

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.

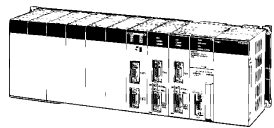
An Expansion Rack consists of a Power Supply Module, a CS1 or C200H Expansion I/O Backplane, Basic I/O Modules, Special I/O Modules, and a CS1 CPU Bus Modules.

Long-distance Expansion Racks

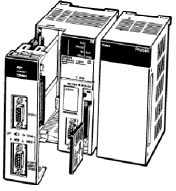
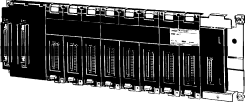


An I/O Control Module and I/O Interface Modules can be used to extend the normal limit of 12 m to 50 m for each of two series of CS1 Expansion Racks. The following Modules can be mounted to Long-distance Expansion Racks: CS1 Basic I/O Modules, CS1 Special I/O Modules, and CS1 CPU Bus Modules. (C200H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

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 Note: 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.

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. Reading the production number □□□□ 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 |

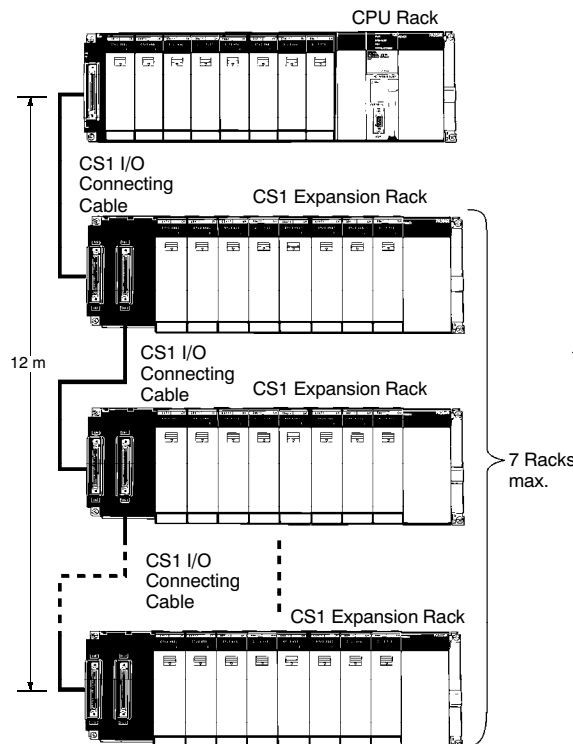
