CS1D-CPU□□

Duplex CPU units

The CS1 Duplex System Boosts the Reliability of Facilities and Equipment

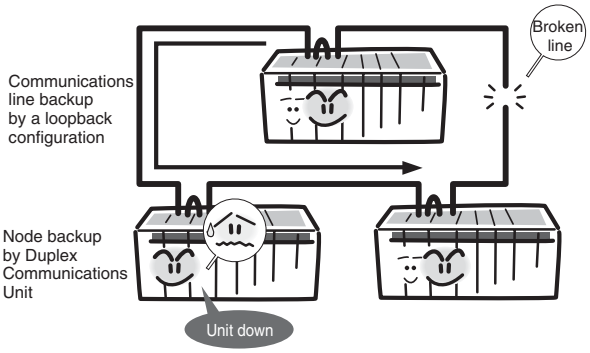
Hot Standby System for CPU Unit Duplexing

- When a problem occurs in the CPU Unit, the system instantly switches control to the other CPU Unit, enabling continuous operation with minimal effect on the system.
- Because there is no need for special duplex programming, the design process is simple and design steps are reduced.

Note: The system can also be configured with only one each of the CPU, Power Supply, and Communications Units. This lets you optimize the system cost by selecting the Units that you need. (The Duplex Unit must be used even when using only one each of the CPU, Power Supply, and Communications Units.)

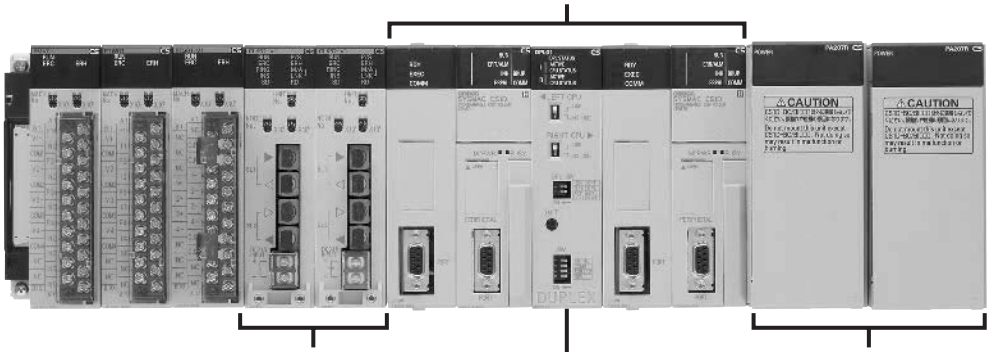
Higher Network Reliability

Duplex Communications Units and a loopback configuration enable continuous communications even in the event of a problem.



Note: The CS1W-CLK12-V1 or CS1W-CLK52-V1 is required for network duplexing.

Duplex CPU Units for greater system reliability



Duplex Communications (Controller Link) Units for greater network reliability

Duplex Unit

Duplex Power Supply Units protect against power supply problems

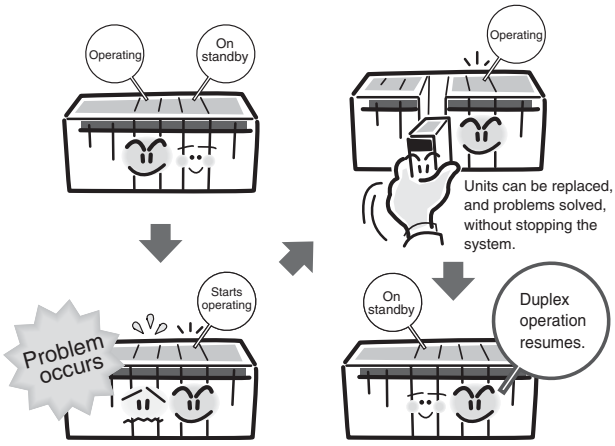
With the Duplex PLC System, restoring the system is fast and easy.

The CPU, Power Supply, or Communications Unit can be replaced while the system continues to operate.

If the CPU Unit should stop due to malfunction, operation continues with the other CPU Unit so you can replace the broken Unit without even stopping the system. The same is possible for the Power Supply and Communications Units.

Naturally, Basic and Special I/O Units can also be replaced.

With the CS1D, Basic I/O Units, Special I/O Units, and CPU Bus Units can all be replaced during operation. The Unit being replaced stops operating during replacement, but all other Units continue to operate.

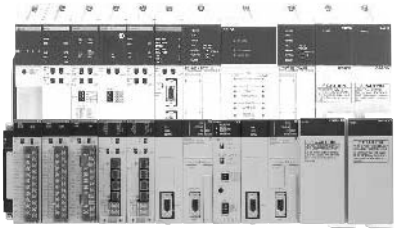


A high-performance PLC with advanced functions to expand control possibilities.

High reliability, plus high performance.

The CPU Units in this Duplex System feature both high performance and advanced functions, providing high reliability even to applications requiring high speed.

Approx. 50% (compared with previous OMRON duplex models)



Of course, PLC functions have also been increased.

- Built-in Flash memory enables battery-less operation.
- Various self-diagnostic functions are included.
- A wide range of calculation functions includes floating point calculations, character string processing, and PID calculations with auto tuning.
- Structured programming (multitask and variable programming supported)

Installation costs and maintenance costs are reduced.

Allows effective use of software assets.

The same support software can be used in systems combining the CS1 and CJ1 Series, and all software programs and data are compatible.

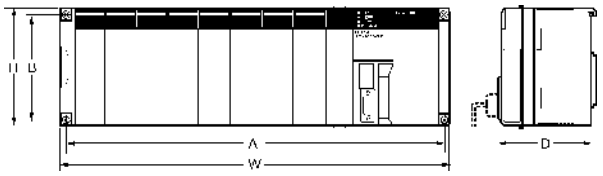
There is no need for ladder programs for duplexing. This means that when converting an existing system to a Duplex System, there is almost no need to revise ladder programs.

Complete compatibility among Units.

The CS1D Duplex System is fully compatible with the I/O Units of the entire CS Series. The same Units and materials can be used for hardware replacement and system maintenance. There is no need to purchase different Units and materials for each system, making the CS1D Duplex System highly economical.

(The CS1D only supports the CS1 Series I/O Units, not the C200H series I/O units)

Dimensions

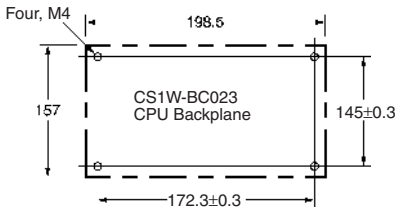


Unit: mm

Backplane	A	B	W	H	D
CS1W-BC023 (2 slots)	172.3	145	198.5	157	123
CS1W-BC033 (3 slots)	246	118	260	130	
CS1W-BC053 (5 slots)	316		330		
CS1W-BC083 (8 slots)	421		435		
CS1W-BC103 (10 slots)	491		505		
CS1D-BC052 (Duplex System)					

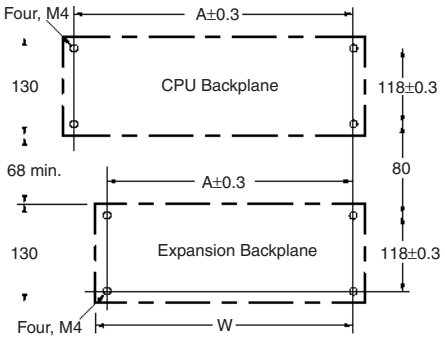
Backplanes

CPU Backplane with 2 Slots



Note: Expansion Backplanes cannot be connected to 2-slot CPU Backplanes.

CPU Backplane with 3, 5, 8, or 10 Slots

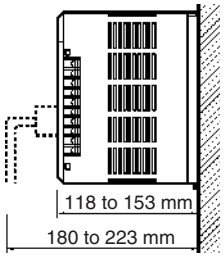


Unit: mm

Backplane	Model	A	W
CPU Backplanes	CS1W-BC023 (2 slots)	172.3	198.5
	CS1W-BC033 (3 slots)	246	260
	CS1W-BC053 (5 slots)	316	330
	CS1W-BC083 (8 slots)	421	435
	CS1W-BC103 (10 slots)	491	505
	CS1D-BC052 (Duplex System)		
CS1 Expansion Backplanes	CS1W-BI033 (3 slots)	246	260
	CS1W-BI053 (5 slots)	316	330
	CS1W-BI083 (8 slots)	421	435
	CS1W-BI103 (10 slots)	491	505
	CS1D-BI092 (Duplex System)		
C200H Expansion I/O Backplanes	C200HW-BI031 (3 slots)	175	189
	C200HW-BI051 (5 slots)	245	259
	C200HW-BI081-V1 (8 slots)	350	364
	C200HW-BI101-V1 (10 slots)	420	434

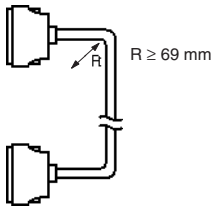
Mounting Depth

The depth of all Racks is from 118 to 153 mm depending on the Units that are mounted. Additional depth is required to connect Peripheral Devices and Cables. Be sure to allow sufficient mounting depth.

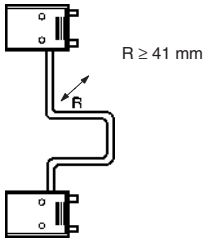


Note: I/O Connecting Cables require sufficient space to maintain the min. bending radius.

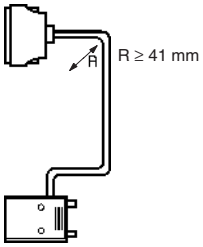
CS1 I/O Connecting Cable
(Cable diameter: 8.6 mm)



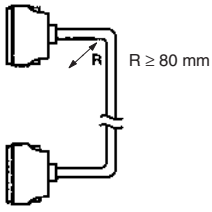
C200H I/O Connecting Cable
(Cable diameter: 5.1 mm)



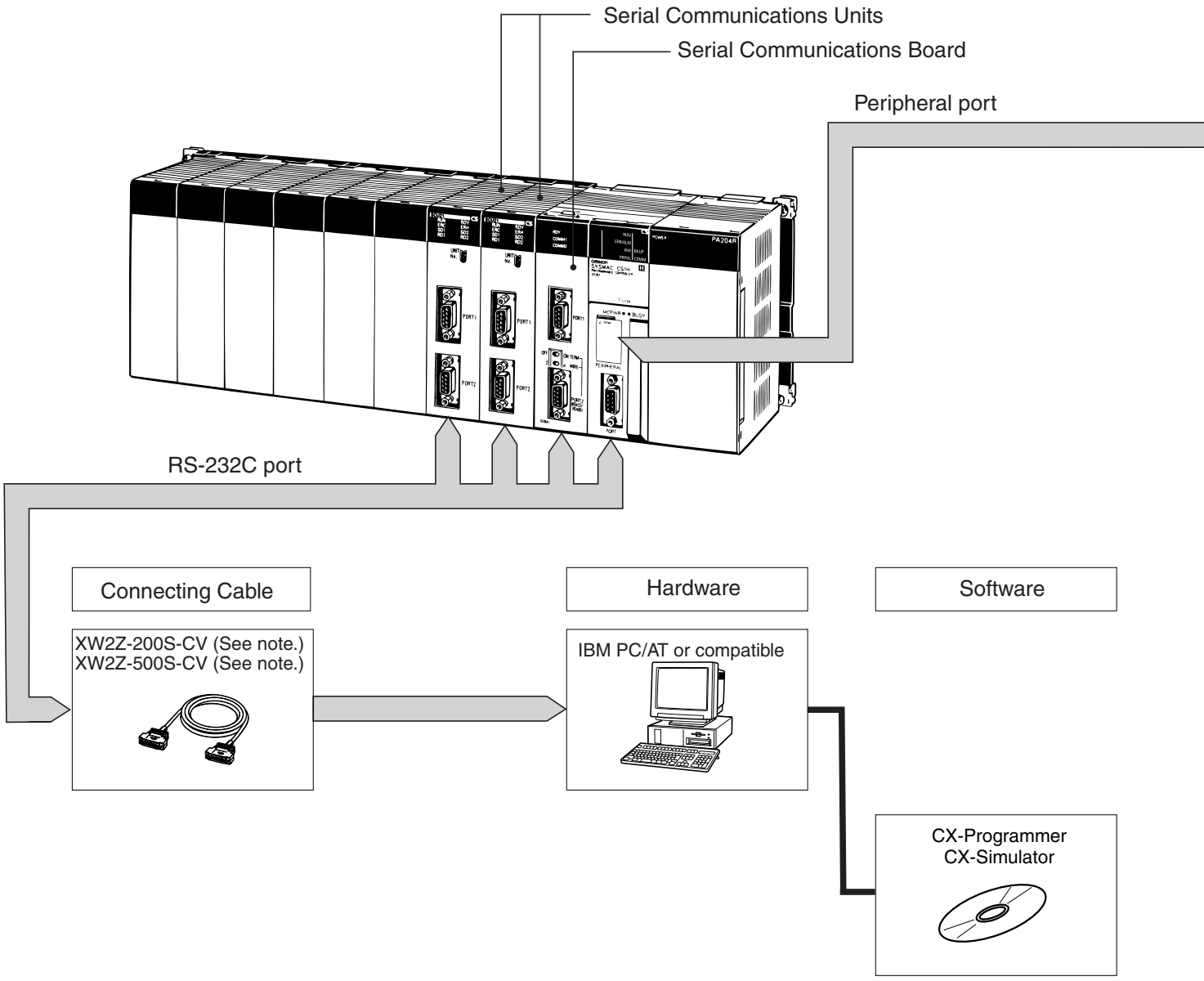
CS1 to C200H I/O Connecting Cable
(Cable diameter: 5.1 mm)



Long-distance Connecting Cable
(Cable diameter: 10 mm)

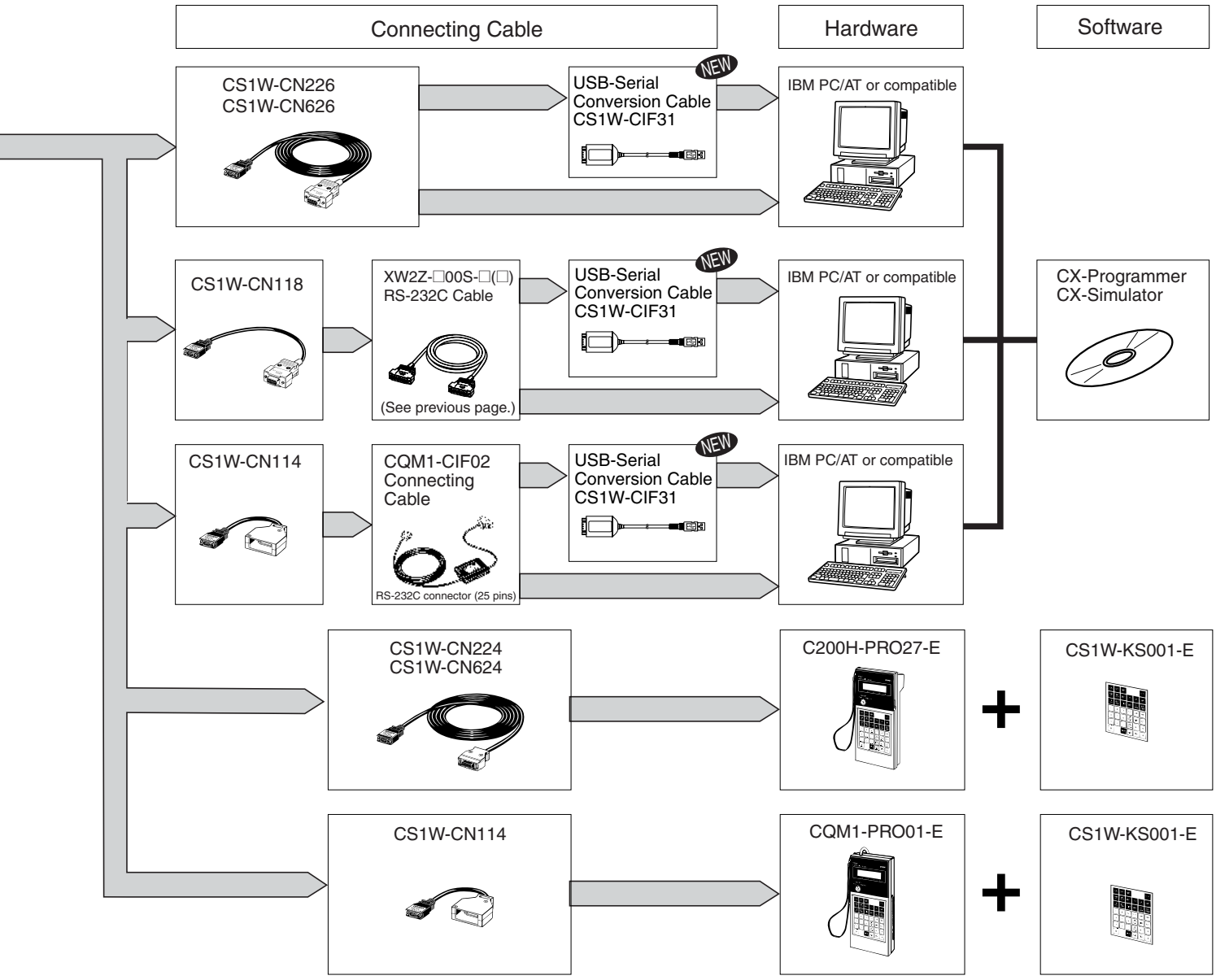


Connections to Programming Devices



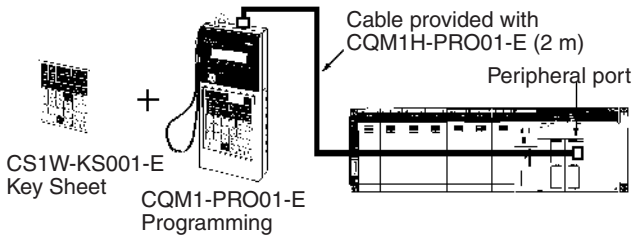
Note: 1. Refer to the next page for details of cables for connecting to computers. Choose the appropriate cable for the communications mode.

2. The following cables can be used for a Host Link connection (but not a peripheral bus connection):


Connecting Cable
Hardware
Software
CS1W-CN226
CS1W-CN626
USB-Serial Conversion Cable CS1W-CIF31
NEW
IBM PC/AT or compatible
CS1W-CN118
XW2Z-□00S-□(□) RS-232C Cable
(See previous page.)
USB-Serial Conversion Cable CS1W-CIF31
NEW
IBM PC/AT or compatible
CX-Programmer
CX-Simulator
CS1W-CN114
CQM1-CIF02 Connecting Cable
RS-232C connector (25 pins)
USB-Serial Conversion Cable CS1W-CIF31
NEW
IBM PC/AT or compatible
CS1W-CN224
CS1W-CN624
C200H-PRO27-E
CS1W-KS001-E
CS1W-CN114
CQM1-PRO01-E
CS1W-KS001-E

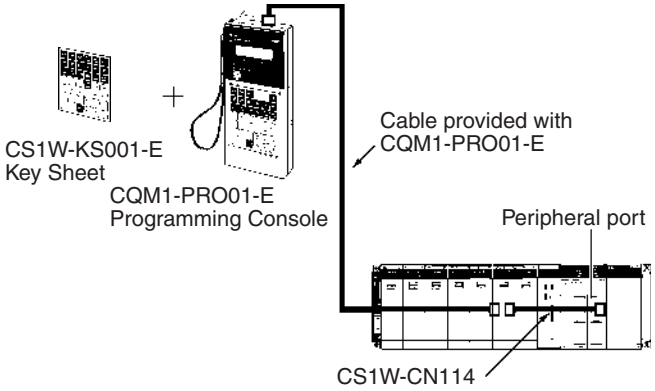
Programming Consoles

CQM1H-PRO01-E



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

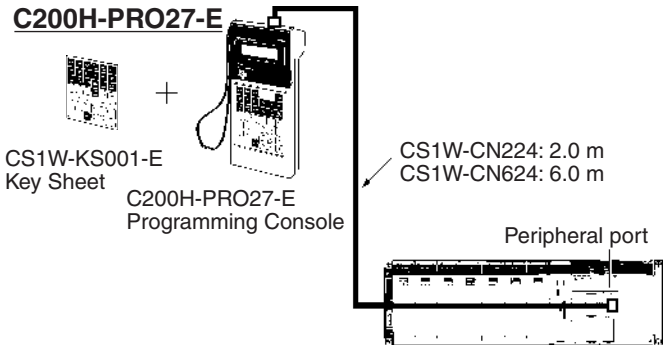
CQM1-PRO01-E (See note.)



Note: The above configuration is also possible for the C200H-PRO27-E with a Programming Console Cable, such as the C200H-CN222.

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

C200H-PRO27-E

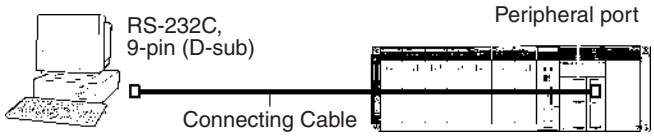


Model	Cable	Cable length
C200H-PR027-E	CS1W-CN224	2.0 m
	CS1W-CN624	6.0 m

Windows-based Programming Software: CX-Programmer

Name	Model		Specifications
CX-Programmer	WS02-CXPC1-EV□□	For 1 license	OS: Windows 95/98 or Windows NT/Me/ 2000/XP
	WS02-CXPC1-EL03-V□□	For 3 licenses	
	WS02-CXPC1-EL10-V□□	For 10 licenses	

Connecting to the Peripheral Port



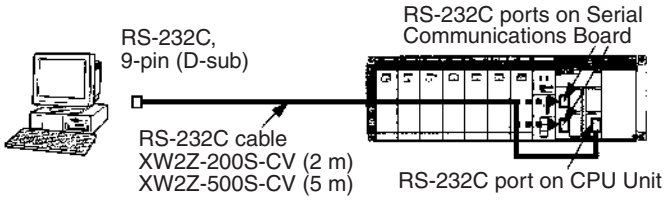
Peripheral Port Connecting Cables

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

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

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

Connecting to the RS-232C Port



RS-232C Port Connecting Cables

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

Note: Cables with model numbers ending in “CV” are antistatic.

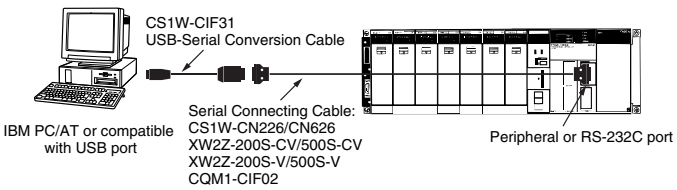
The following cables can be used for an RS-232C connection from the computer to an RS-232C port. (Unlike cables with model numbers ending in “-CV,” however, these cables do not support peripheral bus connection and do not have anti-static specifications.)

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

The following serial communications modes can be used to connect a computer with the CX-Programmer to a CS1 PLC.

Mode	Features
Peripheral bus	The faster mode, peripheral bus is generally used for CX-Programmer connections. Only 1:1 connections are possible. The baud rate is automatically detected with the CS1.
Host Link	A standard protocol for host computers. Slower than peripheral bus, but allows modem or optical adapter connections, or long-distance or 1:N connections via RS422A/485.

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



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

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

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.)	0.5 m + 2.0 m	
			XW2Z-500S-V (See note.)	0.5 m + 5.0 m	

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

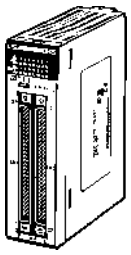
I/O Allocations

I/O Allocations

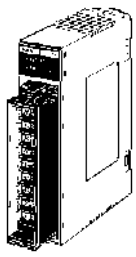
In CS1 PLCs, part of the I/O memory is allocated to each Unit. Units are divided into the following 3 groups for allocations.

- Basic I/O Units
- Special I/O Units
- CS1 CPU Bus Units

Basic I/O Units



CS1 Basic I/O Units



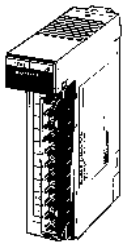
C200H Basic I/O Units

Allocations

CIO Area:
CIO 0000 to CIO 0319 (See Note 1.)
(Memory is allocated in word units in order of mounting position in the Racks.)

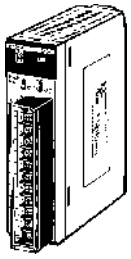
Note 1. The Rack's first word setting can be changed from the default setting (CIO 0000) to any word from CIO 0000 to CIO 9999. The first word setting can be changed only with a Programming Device other than a Programming Console.

2. The unit number setting on the front of C200H Group-2 High-density I/O Units is ignored. Words are allocated to these Units based on their location in the Rack.

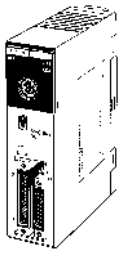


C200H Group-2 High-density I/O Units
(See Note 2.)

Special I/O Units



CS1 Special I/O Units



C200H Special I/O Units
(See Note 2.)

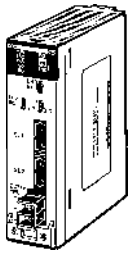
Allocations

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

Note 1. Although there are 96 unit number settings, a maximum of 80 Units can actually be mounted to a PLC because that is the maximum number of slots possible.

2. Some Units classified as I/O Units (namely C200H High-density I/O Units) are actually treated as Special I/O Units.

CS1 CPU Bus Units



CS1 CPU Bus Units

Allocations

CS1 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

Basic I/O Units include CS1 Basic I/O Units, C200H Basic I/O Units, and C200H Group-2 High-density I/O Units.

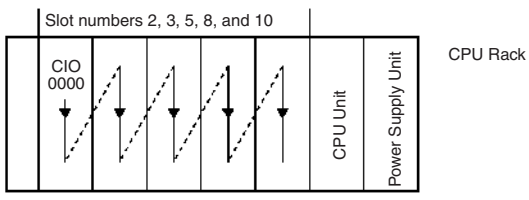
Allocated words in the CIO Area: CIO 0000 to CIO 0319

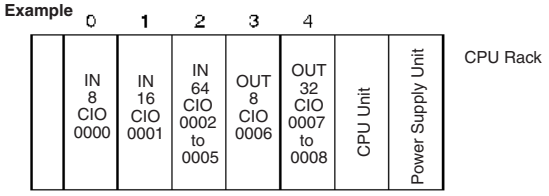
Basic I/O Units can be mounted to the CPU Rack, CS1 Expansion Racks, and C200HX/HG/HE Expansion I/O Racks.

Note: CS1 Basic I/O Units cannot be mounted to C200HX/HG/HE Expansion I/O Racks.

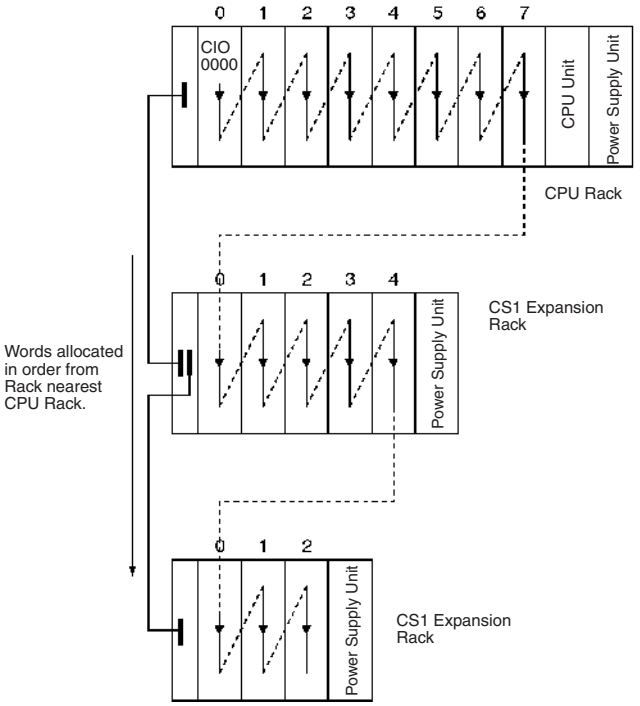
Allocation Methods

1. CPU Rack
Basic I/O Units on the CPU Rack are allocated words left to right; Units are allocated as many words as required in word units.

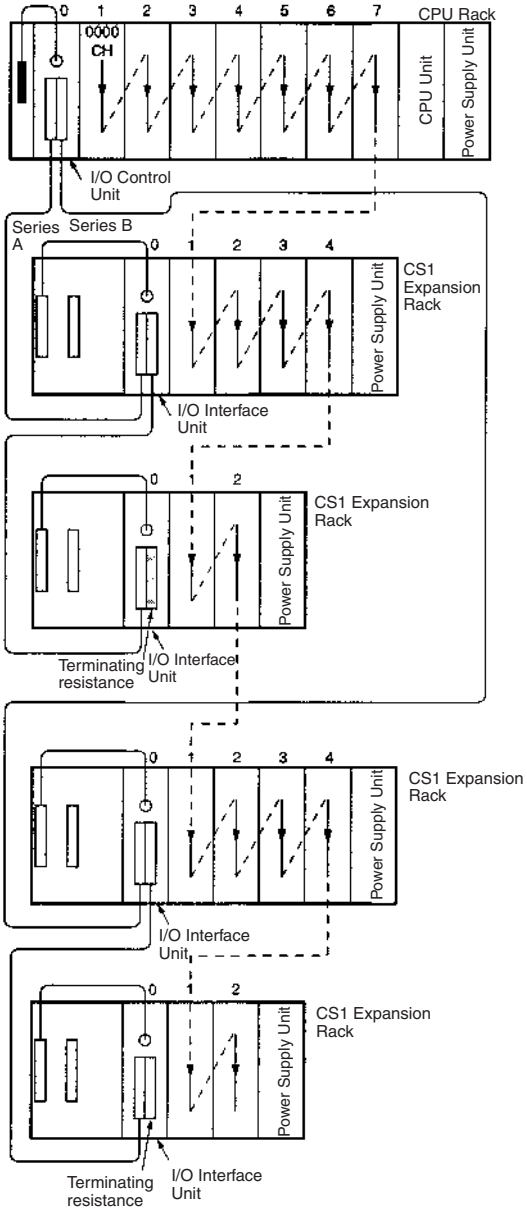




2. Allocations to CS1 Expansion and C200H Expansion I/O Racks
I/O allocations to Basic I/O Units continue from the CPU Rack to the Expansion Racks. Words are allocated from left to right and each Unit is allocated as many words as it requires in word units, just like Units in the CPU Rack.



3. CS1 Long-distance Expansion Racks
Words are allocated to series A and then series B. Otherwise, allocations are the same as for other Racks.



Allocations to Special I/O Units

Special I/O Units include CS1 Special I/O Units and C200H Special I/O Units.

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

Special /O Units can be mounted to the CPU Rack, CS1 Expansion Racks, and C200H Expansion I/O Racks. (See note.)

Note: CS1 Special I/O Units cannot be mounted to C200H Expansion I/O Racks.

Each Unit is allocated 10 words in the Special I/O Unit Area, as shown in the following table.

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

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

Allocations to CS1 CPU Bus Units

Each CS1 CPU Bus Unit is allocated 25 words in the CS1 CPU Bus Unit Area (CIO 1500 to CIO 1899).

CS1 CPU Bus Units can be mounted to the CPU Rack or CS1 Expansion Racks.

Each Unit is allocated 25 words in the CPU Bus Unit Area, as shown in the following table.

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

Note: CS1 CPU Bus Units are ignored during I/O allocation to Basic I/O Units. Slots containing CS1 CPU Bus Units are treated as empty slots.

Current Consumption

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

CPU Racks and Expansion Racks

The following table shows the maximum currents and power that can be supplied by Power Supply Units on CPU Racks and Expansion Racks (both CS1 Expansion Racks and C200H Expansion I/O Racks).

Note: 1. When calculating current/power consumption in a CPU Rack, be sure to include the power required by the CPU Backplane and CPU Unit themselves.

2. Likewise, be sure to include the power required by the Expansion Backplane itself when calculating current/power consumption in an Expansion Rack.

Power Supply Unit	Max. Current Consumption			Max. Total Power Consumption
	5-V group	26-V group	24-V group	
C200HW-PA204	4.6 A	0.6 A	None	30 W
C200HW-PA204S	4.6 A	0.6 A	0.8 A	30 W
C200HW-PA204R	4.6 A	0.6 A	None	30 W
C200HW-PD204	4.6 A	0.6 A	None	30 W
C200HW-PA209R	9 A	1.3 A	None	45 W

Be sure both Condition 1 and Condition 2 are met.

Condition 1: Maximum Current Supply

1. Current required at 5 V DC by all Units (A) ≤ Max. Current shown in table
2. Current required at 26 V DC by all Units (B) ≤ Max. Current shown in table
3. Current required at 24 V DC by all Units (C) ≤ Max. Current shown in table

Condition 2: Maximum Total Current Supply

1. A × 5 V DC + B × 26 V DC + C × 24 V DC ≤ Max. Power shown in table

Example Calculations

In this example, the following Units are mounted to a CPU Rack with a C200HW-PA204S Power Supply Unit.

Unit	Model	Quantity	5- V DC	26- V DC	24- V DC
CPU Backplane (8 slots)	CS1W-BC083	1	0.11 A	---	---
CPU Unit	CS1H-CPU67-EV1	1	1.10 A	---	---
Input Units	C200H-ID216	2	0.10 A	---	---
	CS1W-ID291	2	0.20 A	---	---
Output Units	C200H-OC221	2	0.01 A	0.075 A	---
Special I/O Unit	C200H-NC213	1	0.30 A	---	---
CPU Bus Unit	CS1W-CLK21	1	0.50 A	---	---
Service Power Supply Unit (24 V DC)		0.3 A used	---	---	0.3 A
Total current/power consumption 13.15+3.9+7.2 = 24.25 (≤30 W)			2.63 A (≤4.6) x 5 V = 13.15W	0.15 A (≤0.6A) x 26 V = 3.9 W	0.3 A (≤0.8A) x 24 V = 7.2 W

Current Consumption Tables

5- V DC Voltage Group

Name	Model	Consumption (A)
CPU Units (These values include current consumption by a Programming Console.)	CS1H-CPU67H	0.82 (See note.)
	CS1H-CPU66H	0.82 (See note.)
	CS1H-CPU65H	0.82 (See note.)
	CS1H-CPU64H	0.82 (See note.)
	CS1H-CPU63H	0.82 (See note.)
	CS1G-CPU45H	0.78 (See note.)
	CS1G-CPU44H	0.78 (See note.)
	CS1G-CPU43H	0.78 (See note.)
	CS1G-CPU42H	0.78 (See note.)
Loop Control Boards	CS1W-LCB01	0.22 (See note.)
	CS1W-LCB05	0.22 (See note.)
Serial Communication Boards	CS1W-SCB21	0.28 (See note.)
	CS1W-SCB41	0.36 (See note.)
CPU Backplanes (for CS1 Units only)	CS1W-BC022	0.11
	CS1W-BC032	0.11
	CS1W-BC052	0.11
	CS1W-BC082	0.11
	CS1W-BC102	0.11
CPU Backplanes	CS1W-BC023	0.11
	CS1W-BC033	0.11
	CS1W-BC053	0.11
	CS1W-BC083	0.11
	CS1W-BC103	0.11
I/O Control Unit	CS1W-IC102	0.92
CS1 Expansion Backplanes (for CS1 Units only)	CS1W-BI032	0.23
	CS1W-BI052	0.23
	CS1W-BI082	0.23
	CS1W-BI102	0.23
CS1 Expansion Backplanes	CS1W-BI033	0.23
	CS1W-BI053	0.23
	CS1W-BI083	0.23
	CS1W-BI103	0.23
I/O Interface Unit	CS1W-II102	0.23
C200H Expansion I/O Backplanes	C200HW-BI031	0.15
	C200HW-BI051	0.15
	C200HW-BI081-V1	0.15
	C200HW-BI101-V1	0.15

Note: Add 0.15 A per port when the NT-AL001-E is connected.

