	2 max.	Any of the leftmost 5 slots (CJ1M: 3 slots) next to the CPU Unit on the CPU Rack.	Removable terminal block



High-speed Input Unit

1.

Latches input pulses as short as 50 µs.

- Reads pulses that are too fast for normal I/O, such as is often required for signal exchange with inspection devices.
- Reads pulse widths (ON time) as short as 0.05 ms.
- Inputs stored in the internal circuits are cleared in I/O refresh period.

System Configuration



Specifications

Input voltage	Inputs	Input signal pulse width	No. of mountable Units	Mounting location	External connections
24 V DC	16 inputs	ON: 0.05 ms min. OFF: 0.5 ms min.	No restrictions beyond normal limits for CPU Unit	No restrictions	Removable terminal block

Circuit Configuration and Terminal Connections





CJ1W-TS561/-TS562

Temperature Input Units

Connect up to 6 temperature sensors per Unit.

These Basic I/O units allow up to 6 temperature sensors to be connected.

- Input types (TS561: thermocouple J/K, TS562 : Pt100/Pt1000) can be selected per channel.
- The unit presents the temperature data in the basic I/O area of the PLC occupying from 3 to 6 CIO words.
- Cold junction compensation (TS561) is provided internally.
- Adjustable filtering allows mains frequencies (50/60 Hz) to be suppressed.
- Broken wire (TC/RTD)and short-circuit alarms (RTD) are provided as error code in the PLC, and by LED indication.
- The unit does not provide galvanic isolation between the input signals.



System Configuration



Terminal arrangement

CJ1W-TS561(SL)

	B1		
$\lim_{n \to \infty} u(-)$	DI	A1	Input 1 (_)
Input 2 (+)	B2	40	
NC	B3	A2	Input I (+)
NO		A3	NC
NC	B4		
	DE	A4	NC
Input 4 (–)	50	A5	Input 3 (_)
Input 4 (+)	B6		input 0 ()
	07	A6	Input 3 (+)
Input 6 (–)	В7	<u>۸7</u>	
Input 6 (+)	B8	~ ~ ~	input 5 (–)
		A8	Input 5 (+)
NC	B9		
		A9	NC

CJ1W-TS562(SL)

Input 2 B'	B1		[
Input 0 D	D 0	A 1	Input 1 B'
при 2 в	D2	A2	Input 1 B
Input 2 A	B3	10	
Input 4 B'	B4	AS	Input I A
lagest 4 D	DE	A4	Input 3 B'
Input 4 B	DO	A5	Input 3 B
Input 4 A	B6	4.0	Input 0 A
Input 6 B'	B7	Ab	Input 3 A
Input 0 D		A7	Input 5 B'
Input 6 B	88	A8	Input 5 B
Input 6 A	B9		
		A9	Input 5 A

Programmable Controllers

Item	Classification: Basic I/O Unit		
	CJ1W-TS561 (SL)	CJ1W-TS562 (SL)	
Inputs	6 points	·	
Input Type	Thermocouple types J or K (IEC 60584)	3-wire RTD types Pt100 or Pt1000 (IEC 60751)	
Measurement Range	Type J: -100.0 to +850.0 °C, Type K:-200.0 to 1300.0 °C	Pt100/Pt1000: -200.0 to +650.0 °C	
Input Assignment	by DIP-switch, any combination of input types is possible	·	
Output Data	16-bit signed integer, resolution 0.1 °C		
Conversion time	40 ms to 400 ms per active input (depending on filter setting OFF / 50 Hz / 60 Hz / 10 Hz)		
Accuracy	+/- 0.5% of PV or +/- 0.7 °C, whichever is larger, +/- 1 digit max.	+/- 0.5% of PV or +/- 0.8 °C, whichever is larger, +/- 1 digit max.	
Cold Junction accuracy	+/- 2.0 °C	n.a.	
Sensor connection	terminal block, screw type or screwless clamp (model code + (SL))		

CJ1W-AD (SL)

Analog Input Units

Convert Analog Signals to Binary Data

- Wire burnout detection
- Peak-hold function
- Mean function
- · Offset gain setting
- Range selection per intput
- 1/8000 resolution
- 2 ms conversion time for 8 channels



Function

Convert input signals such as 1 to 5 V or 4 to 20 mA to binary values between 0000 and 1F40 Hex and store the results in the allocated words each cycle. The ladder diagram can be used to transfer the data to the DM Area or the SCALING instructions (e.g., SCL(194)) can be used to scale the data to the desired range.

System Configuration



Terminal Arrangement

Input 2 (+)	B1		
Input $2(-)$	B2	A1	Input 1 (+)
		A2	Input 1 (–)
Input 4 (+)	55	A3	Input 3 (+)
Input 4 (–)	B4	A4	Input 3 (_)
AG	B5	Δ <u>5</u>	
Input 6 (+)	B6	A3	AG
Input 6 (_)	B7	A6	Input 5 (+)
	Do	A7	Input 5 (–)
	00	A8	Input 7 (+)
Input 8 (–)	R8	A9	Input 7 (–)

Item			Classification: Special I/O Unit					
nom			CJ1W-AD081-V1(SL)	CH1W-AD041-V1(SL)				
Inputs			8 pts	4 pts				
Signal range	Voltages	1 to 5 V	Yes	÷				
		0 to 10 V	Yes					
		0 to 5 V	Yes					
		-10 to 10 V	Yes					
	Currents	4 to 20 mA	Yes					
Signal range sett	ings		8 settings (one for each point)	4 settings (one for each point)				
Resolution			1/4000 (default) or 1/8000 (selectable)					
Conversion spee	d		1 ms/point (default), or 250 μs/point (selectable)					
Overall accuracy	(at 23 °C)		Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.2% Current: ±0.4%				
Overall accuracy	(0 to 55 °C)		Voltage: ±0.4% Current: ±0.6%					
Connections			Terminal block	Terminal block				
Features	Wire burnout de	etection	Yes					
	Peak-hold funct	tion	Yes					
	Averaging		Yes					
Unit No.			0 to 95	0 to 95				

CJ1W-DA

Analog Output Units

Convert Binary Data to Analog Signals

- Output hold
- Offset gain adjustment
- Range selection per output
- 1 ms conversion time per channel
- 1/8000 resolution



Function

Binary data between 0000 to 0FA0 Hex in the allocated words can be convert to analog signals such as 1 to 5 V or 4 to 20 mA for output. All that is required in the ladder diagram is to place the data in the allocated words.

System Configuration



Terminal Arrangement

CJ1W-DA08V/DA08C(SL)

		1	
Output 2 (+)	B1	4.1	Output 1 (+)
Output 2 (-)	B2	AI	
		A2	Output 1 (–)
Output 4 (+)	ВЗ	A3	Output 3 (+)
Output 4 (-)	B4		Output 3 (_)
Output 6 (+)	B5	A4	
	00	A5	Output 5 (+)
Output 6 (–)	B6	46	Output 5 (-)
	B7	AU	output o ()
	Do	A7	Output 7 (+)
Output 8 (–)	Bo	A8	Output 7 (-)
0 V	B9	7.0	
		I A9	24 V

CJ1W-DA041(SL)

		-	
Voltage output 2 (+)	B1		
Output 2 (-)	B2	A1	Voltage output 1 (+)
		A2	Output 1 (–)
Current output 2 (+)	- 55	A3	Current output 1 (+)
Voltage output 4 (+)	B4	Δ <i>4</i>	Voltage output 3 (+)
Output 4 (-)	B5		
Current output 4 (+)	B6	A5	Output 3 (–)
	 D7	A6	Current output 3 (+)
N.C.	D/	A7	N.C.
N.C.	B8	48	NC
0 V	B9	70	IN.O.
		A9	24 V

CJ1W-DA021(SL)

Voltage output 2 (+)	BJ	Δ1	
Output 2 (-)	B2	~	voltage output 1 (+)
		A2	Output 1 (–)
Current output 2 (+)	B3	13	Current output 1 (u)
N.C.	B4	73	
		A4	N.C.
N.C.	B2	45	NC
N.C.	B6	~3	14.0.
		A6	N.C.
N.C.	В/	Δ7	NC
N.C.	B8		N.O.
01/	50	A8	N.C.
0 0	RA	۵۵	24 V
		10	



Item			Classification: Special I/O Unit					
			CJ1W-DA08V(SL)	CJ1W-DA08C(SL)	CJ1W-DA041(SL)	CJ1W-DA021(SL)		
Outputs			8 points	8 points	4 points	2 points		
Signal	Voltages	1 to 5 V	Yes	No	Yes	Yes		
range 0 to 10		0 to 10 V	Yes	No	Yes Yes			
		0 to 5 V	Yes	No	Yes	Yes		
		-10 to 10 V	Yes	No	Yes	Yes		
	Currents	4 to 20 mA	No	Yes				
Maximu (for volta	m load curr age outputs	ent):	2,4 mA	n.a.	12 mA			
Maximu (current	Maximum load resistance (current outputs):		n.a.	350 Ω	600 Ω			
Signal r	Signal range settings		8 settings (one for each point)	8 settings (one for each point)	4 settings (one for each point) 2 settings (one for each			
Resolut	ion		1/4000 (default) or 1/8000 (selectable)	1/4000 (default) or 1/8000 (selectable)	1/4000			
Convers	sion speed		1.0 ms/point (default) or 250 μs/point (selectable)	1.0 ms/point (default) or 250 μs/point (selectable)	1.0 ms/pt max.			
Overall	accuracy (a	t 23 °C)	Voltage: ±0.3% Current: ±0.5%					
Overall accuracy (0 to 55 °C)		to 55 °C)	Voltage: ±0.5% Current: ±0.8%					
Connec	tions		Terminal block					
Unit No.			0 to 95					
Externa	l power sup	ply	24 V DC +10%/-15%, 140 mA max.	24 V DC +10%/-15%, 170 mA max.	24 V DC +10%/-15%, 200 mA max.	24 V DC +10%/-15%, 140 mA max.		

CJ1W-MAD42(SL)

Analog I/O Unit

Handles 4 Analog Inputs and 2 Analog Outputs

- · Conversion time: 3 ms for all 6 channels combined
- Resolution: 1/8000

Analog Inputs

- Wire burnout detection
- Peak hold function
- · Mean function
- · Offset gain setting

Analog Outputs

- Output hold
- Offset gain adjustment

Other Features

Scaling function

System Configuration



Terminal Arrangement

		-	
Voltage output 2 (+)	B1		
Output 2 ()	B2	A1	Voltage output 1 (+)
		A2	Output 1 (-)
Current output 2 (+)	ВЗ	A3	Current output 1 (+)
N.C.	B4	A4	NC
Input 2 (+)	B5		N.G.
Input 2 (-)	B6	A5	Input 1 (+)
	50	A6	Input 1 (–)
AG	В/	A7	AG
Input 4 (+)	B8	40	Innut O ()
Input 4 (–)	B9	84	Input 3 (+)
,		A9	Input 3 (–)

ltem			Classification: Special I/O Unit			
			Inputs	Outputs		
Inputs/outputs			4 pts	2 pts		
Signal range	Voltages	1 to 5 V	Yes			
		0 to 10 V	Yes			
		0 to 5 V	Yes			
		-10 to 10 V	Yes			
	Currents	4 to 20 mA	Yes			
Input impedance		•	Voltage inputs 1 M Ω , Current inputs 250 Ω			
Maximum load current (for voltage outputs)				2.4 mA		
Maximum load re	sistance (current ou	itputs)		600 Ω		
Signal range sett	ngs		4 settings (one for each point)	2 settings (one for each point)		
Resolution			1/4000 (default), 1/8000 (selectable)			
Conversion spee	d		1.0 ms/point (default) or 500 µs/point (selectable)			
Overall accuracy	(at 23 °C)		Voltage: ±0.2% Current: ±0.2%	Voltage: ±0.3% Current: ±0.3%		
Overall accuracy	(0 to 55 °C)		Voltage: ±0.5% Current: +0.6%			
Connections			Terminal block			
Functions		Wire burnout	Yes			
		Peak hold	Yes			
		Mean	Yes			
		Output hold		Yes		
		Scaling	Yes			
Unit No.			0 to 95			



Process Input Units

Directly Input Four Temperature Sensors

- Up to four temperature sensor inputs can be directly connected to a single Unit (input signal/ range shared by the four inputs)
- Models with isolation between channels prevent unwanted current paths between Temperature Sensor inputs.
- Measurement value alarm with hysteresis/ON delay (two inputs per channel, one of which can be set as a DO output from the Unit).
- High-resolution, high-speed 2 channel input models provide configurable alarms and maintenance functions



Function

Converts the measured value of DC voltage/current signals, thermocouple or platinum-resistance thermometer inputs (up to 4 points) into binary or BCD code, and stores in the allocated memory area every cycle. The ladder program can be used to transfer the data to a specified words in data memory for use.

Terminal arrangements

CJ1W-PTS51



CJ1W-PTS15

		NC	B1 (10)			
	Thermo-	NC	B2 (11)	A1 (1)	CJ1+	
	input 1	NC	B3 (12)	A2 (2)	CJ1	sensor 1
		1.	B4 (12)	A3 (3)	A3 (3) 1	
Thermocouple input 2			D4 (13)	A4 (4)	2	
<u> </u>		2+	B5 (14)	A5 (5)	NC	
		NC	B6 (15)	A6 (6)	CJ2+	·
		NC	B7 (16)	Δ7 (7)	C 12	Cold junction sensor 2
		NC	B8 (17)		NC	-
		0V	B9 (18)	A8 (8)	NC	
		L		A9 (9)	24V	

Programmable Controllers

CJ1W-PTS52



CJ1W-PTS16



CJ1W-PDC15

		NC	B1 (10)		
] +	110	D1 (10)	A1 (1)	NC
Voltage output		VI	D2 (11)	A2 (2)	1
device		COM1 B3 (12		A3 (3)	NC
	<u>} + </u>	V2	B4 (13)	A3 (3)	110
Voltage output		COM2	B5 (14)	A4 (4)	12
device		NC	B6 (15)	A5 (5)	NC
		NO	DO (10)	A6 (6)	NC
		NC	B7 (16)	A7 (7)	NC
		NC	B8 (17)	AQ (Q)	NC
		0V	B9 (18)	A0 (0)	NC
		L		A9 (9)	24V

		NC	B1 (10)		NO	1
Current output	+	V1	B2 (11)	A1 (1)	NC	-
device		COM1	B3 (12)	A2 (2)	11	
	+	V2	B4 (13)	A3 (3)	NC	
Current output		COM2	B5 (14)	A4 (4)	12	
device		NC	B6 (15)	A5 (5)	NC	
		NC	B7 (16)	A6 (6)	NC	
		NC	D7 (10)	A7 (7)	NC	1
			DO (17)	A8 (8)	NC	
		ŰV	ва (18)	A9 (9)	24V	1
					I	1

Specifications

Item	Specification							
	CJ1W-PDC15	CJ1W-PTS15	CJ1W-PTS16	CJ1W-PTS51	CJ1W-PTS52			
Inputs	2 inputs		-	4 inputs	•			
Input signals	4 to 20 mA, 0 to 20 mA, 0 to 10 V, -10 to 10 V, 0 to 5 V, -5 to 5 V, 1 to 5 V, 0 to 1.25 V, -1.25 to 1.25 V, User-defined	Thermocouple B, E, J, K, L, N, R, S, T, U, WRe5-26, PLII, -100 to 100 mV	Pt50, Pt100 JPt100, Ni508.4	Thermocouple B, J, K, L, R, S, T	Pt100, JPt100			
Input signal ranges	Selectable per input			Same for all 4 inputs				
A/D conversion output data	16-bit binary data, user-adjustable zero/span			Temperature data in binary	or BCD (16 bit)			
Conversion speed	10 ms / 2 inputs			250 ms / 4 inputs				
Overall accuracy	± 0.05% at 25 °C	\pm 0.05% at 25 °C ⁻¹ Cold junction compensation error \pm 1°C, at 20 \pm 10°C	± 0.05 % or ± 0.1 °C, which- ever is larger (at 25 °C)	± 0.3 % of PV or ± 1 °C, whichever is larger, ± 1 digit max.*1	\pm 0.3 % of PV or \pm 0.8 °C, whichever is larger, \pm 1 digit max.			
Connections	Terminal block				•			
Unit classification	CJ1-series Special I/O Unit							
Unit No.	0 to 95							

^{*1} Accuracy of the measured value depends on thermocouple type and actual temperature. Consult Operation Manual W368-E1 for details.

CJ1W-TC

Temperature Control Units

One Unit Functions as Four Temperature Controllers

- Supports 2-loop or 4-loop PID control or ON/OFF control.
- The PID constants for PID control can be set using auto-tuning (AT).
- Select either forward (cooling) operation or reverse (heating) operation.
- Input directly from temperature sensors. (Thermocouples: R, S, K, J, T, B, or L; or platinum resistance thermometers: JPt100 or Pt100.)
- · Open collector output
- · Sampling period: 500 ms
- RUN/STOP control.
- Two internal alarms per loop.
- With 2-loop models, a current transformer can be connected to each loop to detect heater burnout.

Function

Perform PID control (two degrees of freedom) or ON/OFF control based on inputs from thermocouples or platinum resistance thermometers to control open collector output. Four-loop models and two-loop models (with heater burnout detection function) are available. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the target value, read the process value, or perform other operations.



System Configuration



Terminal Wiring Examples

Thermocouple Temperature Control Units

CJ1W-TC001	CJ1W-TC002
(4 loops, NPN outputs)	(4 loops, PNP outputs)
Input 2 - B1 A1 Input 1 - Input 2 + B2 A2 Input 1 + Cold-junction comp.B3 A3 N.C. Cold-junction comp.B4 A4 N.C. Input 4 - B5 A5 Input 3 - Input 4 + B6 A6 Input 3 + Output 2 B7 A7 Output 1 Output 4 B8 A8 Output 3 O V COM (-) B9 24 V	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$
CJ1W-TC003	CJ1W-TC004
(2 loops, NPN outputs, HB alarm)	(2 loops, PNP outputs, HB alarm)

Note: Do not connect any wiring to the N. C. terminals.



Platinum Resistance Thermometer Temperature Control Units

CJ1W-TC101	CJ1W-TC102		
(4 loops, NPN outputs)	(4 loops, PNP outputs)		
Input 2 B' B1 Input 2 B B2 A1 Input 1 B' Input 2 A B3 A3 Input 1 B Input 4 B' B4 A4 Input 3 B' Input 4 B B5 A5 Input 3 B Input 4 A B6 A6 Input 3 A Output 2 B7 A7 Output 1 Output 4 B8 A8 Output 3 OUTPUT 4 B8 A8 Output 3 OUTPUT 4 B8 A7 Output 3 OUTPUT 4 B8 A8 Output 3	Input 2 B' B1 A1 Input 1 B' Input 2 B B2 A2 Input 1 B Input 2 A B3 A3 Input 1 A Input 4 B' B4 A4 Input 3 B' Input 4 A B6 A5 Input 3 B Input 4 A B6 A6 Input 3 A Output 2 B7 A7 Output 1 Output 4 B8 A8 Output 3 0 V COM (-) B9 A9 24 V COM (+)		
CJ1W-TC103 (2 loops, NPN outputs, HB alarm)	CJ1W-TC104 (2 loops, PNP outputs, HB alarm)		

Note: Do not connect any wiring to the N. C. terminals.

Classification	Temperature sensor in- puts	Number of loops	Control outputs	Unit numbers	Model
Special I/O Unit	Thermocouples (R, S, K, J, T, B, or L)	4 loops	Open collector NPN out- put (pulse)	0 to 94	CJ1W-TC001
			Open collector PNP out- put (pulse)		CJ1W-TC002
		2 loops (with heater burn- out detection function)	Open collector NPN out- put (pulse)		CJ1W-TC003
			Open collector PNP out- put (pulse)		CJ1W-TC004
	Platinum resistance ther- mometers (JPt100 or Pt100)	4 loops 2 loops (with heater burn- out detection function)	Open collector NPN out- put (pulse)		CJ1W-TC101
			Open collector PNP out- put (pulse)		CJ1W-TC102
			Open collector NPN out- put (pulse)		CJ1W-TC103
			Open collector PNP out- put (pulse)		CJ1W-TC104

CJ1W-NC

Position Control Units

High-speed, High-precision Positioning with 1, 2, or 4 Axes

- Simple positioning systems can be created by directly specifying operation from the CPU Unit when required.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based Support Software (CX-Position) to easily create positioning data and store data and parameters in files.
- S-curve acceleration/deceleration, forced starting, and other features also supported.
 - Position, speed and acceleration settings can be changed during operation
 - Speed and acceleration can be modified during Jog operation
 - Parameters and data are easily backed up to a memory card in the CPU unit

Function

These Position Control Units support open-loop control with pulse-train outputs. Position using automatic trapezoid or S-curve acceleration and deceleration. Models available with 1, 2, or 4 axes. Use in combination with servomotors or stepping motors what accept pulse-train inputs.



System Configuration



Ma dal						
Model						
	CJTW-NCT33	CJ TW-INC233	GJ T W-INC433			
Unit name	Position Control Unit					
Classification	Special I/O Unit	Special I/O Unit				
Unit numbers	0 to 95	0 to 95 0 to 94				
Control method	Open-loop control by pul	se train output				
Control output interface	CJ1W-NC 13: Open-co	llector output				
	CJ1W-NC 33: Line-driv	er output				
Controlled axes	1	2	4			
Operating modes	Direct operation or mem	ory operation				
Data format	Binary (hexadecimal)					
Affect on scan time for end refresh	0.29 to 0.41 ms max./un	it				
Affect on scan time for IOWR/IORD	0.6 to 0.7 ms max./instru	0.6 to 0.7 ms max./instructions				
Startup time	2 ms max. (Refer to operation manual for conditions.)					
Position data	-1,073,741,823 to +1,073,741,823 pulses					
No. of positions	100 per axis					
Speed data	1 to 500 kpps (in 1-pps units)					
No. of speeds	100 per axis					
Acceleration/	0 t 250 s (time to max. speed)					
deceleration times						
Acceleration/	Trapezoidal or S-curve					
deceleration curves						
Saving data in CPU	Flash memory					
Windows-based Support Software	CX-Position (WS02-NCT	С1-Е)				
Ambient operating temperature	0 to 55 °C		0 to 50 °C			
External power supply	24 V DC ±10%, 5 V DC ±5% (line driver only) 24 V DC ±5%, 5 V DC ±5% (line driver only)					

CJ1W-MCH71 - MECHATROLINK-II Motion Control Unit

Multi-axes Motion Control over high-speed MECHATROLINK-II

- · Up to 30 axes controlled with minimum wiring
- High-speed bus MECHATROLINK-II is specially designed for Motion Control
- Supports Position, speed and Torque control
- Electronic CAM profiles and axes synchronization
- Hardware registration input for every axis
- Program control commands, like Multi-task programming and branching commands, and various arithmetic operations for maximum program efficiency
- · Access to the complete system from one point



Function

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

System Configuration



Programmable Controllers

Specifications

Motion Control Unit

Model		CJ1W-MCH71		
Classification		CJ-series CPU Bus unit		
Applicable PLCs		CJ-series V. 2.0 or later		
Control Method		MECHATROLINK-II (Position, Speed and Torque control)		
Controlled devices		Sigma-II series Servo Drives (ver. 38 or later) with MECHATROLINK-II Interface and various I/O Units.		
Programming language	l.	BASIC type motion control language		
Controlled axes		32 max, including 30 physical or virtual axes and 2 virtual axes		
Operating modes		RUN Mode, CPU Mode, Tool Mode/System (depending on Tool)		
Automatic/Manual Mod	e	Automatic Mode: Mode for executing programs in the Unit		
		Manual Mode: Mode for executing commands from the CPU Unit		
Minimum actting unit		(Via allocated words)		
Maximum setting unit	lue	1, 0.1, 0.01, 0.001, 0.0001 (Onit: mini, inch, degree, place)		
waximum command va	lue	-2,147,463,646 (02,147,463,647 puises (32 bits with sign), minute axis feed mode supported. Example: 16 384 puises/rev. after multiplication, a minimum satting unit of 0.001 mm and 1 mm/rev.		
		would result in -1,310,720,000 to 1,310,719,999 command units.		
Control functions	Servo lock/unlock	Locks and unlocks the servo driver.		
by command from	Jogging	Executes continuous feeding for each axis independently at the speed system parameter times the override.		
CPU Unit	Origin search	Determines the machine origin in the direction set in the system parameters. Can be executed with an absolute en-		
		coder.		
	Absolute origin setting	Sets the origin for when an absolute encoder is used. (Offset value: 32 bits [pulses] with sign)		
	Machine lock	Stops the output of move commands to axes.		
	Single block	Executes motion programs one block at a time.		
Control functions by motion program	Positioning (PTP)	Executes positioning independently for each axis at a specified speed or the speed system parameter. (Simultaneous specification: Up to eight axes/block, Simultaneous execution: Up to 32 blocks/Unit)		
	Linear interpolation	Executes linear interpolation for up to eight axes at a time at the specified interpolation feed speed. (Simultaneous specification: Up to eight axes/block, Simultaneous execution: Up to 32 blocks/system)		
	Circular interpolation	Executes circular interpolation for two axes in either clockwise or counterclockwise at the specified interpolation feed speed. Helical circular interpolation is also possible with single-axis linear interpolation added. (Simultaneous specification: Two or three axes/block, Simultaneous execution: Up to 16 blocks/system)		
	Other functions	Origin searches, interrupt feeding, timed positioning, traverse positioning, independent electronic CAM, synchronized electronic CAM, link operation, electronic gear, follow-up synchronization, speed reference, torque reference		
Acceleration/decel	on curve, on time	Trapezoidal or S-curve, 60,000 ms max. (S-curve: Constant 30,000 ms max.)		
External I/O		One port for MECHATROLINK-II Servo communications, one deceleration stop input, two general inputs, two general outputs		
Feed rate		Rapid, interpolation feed rate: 1 to 2,147,483,647 (command units/min)		
Override		0.00% to 327.67% (setting unit: 0.01%; Can be set for each axis or task.)		
Motion	Number of tasks,	Up to 8 tasks and 256 programs/Unit (8 parallel branches per task max.)		
programs	number of programs			
	Program numbers	0000 to 0499 for main program; 0500 to 0999 for subroutine		
	Program capacity	In motion program conversion, 8,000 blocks/Unit max. (2 Mbytes); number of blocks: 800		
	Data capacity	Position data: 10,240 points/Unit; Cam data: 32 max.; 16,000 points/Unit		
	Subroutine nesting	Five levels max.		
	Start	Programs in other tasks can be started from a program.		
	Deceleration stop	Decelerates to a stop regardless of the block.		
	Block slop	Decelerates to a stop after the block being executed is ended.		
Data ayahanga	Single block	Executes the program one block at a time.		
with CPU Unit	Unit in CIO Area			
	Unit in DM Area	Uses one unit number (100 words). Used for Unit and tasks: 32 to 74 words (depending on the number of tasks)		
	Any area (bits)	Axes: 0 to 64 words (depending on the maximum axis number used)		
	Any area (data)	Axes: 0 to 128 words (depending on the maximum axis number used)		
0	Any area (data)	General I/O: 0 to 1,280 words (depending on the settings)		
Saving programs and d	ata	Memory Card backup (in CPU Unit, 100,000 times max.)		
Self-diagnostic function	S	Watchdog, HAM check, etc.		
Error detection function	S	Deceleration stop inputs, unit number errors, CPU errors, software limit errors, etc.		
Error log function		Head by IORD Instruction from CPU Unit.		
Support Software	voltogo	INICIOSOLE WINDOWS 2000 OF IN 1-4.0 (Processor: Pentium, 100 MHz min., with at least 64 MB of memory)		
External power supply	vollage	24 V DU (21.0 10 20.4 V DU) 0.6 A or loss for 5 V DC		
Weight (not including a	ipiion	200 a may		
weight (not including co	Sinectors)	ovv y max.		

Note: 1. Take the following factors into account when mounting Motion Control Units under a single CPU Unit:

- The maximum number of CPU Bus Units that can be allocated words in the CPU Unit

- The capacity of the Power Supply Unit on each CPU Rack or Expansion I/O Rack and the current consumption of the Units mounted on the Rack (For details, refer to the Operation Manual for the CPU Unit.)

- 2. The required power supply must be provided by the user.
- 3. A Memory Card must be used to add system software functions to the CPU Unit in order to use IOWR and IORD.

CJ1W-NCF71 - MECHATROLINK-II

Position Control Unit

Multi-axes Position Controller over highspeed MECHATROLINK-II

- Up to 16 axes controlled with minimum wiring. Only one cable between devices is needed.
- High-speed bus MECHATROLINK-II is specially designed for Motion Control
- Supports Position, speed and Torque control
- Positioning can be done by direct Ladder commands.
- Access to Servo Drives parameters can be done through PLC operation
- Access to the complete system from one point. Network setup, Servo Drives configuring and monitoring, and PLC Programming.







Specifications

Position Control Unit

Model		CJ1W-NCF71		
Classification		CJ-series CPU Bus unit		
Applicable PLCs		CJ-series		
Possible unit numbe	er settings	0 to F		
Control Method		MECHATROLINK-II (Position, Speed and Torque control)		
Controlled devices		Sigma-II series Servo Drives (ver. 38 or later) with MECHATROLINK-II Interface		
Controlled axes		16 maximum		
I/O allocations	Common Operating Memory Area	Words allocated in CPU Bus Unit Area: 25 words (15 output words, 10 input words)		
	Axis Operating Memory Area	Allocated in one of the following areas (user-specified): CIO, Work, Auxiliary, Holding, DM, or EM Area. Number of words allocated: 50 words (25 output words, 25 input words) × Highest axis No. used		
Control units	Position command unit	Command unit: Depends on the Electronic Gear Setting in the Servo Parameters. Default setting: Pulses		
	Speed command unit for position control	Command units/s		
	Acceleration/deceleration speeds for posi-	10,000 command units/s ²		
	tion control			
	Speed command unit for speed control	0.001% of the motor's maximum speed		
	Torque command unit for torque control	0.001% of the motor's maximum torque		
Control command	Position command range	-2,147,483,648 to 2,147,483,647 (command units)		
range	Speed command range for position control	0 to 2,147,483,647 (command units/s)		
	Acceleration/deceleration speeds for posi- tion control	1 to 65,535 (10,000 command units/s ²)		
	Speed command range for speed control	-199.999% to 199.999% The upper limit is restricted by the maximum speed of the Servomotor.		
	Torque command range for torque control	-199.999% to 199.999% The upper limit is restricted by the maximum torque of the Servomotor.		
Control functions	Servo lock/unlock	Locks and unlocks the Servo Driver.		
	Position control	Positions to an absolute position or relative position according to the specified target position and tar- get speed specified from the ladder program.		
		 method. Present position preset: Changes the present position to a specified position to establish the origin. Origin return: Returns the axis from any position to the established origin. Absolute encoder origin: Establishes the origin using a Servomotor that has an absolute encoder, without having to use an origin search. 		
	Jogging	Outputs a fixed speed in the CW or CCW direction.		
	Interrupt feeding	Performs positioning by moving the axis a fixed amount when an external interrupt input is received while the axis is moving.		
	Speed control	Performs speed control by sending a command to the Servo Driver speed loop.		
	Torque control	Performs torque control by sending a command to the Servo Driver current loop.		
	Stop functions	 Deceleration stop: Decelerates the moving axis to a stop. Emergency stop: Positions the moving axis for the number of pulses remaining in the deviation counter and then stops the axis. 		
Auxiliary functions	Acceleration/deceleration curves	Sets either a trapezoidal (linear) curve, an exponential curve, or an S-curve (moving average).		
	Torque limit	Restricts the torque upper limit during position control.		
	Override	Multiplies the axis command speed by a specified ratio. Override: 0.01% to 327.67%		
	Servo parameter transfer	Reads and writes the Servo Driver parameters from the ladder program in the CPU Unit.		
	Monitoring function	Monitors the control status of the Servo Driver's command coordinate positions, feedback position, current speed, torque, etc.		
	Software limits	Limits software operation for controlling positioning.		
	Backlash compensation	Compensates for the amount of play in the mechanical system according to a set value.		
External I/O	Position Control Unit	One MECHATROLINK-II interface port		
	Servo Driver I/O	CW/CCW limit inputs, origin proximity inputs, external interrupt inputs 1 to 3 (can be used as external origin inputs)		
Self-diagnostic func	tions	Watchdog, flash memory check, memory corruption check		
Error detection func	tions	Overtravel, Servo Driver alarm detection, CPU error, MECHATROLINK communications error, Unit setting error		
Internal current con	sumption	360 mA or less for 5 VDC		
Weight		95 g		

JUSP-NS115 - Mechatrolink-II Interface Unit

Item		Details	
Туре		JUSP-NS115	
Applicable Servo Drive		SGDH-DDDE models (Version 38 or later)	
Installation Method		Mounted on the SGDH Servo Drive side: CN10.	
Basic	Power Supply Method	Supplied from the Servo Drive control power supply.	
Specifications	Power Consumption	2 W	
MECHATROLINK -II Communications	Baud Rate / Transmission Cycle	10 MHz / 500 ms or more. MECHATROLINK-II communications	
Command Format	Operation Specification	Positioning using MECHATROLINK-I/II communications.	
	Reference Input	MECHATROLINK-I/II communications	
		Commands: Motion commands (position, speed), Interpolation commands, Parameter read/write, Monitor output	
Position Control	Acceleration/Deceleration Method	Linear first/second-step, asymmetric, exponential, S-curve	
Functions Fully Closed Control		Position control with fully closed feedback is possible.	
Fully Closed	Fully Closed Encoder Pulse Output	5 V differential line-driver output (complies with EIA Standard RS-422A)	
System	Fully Closed Encoder Pulse Signal	90° Phase difference 2-phase differential pulse (phase A, phase B)	
Specifications	Maximum Receivable Frequency for Servo Drive	1 Mpps	
	Power Supply for Fully Closed Encoder	To be prepared by customer.	
Input Signals	Signal Allocation Changes Possible	Forward/reverse run prohibited, Zero point return deceleration LS	
		External latch signals 1, 2, 3	
		Forward/reverse torque control	
Internal Functions	Position Data Latch Function	Position data latching is possible using phase C, and external signals 1, 2, 3	
	Protection	Parameters damage, Parameter setting errors, Communications errors, WDT errors, Fully closed encoder detecting disconnection	
	LED Indicators	A: Alarm, R: MECHATROLINK-I/II Communicating	

Nomenclature

CJ1W-NCF71 - Position Control Unit



CJ1W-CT021

High-speed Counter Unit

High-speed, flexible control with a wide array of features

- Input frequencies to 500 kHz.
- 32-bit counting range.
- Variable digital noise filter provided.
- 5-/12-/24-V line driver inputs
- · Supports simple, ring, and linear counting modes.
- Supports two external control inputs, and a total of 16 functions can be set: open gate, close gate, preset, reset, capture, stop/capture/reset combinations, reset enable, and more.
- One Unit supports two external outputs and 30 internal outputs with counter value zone comparisons, target comparisons, delays, holds, programmable outputs, and hysteresis settings.
- · Pulse rate measurement function and data logging.
- Counter outputs and external control inputs can be used to trigger interrupt tasks in the CPU Unit.

Function

The High-speed Counter Unit counts pulse signal inputs that are too fast to be detected by normal Input Units. The Unit can be programmed

System Configuration



Specifications

High-speed Counter Unit				
Special I/O Unit				
0 to 92				
2 channels				
Simple counter Linear or ring counter				
Differential phase inputs (x1)	Differential phase inputs (x1, x2, x4)	Up/Down pulse inputs	Pulse and direction inputs	
50 kHz	10, 50, or 500 kHz			
B000 0000 to 7FFF FFFF Liner counter: 8000 0000 to 7FFF FFFF (-2,147,483,648 to 2,147,483,647) (-2,147,483,648 to 2,147,483,647) Ring counter: 0000 0000 to FFFF FFFF (0 to 4,294,967,295)				
•				
Phases A, B, and Z				
24 V DC	5 V DC (for ch1 only)	12 V DC (for ch2 only)	Line driver	
Number of inputs: 2	•	•	•	
24 V DC				
Number of outputs: 2 (switchable between NPN and PNP)				
10.2 to 26.4 V DC				
46 mA at 10.2 V to 100 mA at 26.4 V	46 mA at 10.2 V to 100 mA at 26.4 V			
0.1 ms max.				
0.1 mA max.				
1.5 V max.				
Simple counter: Forced ON/OFF, Line	ear counter: Forced ON/OFF, :	zone comparison, and target o	comparison	
	High-speed Counter Unit Special I/O Unit 0 to 92 2 channels Simple counter Differential phase inputs (x1) 50 kHz 8000 0000 to 7FFF FFFF (-2,147,483,648 to 2,147,483,647) Phases A, B, and Z 24 V DC Number of inputs: 2 24 V DC Number of outputs: 2 (switchable bet 10.2 to 26.4 V DC 46 mA at 10.2 V to 100 mA at 26.4 V 0.1 mA max. 1.5 V max. Simple counter: Forced ON/OFF, Lin	High-speed Counter Unit Special I/O Unit 0 to 92 2 channels Simple counter Linear or ring counter Differential phase inputs (x1) Differential phase inputs (x1, x2, x4) 50 kHz 10, 50, or 500 kHz 8000 0000 to 7FFF FFFF Liner counter: 8000 0000 to (-2, 147, 483, 648 to 2, 147, 483, 647) Phases A, B, and Z 24 V DC 24 V DC 5 V DC (for ch1 only) Number of inputs: 2 24 V DC 24 V DC 5 V DC (for ch1 only) Number of outputs: 2 (switchable between NPN and PNP) 10.2 to 26.4 V DC 46 mA at 10.2 V to 100 mA at 26.4 V 0.1 mA max. 0.1 mA max. 1.5 V max. Simple counter: Forced ON/OFF, Linear counter: Forced ON/OFF,	High-speed Counter Unit Special I/O Unit 0 to 92 2 channels Simple counter Linear or ring counter Differential phase inputs (x1) Differential phase inputs (x1, x2, x4) 50 kHz 10, 50, or 500 kHz 8000 0000 to 7FFF FFFF Liner counter: 8000 0000 to 7FFF FFFF (-2,147,483,648 (-2,147,483,648 to 2,147,483,647) Ring counter: 0000 0000 to FFFF FFFF (0 to 4,294,967,2) Phases A, B, and Z 24 V DC 24 V DC 5 V DC (for ch1 only) 12 V DC (for ch2 only) Number of inputs: 2 24 V DC 24 w DC 5 V DC (for ch1 only) 12 V DC (for ch2 only) Number of outputs: 2 (switchable between NPN and PNP) 10.2 to 26.4 V DC 46 mA at 10.2 V to 100 mA at 26.4 V 0.1 ms max. 0.1 mA max. 0.1 mk max. 1.5 V max. Simple counter: Forced ON/OFF, Linear counter: Forced ON/OFF, zone comparison, and target of the second of the	



to produce outputs according to counter values for specified conditions, and many other functions are supported.

4-Channel Counter Unit

- 4 independent counter channels for encoder or pulse train inputs
- 4 Counter channels with 32-bit counter value
- Linear or circular counter mode selectable per channel.
- Max. input pulse frequency 100 kHz, or 400 k counts/second in quadrature mode
- 32 comparison values (8 per channel) can be used to trigger interrupts to the PLC CPU
- Counter channel settings can be reconfigured onthe-fly
- Input level: line driver
- (24 V inputs through dedicated terminal block).
- Easy connection (line driver or 24V) by using XW2G-40G7-E screwless terminal block)



Function

This Unit offers an economical way to acquire position information from up to four encoders, or to count fast pulse trains up to 100 kHz. Dynamically adjustable counter comparison values offers flexibility in triggering interrupts to the PLC with sub-millisecond response.

System Configuration



Terminal arrangement

			Pin No.	Signal	Pin No.	Signal
		40	Not Connected	39	Not Connected	
	DIN 99		38		37	
	/	4	36	Z-	35	Z+
모개	r	Ĕ.	34	8-	33	B+
		ŝ	32	A-	31	A+
			30	Not Connected	29	Not Connected
			28		27	
::		0	26	Z-	25	Z+
Chame	Ĕ	24	8-	23	B+	
	÷.	22	A-	21	A+	
::			20	Not Connected	19	Not Connected
			18		17	
프레		al 2	16	Z-	15	Z+
ΞIJ	PIN 1	ŭ	14	8-	13	8+
	-	ő	12	A-	11	A+
			10	Not Connected	9	Not Connected
			8		7	
		1	6	Z-	5	Z+
		ũ,	4	8-	3	8+
		ž,	2	Δ.	4	A+

Item	Classification: Special I/O Unit
	CJ1W-CTL41-E
Unit numbers	0 to 92
Counter Inputs	2 Channels
Counter Modes	Linear, Circular
Counter Values	8000 0000 to 7FFF FFFF (-2,147,483,648 to 2,147,483,647)
Comparison values	8 values or 4 ranges per channel
Input Types	Differential Phase Inputs (1x, 2x, 4x) Pulse Up/Down Inputs Pulse + Direction Inputs
Input Voltage	RS422 Line Driver compatible level 24V via XW2G-40G7-E terminal block
Max. input Frequency	100 kHz (A and B signals)
rogrammable Controllers

SSI Encoder Input Unit

2 independently configurable inputs for SSIcompatible sensors

- SSI (synchronous serial interface) is a standard communication protocol mainly used for absolute encoders or distance measurement systems.
- It provides more flexibility, easier connection and reduced wiring compared to parallel connection of absolute encoders.



Function

The Units sets up and maintains data communication with up to two SSI slave devices. Extensive setting options allow matching the coding, baud rate or data length of any SSI device.

SSI Communication

Item	Specification
CLK lines	Non-isolated differential line driver, RS422 compliant
DATA lines	Electrically isolated differential line receiver, RS422 com- pliant
Number of data-bits	9 to 31 (default: 24)
Value coding	Gray / Binary / Tannenbaum / Raw (default: Gray)
Clock frequency	100 kHz to 1.5 MHz
Monoflop time	10 µs to 99.990 µs (default: 40 µs)
Sample rate	About 2,500 Samples/sec with 2 encoders connected (with default settings



Terminal arrangement

Item Description Row B		Termina	ıl no.	Description Row A
SSI DATA CH1	DATA1-	B1		
SSI Clock CH1	CLOCK1-	B2	A1	DATA1+
SSI Power Supply	OV ENC PS	B3	A2	CLOCK1+
OUT CH1			A3	+_ENC_PS
	N.C.	B4	A.4	NC
SSI DATA CH2	DATA2-	B5	A4	N.C.
			A5	DATA2+
SSI CIOCK CH2	CLOCK2-	B6	46	
SSI Power Supply OUT CH2	0V_ENC_PS	B7	Δ7	
	NC	B8	~ ′	+_LNO_I 0
	N.O.	50	A8	N.C.
Encoder Power Supply Input	0V_ENC_PS	B9	A9	+_ENC_PS
			1	

lte m				
Item	Classification: Special I/O Unit			
	CJ1W-CTS21-E			
Unit numbers	0 to 94			
SSI Inputs	2 Channels			
SSI Configuration options	Baud Rate, Value coding (see above)			
(per channel)	Resolution (9-31 bits)			
	Leading/trailing bits (0-31 bits)			
	Encoder Status bits (0-8 bits)			
	Parity (Odd, Even, None)			
	Monoflop time			

Serial Communications

Serial Communications Connections

Unit	Model	Ports	Serial communica	Serial communications mode						
			Protocol macros	Host Link	NT Links	No-protocol	Serial PLC Link	Peripheral bus	Program- ming Con- sole bus	Serial Gate- way (See note 1.)
			General-purpose external devices	Host computers	OMRON PTs	General-purpose external devices	CJ1M	Program- ming De- vices	Program- ming Console	Compo- Way/F- compatible models
CPU Units	All	Port 1: Peripheral	No	Yes	Yes	No	No	Yes	Yes	No
	models	Port 2: RS-232C				Yes	Yes (CJ1M only)		No	Yes
Serial Com- munications	CJ1W- SCU41-V1	Port 1: RS-422/ 485	Yes	Yes	Yes	Yes (See note 1.)	No	No	No	Yes (See note 2.)
Units		Port 2: RS-232C								
	CJ1W- SCU21-V1	Port 1: RS-232C Port 2: RS-232C	Yes	Yes	Yes	Yes (see note 1.)	No	No	No	Yes (See note 2.)

Note: 1. CPU Unit Ver. 3.0 and Serial Communications Unit Ver. 1.2 or later only.

2. Gateway to Host Link FINS is also possible.

Example Serial Communications Configuration



Protocol Macros

Easily Create Protocols for Data Exchange with External Devices Using One Instruction

Function

Data transfer protocol for serial communications vary with the manufacture and with devices. Differences in protocols can make communications between devices by different manufactories very difficult, even when electrical standards are the same.

OMRON's protocol macros solve this problem by enabling easy creation of protocol macros designed to match the protocol of a connected device. Protocol macros will let you communicate with essentially any device with an RS-232C, RS-422, or RS-485 port without having to write a special communications program.

PLCs with Protocol Macros



The Two Main Functions of Protocol Macros

1. Creating Communications Frames

The communications frames can be easily created according to the specifications required by the connected device. Data from I/O memory in the CPU Unit can be easily included as part of a communications frame to read from or write to I/O memory.



2. Creating Frame Send/Receive Procedures

The required processing, including sending and receiving communications frames, can be performed one step at a time according to the results of the previous step, and then CX-Protocol an be used to trace send and receive data.



Types of Protocol

Standard System Protocols

Data transfers with OMRON components can be easily performed using standard system protocols. There is no need to develop you own protocols in this case.



Component	wodei	
CompoWay/F-	compatible components	OMRON Compo- Way/F slave components
Digital Con- trollers and	Small Digital Controller with Communica- tions (53 x 53 mm)	E5CK
Temperature Controllers	Temperature Controllers with Digital Indica- tions (Thermac J with communications) (96 x 96 mm or 48 x 96 mm)	E5□J-A2H0
	Digital Controllers with Communications (96 x 96 mm)	ES100
	High-density Temperature Controller with communications (8 control points)	E5ZE
Intelligent Sign	al Processors	K3T🗆
Bar Code	Laser Scanner type	V500
Readers	CCD type	V520
Laser Microme	eter	3Z4L
Visual Inspec-	High speed, high precision, low cost	F200
tion Systems	High-precision inspection/positioning	F300
	Character inspection software/positioning software	F350
ID Controllers	Electromagnetic coupling (for short distanc- es)	V600
	Microwave (for short distances)	V620
Hayes Modem	AT Command	
C-series PLCs (See note.)		PLC with Host Link (C mode) protocol
CS/CJ-series PLCs (See note.) CVM1/CV-series PLCs (See note.)		PLC with Host Link (FINS) pro- tocol
Mitsubishi PLCs (Sequencer CPU Modules) (See note.)		PLC with Com- puter Link (A- compatible, 1C frame, model 1) slave functions.

Note: Serial Communications Unit Ver. 1.2 or later only.

User-created Protocols

Data transfers with non-OMRON components can be easily created just by defining parameters using the CX-Protocol Windows tool.



Other Protocols

Host Links

Host Link (C-mode) commands or FINS commands placed within host link headers and terminators can be sent to a host computer to read/ write I/O memory, read/control the operating mode, and perform other operations for the PLC.

Unsolicited messages can also be sent from the PLC to the host computer by sending FINS commands from the ladder program using the SEND(090), RECV(098), and CMND(490) instructions.



Custom Protocols

I/O instructions for communications ports (TXD/TXDU, RXD/RXDU) can be used for simple data transfers (custom protocols), such as to input data from bar code readers or output data to a printer. Start/end codes can be specified, and RS, CS, and other control signals can be handled.



1:N NT Links with High-speed Links

The PLC can be connected to a Programmable Terminal (PT) via RS-232C or RS422A/485 ports, and I/O memory in the PLC can be allocated to various PT functions, including status control areas, status notifications areas, touch switches, lamps, memory tables, and other objects.



Note: Either one or up to eight PIs can be connected to a PLC in 1:N NT Links.

High-speed NT Links that are three times faster are possible with the NS Series and version 2 of the NT631 and NT31 Series. This speed is particularly important when connecting to more than one PT.

Serial Gateway Function <u>NEW</u> (CPU Unit Ver. 3.0 or later, Serial Communications Unit

Ver. 1.2 or later only)

When a FINS command containing a CompoWay/F command is received via network or serial communications, the command is automatically converted to a protocol suitable for the message and forwarded using serial communications. This enables access to CompoWay/F-compatible components from a personal computer, PT, or PLC via a network.



Serial PLC Links (CJ1M CPU Unit's Built-in RS-232C Port)

Allows many applications to be easily achieved, such as exclusive control between PCB loaders and unloaders and temperature information and time management between conveyor ovens. Up to 9 CJ1M CPU Units can be connected, with up to 10 words of data between them managed by the built-in RS-232C port. The RS-232C can be converted to RS-422A simply by using a CJ1W-CIF11 RS-422A Conversion Adapter.



CS1W-SCUD1-V1

Serial Communication Unit

Support Protocol Macros, Host Link Communications, and 1:N NT Links

• Mount up to 16 Units (including all other CPU Bus Units) on CPU or Expansion Racks. Ideal for systems that required many serial ports.



Function

The SCU21 and SCU41 CPU Bus Unit can be used to increase the number of serial ports (RS-232C or RS-422A/485) two at a time. The SCU21 provides two RS232C ports, the SCU41 has one RS232C port and one RS422/RS485 port. Specify Serial Gateway, Protocol Macros,

Host Link Communications, or 1:N NT Links separately for each port. With the CJ Series, you can easily provide the right number of serial ports for your system.

System Configuration



Unit	Classification	Serial communications modes	Serial	Unit numbers	Model
Serial Communications Unit	CPU Bus Unit	Protocol Macro, Host Link, 1:N NT Link,	RS-232C x 1 RS-422A/485 x 1	0 to F	CJ1W-SCU41-V1
		Serial Gateway, or non- protocol communications	RS232C x 2		CJ1W-SCU21-V1

RS-422A Adapter

Converts RS-232C to RS-422A/RS-485

- Use to convert RS-232C to RS-422A/RS-485.
- Simply connect this Adapter to the built-in RS-232C port or an RS-232C connector on a Serial Communications Unit (D-sub, 9-pin) to convert to RS-422A/ RS-485).



Specifications

Item	Specifications		
Dimensions	$18.2 \times 34.0 \times 38.8 \text{ mm} (W \times H \times D)$		
Weight	20 g max.		
Rated power supply voltage	+5 V	Supplied from pin 6 on the RS-232C connector.	
Current consumption	40 mA max.		
Isolation	No isolation		
Transmission distance	50 m		

Interface

RS-232C Connector



Pin	Signal	
1	NC	
2	RD	
3	SD	
4	CS	
5	RS	
6	+5V	
7, 8	NC	
9	SG	
Hood	FG	

RS-422A/485 Terminal Block



NT-AL001

RS-232C/RS-422A Adapter Unit

Programmable Controllers

- Long-distance transmissions are possible through an RS-422A interface. By converting from RS-232C to RS-422A and then back to RS-232C, a transmission distance of up to 500 m can be achieved.
- No power supply is required. If the 5-V terminal (150 mA max.) is connected from the RS-232C device, a separate power supply is not required to drive the Adapter Unit.
- Duct wiring can be used. The removable terminal block enables wiring not possible with D-sub connectors. (The RS-232C interface is 9-pin D-sub.)



Function

The NT-AL001 is used to connect a PT or other device with an RS-232C terminal to a device with an RS-422A terminal, or an RS422A multi-drop network..

Communications Specifications

General Specifications

Item	Specification
Rated power supply voltage	$+5 \text{ V} \pm 10\%$
	(Use pin 6 on the RS-232C connector.)
Rated current consumption	150 mA max.
Rush current	0.8 A max.
Weight	200 g max.

RS-422A Interface

Item	Specification
Baud rate	64 Kbps max. (depends on RS-232C baud rate)
Transmission distance	500 m max.
Terminal block	8 terminals, M3.0; detachable

Dimensions

Note: Units are in mm unless specified otherwise.



RS-422A terminal block

RS-232C connector



With RS-422A terminal block cover closed: 30 \times 114 \times 100.2 mm (W \times D \times H) With RS-422A terminal block cover open: 30 \times 114 \times 119.5 mm (W \times D \times H)

RS-232C Interface

Item	Specification
Baud rate	64 Kbps max.
Transmission distance	2 m max.
Connector	9-pin, D-sub connector (female)

RFID Sensor Units

Process RFID tag data directly in the control system.

- Models available to connect to either one R/W Head or two R/W Heads.
- High-speed data communications with the CPU Unit (160 bytes/scan).
- Efficient programming with control bits and data located in different interface areas.
- Common operating methods for both Single-head and Double-head Units to effectively apply programming resources through modularization.
- Status confirmation function without CPU Unit program for faster system setup.
- Power supply error flags and processing provide debugging information (communications TAT and error codes) for easier maintenance.





Function

The ID Sensor Unit interfaces to the V600-series RFID System's Amplifiers and Read/Write Heads and is used together with V600 Data Carriers.



Combine Products and Information

Data Carriers attached to the products being manufactured are used to handle the flow of control and management information on the production line. They can also be used to automatically collect and manage quality information.

Autonomous Control

The information required for production is provided from the product itself, enabling the creation of an autonomous control system that does not need to rely on a host.

Modularization of Control Processes

The required information is available when it is required, enabling simple separation of control processes into autonomous modules.

rogrammable Controllers

Specifications

Item	CJ1W-V600C11	CJ1V	CJ1W-V600C12					
Data transfer speed	160 bytes/scan (between	60 bytes/scan (between CPU Unit and ID Sensor Unit)						
Applicable RFID system	V600 Series	/600 Series						
Number of connectable R/W Heads	1	2						
Commands (The number of bytes that can be specified is given in brackets.)	Read/Write [1 to 2,048] Data Fill (Clear) [1 to 2,048 or through end address] Copy (for Double-head Units only) [1 to 2,048] Calculation Write [1 to 4] Bit Set/Bit Clear [1 to 4] Masked Bit Write [2] Memory Check [2] No. of Writes Control [2]							
Communications processing time (See note.)	Command	Data Carriers with built-in batteries	Battery-free Data Carriers in time priority mode					
	Read	1.8 × N + 48.4 ms	1.8 × N + 79.0 ms					
	Write with verify	4.2 × N + 86.5 ms	7.1 × N + 180.4 ms					
	Write without verify	2.2 × N + 72.8 ms	4.3 × N + 132 ms					
	N = The number of byte	s being read or written.						
Maintenance features	Communications test, processing results monitor data (communications TAT and error codes)							
Error detection	CPU errors, communicati	ons errors with Data Carriers, R/W Head po	ower supply check					

Note: Add the data transfer time to the communications processing time for the command processing time

System Configuration



Note: Refer to the Auto-Identification Components Group Catalog (Cat. No. Q132) for details on the V600 Series.

Communications Networks

Overview

Level	Network	Functions	Communications	Unit/Board	
Information	Ethernet	Host computer to PLC	FINS messages	Ethernet Unit	
networks		PLC to PLC			
		Host computer to CPU Unit memory card	FTP server		
	UNIX computer or other socket ser- vice to PLC		Socket services		
	Controller Link	Computers connected directly to network and PLC	FINS messages	Controller Link Support	
			Data links (offsets and automatic setting)	Board and Unit	
Control networks	Controller Link	PLC to PLC	FINS messages	Controller Link Unit	
			Data links (offsets and automatic setting)		
	DeviceNet		FINS messages on open network	DeviceNet Unit and Configurator	
	DeviceNet	PLC to components (slaves)	HIgh-capacity remote I/O on open network (fixed or user allocations)	DeviceNet Unit and Configurator	
	CompoBus/S		High-speed remote I/O (fixed allocation) on OMRON network.	CompoBus/S Master Unit	
	PROFIBUS-DP		HIgh-capacity remote I/O on open network (fixed or user allocations)	PROFIBUS-DP Unit and Configurator	

Specifications

Network	Ethernet	Controller Link	PROFIBUS-DP	DeviceNet	CompoBus/S
Messages	Yes	Yes	Limited (DPV1 devices)	Yes	
Data links		Yes	Manually configurable		
Remote I/O			Yes	Yes	Yes
Maximum speed	10/100 Mbps	2 Mbps Comm cycle: Approx. 34 ms (Wired: 32 nodes, 2-Kbits + 2-Kword data links)	12 Mbps, Comm. cycle from 1 ms.	500 Kbps Comm cycle: Approx. 5 ms (128 inputs and 128 outputs)	750 Kbps (See note 1.) Comm cycle: Approx. 1 ms (128 inputs and 128 outputs)
Total distance		Twisted-pair cable: 1 km (at 500 bps) Optical cable: 20 km	1200 m up to 93.75 kbps, 100 m at 12 Mpbs, extension by optical links i possible	500 m (at 125 kbps)	Trunk line: 500 m (For the long-distance communications mode) (Total wiring length is 200 m when using the 4-conductor VCTF cable or special flat cable.) Communications cycle: 6 ms max.
Maximum nodes		32/62	126	63	32
Communications media		Special twisted-pair cable or optical cable	PROFIBUS cable	DeviceNet cable	2-conductor VCTF cable 4-conductor VCTF cable Special flat cable (Different ca- bles cannot be used together.)
Network data link capacity		32,000 or 62,000 words			
Remote I/O capacity			7000 words (112000 points), Configurator always required	32,000 pts (with Configurator) 2,048 pts (without Configurator)	256 pts
Supporting PLCs	CJ Series, CS Series, CVM1, CV Series, C200HX/HG/ HE	CJ Series, CS Series, CVM1, CV Series, C200HX/HG/HE, CQM1H	CJ Series, CS Series, C200 HX/HG/HE, C200HS, CQM1H, CPM1A/2A	CJ Series, CS Series, CVM1, CV Series, C200HX/HG/HE, C200HS, CQM1/CQM1H (with I/O Link), CPM1A/2A (I/O Link)	CJ Series, CS Series, C200HX/HG/HE, C200HS, CQM1/CQM1H, CPM2C-S1⊡0c(-DRT), CPM14/2A (with I/O Link), CPM2C (with I/O Link)

Note: 1. For the baud rate of 500 kbps.

2. For the baud rate of 125 kbps.

3. For the high-speed communications mode (trunk length: 100 m) (30 m max. when using 4-conductor VCTF cable or special flat cable)

Programmable Controllers



Ethernet: Information Network

Use an Ethernet Network to organically link production management with the production site using various communications services.

Remote Programming and Monitoring

CX-Programmer running on a computer connected to the Ethernet Network can be used to program and monitoring all the PLCs connected to the Ethernet Network.



Socket Service

Transfer data using either UDP or TCP protocol.



Mail Service

Send electronic mail from the PLC to a host computer when a flag turns ON, when an error occurs, or at scheduled times.



FINS Message Service

Send FINS message between PLCs or between PLCs and host computers. The Ethernet FinsGateway can be used to handle messages from applications without having to program FINS commands directly.



FTP Service

Use the FTP to transfer files between Memory Cards in the CPU Unit and computer memory.



Controller Link: Control Network

Controller Link can easily connect PLCs at the factory site in a fully functional FA network.

Easy Network Construction with Twisted-pair Cables

Repeater Units Enable T-branch Wiring, Extension, Expansion, or Optical Sections in Networks

More Flexibility in Wiring for Layout, Construction, and Expansion Using T-branches

Repeater Units can be used for branching, making complicated wiring paths unnecessary. This method reduces wiring labor, and modularization of equipment into Repeater Units.



 Modularization by Repeater for easy removal from network or changing connections.

Data Links

Efficient, large-capacity data links can be flexibly created between PLCs and between PLCs and host computers. The Controller Link FinsGateway can be used to handle data links from applications without having to program FINS commands directly.



Remote Programming and Monitoring

CX-Programmer connected via RS-232C can be used to program and monitor PLCs on the Controller Link Network.



FINS Message Communications

Large volumes of data can be transferred between PLCs and host computers whenever necessary. The Controller LInk FinsGateway can be used to handle messages from applications without having to program FINS commands directly.



DeviceNet: Component Network

Create a multi-vendor network for multibit communications for lower-level PLCs that need to handle both control signals and data.

Remote I/O Communications

Large-capacity remote I/O can be freely allocated according to application needs.



Select from a Wide Range of Slaves (Connection Possible to Data-intensive Devices)

Connect contact I/O, analog I/O, temperature inputs, sensor (photoelectric or proximity) inputs, and small PLCs (e.g., CQM1).

Message Communications

Send FINS messages between OMRON PLCs and Explicit message between OMRON PLCs and devices from other makers.



Use MULTIPLE I/O TERMINALs as DeviceNet Slaves

I/O can be expanded through one-step connections. Special I/O and explicit messages are also supported.

Connect to DeviceNet Products from Other Manufacturers



CompoBus/S: High-speed ON/OFF Bus

Construct a high-speed remote I/O system under the PLC to reduce wiring for sensors and actuators inside machines.

High-speed Remote Communications at 1 ms or Less

In the High-speed Communication Mode, you can link up to 32 slaves (up to 128 input and 128 output points) with a high-speed communications cycle of 1 ms or less (0.5 ms with up to 16 slaves, 64 input and 64 output points).



High-speed and Long-distance Communications Modes

A switch enables switching between the previous High-speed and a new Long-distance Communications Mode.

- High-speed Mode: 100-m communications distance at 750 Kbits/s (with 2-conductor VCTF cable)
- Long-distance Mode: 500-m communications distance at 93.75 kbits/ s (with 2-conductor VCTF cable)

Reduced Wiring with Special Cables

Connect with special Flat Cables or VCTF Cables.

