

### CPU Rack

A CPU Rack consists of a CPU, Power Supply Unit, CPU Backplane, Basic I/O Modules, Special I/O Modules, and CPU Bus Modules. The Serial Communications Board and Memory Cards are optional.

**Note:** The Backplane depends on the type of CPU Rack, Expansion I/O Racks, and Slave Racks that are used.

### Expansion Racks

Both C200H and CS1 Expansion Racks can be used.

- C200H Expansion I/O Racks can be connected to CPU Racks, CS1 Expansion Racks, or other C200H Expansion I/O Racks.
- CS1 Expansion Racks can be connected to CPU Racks or other CS1 Expansion Racks.

An Expansion Rack consists of a Power Supply Module, a CS1 or C200H Expansion I/O Backplane, Basic I/O Modules, Special I/O Modules, and a CS1 CPU Bus Modules.

### Long-distance Expansion Racks

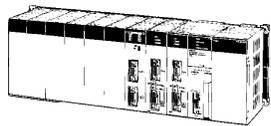
An I/O Control Module and I/O Interface Modules can be used to extend the normal limit of 12 m to 50 m for each of two series of CS1 Expansion Racks. The following Modules can be mounted to Long-distance Expansion Racks: CS1 Basic I/O Modules, CS1 Special I/O Modules, and CS1 CPU Bus Modules. (C200H Modules cannot be mounted to Long-distance Expansion Racks.)

# System Power and Expansion

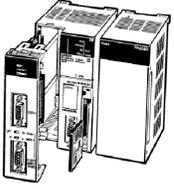
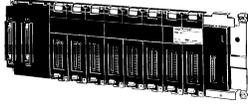


## CPU Rack

### ■ Configuration

Name	Configuration	Remarks
	CPU Backplane	One of each Module required for every CPU Rack.
	CPU Module	Refer to the following table for model number.
	Power Supply Module	
	Memory Card	Install as required.
	Serial Communications Board	Refer to the following table for model number.

### ■ Products Used in CPU Racks

Name	Model	Specifications
	CS1H-CPU67H	I/O bits: 5,120, Program capacity: 250K steps Data Memory: 448K words (DM: 32K words, EM: 32K words x 13 banks)
	CS1H-CPU66H	I/O bits: 5,120, Program capacity: 120K steps Data Memory: 256K words (DM: 32K words, EM: 32K words x 7 banks)
	CS1H-CPU65H	I/O bits: 5,120, Program capacity: 60K steps Data Memory: 128K words (DM: 32K words, EM: 32K words x 3 banks)
	CS1H-CPU64H	I/O bits: 5,120, Program capacity: 30K steps Data Memory: 64K words (DM: 32K words, EM: 32K words x 1 bank)
	CS1H-CPU63H	I/O bits: 5,120, Program capacity: 20K steps Data Memory: 32K words (DM: 32K words, EM: 32K words x 1 bank)
	CS1G-CPU45H	I/O bits: 5,120, Program capacity: 60K steps Data Memory: 128K words (DM: 32K words, EM: 32K words x 3 banks)
	CS1G-CPU44H	I/O bits: 1,280, Program capacity: 30K steps Data Memory: 64K words (DM: 32K words, EM: 32K words x 1 banks)
	CS1G-CPU43H	I/O bits: 960, Program capacity: 20K steps Data Memory: 64K words (DM: 32K words, EM: 32K words x 1 bank)
	CS1G-CPU42H	I/O bits: 960, Program capacity: 10K steps Data Memory: 64K words (DM: 32K words, EM: 32K words x 1 bank)
	CS1W-BC022	2 slots (Connection is not possible to Expansion Backplane.)
	CS1W-BC032	3 slots
	CS1W-BC052	5 slots
	CS1W-BC082	8 slots
	CS1W-BC102	10 slots
	C200HW-PA204	100 to 120 VAC or 200 to 240 VAC, Output capacity: 4.6 A, 5 VDC
	C200HW-PA204S	100 to 120 VAC or 200 to 240 VAC (0.8 A 24 VDC service power ) Output capacity: 4.6 A, 5 VDC
	C200HW-PA204R	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 4.6 A, 5 VDC
	C200HW-PD024	24 VDC, Output capacity: 4.6 A, 5 VDC
	C200HW-PA209R	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 9 A, 5 VDC
I/O Control Module	CS1W-IC102	Connects to CS1 Expansion Racks (two Terminating Resistors included). Must be used together with I/O Interface Modules to connect Long-distance Expansion Racks (50 m max.). Not required to connect CS1 Expansion Racks within 12 m.
	HMC-EF172	Flash memory, 15 MB (See note.)
	HMC-EF372	Flash memory, 30 MB (See note.)
	HMC-EF672	Flash memory, 64 MB (See note.)
	HMC-AP001	Memory Card adapter

(This table continues on the next page.)

**Note:** HMC-EF172/EF372/EF672 flash memory cannot be used with CS1G-CPU□□H, CS1H-CPU□□H, CJ1G-CPU□□H, or CJ1H-CPU□□H Modules predating lot number 020108 (i.e., manufactured before January 8, 2002) or with NS-7-series products predating lot number 0852 (i.e., manufactured before May 8, 2002) cannot be used together.

Products Used in CPU Rack (continued)