Basic I/O Units

Category	Name	Model	Consumption (A)
C200H Input Units	DC Input Units	C200H-ID211	0.01
		C200H-ID212	0.01
	AC Input Units	C200H-IA121	0.01
		C200H-IA122	0.01
		C200H-IA122V	0.01
		C200H-IA221	0.01
		C200H-IA222	0.01
		C200H-IA222V	0.01
C200H Input Units	AC/DC Input Units	C200H-IM211	0.01
		C200H-IM212	0.01
	B7A Interface Units	C200H-B7AI1	0.10
		C200H-B7A12	0.10
	Interrupt Input Unit	C200HS-INT01	0.02
C200H Group-2 High-density Input Units	DC Input Units	C200H-ID216	0.10
		C200H-ID217	0.12
		C200H-ID218	0.10
		C200H-ID219	0.12
		C200H-ID111	0.12
CS1 Input Units	DC Input Units	CS1W-ID211	0.10
		CS1W-ID231	0.15
		CS1W-ID261	0.15
		CS1W-ID291	0.20
	AC Input Units	CS1W-IA111	0.11
		CS1W-IA211	0.11
	Interrupt Input Unit	CS1W-INT01	0.10
	High-speed Input Unit	CS1W-IDP01	0.10
	Safety Relay Unit	CS1W-SF200	0.10

Category	Name	Model	Consumption (A)
C200H Output Units	Relay Output Units	C200H-OC221	0.01
		C200H-OC222	0.01
		C200H-OC222N	0.008
		C200H-OC225	0.05
		C200H-OC226N	0.03
		C200H-OC223	0.01
		C200H-OC224	0.01
		C200H-OC224N	0.01
	Transistor Output Units	C200H-OD411	0.14
		C200H-OD213	0.14
		C200H-OD214	0.14
		C200H-OD216	0.01
		C200H-OD211	0.16
		C200H-OD217	0.01
		C200H-OD212	0.18
		C200H-OD21A	0.16
	B7A Interface Units	C200H-B7A01	0.10
		C200H-B7A02	0.10
	Triac Output Units	C200H-OA223	0.18
		C200H-OA222V	0.20
		C200H-OA224	0.27
CS1 Output Units	Relay Output Units	CS1W-OC201	0.10
		CS1W-OC211	0.13
	Transistor Output Units	CS1W-OD211	0.17
		CS1W-OD212	0.17
		CS1W-OD231	0.27
		CS1W-OD232	0.27
		CS1W-OD261	0.39
		CS1W-OD262	0.39
		CS1W-OD291	0.18
		CS1W-OD292	0.18
	Triac Output Units	CS1W-OA201	0.23 max. (0.07+0.02× No. of points ON)
		CS1W-OA211	0.406 max. (0.07+0.021×No. of points ON)
C200H Group-2 High-density Output Units	Transistor Output Units	C200H-OD218	0.27
		C200H-OD21B	0.48
		C200H-OD219	0.48
CS1 I/O Units	DC Input/Transistor Output Units	CS1W-MD261	0.27
		CS1W-MD262	0.27
		CS1W-MD291	0.35
		CS1W-MD292	0.35
	TTL I/O Unit	CS1W-MD561	0.27
C200H I/O Units	B7A Interface Units	C200H-B7A21	0.10
		C200H-B7A22	0.10
	Analog Timer Unit	C200H-TM001	0.06

Special I/O Units

Category	Name	Model	Consumption (A)
C200H High-density I/O Units (Special I/O Units)	DC Input Unit	C200H-ID215	0.13
	TTL Input Unit	C200H-ID501	0.13
	Transistor Output Unit	C200H-OD215	0.22
	TTL Output Unit	C200H-OD501	0.22
	TTL I/O Unit	C200H-MD501	0.18
	DC Input Transistor Output Unit	C200H-MD215	0.18
		C200H-MD115	0.18
C200H Special I/O Units	Temperature Control Units	C200H-TC001	0.33
		C200H-TC002	0.33
		C200H-TC003	0.33
		C200H-TC101	0.33
		C200H-TC102	0.33
		C200H-TC103	0.33
	Heat/Cool Temperature Control Units	C200H-TV001	0.33
		C200H-TV002	0.33
		C200H-TV003	0.33
		C200H-TV101	0.33
		C200H-TV102	0.33
		C200H-TV103	0.33
	Temperature Sensor Units	C200H-TS001	0.45
		C200H-TS002	0.45
		C200H-TS101	0.45
		C200H-TS102	0.45
C200H Special I/O Units	PID Control Units	C200H-PID01	0.33
		C200H-PID02	0.33
		C200H-PID03	0.33
	Cam Positioner Unit	C200H-CP114	0.30
	ASCII Units	C200H-ASC02	0.20
		C200H-ASC11	0.25
		C200H-ASC21	0.30
		C200H-ASC31	0.30
	Analog Input Units	C200H-AD001	0.55
		C200H-AD002	0.45
		C200H-AD003	0.10
	Analog Output Units	C200H-DA001	0.65
		C200H-DA002	0.60
		C200H-DA003	0.10
		C200H-DA004	0.10
	Analog I/O Units	C200H-MAD01	0.10
	High-speed Counter Units	C200H-CT001-V1	0.30
		C200H-CT002	0.30
		C200H-CT021	0.45
	Motion Control Unit	C200H-MC221	0.65 (w/Teaching Box: 0.85)
		C200HW-MC402-E	0.60
	Position Control Units	C200HW- NC113	0.30
		C200HW-NC213	0.30
		C200HW-NC413	0.50
	ID Sensor Units	C200H-IDS01-V1	0.25
		C200H-IDS21	0.25
	Fuzzy Logic Unit	C200H-FZ001	0.30
	Voice Unit	C200H-OV001	0.30
	DeviceNet Master Unit	C200HW-DRM21-V1	0.25
	DeviceNet I/O Link Unit	C200HW-DRT21	0.25
	CANopen Unit	C200HW-CORT21-V1	0.25
	PROFIBUS-DP Master Unit	C200HW-PRM21	0.60
	PROFIBUS-DP I/O Link Unit	C200HW-PRT21	0.25
	CompoBus/S Master Unit	C200HW-SRM21-V1	0.15
	PC Link Unit	C200H-LK401	0.35

Category	Name	Model	Consumption (A)
CS1 Special I/O Unit	Analog Input Unit	CS1W-AD□□□	0.13
	Analog Output Unit	CS1W-DA□□□	0.13
	Analog I/O Unit	CS1W-MAD44	0.20
	Isolated Thermocouple Input Unit	CS1W-PTS01	0.15
		CS1W-PTS11	0.12
	Isolated Temperature-resistance Thermometer Input Unit	CS1W-PTS02	0.15
		CS1W-PTS12	0.12
	Isolated Temperature-resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	0.15
	Isolated Two-wire Transmission Device Input Unit	CS1W-PTW01	0.15
	Isolated DC Input Unit	CS1W-PDC01	0.15
		CS1W-PDC11	0.12
	Isolated Pulse Input Unit	CS1W-PPS01	0.20
	Isolated Control Output Unit	CS1W-PMV01	0.15
	Power Transducer Input Unit	CS1W-PTR01	0.15
	100-mV DC Input Unit	CS1W-PTR02	
	Motion Control Units	CS1W-MC221	0.60 (w/Teaching Box: 0.80 A)
		CS1W-MC421	0.70 (w/Teaching Box: 1.00 A)
		CS1W-MCH71	0.8
	Position Control Units	CS1W-NC113/ 133	0.25
		CS1W-NC213/ 233	
		CS1W-NC413/ 433	0.36
	High-speed Counter Units	CS1W-CT021	
		CS1W-CT041	0.45
		CS1W-CTS21	0.32
	SSI Input Unit	CS1W-CTS21	
	Customizable Counter Units	CS1W-HCP22-V1	0.80
		CS1W-HCA12-V1 CS1W-HCA22-V1	0.75
		CS1W-HIO01-V1	0.60
	GP-IB Interface Unit	CS1W-GPI01	0.26
	RFID Sensor Unit	CS1W-V600C11	0.26
		CS1W-V600C12	0.32

CS1 CPU Bus Units

Category	Name	Model	Consumption (A)
CS1 CPU Bus Units	Loop Control Unit	CS1W-LC001	0.36
	Controller Link Units	CS1W-CLK52-V1	0.65
		CS1W-CLK21-V1	0.33
		CS1W-CLK12-V1	0.52
	SYSMAC LINK Unit	CS1W-SLK21	0.48
		CS1W-SLK11	0.47
	Serial Communications Unit	CS1W-SCU21	0.29 (See Note.)
	Ethernet Unit	CS1W-ETN01/11/21	0.40
	DeviceNet Unit	CS1W-DRM21	0.29
	PROFIBUS-DP Master Unit	CS1W-PRM21	0.40

Note: Add 0.15 A per port when the NT-AL001-E is connected.

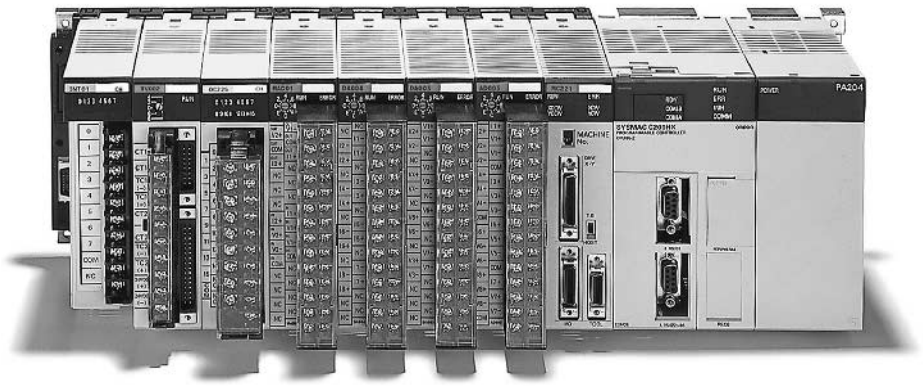
26-V Current Consumption

Category	Name	Model	Consumption (A)
C200H Output Units	Relay Output Units	C200H-OC221	0.075 for 8 points ON at the same time
		C200H-OC222	
		C200H-OC223	
		C200H-OC224	
		C200H-OC225	
		C200H-OC222N	0.09 for 8 points ON at the same time
		C200H-OC226N	
		C200H-OC224N	
	Transistor Output Units	C200H-OD216	0.075 for 8 points ON at the same time
		C200H-OD217	
CS1 Output Units	Relay Output Units	CS1W-OC201	0.006 for each point ON at the same time
		CS1W-OC211	
C200H Special I/O Units	Analog Input Unit	C200H-AD003	0.10
	Analog Output Units	C200H-DA003	0.20
		C200H-DA004	0.25
	Analog I/O Unit	C200H-MAD01	0.20
	ID Sensor Units	C200H-IDS01-V1	0.12
		C200H-IDS21	0.12
CS1 Special I/O Units	Analog Input Unit	CS1W-AD□□□-V1	0.10
	Analog Output Units	CS1W-DA041	0.18
		CS1W-DA08V	0.18
		CS1W-DA08C	0.25
	Analog I/O Unit	CS1W-MAD44	0.20
	Isolated Thermocouple Input Unit	CS1W-PTS01	0.15
		CS1W-PTS11	0.08
	Isolated Temperature- resistance Thermometer Input Unit	CS1W-PTS02	0.15
		CS1W-PTS12	0.07
	Isolated Temperature- resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	0.15
	Isolated Two-wire Transmission Device Input Unit	CS1W-PTW01	0.16
	Isolated DC Input Unit	CS1W-PDC01	
		CS1W-PDC11	0.12
	Isolated Pulse Input Unit	CS1W-PPS01	0.16
	Isolated Control Output Unit	CS1W-PMV01	
	Power Transducer Input Unit	CS1W-PTR01	0.08
	100-mV DC Input Unit	CS1W-PTR02	
	Customizable Counter Unit	CS1W-HCA22	0.15
	RFID Sensor Unit	CS1W-V600C1□	0.12

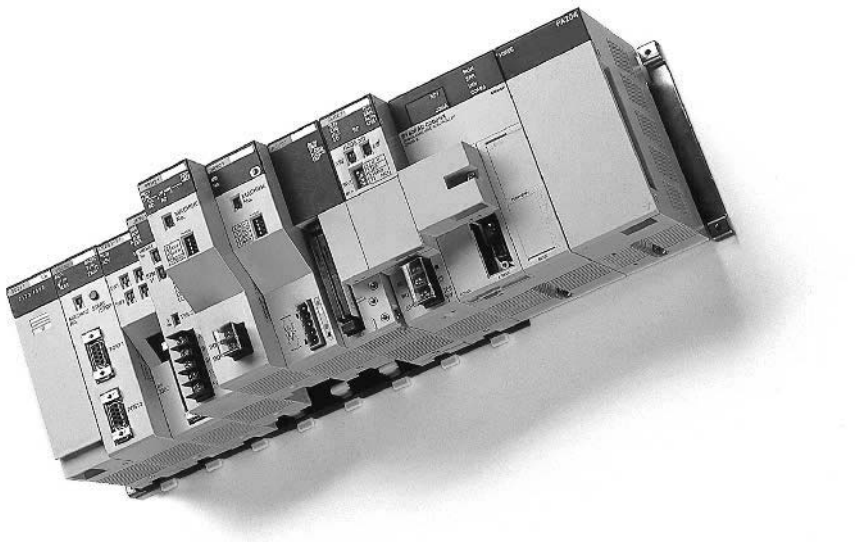
C200H□-CPU□□-E

C200H-series CPU units

SYSMAC HX/HG/HE PLCs with Information Control Functions for More "Intelligent" Production Lines

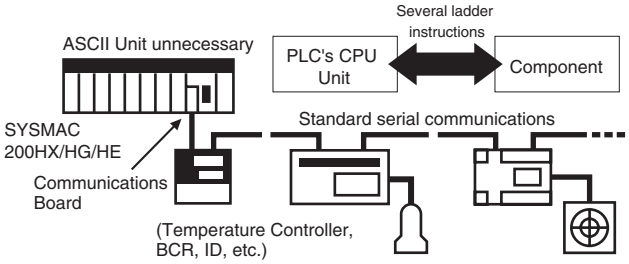


- Simple serial connections for Higher Development Efficiency
  - Built-in protocol macro function
- Special I/O Units
  - 2- or 4-axis Motion Control Unit, Controller Link Unit, CompoBus/S Unit, DeviceNet Unit, PROFIBUS-DP Units, Eight-point Analog I/O Unit, etc.
- SYSMAC C200HX/HG/HE-ZE with Increased Memory Capacity and Instructions Added to the Line-up.
  - Memory capacity up to 63.2 kWords (C200HX-CPU65/85-ZE).
  - EM Area up to 16 banks of 6 kWords each (C200HX-CPU85-ZE).
  - More than 70 types of symbolized compare and arithmetic instructions added.
  - Direct designation possible for one bank of the EM Area.



A Built-in Protocol Macro Function

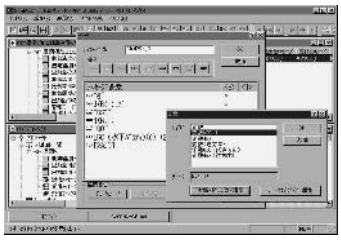
The SYSMAC C200HX/HG/HE PLCs are equipped with the Protocol Macro function that incorporates communications programs into the ladder program using only a few ladder instructions. This function allows data communications with measurement devices and peripheral devices. A variety of workplace data can be processed in real time improving product quality and reducing total product cost. System development time can be reduced substantially.



Note: An optional Communications Board (C200HW-COM04-E/05-E/06-EV1) is required to use the Protocol Macro function.

Windows-based Protocol Support Software

Protocol macro instructions can be customized with the CX-Protocol Protocol Support Software. This makes it easy to modify standard-equipped protocols and and register them for use anytime.



Improved Special I/O Units

The number of Special I/O Units that can be mounted on the CPU Unit has been increased from 10 max. to 16 max. to take further advantage of the capabilities of the C200HX/HG PLCs. The controlled system can be managed easily with the right combination of Special I/O Units. The INTELLIGENT I/O READ and INTELLIGENT I/O WRITE instructions can be executed to transfer more than one word of data. All of the Special I/O Units compatible with the C200HS can be used as they are. In addition, a PC Card Unit, Motion Control Unit, and Eight-point Analog I/O Unit have been added. The SYSMAC C200HX/HG/HE PLCs are becoming increasingly powerful and user-friendly.

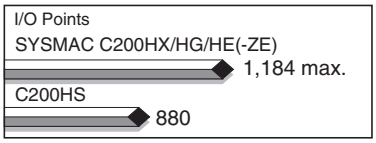
Note: There are restrictions on the Units that can be used.

Additional Basic PLC Functions

The SYSMAC C200HX/HG/HE PLCs offer improved basic functions and performance such as memory capacity and processing speed. This reinforces their use as machine controllers, and also lets you respond more flexibly to advanced information applications on the production floor.

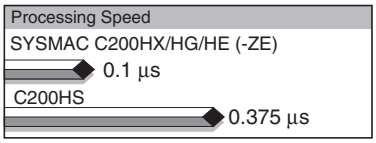
A Large Increase in I/O Points

The number of I/O points has been increased from 640 to 1,184. This is a maximum of 1.4 times as many I/O points as the SYSMAC C200HS, and gives you an extra margin of control.



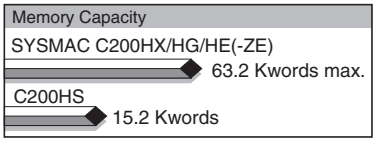
Faster Processing

Basic instructions are processed in 0.1 µs. Compared with the SYSMAC C200HS, processing speed is a maximum of 3.75 times faster. Faster processing shortens production throughput and results in increased productivity.



Larger Memory Capacity

The SYSMAC C200HX/HG/HE PLCs provide 3.2 to 63.2 kWords of program memory and 4 to 24 kWords of data memory. Compared with the SYSMAC C200HS, capacity is a maximum of 2 to 4 times greater. This level of capacity makes it easy to handle even large programs.



More Banks in the EM Area

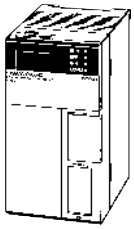
The maximum of three banks in previous models has been increased to a maximum of 16 (using the C200HX-CPU85-ZE). In the SYSMAC C200HX/HG/HE-ZE, one of those banks can be directly designated. Combined with the conventional 6 kWords of data memory, this allows direct use of 12 kWords.

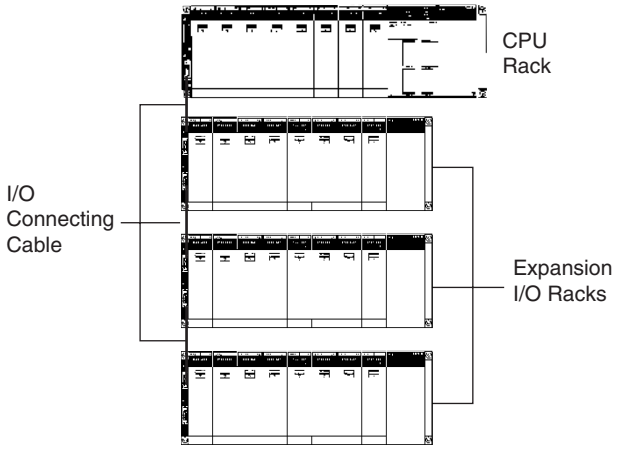
System Configuration

Basic Configuration

Two or three* Expansion I/O Racks can be connected to the CPU Rack for the SYSMAC C200HX, C200HG, and C200HE.

Note: Only for the C200HG-CPU53/63(-ZE) and C200HX-CPU54/64/65/85(-ZE).





Model	Program capacity (words)	DM (words)	EM (words)	Basic instruction processing time	No of I/O points	Max. no. of connecting Expansion I/O Racks	Max. no. of connecting High-density I/O Units (Group-2)*		Max. no. of connecting Special I/O Units*		RS-232C	Clock function	Availability of Communications Board
							Units that are allocated memory for 1 Unit	Units that are allocated memory for 2 Units	Units that are allocated memory for 1 Unit	Units that are allocated memory for 2 Units			
C200HE-CPU11(-Z)E	3.2K	4K	None	0.3 µs min.	640	2	Unavailable	Unavailable	10	5	No	No	No
C200HE-CPU32(-Z)E	7.2K	6K	None	0.3 µs min.	880	2	10	5	10	5	No	Yes	Yes
C200HE-CPU42(-Z)E	7.2K	6K	None	0.3 µs min.	880	2	10	5	10	5	Yes	Yes	Yes
C200HG-CPU33(-Z)E	15.2K	6K	6K	0.15 µs min.	880	2	10	5	10	5	No	Yes	Yes
C200HG-CPU43(-Z)E	15.2K	6K	6K	0.15 µs min.	880	2	10	5	10	5	Yes	Yes	Yes
C200HG-CPU53(-Z)E	15.2K	6K	6K	0.15 µs min.	1,184	3	16	8	16	8	No	Yes	Yes
C200HG-CPU63(-Z)E	15.2K	6K	6K	0.15 µs min.	1,184	3	16	8	16	8	Yes	Yes	Yes
C200HX-CPU34(-Z)E	31.2K	6K	6K x 3 banks (18K)	0.1 µs min.	880	2	10	5	10	5	No	Yes	Yes
C200HX-CPU44(-Z)E	31.2K	6K	6K x 3 banks (18K)	0.1 µs min.	880	2	10	5	10	5	Yes	Yes	Yes
C200HX-CPU54(-Z)E	31.2K	6K	6K x 3 banks (18K)	0.1 µs min.	1,184	3	16	8	16	8	No	Yes	Yes
C200HX-CPU64(-Z)E	31.2K	6K	6K x 3 banks (18K)	0.1 µs min.	1,184	3	16	8	16	8	Yes	Yes	Yes
C200HX-CPU65-ZE	63.2K	6K	6K x 8 banks (48K)	0.1 µs min.	1,184	3	16	8	16	8	Yes	Yes	Yes
C200HX-CPU85-ZE	63.2K	6K	6K x 16 banks (96K)	0.1 µs min.	1,184	3	16	8	16	8	Yes	Yes	Yes

Note: There are restrictions on the number of High-density I/O Units and Special I/O Units that can be mounted per CPU Unit. When mounting, the unit number for each of the Units is set using the rotary switches on the front of the Units. When mounting 16 Units to a CPU Unit (to which 16 Units can be mounted), unit numbers are set from 0 to F. When mounting 10 Units to a CPU Unit (to which 10 Units can be mounted), unit numbers are set from 0 to 9; they cannot be set from A to F. When mounting 16 Units to a CPU Unit (to which 16 Units can be mounted), unit numbers can be set from 0 to F for the following Units:

Special I/O Units
Analog Units: C200H-AD002, C200H-AD003, C200H-DA002, C200H-DA003, and C200H-DA004
High-speed Counter Unit: C200H-CT021
Position Control Unit: C200H-NC211 (allocated memory for 2 Units)
MC Unit: MC221 (allocated memory for 2 Units)

High-density I/O Units (Group-2)
32-point Units: C200H-ID216 and C200H-OD218
64-point Units: C200H-ID111, C200H-ID217, and C200H-OD219 (allocated memory for 2 Units)

With Units other than those listed above, the unit number can only be set in the range 0 to 9 and so only the memory corresponding to these unit numbers can be allocated. Even with CPU Units to which 16 Units can be mounted, the unit number cannot be set up to 16 if a Unit such as the C200H-ID215 Input Unit is used, and so if only this Unit is used, it is not possible to mount 16 Units to the CPU Unit. With Units that are allocated memory for 2 Units, 2 unit numbers are allocated per Unit (i.e., 0, 2, 4, etc.). For example, although 16 Units can normally be mounted to the C200HX-CPU64, if only MC Units are used, the maximum number of mountable Units is 8. When used in combination with 12 C200H-AD003 Analog Units, although 4 High-speed Counter Units can be mounted, only 2 MC Units can be mounted. The unit number is set for the C200-B7A@2 B7A Unit in the same way as for a High-density I/O Unit (Group-2).

Power Supply Unit

Model	Supply voltage	Comments
C200HW-PA204	100 to 120 V AC 200 to 240 V AC	---
C200HW-PA204S	100 to 120 V AC 200 to 240 V AC	With 24- V DC service power supply
C200HW-PA204R*	100 to 120 V AC 200 to 240 V AC	With output contacts during operation
C200HW-PD024	24 V DC	---

*There are restrictions on the CPU Units or Backplanes with which the C200HW-PA204R and C200HW-PA209R Power Supply Units can be used. Refer to the following tables for details.

Model Legend

□□□□

Year (Example: 1997: 7)
Month (January to September: 1 to 9; October to December: X to Z)
Day (01 to 31)

CPU Units that Support C200HW-PA204R

Model	Serial number	
	Made in Japan	Made in Netherlands
C200HX-CPU64-E	Beginning with 20Z6	Beginning with 0147
C200HX-CPU54-E	Beginning with 2817	
C200HX-CPU44-E	Beginning with 19Z6	
C200HX-CPU34-E	Beginning with 2417	
C200HG-CPU63-E	Beginning with 25Z6	
C200HG-CPU53-E	Beginning with 0817	
C200HG-CPU43-E	Beginning with 19Z6	
C200HG-CPU33-E	Beginning with 1017	
C200HE-CPU42-E	Beginning with 20Z5	
C200HE-CPU32-E	Beginning with 19Z6	
C200HE-CPU11-E	Beginning with 20Z6	

CPU Backplanes that Support C200HW-PA204R

Model	Serial number	
	Made in Japan	Made in Netherlands
C200HW-BC031	Beginning with 0617	Beginning with 0147
C200HW-BC051	Beginning with 19Z6	
C200HW-BC081	Beginning with 24Z6	
C200HW-BC101	Beginning with 20Z6	

CPU Backplane

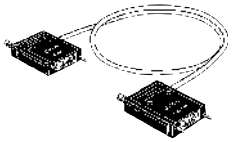
Model	No. of I/O slots
C200HW-BC031	3
C200HW-BC051	5
C200HW-BC081	8
C200HW-BC101	10

I/O Backplane

The I/O Backplane is used to mount Expansion I/O Racks. (See page ntlp.) Four models are available, each with a different number of I/O slots.

Model	No. of I/O slots
C200HW-BI031	3
C200HW-BI051	5
C200HW-BI081	8
C200HW-BI101	10

I/O Connecting Cable



These cables are used to connect a CPU Unit to an Expansion I/O Rack, or to connect two Expansion I/O Racks. Select cables from among the following five types, and use them in combination when necessary. The total cable length must be within 12 m.

Model	Length
C200H-CN311	30 cm
C200H-CN711	70 cm
C200H-CN221	2 m
C200H-CN521	5 m
C200H-CN131	10 m

Communications Board

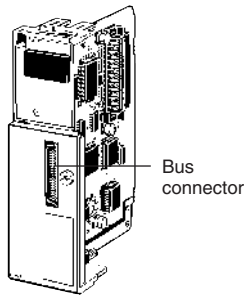
Communications Board

By mounting an appropriate type of Communications Board to an optical slot of the CPU Unit, the CPU Unit can communicate with the SYSMAC LINK Unit Programmable Terminal, Temperature Controller, personal computer, barcode reader, or any other peripheral device via RS-232C, RS-422, or RS-485.

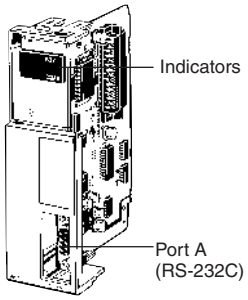
Model	Specifications
C200HW-COM01	Communications port for Controller Link, SYSMAC LINK Units
C200HW-COM02-V1	One RS-232C port
C200HW-COM03-V1	One RS-422/485 port
C200HW-COM04-EV1	Communications port for the Controller Link, SYSMAC LINK Units, one RS-232C port, and a protocol macro function
C200HW-COM05-EV1	Two RS-232C ports and a protocol macro function
C200HW-COM06-EV1	One RS-422/485 port, one RS-232C port, and a protocol macro function

Models Available

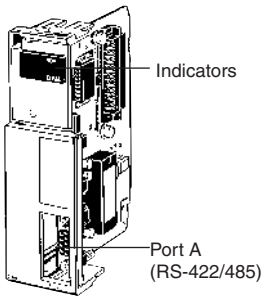
The following Communications Board models are available.



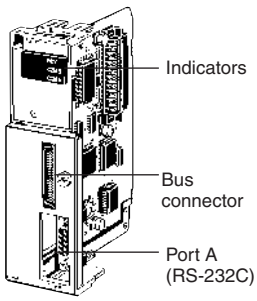
C200HW-COM01



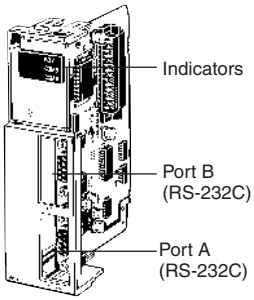
C200HW-COM02-V1



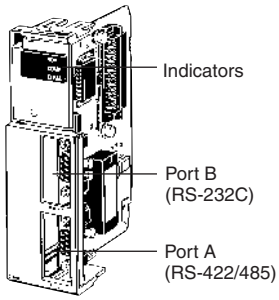
C200HW-COM03-V1



C200HW-COM04-EV1



C200HW-COM05-EV1



C200HW-COM06-EV1

PMCR Ladder Instructions Let You Easily Exchange Data between Peripheral Devices

Protocol Macro Function

Summary

The protocol macro consists of PMCR ladder instructions for communications sequences used to exchange data with a variety of peripheral devices connected to the RS-232C or RS-422/485 port.

Supported Communications Sequences

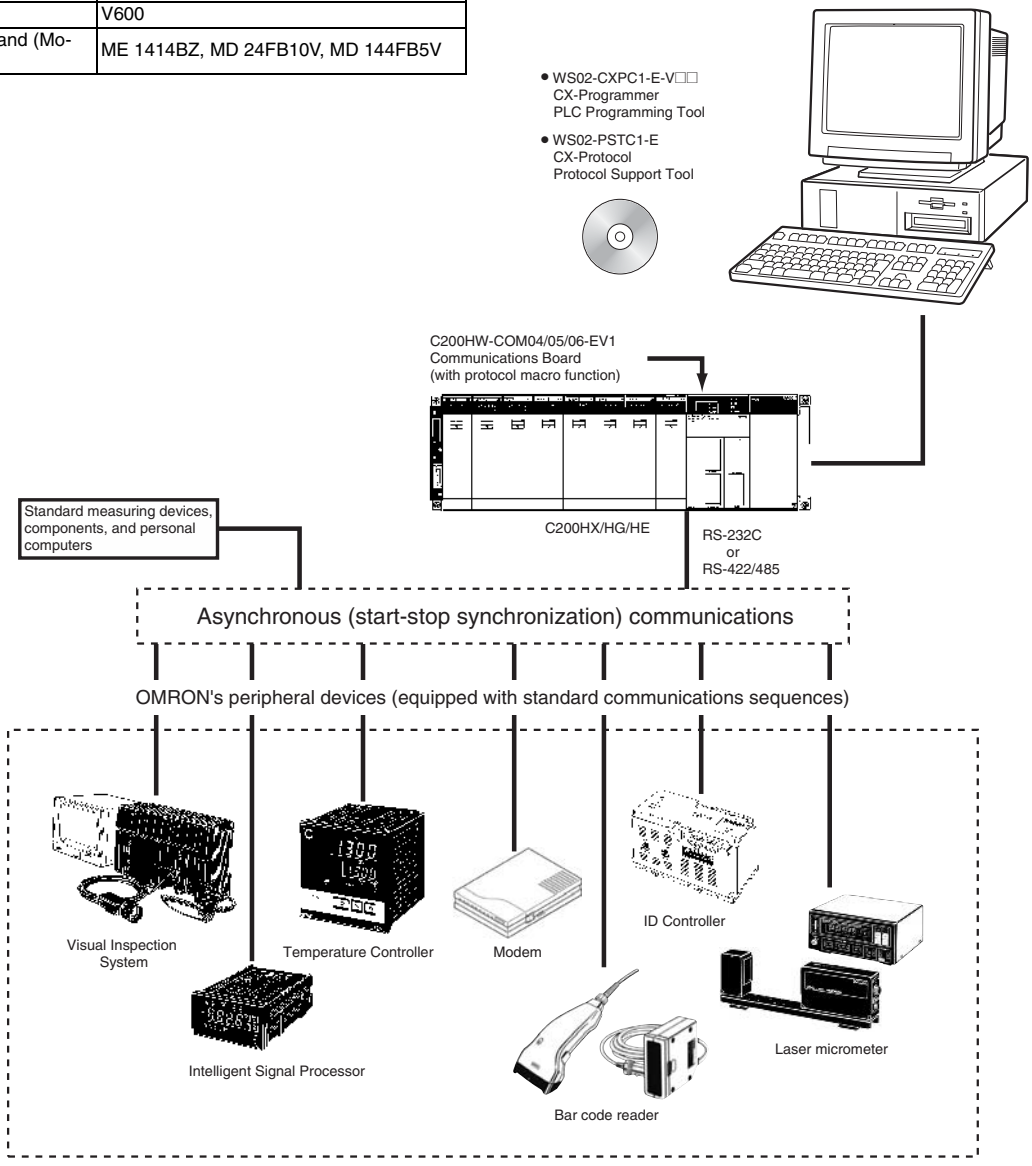
The Protocol Support Software and Communications Boards (i.e., the C200HW-COM04-EV1, C200HW-COM05-EV1, and C200HW-COM06-EV1) support the following seven types of standard communications sequences. Communications sequences other than those listed below can be created using the Windows-based CX-Protocol Protocol Support Software (purchased separately).