A Slave for Essential Any Application

Contact I/O, Contact I/O Modules, Photoelectric/Proximity Sensor Input Slaves are provided along with Analog Input and Analog Output Slaves.

No-restriction Branching in Long-distance Communications Mode

With special Flat Cables or 4-conductor VCTF Cables, you can branch and wire in any required structure for up to a total distance of 200 m.

Ethernet Unit

Enables fast data transfer within Factory Automation systems, and easily links FA systems to plant management systems

- Use the standard Ethernet protocools, TCP/IP and UDP/IP, and OMRON's standard FINS message communications.
- FINS routing provides seamless communication with Controller Link, DeviceNet and other networks.
- Access data files in PLC memory or on Compact-Flash cards using the Unit's FTP server function.
- Freely configurable communications using socket services
- Send e-mails automatically upon preset conditions, including embedded data in the e-mail body, or with data file attachments.
- Receive e-mails (POP3), including commands to the PLC, with password protection.
- Automatic correction of the PLC clock using SNTP function.
- DNS Client function allows server access by host name.
- Set communications parameters with CX-One's setup menus or the HTML setup pages.

Function

Achieve a wide range of communications from PLCs connected to an Ethernet network: Transfer data with TCP/IP or UDP/IP socket services, executed OMRON's standard FINS commands, transfer files with FTP, or send mail with SMTP. Select the communications services that are required and flexibly connect PLCs on an information level Ethernet network.





Classification	Communications services	Unit numbers	Connector	Model
CPU Bus Unit	FINS communications service (TCP/IP, UDP/IP), FTP server functions, socket services, mail transmission service, mail receive, automatically adjusted PLC built-in clock (remote command receive), server/host name specification.	0 to F (4 Units max.)	100Base-TX (10Base-T)	CJ1W-ETN21

CJ1W-CLK21-V1 Controller Link Units

Simpler Controller Link Wiring, Startup, and Construction Provides Larger-capacity Data Links, Greater Flexibility in Area Control, and Supports Multiple Sub-networks



Function

The data link capacity is 20,000 words per node. Allocate both Data Link Area 1 and Area 2 in the same area. Connect up to 8 Units under a single CPU Unit. (Unit Ver. 1.2 only)

Using Wired Controller Link Units together with Repeater Units allows network configurations for essentially any application, including T-branching, long-distance applications, applications with up to 62 nodes, or applications with optical sections in a wired network. Models are also available that enable changes in configurations and automatic 1:N communications while data links are active.

Huge increase in amount of data that can be collected from devices.

Number of data link send/receive words (total of Area 1 and Area 2) for a single Controller Link Unit increased from 12,000 to 20,000 words.





New CS/CJ-series Controller Link Units (Wired/Optical Ring) can handle up to 20,000 send/receive data link words (total of Area 1 and Area 2) for a single node. This enables more data to be collected from each device.

The same Memory Area can be used for the Data Link Areas. For example, Data Link Areas 1 and 2 can be both allocated and managed in EM Bank 0.

Before



Area 1 and Area 2 had to be allocated in separate Memory Areas for user-set data links. Therefore, allocating all data links in the EM Area was not possible.



New CS/CJ-series Controller Link Units (Wired/Optical Ring Units) enable both Areas 1 and 2 to be allocated in the same Memory Area when using user-set data links. Provided addresses do not overlap, the same Memory Area can be used, making area control easier.

Control up to 8 Controller Link sub-networks as a group from the host network.

Previous Units supported connection of up to four Controller Link Units to a single CPU Unit. Creating a gateway to the host network to control the Controller Links as a group of sub-networks required dividing the Units between two PLCs with a maximum of four networks for a single PLC.



New CS/CJ-series Controller Link Units (Wired/Optical Ring) enable connection of up to 8 Controller Link Units for each CPU Unit. This enables easy centralized control of a group of Controller Link subnetworks from the one PLC.



System Configuration

Use Repeater Units for T-branch Wiring, Extension, Expansion, and Optical Sections

T-branching Enables More Flexible Wiring Solutions for Layout, Building, and Expansion of Networks



Wired Types Support Long-distance Extension

The total extended length that was previously 500 m at 2 Mbps can be extended to up to 1.5 km by using two Repeater Units.

Connect up to 64 Nodes Using Wired Types

Networks can be constructed with up to 62 nodes when Controller Link Units/Support Boards with -V1 suffix are combined with Repeater Units.

Wiring with Optical Cables Increases Noise Immunity

Using two Repeater Units for optical ring enables wiring with optical cables in parts of the network subject to noise.

Simpler, More Flexible Data Links

Change Data Link Tables While Data Links Are Active

- When data link tables are changed due to additional nodes or other networking changes, data link tables can be transferred without stopping any data link communications.
- Flexible system configurations can be changed by combining node expansion using Repeater Units.

Specifications

Unit/Board	Classification	Compatible PLC	Media	Model	Connections
Controller Link Units	CPU Bus Unit	CJ Series	Wired	CJ1W-CLK21-V1	Can be mounted to previ-
Controller Link Support Boards	Personal computer board (for PCI bus)			3G8F7-CLK21-EV1	ous Controller Link Units/ Support Boards.
Controller Link Repeater Units		Not mounted to PLC	Twisted-pair cable	CS1W-RPT01	Unit mounted indepen- dently using either DIN Track or screws.
			Optical ring (H-PCF ca- ble)	CS1W-RPT02	
			Optical ring (GI cable)	CS1W-RPT03	

Main Specifications Related to Version Upgrade for Unit Ver. 1.2

Item		Unit Ver. 1.2 or later	Pre-Ver. 1.2	
Number of data link words		Number of send/receive words per Unit	Number of send/receive words per Unitl	
		Total of Area 1 and Area 2: 20,000 words max.	Total of Area 1 and Area 2: 12,000 words max.	
		Number of send words per Unit Total of Area 1 and A	rea 2: 1,000 words max.	
Data Link Area al-	User-set	Areas 1 and 2: CIO Area (including data link words),	DM Area, and EM Area	
locations	allocations	Both Area 1 and Area 2 can be allocated in the same	Both Area 1 and Area 2 cannot be allocated in the	
		area (provided there is no address duplication).	same area.	
	Automatically set	Area 1: CIO Area (including data link words), Area 2:	DM Area and EM Area	
	equal allocations			
	Automatically set	Areas 1 and 2: CIO Area (including data link words), DM Area, and EM Area		
	1:N allocations			
Maximum number of Controller Link		8 Units max.	4 Units max.	
Units connected to	o a single CPU			
Unit				

Note: CX-Programmer Ver. 5.0 or higher is required to set a data link area with a maximum number of send and receive words of 20,000 words per Controller Unit, or to allocate the same area for Area 1 and Area 2.

Specifications for Networks Using Repeaters

Item	Segment (See note 1.)	Total network
Transmission path configuration	Multi-drop	Tree (using Repeaters to connect each segment)
Baud rate/maximum transmission dis-	2 Mbps: 500 m	2 Mbps: 1.5 km
tance (See note 2.)	1 Mbps: 800 m	1 Mbps: 2.4 km
	500 kbps: 1 km	500 kbps: 3.0 km
Maximum number of nodes	Controller Link Unit + Repeater Unit	Controller Link Unit: 62 nodes (using a Controller
	Total number of nodes: 32	Link Unit that supports 62 nodes)
Maximum number of Repeater levels		2 levels
(See note 3.)		

Note: 1. Specifications for each segment are the same as for Wired Controller Link networks.

- Maximum transmission distance: Total wired cable length between the two nodes separated by the longest total wired cable length.
 Maximum number of Repeater levels: Maximum number of Repeaters in a path linking any two nodes. For optical ring types, one set of
- two Units comprises one level.



CJ1W-DRM21

DeviceNet Unit

Multivendor, Multibit Network

- Control of up to 32,000 points (2,000 words) per master.
- Remote I/O communications can be allocated in any area using DM settings.
- 16 DeviceNet Units can be mounted for each CPU Unit (3 max. for fixed allocations).
- When using the Configurator (see note), remote I/O can be allocated in an order independent of node address.
- **Note:** The Configurator is allocating a node-address if connected to DeviceNet using a DeviceNet communication card. It is not doing this if connected through the serial communications interface of the CPU.
- DeviceNet Units can be used as a master and a slave, and this functionality can be used simultaneously.
- DeviceNet Units allow DeviceNet networks to be treated exactly like Controller Link, Ethernet, or other networks for message communications or remote programming and monitoring by CX-Programmer.



Function

OMRON supports the DeviceNet open field network, a multivendor network for machine/line control and information. The following types of communications are possible.

- 1. Remote I/O communications for automatic data transfers between the CPU Unit and Slaves (with no programming in the CPU Unit).
- Explicit message communications. This can be programmed from the CPU unit (IOWR and CMND instructions) and read from/write to other DeviceNet units.
- **3.** With explict message communication FINS commands can be send to other devices that support FINS messaging.



System Configuration



Specifications

DeviceNet Unit

Classification	Types of communications	Specifications	Unit numbers	Model
CPU Bus Unit	Remote I/O communications master	Up to 16 Units can be mounted	0 to F	CJ1W-DRM21
	(fixed or user-set allocations)	when a Configurator is used.	(Configurator required to mount 16	
	Remote I/O communications slave		Units.)	
	(fixed or user-set allocations)			
	Message communications			

DeviceNet Configurator

Name	Model number	Specifications
DeviceNet Configurator WS02-CFDC1-E		Software only (Windows 95, 98, NT 4.0, or 2000)
	3G8E2-DRM21-EV1	PC card with software (Windows 95 or 98)

For all two products, refer to page 449 for more info.

CJ1W-CORT21 CAN Unit

Sending and Receiving 11- or 29-bit CAN messages

The CAN communication protocol is widely used in all kinds of aplications. Benefits are its high reliability, low price and ease of implementation. But for two CAN devices to understand eachother they must speak the same protocol (language). Many implementers of CAN comunication have made their own protocol. The User Defined CAN Unit has the possibility to adapt to any protocol by configuration. This makes it possible to add a PLC and all its opennes, features and extensions to what was once a proprietary solution.



Function

The Unit can send and receive 11- or 29-bit CAN messages. The identifier, datalength and data of the CAN message and the way the CAN message is send (On time, trigger or change) are set buy FINS commands

ISO/OSI Reference Model

CAN communication describes only layers 1 and 2, the Physical and the Datalink Layer. Layer 7, the Application Layer is normally described in protocol standards like CANopen and DeviceNet.

Layer 7	Application Layer
Layer 3-6	
Layer 2	Data Link Layer
	Logical Link Control: LLC
	Acceptance filtering, overload notification, recovery management
	Medium Access Control: MAC
	Data encapsulation and decapsulation frame coding, stuffing
	medium access management error detection error signalling
	acknowledgement
	serialization, deserialization
Layer 1	Physical Layer
	bit encoding / decoding bit timing synchronization

11-bit identifier CAN frame



Applications

Monitoring of diesel-engines and drivetrains in trucks and bus



Robot Control



Item	Classification: Special CPU Unit		
	CJ1W-CORT21		
Unit number	0 to 15		
CAN communication	Any baud rate can be set Transmit and receive 11- or 29-bit CAN messages Transmit messages on time, trigger, or data change		
Configuration	Status and control words provide straightforward operation. All configuration data can can be changed on-line by FINS commands. Up to 640 identifiers can be configured for message filtering. Up to 640 different identifiers can be configured for transmission.		

CJ1W-PRM21

PROFIBUS-DP Master unit

- PROFIBUS-DP master class one with support of DP-V1 data types.
- 7 kWord I/O
- Simple configuration through FDT/DTM based configurator
- Special CPU unit
- Handles data independent of the CPU unit, thus reducing CPU load



Function

The CJ1W-PRM21 is a PROFIBUS-DP Master Class1 device (DPM1).

It exchanges I/O data and communication/status information with the CPU of the PLC and I/O data and diagnistics information with PROFIBUS-DP slave stations on the PROFIBUS network.

The CJ1W-PRM21 can be configured via any communication interface of the PLC system. Since the configuration software uses FINS communication, configuration data and diagnostic information can be routed over Controller Link, Ethernet or serial networks through up to 8 layers.

Model			Remarks
CJ1W-PRM21	Main function	Basic PROFIBUS-DP master Class 1 functions plus: DPV1 data types support	
	Unit No.	0-15	Special CPU unit
	Maximum number of units mountable per PLC	16	Maximum depends on PLC CPU-type
	Configurator	CX-PROFIBUS, FTD/DTM based configura- tor	Incorporates a Generic DTM to use with GSD-file based slaves
	Supported baud rate(s)	All baud rates as specified by the standard EN50170 Volume 2, the PROFIBUS exten- sions to EN50170, as well as the standard IEC61158: 9.6 kBit/s, 19.2 kBit/s, 45.45 kBit/s, 93.75 kBit/s, 500 kBit/s, 1.5 MBit/s, 3 MBit/s, 6 MBit/s, 12 MBit/s	The baud rate value to be used must be selected through the Configurator.
	Selectable PROFIBUS address	0-125	Set through the configurator
	Maximum number of PROFIBUS slaves	125	
	Maximum number of I/O points	7168 words	
	Maximum number of I/O points per PROFIBUS slave	244 bytes In / 244 bytes Out	
	Control and status ares size	25 words	
	Supported Global_Control services	- Sync - Unsync - Freeze - Unfreeze - Clear	Through Control Area
	Supported Master-Slave communication services	- Data_Exchange - Slave_Diag - Set_PRM - Chk_Cfg - Global_Control	
	Power consumption	400 mA at 5 V	
	Dimensions	90 x 65 x 31 mm	
	Weight	100 gr	
	Ambient temperature	Operating: 0 °C to 50 °C	

CJ1W-PRT21

PROFIBUS-DP slave unit

PROFIBUS-DP I/O link unit

- · Data link to any PLC data area
- Simple configuration using max. data input 100 words and max. data output of 100 words. Max. total exchanged data 180 words.
- CJ1 special I/O unit
- Status information overview in host PLC, plus extensive diagnostics via PROFIBUS



Installation	Host PLC System	CJ1		
	Maximum number of Units per PLC system	40		
	Current consumption	400 mA (maximum) at 5V DC from PLC power supply		
	Weight	90 g (typical)		
Environment	Storage temperature	-20°C to +70°C		
	Operating temperature	0°C to +55°C		
	Operating humidity	10 to 90% (non-condensing)		
	Conformance to EMC- and environmental standards	EN50081-2 EN61131-2		
User Interface	Switch settings	Special I/O Machine number (00-95) by 2 rotary switch PROFIBUS-DP node address (00-99) by 2 rotary switches		
	LED Indicators	Unit status: RUN (green LED), ERC (red LED)		
		Network status: COMM (green LED), BF (red LED)		
		CPU status: ERH (red LED)		
PLC Interface	No. of CIO words allocated	PLC \rightarrow Unit: 1 word control data		
		Unit \rightarrow PLC: 1 word status data		
	No. of DM words allocated	Unit \rightarrow PLC: 8 words of Unit setup information		
	Amount of I/O data per Unit	Fixed: 2 words CIO area (one in, one out) for Unit status + control bits. 2 words status information from the host PLC, containing operation status and error code (read from location A400). This information will be sent to the PROFIBUS master: - as extended diagnostics, only at a change of data content. - optionally, attached to the I/O data, each PROFIBUS cycle. Variable: 2 user-defined areas for PROFIBUS I/O data, with the following restrictions: - Up to 100 words input in one PLC area (CIO, H, D, EM). - Up to 100 words output in one PLC area (CIO, H, D, EM).		

CJ1W-SRM21

CompoBus/S Master Unit

CompoBus/S is a high-speed I/O bus

- Up to 256 I/O points per Master.
- Up to 32 Slaves per Master.
- Communications cycle time: 0.5 ms (at 750 kbps).
- Communications distance: Up to 500 m (at 93.75 kbps).
- Free wiring with any branching method for up to 200 m (in long-distance communications mode).



Function

A high-speed ON/OFF bus that automatically transfers remote I/O status to the CPU Unit without any programming in the CPU Unit. Highspeed remote I/O is supported by a communications cycle time of 1 ms maximum for 256 I/O points.

System Configuration



Specifications

Master

I/O points	256 (128 inputs and 128 outputs) or 128 (64 inputs and 64 outputs) (Switch-selectable)
Allocated words	For 256 I/O: 20 words (8 for inputs, 8 for outputs, 4 for status)
	For 128 I/O: 10 words (4 for inputs, 4 for outputs, 2 for status)
No. of mountable Master Units	40
Node address	8 addresses per node
No. of connectable Slaves	32
Status information	Communications Error Flags. Participation Flags

Note: Uses Special I/O Unit Area (in CIO Area).

Communiccations

Communications method		S	Special CompoBus/S protocol				
Coding		M	Manchester				
Connections		M	Multidrop T branch (requires termination)				
Baud rate		н	ligh-speed mode: 750	khne			
			ong-distance mode: 9	3 75 khns. Set via	DIP switch (Set	via DM Area, Default: 750 kbps)	
Communications cycle time High-speed mode		0.	.5 ms (with 8 input and	d 8 output Slaves)			
· · · · · · · · · · · · · · · · · · ·	3	0.	.8 ms (with 16 input ar	nd 16 output Slave	s)		
	Long-distance mode	4.	.0 ms (with 8 input and	d 8 output Slaves)	- /		
	3	6.	.0 ms (with 16 input ar	nd 16 output Slave	s)		
Media		2-	-conductor cable (VCT	F 0.75 x 2), 4-con	, ductor cable (VC	CTF 0.75 x 4), or Special Flat Cable	
Maximum communications distance		W	With 2-conductor Cable				
			Mode	Main	Branch	Total branch	
			High-speed	100 m	3 m	50 m	
			Long-distance	500 m	6 m	120 m	
		W	lith 2-conductor or Sp	ecial Flat Cable			
			Mode	Main	Branch	Total branch	
			High-speed (See note 1.)	30 m	3 m	30 m	
			Long-distance Any up to 200 m total (See note 2.)		<u> </u>		
Max. No. of nodes		32	2				
Error control checks		М	Manchester code, frame length, and parity checks				

Note: 1. For 16 Slaves or fewer: Main: 100 m, Total branch: 50 m.

2. No restrictions on branching method or individual line lengths. Connect terminating resistance to Slave farthest from Master.

Performance

CompoBus/S Master Unit

Name	Classification	Communications function	Specifications	Unit numbers	Model number
CompoBus/S Master Unit	Special I/O Unit	Remote I/O communications	Mountable Units: 40	0 to 94 (when 2 unit numbers are allo- cated to each Master) 0 to 95 (when 1 unit number is allocated to each Master)	CJ1W-SRM21

Ordering Information

International Standards

The standards indicated in the "Standards" column are those current for UL, CSA, cULus, cUL, NK, and Lloyd standards and EC Directives as of the end of September 2004. The standards are abbreviated as follows: U: UL, U1: UL Class 1 Division 2 Products for Hazardous Locations, C: CSA, UC: cULus, UC1: cULus Class 1 Division 2 Products for Hazardous Locations, CU: cUL, N: NK, L: Lloyd, and CE: EC Directives. Ask you OMRON representative for the conditions under which the standards were met.

Basic Configuration Units

Name		Specifications					Model	Standards
CPU Units	CJ1 CPU Units	I/O bits	Program capacity	Data memory capacity	LD instruction execution time	Built-in Functions		
		2,560 (3 Expansion Racks)	250 kSteps	448 kWords (DM: 32 kWords, EM: 32 kWords x 13 banks)	0.02 μs	None	CJ1W-CPU67H	UC1, CE, N, L
			120 kSteps	256 kWords (DM: 32 kWords, EM: 32 kWords × 7 banks)			CJ1H-CPU66H	
		1,280	60 kSteps	128 kWords (DM: 32 kWords, EM: 22 kWords × 2 honk)	0.04 μs		CJ1H-CPU65H CJ1G-CPU45H	
		(3 Expansion Racks) 960	30 kSteps 20 kSteps	64 kWords (DM: 32 kWords,	-		CJ1G-CPU44H CJ1G-CPU43H	-
		(2 Expansion Racks)	10 kSteps	EM: 32 kWords × 1 banks)			CJ1G-CPU42H	
	CJ1G Loop Control CPU Units	1,280 (3 Expansion Racks)	60 kSteps	128 kWords (DM: 32 kWords, EM: 32 kWords x 3 bank)	0.04 μs	Loop Control Engine (300 blocks)	CJ1G-CPU45P	UC1, CE
			30 kSteps	64 kWords			CJ1G-CPU44P	
		960	20 kSteps	(DM: 32 kWords,			CJ1G-CPU43P	
	(2 Expansion Racks)	10 kSteps			Loop Control Engine (50 blocks)	CJ1G-CPU42P		
	CJ1M CPU Units	640 (1 Expan- sion Rack)	20 kSteps	32 kWords (DM only, no EM)	0.1 μs	10 inputs and 6 outputs, with	CJ1M-CPU23	UC1, CE, N, L
	320 (no expansion)	10 kSteps	-		fast pulse- and interrupt func-	CJ1M-CPU22	_	
	160	5 kSteps			(See note 1.)	CJ1M-CPU21		
		640 (1 Expan- sion Rack)	20 kSteps			None	CJ1M-CPU13	-
		320 (no expansion)	10 kSteps				CJ1M-CPU12	
		160	5 kSteps				CJ1M-CPU11	
	CJ1M Ethernet	640 (1 Expan- sion Rack)	20 kSteps	32 kWords (DM only, no EM)	0.1 μs	100 Base-TX Ethernet port	CJ1M-CPU13-ETN	
	CPUs	320 (no expansion)	10 kSteps				CJ1M-CPU12-ETN	-
		160	5 kSteps				CJ1M-CPU11-ETN	
Power Suppl	ly Units	100 to 240 V AC	(with RUN ou	tput), Output capacity: 5 A, 5 V	DC		CJ1W-PA205R	UC1, CE, N, L
		100 10 240 V AC	, Output capac				CJTW-PA202	
		24 V DC, Output	capacity: 5 A,	5 V DC				-
BS-4224 Ad	anter	Converts BS-23	3C to BS-122A	/RS-485				-
I/O Control I	Init	Mount 1 Unit on	the CPU Back	when connecting an Expansio	n Back		CJ1W-IC101	LIC1 CE N L
I/O Interface	Unit	1 required on ea	ch Expansion	Back	in flack.		C.I1W-II101	001, 02, 14, 2
I/O Connecti	ng Cable	For connecting F	xnansion	Cable length: 0.3 m			CS1W-CN313	L CE
	ing oublo	Racks to the CP	U Rack or an-	Cable length: 0.7 m			CS1W-CN713	2, 02
		other Expansion	Rack.	Cable length: 2 m			CS1W-CN223	
				Cable length: 3 m			CS1W-CN323	
				Cable length: 5 m			CS1W-CN523	
				Cable length: 10 m			CS1W-CN133	1
				Cable length: 12 m			CS1W-CN133-B2	1
Memory Car	ds	Flash memory, 3	0 MB				HMC-EF372	L, CE
(See note 2.))	Flash memory, 6	64 MB				HMC-EF672	1
1		Momony Card Adapter (for computer RCMCIA slot)						CE

Note: 1. The connector for built-in I/O is not included. Purchase one of the connectors in the following table separately.

2. TheHMC-EF372, and HMC-EF672 Memory Cards cannot be used with the following products.

The following CPU Units with lot numbers of 020108 or earlier (manufactured 8 January 2002 or earlier): CS1G-CPU H, CS1H-CPU H, CJ1G-CPU H, and CJ1H-CPU H

NS7-series PTs with lot numbers of 0852 or earlier (manufactured 8 May 2002 or earlier)

Name	Specifications		Model	
Applicable Connector	MIL Flat Cable Connectors (Pres	ssure-fitted Connectors)	XG4M-4030-T	
Terminal Blocks	General-purpose type (M3 screw	v terminals,40-pin)	XW2D-40G6	
	Special Connecting Cables	Cable length: 1 m	XW2Z-100K	
		Cable length: 1.5 m	XW2Z-150K	
		Cable length: 2 m	XW2Z-200K	
		Cable length: 3 m	XW2Z-300K	
		Cable length: 5 m	XW2Z-500K	
Servo Relay Units (See note.)	Servo Relay Unit for 1 axis		XW2B-20J6-8A	
	Servo Relay Unit for 2 axes		XW2B-40J6-9A	
	SMARTSTEP Cable for CJ1M C	PU Unit, cable length: 1 m	XW2Z-100J-A26	
	W-series Servo Cable for CJ1M	CPU Unit, cable length: 1 m	XW2Z-100J-A27	

Note: Refer to the catalogs or user manuals for the Servo Drivers.

Programming Devices

Name	Specifications		Model	Standards
Programming Consoles	An English Keyboard Sheet (CS1W-KS001-E) is required. CI (Connects on peripheral port on CPU Unit only.)		CQM1H-PRO01-E	U, C, CE U, C, N, CE
Programming Console Key Sheet	For CQM1H-PRO01-E, CQM1-PRO01-E, and C200H-PRO27-E.		CS1W-KS001-E	CE
Programming Console	Connects the CQM1-PRO01-E Programming (Console. (Length: 0.05 m)	CS1W-CN114	
Connecting Cables	Connects the C200H-PRO27-E Programming	Console. (Length: 6.0 m)	CS1W-CN624	
Programming Device Connecting Cables (for	Connects DOS computers, D-Sub 9-pin recepta nect RS-232C cable to peripheral port)	CS1W-CN118	CE	
peripheral port)	Connects DOS computers, Use D-Sub 9-pin (Length: 2.0 m)	ed for Peripheral Bus or Host Link.	CS1W-CN226	
	Connects DOS computers, D-Sub 9-pin (Length: 6.0 m)		CS1W-CN626	
Programming Device Connecting Cables (for	Connects DOS computers, Use D-Sub 9-pin (Length: 2.0 m) Anti	ed for Peripheral Bus or Host Link. ti-static connectors	XW2Z-200S-CV	
RS-232C port)	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)		XW2Z-500S-CV	
	Connects DOS computers, Use D-Sub 9-pin (Length: 2.0 m) port	ed for Host Link only. Peripheral Bus not sup- ted.	XW2Z-200S-V	
	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)		XW2Z-500S-V	
USB-serial conversion cable	USB-toRS-232C conversion cable (0.5 m) and USB version 1.1, USB plug: A-type, male. RS-2	d driver CD-ROM (WIN98, ME, 2000, XP), -232C plus: 9-pin D-sub, male	CS1W-CIF31	CE
CX-One	Omron's integrated software for programming a nents, including PLCs, HMI, drives, temperatur	and configuration of all control system compo- re controllers and advanced sensors.	CX-ONE-AL□□C-E ^{*1}	

^{*1} $\Box \Box$ = Number of licences; 01, 03, 10

Optional Products, Maintenance Products and DIN rail

Name	Specifications	Model	Standards
Battery Set	For CJ1G and CJ1H CPU Units (Use batteries within two years of manufacture.)	CPM2A-BAT01	L, CE
	For CJ1M CPU Units (Use batteries within two years of manufacture.)	CJ1M-BAT01	CE
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
DIN rail	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 rail.	PFP-M	

Basic I/O Units

Name	Specifications	Connection type	Model	Standards
DC Input Units	12 to 24 V DC, 10 mA, 8 inputs	terminal block	CJ1W-ID201	UC1, CE, N, L
DC input Units	24 V DC, 7 mA, 16 inputs	terminal block	CJ1W-ID211(SL)	
	24 V DC, 4.1 mA, 32 inputs	one 40-pin Fujitsu connector	CJ1W-ID231	
	24 V DC, 4.1 mA, 32 inputs	one 40-pin MIL connector	CJ1W-ID232	
	24 V DC, 4.1 mA, 64 inputs	two 40-pin Fujitsu connectors	CJ1W-ID261	
	24 V DC, 4.1 mA, 64 inputs	two 40-pin MIL connectors	CJ1W-ID262	
AC Input Units	100 to 120 V AC, 7 mA (100 V, 50 Hz), 16 inputs	terminal block	CJ1W-IA111	
	200 to 240 V AC, 10 mA (200 V, 50 Hz), 8 inputs	terminal block	CJ1W-IA201	
Interrupt Input Unit	24 V DC, 7 mA, 16 inputs	terminal block	CJ1W-INT01	
High-speed Input Uni	t 24 V DC, 7 mA, 16 inputs	terminal block	CJ1W-IDP01	
Relay Output Units	250 V AC/24 V DC, 2 A, independent contacts	8 outputs max.	CJ1W-OC201(SL)	UC1, CE, N, L
	250 V AC/24 V DC, 2 A, independent contacts	16 outputs max.	CJ1W-OC211(SL)	
Transistor Output	12 to 24 V DC, 2 A, 8 outputs, sinking	terminal block	CJ1W-OD201	
Units	24 V DC, 2 A, 8 outputs, sourcing, load short-circuit protection, alarm	terminal block	CJ1W-OD202	
	12 to 24 V DC, 0.5 A, 8 outputs, sinking	terminal block	CJ1W-OD203	
	24 V DC, 0.5 A, 8 outputs, sourcing, load short-circuit protection, alarm	terminal block	CJ1W-OD204	
	12 to 24 V DC, 0.5 A, 16 outputs, sinking	terminal block	CJ1W-OD211(SL)	
	24 V DC, 0.5 A, 16 outputs, sourcing, load short-circuit protection, disconnection detection, alarm	terminal block	CJ1W-OD212(SL)	
	12 to 24 V DC, 0.5 A, 32 outputs, sinking	one 40-pin Fujitsu connector	CJ1W-OD231	
	24 V DC, 0.5 A, 32 outputs, sourcing, load short-circuit protection, alarm	one 40-pin MIL connector	CJ1W-OD232	
	12 to 24 V DC, 0.5 A, 32 outputs, sinking	one 40-pin MIL connector	CJ1W-OD233	
	12 to 24 V DC, 0.3 A, 64 outputs, sinking	two 40-pin Fujitsu connectors	CJ1W-OD261	
	12 to 24 V DC, 0.3 A, 64 outputs, sourcing	two 40-pin MIL connectors	CJ1W-OD262	
	12 to 24 V DC, 0.3 A, 64 outputs, sinking	two 40-pin MIL connectors	CJ1W-OD263	
Triac Output Unit	250 V AC, 0.6 A, 8 outputs	terminal block	CJ1W-OA201	
DC Input/Transistor	16 inputs, 24 V DC, 7 mA	two 24-pin	CJ1W-MD231	UC1, CE, N
Output Offits	16 inputs 24 V DC, 7 mA	two 20-nin	C.11W-MD232	
	16 outputs, 12 to 24 V DC, 0.5 A, sourcing, load short circuit protection, alarm	MIL connectors		
	16 inputs, 24 V DC, 7 mA 16 outputs, 12 to 24 V DC, 0.5 A, sinking outputs	two 20-pin MIL connectors	CJ1W-MD233	
	32 inputs, 24 V DC, 4.1 mA 32 outputs, 12 to 24 V DC, 0.3 A sinking outputs	two 40-pin Fujitsu connectors	CJ1W-MD261	
	32 inputs, 24 V DC, 4.1 mA 32 outputs, 12 to 24 V DC, 0.3 A, sinking outputs	two 40-pin MIL connectors	CJ1W-MD263	1
TTL I/O Unit	32 inputs, 5 V DC, 35 mA 32 outputs, 5 V DC, 35 mA/pt. 1.12 A/Unit	two 40-pin MIL connectors	CJ1W-MD563	1
Temperature	6 thermocouples, J-type/K-type, no isolation between channels	terminal block	CJ1W-TS561(SL)	UC1, CE, L
Input Units	6 RTDs, Pt1000, no isolation between channels	terminal block	CJ1W-TS562(SL)	

Note: 1. Units with terminal blocks are generally available with screw connection, or with screwless clamp connection. For M3 screw connection, omit the "(SL)" from the model code.

2. Units with MIL/Fujitsu connectors are not provided with a plug counterpart. Either purchase the matching connector from the list below, or use OMRON XW2Z or G79 cables to connect I/O terminal blocks to the Unit (see "Wiring Systems", page 384).

Connectors for I/O Units

Applicable Units	Name	Connection	Model	Remarks	Standards
I/O Units with terminal blocks	18-point screwless terminal block	Screwless Clamp/ card edge	CJ-WM01-18P-5	Replacement terminal blocks for I/O Units, pack of 5 pcs.	
I/O Units with Fujitsu connectors	40-pin Connector	Soldered	C500-CE404	Connector: FCN-361J040-AU Connector Cover: FCN-360C040-J2	
		Crimped	C500-CE405	Housing: FCN-363J040 Contactor: FCN-363J-AU Connector Cover: FCN-360C040-J2	
		Pressure welded	C500-CE403	FCN-367J040-AU/F	
	24-pin Connector	Soldered	C500-CE241	Connector: FCN-361J024-AU Connector Cover: FCN-360C024-J2	
		Crimped	C500-CE242	Housing: FCN-363J024 Contactor: FCN-363J-AU Connector Cover: FCN-360C024-J2	
		Pressure welded	C500-CE243	FCN-367J024-AU/F	
I/O Units with MIL connectors*	40-pin Connector	Pressure welded	XG4M-4030-T	FRC5-A040-3TOS	
	20-pin Connector		XG4M-2030-T	FRC5-A020-3TOS	

Note: * Connectors according to MIL-C-83503 , also compatible with commercially available connectors according to DIN 41651 or IEC 60603-1 specifications

Special I/O Units

		1	
Name	Specifications	Model	Standards
Analog Input Units	8 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA) Resolution: 1/8000, Conversion speed: 0.25 ms/point	CJ1W-AD081- V1(SL)	UC1, CE, N, L
	4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA) Besolution: 1/8000. Conversion speed: 0.25 ms/opint	CJ1W-AD041-	UC1, CE, N, L
Analog Output Units	8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V) Resolution: 1/4000 Conversion speed: 1 ms/noint max (Settable to 1/8000, 250 us/noint)	CJ1W-DA08V(SL)	UC1, CE, N, L
	8 outputs (14000, Conversion append 1 ms/point max. (Cettable to 1/0000, 250 µs/point)	CJ1W-DA08C(SL)	UC1, CE, N, L
	4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA)	CJ1W-DA041(SL)	UC1, CE, N, L
	2 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA)	CJ1W-DA021(SL)	UC1, CE, N, L
Analog I/O Unit	Resolution: 1/4000, Conversion speed: 1 ms/point max. 4 inputs, 2 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA)	CJ1W-MAD42(SL)	UC1, CE, N, L
	Resolution: 1/4000, Conversion speed: 1 ms/point max. (Settable to 1/8000, 250 µs/point)		
Process Input Units	2 isolated DC inputs, 16-bit resolution, conversion speed 10 ms/2 pts	CJ1W-PDC15	UC1, CE
	2 isolated thermocouple inputs, 16-bit resolution, conversion speed 10 ms/2pts	CJ1W-PTS15	
	2 isolated Pt100 inputs, 16-bit resolution, conversion speed 10 ms/2pts	CJ1W-PTS16	
	4 isolated inputs, thermocouple type R, S, K, J, T, L, B. Conversion speed 250 ms/4 pts	CJ1W-PTS51	
	4 isolated Pt100 inputs (JIS, IEC). Conversion speed 250 ms/4 pts	CJ1W-PTS52	
Temperature	4 loops, thermocouple input, NPN output	CJ1W-TC001	UC1, CE, N, L
Control Units	4 loops, thermocouple input, PNP output	CJ1W-TC002	
	2 loops, thermocouple input, NPN output, heater burnout detection function	CJ1W-TC003]
	2 loops, thermocouple input, PNP output, heater burnout detection function	CJ1W-TC004	1
	4 loops, platinum resistance thermometer input, NPN output	CJ1W-TC101	1
	4 loops, platinum resistance thermometer input, PNP output	CJ1W-TC102	1
	2 loops, platinum resistance thermometer input, NPN output, heater burnout detection function	CJ1W-TC103	1
	2 loops, platinum resistance thermometer input, PNP output, heater burnout detection function	CJ1W-TC104	
High-speed Counter Unit	2 inputs, max, input frequency; 500 kpps	CJ1W-CT021	UC1. CE. N. L
4-Channel Counter Unit	4 inputs, max, input frequency; 100 kpps	CJ1W-CTL41-E	UC1. CE. L
	Screwless Terminal Block for CJ1W-CTI 41-F	XW2G-40G7-F	CF
2-SSI Encoder Input Unit	2 Synchronous Serial Interface channels	CJ1W-CTS21-F	CF I
PBOEIBLIS-DP I/O Link Unit	Exchanges up to 180 words in any memory area with a PBOFIBUS-DP Master Unit	C.I1W-PBT21	UC1_CE
CompoBus/S Master Unit	CompoBus/S remote I/O 256 points may	C I1W-SBM21	UC1 CE N I
Position Control Units	Pulse train open collector output 1 axis		
r osition control onits	Pulse train, open collector output, 7 axis	C.11W-NC213	001, 0L
	Pulse train, open collector output, 2 axes		-
	Pulse train, open collector output, 4 axes (See hole 1.)	C 11W/ NC122	-
	Pulse train, line driver output, 1 axis		-
	Pulse train, line driver output, 2 axes		-
	Puise train, line unver output, 4 axes (See note 1.)		-
Oama Dalau Llaita	Spacer Unit (See note 1.)		+
(See note 2.)	(CSIW-NC113/133, CJ1W-CN113/133, C200HW-NC113, C200H-NC112)	XW2B-20J6-1B	-
	For 2- or 4-Axis Position Control Unit (without communications support) (CS1W-NC213/233/413/433, CJ1W-CN213/233/413/433, C200HW-NC213/413, C500-NC213/ 211, C200H-NC211)	XW2B-40J6-2B	
	For 2- or 4-Axis Position Control Unit (with communications support) (CS1W-NC213/233/413/433, CJ1W-CN213/233/413/433, C200HW-NC213/413)	XW2B-40J6-4A	
Position Control Unit Cables	Connects CJ1W-NC113 to W Series, Cable length: 0.5 m	XW2Z-050J-A14	1
(See note 2.)	Connects CJ1W-NC113 to W Series, Cable length: 1 m	XW2Z-100J-A14	1
	Connects CJ1W-NC213/413 to W Series, Cable length: 0.5 m	XW2Z-050J-A15	1
	Connects CJ1W-NC213/413 to W Series, Cable length: 1 m	XW2Z-100J-A15	1
	Connects CJ1W-NC113 to SmartStep, Cable length: 0.5 m	XW2Z-050J-A16	
	Connects CJ1W-NC113 to SmartStep. Cable length: 1 m	XW2Z-100J-A16	1
	Connects CJ1W-NC213/413 to SmartStep, Cable length: 0.5 m	XW27-050J-A17	1
	Connects C.I1W-NC213/413 to SmartStep, Cable length: 1 m	XW27-100.J-A17	1
	Connects C.I1W-NC133 to W Series, Cable length: 0.5 m	XW2Z-050.J-A18	1
	Connects C I1W-NC133 to W Series, Cable length: 1 m	XW2Z-100 L-418	1
	Connects C 11W NC232/422 to W Series, Cable length: 0.5 m	XW2Z-1000-A10	4
	Connects C 11W NC223/433 to W Series, Cable length: 0.5 m	XW2Z-0505-A19	-
	Connects C 11W NC122 to SmartStop, Cable length, 1 11	XW2Z-100J-A19	4
	Connecto C 11W NC122 to SmartStep, Cable length: U.5 III	XW07 100 L 400	4
	Connects CJ1W-IVC133 to SmartStep, Cable length: 1 m	AVV22-100J-A20	4
	Connects CJ I W-NC233/433 to SmartStep, Cable length: 0.5 m	XVV2Z-050J-A21	4
	Connects CJ1W-NC233/433 to SmartStep, Cable length: 1 m	XW2Z-100J-A21	
ID Sensor Unit	For V600 Series, 1 R/W Head	CJ1W-V600C11	
(See note 3.)	For V600 Series, 2 R/W Heads	CJ1W-V600C12	

1. The ambient operating temperature for 4-Axis Position Control Units is 0 to 50 °C; mount a Spacer Unit to the Position Control Unit in case the ambient temperature may reach 55 °C. The allowable voltage fluctuation on the external 24- V DC power supply is 22.8 to 25.2 V DC (24 V ±5%).

2. Two Servo Relay Units and two cables for the Position Control Unit are required for a 4-Axis Position Control Unit.

3. Refer to the Auto-Identification Components Group Catalog (Cat. No. Q132) for details on the V600 Series RFID System

CPU Bus Units

Name	Specifications	Model	Standards
Controller Link Units	Wired (Shielded twisted-pair cable)	CJ1W-CLK21-V1	UC, CE, N, L
Controller Link Relay Terminal	Wired Set of 5 Terminals	CJ1W-TB101	
Controller Link Support Board	Twisted pair, PCI bus, with Support Software	3G8F7-CLK21-EV1	CE
Controller Link	Twisted-pair cable	CS1W-RPT01	UC1, CE
Repeater Units	Optical Ring (H-PCF cable)	CS1W-RPT02	
	Optical Ring (GI cable)	CS1W-RPT03	
Serial Communica-	1 RS-232C port and 1 RS-422/485 port	CJ1W-SCU41-V1	UC, CE, N, L
tions Units	2 RS-232C ports	CJ1W-SCU21-V1	
Ethernet Unit	100Base-Tx	CJ1W-ETN21	UC, CE, N, L
DeviceNet Unit	Functions as master and/or slave; allows control of 32,000 points max. per master	CJ1W-DRM21	
CAN Unit	Freely configurable reception and transmission of CAN messages	CJ1W-CORT21	UC1, CE
PROFIBUS-DP Master Unit	Controls up to 7000 words of remote I/O data over PROFIBUS-DP	CJ1W-PRM21	UC, CE
CX-PROFIBUS, PROFIBUS-DP Configurator	Software only (Windows 2000, XP)	CX-Profi-V1	
Motion Control Unit	Real axes: 30, Virual Axes: 2, Communication by Mechatrolink-II	CJ1W-MCH71	CE
Position Control Unit	Mechatrolink-II connection to max. 16 axes	CJ1W-NCF71	UC1, CE

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

Cat. No. P04E-EN-03A

In the interest of product improvement, specifications are subject to change without notice.

Rack PLCs

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Rack PLC series CS1

The evolution of the SYSMAC CS1 is accelerating advances in the production site.



Ultimate Performance

Further improvements to instruction execution efficiency, the core of overall PLC performance, enable the highest speeds in the industry. This allows the optimization of processing time and accuracy.



Instructions That Fit the Application

These PLCs have a variety of special instructions that allow their operation to suit the

High-precision Positioning

Automatic Adjustment of PID

Set and reset instructions

PID instructions with

Program Simplification

for DM/EM Area bits

Double-precision

Constants

autotuning



application. High-precision control can be achieved without complex programs.

> • Error Generation for Debugging **Failure diagnosis** instructions

- High-resolution Approximation **APR** instruction
- Workpiece Information Control for Conveyor Systems Table data processing instructions for stacks

Integrated Development Environment and Middleware Program development

CX-One includes powerful software packages for program development, simulation, and communications. Develop more efficient value-added systems in the time allowed.

CX-Programmer Simulation **CX-Simulator**

 Communications middleware **CX-Server**



4 Seamless Networking

The CS1 supports message communications across three network levels, from information networks down to component networks, allowing greater onsite information management. Remote monitoring of installations is also possible using Web functions via the Internet.



5 Easier Connection to Peripheral Devices

Up to 35 peripheral devices can be connected to a CS1 PLC via serial communications. Data can be exchanged with peripheral devices easily using the protocol macro function, eliminating the need for time-consuming communications programs.



6 Inheritance and Maintenance

Today's CS1 PLCs have complete upward compatibility with existing CS1 systems. Facilities performance can be upgraded simply by replacing the CPU Unit (see note). Also, features such as battery-free operation ensure greater convenience for maintenance and operation.



lote: When replacing a CPU Unit with a different model, always test the system to confirm that it has not been adversely affected.

ZPLC-based System Expansion

A variety of system expansions based on CS1 PLCs, such as PLC-based process automation systems, high-precision positioning systems, and remote monitoring systems are possible.


Use the improved SYSMAC CS1 PLCs to scale advanced systems to the optimum size.

1

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

Faster Instruction Execution and Faster Overall Performance

In addition to further improvements to the instruction execution engine, which is the core of overall PLC performance, the high-speed RISC chip has been upgraded to **realize the fastest instruction execution performance in the industry**. Also, the

Common Processing: 1.6 Times Faster

Previous CS1 models	0	.5 ms
New CS1 models	0.3 ms	
The figures at interchangeab	bove are for high-speed, general-purpose PL ble boards.	LCs with

PCMIX Value: 3 Times Higher

Previous CS1 models	5	
New CS1 models		16

The PCMIX is the average number of instructions that can be executed in 1 µs and expresses the over execution performance of the ladder program. This unit was conceived to allow comparing the performance of PLCs from different manufacturers using a common metric.

• Cycle Time: 2.5 to 4.8 Times Shorter (Cycle time for 128 inputs and 128 outputs)

Previous CS1 models	8 Ksteps/ms
New CS1 models	Basic instructions only: 38 Ksteps/ms Including special instructions: 22 Ksteps/ms

With normal I/O refresh, 1-ms pulses are not lost even for largecapacity (e.g., 30-Kstep) programs. This allows use in applications requiring a high working accuracy, such as molding equipment.

System Bus Baud Rate Doubled

The data transfer rate between the CPU Unit and certain Units has been doubled to further improve total system performance.



new models have a mode where

instruction execution and peripheral

processing are processed in parallel,

Previous CS1 models		40 ns
New CS1 models	20 ns	

The development of a special LSI to execute instructions and use of a high-speed RISC chip enable high-speed processing at the CPU.

• OUT Instruction Processing Speed: 8 Times Faster

Previous CS1 models		170 ns
New CS1 models	20 ns	

Programs consisting mainly of basic instructions are processed at ultrahigh speed.

Subroutine Processing Speed: 17.6 Times Faster



Cycle time overhead due to program structuring is minimized.



Reduced Variation in Cycle Time During Data Processing

Instructions that require long execution time, such as table data processing instructions and text string processing instructions, are processed over multiple cycles to minimize variations in cycle time and maintain stable I/O response.



Improved Refresh Performance for Data Links, Remote I/O Communications, and Protocol Macros

In the past, I/O refresh processing with the CPU Bus Unit only occurred during I/O refresh after instructions were executed.



Large Capacity CPU Units for Greater Component Control Power

The CS1 CPU Units boast amazing capacity with up to 5,120 I/O points, 250 Ksteps of programming, 448 Kwords of data memory (including expanded data memory) and 4,096 timers/counters each. With a large programming capacity, CS1 PLCs are not only ideal for large-scale systems but easily handle value-added applications and other advanced data processing.

Control Up to 960 Points with Units Mounted to the CPU Rack

The CS1 provides a high level of space efficiency. As many as 960 I/O points can be controlled by simply mounting ten Basic I/O Units, with 96 I/O points each, to the CPU Rack. Alternatively, as many as 80 analog I/O points can be used by mounting five Analog Input Units and five Analog Output Units.





Five Analog Output Five Analog Input Units of Units of 8 points each 8 points each With the new CS1, however, I/O can be refreshed immediately by using the DLNK instruction. Immediate refreshing for processes peculiar to the CPU Bus Unit, such as for data links and DeviceNet remote I/O communications, and for allocated CIO Area/DM Area words when instructions are executed, means greater refresh responsiveness for CPU Bus Units.

Wide Lineup Makes It Easy to Build the Optimum System

A total of nine CPU Unit models provide for a wide range of applications, from small-scale systems to large. The lineup also includes Memory Cards, Serial Communications Boards, and a wide selection of Special I/O Units that can be used with any CPU Units to flexibly build the system that meets the requirements.



Two Series of Expansion Racks Up to 50 m Long for Long-distance Expansion with Up to 72 Units and 7 Racks

With an expansion capacity of up to 80 Units and 7 Racks over a distance of 12 meters, the CS1 can meet largescale control needs. Alternatively, an I/O Control Unit and I/O Interface Units can be used to connect two series of CS1 Long-distance Expansion Racks extending up to 50 m each and containing a total of up to 72 Units and 7 Racks. CS1 Basic I/O Units, CS1 Special I/O Units, and CS1 CPU Bus Units can be mounted anywhere on the Racks and programmed without being concerned about special remote programming requirements. Note: C200H Units cannot be mounted on the Long-distance Expansion Racks.





2





Convert Between Floating-point Decimal and Character Strings

The new CS1 can convert floating-point decimal (real numbers) to character strings (ASCII) for display on a PT (operator interface). The data can be displayed on the PT as a character-string display element.



PID Autotuning

The new CS1 can autotune PID constants with a PID control instruction. The limit cycle method is used for autotuning, so the tuning is completed quickly. This is particularly effective for multiple-loop PID control.



Error Status Generation for Debugging

A specified error status can be simulated by executing the diagnostic instructions (FAL/FALS). With the new CS1, debugging is simple for applications that display messages on a PT or other display device based on the error status of the CPU Unit.



The new CS1 can convert ASCII character strings read from measurement devices by serial communications to floating-point decimal data for use in data processing.



Highly Accurate Positioning with XY Tables

The new CS1 has many double-precision processing instructions for floating-point decimal operations, enabling positioning with greater accuracy.



Easy Reading of Maintenance Data via DeviceNet

(for CPU Unit Ver. 2.0 or Later)

The addition of special explicit message instructions makes it easy to send explicit messages without having to consider FINS commands. Transferring data among PLCs with explicit messages is also simplified.



Simpler Ladder Programs

Ladder programs that use a lot of basic instructions can be simplified using differentiation instructions LD NOT, AND NOT, and OR NOT, and instructions that access bits in the DM and EM Areas.



Binary Set Values for Timer/Counter Instructions

The SV for a timer or counter instruction can be specified using either BCD or binary. Using binary SV enables longer timers and higher-value counters.

Examples: Timer/Counter Instructions

TIM (BCD): 0 to 999.0 s TIMX(550) (binary) 0 to 6553.5 s CNT (BCD): 0 to 999 counts CNTX(546) (binary) 0 to 65,535 counts

Applicable Timer/Counter Instructions TIMER: TIMX(550) COUNTER: CNTX(546) HIGH-SPEED TIMER: TIMHX(551) ONE-MS TIMER: TMHHX(552) ACCUMULATIVE TIMER: TTIMX(555) LONG TIMER: TIMLX(553) MULTI-OUTPUT TIMER: MTIMX(554) REVERSIBLE COUNTER: CNTRX(547)

Easier and more efficient design, development and maintenance with Windows-based software and middleware

3

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

Improved Support Software in an Integrated Windows-based Development Environment

The CX-One software suite provides tools for more efficient design and development using the CX-Programmer for programming and network configuration, and CX-Simulator for operation simulation.



NEW

CX-Programmer

OMRON FB Library

The OMRON FB library provides function blocks for setting SPs, reading PVs, and reading/writing RUN/STOP status and other Temperature Controller parameters. The programmer simply pastes function blocks from the OMRON FB Library into the ladder program. The desired functions can be utilized simply by inputting the Temperature Controller unit number and address. Simply paste a function block from the OMRON FB Library into the ladder program and enter the unit number, set point, and other parameters.

Example: Function Block for Writing Temperature Controller SPs

Windows

SYSMAC CJ-series PLC



The Structured Text (ST)NEWLanguage Enables TrigonometricFunctions and other Arithmetic

Processes (Unit Ver. 3.0 or later)

In addition to ladder programming, function block logic can be written in ST, which conforms to IEC61131-3. With ST, arithmetic processing is also possible, including processing of absolute values, square roots, logarithms, and trigonometric functions (SIN, COS, and TAN). Processing difficult to achieve in ladder programs becomes easy to write.



Recovery Possible by <u>NEW</u> Uploading Function Blocks from Working PLC (Unit Ver. 3.0 or later)

Programs with function blocks can be uploaded from CPU Units, just like normal programs, without the need for additional memory, such as a Memory Card.



Enhanced Efficiency for Program Development Teams

(for CPU Unit Ver. 2.0 or Later)

Multiple programmers will enjoy better efficiency when working on task-based programs, thanks to automatic checking for address duplication among tasks, downloading and uploading in task units, and easy monitoring of task operating status.

 The execution status of each task can be monitored with CX-Programmer to improve debugging efficiency.



• Checking for address duplication among tasks developed by multiple programmers is automatically executed with the cross reference report of CX-Programmer.



Copy and Paste between

Spreadsheets and Symbol Tables You can use your favorite spreadsheet application to prepare an allocation table with symbol names, addresses, and I/O comments, then copy and paste it into a symbol table, and also do the reverse. This greatly improves programming productivity.

CX-Simulator

Programs Can Be Executed, Monitored, and Debugged without an Actual PLC

The CX-Simulator Software simulates ladder execution of the new CS1 CPU Unit on a computer. Online functions, such as monitoring of I/O bit status, monitoring of I/O memory present values, forced set/reset, differential monitoring, data tracing, and online editing, can be performed by connecting to the virtual CPU Unit on the computer from the CX-Programmer using the CX-Simulator. This reduces the total lead time to machine or system startup.



Data Logging On-site and Operation Verification in the Office

Sequential data from I/O memory in the actual PLC can be obtained and saved as a data recreation file (CSV format). Onsite PLC ladder execution can be recreated on a computer by inputting this

data to the CX-Simulator as virtual external input data.



Comprehensive Debugging Functions Including Ladder Step Execution and Break Points

The new CS1 has comprehensive debugging functions, including ladder step execution (execution by instruction), start point settings, break point setting, I/O break conditions, and scan execution. This enables more detailed debugging without using an actual PLC. Interrupt tasks can be simulated, enabling more realistic debugging.



Middleware to Support PLC-centered System Construction Easy development of user applications for communications with the new CS1.

SYSMAC Compolet: Accessing the CS1 with Visual Basic

Use SYSMAC Compolet for communications with OMRON PLCs to greatly reduce development time of user applications for CS1 I/O memory read and write, forced set/reset, and FINS message communications using Visual Basic.



PLC Reporter 32: Add-on Software for Accessing the New CS1 Using Excel

Use PLC Reporter 32 to automatically collect specific CS1 I/O memory data into Excel 97 or Excel 2000 cells without special programming. Basically, a system can be constructed with a computer, PLC Reporter 32, Excel, and a host link cable. The cost of constructing a monitoring system can thus be greatly reduced.



Further improvements to communications functions. Seamless networks increase production site transparency

4

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

The Solution for Communicating across Network Levels

The SYSMAC CS1 enables FINS message communications across a maximum of eight levels (See note) (using CX-Programmer Ver. 4.0 or higher) in comparison with three levels in previous OMRON systems

Expansion up to eight levels lets you build a seamless communications system for sending FINS messages across multiple levels of Ethernet and Controller Link networks.

Note: For CPU Unit Ver. 2.0 or later.

A Wide Range of Systems, from Small-scale to Large

OMRON offers a full lineup of reliable PLCs including the "flagship" CS1 Series, and ranging from the small-scale CQM1H to the large-scale CV Series. The CS1 Series meets the needs not only of smallscale to large-scale systems, but of distributed systems as well. This allows the construction of the optimum system for the scale and applications of the production site.

Flexible System Building Based on the DeviceNet

The CS1 Series supports the worldwide multivendor bus standard, DeviceNet. Component connections in a multivendor environment are greatly enhanced by connecting to up to 64 nodes for a wide range of FA applications, and by device profiles and configurator tools that ensure high reliability and easy maintenance. Production systems can be configured even more flexibly by incorporating products such as the MULTIPLE I/O TERMINAL.

Functions for Better Ethernet Support

Ethernet is becoming an increasingly important standard for information networks. Up to eight socket interfaces for TCP/IP and UDP/IP are supported, in addition to FINS messages, FTP file transfers, and mail notification, so that production management can now be organically linked with the production site.

High Event Responsiveness and High-speed Instruction Execution

The new CS1 has an operating mode that allows parallel processing for program execution and peripheral services. This has the following benefits.

- Fast exchange with host computers of large amounts of data, without dependence on the program capacity of the new CS1.
- Smooth refreshing of data exchanged with
 SCADA software without variations in timing. Cycle time not affected if communications
- traffic or networks increase when expanding
 facilities in the future.





Peripheral services cannot be executed in shorter period than cycle time.

Add a Redundant Optical Ring to Your Controller Link Communications

A redundant network configuration will keep communications flowing over the duplicate ring-shaped path in the event of a broken optical fiber, preventing system malfunction.

Remote Monitoring via the Web

Connecting via an ONC enables remote monitoring from a Web browser with a userdefined Web application (using Web Tool Kit). It is also possible to automatically collect data on a Memory Card mounted to an ONC and automatically transfer data to the host PLC (using Data Collection/Distribution Software).



Construction of systems in multivendor environments simplified with protocol macros.

5

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

NEW Serial Gateway (CPU Unit Ver. 3.0 or later) (Serial Communications Units/Boards with Ver. 1.2 or later)

Truly Seamless Incorporation of OMRON Components

and Other Devices into Networks

When the CPU Unit (Ver. 3.0 or later) or Serial Communications Board or Serial Communications Unit (Ver. 1.2 or later) receive a FINS command containing a CompoWay/F command (see note 1) via network or serial communications, the command is automatically converted to a protocol suitable for the message and forwarded using serial communications.

CompoWay/F (See note 2.)

 Host Link FINS (Possible only with Serial Communications Boards or Serial Communications Units Ver. 1.2 or later)



Note 1: FINS Abbreviation for Factory Interface Network Service. A Abuteviation of actory interface Network Service. A command system for message services common to OMRON networks. FINS commands can be sent across up to 8 network levels, including serial communications paths using a serial gateway. (Possible only with CS/CJ-series CPU Unit Ver. 2.0 or later.)

Note 2: CompoWay/F CompoWay/F is an integrated communications protocol used for OMRON general-purpose serial communications. It is used by Temperature Controllers, Digital Panel Meters, Timer/Counters, Smart Sensors, Cam Positioners, Safety Controllers, etc. (as of July 2004).

Serial Gateway System (Reference)

When CompoWay/F commands are enclosed in FINS commands and sent to Serial Communications Boards or Serial Communications Units (Ver. 1.2) or serial ports on CPU Unit Ver. 3.0, the enclosed CompoWay/F command is retrieved using a Serial Gateway Function and sent as a CompoWay/F command



More Ports for Even More **Serial Device Connections**

Protocol macros make it easy to create serial communications protocols (communications frames, error checks, retries, error processing, etc.) to match those of remote communications devices. Multiple ports are provided for this function. Each PLC supports up to 16 Serial Communications Units (32 ports total) and one Serial Communications Board (with 2 ports). This makes it possible to connect up to 34 devices with serial communications at a speed of 38.4 Kbps. Message length has been increased from 256 to 1,000 bytes to give communications more power than ever before.

Windows-based Software **Simplifies Serial Device** Connections

Protocol macros for Serial Communications Units and Boards can be created using the CX-Protocol, thus enabling message tracing and greatly reducing the time involved in connecting various serial devices.





Advanced management and resource inheritance providing powerful support for maintenance and operation

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

Remote Maintenance



Memory Cards for Data File Management

User programs, I/O memory, or system parameters can be converted to Windowsbased files and stored in Memory Cards or in EM file memory in the CPU Unit. It is also possible to automatically read the user program and other data from the Memory Card to the CPU Unit at startup, replacing ROM operation. Change programs on-site using only a Memory Card and Programming Console, or use Memory Cards to store symbol tables or I/O comments. Connecting a Programming Device allows monitoring operations with ladder programs with comments. It is also possible to save and read data such as DM data to a Memory Card during operation, and the Memory Cards are ideal for operations such as saving quality data and reading recipes.



Boost Program Security by Keeping Part of It Hidden (for CPU Unit Ver. 2.0 or Later)

You can prevent access to special tasks by requiring the user to have a password to read them.



This allows you to hide crucial parts of the program.

By applying write protection, you can also prevent a user from inadvertently writing over the hidden part of the program. This provides additional protection for your program.



Internal Flash Memory-based Battery-free Operation

Flash memory (non-volatile memory) is built into the new CS1's CPU Unit. User programs and system parameters (e.g., PC Setup and data link tables) are automatically saved to this flash memory. This means that the new CS1 can operate without a Memory Card and battery.



NEW CX-Programmer Ver. 5.0 or higher required.

Prevent Information Leaks from PLCs

(for CPU Unit Ver. 2.0 or Later) In addition to applying read protection functions to the user program area and tasks, you can also protect against the transfer of user programs to a Memory Card.This prevents leaks of proprietary information by completely protecting against the reading of programs inside the PLC.



Easy Replacement of Existing Models

Programs designed for existing models (C200HX/HG/HE, CVM1, or CV-series PLCs) using the CX-Programmer can be converted for use with the new CS1. The following functions are available to make the conversion to the new CS1 even easier.

- CV-CS address conversion instruction to convert programs designed for the CVM1/CV that include internal I/O memory addresses
- C200HX/HG/HE: Region comparison (ZCP and ZCPL) instructions.



Write Protection from a Specific Node over the Network

(for CPU Unit Ver. 2.0 or Later)

You can now stop specific nodes from writing over the network.By preventing unintentionally writes to the PLC while monitoring data over the network, you can prevent potential problems.



Replace Malfunctioning Units without Turning OFF the Power (Online Unit Replacement)

When an I/O Unit, a Special I/O Unit, or a CPU Bus Unit is malfunctioning, it is now possible to replace the faulty Unit while the system continues operating.