■ Products Used in CPU Racks

| 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 |

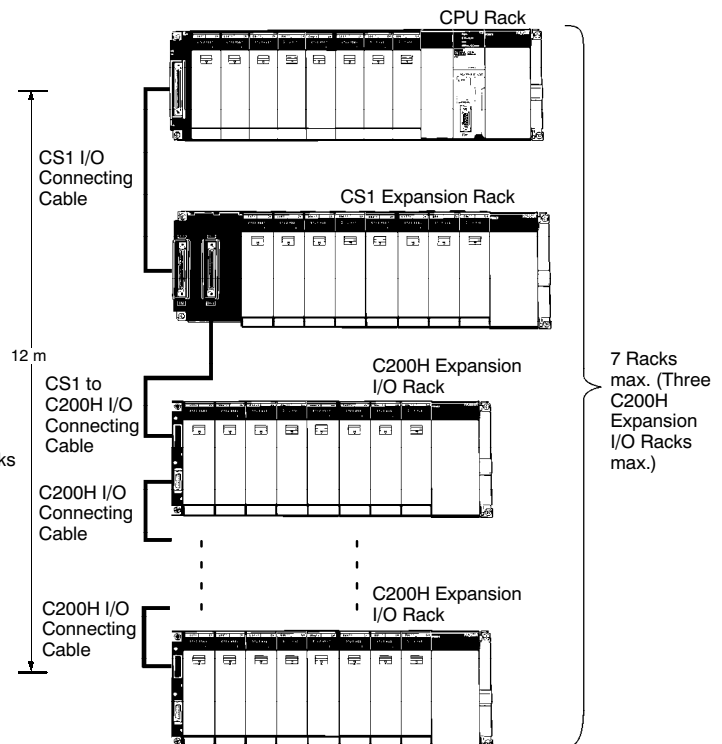
■ Expansion Rack Patterns

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

CPU Rack with CS1 Expansion Racks

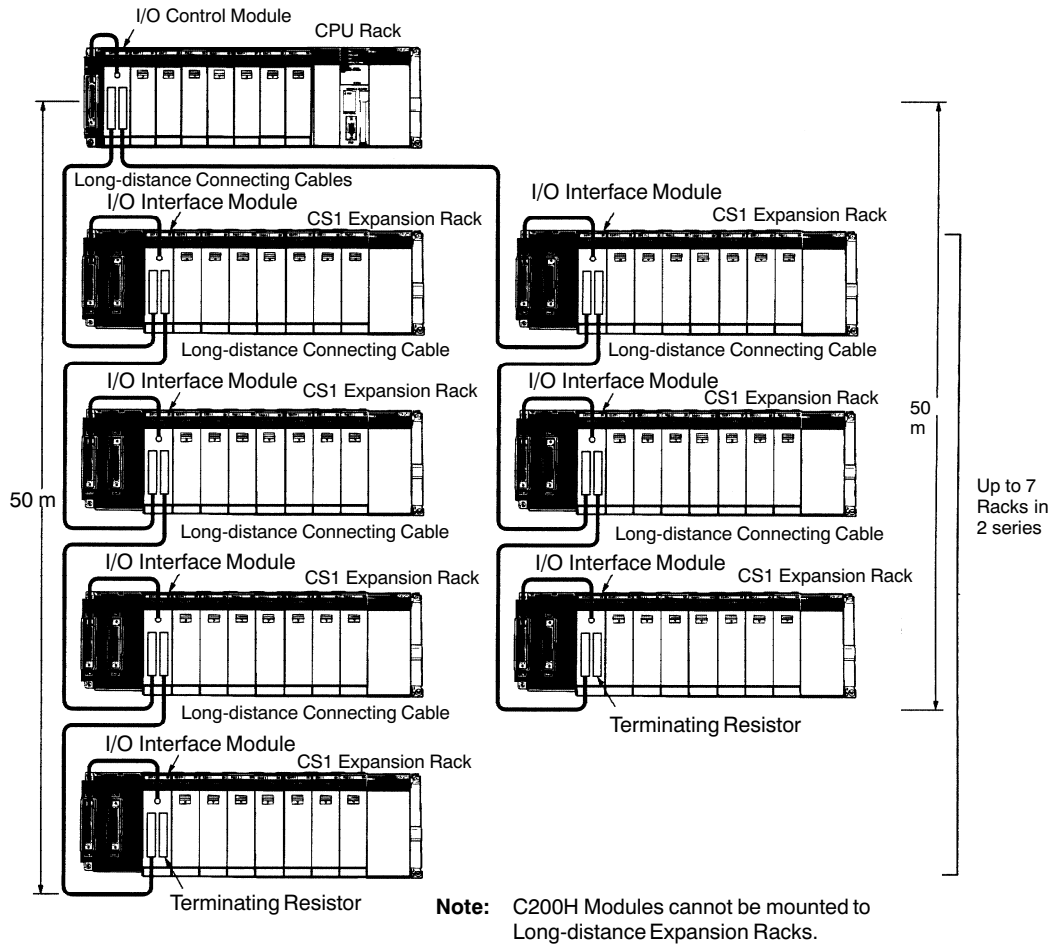


CPU Rack with CS1 Expansion Racks and C200H Expansion I/O Racks

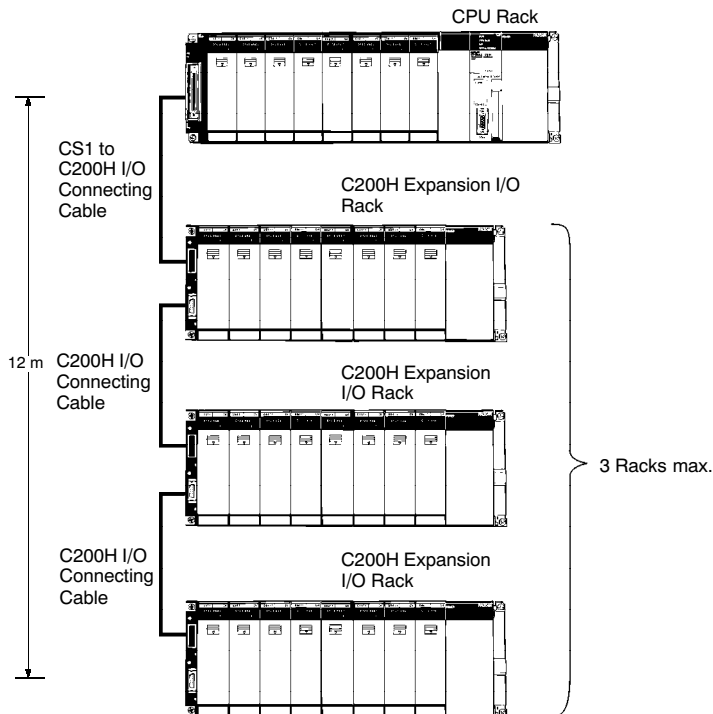


CPU Rack

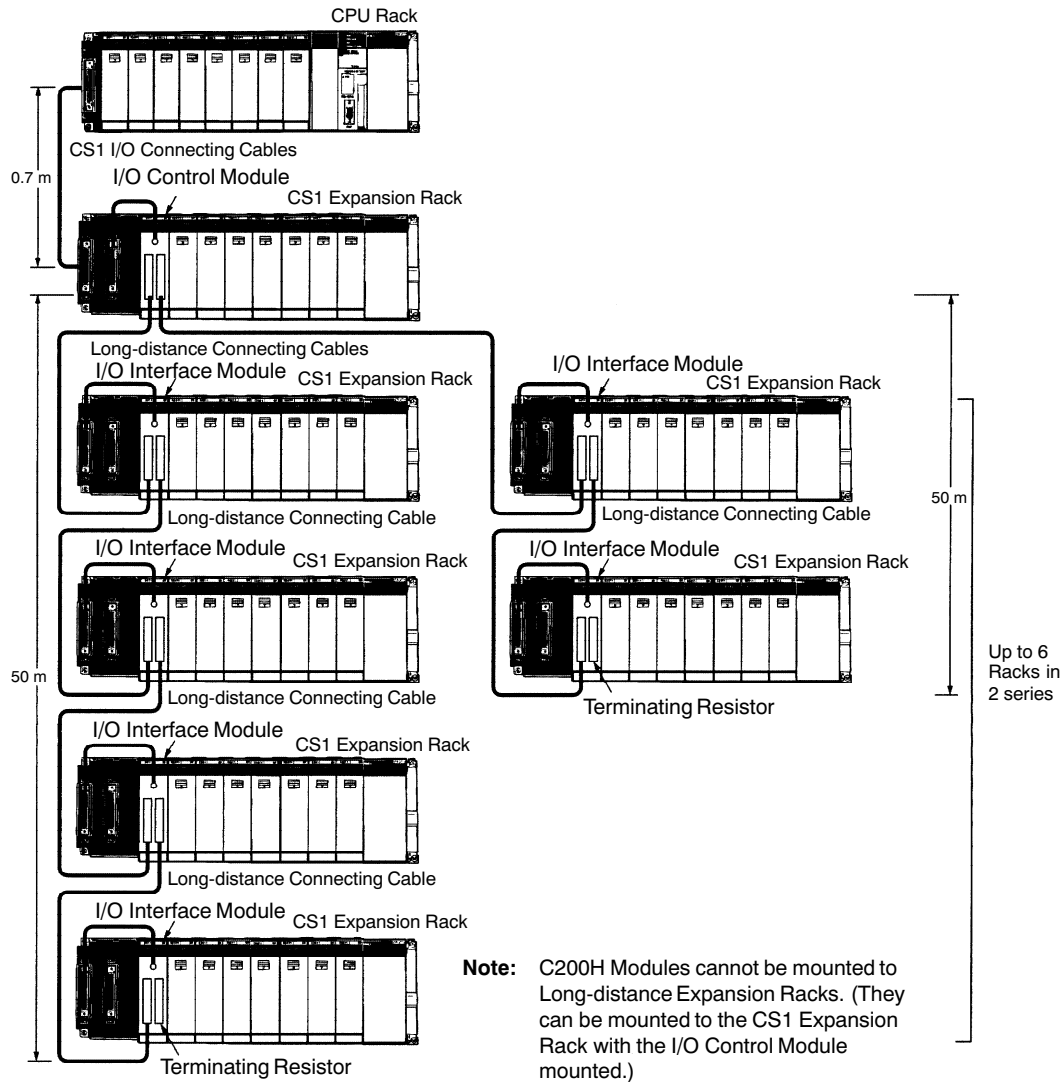
CPU Rack with CS1 Long-Distance Expansion Racks