	Sequence	Model No.
1	Temperature Controller	E5□J, E5□K, ES100□, E5ZE
2	Intelligent Signal Processor	K3TH, K3TR, K3TX, K3TC
3	Bar Code Reader	V500, V520
4	Laser Micrometer	3Z4L
5	Visual Inspection System	F200, F300, F350
6	ID Controller	V600
7	Hayes AT Command (Modem)	ME 1414BZ, MD 24FB10V, MD 144FB5V

Improved Communications Board Functions (-V1 Models)

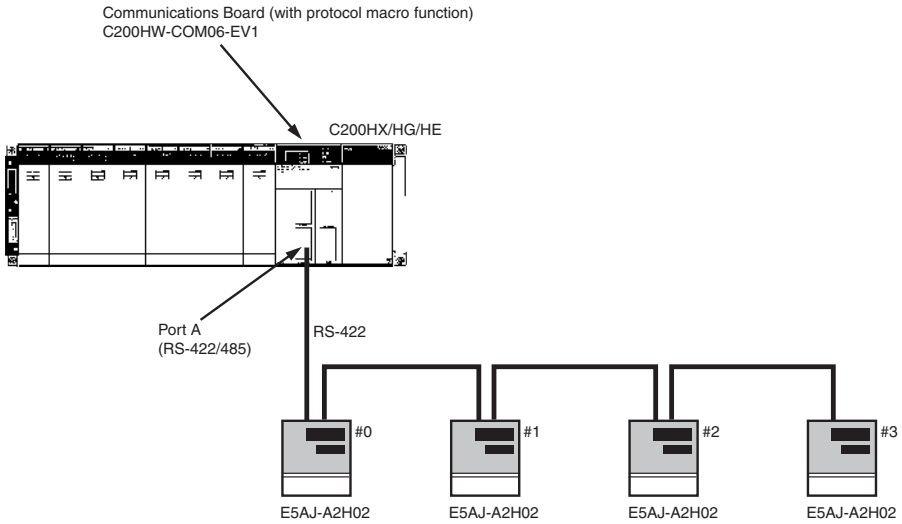
The following functions have been added to C200HW-COM0□V1 Communications Boards.

- SUM2 (2's complement of SUM) and CRC-16 are added as error check codes.
- Repeat counter N's current value, Sequence End Completion Flag, and Sequence Abort Completion Flag are added to the Auxiliary Area.
- A check code can be located after the terminator as an additional message item.
- Possible to swap between the leftmost and rightmost bytes of error check codes.



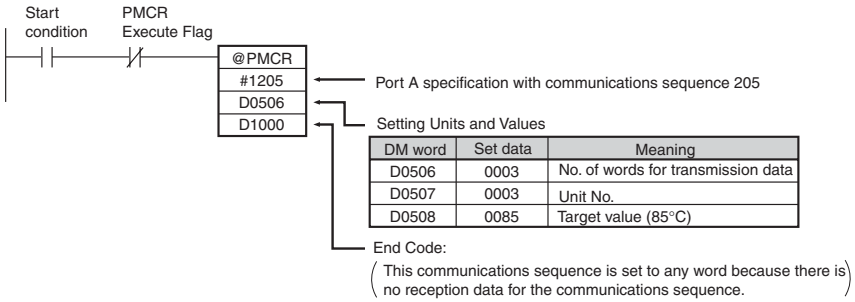
E5AJ Temperature Controller Connection Example

Connections



Program Example

In this example, the E5AJ is set to a target value.



DM word	Set data	Meaning
D0506	0003	No. of words for transmission data
D0507	0003	Unit No.
D0508	0085	Target value (85°C)

Examples of Sequences Available

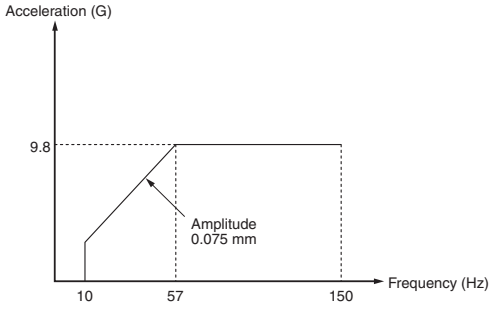
Sequence number	Communications sequence name	Function
200	Remote mode select	Sets the Unit to remote mode.
201	Local mode select	Sets the Unit to local mode.
202	Backup mode select	Changes target value write mode into backup mode.
203	RAM write mode select	Changes target value write mode into RAM write mode.
204	Target value save	Saves the target value.
205	Set value write 1	Writes the target value, alarm value 1, alarm value 2, and heater burnout alarm value all together.
206	Set value write 2	Writes the proportional band, integral time, and derivative time all together.
207	Input compensation value write	Writes the input compensation value.
208	Set value read 1	Reads the target value, alarm value 1, alarm value 2, and heater burnout alarm value all together.
209	Set value read 2	Reads the proportional band, integral time, and derivative time all together.
210	Input compensation value read	Reads the input compensation value in the IOM.
211	Output read	Reads and saves the output in the IOM.
212	Process value read	Reads and saves the process value in the IOM.
213	Target value limit read	Reads and saves the target value limit in the IOM.
214	Heater current read	Reads and saves the heater current in the IOM.
215	Initial status read	Reads and saves the initial status in the IOM.
216	General-purpose write	Writes the designated set value by setting the header code.
217	General-purpose read	Reads the designated set value by setting the header code.

General Specifications

Item	Specifications
Supply voltage	AC power supply:100 to 120/200 to 240 V AC selectable 50/60 Hz DC power supply:24 V DC
Operating voltage range	AC power supply:85 to 132/170 to 264 V AC DC power supply:19.2 to 28.8 V DC
Power consumption	AC power supply:120 VA max. DC power supply:50 W max.
Surge current	30 A max.
Output capacity	4.6 A, 5 V DC; 0.6 A, 26 V DC; <0.3 A: $^{+17\%}/_{-11\%}$/≥0.3 A: $^{+10\%}/_{-11\%}$ 24 V DC$^{+10\%}/_{-20\%}$ (C200HW-PA204S only)
Operation output	SPST-NO, 1 A at 250 V AC/24 V DC (Only the C200HW-PA204R has terminal output.)
Insulation resistance	20 MΩ between AC terminals and the GR terminal at 500 V DC (see note 1)
Dielectric strength	2,300 V AC at 50/60 Hz for 1 minute between AC terminals and housing; 1,000 V AC at 50/60 Hz for 1 minute between DC terminals and housing. Leakage current: 10 mA max. (see note 1)
Noise immunity	Conforms to IEC61000-4-4, 2 kV (power lines)
Vibration	10 to 57 Hz; 0.075 mm amplitude, 57 to 150 Hz (see note 2); acceleration: 9.8 m/s^2, in X, Y, and Z directions, for 80 minutes each (sweep time 8 min x 10 sweeps = 80 min); (When mounted on DIN rail, 2 to 55 Hz, 2.9 m/s^2, in X, Y, and Z directions for 20 minutes each)
Shock	147 m/s^2 in X, Y, and Z directions, 3 times each
Ambient temperature	Operating: 0 to 55°C Storage: –20 to 75°C (without battery)
Humidity	10% to 90% (without condensation)
Atmosphere	Must be free of corrosive gases
Grounding	Less than 100 Ω
Enclosure rating	IEC IP30 (mounted in a panel)
Weight	6 kg max. (CPU Unit: 315 g max., Power Supply Unit: 510 g max., Backplane: 445 g to 1040 g)

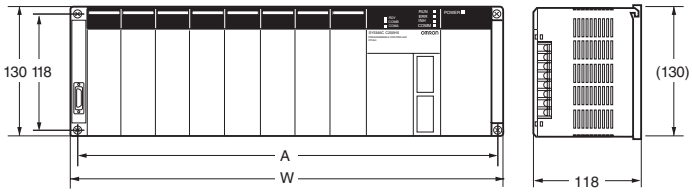
Note: 1. Be sure to disconnect the LG and GR terminals when conducting insulation resistance tests or dielectric strength tests.Internal components might be damaged if insulation resistance tests are repeated many times with the LG and GR terminals connected.

2.



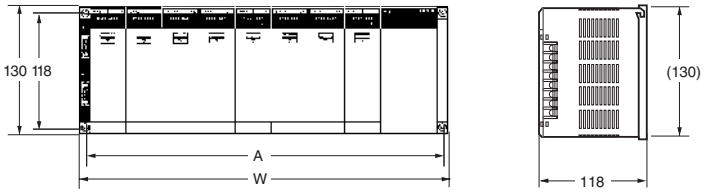
Dimensions

CPU Rack



Backplane	A	W
C200HW-BC031 (3 slots)	246	260
C200HW-BC051 (5 slots)	316	330
C200HW-BC081-V1 (8 slots)	421	435
C200HW-BC101-V1 (10 slots)	491	505

Expansion I/O Rack



Backplane	A	W
C200HW-BI031 (3 slots)	175	189
C200HW-BI051 (5 slots)	245	259
C200HW-BI081-V1 (8 slots)	350	364
C200HW-BI101-V1 (10 slots)	420	434

Characteristics

Item	Specifications
Control method	Stored program
I/O control method	Cyclic scan with direct output and immediate interrupt processing are both possible.
Programming method	Ladder diagram
Instruction length	1 address/instruction, 1 to 4 words/instruction
Number of instructions	14 basic instructions, 231 special instructions (281 special instructions for CPU□□-ZE CPU Units.)
Execution time	Basic instructions: e.g., LD C200HE-CPU□□-(Z)E:0.3 μs C200HG-CPU□□-(Z)E:0.15 μs C200HX-CPU□□-(Z)E:0.1 μs Special instructions: e.g., MOV(21)C200HE-CPU□□-(Z)E:1.2 μs C200HG-CPU□□-(Z)E:0.6 μs C200HX-CPU□□-(Z)E:0.4 μs
Program capacity	C200HE-CPU11-(Z)E:3.2 kWords max. C200HE-CPU32-(Z)E/CPU42-(Z)E:7.2 kWords max. C200HG-CPU□□-(Z)E:15.2 kWords max. C200HX-CPU□4-(Z)E:31.2 kWords max. C200HX-CPU65-ZE/CPU85-ZE:63.2 kWords max.
I/O bits	640 (00000 to 02915, 30000 to 30915)
IR bits	6,528 (03000 to 23515, 31000 to 51115)
SR bits	1,080 (23600 to 25507, 25600 to 29915)
TR bits	8 (TR 0 to 7)
HR bits	1,600 (HR 0000 to 9915)
AR bits	448 (AR 0000 to 2715)
LR bits	1,024 (LR 0000 to 6315)
Timers/Counters	512 (TIM/CNT 000 to 511)
DM words	Read/Write: 6,144 (DM 0000 to 6143) Read-only: 512 (DM 6144 to 6655) Expansion: Up to 3,000 words max. (DM 7000 to 9999)
EM words	Read/Write: C200HE-CPU□□-(Z)E: None C200HG-CPU□□-(Z)E: 6,144 (EM 0000 to EM 6143) C200HX-CPU□□-(Z)E: 6,144 (EM 0000 to EM 6143) ×3 banks C200HX-CPU65-ZE: 6,144 (EM 0000 to EM 6143) ×8 banks C200HX-CPU85-ZE: 6,144 (EM 0000 to EM 6143) ×16 banks
Power failure backup function	Holds HR, AR, CNT, DM, and EM and clock (RTC) contents.
Memory backup time	The battery service life is five years at 25°C. The service life will be shortened if the battery is used at higher temperatures. Replace the battery within one week after the battery alarm indicator starts flashing. When replacing the battery, install the new battery within five minutes after removing the old one.
Self-diagnostic function	CPU Unit errors (watchdog timer), I/O verification errors, host link errors, memory errors, battery errors, I/O bus errors, remote I/O errors, etc.
Program check function	Checks the program from the time the program starts running and checks the omission of the END instruction or any other improper instruction. This function allows three-level checking of programs through the Programming Console.

CS1/C200H Unit Descriptions

Unit		Classification	Model	Page
I/O Units	Input Units	CS1 Basic I/O Unit	CS1W-ID2□□	290
			CS1W-IA□11	291
		C200H Basic I/O Unit	C200H-ID□11	290
			C200H-IA□11	291
			C200H-IM21□	291
		C200H Special I/O Unit	C200H-ID501	290
	Output Units	CS1 Basic I/O Unit	CS1W-OA2□	291
			CS1W-OC□□□	291
			CS1W-OD2□□	291
		C200H Basic I/O Unit	C200H-OA22□(□)	291
			C200H-OC22□(□)	291
			C200H-OD□□□	291
		C200H Group-2 High Density Units	C200H-OD2□□	291
		C200H Special I/O Unit	C200H-OD501	291
	I/O Units	CS1 Basic I/O Unit	CS1W-MD□□□	292
		C200H Special I/O Unit	C200H-MD□□□	292
High-speed Input Unit		CS1 Basic I/O Unit	CS1W-IDP01	292
Interrupt Input Unit		CS1 Basic I/O Unit	CS1W-INT01	293
		C2ooH Basic I/O Unit	C200H-INT01	293
Analog Timer Unit		C200H Special I/O Unit	C200H-TM001	294
B7A Interface Units	Input Units	C200H Basic I/O Unit	C200H-B7AI1/12	295
	Output Units	C200H Basic I/O Unit	C200H-B7AO1/02	295
	I/O Units	C200H Basic I/O Unit	C200H-B7A21/22	295
Safety Relay Unit		CS1 Basic I/O Unit	CS1W-SF200	297
Analog I/O Units	Input Units	CS1 Special I/O Unit	CS1W-AD0□1-V1	299
		C200H Special I/O Unit	C200H-AD003	299
	Output Units	CS1 Special I/O Unit	CS1W-DA041/08V/08C	300
		C200H Special I/O Unit	C200H-DA00□	300
	Analog I/O Units	CS1 Basic I/O Unit	CS1W-MAD44	301
		C200H Special I/O Unit	C200H-MAD01	301
Loop Control Unit		CS1 CPU Bus Unit	CS1W-LC001	302
			CS1D-LCB0□	302
			CS1D-LCB05D	302
Process I/O Units		CS1 Special I/O Unit	CS1W-P□□0□	305
Temperature Sensor Units		CS1 Special I/O Unit	CS1W-PTS□□	307
		C200H Special I/O Unit	C200H-TS□□□	307
Temperature Control Units		C200H Special I/O Unit	C200H-TC□□□	308
Heat/Cool Control Units		C200H Special I/O Unit	C200H-TV□□□	309
PID Control Units		C200H Special I/O Unit	C200H-PID0□	310
Cam Positioner Unit		C200H Special I/O Unit	C200H-CP114	311
Position Control Units		CS1 Special I/O Unit	CS1W-NC□□3	312
		C200H Special I/O Unit	C200HW-NC□□3	312
Motion Control Unit		CS1 Special I/O Unit	CS1W-MC□21	313
		C200H Special I/O Unit	C200HW-MC402-E	315
		CS1 CPU Bus Unit	CS1W-MCH71	317
High-speed Counter Units		CS1 Special I/O Unit	CS1W-CT0□1	319
			CS1W-CTS21	321
		C200H Special I/O Unit	C200H-CT021	319
Customizable Counter Units		CS1 Special I/O Unit	CS1W-HC□/-HIO01	323
ID Sensor Units		CS1 Special I/O Unit	CS1W-V600C1□	325
		C200H Special I/O Unit	C200H-IDS01-V1	325
ASCII Units		C200H Special I/O Unit	C200H-ASC□1	327
Serial Communications Boards/Unit	Serial Communications Boards	Inner Board	CS1W-SCB□1-V1	328
	Serial Communications Unit	CS1 CPU Bus Unit	CS1W-SCU21-V1	328
RS-232C/RS-422 Conversion Unit		---	NT-AL001	330
GP-IB Interface Unit		---	CS1W-GPI01	331
Ethernet Unit		CS1 CPU Bus Unit	CS1W-ETN□1	333
Controller Link Boards/ Unit	Controller Link Unit	CS1 CPU Bus Unit	CS1W-CLK□□-V1	334
	Controller Link Boards	Personal computer ISA board	3F8F7-CLK□□-V1	334
PROFIBUS-DP Units	PROFIBUS-DP Master Unit	CS1 CPU Bus Unit	CS1W-PRM21	335
		C200H Special I/O Unit	C200HW-PRM21	336
	PROFIBUS-DP I/O Link Unit	C200H Special I/O Unit	C200HW-PRT21	338
DeviceNet and Compo-Bus/S Units	DeviceNet Unit	CS1 CPU Bus Unit	CS1W-DRM21-V1	339
	Master Unit	C200H Special I/O Unit	C200HW-DRM21-V1	341
	I/O Link Unit	C200H Special I/O Unit	C200HW-DRT21	342
	CompoBus/S Master Unit	C200H Special I/O Unit	C200HW-SRM21-V1	345
CANopen/User-defined CAN Unit		C200H Special I/O Unit	C200HW-CORT21-V1	343

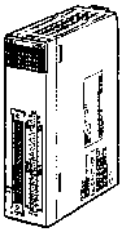
CS1 and C200H-series

Basic I/O Units

I/O Units

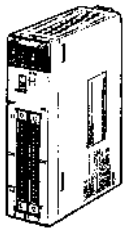
Input Unit
CS1W-ID211
16 points

Output Units
CS1W-OD21□
16 points



Input Unit
CS1W-ID231
32 points

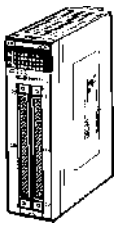
Output Units
CS1W-OD23□
32 points



Input Unit
CS1W-ID261
64 points

Output Units
CS1W-OD26□
64 points

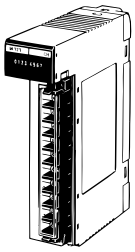
I/O Units
CS1W-MD26□
32/32 points



Input Unit
CS1W-ID291
96 points

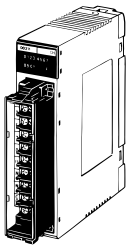
Output Units
CS1W-OD29□
96 points

I/O Units
CS1W-MD29□
48/48 points



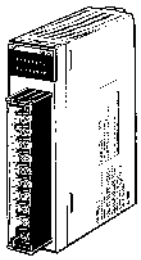
Input Unit
C200H-I□□□□
8 points

Output Units
C200H-O□□□□
5/8 points

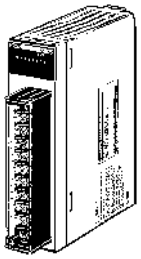


Input Unit
C200H-I□□□□
16 points

Output Units
C200H-O□□□□
16 points

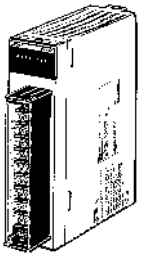


AC Input Units
CS1W-IA□11
16 points



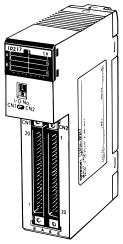
Triac Output Unit
CS1W-OA201
8 points

Triac Output Unit
CS1W-OA211
16 points



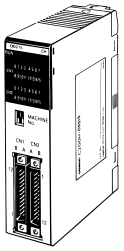
Relay Output Unit
CS1W-OC201
8 independent

Relay Output Unit
CS1W-OC211
16 points



Input Unit
C200H-ID□□□
32/64 points

Output Units
C200H-OD□□□□
32/64 points



Input Unit
C200H-ID□□□
32 points

Output Units
C200H-OD□□□□
32 points

I/O Units
C200H-MD□□□□
16/16 points

DC Input Units

Classification	Input voltage	Inputs	Connections	Model	Remarks
CS1 Basic I/O Unit	24 V DC	16 pts	Removable terminal block	CS1W-ID211	Input current: 7 mA
	24 V DC	32 pts	Connector	CS1W-ID231	Input current: 6 mA
	24 V DC	64 pts		CS1W-ID261	
	24 V DC	96 pts		CS1W-ID291	Input current: approx. 5 mA
C200H Basic I/O Unit	12 to 24 V DC	8 pts	Removable terminal block	C200H-ID211	Input current: 10 mA
	24 V DC	16 pts	Removable terminal block	C200H-ID212	Input current: 7 mA
C200H Group-2 I/O Units	24 V DC	32 pts	Connector	C200H-ID216	Input current: 4.1 mA
	24 V DC	64 pts		C200H-ID217	
	24 V DC	32 pts		C200H-ID218	Input current: 6 mA
	24 V DC	64 pts		C200H-ID219	
	12 V DC	64 pts		C200H-ID111	---
C200H Special I/O Unit	24 V DC	32 pts		C200H-ID215	Input current: 4 mA

TTL Input Units

Classification	Input voltage	Inputs	Connections	Model	Remarks
C200H Special I/O Unit	5 V DC	32 pts	Connector	C200H-ID501	Pulse-catch inputs

AC Input Units (and 100 V DC)

Classification	Input voltage	Inputs	Connections	Model
CS1 Basic I/O Units	100 to 120 V AC, or 100 to 120 V DC	16 pts	Removable terminal block	CS1W-IA111
	200 to 240 V AC	16 pts		CS1W-IA211
C200H Basic I/O Units	100 to 120 V AC	8 pts		C200H-IA121
		16 pts		C200H-IA122
				C200H-IA122V
	200 to 240 V AC	8 pts		C200H-IA221
		16 pts		C200H-IA222
				C200H-IA222V

AC/DC Input Units

Classification	Input voltage	Inputs	Connections	Model
C200H Basic I/O Units	12 to 24 V AC/ V DC	8 pts	Removable terminal block	C200H-IM211
	24 V AC/ V DC	16 pts		C200H-IM212

Relay Output Units

Classification	Outputs	Connections	Model
CS1 Basic I/O Units	8 pts (independent)	Removable terminal block	CS1W-OC201
	16 pts		CS1W-OC211
C200H Basic I/O Units	8 pts		C200H-OC221
	12 pts		C200H-OC222
	12 pts		C200H-OC222N
	16 pts		C200H-OC225
	16 pts		C200H-OC226N
	5 pts		C200H-OC223
	8 pts		C200H-OC224
	8 pts		C200H-OC224N

Transistor Output Units

Classification	Outputs	Max. switching capacity	Connections	Model
CS1 Basic I/O Units	16 pts	12 to 24 V DC, 0.5 A/pt, 8 A/Unit sinking	Removable terminal block	CS1W-OD211
		24 V DC, 0.5 A/pt, 5 A/Unit, sourcing, short circuit protection, alarm		CS1W-OD212
	32 pts	12 to 24 V DC, 0.5 A/pt, 5 A/Unit, sinking	Connector	CS1W-OD231
		24 V DC, 0.5 A/pt, 5 A/Unit, sourcing, short circuit protection, alarm		CS1W-OD232
	64 pts	12 to 24 V DC, 0.3 A/pt, 6.4 A/Unit, sinking		CS1W-OD261
		24 V DC, 0.3 A/pt, 6.4 A/Unit, sourcing, short circuit protection, alarm		CS1W-OD262
	96 pts	12 to 24 V DC, 0.1 A sinking, 7.2 A/Unit		CS1W-OD291
		12 to 24 V DC, 0.1 A sourcing, 7.2 A/Unit		CS1W-OD292
C200H Basic I/O Units	8 pts	12 to 48 V DC, 1 A sinking	Removable terminal block	C200H-OD411
	8 pts	24 V DC, 2.1 A, sinking		C200H-OD213
	8 pts	24 V DC, 0.8 A, sourcing, short circuit protection		C200H-OD214
	8 pts	5 to 24 V DC, 0.3 A, sourcing		C200H-OD216
	12 pts	24 V DC, 0.3 A, sinking		C200H-OD211
	16 pts	24 V DC, 0.3 A, sinking		C200H-OD212
	12 pts	5 to 24 V DC, 0.3 A, sourcing		C200H-OD217
	16 pts	24 V DC, 1.0 A, sourcing, short circuit protection		C200H-OD21A
	16 pts	24 V DC, 0.3 A, sinking		C200H-OD212
C200H Group-2 I/O Units	32 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking	Connector	C200H-OD218
	32 pts	500 mA at 24 V DC, sourcing, short circuit protection		C200H-OD21B
	64 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking		C200H-OD219
C200H Special I/O Unit	32 pts	16 mA at 4.5 V to 100 mA at 26.4 V, sinking 128-pt dynamic outputs possible		C200H-OD215

TTL Output Unit

Classification	Outputs	Max. switching capacity	Connections	Model
C200H Special I/O Unit	32 pts	5 V DC, 35 mA 128-pt dynamic outputs possible	Connector	C200H-OD501

Triac Output Units

Classification	Outputs	Max. switching capacity	Connections	Model
CS1 Basic I/O Units	8 pts	250 V AC, 1.2 A, 50/60 Hz	Removable terminal block	CS1W-OA201
	16 pts	250 V AC, 0.5 A, 50/60 Hz		CS1W-OA211
C200H Basic I/O Units	8 pts	250 V AC, 1.2 A, 50/60 Hz		C200H-OA223
	12 pts	250 V AC, 0.3 A, 50/60 Hz		C200H-OA222V
	12 pts	250 V AC, 0.3 A, 50/60 Hz		C200H-OA224

Mixed I/O Units

Name	Classification	Inputs/ Outputs	Input voltage	Max. switching capacity	Connections	Model	Remarks
DC Input/ Transistor Output Units	CS1 Basic I/O Units	32 inputs/ 32 outputs	24 V DC	12 to 24 V DC, 0.3 A, sinking	Connector	CS1W-MD261	---
		32 inputs/ 32 outputs		24 V DC, 0.3 A, sourcing, load short protection, alarm		CS1W-MD262	---
		48 inputs/ 48 outputs	24 V DC	12 to 24 V DC, 0.1 A, sinking		CS1W-MD291	---
		48 inputs/ 48 outputs		12 to 24 V DC, 0.1 A, sourcing		CS1W-MD292	---
	C200H Special I/O Units	16 inputs/ 16 outputs	24 V DC	16 mA at 4.5 V to 100 mA at 26.4 V DC, sinking		C200H-MD215	Pulse-catch inputs, 128-pt dynamic outputs possible
		16 inputs/ 16 outputs	12 V DC	24 V DC, 50 mA, sinking		C200H-MD115	

Note: In addition to the normal I/O functions, C200H High-density I/O Units (Special I/O Units) provide the following functions.

- Dynamic I/O (except for OD501/OD215): In stead of normal static inputs and normal static outputs, dynamic outputs and dynamic inputs are used to increase I/O capacity to 128 inputs and 128 outputs through the use of strobe signal outputs. These functions can be used to reduce wiring to devices with more digits, such as displays and keyboards.
- Pulse-catch Inputs (except OD501/OD215): Eight of the inputs can be set as pulse-catch inputs to reliably capture short pulses from devices like photomicroswitches.

TTL I/O Unit

Name	Classification	Inputs/ Outputs	Input voltage	Max. switching capacity	Connections	Model	Remarks
TTL I/O Unit	CS1 Basic I/O Units	16 inputs/ 16 outputs	5 V DC	5 V DC, 35 mA	Connector	CS1W-MD561	---
	C200H Special I/O Units					C200H-MD501	Pulse-catch, 128-pt dynamic outputs possible

High-speed Input

Name	Classification	Inputs	Max. switching capacity	Model
Pulse-catch Input Unit	CS1 Basic I/O Units	16 pts	24 V DC, 7 mA	CS1W-IDP01

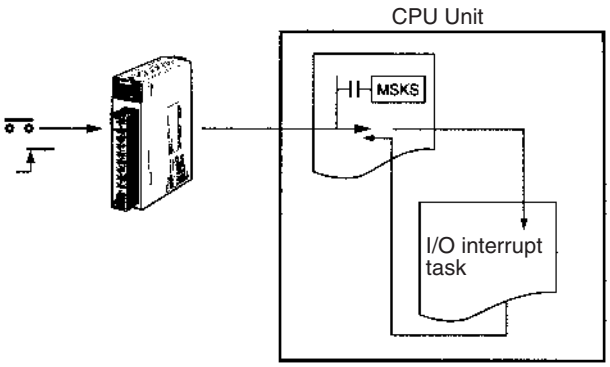
CS1W-INT01, C200HS-INT01

Interrupt Input Units

Triggers interrupt task execution in the CPU

- When the CPU Unit receives an Input from the Interrupt Input, the CPU Unit immediately suspends execution of the Cyclic Task (Regular Program) and executes the I/O Interrupt Task (CS1G/CS1H Only). The Interrupt Input Unit operates as a regular Input Unit in the CS1D PLCs.
- Mount the Interrupt Input Unit in the CPU Rack.
- Up to 2 CS1W-INT01 or 4 C200HS-INT01 Interrupt Input Units can be mounted.

System Configuration



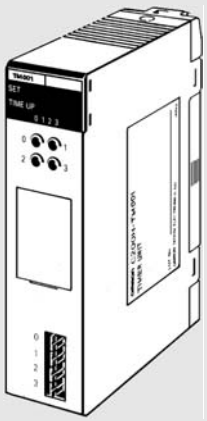
Specifications

Classifications	Input voltage	Inputs	Input pulse width	Connections	Allocations	Model
CS1W Basic I/O Unit	24 V DC	16 pts	ON: 0.1 ms min. OFF: 0.5 ms min.	Removable terminal block	16 bits (CIO 0319 to CIO 2000)	CS1W-INT01
C200H Basic I/O Unit	12 to 24 V DC	8 pts	ON: 0.2 ms max. OFF: 0.5 ms max.		8 bits	C200HS-INT01

Note: The interrupt function can be used with the CPU Backplane only.

C200H-TM001

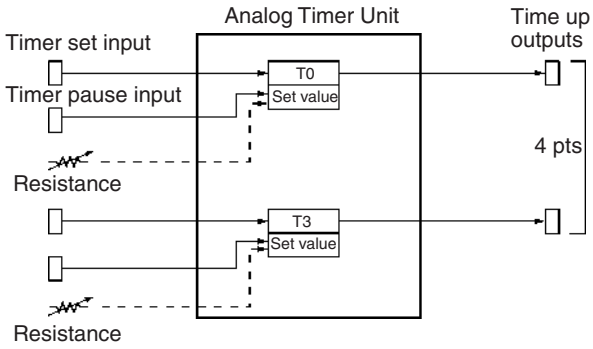
Analog Timer Unit



Easy On-site timer Adjustments

- Provides four timers easily adjusted on-site via front-panel adjustments or external variable resistors: No Programming Device required. Using timer pause inputs enables Usage as accumulative timer.

System Configuration



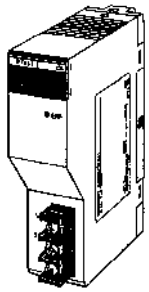
Specifications

Classification	Timers	Setting range	Time setting method	CPU Unit bits	Allocations (CIO 0319 to CIO 2000)	Model
C200H Basic I/O Unit	4 pts	0.1 to 1.0 s, 1 to 10 s, 2 to 60 s, 1 to 10 min	Internal or external variable resistor	Timer set input, timer pause input, and time up output	16 bits	C200H-TM001

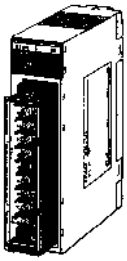
C200H-B7A□□

B7A Interface Units

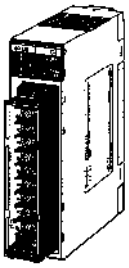
Multiplexing digital I/O units. Reduce wiring by transmitting 16 digital input or output points over 2-wire point-to-point connections.



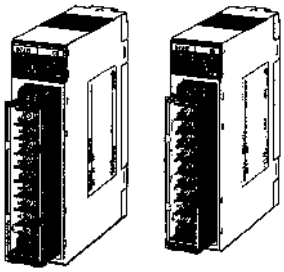
C200H-B7AI1 (16 inputs)
C200H-B7AO1 (16 outputs)



C200H-B7A02
(32 outputs)

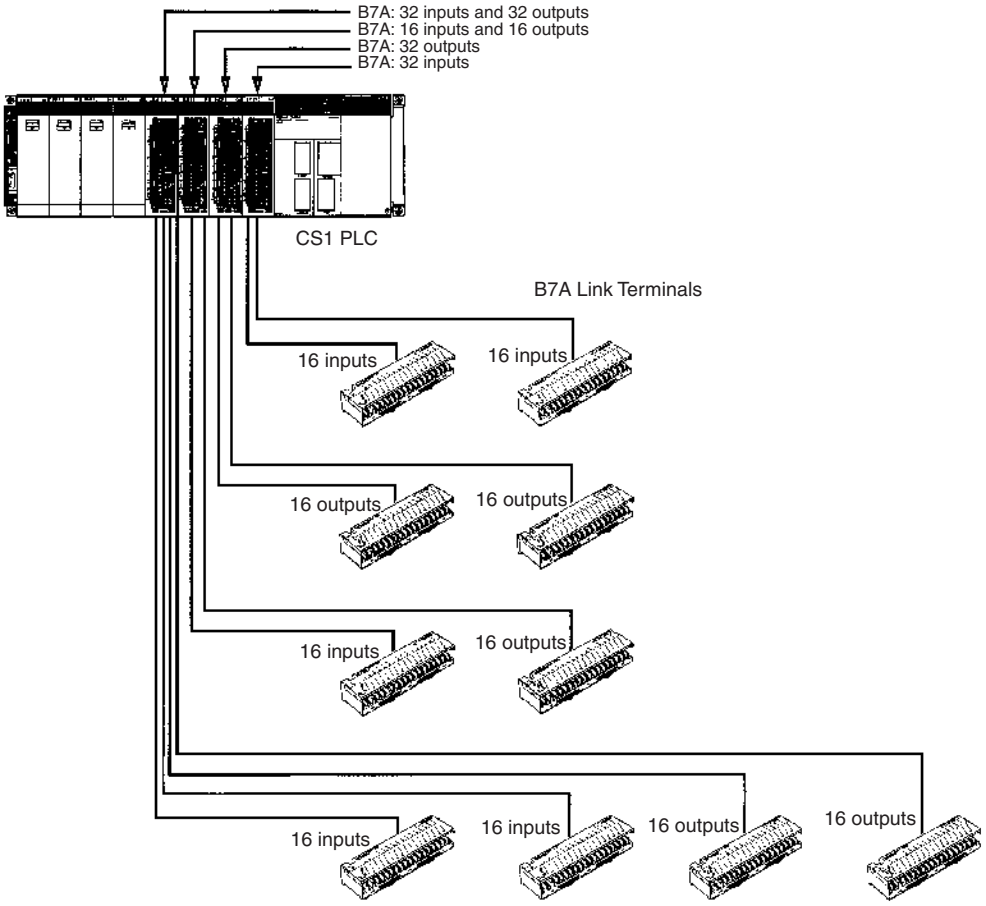


C200H-B7A12
(32 inputs)



C200H-B7A21
(16 inputs/16 outputs)
C200H-B7A22
(32 inputs/32 outputs)

Connection Example



Specifications

Item		B7A Interface Units		B7A Group-2 Interface Units			
		C200H-B7AI1	C200H-B7AO1	C200H-B7A12	C200H-B7A02	C200H-B7A21	C200H-B7A22
I/O capacity	Inputs	16 inputs or 15 + 1 error input	---	32 inputs (See note 1.)	---	16 inputs (See note 2.)	32 inputs (See note 1.)
	Outputs	---	16 outputs	---	32 outputs	16 outputs	32 outputs
Transmission distance		500 m max. if separate power supplies are used for Unit and Link Terminals. 100 m max. if same power supply is used for Unit and Link Terminals.		Normal operation: 500 m max. if separate power supplies are used for Unit Link Terminals. 100 m max. if same power supply is used for Unit Link Terminals. High-speed operation: 100 m max. with shield connected and 10 m max. without shield connected if separate power supplies are used for Unit Link Terminals. 50 m max. with shield connected and 10 m max. without shield connected if same power supply is used for Unit and Link Terminals.			
Transmission delay		19.2 ms typical, 31 ms max.		Normal operation: 19.2 ms typical, 31 ms max. HIgh-speed operation: 3 ms typical, 5 ms max. (See note 3.)			
Internal current consumption		100 mA max. at 5 V DC					
External power supply (See note 4.)		10 mA max. at 12 to 24 V DC ±10%	30 mA max. at 12 to 24 V DC ±10%	50 mA max. at 12 to 24 V DC ±10%	60 mA max. at 12 to 24 V DC ±10%	50 mA max. at 12 to 24 V DC ±10%	80 mA max. at 12 to 24 V DC ±10%
Weight		200 g max.		300 g max.			
I/O word allocations		The unit number set with the I/O number setting switch on the front panel is invalid. I/O words are allocated consecutively according to the mounting position, in the same way as with basic I/O Units.					

