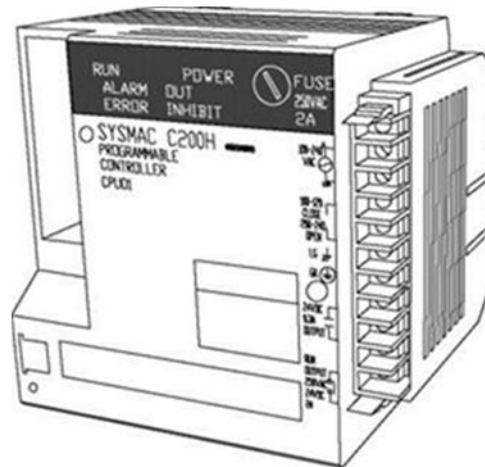


# OMRON

SYSMAC - System C200H CPUs

C200H-CPU01-E

C200H-CPU03-E



*Presented by - MRO Electric and Supply Company, Inc.*

*For Product Needs:*

*Email: [sales@MROELECTRIC.COM](mailto:sales@MROELECTRIC.COM)*

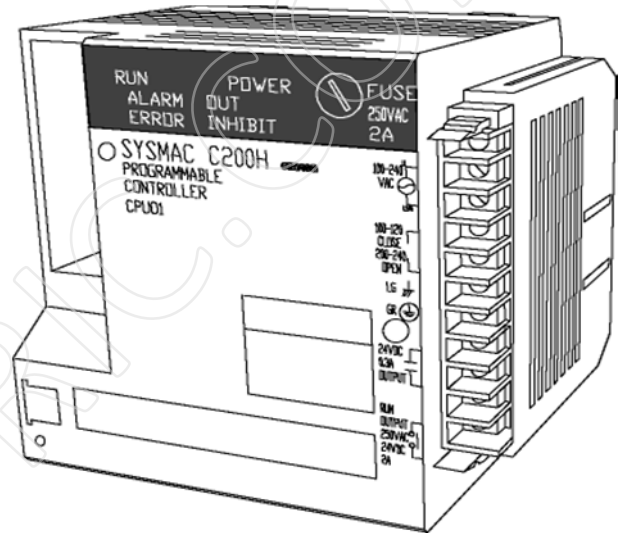
*Call: **1-800-691-8511***

*Fax: **919-415-1614***

[WWW.MROELECTRIC.COM](http://WWW.MROELECTRIC.COM)

### General Information

The CPUs provide a wide variety of features and capabilities for applications requiring simplified configuration and ease of use, maximum reliability and maintainability, and the ability to meet the need for future change and system expansion. A variety of CPUs are available with various memory and I/O configurations allowing selection based on application requirements.



### C200H-CPU01-E/CPU03-E CPUs

#### High Spec, Small Rack Style, OEM Version

The C200H-CPU01-E and C200H-CPU03-E controllers offer big machine functions in a system designed ideally for basic OEM systems from 50 to 480 I/O. A wide variety of plug-in style I/O modules are available, including intelligent modules.

#### Basic Configuration

- Built-in 120 VAC (CPU01) or 24 VDC (CPU03) power supply
- Rack-style PLC with 3-, 5-, 8-, 10-slot racks
- Accepts two local expansion racks
- Accepts remote I/O racks

#### CPU Features

- 4K or 7K word program memory
- Expanded system memory (6,000 internal bits; 2,000 registers)
- 145 instructions
- Fast execution time (0.75-2.25  $\mu$ s per basic instruction)

#### Special Features

- Many intelligent I/O modules
- Versatile communications (Host Link, PLC-to-PLC, Remote I/O)
- ASCII/BASIC module for co-processing/communications

