

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-CPU66H	2,560 bits (Up to 3 Expansion Racks)	120 kSteps	256 kWords (DM: 32 kWords, EM: 32 kWords x 7 banks)	0.02 μs	Peripheral port and RS-232C port	Memory Cards	---
CJ1H-CPU65H	1,280 bits (Up to 3 Expansion Racks)	60 kSteps	128 kWords (DM: 32 kWords, EM: 32 kWords x 3 banks)	0.04 μs			
CJ1G-CPU45H		30 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords x 1 bank)				
CJ1G-CPU44H	960 bits (Up to 2 Expansion Racks)	20 kSteps	32 kWords (DM: 32 kWords, EM: None)	0.10 μs			
CJ1G-CPU43H	2 Expansion Racks	10 kSteps					
CJ1M-CPU13	640 bits (Only 1 Expansion Rack)	20 kSteps					
CJ1M-CPU12	320 bits (No Expansion Rack)	10 kSteps					
CJ1M-CPU11	160 bits (No Expansion Rack)	5 kSteps					
CJ1M-CPU23	640 bits (Only 1 Expansion Rack)	20 kSteps					
CJ1M-CPU22	320 bits (No Expansion Rack)	10 kSteps					
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 CJ1M-CPU□□: 0.5 ms CJ1M-CPU□1: 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 task: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.

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.
The CJ1M-CPU11/12/21/22 do not support Expansion Racks and support a total maximum of 10 Units.

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) 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.
	Built-in I/O Area	10 points, Inputs: CIO 296000 to CIO 296009, Outputs: CIO 296100 to CIO 296105 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 Area	6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899) CPU Bus Unit bits store the operating status of 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 Special I/O Units. (10 words per Unit, 96 Units max.)
	Serial PLC Link Area	90 words, CIO 3100 to CIO 3189 (bits CIO 310000 to CIO 318915) Used for data links in serial PLC links, CJ1M only
	DeviceNet Area / PROFIBUS-DP Area	9,600 (600 words): CIO 320000 to CIO 379915 (words CIO3200 to CIO 3799) DeviceNet bits are allocated to Slaves for DeviceNet Unit remote I/O communications when the master function is used with fixed allocations. Fixed allocation setting 1Outputs:CIO 3200 to CIO 3263 Inputs:CIO 3300 to CIO 3363 Fixed allocation setting 2Outputs:CIO 3400 to CIO 3463 Inputs:CIO 3500 to CIO 3563 Fixed allocation setting 3Outputs:CIO 3600 to CIO 3663 Inputs:CIO 3700 to CIO 3763 The following words are allocated to the master function even when the DeviceNet Unit is used as a slave. Fixed allocation setting 1Outputs:CIO 3370 (master to slave) Inputs:CIO 3270 (slave to master) Fixed allocation setting 2Outputs:CIO 3570 (master to slave) Inputs:CIO 3470 (slave to master) Fixed allocation setting 3Outputs:CIO 3770 (master to slave) Inputs:CIO 3670 (slave to master)
	Internal I/O Area (work bits)	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 bits in CIO Area are used as work bits in programming to control program execution. They cannot be used for external 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) 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.	
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 for Special I/O Units. CPU Bus Unit DM Area: D30000 to D31599 (100 words × 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. 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)	
Index Registers	IR0 to IR15. Store PLC memory addresses for indirect addressing. Index registers can be used independently in each task. One register is 32 bits (2 words). 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 cyclic task is executable and OFF when corresponding task is not executable or in standby status.	
Trace Memory	4,000 words (trace data: 31 bits, 6 words)	
File Memory	Memory Cards: OMRON Memory Cards with 15-MB, 30-MB, or 64-MB capacities can be used. (MS-DOS format). EM file memory: Part of EM Area can be converted to file memory (MS-DOS format).	

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. During I/O refresh period or when CPU BUS UNIT I/O REFRESH (DLNK) instruction is executed.	
I/O memory holding when changing operating modes	Depends on ON/OFF status of IOM Hold Bit in Auxiliary Area.	
Load OFF	All outputs on Output Units can be turned OFF when the CPU Unit is RUN, MONITOR, or PROGRAM mode.	
Input time constant setting	Time constants can be set for inputs from CJ-series 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.	
Operating mode setting at power-up	Possible (By default, the CPU Unit will start in RUN mode if a Programming Console is not connected.)	
Built-in flash memory (CJ1G/H-CPU□□H)	User program and parameter areas (e.g., PC Setup) are automatically backed up and restored.	
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 overwritten when CPU Unit is in PROGRAM or MONITOR mode. This function is not available for block programming areas. With the CX-Programmer, more than one program block can be edited at the same time.	
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-fatal errors) The FPD(269) instruction can be used to check execution time and logic of each programming block. Error status can be simulated with the FAL and FALS instructions.	
Error log	Up to 20 errors are stored in error log. Information includes error code, error details, and time error occurred. The system can be set so that user-defined FAL errors are not stored in the error log.	
Serial communications	Built-in peripheral port: Programming Device (e.g., CX-Programmer or Programming Console), Host Links, NT Links Built-in RS-232C port: Programming Device (e.g., CX-Programmer), Host Links, no-protocol communications, NT Links, Serial PLC Links (CJ1M only) Serial Communications Unit (sold separately): Protocol macros, Host Links, NT Links	
Clock	Provided on all models. Accuracy: ± 1.5 min/mo. at 25°C (accuracy varies with the temperature) 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, user program, Data Memory, Extended Data Memory, and status of counter Completion Flags and present values. Note: If IOM Hold Bit in Auxiliary Area is turned ON, and PLC Setup is set to maintain IOM Hold Bit status when power to PLC is turned ON, contents of CIO Area, Work Area, part of Auxiliary Area, timer Completion Flag and PVs, Index Registers, and Data Registers will be saved for up to 20 days.	
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.	
Three-level communications	Host Link communications can be used for remote programming and remote monitoring from devices on networks up to two 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 or EM file memory.	
Program check	Program checks are performed for items such as no END instruction and instruction errors. CX-Programmer can also be used to check programs.	
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 operating temperature; 0.75 years min. for CJ1H/G, 1.5 years min. for CJ1M) (Use a replacement battery that is within 2 years of its manufacturing data.)	
Self-diagnostics	CPU errors (watchdog timer), I/O bus errors, memory errors, and battery errors	
Other functions	Storage of number of times power has been interrupted. (Stored in A514.)	

General Specifications

Item	Specifications
Power Supply Unit	CJ1W-PA205R CJ1W-PA202 CJ1W-PD025
Supply voltage	100 to 240 V AC (wide-range), 50/60 Hz 24 V DC
Operating voltage and frequency ranges	85 to 264 V AC, 47 to 63 Hz 19.2 to 28.8 V DC
Power consumption	100 VA max. 50 VA max. 50 W max.

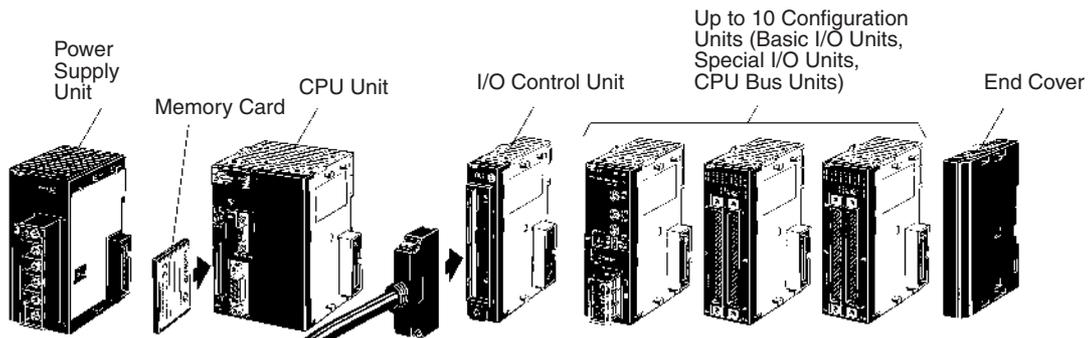
Item	Specifications		
Inrush current (See note 1.)	At 100 to 120 V AC: 15 A/8 ms max. for cold start at room temperature At 200 to 240 V AC: 30 A/8 ms max. for cold start at room temperature	At 100 to 120 V AC: 20 A/8 ms max. for cold start at room temperature At 200 to 240 V AC: 40 A/8 ms max. for cold start at room temperature	At 24 V DC: 30 A/20 ms max. for cold start
Output capacity	5.0 A, 5 V DC (including supply to CPU Unit)	2.8 A, 5 V DC (including supply to CPU Unit)	5.0 A, 5 V DC (including supply to CPU Unit)
	0.8 A, 24 V DC Total: 25 W max.	0.4 A, 24 V DC Total: 14 W max.	0.8 A, 24 V DC Total: 25 W max.
RUN output (See note 2.)	Contact configuration: SPST-NO 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)	Not provided	
Insulation resistance	20 M Ω min. (at 500 V DC) between AC external and GR terminals (See note 3.)		20 M Ω min. (at 500 V DC) between DC external and GR terminals (See note 3.)
Dielectric strength	2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals (See note 3.) Leakage current: 10 mA max.		
	1,000 V AC 50/60 Hz for 1 min between AC external and GR terminals (See note 3.) 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 Ω		
Enclosure	Mounted in a panel.		
Weight	All models are each 5 kg max.		
CPU Rack dimensions	90.7 to 466.7 x 90 x 65 (W x H x D) (not including cables)		
Safety measures	Conforms to cULus and EC Directives.		

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 values. When selecting fuses or breakers for external circuits, allow sufficient margin in shut-off performance.

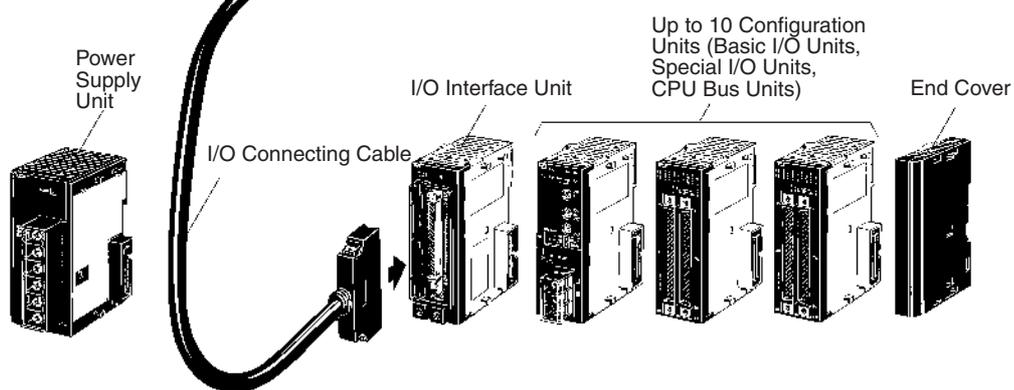
2. Supported only when mounted to CPU Rack.
3. Disconnect the Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength. Testing the insulation and dielectric strength with the LG terminal and the GR terminals connected will damage internal circuits in the CPU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

Basic System Configuration

CPU Rack



Expansion Rack



CJ-series CPU Rack

A CJ-series CPU Rack consists of a CPU Unit, Power Supply Unit, Basic I/O Units, Special I/O Units, CPU Bus Units, and an End Cover. I/O Control Units are required to connect CJ-series Expansion Racks. Memory Cards are optional.

CJ-series Expansion Racks

CJ-series Expansion Racks can be connected to CJ-series CPU Racks or other CJ-series Expansion Racks.

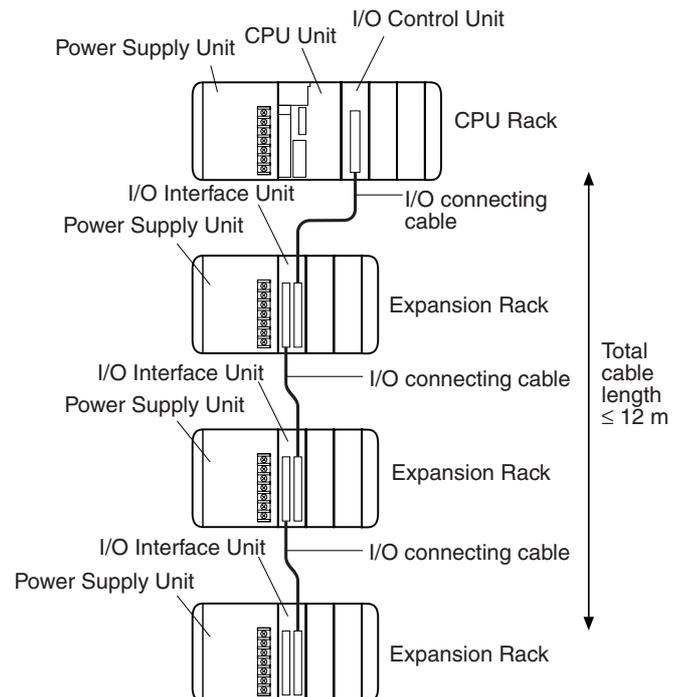
A CJ-series Expansion Rack consists of a Power Supply Unit, an I/O Interface Unit, Basic I/O Units, Special I/O Units, CPU Bus Units, and an End Cover.

Note: Connection of CS-series Expansion Racks is not supported.

Number of Expansion Racks

CPU Unit	No. of Expansion Racks	Max. No. of Units
CJ1H-CPU66H	3	40
CJ1H-CPU65H		
CJ1G-CPU45H		
CJ1G-CPU44H	2	30
CJ1G-CPU43H		
CJ1G-CPU42H	1	20
CJ1M-CPU13		
CJ1M-CPU23	Cannot be connected.	10
CJ1M-CPU11		
CJ1M-CPU12		
CJ1M-CPU21		
CJ1M-CPU22		

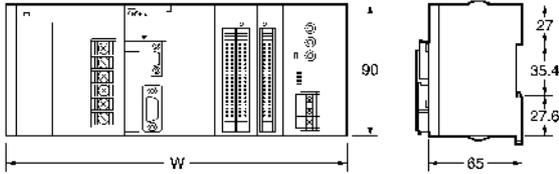
Note:



Dimensions

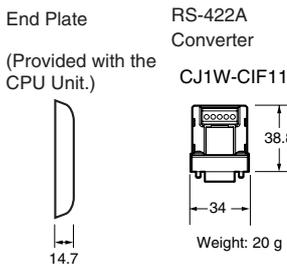
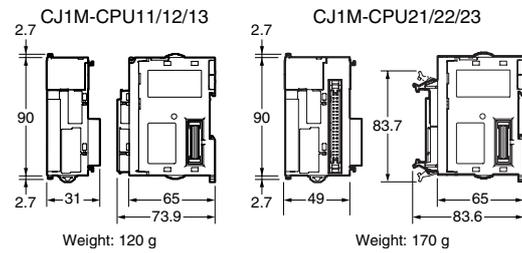
Note: Units are in mm unless specified otherwise.

Product Dimensions



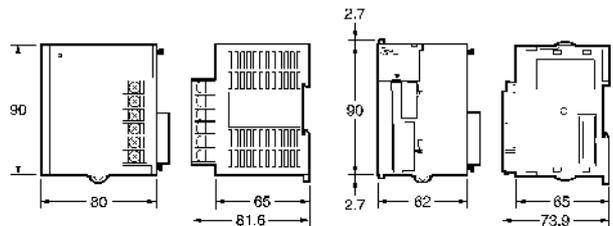
Unit/product	Model number	Width
Power Supply Unit	CJ1W-PA205R	80
	CJ1W-PA202	45
	CJ1W-PD025	60
CPU Unit	CJ1M-CPU11/12/13	31
	CJ1M-CPU21/22/23	49
	CJ1H-CPU□□□□	62
	CJ1G-CPU□□□□	62
End Cover	CJ1W-TER01	14.7

CPU Unit



Width W (mm) When Used with a CJ1W-PA202 Power Supply Unit (AC, 14 W)

Number of I/O Units with 31-mm width	CJ1M-CPU11/12/13	CJ1M-CPU21/22/23
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

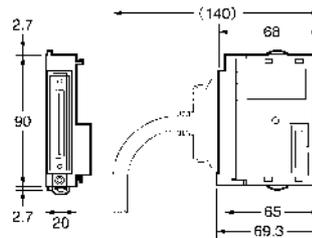


CJ-series Units other than CPU Units and Power Supply Units have a width of either 20 mm or 31 mm, as shown in the tables below.

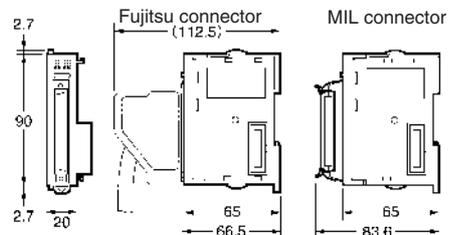
Units of Width 20 mm

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	20
B7A Interface Units	CJ1W-B7A22	
	CJ1W-B7A14 CJ1W-B7A04	

I/O Control Unit



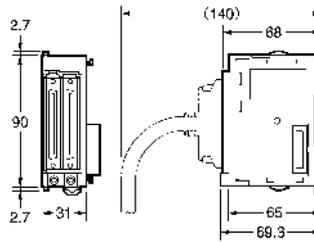
32-point I/O Unit



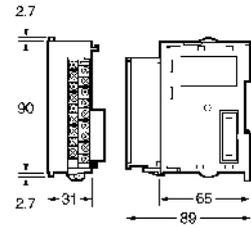
Units of Width 31 mm

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	
CJ1W-OA201		
32-point Basic I/O Units	CJ1W-MD231/232/233	
64-point Basic I/O Units	CJ1W-ID261/262	
	CJ1W-OD261/262/263	
	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	
Temperature Control Units	CJ1W-TC□□□□	
Position Control Units	CJ1W-NC113/133	
	CJ1W-NC213/233	
	CJ1W-NC413/433	
High-speed Counter Unit	CJ1W-CT021	
Controller Link Unit	CJ1W-CLK21	
Serial Communications Unit	CJ1W-SCU41	
Ethernet Unit	CJ1W-ETN11/21	
DeviceNet Unit	CJ1W-DRM21	
PROFIBUS-DP Units	CJ1W-PRM21	
	CJ1W-PRT21	
RFID Sensor Units	CJ1W-V600C11	
	CJ1W-V600C12	

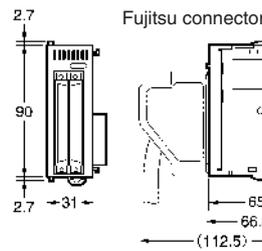
I/O Interface Unit



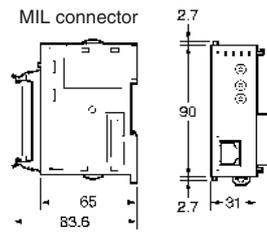
8/16-point Basic I/O Unit and Interrupt Input Unit



64-point Basic I/O Unit



Special I/O Unit /CPU Bus Unit



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

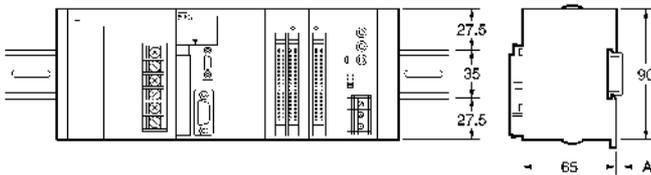
$$W = 80 \text{ (Power Supply Unit)} + 62 \text{ (CPU Unit)} + 20 \times n + 31 \times m + 14.7 \text{ (End Cover) (mm)}$$

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:

$$W = 156.7 + 20 \times 2 + 31 \times 8 = 444.7 \text{ mm}$$

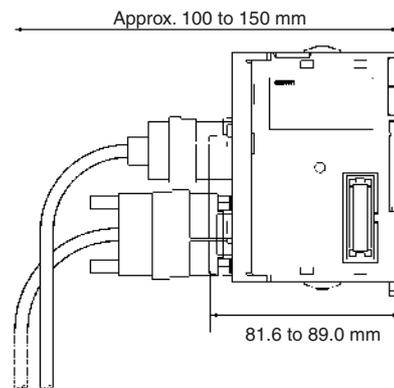
Mounting Dimensions



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

Mounting Depth

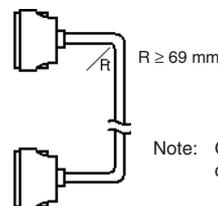
The mounting depth of CJ-series CPU Racks and Expansion Racks is from 81.6 to 89.0 mm depending on the Units that are mounted. Additional depth is required to connect Programming Devices (e.g., CX-Programmer or Programming Console) and Cables. Be sure to allow sufficient mounting depth.



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



Note: Outer diameter of cable: 8.6 mm.