Name	Model	Specifications
Serial Communications Boards	CS1W-SCB21-V1	2 x RS-232C ports, protocol macro function
	CS1W-SCB41-V1	1 x RS-232C port + 1 x RS-422/485 port, protocol macro function
Programming Consoles	CQM1-PRO01-E	An English Keyboard Sheet (CS1W-KS001-E) is required.
	C200H-PRO27-E	
Programming Console Connection Cables	CS1W-CN114	Connects the CQM1-PRO01-E Programming Console. (Length: 0.05 m)
	CS1W-CN224	Connects the C200H-PRO27-E Programming Console. (Length: 2.0 m)
	CS1W-CN624	Connects the C200H-PRO27-E Programming Console. (Length: 6.0 m)
CX-Programmer	WS02-CXPC1-EV3	Windows-based Support Software for Windows 95/98/Me or Windows NT/2000/XP  <b>Note:</b> Can connect through peripheral port or through RS-232C port on CPU Module or Serial Communications Board.
	WS02-CXPC1-EV3L03 (For 3 licenses)	
	WS02-CXPC1-EV3L10 (For 10 licenses)	
Programming Device Connecting Cables (for peripheral port)	CS1W-CN118	Connects DOS computer, D-Sub 9-pin receptacle (Length: 0.1 m)
	CS1W-CN226	Connects DOS computer, D-Sub 9-pin (Length: 2.0 m)
	CS1W-CN626	Connects DOS computer, D-Sub 9-pin (Length: 6.0 m)
	XW2Z-200S-CV CBL-202*	Connects DOS computer, D-Sub 9-pin (Length: 2.0 m)
	XW2Z-500S-CV	Connects DOS computer, D-Sub 9-pin (Length: 5.0 m)
Programming Device Connecting Cables (for RS-232C port)	XW2Z-200S-V CBL-202*	Connects DOS computer, D-Sub 9-pin (Length: 2.0 m) (For Host Link connection)
	XW2Z-500S-V	Connects DOS computer, D-Sub 9-pin (Length: 5.0 m) (For Host Link connection)
CX-Simulator	WS02-SIMC1-E	Windows-based Support Software for Windows 95, 98, Me, NT, or 2000  Simulates operation for CS1 CS1H/CS1G-CPU□□ CPU Modules without "V1" at the end of the model number.
CX-Protocol	WS02-PSTC1-E	Windows-based Support Software for Windows 95, 98, Me, 2000 or NT Used to create and manage protocol macros.
Battery Set	CS1W-BAT01	For CS1 Series only.  Use a replacement battery that is no more than 2 years old from the date of manufacture.

\* Available in Canada only.

# System Power and Expansion



## CPU Rack

### Expansion Rack Configuration

Rack	Configuration	Remarks
CS1 Expansion Rack	CS1 Expansion I/O Backplane	One of each Module is required.
	Power Supply Module	
	For connection to a CPU Backplane or CS1 Expansion I/O Backplane: CS1 I/O Connecting Cable	
	For connection to a C200H Expansion I/O Backplane: CS1 to C200H I/O Connecting Cable	
C200H Expansion I/O Rack	C200H Expansion I/O Backplane	One of each Module is required. A CS1 Expansion Rack cannot be connected after a C200H Expansion I/O Rack.
	Power Supply Module	
	For connection to a CPU Backplane or CS1 Expansion I/O Backplane: CS1 to C200H I/O Connecting Cable	
	For connection to a C200H Expansion I/O Backplane: C200H I/O Connecting Cable	

### Products Used in Expansion Racks

Name	Model	Specifications	Cable Length
CS1 Expansion I/O Backplanes	CS1W-BI032	3 slots	--- These Backplanes are for CS1 Modules only. Use CS1W-BI□□3 Backplanes for C200H Modules.
	CS1W-BI052	5 slots	
	CS1W-BI082	8 slots	
	CS1W-BI102	10 slots	
C200H Expansion I/O Backplanes	C200HW-BI031	3 slots	---
	C200HW-BI051	5 slots	
	C200HW-BI081-V1	8 slots	
	C200HW-BI101-V1	10 slots	
Power Supply Modules	C200HW-PA204	100 to 120 VAC or 200 to 240 VAC Output capacity: 4.6 A, 5 VDC	---
	C200HW-PA204S	100 to 120 VAC or 200 to 240 VAC (with power output terminal: 0.8 A, 24 VDC) Output capacity: 4.6 A, 5 VDC	
	C200HW-PA204R	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 4.6 A, 5 VDC	
	C200HW-PD024	24 VDC	
	C200HW-PA209R	100 to 120 VAC or 200 to 240 VAC (with RUN output) Output capacity: 9 A, 5 VDC	
I/O Interface Module	CS1W-II102	Connects CS1 Expansion Racks. Must be used together with I/O Control Module to connect Long-distance Expansion Racks (50 m max.). Not required to connect CS1 Expansion Racks within 12 m.	---
CS1 I/O Connecting Cables	CS1W-CN313	Connects CS1 Expansion I/O Backplanes to CPU Backplanes or other CS1 Expansion I/O Backplanes.  When using a CS1W-CN313 or CS1W-CN713 I/O Connecting Cable with a CS1□-CPU□□H CPU Module, 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.  <b>Reading the production number</b> □□□□ Year (e.g., 1997=7) Month (1 to 9, X (10), Y (11), Z (12)) Day (01 to 31) 	0.3 m
	CS1W-CN713		0.7 m
	CS1W-CN223		2 m
	CS1W-CN323		3 m
	CS1W-CN523		5 m
	CS1W-CN133		10 m
	CS1W-CN133-B2		12 m

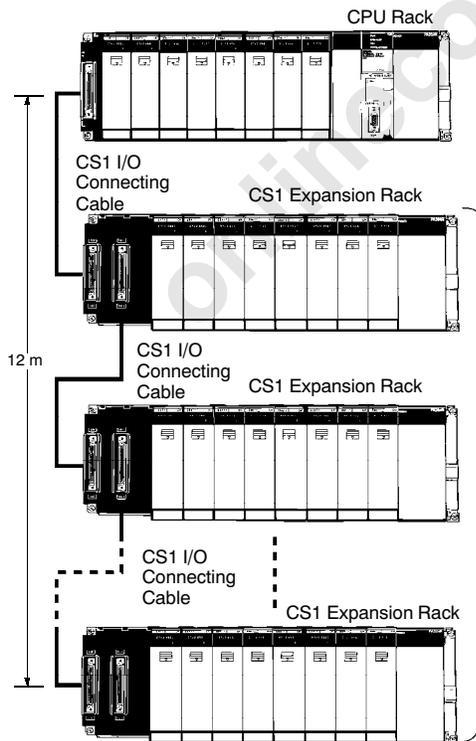
■ Products Used in CPU Racks

Name	Model	Specifications	Cable Length
Long-distance Connecting Cables	CV500-CN312	For Long-distance Expansion Racks	0.3 m
	CV500-CN612	Connects the I/O Control Module to I/O Interface Modules or connects one I/O Interface Module to the next I/O Interface Module.	0.6 m
	CV500-CN122		1 m
	CV500-CN222		2 m
	CV500-CN322		3 m
	CV500-CN522		5 m
	CV500-CN132		10 m
	CV500-CN232		20 m
	CV500-CN332		30 m
	CV500-CN432		40 m
	CV500-CN532		50 m
CS1-C200H I/O Connecting Cables	CS1W-CN311	Connects C200H Expansion I/O Backplanes to CPU Backplanes or CS1 Expansion I/O Backplanes.	0.3 m
	CS1W-CN711		0.7 m
	CS1W-CN221		2 m
	CS1W-CN321		3 m
	CS1W-CN521		5 m
	CS1W-CN131		10 m
	CS1W-CN131-B2		12 m
C200H I/O Connecting Cables	C200H-CN311	Connects C200H Expansion I/O Backplanes to other C200H Expansion I/O Backplanes.	0.3 m
	C200H-CN711		0.7 m
	C200H-CN221		2 m
	C200H-CN521		5 m
	C200H-CN131		10 m