CPU Rack with C200H Expansion I/O Racks



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



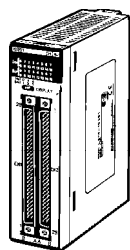
I/O Allocations

■ I/O Allocations

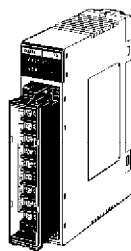
In CS1 PLCs, part of the I/O memory is allocated to each Module. Modules are divided into the following 3 groups for allocations.

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

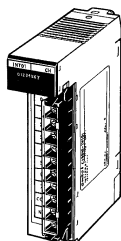
Basic I/O Modules



CS1 Basic I/O Modules



C200H Basic I/O Modules



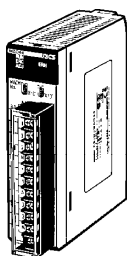
C200H Group-2 High-density I/O Modules
(See Note 2.)

Allocations

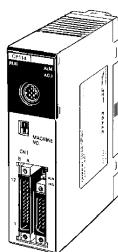
CIO Area:
CIO 0000 to CIO 0319 (See Note 1.)
(Memory is allocated in word Modules in order of mounting position in the Racks.)

- 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.

Special I/O Modules



CS1 Special I/O Modules



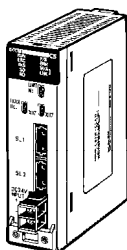
C200H Special I/O Modules
(See Note 2.)

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

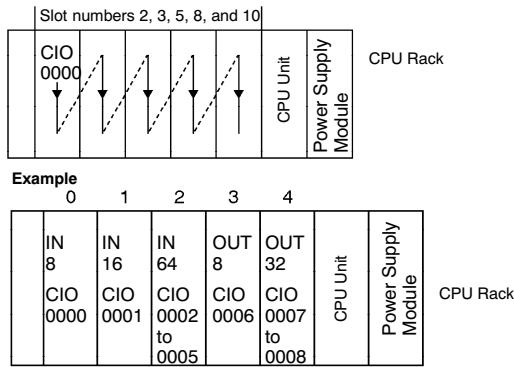
Basic I/O Modules can be mounted to the CPU Rack, CS1 Expansion Racks, and C200HX/HG/HE Expansion I/O Racks.

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

Allocation Methods

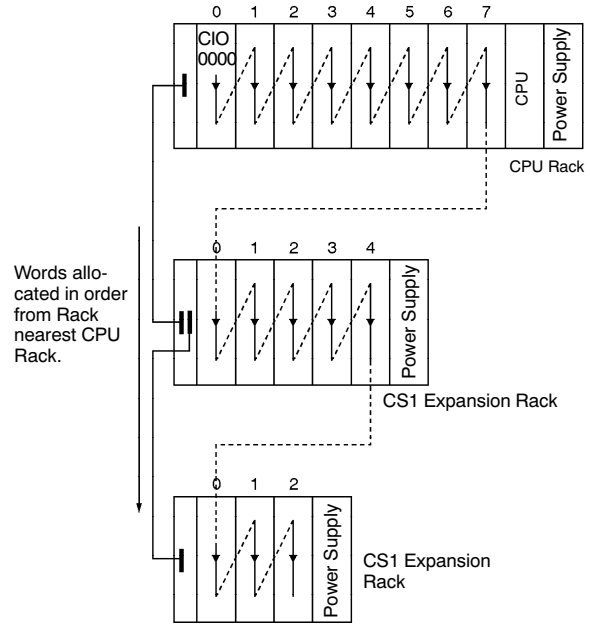
1. CPU Rack

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.