This is particularly effective for systems that cannot be stopped when a problem has occurred in another part of the system. (This function requires a CS1D-CPU S CPU Unit, a CS1D-BC082 or CS1D-BI092 Backplane, and a CS1D-PA207R or CS1D-PD024 Power Supply Unit.)



Store All I/O Comments, Symbol Names, Rung Comments, <u>NEW</u> and Other Information in CPU Unit Comment Memory (Unit Ver. 3.0 or later)

When downloading projects, the Memory Card, EM file memory, or comment memory (in the CPU Unit's flash memory) can be selected as the transfer destination for I/O comments, symbol names, rung comments, and other data. This enables data such as I/O comments, symbol names, and rung comments to be stored in the CPU Unit's internal comment

memory when a Memory Card or EM file memory are both not available. (PLC models: CS/CJ-series with unit version 3.0 or later only.)

The CS1 Duplex System Boots the Reliability of Facilities and Equipment



The evolution of the SYSMAC CS1 is accelerating advances in the production site.



Duplex-CPU System



Hot Standby System Adopted for CPU Unit Duplexing

- When a problem occurs in the CPU Unit, the system instantly switches control to the other CPU Unit, enabling continuous operation with minimal effect on the system.
- Because there is no need for special duplex programming, the design process is simple and design steps are reduced.

The system can also be configured with only one each of the CPU, Power Supply, and Communications Units. This lets you optimize the system cost by selecting the Units that you need. (The Duplex Unit must be used even when using only one each of the CPU, Power Supply, and Communications Units.)

Single-CPU System

Online Unit Replacement

With either a Duplex-CPU or Single-CPU CS1D System, Basic I/O Units, Special I/O Units, and CPU Bus Units can be replaced online while the system continues operation.

Although operation will stop for the Unit being replaced, all other Units will continue operation.





Duplex operation is possible for any or all of the following: CPU Units, Power Supply Units, and Communications Units.

Use duplex operation for the CPU Unit, power supply, or communications depending on system requirements for reliability, costs, and functionality. For example, use duplex operation for all of these for systems that must never go down or use duplex operation for only the power supply (which has a relatively short service life). Just build in the redundancy required by the system.

Increase the Reliability of Information with Duplex Networks

Duplex Ethernet for Greater Information Network Reliability NEW

With redundant networks and Communications Units, communications will continue even if a network line is broken or one of the Communications Units fails. The communications path is automatically selected for each communications process (as opposed to switching the entire line), to enable creating a highly reliable network even against a network line broken in more than one location.



Monitor Connection <u>NEW</u> Status to an Ethernet Network

The connection status for each line is stored in the CIO Area words allocated in the CPU Unit. This enables the ladder program or host to quickly detect faulty nodes or lines to make maintenance easier.



Program without Being Concerned with Duplex Operation

No special programming is required to use duplex communications with the CS1D, making it simple to design programs for duplex systems.

• The complex programming required in previous applications <u>NEW</u> for duplex communications with Ethernet is eliminated.

Previously it was necessary to program operation for both Ethernet Units.

Just program the operation as if for one Ethernet Unit, and the PLC will determine the destination and send the message.



Controller Link networks enable allocating data link areas without wasting memory.



Duplex Networks between PLCs with Controller Link

Even if one Unit fails, the other Unit will back it up and continue communications. Even if a line breaks, a loopback will be used to maintain the network.

Either the CS1W-CLK12-V1 or CS1W-CLK52-V1 is required for a Duplex Controller Link network.



Initial and maintenance costs are reduced.

Allows effective use of software assets.

The same support software can be used in systems combining the CS1 and CJ1 Series, and all software programs and data are compatible. Their application and reuse are extremely easy. There is also no need for ladder programs for duplexing. This means that when converting an existing system to a Duplex System, there is almost no need to revise ladder programs.

Complete compatibility among Units.

The CS1D Duplex System is fully compatible with the I/O Units of the entire CS Series. Accordingly, the same Units and materials can be used for restoring the system and conducting maintenance. There is no need to purchase different Units and materials for each system, making the CS1D Duplex System highly economical.

(C200H Units, however, cannot be used with CS1D PLCs. Refer to user documentation for details.)

8

Machine performance improved with high-speed, high precision, flexible motion control

Position Control Units

Two Types of Outputs and Control of 1, 2, or 4 Axes

Select from 1-axis, 2-axis, and 4-axis models with either open-collector output or line-driver output to suit a number of different applications.

A Variety of Positioning Functions

There are 2 operating modes: direct operation (position, speed, acceleration, and deceleration data specified from the ladder program), which is effective for setting target positions, speeds, and acceleration rates immediately or during operation, and memory operation, where fixed patterns are stored beforehand in the Unit and used for operation. There are also a variety of positioning functions, such as interrupt feeding, which is effective for feeder control, and forced interrupt, which is useful in emergencies.

Advanced Motion Control Units

Easy System Construction

Up to 30 physical axes and two virtual axes, making a total of 32, can be controlled, and the servo interface is handled by high-speed servo communications (MECHATROLINK-II, a registered trademark of Yaskawa Electric Corporation). This makes it possible to control multiple axes with less wiring.

Easy Data Control

High-speed servo communications lets you read programs and parameter settings from CX-Programmer on a PC.

You can also read and track the operating status of parameter settings inside the Servo Driver.

Easy Motion Control

Motion control, including positioning, synchronizing (electronic gears, electronic cams, tracking), speed, and torque control, can all be handled by the CS1.

Eight motion tasks can be used for simultaneous motion program execution.

Motion Control Units

Easy Programming with G Language and Multitasking

The Motion Control Units use G language to ensure easy programming. The Units have a large programming capacity of up to 100 programs and 2,000 program blocks, and allow independent operation of 4 tasks.

High-speed Interlocks

Interrupt programs can be executed from the motion control program using D codes (interrupt codes). Easy, fast interlocks ensure greater production efficiency.

Synchronous control (electronic gears, electronic cams) is also possible.



Smart Process Control

OMRON PLC-based Process Control brings Major Innovations to Process Automation

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The evolution of the SYSMAC CS1 is accelerating advances in the production site.



Provides an exceptionally open environment with PLC-based process control to advance standardization and IT integration of the process control system.



Diversified Loop Control is even easier to use. Programming becomes even easier with function-block programming.

Packed with complete DCS functionality, the LCBs/LCUs are programmed with function blocks designed specifically for process control. Similar to preparing a flow sheet, function blocks are pasted and connections made using a graphic interface. A wide array of control methods, from basic PID control to cascade and feedforward control, are possible.



PLC-based Process Control Application Examples



Batch Control in a Chemical Plant



DeviceNet Creates Many Advantages for Development and Design, for Production and Startup, and for Operation and Maintenance

10

The evolution of the SYSMAC CS1 is accelerating advances in the production site.



Advantages in Development and Design

Hardware Advantages

- Many compatible components for more options and easier system construction. No restrictions on Master, enabling
- equipment modularization at the Slaves.

Software Advantages

- Simple software standardization with profile specified for each component.
- Open network construction eliminates the need to consider communications protocols, allowing program development using ladder diagrams only.

Advantages in Production and Startup

Hardware Advantages

- Assembly time shortened by
- standardization and modularization.
 Number of work hours reduced by less wiring.
- Simple wiring checking process to help prevent wiring mistakes.
- Simple implementation of distributed equipment manufacturing.
- Distributed I/O for more compact control panels and equipment.
- Startup Advantages
- Simple re-assembly at delivery site.Simple settings and communications
- work, shortening startup time.
 Establishing communications with approach with plug and play.
- components with plug-and-play simplicity.
- Simple identification of faults with complete monitoring tools.

Advantages in Operation and Maintenance

Operation Advantages

- Recipe control quickly improves yields. Preventative maintenance to avoid
- system shutdowns and increase operating rates.
- Simple layout changes.
- Lines can be constructed for modular
- replacement.

Maintenance Advantages

- Easy identification of fault locations reduces time to restore operation.
- A wide variety of data can be collected from components, aiding preventative maintenance.
- Simple plug-and-play replacement using connectors.
- Online replacement for maintenance without stopping the system.



Greater Compatibility with PLCs Multilingual Globalization for Greater Machine Flexibility

11

The evolution of the SYSMAC CS1 is accelerating advances in the production site.

Ladder Monitor Function

Save the NS-EXT01 Ladder Monitor system program on a Memory Card (the NS-EXT01 is sold separately) and install the Memory Card to enable monitoring of a ladder program (I/O bit status monitor, address/instruction search, multiple I/O bit monitor, etc.) being executed in a CS/CJseries PLC connected by a serial connection. It is also possible to display I/O comments created with the CX-Programmer.

NS-series

SW2

Note: CS- and CJ-series PLCs connected via a 1:N NT Link to serial port A or B on an NS-series Programmable Terminal can be monitored.

Ladder Monitor

ted from System Menu.)

0000.01 CF003 0002.00

ER LAMP01

Programmable Terminal

CS-/CJ-series PLC

> 1:N NT Link RS-232C

Serial por A or B CD-ROM

0

Ladder Monito application

Instal

Programming Console

Function (Using NS-EXT01-V2 ____Ladder Monitor)

If a Programming Console is selected as the operating mode, a Programming Console is displayed on the Ladder Monitor screen. Operating methods are exactly the same as for a CS-/CJ-series Programming Console. Timer set values can be changed, bit addresses can be added or changed, and many other operations can be performed on-site, all from the screen of the NS-series PT. The

functionality of the Ladder Monitor and Programming Console can be used for primary on-site response without a personal computer.

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Programming Console Function

CX-Programmer CXT file

I/O comment extraction tool

I/O comment file for Ladder Monitor

Memory Card (Sold separately.) (HMC-EF

> Programming Console functionality is displayed when Programming — Console is selected as the operating mode.

Switch Box Function

. (Start

0.00

SW1

The Switch Box Function has been added to the NS-series Programmable Terminals. The Switch Box Function can be used to monitor the status of each bit in a word or a combination of user-selected bits organized like a ladder program section. The Switch Box Function makes it

possible to perform basic troubleshooting on the factory floor even without a computer.



The Switch Box provides the following functions:

- Switching between Monitoring Contiguous or Noncontiguous Bits and Contiguous Words The I/O memoy monitor function monitor words or combinations specified bits. Bit/word comments are imported from the CX-
- specified bits. Bit/word comments are imported from the CX-Programmer. • Register the Words or Bit Combinations To Be Monitored
- by Group Comments can be input for individual groups, e.g., so that the operating conditions of words or bits can be described in text.
- Same User Interface as the Switch Box Utility for Personal Computers
- The same displays can be monitors in the office on a personal computer and onsite at the NS-series PT, making discussions clearer.

Connect to Ethernet or, for High-speed Communications with PLCs, to Controller Link. PT Network Capabilities Are More Powerful than Ever Before. Ethernet



Persona

compute

You may want to transfer screens to a PT through the PLC without changing computer connections or transfer a ladder program to the PLC through the PT by using the Ethernet or Controller Link.

NS-series PTs provide Smart Active Parts (SAP library) enabling direct access to data in various devices.



Multilingual Version to Develop for Various Demands

- Create Chinese or Korean screens on your Windows system.
- Support multiple languages with the same screen data.
- Create the source language labels and let suppliers handle the other languages.

Multi-language Input with Japanese Windows

When Windows 2000 or XP is being used, Simplified Chinese, Traditional Chinese, Korean, and other language text can be input in NS-Designer. Select the desired language with Global IME to input a different language. You can also use this program together with RAKURAKU CHUUGOKUGO and RAKURAKU KANKOKUGO (Chinese

and Korean input systems) to convert Japanese to Chinese and Korean.



For more information on this software, refer to the following site or send email to the following address. URL: http://www.omronsoft.co.jp/SP/ E-mail: rakuraku@omuronsoft.co.jp NS Series: Easily Create Multilingual Screens on Your Windows System

Label Switching to Select from Multiple Languages

Up to 16 groups of labels (labels 0 to 15) can be registered for functional objects such as buttons, lamps, labels, and alarm settings. (Each label can correspond to a different language, for example, label 0 = Japanese, label 1 =

Simplified Chinese, label 2 = Korean, label 3 = English, etc.)

Once all of the labels have been input in each language with the multilingual input function, all of the labels can be switched to a different language at once just by specifying the corresponding label number from the PLC.



Example: The label switch function can be used to switch between English and Simplified Chinese.

Use Screen Import/Export Functions to Separate Translation Work

Property information for labels and other objects in screen data created using the NS-Designer can be exported to CSV files. These files can be edited in Excel and other programs. The screens can be created in the source language and then labels and other text exported to CSV files, which can be sent to translators for conversion to other languages. The translated CSV files can then be imported to automatically input the desired languages into labels.



Note: Refer to the operation manual for NS-Designer for information on importing and exporting.

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A Complete Lineup of Units for Optimal Control.

rogrammable Controllers



Note: HMC-372/672 Memory Cards cannot be used with CS1G-CPU H, CS1H-CPU H, CS1G-CPU H, cCJ1G-CPU H, cCJ1H-CPU H CPU Units prior to Lot No. 02108 (manufactured prior to January 8, 2002, nor with NS-7-series PTs prior to Lot. No. 0852 (manufactured prior to May 8, 2002). Check lot numbers before ordering.

The following restrictions exist in data transfers with the CPU Unit for bit and DM Area specifications for the C200H Special I/O Units marked with asterisks, as well as in data transfers programmed from these Units. Refer to CS-series PLC Operation manuals for details. • Converting data for the CPU Unit using bit and DM Area specifications (source/destination area type and address designation). • Exchanging data with the CPU Unit using instructions (PC READ, PC WRITE, etc.) in the C200H Special I/O Unit program.

CS1H/G-CPU

CS1-series



With the CS1 PLCs, Memory Cards and specified ranges of the EM Area can be used as file memory. File memory can be used to store the entire user program, I/O memory contents, and/or parameter area contents.

File memory	Memory type	Capacity	Model	
Memory Cards	Flash memory	30 MB	HMC-EF372	
		64 MB	HMC-EF672	
EM File Memory EM area Bank 0 Bank n i Bank C Bank C	RAM	EM Area capacity of CPU Unit (Max. capacity for CS1H-CPU67: 832 KB).	From the specified bank in the EM area of I/O memory to the last bank (specified in PC Setup).	

Note: Memory Card Adapter: HMC-AP001 (The Memory Card Adapter can be used to mount Memory Cards in PC card slots to use the Cards on a personal computer.)

Specifications

CPU Units

Model	I/O bits	Program ca- pacity	Data memory ca- pacity (See Note.)	LD instruction pro- cessing speed	Built-in ports	Options
CS1H-CPU67H CS1D-CPU67H CS1D-CPU67S CS1D-CPU67P	5,120 bits (Up to 7 Expansion Racks)	250 kSteps	448 kWords	0.02 µs	Peripheral port and RS-232C port.	Memory Cards Inner Board such as Serial Communications Board, Loop Control Board
CS1H-CPU66H		120 kSteps	256 kWords			(See note 1.)
CS1H-CPU65H CS1D-CPU65H CS1D-CPU65S		60 kSteps	128 kWords			
CS1D-CPU65P						
CS1H-CPU64H		30 kSteps	64 kWords			
CS1H-CPU63H		20 kSteps				
CS1G-CPU45H	5,120 bits (Up to 7 Expansion Racks)	60 kSteps	128 kWords	0.04 µs		
CS1G-CPU44H CS1D-CPU44S	1,280 bits (Up to 3 Expansion Racks)	30 kSteps	64 kWords			
CS1G-CPU43H	960 bits	20 kSteps				
CS1G-CPU42H CS1D-CPU42S	(Up to 2 Expansion Racks)	10 kSteps]			

Note: The available data memory capacity is the sum of the Data Memory (DM) and the Extended Data Memory (EM).

Note: 1. A Loop Control Board cannot be mounted in CS1D-CPU D, use CS1D-CPU P instead. A Serial communications Board cannot be mounted in CS1D-CPU P.

Common Specifications

Item		Specification		
Control method		Stored program		
I/O control method		Cyclic scan and immediate processing		
Programming		Ladder diagram		
Instruction length		1 to 7 steps per instruction		
Ladder instructions		Approx. 400 (3-digit function codes)		
Execution time		asic instructions: 0.02 μs min., Special instructions: 0.04 μs min.		
Function Blocks (C	PU Ver. 3.0 or higher)	Languages supported for use in function block programming: Ladder program language and IEC 61131-3 Structured Text.		
Number of tasks		288 (256 of which are also used as interrupt tasks) Cyclic tasks are executed each cycle and are controlled with TKON(820) and TKOF(821) instructions. The following 4 types of interrupt tasks are supported: Power OFF tasks:1 max., Scheduled interrupt tasks: 2 max., I/O interrupt tasks: 32 max., External interrupt tasks: 256 max.		
Interrupt types (not applicable for CS1D CPUs)		cheduled Interrupts:Interrupts generated at a time scheduled by CPU Unit's built-in timer. O Interrupts:Interrupts from Interrupt Input Units. ower OFF Interrupts:Interrupts executed when CPU Unit's power is turned OFF. xternal I/O Interrupts:Interrupts from Special I/O Units, CS1 Special Units, or Inner Board.		
CIO (Core I/O) Area (The CIO Area can be used as work	I/O Area	5,120: CIO 000000 to CIO 031915 (320 words from CIO 0000 to CIO 0319) Setting of first rack words can be changed from default (CIO 0000) so that CIO 0000 to CIO 0999 can be used. I/O bits are allocated to Basic I/O Units, such as CS1 Basic I/O Units, C200H Basic I/O Units, and C200H Group-2 High- density I/O Units.		
bits if not used as shown here.)	Link Area	3,200 (200 words): CIO 10000 to CIO 119915 (words CIO 1000 to CIO 1199) Link bits are used for data links and are allocated to Units in Controller Link Systems and PC Link Systems.		
	CS1 CPU Bus Unit Area	6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899) CS1 CPU Bus Unit bits store operating status of CS1 CPU Bus Units. (25 words per Unit, 16 Units max.)		
	Special I/O Unit Area	15,360 (960 words): CIO 200000 to CIO 295915 (words CIO 2000 to CIO 2959) Special I/O Unit bits are allocated to CS1 Special I/O Units and C200H Special I/O Units. (See Note.) (10 words per Unit, 96 Units max.) The maximum number of slots, however, is limited to 80 including expansion slots, so maximum number of Units is actually 80.) Note: Some I/O Units are classified as Special I/O Units.		
	Inner Board Area	1,600 (100 words): CIO 190000 to CIO 199915 (words CIO 1900 to CIO 1999) Inner Board bits are allocated to Inner Boards. (100 I/O words max.)		
	SYSMAC BUS Area	800 (50 words): CIO 300000 to CIO 304915 (words CIO 3000 to CIO 3049) SYSMAC BUS bits are allocated to Slave Racks connected to SYSMAC BUS Remote I/O Master Units. (10 words per Rack, 5 Racks max.)		

Note: A max. of 10 or 16 C200H Special I/O Units can be used depending on the CPU Unit. Some I/O Units are Special I/O Units.

Itom			Specification
CIO (Core I/O) Ar-	1/O Termina	al Area	512 (32 worlds): CIO 310000 to CIO 313115 (Worlds CIO 3100 to CIO 3131)
(The CIO Area can			for terminal bits are anotated to 10 Terminal offics (but not to slave hacks) connected to 31 SMAC bos heriote 10 Mas- tar Units (1 word har Terminal 32 Terminale may)
he used as work			
bits if not used as	Unit Area		C200H Special I/O Unit bits are allocated to C200H Special I/O Units and allow access separate from I/O refreshing.
snown nere.)	Device	eNet/	1,600 (100 words):Outputs: CIO 005000 to CIO 009915 (words CIO 0050 to CIO 0099)
	PROFI	IBUS-DP	Inputs: CIO 035000 to CIO 039915 (words CIO 0350 to CIO 0399)
	Area		DeviceNet bits are allocated to Slaves according to DeviceNet remote I/O communications.
	PC Lin	nk Area	64 bits (4 words): CIO 027400 to CIO 025015 (words CIO 0247 to CIO 0250)
			When a PC Link Unit is used in a PC Link, use these bits to monitor PC Link errors and operating status of other CPU Units
Internal I/O Area			4,800 (300 words): CIO 120000 to CIO 149915 (words CIO 1200 to CIO 1499)
			37,504 (2,344 words): CIO 380000 to CIO 614315 (words CIO 3800 to CIO 6143) These bids in CIO Area even and security bits a magnetized sector barrier averaging. They connect by used for external
			Inese bits in CiO Area are used as work bits in programming to control program execution. They cannot be used for external
Work Area			70.
WOIK Alea			6, 192 bits (512 words). Wordow to word 113 (words wood to word)
			Note: When using work bits in programming use bits in Work Area first before using bits from other areas
Holding Area			R 192 bits (512 words): H00000 to H51115 (words H000 to H511)
riolaling Area			Holding bits are used to control execution of program, and maintain their ON/OFF status when PLC is turned OFF or
			operating the device of the Holding area is used for allocation of Function Block variables in CPU Ver 3.0 and
			higher.
Auxiliary Area			Read only: 7,168 bits (448 words): A00000 to A44715 (words A000 to A447)
,			Read/write: 8,192 bits (512 words): A44800 to A95915 (words A448 to A959)
			Auxiliary bits are allocated specific functions.
Temporary Area			16 bits (TR00 to TR15) Temporary bits are used to store ON/OFF execution conditions at program branches.
Timer Area			4,096: T0000 to T4095 (used for timers only)
Counter Area			4,096: C0000 to C4095 (used for counters only)
DM Area			32 kWords: D00000 to D32767
			Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in DM Area maintain their
			status when PLC is turned OFF or operating mode is changed.
			Internal Special I/O Unit DM Area: D20000 to D29599 (100 words × 96 Units). Used to set parameters.
			Liner Read DM Area: D30000 to D31599 (100 words × 16 0mis). Used to set parameters.
			Initial Data Div Alea. Documento to Docuge. Osculto set parameteris toi initial Doalus.
EIVI Area			32 kWords per bank, 13 banks max. $E0_{00000}$ to EC_{0000} max. (Not available on some CFO offiles.)
			Status when PIC is turned OEE or operating mode is changed
			The FM Area is divided into banks, and addresses can be set by either of following methods
			Changing current bank using EMBC(281) instruction and setting addresses for current bank.
			Setting bank numbers and addresses directly.
			EM data can be stored in files by specifying number of first bank. (EM file memory)
Data Registers			DR0 to DR15. Store offset values for indirect addressing. Data registers can be used independently in each task.
Index Perietere			Une register is re bis (i word).
Index Registers			One register is 32 bits (2 words).
Task Flag Area			32 (TK0000 to TK0031). Task Flags are read-only flags that are ON when corresponding cyclic task is executable and OFF
			when corresponding task is not executable or in standby status.
I race Memory			4.000 words (500 data trace samples at the maximum sample size of 31 bits and 6 words)
File Memory			Memory Cards: Compact flash memory cards can be used (MS-DOS format).
			Ewi life memory: Part of Ewi Area can be converted to file memory (MS-DUS format).
1			Compactriash Memory Carus With 15-Mib, 30-Mib, or 64-Mib Capacities can be used.

Programmable Controllers

Function Specifications

Item	Specification
Parallel Processing Mode	The program can be executed simultaneously with peripheral servicing (CS1G/CS1H only).
Battery-free operation	Flash memory is provided as a standard feature and automatically backs up the user program and system parameters.
Constant cycle time	1 to 32,000 ms (Unit: 1 ms)
Cycle time monitoring	Possible (Unit stops operating if cycle is too long): 1 to 40,000 ms (Unit: 10 ms)
I/O refreshing	Cyclic refreshing, immediate refreshing, refreshing by IORF(097).
I/O memory holding when changing oper- ating modes	Possible (Depends on ON/OFF status of IOM Hold Bit in Auxiliary Area.)
Load OFF	All outputs on Output Units can be turned OFF.
Input time constant setting	Time constants can be set for inputs from CS1 Basic I/O Units. The time constant can be increased to reduce influence of noise and chattering or it can be decreased to detect shorter pulses on inputs. (CS1 Basic I/O Units only)
Mode setting at power-up	Possible
Memory Card functions	Automatic reading programs from Memory Card (autoboot).
	Memory Card Storage Data User program: Program file format (binary) PC System Setup: Data file format (binary) I/O Memory: Data file format (binary), text format, CSV format Memory Card Read/Write
	User program instructions, Peripheral Devices (such as Programming Console), Host Link computer.
Filing	Memory Card data and EM (Extended Data Memory) Area can be handled as files.
Debugging	Force-set/reset, differential monitoring, data tracing (scheduled, each cycle, or when instruction is executed), instruction error tracing.
Online editing	One or more program blocks in user programs can be overwritten when CPU Unit is in PROGRAM or MONITOR mode. This function is not available for block programming areas.
Program protection	Overwrite protection:Set using DIP switch. Copy protection: Password set using Peripheral Device.
Error check	User-defined errors (i.e., user can define fatal errors and non-fatal errors) The FPD(269) instruction can be used to check execution time and logic of each programming block.
Error log	Up to 20 errors are stored in error log. Information includes error code, error details, and time error occurred.
Serial communications	Built-in peripheral port: Peripheral Device (including Programming Console), Host Links, NT Links Built-in RS-232C port: Peripheral Device (excluding Programming Console), Host Links, no-protocol communications, NT Links Communications Board (sold separately): Protocol macros. Host Links, NT Links
Clock	Provided on all models. Note: Used to store time when power is turned ON and when errors occur.
Power OFF detection time	10 to 25 ms (not fixed)
Power OFF detection delay time	0 to 10 ms (user-defined, default: 0 ms)
Memory protection	 Held Areas: Holding bits, contents of Data Memory and Extended Data Memory, and status of counter Completion Flags and present values. Note: If IOM Hold Bit in Auxiliary Area is turned ON, and PC Setup is set to maintain IOM Hold Bit status when power to PLC is turnedI ON, contents of CIO Area, Work Area, part of Auxiliary Area, timer Completion Flag and PVs, Index Registers, and Data Registers will be saved.
Sending commands to a Host Link computer	FINS commands can be sent to a computer connected via Host Link System by executing Network Communications Instructions from PLC.
Remote programming and monitoring	Host Link communications can be used for remote programming and remote monitoring through a Controller Link System or Ethernet network.
Eight-level communications (CPU Ver. 3.0 and higher)	Host Link communications can be used for remote programming and remote monitoring from devices on networks up to seven levels away (Controller Link Network, Ethernet Network, or other network).
Storing comments in CPU Unit	I/O comments can be stored in CPU Unit in Memory Cards, EM file memory, or the built-in Comment memory (CPU Ver. 3.0 and higher)
Program check	Program checks are performed at beginning of operation for items such as no END instruction and instruction errors. A Peripheral Device (excluding Programming Console) can also be used to check programs.
Control output signals	RUN output: The contacts will turn ON (close) while CPU Unit is operating. These terminals are provided only on C200HW-PA204R and C200HW-PA209R Power Supply Units.
Battery life	5 years at 25°C (Depending on the ambient operating temperature and communications conditions, 1.1 years min. Battery Set: CS1W-BAT01) Note: Use a replacement battery that is no more than 2 years old from the date of manufacture.
Self-diagnostics	CPU errors (watchdog timer), I/O verification errors, I/O bus errors, memory errors, and battery errors.
Other functions	Storage of number of times power has been interrupted, the times of the interrupts, and system operation time (in Auxiliary Area).

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Specifications - Power Supply Units

Item	Specifications					
Power Supply Unit	C200HW-PA204	C200HW-PA204S	C200HW-PA204R	C200HW-PA209R	C200HW-PD024	C200HW-PD106R
Supply voltage	100 to 120 V AC or	100 to 120 V AC or 200 to 240 V AC, 50/60 Hz				100 V DC
Operating voltage range	85 to 132 V AC or	85 to 132 V AC or 170 to 264 V AC				85 to 143 V DC
Power consumption	120 VA max.			180 VA max.	40 W max.	50 W max.
Inrush current	30 A max.			30 A max./100 to 120 V AC 40 A max./200 to 240 V AC	30 A max.	
Output capacity	4.6 A, 5 V DC (incl	.6 A, 5 V DC (including CPU Unit power)		9 A, 5 V DC (including CPU Unit power)	4.6 A, 5 V DC (in- cluding CPU Unit power)	6 A, 5 V DC (including CPU Unit power)
	0.625 A, 26 V DC Total: 30 W	0.625 A, 26 V DC or 0.8 A, 24 V DC Total: 30 W	0.625 A, 24 V DC Total: 30 W	1.3 A, 26 V DC Total: 45 W	0.625 A, 26 V DC Total: 30 W	1 A, 26 V DC Total: 30 W
Output terminal	Not provided	24 V DC load current consumption Less than 0.3 A: +17%/ -11% 0.3 A or greater: +10%/ -11% (Lot No. 0197 or higher)	Not provided		Not provided	
RUN output (See Note 2.)	Not provided		Contact configuration: SPST-NO Switch capacity: 250 V AC, 2 A (resis- tive load) 250 V AC, 0.5 A (induc- tion load), 24 V DC, 2 A	Contact configuration: SPST-NO Switch capacity: 240 V AC, 2 A (resis- tive load) 120 V AC, 0.5 A (in- ductive load) 24 V DC, 2 A (resis- tive load) 24 V DC, 2 A (induc- tive load)	Not provided	Contact configuration: SPST-NO Switch capacity: 250 V AC, 2 A (resis- tive load) 250 V AC, 0.5 A (in- duction load), 24 V DC, 2 A
Insulation resistance	20 MΩ min. (at 500	V DC) between AC exte	ernal and GR terminals (S	See Note 1.)	20 M Ω min. (at 500 ternal and GR termined and GR termined and GR termined and GR termined and the second	V DC) between DC ex- nals (See Note 1.)
Dielectric strength	2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals (See Note 1.) 1,000 V AC 50/60 Hz for 1 min between AC external and GR terminals (See Note 1.) 1,000 V AC 50/60 Hz for 1 min between AC external and GR terminals (See Note 1.) tween DC external and GR terminals (See Note 1.) Leakage current: 10 mA max. tween DC external and GR terminals (See Note 1.) Leakage current: 10 mA max. tween DC external and GR terminals (See Note 1.)				1,000 V AC 50/ 60 Hz for 1 min be- tween DC external and GR terminals, leakage current: 10 mA max. (See Note 1.)	2,300 V AC 50/60 Hz for 1 min between AC external and GR ter- minals (See Note 1.) Leakage current: 10 mA max.
Noise immunity	Conforms to IEC61	000-4-4, 2 kV (power line	es)		,	
Vibration resistance	10 to 57 Hz, 0.075- (Sweep time 8 min CPU Unit mounted	To to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s ² in X, Y, and Z directions for 80 minutes (Sweep time 8 min \times 10 = total time 80 min.) (CPU Unit mounted to a DIN rail: 2 to 55 Hz, 2.9 m/s ² in X. Y, and Z directions for 20 minutes. According to JIS C0040 / IEC 60068-2-6				
Shock resistance	147 m/s ² , 3 times e	each in X, Y, and Z direct	ions According to JIS CO	0041 / IEC 60068-2-27		
Ambient operating tempera- ture	0 to 55°C					
Ambient operating humidity	10% to 90% (with no condensation)					
Atmosphere	Must be free from corrosive gases.					
Ambient storage tempera- ture	–20 to 75°C (exclu	ding battery)				
Grounding	Less than 100 Ω					
Enclosure	IP20, intended for	panel mounting.				
Weight	All models are eac	h 6 kg max.				
CPU Rack Dimensions (mm) (See note 3.)	2 slots:198.5 × 157 3 slots: 260 × 130 × 5 slots: 330 × 130 ×	⁷ × 123 (W x H x D) 8 slot < 123 (W x H x D) 10 slot < 123 (W x H x D)	s: 435 × 130 × 123 (W x s:505 × 130 × 123 (W x	H x D) H x D)		
Product standards	Conforms to UL. C	SA. cULus. cUL. NK. Llo	vd's, and EC directives.			cULus

Note: 1. Disconnect the Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength.
 2. Only when mounted to a Backplane.
 3. Depth is 153 mm for C200HW-PA209R.
 4. Enquire separately for general specifications of Process I/O Units.

Programmable Controllers

Specifications - Duplex Power Supply Units

Item	Specifications		
Power Supply Unit	CS1D-PA207R CS1D-PD024		
Supply voltage	00 to 120 V AC or 200 to 240 V AC, 50/60 Hz 24 V DC		
Operating voltage range	85 to 132 V AC or 170 to 264 V AC	19.2 to 28.8 V DC	
Power consumption	50 VA max. 40 W max.		
Inrush current	30 A max./100 to 120 V AC	30 A max.	
	40 A max./200 to 240 V AC		
Output capacity	7 A, 5 V DC (including CPU Unit power)	4.3 A, 5 V DC (including CPU Unit power)	
	1.3 A, 26 V DC	0.56 A, 26 V DC	
	Total: 35 W	Total: 28 W	
Output terminal	Not provided	Not provided	
RUN output	Contact configuration: SPST-NO	Not provided	
(See Note 2.)	Switch capacity:		
	240 V AC, 2 A (resistive load)		
	120 V AC, 0.5 A (Inductive load)		
	24 V DC, 2 A (inductive load)		
Insulation resistance	$20 M\Omega$ min. (at 500 V DC) between AC external and GR terminals	20 M Ω min. (at 500 V DC) between DC external and GR terminals	
	(See Note 2.)	(See Note 2.)	
Dielectric strength	2,300 V AC 50/60 Hz for 1 min between AC external and GR ter-	1,000 V AC 50/60 Hz for 1 min between DC external and GR termi-	
	minals (See Note 2.)	nals, leakage current: 10 mA max. (See Note 2.)	
	Leakage current: 10 mA max.		
	1,000 V AC 50/60 Hz for 1 min between AC external and GR ter-		
	minals (See Note 1.)		
NI			
	Conforms to IEC61000-4-4, 2 kV (power lines)		
Vibration resistance	10 to 57 HZ, 0.075-mm amplitude, 57 to 150 HZ, acceleration: 9.8 (Swoon time 8 min $\times 10^{-1}$ total time 80 min)	m/s ² in X, Y, and Z directions for 80 minutes	
	(Sweep time of time of time of time of time of time) CPUL I nit mounted to a DIN rail: 2 to 55 Hz 2.9 m/s ² in X. Y. and	7 directions for 20 minutes. According to JIS C0040 / JEC 60068-2-6	
Shock resistance	Let o unit mound the provide the second seco		
Ambient operating tempera-	147 HVS , 5 times each in A, 1, and 2 directions According to 515 C00417 IEC 60066-2-27		
ture			
Ambient operating humidity	10% to 90% (with no condensation)		
Atmosphere	Must be free from corrosive gases.		
Ambient storage tempera-	-20 to 75°C (excluding battery)		
ture			
Grounding	Less than 100 Ω		
Enclosure	Mounted in a panel.		
Weight	All models are each 6 kg max.		

Basic System Configuration



CPU Rack

A CPU Rack consists of a CPU Unit, Power Supply Unit, CPU Backplane, Basic I/O Units, Special I/O Units, and CPU Bus Units. The Serial Communications Board and Memory Cards are optional.

Note: The Backplane depends on the type of CPU Rack, Expansion I/ O Racks, and Slave Racks that are used.

Expansion Racks

Both C200H and CS1 Expansion Racks can be used.

- C200H Expansion I/O Racks can be connected to CPU Racks, CS1 Expansion Racks, or other C200H Expansion I/O Racks.
- CS1 Expansion Racks can be connected to CPU Racks or other CS1 Expansion Racks.

An Expansion Rack consists of a Power Supply Unit, a CS1 or C200H Expansion I/O Backplane, Basic I/O Units, Special I/O Units, and a CS1 CPU Bus Units.

Long-distance Expansion Racks

An I/O Control Unit and I/O Interface Units can be used to extend the normal limit of 12 m to 50 m for each of two series of CS1 Expansion Racks. The following Units can be mounted to Long-distance Expansion Racks: CS1 Basic I/O Units, CS1 Special I/O Units, and CS1 CPU Bus Units. (C200H Units cannot be mounted to Long-distance Expansion Racks.)

CPU Rack

Configuration

CPU Rack CPU Backplane One of each Unit required for every CPU Rack. CPU Unit Refer to the following table for model number.	Name	Configuration	Remarks
CPU Unit Refer to the following table for model number.	CPU Back	CPU Backplane	One of each Unit required for every CPU Rack.
Bower Supply Unit		CPU Unit	Refer to the following table for model number.
		Power Supply Unit	
Memory Card Install as required.		Memory Card	Install as required.
Serial Communications Board Refer to the following table for model number.		Serial Communications Board	Refer to the following table for model number.

Products Used in CPU Racks

Name	Model	Specifications		
	CS1H-CPU67H	I/O bits: 5,120, Program capacity: 250 kSteps Data Memory: 448 kWords (DM: 32 kWords, EM: 32 kWords x 13 banks)		
	CS1H-CPU66H	I/O bits: 5,120, Program capacity: 120 kSteps Data Memory: 256 kWords (DM: 32 kWords, EM: 32 kWords x 7 banks)		
CPU Units	CS1H-CPU65H	I/O bits: 5,120, Program capacity: 60 kSteps Data Memory: 128 kWords (DM: 32 kWords, EM: 32 kWords x 3 banks)		
	CS1H-CPU64H	I/O bits: 5,120, Program capacity: 30 kSteps Data Memory: 64 kWords (DM: 32 kWords, EM: 32 kWords x 1 bank)		
	CS1H-CPU63H	I/O bits: 5,120, Program capacity: 20 kSteps Data Memory: 32 kWords (DM: 32 kWords, EM: 32 kWords x 1 bank)		
	CS1G-CPU45H	I/O bits: 5,120, Program capacity: 60 kSteps Data Memory: 128 kWords (DM: 32 kWords, EM: 32 kWords x 3 banks)		
	CS1G-CPU44H	I/O bits: 1,280, Program capacity: 30 kSteps Data Memory: 64 kWords (DM: 32 kWords, EM: 32 kWords x 1 banks)		
	CS1G-CPU43H	I/O bits: 960, Program capacity: 20 kSteps Data Memory: 64 kWords (DM: 32 kWords, EM: 32 kWords x 1 bank)		
	CS1G-CPU42H I/O bit Data M		, EM: 32 kWords x 1 bank)	
CPU Backplanes	CS1W-BC022	2 slots (Connection to Expansion Back- plane is not possible.)	These Backplanes are for CS1 Units only. Use CS1W-BC	
	CS1W-BC032	3 slots	Units are to be installed.	
	CS1W-BC052	5 slots		
	CS1W-BC082	8 slots		
	CS1W-BC102	10 slots		

Name	Model	Specifications	
Power Supply Units	C200HW-PA204	100 to 120 V AC or 200 to 240 V AC, Output capacity: 4.6 A, 5 V DC	
	C200HW-PA204S	100 to 120 V AC or 200 to 240 V AC (0.8 A 24 V DC service power) Output capacity: 4.6 A, 5 V DC	
	C200HW-PA204R	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 4.6 A, 5 V DC	
l III III III III III III III III III I	C200HW-PD024	24 V DC, Output capacity: 4.6 A, 5 V DC	
	C200HW-PA209R	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 9 A, 5 V DC	
I/O Control Unit	CS1W-IC102	Connects to CS1 Expansion Racks (two Terminating Resistors included). Must be used together with I/O Interface Units to connect Long-distance Expansion Racks (50 m max.). Not required to connect CS1 Expansion Racks within 12 m.	
Memory Cards	HMC-EF372	Flash memory, 30 MB	
	HMC-EF672	Flash memory, 64 MB	
	HMC-AP001	Memory Card adapter	
Serial Communications Boards	CS1W-SCB21-V1	2 x RS-232C ports, protocol macro function	
	CS1W-SCB41-V1	1 x RS-232C port + 1 x RS-422/485 port, protocol macro function	
Programming Consoles	CQM1-PRO01-E	An English Keyboard Sheet (CS1W-KS001-E) is required.	
	C200H-PRO27-E		
Programming Console Connection	CS1W-CN114	Connects the CQM1-PRO01-E Programming Console. (Length: 0.05 m)	
Cables	CS1W-CN224	Connects the C200H-PRO27-E Programming Console. (Length: 2.0 m)	
	CS1W-CN624	Connects the C200H-PRO27-E Programming Console. (Length: 6.0 m)	
CX-One	CX-ONE-AL##C-E ^{*1}	Omron's integrated software for programming and configuration of all control system components, including PLCs, HMI, drives, temperature controllers and advanced sen- sors.	
Programming Device Connecting	CS1W-CN118	Connects DOS computer, D-Sub 9-pin receptacle (Length: 0.1 m)	
Cables (for peripheral port)	CS1W-CN226	Connects DOS computer, D-Sub 9-pin (Length: 2.0 m)	
	CS1W-CN626	Connects DOS computer, D-Sub 9-pin (Length: 6.0 m)	
	XW2Z-200S-CV	Connects DOS computer, D-Sub 9-pin (Length: 2.0 m)	
	XW2Z-500S-CV	Connects DOS computer, D-Sub 9-pin (Length: 5.0 m)	
Programming Device Connecting	XW2Z-200S-V	Connects DOS computer, D-Sub 9-pin (Length: 2.0 m) (For Host Link connection)	
Cable (for RS-232C port)	XW2Z-500S-V	Connects DOS computer, D-Sub 9-pin (Length: 5.0 m) (For Host Link connection)	
Battery Set	CS1W-BAT01	For CS1 Series only. Note: Use a replacement battery that is no more than 2 years old from the date of man- ufacture.	

^{*1} ## = Number of licences; 01, 03, 10

Expansion Racks

Expansion Rack Configuration

Rack	Configuration	Remarks	
CS1 Expansion Rack	CS1 Expansion I/O Backplane	One of each Unit is required.	
	Power Supply Unit		
	For connection to a CPU Backplane or CS1 Expansion I/O Backplane: CS1 I/O Connecting Cable		
	For connection to a C200H Expansion I/O Backplane: CS1 to C200H I/O Con- necting Cable		
C200H Expansion I/O Rack	C200H Expansion I/O Backplane	One of each Unit is required.	
	Power Supply Unit	A CS1 Expansion Rack cannot be connected after a	
	For connection to a CPU Backplane or CS1 Expansion I/O Backplane: CS1 to C200H I/O Connecting Cable	C200H Expansion I/O Rack.	
	For connection to a C200H Expansion I/O Backplane: C200H I/O Connecting Ca- ble		

Products Used in Expansion Racks

Name	Model	Specifications	Specifications	
CS1 Expansion I/O Back- planes	CS1W-BI032	3 slots	These Backplanes are for CS1 Units	
	CS1W-BI052	5 slots	only. Use CS1W-BI	
	CS1W-BI082	8 slots	If C200H Units are to be installed.	
	CS1W-BI102	10 slots		
C200H Expansion I/O Back-	C200HW-BI031	W-BI031 3 slots		
planes	C200HW-BI051	5 slots	5 slots	
	C200HW-BI081-V1	8 slots	8 slots	
	C200HW-BI101-V1	10 slots	10 slots	
Power Supply Units	C200HW-PA204	100 to 120 V AC or 200 to	100 to 120 V AC or 200 to 240 V AC	
		Output capacity: 4.6 A, 5	Output capacity: 4.6 A, 5 V DC	
	C200HW-PA204S	100 to 120 V AC or 200 to	100 to 120 V AC or 200 to 240 V AC	
		(with power output termin	(with power output terminal: 0.8 A, 24 V DC)	
		Output capacity: 4.6 A, 5	Output capacity: 4.6 A, 5 V DC	
	C200HW-PA204R	100 to 120 V AC or 200 to	100 to 120 V AC or 200 to 240 V AC (with RUN output)	
		Output capacity: 4.6 A, 5	Output capacity: 4.6 A, 5 V DC	
	C200HW-PA209R	100 to 120 V AC or 200 to	100 to 120 V AC or 200 to 240 V AC (with RUN output)	
		Output capacity: 9 A, 5 V	Output capacity: 9 A, 5 V DC	
	C200HW-PD024	24 V DC	24 V DC	

Name	Model	Specifications	Cable Length
I/O Interface Unit	CS1W-II102	Connects CS1 Expansion Racks. Must be used together with I/O Control Unit to connect Long-distance Expansion Racks (50 m max.). Not required to connect CS1 Expansion Racks within 12 m.	
CS1 I/O Connecting Cables	CS1W-CN313	Connects CS1 Expansion I/O Backplanes to CPU Backplanes or other CS1 Expansion I/O Backplanes.	0.3 m
	CS1W-CN713	When using a CS1W-CN313 or CS1W-CN713 I/O Connecting Cable	0.7 m
	CS1W-CN223	with a CS1 -CPU H CPU Unit, use only Cables produced on or after September 20, 2001 (production number 2091). Cables with no production number, a 6-digit production number, or produced before	2 m
	CS1W-CN323	September 20, 2001, cannot be used.	3 m
	CS1W-CN523	Reading the production number	5 m
	CS1W-CN133	□ □ □ □ □	10 m
	CS1W-CN133-B2	Month (1 to 9, X (10), Y (11), Z (12)) Day (01 to 31)	12 m
Long-distance	CV500-CN312	For Long-distance Expansion Racks	0.3 m
Connecting Cables	CV500-CN612	Connects the I/O Control Unit to I/O Interface Units or connects one I/O In-	0.6 m
	CV500-CN122	terface Unit to the next I/O Interface Unit.	1 m
	CV500-CN222	Ide Connects CS1 Expansion I/O Backplanes to CPU Backplanes or other 0 CS1 Expansion I/O Backplanes. 0 When using a CS1W-CN313 or CS1W-CN713 I/O Connecting Cable 0 with a CS1_CPUH CPU Unit, use only Cables produced on or after 2 September 20, 2001 (production number 2091). Cables with no 0 production number, a 6-digit production number, or produced before 3 September 20, 2001, cannot be used. 3 Reading the production number 1 Vear (e.g., 1997=7) Month (1 to 9, X (10), Y (11), Z (12)) Day (01 to 31) 1 For Long-distance Expansion Racks 0 Connects the I/O Control Unit to I/O Interface Units or connects one I/O Interface Unit to the next I/O Interface Unit. 1 Connects C200H Expansion I/O Backplanes to CPU Backplanes or CS1 Expansion I/O Backplanes. 2 September 200H Expansion I/O Backplanes to other C200H Expansion I/O Backplanes. 3	2 m
	CV500-CN322		3 m
	CV500-CN522		5 m
	CV500-CN132		10 m
	CV500-CN232		20 m
	CV500-CN232 CV500-CN332	30 m	
CV	CV500-CN432		40 m
	CV500-CN532		50 m
CS1-C200H I/O	CS1W-CN311	Connects C200H Expansion I/O Backplanes to CPU Backplanes or CS1 Ex-	0.3 m
Long-distance Connecting Cables	CS1W-CN711	pansion I/O Backplanes.	0.7 m
	CS1W-CN221		2 m
	CS1W-CN321		3 m
	CS1W-CN521		5 m
	CS1W-CN131		10 m
	CS1W-CN131-B2		12 m
C200H I/O Connecting	C200H-CN311	Connects C200H Expansion I/O Backplanes to other C200H Expansion I/O	0.3 m
Cables	C200H-CN711	Backplanes.	0.7 m
	C200H-CN221		2 m
	C200H-CN521		5 m
	C200H-CN131		10 m

Expansion Rack Patterns

The following diagrams show the 5 possible patterns of Expansion Racks.



CPU Rack with C200H Expansion I/O Racks







System Configuration (Duplex Systems) **Duplex-CPU System** Duplex (DPL) Unit CS1D-DPL01 CS1D CPU Units for Duplex CPU Backplane CS1D-BC052 (See note.) Duplex-CPU System CS1D-CPU65H/67H/65P/67P CS1D Power Supply Units CS1D-PA207R/PD024 CS1D CPU Back n 0 0 1000 0 ί ΕΣ Up to 5 Units can be mounted. CS1-series Basic I/O Units Duplex CPU Units Duplex Power Supply Units CS1-series Special I/O Units CS1-series CPU Bus Units Note: C200H Units cannot be mounted. Single-CPU System CS1D CPU Units for Single-CPU System CS1D-CPU42S/44S/65S/67S Duplex CPU Backplane CS1D-BC082S (See note.) CS1D Power Supply Units CS1D-PA207R/PD024 CS1D CPU Rack Ø Up to 8 Units can be mounted CS1-series Basic I/O Units **Duplex Power Supply Units**

CS1-series Special I/O Units CS1-series CPU Bus Units Note: C200H Units cannot be mounted.

CPU Rack

A CPU Rack consists of a Duplex CPU Backplane to which CPU Units, Power Supply Units, a Duplex Unit, CS1-series Basic I/O Units, CS1series Special I/O Units, and CS1-series CPU Bus Units are mounted. Memory Cards and Inner Boards to mount in the CPU Units are optional. (Inner Board cannot be mounted to the CS1D-CPU H/P) The CPU Units, Power Supply Units, Duplex CPU Backplane, and Duplex Unit are all designed specifically for CS1D PLCs.

Note: Different Backplanes are used for the CPU Rack and Expansion Racks. Be sure to use the correct Backplane.

Expansion Racks

An Expansion Rack consists of an Expansion Backplane to which Power Supply Units, CS1-series Basic I/O Units, CS1-series Special I/ O Units, and CS1-series CPU Bus Units are mounted.

The Power Supply Units and Expansion Backplane are designed specifically for CS1D PLCs.

CS1-series Expansion Backplanes and C200H Backplanes cannot be connected.

Long-distance Expansion Racks

A Long-distance Expansion Rack consists of an Expansion Backplane to which an I/O Interface Unit, CS1-series Basic I/O Units, CS1-series Special I/O Units, and CS1-series CPU Bus Units are mounted. An I/O Control Unit is used to connect to the Long-distance Expansion Racks. Using Long-distance Expansion Rack increases the normal limit of 12 m for the Rack to 50 m.

CS1D PLCs

With a CS1D Duplex-CPU System, two CPU Units can be mounted to the CPU Rack for Duplex Mode operation (Duplex Mode), or just one CPU Unit can be mounted for Simplex Mode operation. In either case, a Duplex Unit is required.

With a CS1D Single-CPU System, just one CPU Unit is mounted and a Duplex Unit is not required.

Also, two Power Supply Units can be mounted to any Rack to increase redundancy. (Racks can also be operated with only one Power Supply Unit.) With any of these combinations, there are no further restrictions if the system configuration, e.g., the same number of Expansion Racks can be used as with the other CS1-series PLCs.

Note: C200H Basic I/O Units, C200H Special I/O Units, and C200H CPU Bus Units cannot be mounted on any Rack.
rogrammable Controllers

Expansion Patterns for CS1D PLCs

CS1D CPU Rack + CS1D Expansion Rack

CS1D CPU Rack + CS1D Long-distance Expansion Racks



Connects C200H Expansion I/O Backplanes to other C200H Expansion

I/O Backplanes.

C200H I/O Connecting

Cables

CS1W-CN221

CS1W-CN321

CS1W-CN521

CS1W-CN131

C200H-CN311

C200H-CN711

C200H-CN221

C200H-CN521

C200H-CN131

CS1W-CN131-B2

2 m

3 m

5 m

10 m

12 m

0.3 m

0.7 m

2 m

5 m

10 m



Note: Refer to the next page for details of cables for connecting to computers. Choose the appropriate cable for the communications mode.



Programming Consoles

CQM1H-PRO01-E





Windows-based Programming Software: CX-Programmer

Name	Model	Specifications	
CX-Pro-	WS02-CXPC1-EV	For 1 license	OS: Windows
grammer	WS02-CXPC1-EL03-V	For 3 licenses	95/98 or
	WS02-CXPC1-EL10-V	For 10 licenses	2000/XP

Connecting to the Peripheral Port



Peripheral Port Connecting Cables

Cable	Length	Computer connector
CS1W-CN226	2.0 m	D-sub, 9-pin,
CS1W-CN626	6.0 m	male

The following cables can be used for an RS-232C connection from the computer to the peripheral port.

Mode	Connecting cables		Length	Computer connector
Peripheral bus or Host Link	XW2Z-200S-CV or XW2Z-500S-CV	CS1W- CN118	2 or 5 m + 0.1 m	D-sub, 9-pin, male
Host Link	XW2Z-200S-V or XW2Z-500S-V			

Connecting to the RS-232C Port



RS-232C Port Connecting Cables

Mode	Cable	Length	Computer connector
Peripheral	XW2Z-200S-CV	2.0 m	D-sub, 9-pin, male
bus or Host Link	XW2Z-500S-CV	5.0 m	

Note: Cables with model numbers ending in "CV" are antistatic. The following cables can be used for an RS-232C connection from the computer to an RS-232C port. (Unlike cables with model numbers ending in "-CV," however, these cables do not support peripheral bus connection and do not have anti-static specifications.)

Mode	Cable	Length	Computer connector
Host Link	XW2Z-200S-V	2.0 m	D-sub, 9-pin, male
	XW2Z-500S-V	5.0 m	

The following serial communications modes can be used to connect a computer with the CX-Programmer to a CS1 PLC.

Mode	Features
Peripheral bus	The faster mode, peripheral bus is generally used for CX-Programmer connections. Only 1:1 connections are possible. The baud rate is automatically detected with the CS1.
Host Link	A standard protocol for host computers. Slower than peripheral bus, but allows modem or optical adapt- er connections, or long-distance or 1:N connections via RS422A/485.

Using a USB-Serial Conversion Cable to Connect to a Peripheral or RS-232C Port **Applicable Software**

CS1W-CIE31 USB-Serial Conversion Cable Serial Connecting Cable: CS1W-CN226/CN626 XW2Z-200S-CV/500S-CV XW2Z-200S-V/500S-V IBM PC/AT or compatible Peripheral or RS-232C port with USB port

CQM1-CIF02

General Specifications of USB-Serial Conversion Cable

USB interface standard		Conforms to USB Specification 1.1.	
DTE speed		115.2 Kbits/s	
Connectors	On computer	USB (A plug connector, male)	
	On PLC	RS-232C (D-sub, 9-pin, female)	
Power supply		Bus power (supplied from upstream, 5 V DC)	
Current consump	tion	35 mA	
Operating envi- ronment	Ambient temperature	0 to 55 °C	
	Ambient humidity	10% to 90% (with no condensation)	
	Ambient atmosphere	No corrosive gases	
Weight		50 g	

OS with Drivers for USB-Serial Conversion Cable Windows 98, ME, 2000, or XP

Peripheral Port Connecting Cables

CX-Programmer, CX-Simulator, CX-Protocol, CX-Motion, CX-Positioner, CS-Process, DeviceNet Configurator, PLC Reporter 32, CX-Desi-gner, and NT Support Software for Windows (NTST) (See note.)

Note: There are restrictions to the COM port numbers that can be used for the NTST.

Applicable Communications Middleware FinsGateway and CX-Server

Applicable PLCs and PTs The OMRON PLCs and PTs supported by the applicable software can be used. These are listed below.

PLCs

CS Series, CJ Series, C Series (C200HS, C200HX/HG/HE, C200H, C1000H, C2000H, CQM1, CPM1, CPM1A, SRMT, CQM1H, and CPM2C), CVM1, and CV Series

PTs

NS Series and NT Series

Computer	Serial Communications Node	Connecting Cable model number			Length	Computer connector
IBM PC/AT or	Tool bus or SYSMAC WAY	CS1W-CIF31	CS1W-CN226		0.5 m + 2.0 m	USB (A plug connector)
compatible			CS1W-CN626		0.5 m + 6.0 m	
		CS1W-CIF31	XW2Z-200S-CV/ XW2Z-500S-CV	CS1W-CN118	0.5 m + (2.0 m or 5.0 m) + 0.1 m	
	SYSMAC WAY	CS1W-CIF31	XW2Z-200S-V/ XW2Z-500S-V		0.5 m + (2.0 m or 5.0 m) + 0.1 m	

RS-232C Port Connecting Cables

Computer	Serial Communications Node	Connecting Cable model number		Length	Computer connector
IBM PC/AT or compatible	Tool bus or SYSMAC WAY	CS1W-CIF31	XW2Z-200S-CV	0.5 m + 2.0 m	USB (A plug connector)
			XW2Z-500S-CV	0.5 m + 5.0 m	
	SYSMAC WAY	CS1W-CIF31	XW2Z-200S-V (See note.)	0.5 m + 2.0 m	
			XW2Z-500S-V (See note.)	0.5 m + 5.0 m	

Connection in Tool Bus Mode is not possible. The connector does not have ESD measures.

Dimensions



Unit: mm

Backplane	Α	в	W	Н	D
CS1W-BC022/023 (2 slots)	172.3	145	198.5	157	123
CS1W-BC032/033 (3 slots)	246	118	260	132	
CS1W-BC052/053 (5 slots)	316		330		
CS1W-BC082/083 (8 slots)	421		435		
CS1W-BC102/103 (10 slots)	491		505		
CS1D-BC052/082S (Duplex System)					

Backplanes

CPU Backplane with 2 Slots



Note: Expansion Backplanes cannot be connected to 2-slot CPU Back-. planes.

CPU Backplane with 3, 5, 8, or 10 Slots



Unit: mm

Backplane	Model	Α	w
CPU Backplanes	CS1W-BC022/023 (2 slots)	172.3	198.5
	CS1W-BC032/033 (3 slots)	246	260
	CS1W-BC052/053 (5 slots)	316	330
	CS1W-BC082/083 (8 slots)	421	435
	CS1W-BC102/103 (10 slots)	491	505
	CS1D-BC052/082S (Duplex System)		
CS1 Expansion	CS1W-BI032/033 (3 slots)	246	260
Backplanes	CS1W-BI052/053 (5 slots)	316	330
	CS1W-BI082/083 (8 slots)	421	435
	CS1W-BI102/103 (10 slots)	491	505
	CS1D-Bl092 (Duplex System)		
C200H Expansion I/O	C200HW-BI031 (3 slots)	175	189
Backplanes	C200HW-BI051 (5 slots)	245	259
	C200HW-Bl081-V1 (8 slots)	350	364
	C200HW-BI101-V1 (10 slots)	420	434

Mounting Depth

The depth of all Racks is from 118 to 153 mm depending on the Units that are mounted. Additional depth is required to connect Peripheral Devices and Cables. Be sure to allow sufficient mounting depth.



Note: I/O Connecting Cables require sufficient space to maintain the min. bending radius.



C200H I/O Connecting Cable (Cable diameter: 5.1 mm)



CS1 to C200H I/O Connecting Cable (Cable diameter: 5.1 mm)









I/O Allocations

I/O Allocations

In CS1 PLCs, part of the I/O memory is allocated to each Unit. Units are divided into the following 3 groups for allocations.

- Basic I/O Units
- Special I/O Units

CS1 CPU Bus Units

Basic I/O Units





C200H Basic I/O Units

Allocations

CIO Area: CIO 0000 to CIO 0319 (See Note 1.)

(Memory is allocated in word units in order of mounting position in the Racks.)

- Note 1. The Rack's first word setting can be changed from the default setting (CIO 0000) to any word from CIO 0000 to CIO 9999. The first word setting can be changed only with a Programming Device other than a Programming Console.
 - The unit number setting on the front of C200H Group-2 High-density I/O Units is ignored. Words are allocated to these Units based on their location in the Rack.

CS1 Basic I/O Units



C200H Group-2 High-density I/O Units (See Note 2.)

Special I/O Units



CS1 Special I/O Units

CS1 CPU Bus Units





C200H Special I/O Units (See Note 2.)

Allocations

Special I/O Unit Area: CIO 2000 to CIO 2959 (Each Unit is allocated ten words based on its unit number.)

- Note 1. Although there are 96 unit number settings, a maximum of 80 Units can actually be mounted to a PLC because that is the maximum number of slots possible.
 - 2. Some Units classified as I/O Units (namely C200H High-density I/O Units) are actually treated as Special I/O Units.

Allocations

CS1 CPU Bus Unit Area: CIO 1500 to CIO 1899 (Each Unit is allocated 25 words based on its unit number.)

CS1 CPU Bus Units

Allocations to Basic I/O Unit Groups

Basic I/O Units include CS1 Basic I/O Units, C200H Basic I/O Units, and C200H Group-2 High-density I/O Units.

Allocated words in the CIO Area: CIO 0000 to CIO 0319 Basic I/O Units can be mounted to the CPU Rack, CS1 Expansion Racks, and C200HX/HG/HE Expansion I/O Racks.

Note: CS1 Basic I/O Units cannot be mounted to C200HX/HG/HE Expansion I/O Racks.

Allocation Methods

1. CPU Rack

Basic I/O Units on the CPU Rack are allocated words left to right; Units are allocated as many words as required in word units. With CPU Ver. 2.0 and higher it is possible to specify start addresses per rack or per slot.



2. Allocations to CS1 Expansion and C200H Expansion I/O Racks I/O allocations to Basic I/O Units continue from the CPU Rack to the Expansion Racks. Words are allocated from left to right and each Unit is allocated as many words as it requires in word units, just like Units in the CPU Rack.



3. CS1 Long-distance Expansion Racks Words are allocated to series A and then series B. Otherwise, allocations are the same as for other Racks.



Allocations to Special I/O Units

Special I/O Units include CS1 Special I/O Units and C200H Special I/O Units.

Each of these Units is allocated ten words in the Special I/O Unit Area (CIO 2000 to CIO 2959).

Special /O Units can be mounted to the CPU Rack, CS1 Expansion Racks, and C200H Expansion I/O Racks. (See note.)

Note: CS1 Special I/O Units cannot be mounted to C200H Expansion I/O Racks.

Each Unit is allocated 10 words in the Special I/O Unit Area, as shown in the following table.