Note: 1. Can also be used for 32 inputs or 30 inputs + 2 error inputs by changing input mode.
2. Can also be used for 16 inputs or 15 inputs + 1 error input by changing input mode.
3. Normal and high-speed operation set via switch.
4. Not including power supply to B7A Link Terminals

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)
PC connectors	B7A-T□E3	Normal (19.2 ms)
	B7A-T□E8	High-speed (3 ms)

Output Terminals

Type	Model	Transmission delay
Screw terminal	B7A-R6□□1	Normal (19.2 ms)
	B7AS-R6□□1	
	B7A-R6□□6	High-speed (3 ms)
	B7AS-R6□□6	
Modules	B7A-R6A52	Normal (19.2 ms)
	B7A-RA57	High-speed (3 ms)
PC connectors	B7A-R□A□3	Normal (19.2 ms)
	B7A-R□A□8	High-speed (3 ms)

For details, see page 439.

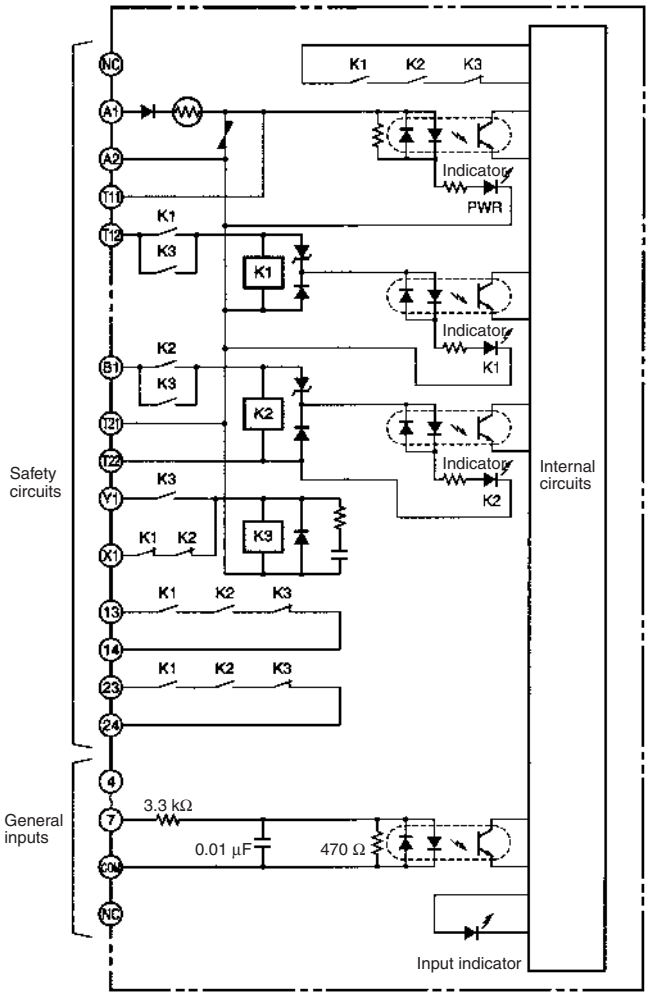
CS1W-SF200

Safety Relay Unit

Reduced Wiring and Space for Safety Circuits

- This Safety Relay Unit mounts as an I/O Unit and provides both safety relays and inputs for monitoring.
- Safety relays and monitor inputs in 1 Unit to reduce wiring and space.
- Safety relays operate with separate power supply from PLC.
- Monitor safety circuit output, K1/K2 relay, or power status from PLC.
- Four general-purpose inputs provided.
- Safety standards: EN954-1 and EN60204-1

Internal Connections



Specifications

General

Item	Specifications
Contact resistance	100 mΩ (5 V DC, 1 A, voltage drop method)
Operating time	300 ms max. (not including bounce)
Response time	10 ms max. (time from input OFF to main contact OFF, not including bounce)
Insulation resistance (See note.)	20 MΩ min. (at 500 V DC) for following: Safety circuits-safety outputs, General inputs-safety outputs, Different poles of safety outputs, and safety circuits-general inputs
Withstand voltage (See note.)	2,500 V AC, 50/60 Hz for 1 min for following: Safety circuits-safety outputs, General inputs-safety outputs, Different poles of safety outputs 500 V AC, 50/60 Hz for 1 min for Safety circuits-general inputs
Durability	Mechanical: 5,000,000 min. (7,200 time/hr) Electrical: 100,000 min. (1,800 time/hr)
Weight	300 g

Note: Measured while mounted to PLC.

Ratings of Safety Circuits

Item		Specification
Power	Supply voltage	24 V DC
	Fluctuation	$^{-15\%}/_{+10\%}$ of supply voltage
	Consumption	24 V DC: 1.7 W max.
Inputs	Current	75 mA max.
Switching	Rated load	250 V AC, 5 A
	Rated ON current	5 A

Ratings of General Inputs

Item	Specifications
Power voltage	24 V DC
Fluctuation	$^{-15\%}/_{+10\%}$ of supply voltage
Input impedance	3.3 kΩ
Input current	7 mA typ. (24 V DC)
ON voltage/current	14.4 V DC min./3 mA min.
OFF voltage/current	5 V DC max./1 mA max.
ON/OFF response	8 ms max. (Set to 1 to 32 in PC Setup)
Circuits	4 points, 1 common
ON points	100% simultaneously ON

OMRON

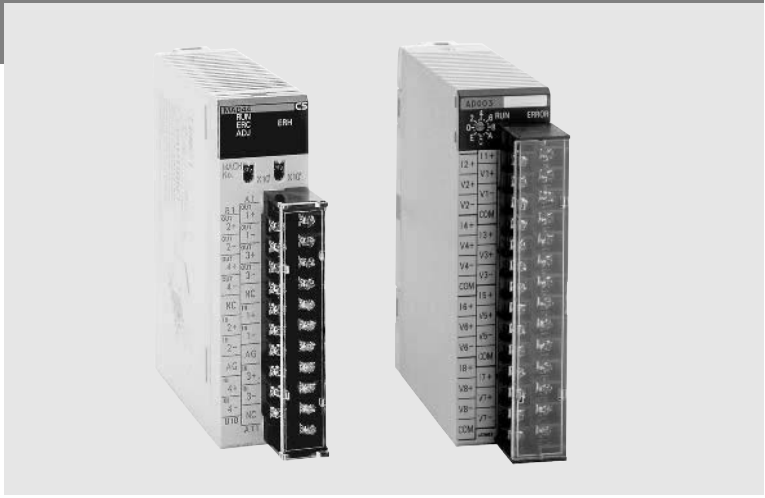
Analog I/O Selection Guide

Classification	Model	I/O capacity	Isolation between I/O points*	I/O ranges/types	Conversion time	Remarks	Page
Analog Input Units	CS1W-AD041-V1	8 inputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA	0.25 ms/pt	---	299
	CS1W-AD081-V1	8 inputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA	0.25 ms/pt	---	
	CS1W-PTW01	4 inputs	Yes	1 to 5 V, 4 to 20 mA	100 ms/4 pts	Built-in power supply for 2-wire transmission device, measured value alarms (HH, H, L, LL), other features	305
	CS1W-PDC01	4 inputs	Yes	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA, 0 to 20 mA	100 ms/4 pts	Measured value alarms (HH, H, L, LL), other features	
	CS1W-PDC11	4 inputs	Yes	4 to 20mA, 0 to 20mA, 0 to 10V, +/-10V, 0 to 5V, +/-5V, 1 to 5V, 0 to 1.25V, +/-1.25V	20 ms/4 pts, 10 ms/2 pts	Process value alarms (HH,H,L,LL) Rate-of-change calculation and alarm Input disconnection detection Top, bottom, valley hold Accumulated value output Variable range zero-span adjustment	
	CS1W-PPS01	4 inputs	Yes	Max. counting speed: 20 K pulses/s (voltage input or no-voltage semi-conductor input) or 20 pulses/s (contact input)	---	---	306
	CS1W-PTR01	8 inputs	No	–1 mA to 1 mA, 0 to 1 mA	200 ms/8 pts	Motor overdrive prevention, measured value alarms (H, L), other features	
	CS1W-PTR02	8 inputs	No	–100 mA to 100 mA, 0 to 100 mV	200 ms/8 pts	Measured value alarms (H, L), other features	
	C200H-AD003	8 inputs	No	1 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA	1 ms/pt max.	---	299
Analog Output Units	CS1W-DA041	4 outputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA	1 ms/pt	---	300
	CS1W-DA08V	4 outputs	No	1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V	1 ms/pt	---	
	CS1W-DA08C	4 outputs	No	4 to 20 mA	1 ms/pt	---	
	CS1W-PMV01	4 outputs	Yes	1 to 5 V, 4 to 20 mA	100 ms/4 pts	Output disconnection alarm, control output answerback input, other features	306
	CS1W-PMV02	4 outputs	Yes	0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V	40 ms/4 pts	---	306
	C200H-DA001	2 outputs	No	0 to 10 V, 1 to 5 V, 4 to 20 mA	2.5 ms/pt max.		300
	C200H-DA002	4 outputs	No	–10 to 10 V, 4 to 20 mA			
	C200H-DA003	8 outputs	No	1 to 5 V, 0 to 10 V, –10 to 10 V	1 ms/pt max.		
	C200H-DA004	8 outputs	No	4 to 20 mA			
Analog I/O Unit	CS1W-MAD44	4 inputs and 4 outputs	No	Inputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA Outputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V	1 ms/pt	---	301
	C200H-MAD01	4 inputs and 4 outputs	No	Inputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA Outputs: 1 to 5 V, 0 to 5 V, 0 to 10 V, ±10 V	1 ms/pt max.		
Temperature Sensor Input Units	CS1W-PTS11	4 inputs	Yes	B, E, J, K, L, N, R, S, T, U, WRe5-26, PLII, ±100 mV	20 ms/4 pts 10 ms/2 pts	Measured value alarms (HH, H, L, LL), input disconnection alarms, top hold, bottom hold, valley hold, zero span adjustment over user-set range, other features.	305
	CS1W-PTS12	4 inputs	Yes	Pt100Ω (JIS, IEC), JPt100Ω, Pt50Ω, Ni508.4Ω			
	CS1W-PTS01-V1	4 inputs	Yes	B, E, J, K, N, R, S, T, ±80 m V DC auto range	150 ms/4 pts	Automatic range setting, measured value alarms (HH, H, L, LL), other features.	307
	CS1W-PTS02	4 inputs	Yes	Pt100 (JIS, DIN, ISO) JPt100	100 ms/4 pts		
	CS1W-PTS03	4 inputs	Yes	Ni508Ω	100 ms/4 pts		
	C200H-TS001	4 inputs	No	K, J	4.8 s max.	---	307
	C200H-TS002	4 inputs	No	K, L	4.8 s max.	---	
	C200H-TS101	4 inputs	No	JPt100	4.8 s max.	---	
	C200H-TS102	5 inputs	No	Pt100	4.8 s max.	---	

Note: Inputs are isolated from PLC signals for all Units.

CS1W-AD0□1-V1, C200H-AD003

Analog Input Units



Convert Analog Signals to Binary Data

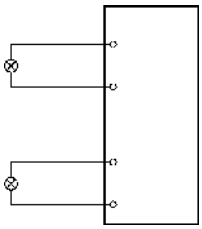
- Wire burnout detection
- Peak-hold function
- Moving average filter function
- Offset gain setting

Note: Analog Input Terminals are also available as remote I/O terminals for DeviceNet, PROFIBUS-DP or CompoBus/S.

Function

Converts input signals such as 1 to 5 V or 4 to 20 mA to binary values between 0000 and 0FA0 Hex and stores the results in the allocated words each cycle. The ladder diagram can be used to transfer the data to the DM Area or the SCALING instructions (e.g., SCL(194)) can be used to scale the data to the desired ranges.

Circuit Configuration



Specifications

Model			CS1W-AD041-V1	CS1W-AD081-V1	C200HW-AD003
Classification			CS1 Special I/O Units		C200 Special I/O Units
Unit number			0 to 95	0 to 95	0 to F
Inputs			4 pts	8 pts	8 pts
Signal range	Voltages	1 to 5 V	Yes	Yes	Yes
		0 to 10 V	Yes	Yes	Yes
		0 to 5 V	Yes	Yes	---
		–10 to 10 V	Yes	Yes	Yes
	Currents	4 to 20 mA	Yes	Yes	Yes
		0 to 20 mA	---	---	---
Signal range settings			4 settings (one for each point)	8 settings (one for each point)	8 settings (one for each point)
Resolution			1/8000	1/8000	1/4000
Conversion speed			0.25 ms/pt max.	0.25 ms/pt max.	1 ms/pt. max
Overall accuracy (at 25 °C)			Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.2% Current: ±0.4%
Connections			Terminal block	Terminal block	Terminal block
Features	Wire burnout detection		Yes	Yes	Yes
	Peak-hold function		Yes	Yes	Yes
	Mean function		Yes	Yes	Yes

Note: Process I/O Units are also available for analog I/O. Refer to page 305.

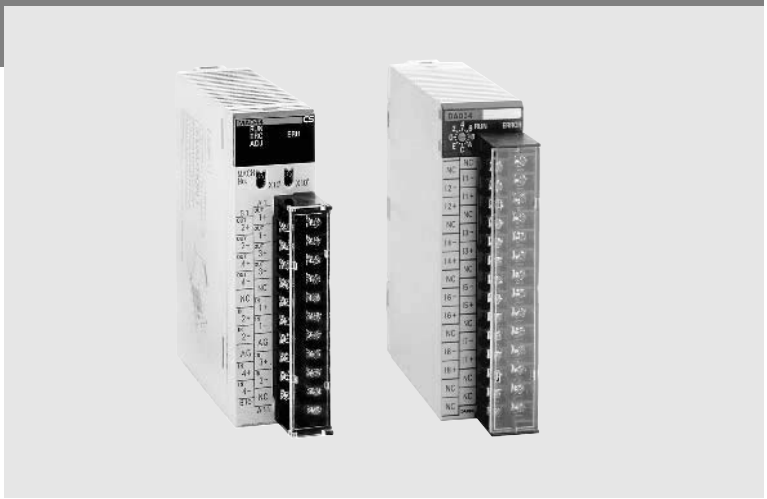
CS1W-DA□, C200H-DA00□

Analog Output Units

Convert Binary Data to Analog Signals

- Output limit
- Upper/Lower limit alarms
- Offset gain adjustment

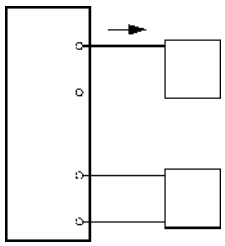
Note: The functions provided depend in the model used. Analog Output Terminals are also available as remote I/O terminals for DeviceNet, PROFIBUS-DP or CompoBus/S.



Function

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

Circuit Configuration



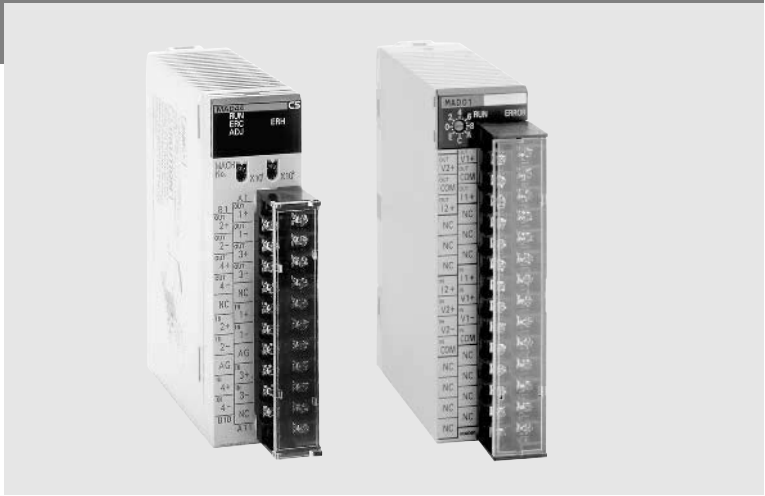
Specifications

Model			CS1W-DA041	CS1W-DA08V	CS1W-DA08C	C200H-DA001	C200H-DA002	C200H-DA003	C200H-DA004
Classification			CS1 Special I/O Units			C200H Special I/O Units			
Unit numbers			0 to 95	0 to 95	0 to 95	0 to 9	0 to F	0 to F	0 to F
Outputs			4 pts	8 pts	8 pts	2 pts	4 pts	8 pts	8 pts
Signal range	Voltages	1 to 5 V	Yes	Yes	---	Yes	---	Yes	---
		0 to 10 V	Yes	Yes	---	Yes	---	Yes	---
		0 to 5 V	Yes	Yes	---	---	---	---	---
		–10 to 10 V	Yes	Yes	---	---	Yes	Yes	---
	Currents	4 to 20 mA	Yes	---	Yes	Yes	Yes	---	Yes
		0 to 20 mA	---	---	---	---	---	---	---
Signal range settings			4 settings (one for each point)	8 settings (one for each point)	8 settings (one for each point)	1 setting (one for two points)	4 settings (one for each point)	8 settings (one for each point)	8 settings (one for each point)
Resolution			1/4000	1/4000	1/4000	1/4095	Voltage: 1/8190 Current: 1/4095	1/4000	1/4000
Conversion speed			1.0 ms/pt max.	1.0 ms/pt max.	1.0 ms/pt max.	2.5 ms/pt max.	2.5 ms/pt max.	1.0 ms/pt max.	1.0 ms/pt max.
Overall accuracy (at 25 °C)			Voltage: ±0.3%FS Current: ±0.5%FS	±0.3% FS	±0.5% FS	±0.5% FS	Voltage: ±0.3%FS Current: ±0.5%FS	±0.3% FS	±0.5% FS
Connections			Terminal block	Terminal block	Terminal block	Terminal block	Terminal block	Terminal block	Terminal block
Features	Output hold function		---	Yes	Yes	---	---	Yes	Yes

Note: Process I/O Units are also available for analog I/O. Refer to page 305.

CS1W-MAD44, C200H-MAD01

Analog I/O Units



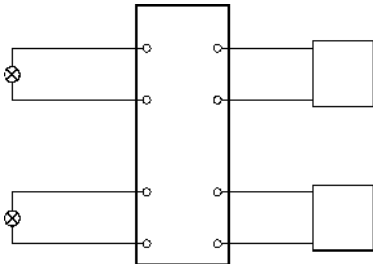
Analog Inputs and Outputs combined in One Unit

- Moving average filter function
- Peak hold function
- Wire burnout detection
- Output hold function
- Ratio conversions

Function

One Unit performs both analog input and analog output operations. The Unit can also be used for ratio and bias processing, which can be performed on analog inputs to output the results as analog outputs.

Circuit Configuration



Specifications

Model			C200H-MAD01	CS1W-MAD44
Classification			C200H Special I/O Unit	CS1 Special I/O Unit
Unit numbers			0 to F	0 to 95
Inputs			2 pts	4 pts
Outputs			2 pts	4 pts
Input signal ranges	Voltages	1 to 5 V	Yes	Yes
		0 to 5 V	---	Yes
		0 to 10 V	Yes	Yes
		–10 to 10 V	Yes	Yes
		4 to 20 mA	Yes	Yes
Output signal ranges	Currents	1 to 5 V	Yes	Yes
		0 to 5 V	---	Yes
		0 to 10 V	Yes	Yes
		–10 to 10 V	Yes	Yes
		4 to 20 mA	Yes	---
Resolution			1/4000 (inputs/outputs)	1/4000 (inputs/outputs)
Conversion speed			1.0 ms/pt max (inputs/outputs)	1.0 ms/pt max (inputs/outputs)
Overall accuracy	Inputs		Voltage: ±0.2% Current: ±0.4%	Voltage: ±0.2% Current: ±0.4%
	Outputs		Voltage: ±0.3% Current: ±0.5%	Voltage: ±0.3% Current: ±0.5%
Connections			Terminal block	Terminal block
Features	Mean function		Yes	Yes
	Peak hold		Yes	Yes
	Wire burnout detection		Yes	Yes
	Output hold		Yes	Yes
	Ratio conversion		Yes	Yes

CS1W-LC001, CS1W-LCB01/05, CS1D-LCB05D

Loop Control Unit

Process Values such as Temperature, Pressure, and Flowrate can be controlled. Supports Control Methods from Simple Loop Control to Genuine Process Control.

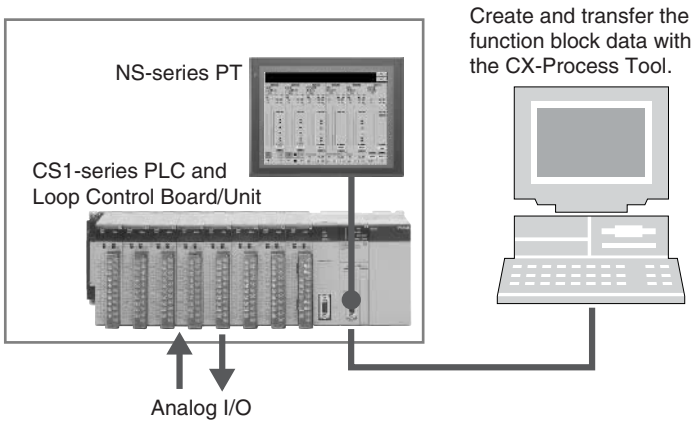
- The control system can be scaled to match the controlled system, from a few loops that replace a Controller to hundreds of loops that perform large-scale process control.
- A variety of control programs can be created by selecting from more than 70 kinds of function blocks suitable for loop control, such as PID calculations, Segment Programs, and square root calculations.
- The CX-Process Tool can be used for easy programming.
- A Tuning Screen can be opened in the CX-Process Tool to change parameters while monitoring the status.
- Duplex systems are available for applications that require high reliability.
- The NS Face Plate Auto Builder software can be used to automatically create a touch panel for NS-series PTs from a function block screen.

Function

The CS1-series Loop Control Boards and Units are packed with DCS functions and can use function block programs, which are ideal for process control. Graphical programming can be used, so function blocks can be pasted into a window and connected with the mouse.

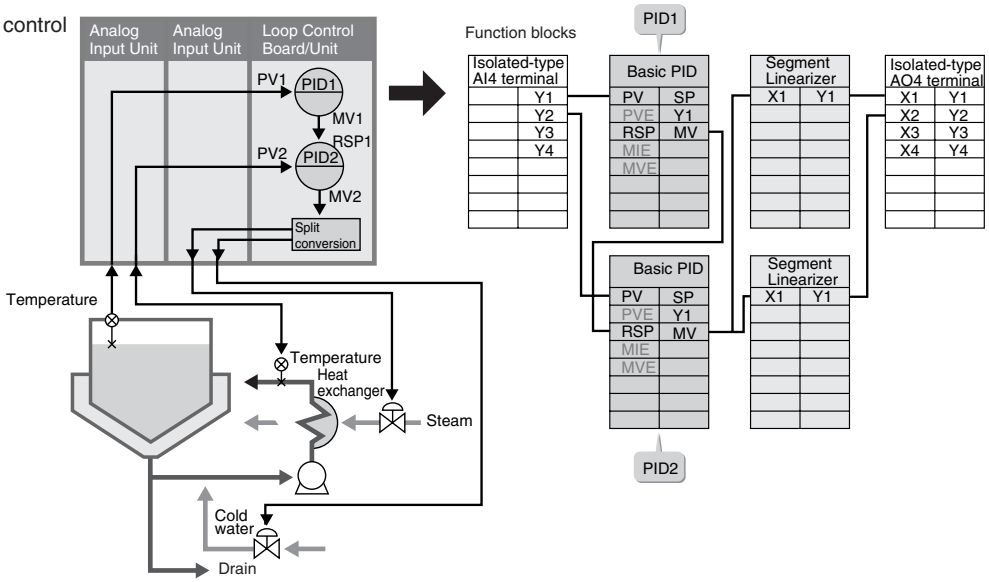
A wide variety of control methods can be executed, from regular PID control to cascade control and feed-forward control.

System Configuration



Function Block Example

Example: Cascade control



Specifications

Item		Specification			
Name		Loop Control Board			Loop Control Unit (See note 1.)
Unit type		CS-series Inner Board			CS-series CPU Bus Unit
Model		CS1W-LCB01 Standard Inner Board	CS1W-LCB05 Advanced Inner Board	CS1D-LCB05D Duplex Inner Board (See note 3.)	CS1W-LC001
Applicable PLCs		CS1G/H-CPU□□F	CS1G/H-CPU□□H	CS1D-CPU□□P (Duplex compatible)	CS-series
Mounting location		CPU Unit's Inner Board slot			CPU Rack
Max. number of Boards/Units		1 Board max. per CPU Unit			3 Units max. per CPU Unit
Data exchange with CPU Unit	Allocation of specific words in a data area	User Link Table function: A function block's ITEM data can be allocated to specified words in a CPU Unit data area (CIO, WR, HR, DM, or EM bank 0).			CPU terminal block: A function block's ITEM data can be allocated to any CPU Unit data area.
	Allocation of all data	HMI Interface function: The ITEM data of a Control Block, Operation Block, or External Controller Block can be allocated to a specified EM bank. (The default EM bank is bank 0.)			Send/Receive All Blocks: Can be allocated to any CPU Unit data area (no default setting).
Setting switches		None			Front panel rotary switches: Unit number setting (0 to F)
Indicators		Three LED indicators: Running, Ready, and Comm. port sending/receiving			Five LED indicators: Running, Comm. port sending, Comm. port receiving, CPU Unit error, and Unit error
Front panel connectors		One RS-232C port (for connection of an ES100X External Controller)			
Data Backup		Super capacitor backs up all function block data (including sequence tables and step ladder program instructions).			Battery backs up all function block data and contents of the error log.
Backup time of backup capacitor or battery		24 hrs at 25°C (The backup time is shorter at higher temperatures.)			5 years at 25°C (The battery life is shorter at higher temperatures.)
Data stored in flash memory		Function block data, data in RAM (can be backed up or recovered at any time), and error log data			Function block data and data in RAM (can be backed up or recovered at any time)
Effect on the CPU Unit's cycle time		0.8 ms max.		20 ms max. (See note 2.)	0.2 ms
Current consumption (supplied by the Power Supply Unit)		220 mA at 5 V DC Note: The current consumption is 150 mA higher when an NT-AL001 Link Adapter is being used.			360 mA at 5 V DC Note: The current consumption is 150 mA higher when an NT-AL001 Link Adapter is being used.
Dimensions		34.5 x 130 x 100.5 mm (W x H x D)			
Weight		100 g max.			220 g max.
Standard accessories		None			C200H-BAT09 Battery Set (factory installed in Unit)

Note: 1. The Loop Control Unit described in this table is equipped with the Version 2.5 functions.

2. The CPU Unit's cycle time will be extended by 2.1 s max during duplex initialization.

3. The CS1D-LCB05D Duplex Loop Control Board is not available separately.
It can only be purchased in combination with a Duplex CPU as models CS1D-CPU65P or CS1D-CPU67P.

Functional Specifications

Item			Specifications		
Model			CS1W-LCB01	CS1W-LCB05/CS1D-LCB05D	CS1W-LC001
Processing method			Function block method		
Operation cycle			Available cycle settings (See note 1.): 0.01 s, 0.02 s, 0.05 s, 0.1 s, 0.2 s, 0.5 s, 1 s, and 2 s (default setting is 1 s) The operation cycle can be set for each function block.		Available cycle settings: 0.1 s, 0.2 s, 0.5 s, 1 s, and 2 s (default setting is 1 s) The operation cycle can be set for each function block.
Number of function blocks	Analog operations	Control Block (See note 2)	50 blocks max.	500 blocks max.	32 blocks max.
		Operation Block (See note 3)			249 blocks max.
		External Controller Block	32 blocks max. (excluding the CS1D-LCB05D)		
	Sequence Control	Sequence Table	None	Number of tables: 200 32 conditions and 32 operations per table (When expanded, there can be up to 64 conditions and 64 operations per table.) Total: 6,400 rules	None
		Step Ladder Block	20 blocks max. 2,000 instructions total 100 instructions max. per block Branch up to 100 steps max.	200 blocks max. 4,000 instructions total 100 instructions max. per block Branch up to 100 steps max.	
	I/O blocks	Field Terminal Block	80 blocks max.		
		User Link Table	2,400 data elements max.		None
		Batch allocation	HMI function: 2,040 words max. Allocated 1 bank of EM area.	HMI function: 20,040 words max. Allocated 1 bank of EM area.	All blocks: send/receive One block each max.
		CPU Terminal Block	None		16 blocks max.
		NodeTerminal Block	None		100 blocks max.
	System Common Block		1 block		
Function block creation/transfer method			Use the CX-Process Tool (sold separately) to create and transfer function blocks.		
Control method	PID control method		PID control with two degrees of freedom (with autotuning function)		
	Combinable control methods		Can be accomplished by combining function blocks such as basic PID control, cascade control, feed-forward control, sample PI control, Smith dead-time compensation control, PID control with differential gap, override control, programmed control, and time-proportional control.		
Alarms	Alarms within PID Blocks		There can be up to 4 PV Alarms (HH, H, L, and LL) and 1 Deviation Alarm per PID Block.		
	Alarm Blocks		High/Low Alarm Block and Deviation Alarm Block		

Note: 1. The CS1D-LCB05D does not support the 0.01 s, 0.02 s, and 0.05 s settings.

2. Control Blocks perform control functions such as PID control.

3. Operation Blocks perform processing operations such as alarm operations, square root operations, time operations, and pulse-train operations.

CS1W-P□□□□

Process I/O Units

Wide variety of built-in signal conversion functions for direct process signal inputs.

- External converters and transducers not required: Greatly reduces costs, space requirements, and labor.
- Receives temperature and other analog inputs. Supports measured value alarms and rate-of-change operation and alarms.
- Control outputs can be limited with the output rate-of-change limit and output high/low limit.
- The CS1W-P□□1□ can limit measured values with peak/bottom hold and top/valley hold functions.
- The CS1W-P□□1□ can count the number of times that a preset threshold value is exceeded and totalize analog values.

Function

Choose from a total of 13 models, including 11 isolated-type models, to handle essentially all normal data collection and process control applications. High-speed (10 ms) and high-resolution (1/64,000) models are available for use in a wide range of applications, from data logging to high-speed temperature control.

Specifications

Unit name	Model	I/O capacity	Field I/O isolation	I/O range/type	Accuracy/effective resolution	Main features
Isolated-type Thermocouple Input Unit	CS1W-PTS01-V1	4 inputs	All inputs isolated.	B, E, J, K, N, R, S, T, ±80 m V DC variable range	Standard accuracy: ±0.1% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 150 ms/4 pts	Variable range setting, output scaling (±32,000), measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, input disconnection alarms
	CS1W-PTS11	4 inputs	All inputs isolated.	B, E, J, K, L, N, R, S, T, U, WRe5-26,PL II, ±100 mV	Standard accuracy: ±0.05% of full scale Temp coefficient: ±0.01%/°C Effective resolution: 1/64,000 Conversion cycle: 20 ms/4 pts 10 ms/2 pts	Output scaling, measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, input disconnection alarms, top hold, bottom hold, valley hold, zero span adjustment over user-set range
Isolated-type Temperature-resistance Thermometer Input Unit	CS1W-PTS02	4 inputs	All inputs isolated.	Pt100 (JIS, IEC) JPt100	Standard accuracy: Larger of ±0.1% or ±0.1°C Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Variable range setting, output scaling (±32,000), measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, input disconnection alarms
	CS1W-PTS12	4 inputs	All inputs isolated.	Pt100Ω (JIS, IEC), JPt100Ω, Pt50Ω, Ni508.4Ω	Standard accuracy: Larger of ±0.05% of full scale or ±0.1°C Temp coefficient: ±0.01%/°C Effective resolution: 1/64,000 Conversion cycle:20 ms/4 pts 10 ms/2 pts	Output scaling, measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, input disconnection alarms, top hold, bottom hold, valley hold, zero span adjustment over user-set range
Isolated-type Temperature-resistance Thermometer Input Unit (Ni508.4 Ω)	CS1W-PTS03	4 inputs	All inputs isolated.	Ni508.4Ω	Standard accuracy: Larger of ±0.2% or ±0.2°C Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Variable range setting, output scaling (±32,000), measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, input disconnection alarms

Unit name	Model	I/O capacity	Field I/O isolation	I/O range/type	Accuracy/effective resolution	Main features
Isolated-type Two-wire Transmission Device Input Unit	CS1W-PTW01	4 inputs	All inputs isolated.	4 to 20 mA, 1 to 5 V	Standard accuracy: ±0.2% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Built-in power supply for 2-wire transmission device output scaling (±32,000), measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, input disconnection alarms
Isolated-type Analog Input Unit	CS1W-PDC01	4 inputs	All inputs isolated.	±10 V, 0 to 10 V, ± 5 V, 0 to 5 V, 1 to 5 V, ±10 V DC variable range, 4 to 20 mA, 0 to 20 mA	Standard accuracy: ±0.1% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 100 ms/4 pts	Output scaling (±32,000), measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, square root, input error alarms
	CS1W-PDC11	4 inputs	All inputs isolated.	4 to 20 mA, 0 to 20 mA, 0 to 10 V, ±10 V, 0 to 5 V, ± 5 V, 1 to 5 V, 0 to 1.25 V, ±1.25 V	Standard accuracy: ±0.05% of full scale Temp coefficient: ±0.01%/°C Effective resolution: 1/64,000 Conversion cycle:20 ms/4 pts 10 ms/2 pts	Output scaling, measured value alarms (HH, H, L, LL), rate-of-change operation and alarms, input disconnection alarms, top hold, bottom hold, valley hold, total value measurement
Isolated-type Pulse Input Unit	CS1W-PPS01	4 inputs	All inputs isolated.	Max. counting speed: 20 K pulses/s (voltage input or no-voltage semi-conductor input) or 20 pulses/s (contact input)	---	Built-in sensor power supply, contact bounce filter, unit pulse conversion, accumulative and instantaneous value output, 4 instantaneous value alarms.
Isolated-type Control Output Unit	CS1W-PMV01	4 outputs	All outputs isolated.	4 to 20 mA, 1 to 5 V	Standard accuracy: 4 to 20 mA: ±0.1% 1 to 5 V: ±0.2% Temp coefficient: ±0.015%/°C 4,000 (outputs) Conversion cycle: 100 ms/4 pts	Output disconnection alarms, control output answerback input, output rate-of-change limit, output high/low limits
Isolated-type Power Voltage Output Unit	CS1W-PMV02	4 outputs	All outputs isolated	0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V	Standard accuracy: ±0.1% Temp coefficient: ±0.015%/°C Resolution (at full scale): ±10 V or ±1 V: 1/16,000 0 to 10 V, 0 to 1 V, or ±5 V: 1/8,000 0 to 5 V: 1/4,000 Conversion cycle: 40 ms/4 pts	Output rate-of-change limit, Output high/low limit, Output scaling (±32,000)
Power Transducer Input Unit	CS1W-PTR01	8 inputs	No isolation between inputs.	±1 mA, 0 to 1 mA	Standard accuracy: ±0.2% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 200 ms/8 pts	Motor overdrive prevention at startup, output scaling (±32,000), measured value alarms (H, L)
Analog Input Unit	CS1W-PTR02	8 inputs	No isolation between inputs.	±100 mV, 0 to 100 mV	Standard accuracy: ±0.2% Temp coefficient: ±0.015%/°C Resolution: 1/4,096 Conversion cycle: 200 ms/8 pts	Output scaling (±32,000), measured value alarms (H, L)

Note: Refer to pages 299 to 301 for descriptions of the Analog I/O Units (CS1W-AD0□□, CS1W-DA0□□, CS1W-MAD44.)