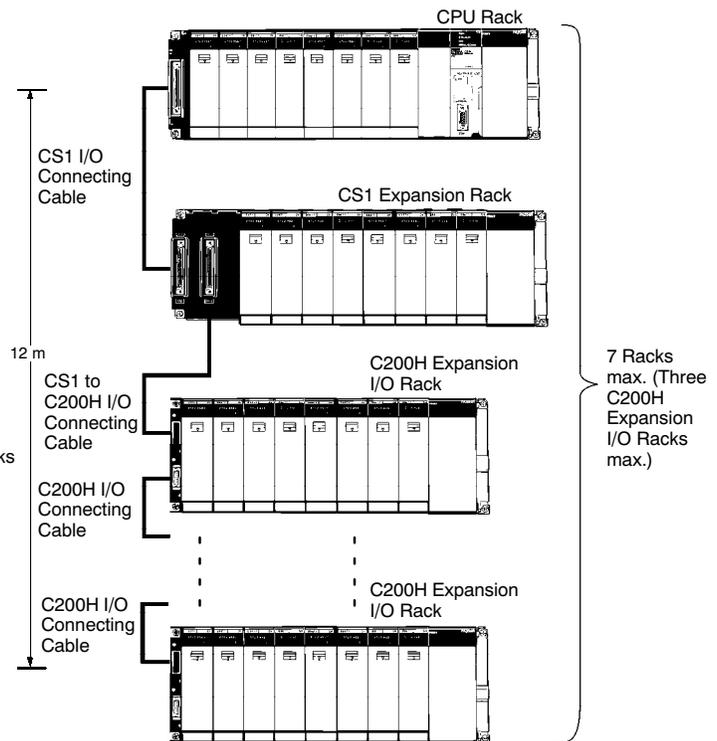
■ Expansion Rack Patterns

The following diagrams show the 5 possible patterns of Expansion Racks.

CPU Rack with CS1 Expansion Racks



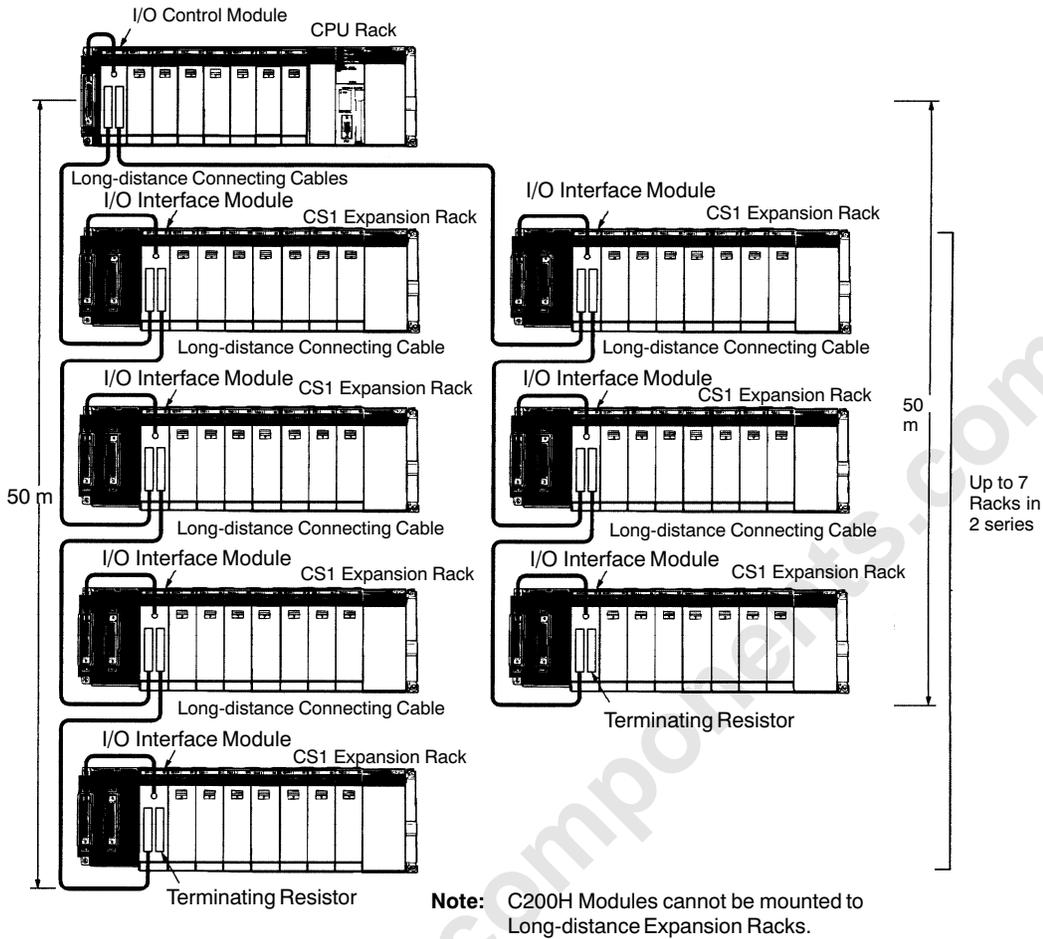
CPU Rack with CS1 Expansion Racks and C200H Expansion I/O Racks