Unit number	Words allocated
0	CIO 2000 to CIO 2009
1	CIO 2010 to CIO 2019
2	CIO 2020 to CIO 2029
15	CIO 2150 to CIO 2159
95	CIO 2950 to CIO 2959

Note: Special I/O Units are ignored during I/O allocation to Basic I/O Units. Slots containing Special I/O Units are treated as empty slots.

Current Consumption

The amount of current/power that can be supplied to the Units mounted in a Rack is limited by the capacity of the Rack's Power Supply Unit. The system must be designed so that the total current consumption of the Units does not exceed the maximum current for each voltage group and the total power consumption does not exceed the maximum for the Power Supply Unit.

CPU Racks and Expansion Racks

The following table shows the maximum currents and power that can be supplied by Power Supply Units on CPU Racks and Expansion Racks (both CS1 Expansion Racks and C200H Expansion I/O Racks).

- Note: 1. When calculating current/power consumption in a CPU Rack, be sure to include the power required by the CPU Backplane and CPU Unit themselves.
 - 2. Likewise, be sure to include the power required by the Expansion Backplane itself when calculating current/power consumption in an Expansion Rack.

Power Supply Unit	Max. Current Consumption			Max. Total Power
	5-V group	26-V group	24-V group	Consumption
C200HW-PA204	4.6 A	0.6 A	None	30 W
C200HW-PA204S	4.6 A	0.6 A	0.8 A	30 W
C200HW-PA204R	4.6 A	0.6 A	None	30 W
C200HW-PD204	4.6 A	0.6 A	None	30 W
C200HW-PA209R	9.0 A	1.3 A	None	45 W
C200HW-PD106R	6.0 A	1.0 A	None	30 W
CS1D-PA207R	7.0 A	1.3 A	None	35 W
CS1D-PD024	4.3 A	0.56 A	None	28 W

Be sure both Condition 1 and Condition 2 are met.

Condition 1: Maximum Current Supply

- **1.** Current required at 5 V DC by all Units (A) \leq Max. Current shown in table
- **2.** Current required at 26 V DC by all Units (B) \leq Max. Current shown in table
- **3.** Current required at 24 V DC by all Units (C) \leq Max. Current shown in table

Condition 2: Maximum Total Current Supply

1. A \times 5 V DC + B \times 26 V DC + C \times 24 V DC \leq Max. Power shown in table

Example Calculations

In this example, the following Units are mounted to a CPU Rack with a C200HW-PA204S Power Supply Unit.

Unit	Model	Quantity	5- V DC	26- V DC	24- V DC
CPU Backplane	CS1W-BC083	1	0.11 A		
(8 slots)					
CPU Unit	CS1H-CPU67-EV1	1	1.10 A		
Input Units	C200H-ID216	2	0.10 A		
	CS1W-ID291	2	0.20 A		
Output Units	C200H-OC221	2	0.01 A	0.075 A	
Special I/O Unit	C200H-NC213	1	0.30 A		
CPU Bus Unit	CS1W-CLK21	1	0.50 A		
Service Power Supply Uni	t (24 V DC)	0.3 A used			0.3 A
Total current/power con 13.15+3.9+7.2 = 24.25 (≤	sumption 30 W)		2.63 A (≤4.6) x 5 V = 13.15W	0.15 A (≤0.6A) x 26 V = 3.9 W	0.3 A (≤0.8A) x 24 V = 7.2 W

Allocations to CS1 CPU Bus Units

Each CS1 CPU Bus Unit is allocated 25 words in the CS1 CPU Bus Unit Area (CIO 1500 to CIO 1899).

 $\mbox{CS1}$ CPU Bus Units can be mounted to the CPU Rack or CS1 Expansion Racks.

Each Unit is allocated 25 words in the CPU Bus Unit Area, as shown in the following table.

Unit number	Words allocated
0	CIO 1500 to CIO 1524
1	CIO 1525 to CIO 1549
2	CIO 1550 to CIO 1574
15	CIO 1875 to CIO 1899

Note: CS1 CPU Bus Units are ignored during I/O allocation to Basic I/ O Units. Slots containing CS1 CPU Bus Units are treated as empty slots.

Current Consumption Tables

5- V DC Voltage Group

CPU Units (These values include current consumption by a Programming Console.) CS1H-CPU67H (S1D-CPU67S) 0.82 (See note.) CS1H-CPU67H (S1D-CPU65H) 0.82 (See note.) CS1H-CPU67H (S1D-CPU65H) 0.82 (See note.) CS1H-CPU66H 0.82 (See note.) CS1H-CPU65H 0.82 (See note.) CS1H-CPU65H 0.82 (See note.) CS1H-CPU65H 0.82 (See note.) CS1H-CPU63H 0.82 (See note.) CS1G-CPU44H 0.82 (See note.) CS1G-CPU45H 0.78 (See note.) CS1G-CPU44H 0.78 (See note.) CS1G-CPU44H 0.78 (See note.) CS1D-CPU67P 1.04 CS1D-CPU65P 1.04 CS1D-CPU65P 1.04 Loop Control Boards CS1W-LCB01 0.22 (See note.) CS1W-SCB21-V1 0.36 (See note.) CS1W-SCB21-V1 0.36 (See note.) CS1W-BC032 0.11 CS1W-BC032 0.11 CS1W-BC032 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033	Name	Model	Consumption (A)
Chese values include current consumption by a Programming Console.) CS1D-CPU67H CS1D-CPU67S O.82 (See note.) CS1H-CPU65H CS1H-CPU65H 0.82 (See note.) CS1H-CPU65H CS1D-CPU65H 0.82 (See note.) CS1H-CPU66H 0.82 (See note.) CS1H-CPU66H 0.82 (See note.) CS1H-CPU63H 0.82 (See note.) CS1H-CPU64H 0.82 (See note.) CS1G-CPU45H 0.78 (See note.) CS1G-CPU44H 0.78 (See note.) CS1G-CPU44H 0.78 (See note.) CS1D-CPU44S CS1D-CPU44S Duplex Process CPU Units CS1D-CPU45B 0.22 (See note.) CS1D-CPU44S CS1D-CPU44S 0.78 (See note.) CS1D-CPU44S CS1D-CPU44S Duplex Process CPU Units CS1W-LCB05 0.22 (See note.) CS1W-LCB05 0.22 (See note.) CS1W-LCB05 0.22 (See note.) CS1W-SCB2 0.11 CS1W-BC032 0.11 CS1W-BC052 0.11 CS1W-BC032 0.11 CS1W-BC032 0.11 CPU Backplanes CS1W-BC033 0.11 CS1W-BC033 0.11 CPU Backplanes CS1W-BC033 0.11 CS1W-BC033 0.11	CPU Units	CS1H-CPU67H	0.82 (See note)
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CS1W-BC052 0.11 CS1W-BC082 0.11 CS1W-BC082 0.11 CS1W-BC102 0.11 CPU Backplanes CS1W-BC023 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 (VO control Unit CS1W-BC032 0.23 CS1W-BC032 0.23 CS1 Expansion Backplanes (for CS1W-Bl032 0.23 CS1W-BI022 0.23 CS1 Expansion Backplanes CS1W-BI032 0.23 CS1W-BI033 0.23 CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI033 0.23 CS1 W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 (VO Interface Unit CS1W-BI031 0.15 C200HW-BI031 0.15 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI031 0.15 C200H W-BI081-V1 0.15	only)	CS1W-BC032	0.11
CS1W-BC082 0.11 CPU Backplanes CS1W-BC023 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 I/O Control Unit CS1W-BC032 0.23 CS1W-BC032 0.23 CS1 Expansion Backplanes (for CS1 W-BI032 CS1W-BI052 0.23 CS1W-BI022 0.23 CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI033 0.23 CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI033 0.23 CS1 Expansion I/O Backplanes CS1W-BI031 0.15 C200HW-BI031 0.15 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI031 0.15 C200H W-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 C200H W-BI081-V1 0.15 C200HW-BI081-V1 0.		CS1W-BC052	0.11
CS1W-BC102 0.11 CPU Backplanes CS1W-BC023 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC053 0.11 CS1W-BC083 0.11 CS1W-BC083 0.11 CS1W-BC083 0.11 CS1W-BC033 0.11 CS1W-BC083 0.11 I/O Control Unit CS1W-BC032 0.23 CS1W-BC032 0.23 CS1 Expansion Backplanes (for CS1 Units only) CS1W-B1032 0.23 CS1W-B1022 0.23 CS1 Units only) CS1W-B102 0.23 CS1W-B102 0.23 CS1 Expansion Backplanes CS1W-B1033 0.23 CS1W-B1033 0.23 CS1 Expansion Backplanes CS1W-B1033 0.23 CS1W-B1033 0.23 CS1 W-B1033 0.23 CS1W-B1031 0.15 C200HW-B1031 0.15 C200H Expansion I/O Backplanes C200HW-B1031 0.15 C200HW-B1031 0.15 C200H W-B1031 0.15 C200HW-B1031-V1 0.15 C200HW-B101-V1 0.15 CS1 Duplex Backplane CS1D-DPL		CS1W-BC082	0.11
CPU Backplanes CS1W-BC023 0.11 CS1W-BC033 0.11 CS1W-BC053 0.11 CS1W-BC083 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.11 CS1W-BC033 0.23 CS1Units only) CS1W-Bl082 0.23 CS1W-Bl082 0.23 CS1W-Bl083 0.23 CS1W-Bl083 <td< td=""><td></td><td>CS1W-BC102</td><td>0.11</td></td<>		CS1W-BC102	0.11
CS1W-BC033 0.11 CS1W-BC053 0.11 CS1W-BC083 0.11 CS1W-BC083 0.11 CS1W-BC083 0.11 CS1W-BC103 0.11 CS1W-BC102 0.92 CS1 Expansion Backplanes (for CS1 Units only) CS1W-BI032 0.23 CS1W-BI02 0.23 CS1W-BI082 0.23 CS1W-BI02 0.23 CS1W-BI082 0.23 CS1W-BI02 0.23 CS1W-BI033 0.23 CS1W-BI03 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CVO Interface Unit CS1W-BI031 0.15 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200H W-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI01-V1 0.15 C200HW-BI031 0.15 CS1 Duplex Backplane CS1D-BC052 Total	CPU Backplanes	CS1W-BC023	0.11
CS1W-BC053 0.11 CS1W-BC083 0.11 CS1W-BC103 0.11 CS1W-BC103 0.11 I/O Control Unit CS1W-BC102 0.92 CS1 Expansion Backplanes (for CS1 Units only) CS1W-BI032 0.23 CS1W-BI052 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS0HW-BI031 0.15 C200HW-BI031 0.15 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200H W-BI051 0.15 C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1D Duplex Unit CS1D-BC082S 0.17		CS1W-BC033	0.11
CS1W-BC083 0.11 I/O Control Unit CS1W-BC103 0.11 I/O Control Unit CS1W-BC102 0.92 CS1 Expansion Backplanes (for CS1 Units only) CS1W-BI032 0.23 CS1 Units only) CS1W-BI052 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS0HW-BI033 0.23 CS1W-BI033 0.23 C200H W-BI031 0.15 C200HW-BI031 0.15 C200H W-BI031 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V11 0.15 C200HW-BI081-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1D Duplex Unit CS1D-BC082S 0.17		CS1W-BC053	0.11
CS1W-BC103 0.11 I/O Control Unit CS1W-BC102 0.92 CS1 Expansion Backplanes (for CS1 Units only) CS1W-BI032 0.23 CS1 Units only) CS1W-BI052 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI053 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 C200H Expansion I/O Backplanes CS1W-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1D Duplex Unit CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		CS1W-BC083	0.11
I/O Control Unit CS1W-IC102 0.92 CS1 Expansion Backplanes (for CS1 Units only) CS1W-BI032 0.23 CS1W-BI052 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI083 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI083 0.23 CS1W-BI083 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS0HW-BI031 0.15 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI081-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		CS1W-BC103	0.11
CS1 Expansion Backplanes (for CS1 Units only) CS1W-BI032 0.23 CS1 Units only) CS1W-BI052 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI033 0.23 CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 CS1W-BI033 0.23 I/O Interface Unit CS1W-BI033 0.23 CS1W-BI033 0.23 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1D CS1D CS1D CS1 Duplex Unit CS1D-DPL01 0.55 CS1D <	I/O Control Unit	CS1W-IC102	0.92
CS1 Units only) CS1W-BI052 0.23 CS1W-BI082 0.23 CS1W-BI082 0.23 CS1W-BI02 0.23 CS1W-BI03 0.23 CS1W-BI033 0.23 CS1W-BI031 0.15 C200H W-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI031 0.15 CS1 Duplex Backplane CS1D-BC052 CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28	CS1 Expansion Backplanes (for	CS1W-BI032	0.23
CS1W-BI082 0.23 CS1 Expansion Backplanes CS1W-BI02 0.23 CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI053 0.23 CS1W-BI083 0.23 CS1W-BI083 0.23 CS1W-BI083 0.23 I/O Interface Unit CS1W-BI031 0.23 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28	CS1 Units only)	CS1W-BI052	0.23
CS1W-BI102 0.23 CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI053 0.23 CS1W-BI053 0.23 CS1W-BI083 0.23 CS1W-BI083 0.23 CS1W-BI03 0.23 CS1W-BI03 0.23 I/O Interface Unit CS1W-BI03 0.23 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI031 0.15 C200HW-BI081-V1 C200HW-BI081-V1 0.15 C200HW-BI081-V1 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		CS1W-BI082	0.23
CS1 Expansion Backplanes CS1W-BI033 0.23 CS1W-BI053 0.23 CS1W-BI083 0.23 CS1W-BI083 0.23 CS1W-BI03 0.23 CS00H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI051 0.15 C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		CS1W-BI102	0.23
CS1W-BI053 0.23 CS1W-BI083 0.23 CS1W-BI083 0.23 CS1W-BI103 0.23 CS1W-BI103 0.23 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 C200HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28	CS1 Expansion Backplanes	CS1W-BI033	0.23
CS1W-BI083 0.23 I/O Interface Unit CS1W-BI103 0.23 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI051 0.15 C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 C200HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		CS1W-BI053	0.23
CS1W-BI103 0.23 I/O Interface Unit CS1W-II102 0.23 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 C200HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		CS1W-BI083	0.23
I/O Interface Unit CS1W-II102 0.23 C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 C200HW-BI01-V1 0.15 C31 Duplex Backplane CS1D-BC052 Total CS1D Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		CS1W-BI103	0.23
C200H Expansion I/O Backplanes C200HW-BI031 0.15 C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 C210HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28	I/O Interface Unit	CS1W-II102	0.23
C200HW-BI051 0.15 C200HW-BI081-V1 0.15 C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28	C200H Expansion I/O Backplanes	C200HW-BI031	0.15
C200HW-BI081-V1 0.15 C200HW-BI01-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		C200HW-BI051	0.15
C200HW-BI101-V1 0.15 CS1 Duplex Backplane CS1D-BC052 Total CS1 Duplex Unit CS1D-DPL01 0.55 CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28		C200HW-BI081-V1	0.15
CS1 Duplex BackplaneCS1D-BC052TotalCS1 Duplex UnitCS1D-DPL010.55CS1D Single CPU BackplaneCS1D-BC082S0.17CS1D Expansion BackplaneCS1D-BI0920.28		C200HW-BI101-V1	0.15
CS1 Duplex UnitCS1D-DPL010.55CS1D Single CPU BackplaneCS1D-BC082S0.17CS1D Expansion BackplaneCS1D-BI0920.28	CS1 Duplex Backplane	CS1D-BC052	Total
CS1D Single CPU Backplane CS1D-BC082S 0.17 CS1D Expansion Backplane CS1D-BI092 0.28	CS1 Duplex Unit	CS1D-DPL01	0.55
CS1D Expansion Backplane CS1D-BI092 0.28	CS1D Single CPU Backplane	CS1D-BC082S	0.17
	CS1D Expansion Backplane	CS1D-BI092	0.28

Note: Add 0.15 A per port when the NT-AL001-E is connected.

Basic I/O Units

Category	Name	Model	Consumption (A)
C200H Input	DC Input Units	C200H-ID211	0.01
Units		C200H-ID212	0.01
	AC Input Units	C200H-IA121	0.01
		C200H-IA122	0.01
		C200H-IA122V	0.01
		C200H-IA221	0.01
		C200H-IA222	0.01
		C200H-IA222V	0.01
C200H Input	AC/DC Input	C200H-IM211	0.01
Units	Units	C200H-IM212	0.01
	B7A Interface	C200H-B7AI1	0.10
	Units	C200H-B7A12	0.10
	Interrupt Input Unit	C200HS-INT01	0.02
C200H Group-	DC Input Units	C200H-ID216	0.10
2 High-density		C200H-ID217	0.12
Input Units		C200H-ID218	0.10
		C200H-ID219	0.12
		C200H-ID111	0.12

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Category	Name	Model	Consumption (A)
CS1 Input	DC Input Units	CS1W-ID211	0.10
Units		CS1W-ID231	0.15
		CS1W-ID261	0.15
		CS1W-ID291	0.20
	AC Input Units	CS1W-IA111	0.11
		CS1W-IA211	0.11
	Interrupt Input Unit	CS1W-INT01	0.10
	High-speed Input Unit	CS1W-IDP01	0.10
	Safety Relay Unit	CS1W-SF200	0.10
C200H Output	Relay Output	C200H-OC221	0.01
Units	Units	C200H-OC222	0.01
		C200H-OC222N	0.008
		C200H-OC225	0.05
		C200H-OC226N	0.03
		C200H-OC223	0.01
		C200H-OC224	0.01
		C200H-OC224N	0.01
	Transistor Out-	C200H-OD411	0.14
	put Units	C200H-OD213	0.14
		C200H-OD214	0.14
		C200H-OD216	0.01
			0.01
			0.10
			0.01
			0.18
		C200H-OD21A	0.16
	B/A Interface	C200H-B7A01	0.10
		C200H-B7A02	0.10
	Triac Output	C200H-OA223	0.18
	Units	C200H-OA222V	0.20
		C200H-OA224	0.27
CS1 Output	Relay Output	CS1W-OC201	0.10
Units	Units	CS1W-OC211	0.13
	Transistor Out-	CS1W-OD211	0.17
	put Units	CS1W-OD212	0.17
		CS1W-OD231	0.27
		CS1W-OD232	0.27
		CS1W-OD261	0.39
		CS1W-OD262	0.39
		CS1W-OD291	0.48
		CS1W-OD292	0.48
	Triac Output Units	CS1W-OA201	0.23 max. (0.07+0.02× No. of points ON)
		CS1W-OA211	0.406 max. (0.07+0.021×No. of points ON)
C200H Group-	Transistor Out-	C200H-OD218	0.27
2 High-density	put Units	C200H-OD21B	0.48
Output Units		C200H-OD219	0.48
CS1 I/O Units	DC Input/Tran-	CS1W-MD261	0.27
	sistor Output	CS1W-MD262	0.27
	Units	CS1W-MD291	0.35
1		CS1W-MD292	0.35
	TTL I/O Unit	CS1W-MD561	0.27
C200H I/O	B7A Interface	C200H-B7A21	0.10
Units	Units	C200H-B7A22	0.10
	Analog Timer Unit	C200H-TM001	0.06
Units	Units Analog Timer Unit	C200H-B7A22 C200H-TM001	0.10 0.06

Note: This table may contain Units that are no longer in production

Special I/O Units

Category	Name	Model	Consumption (A)
C200H High-	DC Input Unit	C200H-ID215	0.13
density I/O	TTL Input Unit	C200H-ID501	0.13
Units (Special I/	Transistor Output Unit	C200H-OD215	0.22
O Units)	TTL Output Unit	C200H-OD501	0.22
	TTL I/O Unit	C200H-MD501	0.18
	DC Input Transistor Out-	C200H-MD215	0.18
	put Unit	C200H-MD115	0.18
C200H Special	Temperature Control	C200H-TC001	0.33
I/O Units	Units	C200H-TC002	0.33
		C200H-TC003	0.33
		C200H-TC101	0.33
		C200H-TC102	0.33
		C200H-TC103	0.33
	Heat/Cool Temperature	C200H-TV001	0.00
	Control Units	C200H-TV001	0.33
			0.00
		C200H-1V003	0.33
		C200H-1V101	0.33
		C200H-1V102	0.33
	T	C200H-1V103	0.33
	Temperature Sensor	C200H-15001	0.45
	Offics	C200H-1S002	0.45
		C200H-1S101	0.45
0000110		C200H-1S102	0.45
C200H Special	PID Control Units	C200H-PID01	0.33
1/O Units		C200H-PID02	0.33
		C200H-PID03	0.33
	Cam Positioner Unit	C200H-CP114	0.30
	ASCII Units	C200H-ASC02	0.20
		C200H-ASC11	0.25
		C200H-ASC21	0.30
		C200H-ASC31	0.30
	Analog Input Units	C200H-AD001	0.55
		C200H-AD002	0.45
		C200H-AD003	0.10
	Analog Output Units	C200H-DA001	0.65
		C200H-DA002	0.60
		C200H-DA003	0.10
		C200H-DA004	0.10
	Analog I/O Units	C200H-MAD01	0.10
	High-speed Counter	C200H-CT001-V1	0.30
	Units	C200H-CT002	0.30
		C200H-CT021	0.45
	Motion Control Unit	C200H-MC221	0.65 (/Teaching
			(W/ Leaching
		C200HW-MC402- E	0.60
	Position Control Units	C200HW- NC113	0.30
		C200HW-NC213	0.30
		C200HW-NC413	0.50
	ID Sensor Units	C200H-IDS01-V1	0.25
		C200H-IDS21	0.25
	Fuzzy Logic Unit	C200H-FZ001	0.30
	Voice Unit	C200H-OV001	0.30
	DeviceNet Master Unit	C200HW- DRM21-V1	0.25
	DeviceNet I/O Link Unit	C200HW-DRT21	0.25
	CANopen Unit	C200HW- CORT21-V1	0.25
	PROFIBUS-DP Master Unit	C200HW-PRM21	0.60
	PROFIBUS-DP I/O Link Unit	C200HW-PRT21	0.25
	CompoBus/S Master Unit	C200HW- SRM21-V1	0.15
	PC Link Unit	C200H-LK401	0.35

Category	Name	Model	Consumption (A)
CS1 Special	Analog Input Unit	CS1W-AD0□1-V1	0.13
I/O Unit		CS1W-AD161	0.15
	Analog Output Unit	CS1W-DA0	0.13
	Analog I/O Unit	CS1W-MAD44	0.20
	Isolated Thermocouple	CS1W-PTS01-V1	0.15
	Input Unit	CS1W-PTS11	0.12
		CS1W-PTS51	0.25
		CS1W-PTS55	0.18
	Isolated Temperature-	CS1W-PTS02	0.15
	resistance Thermome-	CS1W-PTS12	0.12
	ter Input Unit	CS1W-PTS52	0.25
		CS1W-PTS56	0.18
	Isolated Temperature- resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	0.15
	Isolated Two-wire Transmission Device Input Unit	CS1W-PTW01	0.15
	Isolated DC Input Unit	CS1W-PDC01	0.15
		CS1W-PDC11	0.12
		CS1W-PDC55	0.18
	Isolated Pulse Input Unit	CS1W-PPS01	0.20
	Isolated Control	CS1W-PMV01	0.15
	Output Unit	CS1W-PMV02	0.12
	Power Transducer Input Unit	CS1W-PTR01	0.15
	100-mV DC Input Unit	CS1W-PTR02	
	Motion Control Units	CS1W-MC221	0.60 (w/Teaching Box: 0.80 A)
		CS1W-MC421	0.70 (w/Teaching Box: 1.00 A)
	Position Control Units	CS1W-NC113/ 133	0.25
		CS1W-NC213/ 233	
		CS1W-NC413/ 433	0.36
	High-speed Counter	CS1W-CT021	
	Units	CS1W-CT041	0.45
	SSI Input Unit	CS1W-CTS21	0.32
	Customizable Counter	CS1W-HCP22-V1	0.80
	Units	CS1W-HCA12-V1 CS1W-HCA22-V1	0.75
		CS1W-HIO01-V1	0.60
	GP-IB Interface Unit	CS1W-GPI01	0.26
	RFID Sensor Unit	CS1W-V600C11	0.26
		CS1W-V600C12	0.32

CS1 CPU Bus Units

Category	Name	Model	Consump- tion (A)
CS1 CPU Bus	Loop Control Unit	CS1W-LC001	0.36
Units	Motion Control Unit	CS1W-MCH71	0.8
	Controller Link Units	CS1W-CLK52-V1	0.65
		CS1W-CLK21-V1	0.33
		CS1W-CLK12-V1	0.52
	SYSMAC LINK Unit	CS1W-SLK21	0.48
		CS1W-SLK11	0.47
	Serial Communica-	CS1W-SCU21	0.29
	tions Unit		(See Note.)
	Ethernet Unit	CS1W-ETN□□, -ETN21D	0.40
	DeviceNet Unit	CS1W-DRM21-V1	0.29
	PROFIBUS-DP Master Unit	CS1W-PRM21	0.40

Note: Add 0.15 A per port when the NT-AL001-E is connected. **Note:** This table may contain Units that are no longer in production

26-V Current Consumption

Category	Name	Model	Consumption (A)
C200H Out-	Relay Output	C200H-OC221	0.075 for 8 points ON at
put Units	Units	C200H-OC222	the same time
		C200H-OC223	
		C200H-OC224	
		C200H-OC225	
		C200H-OC222N	0.09 for 8 points ON at
		C200H-OC226N	the same time
		C200H-OC224N	
	Transistor Output	C200H-OD216	0.075 for 8 points ON at
	Units	C200H-OD217	the same time
CS1 Output	Relay Output	CS1W-OC201	0.006 for each point ON
Units	Units	CS1W-OC211	at the same time
C200H Spe-	Analog Input Unit	C200H-AD003	0.10
cial I/O	Analog Output	C200H-DA003	0.20
Units	Units	C200H-DA004	0.25
	Analog I/O Unit	C200H-MAD01	0.20
	ID Sensor Units	C200H-IDS01-V1	0.12
		C200H-IDS21	0.12
CS1 Special	Analog Input Unit	CS1W-AD0□1-V1	0.09
I/O Units		CS1W-AD161	0.06
	Analog Output	CS1W-DA041	0.18
	Units	CS1W-DA08V	0.18
		CS1W-DA08C	0.25
	Analog I/O Unit	CS1W-MAD44	0.20
	Isolated	CS1W-PTS01	0.15
	Thermocouple	CS1W-PTS11	0.08
	Input Unit	CS1W-PTS55	0.06
	Isolated Tempe-	CS1W-PTS02	0.15
	rature-resistance	CS1W-PTS12	0.07
	Thermometer Input Unit	CS1W-PTS56	0.06
	Isolated Tempera-	CS1W-PTS03	0.15
	ture- resistance		
	Thermometer		
	Input Unit		
	(NI508.4 Ω)		0.40
	Isolated I wo-wire	CS1W-P1W01	0.16
	Device Input Unit		
	Isolated DC Input	CS1W-PDC01	
	Unit	CS1W-PDC11	0.12
		CS1W-PDC55	0.06
	Isolated Pulse	CS1W-PPS01	0.16
	Input Unit		
	Isolated Control	CS1W-PMV01	
		CS1W-PMV02	0.12
	Power Transducer Input Unit	CS1W-PTR01	0.08
	100-mV DC Input Unit	CS1W-PTR02	
	Customizable Counter Unit	CS1W-HCA□2	0.15
	RFID Sensor Unit	CS1W-V600C1	0.12

Note: This table may contain Units that are no longer in production

CS1 Unit Descriptions

Unit		Classification	Model	Page
I/O Units	Input Units	CS1 Basic I/O Unit		300
	par erine			301
		C200H Basic I/O Unit		300
				301
				301
		C200H Special I/O Unit		300
	Output Units	CS1 Basic I/O Unit		301
				301
				301
		C200H Basic I/O Unit		301
			C200H-OC22	301
				301
		C200H Group-2 High Density Units		301
		C200H Special I/O Unit	C200H-OD501	301
	I/O Units	CS1 Basic I/O Unit		302
		C200H Special I/O Unit		302
High-speed Input Unit		CS1 Basic I/O Unit	CS1W-IDP01	302
Interrupt Input Unit		CS1 Basic I/O Unit	CS1W-INT01	313
interrupt input onit		C200H Basic I/O Unit	C200H-INT01	313
Analog Timer Llnit			C200H-TM001	315
Safety Belay Linit		CS1 Basic I/O Unit	CS1W-SE200	316
Analog I/O I Inits	Input I Inits	CS1 Special I/O Unit		318
				318
	Output Units	CS1 Special I/O Unit	CS1W-DA041/08V/08C	320
	Output Onits		C200H-DA041/080/08C	320
	Analog I/O Lipita	CS1 Basic I/O Unit		320
	Analog 1/O Onits			322
La an Oantral I Init				322
		Inner Board		323
Duplox Process CPU				323
Process I/O Unite		CS1 Special I/O LInit		326
Tomporature Soncer Units				320
Temperature Sensor Unit	5			226
Temperature Control Unit	6	C200H Special I/O Unit		337
Position Control Units	3			220
FOSILION CONTON ONITS				220
Motion Control Unit		CS1 Special I/O Unit		330
				241
				242
High-speed Counter Units	x			345
riigh-speed Obuiller Office	5	OST Special #O Onit		247
		C200H Special I/O Linit		245
ID Sensor Linits		CS1 Special I/O Unit		354
ID Gensor Onits				254
ASCII Linite				250
Sorial Communications	Sorial Communications Boards	Innor Board		251
Boards/Unit	Serial Communications Doards			251
DS 222C/DS 422 Convor				252
GP IB Interface Unit	sion onit			255
Ethernet Unit		CS1 CDL Bug Unit		257
Controller Link Poordo/	Controllor Link Linit	CS1 CPU Bus Unit		357
Unit	Controller Link Boards	Personal computer ISA board		359
				203
PROFIBUS-DP UNITS				301
DoviceNet and Comm-				30∠ 262
Deviceiver and Compo-				303
		C200H Special I/O Unit		305
0.4.1	CompoBus/S Master Unit	C200H Special I/O Unit	C200HW-SRM21-V1	368
CANopen/User-defined C	AN UNIT	C200H Special I/O Unit	C200HW-CORT21-V1	366

CS1-series

Basic I/O Units

I/O Units



Input Unit CS1W-ID211 16 points

Output Units CS1W-OD21 16 points



AC Input Units CS1W-IAD11 16 points

DC Input Units Classification

CS1 Basic I/O Unit

C200H Basic I/O Unit

C200H Group-2 I/O Units

C200H Special I/O Unit

C200H Special I/O Unit

TTL Input Units Classification



Input Unit CS1W-ID231 32 points

Output Units CS1W-OD23□ 32 points



Triac Output Unit CS1W-OA201 8 points

Triac Output Unit CS1W-OA211 16 points



Input Unit CS1W-ID261 64 points Output Units CS1W-OD26 64 points

I/O Units CS1W-MD26 32/32 points



Relay Output Unit CS1Ŵ-OĊ201 8 independent points Relay Output Unit CS1W-OC211 16 points

Inputs

16 pts

32 pts

64 pts

96 pts

8 pts

16 pts

32 pts

64 pts

32 pts

64 pts

64 pts

32 pts

Inputs

32 pts



Input Unit CS1W-ID291 96 points Output Units CS1W-OD29 96 points

I/O Units CS1W-MD29 48/48 points

Input Unit

32/64 points

Output Units

32/64 points

C200H-ID

C200H-OD

Connections

block

block

block

Connector

Connector

Removable terminal

Removable terminal

Removable terminal

Connections

Connector



C200H-I 8 points **Output Units**

C200H-O

5/8 points



Input Unit C200H-ID 32 points **Output Units** C200H-OD 32 points I/O Units C200H-MD 16/16 points

Model

CS1W-ID211

CS1W-ID231

CS1W-ID261

CS1W-ID291

C200H-ID211

C200H-ID212

C200H-ID216

C200H-ID217

C200H-ID218

C200H-ID219

C200H-ID111

C200H-ID215

Model

C200H-ID501



Input Unit C200H-I 16 points Output Units C200H-O 16 points





Input voltage

12 to 24 V DC

12 to 24 V DC

12 V DC

24 V DC

5 V DC

Input voltage



Remarks

5 mA

Input current: 7 mA

Input current: 6 mA

Input current: approx.

Input current: 10 mA

Input current: 7 mA

Input current: 4.1 mA

Input current: 6 mA

nput current: 4.1 mA

Input current: 4.1 mA

Pulse-catch inputs

Remarks

Programmable Controllers

AC Input Units (and 100 V DC)

Classification	Input voltage	Inputs	Connections	Model
CS1 Basic I/O Units	100 to 120 V AC, or 100 to 120 V DC	16 pts	Removable terminal block	CS1W-IA111
	200 to 240 V AC	16 pts		CS1W-IA211
C200H Basic I/O Units	100 to 120 V AC	8 pts		C200H-IA121
		16 pts		C200H-IA122
				C200H-IA122V
	200 to 240 V AC	8 pts		C200H-IA221
		16 pts		C200H-IA222
				C200H-IA222V

AC/DC Input Units

Classification	Input voltage	Inputs	Connections	Model
C200H Basic I/O Units	12 to 24 V AC/ V DC	8 pts	Removable terminal block	C200H-IM211
	24 V AC/ V DC	16 pts		C200H-IM212

Relay Output Units

Classification	Outputs	Connections	Model
CS1 Basic I/O Units	8 pts (independent)	Removable terminal block	CS1W-OC201
	16 pts		CS1W-OC211
C200H Basic I/O Units	8 pts		C200H-OC221
	12 pts		C200H-OC222
	12 pts		C200H-OC222N
	16 pts		C200H-OC225
	16 pts		C200H-OC226N
	5 pts		C200H-OC223
	8 pts		C200H-OC224
	8 pts		C200H-OC224N

Transistor Output Units

Classification	Outputs	Max. switching capacity	Connections	Model
CS1 Basic I/O Units	16 pts	12 to 24 V DC, 0.5 A/pt, 8 A/Unit sinking	Removable	CS1W-OD211
		24 V DC, 0.5 A/pt, 5 A/Unit, sourcing, short circuit protec-	terminal block	CS1W-OD212
		tion, alarm		
	32 pts	12 to 24 V DC, 0.5 A/pt, 5 A/Unit, sinking	Connector	CS1W-OD231
		24 V DC, 0.5 A/pt, 5 A/Unit, sourcing, short circuit protec-		CS1W-OD232
		tion, alarm		
	64 pts	12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sinking		CS1W-OD261
		24 V DC, 0.3 A/pt, 6.4 A/Unit, sourcing, short circuit protec-		CS1W-OD262
		tion, alarm		
	96 pts	12 to 24 V DC, 0.1 A sinking, 7.2 A/Unit		CS1W-OD291
		12 to 24 V DC, 0.1 A sourcing, 7.2 A/Unit		CS1W-OD292
C200H Basic I/O Units	8 pts	12 to 48 V DC, 1 A sinking	Removable	C200H-OD411
	8 pts	24 V DC, 2.1 A, sinking	terminal block	C200H-OD213
	8 pts	24 V DC, 0.8 A, sourcing, short circuit protection]	C200H-OD214
	8 pts	5 to 24 V DC, 0.3 A, sourcing	Ī	C200H-OD216
	12 pts	24 V DC, 0.3 A, sinking	Ī	C200H-OD211
	16 pts	24 V DC, 0.3 A, sinking	Ī	C200H-OD212
	12 pts	5 to 24 V DC, 0.3 A, sourcing	Ť	C200H-OD217
	16 pts	24 V DC, 1.0 A, sourcing, short circuit protection	Ī	C200H-OD21A
	16 pts	24 V DC, 0.3 A, sinking	Ī	C200H-OD212
C200H Group-2 I/O Units	32 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking	Connector	C200H-OD218
	32 pts	500 mA at 24 V DC, sourcing, short circuit protection	Ī	C200H-OD21B
	64 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking	Ī	C200H-OD219
C200H Special I/O Unit	32 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking		C200H-OD215
	-	128-pt dynamic outputs possible		

TTL Output Unit

Classification	Outputs	Max. switching capacity	Connections	Model
C200H Special I/O Unit	32 pts	5 V DC, 35 mA 128-pt dynamic outputs possible	Connector	C200H-OD501

Triac Output Units

Classification	Outputs	Max. switching capacity	Connections	Model
CS1 Basic I/O Units	8 pts	250 V AC, 1.2 A, 50/60 Hz	Removable terminal block	CS1W-OA201
	16 pts	250 V AC, 0.5 A, 50/60 Hz		CS1W-OA211
C200H Basic I/O Units	8 pts	250 V AC, 1.2 A, 50/60 Hz		C200H-OA223
	12 pts	250 V AC, 0.3 A, 50/60 Hz		C200H-OA222V
	12 pts	250 V AC, 0.5 A, 50/60 Hz	Ţ	C200H-OA224

Mixed I/O Units

Name	Classifica- tion	Inputs/ Outputs	Input voltage	Max. switching ca- pacity	Connections	Model	Remarks
DC Input/ Transis- tor Output Units	CS1 Basic I/O Units	32 inputs/ 32 outputs	24 V DC	12 to 24 V DC, 0.3 A, sinking	Connector	CS1W-MD261	
		32 inputs/ 32 outputs		24 V DC, 0.3 A, sourcing, load short protection, alarm		CS1W-MD262	
		48 inputs/ 48 outputs	24 V DC	12 to 24 V DC, 0.1 A, sinking		CS1W-MD291	
		48 inputs/ 48 outputs		12 to 24 V DC, 0.1 A, sourcing		CS1W-MD292	
	C200H Spe- cial I/O Units	16 inputs/ 16 outputs	24 V DC	16 mA at 4.5 V to 100 mA at 26.4 V DC, sinking		C200H-MD215	Pulse-catch inputs, 128-pt dynamic outputs possible
		16 inputs/ 16 outputs	12 V DC	24 V DC, 50 mA, sinking		C200H-MD115	

Note: In addition to the normal I/O functions, C200H High-density I/O Units (Special I/O Units) provide the following functions.

- Dynamic I/O (except for OD501/OD215): In stead of normal static inputs and normal static outputs, dynamic outputs and dynamic inputs are used to increase I/O capacity to 128 inputs and 128 outputs through the use of strobe signal outputs. These functions can be used to reduce wiring to devices with more digits, such as displays and keyboards.
- Pulse-catch Inputs (except OD501/OD215): Eight of the inputs can be set as pulse-catch inputs to reliably capture short pulses from devices like photomicroswitches.

TTL I/O Unit

Name	Classification	Inputs/ Out- puts	Input voltage	Max. switch- ing capacity	Connections	Model	Remarks
TTL I/O Unit	CS1 Basic I/O Units	32 inputs + 32 outputs	5 V DC	5 V DC, 35 mA	Connector	CS1W-MD561	
	C200H Special I/O Units	16 inputs/ 16 outputs				C200H-MD501	Pulse-catch, 128-pt dynamic outputs possible

High-speed Input

Name	Classification	Inputs	Max. switching capacity	Model
Pulse-catch Input Unit	CS1 Basic I/O Units	16 pts	24 V DC, 7 mA	CS1W-IDP01

Circuit Configuration and Terminal Arrangement

CS1W-ID211



CS1W-ID231



CS1W-ID261



CS1W-ID291



CS1W-IA111



CS1W-IA211



CS1W-OC201



CS1W-OC211





CS1W-OD212





CS1W-OD232



CS1W-OD261





CS1W-OD291







CS1W-OA211



CS1W-MD261



CS1W-MD262



CS1W-MD291





CS1W-MD292



CS1W-MD561



CS1W-IDP01



CS1W-INT01, C200HS-INT01

Interrupt Input Units

Triggers interrupt task execution in the CPU

- When the CPU Unit receives an Input from the Interrupt Input, the CPU Unit immediately suspends execution of the Cyclic Task (Regular Program) and executes the I/O Interrupt Task (CS1G/CS1H Only). The Interrupt Input Unit operates as a regular Input Unit in the CS1D PLCs.
- Mount the Interrupt Input Unit in the CPU Rack.
- Up to 2 CS1W-INT01 or 4 C200HS-INT01 Interrupt Input Units can be mounted.

System Configuration



Circuit Configuration (CS1W-INT01)



Terminal Arrangement (CS1W-INT01)



Polarity of the input power supply can connected in either direction.



Specifications

Classifications	Input voltage	Inputs	Input pulse width	Connections	Allocations	Model
CS1W Basic I/O Unit	24 V DC	16 pts	ON: 0.1 ms min. OFF: 0.5 ms min.	Removable terminal block	16 bits (CIO 0319 to CIO 2000)	CS1W-INT01
C200H Basic I/O Unit	12 to 24 V DC	8 pts	ON: 0.2 ms max. OFF: 0.5 ms max.		8 bits	C200HS-INT01

Note: The interrupt function can be used with the CPU backplane (except CS1D) only.

C200H-TM001

Analog Timer Unit

Easy On-site timer Adjustments

 Provides four timers easily adjusted on-site via front-panel adjustments or external variable resistors: No Programming Device required. Using timer pause inputs enables Usage as accumulative timer.



System Configuration



Specifications

Classification	Timers	Setting range	Time setting method	CPU Unit bits	Allocations (CIO 0319 to CIO 2000)	Model
C200H Basic I/O Unit	4 pts	0.1 to 1.0 s, 1 to 10 s, 2 to 60 s, 1 to 10 min	Internal or external variable resistor	Timer set input, tim- er pause input, and time up output	16 bits	C200H-TM001

Safety Relay Unit

Reduced Wiring and Space for Safety Circuits

- This Safety Relay Unit mounts as an I/O Unit and provides both safety relays and inputs for monitoring.
- Safety relays and monitor inputs in 1 Unit to reduce wiring and space.
- Safety relays operate with separate power supply from PLC.
- Monitor safety circuit output, K1/K2 relay, or power status from PLC.
- Four general-purpose inputs provided.
- Safety standards: EN954-1 and EN60204-1



Internal Connections



Specifications

General

Item	Specifications
Contact resistance	100 mΩ (5 V DC, 1 A, voltage drop method)
Operating time	300 ms max. (not including bounce)
Response time	10 ms max. (time from input OFF to main contact OFF, not including bounce)
Insulation resistance (See note.)	$20 \ M\Omega$ min. (at 500 V DC) for following: Safety circuits-safety outputs, General inputs-safety outputs, Different poles of safety outputs, and safety circuits-general inputs
Withstand voltage (See note.)	2,500 V AC, 50/60 Hz for 1 min for following: Safety circuits-safety outputs, General inputs- safety outputs, Different poles of safety outputs 500 V AC, 50/60 Hz for 1 min for Safety circuits- general inputs
Durability	Mechanical: 5,000,000 min. (7,200 time/hr) Electrical: 100,000 min. (1,800 time/hr)
Weight	300 g

Note: Measured while mounted to PLC.

Ratings of Safety Circuits

Item		Specification
Power	Supply voltage	24 V DC
	Fluctuation	^{-15%} / _{+10%} of supply voltage
	Consumption	24 V DC: 1.7 W max.
Inputs	Current	75 mA max.
Switching	Rated load	250 V AC, 5 A
	Rated ON current	5 A

Ratings of General Inputs

Item	Specifications
Power voltage	24 V DC
Fluctuation	^{-15%} / _{+10%} of supply voltage
Input impedance	3.3 kΩ
Input current	7 mA typ. (24 V DC)
ON voltage/current	14.4 V DC min./3 mA min.
OFF voltage/current	5 V DC max./1 mA max.
ON/OFF response	8 ms max. (Set to 1 to 32 in PC Setup)
Circuits	4 points, 1 common
ON points	100% simultaneously ON

Analog I/O Selection Guide

Classification	Model	I/O capacity	Isolation between I/O points*	I/O ranges/types	Conversion time	Remarks	Page
Analog Input	CS1W-AD041-V1	4 inputs	No	1 to 5 V, 0 to 5 V,	0.25 ms/pt		318
Units	CS1W-AD081-V1	8 inputs		0 to 10 V, ±10 V, 4 to 20 mA			
	CS1W-AD161	16 inputs				2 x 34-pin MIL connectors	318
	CS1W-PTW01	4 inputs	Yes	1 to 5 V, 4 to 20 mA	1 to 5 V, 4 to 20 mA 100 ms/4 pts		326
	CS1W-PDC11	4 inputs		4 to 20mA, 0 to 20mA, 0 to 10V, +/-10V, 0 to 5V, +/-5V, 1 to 5V, 0 to 1.25V, +/-1.25V	20 ms/4 pts, 10 ms/2 pts	Process value alarms (HH,H,L,LL) Rate-of-change calculation and alarm Input disconnection detection Top, bottom, valley hold Accumulated value output Variable range zero-span adjustment	326
	CS1W-PDC55	8 inputs		4 to 20 mA, 0 to 10 V, 0 to 5 V, 1 to 5 V	250 ms/8 pts	Measured value alarms (H, L) and other features	326
	CS1W-PTR01		No	-1 mA to 1 mA, 0 to 1 mA	200 ms/8 pts	Motor overdrive prevention, measured value alarms (H, L), other features	326
	CS1W-PTR02			-100 mV to 100 mV, 0 to 100 mV		Measured value alarms (H, L), other features	326
	C200H-AD003			1 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA	1 ms/pt max.		318
Analog Output Units	CS1W-DA041	4 outputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA	1 ms/pt		320
	CS1W-DA08V	8 outputs		1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V			
	CS1W-DA08C			4 to 20 mA			
	C200H-DA003	8 outputs	No	1 to 5 V, 0 to 10 V, –10 to 10 V	1 ms/pt max.		320
	C200H-DA004			4 to 20 mA			
Analog I/O Unit	CS1W-MAD44	4 inputs and 4 outputs	No	Inputs: 1 to 5 V, 0 to 5 V, 1 ms/pt 0 to 10 V, ±10 V, 4 to 20 mA Outputs: 1 to 5 V, 0 to 5 V, 0 to 10 V ±10 V			322
	C200H-MAD01	2 inputs and 2 outputs		Inputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, \pm 10 V, 4 to 20 mA Outputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, \pm 10 V	1 ms/pt max.		
Temperature	CS1W-PTS11	4 inputs	Yes	B, E, J, K, L, N, R, S, T, U,	20 ms/4 pts	Measured value alarms	
Sensor Input Units	CS1W-PTS12	-		WHe5-26, PLII, ±100 mV Pt100Ω (JIS, IEC), JPt100Ω, Pt50Ω, Ni508.4Ω	10 ms/2 pts	(HH, H, L, LL), input disconnection alarms, top hold, bottom hold, valley hold, zero span adjustment over user-set range, other fea- tures.	
	CJ1W-PTS51			B, J, K, R, S, T, L	250 ms/4 pts	Measured value alarms (H, L),	336
	CJ1W-PTS52			Pt100 (IEC, JIS), JPt100	250 ms/8 pts	input disconnection alarm,	
	CJ1W-PTS55	8 inputs	1	B, J, K, R, S, T, L	250 ms/4 pts	and other leadnes	
	CJ1W-PTS56	1		Pt100 (IEC, JIS), JPt100	250 ms/8 pts	1	
	C200H-TS001	4 inputs	No	K, J	4.8 s max.		336
	C200H-TS002			K, L	1		
	C200H-TS101			JPt100	1		
	C200H-TS102	5 inputs		Pt100			

Note: Inputs are isolated from PLC signals for all Units.

CS1W-AD 1-V1, C200H-AD003

Analog Input Units

Convert Analog Signals to Binary Data

- Wire burnout detection
- Peak-hold function
- Moving average filter function
- Offset gain setting
- Note: Analog Input Terminals are also available as remote I/O terminals for DeviceNet, PROFIBUS-DP or CompoBus/S.



Function

Converts input signals such as 1 to 5 V or 4 to 20 mA to binary values between 0000 and 0FA0 Hex and stores the results in the allocated words each cycle. The ladder diagram can be used to transfer the data

to the DM Area or the SCALING instructions (e.g., SCL(194)) can be used to scale the data to the desired ranges.

Terminal Arrangement

CS1W-AD041-V1

		A1	Input 1 (+)	
Input 2 (+)	B1			
Input 2 (-)	B2	A2	Input 1 (–)	
	22	A3	AG	
AG	B3			
Input 4 (1)	B4	A4	Input 3 (+)	
input 4 (+)	<u> </u>	A5	Input 3 (–)	
Input 4 (–)	B5	4.0	N.C.	
N.C.	B6	A6		
		A7	N.C.	
N.C.	B7			
NO	B8	A8	N.C.	
N.C.	50	A9	N.C.	
N.C.	B9			
NO	D10	A10	N.C.	
N.C. B10		A 1 1	NO	
			N.C.	

CS1W-AD081-V1			
		A1	Input 1 (+)
Input 2 (+)	B1		
Input 2 (–)	B2	A2	Input 1 (–)
		A3	AG
AG	ВЗ	A4	Input 3 (+)
Input 4 (+)	B4		
Input 4 (–)	B5	AS	Input 3 (–)
	B6	A6	Input 5 (+)
		A7	Input 5 (–)
Input 6 (–)	B7	48	AG
AG	B8		
	RQ	A9	Input 7 (+)
		A10	Input 7 (–)
Input 8 (–)	B10		
		A11	N.C.

CS1W-AD161

CN2	Inputs	9	to16
	inputo	0	1010

Input 9+	1	2	Input 10+
Current mode 9	3	4	Current mode 10
Input 9–	5	6	Input 10–
AG	7	8	AG
Input 11+	9	10	Input 12+
Current mode 11	11	12	Current mode 12
Input 11–	13	14	Input 12–
AG	15	16	AG
Input 13+	17	18	Input 14+
Current mode 13	19	20	Current mode 14
Input 13–	21	22	Input 14–
AG	23	24	AG
Input 15+	25	26	Input 16+
Current mode 15	27	28	Current mode 16
Input 15-	29	30	Input 16-
AG	31	32	AG
NC	33	34	NC

CN1 Inputs 1 to 8						
Input 1+	1	2	Input 2+			
Current mode 1	3	4	Current mode 2			
Input 1–	5	6	Input 2–			
AG	7	8	AG			
Input 3+	9	10	Input 4+			
Current mode 3	11	12	Current mode 4			
Input 3–	13	14	Input 4–			
AG	15	16	AG			
Input 15+	17	18	Input 6+			
Current mode 5	19	20	Current mode 6			
Input 5–	21	22	Input 6–			
AG	23	24	AG			
Input 7+	25	26	Input 8+			
Current mode 7	27	28	Current mode 8			
Input 7–	29	30	Input 8–			
AG	31	32	AG			
NC	33	34	NC			

Specifications

Model		CS1W-AD041-V1 CS1W-AD081-V1		CS1W-AD081-V1	C200HW-AD003	CS1W-AD161			
Classification		CS1 Special I/O Units	CS1 Special I/O Units		CS1 Special I/O Units				
Unit num	Unit number		0 to 95	0 to 95	0 to F	0 to 94			
Inputs			4 pts	8 pts	8 pts	16 pts			
Signal	Voltages	1 to 5 V	Yes		*				
range		0 to 10 V	Yes						
		0 to 5 V	Yes	Yes		Yes			
		-10 to 10 V	Yes	Yes					
	Currents	4 to 20 mA	Yes	Yes					
		0 to 20 mA							
Signal range settings		4 settings	8 settings	8 settings	16 settings				
		(one for each point)	(one for each point)	(one for each point)	(one for each point)				
Resolutio	n		1/8000	1/8000	1/4000	1/8000			
Conversi	on speed		0.25 ms/pt max.	0.25 ms/pt max.	1 ms/pt. max	0.25 ms/pt			
Overall a	ccuracy (at 25	5 °C)	Voltage: ±0.2%	Voltage: ±0.2%					
			Current: ±0.4% Current: ±0.2%						
Connections			Terminal block	Terminal block 2 x 34 point MIL connectors					
Features	Wire burno	ut detection	Yes	Yes					
	Peak-hold	unction	Yes	Yes					
	Mean funct	ion	Yes	Yes					

Note: Process I/O Units with individually isolated channels are also available for analog I/O. Refer to page 326.

CS1W-DA0 , C200H-DA00

Analog Output Units

Convert Binary Data to Analog Signals

- Output limit
- Upper/Lower limit alarms

• Offset gain adjustment

Note: The functions provided depend in the model used. Analog Output Terminals are also available as remote I/O terminals for DeviceNet, PROFIBUS-DP or CompoBus/S.



Function

Binary data in the allocated words is converted to analog signals such as 1 to 5 V or 4 to 20 mA for output. All that is required in the ladder diagram is to place the data in the allocated words.

Terminal Arrangement

CS1W-DA08V/08C

		A1	N.C.
N.C.	B1		
Output 2 (+)	B2	A2	Output 1 (+)
	02	A3	Output 1 (–)
Output 2 (–)	B3		
Output $4(\pm)$	B4	A4	Output 3 (+)
	<u> </u>	A5	Output 3 (-)
Output 4 (–)	B5	4.0	
Output 6 (+)	B6	AO	Output 5 (+)
		A7	Output 5 (-)
Output 6 (–)	B7	4.0	
O_{i}	B8	Að	Output 7 (+)
		A9	Output 7 (–)
Output 8 (–)	B9	A 1 0	
NC	B10	AIU	N.C.
N.C. BIU		Δ11	NC
			N.O.

CS1W-DA041

		A1	N.C.	
N.C.	B1		-	
Output voltage 2 (+)	B2	A2	Output voltage 1 (+)	
		A3	Output 1 (–)	
Output 2 (–)	B3	Δ4	Output current 1 (+)	
Output current 2 (+)	B4	74		
	DE	A5	N.C.	
N.C.	БЭ	A6	N.C.	
N.C.	B6			
	B7	A7	Output voltage 3 (+)	
	5,	A8	Output 3 (–)	
Output 4 (–)	B8	10		
	B9	A9	Output current 3 (+)	
Output current 4 (+)	20	A10	N.C.	
N.C.	B10			
		A11	N.C.	
		/\\\	-	

Specifications

Madal							
wodel			CSTW-DA041	CSTW-DA08V	CSTW-DA08C	C200H-DA003	C200H-DA004
Classification			CS1 Special I/O Units		C200H Special I/O Ur	nits	
Unit numbers			0 to 95	0 to 95	0 to 95	0 to F	0 to F
Outputs			4 pts	8 pts	8 pts	8 pts	8 pts
Signal range	Voltages	1 to 5 V	Yes	Yes		Yes	
		0 to 10 V	Yes	Yes		Yes	
		0 to 5 V	Yes	Yes			
		-10 to 10 V	Yes	Yes		Yes	
	Currents	4 to 20 mA	Yes		Yes		Yes
		0 to 20 mA					
Signal range	settings		4 settings (one for each point)	8 settings (one for each point)			
Resolution			1/4000	1/4000	1/4000	1/4000	1/4000
Conversion speed		1.0 ms/pt max.	1.0 ms/pt max.	1.0 ms/pt max.	1.0 ms/pt max.	1.0 ms/pt max.	
Overall accuracy (at 25 °C)		Voltage: ±0.3%FS Current: ±0.5%FS	±0.3% FS	±0.5% FS	±0.3% FS	±0.5% FS	
Connections			Terminal block				
Features	Output hold	function		Yes	Yes	Yes	Yes

Note: Process I/O Units with individually isolated channels are also available for analog I/O. Refer to page 326.

CS1W-MAD44, C200H-MAD01

Analog I/O Units

Analog Inputs and Outputs combined in One Unit

One Unit performs both analog input and analog output operations. The Unit can also be used for ratio and bias processing, which can be performed on analog inputs to output the results as analog outputs.

- · Moving average filter function
- · Peak hold function
- Wire burnout detection
- · Output hold function
- · Ratio conversions

Function



Terminal Arrangement (CS1W-MAD44)

		A1	Output 1 (+)
Output 2 (+)	B1		
Output 2 (-)	B2	A2	Output 1 (–)
	-	A3	Output 3 (+)
Output 4 (+)	B3		
Output $4(-)$	B/	A4	Output 3 (–)
		Δ5	NC
N.C.	B5	7.5	11.0.
Innut Q (.)	DC	A6	Input 1 (+)
input 2 (+)	BO		lement 1 ()
Input 2 (–)	B7	A/	input i (–)
		A8	AG
AG	B8	-	
Input $A(\pm)$	BO	A9	Input 3 (+)
	03	Δ10	Input 3 ()
Input 4 (–)	B10	////	input o ()
· · · ·	1	A11	N.C.

Specifications

Model			C200H-MAD01	CS1W-MAD44
Classification			C200H Special I/O Unit	CS1 Special I/O Unit
Unit numbers			0 to F	0 to 95
Inputs			2 pts	4 pts
Outputs			2 pts	4 pts
Input signal ranges	Voltages	1 to 5 V	Yes	Yes
		0 to 5 V		Yes
		0 to 10 V	Yes	Yes
		-10 to 10 V	Yes	Yes
		4 to 20 mA	Yes	Yes
Output signal ranges	Currents	1 to 5 V	Yes	Yes
		0 to 5 V		Yes
		0 to 10 V	Yes	Yes
		-10 to 10 V	Yes	Yes
		4 to 20 mA	Yes	
Resolution			1/4000 (inputs/outputs)	1/4000 (inputs/outputs)
Conversion speed			1.0 ms/pt max (inputs/outputs)	1.0 ms/pt max (inputs/outputs)
Overall Inputs accuracy Outputs			Voltage: ±0.2%	Voltage: ±0.2%
		Voltage: ±0.3% Current: ±0.5%	Voltage: ±0.3%	
Connections			Terminal block	Terminal block
Features	Mean function		Yes	Yes
	Peak hold		Yes	Yes
	Wire burnout detection		Yes	Yes
	Output hold		Yes	Yes
	Ratio conversion		Yes	Yes
CS1W-LC001, CS1W-LCB01/05, CS1D-CPU

Loop Control Unit

Programmable Controllers

Integrate Process Control and Monitoring functions with PLC sequence control. With easy-to-use DCS-style function block configuration, complex control systems can be set up in minutes.

- The control system can be scaled to match the controlled system, from a few loops that replace a Controller to hundreds of loops that perform large-scale process control.
- A variety of control programs can be created by selecting from more than 70 kinds of function blocks suitable for loop control, such as PID calculations, Segment Programs, and square root calculations.
- The CX-Process Tool, included in CX-One, can be used for easy programming.
- A Tuning Screen can be opened in the CX-Process Tool to change parameters while monitoring the status.
- Duplex systems are available for applications that require high reliability.
- The NS Face Plate Auto Builder software can be used to automatically create a touch panel for NS-series PTs from a function block screen.



Function

The CS1-series Loop Control Boards and Units are packed with DCS functions and can use function block programs, which are ideal for process control. Graphical programming can be used, so function blocks can be pasted into a window and connected with the mouse.

A wide variety of control methods can be executed, from regular PID control to cascade control and feed-forward control.

System Configuration





Function Block Example



Specifications

Item		Specification				
Name		Loop Control Board			Loop Control Unit (See note 1.)	
Unit type		CS-series Inner Board			CS-series CPU Bus Unit	
Model		CS1W-LCB01 Standard Inner Board	CS1W-LCB05 Ad- vanced Inner Board	CS1D-LCB05D Duplex Inner Board (See note 3.)	CS1W-LC001	
Applicable PLCs		CS1G/H-CPU□□F	CS1G/H-CPU□□H	CS1D-CPU (Duplex compatible)	CS-series	
Mounting location		CPU Unit's Inner Board	slot	•	CPU Rack	
Max. number of B	oards/Units	1 Board max. per CPU l	Unit		3 Units max. per CPU Unit	
Data exchange with CPU Unit	Allocation of specific words in a data area	User Link Table function A function block's ITEM Unit data area (CIO, WF	n: data can be allocated to R, HR, DM, or EM bank (specified words in a CPU)).	CPU terminal block: A function block's ITEM data can be allo- cated to any CPU Unit data area.	
	Allocation of all data	HMI Interface function: The ITEM data of a Con Block can be allocated t bank 0.)	trol Block, Operation Blo o a specified EM bank. (Send/Receive All Blocks: Can be allocated to any CPU Unit data area (no default setting).		
Setting switches	·	None		Front panel rotary switches: Unit number setting (0 to F)		
Indicators		Three LED indicators: Running, Ready, and Co	omm. port sending/recei	Five LED indicators: Running, Comm. port sending, Comm. port receiving, CPU Unit error, and Unit error		
Front panel conne	ectors	One RS-232C port (for c	connection of an ES100			
Data Backup		Super capacitor backs u tables and step ladder p	p all function block data program instructions).	Battery backs up all function block data and contents of the error log.		
Backup time of ba	ckup capacitor or battery	24 hrs at 25°C (The bac	kup time is shorter at hig	5 years at 25°C (The battery life is shorter at higher temperatures.)		
Data stored in flas	h memory	Function block data, dat time), and error log data	a in RAM (can be backe	d up or recovered at any	Function block data and data in RAM (can be backed up or recovered at any time)	
Effect on the CPU	Unit's cycle time	0.8 ms max.		20 ms max. (See note 2.)	0.2 ms	
Current consumpt Supply Unit)	ion (supplied by the Power	220 mA at 5 V DC Note: The current consu Adapter is being used.	mption is 150 mA higher	360 mA at 5 V DC Note: The current consumption is 150 mA higher when an NT-AL001 Link Adapter is being used.		
Dimensions		34.5 x 130 x 100.5 mm	(W x H x D)			
Weight		100 g max.			220 g max.	
Standard accesso	ries	None			C200H-BAT09 Battery Set (factory installed in Unit)	

Note: 1. The Loop Control Unit described in this table is equipped with the Version 2.5 functions.