CS1W-PTS□□, C200H-TS□□□

Temperature Sensor Units

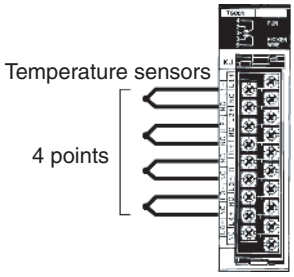
Direct Input from Four Temperature Sensors

- Input directly from up to four temperature sensors with one Unit. (The types of temperature sensor and temperature ranges can be set separately for each input for the CS1W-PTS□□.)
- Models available with isolated inputs to prevent unwanted current flow between temperature sensor inputs (CS1W-PTS□□ only).
- Provided with measured value alarms (4 points each) (CS1W-PTS□□ only).
- Line disconnection detection provided.

Function

Using input from thermocouples or resistance thermometers (up to 4 inputs), the Unit converts the measured temperatures into BCD or binary data and stores them in the allocated relay area every cycle. The data can be transferred to the DM Area or other memory locations using the ladder program.

Circuit Configuration



Specifications

Model			CS1W-PTS11	CS1W-PTS12	CS1W-PTS01	CS1W-PTS02	CS1W-PTS03	C200H-TS001	C200H-TS002	C200H-TS101	C200H-TS102
Classification			CS1 Special I/O Units					C200H Special I/O Units			
Unit numbers			0 to 95	0 to 95	0 to 95	0 to 95	0 to 95	0 to 9	0 to 9	0 to 9	0 to 9
Inputs			4 pts					4 pts			
Input signals	Thermo-couples	K	Yes	---	Yes	---	---	Yes	Yes	---	---
		J	Yes	---	Yes	---	---	Yes	---	---	---
		L	Yes	---	---	---	---	---	Yes	---	---
		R	Yes	---	Yes	---	---	---	---	---	---
		S	Yes	---	Yes	---	---	---	---	---	---
		T	Yes	---	Yes	---	---	---	---	---	---
		E	Yes	---	Yes	---	---	---	---	---	---
		B	Yes	---	Yes	---	---	---	---	---	---
		N	Yes	---	Yes	---	---	---	---	---	---
		W	Yes	---	---	---	---	---	---	---	---
		U	Yes	---	---	---	---	---	---	---	---
		PLII	Yes	---	---	---	---	---	---	---	---
		±80 mV	---	Yes	Yes	---	---	---	---	---	---
	Resistance thermometers	JPt100	---	Yes	---	Yes	---	---	---	Yes	---
		PT100	---	Yes	---	Yes	---	---	---	---	Yes
		Ni508.4Ω	---	Yes	---	---	Yes	---	---	---	---
Input signal range settings			4 pts set individually					One setting for all 4 pts			
A/D conversion output data			4-digit binary					4-digit BCD			
Conversion speed			20 ms/4 points, 10 ms/2 points		150 ms/4 pts	100 ms/4 points		4.8 s max. (when 4 pts are set for Unit)			
Overall accuracy	Standard accuracy		±0.05% of full scale	Larger of ±0.05% of full scale or ±0.1°C	±0.1%	Larger of ±0.1% or ±0.1°C		±1% + 1°C			
	Temperature coefficient		±0.01%/°C		±0.015%/°C						
	Cold junction compensation error		±1°C	---	±1°C	---					
Connections			Terminal block					Terminal block			

Note: Refer to page 305 for information on CS1W-PTS□□ Process I/O Units.

C200H-TC□□□

Temperature Control Units

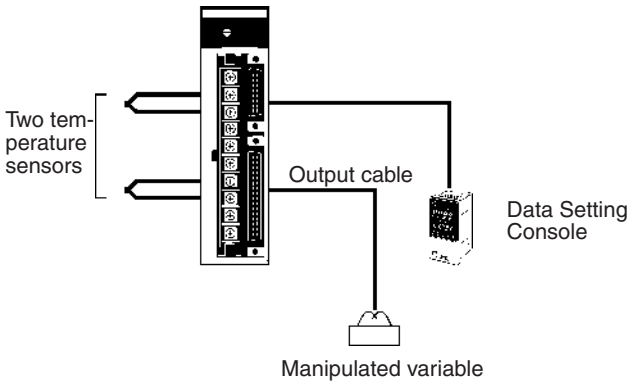
One Unit Functions as Two Temperature Controllers

- Supports 2-loop PID control (two degrees of freedom) or ON/OFF control.
- Input directly from two temperature sensors (thermocouples: R, S, K, J, T, E, B, N, L, or U) or platinum resistance thermometers (JPt00, Pt100).
- Open-collector, voltage, or current outputs
- Sampling period: 500 ms
- Run/start control.
- Two internal alarms per loop.
- Detects heater burnout though current detectors for both loops.
- Record up to eight sets of target values, alarm values, and PID parameters.
- Connects to Data Setting Console.

Function

Perform 2-loop PID control based on inputs from thermocouples or platinum resistance thermometers to control a transistor, voltage, or current output. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the target value, read the process value, or perform other operations.

System Configuration



Specifications

General

Classification	Temperature sensor inputs	Control outputs	Unit numbers	Model
C200H Special I/O Unit	Thermocouples (R, S, K, J, T, E, B, N, L, or U)	Open-collector (pulse)	0 to 9	C200H-TC001
		Voltage (pulse)		C200H-TC002
		Current (linear)		C200H-TC003
	Platinum resistance thermometers (JPt00, Pt100)	Open-collector (pulse)		C200H-TC101
		Voltage (pulse)		C200H-TC102
		Current (linear)		C200H-TC103

Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01

C200H-TV□□□

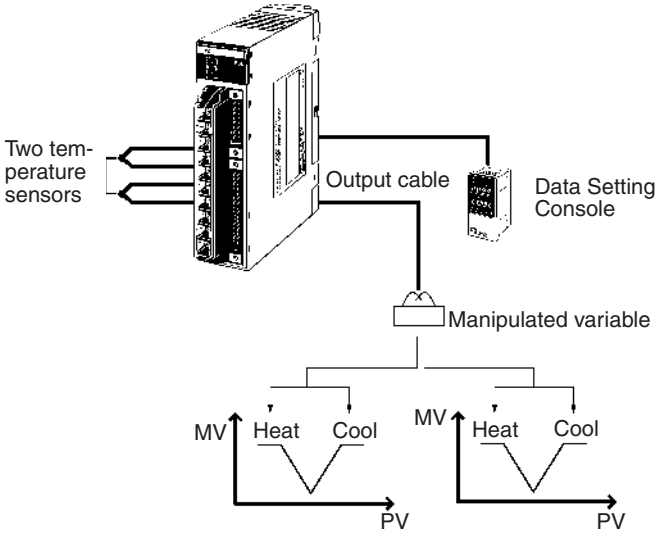
Heat/Cool Control Units

- Supports 2-loop PID control (two degrees of freedom) or ON/OFF control.
- Input directly from two temperature sensors (thermocouples: R, S, K, J, T, E, B, N, L, or U) or platinum resistance thermometers (JPt00, Pt100).
- Open-collector, voltage, or current outputs
- Sampling period: 500 ms
- Run/start control.
- Two internal alarms per loop.
- Detects heater burnout though current detectors for both loops.
- Record up to eight sets of set points, alarm values, and PID parameters.
- Connects to Data Setting Console.

Function

Perform 2-loop PID control (two degrees of freedom) based on inputs from thermocouples or platinum resistance thermometers to control heating and cooling through transistor, voltage, or current outputs. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the set point, read the process value, or perform other operations.

System Configuration



Specifications

General

Classification	Temperature sensor inputs	Heating control output	Cooling control output	Unit numbers	Model
C200H Special I/O Unit	Thermocouples (R, S, K, J, T, E, B, N, L, or U)	Open-collector (pulse)	Open-collector (pulse)	0 to 9	C200H-TV001
		Voltage (pulse)			C200H-TV002
		Current (linear)			C200H-TV003
	Platinum resistance thermometers (JPt00, Pt100)	Open-collector (pulse)			C200H-TV101
		Voltage (pulse)			C200H-TV102
		Current (linear)			C200H-TV103

Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01

C200H-PID□□

PID Control Units

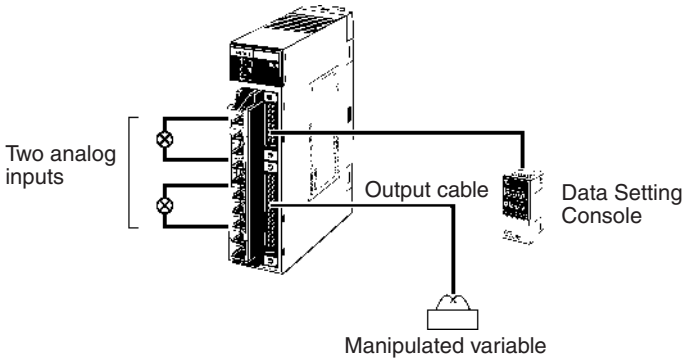
Ideal for Analog Control of Pressures, Flows, and other Variables

- Supports 2-loop PID control (two degrees of freedom) or ON/OFF control.
- Directly input analog signal.
- Open-collector, voltage, or current outputs
- Sampling period: 100 ms
- Run/start control.
- Manual outputs supported.
- Set two internal alarms for each loop.
- Record up to eight sets of set points, alarm values, and PID parameters.
- Digital filters can be set to dampen rapid changes in inputs.
- Connects to Data Setting Console.

Function

Perform 2-loop PID control (two degrees of freedom) based on input ranges such as 4 to 20 mA or 1 to 5 V to control transistor, voltage, or current outputs. Words allocated to the Unit in memory can be manipulated from the ladder diagram to start/stop operation, set the set point, read the process value, or perform other operations.

System Configuration



Specifications

General

Classifications	Temperature sensor input	Control output	Unit numbers	Model
C200H Special I/O Unit	4 to 20 mA, 1 to 5 V, 0 to 5 V or 0 to 10 V	Open-collector (pulse)	0 to 9	C200H-PID01
		Voltage (pulse)		C200H-PID02
		Current (linear)		C200H-PID03

Data Setting Console

Specifications	Model
Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01

C200H-CP114

Cam Positioner Unit

One Unit Functions as 48 Mechanical Cams

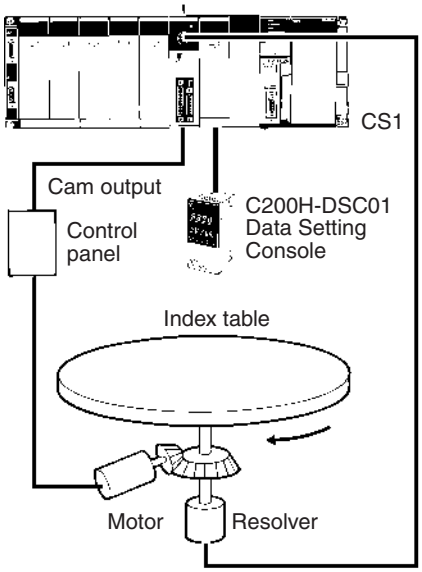
- Supports16 external outputs and 32 internal outputs for a total of 48 cam outputs.
- Set up to seven ON/OFF data for each cam.
- The Data Setting Console allows easy monitoring of cam data settings, present cam angles, or etc.
- An Adjustment Operation function enables setting cam outputs while actually operating the controlled machine.

Function

Angles are detected though an externally connected resolver (3F88L-RS□□ angle detector) and cam outputs are produced for preset ON/OFF angle data.

System Configuration

C200H-CP114
Cam Positioner Unit



Specifications

Classification	Model	No. of cam outputs	Control unit	Resolver response speed	Unit numbers	Resolver response time
Cam Positioner Unit	C200H-CP114	48 (external outputs: 16, internal outputs: 32)	1°	800 r/min max.	0 to 9	200 µs (sampling frequency: 5 KHz)

Programming Devices

Name	Specifications	Model
Data Setting Console	Used to monitor, set, or change various settings such as present values, target set values, alarm set values, PID values, and bank numbers.	C200H-DSC01

CS1W-NC□□□, C200HW-NC□□□

Position Control Units

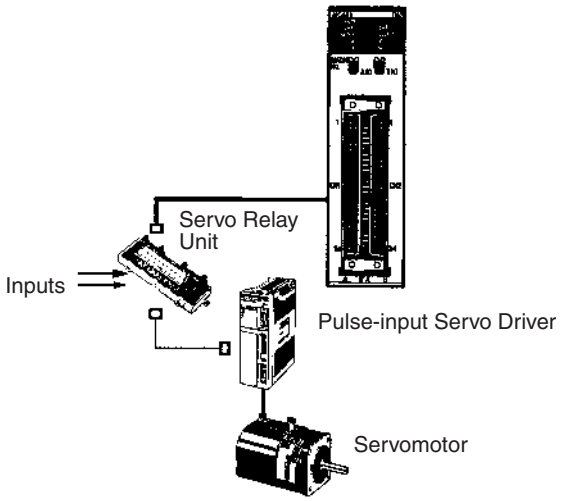
High-speed, High-precision Positioning with 1, 2, or 4 Axes

- Simple positioning systems can be created by directly specifying operation from the CPU Unit when required.
- Positioning data is saved in internal flash memory, eliminating the need to maintain a backup battery.
- Use Windows-based Support Software to easily create positioning data and store data and parameters in files. (Use WS01-NCTF1-E with C200HW-NC□ models and WS02-NCTC1-E with CS1W-NC□□ models.)
- Interrupt feeding, forced starting, and other features also supported.

Function

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

System Configuration



Specifications

Model	CS1W-NC113 CS1W-NC133	CS1W-NC213 CS1W-NC233	CS1W-NC413 CS1W-NC433	C200HW-NC113	C200HW-NC213	C200HW-NC413
Unit name	Position Control Unit					
Classification	CS1 Special I/O Units			C200H Special I/O Units		
Unit numbers	0 to 95			0 to 15 (0 to F)		
Control method	Open-loop, automatic trapezoid acceleration/deceleration					
Control output signals	CS1W-NC□13: Open-collector outputs CS1W-NC□33: Line-driver outputs			Open-collector		
Controlled axes	1	2	4	1	2	4
Operating modes	Direct operation or memory operation					
Data format	Binary (hexadecimal)			BCD		
Affect on scan time for end refresh	0.29 to 0.41 ms max./unit			2.6 to 4.5 ms max./unit		
Affect on scan time for IOWR/IORD	0.6 to 0.7 ms max./instructions			2.6 to 5.5 ms max./instructions		
Startup time	2 ms min. (Refer to operation manual for conditions.)			7.51 ms min. (Refer to operation manual for conditions.)		
Position data	–1,073,741,823 to +1,073,741,823 pulses			–9,999,999 to +9,999,999 pulses		
No. of positions	100 per axis					
Speed data	1 to 500 kpps (in 1-pps units)			1 to 500 kpps (specified as factor)		
No. of speeds	100 per axis					
Acceleration/ deceleration times	0 to 250 s (time to max. speed)					
Acceleration/ deceleration curves	Trapezoidal or S-curve					
Saving data in CPU	Flash memory					
Windows-based Support Software	CX-Position			SYSMAC-NCT (WS01-NCTF1-E)		

CS1W-MC421/-MC221

Motion Control Units

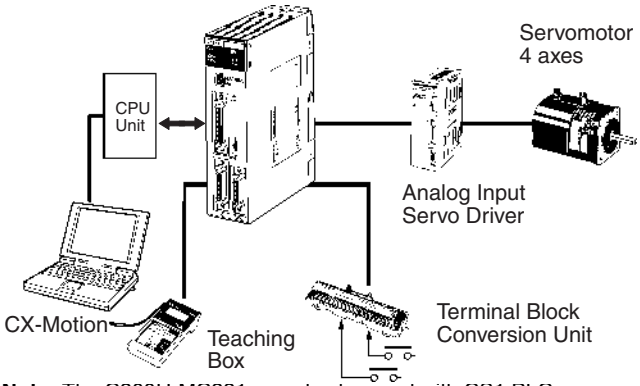
High-precision, Two-axis Motion Control with Multi-tasking G-language Programming

- High-speed control of up to 4 axes with one Unit and up to 76 axes with one PLC (19 Units x 4 axes) (assumes that Power Supply Unit capacity is not exceeded).
- Winding operations easily controlled at high-speed using traverse positioning control.
- High-speed response to commands from CPU Unit (8 ms for 2 axes, 13 ms for 4 axes).
- Encoder response of 2 Mpps possible with 4x frequency multiplication for applications with high-speed, high-precision servomotors.
- D interrupt code outputs to CPU Unit at end of positioning or at specified positions (D code output time: 3.3 ms max.).
- CX-Motion Windows-based Support Software
  Define user mnemonics to use in place of G codes to simplify MC program development and analysis.
- Servo trace function from CX-Motion to trace error counter changes or motor speeds.
- Automatic Loading Function
  MC programs and positioning data can be automatically downloaded from computer memory when required by the MC Unit.

Function

The Motion Controller provides closed-loop control with analog outputs for up to 2 or 4 axes, and supports the G language for advanced, high-speed, high-precision position control, such as traverse operation. Multi-tasking allows you to run the two axes independently for a wider range of application.

System Configuration



Note: The C200H-MC221 can also be used with CS1 PLCs.

Specifications

General

Model		CS1W-MC421	CS1W-MC221
Classification		CS1 Special I/O Unit	
Control method		Closed loop with automatic trapezoid or S-curve acceleration/deceleration	
Control output signals		Analog	
Internal programming language		G language (Program started by command sent from CPU Unit's ladder program.)	
Controlled axes		4 axes max.	2 axes max.
Maximum position value		–39,999,999 to 39,999,999 (for minimum setting unit of 1)	
Synchronous axis control		4 axes max.	2 axes max.
Positioning	Linear interpolation	4 axes max.	2 axes max.
	Arc interpolation	2 axes max. in a plane	
	Helical interpolation	2-axis arc interpolation in a plane + feed axis	---
	Traverse	2-axis traverse feeding	
	Infinite feed	Infinite feeding of one or more axes	
	Interrupt feed	Interrupt feeding for specified axes (Positioning can be specified for when there is no interrupt.)	
Task programming capacity	Number of tasks	4 tasks max.	2 tasks max.
	Number of programs	25 programs when using 4 tasks	50 programs when using 2 tasks
	Program capacity	500 blocks per task when using 4 tasks	1,000 blocks per task when using 2 tasks

CX-Motion: Windows-based Support Software

Model	WS02-MCTC1-EV□
Supported MC Units	CS1W-MC221/421, C200H-MC221, and CV500-MC221/421
Applicable computer	DOS, OS: Windows 95/98 or Windows NT Version 4.0
Functions	Functions required for MC Unit control: Creating/editing/saving/printing system parameters, positioning data, and MC programs; monitoring MC Unit operation

C200HW-MC402-E

Motion Control Unit

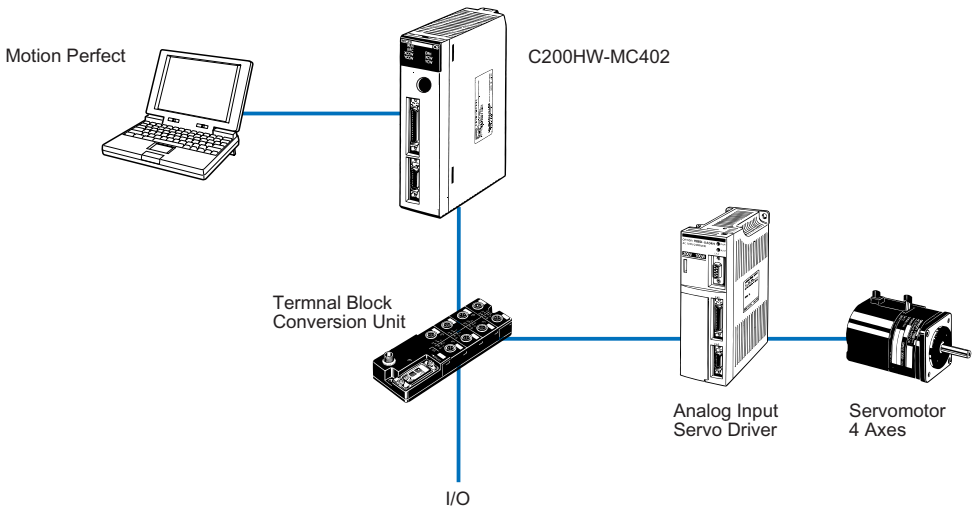
Advanced multi-axes Motion Control with Multi-task BASIC language programming

- Advanced Motion control of 4 axes per unit and up to 16 modules can be installed in one PLC
- Analogue outputs for position, Speed and Torque control
- Hardware registration input for every axis
- Electronic CAM profiles and axes synchronization
- Friendly Motion Perfect Windows-based programming and debugging software. Provides versatile test and monitoring functions including a 4-channel software oscilloscope.

Function

The advanced Motion control unit provides closed-loop control of up to 4 axes, programmed in a multi-task BASIC type language and supported by the powerful software tool. The unit provides a complete command set, allowing applications such as flying saws, rotaring knives, any synchronization and electronic CAM profile to be easily programmed.

System Configuration



Specifications

General

Model		C200HW-MC402-E
Classification		C200H Special I/O Unit
Control Method		Closed loop Position, Speed and Torque control
Control Output signals		Analogue
Programming language		BASIC type motion control language
Controlled axes		4 real axes and 4 virutal axes
Measurement units		User definable
Positioning	Linear interpolation	4 axes
	Arc interpolation	For any 2 axes
	Helical interpolation	For any 3 axes
	Axes Synchronization	For any 2 axes
	Axes Linked CAM profile	For any 2 axes
	Hardware Registration Interrupt	4 axes
Task programming capacity	Number of tasks	Up 5 tasks simultaneous plus interface task
	Number of programs	14
	Data storage capacity	251 (VR) + 16000 (Table) max.

Motion Perfect Software

Model	Motion Perfect
Supported MC Units	C200HW-MC402-E, R88A-MCW151-E, R88A-MCW151-DRT-E
Applicable computer	Windows 95/98/2000/NT4.0
Functions	Programming and debugging software tool. Test and moitoring functions including a 4-channel software oscillos-cope.

CS1W-MCH71

Motion Control Unit

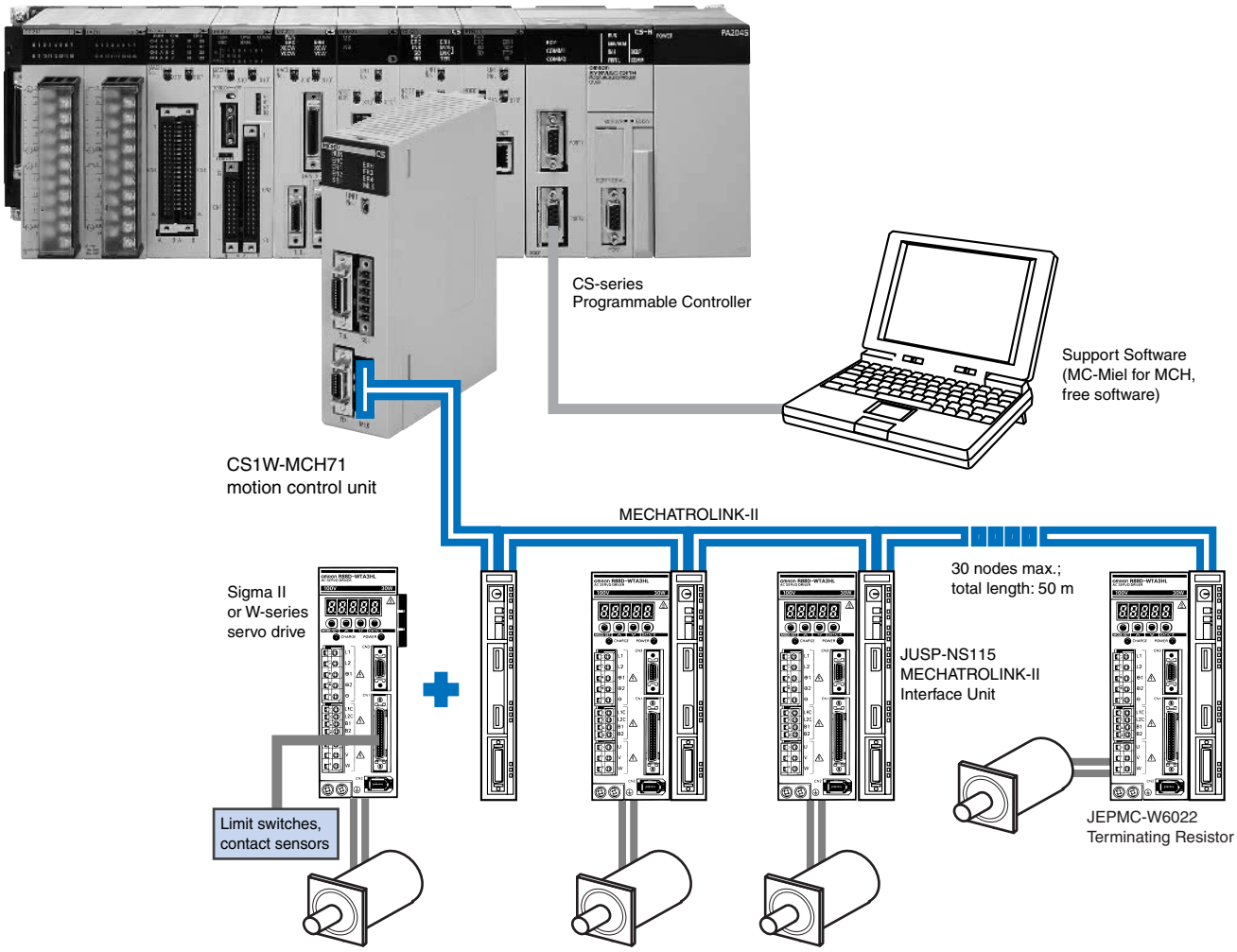
Multi-axes Motion Control over high-speed MECHATROLINK-II

- Up to 30 axes controlled with less wiring
- Supports Position, speed and Torque control
- Electronic CAM profiles and axes synchronization
- Hardware registration input for every axis
- Program control commands, like Multi-task programming and branching commands, and various arithmetic operations for maximum program efficiency
- Access to the complete system from one point

Function

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

System Configuration



Ordering Information

Motion Controller

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

Mechatrolink-II related devices

Name	Model	Remarks
Mechatrolink-II Interface Unit	JUSP-NS115	For Sigma-II and W-series Servo drives
Mechatrolink-II Terminator	JEPMC-W6022	Terminating resistor
Mechatrolink-II Cables	JEPMC-W6003-A5	0.5 meter
	JEPMC-W6003-01	1 meter
	JEPMC-W6003-03	3 meters
	JEPMC-W6003-05	5 meters
	JEPMC-W6003-10	10 meters
	JEPMC-W6003-20	20 meters
	JEPMC-W6003-30	30 meters
24V DC I/O Module	JEPMC-IO2310	64 Inputs, 64 Outputs
Counter Module	JEPMC-PL2900	Reversible counters, 2 channels
Pulse Output Module	JEPMC-PL2910	Pulse train positioning, 2 channels

Specifications

General

Model		CS1W-MCH71
Classification		CS-series CPU Bus unit
Applicable PLCs		CS-series, new version (CS1[]-CPU[][]H)
Control Method		MECHATROLINK-II (Position, Speed and Torque control)
Controlled devices		Sigma-II and W-series Servo Drives (ver. 38 or later) with MECHATROLINK-II Interface and various I/O Units.
Programming language		BASIC type motion control language
Controlled axes		32 max, including 30 physical or virtual axes and 2 virtual axes
Control functions	Positioning (PTP)	Executes positioning independently for each axis at a specified speed or the speed system parameter. (Simultaneous specification: Up to eight axes/block, Simultaneous execution: Up to 32 blocks/Unit)
	Linear interpolation	Executes linear interpolation for up to eight axes at a time at the specified interpolation feed speed. (Simultaneous specification: Up to eight axes/block, Simultaneous execution: Up to 32 blocks/system)
	Circular interpolation	Executes circular interpolation for two axes in either clockwise or counterclockwise at the specified interpolation feed speed. Helical circular interpolation is also possible with single-axis linear interpolation added. (Simultaneous specification: Two or three axes/block, Simultaneous execution: Up to 16 blocks/system)
	Other functions	Origin searches, interrupt feeding, timed positioning, traverse positioning, independent electronic cam, synchronized electronic cam, link operation, electronic gear, follow-up synchronization, speed reference, torque reference
Motion programs	Number of tasks, number of programs	Up to 8 tasks and 256 programs/Unit (8 parallel branches per task max.)
	Program capacity	In motion program conversion, 8,000 blocks/Unit max. (2 Mbytes); number of blocks: 800
	Data capacity	Position data: 10,240 points/Unit; Cam data: 32 max.; 16,000 points/Unit
	Subroutine nesting	Five levels max.

CS1W-CT0□1, C200H-CT021

High-speed Counter Units

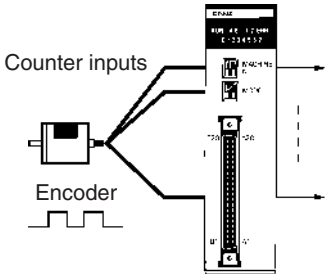
Two- and four-channel high-speed counter units with built-in fast control I/O

- Max. input frequency = 500 kHz. (when line driver input is used)
- Output turns ON less than 0.5 ms after set value is reached. (may deviate during execution of IORD/IOWR instructions)
- 32-bit counting range.
- 2- and 4-axis operation available.
- Digital variable noise filter provided.
- 5-, 12-, and 24-V line driver inputs available. (5- and 12-V line driver input is only available, however, for 1 axis with the CS1W-CT021 and 2 axes with the CS1W-CT041.)
- Supports simple, ring, and linear counting modes.
- Supports offset phase input, up and down pulse input, and pulse+direction input.
- Supports 4 external control inputs, and a total of 16 functions can be set including open gate, close gate, preset, reset, capture, stop/capture/reset combinations, and reset enable.
- One Unit supports 4 external outputs and 28 internal outputs with counter value zone comparisons, target comparisons, delays, holds, programmable outputs, and hysteresis settings.
- Pulse rate measurement function and data logging.
- Counter outputs and external control inputs can be used to trigger interrupt tasks in the CPU Unit.
- Settings can be changed during Unit operation.

Function

The High-speed Counter Units count pulse signal inputs that are too fast to be detected by normal Input Units. The Units can be programmed to produce outputs according to counter values for specified conditions, and many other functions are supported.

System Configuration



Specifications

General

Classification	Number of counters	Encoder A and B input, pulse input, Z signal	Maximum counting speed	Unit numbers	Model
C200H Special I/O Unit	2	Open-collector Input voltage: 12 V DC or 24 V DC	50 kcps	0 to F	C200H-CT021
		RS-422 line driver	75 kcps		
CS1 Special I/O Unit	2	Open-collector Input voltage: 5 V DC, 12 V DC, or 24 V DC (5- and 12- V DC input only possible for 1 axis.)	50 kcps	0 to 92 (4 unit numbers per Unit)	CS1W-CT021
		RS-422 line driver	500 kcps		
	4	Open-collector Input voltage: 5 V DC, 12 V DC, or 24 V DC (5- and 12- V DC input only possible up to 2 axes.)	50 kcps		CS1W-CT041
		RS-422 line driver	500 kcps		

CS1W-CTS21

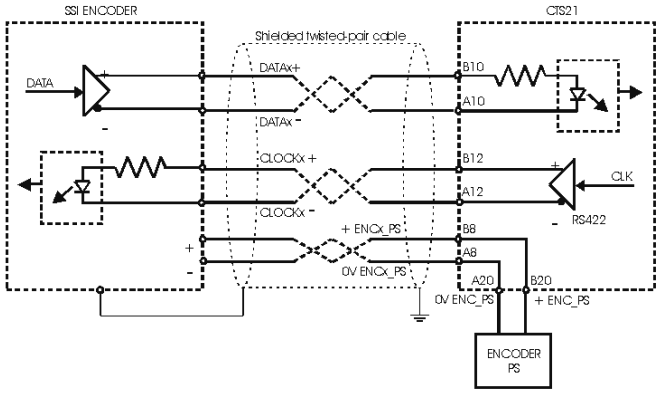
SSI Encoder Input Unit

SSI (synchronous serial interface) is a standard communication protocol developed for absolute encoders. It provides easier connection and reduced wiring compared to parallel connection.

Specifications

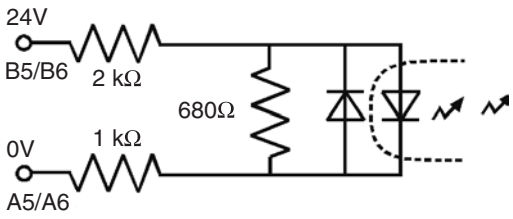
SSI Communication

Item	Specification
CLK lines	Non-isolated differential line driver, RS422 compliant
DATA lines	Electrically isolated differential line receiver, RS422 compliant
Number of data-bits	9 to 31 (default: 24)
Value coding	Gray/Binary/Tannenbaum/Raw (default Gray)
Clock frequency	100kHz to 1.5MHz
Monoflop time	10µs to 99,990µs (default: 40 µs)
Sample rate	About 2500 Samples/sec with 2 encoders connected (with default settings)



Input Specifications

Item	Digital Inputs
Input Voltage	24 V DC (19.6 V to 26.4 V)
Input Current (typical)	7.6 mA
ON Voltage (min.)	19.6 V
OFF Voltage (max.)	4 V
Max. repetition rate	1 kHz
Min. pulse width	10 µs
Input Voltage	24 V DC (19.6V to 26.4V)



Output Specifications

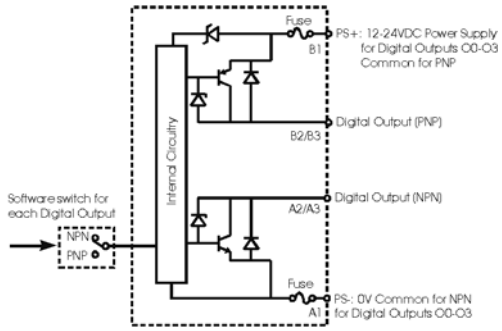
Item	Specification
Driver Type	Open Collector (NPN/PNP selectable)
Operating Voltage Range	12-24 V (10.2 to 26.4 V)
Maximum Switching Capacity	46 mA at 10.2 V to 100 mA at 20.4 V to 26.4 V (400mA max./common) (linear behaviour)
Minimum Switching Current	5 mA
Output ON-delay	0.1ms max.
Output OFF-delay	0.1ms max.
Leakage Current	0.1mA max.