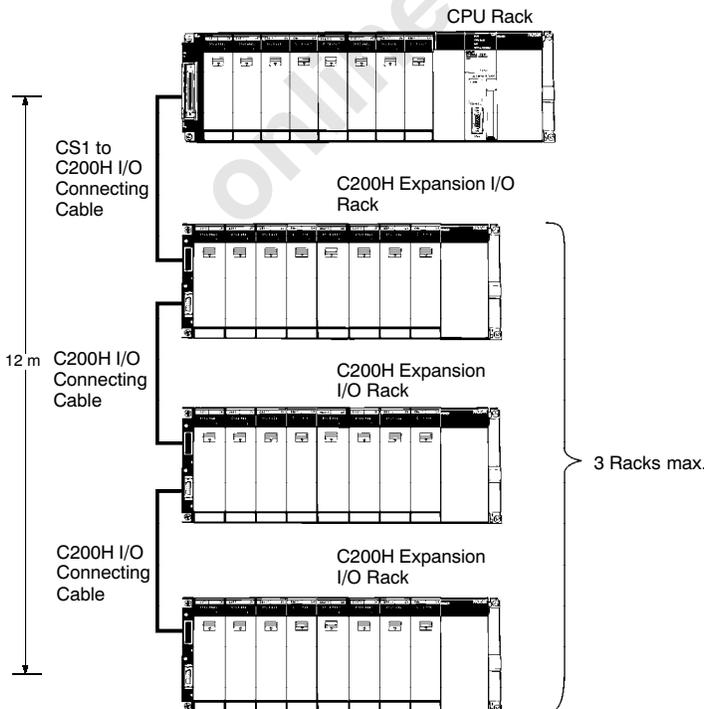
# System Power and Expansion

## CPU Rack

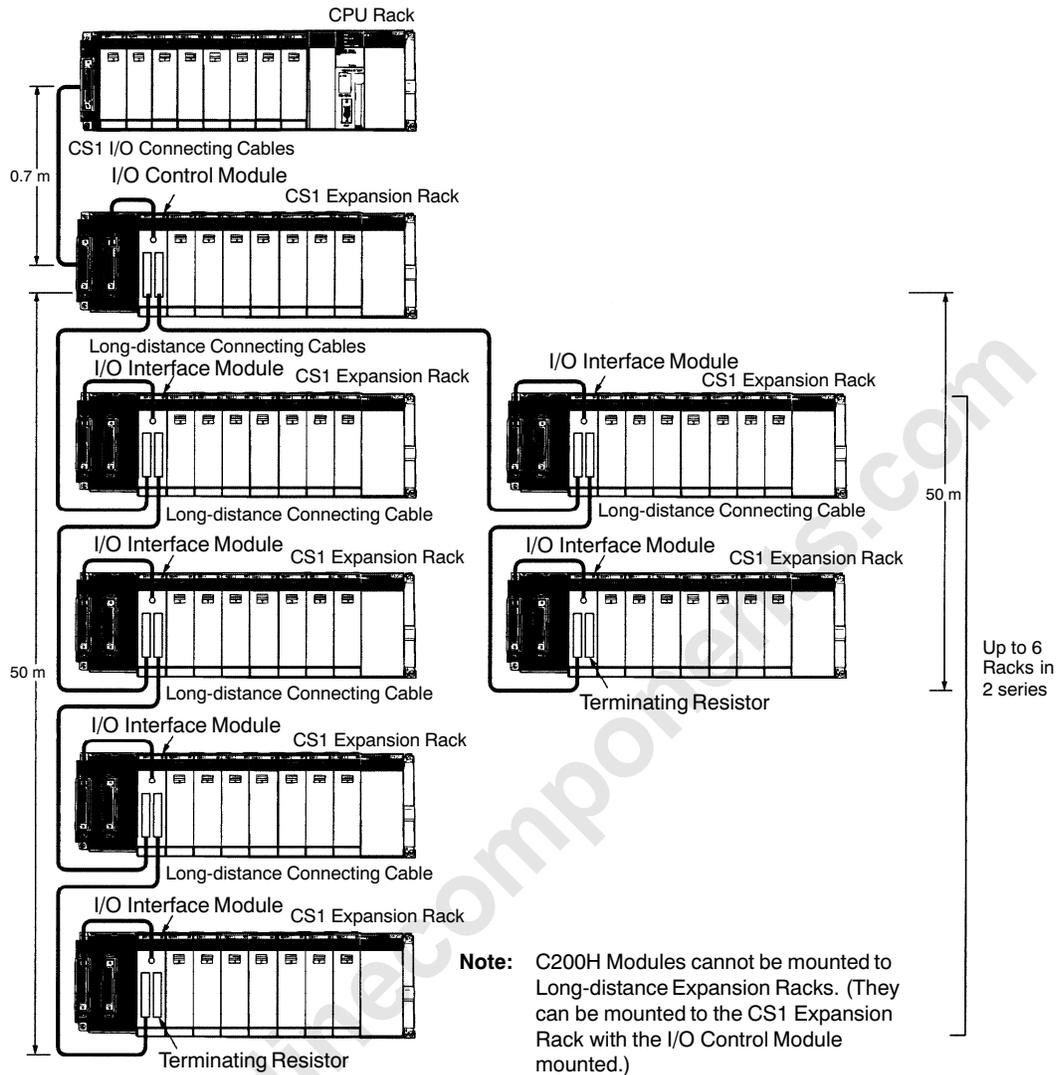
CPU Rack with CS1 Long-Distance Expansion Racks



CPU Rack with C200H Expansion I/O Racks



CPU Rack with CS1 Expansion Rack and CS1 Long-Distance Expansion Racks



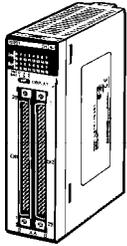
## I/O Allocations

### ■ I/O Allocations

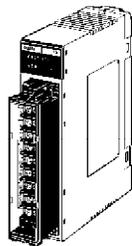
In CS1 PLCs, part of the I/O memory is allocated to each Module. Modules are divided into the following 3 groups for allocations.

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

#### Basic I/O Modules



CS1 Basic I/O Modules

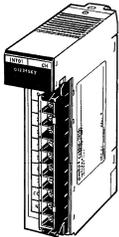


C200H Basic I/O Modules

#### Allocations

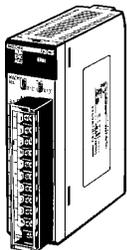
CIO Area:  
CIO 0000 to CIO 0319 (See Note 1.)  
(Memory is allocated in word Modules in order of mounting position in the Racks.)

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

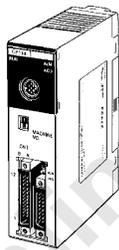


C200H Group-2 High-density I/O Modules  
(See Note 2.)

#### Special I/O Modules



CS1 Special I/O Modules



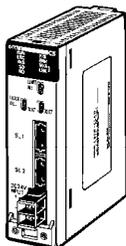
C200H Special I/O Modules  
(See Note 2.)