2. The CPU Unit's cycle time will be extended by 2.1 s max during duplex initialization.

3. The CS1D-LCB05D Duplex Loop Control Board is not available separately.

It can only be purchased in combination with a Duplex CPU as models CS1D-CPU65P or CS1D-CPU67P.

Functional Specifications

Item			Specifications				
Model numbers			CS1W-LCB01	CS1W-LCB05 CS1D-LCB05D	CS1W-LC001		
Operation method			Function block method		•		
Operation cycle			Settable cycles: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, Can be set for each function bloc	or 2 s(default: 1 s) ck. (See note 1.)	Settable cycles: 0.1, 0.2, 0.5, 1, or 2 s (default: 1 s) Can be set for each function block.		
Number of function blocks	Analog operation	Control blocks (See note 2.)	50 blocks max.	500 blocks max.	32 blocks max.		
		Operation blocks (See note 3.)			249 blocks max.		
		External controller blocks	32 blocks max. (CS1D-LCB05D	not included)	·		
	Sequence control	Sequence tables	None	200 tables max. 32 conditions and 32 actions per table max. (expandable to 64 conditions and 64 actions per ta- ble) 6,400 rules total max.	None		
		Step ladder program blocks	20 blocks max. 2,000 commands total 100 commands max. per block Separable into a 100 steps max.	200 blocks max. 4,000 commands total 100 commands max. per block Seperable into a 100 steps max.			
	I/O blocks	Field terminal blocks	80 blocks max.				
		User link tables	2,400 data items max.		None		
		All data	HMI functions 2,040 words max. Allocated 1 EM Area bank	HMI functions 20,040 words max. Allocated 1 EM Area bank	Send/Receive All Blocks: 1 block each max.		
		CPU terminal blocks	None		16 blocks max.		
		Node terminal blocks	None		1000 blocks max.		
	System common blo	ocks	1 block max.				
Method for creating function blocks	and transfering		Created and transferred using C	X-Process Tool (purchased separa	ately).		
Control methods	PID control method		PID with 2 degrees of freedom (w	with auto-tuning)			
	Control combination	S	Any of the following function blocks can be combined: Basic PID control, cascade control, feed-forward control, sample PI control, Smith dead time compen- sation control, PID control with differential gap, override control, program control, time-proportional control, etc.				
Alarms	PID block internal al	arms	4 PV alarms (upper upper-limit, u per PID block	upper limit, lower limit, lower lower	limit) and 1 deviation alarm		
	Alarm blocks		High/low alarm blocks, deviation	alarm blocks			

Note: 1. Operation cycles of 0.01, 0.02, and 0.05 s cannot be set for the CS1D-LCB05D.

2. Control blocks such as those for PID control.

3. Operation blocks for process control such as those for alarms, square roots, time/date calculations, and pulse-train computations.

CS1W-P

Process I/O Units

Wide variety of built-in signal conversion functions for direct process signal inputs.

- External converters, isolators or transducers are not required: Greatly reduces costs, space requirements, and labor.
- Receives temperature and other analog inputs.
- Built-in alarms on measured value and rate-of change reduce the amount PLC programming.
- Control outputs can be limited with the output rate-of-change limit and output high/low limit.
- Data processing includes peak/bottom hold and top/valley hold functions.
- Count the number of times that a preset threshold value is exceeded and totalize analog values.



Function

Choose from a total of 13 models, including 11 isolated-type models, to handle essentially all normal data collection and process control applications. High-speed (10 ms) and high-resolution (1/64,000) models are available for use in a wide range of applications, from data logging to high-speed temperature control.

Terminal Arrangement

CS1W-PTS01-V1



CS1W-PTS01-V1 Isolated-type Thermocouple Input Unit

Programmable Controllers

CS1W-PTS11



CS1W-PTS51



CS1W-PTS55



CS1W-PTS02

CS1W-PTS02 Isolated-type Resistance Thermometer Unit

				NO		
	N.C.	B1	AI	N.C.]	
			A2	1A		
	N.C.	B2	43	1B		Resistance thermometer
	N.C.	B3	70		\sim 1	No. 1 input
	24	DA	A4	1b		
	28	D 4	A5	3A		
Resistance thermometer §	2B	B5				Resistance thermometer
No. 2 input	2h	B6	A6	38	× *	
-	20	DO	A7	3b		No. 3 Input
	N.C.	B7	10			
	N.C.	B8	AO	N.C.		
			A9	4A		
	N.C.	B9	A10	4B	1 2	Resistance thermometer
	N.C.	B10		40	[]	No. 4 input
		L	A11	4b	$\vdash \rightarrow$	

CS1W-PTS03

CS1W-PTS03 Isolated-type Resistance Thermometer Unit



CS1W-PTS56

No. 1	_	1A	B1	A 1	0.4	1
Platinum-resistance	I	1B	B2	AI	2A	No. 2
I hermometer input		1b	B3	A2	2B	Thermometer input
		24	D4	A3	2b	
No. 3 Platinum-resistance Thermometer input	Í.	3A	D4	A4	4A	No 4
		3B	B5	A5	4B	Platinum-resistance
		3b	B6	10	15 4b	Thermometer input
No 5		5A	B7	AO	40	4
Platinum-resistance		5B F	B8	A7	6A	No. 6
Thermometer input		5-1 5-b	BO	A8	6B	Platinum-resistance
		50	59	A9	6b	
No. 7		7A	B10	A10	8A	
Platinum-resistance Thermometer input	Ē	— 7B E		A 11	0P	Platinum-resistance
		7b	B12	AII	00	Thermometer input
				A12	8b	

CS1W-PTW01

CS1W-PTW01 Isolated-type 2-Wire Transmitter Input Unit

		Δ1	P1+	+		
V1	B1	~'	1 17		2-wire	No.1
	_	A2	11	_	transmitter	
COM1	B2	40	DO .	+		
V2	B3	A3	P2+		2-wire	No 2
VL	00	A4	12	1	transmitter	110.2
COM2	B4			+		
1/2	DE	A5	P3+		2-wire	No 2
V3	БЭ	46	13		transmitter	N0.5
COM3	B6	~~	10	↓.		
		A7	P4+	+	2 wiro	
V4	B7	40	14	-	transmitter	No.4
COM4	B8	AO	14		tranomitter	
	00	A9	N.C.			
N.C.	B9			-		
NC	D10	A10	N.C.			
N.O.	ы	A11	NC	1		

	2-Wire Tr	ansmit	tter Inp	out Unit	-				
	1/1	D1	A1	P1+					
	V1	DI	-A2	11	1—	-	←+	Current	٦
	СОМ1	B2	A3	P2+			_	output device	No."
	V2	B3	A4	12			←+	Current	_ ר
	COM2	B4	Λ <u>5</u>	 			_	output device	No.2
	V3	B5	A0	F3+			←+	L	
_	СОМЗ	B6	Ab	13			_	Current output	No.3
	V4	B7	A7	P4+			<u> </u>	device	
	COM4	B8	A8	14			· ·	Current output	No
		DO	A9	N.C.		Г	_	device	
	N.C.	Da	A10	N.C.					
	N.C.	B10	A11	NC	1				

CS1W-PDC01

Voltage input

r	ı+	144		A1	N.C.
Voltage output		V1	BI	A2	11
device		COM1	B2	10	
	+	V2	B3	A3	N.C.
Voltage output device	_	COMO	D4	A4	12
) \ +	COIVIZ	D4	A5	N.C.
Voltage output		V3	B5	46	13
device	-	СОМЗ	B6	70	10
	<u>+</u>	VA	B7	A7	N.C.
Voltage output device	_	00144	<u>D</u> ,	A8	l4
]	COM4	88	A9	N.C.
		N.C.	B9	A 10	NO
		N.C.	B10	AIU	N.C.
				A11	N.C.

Current input



CS1W-PDC11

Voltage Inputs

Current inputs

Γ

		CS1W-PDC11									
	1+			A1	N.C.						
Voltage output	_	V1	B1	A2	11						
device		COM1	B2	A3	NC						
Voltage	<u> </u>	V2	B3	A.4	10						
device		COM2	B4	A4	12						
Voltage	<u> +</u>	V3	B5	A5	N.C.						
output	_	COM3	B6	A6	13						
Voltago	, 1 +		D7	A7	N.C.						
output	_	V4	D/	A8	14						
device]	COM4	В8	A9	N.C.						
		N.C.	B9	Δ10	NC						
		N.C.	B10	710	11.0.						
				A11	N.C.						

	CS1W-PDC11									
+		1_	A1	N.C.						
Current output	V1	B1	A2	1						
	COM1	B2	Δ3	N C						
Current output	V2	B3		10.0.						
device –	 COM2	B4	A4	12						
Current output	 V3	B5	A5	N.C.	1					
device –	СОМЗ	B6	A6	13						
+	 VA	B7	A7	N.C.						
device –	00144		A8	14						
	COM4	88	A9	N.C.						
	N.C.	B9	A10	NC						
	N.C.	B10	A11	N.C.						
					1					

CS1W-PDC55

Voltage Inputs

	CS1W-PDC55										
	լ+	V1+	B1			+					
Voltage		11+	B2	A1	V2+	T	Voltage				
output device	-	COM1	B3	A2	12+		output device				
	<u>1 +</u>	V3.	B/	A3	COM2	-					
Voltage		10.	D4	A4	V4+	+					
output device	-	13+	<u>Б</u> р	A5	14+		Voltage output device				
		COM3	B6	A 6	COM4	-					
Mallana	+	V5+	B7	10		+					
voitage		15+	B8	Α/	V6+		Voltage				
output do noo	-	COM5	B9	A8	l6+		output device				
	1 +	V7.	B10	A9	COM6	-					
Voltage		17.	DIU	A10	V8+	+					
output device		1/+	BII	A11	18+		Voltage				
	-	COM7	B12	A10	COM9	-	output device				
				AIZ	CONIO						

Current inputs

CS1W-PDC55										
	+ +	V1+	B1			ı .				
Current output		11+	B2	A1	V2+		Current output			
device	-	COM1	B3	A2	l2+		device			
	+ •		D0 D4	A3	COM2	-				
Current output device	Ī	V 3+	D4	A4	V4+	+				
		13+	B2	A5	14+		Current output			
	-	COM3	B6	10	COM4	_	device			
	+ +	V5+	B7	AO	COIVI4	+				
Current output		15+	B8	A7	V6+		Current output			
device	-	COME	BO	A8	l6+		device			
	. + .	V7.	D3	A9	COM6					
Current output		V/+	ыл	A10	V8+	+				
device		17+	B11		10.		Current output			
	-	COM7	B12	A11	۱ö+		device			
				A12	COM8					

CS1W-PTR01

CS1W-PRT01 Power Transducer Input Unit

	······			A1	1+	Power	N . 4
No.2	Power	- 2+	BI	A2	1_	 transducer	NO.1
	transducer	2-	B2	43	31		
	Power	4+	B3	<u> </u>		Power	No.3
N0.4	transducer	4-	B4	A4	3-	transuucei	
No.6		6.	B5	A5	5+	 Power	No 5
	Power	0+	55	A6	5-	 transducer	110.0
		- 6-	B6	A7	7+	 _	
No 8	Power	- 8+	B7		7_	Power transducer	No.7
140.0	transducer	- 8-	B8	AO	/-	lianodaoon	
		N.C.	B9	A9	N.C.		
			D10	A10	N.C.		
		N.C.	ы	A11	N.C.		
				1			

CS1W-PTR02

						-		
	·			A1	1+		Voltogo output	N - 4
No 2	Voltage output	2+	BI	Δ2	1_		device	NO.1
	device	2-	B2		-			
		A+	B3	A3	3+		Voltage output	No 3
No.4	Voltage output		00	A4	3–		device	N0.0
device	device	4-	4- B4 -	Λ <u>5</u>	5.			
No.6	No.6 Voltage output	6+	B5	AS	J+		Voltage output	No.5
			De	A6	5–		device	
		0-	DO	A7	7+			
	Voltage output	- 8+	B7	4.0	7		Voltage output device	No.7
N0.0	device	device 8- B8	B8	Að	/-			
				A9	N.C.			
		N.C.	Rð	A10	NC			
		N.C.	B10					
		L	L	A11	N.C.			

CS1W-PRT02 Analog Input Unit

CS1W-PPS01

No-voltage Semiconductor Input

CS1W-PPS01 Isolated-type Pulse Input Unit

No 1			Δ1	P1+
	F1	B1	~	1 1 T
-{ ·			A2	S1
I	COM1	B2	10	50
No.2	EO	22	A3	P2+
	Γ2	63	A4	S2
<u>م</u>	COM2	B4		02
No.3			A5	P3+
	F3	B2	16	63
<u>ا</u>	COM3	B6	~0	
No.4			A7	P4+
r	F4	B7		•
	COMA	Do	A8	S4
	001014	DO	۵Q	NC
	N.C.	B9	/.0	14.0.
			A10	N.C.
	N.C.	B10		NO
			A I I	N.C.

Voltage Input

CS1W-PPS01 Isolated-type Pulse Input Unit

Malta na mula a mananatian							
voltage pulse g	eneration		A1	P1+			
	F1	B1		~ .			
	COMI	P2	A2	S1			
		02	A3	P2+			
N +	F2	B3					
NO.2 _T	COM2	D/	A4	S2			
		D4	A5	P3+			
No. 0 +	F3	B5					
NO.3 _T	COM3	Be	A6	S3			
	001013	00	A7	P4+			
	F4	B7		~ ~			
NO.4 _T	COMA	BB	A8	<u>S4</u>			
	001014		A9	N.C.			
	N.C.	B9					
	NC	B10	A10	N.C.			
	N.U.		A11	N.C.			

Contact Input

3-wire Sensor Input

CS1W-PPS01 Isolated-type Pulse Input Unit No.2 \sim No.1 6 A1 P1+ F1 Β1 A2 **S1** COM1 B2 A3 P2+ F2 В3 A4 **S**2 COM2 B4 A5 P3+ F3 B5 A6 S3 COM3 **B**6 A7 P4+ F4 **B**7 **A**8 S4 COM4 **B**8 A9 N.C. N.C. **B**9 A10 N.C. N.C. B10 A11 N.C. No.4 $\overline{}$ No.3 0

No.1 Internal power supply A1 P1+ F1 B1 No.2 A2 **S**1 λ Internal power supply COM1 B2 A3 P2+ F2 В3 A4 S2 ٦ COM2 Β4 A5 P3+ F3 **B**5 S3 A6 СОМЗ **B**6 No.4 Internal A7 P4+ power supply F4 Β7 A8 S4 No.3 k COM4 B8 Internal N.C. A9 power supply N.C. B9 A10 N.C. N.C. B10 A11 N.C.

CS1W-PPS01 Isolated-type Pulse Input Unit

CS1W-PMV01

Voltage Output

CS1W-PMV01 Isolated-type Analog Output Unit

No.2									
No.1									
	V1	B1	A1	P1+	+				
	COM1	B2	A2	N.C.					
		B3	A3	P2+	+				
	- COM2	B/	A4	N.C.					
		D4 D5	A5	P3+	+				
	0042	DD	A6	N.C.					
[_		00	A7	P4+	+				
			A8	N.C.					
I		DO	A9	N.C.					
	N.C.	Ba	A10	N.C.					
	N.C.	вто	A11	N.C.	1				
No.4									
No.3									
L		- Loa	ad F						

Current Output

CS1W-PMV01 Isolated-type Analog Output Unit



CS1W-PMV02

CS1W-PMV02 Isolated-type Analog Output Unit

			A1	V1H	T
	V1L	B1	A2	COM1	
	COM1	B2			
1 +	V2I	B3	A3	V2H	
	0.0110	50	A4	COM2	
<u> </u>	COM2	B4	A5	V3H	
	V3L	B5	10	00140	
	COM3	B6	Ab	CONI3	
			A7	V4H	
	V4L	B/	A8	COM4	
	COM4	B8	۸٥	NC	
	N.C.	B9	A9	N.C.	
	NC	D10	A10	N.C.	
	N.C.	ыо	A11	N.C.	
					1

Programmable Controllers

Specifications

Unit name	Model	I/O capacity	Field I/O isolation	I/O range/type	Accuracy/effective resolution	Main features
Isolated-type Thermocouple Input Unit	CS1W-PTS11	4 inputs	All inputs isolated.	B, E, J, K, L, N, R, S, T, U, WRe5-26,PL II, ±100 mV	Standard accuracy: ±0.05% of full scale Temp coefficient: ±0.01%/°C Effective resolution: 1/64,000 Conversion cycle: 20 ms/4 pts 10 ms/2 pts	Output scaling, measured value alarms (HH, H, L, LL), rate-of-change opera- tion and alarms, input dis- connection alarms, top hold, bottom hold, valley hold, zero span adjust- ment over user-set range
Isolated-type Resistance Thermometer Input Unit	CS1W-PTS12	4 inputs	All inputs isolated.	Pt100Ω (JIS, IEC), JPt100Ω, Pt50Ω, Ni508.4Ω	Standard accuracy: Larger of ±0.05% of full scale or ±0.1°C Temp coefficient: ±0.01%/°C Effective resolution: 1/64,000 Conversion cycle:20 ms/4 pts 10 ms/2 pts	Output scaling, measured value alarms (HH, H, L, LL), rate-of-change opera- tion and alarms, input dis- connection alarms, top hold, bottom hold, valley hold, zero span adjust- ment over user-set range
Isolated-type Thermocouple Input Units (Economical type)	CS1W-PTS51 CS1W-PTS55	4 inputs 8 inputs	All inputs are isolated	B, J, K, R, S, T, L	Overall accuracy: ± 0.3% of PV or ± 1°C, whichever is larger, ± 1digit max. Conversion cycle: 250 ms/4 pts	Process value alarms (H, L) Process value alarm DO output Input disconnection
Isolated-type Resistance Thermometer Input Unit (Economical type)	CS1W-PTS52 CS1W-PTS56	4 inputs 8 inputs	Alle inputs are isolated	Pt100 (JIS, IEC), JPt100	Overall accuracy: \pm 0.3% of PV or \pm 0.8°C, whichever is larger, \pm 1 digit max. Conversion cycle: 250 ms/4 pts	Process value alarms (H, L) Process valu alarm DO output Input disconnection detection
Isolated-type Two-wire Transmission Device Input Unit	CS1W-PTW01	4 inputs	All inputs isolated.	4 to 20 mA, 1 to 5 V	Standard accuracy: ±0.2% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Built-in power supply for 2- wire transmission device output scaling (±32,000), measured value alarms (HH, H, L, LL), rate-of- change operation and alarms, input disconnec- tion alarms
Isolated-type Analog Input Unit	CS1W-PDC11	4 inputs	All inputs isolated.	4 to 20 mA, 0 to 20 mA, 0 to 10 V, ±10 V, 0 to 5 V, ± 5 V, 1 to 5 V, 0 to 1.25 V, ±1.25 V	Standard accuracy: ±0.05% of full scale Temp coefficient: ±0.01%/°C Effective resolution: 1/64,000 Conversion cycle:20 ms/4 pts 10 ms/2 pts	Output scaling, measured value alarms (HH, H, L, LL), rate-of-change opera- tion and alarms, input dis- connection alarms, top hold, bottom hold, valley hold, total value measure- ment
	CS1W-PDC55	8 inputs	All inputs isolated	4 to 20 mA, 0 to 10 V, 0 to 5 V, 1 to 5 V	Standard accuracy: ±0.3% full scale. Resolution 1/16000. Conversion cycle 250 ms/8 pts	Measured value alarms (H, L), input detection
Isolated-type Pulse Input Unit	CS1W-PPS01	4 inputs	All inputs isolated.	Max. counting speed: 20 K pulses/s (voltage input or no- voltage semi-conductor in- put) or 20 pulses/s (contact input)		Built-in sensor power sup- ply, contact bounce filter, unit pulse conversion, ac- cumulative and instanta- neous value output, 4 instantaneous value alarms.
Isolated-type Control Output Unit	CS1W-PMV01	4 outputs	All outputs isolated.	4 to 20 mA, 1 to 5 V	Standard accuracy: 4 to 20 mA: ±0.1% 1 to 5 V: ±0.2% Temp coefficient: ±0.015%/°C 4,000 (outputs) Conversion cycle: 100 ms/4 pts	Output disconnection alarms, control output an- swerback input, output rate-of-change limit, out- put high/low limits
Isolated-type Power Voltage Output Unit	CS1W-PMV02	4 outputs	All outputs isolated	0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V	Standard accuracy: ±0.1% Temp coefficient: ±0.015%/°C Resolution (at full scale): ±10 V or ±1 V: 1/16,000 0 to 10 V, 0 to 1 V, or ±5 V: 1/8,000 0 to 5 V: 1/4,000 Conversion cycle: 40 ms/4 pts	Output rate-of-change limit, Output high/low limit, Output scaling (±32,000)
Power Transducer Input Unit	CS1W-PTR01	8 inputs	No isolation between inputs.	±1 mA, 0 to 1 mA	Standard accuracy: ±0.2% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 200 ms/8 pts	Motor overdrive preven- tion at startup, output scal- ing (±32,000), measured value alarms (H, L)
Analog Input Unit	CS1W-PTR02	8 inputs	No isolation between inputs.	±100 mV, 0 to 100 mV	Standard accuracy: ±0.2% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 200 ms/8 pts	Output scaling (±32,000), measured value alarms (H, L)

Note: Refer to pages 318 to 322 for descriptions of the Analog I/O Units (CS1W-AD0 , CS1W-DA0 , CS1W-MAD44.)

CS1W-PTS , C200H-TS

Temperature Sensor Units

Direct Input from Four to Eight Temperature Sensors

- · Input directly from up to eight temperature sensors with one Unit. (The types of temperature sensor and temperature ranges can be set separately for each input for the CS1W-PTS
- Models available with isolated inputs to prevent unwanted current flow between temperature sensor inputs (CS1W-PTS only).
- · Provided with measured value alarms (4 points each) (CS1W-PTS only).
- · Sensor disconnection detection provided.



Circuit Configuration



Function

inputs), the Unit converts the measured temperatures into BCD or binary data and stores them in the allocated relay area every cycle. The data can be processed using the ladder program.

Using input from thermocouples or resistance thermometers (up to 8

Specifications

Model			CS1W-PTS11	CS1W-PTS51	CS1W-PTS55	CS1W-PTS12	CS1W-PTS52	CS1W-PTS56	C200H-TS001/002/101/102
Classifica	tion		CS1 Special I/	O Units		•	•	•	C200H Special I/O Units
Unit numb	ers		0 to 95	0 to 95	0 to 95	0 to 95	0 to 95	0 to 95	0 to 9
Inputs			4 pts	4 pts	8 pts	4 pts	4 pts	8 pts	4 pts
Input	Thermo-	К	Yes	Yes	Yes				TS001, TS002
signals	couples	J	Yes	Yes	Yes				TS001
		L	Yes	Yes	Yes				TS002
		R	Yes	Yes	Yes				
		S	Yes	Yes	Yes				
		т	Yes	Yes	Yes				
		E	Yes						
		В	Yes	Yes	Yes				
		Ν	Yes						
		W	Yes						
		U	Yes						
		PLII	Yes						
		±100 mV	Yes						
	Resistance	JPt100				Yes	Yes	Yes	TS101
	ters	PT100				Yes	Yes	Yes	TS102
		Ni508.4 Ω				Yes	Yes	Yes	
Input sign	al range setti	ngs	4 pts set individually	4 pts set individually	8 pts set individually	4 pts set individually	4 pts set individually	8 pts set individually	One setting for all 4 pts
A/D conve	ersion output	data	4-digit binary	4-digit binary or BCD	4-digit binary or BCD	4-digit binary	4-digit binary or BCD	4-digit binary or BCD	4-digit BCD
Conversio	n speed		20 ms/ 4 points, 10 ms/ 2 points	250 ms/Unit	250 ms/Unit	20 ms/ 4 points, 10 ms/ 2 points	250 ms/Unit	250 ms/Unit	4.8 s max. (when 4 pts are set for Unit)
Overall accuracy	Standard acc	curacy	±0.05% of full scale	±0.3% of PV o whichever is la ±1 digit max.	r ±1°C, arger,	Larger of ±0.05% of full scale or ±0.1°C	±0.3% of PV of whichever is la ±1 digit max.	or ±0.8°C, arger,	±1% + 1°C
	Temperature cient	coeffi-	±0.01%/°C						
	Cold junction compensation	n on error	±1°C						
Connectio	ons		Terminal block	(

Note: Refer to page 326 for information on CS1W-PTS D Process I/O Units.

C200H-TC

Temperature Control Units

One Unit Functions as Two Temperature Controllers

- Supports 2-loop PID control (two degrees of freedom) or ON/OFF control.
- Input directly from two temperature sensors (thermocouples: R, S, K, J, T, E, B, N, L, or U) or platinum resistance thermometers (JPt00, Pt100).
- · Open-collector, voltage, or current outputs
- Sampling period: 500 ms
- Run/start control.
- Two internal alarms per loop.
- Detects heater burnout though current detectors for both loops.
- Record up to eight sets of target values, alarm values, and PID parameters.
- Connects to Data Setting Console.

Function

Perform 2-loop PID control based on inputs from thermocouples or platinum resistance thermometers to control a transistor, voltage, or current output. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the target value, read the process value, or perform other operations.



Specifications

General

Classification	Temperature sensor inputs	Control outputs	Unit numbers	Model
C200H Special I/O Unit	Thermocouples (R, S, K, J, T, E,	Open-collector (pulse)	0 to 9	C200H-TC001
	B, N, L, or U)	Voltage (pulse)		C200H-TC002
		Current (linear)		C200H-TC003
Platinum resistance thermo		Open-collector (pulse)		C200H-TC101
	ters (JPt00, Pt100)	Voltage (pulse)	1	C200H-TC102
		Current (linear)	1	C200H-TC103

Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm	C200H-DSC01

CS1W-NC

Position Control Units

High-speed, High-precision Positioning with

1, 2, or 4 Axes

- Simple positioning systems can be created by directly specifying operation from the CPU Unit when required.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based Support Software to easily create positioning data and store data and parameters in files. (Use WS01-NCTF1-E with C200HW-NC□ models and WS02-NCTC1-E with CS1W-NC□□ models.)
- Interrupt feeding, forced starting, and other features also supported.

Function

These Position Control Units support open-loop control with pulse-train outputs. Position using automatic trapezoid or S-curve acceleration and deceleration. Models available with 1, 2, or 4 axes. Use in combination with servomotors or stepping motors that accept pulse-train inputs.



System Configuration



Specifications

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

CS1W-MC421/-MC221

Motion Control Units

High-precision, Two-axis Motion Control with Multi-tasking G-language Programming

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

Function

The Motion Controller provides closed-loop control with analog outputs for up to 2 or 4 axes, and supports the G language for advanced, high-speed, high-precision position control, such as traverse operation. Multi-tasking allows you to run the two axes independently for a wider range of application.

System Configuration



Note: The C200H-MC221 can also be used with CS1 PLCs.





Specifications

General

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

CX-Motion: Windows-based Support Software

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

C200HW-MC402-E

Motion Control Unit

Advanced multi-axes Motion Control with Multi-task BASIC language programming

- Advanced Motion control of 4 axes per unit and up to 16 modules can be installed in one PLC
- Analogue outputs for position, Speed and Torque control
- · Hardware registration input for every axis
- · Electronic CAM profiles and axes synchronization
- Friendly Motion Perfect Windows-based programming and debugging software. Provides versatile test and monitoring functions including a 4-channel software oscilloscope.



Function

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

System Configuration





rogrammable Controllers

Specifications

General

Model		C200HW-MC402-E
Classification		C200H Special I/O Unit
Control Method		Closed loop Position, Speed and Torque control
Control Output signals		Analogue
Programming language		BASIC type motion control language
Controlled axes		4 real axes and 4 virutal axes
Measurement units		User definable
Positioning	Linear interpolation	4 axes
	Arc interpolation	For any 2 axes
	Helical interpolation	For any 3 axes
	Axes Synchronization	For any 2 axes
	Axes Linked CAM profile	For any 2 axes
	Hardware Registration Interrupt	4 axes
Task programming capacity	Number of tasks	Up 5 tasks simultaneous plus interface task
	Number of programs	14
	Data storage capacity	251 (VR) + 16000 (Table) max.

Motion Perfect Software

Model	Motion Perfect
Supported MC Units	C200HW-MC402-E, R88A-MCW151-E, R88A-MCW151-DRT-E
Applicable computer	Windows 95/98/2000/NT4.0
Functions	Programming and debugging software tool. Test and moitoring functions including a 4-channel software oscillos- cope.

Motion Control Unit

Multi-axes Motion Control over high-speed MECHATROLINK-II

- · Up to 30 axes controlled with less wiring
- Supports Position, speed and Torque control
- Electronic CAM profiles and axes synchronization
- · Hardware registration input for every axis
- Program control commands, like Multi-task programming and branching commands, and various arithmetic operations for maximum program efficiency
- · Access to the complete system from one point



torque control are all supported, enabling a wide range of applications.

By using high-speed servo communications, motion programs, system

parameters, system data, and servo drive parameters can be set and

read from the software tool.

Function

Multi-axes control is made easy by freely combining control axes. Up to 32 axes can be used, including 30 physical axes and two virtual axes, and each axis can be set individually. Position Control, synchronized control (electronic gear, electronic Cam, follow-up), speed control, and

System Configuration

5 1] CS-series Programmable Controller Support Software (MC-Miel for MCH, free software) CS1W-MCH71 motion control unit MECHATROLINK-II a a a a -30 nodes max.; total length: 50 m Sigma II Θ or W-series 88888 servo drive JUSP-NS115 MECHATROLINK-II Interface Unit 60 00 JEPMC-W6022 Limit switches, Terminating Resistor contact sensors

Ordering Information

Motion Controller

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

Mechatrolink-II related devices

Name	Model	Remarks
Mechatrolink-II Interface Unit	JUSP-NS115	For Sigma-II and W-series Servo drives
Mechatrolink-II Terminator	JEPMC-W6022	Terminating resistor
Mechatrolink-II Cables	JEPMC-W6003-A5	0.5 meter
	JEPMC-W6003-01	1 meter
	JEPMC-W6003-03	3 meters
	JEPMC-W6003-05	5 meters
	JEPMC-W6003-10	10 meters
	JEPMC-W6003-20	20 meters
	JEPMC-W6003-30	30 meters
24V DC I/O Module	JEPMC-IO2310	64 Inputs, 64 Outputs
Counter Module	JEPMC-PL2900	Reversible counters, 2 channels
Pulse Output Module	JEPMC-PL2910	Pulse train positioning, 2 channels

Specifications

General

Model		CS1W-MCH71	
Classification		CS-series CPU Bus unit	
Applicable PLCs		CS-series, new version (CS1[]-CPU[][]H)	
Control Method		MECHATROLINK-II (Position, Speed and Torque control)	
Controlled device	S	Sigma-II and W-series Servo Drives (ver. 38 or later) with MECHATROLINK-II Interface and various I/O Units.	
Programming lan	guage	BASIC type motion control language	
Controlled axes		32 max, including 30 physical or virtual axes and 2 virtual axes	
Control functions	Positioning (PTP)	Executes positioning independently for each axis at a specified speed or the speed system parameter. (Simultaneous specification: Up to eight axes/block, Simultaneous execution: Up to 32 blocks/Unit)	
	Linear interpolation	Executes linear interpolation for up to eight axes at a time at the specified interpolation feed speed. (Simultaneous specification: Up to eight axes/block, Simultaneous execution: Up to 32 blocks/system)	
	Circular interpolation	Executes circular interpolation for two axes in either clockwise or counterclockwise at the specified interpolation feed speed. Helical circular interpolation is also possible with single-axis linear interpolation added. (Simultaneous specification: Two or three axes/block, Simultaneous execution: Up to 16 blocks/system)	
	Other functions	Origin searches, interrupt feeding, timed positioning, traverse positioning, independent electronic cam, synchronized electronic cam, link operation, electronic gear, follow-up synchronization, speed reference, torque reference	
Motion Number of tasks, number Up to 8 tasks and 256 programs/Unit (8 parallel branches per task max.) programs of programs		Up to 8 tasks and 256 programs/Unit (8 parallel branches per task max.)	
	Program capacity	In motion program conversion, 8,000 blocks/Unit max. (2 Mbytes); number of blocks: 800	
	Data capacity	Position data: 10,240 points/Unit; Cam data: 32 max.; 16,000 points/Unit	
	Subroutine nesting	Five levels max.	

CS1W-CT001, C200H-CT021

High-speed Counter Units

Two- and four-channel high-speed counter units with built-in fast control I/O

- Max. input frequency = 500 kHz. (when line driver input is used)
- Output turns ON less than 0.5 ms after set value is reached. (may deviate during execution of IORD/ IOWR instructions)
- 32-bit counting range.
- · 2- and 4-axis operation available.
- Digital variable noise filter provided.
- 5-, 12-, and 24-V line driver inputs available. (5- and 12-V line driver input is only available, however, for 1 axis with the CS1W-CT021 and 2 axes with the CS1W-CT041.)
- Supports simple, ring, and linear counting modes.
- Supports offset phase input, up and down pulse input, and pulse+direction input.
- Supports 4 external control inputs, and a total of 16 functions can be set including open gate, close gate, preset, reset, capture, stop/capture/reset combinations, and reset enable.
- One Unit supports 4 external outputs and 28 internal outputs with counter value zone comparisons, target comparisons, delays, holds, programmable outputs, and hysteresis settings.
- Pulse rate measurement function and data logging.
- Counter outputs and external control inputs can be used to trigger interrupt tasks in the CPU Unit.
- Settings can be changed during Unit operation.

Function

The High-speed Counter Units count pulse signal inputs that are too fast to be detected by normal Input Units. The Units can be programmed to produce outputs according to counter values for specified conditions, and many other functions are supported.

System Configuration









Terminal Arrangement

Item		Connector 2 (CN2)		Pin
		Row A	Row B	NO.
Power Supply (t the outputs)	o feed	-PS: 0V	+PS: 12 to 24V	1
Digital Outputs	Digital Outputs		O2: PNP	2
[0-3] (NPN/PNP)		O3: NPN	O3: PNP	3
Spare				4
Digital Inputs		I2: 0V	I2: 24V	5
[0-3]	[0-3]		13: 24V	6
Spare				7
Counter 1 & Counter 2	A	CH2: LD- / 0V	CH2: LD+	8
		CH2: 12V	CH2: 24V	9
	в	CH2: LD- / 0V	CH2: LD+	10
		CH2: 12V	CH2: 24V	11
	Z	CH2: LD- / 0V	CH2: LD+	12
		CH2: 12V	CH2: 24V	13
Spare				14
Counter 3 & Counter 4*	Α	CH4: LD- / 0V	CH4: LD+	15
		CH4: 12V	CH4: 24V	16
	в	CH4: LD- / 0V	CH4: LD+	17
		CH4:12V	CH4: 24V	18
	z	CH4: LD- / 0V	CH4: LD+	19
		CH4:12V	CH4: 24V	20

Connector 1 (CN1)	Pin	
Row A	Row B	NO.
-PS: 0V	+PS:12 to 24V	1
O0: NPN	O0: PNP	2
O1: NPN	O1: PNP	3
		4
10: 0V	10: 24V	5
I1: 0V	l1: 24V	6
		7
CH1: LD- / 0V	CH1: LD+	8
CH1: 5V	CH1: 24V	9
CH1: LD- / 0V	CH1: LD+	10
CH1: 5V	CH1: 24V	11
CH1: LD- / 0V	CH1: LD+	12
CH1: 5V	CH1: 24V	13
		14
CH3: LD- / 0V	CH3: LD+	15
CH3: 5V	CH3: 24V	16
CH3: LD- / 0V	CH3: LD+	17
CH3: 5V	CH3: 24V	18
CH3: LD- / 0V	CH3: LD+	19
CH3: 5V	CH3: 24V	20

Specifications

General

Classification	Number of counters	Encoder A and B input, pulse input, Z signal	Maximum counting speed	Unit numbers	Model
C200H Special I/O Unit	2	Open-collector Input voltage: 12 V DC or 24 V DC	50 kcps	0 to F	C200H-CT021
		RS-422 line driver	75 kcps		
CS1 Special I/O Unit 2		Open-collector Input voltage: 5 V DC, 12 V DC, or 24 V DC (5- and 12- V DC input only possible for 1 axis.)	50 kcps	0 to 92 (4 unit numbers per Unit)	CS1W-CT021
		RS-422 line driver	500 kcps		
	4	Open-collector Input voltage: 5 V DC, 12 V DC, or 24 V DC (5- and 12- V DC input only possible up to 2 axes.)	50 kcps		CS1W-CT041
		RS-422 line driver	500 kcps		

rogrammable Controllers

CS1W-CTS21 **SSI Encoder Input Unit**

SSI (synchronous serial interface) is a standard communication protocol developed for absolute encoders. It provides easier connection and reduced wiring compared to parallel connection.



Specifications

SSI Communication

Item	Specification
CLK lines	Non-isolated differential line driver, RS422 compliant
DATA lines	Electrically isolated differential line receiver, RS422 compliant
Number of data-bits	9 to 31 (default: 24)
Value coding	Gray/Binary/Tannenbaum/Raw (default Gray)
Clock frequency	100kHz to 1.5MHz
Monoflop time	10μs to 99,990μs (default: 40 μs)
Sample rate	About 2500 Samples/sec with 2 encoders connected (with default settings)



Input Specifications

Item	Digital Inputs
Input Voltage	24 V DC (19.6 V to 26.4 V)
Input Current (typical)	7.6 mA
ON Voltage (min.)	19.6 V
OFF Voltage (max.)	4 V
Max. repetition rate	1 kHz
Min. pulse width	10 μs
Input Voltage	24 V DC (19.6V to 26.4V)



Output Specifications

Item	Specification
Driver Type	Open Collector (NPN/PNP selectable)
Operating Voltage Range	12-24 V (10.2 to 26.4 V)
Maximum Switching Capacity	46 mA at 10.2 V to 100 mA at 20.4 V to 26.4 V (400mA max./common) (linear behaviour)
Minimum Switching Current	5 mA
Output ON-delay	0.1ms max.
Output OFF-delay	0.1ms max.
Leakage Current	0.1mA max.

The power supplied to the Unit, to feed the Digital Outputs, has to be supplied externally and should be a double insulated class II (over-voltage) type with ratings from 12 to 24VDC (10.2 to 26.4VDC). Characteristics of the Power Supply Input circuitry are summarised in the following table.

Item	Specification
Operating Voltage Range	10.2-26.4 V DC
Current Consumption	25 mA max. (excl. load current)
Internal Fault Protection	Two 1 A (not replaceable) fuses in Power Supply lines
Reverse Polarity Protection	Yes

The Digital Outputs are insulated from the I/O-bus but not from each other. They are not short circuit protected.

Digital Output Circuitry:



Connector (CN1 and CN2) Pin-layout

Use the following table to make connections directly to the soldering terminals of the connector jack(s) (see *Nomenclature* section for position of connectors 1 and 2 and rows A and B):

	Connector 2 (CN2)				Connector 1 (CN1)				
	Row A	Row B		Row A Row B					
A1	0V_PS ¹	24V_PS ²	B1	A1	0V_PS ¹	24V_PS ²	B1		
A2	O2 NPN	O2 PNP	B2	A2	O0 NPN	O0 PNP	B2		
A3	O3 NPN	O3 PNP	B3	A3	O1 NPN	O1 PNP	B3		
A4			B4	A4			B4		
A5	0V I2	24V I2	B5	A5	0V I0	24V I0	B5		
A6	0V I3	24V I3	B6	A6	0V I1	24V I1	B6		
A7			B7	A7			B7		
A8	0V ENC2_PS ³	+ ENC2_PS ⁴	B8	A8	0V ENC1_PS ³	+ ENC1_PS ⁴	B8		
A9			B9	A9			B9		
A10	DATA2 -	DATA2 +	B10	A10	DATA1 -	DATA1 +	B10		
A11			B11	A11			B11		
A12	CLOCK2 -	CLOCK2 +	B12	A12	CLOCK1 -	CLOCK1 +	B12		
A13			B13	A13			B13		
A14			B14	A14			B14		
A15			B15	A15			B15		
A16			B16	A16			B16		
A17			B17	A17			B17		
A18			B18	A18			B18		
A19			B19	A19			B19		
A20	0V ENC_PS ³	+ ENC_PS ⁴	B20	A20	0V ENC_PS ³	+ ENC_PS ⁴	B20		

Serial Communications Features

Unit	Model	Ports	Serial comm	nunications r	node					BASIC	Message
			Protocol macros	Host Link	NT Links	No-proto- col	Peripheral bus	Program- ming Console bus	Serial Gateway (see note)	program- ming	communi- cations
			General- purpose external devices	Host computers	OMRON PTs	General- purpose external devices	Program- ming Devices	Program- ming Console	Compo- Way/F devices, Inverters, Servo Drives	General- purpose external device	
CPU Units	All models	Port 1: Peripheral	No	Yes	Yes	No	Yes	Yes	No	No	No
		Port 2: RS-232C	No	Yes	Yes	Yes	Yes	No	Yes	No	No
ASCII Units	C200H- ASC11	Port 1: RS-232C	No	No	No	No	No	No	Yes	Yes	No
		Port 2: RS-232C	No	No	No	No	No	No	Yes	Yes	No
	C200H-	Port 1: RS-232C	No	No	No	No	No	No	Yes	Yes	No
	ASC21	Port 2: RS-422A/485	No	No	No	No	No	No	Yes	Yes	No
	C200H-	Port 1: RS-232C	No	No	No	No	No	No	Yes	Yes	No
	ASC31	Port 2: RS-232C	No	No	No	No	No	No	Yes	Yes	No
Serial Com-	CS1W-	Port 1: RS-232C	Yes	Yes	Yes	No	No	No	No	No	No
munications	SCB21-V1	Port 2: RS-232C	Yes	Yes	Yes	No	No	No	No	No	No
Boards/Units	CS1W-	Port 1: RS-232C	Yes	Yes	Yes	No	No	No	No	No	No
	SCB41-V1	Port 2: RS-422A/485	Yes	Yes	Yes	No	No	No	No	No	No
	CS1W-	Port 1: RS-232C	Yes	Yes	Yes	No	No	No	No	No	No
	SCU21-V1	Port 2: RS-232C	Yes	Yes	Yes	No	No	No	No	No	No

Note: Requires SCU/SCB Ver 1.2 or later mounted on CS1 CPU Unit Ver 3.0.

ASCII Units

Easily Perform Serial Data Communications

- Perform ASCII communications with a wide range of external devices.
- The C200H-ASC11/ASC21/ASC31 function as special processing units with BASIC programming.
- Large-capacity user memory: 200 Kbytes
- Model available with RS422A/485 port.
- Various forms of data exchanges with CPU Unit: Select the best method for the read/write trigger and timing.
- High-speed data exchanges possible with shared memory (not dependant on I/O refresh).
- A wide range of interrupt processes: Interrupts from CPU to ASCII Unit, communications interrupt, key interrupts, timer interrupts, error interrupts, etc.
- Easy control of transmission control signals.
- Calculation instructions for error check codes.
- Many BASIC debugging functions (break points, 1-step execution, execution stop monitoring, etc.)
- Error log supported with up to 30 error records.

The ASCII Units support BASIC language programming and RS-232C and RS422A/485 serial communications. BASIC programming enables

ASCII communications with essential any external device. It can also be used as a special processing unit to aid the CPU Unit without using

The C200H-ASC11/ASC21/ASC31 provide shared memory with the CPU Unit, and both the ASCII Unit and the CPU Unit can access the

A library interface toolkit is available for the creation of user-defined

shared memory asynchronously, providing for high-speed data

exchanges between the two Units without using interrupts.



System Configuration



Specifications

Function

external communications.

library routines in BASIC or C.

General

Classification	User memory	Shared memory	Serial communica- tions ports	Unit numbers	Model
C200H Special I/O Unit	200 Kbytes	Provided	RS-232C x 2	0 to F	C200H-ASC11
		(90 words in I/O memory)	RS-232C x 1, RS-422A/		C200H-ASC21
			485 x 1		
			RS-232C x 2, RS-232C		C200H-ASC31
			x 1 for terminal		

Note: The C200H-ASC02 can also be used with CS1 PLCs.

CS1W-SCU21-V1/-SCB□1-V1

Serial Communications Units/Boards

Programmable Controllers

Supports Protocol Macros, Host Link Communications, and 1:N NT Links

- · Serial Communications Board
- Increase the number of serial ports without using I/O slots.
- Connect general-purpose external devices 1:N using RS-422A/485.
- Generate interrupts to the CPU Unit when data is received.
- · Serial Communications Unit
- Mount up to 16 Units (including all other CPU Bus Units) on CPU or Expansion Racks. Ideal for systems that require many serial ports.



Function

Either an Inner Board or CPU Bus Unit can be used to increase the number of serial ports (RS-232C or RS-422A/485) two at a time. You can specify Protocol Macros, Host Link Communications, or 1:N NT Links separately for each port. With the CS1 Series, you can always install the right number of serial ports for your system.

The Serial Gateway function available in SCU/SCB Units Ver.1.2 and higher enable seamless access to field devices like temperature controllers, inverters or servo drives over multiple network layers. The Gateway function handles the de/encapsulation of serial communication messages in the higher-layer FINS communication, e.g. over Controller Link or Ethernet.

System Configuration



Specifications

General

Unit	Classification	Serial communications modes	Serial	Unit numbers	Model
Serial Communications	Inner Board	Set separately for each	RS-232C x 2		CS1W-SCB21-V1
Board		port: Protocol Macro, Host Link,	RS-232C x 1, RS-422A/485 x 1		CS1W-SCB41-V1
Serial Communications Unit	CS1 CPU Bus Unit	or 1:N NT Link, Serial Gateway or non-protocol communications.	RS-232C x 2	0 to F	CS1W-SCU21-V1

Protocol Macros

Easily Create Protocols for Data Exchange with External Devices; Execute with One Instruction

Function

Protocols for communications with external devices can be easily created according to the communications standards required by the external device. Protocol macros enable communications with essentially any external device with an RS-232C or RS-422A/485 port without programming communications in the PLC.

Standard system protocols are provided as a standard feature for communications with OMRON components, such as Temperature Controllers, Panel Meters, Bar Code Readers, and Modems. A Windowsbased tool called CX-Protocol is also available to enable creation of protocols for most any external device.

System Configuration



Types of Protocol

Protocols	External devices	Required products
Standard system protocols	OMRON components	Serial Communications Board or Unit
User-created protocols	General-purpose external device	Serial Communications Board or Unit + CX-Protocol (Windows-based protocol support software)

Standard System Protocols

Component		Model	Send/receive sequences
CompoWay/F-compati	ble components	OMRON CompoWay/F slave components	CompoWay/F command send/response receive
Digital Controllers and	Small Digital Controller with Communications (53 x 53 mm)	E5CK	Present value read, set point read, ma-
Temperature Control- lers	Temperature Controllers with Digital Indications (Thermac J with com- munications) (96 x 96 mm or 48 x 96 mm)	E5□J-A2H0	nipulated variable read, etc. Set point write, alarm write, PID param-
	Digital Controllers with Communications (96 x 96 mm)	ES100	eter write, etc.
	High-density Temperature Controller with communications (8 control points)	E5ZE	
Intelligent Signal Processors (special specifications)		КЗТ□	Display value read, comparison value read, write, etc.
Bar Code Readers	Laser Scanner type	V500	Read start, data read, read stop, etc.
	CCD type	V520	1
Laser Micrometer		3Z4L	Measurement condition set, continuous measurement start, etc.
Visual Inspection Sys-	High speed, high precision, low cost	F200	Measurement, continuous measure-
tems	High-precision inspection/positioning	F300	ment, etc.
	Character inspection software/positioning software	F350	Measurement, positioning, inspection, character inspection, etc.
RFID Controllers	Electromagnetic coupling (for short distances)	V600	Carrier data read, autoread, write, etc.
	Microwave (for long distances)	V620	1
Hayes Modem AT Con	nmand		Modem initialize, dial, send, etc.
OMRON PLCs with Ho	ost Link (C-mode) protocol	C-Series PLCs	
OMRON PLCs with Ho	ost Link (FINS) protocol	CS/CJ-series PLCs	Requires SCU/SCB Ver. 1.2 or higher

NT-AL001

RS-232C/RS-422A Adapter Unit

Programmable Controllers

Allows integration of RS232C devices into RS-422A networks.

- Long-distance transmissions are possible through an RS-422A interface. By converting from RS-232C to RS-422A and then back to RS-232C, a transmission distance of up to 500 m can be achieved.
- No power supply is required. If the 5-V terminal (150 mA max.) is connected from the RS-232C device, a separate power supply is not required to drive the Adapter Unit.
- The removable terminal block enables wiring not possible with D-sub connectors. (The RS-232C interface is 9-pin D-sub.)



RS-232C Interface

Item	Specification
Baud rate	64 Kbps max.
Transmission distance	2 m max.
Connector	9-pin, D-sub connector (female)

RS-422A Interface

Item	Specification
Baud rate	64 Kbps max. (depends on RS-232C baud rate)
Transmission distance	500 m max.
Terminal block	8 terminals, M3.0; detachable



CS1W-V600 //C200H-IDS01-V1

RFID Sensor Unit

Easy integration of RFID Systems into PLC's.

- Connects V600 RFID read/write heads directly to the PLC.
- Function checking possible with standard hand-held Programming Console.
- Read data from Data Carriers simply by sending a read command.
- The C200H-IDS01-V1 can read/write up to 1,024 bytes. The CS1W-V600C11/12 can read/write up to 2,048 bytes.



Function

Read/write data in Data Carrier memory by sending read/write commands from the CPU Unit to the Read/Write Head. One Read/Write Head can be connected to the CS1W-V600C11 and two Read/Write Heads can be connected to the CS1W-V600C12. The data transfer speed has been increased in both models.

System Configuration



Specifications

Classification	Connectable ID System	Connectable Read/ Write Heads	External power supply	Unit numbers	Model
CS1 CPU Bus Unit	V600 Series (electromagnetic,	1 Read/Write Head	Not required	0 to 95	CS1W-V600C11
for short distances)		2 Read/Write Heads	24 V DC	0 to 94	CS1W-V600C12
C200H Special I/O Unit			Not required	0 to 9	C200H-IDS01-V1

GP-IB Interface Unit

- Enables communications between SYSMAC CS-series PLCs and GP-IB instruments.
- Conforms to the standard interface IEEE-488-1978 (GP-IB).
- Usable in either Master Mode (controller) or Slave Mode (talker, listener).
- Communications with GP-IB instruments are easily implimented simply by using the INTELLIGENT I/O READ and INTELLIGENT I/O WRITE (IORD/IOWR) instruction in the ladder program in the CPU Unit to read and write buffer memory in the GP-IB Interface Unit.



Programmable Controllers

Specifications

Item	Specification
Name	SYSMAC CS-series GP-IB Interface Unit
Model number	CS1W-GPI01
Unit type	CS1 Special I/O Unit
Mounting location	CS1 CPU Rack or CS1 Expansion Rack
Max. number of GP-IB Interface Units	Up to 4 GP-IB Interface Units per CPU Unit
Unit number setting range	0 to 95
GP-IB Interface Unit settings when editing the I/O tables offline	Number of unit numbers used: 1
with the CX-Programmer	Number of input words allocated: 5
	Number of output words allocated: 5
Transmission method	8-bit parallel data transfer
Communications method	Half duplex
Interface	Conforms to IEEE-488-1978 (24-pin) standards
Handshaking method	Three-line handshaking
Functional specifications	Master mode: SH1, AH1, T6, TE0, L4, LE0, C1 to C4, and C28
(GP-IB interface functions)	Slave mode: SH1, AH1, T6, TE0, L4, LE0, SR1, RL0, PP0, DC1, and DT0
Connection configurations	Star configuration or daisy-chain configuration
Transmission distance	Limits on the length of cables in the system
	(All three of these conditions must be satisfied simultaneously.)
	Total cable length \leq Number of devices in the system \times 2 m
	Total cable length \leq 20 m
	Length of a single cable \leq 4 m (for a 1:1 connection)
Max. number of connected devices	15 devices max. including the GP-IB Interface Unit
GP-IB device address	0 to 30
Delimiters	Select from the following: CR + LF, CR, LF, EOI, or user-set code.
Max. data transfer size	512 bytes max. in a single reception or transmission
Max. number of connectors	2 (connectors can be stacked)
Current consumption	5 VDC, 330 mA
Dimensions	$35 \times 130 \times 101 \text{ mm} (W \times H \times D)$
Weight	258 g max.



Communications Networks

Overview

Level	Network	Functions	Communications	Unit/Board	
Information net-	Ethernet	Host computer to PLC	FINS messages	Ethernet Unit	
works		PLC to PLC			
		Host computer to CPU Unit memory card	FTP server	_	
		UNIX computer or other socket ser- vice to PLC	Socket services		
	Controller Link	Computers connected directly to	FINS messages	Controller Link Support	
		network and PLC	Data links (offsets and automatic setting)	Board and Unit	
Control	Controller Link	PLC to PLC	to PLC FINS messages		
networks			Data links (offsets and automatic setting)	7	
	DeviceNet		FINS messages on open network	DeviceNet Master Unit	
	DeviceNet	PLC to components (slaves)	High-capacity remote I/O on open network (fixed or user allocations)	DeviceNet Master Unit	
	PROFIBUS-DP	PLC to components (slaves)	High-capacity remote I/O on open network (user allocations)	PROFIBUS-DP Master, I/O Unit	
	CAN/CANopen	Component to components	Freely configurable, object-oriented communication using CANopen or user-defined CAN protocols	CANopen Unit	
	CompoBus/S	PLC to components (slaves)	High-speed remote I/O with OMRON network (fixed allocations)	CompoBus/S Master Unit	

Specifications

Communications

Network	Ethernet	Controller Link	PROFIBUS-DP	DeviceNet	CANopen	CompoBus/S
Messages	Yes	Yes	Limited to DPV1 devices	Yes	Yes	
Data links		Yes	Manually configurable		Yes	
Remote I/O			Yes	Yes	Yes	Yes
Maximum speed	10/100 Mbps	2 Mbps Comm cycle: Approx. 34 ms (Wired: 32 nodes, 2- Kbits + 2-Kword data links)	12 Mbps Comm cycle from 1 ms	500 Kbps Comm cycle: Approx. 5 ms (128 inputs and 128 outputs)	1 Mbps (acyclic, on-event communication)	750 Kbps (See note 1.) Comm cycle: Approx. 1 ms (128 inputs and 128 outputs)
Total distance		Twisted-pairs:1 km (at 500 bps) Optical: 20 km	1200 m up to 93.75 kbps, 100 m at 12 Mbps. Extension by optical links is possible.	500 m (at 125 kbps)	5 km at 10 kbps to 40 m at 1 Mbps	Trunk line: 500 m (See note 2.) Communications cy- cle: 6 ms max.
Maximum nodes		32/62 with repeaters	126 with repeaters	63	127	32
Communications media		Special twisted-pair cable or optical cable	PROFIBUS cable	DeviceNet cable	ISO11898. e.g. DeviceNet cable	2-core or 4-core VCTF cable, special flat cable (See note 3.)
Network data link ca- pacity		32,000/62,000 words				
Remote I/O capacity			300 words (C200H) 7000 words (CJ1, CS1)	32,000 pts (with Configurator) 2,048 pts (without Configurator)	Up to 200 words configurable	256 pts
Supporting PLCs	CS1, CJ1, CVM1, CV Series, C200HX/HG/HE	CS1, CJ1, CVM1, CV Series, C200HX/HG/HE	CS1, CJ1, C200HX/HG/HE/HS, CQM1/CQM1H (I/O link), CPM1A (I/O link)	CS1, CJ1, CVM1, CV Series, C200HX/HG/HE, C200HS, CQM1/ CQM1H (with I/O Link), CPM2C (with I/O Link)	CS1, C200HX/HG/HE	CS1, CJ1, C200HX/ HG/HE, C200HS, CQM1/CQM1H, CPM2C-S1□0C (-DRT) SRM1; CPM1A/CPM2C (with I/O Link)

Note: 1. For high-speed communications mode. Trunk line length is 100 m (30 m max. for 4-core VCTF or special flat cable).

2. For long-distance communications mode (200 m max. for 4-core VCTF or special flat cable).

3. Different types of cables cannot be mixed.

Ethernet Units

Enables fast data transfer within Factory Automation systems, and easily links FA systems to plant management systems

- Access socket services simply by manipulating specific bits in memory.
- Take advantage of data transfer by e-mail.
- Seamless communication with Controller Link and other networks.
- Use the Ethernet standard protocols, TCP/IP and UDP/IP.
- Use OMRON's standard FINS message communications.
- Exchange files with host computers using FTP.
- Set communications parameters with the CX-Programmer setup menus.



Features of the 100Base-TX Model

- While the 100Base-TX model maintains backward compatibility with the earlier models (10Base-5 and 10Base-T), the new model has a basic system repsonse performance about 4 times faster.
- The FINS message communications capabilities have been improved dramatically.
 - Increased number of nodes (from 124 to 254 nodes)
 - Supports TCP/IP protocol as well as the earlier UDP/IP protocol.
 - \bullet The host computer's IP address can be set dynamically (DHCP).
- A mail receiving function has been added (POP3).
- A function has been added that automatically corrects the PLC's internal clock (SNTP).
- Various kinds of servers can be specified by their host name (DNS).

Function

Achieve a wide range of communications from PLCs connected to an Ethernet network: Transfer data with TCP/IP or UDP/IP socket services, executed OMRON's standard FINS commands, transfer files with FTP, or send mail with SMTP. Select the communications services that are required and flexibly connect PLCs on an information level Ethernet network.



System Configuration



Specifications

Unit name	Туре	Communications service	Connector	Model
Ethernet Unit	CS CPU Bus Unit	FINS communications service (TCP/IP, UDP/IP), FTP server	100Base-TX	CS1W-ETN21
(100Base-TX)		functions, socket services, mail transmission service,	(10Base-T)	CS1D-ETN21D
		mail receive (remote command receive), automatically adjusted		
		PLC built-in clock, server/host name specification)		
CS1W-CLK **Controller Link Units and PCI Boards**

OMRON's efficient and easy-to-use FA Network

- Achieve high-capacity, flexible data links.
- · Transfer large volumes of data through a message service.
- Connect through twisted-pair cables or optical fiber • cables.
- Connect CS1, CJ1, C200HX/HG/HE and CQM1H • PLCs.
- Complete error correction and troubleshooting functions.
- Quick configuration of communication links with CX-Programmer's setup menus.
- · Increase network reliability with duplex connections for optical networks.
- · Use either ring mode or bus mode for optical networks.

Function

Controller Link is OMRON's proprietary FA-level network. It supports automatic data links between PLCs and between PLCs and host computer, as well as programmed data transfers using a message service.



System Configuration

Use Repeater Units for T-branch Wiring, Extension, Expansion, and Optical Sections

T-branching Enables More Flexible Wiring Solution for Layout, Building, and Expansion of Networks





Connect up to 64 Nodes Using Wired Types

Networks can be constructed with up to 62 nodes when Controller Link Units/Support Boards with -V1 suffix are combined with Repeater Units.

Wiring with Optical Cables Increases Noise Immunity

Using two Repeater Units for optical ring enables wiring with optical cables in parts of the network subject to noise.

Simpler, More Flexible Data Links

Change Data Link Tables Whilte Data Links Are Active

- When data link tables are changed due to additional nodes or other networking changes, data link tables can be transferred without stopping any data link communications.
- · Flexbile system configurations can be changed by combining node expansion using Repeater Units.



Specifications

Unit/Board	Classification	Compatible PLC	Media	Model	Connections
Controller Link Units	CPU Bus Unit	CS Series	Wired	CS1W-CLK21-V1	Can be mounted together
			Optical ring (H-PCF cable)	CS1W-CLK12-V1 (See note.)	with previous Controller Link Units/Support Boards.
			Optical ring (GI cable)	CS1W-CLK52-V1 (See note.)	
Controller Link Support	Personal computer board		Wired	3G8F7-CLK21-EV1	
Boards (fo	(for PCI bus)		Optical ring (H-PCF cable)	3G8F7-CLK12-EV1	
			Optical ring (GI cable)	3G8F7-CLK52-EV1	
Controller Link Repeater		Not mounted to PLC	Twisted-pair cable	CS1W-RPT01	Unit mounted indepen-
Units			Optical ring (H-PCF cable)	CS1W-RPT02	dently using either DIN Track or screws.
			Optical ring (GI cable)	CS1W-RPT03	

Note: Lot numbers for the CS1W-CLK12-V1 and CS1W-CLK52-V1 are 030602 or later (June 2003 or later).

Main Specifications Related to Version Upgrade for Unit Ver. 1.2

Item		Unit Ver. 1.2 or later	Pre-Ver. 1.2
Number of data link words		Number of send/receive words per Unit	Number of send/receive words per Unit
		Total of Area 1 and Area 2: 20,000 words max.	Total of Area 1 and Area 2: 12,000 words max.
		Number of send words per Unit Total of Area 1 and Ar	ea 2: 1,000 words max.
Data Link Area allocations User-set allocations		Areas 1 and 2: CIO Area (including data link words), DM Area, and EM Area	
	Automatically set equal allocations	Area 1: CIO Area (including data link words), Area 2: [DM Area and EM Area
	Automatically set 1: N allocations	Areas 1 and 2: CIO Area (including data link words), D	M Area, and EM Area
Maximum number of Controller Link Units connected to a single CPU Unit		8 Units max.	4 Units max.