The power supplied to the Unit, to feed the Digital Outputs, has to be supplied externally and should be a double insulated class II (overvoltage) type with ratings from 12 to 24VDC (10.2 to 26.4VDC). Characteristics of the Power Supply Input circuitry are summarised in the following table.

Item	Specification
Operating Voltage Range	10.2-26.4 V DC
Current Consumption	25 mA max. (excl. load current)
Internal Fault Protection	Two 1 A (not replaceable) fuses in Power Supply lines
Reverse Polarity Protection	Yes

The Digital Outputs are insulated from the I/O-bus but not from each other. They are not short circuit protected.

Digital Output Circuitry:



Connector (CN1 and CN2) Pin-layout

Use the following table to make connections directly to the soldering terminals of the connector jack(s) (see *Nomenclature* section for position of connectors 1 and 2 and rows A and B):

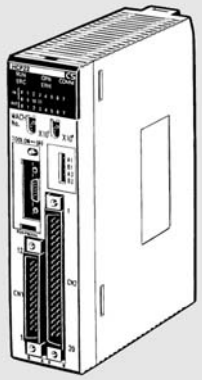
Connector 2 (CN2)				Connector 1 (CN1)			
Row A		Row B		Row A		Row B	
A1	0V_PS[1]	24V_PS[2]	B1	A1	0V_PS[1]	24V_PS[2]	B1
A2	O2 NPN	O2 PNP	B2	A2	O0 NPN	O0 PNP	B2
A3	O3 NPN	O3 PNP	B3	A3	O1 NPN	O1 PNP	B3
A4			B4	A4			B4
A5	0V I2	24V I2	B5	A5	0V I0	24V I0	B5
A6	0V I3	24V I3	B6	A6	0V I1	24V I1	B6
A7			B7	A7			B7
A8	0V ENC2_PS[3]	+ ENC2_PS[4]	B8	A8	0V ENC1_PS[3]	+ ENC1_PS[4]	B8
A9			B9	A9			B9
A10	DATA2 -	DATA2 +	B10	A10	DATA1 -	DATA1 +	B10
A11			B11	A11			B11
A12	CLOCK2 -	CLOCK2 +	B12	A12	CLOCK1 -	CLOCK1 +	B12
A13			B13	A13			B13
A14			B14	A14			B14
A15			B15	A15			B15
A16			B16	A16			B16
A17			B17	A17			B17
A18			B18	A18			B18
A19			B19	A19			B19
A20	0V ENC_PS[3]	+ ENC_PS[4]	B20	A20	0V ENC_PS[3]	+ ENC_PS[4]	B20

CS1W-HC□□□/-HIO01

Customizable Counter Units

Dedicated PLC unit for position control.

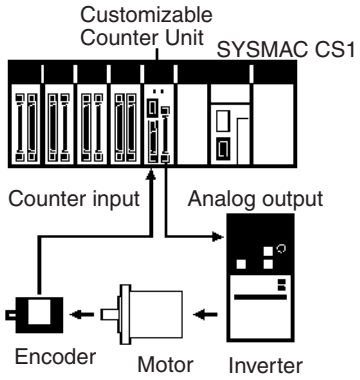
- Fast loop control with all the flexibility and functionality of a PLC.
- Position control using Analog or pulse train output.
- Standard encoder interface inputs.
- Programmed using standard PLC Ladder language and CX-Programmer software.



Function

The customizable counter units provide a highly flexible solution for fast loop control. The PLC functionality together with the high-speed allows the units to be used in a wide range of general purpose applications including closed-loop position control.

System Configuration



Specifications

General

Model number		CS1W-HCP22-V1	CS1W-HCA12-V1	CS1W-HCA22-V1	CS1W-HIO01-V1
Type		Counter inputs, pulse outputs	Analog inputs, counter inputs, analog outputs	Counter inputs, pulse outputs	Basic type
Inputs	12 DC inputs	Yes	Yes	Yes	Yes
	Counter inputs	Yes (2 inputs)	Yes (1 input)	Yes (2 inputs)	No
	1 analog input	No	Yes	No	No
Outputs	8 transistor outputs	Yes	Yes	Yes	Yes
	2 pulse outputs	Yes	No	No	No
	2 analog outputs	No	Yes	Yes	No

Programming Functions

Programming language	Ladder programming
Basic instruction execution speed	200 ns (1 Kword) or 400 ns (4 kWords), switchable
Program capacity	1 Kword or 4 kWords, switchable
Data memory capacity	6 kWords + 2 kWords of expanded data memory
Backup functions	10-day capacitor backup and flash memory storage
CS1 CPU Unit data exchange	132-channel data link (maximum)
Programming Device	CX-Programmer (versions 1.2. or later) or Programming Console
Programming Device Connecting Cable	CS1 Connecting Cable or Programming Console Cable

Counter Inputs (CS1W-HCP22/HCA22)

Operating modes	Linear and ring
Signal level	5, 12, or 24 V, or line driver (only one input each for 5 and 12 V)
Input method	Phase difference (×1, ×2, or ×4), up/down, or pulse with direction
Counting speed	Voltage: 50 kcps Line driver: 50/200 kcps
Other functions	Compatible with absolute encoder Servo Driver s (such as the OMRON W Series). Virtual axis function

Pulse Outputs (CS1W-HCP22)

Output signal	Clockwise/counterclockwise
Signal level	5 to 24 V
Output speed	200 kpps

Analog Outputs (CS1W-HCA12/HCA22)

Output signal	–10 to 10 V, 0 to 10 V, 1 to 5 V, 0 to 5 V
Resolution	1/4,000, 1/10,000 (for –10 to 10 V only)
Accuracy	±0.3% of FS (23±2°C), ±0.5% of FS (0 to 55 °C)
Conversion speed	0.5 ms max.

CS1W-V600□□□/C200H-IDS01-V1

RFID Sensor Unit

Easy integration of RFID Systems into PLC's.

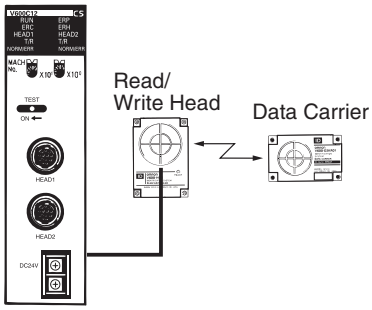
- Connects V600 RFID read/write heads directly to the PLC.
- Function checking possible with standard hand-held Programming Console.
- Read data from Data Carriers simply by sending a read command.
- The C200H-IDS01-V1 can read/write up to 1,024 bytes. The CS1W-V600C11/12 can read/write up to 2,048 bytes.

Function

Read/write data in Data Carrier memory by sending read/write commands from the CPU Unit to the Read/Write Head.

One Read/Write Head can be connected to the CS1W-V600C11 and two Read/Write Heads can be connected to the CS1W-V600C12. The data transfer speed has been increased in both models.

System Configuration



Specifications

Classification	Connectable ID System	Connectable Read/ Write Heads	External power supply	Unit numbers	Model
CS1 CPU Bus Unit	V600 Series (electromagnetic, for short distances)	1 Read/Write Head	Not required	0 to 95	CS1W-V600C11
		2 Read/Write Heads	24 V DC	0 to 94	CS1W-V600C12
C200H Special I/O Unit		---	Not required	0 to 9	C200H-IDS01-V1

Serial Communication Units

Serial Communications Features

Unit	Model	Ports	Serial communications mode						BASIC programming	Message communications
			Protocol macros	Host Link	NT Links	No-protocol	Peripheral bus	Programming Console bus		
			General-purpose external devices	Host computers	OMRON PTs	General-purpose external devices	Programming Devices	Programming Console	General-purpose external device	
CPU Units	All models	Port 1: Peripheral	No	Yes	Yes	No	Yes	Yes	No	No
		Port 2: RS-232C	No	Yes	Yes	Yes	Yes	No	No	No
ASCII Units	C200H-ASC02	Port 1: RS-232C	No	No	No	No	No	No	Yes	No
		Port 2: RS-232C	No	No	No	No	No	No	Yes	No
	C200H-ASC11	Port 1: RS-232C	No	No	No	No	No	No	Yes	No
		Port 2: RS-232C	No	No	No	No	No	No	Yes	No
	C200H-ASC21	Port 1: RS-232C	No	No	No	No	No	No	Yes	No
		Port 2: RS-422A/485	No	No	No	No	No	No	Yes	No
	C200H-ASC31	Port 1: RS-232C	No	No	No	No	No	No	Yes	No
		Port 2: RS-232C	No	No	No	No	No	No	Yes	No
Serial Communications Boards/Units	CS1W-SCB21-V1	Port 1: RS-232C	Yes	Yes	Yes	No	No	No	No	No
		Port 2: RS-232C	Yes	Yes	Yes	No	No	No	No	No
	CS1W-SCB41-V1	Port 1: RS-232C	Yes	Yes	Yes	No	No	No	No	No
		Port 2: RS-422A/485	Yes	Yes	Yes	No	No	No	No	No
	CS1W-SCU21-V1	Port 1: RS-232C	Yes	Yes	Yes	No	No	No	No	No
		Port 2: RS-232C	Yes	Yes	Yes	No	No	No	No	No
DeviceNet RS-232C Unit	DRT1-232C2	Port 1: RS-232C Port 2: RS-232C	No	No	No	No	No	No	No	Yes

C200H-ASC□□

ASCII Units

Easily Perform Serial Data Communications

- Perform ASCII communications with a wide range of external devices.
- The C200H-ASC11/ASC21/ASC31 function as special processing units with BASIC programming.
- Large-capacity user memory: 200 Kbytes
- Model available with RS422A/485 port.
- Various forms of data exchanges with CPU Unit: Select the best method for the read/write trigger and timing.
- High-speed data exchanges possible with shared memory (not dependant on I/O refresh).
- A wide range of interrupt processes: Interrupts from CPU to ASCII Unit, communications interrupt, key interrupts, timer interrupts, error interrupts, etc.
- Easy control of transmission control signals.
- Calculation instructions for error check codes.
- Many BASIC debugging functions (break points, 1-step execution, execution stop monitoring, etc.)
- Error log supported with up to 30 error records.

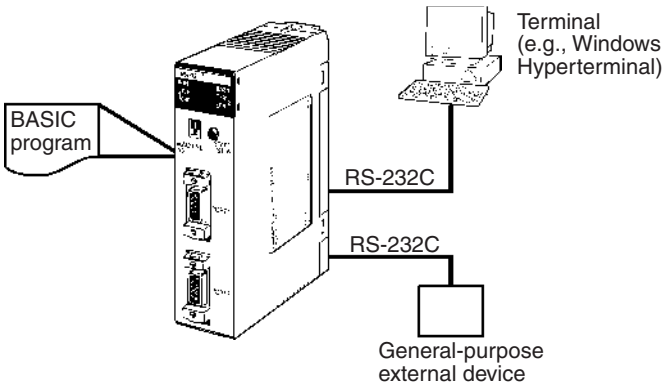
Function

The ASCII Units support BASIC language programming and RS-232C and RS422A/485 serial communications. BASIC programming enables ASCII communications with essential any external device. It can also be used as a special processing unit to aid the CPU Unit without using external communications.

The C200H-ASC11/ASC21/ASC31 provide shared memory with the CPU Unit, and both the ASCII Unit and the CPU Unit can access the shared memory asynchronously, providing for high-speed data exchanges between the two Units without using interrupts.

A library interface toolkit is available for the creation of user-defined library routines in BASIC or C.

System Configuration



Specifications

General

Classification	User memory	Shared memory	Serial communications ports	Unit numbers	Model
C200H Special I/O Unit	200 Kbytes	Provided (90 words in I/O memory)	RS-232C x 2	0 to F	C200H-ASC11
			RS-232C x 1, RS-422A/485 x 1		C200H-ASC21
			RS-232C x 2, RS-232C x 1 for terminal		C200H-ASC31

Note: The C200H-ASC02 can also be used with CS1 PLCs.

CS1W-SCU21-V1/-SCB□1-V1

Serial Communications Units/Boards

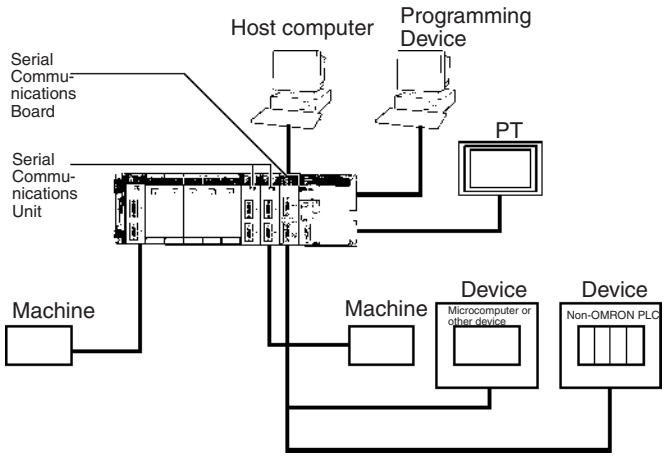
Supports Protocol Macros, Host Link Communications, and 1:N NT Links

- Serial Communications Board
- Increase the number of serial ports without using I/O slots.
- Connect general-purpose external devices 1:N using RS-422A/485.
- Generate interrupts to the CPU Unit when data is received.
- Serial Communications Unit
- Mount up to 16 Units (including all other CPU Bus Units) on CPU or Expansion Racks. Ideal for systems that require many serial ports.

Function

Either an Inner Board or CPU Bus Unit can be used to increase the number of serial ports (RS-232C or RS-422A/485) two at a time. You can specify Protocol Macros, Host Link Communications, or 1:N NT Links separately for each port. With the CS1 Series, you can always install the right number of serial ports for your system.

System Configuration



Specifications

General

Unit	Classification	Serial communications modes	Serial	Unit numbers	Model
Serial Communications Board	Inner Board	Set separately for each port: Protocol Macro, Host Link, or 1:N NT Link	RS-232C x 2	---	CS1W-SCB21-V1
			RS-232C x 1, RS-422A/485 x 1		CS1W-SCB41-V1
Serial Communications Unit	CS1 CPU Bus Unit		RS-232C x 2	0 to F	CS1W-SCU21-V1

Protocol Macros

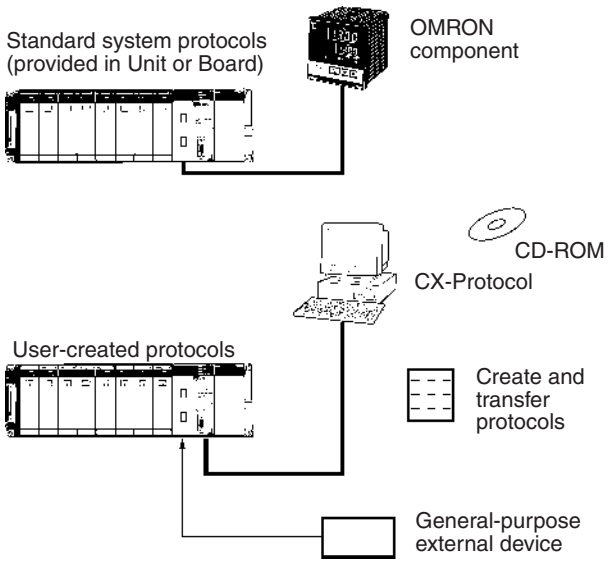
Easily Create Protocols for Data Exchange with External Devices; Execute with One Instruction

Function

Protocols for communications with external devices can be easily created according to the communications standards required by the external device. Protocol macros enable communications with essentially any external device with an RS-232C or RS-422A/485 port without programming communications in the PLC.

Standard system protocols are provided as a standard feature for communications with OMRON components, such as Temperature Controllers, Panel Meters, Bar Code Readers, and Modems. A Windows-based tool called CX-Protocol is also available to enable creation of protocols for most any external device.

System Configuration



Types of Protocol

Protocols	External devices	Required products
Standard system protocols	OMRON components	Serial Communications Board or Unit
User-created protocols	General-purpose external device	Serial Communications Board or Unit + CX-Protocol (Windows-based protocol support software)

Standard System Protocols

Component		Model	Send/receive sequences
CompoWay/F-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)	E5CK	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)	E5□J-A2H0	
	Digital Controllers with Communications (96 x 96 mm)	ES100□	
	High-density Temperature Controller with communications (8 control points)	E5ZE	
Intelligent Signal Processors (special specifications)		K3T□	Display value read, comparison value read, write, etc.
Bar Code Readers	Laser Scanner type	V500	Read start, data read, read stop, etc.
	CCD type	V520	
Laser Micrometer		3Z4L	Measurement condition set, continuous measurement start, etc.
Visual Inspection Systems	High speed, high precision, low cost	F200	Measurement, continuous measurement, etc.
	High-precision inspection/positioning	F300	
	Character inspection software/positioning software	F350	Measurement, positioning, inspection, character inspection, etc.
RFID Controllers	Electromagnetic coupling (for short distances)	V600	Carrier data read, autoread, write, etc.
	Microwave (for long distances)	V620	
Hayes Modem AT Command		---	Modem initialize, dial, send, etc.

NT-AL001

RS-232C/RS-422A Adapter Unit

Allows integration of RS232C devices into RS-422A networks.

- Long-distance transmissions are possible through an RS-422A interface. By converting from RS-232C to RS-422A and then back to RS-232C, a transmission distance of up to 500 m can be achieved.
- No power supply is required. If the 5-V terminal (150 mA max.) is connected from the RS-232C device, a separate power supply is not required to drive the Adapter Unit.
- The removable terminal block enables wiring not possible with D-sub connectors. (The RS-232C interface is 9-pin D-sub.)

Specifications

RS-232C Interface

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

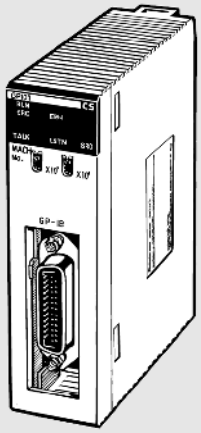
RS-422A Interface

Item	Specification
Baud rate	64 Kbps max. (depends on RS-232C baud rate)
Transmission distance	500 m max.
Terminal block	8 terminals, M3.0; detachable

CS1W-GPI01

GP-IB Interface Unit

- Enables communications between SYSMAC CS-series PLCs and GP-IB instruments.
- Conforms to the standard interface IEEE-488-1978 (GP-IB).
- Usable in either Master Mode (controller) or Slave Mode (talker, listener).
- Communications with GP-IB instruments are easily implimented simply by using the INTELLIGENT I/O READ and INTELLIGENT I/O WRITE (IORD/IOWR) instruction in the ladder program in the CPU Unit to read and write buffer memory in the GP-IB Interface Unit.



Specifications

Item	Specification
Name	SYSMAC CS-series GP-IB Interface Unit
Model number	CS1W-GPI01
Unit type	CS1 Special I/O Unit
Mounting location	CS1 CPU Rack or CS1 Expansion Rack
Max. number of GP-IB Interface Units	Up to 4 GP-IB Interface Units per CPU Unit
Unit number setting range	0 to 95
GP-IB Interface Unit settings when editing the I/O tables offline with the CX-Programmer	Number of unit numbers used: 1 Number of input words allocated: 5 Number of output words allocated: 5
Transmission method	8-bit parallel data transfer
Communications method	Half duplex
Interface	Conforms to IEEE-488-1978 (24-pin) standards
Handshaking method	Three-line handshaking
Functional specifications (GP-IB interface functions)	Master mode: SH1, AH1, T6, TE0, L4, LE0, C1 to C4, and C28 Slave mode: SH1, AH1, T6, TE0, L4, LE0, SR1, RL0, PP0, DC1, and DT0
Connection configurations	Star configuration or daisy-chain configuration
Transmission distance	Limits on the length of cables in the system (All three of these conditions must be satisfied simultaneously.) Total cable length ≤ Number of devices in the system × 2 m Total cable length ≤ 20 m Length of a single cable ≤ 4 m (for a 1:1 connection)
Max. number of connected devices	15 devices max. including the GP-IB Interface Unit
GP-IB device address	0 to 30
Delimiters	Select from the following: CR + LF, CR, LF, EOI, or user-set code.
Max. data transfer size	512 bytes max. in a single reception or transmission
Max. number of connectors	2 (connectors can be stacked)
Current consumption	5 VDC, 330 mA
Dimensions	35 × 130 × 101 mm (W × H × D)
Weight	258 g max.

OMRON

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	
	Controller Link	Computers connected directly to network and PLC	FINS messages	Controller Link Support Board and Unit
			Data links (offsets and automatic setting)	
Control networks	Controller Link	PLC to PLC	FINS messages	Controller Link Unit
			Data links (offsets and automatic setting)	
	PC Link		Simple data links	PC Link Unit
	DeviceNet		FINS messages on open network	DeviceNet Master Unit and Configurator
	DeviceNet	PLC to components (slaves)	High-capacity remote I/O on open network (fixed or user allocations)	DeviceNet Master Unit and Configurator
	PROFIBUS-DP	PLC to components (slaves)	High-capacity remote I/O on open network (user allocations)	PROFIBUS-DP Master, I/O Unit and Configurator
	CAN/CANopen	Component to components	Freely configurable, object-oriented communication using CANopen or user-defined CAN protocols	CANopen Unit
	CompoBus/S	PLC to components (slaves)	High-speed remote I/O with OMRON network (fixed allocations)	CompoBus/S Master Unit

Specifications

Communications

Network	Ethernet	Controller Link	PROFIBUS-DP	DeviceNet	CANopen	CompoBus/S
Messages	Yes	Yes	Limited to DPV1 devices	Yes	Yes	---
Data links	---	Yes	Manually configurable	---	Yes	---
Remote I/O	---	---	Yes	Yes	Yes	Yes
Maximum speed	10/100 Mbps	2 Mbps Comm cycle: Approx. 34 ms (Wired: 32 nodes, 2-Kbits + 2-Kword data links)	12 Mbps Comm cycle from 1 ms	500 Kbps Comm cycle: Approx. 5 ms (128 inputs and 128 outputs)	1 Mbps (acyclic, on-event communication)	750 Kbps (See note 1.) Comm cycle: Approx. 1 ms (128 inputs and 128 outputs)
Total distance	---	Twisted-pairs:1 km (at 500 bps) Optical: 20 km	1200 m up to 93.75 kbps, 100 m at 12 Mbps. Extension by optical links is possible.	500 m (at 125 kbps)	5 km at 10 kbps to 40 m at 1 Mbps	Trunk line: 500 m (See note 2.) Communications cycle: 6 ms max.
Maximum nodes	---	32/62 with repeaters	126 with repeaters	63	127	32
Communications media	---	Special twisted-pair cable or optical cable	PROFIBUS cable	DeviceNet cable	ISO11898. e.g. DeviceNet cable	2-core or 4-core VCTF cable, special flat cable (See note 3.)
Network data link capacity	---	32,000/62,000 words	---	---	---	---
Remote I/O capacity	---	---	300 words (C200H) 7000 words (CJ1, CS1)	32,000 pts (with Configurator) 2,048 pts (without Configurator)	Up to 200 words configurable	256 pts
Supporting PLCs	CS1, CJ1, CVM1, CV Series, C200HX/HG/HE	CS1, CJ1, CVM1, CV Series, C200HX/HG/HE	CS1, CJ1, C200HX/HG/HE/HS, CQM1/CQM1H (I/O link), CPM1A (I/O link)	CS1, CJ1, CVM1, CV Series, C200HX/HG/HE, C200HS, CQM1/CQM1H (with I/O Link), CPM2C (with I/O Link)	CS1, C200HX/HG/HE	CS1, CJ1, C200HX/HG/HE, C200HS, CQM1/CQM1H, CPM2C-S1□0C (-DRT) SRM1; CPM1A/CPM2C (with I/O Link)

Note: 1. For high-speed communications mode. Trunk line length is 100 m (30 m max. for 4-core VCTF or special flat cable).
2. For long-distance communications mode (200 m max. for 4-core VCTF or special flat cable).
3. Different types of cables cannot be mixed.

CS1W-ETN□□

Ethernet Units

Enables fast data transfer within Factory Automation systems, and easily links FA systems to plant management systems

- Access socket services simply by manipulating specific bits in memory.
- Take advantage of data transfer by e-mail.
- Seamless communication with Controller Link and other networks.
- Use the Ethernet standard protocols, TCP/IP and UDP/IP.
- Use OMRON's standard FINS message communications.
- Exchange files with host computers using FTP.
- Set communications parameters with the CX-Programmer setup menus.

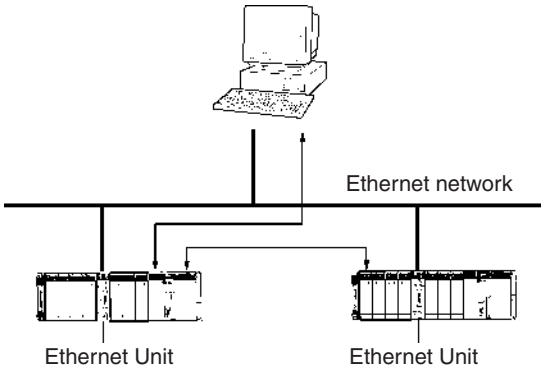
Features of the 100Base-TX Model

- While the 100Base-TX model maintains backward compatibility with the earlier models (10Base-5 and 10Base-T), the new model has a basic system repsonse performance about 4 times faster.
- The FINS message communications capabilities have been improved dramatically.
  - Increased number of nodes (from 124 to 254 nodes)
  - Supports TCP/IP protocol as well as the earlier UDP/IP protocol.
  - The host computer's IP address can be set dynamically (DHCP).
- A mail receiving function has been added (POP3).
- A function has been added that automatically corrects the PLC's internal clock (SNTP) .
- Various kinds of servers can be specified by their host name (DNS).

Function

Achieve a wide range of communications from PLCs connected to an Ethernet network: Transfer data with TCP/IP or UDP/IP socket services, executed OMRON's standard FINS commands, transfer files with FTP, or send mail with SMTP. Select the communications services that are required and flexibly connect PLCs on an information level Ethernet network.

System Configuration



Specifications

Classification	Communications services	Unit numbers	Connector	Model
CS1 CPU Bus Unit	FINS communications, FTP server, socket services, and mail services	0 to F max. 4 Units per CPU	10Base-5	CS1W-ETN01
			10Base-T	CS1W-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)	CS1W-ETN21

CS1W-CLK□□-V1, 3G8F7-CLK□□-V1

Controller Link Units and Controller Link Support Board

OMRON's efficient and easy-to-use FA Network

- Achieve high-capacity, flexible data links.
- Transfer large volumes of data through a message service.
- Connect through twisted-pair cables or optical fiber cables.
- Connect CS1, CJ1, C200HX/HG/HE and CQM1H PLCs.
- Complete error correction and troubleshooting functions.
- Quick configuration of communication links with CX-Programmer's setup menus.
- Increase network reliability with duplex connections for optical networks.
- Use either ring mode or bus mode for optical networks.

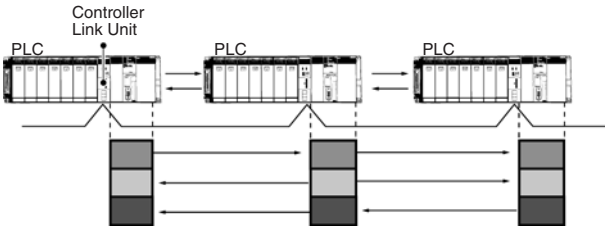
Function

Controller Link is OMRON's proprietary FA-level network. It supports automatic data links between PLCs and between PLCs and host computer, as well as programmed data transfers using a message service.

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.

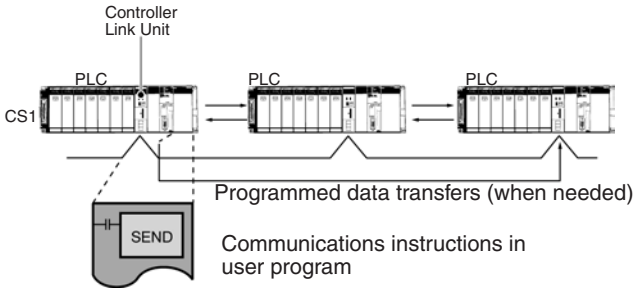
System Configuration

Data Links



Cyclic transfer with shared memory data areas
I/O bits, LR Area bits, DM Area words, etc.

Message Communications



Programmed data transfers (when needed)

Communications instructions in user program

Specifications

General

Unit/Board	Classification	Communications	Media	Specifications	Unit numbers	Model
Controller Link Units	CS1 Bus Unit	Data links and message communications	Wired	Up to 4 Units can be mounted to CPU Rack or CS1 Expansion Racks.	0 to F (4 Unit max.)	CS1W-CLK21-V1
			Optical (H-PCF cable)			CS1W-CLK12-V1
			Optical (GI fiber 62.5/125 µm)			CS1W-CLK52-V1
Controller Link Support Boards	Personal computer board		Wired	Applicable computer: Windows-compatible computer with PCI bus	---	3G8F7-CLK21-V1
			Optical (H-PCF cable)			3G8F7-CLK12-V1
			Optical (GI fiber 62.5/125 µm)			3G8F7-CLK52-V1

CS1W-PRM21

PROFIBUS-DP Master Unit

- PROFIBUS-DP master class one with support of DP-V1 data types.
- 7 kWord I/O
- Simple configuration through FDT/DTM based configurator
- Special CPU unit
- Handles data independent of the CPU unit, thus reducing CPU load

Function

The CS1W-PRM21 is a master system (DPM1). It exchanges I/O data and communication/status information with the CPU of the PLC. To configure the CS1W-PRM21 a serial port of the CPU can be used. But because configuring is done through FINS communication virtual any accesspoint on the PLC network can be used. It exchanges data and commands with PROFIBUS-DP slave stations over the PROFIBUS network.

Specifications

Model			Remarks
CS1W-PRM21	Main function	Basic PROFIBUS-DP master Class 1 functions plus: DPV1 data types support	
	Unit No.	0-15	Special CPU unit
	Maximum number of units mountable per PLC	16	Maximum depends on PLC CPU-type
	Configurator	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	34.5 mm wide x 130 mm height x 111.2 mm depth	
	Weight	154 gr	
	Ambient temperature	Operating: 0 °C to 50 °C	

C200HW-PRM21

PROFIBUS-DP Master Unit

PROFIBUS-DP master for C200HX, C200HG, C200HE, C200HS and CS1

- The C200HW-PRM21 is the PROFIBUS-DP master unit for OMRON's CS1 and C200H-series.
- Multiple PROFIBUS-DP masters can be mounted in the same PLC system.
- Switch to activate bus termination
- Supports up to 124 slaves.
- Allows mapping of slave data to any PLC data area.
- Default mode requires no PLC settings.

Ordering Information

Product Code	Description
C200HW-PRM21	PROFIBUS master unit for C200Hα and CS1 PLCs
W349-E2-02	User Manual for PROFIBUS unit + configurator
WS02-PDC2-E	Configurator Software

Specifications

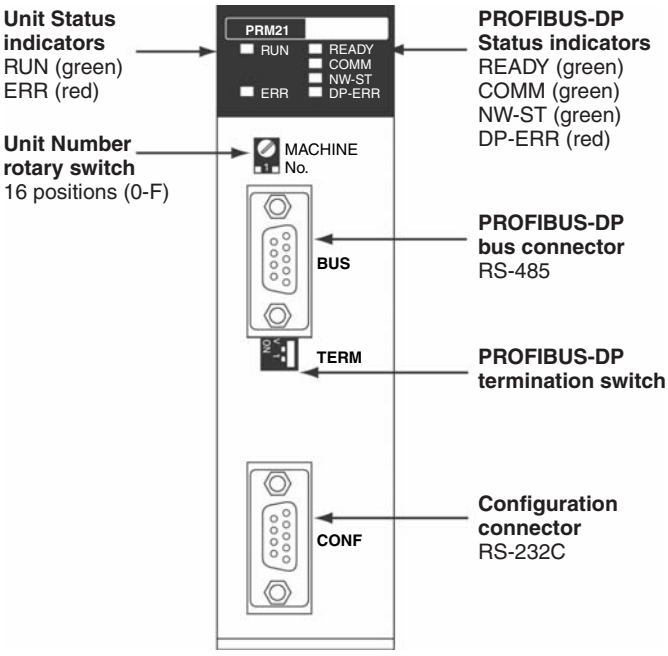
Communication Specification

Applicable standard	EN 50170 vol.2
Network topology	Line, max. 125 node addresses
Bus connector	9-pin sub-D female
Bus termination	Built in, switch selectable
Baud rates	9.6k, 19.2k, 93.75k, 187.5k, 500k, 1.5M, 3M, 6M, 12M bits/s, set by configurator (default 1.5M).
Communication distance	100 m (at 12 Mbit/s) to 1200 m (at 9.6 kbit/s) per segment. Extendible to 4800 m (at 9.6 kbit/s) using 3 repeaters.
Communication cable	Type A (EN 50170 vol. 2).
Fieldbus cycle time	Minimum 1 ms (at 12 Mbit/s)
Supported DP functions **as responder** **as requester**	Get_Master_Diag Data_Exchange - synchronous with PLC cycle. - asynchronous, independent of PLC cycle (default). Slave_Diag - by configurator s/w (all CPU's) - by IOWR/IORD (C200HE/-G/-X and higher CPU models only). Set_Prm - automatic, at start-up. Chk_Cfg - automatic, at start-up. Global_Control - Multi-cast / Broadcast of Sync, Freeze and Clear_Data
PROFIBUS-DP GSD file	OC_1656.GSD

Unit Specification

		C200HS	C200HE/HG/HX/CS1	
Model code		C200HW-PRM21		
Maximum. number of Master Units (with user defined I/O mapping)		10	C200HE-CPU11/32/42 C200HG-CPU33/43 C200HX-CPU34/44	10
			C200HG-CPU53/63 C200HX-CPU54/64 CS1	16
Master Unit mounting position		CPU Rack or Expansion I/O Rack (classified as Special I/O Unit) Unit cannot be mounted to SYSMAC BUS Slave Racks. Unit cannot be used on a C200H PLC system.		
Settings		Rotary switch : Unit number Toggle switch : Bus termination		
Displays		Unit status: RUN (green LED), ERR (red LED) Network status: READY (green LED), COMM (green LED), NW-ST (green LED), DP-ERR (red LED)		
External connectors		9-pin female sub-D connector (fieldbus connector, RS-485) 9-pin female sub-D connector (configurator connector, RS-232C)		
No. of IR words		2 words of control data out + 3 words of unit status in		
No. of DM settings		18 words of unit setup information		
No. of slave status words		16 words of status + diagnostic bits (location is user definable)		
Remote I/O communications	Max. No. of Slaves per Master Unit	124		
	Max. No. of I/O words per Master Unit	With default DM settings: 32 words in, 32 words out With user defined DM settings: 80 words, in up to 4 areas	With default DM settings: 50 words in, 50 words out With user defined DM settings: 300 words in up to 4 areas; maximum 100 words per area	
Slave diagnostics		Not supported	via IOWR / IORD instructions	
PROFIBUS-DP	Baud rate	9.6 / 19.2 / 93.75 / 187.5 / 500 kbit/s, 1.5 / 3 / 6 / 12 Mbit/s		
	Supported functions	as client : Data_Exchange, Slave_Diag, Set_Prm, Chk_Cfg, Global_Control as server: Get_Master_Diag		
Network configuration		Configurator program (SyConDP V.2.x) for WIN 95 and WIN NT		
Current consumption		600 mA at 5 V DC (from PLC power supply)		
Storage temperature		–20 to +75°C		
Operating temperature		0 to +55°C		
Operating humidity		10% to 90% (non-condensing)		
Conformance to EMC- and environmental standards		EN 50081-2 EN 61131-2		
Weight		250 g		

Nomenclature



C200HW-PRT21

PROFIBUS-DP Slave Unit

I/O Link Unit for C200H□ and CS1 PLC
Ideal for distributed control.