#### Allocations

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

- Note**
1. Although there are 80 Module number settings, a maximum of 80 Modules can actually be mounted to a PLC because that is the maximum number of slots possible.
  2. Some Modules classified as I/O Modules (namely C200H High-density I/O Modules) are actually treated as Special I/O Modules.

#### CS1 CPU Bus Modules



CS1 CPU Bus Modules

#### Allocations

CS1 CPU Bus Module Area:  
CIO 1500 to CIO 1899  
(Each Module is allocated 25 words based on its Module number.)

**■ Allocations to Basic I/O Module Groups**

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

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

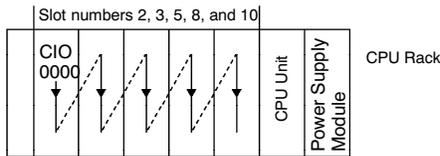
Basic I/O Modules can be mounted to the CPU Rack, CS1 Expansion Racks, and C200HX/HG/HE Expansion I/O Racks.

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

**Allocation Methods**

**1. CPU Rack**

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

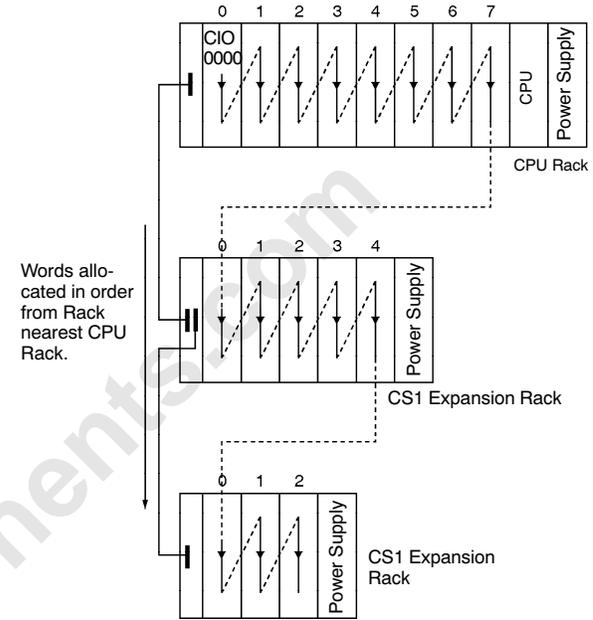


**Example**

0	1	2	3	4		
IN 8	IN 16	IN 64	OUT 8	OUT 32	CPU Unit	Power Supply Module
CIO 0000	CIO 0001	CIO 0002 to 0005	CIO 0006	CIO 0007 to 0008	CPU Rack	

**2. Allocations to CS1 Expansion and C200H Expansion I/O Racks**

I/O allocations to Basic I/O Modules continues from the CPU Rack to the Expansion Racks. Words are allocated from left to right and each Module is allocated as many words as it requires in word Modules, just like Modules in the CPU Rack.



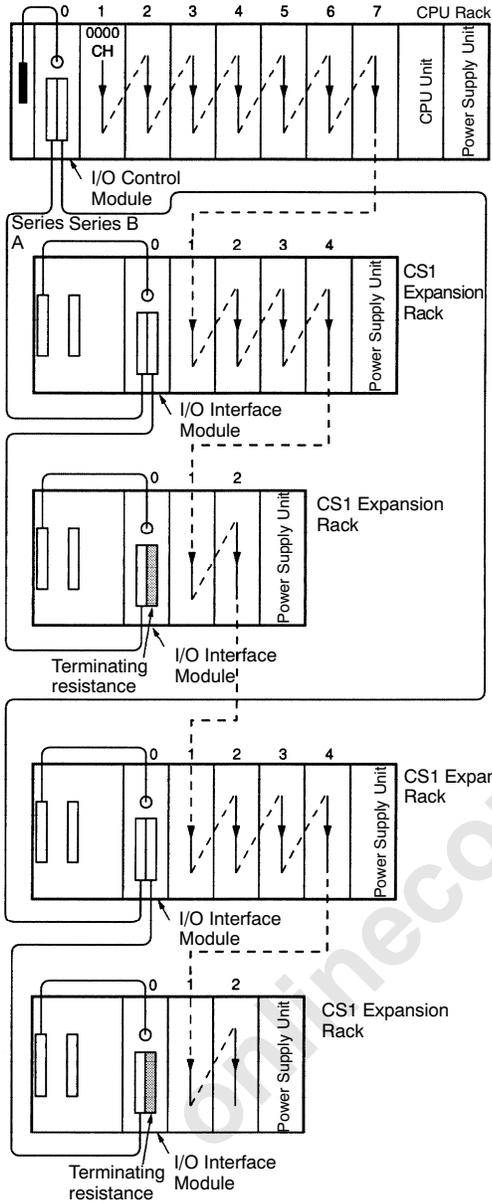
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# System Power and Expansion

## I/O Allocations

### 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 Modules

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

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

Special I/O Modules can be mounted to the CPU Rack, CS1 Expansion Racks, and C200H Expansion I/O Racks\*.

**Note:** \*CS1 Special I/O Modules cannot be mounted to C200H Expansion I/O Racks.

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

Module 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 Modules are ignored during I/O allocation to Basic I/O Modules. Slots containing Special I/O Modules are treated as empty slots.

■ Allocations to CS1 CPU Bus Modules

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

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

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

Module 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 Modules are ignored during I/O allocation to Basic I/O Modules. Slots containing CS1 CPU Bus Modules are treated as empty slots.

# System Power and Expansion

## Current Consumption

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

### ■ CPU Racks and Expansion Racks

The following table shows the maximum currents and power that can be supplied by Power Supply Modules 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 Module 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 Module	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 VDC by all Modules (A)  $\leq$  Max. Current shown in table
2. Current required at 26 VDC by all Modules (B)  $\leq$  Max. Current shown in table
3. Current required at 24 VDC by all Modules (C)  $\leq$  Max. Current shown in table

#### Condition 2: Maximum Total Current Supply

1.  $A \times 5 \text{ VDC} + B \times 26 \text{ VDC} + C \times 24 \text{ VDC} \leq$  Max. Power shown in table

### ■ Example Calculations

#### Example 1

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

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

■ Current Consumption Tables

5-VDC Voltage Group

Name	Model	Consumption (A)
CPU Modules (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.)
Serial Communication Boards	CS1W-SCB21-V1	0.28 (See note.)
	CS1W-SCB41-V1	0.36 (See note.)
CPU Backplanes (for CS1 Modules 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 Module	CS1W-IC102	0.92
CS1 Expansion Backplanes (for CS1 Modules 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 Module	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 Modules

Category	Name	Model	Consumption (A)
C200H Input Modules	DC Input Modules	C200H-ID211	0.01
		C200H-ID212	0.01
	AC Input Modules	C200H-IA121	0.01
		C200H-IA122	0.01
		C200H-IA122V	0.01
		C200H-IA221	0.01
		C200H-IA222	0.01
		C200H-IA222V	0.01
		AC/DC Input Modules	C200H-IM211
	C200H-IM212		0.01
	B7A Interface Modules	C200H-B7A11	0.10
		C200H-B7A12	0.10
	Interrupt Input Modules	C200HS-INT01	0.02

(This table continues on the next page.)