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 consumption			(C) Maximum total power consumption
	(A) 5-V group	(B) 24-V group relay driver power supply	24-V group service power supply	
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

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

$A \times 5 \text{ V DC} + B \times 24 \text{ V DC} + C \times 24 \text{ V DC} \leq$ 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		$0.910+0.020+0.080 \times 2+0.090 \times 2+0.090 \times 2+0.120+0.350$	0.048 Ax2
	Result		1.92 A (≤5.0 A)	0.096 A (≤0.8 A)
Power consumption	Calculation		$1.92 \times 5 \text{ V} = 9.60 \text{ W}$	$0.096 \text{ Ax} 24 \text{ V} = 2.304 \text{ W}$
	Result		$9.60+2.304=11.904 \text{ W} (\leq 25 \text{ W})$	

Current Consumption Tables

CPU Units and Expansion Units

Name	Model	Current consumption at 5 V (A)
CPU Units (These values include current consumption for a Programming Console or CX-Programmer.)	CJ1H-CPU66H/65H	0.99 (See note.)
	CJ1G-CPU45H/44H/43H/42H	0.91 (See note.)
	CJ1M-CPU11/12/13	0.58 (See note.)
	CJ1M-CPU21/22/23	0.64 (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 Input Units	DC Input Units	CJ1W-ID201	0.08	---		
		CJ1W-ID211	0.08			
		CJ1W-ID231	0.09			
		CJ1W-ID232	0.09			
		CJ1W-ID261	0.09			
		CJ1W-ID262	0.09			
	AC Input Units	CJ1W-IA111	0.09			
	CJ1W-IA201	0.08				
Basic Output Units	Transistor Output Units	CJ1W-OD201	0.09	---		
		CJ1W-OD202	0.11			
		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 Output Unit	CJ1W-OA201	0.22		---	
	Basic I/O Units	DC Input/Transistor Output Units	CJ1W-MD231		0.13	---
			CJ1W-MD233		0.13	
CJ1W-MD234			0.13			
CJ1W-MD261			0.14			
CJ1W-MD263			0.14			
TTL I/O Unit	CJ1W-MD563	0.19				
Interrupt Input Unit	CJ1W-INT01	0.08				
High-speed Input Unit	CJ1W-IDP01	0.08				
B7A Interface Units	CJ1W-B7A	CJ1W-B7A22	0.07	---		
		CJ1W-B7A14	0.07			
		CJ1W-B7A04	0.07			

CJ-series Special I/O Units

Name	Model	Current consumption at 5 V (A)	Current consumption at 24 V (A)	
Analog Input Units	CJ1W-AD081-V1	0.42	---	
	CJ1W-AD041-V1	0.42		
Analog Output Units	CJ1W-DA041	0.12		
	CJ1W-DA021	0.12		
	CJ1W-DA08V/08C	0.14		
Analog I/O Unit	CJ1W-MAD42	0.58		
Temperature Control Units	CJ1W-TC□□□□	0.25		
Position Control Units	CJ1W-NC113/133	0.25		---
	CJ1W-NC213/233			
	CJ1W-NC413/433	0.36		
High-speed Counter Unit	CJ1W-CT021	0.28		
ID Sensor Units	CJ1W-V600C11	0.26	0.12	
	CJ1W-V600C12	0.32	0.24	
PROFIBUS-DP Slave Unit	CJ1W-PRM21	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.)
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.

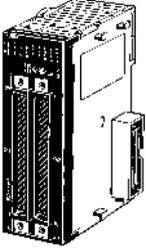
I/O Allocations

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

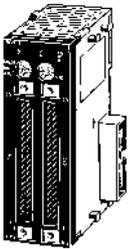


Allocations

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.

Special I/O Units



Special I/O Units

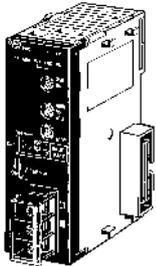


Allocations

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.

CJ1 CPU Bus Units



CJ1 CPU Bus Units



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

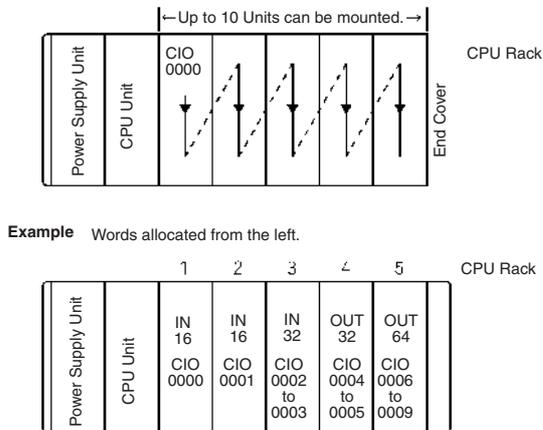
Allocated words in the CIO Area: CIO 0000 to CIO 0079

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

Allocation Methods

1. CPU Rack

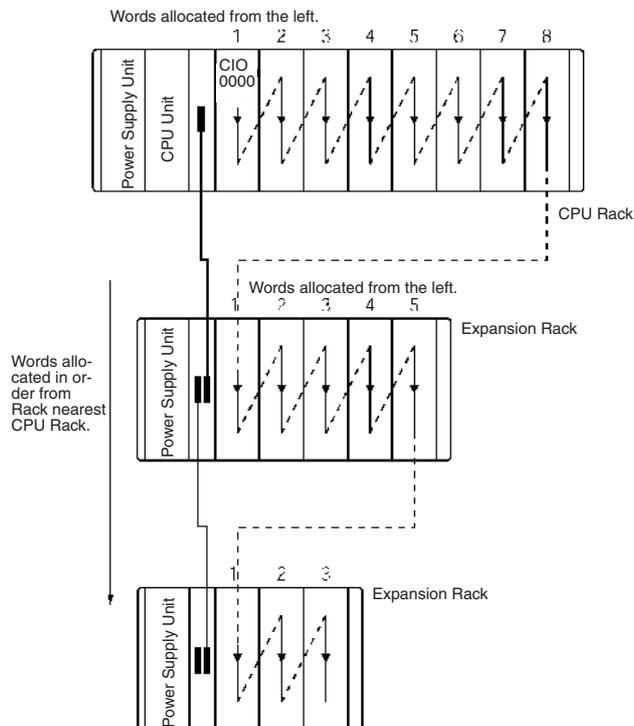
Basic I/O Units on the CPU Rack are allocated words left to right (i.e., from the Unit nearest the CPU Unit) starting from CIO 0000. Units are allocated as many words as required in word units. Words can be reserved using the CX-Programmer.



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 I/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
⋮	⋮
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.

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.

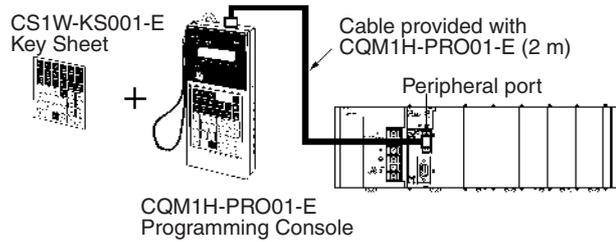
Each Unit is allocated 25 words in the CPU Bus Unit Area according to its unit number, as shown in the following table.

Unit number	Words allocated
0	CIO 1500 to CIO 1524
1	CIO 1525 to CIO 1549
2	CIO 1550 to CIO 1574
⋮	⋮
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

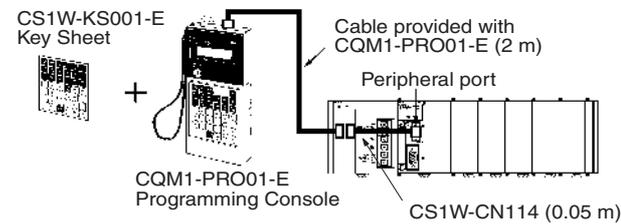
CQM1H-PRO01-E



Model	Cable	Cable length
CQM1H-PRO01-E	Not required.	---

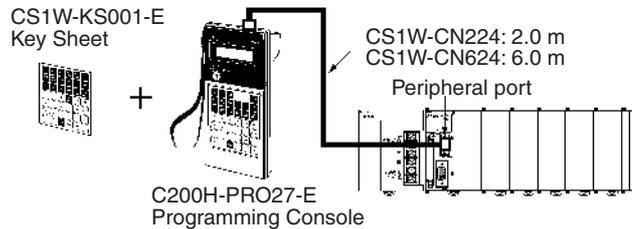
CQM1-PRO01-E

(Including cases where C200H-PRO027 is connected to the C200H-CN222 Cable.)



Model	Cable	Cable length
CQM1-PRO01-E	CS1W-CN114	0.05 m

C200H-PRO27-E



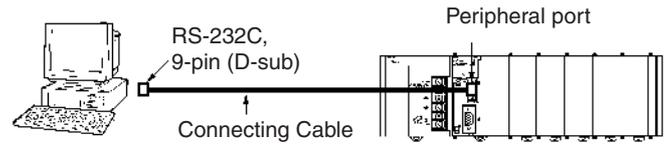
Model	Cable	Cable length
C200H-PRO27-E	CS1W-CN224	2.0 m
	CS1W-CN624	6.0 m

Windows-based Programming Software: CX-Programmer

Name	Model	Specifications
CX-Programmer	WS02-CXPC1-EV** (See note.)	OS: Windows 95/98 or Windows NT/Me/2000

Note: Only version 2.04 and later versions can be connected to CJ-series PLCs.

Connecting to the Peripheral Port

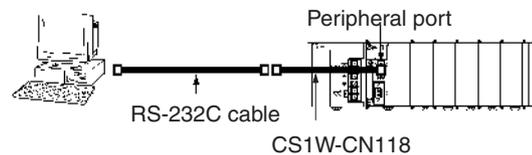


Peripheral Port Connecting Cables

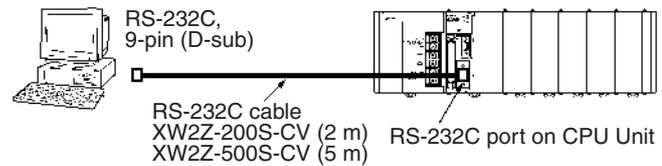
Cable	Length	Computer connector
CS1W-CN226	2.0 m	D-sub, 9-pin, male
CS1W-CN626	6.0 m	D-sub, 9-pin, male

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
	XW2Z-200S-V or XW2Z-500S-V		



Connecting to the RS-232C Port



RS-232C Port Connecting Cables

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

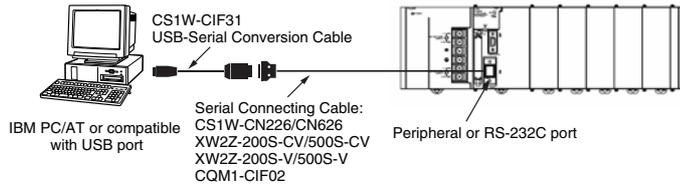
Note: Cables with model numbers ending in "CV" are anti-static. The following cables can be used for an RS-232C connection from the computer to an RS-232C port. (Unlike "CV" models, however, they do not support Peripheral Bus and do not use anti-static connectors.)

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-Programmer connections. Only 1:1 connections are possible. The baud rate is automatically 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



Applicable Software

CX-Programmer, CX-Simulator, CX-Protocol, CX-Motion, CX-Positioner, CS-Process, DeviceNet Configurator, PLC Reporter 32, NS-Designer, 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

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 consumption		35 mA
Operating environment	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

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

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

CJ1 Unit Descriptions

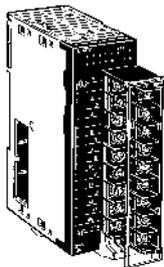
Table of Units

Unit		Classification	Model	Page
I/O Units	Input Units	Basic I/O Unit	CJ1W-ID□□□□/IA□□□□	195
	Output Units		CJ1W-OD□□□□/OC□□□□/OA□□□□	195/ 196
	I/O Units		CJ1W-MD□□□□	196
Interrupt Input Unit		Basic I/O Unit	CJ1W-INT01	207
High-speed Input Units		Basic I/O Unit	CJ1W-IDP01	208
B7A Interface Units		Basic I/O Unit	CJ1W-B7A□□	209
Analog I/O Units	Input Units	Special I/O Unit	CJ1W-AD□□□□	211
	Output Units		CJ1W-DA□□□□	212
	I/O Unit		CJ1W-MAD42	214
Temperature Control Units		Special I/O Unit	CJ1W-TC□□□□	216
Position Control Units		Special I/O Unit	CJ1W-NC□□□□	217
High-speed Counter Unit		Special I/O Unit	CJ1W-CT021	218
ID Sensor Units		Special I/O Unit	CJ1W-V600C1□	220
Serial Communications Units		CPU Bus Unit	CJ1W-SCU□1	223
RS-232C/RS-422A Adapter Units		---	NT-AL001	225
Communications Networks				226
Ethernet Units		CPU Bus Unit	CJ1W-ETN11/21	227
Controller Link Boards/ Units	Controller Link Units	CPU Bus Unit	CJ1W-CLK21-V1	228
	Controller Link Boards	Personal computer board (for PCI bus)	3G8F7-CLK21-E	
DeviceNet Units	DeviceNet Units	CPU Bus Unit	CJ1W-DRM21	229
PROFIBUS-DP Units	PROFIBUS-DP Master	CPU Bus Unit	CJ1W-PRM21	231
	PROFIBUS-DP Slave	Special I/O Unit	CJ1W-PRT21	232
CompoBus/S Units	Master Unit	Special I/O Unit	CJ1W-SRM21	233

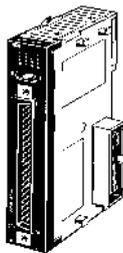
CJ1W-ID/IA/OC/OD/OA/MD

Basic I/O Units

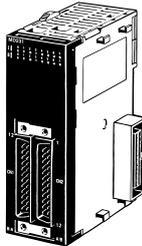
I/O Units



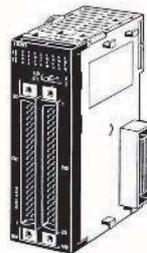
Input Unit (8/16 points)
CJ1W-ID201/211
CJ1W-IA□□□□
Output Units (8/16 points)
CJ1W-OD20□/21□
CJ1W-OA201



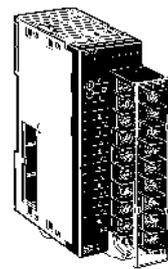
Input Units (32 points)
CJ1W-ID23□
Output Units (32 points)
CJ1W-OD23□



I/O Units (32 points)
CJ1W-MD23□



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	Removeable terminal block	CJ1W-ID201
	16 pts	24 V DC, 7 mA	Removeable terminal block	CJ1W-ID211
	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)	Removeable 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	Removeable terminal block	CJ1W-OC201
	16 pts			CJ1W-OC211

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	Removeable terminal block	CJ1W-OD201	
		24 V DC, 2 A/pt, 8 A/Unit, sourcing, load short protection, disconnection detection, alarm		CJ1W-OD202	
		12 to 24 V DC, 0.5 A/pt, 4 A/Unit, sinking		Removeable terminal block	CJ1W-OD203
		24 V DC, 0.5 A/pt, 4 A/Unit, sourcing, load short protection, disconnection detection, alarm		Removeable terminal block	CJ1W-OD204
	16 pts	12 to 24 V DC, 0.5 A/pt, 5 A/Unit sinking	Removeable terminal block	CJ1W-OD211	
		24 V DC, 0.5 A/pt, 5 A/Unit, sourcing, load short protection, alarm		CJ1W-OD212	
	32 pts	12 to 24 V DC, 0.5 A/pt, 4 A/Unit, sinking	Fujitsu-compatible connector	CJ1W-OD231	
		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		MIL connector	CJ1W-OD233
	64 pts	12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sinking	Fujitsu-compatible connector	CJ1W-OD261	
		12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sinking		MIL connector	CJ1W-OD263
		12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sourcing		MIL connector	CJ1W-OD262

Triac Output Units

Classification	Outputs	Maximum switching capacity	Connections	Model
Basic I/O Unit	8 pts	250 V AC, 0.6 A/pt. 2.4 A/Unit, 50/60 Hz	Removeable terminal block	CJ1W-OA201

DC Input/Transistor Output Units

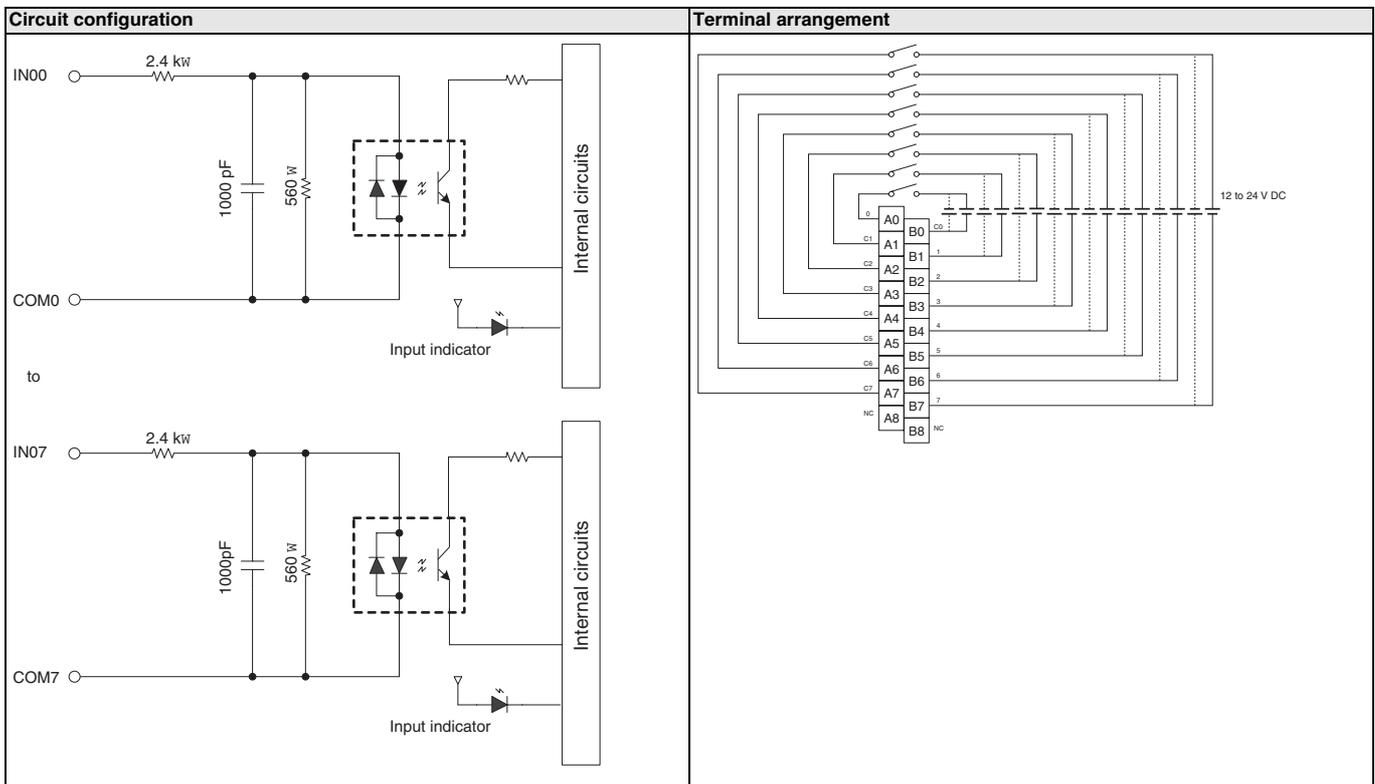
Classification	Inputs/Outputs	Input voltage	Input current (typical)	Max. output switching capacity	Connections	Model
Basic I/O Unit	16 inputs/ 16 outputs	24 V DC	7 mA	12 to 24 V DC, 0.5 A/pt. 2.0 A/Unit, sinking outputs	Fujitsu-compatible connector	CJ1W-MD231
				MIL connector	CJ1W-MD233	
	32 inputs/ 32 outputs		4.1 mA	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
				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

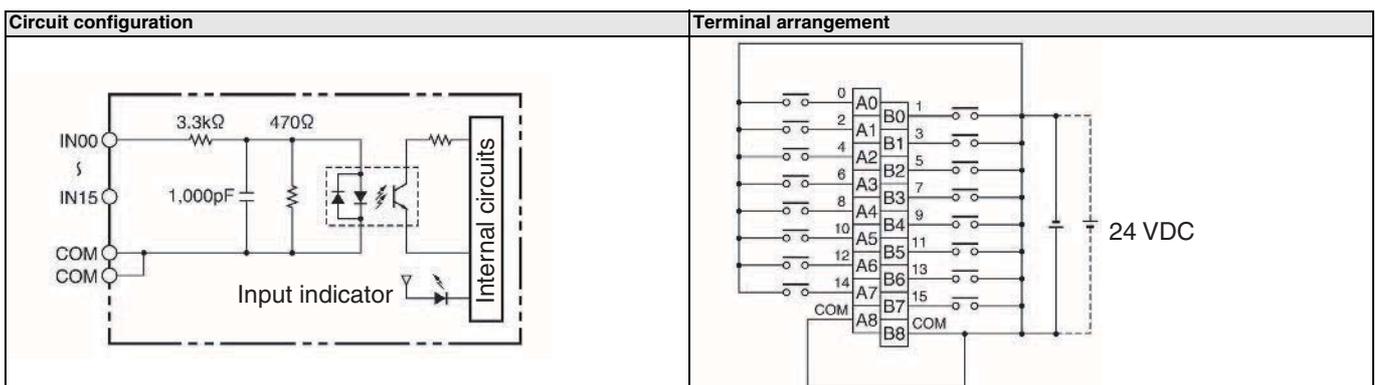
Classification	Inputs/Outputs	Input voltage	Input current (typical)	Max. output switching capacity	Connections	Model
Basic I/O Unit	32 inputs/ 32 outputs	5 V DC	3.5 mA	5 V DC, 35 mA/pt. 1.12 A/Unit	MIL connector	CJ1W-MD563