Note: CX-Programmer Ver. 5.0 or higher is requested to set a data link area with a maximum number of send and receive words of 20,000 words per Controller Unit, or to allocate the same area for Area 1 and Area 2.

Specifications for Networks Using Repeaters

Item	Segment (See note 1.)	Total network
Transmission path configuration	Multi-drop	Tree (using Repeaters to connect each segment)
Baud rate/maximum transmission distance (See note 2.)	2 Mbps: 500 m 1 Mbps: 800 m 500 kbps: 1 km	2 Mbps: 1.5 km 1 Mbps: 2.4 km 400 kbps: 3.0 km
Maximum number of nodes	Controller Link Unit + Repeater Unit Total number of nodes: 32	Controller Link Unit: 62 nodes (using a Controller Link Unit htat supports 62 nodes)
Maximum number of Repeater levels (See note 3.)		2 levels

Note: 1. Specifications for each segment are the same as for Wired Controller Link networks.

- 2. Maximum transmission distance: Total wired cable length between the two nodes separated by the longest total wired cable length.
- 3. Maximum number of Repeater levels: Maximum number of Repeaters in a path linking any two nodes. For optical ring types, one set of two Units comprises one level.

CS1W-PRM21

PROFIBUS-DP Master Unit

- PROFIBUS-DP master class one with support of DP-V1 data types.
- 7 kWord I/O
- Simple configuration through FDT/DTM based configurator
- Special CPU unit
- Handles data independent of the CPU unit, thus reducing CPU load



Function

The CS1W-PRM21 is a master system (DPM1). It exchanges I/O data and communication/status information with the CPU of the PLC. To configure the CS1W-PRM21 a serial port of the CPU can be used. But because configuring is done through FINS

communication virtual any accesspoint on the PLC network can be used. It exchanges data and commands with PROFIBUS-DP slave stations over the PROFIBUS network.

Specifications

CS1W-PRM21 Main function Basic PROFIBUS-DP master Class 1 Unit No. 0-15 Special CPU unit Maximum number of units mountable per PLC 16 Maximum depends on PLC CPU-type Configurator FTD/DTM based Incorporates a Generic DTM to use with GSD-file based slaves Supported baud rate(s) All baud rates as specified by the standard isons to ENS0170, as well as the standard ison to mumber of PROFIBUS stares isons to ENS0170, as well as the standard ison to mumber of PROFIBUS stares Supported Global_Control services On to control Area Supported Global_Control services Sync Unexpec Clear Supported Global_Control services Sync Unexpec Clear Data_Exchange Size_PRM ChC, Clg Global_Control Data_Exchange Size_PRM ChC, Clg Global_Control	Model			Remarks
Unit No. 0-15 Special CPU unit Maximum number of units mountable per PLC 16 Maximum depends on PLC CPU-type PLC Configurator FTD/DTM based Incorporates a Generic DTM to use with GSD-file based slaves Supported baud rate(s) All baud rates as specified by the standard IEC61156 The baud rate value to be used must be selected through the Configurator. Supported baud rate(s) All baud rates as specified by the standard IEC61156 The baud rate value to be used must be selected through the Configurator. Supported baud rate(s) SkBit/s, 19.2 kBit/s, 45.45 kBit/s, 19.2 kBit/s, 15.5 kBit/s, 15.0 KBit/s, 15.0 kBit/s, 15.0 kBit/s, 12.2 kBit/s The baud rate value to be used must be selected through the Configurator. Selectable PROFIBUS address 0-125 Set through the configurator Maximum number of IVO points 7168 words Incorporates address Maximum number of IVO points per PROFIBUS slaves 24 bytes In / 244 bytes Out Incorporates Incorporates Supported Master-Slave communication services Sync Untrezze Clear Through Control Area Unsync Freeze Clear Through Control Area Maximum number of IVO points per PROFIBUS slave_Diag Sat_PRM Chk_Ctg Global_Control Data_Exchange Slave_Diag Sat_PRM Chk_Ctg Incorporates Intezen Incorporates Intezen	CS1W-PRM21	Main function	Basic PROFIBUS-DP master Class 1 functions plus: DPV1 data types support	
Maximum number of units mountable per PLC 16 Maximum depends on PLC CPU-type Configurator FTDOTM based incorporates a Generic DTM to use with GSD-file based slaves Supported baud rate(s) All baud rates as specified by the standard ENG0170 Volume 2, the PROFIBUS exten- sions to ENG0170, as well as the standard BCG1198; 93 / 8 KBits, 19 2 KBi		Unit No.	0-15	Special CPU unit
Configurator FTD/DTM based Incorporates a Generic DTM to use with GSD-file based slaves Supported baud rate(s) All baud rates as specified by the standard EN50170 Volume 2, the PROFIBUS exten- sions to EN50170, as well as the standard IEC61156: The baud rate value to be used must be selected through the Configurator. 9 & RBI/s, 19 2 KBI/s, 19 2 KBI/s, 19 7 S KBI/s, 500 KBI/s, 115 MBI/s, 500 KBI/s, 15 MBI/s, 500 KBI/s, 12 MBI/s, 6 MBI/s, 12		Maximum number of units mountable per PLC	16	Maximum depends on PLC CPU-type
Supported baud rate(s) All baud rates as specified by the PROFIBUS standard ENSOTO, as well as the standard IE OF 1158: 9.6 kBit/s, 19.2 kBit/s, 45.45 kBit/s, 19.2 kBit/s, 187.5 kBit/s, 187.5 kBit/s, 187.5 kBit/s, 112 MBit/s, 12		Configurator	FTD/DTM based	Incorporates a Generic DTM to use with GSD-file based slaves
Selectable PROFIBUS address 0-125 Set through the configurator Maximum number of PROFIBUS slaves 125 Maximum number of I/O points 7168 words Maximum number of I/O points per PROFIBUS slave 244 bytes In / 244 bytes Out Control and status ares size 25 words Supported Global_Control services Sync Through Control Area Unrigotic Freeze Unfreeze Unfreeze Clear Supported Master-Slave communication services Data_Exchange Set_PRM Chk, Cfg Global_Control Global_Control 400 mA at 5 V Dimensions 34.5 mm widex 130 mm height x 111.2 mm depth Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Supported baud rate(s)	All baud rates as specified by the standard EN50170 Volume 2, the PROFIBUS exten- sions to EN50170, as well as the standard IEC61158: 9.6 kBit/s, 19.2 kBit/s, 45.45 kBit/s, 93.75 kBit/s, 500 kBit/s, 1.5 MBit/s, 3 MBit/s, 12 MBit/s	The baud rate value to be used must be selected through the Configurator.
Maximum number of PROFIBUS slaves 125 Maximum number of I/O points 7168 words Maximum number of I/O points per PROFIBUS slave 244 bytes In / 244 bytes Out Control and status ares size 25 words Supported Global_Control services Sync Unsync Freeze Clear Through Control Area Supported Master-Slave communication services Data_Exchange Slave_Diag Set_PRM Chk_Cfg Global_Control Data_Exchange Slave_Diag Stet_PRM Chk_Cfg Global_Control Power consumption 400 mA at 5 V Immediate X 130 mm height x 111.2 mm depth Weight 154 gr Operating: 0 °C to 50 °C		Selectable PROFIBUS address	0-125	Set through the configurator
Maximum number of I/O points 7168 words Maximum number of I/O points per PROFIBUS slave 244 bytes In / 244 bytes Out Control and status ares size 25 words Supported Global_Control services Sync Unsync Freeze Clear Through Control Area Supported Master-Slave communication services Data_Exchange Slave_Diag Set_PRM Chk_Cfg Global_Control Data_Exchange Ster_PRM Chk_Cfg Global_Control Power consumption 400 mA at 5 V Dimensions 34.5 mm wide x 130 mm height x 111.2 mm depth Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Maximum number of PROFIBUS slaves	125	
Maximum number of I/O points per PROFIBUS slave 244 bytes In / 244 bytes Out Control and status ares size 25 words Supported Global_Control services Sync Unsync Freeze Unfreeze Clear Through Control Area Supported Master-Slave communication services Data_Exchange Slave_Diag Set_PRM Chk_Cfg Global_Control Data_Exchange Slave_Diag Set_PRM Chk_Cfg Power consumption 400 mA at 5 V Dimensions Dimensions 34.5 mm wide x 130 mm height x 111.2 mm depth Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Maximum number of I/O points	7168 words	
Control and status ares size25 wordsSupported Global_Control servicesSync Unsync Freeze Unfreeze ClearThrough Control AreaSupported Master-Slave communication servicesData_Exchange Slave_Diag Set_PRM Chk_Cfg Global_ControlAta_Exchange Slave_Diag Set_PRM Chk_Cfg Global_ControlPower consumption400 mA at 5 VDimensions34.5 mm wide x 130 mm height x 111.2 mm depthWeight154 grAmbient temperatureOperating: 0 °C to 50 °C		Maximum number of I/O points per PROFIBUS slave	244 bytes In / 244 bytes Out	
Supported Global_Control services Sync Through Control Area Unsync Freeze Unfreeze Clear Data_Exchange Supported Master-Slave communication services Data_Exchange Slave_Diag Set_PRM Ch_Cfg Global_Control Power consumption 400 mA at 5 V Dimensions 34.5 mm wide x 130 mm height x 111.2 mm depth 114.2 mm depth Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Control and status ares size	25 words	
Supported Master-Slave communication services Data_Exchange Slave_Diag Set_PRM Ch_Cfg Global_Control Power consumption 400 mA at 5 V Dimensions 34.5 mm wide x 130 mm height x 111.2 mm depth Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Supported Global_Control services	Sync Unsync Freeze Unfreeze Clear	Through Control Area
Power consumption 400 mA at 5 V Dimensions 34.5 mm wide x 130 mm height x 111.2 mm depth Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Supported Master-Slave communication services	Data_Exchange Slave_Diag Set_PRM Chk_Cfg Global_Control	
Dimensions 34.5 mm wide x 130 mm height x 111.2 mm depth Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Power consumption	400 mA at 5 V	
Weight 154 gr Ambient temperature Operating: 0 °C to 50 °C		Dimensions	34.5 mm wide x 130 mm height x 111.2 mm depth	
Ambient temperature Operating: 0 °C to 50 °C		Weight	154 gr	
		Ambient temperature	Operating: 0 °C to 50 °C	

C200HW-PRT21

PROFIBUS-DP Slave Unit

I/O Link Unit for C200H□ and CS1 PLC Ideal for distributed control.

- OMRON's C200HS, C200HE, C200HG, C200HX and CS1 PLCs can be used as an intelligent Slave on a PROFIBUS-DP network.
- Default 2 words in + 2 words out, maximum 100 words in + 100 words out.
- Simple PROFIBUS-DP node address setting by rotary switches.
- Supports SYNC/FREEZE and Fail-Safe functions.

Specifications

Communication Specifications

Applicable standard	EN 50170 vol. 2
Station type	Modular station, max. 32 modules Configurable with In-, Out- and I/O-modules of 1, 2, 4, 8 and 16 words Total of 0 to 100 words in + 0 to 100 words out, with consistency over the full length
Bus connector	9-pin female sub-D connector (RS-485 PROFIBUS connector)
Bus termination	External
Baud rate (auto-detect)	9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s, 1.5 / 3 / 6 / 12 Mbit/s
PROFIBUS address range	0 to 125, Remote setting not supported
Communication cable	Type A (EN 50170 vol. 2)
Minimum slave interval time	0.5 ms
Supported DP functions	Data_Exchange Slave_Diag Set_Prm Chk_Cfg Global_Control (SYNC, FREEZE, CLEAR) Get_Cfg RD_Imp RD_Outp
PROFIBUS-DP GSD file	OC_04AC.GSD

Unit Specifications

Host PLC system	C200HS, C200HE, C200HG, C200HX, CS1	
Maximum number of Units per PLC system	C200HS C200HE-CPU11/32/42 C200HG-CPU33/43 C200HX-CPU34/44	10
	All others	16
Slave unit mounting position	CPU Rack or Expansion I/O Rack Unit: cannot be mounted to SYSMAC BUS Slave Racks Unit: cannot be used on a C200H PLC system	;
Current consumption	250 mA at 5 V DC (from PLC power supply)	
Weight	180 g	
Switch settings	Special I/O Unit number (0-F) by notary switch PROFIBUS-DP mode address (o to 125) by 3 rotary swi	itches
LED indicators	Unit status: RUN (green LED), ERR (red LED) Network status: COMM (green LED), BF (red LED)	
No. of IR words	PLC to Slave Unit: 3 words (1 word of control data + 2 w Slave unit to PLC: 5 words (3 words of unit status + 2 w	vords slave input data) ords slave output data)
No. of DM settings	8 words of Unit setup information	
Amount of I/O data per Unit	Default (DM settings all 0000)	all PLC's: 2 words in + 2 words out
	With user defined DM settings	C200HS: up to 80 words in + out all others: up to 100 words in + 100 words out
Storage temperature	- 20 °C to + 75 °C	
Operating temperature	0 °C to + 55 °C	
Operating humidity	10% to 90% (non-condensing)	
Conformance to EMC- and environmental standards	EN50081-2 EN61131-2	

CS1W-DRM21-V1

DeviceNet Unit

Multivendor Field Network

- Control of up to 32,000 points (2,000 words) per master.
- Remote I/O communications can be allocated in any area using DM settings.
- 16 DeviceNet Units can be mounted for each CPU Unit (3 max. for fixed allocations).
- When using the Configurator (see note), remote I/O can be allocated in an order independent of node address.
- **Note:** The Configurator is allocating a node-address if connected to DeviceNet using a DeviceNet communication card. It is not doing this if connected through the serial communications interface of the CPU.
- DeviceNet Units can be used as a master and a slave, and this functionality can be used simultaneously.
- Note: DeviceNet Units allow DeviceNet networks to be treated exactly like Controller Link, Ethernet, or other networks for message communications or remote programming and monitoring by a CX-Programmer.

Function

OMRON supports the DeviceNet open field network, a multivendor network for machine/line control and information. The following types of communications are possible.

 Remote I/O communications for automatic data transfers between the CPU Unit and Slaves (with no programming in the CPU Unit).

System Configuration





- Explicit message communications. This can be programmed from the CPU unit (IOWR and CMND instructions) and read from/write to other DeviceNet units.
- **3.** With explict message communication FINS commands can be send to other devices that support FINS messaging.



Ordering Information

Compatible PLCs		Maximum number of I/O points			Model
		Fixed allocations	User-set allocations		
			Using allocated DM Area words	Using Configurator	
CS1 Series	When used as a master	Input: 1,024 points Output: 1,024 points Total: 2,048 points (128 words)	Input: 8,000 points Output: 8,000 points Total: 16,000 points (1,000 words)	Input: 8,000 points x 2 blocks Output: 8,000 points x 2 blocks Total: 32,000 points (2,000 words)	CS1W-DRM21
	When used as a slave	Input: 16 points Output: 16 points Total: 32 points (2 words)	Input: 1,600 points Output: 1,600 points Total: 3,200 points (200 words)	Input: 1,600 points x 1 block Output: 1,600 points x 2 blocks Total: 4,800 points (300 words)	

Specifications

Master/Slave Specifications

Communications power supply voltage				11 to 25 V DC (supplied from the communications connector) (See note 1.)
Current consumption				Communications:30 mA max.
				Internal circuit:290 mA max.
Max. number of connectable slaves	Remote I/O, ex	plicit message service		63 (See note 2.)
Max. number of I/O points	Fixed allocations		When used as a master	2,048 points
			When used as a slave	32 points
	User-set allocations	Using allocated DM Area words	When used as a master	16,000 points
			When used as a slave	3,200 points
	Ī	Using Configurator	When used as a master	32,000 points
			When used as a slave	4,800 points
Number of allocated words	Fixed allocations		When used as a master	64 input and 64 output words Software switch/status area: 25 words
			When used as a slave	1 input word, 1 output word (See note 3.)
	User-set Using allocations words Using	Using allocated DM Area words	llocated DM Area When used as a master	500 input and 500 output words Software switch/status area: 25 words
			When used as a slave	100 input and 100 output words (See note 3.) Software switch/status area: 25 words
		Using Configurator	When used as a master	500 input words x 2 blocks, 500 output words x 2 blocks Software switch/Status area: 25 words
			When used as a slave	100 input words x 1 blocks, 100 output words x 2 blocks Software switch/Status area: 25 words
Max. message length				542 bytes (See note 4.)
Max. number of Units	Fixed allocation	ns		3
mountable to PLC	User-set alloca	tions		16
Weight				172 g max.

Note: 1. Refer to the DeviceNet (CompoBus/D) Operation Manual (W267) for the communications power supply specifications.

- 2. The DeviceNet unit uses a node of the 64 supported by DeviceNet, leaves connection is possible to 63 slaves.
- 3. When the DeviceNet is used a slave, "input" and "output" respectively refer to input from the master to the slave and output from the slave to the master.
- 4. The maximum message length includes the command code when using the CMND instruction.
- 5. The CS1W–DRM21 cannot perform message communications with the E5ZE-8 D1 B. Use the E5ZE-8 D1 B-V2, which is a later version. For details on the E5ZE-8 D1 B-V2, refer to the catalog for the product itself (SGTD-017).

DeviceNet Unit

Classification	Types of communications	Specifications	Unit numbers	Model
CS1 CPU Bus Unit	Remote I/O communications master (fixed or user-set allocations) Remote I/O communications slave (fixed or user-set allocations) Message communications	Up to 16 Units can be mounted when a Configurator is used.	0 to F (Configurator required to mount 16 Units.)	CS1W-DRM21
C200H Special I/O	Remote I/O communications master			C200HW-DRM21-V1
Unit	Remote I/O communications slave]		C200HW-DRT21

DeviceNet Configurator

Model number	Specifications
WS02-CFDC1-E	Software only (Windows 95, 98, NT 4.0, 2000, or XP)
3G8E2-DRM21-E-V1	PC card with software (Windows 95 or 98)

C200HW-DRT21

DeviceNet I/O Link Unit

I/O Link Unit is ideal for distributed control. PLC can be used as an Intelligent Slave on the DeviceNet.

- Intelligent DeviceNet Slave
- Supports I/O and message communications.
- Maximum I/O area size: 512 input points (32 words) 512 output points (32 words)
- Programming Console or Configurator freely allocates I/O areas.



Ordering Information

Name	Max. number I/O points	Model
I/O Link Unit (for SYSMAC CS1, C200HX/HG/HE)	512 inputs, 512 outputs (1,024 points in total)	C200HW-DRT21

Specifications

Ratings/Characteristics

General Specifications

Item	Specification
Communications power supply voltage	11 to 25 V DC
Current consumption	Communications power supply: 45 mA max. Internal circuit power supply: 250 mA max. at 5 V DC
Max. number of I/O points	512 input points (32 words) 512 output points (32 words)
Default area	Write area (linking with Master's write area): 1 word out of 350 IR words Read area (linking with Master's read area): 1 word out of 50 IR words
No. of connectable Units	10 max. (CS1/C200HX/HG/HE CPU Unit handles up to 880 I/O points)
	16 max. (CS1/C200HX/HG/HE CPU Unit handles more than 880 I/O points)
Weight	250 g max.

Function Specifications

Settings (Slave)

Item	Specification						
Function	A write area block and a read area b	write area block and a read area block can be freely allocated to any areas or addresses respectively					
Allowable setting area	Both read and write areas can be all	oth read and write areas can be allocated to IR, DM, HR, AR, LR, T/C, and EM areas					
First address	A readable or writable area by word	readable or writable area by word (with some restrictions)					
Area size	Set in 1-byte increments up to 64 by	et in 1-byte increments up to 64 bytes for both read and write areas					
Setting method	Configurator	Refer to the DeviceNet Configurator Operation Manual (W328).					
	Programming Console	1. Write the set value to I/O setting area allocated to the Special I/O Area.					
		 Turn ON the software switch allocated to the Special I/O Area and write the settings. 					
		3. Turn the Programming Console OFF and ON or reset the AR area.					

Message Communications

Item	Specification
Function	Supports messages that can be written to or read from the CS1/C200HX/HG/HE's user I/O areas (i.e., IR, DM, HR, AR, LR, T/C, and EM areas)
Master	OMRON's Master Unit or compatible unit from Rockwell
Max. message size	Slave (C200HW-DRT21) 200 bytes per READ or WRITE command

Dimensions

 $35 \times 130 \times 101 \text{ mm} (W \times H \times D)$

Precautions

Refer to the relevant catalog for details on CS1-series and C200HX/HG/HE PLCs (CS1 Series: Cat. No. P047; C200HX/HG/HE: Cat. No. P036).

C200HW-CORT21-V1

CAN & CANopen communication unit

CAN & CANopen communication unit Supports CANopen, but can also be used to communicate with a user-defined CAN protocol

- PDO's configurable with CANopen Configurator or IOWR PLC instructions
- Able to transceive any user defined CAN message up to 2000 msgs/s using IOWR PLC instructions
- Able to set any arbitrary baud rate supported by the CAN controller
- Mountable on C200H Alpha and CS1 backplanes



System Configuration



Programmable Controllers

Specifications

Installation	Host PLC system	C200HE, C200HG, C200HX, CS1-series	1					
	Maximum number of Units per PLC system		10					
			16					
	Linit mounting position	CPU Back of Expansion I/O Back	10					
	onit mounting position	Unit cannot be mounted to SYSMAC BUS SI	ave Backs					
	Current consumption	Internal I/O power supply: 250 mA at 5V DC	c max. (from PLC)					
		Network power supply: 45 mA max (from	n communications connector)					
	Network power supply	$24 \text{ V DC} \pm 10\%$						
	Weight	250 g						
Environment	Storage temperature	- 20 °C to + 75 °C						
	Operating temperature	0 °C to + 55 °C						
	Operating humidity	10 to 90% (non-condensing)						
	Conformance to EMC- and environmental standards	EN50081-2 EN61131-2						
User Interface	Switch settings	Special I/O Unit number (0~F) by rotary swite	ch (front)					
		Network baud rate (10 kbit/s ~ 1000 kbit/s) b	y 3 DIP-switches (front)					
		CANopen node address (001 ~ 127) by 7 DII	P-switches (rear)					
	Indicators	Unit status: RUN (green LED), ERR	(red LED)					
		Network status: 2 x 7-segment display						
PLC Interface	No. of IR words	PLC \rightarrow Unit: 3 words (1 word control	data + 2 words CANopen transmit data)					
		Unit \rightarrow PLC: 5 words (3 words Unit st	atus + 2 words CANopen receive data)					
	No. of DM settings	20 words						
	Amount of I/O data per Unit	Default [DM settings all 0000]: 2 words in + 2	words out					
		With user defined DM settings: additionally u	p to 100 words in + 100 words out					
	Message communications	By IOWR/IORD instructions						
Network	CAN interface	ISO 11898, High Speed CAN						
interface	Bus connector	5-pin mal open style connector						
	Node address	1 to 127, remote setting not supported						
	Baud rate	10, 20, 50, 125, 250, 500, 800, 1000 kbit/s						
		(Note: Refer to appendix D for the configurat	ion of any arbitrary baud rate via the DM settings.)					
	Profile	Communication Profile DS301 version 4.0						
		Manufacturer Specific Application Profile						
	Supported functions	Boot-up type	Minimum					
			Slave					
		Number of PDOS	Default:					
		PDO transmission modes	Configurable: Synchronous cyclic					
			Synchronous acyclic					
		PDO linking	Supported					
		PDO mapping	Variable					
		Application objects	Default configuration:					
			Transmit objects: 4 x 8-bit					
			Receive objects: 4 x 8-bit					
			Additionally configurable:					
			I ransmit objects: 8-bit (max. 100) 16-bit (max. 100)					
			32-bit (max. 50)					
			64-bit (max. 25)					
			Receive objects: 8-bit (max. 100)					
			16-bit (max. 100)					
			64-bit (max. 50)					
			The total size of additonally configured transmit- and receive objects is limited to 100 words each.					
		Number of SDOs	1 server					
		Emergency Message	EMCY Producer					
		Synchronisation	SYNC Consumer					
		Error control servies	Heartbeat (1 producer and 1 consumer) and					
			Node guarding					
		Storing of Parameters	Yes, can be stored in non-volatile memory					
		User defined CAN messages	Transmission using IOWR PLC instruction					
			neception through configurable identifier fliter					
	EDS IIIe							

C200HW-SRM21-V1

CompoBus/S Master Unit

CompoBus/S is a high-speed I/O bus

- Up to 256 I/O points per Master.
- Up to 32 Slaves per Master.
- Communications cycle time: 0.5 ms (at 750 kbps).
- Communications distance: Up to 500 m (at 93.75 kbps).

Free wiring with any branching method for up to 200 m (in long-distance communications mode).



Function

A high-speed ON/OFF bus that automatically transfers remote I/O status to the CPU Unit without any programming in the CPU Unit. Highspeed remote I/O is supported by a communications cycle time of 1 ms maximum for 256 I/O points.

System Configuration



Specifications

General

Classification	Communications	Specifications	Unit number	Model
C200H Special I/O Unit	Remote I/O	No. of mountable Units: 16	0 to F	C200HW-SRM21-V1

Unit Specifications

Current consumpti	on	150 mA max. at 5 V DC					
Number of I/O points 256 points (128 inputs/128 outputs), 128 points (64 inputs/64 outputs) (switchable)							
Number of occupied words		256 points:20 words (8 input words/8 output words, 4 status data) 128 points:10 words (4 input words/4 output words, 2 status data)					
PLC		CS1, C200HX (-ZE), C200HG (-ZE), C200HE (-ZE), C200HS					
Number of	C200HE	128 points: 10, 256 points: 5					
Master Units mountable	C200HG-CPU33/43	128 points: 10, 256 points: 5					
	C200HG-CPU53/63	128 points: 16, 256 points: 8					
	C200HX-CPU34/44	128 points: 10, 256 points: 5					
	C200HX-CPU54/64	128 points: 16, 256 points: 8					
	C200HS	128 points: 10, 256 points: 5					
	CS1	128 points: 16, 256 points: 8					
Number of points p	per node number	8 points					
Max. number of Sla	aves per Master	32					
Status data		Communications Error Flag and Active Slave Node (see note)					
Weight		200 g max.					
Approved standard	ls	UL 508 (E95399), CSA C22.2 No. 142 (LR51460)					

These flags use the AR area.

Programmable Controllers

Communications Specifications

Communications m	ethod	CompoBus/S protocol				
Coding method		Manchester coding method				
Connection method		Multi-drop method and T-branch method (see note 1)				
Communications baud rate		750,000 bps, 93,750 bps (see note 2)				
Communications	High-speed communications	0.5 ms with 8 Slaves for inputs and 8 Slaves for outputs				
cycle time	mode	0.8 ms with 16 Slaves for inputs and 16 Slaves for outputs				
	Long-distance	4.0 ms with 8 Slaves for inputs and 8 Slaves for outputs				
	communications mode	6.0 ms with 16 Slaves for inputs and 16 Slaves for outputs				
Communications cable		2-conductor VCTF cable (0.75 x 2), 4-conductor VCTF cable (0.75 x 4) Special Flat Cable				
Communications distance	High-speed communications mode	2-conductor VCTF cable: Main line length:100 m max. Branch line length:3 m max. Total branch line length:50 m max. Special Flat Cable, 4-conductor VCTF cable: Main line length:30 m max. Branch line length:30 m max. Total branch line length:30 m max. (When Special Flat Cable is used to connect fewer than 16 Slaves, the main line can be up to 100 m long and the total branch line length can be up to 50 m.)				
	Long-distance communications mode	2-conductor VCTF cable: Main line length:500 m max. Branch line length:6 m max. Total branch line length:120 m max. Special Flat Cable, 4-conductor VCTF cable: Variable branch wiring (total cable length 200 m max.) (There are no limits on the branching format or main, branch, or total line lengths. The terminator must be connected to the point in the system farthest from the master.)				
Max. number of cor	necting nodes	32				
Error control checks	3	Manchester code check frame length check and parity check				

Note: 1. A terminator must be connected to the point in the system most remote from the Master.

2. The communications baud rate is set by the DIP switch.

Ordering Information

International Standards

The indicated standards are those current for UL, CSA, cULus, NK and Lloyds standards and EC directives as of September 2004. Abbreviations used:

U = UL, U1 = UL Class I Div.2 for hazardous locations, C = CSA, UC = cULus, UC1 = cULus Class I Div.2 for hazardous locations CU = cUL, N = NK (Nippon Kaiji Kyokai), L = Lloyd's Register, CE = EC Directives. Please contact OMRON representative for application conditions.

CPU Rack

Name	Specifica	tions	Model	Standards	
CPU Units (See note.)	I/O bits	Program capacity			
. ,	5,120	250 kSteps	448 kWords (DM: 32 kWords, EM: 32 kWords ×13 banks)	CS1H-CPU67H	UC1, N, L, CE
	5,120	120 kSteps	256 kWords (DM: 32 kWords, EM: 32 kWords ×7 banks)	CS1H-CPU66H	
	5,120	60 kSteps	128 kWords (DM: 32 kWords, EM: 32 kWords ×3 banks)	CS1H-CPU65H	
	5,120	30 kSteps	CS1H-CPU64H		
	5,120	20 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1H-CPU63H	
	5,120	60 kSteps	128 kWords (DM: 32 kWords, EM: 32 kWords ×3 banks)	CS1G-CPU45H	
	1,280	30 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1G-CPU44H	
	960	20 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1G-CPU43H	
	960	10 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1G-CPU42H	
CPU Backplanes	2 slots (D	oes not connect to	Expansion Rack.)	CS1W-BC022	U, C, N, L, CE
(for CS1 Units only)	3 slots			CS1W-BC032	
	5 slots			CS1W-BC052	
	8 slots			CS1W-BC082	
	10 slots			CS1W-BC102	
CPU Backplanes	2 slots (D	oes not connect to	Expansion Rack.)	CS1W-BC023	U, C, N, L, CE
(for CS1- and	3 slots			CS1W-BC033	
C200H I/O Units)	5 slots			CS1W-BC053	
	8 slots			CS1W-BC083	
	10 slots			CS1W-BC103	
Power Supply Units	100 to 120	0 V AC or 200 to 2	40 V AC; Output capacity: 4.6 A, 5 V DC	C200HW-PA204	U, C, N, L, CE
	100 to 120 Output ca	0 V AC or 200 to 2 pacity: 4.6 A, 5 V I	C200HW-PA204S		
	100 to 120	0 V AC or 200 to 2	C200HW-PA204R	U, C	
	100 to 120	0 V AC or 200 to 2	C200HW-PA209R	U. C. N. L. CE	
	24 V DC,	Output capacity: 4	C200HW-PD024	UC1, N, L, CE	
	100 V DC	, Output capacity:	C200HW-PD106R	U, C	
I/O Control Unit	For Expar included.	nsion Racks conne C200H Units cann	cted over a distance of more than 12 m (2 terminating resistors ot be used on Long-distance Expansion Racks.)	CS1W-IC102	U, C, CE
Memory Cards	Flash mer	mory, 30 MB	HMC-EF372	L, CE	
	Flash mer	mory, 64 MB	HMC-EF672		
	Memory C	Card Adapter (for c	HMC-AP001	CE	
Serial Communications	2 × RS-23	32C ports, protocol	macro function	CS1W-SCB21-V1	U, C, N, L, CE
Boards	1 × RS-23	B2C port + 1 × RS-	422/485 port, protocol macro function	CS1W-SCB41-V1	
Programming Consoles	An Englis	h Keyboard Sheet	CQM1-PRO01-E	U, C, CE	
	(Connects	s to peripheral port	on CPU Unit only. Cannot be connected to RS-232C port.)	C200H-PRO27-E	U, C, N, CE
Programming Console Key Sheet	For C200	H-PRO27 and CQ	M1H-PRO01	CS1W-KS001-E	CE
Programming Console	Connects	the C200H-PRO2	7-E Programming Console. (Length: 2.0 m)	CS1W-CN224	
Connecting Cables	Connects	the C200H-PRO2	7-E Programming Console. (Length: 6.0 m)	CS1W-CN624	
CX-One	Omron's i nents, inc	ntegrated software	for programming and configuration of all control system compo- drives, temperature controllers and advanced sensors.	CX-ONE-AL□□C-E ^{*1}	
Peripheral Device Connecting Cables	Connects (Conversi	personal compute on cable to connect	rs, D-Sub 9-pin receptacle (Length: 0.1 m) t RS-232C cable to peripheral port)	CS1W-CN118	CE
(for peripheral port)	Periphera	I bus or Host Link	Connects personal computers. D-Sub 9-pin (Length: 2.0 m)	CS1W-CN226	
			CS1W-CN626	-	
Peripheral Device	Periphera	l bus or Host Link	Connects personal computers. D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-CV	
Connecting Cables	antistatic		Connects personal computers, D-sub 9-pin (Length: 5.0 m)	XW27-500S-CV	_
(for RS-232C port)	Host Link		Connects personal computers D-Sub 9-pin (Length: 0.0 m)	XW2Z-200S-V	-
			Connects personal computers, D-Sub 9-pin (Length: 5.0 m)	XW27-500S-V	-
USB-Serial Conversion	Converte	hetween LISR and	BS-232C, cable length: 0.5 m	CS1W-CIE31	
Cable	PC driver a Periphe	provided on CD-R pral or RS-232C Pc	OM. Refer to Using a USB-Serial Conversion Cable to Connect to t on page 291 for specifications.		
Battery Set	For CS1 S	Series only. (Instal	a replacement battery within 2 years of the production date.)	CS1W-BAT01	L, CE

^{*1} $\Box \Box$ = Number of licences; 01, 03, 10

Note: When using a CS1W-CN313 or CS1W-CN713 I/O Connecting Cable with a CS1□-CPU□□H CPU Unit, use only Cables produced on or after September 20, 2001 (production number 2091). Cables with no production number, a 6-digit production number, or produced before September 20, 2001, cannot be used.

SYSMAC CS1D Duplex System

Name	Specification	າຣ	Model	Standards	
Duplex CPU Units	I/O capacity	Program capacity		UC1, N, L, CE	
	5,120 points	60 Ksteps	128 Kwords (DM: 32 Kwords, EM: 32 Kwords x 3 banks)	CS1D-CPU65H	
		250 Ksteps	448 Kwords (DM: 32 Kwords, EM: 32 Kwords x 13 banks)	CS1D-CPU67H	
Duplex process control CPUs (include LCB05 option board for duplex system)	5,120 points	60 Ksteps	128 Kwords (DM: 32 Kwords, EM: 32 Kwords x 3 banks)	CS1D-CPU65P CS1D-CPU67P	UC1, CE
Single CPU Units supporting online I/O unit	5120	250 kSteps	448 kWords (DM: 32 kWords, EM 32 kWords x 13 banks)	CS1D-CPU67S	UC1, N, L, CE
replacement	5120	60 kSteps	128 kWords (DM: 32 kWords, EM 32 kWords x 3 banks)	CS1D-CPU65S	
	1280	280 30 kSteps 64 kWords (DM: 32 kWords, EM 32 kWords x 1 bank)		CS1D-CPU44S	
	960	10 kSteps	64 kWords (DM: 32 kWords, EM 32 kWords x 1 bank)	CS1D-CPU42S	
Duplex Unit		•	·	CS1D-DPL01	UC1, N, L, CE
CS1D Power Supply Units	100 to 120 VA Output capac	AC or 200 to 240 VA ity: 7 A, 5 VDC; 1.3	CS1D-PA207R		
	24 VDC, Outp	out capacity: 4.3 A, 5	CS1D-PD024		
Duplex CPU Backplane	5 slots, suppo on-line Unit re	orts dual CPUs and c	luplex unit, dual power supplies and	CS1D-BC052	
Single CPU backplane	8 slots (suppo	orts dual power supp	ly and on-line Unit replacement)	CS1D-BC082S	
Expansion Backplane	9 slots (Used Racks.)	both for CS1D Expa	nsion Racks and CS1D Long-distance Expansion	CS1D-BI092	
Controller Link Units	Optical ring ty	pe with H-PCF cable	9	CS1D-CLK12-V1	
	Optical ring ty	pe with GI cable	CS1D-CLK52-V1		
CX-One	Omron's integ components, sors.	grated software for p including PLCs, HM	rogramming and configuration of all control system I, drives, temperature controllers and advanced sen-	CX-ONE-AL□□C-E [™]	
Optical Fiber Cable	H-PCF cable cable length:	for for interconnection 50 cm	CS1D-CN051		

^{*1} \square = Number of licences; 01, 03, 10

Expansion Racks

Name	Specifications		Model	Standards	
CS1 Expansion Backplanes	3 slots	CS1W-BI032	U, C, N, L, CE		
(for CS1 Units only)	5 slots		CS1W-BI052		
	8 slots	CS1W-BI082			
	10 slots	CS1W-BI102			
CS1 Expansion Backplanes	3 slots	CS1W-BI033	U, C, N, L, CE		
(for CS1 and C200H I/O Units)	5 slots		CS1W-BI053		
	8 slots	CS1W-BI083			
	10 slots	CS1W-BI103			
C200H Expansion I/O Backplanes	3 slots		C200HW-BI031	U, C, N, L, CE	
	5 slots	C200HW-BI051			
	8 slots	C200HW-BI081-V1			
	10 slots		C200HW-BI101-V1		
Power Supply Units	100 to 120 V AC or 200 to 240 V AC, Output capacity: 4.6	A, 5 V DC	C200HW-PA204		
	100 to 120 V AC or 200 to 240 V AC (with service supply: 0 pacity: 4.6 A, 5 V DC	0.8 A, 24 V DC), Output ca-	C200HW-PA204S		
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 4.6 A, 5 V DC		C200HW-PA204R	U, C	
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 9 A, 5 V DC	C200HW-PA209R	U, C, N, L, CE		
	24 V DC, Output capacity: 4.6 A, 5 V DC		C200HW-PD024	UC1, N, L, CE	
	100 V DC, Output capacity: 6 A, 5 V DC	C200HW-PD106R	U, C		
I/O Interface Unit	For Expansion Racks connected over a distance of more th cannot be used on Long-distance Expansion Racks.)	CS1W-II102	U, C, N, L, CE		
CS1 I/O Connecting Cables	Connects CS1 Expansion I/O Backplanes to CPU Back-	Length: 0.3 m	CS1W-CN313	N, L, CE	
	planes or other CS1 Expansion I/O Backplanes.	Length: 0.7 m	CS1W-CN713		
		Length: 2 m	CS1W-CN223		
		Length: 3 m	CS1W-CN323	_	
		Length: 5 m	CS1W-CN523		
		Length: 10 m	CS1W-CN133		
		Length: 12 m	CS1W-CN133-B2		
Long-distance Expansion Rack	Connect I/O Control Unit to I/O Interface Unit or connects	Length: 0.3 m	CV500-CN312	N, L, CE	
Cables	two I/O Interface Units	Length: 0.6 m	CV500-CN612	N, L, CE	
		Length: 1 m	CV500-CN122		
		Length: 2 m	CV500-CN222	N, CE	
		Length: 3 m	CV500-CN322	N, CE	
		Length: 5 m	CV500-CN522	N, CE	
		Length: 10 m	CV500-CN132	N, L, CE	
		Length: 20 m	CV500-CN232	N, CE	
		Length: 30 m	CV500-CN332	N, L, CE	
		Length: 40 m	CV500-CN432	N, CE	
		Length: 50 m	CV500-CN532	N, L, CE	
CS1 to C200H I/O	Connects C200H Expansion I/O Backplanes to CPU Back-	Length: 0.3 m	CS1W-CN311	N, L, CE	
Connecting Cables	planes or CS1 Expansion I/O Backplanes.	Length: 0.7 m	CS1W-CN711		
		Length: 2 m	CS1W-CN221		
		Length: 3 m	CS1W-CN321		
		Length: 5 m	CS1W-CN521	_	
		Length: 10 m	CS1W-CN131		
		Length: 12 m	CS1W-CN131-B2		
C200H I/O Connecting	Connects C200H Expansion I/O Backplanes to other C200H	Length: 0.3 m	C200H-CN311	N, L, CE	
Cables	Expansion I/O Backplanes.	Length: 0.7 m	C200H-CN711		
		Length: 2 m	C200H-CN221		
		Length: 5 m	C200H-CN521	L, CE	
		Length: 10 m	C200H-CN131		

I/O Units

CS1 Basic I/O Units

Classifica-	Name	Specifications		M	ountable Ra	cks		Words	Model	Standards
tion			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks	allocated (CIO 0000 to CIO 0319)		
CS1 Input	DC Input Units	24 VDC, 16 inputs, 7 mA	Yes	No	Yes	Yes	No	1	CS1W-ID211	UC1, N, L,
Units		24 VDC, 32 inputs, 6 mA	Yes	No	Yes	Yes	No	2	CS1W-ID231	CE
		24 VDC, 64 inputs, 6 mA	Yes	No	Yes	Yes	No	4	CS1W-ID261	
		24 VDC, 96 inputs, approx. 5 mA	Yes	No	Yes	Yes	No	6	CS1W-ID291	U, C, N, L, CE
	AC Input Units	100 to 120 VAC, 100 to 120 VDC, 16 inputs	Yes	No	Yes	Yes	No	1	CS1W-IA111	UC1, N, L, CE
		200 to 240 VAC, 16 inputs	Yes	No	Yes	Yes	No	1	CS1W-IA211	UC, N, L, CE
	Interrupt Input Unit	24 VDC, 16 inputs, 7 mA	Yes	No	Yes (See note.)	Yes (See note.)	No	1	CS1W-INT01	UC1, N, L, CE
	High-speed Input Unit	24 VDC, 16 inputs, 7 mA	Yes	No	Yes	Yes	No	1	CS1W-IDP01	
	Safety Relay Unit	24 VDC, 2 channels with 4 in- puts each, 4 pts/common	Yes	No	Yes	Yes	No	1	CS1W-SF200	U, C, CE
CS1 Out- put Units	Relay Output Units	250 VAC or 120 VDC, inde- pendent contacts, 8 outputs, 2 A	Yes	No	Yes	Yes	No	1	CS1W-OC201	UC1, N, L, CE
		250 VAC or 120 VDC, 16 outputs, 2 A	Yes	No	Yes	Yes	No	1	CS1W-OC211	
	Transistor Output Units	12 to 24 VDC, 0.5A, 16 sinking outputs	Yes	No	Yes	Yes	No	1	CS1W-OD211	
		24 VDC, 0.5A, 16 sourcing outputs	Yes	No	Yes	Yes	No	1	CS1W-OD212	U, C, N, L, CE
		12 to 24 VDC, 0.5A, 32 sinking outputs	Yes	No	Yes	Yes	No	2	CS1W-OD231	UC1, N, L, CE
		24 VDC, 0.5A, 32 sourcing outputs	Yes	No	Yes	Yes	No	2	CS1W-OD232	U, C, N, L, CE
		12 to 24 VDC, 0.3A, 64 sinking outputs	Yes	No	Yes	Yes	No	4	CS1W-OD261	UC1, N, L, CE
		24 VDC, 0.3A, 64 sourcing outputs	Yes	No	Yes	Yes	No	4	CS1W-OD262	
		12 to 24 VDC, 0.1A, 96 sinking outputs	Yes	No	Yes	Yes	No	6	CS1W-OD291	U, C, N, L, CE
		12 to 24 VDC, 0.1 A, 96 sourcing outputs	Yes	No	Yes	Yes	No	6	CS1W-OD292	
	Triac Output	250 VAC, 1.2 A, 8 outputs	Yes	No	Yes	Yes	No	1	CS1W-OA201	UC, N, L, CE
	Units	250 VAC, 0.5 A, 16 outputs	Yes	No	Yes	Yes	No	1	CS1W-OA211	
CS1 I/O Units	DC Input/ Transistor Output Units	24 VDC, 6 mA, 32 inputs, 12 to 24 VDC, 0.3 A, 32 sinking outputs	Yes	No	Yes	Yes	No	Inputs: 2 Outputs: 2	CS1W-MD261	UC1, N, L, CE
		24 VDC, 6 mA, 32 inputs, 24 VDC, 0.3 A, 32 sourcing outputs	Yes	No	Yes	Yes	No	Inputs: 2 Outputs: 2	CS1W-MD262	U, C, N, L, CE
		24 VDC, approx. 5 A, 48 inputs, 12 to 24 VDC, 0.1 A, 48 outputs, sinking inputs/outputs	Yes	No	Yes	Yes	No	Inputs: 3 Outputs: 3	CS1W-MD291	
		24 VDC, approx. 5A, 48 inputs, 12 to 24 VDC, 0.1 A, 48 outputs, sourcing inputs/outputs	Yes	No	Yes	Yes	No	Inputs: 3 Outputs: 3	CS1W-MD292	
	TTL I/O Unit	5 VDC, 32 inputs, 32 outputs	Yes	No	Yes	Yes	No	Inputs: 2 Outputs: 2	CS1W-MD561	UC, N, L, CE

Note: Interrupt inputs are not supported on these Racks (i.e., used as normal I/O Unit).

C200H Basic I/O Units

Classifica-	Name	Specifications	Mountable Racks			Words	Standards			
tion			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks	allocated (CIO 0000 to CIO 0319)		
C200H Input	DC Input Units	12 to 24 VDC, 8 inputs	Yes	Yes	Yes	No	Yes	1	C200H-ID211	U, C, N, L,
Units (See		24 VDC, 16 inputs	Yes	Yes	Yes	No	Yes	1	C200H-ID212	CE
note I.)	AC Input Units	100 to 120VAC, 8 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IA121	U, C, N, L
		100 to 120VAC, 16 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IA122	
		100 to 120VAC, 16 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IA122V	CE
		200 to 240VAC, 8 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IA221	U, C, N, L
		200 to 240VAC, 16 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IA222	
		200 to 240VAC, 16 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IA222V	CE
	AC/DC Input Units	12 to 24 VAC/VDC, 8 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IM211	U, C, N, L, CE
		24 VAC/VDC, 16 inputs	Yes	Yes	Yes	No	Yes	1	C200H-IM212	
	Interrupt Input Unit	12 to 24 VDC, 8 inputs	Yes	Yes (See note 2.)	Yes (See note 2.)	No (See note 2.)	No	1	C200HS-INT01	
C200H Out- put Units	Relay Bit Out- put Units	250 VAC/24VDC, 2 A, 8 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC221	U, C, N
(See note 1.)		250 VAC/24VDC, 2 A, 12 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC222	
		250 VAC/24VDC, 2A, 12 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC222N	CE
		250 VAC/24VDC, 2 A, 16 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC225	U, C, N, L
		250 VAC/24VDC, 2 A, 16 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC226N	CE
		250 VAC/24 VDC, 2 A, independent contacts, 5 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC223	U, C, N, L
		250 VAC/24 VDC, 2 A, independent contacts, 8 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC224	
		250 VAC/24 VDC, 2 A, independent contacts, 8 outputs max.	Yes	Yes	Yes	No	Yes	1	C200H-OC224N	CE
C200H Out- put Units	Transistor Out- put Units	12 to 48 VDC, 1A, 8 sinking outputs	Yes	Yes	Yes	No	Yes	1	C200H-OD411	U, C, N, L, CE
(See note 1.)		24 VDC, 2.1 A, 8 sinking outputs	Yes	Yes	Yes	No	Yes	1	C200H-OD213	
		24 VDC, 0.8 A, 8 sourcing outputs, load short-circuit protection.	Yes	Yes	Yes	No	Yes	1	C200H-OD214	U, C, N, L
		5 to 24 VDC, 0.3 A, 8 sourcing outputs	Yes	Yes	Yes	No	Yes	1	C200H-OD216	
		24 VDC, 0.3 A, 12 sinking outputs	Yes	Yes	Yes	No	Yes	1	C200H-OD211	U, C, N, L, CE
		5 to 24 VDC, 0.3 A, 12 sourcing outputs	Yes	Yes	Yes	No	Yes	1	C200H-OD217	
		24 VDC, 0.3 A, 16 sinking outputs	Yes	Yes	Yes	No	Yes	1	C200H-OD212	
		24 VDC, 1 A, 16 sourcing outputs, load short-circuit pro- tection.	Yes	Yes	Yes	No	Yes	1	C200H-OD21A	CE
	Triac Output Units	250 VAC, 1.2 A, 8 outputs	Yes	Yes	Yes	No	Yes	1	C200H-OA223	CE
		250 VAC, 0.3 A, 12 outputs	Yes	Yes	Yes	No	Yes	1	C200H-OA222V	1
		250 VAC, 0.5 A, 12 outputs	Yes	Yes	Yes	No	Yes	1	C200H-OA224	U, C, N, L

Note: 1. C200H Units cannot be used with CS1D CPU Units.

2. Interrupt inputs are not supported on these Racks (i.e., used as normal I/O Unit).

3. The C200H-ID001 (no-voltage contacts, 8 inputs, NPN) and C200H-ID002 (no-voltage contacts, 8 inputs, PNP) cannot be used.

Programmable Controllers

C200H Group-2 High-density I/O Units

Classifica-	Name	Specifications		Mountable Racks					Model	Standards
tion			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks	allocated (CIO 0000 to CIO 0319)		
C200H	DC Input Units	24 VDC, 32 inputs	Yes	Yes	Yes	No	No	2	C200H-ID216	U, C, N, L, CE
Group-2		24 VDC, 64 inputs	Yes	Yes	Yes	No	No	4	C200H-ID217	
Input Units		24 VDC, 32 inputs, 6 mA	Yes	Yes	Yes	No	No	2	C200H-ID218	U, C, CE
(See note.)		24 VDC, 64 inputs, 6 mA	Yes	Yes	Yes	No	No	4	C200H-ID219	
		12 VDC, 64 inputs	Yes	Yes	Yes	No	No	4	C200H-ID111	U, C
C200H Tra Group-2 put High-density Output Units (See note.)	Transistor Out- put Units	16 mA/4.5 V to 100 mA/26.4 V, 32 sinking outputs	Yes	Yes	Yes	No	No	2	C200H-OD218	U, C, N, L, CE
		0.5 A/ 24 VDC, 32 sourcing outputs, load short-circuit protection	Yes	Yes	Yes	No	No	2	C200H-OD21B	U, C, CE
		16 mA/4.5 V to 100mA/ 26.4 V, 64 sinking outputs	Yes	Yes	Yes	No	No	4	C200H-OD219	U, C, N, L, CE

Note: C200H Units cannot be used with CS1D CPU Units.

Connectors for CS1 32- and 64-point I/O units, and C200H Group-2 High-density I/O Units

Part	Connection		Remarks	Model	Standards
Applicable connector	Soldered (included with Unit)		From Fujitsu Socket: FCN-361J040-AU Connector bar: FCN-360C040-J2	C500-CE404	
	Crimped		From Fujitsu Socket: FCN-363J040 Connector bar: FCN-360C040-J2 Contacts: FCN-363J-AU	C500-CE405	
	Pressure welded		From Fujitsu: FCN-367J040-AU	C500-CE403	
Terminal block connection parts	1:1 connections	Special Cable	For CS1W-ID231/ID261/OD231/ OD232/OD261/OD262/MD261/	XW2Z-□□□B (See note 1.)	
		Terminal Block Unit	MD262 and C200H-ID216/ID217/	XW2B-40G4	
			ID218/ID219/ID111/OD218/OD21B/	XW2B-40G5	
			00219	XW2D-40G6	
	1:2 connections	Special Cable		XW2Z-DD (See notes 1 and 2.)	
		Terminal Block Unit		XW2B-20G4	
				XW2B-20G5	
				XW2D-20G6	
				XW2C-20G5-IN16	

Note: 1. Refer to page 384 (Wiring Devices) for details. (Square boxes indicate the cable length.)

2. The XW2Z-DD, CS1W-ODD, and C200H-ODD cannot be connected. Only the inputs of the CS1W-MD can be connected.

Connectors for CS1 96-point I/O Units

Part	Connection		Remarks	Model	Standards
Applicable connectors	Soldered (included with Unit)		From Fujitsu Socket: FCN-361J056-AU Connector bar: FCN-360C056-J3	CS1W-CE561	
	Crimped		From Fujitsu Socket: FCN-363J056 Connector bar: FCN-360C056-J3 Contacts: FCN-363J-AU	CS1W-CE562	
	Pressure welded		From Fujitsu: FCN-367J056-AU	CS1W-CE563	
Terminal block	1:1	Special Cable	For CS1W-ID291/OD291/OD292/	XW2Z-DDH-1 (see note.)	
		Terminal Block Unit	MD291/MD292	XW2B-60G4	
				XW2B-60G5	
	1:2	Special Cable		XW2Z-DDH-2 (see note.)	
		Terminal Block Unit		XW2B-20G4	
				XW2B-20G5	
				XW2D-20G6	
				XW2B-40G4	
				XW2B-40G5	1
				XW2D-40G6	
	1:3	Special Cable		XW2Z-DDH-3 (see note.)	-
		Terminal Block Unit		XW2B-20G4	
				XW2B-20G5	
				XW2D-20G6	

Note: Refer to page 384 (Wiring Devices) for details. (Square boxes indicate the cable length.)

C200H High-density I/O Units Classified as Special I/O Units

Name	Specifications	Mountable	e Racks				Unit	Model	Standards
		CPU Rack	C200H Ex- pansion I/O Racks	CS1 Expan- sion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks	No.		
DC Input Units	24 V DC, 32 inputs	Yes	Yes	Yes	No	Yes	0 to 9	C200H-ID215	U, C, N, L, CE
TTL Input Units	5 V DC, 32 inputs	Yes	Yes	Yes	No	Yes		C200H-ID501	
Transistor Output Units	24 V DC, 32 sinking outputs	Yes	Yes	Yes	No	Yes		C200H-OD215	
TTL Output Units	5 V DC, 32 sinking outputs	Yes	Yes	Yes	No	Yes		C200H-OD501	
TTL I/O Units	5 V DC, 16 inputs, 16 sinking outputs	Yes	Yes	Yes	No	Yes		C200H-MD501	
DC Input/Transistor Output Units	24 V DC, 16 inputs, 16 sinking outputs	Yes	Yes	Yes	No	Yes		C200H-MD215	
	12 V DC, 16 inputs, 16 sinking outputs	Yes	Yes	Yes	No	Yes		C200H-MD115	U, C, N

Connectors for C200H High-density I/O Units

Part	Connection	Remarks	Model	Standards	
Applicable connectors	Soldered (included with Unit)	From Fujitsu Socket: FCN-361J024-AU Connector bar: FCN-360C024-J2	C500-CE241		
	Crimped	From Fujitsu Socket: FCN-363J024 Connector bar: FCN-360C024-J2 Contacts: FCN-363J-AU	C500-CE242		
	Pressure welded	From Fujitsu: FCN-367J024-AU/F	C500-CE243		
Terminal block	Special Cable	For C200H-ID215/ID501/OD215/	XW2Z-DDA (See note.)		
connection parts	Terminal Block Connector	MD115/MD215	XW2B-20G4		
		For C200H-ID215/ID501/MD115/	XW2B-20G5		
		$\Box \Box \Box = cable length$	XW2D-20G6		
			XW2B-20G5-D		
			XW2B-40G5-T		
	Special Cable		XW2Z-DDA (see note)		
	Terminal Block Connector		XW2C-20G6-IN16		

Note: Refer to page 384 (Wiring Devices) for details. (Square boxes indicate the cable length.)