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## Current Consumption

### Basic I/O Modules (continued)

Category	Name	Model	Consumption (A)	
C200H Group-2 High-density Input Modules	DC Input Modules	C200H-ID216	0.10	
		C200H-ID217	0.12	
		C200H-ID218	0.10	
		C200H-ID219	0.12	
		C200H-ID111	0.12	
CS1 Input Modules	DC Input Modules	CS1W-ID211	0.10	
		CS1W-ID231	0.15	
		CS1W-ID261	0.15	
		CS1W-ID291	0.20	
	AC Input Modules	CS1W-IA111	0.11	
		CS1W-IA211	0.11	
	Interrupt Input Module	CS1W-INT01	0.10	
High-speed Input Module	CS1W-IDP01	0.10		
Safety Relay Module	CS1W-SF200	0.10		
C200H Output Modules	Relay Output Modules	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 Modules	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 Modules	C200H-B7A01	0.10	
		C200H-B7A02	0.10	
	Triac Output Modules	C200H-OA223	0.18	
		C200H-OA222V	0.20	
		C200H-OA224	0.27	
	CS1 Output Modules	Relay Output Modules	CS1W-OC201	0.10
			CS1W-OC211	0.13
		Transistor Output Modules	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			0.48	
CS1W-OD292		0.48		
Triac Output Modules		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 Modules		Transistor Output Modules	C200H-OD218	0.27
	C200H-OD21B		0.48	
	C200H-OD219		0.48	

(This table continues on the next page.)

Basic I/O Modules (continued)

Category	Name	Model	Consumption (A)
CS1 I/O Modules	DC Input/Transistor Output Modules	CS1W-MD261	0.27
		CS1W-MD262	0.27
		CS1W-MD561	0.27
CS1 I/O Modules		CS1W-MD291	0.35
CS1 I/O Modules		CS1W-MD292	0.35
C200H I/O Modules	B7A Interface Modules	C200H-B7A21	0.10
		C200H-B7A22	0.10
	Analog Timer Module	C200H-TM001	0.06

Special I/O Modules

Category	Name	Model	Consumption (A)
C200H High-density I/O Modules (Special I/O Modules)	DC Input Module	C200H-ID215	0.13
	TTL Input Module	C200H-ID501	0.13
	Transistor Output Module	C200H-OD215	0.22
	TTL Output Module	C200H-OD501	0.22
	TTL I/O Module	C200H-MD501	0.18
	DC Input Transistor Output Module	C200H-MD215	0.18
		C200H-MD115	0.18
C200H Special I/O Modules	Temperature Control Modules	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 Modules	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 Modules	C200H-TS001
	C200H-TS002		0.45
	C200H-TS101		0.45
	C200H-TS102		0.45
	PID Control Modules	C200H-PID01	0.33
		C200H-PID02	0.33
		C200H-PID03	0.33
	Cam Positioner Module	C200H-CP114	0.30
	ASCII Modules	C200H-ASC02	0.20
		C200H-ASC11	0.25
		C200H-ASC21	0.30
		C200H-ASC31	0.30
	Analog Input Modules	C200H-AD001	0.55
		C200H-AD002	0.45
		C200H-AD003	0.10
	Analog Output Modules	C200H-DA001	0.65
		C200H-DA002	0.60
		C200H-DA003	0.10
		C200H-DA004	0.10
	Analog I/O Modules	C200H-MAD01	0.10
	High-speed Counter Modules	C200H-CT001-V1	0.30
		C200H-CT002	0.30
		C200H-CT021	0.45
	Motion Control Module	C200H-MC221	0.65 (w/ Teaching Box: 0.85 )
	Position Control Modules	C200HW- NC113	0.30
		C200HW-NC213	0.30
		C200HW-NC413	0.50

(This table continues on the next page.)

# System Power and Expansion



## Current Consumption

### Special I/O Modules (continued)

Category	Name	Model	Consumption (A)
C200H Special I/O Modules	ID Sensor Modules	C200H-IDS01-V1	0.25
		C200H-IDS21	0.25
	Fuzzy Logic Module	C200H-FZ001	0.30
	Voice Module	C200H-OV001	0.30
	PC Card Module	C200HW-PCV01	(See note.)
	DeviceNet Master Module	C200HW-DRM21-V1	0.25
	DeviceNet I/O Link Module	C200HW-DRT21	0.25
	Profibus-DP Master Module	C200HW-PRM21	0.6
	Profibus I/O Link Module	C200HW-PRT21	0.25
	CompoBus/S Master Module	C200HW-SRM21-V1	0.15
PC Link Module	C200H-LK401	0.35	

**Note:** The consumption depends on the commercial memory card used. Calculate the consumption using the following.  
 +5 VDC, 0.7 A max. (for each Module) + PC card output current (I<sub>card</sub>)  
 $I_{5V} (1 \text{ slot}) \leq 0.5 \text{ A}, I_{12V} (1 \text{ slot}) \leq 0.1 \text{ A}$   
 However,  $I_{card} = I_{5V} (2 \text{ slots}) + 3.4 \times I_{12V} (2 \text{ slots}) \leq 1.0 \text{ A}$