Circuit Configuration and Terminal Arrangement

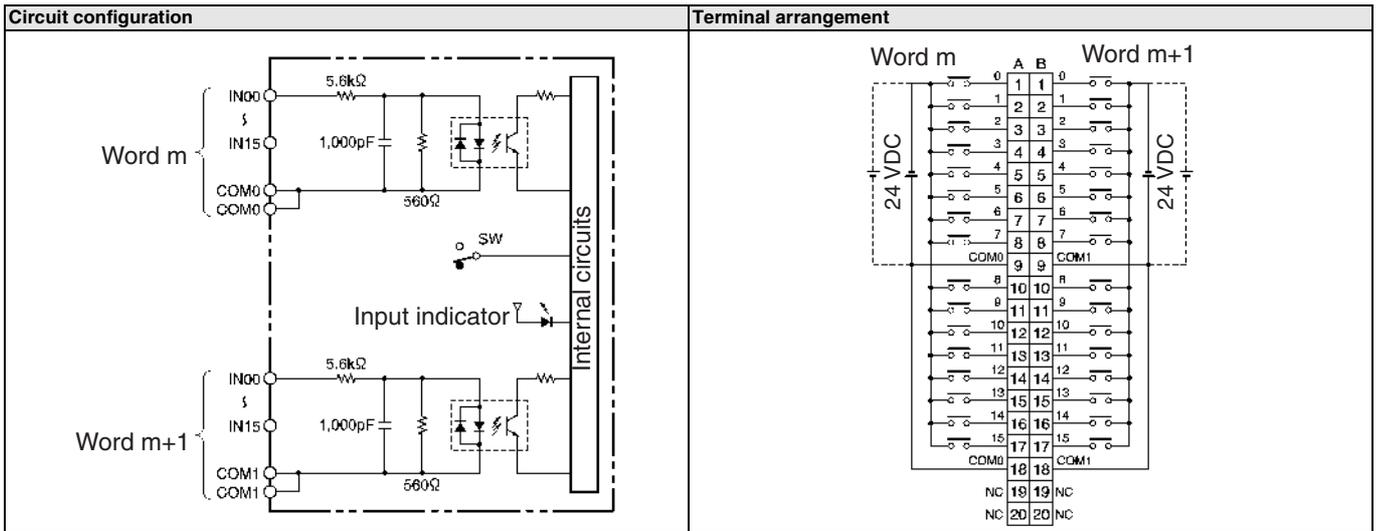
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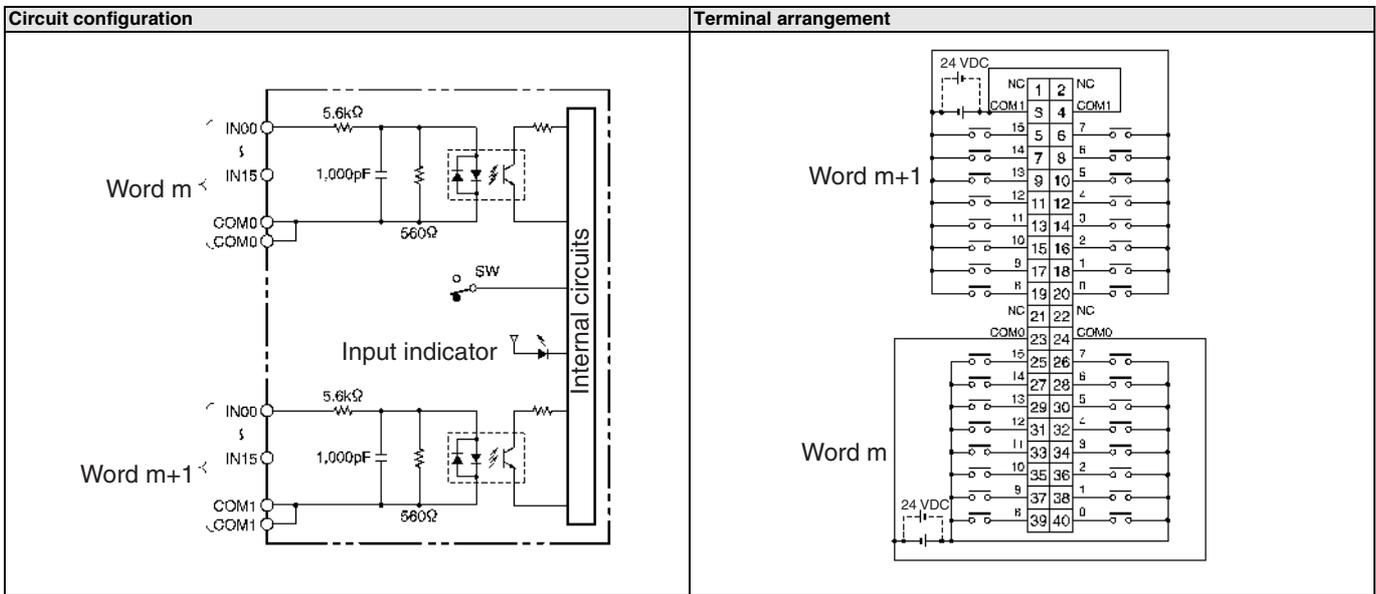
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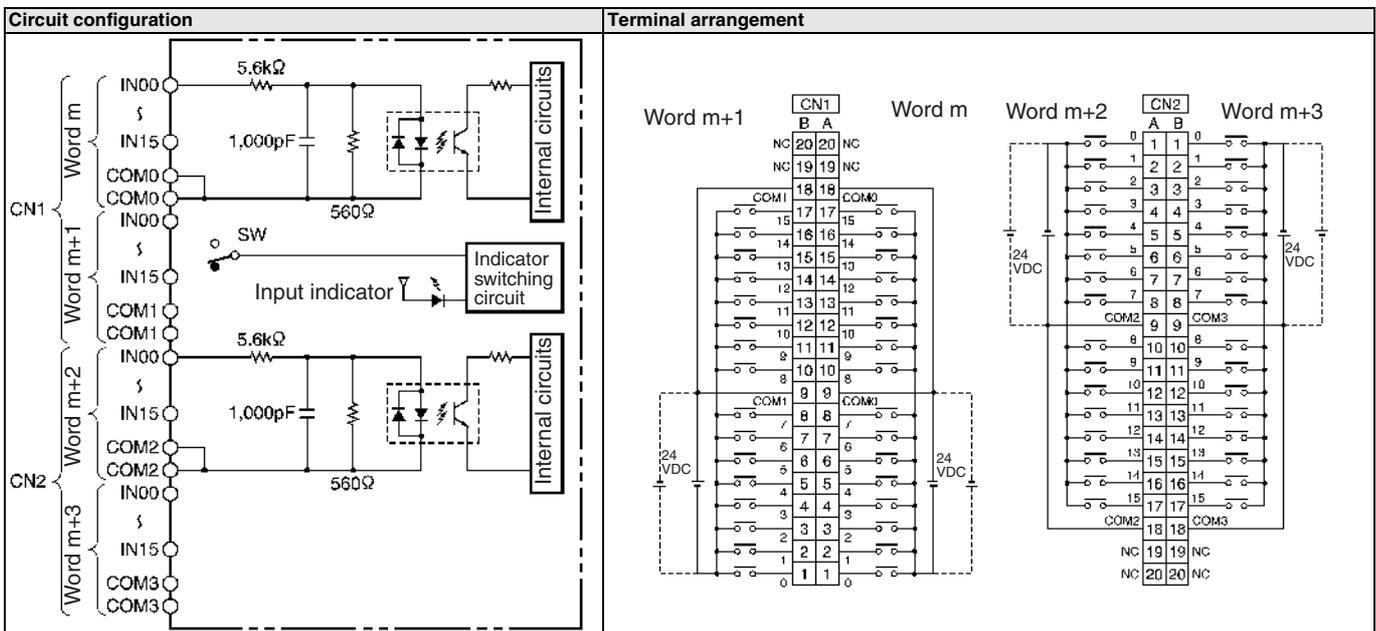
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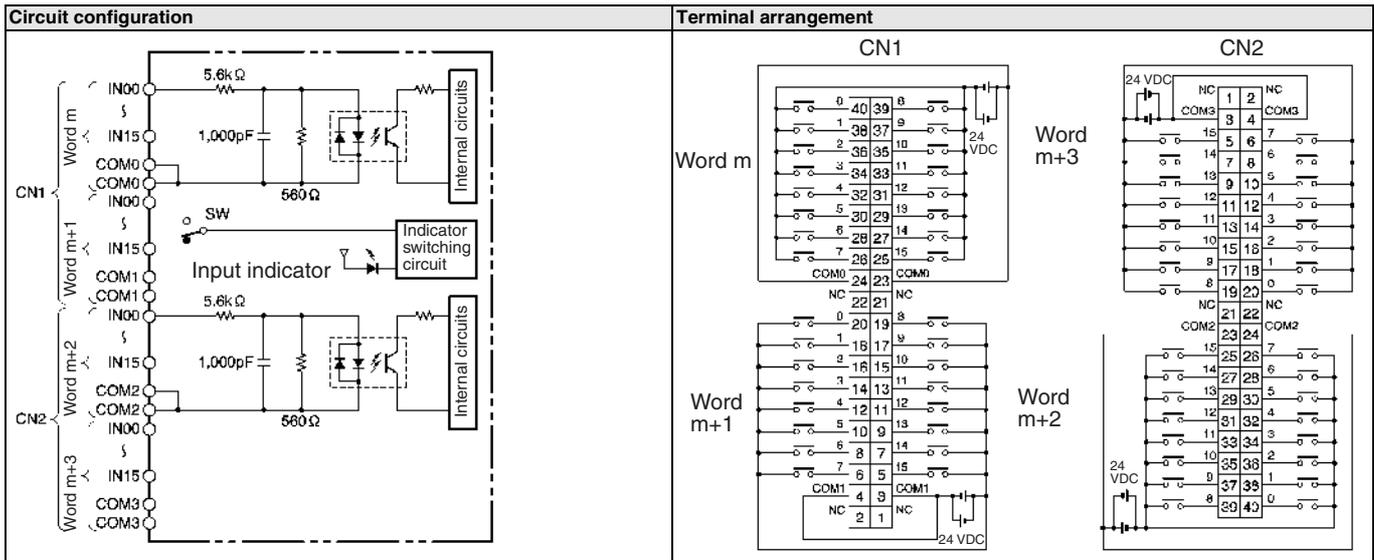
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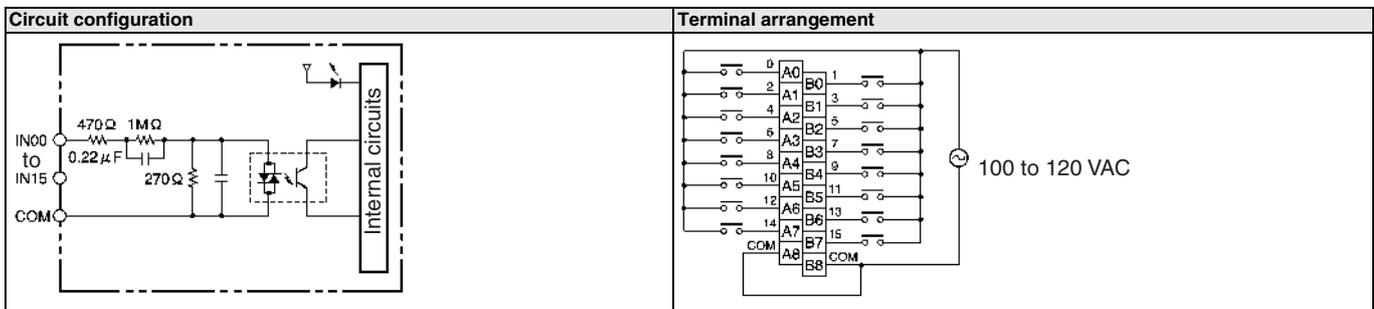
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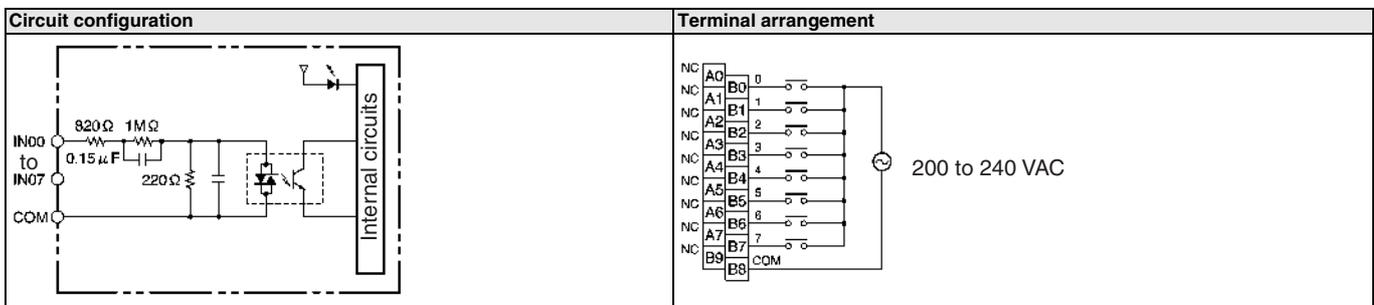
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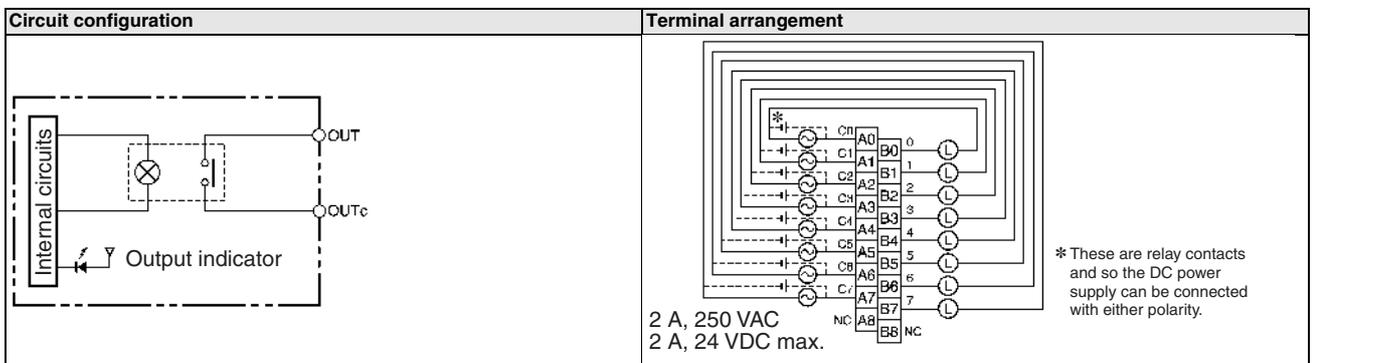
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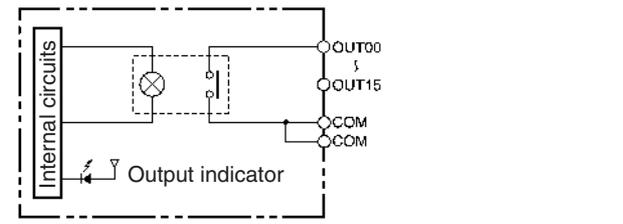
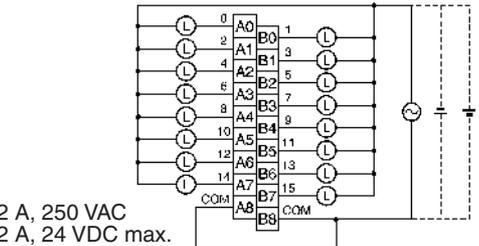
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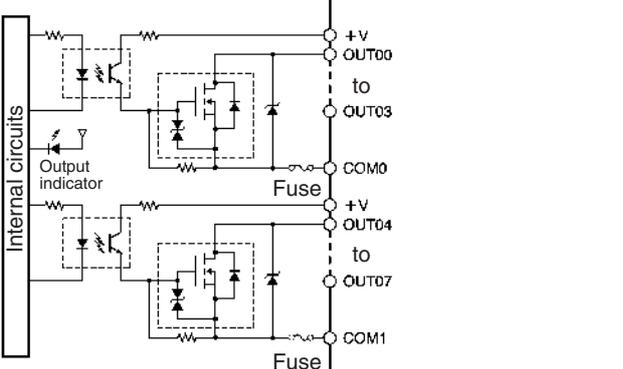
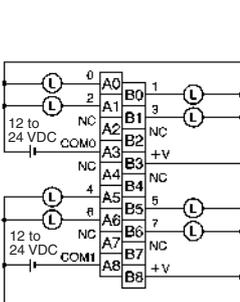
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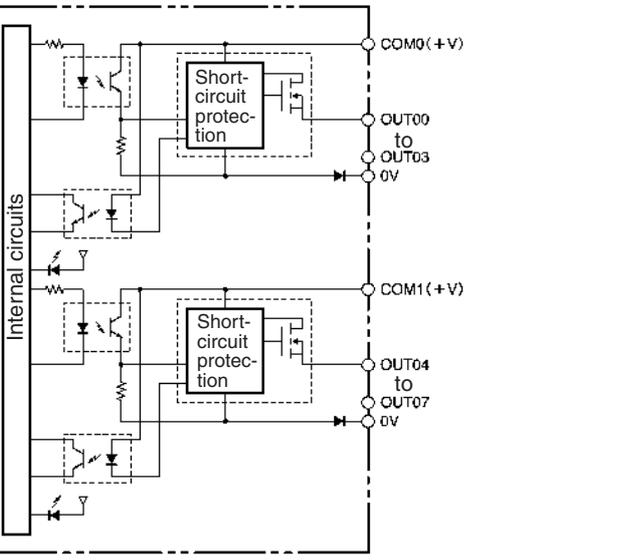
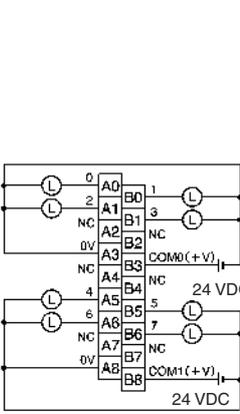
CJ1W-OC211

Circuit configuration	Terminal arrangement
	 <p>2 A, 250 VAC 2 A, 24 VDC max.</p>