C200H Special I/O Units (Cannot be used with CS1D)

Name	Specifications	Mountable Racks						Model	Standards
		CPU Rack	C200H Ex- pansion I/O Racks	CS1 Expan- sion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks			
Temperature Control Units	Thermocouple input, time-proportioning PID, or ON/OFF transistor output	Yes	Yes	Yes	No	Yes	0 to 9	C200H-TC001	U, C, CE
	Thermocouple input, time-proportioning PID, or ON/OFF voltage out- put	Yes	Yes	Yes	No	Yes		C200H-TC002	
	Thermocouple input, PID current output	Yes	Yes	Yes	No	Yes		C200H-TC003	
	Temperature-resistanc thermometer input, tim proportioning PID, or ON/OFF transistor out- put	Yes	Yes	Yes	No	Yes		C200H-TC101	
	Temperature-resistance thermometer input, time- proportioning PID, or ON/OFF voltage output	Yes	Yes	Yes	No	Yes		C200H-TC102	
	Temperature-resistance thermometer input, PID current output	Yes	Yes	Yes	No	Yes		C200H-TC103]
Data Setting Console	Used with Temperature Control Units. Monitoring, setting, and changing present val- ues, set points, alarm values, PID parameters, bank numbers, etc.					<u>.</u>		C200H-DSC01	
	Connecting Cable, 2 m]	C200H-CN225	
	Connecting Cable, 4 m							C200H-CN425	

Namo	Specifications	Mountab	lo Packs		Unit No	Model	Standards		
Name	Specifications	CPU Rack	C200H Ex- pansion I/O Racks	CS1 Expan- sion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks		Model	Standarus
Heat/Cool Temperature Control Units	Thermocouple input, time-proportioning PID, or ON/OFF transistor output	Yes	Yes	Yes	No	Yes	0 to 9	C200H-TV001	U, C, CE
	Thermocouple input, time-proportioning PID, or ON/OFF voltage out- put	Yes	Yes	Yes	No	Yes		C200H-TV002	
	Thermocouple input, PID current output	Yes	Yes	Yes	No	Yes		C200H-TV003	
	Temperature-resistance thermometer input, time- proportioning PID, or ON/OFF transistor out- put	Yes	Yes	Yes	No	Yes		C200H-TV101	
1	Temperature-resistance thermometer input, time- proportioning PID, or ON/OFF voltage output	Yes	Yes	Yes	No	Yes		C200H-TV102	
	Temperature-resistance thermometer input, PID current output	Yes	Yes	Yes	No	Yes		C200H-TV103	
Temperature Sensor Units	Thermocouple input, K/J selectable	Yes	Yes	Yes	No	Yes	0 to 9	C200H-TS001	U, C
	Thermocouple input, K/L selectable	Yes	Yes	Yes	No	Yes		C200H-TS002	
	Temperature-resistance thermometer, JPt 100	Yes	Yes	Yes	No	Yes		C200H-TS101	
	Temperature-resistance thermometer, Pt 100	Yes	Yes	Yes	No	Yes		C200H-TS102	_
PID Control Units	nits Voltage output/current Yes Yes input, time-proportion- ing PID, or ON/OFF tran- sistor output	Yes	Yes	No	Yes	0 to 9	C200H-PID01	U, C, CE	
	Voltage output/current input, time-proportion- ing PID, or ON/OFF volt- age output	Yes	Yes	Yes	No	Yes		C200H-PID02	
	Voltage output/current input, PID current output	Yes	Yes	Yes	No	Yes		C200H-PID03	
Data Setting Console	Used with PID Control Units. Monitoring, setting, and changing present val- ues, set points, alarm values, PID parameters, bank numbers, etc.		 				C200H-DSC01		
	Connecting Cable, 2 m							C200H-CN225	
ASCII Units	200-Kbyte RAM, 2 RS-232C ports	Yes	Yes	Yes	No	Yes	0 to F	C200H-ASC11	U, C, CE
	200-Kbyte RAM, RS-232C port, RS-422/ 485 port	Yes	Yes	Yes	No	Yes		C200H-ASC21	
	200-Kbyte RAM, 3 RS-232C ports (Yes	Yes	Yes	No	Yes		C200H-ASC31	
Analog Input Units	4 to 20 mA, 1 to 5/0 to 10 V/-10 to +10 V (select- able); 8 inputs; 1/4.000 resolution	Yes	Yes	Yes	No	Yes	0 to F	C200H-AD003	U, C, N, L, CE
Ánalog Output Units	1 to 5 V, -10 to +10 V (selectable), 8 outputs; 1/4.000 resolution	Yes	Yes	Yes	No	Yes	0 to F	C200H-DA003	U, C, N, L, CE
	4 to 20 mA, 8 outputs; 1/ 4,000 resolution	Yes	Yes	Yes	No	Yes	1	C200H-DA004	
Analog I/O Units	2 inputs (4 to 20 mA,1 to 5 V, etc.) 2 outputs (4 to 20 mA, 1 to 5 V, etc.)	Yes	Yes	Yes	No	Yes		C200H-MAD01	
High-Speed Counter Units	Two-axis pulse input, counting rate: 75 kcps max., line driver compat- ible	Yes	Yes	Yes	No	Yes	0 to F	C200H-CT021	U, C, CE

Name	Specifications	Mountable Racks					Unit No.	Model	Standards
	opcontourione	CPU Rack	C200H Ex- pansion I/O Racks	CS1 Expan- sion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks			Chandardo
Motion Control Units	G-language program- mable, two-axis analog outputs	Yes	Yes	Yes	No	Yes	0 to F	C200H-MC221	U, C, CE
	MC Support Software IBM PC/AT or compati- ble					CV500-ZN3AT1-E			
	Connecting Cable: 3.3 m							CV500-CIF01	
	Teaching Box							CVM1-PRO01	U, C, CE
	Connection cable for Teaching Box: 2 m long					CV500-CN224	CE		
	Memory Pack							CVM1-MP702	U, C, CE
	Terminal Block Conver- sion Unit Simplifies wiring.					XW2B-20J6-6			
	Connecting Cable for Terminal Block Conver- sion Unit							XW2Z-100J-F1	
	4 axes, analog+digital I/O, Motion Perfect BASIC language	Yes	Yes	Yes	No	No	0 to F	C200HW-MC402-E	CE
Position Control Units	One-axis pulse-train open-collector output	Yes	Yes	Yes	No	Yes	0 to F	C200HW-NC113	U, C, CE
	Two-axis pulse-train open-collector output	Yes	Yes	Yes	No	Yes		C200HW-NC213	
	Four-axis pulse-train open-collector output	Yes	Yes	Yes	No	Yes		C200HW-NC413	
	Peripheral Port Connect- ing Cables for computer							CS1W-CN226 (2 m) CS1W-CN626 (6 m)	CE
	RS-232C Port Connect- ing Cables for computer							XW2Z-200S-CV (2 m) NCT V1.11 or earlier	
								XW2Z-500S-CV (5 m) NCT V1 11 or earlier	
								XW2Z-200S (2 m) (See note 1.)	-
								XW2Z-500S (5 m) (See note 1.)	
	1-axis Relay Unit for C200HW-NC113							XW2B-20J6-1B	
	2-axis Relay Unit for C200HW-NC213/ NC413							XW2B-40J6-2B	
	1-axis U, H, M Connect- ing Cables for C200HW- NC113							XW2Z-050J-A6 (0.5 m)	
	2-axis U, H, M Connect- ing Cables for C200HW- NC213/NC413	-						XW2Z-1003-A6 (111) XW2Z-050J-A7 (0.5 m)	-
1 + 	1-axis UEP Connecting Cables for C200HW- NC113							XW2Z-100J-A7 (1 m) XW2Z-050J-A8 (0.5 m) XW2Z-100,I-A8 (1 m)	
	2-axis UEP Connecting Cables for C200HW- NC213/NC413							XW2Z-050J-A9 (0.5 m) XW2Z-100J-A9 (1 m)	

Programmable Controllers

CS1 Special I/O Units

N	ame	Specifications	Mountable	e Racks				Unit No.	Model	Standards
			CPU Rack	C200H Ex- pansion I/O Racks	CS1 Expan- sion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks			
Aı	nalog Input Units	4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA) Resolution: 1/4,000	Yes	No	Yes	Yes	No	0 to 95	CS1W-AD041-V1	UC1, N, L, CE
		8 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA) Resolution: 1/4,000							CS1W-AD081-V1	
		16 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V,–10 to 10 V, 4 to 20 mA)						0 to 94	CS1W-AD161	UC1, N, CE
Aı Uı	nalog Output nits	4 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA) Resolution: 1/4,000						0 to 95	CS1W-DA041	UC1, N, L, CE
		8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, -10 to 10 V, 4 to 20 mA) Resolution: 1/4,000							CS1W-DA08V	
		8 outputs (4 to 20 mA) Besolution: 1/4 000							CS1W-DA08C	
Aı	nalog I/O Unit	4 inputs (4 to 20 mA, 1 to 5 V, etc.) 4 outputs (1 to 5 V, 0 to							CS1W-MAD44	
D.		10 V, etc.)								
	Isolated Ther- mocouple Input Unit	4 inputs, B, E, J, K, N, R, S, T, U, WRe5-26, PLII, ±100 mV	Yes	No	Yes	Yes	No	0 to 95	CS1W-PTS11	UC1, CE, N
		4 inputs, B, J, K, R, S, T,							CS1W-PTS51	CE, UC1
		8 inputs, B, J, K, R, S, T,							CS1W-PTS55	UC1, CE
	Isolated Temperature- resistance	4 inputs, Pt100Ω (JIS, IEC), JPt100Ω, Pt150Ω,							CS1W-PTS12	UC1, CE, N
	Thermometer	Ni508.4Ω 4 inputs, Pt100Ω							CS1W-PTS52	UC1, CE
	Input Unit	$(JIS, IEC), JP5100\Omega$ 8 inputs, Pt100 Ω							CS1W-PTS56	
	Isolated Two-	$(JIS, IEC), JPt100\Omega$ 4 inputs, 4 to 20 mA,							CS1W-PTW01	UC1, CE
	wire Transmis- sion Device In- put Unit	1 to 5 V								
	Input Unit	4 inputs, 4 to 20 mA, 1 to 5 V, 0 to 5 V, ±5 V, 0 to 10 V, ±10 V							CS1W-PDC01	
		4 inputs, 4 to 20 mA, 0 to 20 mA, 0 to 10 V, ±10V, 0 to 5 V, ±5V, 1 to 5 V, 0 to 1.25 V, ±1.25 V							CS1W-PDC11	UC1, CE, N
		8 inputs, 4 to 20 mA, 0 to 10 V, 1 to 5 V, 0 to 5 V							CS1W-PDC55	
	Isolated Pulse Input Unit	4 inputs							CS1W-PPS01	UC1, CE
	Isolated Control Output Unit	4 outputs, 4 to 20 mA, 1 to 5 V							CS1W-PMV01	
	·	4 outputs, 0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V							CS1W-PMV02	
	Power Trans- ducer Input Unit	8 inputs, 0 to 1 mA, ±1 mA							CS1W-PTR01	
	100-mV DC	8 inputs, 0 to 100 mA, +100 mV							CS1W-PTR02	
Lo	pop Control Units	Control loops: 32	Yes	No	No	No	No	0 to F	CS1W-LC001	UC1, N, CE
Lo Bo	oop Control oards	50 blocks maximum in- cluding both adjustment	CPU Unit I	nner Board for	CS1-H PLCs	1	1	1	CS1W-LCB01	UC1, N, CE
		500 blocks maximum in- cluding both adjustment and operation blocks							CS1W-LCO05	

Name	Specifications	Mountabl	e Backs				Unit No	Model	Standards
Name	opecifications	CPU Rack	C200H Ex- pansion I/O Racks	CS1 Expan- sion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks		Model	Standarus
High-Speed Counter Units	Pulse input: 2 pts Count- ing speed: 500 kcps max.	Yes	No	Yes	Yes	No	0 to 92	CS1W-CT021	U, C, CE
	Pulse input: 4 pts Count- ing speed: 500 kcps max.	-						CS1W-CT041	
	Solder terminal; 40p and				1			C500-CE401	
	Solderless terminal; 40p and a Connector Cover							C500-CE402	
	Pressure welded termi-						-	C500-CE403	
	nal; 40p Solder terminal; 40p and a Connector Cover (Hor-							C500-CE404	
	Crimp-style terminal; 40p and a Connector Cover (Horizontal-type)							C500-CE405	
Position Control	One-axis pulse train	Yes	No	Yes	Yes	No	0 to 95	CS1W-NC113	U, C, N, L, CE
Onits	Two-axis pulse train	-						CS1W-NC213	
	Four-axis pulse train	-					0 to 94	CS1W-NC413	
	One-axis pulse train line- driver output	-					0 to 95	CS1W-NC133	•
	Two axis pulse train line- driver output							CS1W-NC233	
	Four axis pulse train line-driver output						0 to 94	CS1W-NC433	
SSI Unit	SSI encoder inputs: 2 channels	Yes	No	Yes	Yes	No	0 to 94	CS1W-CTS21	CE
Motion Control Units	4 axes, analog outputs, G language	Yes	No	Yes	Yes	No	0 to 93	CS1W-MC421	U, C, CE
	2 axes, analog outputs, G language MCH high-speed serial	-					0 to F	CS1W-MC221 CS1W-MCH71	
Computer Con-	link Peripheral port on CPU							CS1W-CN226 (2 m)	CE
necting Cables	Unit BS-232C port on CPU							CS1W-CN626 (6 m)	
	Unit							(2 m) XW2Z-500S-CV (5 m)	
Teaching Box								CVM1-PRO01	U, C, CE
Teaching Box Con	necting Cable (2 m)							CV500-CN224	
MC Terminal Block	c Conversion Unit for 2							XW2B-20J6-6	
MC Terminal Block Axes (simplifies wi	Conversion Unit for 4 ring I/O connectors)	-						XW2B-40J6-7	
MC Terminal Block	Conversion Unit Cable			1.7	1.4	1		XW2Z-100J-F1	
nications Unit	Two RS-232C Ports	Yes	NO	Yes	Yes	NO		CS1W-SCU21-V1	U, C, L, N, CE
RS-232C–RS- 422A Conver- sion Unit	1 RS-232C port and 1 RS-422A terminal block							NT-AL001	
Ethernet Unit	100Base-Tx	Yes	No	Yes	Yes	No	0 to F	CS1W-ETN21 CS1D-ETN21D	UC1, L, N,
Controller Link	Wired	Yes	No	Yes	Yes	No	0 to F	CS1W-CLK21-V1	U, C, L, N, CE
Units	Optical (H-PCF cable) Optical	-					0 to F	CS1W-CLK12-V1 CS1W-CLK52-V1	U, C, CE
Controller Link	Wired							3G8F7-CLK21-V1	CE
Support Boards	Optical (H-PCF cable)	-						3G8F7-CLK12-V1	
Controller Link	(GI fiber 62.5/125 μm) Wired (a set of 5)							CJ1W-TB101	
Relay Terminals									
Repeater Units	Optical ring							CS1W-RPT01	
	Optical ring							CS1W-RPT03	
GPIB Unit	Supports Master and Slave Modes	Yes	No	Yes	Yes	No	0 to 95	CS1W-GPI01	UC, CE

Programmable Controllers

Name	Specifications	Mountabl	e Racks				Unit No.	Model	Standards
		CPU Rack	C200H Ex- pansion I/O Racks	CS1 Expan- sion Racks	CS1 Long- distance Racks	SYSMAC BUS Slave Racks			
DeviceNet Unit	Functions as master and/or slave; allows control of 2,048 points max. per mas- ter.	Yes	No	Yes	Yes	No		CS1W-DRM21-V1	0 to F
PROFIBUS-DP Unit	Master Unit for up to 7000 remote I/O words	Yes	No	Yes	Yes	No	0 to F	CS1W-PRM21	CE
	Master Unit for up to 300 remote I/O words	Yes	Yes	Yes	No	No		C200HW-PRM21	
	I/O Link for up to 200 I/O words							C200HW-PRT21	U, L, C, CE
CAN/CANopen Unit	Freely configurable CAN communica- tion, or CANopen protocol	Yes	Yes	Yes	No	No	0 to F	C200HW- CORT21-V1	U, C, CE

Note: 1. A 25-pin to 9-pin adapter is required to connected to a 9-pin, D-sub RS-232C connector on an IBM PC/AT or compatible. **Note:** Setting tool software for the Processing I/O Units also supports CS1W-AD

Optional Products

Name	Specifications	Specifications							
I/O Unit Cover	Cover for 10-pin terminal block	Cover for 10-pin terminal block							
Terminal Block Covers	Short protection for 10-pin terminal block (package of 10) covers); 8 pts	C200H-COV02						
	Short protection for 19-pin terminal block (package of 10	Short protection for 19-pin terminal block (package of 10 covers); 12 pts Protective cover for unused I/O Connecting Cable connectors							
C200H Unit Connector Cover	Protective cover for unused I/O Connecting Cable connection								
CS1 Special I/O Unit Connector Cover	Protective cover for unused I/O Connecting Cable connection	ectors	CV500-COV01	_					
C200H Expansion I/O	Electrically insulate C200H Expansion I/O Backplanes	For 3-slot Backplane	C200HW-ATT32	N, L, CE					
Backplane Insulation	from the control panel to increase noise resistance.	For 5-slot Backplane	C200HW-ATT52						
Plates		For 8-slot Backplane	C200HW-ATT82						
		C200HW-ATTA2							
Relay	24 V DC, for C200H-OC221/OC222/OC223/OC224/OC2	225	G6B-1174P-FD-US						
Programming Console Mounting Bracket	Used to attach C200H-PRO27-E Hand-held Programmir	ed to attach C200H-PRO27-E Hand-held Programming Console to a panel.							
Space Unit	Used for empty I/O slot on the CS1W-BC 3/BI 3 or	⁻ C200HW-BI□□□.	C200H-SP001						
	Used for empty I/O slot on CS1W-BC 2/BI 2 and C	S1D-BC (S)/BI	CS1W-SP001						
	Used for empty Power Supply Unit slot on CS1D-BC	□(S)/BI□□□;	CS1W-SP002						
	Used for empty Power Supply Unit slot on CS1D-BC	CS1W-SP002							
Battery Set	For CS-series CPU Units. (Use batteries within wo years	s of manufacture).	CS1W-BAT01	L, CE					
Terminating Resistor (See note.)	Mounts to end of CS1 Long-distance Expansion Rack		CV500-TER01	U, C					

Note: Two Terminating Resistors are included with the CS1W-IC102 I/O Control Unit.

Mounting Rails and Accessories

Name	Specifications	Model number	Standards
DIN rail Mounting Bracket	1 set (2 included)	C200H-DIN01	
DIN rails	Length: 50 cm; height: 7.3 cm	PFP-50N	
	Length: 1 m; height: 7.3 cm	PFP-100N	
	Length: 50 cm; height: 16 mm	PFP-100N2	
End Plate		PFP-M	
Spacer		PFP-S	

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

Cat. No. P08E-EN-03A

In the interest of product improvement, specifications are subject to change without notice.

Wiring Systems

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Wiring Systems

Introduction to I/O Blocks, I/O Terminals, and I/O Block Bases

G70D, G7TC, and G70A-ZOC16

Unify Wiring with One Connecting Cable.

Simplify Connections to the Controller and Reduce Wiring in the Control Panel. Improve Surge Suppression and Increase Capacity at the Same Time.

G70D

Compact Output Terminals Save Control Panel Space

- The G70D Series consists of 16-point Relay Output Terminals.
- Two configurations are available: The standard low-profile version is just $156 \times 51 \times 39$ mm (W×D×H) and the vertical version is just $135 \times 46 \times 81$ mm (W×D×H).
- Relay output models are equipped with G6D power relays (low-profile: SPST-NO 3 A/common; vertical: SPST-NO 3 A/output) and power MOSFET relay models are equipped with G3DZ power MOSFET relays (SPST-NO 0.3 A/output).
- The flat models have 2 common terminals. The vertical models have 16 independent outputs.

Note: See page 392 and page 387 for more details.



G7TC

Both Input Blocks and Output Blocks are Available. G7TC I/O Blocks are Ideal as Controller Interfaces.

- Output Blocks with 8 or 16 outputs are available. Input Blocks with 16 inputs are available.
 - The 16-point Output Blocks are available with PNP circuits.
- The 16-point models are just 182 × 85 × 68 mm (W×D×H) and the 8-point models are just 102 × 85 × 68 mm (W×D×H).
- Equipped with G7T I/O Relays (SPST-NO 5 A/output).
- · G7TC models conform to UL and CSA standards.
- 16-point models with independent terminals.
- Models are also available with G3TA Solid State Relays. Note: See page 398 for more details.



16-point model

8-point model

G70A-ZOC16

High-capacity Relay Sockets can be Equipped with G2R (SPDT) Relays.

- Sixteen relay terminal sockets for output relays only.
- · Models are available with PNP circuits.
- Compact case is just 234 × 75 × 64 mm (W×D×H).
- Install OMRON G2R Power Relays, G3R Solid State Relays, G3RZ Power MOSFET Relays, and H3RN Timers as required. (Relays and Timers are sold separately.)
- High-capacity 10-A Terminal Block
- Conforms to VDE standards.
- Sixteen independent terminals

Note: See page 386 for more details.



*Relays are sold separately.

G70D-SOC08

Space-saving and Labor-saving 8-point Output Block

- Compact terminal block is just $68 \times 80 \times 44$ mm (W \times H \times D, when mounted upright).
- Independent contacts and shorting bars allow easy common connections.
- The common can now be connected with a shorting bar in the G70D-SOC08 and G70R-SOC08.
- No tools are required to remove Relays, so Relay replacement is easier than ever.
- The attached terminal cover prevents shocks.
- Equipped with operation indicators.
- Built-in diodes absorb coil surge.
- Mount either to DIN rail or via screws.
- Note: See page 389 for details.



G70R-SOC08

Space-saving and Labor-saving 8-point Output Block

- Compact terminal block is just $136 \times 80 \times 55$ mm (W \times H \times D, when mounted upright).
- Independent contacts and shorting bars allow easy common connections.
- The common can now be connected with a shorting bar in the G70D-SOC08 and G70R-SOC08.
- No tools are required to remove Relays, so Relay replacement is easier than ever.
- The attached terminal cover prevents shocks.
- Built-in diodes absorb coil surge.
- Mount either to DIN rail or via screws.

Note: See page 395 for details.



G70A-ZOC16 I/O Terminal Bases

16-point I/O Block accepts Various Devices such as G2R Relays, Solid State Relays, and Timers for More System Flexibility

- Connects to a PLC or SBC with a simple snap-in connector.
- The G70A-ZOC16-3 can be combined with a DRT1-OD32ML I/O Terminal for DeviceNet connectivity or an SRT2-VOD16ML Connector Terminal for CompoBus/S connectivity.
- SPDT relays can be mounted.
- Conforms to VDE (VDE0106) and CE standards.
- Electric-shock preventive (finger-touch protection) terminal block
- DIN rail mountable
- High-capacity (10 A) terminal block
- · Excellent noise resistance characteristics
- · Built-in diodes for coil surge suppression

Ordering Information



Internal I/O circuit common	Rated voltage	Model	Compatible Relays/Timers (sold separately)
NPN compatible (+ common)	24 V DC	G70A-ZOC16-3	G2R-1-S (SPDT), G2R-1-SN (SPDT with indicator), G3R-
PNP compatible (- common)	24 V DC	G70A-ZOC16-4	OA202SZN, G3R-OA202SLN, G3R-ODX02SN, G3R-OD201SN, G3RZ-201SLN, H3RN-1, and H3RN-11

Note: Each relay to be mounted must incorporate a coil that has proper specifications within the maximum rated voltage range.

Specifications

Ratings/Characteristics

Item		G70A-ZOC16-3 and G70A-ZOC16-4	
Contact res	sistance	10 m Ω (excluding the resistance of the relay to be used)	
Permissible	e current	10 A	
Max. opera	ating voltage	380 V AC, 125 V DC	
Terminal block	Dielectric strength	4,000 V AC, 50/60 Hz for 1 min between connector and output terminals 2,000 V AC, 50/60 Hz for 1 min between output terminals 250 V AC, 50/60 Hz for 1 min between connectors	
	Insulation resistance	1,000 MΩ (at 250/500 V)	
	Vibration resistance	Malfunction: 10 to 61.2 to 10 Hz, 0.1-mm double amplitude 0.2; 61.2 to 150 to 61.2 Hz, 14.7 m/s ²	
Shock resis	stance	Malfunction: 200 m/s ² (approx. 20G)	
Noise imm	unity	Noise level: 2.0 kV; pulse width: 100 ns to 1 µs	
Ambient temperature		Operating: 0°C to 55°C (with no condensation or icing)	
Ambient humidity		Operating: 35% to 85%	
Coil surge absorption element		Diode: 1 A, 400 V	
Protection against reversed connection		Diode (2 A, withstand inverse voltage: 40 V)	
Tensile strength No damage		No damage when a tensile force of 49 N is applied for 1 second in any direction	
I/O terminal tightening torque Tightening strength: 0.59 N·m; Tensile strength 49 N for 1 m		Tightening strength: 0.59 N·m; Tensile strength 49 N for 1 min	
Weight Approx. 400 g		Approx. 400 g	

Accessories (Order Separately)

G79 Connecting Cables

Cable Type	Model
Cable with Loose Wire and Crimp Terminals	G79-Y□C
Cable with Loose Wires	G79-A□C
Cable with Three Connectors (1:3)	G79-□C-□-□
Cable with Two Connectors (1:2)	G79-□C-□
Cable with One Connector (1:1)	G79-□C

Note: See pages page 401 for details.

Short Bar

Applicable I/O block	Model
G70A-ZOC 16-4	G78-16-E

G70D

Relay output terminal blocks

Compact, Low-profile 16-point Output Block

- Compact terminal block is just 156 \times 51 \times 39 mm (W \times D \times H)
- Models with Power MOSFET Relays are available for high-frequency switching of AC or DC loads.
- Wire loads directly from terminal blocks; no need for relaying.
- Operation indicators show each I/O signal's ON/OFF status at a glance.
- The G70D-SOC16 and G70D-FOM16 can be combined with a DRT1-OD32ML I/O Terminal for DeviceNet connectivity or an SRT2-VOD16ML Connector Terminal for CompoBus/S connectivity.
- Equipped with surge-absorbing diodes.
- Relay Removal Tool included.
- · Mount either to DIN rail or via screws.



Ordering Information

Classification	Points	Internal output circuit common	Rated voltage	Model
Relay outputs	16 points (SPST-NO × 16)	NPN compatible (+common)	24 V DC	G70D-SOC16
		PNP compatible (– common)		G70D-SOC16-1
Power MOSFET relay outputs		NPN compatible (+ common)		G70D-FOM16
		PNP compatible (– common)		G70D-FOM16-1

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

Specifications

Ratings

Relay Specifications

Note: The following specifications apply to G6D Relays mounted in a G70D Output Block and not the G6D Relay itself.

Coil Ratings (per G6D Relay)

Rated voltage	24 V DC
Rated current	10.5 mA
Coil resistance	2,880 Ω
Must-operate voltage	70% max. of rated voltage
Must release voltage	10% min. of rated voltage
Max. voltage	130% of rated voltage
Power consumption	Approx. 200 mW

- Note: 1. The must-operate voltage is 75% or less of the rated voltage if the relay is mounted upside down.
 - 2. Rated current and coil resistance were measured at a coil temperature of 23°C with a tolerance of $\pm 10\%$.
 - Operating characteristics were measured at a coil temperature of 23°C.
 - 4. The maximum allowable voltage is the maximum value of the allowable voltage range for the relay coil operating power supply. There is no continuous allowance.
 - 5. The rated current includes the terminal's LED current.

Contact Ratings (per G6D Relay)

Load	Resistive load $(\cos \phi = 1)$
Rated load	3 A at 250 V AC, 3 A at 30 V DC
Rated carry current	3 A
Max. switching voltage	250 V AC, 30 V DC
Max. switching current	3 A
Min. permissible load (reference value) (see note 2)	10 mA at 5 V DC
Life expectancy	Electrical: 100,000 operations min. (un- der and at the rated load at 1,800 oper- ations/hr) Mechanical: 20,000,000 operations min. (at 18,000 operations/hr)

- Note: 1. Up to 3 A can be carried by the power supply terminals for outputs (terminals B0 to B7.)
 - 2. This value is for a switching frequency of 120 times per minute.



Power MOSFET Relay Specifications

Input (per G3DZ Power MOSFET Relay)

Rated voltage		24 V DC
Operating voltage		19.2 to 28.8 V DC
Voltage level Must-operate		19.2 V DC max.
Must release		1 V DC min.
Input impedance	4 kΩ±20%	
Rated current		8.2 mA±20%

Output (per G3DZ Power MOSFET Relay)

Load voltage	3 to 264 V AC, 3 to 125 V DC
Load current	100 μA to 0.3 A
Inrush current	6 A (10 ms)

Note: The rated current includes the terminal's LED current.

Characteristics

Item	G70D-SOC16(-1)	G70D-FOM16(-1)
Classification	Relay outputs	Power MOSFET relay outputs
Contact form	16 points (SPST-NO × 16)	
Contact mechanism	Single	
Contact material	AgCdO	
Contact resistance	100 mΩ max. (see note 2)	
Isolation method		Photocoupler
Must-operate time	10 ms max. (see note 3)	6 ms max.
Release time	10 ms max. (see note 3)	
Output ON-resistance		2.4 Ω max.
Open-state leakage current		10 µA max. (at 125 V DC)
Max. switching frequency	Mechanical:18,000 operations/hr	
	Rated load:1,800 operations/hr	
Insulation resistance	100 MΩ min. (at 500 V DC)	
Dielectric strength	2,000 V AC for 1 min between coil and contact	2,000 V AC for 1 min between input and output terminals
Noise immunity	Power input (normal mode): 600 V for 10 min with a pulse width of 100 ns to 1 µs	
	For the sple (control in the splet of the splet with the splet μ is the	
	Unit body (colling): 600 V for 10 min with a pulse width of 100 ns to 1 µs	
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.5-mm amplitude (1.0-mm double)	
	Malfunction: 10 to 55 to 10 Hz, 0.375-mm amplitude (0.75-mm double)	
Shock resistance	Destruction:300 m/s ² (approx. 30G), Malfunction:100 m/s ² (approx. 10G)	
Operating voltage range	24 V DC ^{+10%} / _{-15%}	
Current consumption	Approx. 300 mA at 24 V DC (see note 4)	Approx. 300 mA at 24 V DC (see note 5)
Cable length	Between block and controller: 5 m max. (reference value for AWG28) Between block and external device: Dependent on load	
LED color	Operation indicator: orange; power supply: green	
Coil surge absorber	Diode (400 V, 300 mA)	
Ambient temperature	Operating: 0°C to 55°C	
Ambient humidity	Operating: 35% to 85%	
Mounting strength	No damage when 5 kgf (49 N) pull load was applied for 1 s in all directions (except for 1 kgf (9.8 N) in direction of rail)	
Terminal strength	Tightening torque: 0.78 to 0.98 N·m), Pull strength: 49 N for 1 mi	n
Weight	Approx. 200 g	

Note: 1. These values are initial values.

2. Measurement condition: 1 A at 5 V DC

3. Ambient temperature: 23°C

- 4. Current consumption is when all points are ON and includes G6D Relay coil current but does not include any external load current.
- 5. Current consumption is when all points are ON and includes G3DZ input current but does not include any external load current.

Accessories (Order Separately)

G79 Connecting Cables

Cable Type	Model
Cable with Loose Wire and Crimp Ter- minals	G79-Y□C
Cable with Loose Wires	G79-A□C
Cable with Three Connectors (1:3)	G79-□C-□-□
Cable with Two Connectors (1:2)	G79-□C-□
Cable with One Connector (1:1)	G79-□C

Note: See page 401 for details.

Replacement Relays

Applicable Output Block	Rated voltage	Model
G70D-SOC16 G70D-SOC16-1	24 V DC	G6D-1A
G70D-FOM16 G70D-FOM16-1	24 V DC	G3DZ-2R6PL (see note)

Note: This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

G70D-SOC08

Relay Output Terminal Block

Programmable Controllers

Space-saving and Labor-saving 8-point Output Block

- Compact terminal block is just $68 \times 80 \times 44$ mm (W × H × D, when mounted upright)..
- Independent contacts and shorting bars allow easy common connections.
- The common can now be connected with a shorting bar in the G70D-SOC08 and G70R-SOC08.
- No tools are required to remove Relays, so Relay replacement is easier than ever.
- · The attached terminal cover prevents shocks.
- Equipped with operation indicators.
- Built-in diodes absorb coil surge.
- · Mount either to DIN rail or via screws.



Ordering Information

Classification	Points	Internal output circuit common	Rated voltage	Model
Relay outputs	8 points (SPST-NO \times 8)	NPN compatible (+ common)	24 V DC	G70D-SOC08

This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

Specifications

Ratings

The following specifications apply to G6D Relays mounted in a G70D Output Block and not the G6D Relay itself.

Coil Ratings (per G6D Relay)

Rated voltage	Rated current	Coil resis- tance	Must-op- erate volt- age	Release voltage	Max. al- Iowable voltage	Power con- sumption
24 V DC	10.5 mA	2,880 Ω	70% max. of rated voltage	10% min. of rated voltage	130%	Approx. 200 mW

- Note: 1. The must-operate voltage is 75% max. of the rated voltage if the Relay is mounted upside down.
 - 2. Rated current and coil resistance were measured at a coil temperature of 23° C with a tolerance of $\pm 10\%$.
 - **3.** Operating characteristics were measured at a coil temperature of 23°C.
 - The maximum allowable voltage is the maximum value of the allowable voltage range for the relay coil operating power supply. There is no continuous allowance.
 - 5. The rated current includes the current consumption of the operation indicator.

Contact Ratings (per G6D Relay)

Item	Load	Resistive load (cos	
Rated load		5 A at 250 V AC, 5 A at 30 V DC	
Rated carry current		5 A	
Max. switching volta	ge	250 V AC, 30 V DC	
Max. switching curre	nt	5 A	
Max. switching capacity (reference value)		1,250 VA, 150 W	
Min. permissible load (reference value; see note.)		5 V DC, 10 mA	
Life expectancy Electrical Mechanical		100,000 operations min. (at or below the rated load at 1,800 operations/hr)	
		20,000,000 operations min. (at 18,000 operations/hr)	

Note: This value is for a switching frequency of 120 times per minute.



Characteristics

	Model	G70D-SOC08	
Item		Relay outputs	
Contact form		8 points (SPST-NO \times 8)	
Contact mechanism		Single	
Contact resistance (See no	te 1.)	100 mΩ max.	
Must-operate time (See not	e 2.)	100 ms max.	
Release time (See note 3.)		10 ms max.	
Max. switching frequency	Mechanical	18,000 operations/hr	
	Rated load	1,800 operations/hr	
Insulation resistance		100 MΩ min. (at 500 V DC)	
Dielectric strength	Between coil and contact	2,000 V AC for 1 min	
	Between contacts of same polarity	750 V AC for 1 min	
	Between contacts of different polarity	1,500 V AC for 1 min	
Vibration resistance	Destruction	10 to 55 to 10 Hz, 0.5-mm amplitude (1.0-mm double)	
	Malfunction	10 to 55 to 10 Hz, 0.5-mm amplitude (1.0-mm double)	
Shock resistance	Destruction	300 m/s ²	
Malfunction		100 m/s ²	
Noise immunity	Power input (normal mode)	600 V for 10 min with a pulse width of 100 ns to 1 μ s	
	Power input (common mode)	1.5 kV for 10 min with a pulse width of 100 ns to 1 μ s	
	Input cable (coiling)	1.5 kV for 10 min with a pulse width of 100 ns to 1 μ s	
	Unit body (coiling)	600 V for 10 min with a pulse width of 100 ns to 1 μ s	
Allowable power supply vol	tage fluctuation	24 V DC +10%/-15%	
Current consumption (See	note 3.)	Approx. 80 mA at 24 V DC	
Cable length	Between block and controller	5 m max. (reference value for AWG 28)	
	Between block and external device	Determine appropriate length for the connected load.	
LED indicator color		Orange	
Coil surge absorber		Diode	
Ambient operating tempera	ture	-10 to 55°C	
Ambient storage temperature		35% to 85%	
Ambient operating humidity		-20 to 65°C	
Mounting strength		No damage when 49 N pull load was applied for 1 s in all directions	
		(except for 9.8 N min. in direction of track)	
Terminal strength	Tightening torque	9.8 N·m	
	Pull strength	49 N for 1 min	
Weight		Approx. 145 g	

Note: 1. These values are initial values.

- 2. Measurement conditions: 1 A at 5 V DC
- **3.** Ambient temperature: 23°C
- 4. The current consumption is the value when all points are ON and includes the G6D Relay coil current.

Engineering Data

Life expectancyMaximum switching capacity





- When using with a carry current of 5 A, no more than 4 contacts may be ON.
- The carry current is 3 A when all contacts are ON.

Note: The data shown in these graphs is based on actual values sampled from a production line; please use this data for reference only. As a general rule, allow for slight variations in the Relays because the Relays are mass produced.

Accessories for the G70D-SOC08 (Order Separately)

Shorting Bar



Replacement Relays

Applicable Output Block	Rated voltage	Model
G70D-SOC08	24 V DC	G6D-1A (See note.)
		G6D-1A-AP (See note.)

Note: The minimum permissible load (reference value) for the G6D-1A is 10 mA at 5 V DC.

G70D-VSOC16/-VFOM16

Relay output terminal blocks

Easy-to-use, Space-saving 16-point Output Block

- Slim terminal block is just 135×40 mm (W \times D).
- Independent contacts and short bars allow easy common connections.
- An Expansion Terminal Block can be mounted for power line connections.
- M3.5 fork-type crimp terminals (with a maximum terminal width of 6.2 mm) can be used.
- Lever mechanism allows Relays to be installed and removed easily without tools.
- Relay models and power MOSFET Relay models are available.
- · Equipped with operation indicators.
- Can be combined with a DRT1-OD32ML I/O Terminal for DeviceNet connectivity or an SRT2-VOD16ML Connector Terminal for CompoBus/S connectivity.
- Built-in diode absorbs coil surge.
- Mount either to DIN rail or via screws.



Ordering Information

Classification	Points	Internal output circuit common	Rated voltage	Model
Relay outputs	16 points (SPST-NO × 16)	NPN compatible	24 V DC	G70D-VSOC16
Power MOSFET Relay outputs		(+ common)		G70D-VFOM16

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

Specifications

Ratings

Relay Specifications

Note: The following specifications apply to G6D Relays mounted in a G70D Output Block and not the G6D Relay itself.

Coil Ratings (per G6D Relay)

Rated voltage	24 V DC
Rated current	10.5 mA
Coil resistance	2,880 Ω
Must-operate voltage	70% max. of rated voltage
Release voltage	10% min. of rated voltage
Max. allowable voltage	130% of rated voltage
Power consumption	Approx. 200 mW

- Note: 1. The must-operate voltage is 75% max. of the rated voltage if the Relay is mounted upside down.
 - Rated current and coil resistance were measured at a coil temperature of 23°C with a tolerance of ±10%.
 - Operating characteristics were measured at a coil temperature of 23°C.
 - **4.** The maximum allowable voltage is the maximum value of the allowable voltage range for the relay coil operating power supply. There is no continuous allowance.
 - 5. The rated current includes the current consumption of the operation indicator.

Contact Ratings (per G6D Relay)

Load	Resistive load ($\cos \phi = 1$)
Rated load	3 A at 250 V AC, 3 A at 30 V DC
Rated carry current	5 A (see note 1)
Max. switching voltage	250 V AC, 30 V DC
Max. switching current	5 A
Max. switching capacity	1,250 VA, 150 W
Min. permissible load (reference value) (See note .2)	5 V DC, 1 mA
Life expectancy	Electrical: 100,000 operations min. (un- der and at the rated load at 1,800 oper- ations/hr), Mechanical: 20,000,000 operations min. (at 18,000 operations/ hr)

Note: 1. Up to 5 A can be carried when 8 or fewer outputs are ON.

2. This value is for a switching frequency of 120 times per minute.

Power MOSFET Relay Specifications

Note: The following values apply to G3DZ Relays mounted in a G70D Output Block and not the G3DZ Relay itself.

Input (per G3DZ Power MOSFET Relay)

Rated voltage		24 V DC
Operating voltage		19.2 to 28.8 V DC
Voltage level	Must operate	19.2 V DC max.
	Must release	1 V DC min.
Input impedance		4 kΩ±20%
Rated current		8.2 mA±20%

Output (per G3DZ Power MOSFET Relay)

Load voltage	3 to 264 V AC, 3 to 125 V DC
Load current	100 µA to 0.3 A
Inrush current	6 A (10 ms)

Note: The rated current includes the current consumption of the operation indicator.

Characteristics

Item	G70D-VSOC16	G70D-VFOM16	
	Relay outputs	Power MOSFET Relay outputs	
Contact form	16 points (SPST-NO × 16)		
Contact mechanism	Single		
Contact resistance	100 m Ω max. (see note 2)		
Isolation method		Photocoupler	
Must-operate time	10 ms max. (see note 3)	6 ms max.	
Release time	10 ms max. (see note 3)	10 ms max.	
Output ON-resistance		2.4 Ω max.	
Open-circuit leakage current		10 μA max. (at 125 V DC)	
Max. switching frequency	Mechanical:18,000 operations/hr Rated load:1,800 operations/hr		
Insulation resistance	100 MΩ min. (at 500 V DC)	·	
Dielectric strength	2,000 V AC for 1 min between coil and contact 2,000 V AC for 1 min between input and output terminals		
Noise immunity	Power input (normal mode): 600 V for 10 min with a pulse width of 100 ns to 1 μ s Power input (common mode): 1.5 kV for 10 min with a pulse width of 100 ns to 1 μ s Input cable (coiling): 1.5 kV for 10 min with a pulse width of 100 ns to 1 μ s Unit body (coiling): 600 V for 10 min with a pulse width of 100 ns to 1 μ s		
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.5-mm amplitude (1.0-mm doub Malfunction: 10 to 55 to 10 Hz, 0.375-mm amplitude (0.75-mm d	le) ouble)	
Shock resistance	Destruction: 300 m/s ² , Malfunction: 100 m/s ²		
Operating voltage range	24 V DC ^{+10%} / _{-15%}		
Current consumption	Approx. 170 mA at 24 V DC (see note 4)	Approx. 125 mA at 24 V DC (see note 5)	
Cable length	Between block and controller:5 m max. (reference value for AWG28) Between block and external device:Dependent on load		
LED color	Operation indicator: orange		
Coil surge absorber	Diode (600 V, 1 A)		
Ambient temperature	Operating: -25°C to 55°C (with no icing or condensation)		
Ambient humidity	Operating: 45% to 85%		
Mounting strength	No damage when 49 N pull load was applied for 1 s in all directions (except for 9.8 N min. in direction of rail)		
Terminal strength	Tightening torque: 0.78 to 1.18 N·m, Tightening torque: 0.78 to 0.98 N·m, Pull strength: 49 N for 1 min Pull strength: 49 N for 1 min		
Weight (see note 6)	Approx. 280 g		

Note: 1. These values are initial values.

2. Measurement condition: 1 A at 5 V DC

3. Ambient temperature: 23°C

4. Current consumption is when all points are ON and includes G6D Relay coil current but does not include any external load current.

5. Current consumption is when all points are ON and includes G3DZ input current but does not include any external load current.

6. The Unit weighs approximately 315 g with the Expansion Terminal Block mounted.

Accessories (Sold Separately)

G79 Connecting Cables

Cable Type	Model
Cable with Loose Wire and Crimp Terminals	G79-Y□C
Cable with Loose Wires	G79-A□C
Cable with Three Connectors (1:3)	G79-□C-□-□
Cable with Two Connectors (1:2)	G79-□C-□
Cable with One Connector (1:1)	G79-□C

Note: See page 401 for details.

Expansion Terminal Block

Applicable Output Block	Appearance	Model
G70D-VSOC16		G70D-ET (see note)
G70D-VFOM16	THE REAL PROPERTY OF THE PROPE	

Note: This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

Short Bar

Applicable Output Block	Appearance	Model
G70D-VSOC16		G6D-4-SB
G70D-VFOM16	MAMA	

Replacement Relays

Applicable Out- put Block	Rated voltage	Model
G70D-VSOC16	24 V DC	G6D-1A (see note 1)
	24 V DC	G6D-1A-AP (see notes 2 and 3)
G70D-VFOM16	24 V DC	G3DZ-2R6PL (see note 3)

Note: 1. The minimum permissible load (reference value) for the G6D-1A is 10 mA at 5 V DC.

- 2. The minimum permissible load (reference value) for the G6D-1A-AP is 1 mA at 5 V DC.
- **3.** These are non-standard models and require a special order. Contact your OMRON representative for details on availability.
G70R-SOC08

Relay output terminal block

Space-saving and Labor-saving 8-point Output Block

- Compact terminal block is just $136 \times 80 \times 55$ mm (W \times H \times D) when mounted upright).
- Independent contacts and shorting bars allow easy common connections.
- The common can now be connected with a shorting bar in the G70D-SOC08 and G70R-SOC08.
- No tools are required to remove Relays, so Relay replacement is easier than ever.
- · The attached terminal cover prevents shocks.
- Built-in diodes absorb coil surge.
- · Mount either to DIN rail or via screws.



Ordering Information

Classification	Points	Internal output circuit common	Rated voltage	Model
Relay outputs	8 points (SPST-NO $ imes$ 8)	NPN compatible (+ common)	24 V DC	G70R-SOC08

This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

Specifications

Ratings

The following specifications apply to G2R Relays mounted in a G70R Output Block and not the G2R Relay itself.

Coil Ratings (per G2R Relay)

Rated voltage	Rated current	Coil resistance	Must- operate voltage	Release voltage	Max. allowable voltage	Power consump- tion
24 V DC	25.8 mA	1,100 Ω	70% max. of rated voltage	15% min. of rated voltage	130%	Approx. 530 mW

- Note: 1. The must-operate voltage is 75% max. of the rated voltage if the Relay is mounted upside down.
 - 2. Rated current and coil resistance were measured at a coil temperature of 23°C with a tolerance of $\pm 10\%$.
 - Operating characteristics were measured at a coil temperature of 23°C.
 - **4.** The maximum allowable voltage is the maximum value of the allowable voltage range for the relay coil operating power supply. There is no continuous allowance.
 - 5. The rated current includes the current consumption of the operation indicator.

Contact Ratings (per G2R Relay)

Item	Load	Resistive load (cos∳ = 1)		
Rated load		10 A at 250 V AC, 10 A at 30 V DC		
Rated carry current		10 A		
Max. switching voltage	je	380 V AC, 125 V DC		
Max. switching curre	nt	10 A		
Max. switching capao value)	city (reference	2.50 VA, 300 W		
Min. permissible load ue; see note.)	l (reference val-	5 V DC, 10 mA		
Life expectancy Electrical		100,000 operations min. (at the rated load and 1,800 operations/hr)		
Mechanical		10,000,000 operations min. (at 18,000 operations/hr)		

Note: This value is for a switching frequency of 120 times per minute.

Characteristics

	Model	G70R-SOC08
Item		Relay outputs
Contact form		8 points (SPST-NO \times 8)
Contact mechanism		Single
Contact resistance (Se	ee note 1.)	30 mΩ max.
Must-operate time (Se	e note 2.)	15 ms max.
Release time (See not	te 3.)	15 ms max.
Max. switching fre-	Mechanical	18,000 operations/hr
quency	Rated load	1,800 operations/hr
Insulation resistance		100 MΩ min. (at 500 V DC)
Dielectric strength	Between coil and contact	2,000 V AC for 1 min
	Between contacts of same polarity	750 V AC for 1 min
	Between contacts of different polarity	1,500 V AC for 1 min
Vibration resistance	Destruction	10 to 55 to 10 Hz, 0.5-mm amplitude (1.0-mm double)
	Malfunction	10 to 55 to 10 Hz, 0.5-mm amplitude (1.0-mm double)
Shock resistance	Destruction	300 m/s ²
	Malfunction	100 m/s ²
Noise immunity	Power input (normal mode)	600 V for 10 min with a pulse width of 100 ns to 1 μ s
	Power input (common mode)	1.5 kV for 10 min with a pulse width of 100 ns to 1 μ s
	Input cable (coiling)	1.5 kV for 10 min with a pulse width of 100 ns to 1 μ s
	Unit body (coiling)	600 V for 10 min with a pulse width of 100 ns to 1 μ s
Allowable power supp	ly voltage fluctuation	24 V DC +10%/-15%
Current consumption (See note 3.)	Approx. 185 mA at 24 V DC
Cable length	Between block and controller	5 m max. (reference value for AWG 28)
	Between block and external device	Determine appropriate length for the connected load.
Coil surge absorber		Diode
Ambient operating terr	nperature	–10 to 55°C
Ambient operating hur	nidity	35% to 85%
Ambient storage temp	erature	–20 to 65°C
Mounting strength		No damage when 49 N pull load was applied for 1 s in all directions (except for 9.8 N min. in direction of track)
Terminal strength	Tightening torque	0.98 N·m
	Pull strength	49 N for 1 min
Weight		Approx. 350 g

Note: 1. These values are initial values.

- 2. Measurement conditions: 1 A at 5 V DC
- 3. Ambient temperature: 23°C
- 4. The current consumption is the value when all points are ON and includes the G2R Relay coil current.

Engineering Data

Life expectancyMaximum switching capacity





Note: The data shown in these graphs is based on actual values sampled from a production line; please use this data for reference only. As a general rule, allow for slight variations in the Relays because the Relays are mass produced.

- When using with a carry current of 10 A, no more than 4 contacts may be ON.
- The carry current is 8 A when all contacts are ON.

Accessories for the G70R-SOC08 (Order Separately)

Shorting Bar



Replacement Relays

Applicable Output Block	Rated voltage	Model
G70R-SOC08	24 V DC	G2R-1-S
		G2R-1-SN

Relay I/O terminal blocks

Unify PLC Wiring to a Single Cable to Reduce Wiring in the Control Panel and Save Space

- The 16-point Input and Output Blocks are just 182 × 85 × 68 mm (W × D × H) and the 8-point Output Block is just 102 × 85 × 68 mm (W × D × H).
- Also connects to an SBC with a simple snap-in connector.
- Surge suppressor circuit built-in.
- Operation indicators show each I/O signal's ON/OFF status at a glance.
- Mount to DIN rail.
- The G7TC-OC16 and G7TC-OC08 can be combined with a DRT1-OD32ML I/O Terminal for DeviceNet connectivity or an SRT2-VOD16ML Connector Terminal for CompoBus/S connectivity.
- G3TA I/O Solid-state Relays can be mounted.
- · Conforms to UL and CSA standards.



Ordering Information

I/O classification	I/O points	Internal I/O circuit common	Rated voltage	Model
Input	16	NPN compatible (- common)	12 V DC	G7TC-ID16*
			24 V DC	
			100/110 V DC	
			100/110 V AC	G7TC-IA16*
			200/220 V AC	
Output	16	NPN compatible (+ common)	12 V DC	G7TC-OC16
			24 V DC	
		PNP compatible (– common)	12 V DC	G7TC-OC16-1*
			24 V DC	
	8	NPN compatible (+ common)	12 V DC	G7TC-OC08*
			24 V DC	
		PNP compatible (+ common)	24 V DC	G7TC-OC08-1*
		PNP compatible (- common)	24 V DC	

* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

rogrammable Controllers

Specifications

Coil Ratings (Common to Input/Output per Relay)

Item		Rated currer	ıt (mA)	Coil resistance (Ω)	Must operate	Must release	Maximum voltage	Power consumption	on
Rated vo	oltage (V)	50 Hz	60 Hz		of rated voltage	je		per Relay	per 16 Relays
AC	100/110 200/220	8.2 4.1	7/7.7 3.5/3.88	8,700 33,300	80% max.	30% min.	105%	0.7 VA	11 VA
DC	12 24 100/110	42 21 5		290 1,150 20,000	80% max.	10% min.	105%	0.5 W	8 W

Note: 1. The rated current and coil resistance are measured at a coil temperature of +23°C with a tolerance of +15%/-20% for AC rated current and \pm 15% for coil resistance.

- 2. The operating characteristics are measured at a coil temperature of +23°C.
- 3. The value for maximum voltage is the maximum value within the allowable voltage fluctuation range for the relay coil's operating power supply. Continuous operation at this voltage is not within product specifications.
- 4. Approx. 4 mA flows into each LED indicator. To calculate the power supply capacity, add the current value of each LED indicator.

Contact Ratings (G7T I/O Relay)

Classification	For input		For output		
Item	Resistive load (coso=1)	Inductive load (cos∳=0.4 L/R=7 ms)	Resistive load (cos∳=1)	Inductive load (cos∳=0.4 L/R=7 ms)	
Rated load	1 A at 24 V DC	0.5 A at 24 V DC	5 A at 24 V DC 2 A at 220 V AC	2 A at 24 V DC 1 A at 220 V AC	
Rated carry current	1 A	•	5 A		
Max. switching voltage	250 V AC, 125 V DC				
Max. switching current	1 A	0.5 A	5 A	2 A	
Min. permissible load (reference value) (See note.)	100 μA at 1 V		10 mA at 5 V		
Electrical life expectancy	10,000,000 operations (at 10 mA) 50,000 operations (at 1 A)	2,500,000 operations (at 10 mA) 20,000 operations (at 1 A)	1,000,000 operations (u	under rated load)	
Mechanical life expectancy	50,000,000 operations				

Note: The above values are for a switching frequency of 120 operations/min.

Characteristics

Model G7TC-IA16 G7TC-ID16 G7TC-OC16 (-1) (out-				G7TC-OC08(-1)		
Item			(input, DC coll)	put, DC coll)		
Contact form		SPST-NO×16	SPST-NU × 16 [SPST-N			
Contact mechanism		Bifurcated crossbar conta	act	Single contact		
Contact material		Au cladding + Ag		AgInSn		
Contact resistance (S	See note 2.)	50 m Ω max.				
Must Operate time (S	see note 3.)	15 ms max.				
Release time (See no	ote 3.)	15 ms max.				
Max. switching fre-	Mechanical limit	18,000 operations/hour				
quency	At rated load	1,800 operations/hour				
Insulation resistance		100 MΩ (at 500 V DC)				
Dielectric strength	Between coil and contact	2,000 V AC, 50/60 Hz for	1 minute			
	Between same polarity contacts	1,000 V AC, 50/60 Hz for	1 minute			
Between paired connectors		250 V AC, 50/60 Hz for 1 minute				
Vibration resistance	•	10 to 55 to 10 Hz with 0.5-mm single amplitude (1.0-mm double amplitude)				
Shock resistance		200 m/s ²				
Noise immunity		Noise level: 1.5 kV; pulse width: 100 ns to 1 μs				
Rated voltage betwee	en positive and negative terminal blocks	Rated voltage of controller's (PLC or other) input cir- cuit 12 V DC \pm 5% (See note 5.) 24 V DC \pm 5%			5.)	
Rated current betwee	en positive and negative terminal blocks	Input circuit current of controller (PLC or other) \times number of ON points		12 V DC: 46 mA × numb 24 V DC: 25 mA × numb	er of ON points er of ON points	
Cable length	To controller	5 m max. (reference value)				
(See note 4.)	To I/O devices	50 m max. (reference value, for 2-mm ² CVV cable) Dependent on load				
Ambient operating ter	mperature	0 to 55°C				
Ambient operating hu	midity	35% to 85% (with no icing or condensation)				
Tightening torque for	external connections	0.78 to 1.18 N m				
Tensile strength		No damage when a tensile force of 49 N is applied in each direction. In the direction of the track, the tensile strength is 9.8 N min.				
I/O terminal tightening torque		Tightening strength: 0.98	N·m; Tensile strength 49	N for 1 minute		
LED color		Red	Green			
Case color		Transparent red	Transparent green	Transparent		
Coil surge absorber		Varistor	Diode (1 A, 400 V)			
Weight		Approx. 640 g	Approx. 630 g	Approx. 670 g	Approx. 350 g	

Note: 1. These are initial values.

- 2. Measurement condition: 1 A at 5 V DC.
- **3.** Ambient temperature: 23°C.
- 4. Connecting cables up to 5 m are available as standard products. (See page 401.) For longer cables, enquire separately.
- 5. G7TC-OC08-01 is not available in 12 V DC type.

Accessories (Order Separately)

G79 Connecting Cables

Cable Type	Model
Cable with Loose Wire and Crimp Ter- minals	G79-Y□C
Cable with Loose Wires	G79-A□C
Cable with Three Connectors (1:3)	G79-□C-□-□
Cable with Two Connectors (1:2)	G79-□C-□
Cable with One Connector (1:1)	G79-□C

Note: See page 401 for more details.

G78-04 Shorting Bar

Use this piece to short-circuit adjacent terminals. Max. current flow: 20 A



G77-S Output Short-Circuit Module

A G77-S Output Short-Circuit Module can be used to output directly without a relay. The G77-S Output Short-Circuit Module cannot be used for inputs.

P7TF-05 Socket

The G7T (SPST-NO, SPST-NC, and SPDT types) and the G3TA I/O Relays can be mounted on the P7TF-05 Socket.

The P7TF-05 can be used for applications involving sequences that require slim relays, or to enable use of SPDT relays with the I/O Block. To use part of the I/O Block with SPDT specifications, insert an Output Short-Circuit Module into the I/O Block, and use the P7TF-05 Socket in combination with an SPDT Relay for the Module's output.



Specifications

Contact resistance	10 m Ω max. (measured at 5 V DC, 1 A)
Dielectric strength	2,000 V AC for 1 minute
Insulation resistance	100 MΩ (at 500 V)
Vibration resistance	10 to 55 to 10 Hz with 0.5-mm single amplitude (1.0-mm double amplitude)
Shock resistance	200 m/s ²
Ambient temperature	Operating: 0 to 55°C
Ambient humidity	35% to 85%
Weight	Approx. 28 g

P70 Indicator Module and Surge Suppressor

Remove the transparent style strip of the P7TF-05 socket and mount this module and it will function as an operation indicator and surge suppressor.



Ordering Information

Model		Applicable relay coil voltage	Remarks
For AC relay	P70A	100 (110) V AC	Varistor surge
		200 (220) V AC	suppression
For DC relay	P70D	12/24 V DC	Diode surge
			suppression

Note: 1. Order the indicator module suitable for the relay coil voltage.2. The indicator module for DC relays can be used with a 12-V or 2- V DC power supply.

Precautions

General

I/O Relays and I/O Block Bases can be combined as follows to form I/O Blocks:

	Combinations (See note.)	Block Base	I/O Relay	I/O SSR	
DC output	G7TC-OC16 G7TC-OC16-1	P7TF-OS16 P7TF-OS16-1 P7TF-OS08 P7TF-OS08-1	G7T-1112S	AC	G3TA-OA202SZ G3TA-OA202SL
	G7TC-OC08 G7TC-OC08-1			DC	G3TA-ODX02S G3TA-OD201S
DC input	G7TC-ID16	P7TF-IS16 (DC type)	-IS16 (DC type) G7T-1122S I	DC	G3TA-IDZR02S (M)
AC input	G7TC-IA16	P7TF-IS16 (AC type)		AC	G3TA-IAZR02S

Note: The model numbers given under "Combinations" are for combinations with I/O Relays. To use I/O SSRs, either replace an I/O Relay with the SSR, or purchase an I/O Terminal (Block Base) and an I/O SSR (i.e., not the combined Unit).

 AC Input Relays/SSRs and DC Input Relays/SSRs cannot be used together in the same Terminal because of the specifications for coil surge suppression elements are different.

Furthermore, Relays/SSRs with different voltage specifications cannot be used together in the same Terminal because the specifications of operation indicator circuits are different. (For example, a 100-V AC Input Relay and a 200-V AC Input Relay, or a 12-V DC Output Relay and a 24-V DC Output Relay cannot be used in the same Terminal.)

 Only use I/O Terminals, I/O Relays, and I/O SSRs with the same specifications for rated voltage.

G79

I/O Block Connecting Cables

G79 Connecting Cables

Connecting Cables with Crimp Terminals (G79-Y C)

This Cable is convenient for connecting I/O Blocks to devices equipped with screw terminals.

Length (1)	Model
1,000 mm	G79-Y100C*
1,500 mm	G79-Y150C*
2,000 mm	G79-Y200C*
3,000 mm	G79-Y300C*
5,000 mm	G79-Y500C*



- Note: 1. The power line capacity is 50 mA max. per I/O point. Also, always check the driver capacity and I/O relay power consumption when using an Output Block.
 - The crimp terminals are labeled with the corresponding connector pin numbers in parentheses.
 - **3.** Connect terminals 9 and 19 and terminals 10 and 20 together when using the G7TC-OC08.
 - 4. The wire gauge of the wires in the cable is 28 AWG (10/0.38).

Loose-wire Connecting Cables (G79A C)

This Cable has loose wires at the device end.

Length (l)	Model	
2,000 mm	G79-A200C*	
5,000 mm	G79-A500C*	



- Note: 1. The wire gauge of the wires in the cable is 24 AWG (7/0.203).2. Connect terminals 9 and 19 and terminals 10 and 20 together
 - when using the G7TC-OC08.

Connecting Cables with One Connector (G79-□C)

This Cable is convenient for connecting an I/O Block to a single device equipped with one connector socket.

Length (1)	Model
1,000 mm	G79-100C*
1,500 mm	G79-150C*
2,000 mm	G79-200C*
3,000 mm	G79-300C*
5,000 mm	G79-500C*



Connecting Cables with Two Connectors (G79-O C-) and G79-I C-)

Cables for both Output Blocks (for connection to SYSMAC I/O Units; tape color: red) and Input Blocks (for connection to SYSMAC I/O Units; tape color: yellow) are available.

Length		Cables for Input	Cables for Output	
Α	В	Blocks	Blocks	
1,000 mm	750 mm	G79-I100C-75*	G79-O100C-75*	
1,500 mm	1,250 mm	G79-I150C-125*	G79-O150C-125*	
2,000 mm	1,750 mm	G79-I200C-175*	G79-O200C-175	
3,000 mm	2,750 mm	G79-I300C-275*	G79-O300C-275*	
5,000 mm	4,750 mm	G79-I500C-475*	G79-O500C-475*	



Note: The 32-point card-type connectors for the Input Block Cables and and Output Block Cables have different pin arrangements.

* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.



Connecting Cables for Mitsubishi PLCs

The following cables can be used to connect a Mitsubishi PLC (with a 32-point connector) to I/O Blocks.

Length		Model	Model
Α	В		
1,000 mm	750 mm	G79-I100C-75-MN (See note.)	G79-O100C-75-MN
1,500 mm	1,250 mm	G79-I150C-125-MN (See note.)	G79-O150C-125-MN
2,000 mm	1,750 mm	G79-I200C-175-MN	G79-O200C-175-MN
3,000 mm	2,750 mm	G79-I300C-275-MN	G79-O300C-275-MN

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

Note: 1. Applicable Mitsubishi PLC models Inputs: AX42, A1SX41, and A1SX42 Outputs: AY42, A1SY41, and A1SY42



Connecting Cables with Three Connectors (G79-□C-□-□)

Length			Model
Α	В	С	
1,500 mm	1,250 mm	1,000 mm	G79-150C-125-100
2,000 mm	1,750 mm	1,500 mm	G79-200C-175-150
3,000 mm	2,750 mm	2,500 mm	G79-300C-275-250

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.



I/O terminal blocks and cables

Ideal for Reducing Wiring to PLCs and Other Equipment in the Control Panel

Connecting Components (PLC Units, Connector-Terminal Conversion Units, and Cables)

Use the XW2D for Connections to Controllers





I/O Units with 32-point Connectors (Group-2) I/O Units with 64-point Connectors



I/O terminal block

^rrogrammable Controllers

XW2B

I/O terminal block

Easily wire connectors to Terminal Blocks and Reduce Control Panel Wiring

- · Can be mounted with screws or snapped onto DIN rail.
- Standard models are available with MIL flat cable connectors and multipole rectangular connectors.
- Terminal Blocks are available with M2.5 or M3.5 screws.
- Cables are available for OMRON PLC connectors.

Ordering Information

Poles	Model
20	XW2B-20G5
34	XW2B-34G5*
40	XW2B-40G5
50	XW2B-50G5*
60	XW2B-60G5*
20	XW2B-20G4
34	XW2B-34G4*
40	XW2B-40G4
50	XW2B-50G4*
60	XW2B-60G4*

* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

Specifications

Ratings/Characteristics

Rated current	1 A
Rated voltage	125 V AC
Insulation resistance	100 MΩ min. (at 500 V DC)
Dielectric strength	500 V AC for 1 min (with a leakage current of 1 mA max.)
Ambient temperature	Operating: -25 to 80 °C





Dimensions

Note: All dimensions are in mm.

XW2B-□□G5 (M3.5 Screws)







Dimensions

Model	Poles	Dimension A (mm)
XW2B-20G5	20	112.5
XW2B-34G5	34	180.0
XW2B-40G5	40	202.5
XW2B-50G5	50	247.5
XW2B-60G5	60	292.5





XW2B-□□G4 (M2.5 Screws)

Dimensions

Model	Poles	Dimension A (mm)
XW2B-20G4	20	67.5
XW2B-34G4	34	112.5
XW2B-40G4	40	135.0
XW2B-50G4	50	157.5
XW2B-60G4	60	180.0

XW2B

Servo I/O terminal block

Combines Connectors and the Terminal Block to Reduce Wiring between Servo Drivers and Position Control Units

- Allows simple terminal block wiring of control signals between a Servo Driver and a Position Control Unit or CQM1 PLC (with built-in pulse I/O function).
- No need to solder connections; all you need is a screwdriver.
- Special cables are available to connect various Units.
- Only a 24-V DC power supply is required for control signals.
- Space-saving terminal blocks use M3.0 screws.
- Can be mounted with screws or snapped onto DIN rail.



Ordering Information

Compatible Servo Drivers	Compatible Position Control Units	Model number
SMARTSTEP Series: R7D-AP W Series: R88D-WT U Series:	NC Units (Communications functions are not supported.) CS1W-NC113/133CJ1W-NC113/133 C200HW-NC113 C200H-NC112 3F88M-DRT141	XW2B-20J6-1B
R88D-UP	NC Units (Communications functions are not supported.) CS1W-NC213/233/413/433 CJ1W-NC213/233/413/433 C200HW-NC213/413 C200H-NC211	XW2B-40J6-2B
H Series: R88D-H	Other Units (Communications functions are not supported.) CS1W-HCP22 CQM1H-PLB21 CQM1-CPU43-V1	XW2B-20J6-3B
	NC Units (Communications functions are supported.) CS1W-NC213/233/413/433 CJ1W-NC213/233/413/433	XW2B-40J6-4A
	CPU units (Communications functions are not supported) CJ1M-CPU22/23	XW2B-20J6-8A (one axis)
	CPU units (Communications functions are not supported) CJ1M-CPU22/23	WX2B-20J6-9A (two axis)

Connection Example



· Simple terminal block wiring of control signals between Servo Driver and Position Control Unit.

Input terminal block

Equipped with Power Supply Common and Operation Indicators and Reduces Control Panel Wiring to Input Devices

- Equipped with a power supply common for input devices.
- Operation indicators show each I/O signal's ON/ OFF status at a glance.
- Can be mounted on DIN rail or screw-mounted.
- Compatible Connecting Cables are available (sold separately.)



Ordering Information

Points	Internal I/O circuit common	Model
16 inputs	NPN compatible (+ common)	XW2C-20G5-IN16

This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

Specifications

Ratings/Characteristics

Rated current	1 A/common
Rated voltage	12 to 24 V DC
Number of circuits	16 points
Input display	LED indicators (orange)
Power supply voltage range	12 to 24 V DC ±5%
LED indicator current	10 mA/input max. at 24 V DC
Insulation resistance	50 MΩ min. (at 500 V DC)
Dielectric strength	500 V AC for 1 min
Ambient temperature	Operating: 0 to 55 °C

Dimensions

Note: All dimensions are in mm.