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

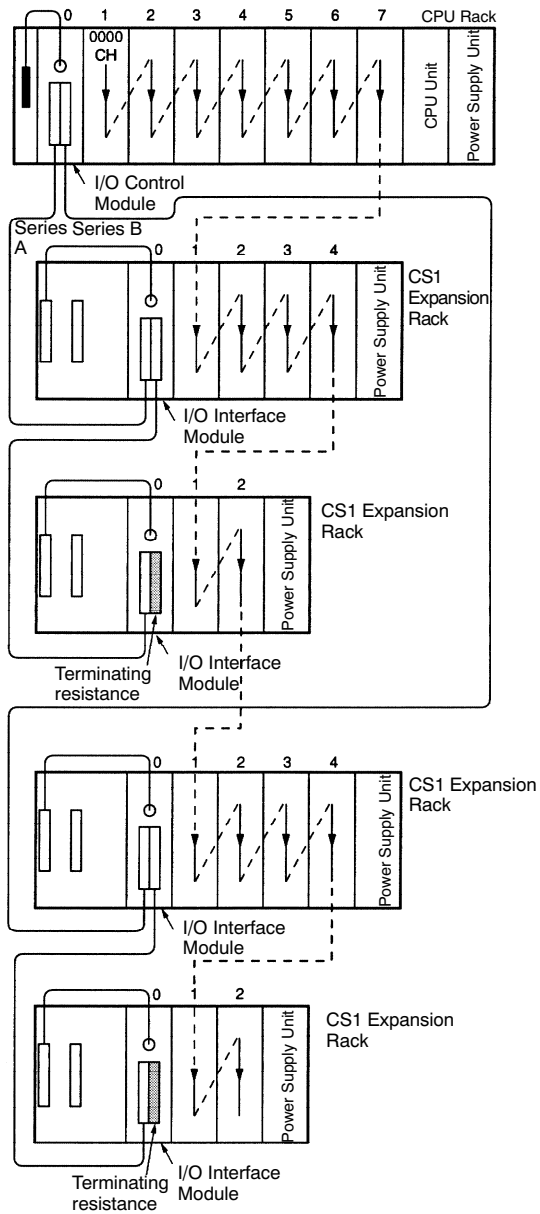
I/O allocations to Basic I/O Modules continues from the CPU Rack to the Expansion Racks. Words are allocated from left to right and each Module is allocated as many words as it requires in word Modules, just like Modules in the CPU Rack.



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.

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.)

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.)

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_{card})
 $I_{5V} (1 \text{ slot}) \leq 0.5 \text{ A}$, $I_{12V} (1 \text{ slot}) \leq 0.1 \text{ A}$
 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 | |
| | | | CS1W-HIO01 | |
| ID Sensor Modules | ID Sensor Modules | CS1W-V600C11 | 0.60 | |
| | | CS1W-V600C12 | 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 | |
| Transistor Output Modules | C200H-OD216 | 0.075 for 8 points ON at the same time | |
| | C200H-OD217 | | |
| CS1 Output Modules | Relay Output Modules | CS1W-OC201 | 0.006 for each point ON at the same time |
| | | CS1W-OC211 | |
| C200H Special I/O Modules | Analog Input Module | C200H-AD003 | 0.10 |
| | Analog Output Modules | C200H-DA003 | 0.20 |
| | | C200H-DA004 | 0.25 |
| | Analog I/O Module | 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 |
| | 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 | 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 | CS1W-PTR01 | 0.08 |
| | 100-mV DC Input Module | CS1W-PTR02 | |
| | 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. | |

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 k Ω to 10 k Ω .) | |
| | 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. | |

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