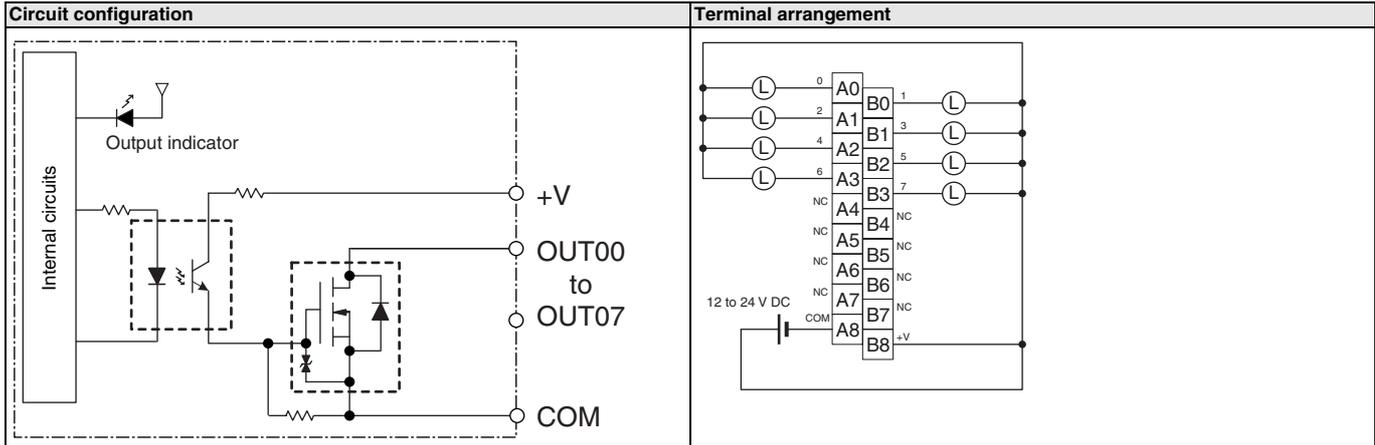
CJ1W-OD201

Circuit configuration	Terminal arrangement
	

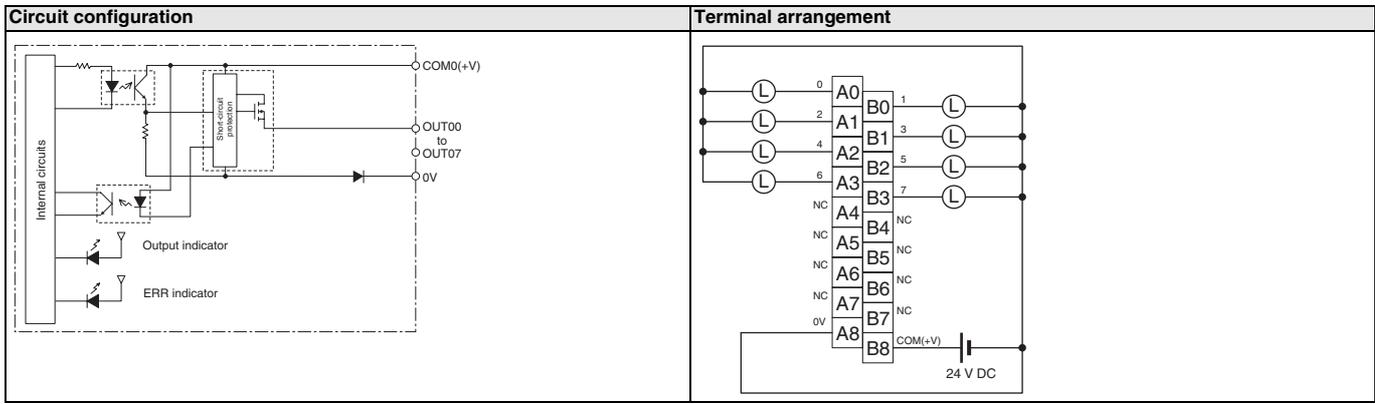
CJ1W-OD202

Circuit configuration	Terminal arrangement
	

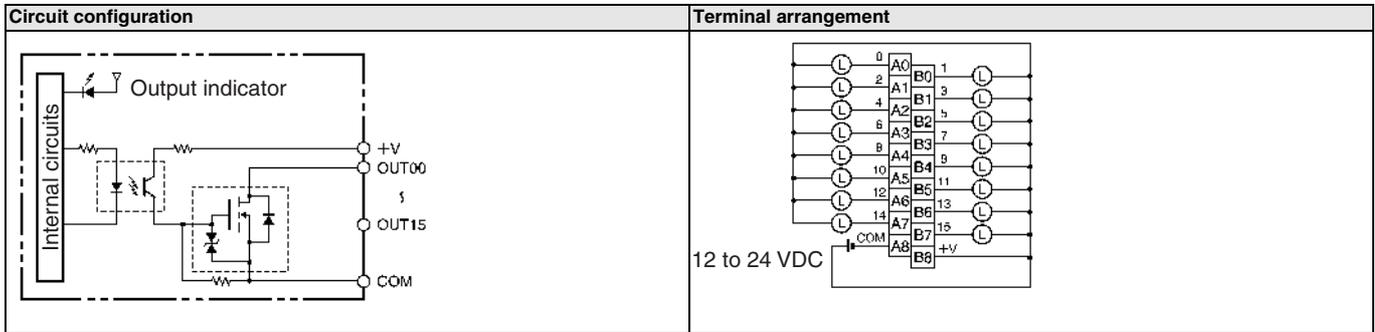
CJ1W-OD203



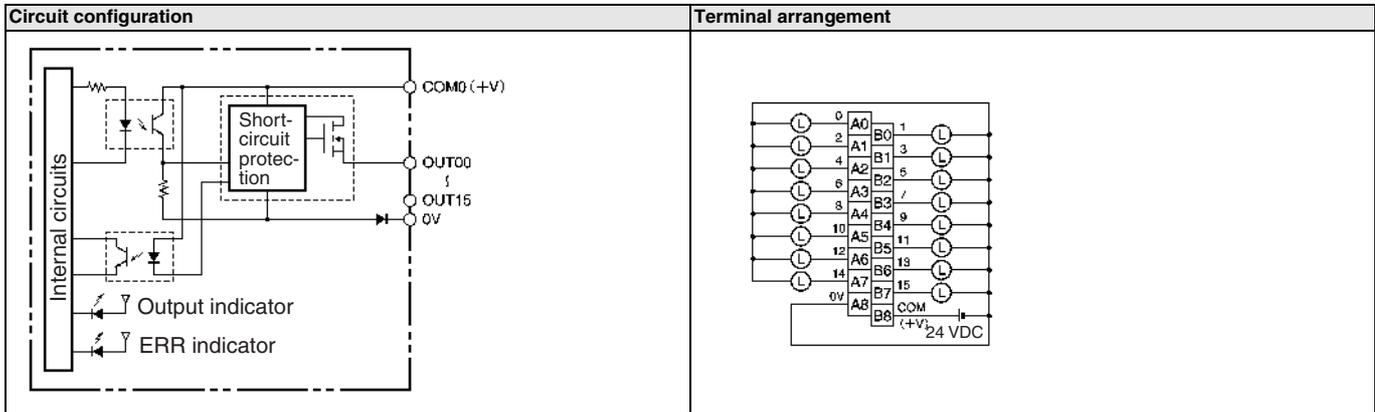
CJ1W-OD204



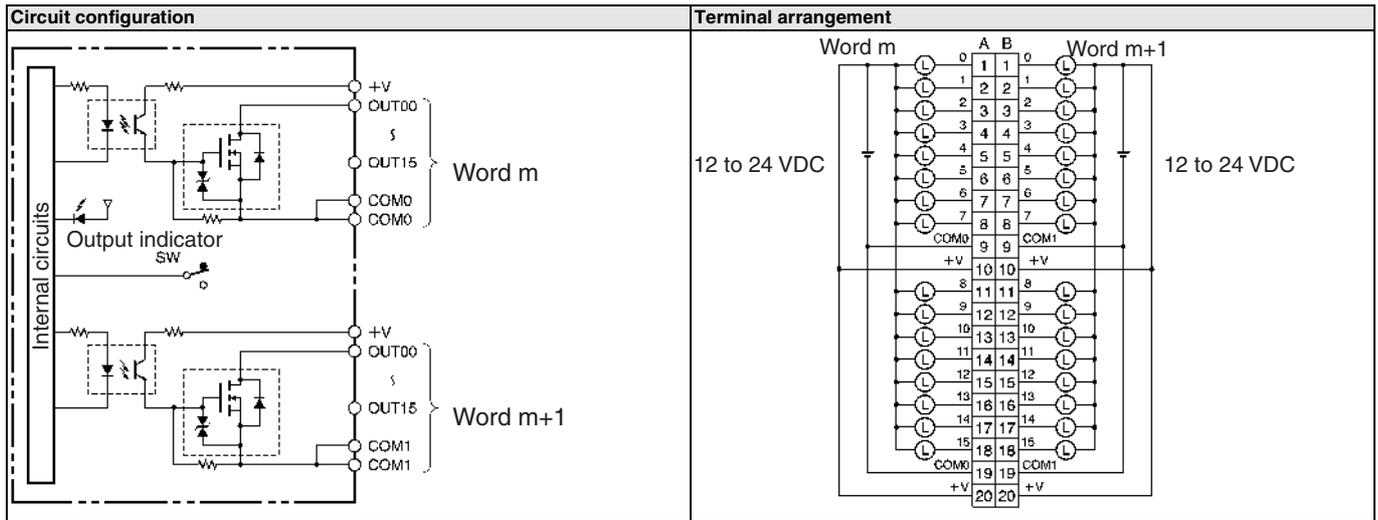
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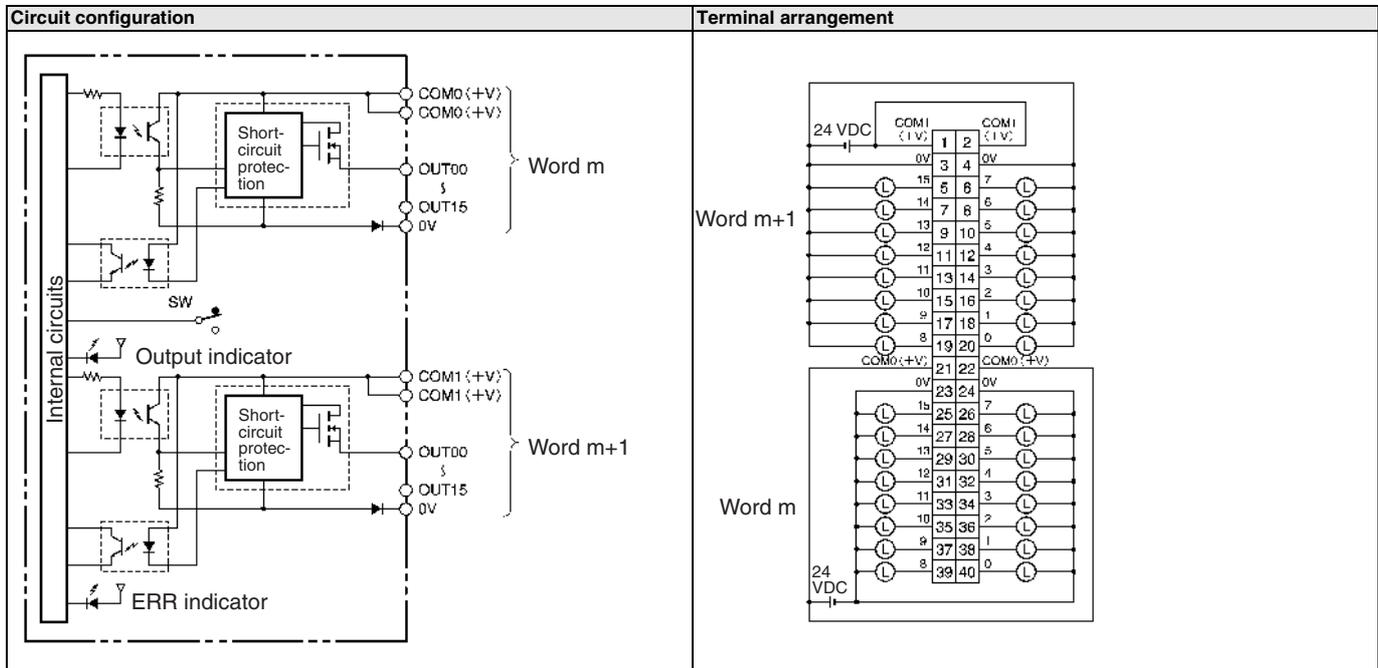
CJ1W-OD212



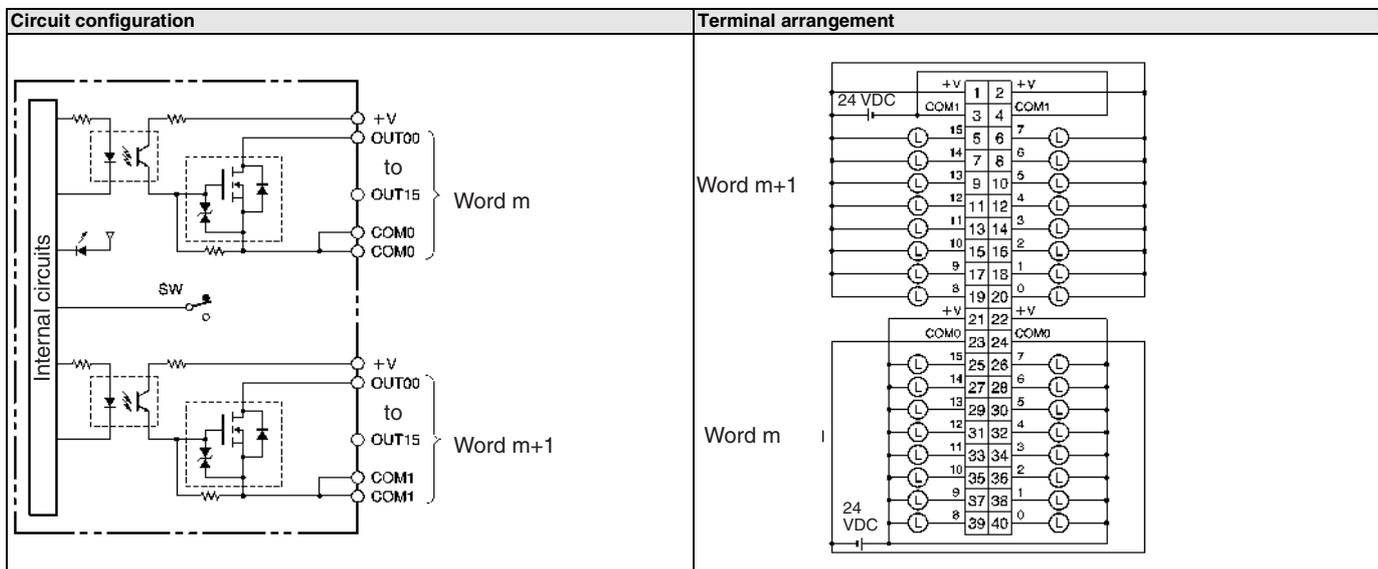
CJ1W-OD231



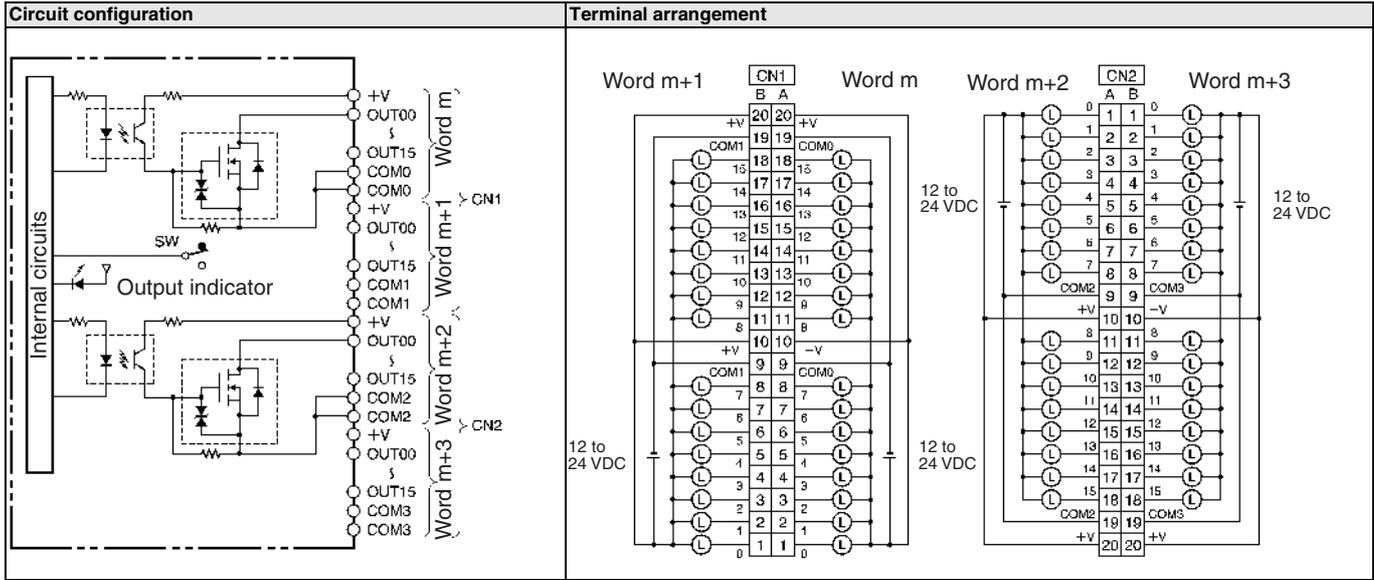
CJ1W-OD232



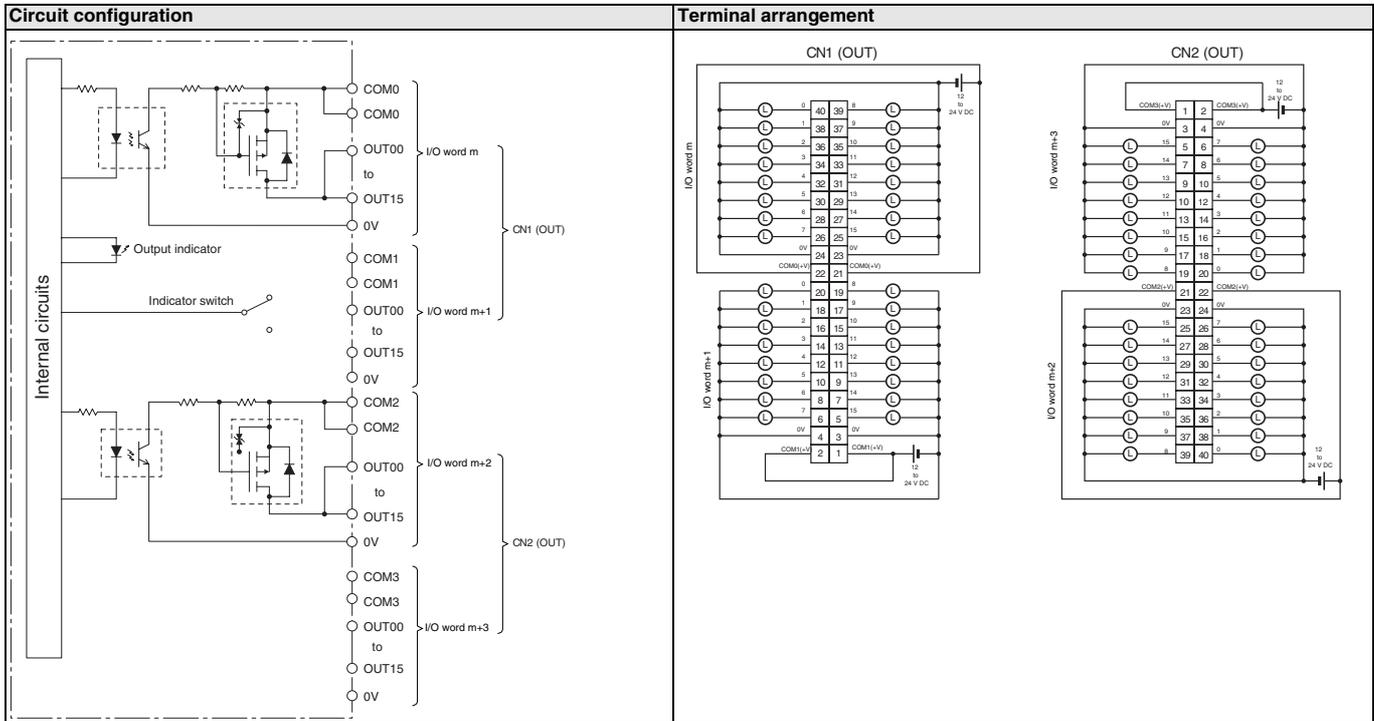
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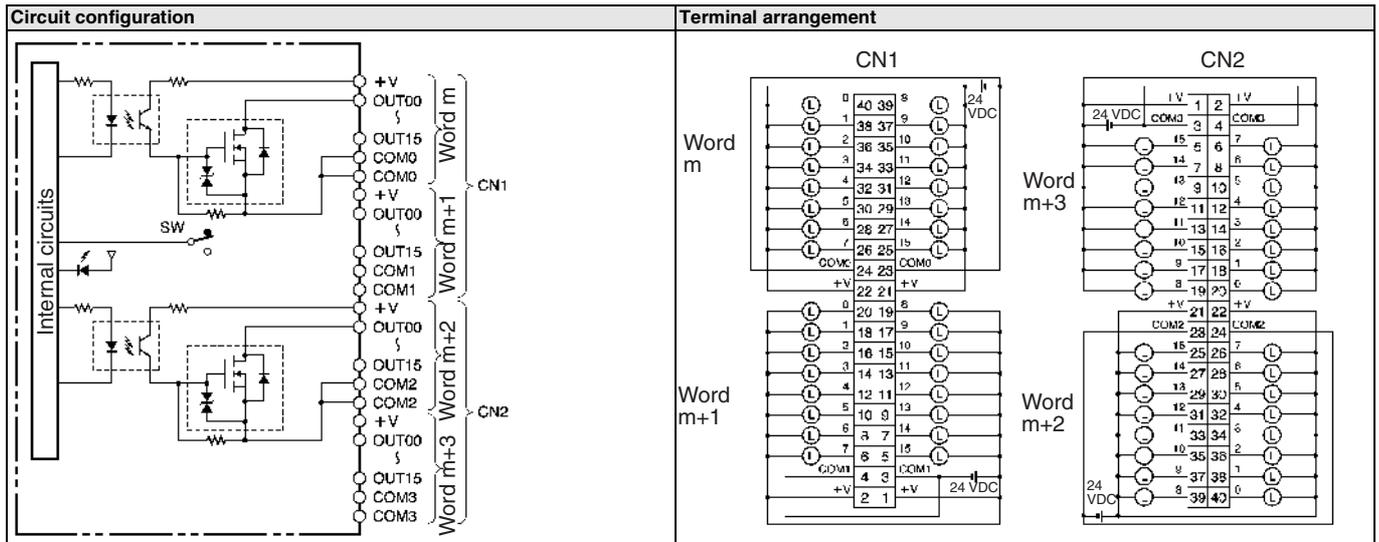
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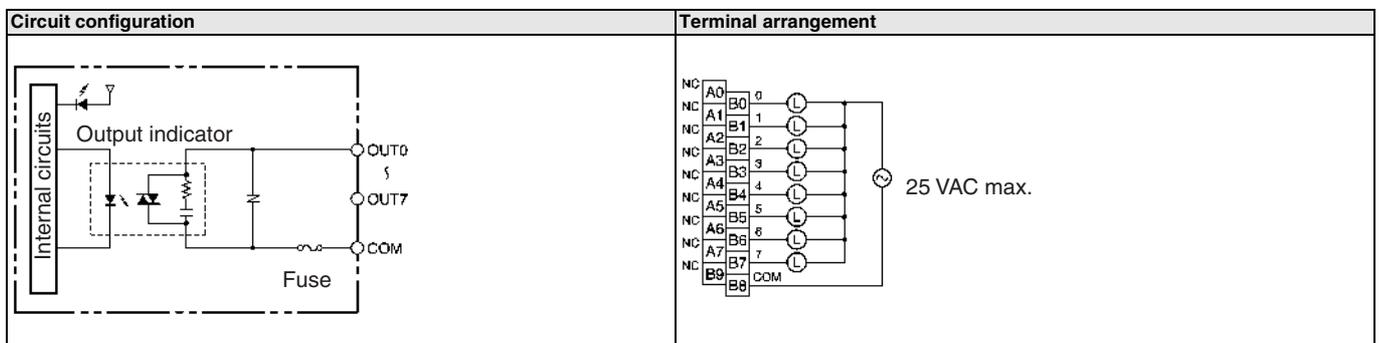
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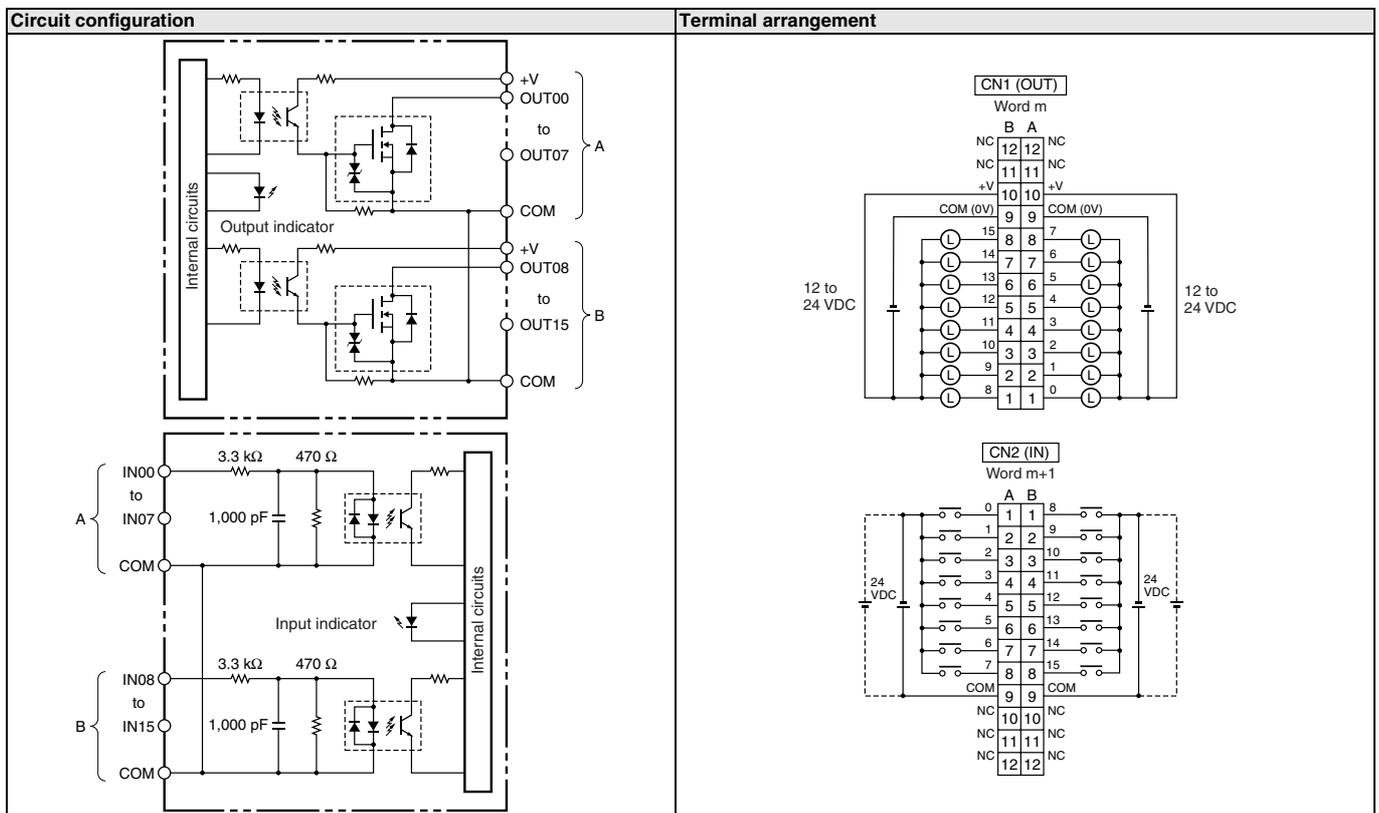
CJ1W-OD263