XW2C-20G5-IN16



Slim Input terminal block

Introducing the XW2D Series, a Slim Version of the I/O terminal block

- Required mounting area reduced by 35% (compared to OMRON's 40-pole XW2B Unit), allowing for smaller control panels and automatic equipment.
- Terminal screw mechanism prevents lost terminal screws.
- Use either round or forked crimp terminals.
- Mount via DIN rail or screws. Unique DIN rail lock to mount or remove Units from DIN rail while open.
- Terminal cover can be fixed in the open position.
- Easy-count terminal numbers with different colors every five terminals.



Ordering Information

Mounted connec- tor	Poles	Model	Dimension A	Dimension B	Mounted connector model	Cable connector model
MIL, XG4A	20	XW2D-20G6	79	57	XG4A-2031	XG4M-2030-T
	34	XW2D-34G6*	128	100	XG4A-3431	XG4M-3430-T
	40	XW2D-40G6	149	110	XG4A-4031	XG4M-4030-T
		XW2D-40G6-RF* (See note 1.)	149	110	XG4A-4031	XG4M-4030-T
		XW2D-40G6-RM* (See note 2.)	149	110	XG4A-4031	XG4M-4030-T
	50	XW2D-50G6*	184	144	XG4A-5031	XG4M-5030-T
MIL, XG4C	20	XW2D-20C6*	79	57	XG4C-2031	XG4M-2030-U
	34	XW2D-34C6*	128	100	XG4C-3431	XG4M-3430-U
	40	XW2D-40C6*	149	110	XG4C-4031	XG4M-4030-U
	50	XW2D-50C6*	184	144	XG4C-5031	XG4M-5030-U
MR Socket	20	XW2D-20X6*	79	57	MR-20RFD2	MR-20M
(See note 3.)	34	XW2D-34X6*	128	100	MR-34RFD2	MR-34M
	50	XW2D-50X6*	184	144	MR-50RFD2	MR-50M
MR Plug	20	XW2D-20Y6*	79	57	MR-20RMD2	MR-20F
(See note 3.)	34	XW2D-34Y6*	128	100	MR-34RMD2	MR-34F
	50	XW2D-50Y6*	184	144	MR-50RMD2	MR-50F

Note: 1. Has a built-in bleeder resistor and is for the CJ1W-ID231/ID261. External dimensions are the same as the XW2D-40G6.

- 2. Has a built-in bleeder resistor and is for the CJ1W-ID232. External dimensions are the same as the XW2D-40G6.
- 3. The MR Connectors are manufactured by Honda Tsushin Kogyou Co., Ltd.

Specifications

Ratings /Characteristics

Rated current	1 A
Rated voltage	125 V AC, 24 V DC
Insulation resistance	100 MΩ max. (at 500 V DC)
Dielectric strength	500 V AC for 1 min (with a leakage current of 1 mA max.)
Ambient temperature	Operating: 0 to 55 °C

Dimensions

XW2D-DG6 with XG4A MIL Connector

Note: In the 20-pole models, there is just one DIN rail lock located at the bottom-center of the Unit.



Connection Diagram (50-pole model)



Note: The connector's odd-numbered poles connect to the "A" terminals and the connector's even-numbered poles connect to the "B" terminals.

XW2D-DC6 with XG4C MIL Connector

Note: In the 20-pole models, there is just one DIN rail lock located at the bottom-center of the Unit.



Connection Diagram (50-pole model)



Note: The connector's odd-numbered poles connect to the "A" terminals and the connector's even-numbered poles connect to the "B" terminals.

XW2D-DIX6 with MR Socket Connector

Note: In the 20-pole models, there is just one DIN rail lock located at the bottom-center of the Unit.



XW2D-DDY6 with MR Plug Connector

Note: In the 20-pole models, there is just one DIN rail lock located at the bottom-center of the Unit.



Connection Diagram (50-pole model)



Terminals

Note: The pin numbers on the connector correspond directly to the terminal numbers on the terminal block.

XW2Z

Connecting Cables for I/O terminal blocks

• Refer to page 416 for connection details.

XW2Z-

Ordering Information

XW2Z-



*Cable length L (mm)	Model
500 mm	XW2Z-050A
1,000 mm	XW2Z-100A
1,500 mm	XW2Z-150A*
2,000 mm	XW2Z-200A
3,000 mm	XW2Z-300A*
5,000 mm	XW2Z-500A*

XW2Z-DDAU (See note.)	
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*Cable length L (mm)	Model
500 mm	XW2Z-050AU*
1,000 mm	XW2Z-100AU*
1,500 mm	XW2Z-150AU*
2,000 mm	XW2Z-200AU*
3,000 mm	XW2Z-300AU*
5,000 mm	XW2Z-500AU*

XW2Z-DB Cables for Group-2 PLC I/O Units with 32-point Connectors and PLC I/O Units with 64-point Connectors

XW2Z-





Wiring	*Cable length L (mm)	Model
Normal wiring	500 mm	XW2Z-050B
	1,000 mm	XW2Z-100B
	1,500 mm	XW2Z-150B*
	2,000 mm	XW2Z-200B
	3,000 mm	XW2Z-300B
	5,000 mm	XW2Z-500B

XW2Z-DDBU (See note.)



*Cable length (mm)

Wiring	*Cable length L (mm)	Model
Normal wiring	500 mm	XW2Z-050BU*
	1,000 mm	XW2Z-100BU*
	1,500 mm	XW2Z-150BU*
	2,000 mm	XW2Z-200BU*
	3,000 mm	XW2Z-300BU*
	5,000 mm	XW2Z-500BU*

XW2Z-DD Cables for Group-2 PLC Input Units with 32-point Connectors and PLC Input Units with 64-point Connectors

XW2Z-DDD





*Cable lengths (mm)		Model
Α	В	
1,000 mm	750 mm	XW2Z-100D*
1,500 mm	1,250 mm	XW2Z-150D*
2,000 mm	1,750 mm	XW2Z-200D*
3,000 mm	2,750 mm	XW2Z-300D*
5,000 mm	4.750 mm	XW2Z-500D*

* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

XW2Z-DDF Cables with Crimp Terminals (20 poles)

XW2Z-DDF



*Cable length L (mm)	Model
1,000 mm	XW2Z-100F
1,500 mm	XW2Z-150F
2,000 mm	XW2Z-200F
3,000 mm	XW2Z-300F
5,000 mm	XW2Z-500F

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

XW2Z-DC Cables for Group-2 PLC Output Units with 32-point Connectors and PLC Output Units with 64-point Connectors

XW2Z-DDL



The pins in CN2 (white) connect to row A of CN1 and the pins in CN3 (green) connect to row B of CN1.

*Cable lengths (mm)		Model
Α	В	
1,000 mm	750 mm	XW2Z-100L
1,500 mm	1,250 mm	XW2Z-150L
2,000 mm	1,750 mm	XW2Z-200L
3,000 mm	2,750 mm	XW2Z-300L
5,000 mm	4.750 mm	XW2Z-500L

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

XW2Z-DH Cables for PLC I/O Units with 96-point Connectors

XW2Z-00H-1





Cable length (mm)	Model
500 mm	XW2Z-050H-1
1,000 mm	XW2Z-100H-1
1,500 mm	XW2Z-150H-1
2,000 mm	XW2Z-200H-1
3,000 mm	XW2Z-300H-1
5,000 mm	XW2Z-500H-1
7,000 mm	XW2Z-700H-1
10,000 mm	XW2Z-010H-1

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.



Cable lengths (mm)	Model	
Α	В	
1,000 mm	750 mm	XW2Z-100H-2
1,500 mm	1,250 mm	XW2Z-150H-2
2,000 mm	1,750 mm	XW2Z-200H-2
3,000 mm	2,750 mm	XW2Z-300H-2
5,000 mm	4.750 mm	XW2Z-500H-2
10,000 mm	9,750 mm	XW2Z-010H-2

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

XW2Z-00H-3





Cable lengths	Model		
Α	В	С	
1,000 mm	750 mm	1,000 mm	XW2Z-100H-3
1,500 mm	1,250 mm	1,500 mm	XW2Z-150H-3
2,000 mm	1,750 mm	2,000 mm	XW2Z-200H-3
3,000 mm	2,750 mm	3,000 mm	XW2Z-300H-3
5,000 mm	4.750 mm	5,000 mm	XW2Z-500H-3
10,000 mm	9,750 mm	10,000 mm	XW2Z-010H-3

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

XW2Z-DCK/N Cables for PLC I/O Units with 32-point MIL Connectors

XW2Z-DDK

XW2Z-DDDN





Cable length (mm)	Model (See note.)
1,000 mm	XW2Z-100K
1,500 mm	XW2Z-150K*
2,000 mm	XW2Z-200K
3,000 mm	XW2Z-300K*
5,000 mm	XW2Z-500K*

* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

	*Cable lengths (m
	•®

Wiring distance (not including bends)

m)

Cable lengths (mm	Model	
Α	В	
1,000 mm	750 mm	XW2Z-100N
1,500 mm	1,250 mm	XW2Z-150N
2,000 mm	1,750 mm	XW2Z-200N
3,000 mm	2,750 mm	XW2Z-300N
5,000 mm	4.750 mm	XW2Z-500N

These are all non-standard model and require a special order. Contact your OMRON representative for details on availability.

XW2Z

Host Link Cables

PLC-compatible RS-232C Cables Ideal for Host Link Connections between a PLC and Host Computer or other Device

Ordering Information

SYSMAC PLC end	XW2Z Host Link Cable (PLC-compatible RS-232C cable		Host device end	
	Wiring configuration	Cable length L (See note 1.)	Model number	
CS1 CPU	0 sis D Out Dive	2 m	XW2Z-200S-V	Personal Computer
CJ1 - CPU - CPM2A-CPU - CPM2A-CPU - CPM2A-CPU - CPU -	9-pin D-Sub Plug 9-pin D-Sub Socket PLC end Shield Connector hood FG 1 SD 2 2 RD 3 SD RS 4 ER CS 5 G 7 RS 7 RS 8 CS SG 9	5 m	XW2Z-500S-V*	
		2 m	XW2Z-200S-CV*	
	9-pin D-Sub Plug 9-pin D-Sub Socket PLC end Shield Connector hood FG 1 RD 3 RS 4 CS 5 SG 9 BR 7 RS 8 CS 5 SG 9 ESD-preventive connectors are used.	5 m	XW2Z-500S-CV*	
	9-pin D-Sub Plug 9-pin D-Sub Plug	2 m	XW2Z-200T	Programmable Terminal:
	PLC end Host end Connector hood FG SD 2 RD 3 RS 4 CS 5 SG 9	5 m	XW2Z-500T	N 120S, N 1600S, NT620S, NT620C, NT30, or NT30C NT31, or NT31C, NT631, or NT 631 C, NS-series

Note: 1. The cable length does not include the connectors, as shown in the following diagram.



* This is a non-standard model and requires a special order. Contact your OMRON representative for details on availability.

I/O Connecting Cable Selection guide

Connecting to CS1 I/O Units

I/O Unit	Connector-Terminal	Connect	ing Cabl	е		I/O Unit	Connector-Terminal	Connecting Cable			
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page	model	or I/O Block model	Branch- ing	Length (m)	Model	Page
CS1W-ID291	XW2B-60G5	1:1	0.5	XW2Z-050H-1	413	CS1W-	XW2B-60G5	1:1	0.5	XW2Z-050H-1	413
(48 points x	XW2B-60G4		1	XW2Z-100H-1		OD292 (48	XW2B-60G4		1	XW2Z-100H-1	
2)			1.5	XW2Z-150H-1		points \times 2)			1.5	XW2Z-150H-1	
			2	XW2Z-200H-1					2	XW2Z-200H-1	
			3	XW2Z-300H-1					3	XW2Z-300H-1	1
			5	XW2Z-500H-1					5	XW2Z-500H-1	1
			7	XW2Z-700H-1					7	XW2Z-700H-1	1
			10	XW2Z-010H-1					10	XW2Z-010H-1	
	XW2D-20G6 +	1:2	1	XW2Z-100H-2			XW2D-20G6 +	1:2	1	XW2Z-100H-2	
	XW2D-40G6		1.5	XW2Z-150H-2			XW2D-40G6		1.5	XW2Z-150H-2	1
	XW2B-20G5 + XW2B-		2	XW2Z-200H-2			XW2B-20G5 + XW2B-		2	XW2Z-200H-2	
	40G5		3	XW2Z-300H-2			40G5 XW2B-20G4 + XW2B-		3	XW2Z-300H-2	
	XW2B-20G4 + XW2B-		5	XW2Z-500H-2			40G4		5	XW2Z-500H-2	
	4004		10	XW27-010H-2					10	XW2Z-010H-2	
	XW2D-20G6 (3 Units)	1:3	1	XW2Z-100H-3			XW2D-20G6 (3 Units)	1:3	1	XW2Z-100H-3	
	XW2B-20G5 (3 Units)		1.5	XW27-150H-3			XW2B-20G5 (3 Units)		1.5	XW2Z-150H-3	
	XW2B-20G4 (3 Units)		2	XW27-200H-3			XW2B-20G4 (3 Units)		2	XW2Z-200H-3	
			3	XW27-300H-3					3	XW2Z-300H-3	
			5	XW27-500H-3					5	XW2Z-500H-3	
			10	XW2Z-010H-3					10	XW2Z-010H-3	
	G7TC-IA16/ID16	1:3	1.5	G79-150C-125-	402		G7TC-OC16-1	1:3	1.5	G79-150C-125- 100	402
			2	G79-200C-175-					2	G79-200C-175- 150	
			3	G79-300C-275-					3	G79-300C-275- 250	
CS1W-	XW2B-60G5	1.1	0.5	XW27-050H-1	413	CS1W-	XW2B-60G5	1:1	0.5	XW2Z-050H-1	413
OD291 (48	XW2B-60G4		1	XW2Z-100H-1	410	MD291	XW2B-60G4		1	XW2Z-100H-1	
points \times 2)			15	XW2Z-100H-1		(48 inputs)			1.5	XW2Z-150H-1	
			2	XW2Z-200H-1		(48 outputs)			2	XW2Z-200H-1	1
			3	XW2Z-300H-1					3	XW2Z-300H-1	
			5	XW2Z-500H-1					5	XW2Z-500H-1	
			7	XW2Z-700H-1					7	XW2Z-700H-1	1
			10	XW2Z-010H-1					10	XW2Z-010H-1	
	XW2D-20G6 +	1.2	1	XW27-100H-2			XW2D-20G6 +	1:2	1	XW2Z-100H-2	
	XW2D-40G6		1.5	XW2Z-150H-2			XW2D-40G6		1.5	XW2Z-150H-2	
	XW2B-20G5 + XW2B-		2	XW27-200H-2			XW2B-20G5 + XW2B-		2	XW2Z-200H-2	
	40G5		3	XW27-300H-2					3	XW2Z-300H-2	
	XW2B-20G4 + XW2B-		5	XW2Z-500H-2			40G4		5	XW2Z-500H-2	
	4004		10	XW27-010H-2					10	XW2Z-010H-2	
	XW2D-20G6 (3 Units)	1:3	1	XW2Z-100H-3			XW2D-20G6 (3 Units)	1:3	1	XW2Z-100H-3	
	XW2B-20G5 (3 Units)		1.5	XW2Z-150H-3			XW2B-20G5 (3 Units)		1.5	XW2Z-150H-3	
	XW2B-20G4 (3 Units)		2	XW2Z-200H-3			XW2B-20G4 (3 Units)		2	XW2Z-200H-3	
			3	XW2Z-300H-3					3	XW2Z-300H-3	
			5	XW2Z-500H-3					5	XW2Z-500H-3	
			10	XW2Z-010H-3					10	XW2Z-010H-3	
	G7TC-OC16/08 G70D-SOC16/	1:3	1.5	G79-150C-125-	402		G7TC-IA16/ID16 G7TC-OC16/08	1:3	1.5	G79-150C-125- 100	402
	VSOC16 G70A-ZOC16-3		2	G79-200C-175-			G70D-SOC16/ VSOC16		2	G79-200C-175- 150	
			3	G79-300C-275-			G70A-ZOC16-3		3	G79-300C-275- 250	
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I/O Unit	Connector-Terminal	Connecti	ing Cabl	e		I/O Unit	Connector-Terminal	Connecti	ng Cabl	e
inouei	or I/O Block model	Branch- ing	Length (m)	Model	Page	moder	or I/O Block model	Branch- ing	Length (m)	Model
CS1W-	XW2B-60G5	1:1	0.5	XW2Z-050H-1	413	CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B
MD292	XW2B-60G4		1	XW2Z-100H-1		OD232 (32	XW2B-40G5		1	XW2Z-100B
(48 outputs)			1.5	XW2Z-150H-1		points)	71120-4004		1.5	XW2Z-150B
,			2	XW2Z-200H-1	_				2	XW2Z-200B
			3	XW2Z-300H-1 XW2Z-500H-1	-				3 5	XW2Z-300B
			7	XW2Z-700H-1	_		XW2D-40C6	1:1	0.5	XW2Z-050BU
			10	XW2Z-010H-1					1	XW2Z-100BU
	XW2D-20G6 +	1:2	1	XW2Z-100H-2					1.5	XW2Z-150BU
	XW2D-40G6		1.5	XW2Z-150H-2					2	XW2Z-200BU
	XW2B-20G5 + XW2B- 40G5		2	XW2Z-200H-2					3	XW2Z-300BU
	XW2B-20G4 + XW2B-		3	XW2Z-300H-2					5	XW2Z-500BU
	40G4		5	XW2Z-500H-2	-		XW2D-20G6 (2 Units) XW2B-20G5 (2 Units)	1:2	1	XW2Z-100L
	XW2D-20G6 (3 Linite)	1.3	10	XW2Z-010H-2 XW2Z-100H-3	-		XW2B-20G4 (2 Units)		1.5	XW2Z-150L
	XW2B-20G5 (3 Units)	1.5	1.5	XW2Z-150H-3	_		XW2B-40G5-T		3	XW2Z-200L
	XW2B-20G4 (3 Units)		2	XW2Z-200H-3			XW2C-20G6-I016 (2 Units)		5	XW2Z-500L
			3	XW2Z-300H-3		CS1W-ID261	XW2D-40G6	1:1	0.5	XW2Z-050B
			5	XW2Z-500H-3		(32 points \times	XW2B-40G5		1	XW2Z-100B
			10	XW2Z-010H-3		2)	XW2B-40G4		1.5	XW2Z-150B
	G7TC-IA16/ID16	1:3	1.5	G79-150C-125-	402				2	XW2Z-200B
	G/10-0016-1		2	100 G79-200C-175-	-				3	XW2Z-300B
			2	150					5	XW2Z-500B
			3	G79-300C-275-			XW2D-40C6	1:1	0.5	XW2Z-050BU
				250					15	XW2Z-100BU
CS1W-ID231	XW2D-40G6	1:1	0.5	XW2Z-050B	412				2	XW2Z-150BU XW2Z-200BU
(32 points)	XW2B-40G5 XW2B-40G4		1	XW2Z-100B	_				3	XW2Z-300BU
			1.5	XW2Z-150B	-				5	XW2Z-500BU
			3	XW2Z-200B	-		XW2D-20G6 (2 Units)	1:2	1	XW2Z-100D
			5	XW2Z-500B			XW2B-20G5 (2 Units)		1.5	XW2Z-150D
	XW2D-40C6	1:1	0.5	XW2Z-050BU			XW2B-20G4 (2 Onits) XW2B-40G5-T		2	XW2Z-200D
			1	XW2Z-100BU			XW2C-20G6-IO16		3	XW2Z-300D
			1.5	XW2Z-150BU			(2 Units)		5	XW2Z-500D
			2	XW2Z-200BU			XW2C-20G5-IN16 (2 Units)			
			3	XW2Z-300BU			XW2E-20G5-IN16			
		1.0	5	XW2Z-500BU			(2 Units)			
	XW2D-20G6 (2 Units) XW2B-20G5 (2 Units)	1:2	1	XW2Z-100D	-	CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B
	XW2B-20G4 (2 Units)		2	XW2Z-200D	-	points \times 2)	XW2B-40G5 XW2B-40G4		1	XW2Z-100B
	XW2B-40G5-T		3	XW2Z-300D		· /			1.5	XW2Z-150B
	(2 Units)		5	XW2Z-500D					3	XW2Z-300B
	XW2C-20G5-IN16								5	XW2Z-500B
	(2 Units)						XW2D-40C6	1:1	0.5	XW2Z-050BU
	(2 Units)								1	XW2Z-100BU
CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B	412				1.5	XW2Z-150BU
OD231 (32	XW2B-40G5		1	XW2Z-100B					2	XW2Z-200BU
points)	XW2B-40G4		1.5	XW2Z-150B					3	XW2Z-300BU
			2	XW2Z-200B			XW2D 20G6 (2 Lipite)	1.0	ວ 1	XW2Z-500BU
			3	XW2Z-300B	_		XW2B-20G5 (2 Units) XW2B-20G5 (2 Units)	1.2	1.5	XW2Z-150L
		1.1	5	XW2Z-500B			XW2B-20G4 (2 Units)		2	XW2Z-200L
	XVV2D-40C6	1.1	0.5	XW2Z-050B0			XW2B-40G5-T		3	XW2Z-300L
			1.5	XW2Z-150BU			(2 Units)		5	XW2Z-500L
			2	XW2Z-200BU		CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B
			3	XW2Z-300BU		OD262 (32	XW2B-40G5		1	XW2Z-100B
			5	XW2Z-500BU		points $\times 2$)	XW2B-40G4		1.5	XW2Z-150B
	XW2D-20G6 (2 Units)	1:2	1	XW2Z-100L	413				2	XW2Z-200B
	XW2B-20G5 (2 Units) XW2B-20G4 (2 Units)		1.5	XW2Z-150L					3	XW2Z-300B
	XW2B-40G5-T		2	XW2Z-200L	_			1.1	5	XW2Z-500B
	XW2C-20G6-IO16		3	XW2Z-300L	-		XW2D-40C0	1.1	0.5	XW2Z-050BU
	(2 Units)		5	XW22-300L					1.5	XW2Z-150BU
									2	XW2Z-200BU
									3	XW2Z-300BU
									5	XW2Z-500BU
							XW2D-20G6 (2 Units)	1:2	1	XW2Z-100L
							XW2B-20G5 (2 Units) XW2B-20G4 (2 Units)		1.5	XW2Z-150L
							XW2B-40G5-T		2	XW2Z-200L
							XW2C-20G6-IO16		3 5	XW2Z-300L
							(∠ Units)		2	

I/O Unit	Connector-Terminal	Connect	ing Cabl	ng Cable				
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page			
CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B	412			
MD261 (32	XW2B-40G5		1	XW2Z-100B				
inputs)	XW2B-40G4		1.5	XW2Z-150B				
			2	XW2Z-200B				
			3	XW2Z-300B				
			5	XW2Z-500B				
	XW2D-40C6	1:1	0.5	XW2Z-050BU				
			1	XW2Z-100BU				
			1.5	XW2Z-150BU				
			2	XW2Z-200BU				
			3	XW2Z-300BU				
			5	XW2Z-500BU				
	XW2D-20G6 (2 Units)	1:2	1	XW2Z-100D				
	XW2B-20G5 (2 Units)		1.5	XW2Z-150D				
	XW2B-20G4 (2 Units)		2	XW27-200D				
	XW2B-40G5-T		3	XW2Z-300D				
	XW2C-20G6-IO16		5	XW2Z-500D				
	(2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16 (2 Units)							
CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B	412			
MD261 (32	XW2B-40G5		1	XW2Z-100B				
outputs)	XW2B-40G4		1.5	XW2Z-150B				
			2	XW2Z-200B				
			3	XW2Z-300B				
			5	XW2Z-500B				
	XW2D-40C6	1:1	0.5	XW2Z-050BU				
			1	XW2Z-100BU				
			1.5	XW2Z-150BU				
			2	XW2Z-200BU				
			3	XW2Z-300BU				
			5	XW2Z-500BU				
	XW2D-20G6 (2 Units)	1.2	1	XW27-1001	413			
	XW2B-20G5 (2 Units)	• •=	15	XW27-150L				
	XW2B-20G4 (2 Units)		2	XW27-2001				
	XW2B-40G5-T		3	XW2Z-300L				
	XW2C-20G6-IO16		5	XW2Z-500L				
	(2 Units)		5	XWZZ-SOUL				
CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B	412			
inputs)	XW2B-40G5 XW2B-40G4		1	XW2Z-100B				
inputo)			1.5	XW2Z-150B				
			2	XW2Z-200B				
			3	XW2Z-300B				
			5	XW2Z-500B				
	XW2D-40C6	1:1	0.5	XW2Z-050BU				
			1	XW2Z-100BU				
			1.5	XW2Z-150BU				
			2	XW2Z-200BU				
			3	XW2Z-300BU				
			5	XW2Z-500BU				
	XW2D-20G6 (2 Units)	1:2	1	XW2Z-100D				
	XW2B-20G5 (2 Units)		1.5	XW2Z-150D				
	XW2B-20G4 (2 Units)		2	XW2Z-200D]			
	XW2C-20G6-I016		3	XW2Z-300D]			
	(2 Units) XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16		5	XW2Z-500D				

I/O Unit	Connector-Terminal	Connecting Cable						
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page			
CS1W-	XW2D-40G6	1:1	0.5	XW2Z-050B	412			
MD262 (32	XW2B-40G5		1	XW2Z-100B				
outputs)	XW2B-40G4		1.5	XW2Z-150B				
			2	XW2Z-200B				
			3	XW2Z-300B				
			5	XW2Z-500B				
	XW2D-40C6	1:1	0.5	XW2Z-050BU				
			1	XW2Z-100BU	1			
			1.5	XW2Z-150BU				
			2	XW2Z-200BU				
			3	XW2Z-300BU				
			5	XW2Z-500BU				
	XW2D-20G6 (2 Units)	1:2	1	XW2Z-100L	413			
	XW2B-20G5 (2 Units)		1.5	XW2Z-150L				
	XW2B-20G4 (2 Units)		2	XW2Z-200L				
	XW2C-20G6-IO16		3	XW2Z-300L				
	(2 Units)		5	XW2Z-500L				

Connecting to CJ1 I/O Units

I/O Unit	Connector-Terminal	Connecting Cable			
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page
CJ1W-ID231	XW2D-40G6	1:1	0.5	XW2Z-050B	412
(32 points)	XW2D-40G6-RF		1	XW2Z-100B	
	XW2B-40G5		1.5	XW27-150B	
	XW2B-40G4		2	XW2Z 100B	
			2	XW2Z-200D	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	1
			2	XW2Z-200BU	
			3	XW/27-300BU	
			5	XW2Z COODU	
		1.0	5	XW2Z-300BU	
	XW2D-20G6 (2 Units)	1:2	1	XW2Z-100D	
	XW2B-20G5 (2 Units)		1.5	XW2Z-150D	
			2	XW2Z-200D	
	XW2C-20G6-IO16		3	XW2Z-300D	
	(2 Inite)		5	XW2Z-500D	
	XW2C-20G5-IN16 (2 Units) XW2E-20G5-IN16				
	(2 Units)				
	G7TC-IA16/ID16	1:2	1	G79-I100C-75	401
			1.5	G79-I150C-125	1
			2	G79-I200C-175	
			3	G79-1300C-275	
			5	070 15000 475	
			5	G79-I500C-475	
CJ1W-	XW2D-40G6	1:1	0.5	XW2Z-050B	412
OD231	XW2B-40G5		1	XW2Z-100B	
(32 points)	XW2B-40G4		1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW/27-300B	
			5	XW22-300D	
	14140D 4000		5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	1
			3	XW27-300BU	
			5	XW/27-500BU	
		1.0	1	XW22 300000	410
	XW2D-20G6 (2 Units)	1:2	1	XVV2Z-100L	413
	XW2B-20G5 (2 Units)		1.5	XW2Z-150L	
	XW2B-20G4 (2 01115)		2	XW2Z-200L	
	XW2C 20C6 1016		3	XW2Z-300L	
	(2 Unite)		5	XW2Z-500L	
			-	070 01000 75	404
	G70D-SOC16/ VSOC16	1:2	1.5	G79-O100C-75 G79-O150C- 125	401
	G70A-ZOC16-3		2	G79-O200C- 175	
			3	G79-O300C- 275	
			5	G79-O500C- 475	
CJ1W-ID232	XW2D-40G6	1:1	1	XW2Z-100K	414
(32 points)	XW2D-40G6-RM		1.5	XW2Z-150K	
	XW2B-40G5		2	XW2Z-200K	1
	XVV2B-40G4		3	XW2Z-300K	1
		1	5	XW27-500K	1
		1.0	1	XW22 100N	
		1:2	<u> </u>	AVVZZ-TUUN	
			1.5	XW2Z-150N	
	XVV2B-20G4 (2 Units)	1	2	XW2Z-200N	
	XW2B-40G5-1		3	XW2Z-300N	1
	xw2C-20G6-IO16 (2 Units) XW2C-20G5-IN16 (2 Units)		5	XW2Z-500N	
	XW2E-20G5-IN16 (2 Units)				

I/O Unit	Connector-Terminal	Connecting Cable				
model	Conversion Unit	Branch-	Length	Model	Page	
	OF I/O BIOCK HIDDEI	ing	(m)			
CJ1W-	XW2D-40G6	1:1	1	XW2Z-100K	414	
(32 points)	XW2B-40G5 XW2B-40G4		1.5	XW2Z-150K		
	XW2D-4004		2	XW2Z-200K		
			3	XW2Z-300K	_	
			5	XW2Z-500K		
	XW2D-20G6 (2 Units)	1:2	1	XW2Z-100N		
	XW2B-20G5 (2 Units)		1.5	XW2Z-150N		
	XW2B-20G4 (2 01113)		2	XW2Z-200N		
	XW2C-20G6-IO16		3	XW2Z-300N		
	(2 Units)		5	XW2Z-500N		
CJ1W-	XW2D-40G6	1:1	1	XW2Z-100K	414	
OD233	XW2B-40G5		1,5	XW2Z-150K		
(32 points)	XW2B-40G4		2	XW2Z-200K		
			3	XW2Z-300K	-	
			5	XW2Z-500K		
	XW2D-20G6 (2 units)	1:2	1	XW2Z-100N	414	
	XW2B-20G5 (2 units)		1.5	XW2Z-150N	-	
	XW2B-20G4 (2units)		2	XW27-200N	-	
	XW2B-40G5-T		3	XW2Z-300N		
	XW2C-20G6-IO16		5	XW2Z-500N		
	(2 units)		Ŭ			
CJ1W-	XW2D-20G6	1:1	0.5	XW2Z-050A	412	
MD231	XW2B-20G5	-	1	XW2Z-100A	-	
(16 inputs)	XW2B-20G4	-	1.5	XW27-150A		
	XW2C-20G6-IO16	•	2	XW27-200A		
	XW2C-20G5-IN16		3	XW/27-300A		
	XW2E-20G5-IN16		5	XW2Z-500A		
	XW2D-20C6	1.1	0.5	XW2Z-050AU	412	
	XW2D 2000		1	XW22-100AU	-12	
			15	XW2Z-160AU	-	
			2	XW2Z 200AU	-	
			2	XW2Z-200AU	-	
			5	XW2Z-300AU	-	
CHW		1.1	0.5	XW22-300A0	410	
MD231	XW2D-2006	1.1	0,5	XW2Z-050A	412	
(16 outputs)	XW2B-20G3	_	1 5	XW2Z-100A		
	XW2D-2004	_	1,5	XW2Z-150A		
	XW2C-20G6-IO16		2	XW2Z-200A	-	
			3	XW2Z-300A	_	
	1/1/10D 0000		5	XW2Z-500A		
	XW2D-20C6	1:1	0,5	XW2Z-050AU	412	
			1	XW2Z-100AU	_	
			1,5	XW2Z-150AU		
			2	XW2Z-200AU		
			3	XW2Z-300AU		
			5	XW2Z-500AU		
CJ1W-	XW2D-20G6	1:1	0,25	G79-O25C	401	
MD233	XW2B-20G5		0,5	G79-O50C	1	
(io inputs)	XW2B-20G4				1	
	XW2C-20G6-IO16				1	
	XW2C-20G5-IN16					
	XW2E-20G5-IN16	1				
CJ1W-	XW2D-20G6	1:1	0,25	G79-O25C	401	
MD233	XW2B-20G5	1	0,5	G79-O50C	1	
(16 outputs)	XW2B-20G4	1	·			
	XW2C-20G6-IO16	1	1		1	

I/O Unit	Connector-Terminal	Connect	ing Cabl	e		I/O Unit	Connector-Terminal	I Connecting Cable			
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page	model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page
CJ1W-ID261	XW2D-40G6	1:1	0.5	XW2Z-050B	412	CJ1W-ID262	XW2D-40G6	1:1	1	XW2Z-100K	414
(32 points \times	XW2D-40G6-RF		1	XW2Z-100B		(32 points x	XW2D-40G6-RM		1,5	XW2Z-150K	
2)	XW2B-40G5		1.5	XW2Z-150B		2)	XW2B-40G5		2	XW2Z-200K	
	XW2B-40G4		2	XW2Z-200B			XW2B-40G4		3	XW2Z-300K	
			3	XW2Z-300B					5	XW2Z-500K	
			5	XW27-500B			XW2D-20G6 (2 units)	1.2	1	XW27-100N	414
	XW2D-40C6	1.1	0.5	XW2Z-050BU			XW2B-20G5 (2 units)	1.2	1.5	XW2Z-150N	1
			1	XW2Z-100BU			XW2B-20G4 (2units)		2	XW27-200N	-
			15	XW27-150BU			XW2B-40G5-T		3	XW27-300N	-
			2	XW2Z-200BU			XW2C-20G6-IO16		5	XW2Z-500N	-
			3	XW2Z-300BU			(2 units)		S	XWEE SOON	
			5	XW2Z-500BU			XW2C-20G5-IN16				
	XW2D 20C6 (2 Linite)	1.0	1	XW2Z-300D0			(2 units)				
	XW2B-20G5 (2 Units)	1.2	1	XW2Z-100D	-		XW2E-20G5-IN16				
	XW2B-20G4 (2 Units)		1.5	XW2Z-150D			(2 units)				
	XW2B-40G5-T		2	XW2Z-200D		CJ1W-	XW2D-40G6	1:1	0,5	XW2Z-050B	412
	XW2C-20G6-IO16		3	XW2Z-300D		MD261	XW2D-40G6-RF		1	XW2Z-100B	
	(2 Units)		э	XVV2Z-500D		(32 Inputs)	XW2B-40G5		1,5	XW2Z-150B	
	XW2C-20G5-IN16						XW2B-40G4		2	XW2Z-200B	
	(2 01115) XW2E-20G5-IN16								3	XW2Z-300B	
	(2 Units)								5	XW2Z-500B	
	G7TC-IA16/ID16	1:2	1	G79-I100C-75	401		XW2D-40C6	1:1	0.5	XW2Z-050BU	412
			1.5	G79-I150C-125					1	XW2Z-100BU	-
			2	G79-1200C-175					1.5	XW27-150BU	-
			3	G79-1300C-275					2	XW27-200BU	-
			5	G79-1500C-475	-				3	XW2Z-300BU	-
CI1W-	XW2D-40G6	1.1	0.5	XW27-050B	412				5	XW2Z-500BU	
OD261 (32	XW2B-40G5		1	XW2Z-100B	-12		XW2D-20G6 (2 units)	1.2	1	XW2Z-100D	412
points \times 2)	XW2B-40G4		15	XW2Z-160B	-		XW2B-20G5 (2 units)	1.2	15	XW2Z-150D	
			2	XW2Z-150D	-		XW2B-20G4 (2 units)		2	XW2Z-200D	-
			2	XW2Z-200D			XW2B-20G5-T		3	XW2Z-300D	-
			5	XW2Z-300B			XW2D 4000 1 XW2C-20G6-IO16		5	XW2Z-500D	-
	XW2D-40C6	1.1	0.5	XW2Z-050BU	-		(2 units)		S	XW22 300D	
	XW2D 4000		1	XW2Z-100BU	-		XW2C-20G5-IN16				
			15	XW2Z-100D0	-		(2 units)				
			2	XW2Z-150D0	-		XW2E-20G5-IN16				
			3	XW2Z-300BU	-		(2 units)				
			5	XW2Z-500BU	-	CJ1W-	XW2D-40G6	1:1	0,5	XW2Z-050B	412
	XW2D-20G6 (2 Units)	1.2	1	XW2Z-100I	413	MD261	XW2B-40G5		1	XW2Z-100B	
	XW2B-20G5 (2 Units)		15	XW27-150L		(32 Outputs)	XW2B-40G4		1,5	XW2Z-150B	
	XW2B-20G4 (2 Units)		2	XW2Z-2001					2	XW2Z-200B	
	XW2B-40G5-T		3	XW2Z-300L	-				3	XW2Z-300B	
	XW2C-20G6-IO16		5	XW2Z-500L					5	XW2Z-500B	
		1.0	-	C70 0100C 75	401		XW2D-40C6	1:1	0,5	XW2Z-050BU	412
	G70D-SOC16/	1.2	1	G79-0100C-75	401				1	XW2Z-100BU	
	VSOC16		1.5	125					1,5	XW2Z-150BU	
	G70A-ZOC16-3		2	G79-0200C-					2	XW2Z-200BU	
			-	175					3	XW2Z-300BU	
			3	G79-O300C-					5	XW2Z-500BU	
				275			XW2D-20G6 (2 units)	1:2	1	XW2Z-100L	413
			5	G79-O500C-			XW2B-20G5 (2 units)		1,5	XW2Z-150L	
				475			XW2B-20G4 (2units)		2	XW2Z-200L	
CJ1W-	XW2D-40G6	1:1	1	XW2Z-100K	414		XW2B-40G5-T		3	XW2Z-300L	_
OD263	XW2B-40G5		1,5	XW2Z-150K			XW2C-20G6-IO16		5	XW2Z-500L	
(32 points x 2)	XW2B-40G4		2	XW2Z-200K		0.1111				V04/07 400/4	
-,			3	XW2Z-300K		MD263	XW2D-40G6	1:1	1	XW2Z-100K	414
			5	XW2Z-500K		(32 Inputs)	XW2D-40G6-RM		1,5	XW2Z-150K	-
	XW2D-20G6 (2 units)	1:2	1	XW2Z-100N	414	(XW2B-40G5		2	XW2Z-200K	-
	XW2B-20G5 (2 units)		1,5	XW2Z-150N			XW2B-40G4		3	XW2Z-300K	-
	XW2B-20G4 (2units)		2	XW2Z-200N				1.0	5	XW2Z-500K	44.4
	XW2B-40G5-T		3	XW2Z-300N			XW2D-20G6 (2 units)	1:2	1	XW2Z-100N	414
	XW2C-20G6-IO16		5	XW2Z-500N			XW2B-20G5 (2 units)		1,5	XW2Z-150N	-
	(2 units)						XVV2B-20G4 (2units)		2	XW2Z-200N	4
							XW2B-40G5-1		3	XW2Z-300N	-
							XVV2C-20G6-1016		5	XW2Z-500N	1
							XW/2C-20C5-INI16				1
							(2 units)				1
							XW2E-20G5-IN16	1			1
							(2 units)				

I/O Unit	Connector-Terminal	Connecting Cable				
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page	
CJ1W-	XW2D-40G6	1:1	1	XW2Z-100K	414	
MD263	XW2B-40G5		1,5	XW2Z-150K		
(32 Outputs)	XW2B-40G4		2	XW2Z-200K		
			3	XW2Z-300K		
			5	XW2Z-500K		
	XW2D-20G6 (2 units)	1:2	1	XW2Z-100N	414	
	XW2B-20G5 (2 units)		1,5	XW2Z-150N		
	XW2B-20G4 (2units)		2	XW2Z-200N		
	XW2B-40G5-T		3	XW2Z-300N		
	XW2C-20G6-IO16 (2 units)		5	XW2Z-500N		
CJ1W-	XW2D-40G6	1:1	1	XW2Z-100K	414	
MD563	XW2D-40G6-RM		1,5	XW2Z-150K		
(32 Inputs)	XW2B-40G5		2	XW2Z-200K	-	
	XW2B-40G4		3	XW2Z-300K		
			5	XW2Z-500K		
	XW2D-20G6 (2 units)	1:2	1	XW2Z-100N	414	
	XW2B-20G5 (2 units)		1,5	XW2Z-150N		
	XW2B-20G4 (2units)		2	XW2Z-200N		
	XW2B-40G5-T		3	XW2Z-300N		
	XW2C-20G6-IO16		5	XW2Z-500N		
	(2 units)					
	XW2C-20G5-IN16					
	(2 units)					
	XW2E-20G5-IN16 (2 units)					
CJ1W-	XW2D-40G6	1:1	1	XW2Z-100K	414	
MD563	XW2B-40G5		1,5	XW2Z-150K		
(32 Outputs)	XW2B-40G4		2	XW2Z-200K		
			3	XW2Z-300K		
			5	XW2Z-500K	1	
	XW2D-20G6 (2 units)	1:2	1	XW2Z-100N	414	
	XW2B-20G5 (2 units)		1,5	XW2Z-150N		
	XW2B-20G4 (2units)		2	XW2Z-200N		
	XW2B-40G5-T		3	XW2Z-300N]	
	XW2C-20G6-IO16 (2 units)]	5	XW2Z-500N		

Connecting to CPM2C I/O Units

I/O Unit	Connector-Terminal	Connecting Cable				
model	or I/O Block model	Branch- ing	Length (m)	Model	Page	
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412	
10CDTC-D	0CDTC-D XW2B-20G5		1	XW2Z-100A		
(6 inputs)	XW2B-20G4		1.5	XW2Z-150A		
(4 outputs)			2	XW2Z-200A		
			3	XW2Z-300A		
			5	XW2Z-500A		
	XW2D-20C6	1:1	0.5	XW2Z-050AU		
			1	XW2Z-100AU		
			1.5	XW2Z-150AU		
			2	XW2Z-200AU		
			3	XW2Z-300AU		
			5	XW2Z-500AU		
	G7TC-IA16/ID16	1:1	1	G79-100C	401	
	G7TC-OC16/08		1.5	G79-150C	1	
	G70D-SOC16/VSOC16		2	G79-200C		
	G/UA-20016-3		3	G79-300C	1	
			5	G79-500C	1	

I/O Unit	Connector-Terminal	Connecting Cable					
model	or I/O Block model	Branch- ing	Length (m)	Model	Page		
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412		
10C1DTC-D	XW2B-20G5		1	XW2Z-100A			
(6 inputs)	XW2B-20G4		1.5	XW2Z-150A			
(4 outputs)			2	XW2Z-200A			
			3	XW2Z-300A			
			5	XW2Z-500A			
	XW2D-20C6	1:1	0.5	XW2Z-050AU	-		
			1	XW2Z-100AU			
			1.5	XW2Z-150AU			
			2	XW2Z-200AU			
			3	XW2Z-300AU			
			5	XW2Z-500AU			
	G7TC-IA16/ID16	1:1	1	G79-100C	401		
	G7TC-OC16/08		1.5	G79-150C			
	G/0D-SOC16/VSOC16		2	G79-200C			
	G70A-20010-3		3	G79-300C	1		
			5	G79-500C			

I/O Unit	Connector-Terminal	ninal Connecting Cable				onnector-Terminal Connecting Ca			
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page				
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412				
10CDT1C-D	XW2B-20G5		1	XW2Z-100A]				
(6 inputs)	XW2B-20G4		1.5	XW2Z-150A					
(4 00(puto)			2	XW2Z-200A					
			3	XW2Z-300A					
			5	XW2Z-500A					
	XW2D-20C6	1:1	0.5	XW2Z-050AU					
			1	XW2Z-100AU					
			1.5	XW2Z-150AU	4				
			2	XW2Z-200AU	-				
			3	XW2Z-300AU	+				
	G7TC 0C16 1	1.1	о 1	AW2Z-500AU	401				
	G/10-0010-1	1.1	15	G79-150C	401				
			2	G79-200C	+				
			2	G79-300C	+				
			5	G79-500C	+				
CPM2C-	XW2D-20G6	1.1	0.5	XW27-050A	412				
10C1DT1C-	XW2B-20G5		1	XW22-100A	-12				
D	XW2B-20G4		1.5	XW27-150A	+				
(6 inputs)			2	XW27-200A	1				
(4 outputs)			3	XW2Z-300A					
			5	XW2Z-500A					
	XW2D-20C6	1:1	0.5	XW2Z-050AU					
			1	XW2Z-100AU	1				
			1.5	XW2Z-150AU	1				
			2	XW2Z-200AU	1				
			3	XW2Z-300AU					
			5	XW2Z-500AU	1				
	G7TC-OC16-1	1:1	1	G79-100C	401				
			1.5	G79-150C	1				
			2	G79-200C	1				
			3	G79-300C	1				
			5	G79-500C	1				
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412				
20CDTC-D	XW2B-20G5		1	XW2Z-100A	t I				
(12 inputs)	XW2B-20G4		1.5	XW2Z-150A	t I				
(8 outputs)			2	XW2Z-200A	T I				
			3	XW2Z-300A	T I				
			5	XW2Z-500A]				
	XW2D-20C6	1:1	0.5	XW2Z-050AU					
			1	XW2Z-100AU					
			1.5	XW2Z-150AU					
			2	XW2Z-200AU					
			3	XW2Z-300AU					
			5	XW2Z-500AU					
	G7TC-IA16/ID16	1:1	1	G79-100C	401				
	G70D-SOC16/08		1.5	G79-150C					
	G70A-ZOC16-3		2	G79-200C					
			3	G79-300C					
0.00400		4.4	5	G79-500C	440				
	XW2D-20G6 XW2B-20G5	1:1	0.5	XW2Z-050A	412				
(12 inputs)	XW2B-20G3 XW2B-20G4		15	XW2Z-100A	-				
(8 outputs)			1.5	XW2Z-150A	4				
			2	XW2Z-200A	+				
			5	XW2Z-300A	+				
	XW2D-20C6	1.1	0.5	XW27-050411					
	XW2D-2000	1.1	1	XW27-100AU	$\left \right $				
			15	XW27-150AU	+				
			2	XW27-2004U	+				
			2	XW27-200AU	$\left \right $				
			5	XW27-500AU	+				
		1.1	1	G79-100C	401				
	G7TC-OC16/08	1.1	15	G79-150C					
	G70D-SOC16/VSOC16		2	G79-200C	+				
	G70A-ZOC16-3		3	G79-300C	+				
			5	G79-500C	+				
L	1		5	G13-3000	1				

I/O Unit	Connector-Terminal	Connector-Terminal Connecting Cab			able	
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page	
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412	
20CDT1C-D	XW2B-20G5		1	XW2Z-100A		
(12 inputs)	XW2B-20G4		1.5	XW2Z-150A		
(8 outputs)			2	XW2Z-200A		
			3	XW2Z-300A		
			5	XW2Z-500A		
	XW2D-20C6	1:1	0.5	XW2Z-050AU		
			1	XW2Z-100AU		
			1.5	XW2Z-150AU		
			2	XW2Z-200AU		
			3	XW2Z-300AU		
			5	XW2Z-500AU		
	G7TC-OC16-1	1:1	1	G79-100C	401	
			1.5	G79-150C		
			2	G79-200C		
			3	G79-300C		
			5	G79-500C		
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412	
20C1DT1C-	XW2B-20G5		1	XW2Z-100A		
D (12 inputs)	XW2B-20G4		1.5	XW2Z-150A		
(8 outputs)			2	XW2Z-200A		
			3	XW2Z-300A		
			5	XW2Z-500A		
	XW2D-20C6	1:1	0.5	XW2Z-050AU		
			1	XW2Z-100AU		
			1.5	XW2Z-150AU		
			2	XW2Z-200AU		
			3	XW2Z-300AU		
			5	XW2Z-500AU		
	G7TC-OC16-1	1:1	1	G79-100C	401	
			1.5	G79-150C		
			2	G79-200C		
			3	G79-300C		
			5	G79-500C		
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412	
8EDC (8 in-	XW2B-20G5		1	XW2Z-100A		
puis)	XW2D-2004		1.5	XW2Z-150A		
			2	XW2Z-200A		
			3	XW2Z-300A		
			5	XW2Z-500A		
	XW2D-20C6	1:1	0.5	XW2Z-050AU		
			1	XW2Z-100AU		
			1.5	XW2Z-150AU		
			2	XW2Z-200AU		
			3	XW2Z-300AU		
			5	XW2Z-500AU		
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412	
16EDC (16 inputs)	XW2B-20G5 XW2B-20G4		1	XW2Z-100A		
(TO Inputs)	XW2D-2004		1.5	XW2Z-150A		
			2	XW2Z-200A		
			3	XW2Z-300A		
			5	XW2Z-500A		
	XW2D-20C6	1:1	0.5	XW2Z-050AU		
			1	XW2Z-100AU		
			1.5	XW2Z-150AU		
			2	XW2Z-200AU		
			3	XW2Z-300AU		
			5	XW2Z-500AU		
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412	
(8 outpute)	XW2B-20G5		1	XW2Z-100A		
(0 0010013)	XW20 2004		1.5	XW2Z-150A		
			2	XW2Z-200A		
			3	XW2Z-300A		
			5	XW2Z-500A		
	XW2D-20C6	1:1	0.5	XW2Z-050AU	l	
			1	XW2Z-100AU		
			1.5	XW2Z-150AU		
			2	XW2Z-200AU		
			3	XW2Z-300AU		
			5	XW2Z-500AU		

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I/O Unit	Connector-Terminal	Connect	ing Cabl	e	
model	or I/O Block model	Branch-	Length (m)	Model	Page
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412
8ET1C	XW2B-20G5		1	XW2Z-100A	
(8 outputs)	XW2B-20G4		1.5	XW2Z-150A	
			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	
			3	XW2Z-300AU	
			5	XW2Z-500AU	
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412
(16 outputs)	XW2B-20G5 XW2B-20G4		1	XW2Z-100A	_
(10 0010013)			1.5	XW2Z-150A	_
			2	XW2Z-200A	_
			3	XW2Z-300A	_
	1/11/0D 0000		5	XW2Z-500A	_
	XW2D-20C6	1:1	0.5	XW2Z-050AU	_
			1	XW2Z-100AU	_
			1.5	XW2Z-150AU	-
			2	XW2Z-200AU	-
			3	XW2Z-300AU	_
CRMAC		1.1	5	XW2Z-500AU	410
16FT1C	XW2D-20G6 XW2B-20G5	1.1	0.5	XW2Z-050A	412
(16 outputs)	XW2B-20G4		1 5	XW2Z-100A	-
,			2	XW2Z-150A	_
			2	XW2Z-200A	-
			5	XW2Z-500A	_
	XW2D-20C6	1:1	0.5	XW2Z-500A	_
	XW2D-2000		1	XW2Z-050A0	_
			15	XW2Z-100AU	-
			2	XW2Z-200AU	-
			2	XW2Z-200AU	-
			5	XW2Z-500AU	-
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412
24EDTC	XW2D-20G6 XW2B-20G5		1	XW2Z-100A	-
(16 inputs)	XW2B-20G4		1.5	XW2Z-150A	-
(8 outputs)			2	XW2Z-200A	-
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	-
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-IA16/ID16	1:1	1	G79-100C	401
	G7TC-OC16/08		1.5	G79-150C	
	G70D-SOC16/VSOC16		2	G79-200C	
	G70A-20016-3		3	G79-300C	
			5	G79-500C	
CPM2C-	XW2D-20G6	1:1	0.5	XW2Z-050A	412
24EDT1C	XW2B-20G5		1	XW2Z-100A	
(16 inputs)	XW2B-20G4		1.5	XW2Z-150A	
(o outputs)			2	XW2Z-200A	
			3	XW2Z-300A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW2Z-050AU	
			1	XW2Z-100AU	
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	1
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-OC16-1	1:1	1	G79-100C	401
			1.5	G79-150C	
		2 2	2	G79-200C	
			3	G79-300C	
	1	1	E	C70 500C	7

Connecting to DeviceNet I/O Terminals

I/O Unit	it Connector-Terminal Connecting Cable				
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page
GT1-ID32ML	XW2D-40G6	1:1	0.5	XW2Z-050B	412
(32 points)	XW2B-40G5		1	XW2Z-100B	
	XW2D-40G4		1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
		1.1	5	XW2Z-500B	410
	XVV2D-40C6	1:1	0.5	XW2Z-050BU	412
			1	XW2Z-100BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
	G7TC-IA16/ID16	1:1	0.25	G79-I25C	
			0.5	G79-I50C	
GT1-	XW2D-40G6	1:1	0.5	XW2Z-050B	412
ID32ML-1	XW2B-40G5		1	XW2Z-100B	
(32 points)	XW2B-40G4		1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	412
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
			5	XW2Z-500BU	
GT1-	XW2D-40G6	1:1	0.5	XW2Z-050B	412
OD32IVIL (32	XW2B-40G5 XW2B-40G4		1	XW2Z-100B	
points)	XW2D 4004		1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
		4.4	5	XW2Z-500B	410
	XVV2D-40C6	1:1	0.5	XW2Z-050BU	412
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			5	XW2Z-500BU	
	G7TC-OC16/08	1.1	0.25	G79-025C	
	G70D-SOC16/VSOC16 G70A-ZOC16-3		0.5	G79-O50C	
GT1-	XW2D-40G6	1:1	0.5	XW2Z-050B	412
OD32ML-1	XW2B-40G5		1	XW2Z-100B	
(32 points)	XW2B-40G4		1.5	XW2Z-150B	
			2	XW2Z-200B	
			3	XW2Z-300B	
			5	XW2Z-500B	
	XW2D-40C6	1:1	0.5	XW2Z-050BU	412
			1	XW2Z-100BU	
			1.5	XW2Z-150BU	
			2	XW2Z-200BU	
			3	XW2Z-300BU	
		1.1	5	XW2Z-500BU	410
(16 points)	XW2D-20G6 XW2B-20G5	1.1	0.5	XW2Z-050A	412
(XW2B-20G4		1	XW2Z-100A	-
			2	XW2Z-150A	
			2	XW2Z-200A	
			5	XW2Z-500A	
	XW2D-20C6	1:1	0.5	XW27-050AU	412
			1	XW27-100AU	1
			1.5	XW2Z-150AU	
			2	XW2Z-200AU	1
			3	XW2Z-300AU	
			5	XW2Z-500AU	
	G7TC-IA16/ID16	1:1	1	G79-100C	401
			1.5	G79-150C	
			2	G79-200C	1
			3	G79-300C	1
			5	G79-500C	1

I/O Unit	Connector-Terminal	Connecting Cable					
model	Conversion Unit or I/O Block model	Branch- ing	Length (m)	Model	Page		
GT1-	XW2D-20G6	1:1	0.5	XW2Z-050A	412		
ID16ML-1	XW2B-20G5		1	XW2Z-100A	-		
(16 points)	XW2B-20G4		1.5	XW2Z-150A			
			2	XW2Z-200A			
			3	XW2Z-300A	-		
			5	XW2Z-500A			
	XW2D-20C6	1:1	0.5	XW2Z-050AU	412		
			1	XW2Z-100AU	-		
			1.5	XW2Z-150AU	-		
			2	XW2Z-200AU			
			3	XW2Z-300AU	-		
			5	XW2Z-500AU			
GT1-	XW2D-20G6	1:1	0.5	XW2Z-050A	412		
OD16ML	XW2B-20G5		1	XW2Z-100A	-		
(16 points)	XW2B-20G4		1.5	XW2Z-150A			
			2	XW2Z-200A	-		
			3	XW2Z-300A			
			5	XW2Z-500A			
	XW2D-20C6	1:1	0.5	XW2Z-050AU	412		
			1	XW2Z-100AU			
			1.5	XW2Z-150AU			
			2	XW2Z-200AU			
			3	XW2Z-300AU			
			5	XW2Z-500AU			
	G7TC-OC16/08	1:1	1	G79-100C	401		
	G70D-SOC16/VSOC16		1.5	G79-150C			
	G70A-ZOC16-3		2	G79-200C			
			3	G79-300C			
			5	G79-500C			
GT1-	XW2D-20G6	1:1	0.5	XW2Z-050A	412		
OD16ML-1	XW2B-20G5		1	XW2Z-100A			
(16 points)	XW2B-20G4		1.5	XW2Z-150A			
			2	XW2Z-200A			
			3	XW2Z-300A			
			5	XW2Z-500A			
	XW2D-20C6	1:1	0.5	XW2Z-050AU	412		
			1	XW2Z-100AU	1		
			1.5	XW2Z-150AU	1		
			2	XW2Z-200AU	-		
			3	XW2Z-300AU			
			5	XW2Z-500AU	1		

Connecting to CompoBus/S I/O Terminals

I/O Unit	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable				
model		Branch- ing	Length (m)	Model	Page	
SRT2-	XW2D-20G6	1:1	0.25	G79-O25C		
VID16ML	XW2B-20G5		0.5	G79-O50C		
(16 points)	XW2B-20G4					
	XW2C-20G6-IO16					
	XW2C-20G5-IN16					
	XW2E-20G5-IN16		0.05	070 1050		
	G71C-IA16/ID16	1:1	0.25	G79-125C		
			0.5	G79-I50C		
SRT2-	XW2D-20G6	1:1	0.25	G79-O25C		
VID16ML-1	XW2B-20G5		0.5	G79-O50C		
(To points)	XW2D-2004					
	XW2C-20G6-1016					
	XW2E-20G5-IN16					
SBT2-	XW2D-20G6	1.1	0.25	G79-025C		
VOD16MI	XW2B-20G5	1.1	0.25	G70 OF0C		
(16 points)	XW2B-20G4		0.5	G79-050C		
(XW2C-20G6-IO16					
	XW2C-20G5-IN16					
	XW2E-20G5-IN16					
	G7TC-OC16/08	1:1	0.25	G79-O25C		
	G70D-SOC16/		0.5	G79-O50C		
	VSOC16					
	G70A-ZOC16-3					
SRT2-	XW2D-20G6	1:1	0.25	G79-O25C		
VOD16ML-1	XW2B-20G5		0.5	G79-O50C		
(16 points)	XW2B-20G4					
	XW2C-20G6-IO16					
	XW2C-20G5-IN16					
	XW2E-20G5-IN16		0.05	070 0050		
	G70A-ZOC16-4	1:1	0.25	G79-025C		
			0.5	G79-O50C		
SRT2-	XW2D-40G6	1:1	0.25	XW2Z-C25K		
ID32ML	XW2B-40G5		0.5	XW2Z-C50K		
(32 points)	XW2B-40G4		1	XW2Z-100K	414	
			1.5	XW2Z-150K		
			2	XW2Z-200K		
			3	XW2Z-300K		
			5	XW2Z-500K		
	G7TC-IA16/ID16	1.2	0.5	G79-I50-25-D1		
			0.0	G70 175 50 D1		
CDTO		4.4	0.75	XW07 C05K		
5H12-	XW2D-40G6 XW2B-40G5	1:1	0.25	XW2Z-C25K		
(32 noints)	XW2B-40G4		0.5	XW2Z-C50K		
	XW2D 4004		1	XW2Z-100K	414	
			1.5	XW2Z-150K		
			2	XW2Z-200K		
			3	XW2Z-300K		
			5	XW2Z-500K		
SRT2-	XW2D-40G6	1:1	0.25	XW2Z-C25K		
OD32ML	XW2B-40G5		0.5	XW27-C50K		
(32 points)	XW2B-40G4		1	XW27-100K	414	
			15	XW2Z-150K		
			1.5	XW2Z-150K		
			2	XW2Z-200K		
			3	XW2Z-300K		
			5	XW2Z-500K		
	G7TC-OC16/08	1:2	0.5	G79-O50-25-D1		
	G70D-SOC16/	1	0.75	G79-O75-50-D1		
		1				
0070	G/UA-ZUC16-3		0.07	1007 00511		
SRI2-	XW2D-40G6	1:1	0.25	XW2Z-C25K		
OD32ML-1	XW2B-40G5		0.5	XW2Z-C50K		
(32 points)	AW2B-40G4	1	1	XW2Z-100K	414	
		1	1.5	XW2Z-150K]	
		1	2	XW2Z-200K	1	
		1	3	XW2Z-300K	1	
		1	5	XW27-500K	1	
	G704-70016 4	1.2	0.5	G79_M50_25 D1		
	GI 07-20010-4	1.4	0.5	G70 M75 50 D1		
	1	1	0.75	G/9-W/2-20-D1	I I	

I/O Unit model	Connector-Terminal Conversion Unit or I/O Block model	Connecting Cable			
		Branch- ing	Length (m)	Model	Page
SRT2- MD32ML (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	
			0.5	XW2Z-C50K	
			1	XW2Z-100K	414
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G7TC-IA16/ID16 G7TC-OC16/08 G70D-SOC16/ VSOC16 G70A-ZOC16-3	1:2	0.5	G79-M50-25-D1	
			0.75	G79-M75-50-D1	
SRT2- MD32ML-1 (32 points)	XW2D-40G6 XW2B-40G5 XW2B-40G4	1:1	0.25	XW2Z-C25K	
			0.5	XW2Z-C50K	
			1	XW2Z-100K	414
			1.5	XW2Z-150K	
			2	XW2Z-200K	
			3	XW2Z-300K	
			5	XW2Z-500K	
	G70A-ZOC16-4	1:2	0.5	G79-M50-25-D1	
			0 75	G79-M75-50-D1	

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

Cat. No. P10E-EN-03A

In the interest of product improvement, specifications are subject to change without notice.