- OMRON's C200HS, C200HE, C200HG, C200HX and CS1 PLCs can be used as an intelligent Slave on a PROFIBUS-DP network.
- Default 2 words in + 2 words out, maximum 100 words in + 100 words out.
- Simple PROFIBUS-DP node address setting by rotary switches.
- Supports SYNC/FREEZE and Fail-Safe functions.

Specifications

Communication Specifications

Applicable standard	EN 50170 vol. 2
Station type	Modular station, max. 32 modules Configurable with In-, Out- and I/O-modules of 1, 2, 4, 8 and 16 words Total of 0 to 100 words in + 0 to 100 words out, with consistency over the full length
Bus connector	9-pin female sub-D connector (RS-485 PROFIBUS connector)
Bus termination	External
Baud rate (auto-detect)	9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s, 1.5 / 3 / 6 / 12 Mbit/s
PROFIBUS address range	0 to 125, Remote setting not supported
Communication cable	Type A (EN 50170 vol. 2)
Minimum slave interval time	0.5 ms
Supported DP functions	Data_Exchange Slave_Diag Set_Prm Chk_Cfg Global_Control (SYNC, FREEZE, CLEAR) Get_Cfg RD_Inp RD_Outp
PROFIBUS-DP GSD file	OC_04AC.GSD

Unit Specifications

Host PLC system	C200HS, C200HE, C200HG, C200HX, CS1	
Maximum number of Units per PLC system	C200HS C200HE-CPU11/32/42 C200HG-CPU33/43 C200HX-CPU34/44	10
	All others	16
Slave unit mounting position	CPU Rack or Expansion I/O Rack Unit: cannot be mounted to SYSMAC BUS Slave Racks Unit: cannot be used on a C200H PLC system	
Current consumption	250 mA at 5 V DC (from PLC power supply)	
Weight	180 g	
Switch settings	Special I/O Unit number (0-F) by notary switch PROFIBUS-DP mode address (o to 125) by 3 rotary switches	
LED indicators	Unit status: RUN (green LED), ERR (red LED) Network status: COMM (green LED), BF (red LED)	
No. of IR words	PLC to Slave Unit: 3 words (1 word of control data + 2 words slave input data) Slave unit to PLC: 5 words (3 words of unit status + 2 words slave output data)	
No. of DM settings	8 words of Unit setup information	
Amount of I/O data per Unit	Default (DM settings all 0000)	all PLC's: 2 words in + 2 words out
	With user defined DM settings	C200HS: up to 80 words in + out all others: up to 100 words in + 100 words out
Storage temperature	- 20 °C to + 75 °C	
Operating temperature	0 °C to + 55 °C	
Operating humidity	10% to 90% (non-condensing)	
Conformance to EMC- and environmental standards	EN50081-2 EN61131-2	

CS1W-DRM21

DeviceNet Unit

Multivender, 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.

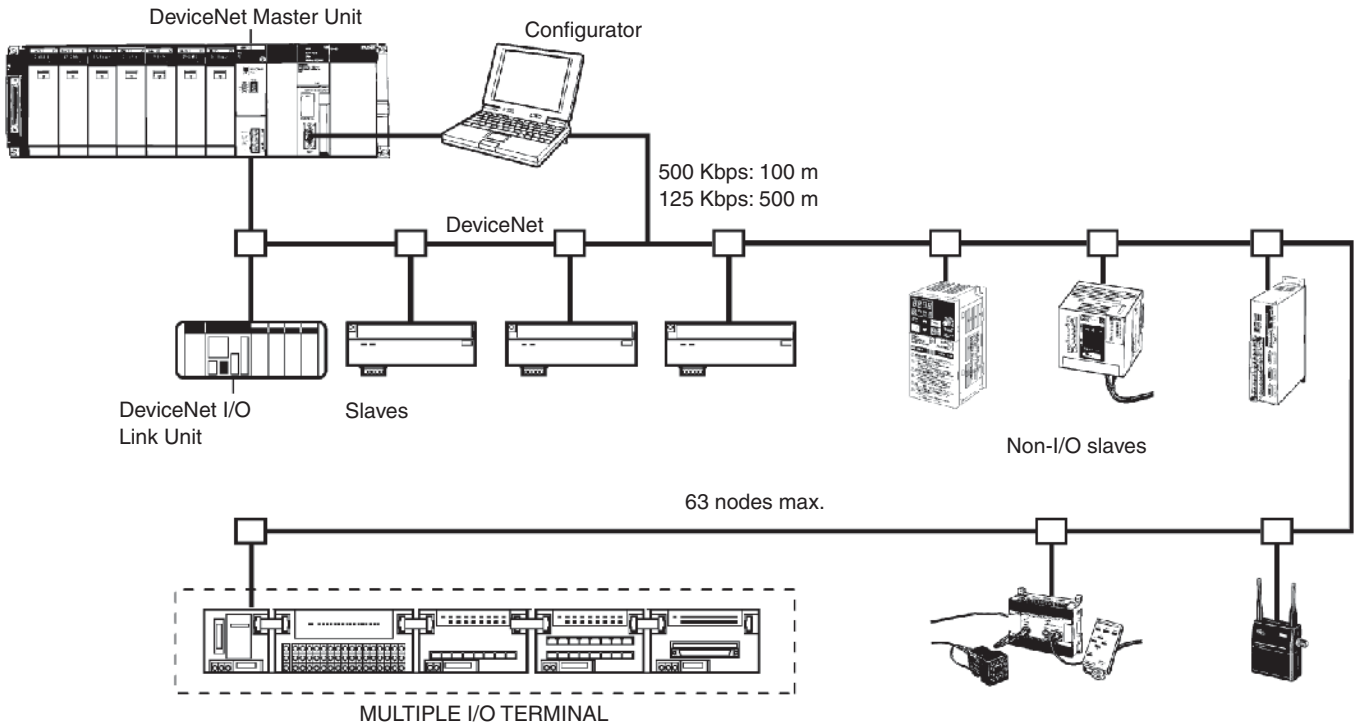
Note: DeviceNet Units allow DeviceNet networks to be treated exactly like Controller Link, Ethernet, or other networks for message communications or remote programming and monitoring by a CX-Programmer.

Function

OMRON supports the DeviceNet open field network, a multivender 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 explict message communication FINS commands can be send to other devices that support FINS messaging.

System Configuration



Ordering Information

Compatible PLCs		Maximum number of I/O points			Model
		Fixed allocations	User-set allocations		
			Using allocated DM Area words	Using Configurator	
CS1 Series	When used as a master	Input: 1,024 points Output: 1,024 points Total: 2,048 points (128 words)	Input: 8,000 points Output: 8,000 points Total: 16,000 points (1,000 words)	Input: 8,000 points x 2 blocks Output: 8,000 points x 2 blocks Total: 32,000 points (2,000 words)	CS1W-DRM21
	When used as a slave	Input: 16 points Output: 16 points Total: 32 points (2 words)	Input: 1,600 points Output: 1,600 points Total: 3,200 points (200 words)	Input: 1,600 points x 1 block Output: 1,600 points x 2 blocks Total: 4,800 points (300 words)	

Specifications

Master/Slave Specifications

Communications power supply voltage				11 to 25 V DC (supplied from the communications connector) (See note 1.)
Current consumption				Communications:30 mA max. Internal circuit:290 mA max.
Max. number of connectable slaves	Remote I/O, explicit message service			63 (See note 2.)
Max. number of I/O points	Fixed allocations		When used as a master	2,048 points
			When used as a slave	32 points
	User-set allocations	Using allocated DM Area words	When used as a master	16,000 points
			When used as a slave	3,200 points
		Using Configurator	When used as a master	32,000 points
			When used as a slave	4,800 points
Number of allocated words	Fixed allocations		When used as a master	64 input and 64 output words Software switch/status area: 25 words
			When used as a slave	1 input word, 1 output word (See note 3.)
	User-set allocations	Using allocated DM Area words	When used as a master	500 input and 500 output words Software switch/status area: 25 words
			When used as a slave	100 input and 100 output words (See note 3.) Software switch/status area: 25 words
		Using Configurator	When used as a master	500 input words x 2 blocks, 500 output words x 2 blocks Software switch/Status area: 25 words
			When used as a slave	100 input words x 1 blocks, 100 output words x 2 blocks Software switch/Status area: 25 words
Max. message length				542 bytes (See note 4.)
Max. number of Units mountable to PLC	Fixed allocations			3
	User-set allocations			16
Weight				172 g max.

Note: 1. Refer to the *DeviceNet (CompoBus/D) Operation Manual (W267)* for the communications power supply specifications.

2. The DeviceNet unit uses a node of the 64 supported by DeviceNet, leaves connection is possible to 63 slaves.

3. When the DeviceNet is used a slave, “input” and “output” respectively refer to input from the master to the slave and output from the slave to the master.

4. The maximum message length includes the command code when using the CMND instruction.

5. The CS1W–DRM21 cannot perform message communications with the E5ZE-8□D1□B. Use the E5ZE-8□D1□B-V2, which is a later version. For details on the E5ZE-8□D1□B-V2, refer to the catalog for the product itself (SGTD-017).

DeviceNet Unit

Classification	Types of communications	Specifications	Unit numbers	Model
CS1 CPU Bus Unit	Remote I/O communications master (fixed or user-set allocations) Remote I/O communications slave (fixed or user-set allocations) Message communications	Up to 16 Units can be mounted when a Configurator is used.	0 to F (Configurator required to mount 16 Units.)	CS1W-DRM21
C200H Special I/O Unit	Remote I/O communications master			C200HW-DRM21-V1
	Remote I/O communications slave			C200HW-DRT21

DeviceNet Configurator

Model number	Specifications
WS02-CFDC1-E	Software only (Windows 95, 98, NT 4.0, 2000, or XP)
3G8E2-DRM21-E-V1	PC card with software (Windows 95 or 98)

C200HW-DRM21-V1

DeviceNet Master Unit

Master Unit for CS1H, CS1G, C200HX, C200HG, C200HE, and C200HS

- Incorporating a remote I/O and message communications functions.
- The Configurator is available for easy remote I/O allocation.
- The control of a maximum of 300 words is possible over remote I/O with the CS1H, CS1G, C200HX, C200HG, or C200HE.
- The Configurator makes it possible for a single Programmable Controller to connect to up to 16 Master Units.

Ordering Information

PLC	Max. number of I/O points			Model
	Configurator not in use	Configurator in use		
		No message communications	Message communications	
CS1H, CS1G, C200HX, C200HG, C200HE	1,600 points (800 inputs/ 800 outputs)	Two-block inputs and two-block outputs (with a maximum of 1,600 points or 100 words per block) and a total of 4,800 points or 300 words.	Two-block inputs and two-block outputs (with a maximum of 1,600 points or 100 words per block) and a total of 1,600 points or 100 words.	C200HW-DRM21-V1
C200HS	1,024 points (512 inputs/ 512 outputs)	Two-block inputs and two-block outputs (with a maximum of 1,280 points or 80 words per block) and a total of 1,280 points or 80 words.	---	

Note: The DeviceNet Configurator is required for the Master Unit to be in configuration control.

Specifications

Unit Specifications

Communications power supply voltage			11 to 25 V DC (supplied from the communications connector) (See note 1.)
Current consumption			Communications:45 mA max. at 24 V DC Internal circuit:250 mA max. at 5 V DC
Max. number of connectable Slaves	Remote I/O (explicit message service)	Configurator not in use	CS1H/CS1G/C200HX/C200HG/C200HE:50 Units (See note 2.) C200HS:32 Units (See note 2.)
		Configurator in use	63 (See note 3.)
	FINS message service		8 (See note 4.)
Number of I/O points	Configurator not in use		CS1H/CS1G/C200HX/C200HG/C200HE:1,600 points (800 input and 800 output points) C200HS:1,024 points (512 input and 512 output points)
	Configurator in use		CS1H/CS1G/C200HX/C200HG/C200HE:4,800 remote I/O points only, and 1,600 points with messages used C200HS:1,280 points
Number of allocated words	Configurator not in use (fixed allocation)		CS1H/CS1G/C200HX/C200HG/C200HE:50 input and 50 output words and 10 words for software switch/status area C200HS:32 input and 32 output words with 10 words for software switch/status area
	Configurator in use (free allocation)		Input x 2 blocks, output x 2 blocks (with a maximum of 100 words per block) (See note 5.) Software switch/Status area: 10 words
	Max. message length (for FINS or explicit message)		160 kbytes
Max. number of Units mountable to PLC	Configurator not in use		1
	Configurator in use		10 Units (any C200HS-series CPU Unit or CS1H, CS1G or C200HX-, C200HG-, or C200HE-series CPU Unit with a maximum of 880 I/O Points)
			16 Units (any SYSMAC CS1H, CS1G or C200HX-, C200HG, or C200HE-series CPU Unit with a maximum of 880 I/O points)
Weight			250 g max.

Note: 1. Refer to the *DeviceNet (CompoBus/D) Operation Manual (W267)* for the communications power supply specifications.

2. The Master Unit uses a node. Therefore, set the PLC's node numbers within a range of 50 to 63 if the number of CS1H, CS1G, C200HX, C200HG, or C200HE PLCs connected to the Master Unit is 50 and within a range of 32 to 63.

3. The Master Unit uses one node. Therefore 63 Slave Units can be connected.

4. C200HS Series are not connected.

5. A maximum of 80 words per block can be used if the Master Unit is mounted to the C200HS Series.

C200HW-DRT21

DeviceNet I/O Link Unit

I/O Link Unit is ideal for distributed control. PLC can be used as an Intelligent Slave on the DeviceNet.

- Intelligent DeviceNet Slave
- Supports I/O and message communications.
- Maximum I/O area size:
  512 input points (32 words)
  512 output points (32 words)
- Programming Console or Configurator freely allocates I/O areas.

Ordering Information

Name	Max. number I/O points	Model
I/O Link Unit (for SYSMAC CS1, C200HX/HG/HE)	512 inputs, 512 outputs (1,024 points in total)	C200HW-DRT21

Specifications

Ratings/Characteristics

General Specifications

Item	Specification
Communications power supply voltage	11 to 25 V DC
Current consumption	Communications power supply: 45 mA max. Internal circuit power supply: 250 mA max. at 5 V DC
Max. number of I/O points	512 input points (32 words) 512 output points (32 words)
Default area	Write area (linking with Master's write area): 1 word out of 350 IR words Read area (linking with Master's read area): 1 word out of 50 IR words
No. of connectable Units	10 max. (CS1/C200HX/HG/HE CPU Unit handles up to 880 I/O points)
	16 max. (CS1/C200HX/HG/HE CPU Unit handles more than 880 I/O points)
Weight	250 g max.

Function Specifications

Settings (Slave)

Item	Specification	
Function	A write area block and a read area block can be freely allocated to any areas or addresses respectively	
Allowable setting area	Both read and write areas can be allocated to IR, DM, HR, AR, LR, T/C, and EM areas	
First address	A readable or writable area by word (with some restrictions)	
Area size	Set in 1-byte increments up to 64 bytes for both read and write areas	
Setting method	Configurator	Refer to the *DeviceNet Configurator Operation Manual (W328).*
	Programming Console	**1.** Write the set value to I/O setting area allocated to the Special I/O Area. **2.** Turn ON the software switch allocated to the Special I/O Area and write the settings. **3.** Turn the Programming Console OFF and ON or reset the AR area.

Message Communications

Item	Specification
Function	Supports messages that can be written to or read from the CS1/C200HX/HG/HE's user I/O areas (i.e., IR, DM, HR, AR, LR, T/C, and EM areas)
Master	OMRON's Master Unit or compatible unit from Rockwell
Max. message size	Slave (C200HW-DRT21) 200 bytes per READ or WRITE command

Dimensions

35 × 130 × 101 mm (W × H × D)

Precautions

Refer to the relevant catalog for details on CS1-series and C200HX/HG/HE PLCs (CS1 Series: Cat. No. P047; C200HX/HG/HE: Cat. No. P036).

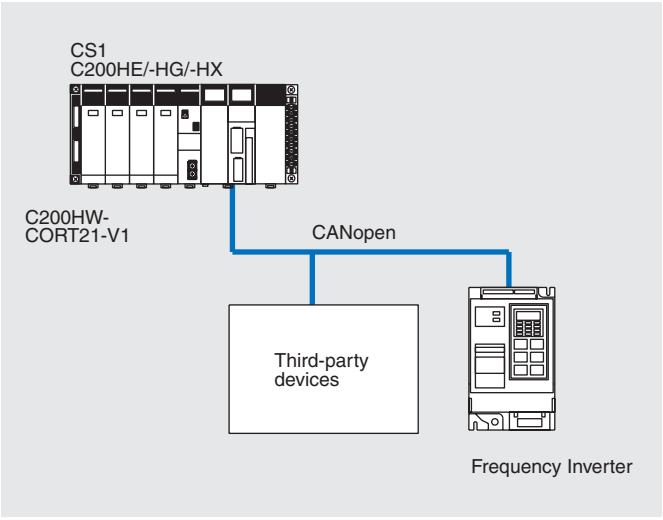
C200HW-CORT21-V1

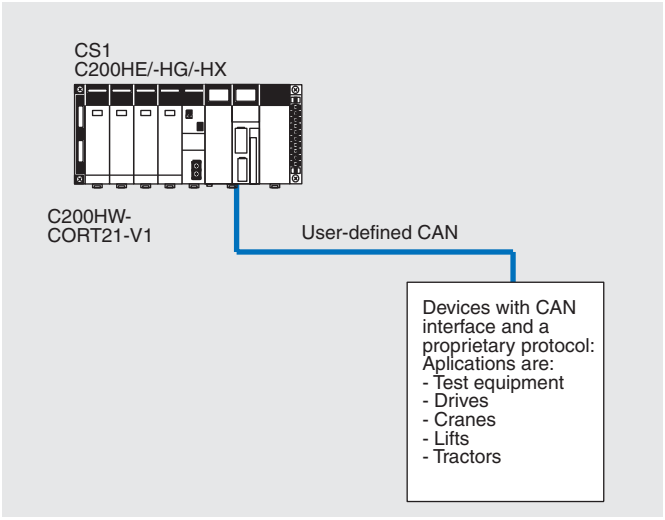
CAN & CANopen communication unit

CAN & CANopen communication unit Supports CANopen, but can also be used to communicate with a user-defined CAN protocol

- PDO's configurable with CANopen Configurator or IOWR PLC instructions
- Able to transceive any user defined CAN message up to 2000 msgs/s using IOWR PLC instructions
- Able to set any arbitrary baud rate supported by the CAN controller
- Mountable on C200H Alpha and CS1 backplanes

System Configuration





Specifications

Installation	Host PLC system	C200HE, C200HG, C200HX, CS1-series	
	Maximum number of Units per PLC system	C200HE C200HG-CPU3□-E/CPU4□-E C200HX-CPU3□-E/CPU4□-E	10
		All others	16
	Unit mounting position	CPU Rack of Expansion I/O Rack Unit cannot be mounted to SYSMAC BUS Slave Racks	
	Current consumption	Internal I/O power supply: 250 mA at 5V DC max. (from PLC) Network power supply: 45 mA max. (from communications connector)	
	Network power supply	24 V DC ± 10%	
	Weight	250 g	
Environment	Storage temperature	- 20 °C to + 75 °C	
	Operating temperature	0 °C to + 55 °C	
	Operating humidity	10 to 90% (non-condensing)	
	Conformance to EMC- and environmental standards	EN50081-2 EN61131-2	
User Interface	Switch settings	Special I/O Unit number (0~F) by rotary switch (front) Network baud rate (10 kbit/s ~ 1000 kbit/s) by 3 DIP-switches (front) CANopen node address (001 ~ 127) by 7 DIP-switches (rear)	
	Indicators	Unit status: RUN (green LED), ERR (red LED) Network status: 2 x 7-segment display	
PLC Interface	No. of IR words	PLC → Unit: 3 words (1 word control data + 2 words CANopen transmit data) Unit → PLC: 5 words (3 words Unit status + 2 words CANopen receive data)	
	No. of DM settings	20 words	
	Amount of I/O data per Unit	Default [DM settings all 0000]: 2 words in + 2 words out With user defined DM settings: additionally up to 100 words in + 100 words out	
	Message communications	By IOWR/IORD instructions	
Network interface	CAN interface	ISO 11898, High Speed CAN	
	Bus connector	5-pin mal open style connector	
	Node address	1 to 127, remote setting not supported	
	Baud rate	10, 20, 50, 125, 250, 500, 800, 1000 kbit/s (Note: Refer to appendix D for the configuration of any arbitrary baud rate via the DM settings.)	
	Profile	Communication Profile DS301 version 4.0 Manufacturer Specific Application Profile	
	Supported functions	Boot-up type	Minimum
		NMT	Slave
		Number of PDOs	Max. 64 transmit PDOs and 64 receive PDOs
		PDO transmission modes	Default: Asynchronous
			Configurable: Synchronous cyclic Synchronous acyclic
		PDO linking	Supported
		PDO mapping	Variable
		Application objects	Default configuration: Transmit objects: 4 x 8-bit Receive objects: 4 x 8-bit
			Additionally configurable: Transmit objects: 8-bit (max. 100) 16-bit (max. 100) 32-bit (max. 50) 64-bit (max. 25) Receive objects: 8-bit (max. 100) 16-bit (max. 100) 32-bit (max. 50) 64-bit (max. 25) The total size of additonally configured transmit- and receive objects is limited to 100 words each.
		Number of SDOs	1 server
		Emergency Message	EMCY Producer
		Synchronisation	SYNC Consumer
		Error control servies	Heartbeat (1 producer and 1 consumer) and Node guarding
		Storing of Parameters	Yes, can be stored in non-volatile memory
		User defined CAN messages	Transmission using IOWR PLC instruction Reception through configurable identifier filter
	EDS file	CORT21V1.eds	

C200HW-SRM21-V1

CompoBus/S Master Unit

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

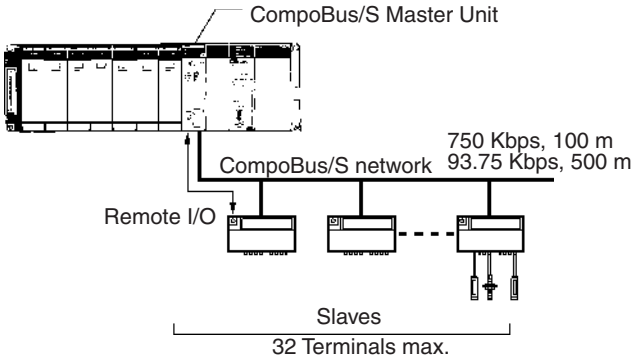
- Up to 256 I/O points per Master.
- Up to 32 Slaves per Master.
- Communications cycle time: 0.5 ms (at 750 kbps).
- Communications distance: Up to 500 m (at 93.75 kbps).

Free wiring with any branching method for up to 200 m (in long-distance communications mode).

Function

A high-speed ON/OFF bus that automatically transfers remote I/O status to the CPU Unit without any programming in the CPU Unit. High-speed remote I/O is supported by a communications cycle time of 1 ms maximum for 256 I/O points.

System Configuration



Specifications

General

Classification	Communications	Specifications	Unit number	Model
C200H Special I/O Unit	Remote I/O	No. of mountable Units: 16	0 to F	C200HW-SRM21-V1

Unit Specifications

Current consumption		150 mA max. at 5 V DC
Number of I/O points		256 points (128 inputs/128 outputs), 128 points (64 inputs/64 outputs) (switchable)
Number of occupied words		256 points:20 words (8 input words/8 output words, 4 status data) 128 points:10 words (4 input words/4 output words, 2 status data)
PLC		CS1, C200HX (-ZE), C200HG (-ZE), C200HE (-ZE), C200HS
Number of Master Units mountable	C200HE	128 points: 10, 256 points: 5
	C200HG-CPU33/43	128 points: 10, 256 points: 5
	C200HG-CPU53/63	128 points: 16, 256 points: 8
	C200HX-CPU34/44	128 points: 10, 256 points: 5
	C200HX-CPU54/64	128 points: 16, 256 points: 8
	C200HS	128 points: 10, 256 points: 5
	CS1	128 points: 16, 256 points: 8
Number of points per node number		8 points
Max. number of Slaves per Master		32
Status data		Communications Error Flag and Active Slave Node (see note)
Weight		200 g max.
Approved standards		UL 508 (E95399), CSA C22.2 No. 142 (LR51460)

These flags use the AR area.

Communications Specifications

Communications method		CompoBus/S protocol
Coding method		Manchester coding method
Connection method		Multi-drop method and T-branch method (see note 1)
Communications baud rate		750,000 bps, 93,750 bps (see note 2)
Communications cycle time	High-speed communications mode	0.5 ms with 8 Slaves for inputs and 8 Slaves for outputs
		0.8 ms with 16 Slaves for inputs and 16 Slaves for outputs
	Long-distance communications mode	4.0 ms with 8 Slaves for inputs and 8 Slaves for outputs
		6.0 ms with 16 Slaves for inputs and 16 Slaves for outputs
Communications cable		2-conductor VCTF cable (0.75 x 2), 4-conductor VCTF cable (0.75 x 4) Special Flat Cable
Communications distance	High-speed communications mode	2-conductor VCTF cable: Main line length:100 m max. Branch line length:3 m max. Total branch line length:50 m max. Special Flat Cable, 4-conductor VCTF cable: Main line length:30 m max. Branch line length:3 m max. Total branch line length:30 m max. (When Special Flat Cable is used to connect fewer than 16 Slaves, the main line can be up to 100 m long and the total branch line length can be up to 50 m.)
	Long-distance communications mode	2-conductor VCTF cable: Main line length:500 m max. Branch line length:6 m max. Total branch line length:120 m max. Special Flat Cable, 4-conductor VCTF cable: Variable branch wiring (total cable length 200 m max.) (There are no limits on the branching format or main, branch, or total line lengths. The terminator must be connected to the point in the system farthest from the master.)
Max. number of connecting nodes		32
Error control checks		Manchester code check, frame length check, and parity check

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

2. The communications baud rate is set by the DIP switch.

Ordering Information

International Standards

The products shown in the attached tables are those that conform to the UL, CSA, cULus, cUL, NK, Lloyd's Register, and EC Directives as of September 2003.
(U: UL, C: CSA, UC: cULus, CU: cUL, N: NK, L: Lloyd, CE: EC Directives)
Please contact OMRON representative for application conditions.

CPU Rack

Name	Specifications			Model	Standards
CPU Units (See note.)	**I/O bits**	**Program capacity**	**Data memory capacity**	---	---
	5,120	250 kSteps	448 kWords (DM: 32 kWords, EM: 32 kWords ×13 banks)	CS1H-CPU67H	U, C, N, L, CE (N, L soon to be received.)
	5,120	120 kSteps	256 kWords (DM: 32 kWords, EM: 32 kWords ×7 banks)	CS1H-CPU66H	
	5,120	60 kSteps	128 kWords (DM: 32 kWords, EM: 32 kWords ×3 banks)	CS1H-CPU65H	
	5,120	30 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1H-CPU64H	
	5,120	20 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1H-CPU63H	
	5,120	60 kSteps	128 kWords (DM: 32 kWords, EM: 32 kWords ×3 banks)	CS1G-CPU45H	
	1,280	30 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1G-CPU44H	
	960	20 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1G-CPU43H	
	960	10 kSteps	64 kWords (DM: 32 kWords, EM: 32 kWords ×1 bank)	CS1G-CPU42H	
CPU Backplanes (for CS1 Units only)	2 slots (Does not connect to Expansion Rack.)			CS1W-BC022	U, C, N, L, CE
	3 slots			CS1W-BC032	
	5 slots			CS1W-BC052	
	8 slots			CS1W-BC082	
	10 slots			CS1W-BC102	
CPU Backplanes	2 slots (Does not connect to Expansion Rack.)			CS1W-BC023	U, C, N, L, CE
	3 slots			CS1W-BC033	
	5 slots			CS1W-BC053	
	8 slots			CS1W-BC083	
	10 slots			CS1W-BC103	
Power Supply Units	100 to 120 V AC or 200 to 240 V AC; Output capacity: 4.6 A, 5 V DC			C200HW-PA204	U, C, N, L, CE
	100 to 120 V AC or 200 to 240 V AC (with 0.8 A, 24 V DC service power supply) Output capacity: 4.6 A, 5 V DC			C200HW-PA204S	
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 4.6 A, 5 V DC			C200HW-PA204R	U, C
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 9 A, 5 V DC			C200HW-PA209R	U, C, N, L, CE
	24 V DC, Output capacity: 4.6 A, 5 V DC			C200HW-PD024	U, C, N, L, CE
I/O Control Unit	For Expansion Racks connected over a distance of more than 12 m (2 terminating resistors included. C200H Units cannot be used on Long-distance Expansion Racks.)			CS1W-IC102	U, C, CE
Memory Cards	Flash memory, 15 MB			HMC-EF172	L, CE
	Flash memory, 30 MB			HMC-EF372	
	Flash memory, 64 MB			HMC-EF672	
	Memory Card Adapter (for computer PCMIA slot)			HMC-AP001	CE
Serial Communications Boards	2 × RS-232C ports, protocol macro function			CS1W-SCB21-V1	U, C, N, L, CE
	1 × RS-232C port + 1 × RS-422/485 port, protocol macro function			CS1W-SCB41-V1	
Programming Consoles	An English Keyboard Sheet (CS1W-KS001-E) is required. (Connects to peripheral port on CPU Unit only. Cannot be connected to RS-232C port.)			CQM1-PRO01-E	U, C, N, CE
				C200H-PRO27-E	
Programming Console Key Sheet	For C200H-PRO27 and CQM1-PRO01			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	For 1 license		Windows-based Support Software for ladder programming on Windows 95, 98, Me, NT 4.0, 2000 or XP (Connects to peripheral port on CPU Unit or RS-232C port on CPU Unit or Serial Communications Unit/Board.)	WS02-CXPC1-EV□	---
	For 3 licenses			WS02-CXPC1-EV□L03	
	For 10 licenses			WS02-CXPC1-EV□L10	
Peripheral 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
	Peripheral bus or Host Link		Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	CS1W-CN226	
			Connects DOS computers, D-Sub 9-pin (Length: 6.0 m)	CS1W-CN626	
Peripheral Device Connecting Cables (for RS-232C port)	Peripheral bus or Host Link, antistatic		Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-CV	---
			Connects DOS computers, D-sub 9-pin (Length: 5.0 m)	XW2Z-500S-CV	
	Host Link		Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-V	
			Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-V	
USB-Serial Conversion Cable	Converts between USB and RS-232C, cable length: 0.5 m PC driver provided on CD-ROM. Refer to *Using a USB-Serial Conversion Cable to Connect to a Peripheral or RS-232C Port* on page 273 for specifications.			CS1W-CIF31	---
CX-Simulator	Windows-based Support Software for simulating ladder program operation on Windows 95, 98, Me, NT 4.0, 2000 or XP			WS02-SIMC1-E	---
CX-Protocol	Windows-based Protocol Creation Software for Windows 95, 98, Me, NT 4.0, 2000 or XP			WS02-PSTC1-E	---
Battery Set	For CS1 Series only. (Install a replacement battery within 2 years of the production date.)			CS1W-BAT01	L, CE

Note: When using a CS1W-CN313 or CS1W-CN713 I/O Connecting Cable with a CS1□-CPU□□H CPU Unit, use only Cables produced on or after September 20, 2001 (production number 2091). Cables with no production number, a 6-digit production number, or produced before September 20, 2001, cannot be used.

SYSMAC CS1D Duplex System

Name	Specifications				Model	Standards
CS1D CPU Units	I/O capacity	Program capacity	Data memory capacity		---	UC1, N, L, CE
	5,120 points	60 Ksteps	128 Kwords (DM: 32 Kwords, EM: 32 Kwords x 3 banks)		CS1D-CPU65H	
		250 Ksteps	448 Kwords (DM: 32 Kwords, EM: 32 Kwords x 13 banks)		CS1D-CPU67H	
Duplex Unit	---				CS1D-DPL01	
CS1D Power Supply Units	100 to 120 VAC or 200 to 240 VAC, 50/60 Hz (with RUN output) Output capacity: 7 A, 5 VDC; 1.3 A, 26 VDC, 35 W total max.				CS1D-PA207R	
	24 VDC, Output capacity: 4.3 A, 5 VDC; 0.56 A, 26 VDC, 28 W total max.				CS1D-PD024	
Duplex CPU Backplane	5 slots				CS1D-BC052	
Backplane for Online Unit Replacement	9 slots (Used both for CS1D Expansion Racks and CS1D Long-distance Expansion Racks.)				CS1D-BI092	
Controller Link Units	Optical ring type with H-PCF cable				CS1D-CLK12-V1	
	Optical ring type with GI cable				CS1D-CLK52-V1	
Loop Control Board (LCB)	Processing method: Function blocks, Number of function blocks: 500 max., Supports duplex operation.				CS1D-LCB05D (See note.)	UC1, N, CE
CX-Programmer	Windows-based Support Software for ladder programming on Windows 95, 98, Me, NT 4.0, 2000, or XP			For 1 license	WS02-CXPC1-E-V□	---
				For 3 licenses	WS02-CXPC1-E-V□L03	
				For 10 licenses	WS02-CXPC1-E-V□L10	
Optical Fiber Cable	H-PCF cable for Controller Link Units, cable length: 50 cm				CS1D-CN051	

This Inner Board is sold only as a set with a CS1D CPU Unit. The set is the CS1D-CPU6□P CS1D Process-control CPU Unit.