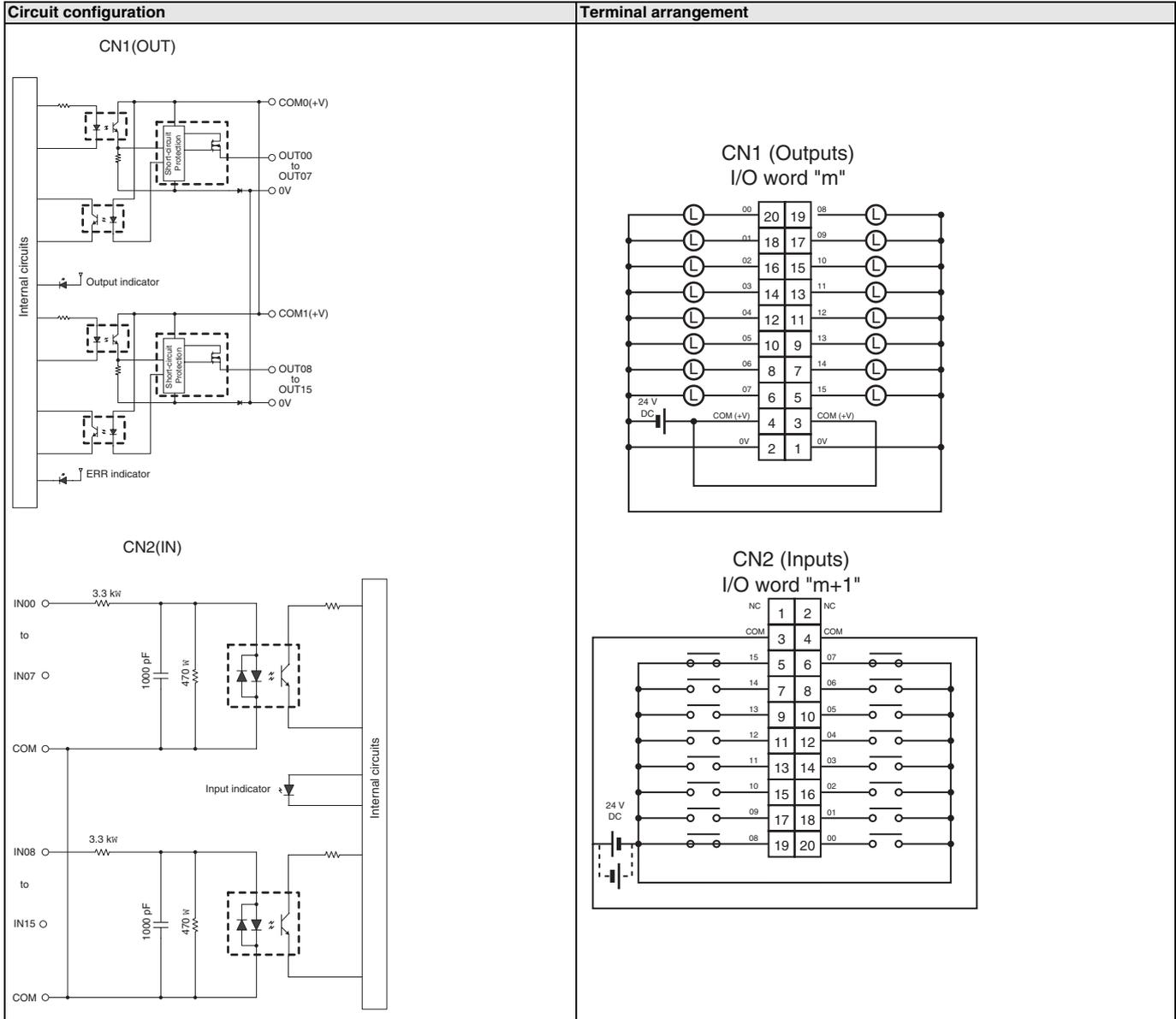


CJ1W-OA201

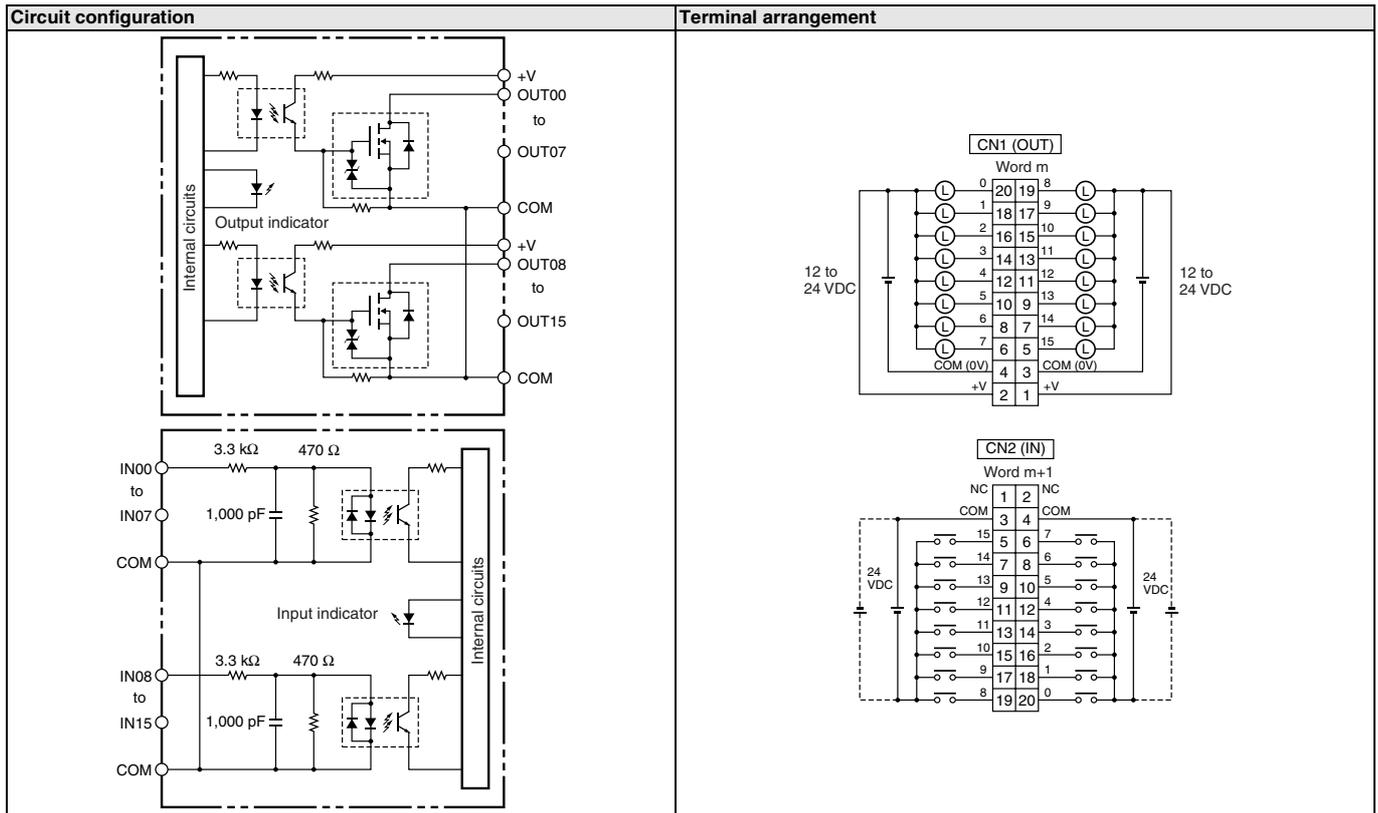


CJ1W-MD231

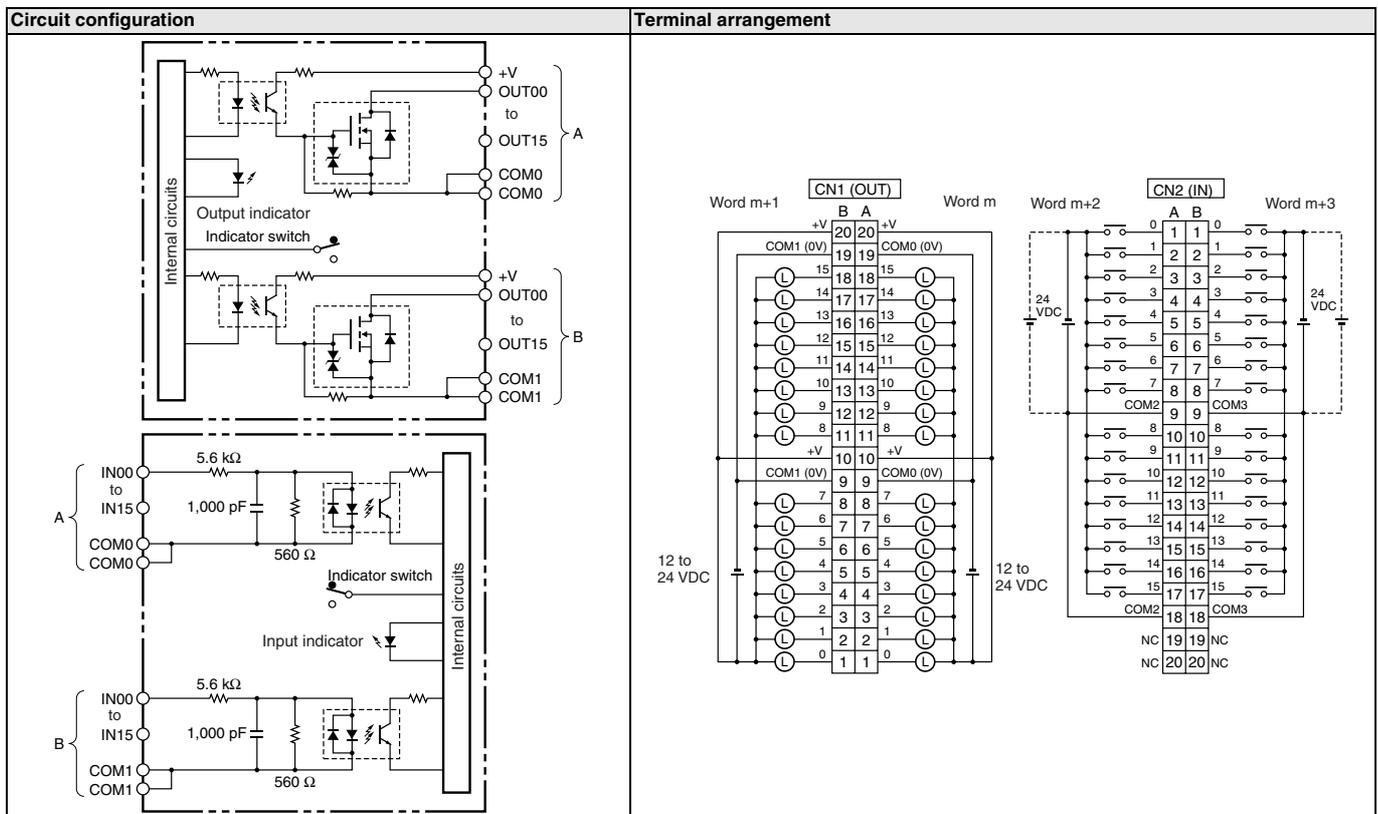




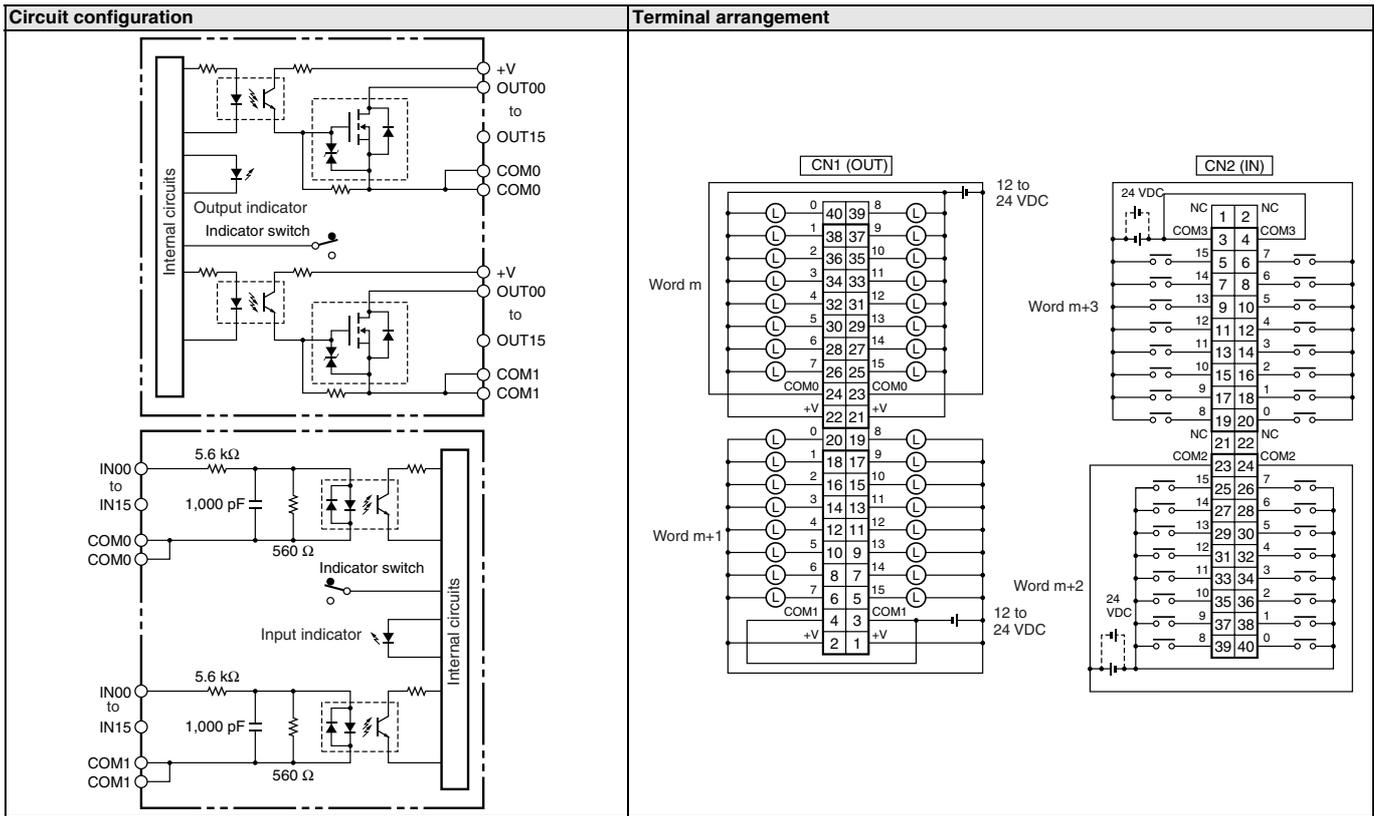
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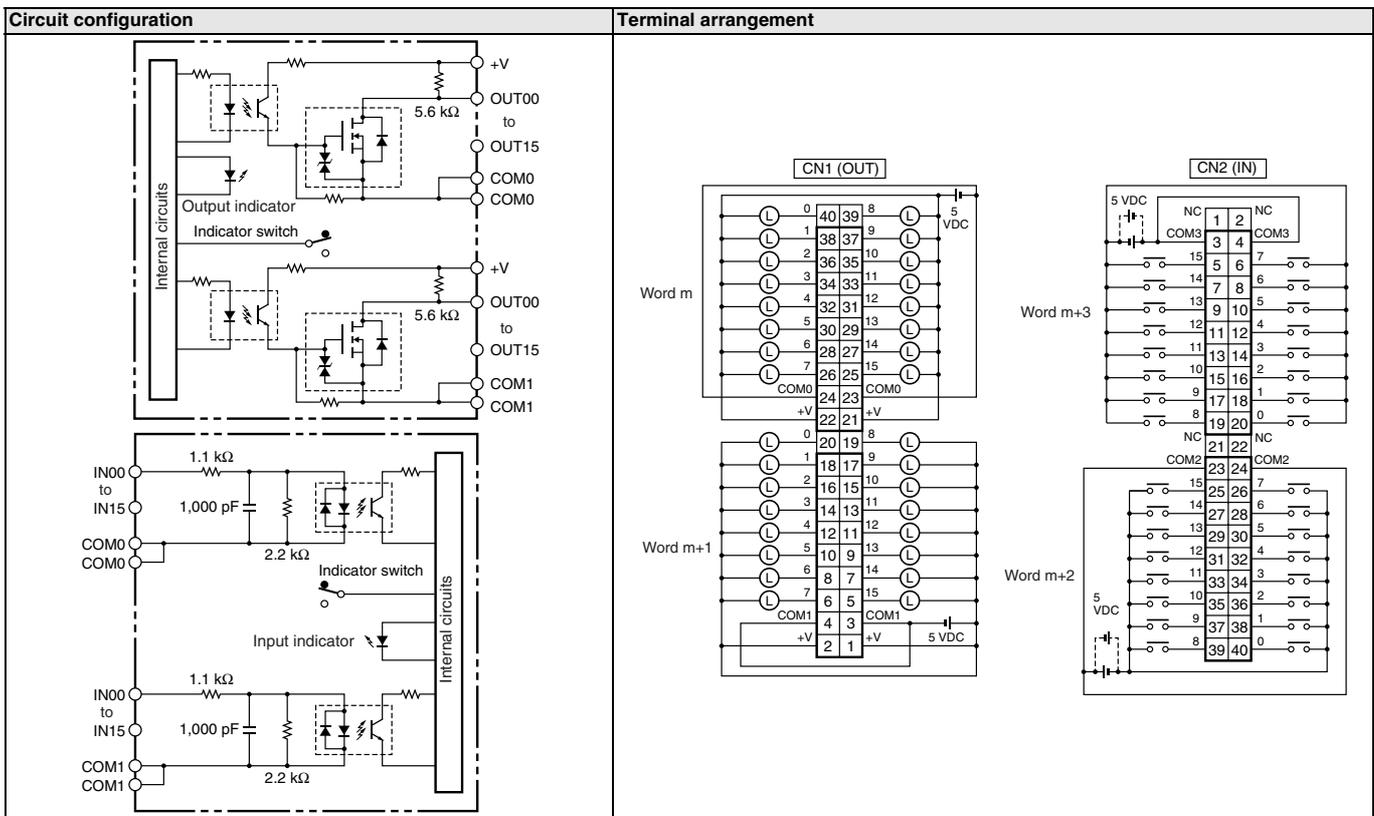
CJ1W-MD261



CJ1W-MD263



CJ1W-MD563



CJ1W-INT01

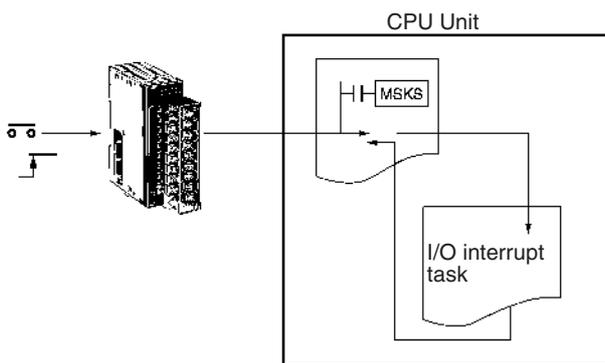
Interrupt Input Unit

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



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.	2 max.	Any of the leftmost 5 slots (CJ1M: 3 slots) next to the CPU Unit on the CPU Rack.	Removable terminal block

Circuit configuration	Terminal connections

CJ1W-IDP01

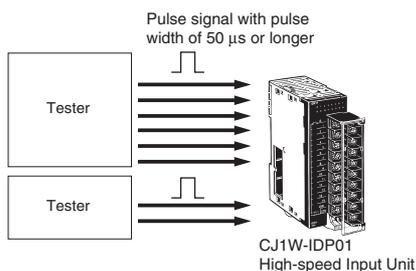
High-speed Input Unit

Input Signals as Short as 50 μ s as Normal Inputs

- 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.