Category	Name	Model	Consumption (A)	
CS1 Special I/O Module	Analog Input Module	CS1W-AD□□□	0.13	
	Analog Output Module	CS1W-DA□□□	0.13	
	Analog I/O Module	CS1W-MAD44	0.20	
	Isolated Thermocouple Input Module	Isolated Thermocouple Input Module	CS1W-PTS01	0.15
		Isolated Temperature- resistance Thermometer Input Module	CS1W-PTS02	
		Isolated Temperature- resistance Thermometer Input Module (Ni508.4 Ω)	CS1W-PTS03	
	Isolated Two-wire Transmission Device Input Module	Isolated Two-wire Transmission Device Input Module	CS1W-PTW01	0.16
		Isolated DC Input Module	CS1W-PDC01	
		Isolated Pulse Input Module	CS1W-PPS01	
		Isolated Control Output Module	CS1W-PMV01	
	Power Transducer Input Module	Power Transducer Input Module	CS1W-PTR01	0.08
		100-mV DC Input Module	CS1W-PTR02	
	Motion Control Modules	Motion Control Modules	CS1W-MC221	0.60 (w/ Teaching Box: 0.80 A)
			CS1W-MC421	0.70 (w/ Teaching Box: 1.00 A)
	Position Control Modules	Position Control Modules	CS1W-NC113/ 133	0.25
			CS1W-NC213/ 233	
			CS1W-NC413/ 433	
	High-speed Counter Modules	High-speed Counter Modules	CS1W-CT021	0.36
			CS1W-CT041	
			CS1W-CTS21	
	Customizable Counter Modules	Customizable Counter Modules	CS1W-HCP22	0.80
			CS1W-HCA22	0.75
			CS1W-HIO01	0.60
ID Sensor Modules	ID Sensor Modules	CS1W-V600C11	0.26	
		CS1W-V600C12	0.32	

CS1 CPU Bus Modules

Category	Name	Model	Consumption (A)
CS1 CPU Bus Modules	Loop Control Module	CS1W-LC001	0.36
	Controller Link Modules	CS1W-CLK52-V1	0.65
		CS1W-CLK21-V1	0.33
		CS1W-CLK12-V1	0.52
	SYSMAC LINK Module	CS1W-SLK21	0.48
		CS1W-SLK11	0.47
	Serial Communications Module	CS1W-SCU21-V1	0.29 (See Note.)
	Ethernet Module	CS1W-ETN01/11	0.40
		CS1W-ETN21	0.38
	DeviceNet Module	CS1W-DRM21	0.29

**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 Modules	Relay Output Modules	C200H-OC221	0.075 for 8 points ON at the same time
		C200H-OC222	
		C200H-OC223	
		C200H-OC224	
		C200H-OC225	
	Transistor Output Modules	C200H-OC222N	0.09 for 8 points ON at the same time
		C200H-OC226N	
		C200H-OC224N	
CS1 Output Modules	Relay Output Modules	C200H-OD216	0.075 for 8 points ON at the same time
		C200H-OD217	
C200H Special I/O Modules	Relay Output Modules	CS1W-OC201	0.006 for each point ON at the same time
		CS1W-OC211	
	Analog Input Module	C200H-AD003	0.10
		C200H-DA003	0.20
	Analog Output Modules	C200H-DA004	0.25
		C200H-MAD01	0.20
ID Sensor Modules	C200H-IDS01-V1	0.12	
	C200H-IDS21	0.12	
CS1 Special I/O Modules	Analog Input Module	CS1W-AD□□□	0.10
	Analog Output Modules	CS1W-DA041	0.18
		CS1W-DA08V	0.18
		CS1W-DA08C	0.25
	Analog I/O Module	CS1W-MAD44	0.20
	Isolated Thermocouple Input Module	CS1W-PTS01-V1	0.15
		CS1W-PTS02	
		CS1W-PTS03	
	Isolated Temperature- resistance Thermometer Input Module (Ni508.4 Ω)	CS1W-PTS03	0.16
		CS1W-PTW01	
		CS1W-PTW01	
	Isolated Two-wire Transmission Device Input Module	CS1W-PDC01	0.08
		CS1W-PPS01	
		CS1W-PMV01	
	Isolated Control Output Module	CS1W-PMV01	0.08
CS1W-PTR01			
Power Transducer Input Module	CS1W-PTR01	0.08	
100-mV DC Input Module	CS1W-PTR02	0.15	
Customizable Counter Module	CS1W-HCA22	0.15	
ID Sensor Module	CS1W-V600C11	0.12	

## Replacing C200H I/O Modules

### ■ Replacing C200H I/O Modules with CS1 I/O Modules

This section shows the corresponding CS1 I/O models and notes for replacing C200H I/O Modules.

#### 16-point DC Input Modules

Item	C200H I/O Modules	Corresponding CS1 I/O Modules
Model number	C200H-ID212	CS1W-ID211
Description	16-point DC Input Modules with terminal blocks	
Notes	The terminal arrangement must be changed.	
	The impedance increases (from 3 kΩ to 3.3 kΩ). Check that correct operation is possible in cases where increased impedance may influence operation.	
	The internal 5-V current consumption increases (from 10 mA to 100 mA). Check that the increased current is within the range of the power supply.	

#### 32-point DC Input Modules

Item	C200H I/O Modules	Corresponding CS1 I/O Modules
Model number	C200H-ID218/C200H-ID216	CS1W-ID231
Description	32-point DC Input Modules with connectors. The connectors, the pin arrangement, and the input specifications are the same.	
Notes	There are 2 commons instead of 1. Connect where necessary.	
	The input specifications change (e.g., the impedance decreases and the input current increases from 4.1 mA to 6 mA.) Check that correct operation is possible in cases where changes in input specifications may influence operation.	
	The internal 5-V current consumption increases (from 100 mA to 150 mA). Check that the increased current is within the range of the power supply.	

#### 64-point DC Input Modules

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-ID219/C200H-ID217	CS1W-ID261
Description	64-point DC Input Modules with connectors. The connectors, the pin arrangement, and the input specifications are the same.	
Notes	There are 4 commons instead of 2. Connect where necessary.	
	The input specifications change (e.g., the impedance decreases and the input current increases from 4.1 mA to 6 mA.) Check that correct operation is possible in cases where changes in input specifications may influence operation.	
	The internal 5-V current consumption increases from 120 mA to 150 mA (C200H-ID219) and from 100 mA to 150 mA (C200H-ID217). Check that the increased current is within the range of the power supply.	

#### 16-point Sinking Transistor Output Modules

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OD212	CS1W-OD211
Description	16-point Transistor Output (sinking) Modules with terminal blocks. The output current capacity increases (from 0.3 A per point and 4.8 A per Module to 0.5 A per point and 8 A per Module). The rated voltage range also increases (from 24 V to any voltage in the range 12 to 24 V).	
Notes	The terminal arrangement must be changed.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.3 ms to 1 ms.)	