Expansion Racks

Name	Specifications		Model	Standards
CS1 Expansion Backplanes (for CS1 Units only)	3 slots		CS1W-BI032	U, C, N, L, CE
	5 slots		CS1W-BI052	
	8 slots		CS1W-BI082	
	10 slots		CS1W-BI102	
CS1 Expansion Backplanes	3 slots		CS1W-BI033	U, C, N, L, CE
	5 slots		CS1W-BI053	
	8 slots		CS1W-BI083	
	10 slots		CS1W-BI103	
C200H Expansion I/O Backplanes	3 slots		C200HW-BI031	U, C, N, L, CE
	5 slots		C200HW-BI051	
	8 slots		C200HW-BI081-V1	
	10 slots		C200HW-BI101-V1	
Power Supply Units	100 to 120 V AC or 200 to 240 V AC, Output capacity: 4.6 A, 5 V DC		C200HW-PA204	
	100 to 120 V AC or 200 to 240 V AC (with service supply: 0.8 A, 24 V DC), Output capacity: 4.6 A, 5 V DC		C200HW-PA204S	
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 4.6 A, 5 V DC		C200HW-PA204R	U, C
	24 V DC		C200HW-PD024	U, C, N, L, CE
	100 to 120 V AC or 200 to 240 V AC (with RUN output) Output capacity: 9 A, 5 V DC		C200HW-PA209R	U, C, N, L, CE
I/O Interface Unit	For Expansion Racks connected over a distance of more than 12 m. (C200H Units cannot be used on Long-distance Expansion Racks.)		CS1W-II102	U, C, CE
CS1 I/O Connecting Cables	Connects CS1 Expansion I/O Backplanes to CPU Backplanes or other CS1 Expansion I/O Backplanes.	Length: 0.3 m	CS1W-CN313	L, CE
		Length: 0.7 m	CS1W-CN713	
		Length: 2 m	CS1W-CN223	
		Length: 3 m	CS1W-CN323	
		Length: 5 m	CS1W-CN523	
		Length: 10 m	CS1W-CN133	
		Length: 12 m	CS1W-CN133-B2	
Long-distance Expansion Rack Cables	Connect I/O Control Unit to I/O Interface Unit or connects two I/O Interface Units	Length: 0.3 m	CV500-CN312	N, L, CE
		Length: 0.6 m	CV500-CN612	N, CE
		Length: 1 m	CV500-CN122	
		Length: 2 m	CV500-CN222	CE
		Length: 3 m	CV500-CN322	
		Length: 5 m	CV500-CN522	
		Length: 10 m	CV500-CN132	
		Length: 20 m	CV500-CN232	
		Length: 30 m	CV500-CN332	
		Length: 40 m	CV500-CN432	
		Length: 50 m	CV500-CN532	
CS1 to C200H I/O Connecting Cables	Connects C200H Expansion I/O Backplanes to CPU Backplanes or CS1 Expansion I/O Backplanes.	Length: 0.3 m	CS1W-CN311	L, CE
		Length: 0.7 m	CS1W-CN711	
		Length: 2 m	CS1W-CN221	
		Length: 3 m	CS1W-CN321	
		Length: 5 m	CS1W-CN521	
		Length: 10 m	CS1W-CN131	
		Length: 12 m	CS1W-CN131-B2	
C200H I/O Connecting Cables	Connects C200H Expansion I/O Backplanes to other C200H Expansion I/O Backplanes.	Length: 0.3 m	C200H-CN311	N, L, CE
		Length: 0.7 m	C200H-CN711	
		Length: 2 m	C200H-CN221	
		Length: 5 m	C200H-CN521	L, CE
		Length: 10 m	C200H-CN131	

I/O Units

Name	Specifications	Model	Mountable Racks					Bits allocated (CIO 0000 to CIO 0319)	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
AC Input Units	100 to 120 V AC, 8 inputs	C200H-IA121	Yes	Yes	Yes	No	Yes	16	U, C, N, L
	100 to 120 V AC, 16 inputs	C200H-IA122	Yes	Yes	Yes	No	Yes	16	
	100 to 120 V AC, 16 inputs	C200H-IA122V	Yes	Yes	Yes	No	Yes	16	CE
	200 to 240 V AC, 8 inputs	C200H-IA221	Yes	Yes	Yes	No	Yes	16	U, C, N, L
	200 to 240 V AC, 16 inputs	C200H-IA222	Yes	Yes	Yes	No	Yes	16	
	200 to 240 V AC, 16 inputs	C200H-IA222V	Yes	Yes	Yes	No	Yes	16	CE
AC Input Units	100 to 120 V AC, 100 to 120 V DC, 16 inputs	CS1W-IA111	Yes	No	Yes	Yes	No	16	UC, N, CE
	200 to 240 V AC, 16 inputs	CS1W-IA211	Yes	No	Yes	Yes	No	16	
AC/DC Input Units	12 to 24 V AC/ V DC, 8 inputs	C200H-IM211	Yes	Yes	Yes	No	Yes	16	U, C, N, L, CE
	24 V AC/ V DC, 16 inputs	C200H-IM212	Yes	Yes	Yes	No	Yes	16	
DC Input Units	24 V DC, 16 inputs, 7 mA	CS1W-ID211	Yes	No	Yes	Yes	No	16	U, C, N, CE
	24 V DC, 32 inputs, 6 mA	CS1W-ID231	Yes	No	Yes	Yes	No	32	
	24 V DC, 64 inputs, 6 mA	CS1W-ID261	Yes	No	Yes	Yes	No	64	
	24 V DC, 96 inputs, approx. 5 mA	CS1W-ID291	Yes	No	Yes	Yes	No	96	U, C, N, L, CE
DC Input Units	12 to 24 V DC, 8 inputs	C200H-ID211	Yes	Yes	Yes	No	Yes	16	U, C, N, L, CE
	24 V DC, 16 inputs	C200H-ID212	Yes	Yes	Yes	No	Yes	16	
Interrupt Input Unit	12 to 24 V DC, 8 inputs	C200HS-INT01	Yes	Yes (See note 3)	Yes (See note 3)	No (See note 3)	No	16	U, C, CE
Interrupt Input Unit	24 V DC, 16 inputs, 7 mA	CS1W-INT01	Yes	No	Yes (See note 4)	Yes (See note 4)	No	16	U, C, N, CE
B7A Input Units	16 inputs	C200H-B7AI1	Yes	Yes	Yes	No	Yes	16	U, C, CE
	32 inputs	C200H-B7A12	Yes	Yes	Yes	No	No (See note 2)	32	U, C
High-speed Input Unit	24 V DC, 16 inputs, 7 mA	CS1W-IDP01	Yes	No	Yes	Yes	No	16	U, C, N, CE
Safety Relay Unit	24 V DC, 2 channels with 4 inputs each, 4 pts/common	CS1W-SF200	Yes	No	Yes	Yes	No	16	U, C, CE
Relay Output Units	250 V AC or 120 V DC, independent contacts, 8 outputs, 2 A	CS1W-OC201	Yes	No	Yes	Yes	No	16	UC, N, CE
	250 V AC or 120 V DC, 16 outputs, 2 A	CS1W-OC211	Yes	No	Yes	Yes	No	16	
Relay Output Units	250 V AC/24 V DC, 2 A, 8 outputs max.	C200H-OC221	Yes	Yes	Yes	No	Yes	16	U, C, N
	250 V AC/24 V DC, 2 A, 12 outputs max.	C200H-OC222	Yes	Yes	Yes	No	Yes	16	
	250 V AC/24 V DC, 2 A, 12 outputs max.	C200H-OC222N	Yes	Yes	Yes	No	Yes	16	CE
	250 V AC/24 V DC, 2 A, 16 outputs max.	C200H-OC225	Yes	Yes	Yes	No	Yes	16	U, C, N, L
	250 V AC/24 V DC, 2 A, 16 outputs max.	C200H-OC226N	Yes	Yes	Yes	No	Yes	16	CE
	250 V AC/24 V DC, 2 A, independent contacts, 5 outputs max.	C200H-OC223	Yes	Yes	Yes	No	Yes	16	U, C, N, L
	250 V AC/24 V DC, 2 A, independent contacts, 8 outputs max.	C200H-OC224	Yes	Yes	Yes	No	Yes	16	
	250 V AC/24 V DC, 2 A, independent contacts, 8 outputs max.	C200H-OC224N	Yes	Yes	Yes	No	Yes	16	CE

Name	Specifications	Model	Mountable Racks					Bits allocated (CIO 0000 to CIO 0319)	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Transistor Output Units	12 to 48 V DC, 1 A, 8 sinking outputs	C200H-OD411	Yes	Yes	Yes	No	Yes	16	U, C, N, L, CE
	24 V DC, 2.1 A, 8 sinking outputs	C200H-OD213	Yes	Yes	Yes	No	Yes	16	
	24 V DC, 0.8 A, 8 sourcing outputs, load short-circuit protection.	C200H-OD214	Yes	Yes	Yes	No	Yes	16	U, C, N, L
	5 to 24 V DC, 0.3 A, 8 sourcing outputs	C200H-OD216	Yes	Yes	Yes	No	Yes	16	
	24 V DC, 0.3 A, 12 sinking outputs	C200H-OD211	Yes	Yes	Yes	No	Yes	16	U, C, N, L, CE
	5 to 24 V DC, 0.3 A, 12 sourcing outputs	C200H-OD217	Yes	Yes	Yes	No	Yes	16	
	24 V DC, 0.3 A, 16 sinking outputs	C200H-OD212	Yes	Yes	Yes	No	Yes	16	
	24 V DC, 1 A, 16 sourcing outputs, load short-circuit protection.	C200H-OD21A	Yes	Yes	Yes	No	Yes	16	CE
B7A Output Units	16 outputs	C200H-B7AO1	Yes	Yes	Yes	No	Yes	16	U, C, CE
	32 outputs	C200H-B7A02	Yes	Yes	Yes	No	No (See note 2)	32	U, C
Triac Output Units	250 V AC, 1.2 A, 8 outputs	C200H-OA223	Yes	Yes	Yes	No	Yes	16	CE
	250 V AC, 0.3 A, 12 outputs	C200H-OA222V	Yes	Yes	Yes	No	Yes	16	
	250 V AC, 0.5 A, 12 outputs	C200H-OA224	Yes	Yes	Yes	No	Yes	16	U, C, N, L
Transistor Output Units	12 to 24 V DC, 0.5A, 16 sinking outputs	CS1W-OD211	Yes	No	Yes	Yes	No	16	U, C, N, CE
	24 V DC, 0.5A, 16 sourcing outputs	CS1W-OD212	Yes	No	Yes	Yes	No	16	
	12 to 24 V DC, 0.5A, 32 sinking outputs	CS1W-OD231	Yes	No	Yes	Yes	No	32	
	24 V DC, 0.5A, 32 sourcing outputs	CS1W-OD232	Yes	No	Yes	Yes	No	32	
	12 to 24 V DC, 0.3A, 64 sinking outputs	CS1W-OD261	Yes	No	Yes	Yes	No	64	
	24 V DC, 0.3A, 64 sourcing outputs	CS1W-OD262	Yes	No	Yes	Yes	No	64	
	12 to 24 V DC, 0.1 A, 96 sinking outputs	CS1W-OD291	Yes	No	Yes	Yes	No	96	U, C, N, L, CE
	12 to 24 V DC, 0.1 A, 96 sourcing outputs	CS1W-OD292	Yes	No	Yes	Yes	No	96	
Triac Output Units	250 V AC, 1.2 A, 8 outputs	CS1W-OA201	Yes	No	Yes	Yes	No	16	UC, N, CE
	250 V AC, 0.5 A, 16 outputs	CS1W-OA211	Yes	No	Yes	Yes	No	16	
DC Input/Transistor Output Units	24 V DC, 6 mA, 32 inputs, 12 to 24 V DC, 0.3 A, 32 sinking outputs	CS1W-MD261	Yes	No	Yes	Yes	No	Inputs: 32 Outputs: 32	U, C, N, CE
	24 V DC, 6 mA, 32 inputs, 24 V DC, 0.3 A, 32 sourcing outputs	CS1W-MD262	Yes	No	Yes	Yes	No	Inputs: 32 Outputs: 32	
	24 V DC, approx. 5 A, 48 inputs, 12 to 24 V DC, 0.1 A, 48 outputs, sinking inputs/outputs	CS1W-MD291	Yes	No	Yes	Yes	No	Inputs: 48 Outputs: 48	U, C, N, L, CE
	24 V DC, approx. 5A, 48 inputs, 12 to 24 V DC, 0.1 A, 48 outputs, sourcing inputs/outputs	CS1W-MD292	Yes	No	Yes	Yes	No	Inputs: 48 Outputs: 48	

Note: 1. Interrupt Input Units cannot be used to input interrupts on any but the CPU Rack. They will function as normal I/O Units on other Racks.

2. C200H-B7A12/02/21/22 are C200H Group-2 Units.

3. The C200H-ID001 (no-voltage contacts, 8 inputs, NPN) and C200H-ID002 (no-voltage contacts, 8 inputs, PNP) cannot be used.

4. Interrupt input is not available when mounted on these Racks (i.e., used as normal I/O Unit).

Connectors for C200H Group-2 High-density I/O Units

Part	Connection		Model	Remarks	Standards
Applicable connector	Soldered (included with Unit)		C500-CE404	From Fujitsu Socket: FCN-361J040-AU Connector bar: FCN-360C040-J2	---
	Crimped		C500-CE405	From Fujitsu Socket: FCN-363J040 Connector bar: FCN-360C040-J2 Contacts: FCN-363J-AU	
	Pressure welded		C500-CE403	From Fujitsu: FCN-367J040-AU	
Terminal block connection parts	1:1 connections	Special Cable	XW2Z-□□□B (See note 1.)	For CS1W-ID231/ID261/OD231/OD232/OD261/OD262/MD261/MD262 and C200H-ID216/ID217/ID218/ID219/ID111/OD218/OD21B/OD219	
		Terminal Block Unit	XW2B-40G4		
			XW2B-40G5		
			XW2D-40G6		
	1:2 connections	Special Cable	XW2Z-□□□D (See notes 1 and 2.)		
		Terminal Block Unit	XW2B-20G4		
			XW2B-20G5		
			XW2D-20G6		
			XW2C-20G5-IN16		

Note: 1. Refer to page 386 (Wiring Devices) for details. (Square boxes indicate the cable length.)

2. The XW2Z-□□□D, CS1W-OD□□□, and C200H-OD□□□ cannot be connected. Only the inputs of the CS1W-MD□□□ can be connected.

Connectors for CS1 High-density I/O Units

Part	Connection		Model	Remarks	Standards
Applicable connectors	Soldered (included with Unit)		CS1W-CE561	From Fujitsu Socket: FCN-361J056-AU Connector bar: FCN-360C056-J3	---
	Crimped		CS1W-CE562	From Fujitsu Socket: FCN-363J056 Connector bar: FCN-360C056-J3 Contacts: FCN-363J-AU	
	Pressure welded		CS1W-CE563	From Fujitsu: FCN-367J056-AU	
Terminal block	1:1	Special Cable	XW2Z-□□□H-1 (see note.)	For CS1W-ID291/OD291/OD292/MD291/MD292	
		Terminal Block Unit	XW2B-60G4		
			XW2B-60G5		
	1:2	Special Cable	XW2Z-□□□H-2 (see note.)		
		Terminal Block Unit	XW2B-20G4		
			XW2B-20G5		
			XW2D-20G6		
			XW2B-40G4		
			XW2B-40G5		
			XW2D-40G6		
	1:3	Special Cable	XW2Z-□□□H-3 (see note.)		
		Terminal Block Unit	XW2B-20G4		
			XW2B-20G5		
			XW2D-20G6		

Note: Refer to page 386 (Wiring Devices) for details. (Square boxes indicate the cable length.)

C200H High-density I/O Units Classified as Special I/O Units

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
DC Input Units	24 V DC, 32 inputs	C200H-ID215	Yes	Yes	Yes	No	Yes	0 to 9	U, C, N, L, CE
TTL Input Units	5 V DC, 32 inputs	C200H-ID501	Yes	Yes	Yes	No	Yes		
Transistor Output Units	24 V DC, 32 sinking outputs	C200H-OD215	Yes	Yes	Yes	No	Yes		
TTL Output Units	5 V DC, 32 sinking outputs	C200H-OD501	Yes	Yes	Yes	No	Yes		
TTL I/O Units	5 V DC, 16 inputs, 16 sinking outputs	C200H-MD501	Yes	Yes	Yes	No	Yes		
DC Input/Transistor Output Units	24 V DC, 16 inputs, 16 sinking outputs	C200H-MD215	Yes	Yes	Yes	No	Yes		
	12 V DC, 16 inputs, 16 sinking outputs	C200H-MD115	Yes	Yes	Yes	No	Yes		U, C, N

Connectors for C200H High-density I/O Units

Part	Connection	Model	Remarks	Standards
Applicable connectors	Soldered (included with Unit)	C500-CE241	From Fujitsu Socket: FCN-361J024-AU Connector bar: FCN-360C024-J2	---
	Crimped	C500-CE242	From Fujitsu Socket: FCN-363J024 Connector bar: FCN-360C024-J2 Contacts: FCN-363J-AU	
	Pressure welded	C500-CE243	From Fujitsu: FCN-367J024-AU/F	
Terminal block connection parts	Special Cable	XW2Z-□□□A (See note.)	For C200H-ID215/ID501/OD215/MD115/MD215 For C200H-ID215/ID501/MD115/MD215/MD501 □□□ = cable length	
	Terminal Block Connector	XW2B-20G4		
		XW2B-20G5		
		XW2D-20G6		
		XW2B-20G5-D		
		XW2B-40G5-T		
	Special Cable	XW2Z-□□□A (see note)		
	Terminal Block Connector	XW2C-20G6-IN16		

Note: Refer to page 386 (Wiring Devices) for details. (Square boxes indicate the cable length.)

Special I/O Units

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Temperature Control Units	Thermocouple input, time-proportioning PID, or ON/OFF transistor output	C200H-TC001	Yes	Yes	Yes	No	Yes	0 to 9	U, C, CE
	Thermocouple input, time-proportioning PID, or ON/OFF voltage output	C200H-TC002	Yes	Yes	Yes	No	Yes		
	Thermocouple input, PID current output	C200H-TC003	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF transistor output	C200H-TC101	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF voltage output	C200H-TC102	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, PID current output	C200H-TC103	Yes	Yes	Yes	No	Yes		
Data Setting Console	Used with Temperature Control Units. Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01	---					---	---
	Connecting Cable, 2 m	C200H-CN225	---						
	Connecting Cable, 4 m	C200H-CN425	---						
Heat/Cool Temperature Control Units	Thermocouple input, time-proportioning PID, or ON/OFF transistor output	C200H-TV001	Yes	Yes	Yes	No	Yes	0 to 9	U, C, CE
	Thermocouple input, time-proportioning PID, or ON/OFF voltage output	C200H-TV002	Yes	Yes	Yes	No	Yes		
	Thermocouple input, PID current output	C200H-TV003	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF transistor output	C200H-TV101	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, time-proportioning PID, or ON/OFF voltage output	C200H-TV102	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer input, PID current output	C200H-TV103	Yes	Yes	Yes	No	Yes		

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Temperature Sensor Units	Thermocouple input, K/J selectable	C200H-TS001	Yes	Yes	Yes	No	Yes	0 to 9	U, C
	Thermocouple input, K/L selectable	C200H-TS002	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer, JPt 100	C200H-TS101	Yes	Yes	Yes	No	Yes		
	Temperature-resistance thermometer, Pt 100	C200H-TS102	Yes	Yes	Yes	No	Yes		
PID Control Units	Voltage output/current input, time-proportioning PID, or ON/OFF transistor output	C200H-PID01	Yes	Yes	Yes	No	Yes	0 to 9	U, C, CE
	Voltage output/current input, time-proportioning PID, or ON/OFF voltage output	C200H-PID02	Yes	Yes	Yes	No	Yes		
	Voltage output/current input, PID current output	C200H-PID03	Yes	Yes	Yes	No	Yes		
Data Setting Console	Used with PID Control Units. Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01	---					---	---
	Connecting Cable, 2 m	C200H-CN225	---						
	Connecting Cable, 4 m	C200H-CN425	---						
Cam Positioner Unit	48 cam outputs (16 external outputs and 32 internal outputs), Resolver speed: 20 μs (5 kHz)	C200H-CP114	Yes	Yes	Yes	No	Yes	0 to 9	U, C
Data Setting Console	Used with Cam Positioner Unit. Monitoring, setting, and changing present values, set points, alarm values, PID parameters, bank numbers, etc.	C200H-DSC01	---					---	---
	Connecting Cable, 2 m	C200H-CN225	---						
	Connecting Cable, 4 m	C200H-CN425	---						
ASCII Units	200-Kbyte RAM, 2 RS-232C ports	C200H-ASC11	Yes	Yes	Yes	No	Yes	0 to F	U, C, CE
	200-Kbyte RAM, RS-232C port, RS-422/485 port	C200H-ASC21	Yes	Yes	Yes	No	Yes		
	200-Kbyte RAM, 3 RS-232C ports (1 terminal only)	C200H-ASC31	Yes	Yes	Yes	No	Yes		
Analog Input Units	4 to 20 mA, 1 to 5/0 to 10 V (selectable), 4 inputs, 1/4,000 resolution		Yes	Yes	Yes	No	Yes	0 to 9	U, C, N, L
	4 to 20 mA, 1 to 5/0 to 10 V/–10 to +10 V (selectable); 8 inputs; 1/4,000 resolution		Yes	Yes	Yes	No	Yes	0 to F	U, C, N, L, CE
	4 to 20 mA, 1 to 5/0 to 10 V/–10 to +10 V (selectable); 8 inputs; 1/4,000 resolution	C200H-AD003	Yes	Yes	Yes	No	Yes		
Ánalog Output Units	4 to 20 mA, 1 to 5/0 to 10 V (selectable); 2 outputs; 1/4,075 resolution	C200H-DA001	Yes	Yes	Yes	No	Yes	0 to 9	U, C, N, L
	4 to 20 mA, –10 to +10 V (selectable), 4 outputs; voltage: 1/8,190 current: 1/4,095	C200H-DA002	Yes	Yes	Yes	No	Yes	0 to F	U, C, N, L, CE
	1 to 5 V, –10 to +10 V (selectable), 8 outputs; 1/4,000 resolution	C200H-DA003	Yes	Yes	Yes	No	Yes		
	4 to 20 mA, 8 outputs; 1/4,000 resolution	C200H-DA004	Yes	Yes	Yes	No	Yes		
Analog I/O Units	2 inputs (4 to 20 mA,1 to 5 V, etc.) 2 outputs (4 to 20 mA, 1 to 5 V, etc.)	C200H-MAD01	Yes	Yes	Yes	No	Yes		

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Customizable Counter Units	Pulse input: 2 pts Pulse output: 2 pts Contact input: 12 pts Contact output: 8 pts	CS1W-HCP22-V1	Yes	No	Yes	Yes	No	0 to 95	U, C, CE
	Pulse input: 1 pt, Analog input: 1 pt, Analog output: 2pts, Contact input: 12 pts, Transistor outputs: 8 pts	CS1W-HCA12-V1							
	Pulse input: 2 pts Analog output: 2 pts Contact input: 12 pts Contact output: 8 pts	CS1W-HCA22-V1							
	Contact input: 12 pts Contact output: 8 pts	CS1W-HIO01-V1							
Analog Input Units	4 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA) Resolution: 1/4,000	CS1W-AD041-V1	Yes	No	Yes	Yes	No	0 to 95	U, C, N, L, CE
	8 inputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA) Resolution: 1/4,000	CS1W-AD081-V1							
Analog Output Units	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	CS1W-DA041							
	8 outputs (1 to 5 V, 0 to 5 V, 0 to 10 V, –10 to 10 V, 4 to 20 mA) Resolution: 1/4,000	CS1W-DA08V							
	8 outputs (4 to 20 mA) Resolution: 1/4,000	CS1W-DA08C							
Analog I/O Unit	4 inputs (4 to 20 mA, 1 to 5 V, etc.) 4 outputs (1 to 5 V, 0 to 10 V, etc.)	CS1W-MAD44							
Loop Control Unit	Control loops: 32 Processes: 250	CS1W-LC001	Yes	No	No	No	No	---	0 to F
Process I/O Units									
Isolated Thermocouple Input Unit	4 inputs, B, E, J, K, N, R, S, T ±80 mV	CS1W-PTS01-V1	Yes	No	Yes	Yes	No	0 to 95	U, C, CE
Isolated Temperature- resistance Thermometer Input Unit	4 inputs, Pt100, JPt	CS1W-PTS02							
Isolated Temperature- resistance Thermometer Input Unit (Ni508.4 Ω)	4 inputs, Ni508.4Ω	CS1W-PTS03							
Isolated Two-wire Transmission Device Input Unit	4 inputs, 4 to 20 mA, 1 to 5 V	CS1W-PTW01							
Isolated DC Input Unit	4 inputs, 4 to 20 mA, 1 to 5 V, 0 to 5 V, ±5 V, 0 to 10 V, ±10 V	CS1W-PDC01							
Isolated Pulse Input Unit	4 inputs	CS1W-PPS01							
Isolated Control Output Unit	4 outputs, 4 to 20 mA, 1 to 5 V	CS1W-PMV01							
	4 outputs, 0 to 10 V, ±10 V, 0 to 5 V, ±5 V, 0 to 1 V, ±1 V	CS1W-PMV02							
Power Transducer Input Unit	8 inputs, 0 to 1 mA, ±1 mA	CS1W-PTR01							
100-mV DC Input Unit	8 inputs, 0 to 100 mA, ±100 mV	CS1W-PTR02							
Support Software	Setting tool software for the Processing I/O Units, OS: Windows 95, 98, NT 4.0 (see note)	WS02-PUTC1-E	---					---	---

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
High-speed Counter Units	Two-axis pulse input, counting rate: 75 kcps max., line driver compatible	C200H-CT021	Yes	Yes	Yes	No	Yes	0 to F	U, C, CE
	Solder terminal; 40p and a Connector Cover	C500-CE401	---					---	---
	Solderless terminal; 40p and a Connector Cover (Crimped)	C500-CE402	---						
	Pressure welded terminal; 40p	C500-CE403	---						
	Solder terminal; 40p and a Connector Cover (Horizontal-type)	C500-CE404	---						
	Crimp-style terminal; 40p and a Connector Cover (Horizontal-type)	C500-CE405	---						
High-speed Counter Units	Pulse input: 2 pts Counting speed: 500 kcps max.	CS1W-CT021	Yes	No	Yes	Yes	No	0 to 92	U, C, CE
	Pulse input: 4 pts Counting speed: 500 kcps max.	CS1W-CT041							
SSI Unit	SSI encoder inputs: 2 channels	CS1W-CTS21	Yes	No	Yes	Yes	No	0 to 94	CE
Motion Control Units	4 axes, analog outputs, G language	CS1W-MC421	Yes	No	Yes	Yes	No	0 to 93	U, C, CE
	2 axes, analog outputs, G language	CS1W-MC221							
	MCH high-speed serial link	CS1W-MCH71						0 to F	
MC Support Software	Windows 95, 98, or NT	WS02-MCTC1-EV□	---					---	---
Computer Connecting Cables	Peripheral port on CPU Unit	CS1W-CN226 (2 m)	---						CE
		CS1W-CN626 (6 m)							
	RS-232C port on CPU Unit	XW2Z-200S-CV (2 m)							---
		XW2Z-500S-CV (5 m)							
Teaching Box		CVM1-PRO01	---					---	U, C, CE
Teaching Box Connecting Cable (2 m)		CV500-CN224							CE
Memory Pack		CVM1-MP702							U, C, CE
MC Terminal Block Conversion Unit for 2 Axes (simplifies wiring I/O connectors)		XW2B-20J6-6							---
MC Terminal Block Conversion Unit for 4 Axes (simplifies wiring I/O connectors)		XW2B-40J6-7							
MC Terminal Block Conversion Unit Cable		XW2Z-100J-F1							
Motion Control Units	G-language programmable, two-axis analog outputs	C200H-MC221	Yes	Yes	Yes	No	Yes	0 to F	U, C, CE
	MC Support Software IBM PC/AT or compatible	CV500-ZN3AT1-E	---					---	---
	Connecting Cable: 3.3 m	CV500-CIF01	---						
	Teaching Box	CVM1-PRO01	---						U, C, CE
	Connection cable for Teaching Box: 2 m long	CV500-CN224	---						CE
	Memory Pack	CVM1-MP702	---						U, C, CE
	Terminal Block Conversion Unit Simplifies wiring.	XW2B-20J6-6	---						---
	Connecting Cable for Terminal Block Conversion Unit	XW2Z-100J-F1	---						
	4 axes, analog+digital I/O, Motion Perfect BASIC language	C200HW-MC402-E	Yes	Yes	Yes	No	No	0 to F	CE

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
Position Control Units	One-axis pulse-train open-collector output	C200HW-NC113	Yes	Yes	Yes	No	Yes	0 to F	U, C, CE
	Two-axis pulse-train open-collector output	C200HW-NC213	Yes	Yes	Yes	No	Yes		
	Four-axis pulse-train open-collector output	C200HW-NC413	Yes	Yes	Yes	No	Yes		
	NC Support Software (SYSMAC-NCT)	WS01-NCTF1-E	---					---	---
	Peripheral Port Connecting Cables for computer	CS1W-CN226 (2 m)	---						CE
		CS1W-CN626 (6 m)							
	RS-232C Port Connecting Cables for computer	XW2Z-200S-CV (2 m) NCT V1.11 or earlier	---						---
		XW2Z-500S-CV (5 m) NCT V1.11 or earlier							
		XW2Z-200S (2 m) (See note 1.)							
		XW2Z-500S (5 m) (See note 1.)							
	1-axis Relay Unit for C200HW-NC113	XW2B-20J6-1B							
	2-axis Relay Unit for C200HW-NC213/NC413	XW2B-40J6-2B							
	1-axis U, H, M Connecting Cables for C200HW-NC113	XW2Z-050J-A6 (0.5 m)							
		XW2Z-100J-A6 (1 m)							
	2-axis U, H, M Connecting Cables for C200HW-NC213/NC413	XW2Z-050J-A7 (0.5 m)							
		XW2Z-100J-A7 (1 m)							
	1-axis UEP Connecting Cables for C200HW-NC113	XW2Z-050J-A8 (0.5 m)							
		XW2Z-100J-A8 (1 m)							
	2-axis UEP Connecting Cables for C200HW-NC213/NC413	XW2Z-050J-A9 (0.5 m)	---					---	---
		XW2Z-100J-A9 (1 m)							
Serial Communications Unit	Two RS-232C Ports	CS1W-SCU21-V1	Yes	No	Yes	Yes	No	0 to F	U, C, L, N, CE
RS-232C–RS-422A Conversion Unit	1 RS-232C port and 1 RS-422A terminal block	NT-AL001	---					---	---
Ethernet Unit	10Base-5	CS1W-ETN01	Yes	No	Yes	Yes	No	0 to F	U, C, L, N, CE
	10Base-T	CS1W-ETN11							
	100Base-Tx	CS1W-ETN21							
Controller Link Units	Wired	CS1W-CLK21-V1	Yes	No	Yes	Yes	No	0 to F	U, C, L, N, CE
	Optical (H-PCF cable)	CS1W-CLK12-V1						0 to F	U, C, CE
	Optical (GI fiber 62.5/125 μm)	CS1W-CLK52-V1							
Controller Link Support Boards	Wired	3G8F7-CLK21-V1	---					---	CE
	Optical (H-PCF cable)	3G8F7-CLK12-V1							
	Optical (GI fiber 62.5/125 μm)	3G8F7-CLK52-V1							
DeviceNet Unit	Functions as master and/or slave; allows control of 2,048 points max. per master.	CS1W-DRM21	Yes	No	Yes	Yes	No	---	0 to F
PROFIBUS-DP Unit	Master Unit for up to 7000 remote I/O words	CS1W-PRM21	Yes	No	Yes	Yes	No	0 to F	CE
	Master Unit for up to 300 remote I/O words	C200HW-PRM21	Yes	Yes	Yes	No	No		
	I/O Link for up to 200 I/O words	C200HW-PRT21							U, L, C, CE
CAN/CANopen Unit	Freely configurable CAN communication, or CANopen protocol	C200HW-CORT21-V1	Yes	Yes	Yes	No	No	0 to F	U, C, CE

Name	Specifications	Model	Mountable Racks					Unit No.	Standards
			CPU Rack	C200H Expansion I/O Racks	CS1 Expansion Racks	CS1 Long-distance Racks	SYSMAC BUS Slave Racks		
CX-Process	For Loop Control Unit, Programming Tool and Monitor Tool software, OS for Tool: Windows 95, 98, NT 4.0, OS for Monitor: Windows NT 4.0 (License key sold separately)	WS02-LCTC1-J	---					---	---
License Key for Monitor Software	Hardware key for Monitor software, with license	WS02-LCTK1-JL01	---					---	---
Peripheral 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	---					---	---
	Peripheral bus or Host Link, Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	CS1W-CN226	---					---	---
	Peripheral bus or Host Link, Connects DOS computers, D-Sub 9-pin (Length: 6.0 m)	CS1W-CN626	---					---	---
Peripheral Device Connecting Cables (for RS-232C port)	Peripheral bus or Host Link, Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	XW2Z-200S-V	---					---	---
	Peripheral bus or Host Link, Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)	XW2Z-500S-V	---					---	---

Note: 1. A 25-pin to 9-pin adapter is required to connected to a 9-pin, D-sub RS-232C connector on an IBM PC/AT or compatible.
Note: Setting tool software for the Processing I/O Units also supports CS1W-AD□□□, CS1WS-DA□□□, and CS1W-MAD44.

Optional Products

Name	Specifications		Model	Standards
I/O Unit Cover	Cover for 10-pin terminal block		C200H-COV11	---
Terminal Block Covers	Short protection for 10-pin terminal block (package of 10 covers); 8 pts		C200H-COV02	
	Short protection for 19-pin terminal block (package of 10 covers); 12 pts		C200H-COV03	
C200H Unit Connector Cover	Protective cover for unused I/O Connecting Cable connectors		C500-COV01	
CS1 Special I/O Unit Connector Cover	Protective cover for unused I/O Connecting Cable connectors		CV500-COV01	
C200H Expansion I/O Backplane Insulation Plates	Electrically insulate C200H Expansion I/O Backplanes from the control panel to increase noise resistance.	For 3-slot Backplane	C200HW-ATT32	N, L, CE
		For 5-slot Backplane	C200HW-ATT52	
		For 8-slot Backplane	C200HW-ATT82	
		For 10-slot Backplane	C200HW-ATTA2	
Relay	24 V DC, for C200H-OC221/OC222/OC223/OC224/OC225		G6B-1174P-FD-US	---
Programming Console Mounting Bracket	Used to attach C200H-PRO27-E Hand-held Programming Console to a panel.		C200H-ATT01	
Space Unit	Used for empty I/O slot.		C200H-SP001	---
Terminating Resistor (See note.)	Mounts to end of CS1 Long-distance Expansion Rack		CV500-TER01	U, C

Note: Two Terminating Resistors are included with the CS1W-IC102 I/O Control Unit.

Mounting Rails and Accessories

Name	Specifications	Model number	Standards
DIN rail Mounting Bracket	1 set (2 included)	C200H-DIN01	---
DIN rails	Length: 50 cm; height: 7.3 cm	PFP-50N	
	Length: 1 m; height: 7.3 cm	PFP-100N	
	Length: 50 cm; height: 16 mm	PFP-100N2	
End Plate	---	PFP-M	
Spacer		PFP-S	