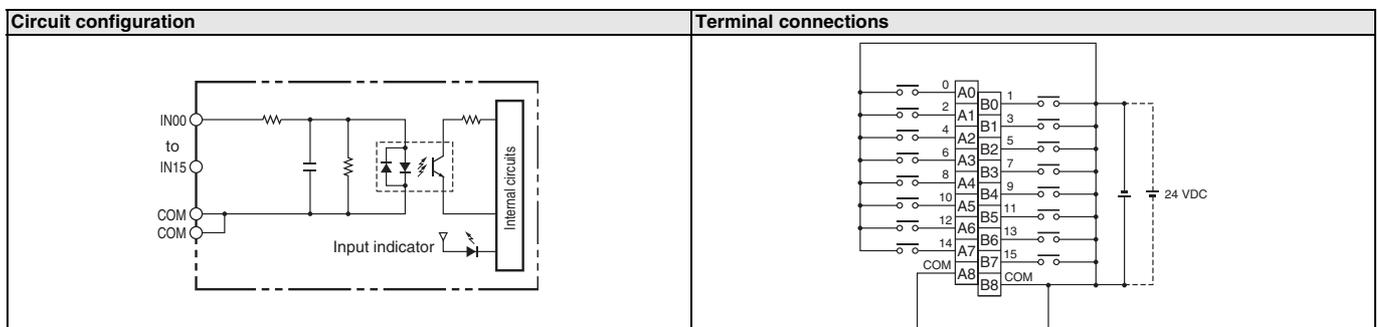
System Configuration



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

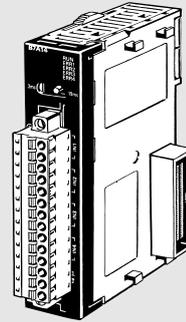


CJ1W-B7A□□

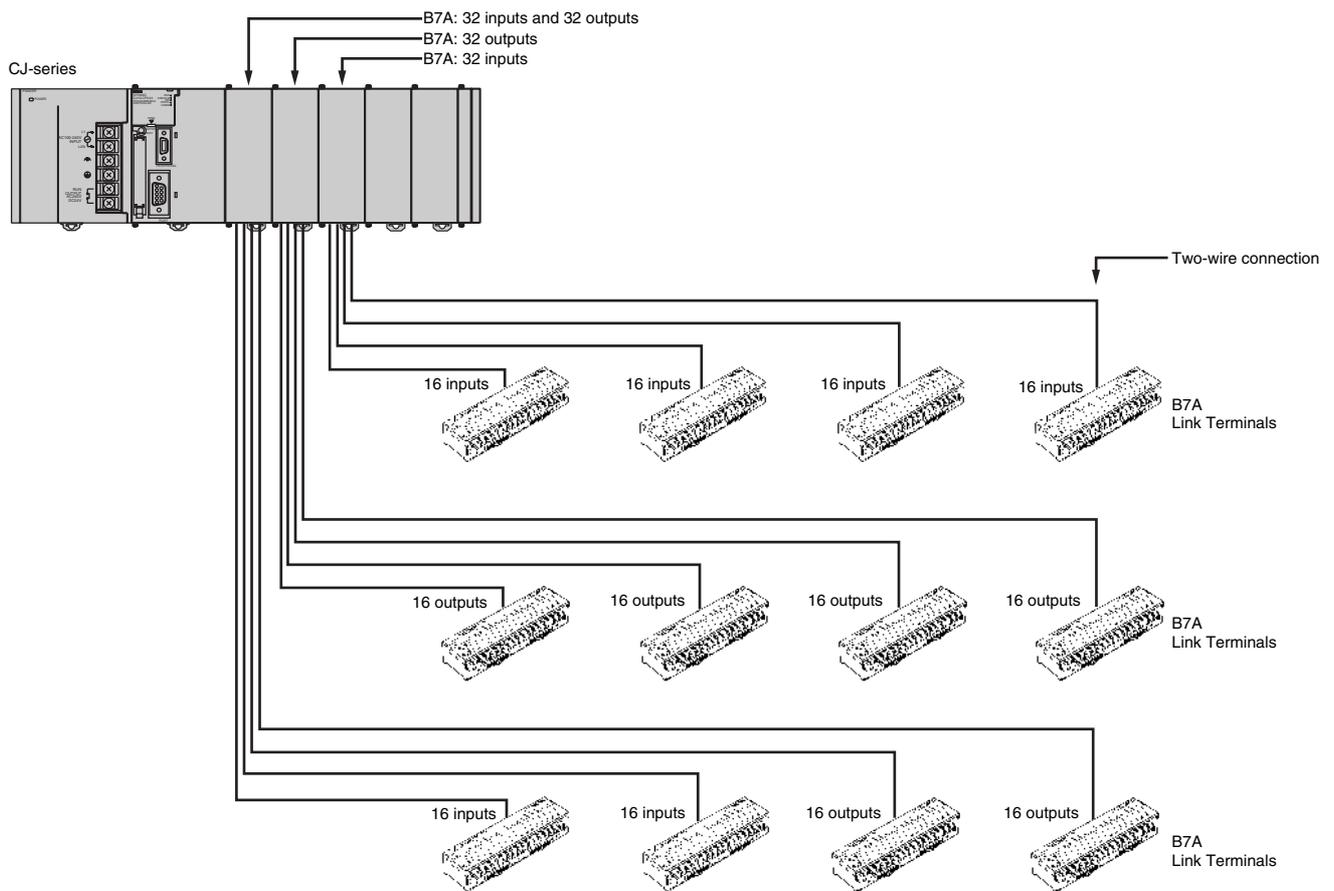
B7A Interface Units

Wire-reduction Units That Transfer 16 Points of Information on Two Signal Wires

- Wire remote switches, lamps, and other devices by settings-free point-to-point serial communications, and reduce wiring both inside and outside the control panel.
- Handle up to 64 signals with each Unit.
- Communications possible for up to 500 m.
- No settings or special programming required (operates as a Basic I/O Unit).



System Configuration



Specifications

Item		Specification		
		CJ1W-B7A22	CJ1W-B7A14	CJ1W-B7A04
Unit classification		Basic I/O Unit		
Inputs/outputs		32 inputs/32 outputs	64 inputs	64 outputs
Transmission distance	High-speed operation	Same power supply for Unit and Link Terminals	With 0.75 mm ² or larger communications line Not shielded: 10 m max. Shielded: 50 m max.	
		Separate power supplies for Unit and Link Terminals	With 0.75 mm ² or larger communications line Not shielded: 10 m max. Shielded: 100 m max.	
	Normal operation	Same power supply for Unit and Link Terminals	With 0.75 mm ² or larger communications line: 100 m max.	
		Separate power supplies for Unit and Link Terminals	With 0.75 mm ² or larger communications line: 500 m max.	
Transmission delay		Normal operation: 19.2 ms (typical), High-speed operation: 3 ms (typical)		
Power supply voltage		12 to 24 V DC (allowable range: 10.8 to 26.4 V DC)		
I/O word allocations		Words are allocated according to the location the Unit is connected in the PLC. Four words (64 points) are allocated to each Unit.		

Applicable B7A Link Terminals

Input Terminals

Type	Model	Transmission delay
Screw terminals	B7A-T6□1	Normal (19.2 ms)
	B7AS-T6□1	
	B7A-T6□6	High-speed (3 ms)
	B7AS-T6□6	
Modules	B7A-T6D2	Normal (19.2 ms)
	B7A-T6D7	High-speed (3 ms)
PLC connectors	B7A-T□E3	Normal (19.2 ms)
	B7A-T□E8	High-speed (3 ms)

I/O Terminal and Input Terminal with 32 Inputs

Type	Model	Transmission delay	
Screw terminals	Mixed I/O	B7AM-6BS	Normal (19.2 ms) or
	32-point input	B7AS-RT3BS	High-speed (3 ms)

Note: See page 439 for details.

Output Terminals

Type	Model	Transmission delay
Screw terminals	B7A-R6□□1	Normal (19.2 ms)
	B7AS-R6□□1	
	B7A-R6□□6	High-speed (3 ms)
	B7AS-R6□□6	
Relay outputs	G70D-R6R□1-B7A	Normal (19.2 ms)
	G70D-R6M□1-B7A	High-speed (3 ms)
Modules	B7A-R6A52	Normal (19.2 ms)
	B7A-R6A57	High-speed (3 ms)
PLC connectors	B7A-R□A□3	Normal (19.2 ms)
	B7A-R□A□8	High-speed (3 ms)

- Note: 1. Use a B7A Link Terminal that has the same delay as the B7A Interface Unit.
 2. B7A Link Terminals with 10 points cannot be connected.

CJ1W-AD□□□□

Analog Input Units

Convert Analog Signals to Binary Data

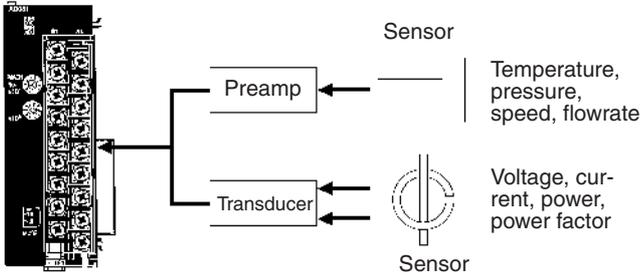
- Wire burnout detection
- Peak-hold function
- Mean function
- Offset gain setting
- Range selection per input
- 1/8000 resolution
- 2 ms conversion time for 8 channels



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	A1	Input 1 (+)
Input 2 (-)	B2	A2	Input 1 (-)
Input 4 (+)	B3	A3	Input 3 (+)
Input 4 (-)	B4	A4	Input 3 (-)
AG	B5	A5	AG
Input 6 (+)	B6	A6	Input 5 (+)
Input 6 (-)	B7	A7	Input 5 (-)
Input 8 (+)	B8	A8	Input 7 (+)
Input 8 (-)	B9	A9	Input 7 (-)

Specifications

Item		Classification: Special I/O Unit	
		CJ1W-AD081-V1	CH1W-AD041-V1
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 settings		8 settings (one for each point)	4 settings (one for each point)
Resolution		1/4000 (default) or 1/8000 (selectable)	
Conversion speed		1 ms/point (default), or 250 μs/point (selectable)	
Overall accuracy (at 23 °C)		Voltage: ±0.2% Current: ±0.4%	
Overall accuracy (0 to 55 °C)		Voltage: ±0.4% Current: ±0.6%	
Connections		Terminal block	
Features	Wire burnout detection	Yes	
	Peak-hold function	Yes	
	Averaging	Yes	
Unit No.		0 to 95	

CJ1W-DA□□□

Analog Output Units

Convert Binary Data to Analog Signals

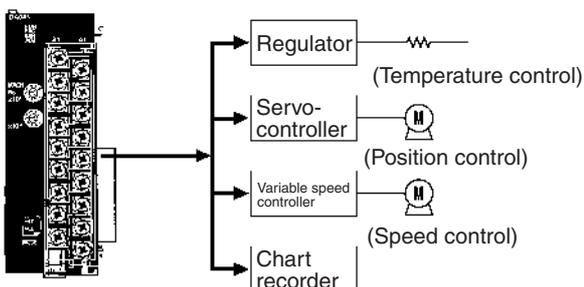
- Output hold
- Offset gain adjustment
- Range selection per output
- 1 ms conversion time per channel
- 1/8000 resolution



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

Output 2 (+)	B1	A1	Output 1 (+)
Output 2 (-)	B2	A2	Output 1 (-)
Output 4 (+)	B3	A3	Output 3 (+)
Output 4 (-)	B4	A4	Output 3 (-)
Output 6 (+)	B5	A5	Output 5 (+)
Output 6 (-)	B6	A6	Output 5 (-)
Output 8 (+)	B7	A7	Output 7 (+)
Output 8 (-)	B8	A8	Output 7 (-)
0 V	B9	A9	24 V

CJ1W-DA041

Voltage output 2 (+)	B1	A1	Voltage output 1 (+)
Output 2 (-)	B2	A2	Output 1 (-)
Current output 2 (+)	B3	A3	Current output 1 (+)
Voltage output 4 (+)	B4	A4	Voltage output 3 (+)
Output 4 (-)	B5	A5	Output 3 (-)
Current output 4 (+)	B6	A6	Current output 3 (+)
N.C.	B7	A7	N.C.
N.C.	B8	A8	N.C.
0 V	B9	A9	24 V

CJ1W-DA021

Voltage output 2 (+)	B1	A1	Voltage output 1 (+)
Output 2 (-)	B2	A2	Output 1 (-)
Current output 2 (+)	B3	A3	Current output 1 (+)
N.C.	B4	A4	N.C.
N.C.	B5	A5	N.C.
N.C.	B6	A6	N.C.
N.C.	B7	A7	N.C.
N.C.	B8	A8	N.C.
0 V	B9	A9	24 V

Specifications

Item		Classification: Special I/O Unit				
		CJ1W-DA08V	CJ1W-DA08C	CJ1W-DA041	CJ1W-DA021	
Outputs		8 points	8 points	4 points	2 points	
Signal range	Voltages	1 to 5 V	Yes	No	Yes	Yes
		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		
Maximum load current (for voltage outputs):		2,4 mA	n.a.	12 mA		
Maximum load resistance (current outputs):		n.a.	350 Ω	600 Ω		
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 point)	
Resolution		1/4000 (default) or 1/8000 (selectable)	1/4000 (default) or 1/8000 (selectable)	1/4000		
Conversion 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 (at 23 °C)		Voltage: ±0.3% Current: ±0.5%				
Overall accuracy (0 to 55 °C)		Voltage: ±0.5% Current: ±0.8%				
Connections		Terminal block				
Unit No.		0 to 95				
External power supply		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

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

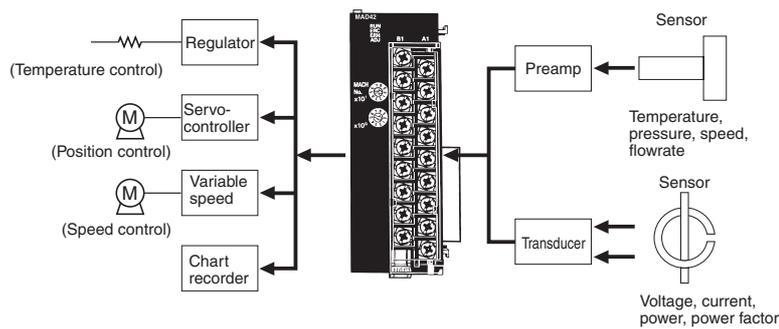
- Output hold
- Offset gain adjustment

Other Features

- Scaling function



System Configuration



Terminal Arrangement

Voltage output 2 (+)	B1	A1	Voltage output 1 (+)
Output 2 (-)	B2	A2	Output 1 (-)
Current output 2 (+)	B3	A3	Current output 1 (+)
N.C.	B4	A4	N.C.
Input 2 (+)	B5	A5	Input 1 (+)
Input 2 (-)	B6	A6	Input 1 (-)
AG	B7	A7	AG
Input 4 (+)	B8	A8	Input 3 (+)
Input 4 (-)	B9	A9	Input 3 (-)

Specifications

Item			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 MΩ	Current inputs 250 Ω
Maximum load current (for voltage outputs)			2.4 mA	
Maximum load resistance (current outputs)			600 Ω	
Signal range settings			4 settings (one for each point)	2 settings (one for each point)
Resolution			1/4000 (default), 1/8000 (selectable)	
Conversion speed			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	

CJ1W-TC□□

Temperature Control Units

One Unit Functions as Four Temperature Controllers

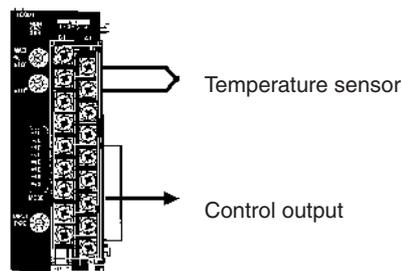
- Supports 2-loop or 4-loop PID control or ON/OFF control.
- The PID constants for PID control can be set using auto-tuning (AT).
- Select either forward (cooling) operation or reverse (heating) operation.
- Input directly from temperature sensors. (Thermocouples: R, S, K, J, T, B, or L; or platinum 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



Specifications

Classification	Temperature sensor inputs	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 output (pulse)	0 to 94	CJ1W-TC001
			Open collector PNP output (pulse)		CJ1W-TC002
		2 loops (with heater burnout detection function)	Open collector NPN output (pulse)		CJ1W-TC003
			Open collector PNP output (pulse)		CJ1W-TC004
	Platinum resistance thermometers (JPt100 or Pt100)	4 loops	Open collector NPN output (pulse)		CJ1W-TC101
			Open collector PNP output (pulse)		CJ1W-TC102
		2 loops (with heater burnout detection function)	Open collector NPN output (pulse)		CJ1W-TC103
			Open collector PNP output (pulse)		CJ1W-TC104

CJ1W-NC□□

Position Control Units

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

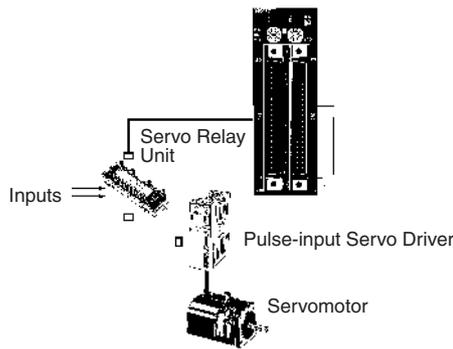
- Simple positioning systems can be created by directly specifying operation from the CPU Unit when required.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based Support Software (CX-Position) to easily create positioning data and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



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



Specifications

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

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, pre-set, 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.

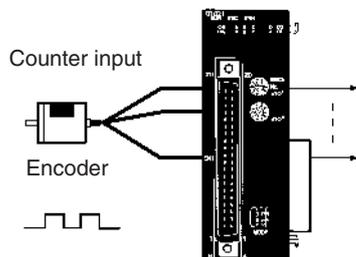


Function

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

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

System Configuration



Specifications

Unit name	High-speed Counter Unit			
Classification	Special I/O Unit			
Unit numbers	0 to 92			
Countable inputs	2 channels			
Counter modes	Simple counter	Linear or ring counter		
Input types	Differential phase inputs (x1)	Differential phase inputs (x1, x2, x4)	Up/Down pulse inputs	Pulse and direction inputs
Countable frequencies	50 kHz	10, 50, or 500 kHz		
Counter values	8000 0000 to 7FFF FFFF (-2,147,483,648 to 2,147,483,647)	Liner counter: 8000 0000 to 7FFF FFFF (-2,147,483,648 to 2,147,483,647) Ring counter: 0000 0000 to FFFF FFFF (0 to 4,294,967,295)		
Counter inputs				
Input signals	Phases A, B, and Z			
Input voltage (selected via connector)	24 V DC	5 V DC (for ch1 only)	12 V DC (for ch2 only)	Line driver
External inputs				
Number of inputs:	2			
Input voltage	24 V DC			
External outputs				
Number of outputs:	2 (switchable between NPN and PNP)			
External power supply				
External power supply	10.2 to 26.4 V DC			
Max. switching capacity	46 mA at 10.2 V to 100 mA at 26.4 V			
Response time	0.1 ms max.			
Leakage current	0.1 mA max.			
Residual voltage	1.5 V max.			
Control methods	Simple counter: Forced ON/OFF, Linear counter: Forced ON/OFF, zone comparison, and target comparison			

Serial Communications Features

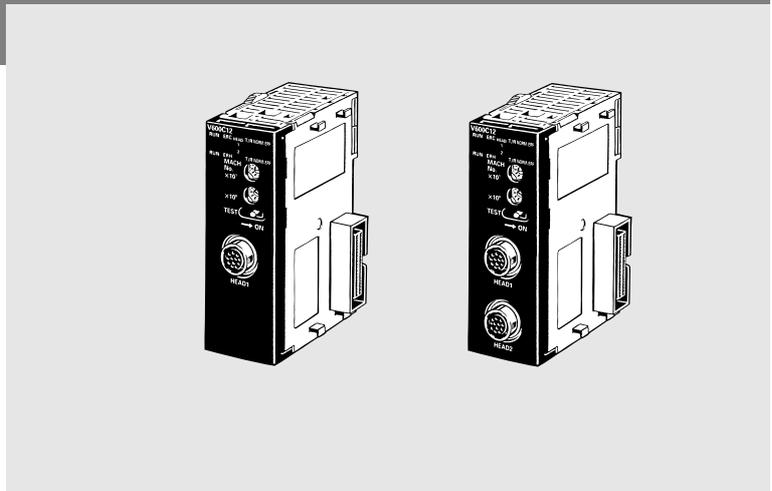
Unit	Model	Ports	Serial communications mode						BASIC programming	Message communications
			Protocol macros	Host Link	NT Links	No-protocol	Peripheral bus	Program- ming Con- sole bus		
			General-pur- pose external devices	Host comput- ers	OMRON PTs	General-pur- pose external devices	Program- ming Devices	Program- ming Con- sole		
CPU Units	All models	Port 1: Peripheral	No	Yes	Yes	No	Yes	Yes	No	No
		Port 2: RS-232C				Yes		No		
Serial Com- munications Units	CJ1W- SCU41	Port 1: RS-422/485	Yes	Yes	Yes	No	No	No	No	No
		Port 2: RS-232C								
DeviceNet RS-232C Unit	DRT1- 232C2	Port 1: RS-232C	No	No	No	No	No	No	No	Yes
		Port 2: RS-232C								

CJ1W-V600C1□

RFID Sensor Units

Build a Flexible System Combining Distributed and Central Control

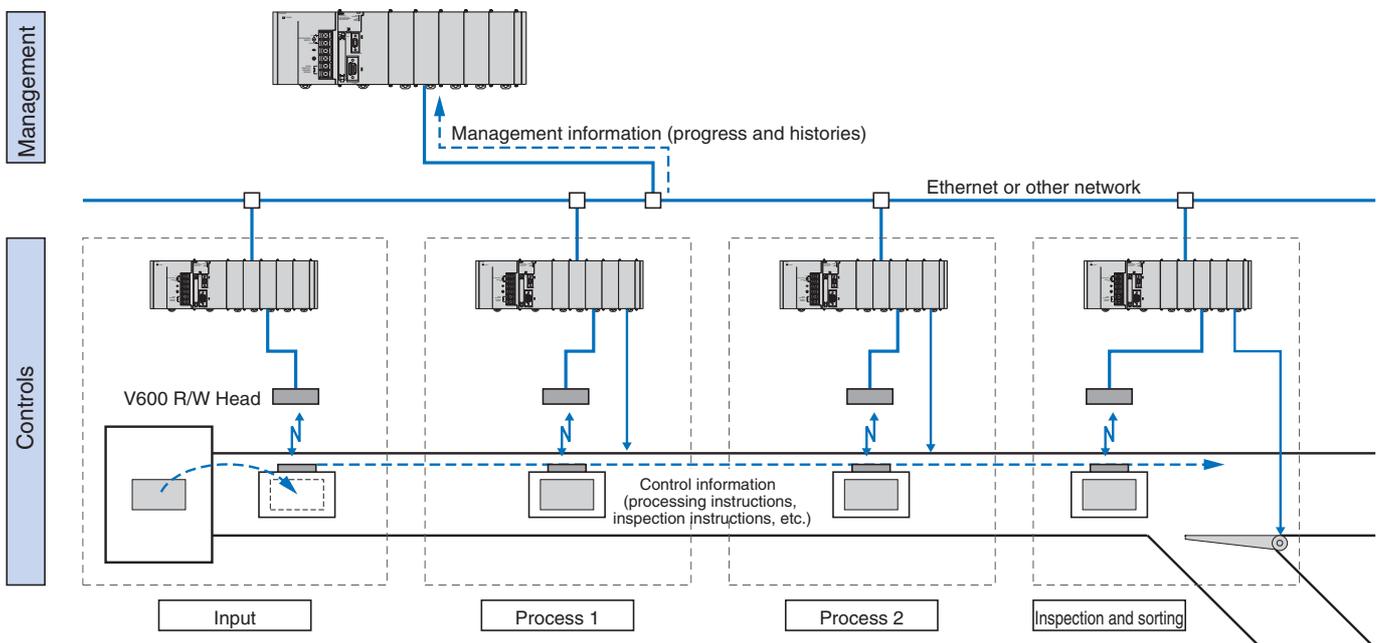
- Models available to connect to either one R/W Head or two R/W Heads.
- High-speed data communications with the CPU Unit (160 bytes/scan).
- Efficient programming with control bits and data located in different interface areas.
- Common operating methods for both Single-head and Double-head Units to 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.