**16-point Sourcing Transistor Output Modules**

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OD21A	CS1W-OD212
Description	16-point Transistor Output (sourcing) Modules with terminal blocks.	
Notes	The terminal arrangement must be changed.	
	The output capacity changes (from 1 A per point and 4 A per Module to 0.5 A per point and 5 A per Module). Check that correct operation is possible in cases where changes in output capacity may influence operation.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.3 ms to 1 ms.)	
	The internal 5-V current consumption increases (from 160 mA to 170 mA). The external 24-V power supply current also increases (from 35 mA to 40 mA). Check that the increased current is within the range of the power supply.	
	There are no alarm output contacts. Use the alarm bits in the Auxiliary Area.	

**32-point Sinking Transistor Output Modules**

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OD218	CS1W-OD231
Description	32-point Transistor Output (sinking) Modules with connectors. The connectors and the pin arrangement are the same. The output current capacity increases (from 100 mA to 0.5 A per point, 2.5 A per common, and 5 A per Module). The load voltage range changes from 4.5 to 26.4 V to 10.2 to 26.4 V.	
Notes	There are 2 commons instead of 1. Connect where necessary.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.4 ms to 1 ms.)	
	Replacement is not possible for applications with an output load range of 4.5 to 10.2 V.	
	The internal 5-V current consumption increases (from 180 mA to 270 mA). Check that the increased current is within the range of the power supply.	

**32-point Sourcing Transistor Output Modules**

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OD21B	CS1W-OD232
Description	32-point Transistor Output (sourcing) Modules with connectors. The connectors and the pin arrangement are the same.	
Notes	There are 2 commons instead of 1. Connect where necessary.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.3 ms to 1 ms.)	
	The internal 5-V current consumption increases (from 180 mA to 270 mA). Check that the increased current is within the range of the power supply.	

# System Power and Expansion



## Replacing C200H I/O Modules

### 64-point Sinking Transistor Output Modules

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OD219	CS1W-OD261
Description	64-point Transistor Output (sinking) Modules with connectors. The connectors and the pin arrangement are the same. The output current capacity increases (from 100 mA to 0.3 A per point, 1.6 A per common, and 6.4 A per Module). The load voltage range changes from 4.5 to 26.4 V to 10.2 to 26.4 V.	
Notes	There are 4 commons instead of 2. Connect where necessary.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Residual voltage increases from 0.8 V to 1.5 V, ON response time increases from 0.1 ms to 0.5 ms, OFF response time increases from 0.4 ms to 1 ms.)	
	Replacement is not possible for applications with an output load range of 4.5 to 10.2 V.	
	The internal 5-V current consumption increases (from 270 mA to 390 mA). Check that the increased current is within the range of the power supply.	

### 16-point 100-VAC Input Modules

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-IA122/122V	CS1W-IA111
Description	16-point 100-VAC Input Modules with terminal blocks. 100-VDC input also possible.	
Notes	The terminal arrangement must be changed.	
	The input specifications change. Check that correct operation is possible in cases where changes in input specifications may influence operation. (ON voltage increases from 60 VAC min. to 65 VAC min. and the input impedance (50 Hz) increases from 9.7 kΩ to 10 kΩ.)	
	The internal 5-V current consumption increases (from 10 mA to 110 mA). Check that the increased current is within the range of the power supply.	

### 16-point 200-VAC Input Modules

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-IA222/222V	CS1W-IA211
Description	16-point 200-VAC Input Modules with terminal blocks. The input specifications are the same.	
Notes	The terminal arrangement must be changed.	
	The internal 5-V current consumption increases (from 10 mA to 110 mA). Check that the increased current is within the range of the power supply.	

### 8-point Triac Output Modules

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OA223	CS1W-OA201
Description	8-point Triac Output Modules with terminal blocks. The output current capacity increases (from 4 A per Module to 4.8 A per Module).	
Notes	The terminal arrangement must be changed.	
	The maximum inrush current changes. Check that correct operation is possible in cases where changes in maximum inrush current may influence operation. (Changes from 15 A for a pulse width of 100 ms and 30 A for a pulse width of 10 ms to 10 A for a pulse width of 100 ms and 20 A for a pulse width of 10 ms.)	
	The internal 5-V current consumption increases (from 180 mA to 230 mA). Check that the increased current is within the range of the power supply.	

**16-point Triac Output Modules**

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OA224	CS1W-OA211
Description	16-point Triac Output Modules with terminal blocks. The number of output points increases (from 12 to 16). The output current capacity also increases (from 2 A per Module to 4 A per Module).	
Notes	The terminal arrangement must be changed.	
	The output specifications change. Check that correct operation is possible in cases where changes in output specifications may influence operation. (Maximum inrush current decreases from 20 A for a pulse width of 10 ms to 15 A for a pulse width of 10 ms and the residual voltage increases from 1.5 VAC (50 to 500 mA) to 1.6 VAC.)	
	The internal 5-V current consumption increases (from 270 mA to 406 mA). Check that the increased current is within the range of the power supply.	

**8-point Independent Relay Output Modules**

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OC224/OC224N	CS1W-OC201
Description	Relay Output Modules with 8 independent output points and terminal blocks. 100-VDC input also possible.	
Notes	The terminal arrangement must be changed.	
	The ON/OFF response time changes (C200H-OC224 only). Check that correct operation is possible in cases where an increased ON/OFF response time may influence operation. (Increases from 10 ms to 15 ms)	
	The internal 5-V current consumption increases (from 10 mA to 100 mA). Check that the increased current is within the range of the power supply.	

**16-point Relay Output Modules**

Item	C200H I/O Module	Corresponding CS1 I/O Module
Model number	C200H-OC225/OC226N	CS1W-OC211
Description	16-point Relay Output Modules with terminal blocks. Restrictions on the number of points per current for simultaneous turning ON of more than 1 contact are removed. 100-VDC input also possible.	
Notes	The terminal arrangement must be changed.	
	The ON/OFF response time changes (C200H-OC225 only). Check that correct operation is possible in cases where an increased ON/OFF response time may influence operation. (Increases from 10 ms to 15 ms)	
	The internal 5-V current consumption increases (from the range 30 to 50 mA to 130 mA at 5 V and from the range 75 to 90 mA to 96 mA at 26 V.) Check that the increased current is within the range of the power supply.	