System Configuration



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

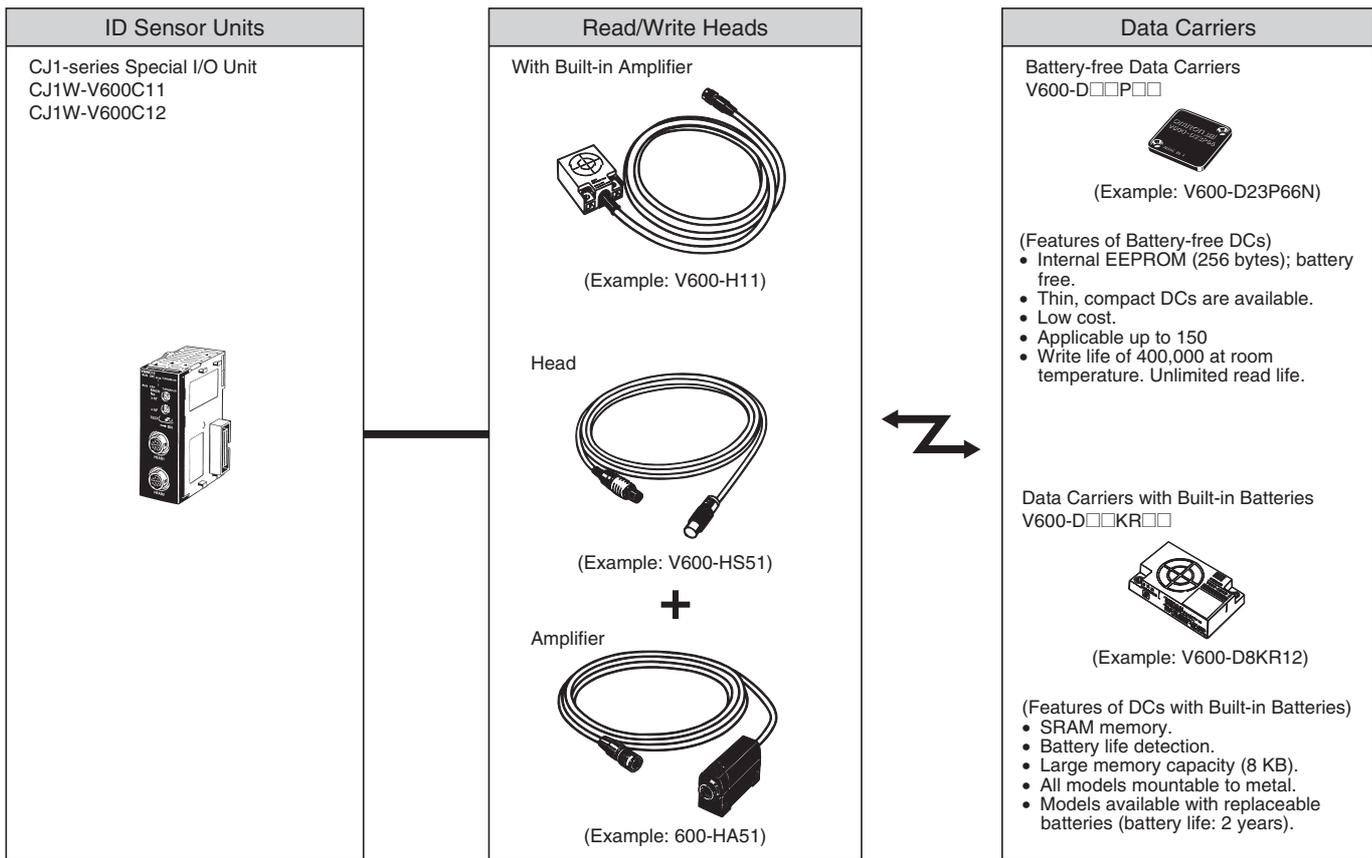
The required information is available when it is required, enabling simple separation of control processes into autonomous modules.

Specifications

Item	CJ1W-V600C11	CJ1W-V600C12													
Data transfer speed	160 bytes/scan (between CPU Unit and ID Sensor Unit)														
Applicable RFID system	V600 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.)	<table border="1"> <thead> <tr> <th>Command</th> <th>Data Carriers with built-in batteries</th> <th>Battery-free Data Carriers in time priority mode</th> </tr> </thead> <tbody> <tr> <td>Read</td> <td>$1.8 \times N + 48.4$ ms</td> <td>$1.8 \times N + 79.0$ ms</td> </tr> <tr> <td>Write with verify</td> <td>$4.2 \times N + 86.5$ ms</td> <td>$7.1 \times N + 180.4$ ms</td> </tr> <tr> <td>Write without verify</td> <td>$2.2 \times N + 72.8$ ms</td> <td>$4.3 \times N + 132$ ms</td> </tr> </tbody> </table>			Command	Data Carriers with built-in batteries	Battery-free Data Carriers in time priority mode	Read	$1.8 \times N + 48.4$ ms	$1.8 \times N + 79.0$ ms	Write with verify	$4.2 \times N + 86.5$ ms	$7.1 \times N + 180.4$ ms	Write without verify	$2.2 \times N + 72.8$ ms	$4.3 \times N + 132$ ms
	Command	Data Carriers with built-in batteries	Battery-free Data Carriers in time priority mode												
	Read	$1.8 \times N + 48.4$ ms	$1.8 \times N + 79.0$ ms												
	Write with verify	$4.2 \times N + 86.5$ ms	$7.1 \times N + 180.4$ ms												
	Write without verify	$2.2 \times N + 72.8$ ms	$4.3 \times N + 132$ ms												
N = The number of bytes being read or written.															
Maintenance features	Communications test, processing results monitor data (communications TAT and error codes)														
Error detection	CPU errors, communications errors with Data Carriers, R/W Head power supply check														

Note: Add the data transfer time to the communications processing time for the command processing time

System Configuration



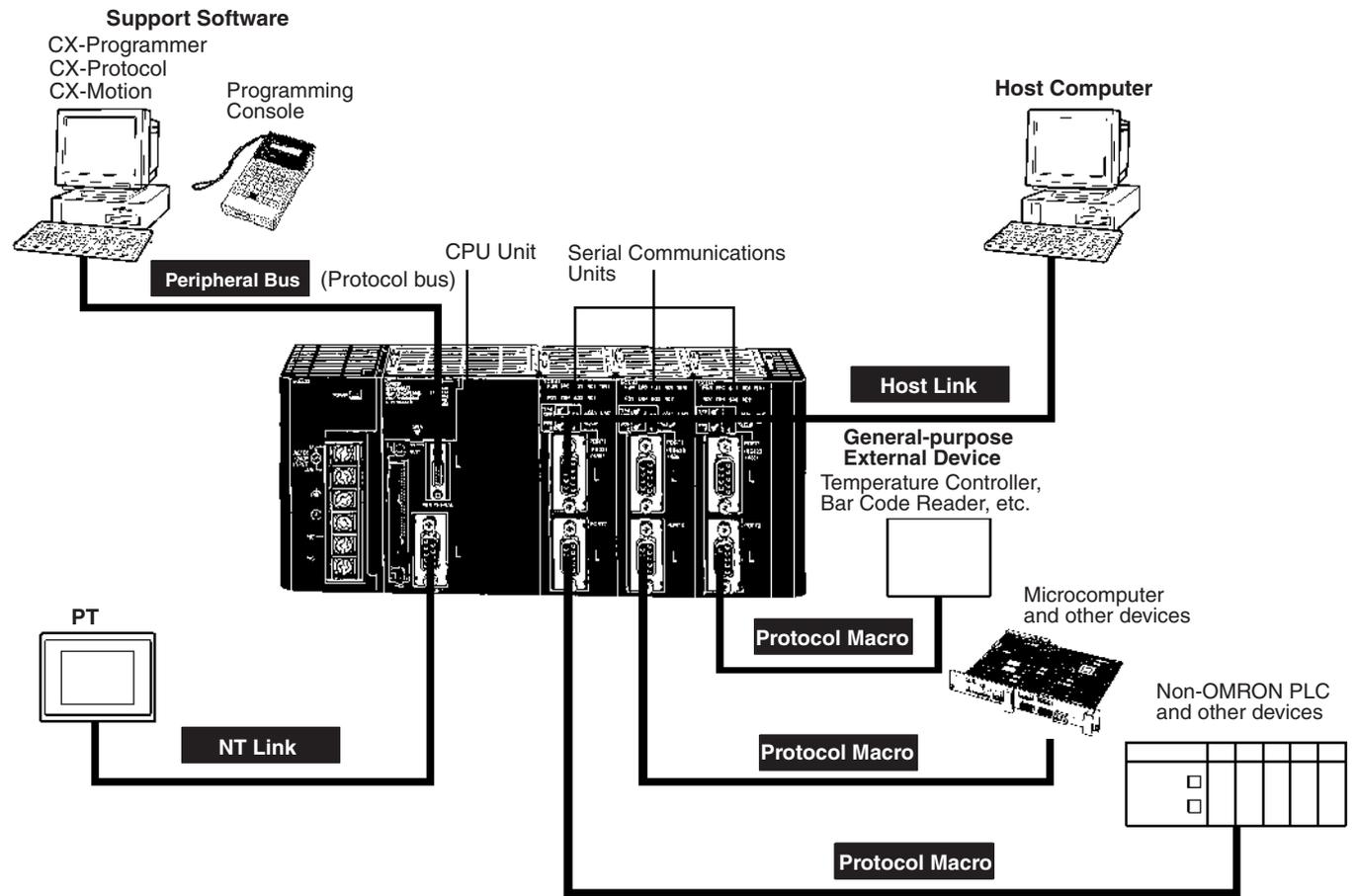
Note: Refer to the *Auto-Identification Components Group Catalog* (Cat. No. Q132) for details on the V600 Series.

Serial Communications

Serial Communications Connections

Unit	Model	Ports	Serial communications mode						
			Protocol macros	Host Link	NT Links	No-protocol	Serial PLC Link	Peripheral bus	Program- ing Con- sole bus
			General-purpose external devices	Host com- puters	OMRON PTs	General-purpose external devices	CJ1M (CJ1M only)	Program- ing Devic- es	Program- ing Con- sole
CPU Units	All models	Port 1: Peripheral	No	Yes	Yes	No	No	Yes	Yes
		Port 2: RS-232C				Yes	Yes (CJ1M only)		No
Serial Com- munications Units	CJ1W- SCU41	Port 1: RS-422/485 Port 2: RS-232C	Yes	Yes	Yes	No	No	No	No
	CJ1W- SCU21	Port 1: RS-232C Port 2: RS-232C	Yes	Yes	Yes	No	No	No	No

Example Serial Communications Configuration



CS1W-SCU□1

Serial Communications 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.

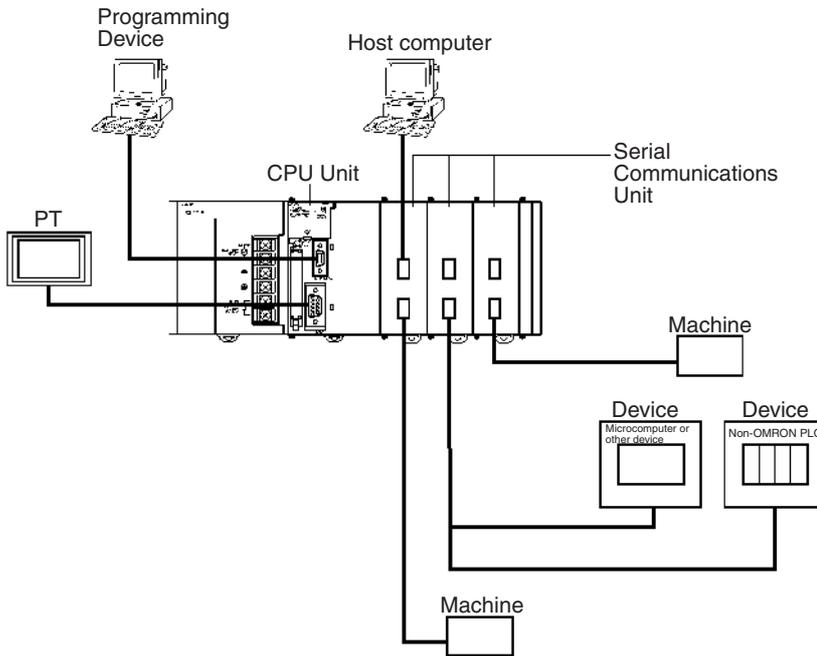


Function

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 Protocol Macros, Host Link Com-

munications, 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



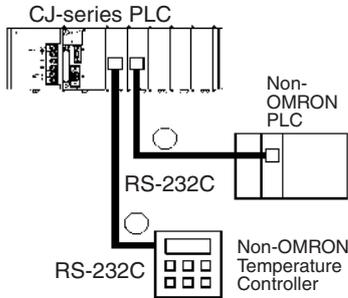
Specifications

Unit	Classification	Serial communications modes	Serial	Unit numbers	Model
Serial Communications Unit	CPU Bus Unit	Set separately for each port: Protocol Macro, Host Link, or 1:N NT Link	RS-232C x 1 RS-422A/485 x 1	0 to F	CJ1W-SCU41
Serial Communications Unit	CPU Bus Unit	Set separately for each port: Protocol Macro, Host Link, or 1:N NT Link	RS232C x 2	0 to F	CJ1W-SCU21

Protocol Macros

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

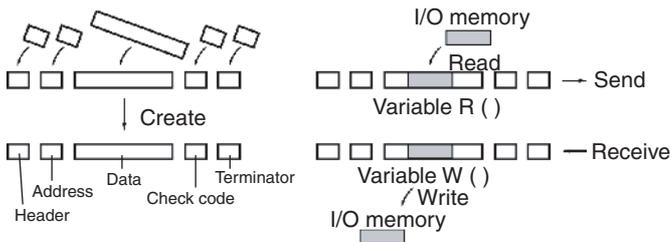
OMRON's protocol macros solve this problem by enabling easy creation of protocol macros designed to match the protocol of a connected device. Protocol macros will let you communicate with essentially any device with an RS-232C, RS-422, or RS-485 port without having to write a special communications program.



The Two Main Functions of Protocol Macros

1. Creating Communications Frames

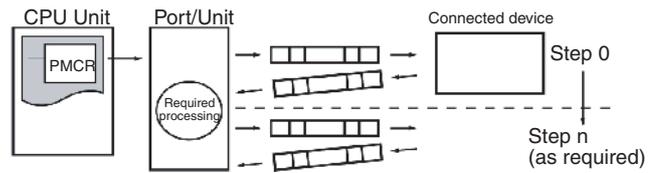
The communications frames can be easily created according to the specifications required by the connected device. Data from I/O memory in the CPU Unit can be easily included as part of a communications frame to read from or write to I/O memory.



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

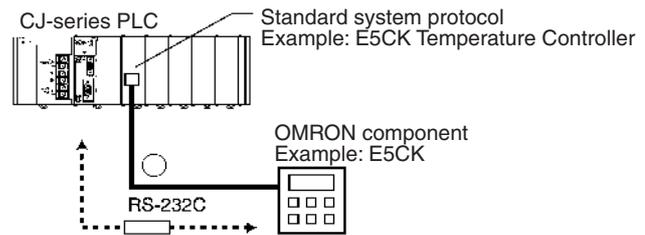
results of the previous step, and then CX-Protocol can be used to trace send and receive data.



Application Examples

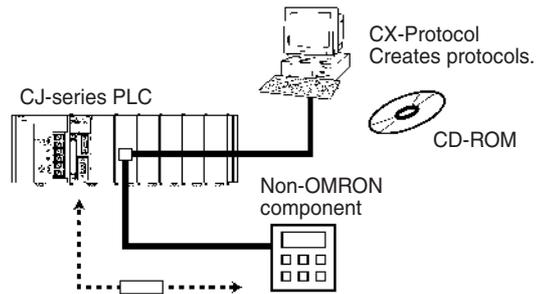
Standard System Protocols

Data transfers with OMRON components can be easily performed using standard system protocols. There is no need to develop your own protocols in this case.



User-created Protocols

Data transfers with non-OMRON components can be easily created just by defining parameters using the CX-Protocol Windows tool.



Standard System Protocols

Component	Model	Send/receive sequences
CompoWay/F-compatible components	OMRON CompoWay/F slave components	CompoWay/F command send/response receive
Digital Controllers and Temperature Controllers	Small Digital Controller with Communications (53 x 53 mm)	Present value read, set point read, manipulated variable read, etc. Set point write, alarm write, PID parameter write, etc.
	Temperature Controllers with Digital Indications (Thermac J with communications) (96 x 96 mm or 48 x 96 mm)	
	Digital Controllers with Communications (96 x 96 mm)	
	High-density Temperature Controller with communications (8 control points)	
Intelligent Signal Processors	K3T□	Display value read, comparison value read, write, etc.
Bar Code Readers	Laser Scanner type	Read start, data read, read stop, etc.
	CCD type	
Laser Micrometer	3Z4L	Measurement condition set, continuous measurement start, etc.
Visual Inspection Systems	High speed, high precision, low cost	Measurement, continuous measurement, etc.
	High-precision inspection/positioning	
	Character inspection software/positioning software	
ID Controllers	Electromagnetic coupling	Carrier data read, autoread, write, etc.
	Microwave	
Hayes Modem AT Command	---	Modem initialize, dial, send, etc.

NT-AL001

RS-232C/RS-422A Adapter Unit

- 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 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-232C Interface

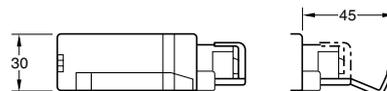
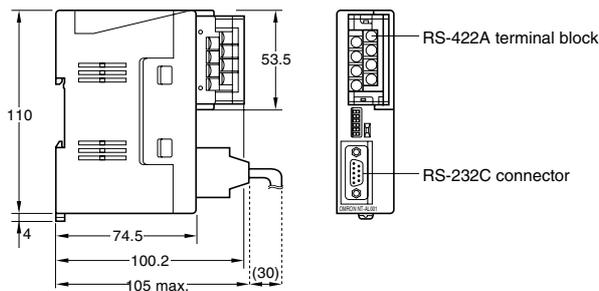
Item	Specification
Baud rate	64 Kbps max.
Transmission distance	2 m max.
Connector	9-pin, D-sub connector (female)

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

Dimensions

Note: Units are in mm unless specified otherwise.



With RS-422A terminal block cover closed: 30 × 114 × 100.2 mm (W × D × H)
 With RS-422A terminal block cover open: 30 × 114 × 119.5 mm (W × D × H)

Communications Networks

Overview

Level	Network	Functions	Communications	Unit/Board
Information networks	Ethernet	Host computer to PLC	FINS messages	Ethernet Unit
		PLC to PLC		
		Host computer to CPU Unit memory card	FTP server	
	UNIX computer or other socket service to PLC	Socket services		
Control networks	Controller Link	Computers connected directly to network and PLC	FINS messages Data links (offsets and automatic setting)	Controller Link Support Board and Unit
	Controller Link	PLC to PLC	FINS messages	Controller Link Unit
			Data links (offsets and automatic setting)	
	DeviceNet	PLC to components (slaves)	FINS messages on open network	DeviceNet Unit and Configurator
	DeviceNet		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 Mbps, extension by optical links if 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 cables 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), CPM1A/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)

CJ1W-ETN11/21

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.

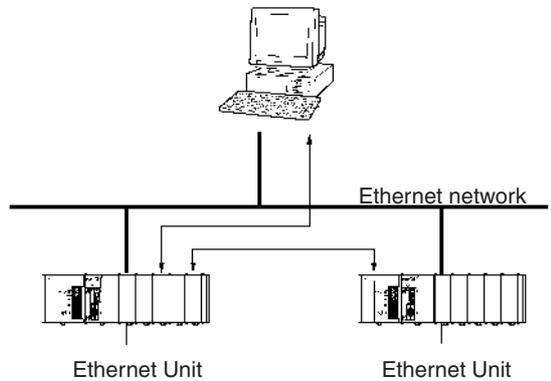


Features of the 100Base-TX Model

- While the 100Base-TX model maintains backward compatibility with the earlier models (10Base-5 and 10Base-T), the new model has a basic system response 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.
 - 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.



Specifications

Classification	Communications services	Unit numbers	Connector	Model
CPU Bus Unit	FINS communications, FTP server, socket services, and mail services	0 to F (4 Units max.)	10Base-T	CJ1W-ETN11
	In addition to the services listed above, the CS1W-ETN21 supports FINS communications through TCP/IP, auto-correction of the PLC's internal clock, and host name identification of various kinds of servers.		100Base-TX (10Base-T)	CJ1W-ETN21

CJ1W-CLK21-V1

Controller Link Units and Support Boards

OMRON's Efficient FA Network

- Achieve high-capacity, flexible data links.
- Transfer large volumes of data through a message service.
- Connect CJ-series, CS-series, and C200HX/HG/HE PLCs.
- Complete error correction and troubleshooting functions.
- Set communications parameters with CX-Programmer.



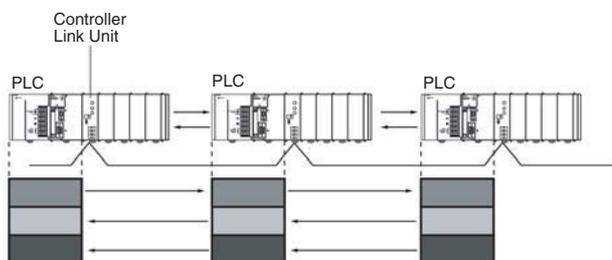
Function

Controller Link is OMRON's easy-to-use and highly efficient 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. You get high-capacity, flexible data links and high-capacity data transfers with messages. For a low-cost communications system, twisted-pair cables can be used.

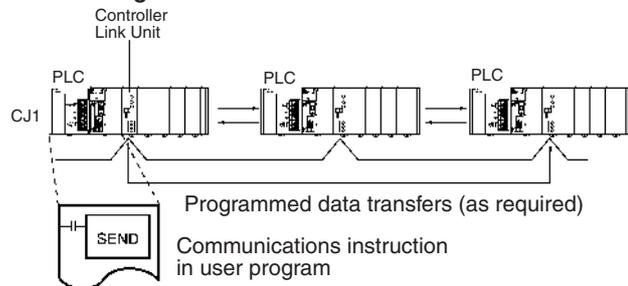
System Configuration

Data Links



Shared memory data transfers (continuous) I/O bits, link bits, DM Area words, etc.

Message Communications



Specifications

Unit/Board	Classification	Communications	Media	Specifications	Unit numbers	Model
Controller Link Units	CPU Bus Unit	Data links and message communications	Wired	Up to 4 Units can be mounted to CPU Rack or Expansion Racks.	0 to F (4 Units max.)	CJ1W-CLK21-V1
Controller Support Boards	Personal computer board		Wired	IBM PC/AT or compatible with PCI bus	---	3G8F7-CLK21-EV1

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.

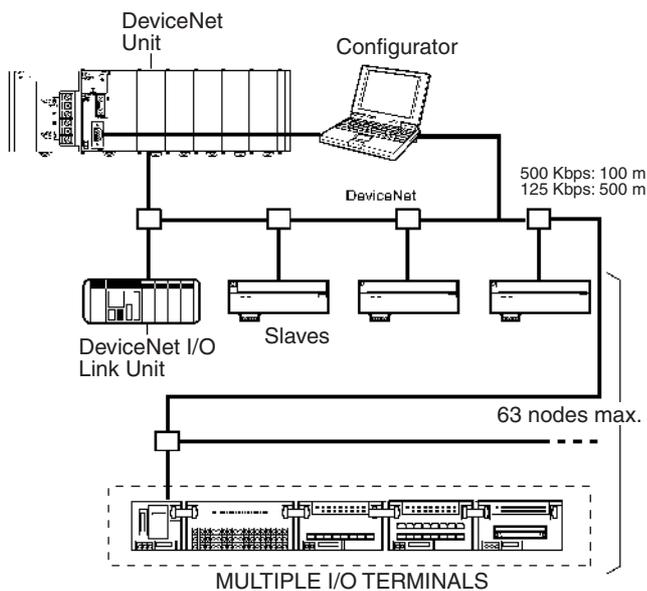


Function

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).
2. 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 explicit 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 (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.)	CJ1W-DRM21

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 688 for more info.

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 following figure is a typical PROFIBUS-DP system configuration using the CJ1W-PRM21. The CJ1W-PRM21 is a master system (DPM1). It exchanges I/O data and communication/status information with the CPU of the PLC. To configure the CJ1W-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

Model			Remarks
CJ1W-PRM21	Main function	Basic PROFIBUS-DP master Class 1 functions plus: DPV1 data tapes support	
	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 EN50170 Volume 2, the PROFIBUS extensions to EN50170, as well as the standard IEC61158: 9.6 kBit/s, 19.2 kBit/s, 45.45 kBit/s, 93.75 kBit/s, 187.5 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



Specifications

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 → Unit: 1 word control data Unit → PLC: 1 word status data
	No. of DM words allocated	Unit → 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). - Inputs+outputs must be 180 words or less

CJ1W-SRM21

CompoBus/S Master Unit

CompoBus/S is a high-speed I/O bus

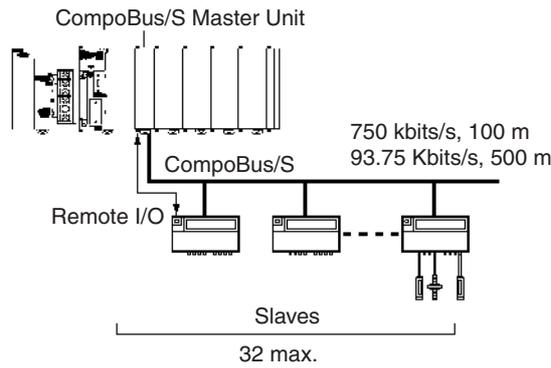
- Up to 256 I/O points per Master.
- Up to 32 Slaves per Master.
- Communications cycle time: 0.5 ms (at 750 kbps).
- Communications distance: Up to 500 m (at 93.75 kbps).
- Free wiring with any branching method for up to 200 m (in long-distance communications mode).



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. High-speed 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).

Communications

Communications method		Special CompoBus/S protocol			
Coding		Manchester			
Connections		Multidrop, T-branch (requires termination)			
Baud rate		High-speed mode: 750 kbps Long-distance mode: 93.75 kbps. Set via DIP switch. (Set via DM Area, Default: 750 kbps)			
Communications cycle time	High-speed mode	0.5 ms (with 8 input and 8 output Slaves)			
		0.8 ms (with 16 input and 16 output Slaves)			
	Long-distance mode	4.0 ms (with 8 input and 8 output Slaves)			
		6.0 ms (with 16 input and 16 output Slaves)			
Media		2-conductor cable (VCTF 0.75 x 2), 4-conductor cable (VCTF 0.75 x 4), or Special Flat Cable			
Maximum communications distance		With 2-conductor Cable			
		Mode	Main	Branch	Total branch
		High-speed (See note 1.)	100 m	3 m	50 m
		Long-distance (See note 2.)	500 m	6 m	120 m
Maximum communications distance		With 2-conductor or Special Flat Cable			
		Mode	Main	Branch	Total branch
		High-speed (See note 1.)	30 m	3 m	30 m
		Long-distance (See note 2.)	Any up to 200 m total		
Max. No. of nodes		32			
Error control checks		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 allocated to each Master) 0 to 95 (when 1 unit number is allocated to each Master)	CJ1W-SRM21

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.

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 I/O	---	---	
		2,560 (3 Expansion Racks)	120 kSteps	256 kWords (DM: 32 kWords, EM: 32 kWords × 7 banks)	0.02 μs	None	CJ1H-CPU66H	UC, CE, N, L	
		1,280 (3 Expansion Racks)	60 kSteps	128 kWords (DM: 32 kWords, EM: 32 kWords × 3 bank)	0.04 μs	CJ1H-CPU65H			
			30 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords × 1 banks)		CJ1G-CPU45H			
		960 (2 Expansion Racks)	20 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords × 1 banks)	CJ1G-CPU44H				
		10 kSteps	CJ1G-CPU43H						
		CJ1M CPU Units	160	5 kSteps	32 kWords (DM only, no EM)	0.1 μs	10 inputs and 6 outputs (See note 1.)		CJ1M-CPU11
			320 (no expansion)	10 kSteps					CJ1M-CPU12
	640 (1 Expansion Rack)		20 kSteps	CJ1M-CPU13					
	160		5 kSteps	CJ1M-CPU21					
	320 (no expansion)		10 kSteps	CJ1M-CPU22					
	640 (1 Expansion Rack)		20 kSteps	CJ1M-CPU23					
	Power Supply Units		100 to 240 V AC (with RUN output), Output capacity: 5 A, 5 V DC					CJ1W-PA205R	UC, CE, N, L
			100 to 240 V AC, Output capacity: 2.8 A, 5 V DC					CJ1W-PA202	
		24 V DC, Output capacity: 5 A, 5 V DC					CJ1W-PD025		
RS-422A Adapter		Converts RS-232C to RS-422A/RS-485					CJ1W-CIF11	UC, CE, N, L	
I/O Control Unit		Mount 1 Unit on the CPU Rack when connecting an Expansion Rack.					CJ1W-IC101		
I/O Interface Unit		1 required on each Expansion Rack.					CJ1W-II101		
I/O Connecting Cable		For connecting Expansion Racks to the CPU Rack or another Expansion Rack.	Cable length: 0.3 m		CS1W-CN313	L, CE			
			Cable length: 0.7 m		CS1W-CN713				
			Cable length: 2 m		CS1W-CN223				
			Cable length: 3 m		CS1W-CN323				
			Cable length: 5 m		CS1W-CN523				
			Cable length: 10 m		CS1W-CN133				
			Cable length: 12 m		CS1W-CN133-B2				
Memory Cards (See note 2.)		Flash memory, 15 MB		HMC-EF172	CE				
		Flash memory, 30 MB		HMC-EF372					
		Flash memory, 64 MB		HMC-EF672					
		Memory Card Adapter (for computer PCMCIA slot)		HMC-AP001					

- Note: 1.** The connector for built-in I/O is not included. Purchase one of the connectors in the following table separately.
2. The HMC-EF172, HMC-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 (Pressure-fitted Connectors)	XG4M-4030-T	
Connector-Terminal Block Conversion	Slim type (M3 screw 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 CPU 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. (Connects on peripheral port on CPU Unit only.)	CQM1H-PRO01-E	U, C, CE	
		CQM1-PRO01-E	U, C, N, CE	
		C200H-PRO27-E		
Programming Console Key Sheet	For CQM1H-PRO01-E, CQM1-PRO01-E, and C200H-PRO27-E.	CS1W-KS001-E	CE	
Programming Console Connecting Cables	Connects the CQM1-PRO01-E Programming Console. (Length: 0.05 m)	CS1W-CN114		
	Connects the C200H-PRO27-E Programming Console. (Length: 2.0 m)	CS1W-CN224		
	Connects the C200H-PRO27-E Programming Console. (Length: 6.0 m)	CS1W-CN624		
CX-Programmer	Windows-based Programming Device OS: Windows 95, 98, Me, NT4.0, 2000, or XP Connected to the peripheral port or RS-232C port on the CPU Unit or connected to the RS-232C port on a Serial Communications Unit.	WS02-CXPC1-E-V□□	---	
3 licenses		WS02-CXPC1-E-V3□L03		
10 licenses		WS02-CXPC1-E-V3□L10		
Programming Device Connecting Cables (for peripheral port)	Connects DOS computers, D-Sub 9-pin receptacle (Length: 0.1 m) (Conversion cable to connect RS-232C cable to peripheral port)	CS1W-CN118	CE	
	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	Used 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 RS-232C port)	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	Used for Peripheral Bus or Host Link. Anti-static connectors	XW2Z-200S-CV	---
	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-CV		
	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	Used for Host Link only. Peripheral Bus not supported. XW2Z-200S-V		
	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-V		
CX-Simulator	Windows-based Support Software for Windows 95, 98, Me, NT, 2000, or XP.	WS02-SIMC1-E	---	
CX-Protocol	Windows-based Protocol Creation Software for Windows 95, 98, Me, NT4.0, 2000, or XP	WS02-PSTC1-E	---	

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	UC, CE
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	Model	Standards	
DC Input Units	12 to 24 V DC, 10 mA, 8 inputs, terminal block	CJ1W-ID201	UC, CE, N, L	
	24 V DC, 7 mA, 16 inputs, terminal block	CJ1W-ID211		
	24 V DC, 4.1 mA, 32 inputs, Fujitsu-compatible connector	CJ1W-ID231 (See note.)		
	24 V DC, 4.1 mA, 32 inputs, MIL connector	CJ1W-ID232 (See note.)		
	24 V DC, 4.1 mA, 64 inputs, Fujitsu-compatible connector	CJ1W-ID261 (See note.)		
	24 V DC, 4.1 mA, 64 inputs, MIL connector	CJ1W-ID262 (See note)		
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 Unit	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	UC, CE, N, L	
	250 V AC/24 V DC, 2 A, independent contacts, 16 outputs max.	CJ1W-OC211		
Transistor Output Units	12 to 24 V DC, 2 A, 8 outputs, sinking, terminal block	CJ1W-OD201		
	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		
	24 V DC, 0.5 A, 16 outputs, sourcing, load short-circuit protection, disconnection detection, alarm, terminal block	CJ1W-OD212		
	12 to 24 V DC, 0.5 A, 32 outputs, sinking, Fujitsu-compatible connector	CJ1W-OD231 (See note 1.)		
	24 V DC, 0.5 A, 32 outputs, sourcing, load short-circuit protection, alarm, MIL connector	CJ1W-OD232 (See note 1.)		
	12 to 24 V DC, 0.5 A, 32 outputs, sinking, MIL connector	CJ1W-OD233 (See note 1.)		
	12 to 24 V DC, 0.3 A, 64 outputs, sinking, Fujitsu-compatible connector	CJ1W-OD261 (See note 1.)		
	12 to 24 V DC, 0.3 A, 64 outputs, sourcing, MIL connector	CJ1W-OD262 (See note 1.)		
	12 to 24 V DC, 0.3 A, 64 outputs, sinking, MIL connector	CJ1W-OD263 (See note 1.)		
Triac Output Unit	250 V AC, 0.6 A, 8 outputs, terminal block	CJ1W-OA201		
DC Input/Transistor Output Units	16 inputs, 24 V DC, 7 mA	Fujitsu-compatible connector	UC, CE, N	
	16 outputs, 12 to 24 V DC, 0.5 A, sinking outputs			CJ1W-MD231 (See note 2.)
	16 inputs, 24 V DC, 7 mA	MIL connector		CJ1W-MD232 (See note 2.)
	16 outputs, 12 to 24 V DC, 0.5 A, sourcing, load short circuit protection, alarm			CJ1W-MD233 (See note 2.)
	16 inputs, 24 V DC, 7 mA	Fujitsu-compatible connector		CJ1W-MD261 (See note 1.)
	16 outputs, 12 to 24 V DC, 0.5 A, sinking outputs			CJ1W-MD263 (See note 1.)
32 inputs, 24 V DC, 4.1 mA	MIL connector	CJ1W-MD563 (See note 1.)		
32 outputs, 12 to 24 V DC, 0.3 A, sinking outputs				
TTL I/O Unit	32 inputs, 5 V DC, 35 mA	MIL connector		
	32 outputs, 5 V DC, 35 mA/pt. 1.12 A/Unit			
B7A Interface Units	64 inputs	CJ1W-B7A14	CE	
	64 outputs	CJ1W-B7A04		
	32 inputs/32 outputs	CJ1W-B7A22		

Note: 1. Connectors are not provided with these connector models. Either purchase one of the following 40-pin Connectors, or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal.

2. Connectors are not provided with these connector models. Either purchase one of the following 20-pin or 24-pin Connectors, or use an OMRON XW2□ Connector-Terminal Block Conversion Unit or a G7□ I/O Relay Terminal.

Connectors for 32-point and 64-point I/O Units

Applicable Units	Name	No. required	Connection	Model	Remarks	Standards
I/O Units with Fujitsu connectors	40-pin Connector	1 per Unit for CJ1W-ID231/OD231 2 per Unit for CJ1W-ID261/OD261/MD261	Soldered	C500-CE404	Connector: FCN-361J040-AU Connector Cover: FCN-360C040-J2	---
			Crimped	C500-CE405	Housing: FCN-363J040 Contact: FCN-363J-AU Connector Cover: FCN-360C040-J2	
			Pressure welded	C500-CE403	FCN-367J040-AU/F	
	24-pin Connector	2 per Unit for CJ1W-MD231	Soldered	C500-CE241	Connector: FCN-361J024-AU Connector Cover: FCN-360C024-J2	---
			Crimped	C500-CE242	Housing: FCN-363J024 Contact: 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	1 per Unit for CJ1W-ID232/OD232/OD233 2 per Unit for CJ1W-ID262/OD263/MD263/MD563	Pressure welded	XG4M-4030-T	FRC5-A040-3TOS	
	20-pin Connector	2 per Unit for CJ1W-MD233		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

Name	Specifications	Model	Standards
Analog Input Unit	8 inputs (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. (Settable to 1/8000, 250 μs/point)	CJ1W-AD081-V1	UC, 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) Resolution: 1/4000, Conversion speed: 1 ms/point max. (Settable to 1/8000, 250 μs/point)	CJ1W-AD041-V1	UC, CE, N
Outputs	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/point max. (Settable to 1/8000, 250 μs/point)	CJ1W-DA08V	UC, CE, N
	8 outputs (4 to 20 mA) Resolution: 1/4000, Conversion speed: 1 ms/point max. (Settable to 1/8000, 250 μs/point)	CJ1W-DA08C	UC, CE, N
	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, Conversion speed: 1 ms/point max.	CJ1W-DA041	UC, 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) Resolution: 1/4000, Conversion speed: 1 ms/point max.	CJ1W-DA021	UC, CE, N
	4 inputs, 2 outputs (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. (Settable to 1/8000, 250 μs/point)	CJ1W-MAD42	UC, CE, N
Temperature Control Units	4 loops, thermocouple input, NPN output	CJ1W-TC001	UC, CE, N, L
	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	
	4 loops, platinum resistance thermometer input, NPN output	CJ1W-TC101	
	4 loops, platinum resistance thermometer input, PNP output	CJ1W-TC102	
	2 loops, platinum resistance thermometer input, NPN output, heater burnout detection function	CJ1W-TC103	
	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	UC, CE, N
PROFIBUS-DP I/O Link Unit	Exchanges up to 180 words in any memory area with a PROFIBUS-DP Master Unit	CJ1W-PRT21	UC, CE
CompoBus/S Master Unit	CompoBus/S remote I/O, 256 points max.	CJ1W-SRM21	UC, CE, N, L
Position Control Units	Pulse train, open collector output, 1 axis	CJ1W-NC113	UC, CE
	Pulse train, open collector output, 2 axes	CJ1W-NC213	
	Pulse train, open collector output, 4 axes (See note 1.)	CJ1W-NC413	
	Pulse train, line driver output, 1 axis	CJ1W-NC133	
	Pulse train, line driver output, 2 axes	CJ1W-NC233	
	Pulse train, line driver output, 4 axes (See note 1.)	CJ1W-NC433	
CX-Position (NC Support Software)	Windows 95, 98, NT 4.0, or 2000, Pentium 100 MHz or better, 32 Mbytes of memory min., 50 Mbytes of hard disk space min.	WS02-NCTC1-E	---
Servo Relay Units (See note 2.)	For 1-Axis Position Control Unit (without communications support) (CS1W-NC113/133, CJ1W-CN113/133, C200HW-NC113, C200H-NC112)	XW2Z-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)	XW2Z-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)	XW2Z-40J6-4A	
Position Control Unit Cables (See note 2.)	Connects CJ1W-NC113 to W Series, Cable length: 0.5 m	XW2Z-050J-A14	
	Connects CJ1W-NC113 to W Series, Cable length: 1 m	XW2Z-100J-A14	
	Connects CJ1W-NC213/413 to W Series, Cable length: 0.5 m	XW2Z-050J-A15	
	Connects CJ1W-NC213/413 to W Series, Cable length: 1 m	XW2Z-100J-A15	
	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	
	Connects CJ1W-NC213/413 to SmartStep, Cable length: 0.5 m	XW2Z-050J-A17	
	Connects CJ1W-NC213/413 to SmartStep, Cable length: 1 m	XW2Z-100J-A17	
	Connects CJ1W-NC133 to W Series, Cable length: 0.5 m	XW2Z-050J-A18	
	Connects CJ1W-NC133 to W Series, Cable length: 1 m	XW2Z-100J-A18	
	Connects CJ1W-NC233/433 to W Series, Cable length: 0.5 m	XW2Z-050J-A19	
	Connects CJ1W-NC233/433 to W Series, Cable length: 1 m	XW2Z-100J-A19	
	Connects CJ1W-NC133 to SmartStep, Cable length: 0.5 m	XW2Z-050J-A20	
	Connects CJ1W-NC133 to SmartStep, Cable length: 1 m	XW2Z-100J-A20	
	Connects CJ1W-NC233/433 to SmartStep, Cable length: 0.5 m	XW2Z-050J-A21	
Connects CJ1W-NC233/433 to SmartStep, Cable length: 1 m	XW2Z-100J-A21		
ID Sensor Unit (See note 3.)	For V600 Series, 1 R/W Head	CJ1W-V600C11	---
	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; 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	UC, CE, N, L
Controller Link Relay Terminal	Wired Includes 5 Terminals	CJ1W-TB101	---
Controller Link Support Board	Twisted pair, PCI bus, with Support Software	3G8F7-CLK21-E	CE
Serial Communications Units	1 RS-232C port and 1 RS-422/485 port	CJ1W-SCU41	UC, CE, N, L
	2 RS-232C ports	CJ1W-SCU21	
CX-Protocol	Windows-based Protocol Creation Software for Windows 95, 98, Me, NT4.0, 2000, or XP	WS02-PSTC1-E	---
Ethernet Unit	10Base-T	CJ1W-ETN11	UC, CE, N, L
	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

Field Network Configurators

Name	Specifications	Model	Standards
DeviceNet Configurator	Software only (Windows 95, 98, NT 4.0, 2000, or XP)	WS02-CFDC1-E	---
	PC card with software (Windows 95 or 98)	3G8E2-DRM21-EV1	
CX-PROFIBUS, PROFIBUS-DP Configurator	Software only (Windows 2000, XP)	WS02-PDC3	

Setting and Monitoring Software

Name	Specifications	Model number	Standards
NX-Server	DDE edition (Windows 95, 98, NT 4.0, 2000, or XP)	WS02-NXD1-E	---