C200H Comparison Table

Item	C200H				
	CPU01-E	CPU03-E	CPU21-E	CPU23-E	CPU31-E
Group 2 High-density I/O Module compatibility C200H-ID216/ID217/OD218/OD219	No	No	Yes	Yes	Yes
Error history	No	No	Yes	Yes	Yes
Clock/calendar*	No	No	Yes	Yes	Yes
Forced Status Hold Bit (SR 25211)	No	No	Yes	Yes	Yes
TERMINAL mode for Programming Console	No	No	Yes	Yes	Yes
Optional instructions 1 (refer to Instruction Set Section):No REVERSIBLE WORD SHIFT - RWS(17) SCAN TIME - SCAN(18) MULTI-WORD COMPARE - MCMP(19) LONG MESSAGE - LMSG(47) TERMINAL MODE - TERM(48) SET SYSTEM - SET(49) DOUBLE COMPARE - CMPL(60) COLUMN-TO-WORD - CTW(63) WORD-TO-COLUMN - WTC(64) HOURS-TO-SECONDS - HTS(65) SECONDS-TO-HOURS - STH(66) VALUE CALCULATE - VCAL(69) MULTIPOINT I/O REFRESH - MPRF(61)		No	Yes	Yes	Yes
Optional instructions 2 (refer to Instruction Set Section):No PID CONTROL - PID(*) SCALING - SCL(*) TOTALIZING TIMER - TTIM(87) 2's COMPLEMENT - NEG(*) DOUBLE 2's COMPLEMENT - NEGL(*) FIND MINIMUM - MIN(*) FIND MAXIMUM - MAX(*) TENKEY INPUT - TKY(*) MATRIX INPUT - MTR(*) ASCII-to-HEX - HEX(*) AVERAGE - AVG(*) SUM - SUM(*) FAILURE POINT DETECT - FPD(*) <b>Note</b> For complete list refer to instruction set section.		No	No	No	No
SYSMAC NET, SYSMAC LINK network compatibility and instructions: NETWORK SEND - SEND(90) NETWORK RECEIVE - RECV(98)	No	No	No	No	Yes
Power supply	AC	DC	AC	DC	AC
Internal logic current capacity (for I/O modules)	1.6 A	1.6 A	3.2 A	1.6 A	3.0 A

\*A clock is built into the C200H-CPU31-E; the C200H-CPU21-E and C200H-CPU23-E can use the clock built into some of the Memory Packs. (Refer to Standard Parts.)

C200HS Comparison Table

Item	C200HS					
	CPU01-E	CPU03-E	CPU21-E	CPU23-E	CPU31-E	CPU33-E
Group 2 High-density I/O Module compatibility C200H-ID216/ID217/OD218/OD219	Yes	Yes	Yes	Yes	Yes	Yes
Error history	Yes	Yes	Yes	Yes	Yes	Yes
Clock/calendar*	Yes	Yes	Yes	Yes	Yes	Yes
Forced Status Hold Bit (SR 25211)	Yes	Yes	Yes	Yes	Yes	Yes
TERMINAL mode for Programming Console	Yes	Yes	Yes	Yes	Yes	Yes
Optional instructions 1 (refer to Instruction Set Section): REVERSIBLE WORD SHIFT - RWS(17) SCAN TIME - SCAN(18) MULTI-WORD COMPARE - MCMP(19) LONG MESSAGE - LMSG(47) TERMINAL MODE - TERM(48) SET SYSTEM - SET(49) DOUBLE COMPARE - CMPL(60) COLUMN-TO-WORD - CTW(63) WORD-TO-COLUMN - WTC(64) HOURS-TO-SECONDS - HTS(65) SECONDS-TO-HOURS - STH(66) VALUE CALCULATE - VCAL(69) MULTIPOINT I/O REFRESH - MPRF(61)	Yes	Yes	Yes	Yes	Yes	Yes
Optional instructions 2 (refer to Instruction Set Section): PID CONTROL - PID(*) SCALING - SCL(*) TOTALIZING TIMER - TTIM(87) 2's COMPLEMENT - NEG(*) DOUBLE 2's COMPLEMENT - NEGL(*) FIND MINIMUM - MIN(*) FIND MAXIMUM - MAX(*) TENKEY INPUT - TKY(*) MATRIX INPUT - MTR(*) ASCII-to-HEX - HEX(*) AVERAGE - AVG(*) SUM - SUM(*) FAILURE POINT DETECT - FPD(*) <b>Note</b> For complete list refer to instruction set section.	Yes	Yes	Yes	Yes	Yes	Yes
SYSMAC NET, SYSMAC LINK network compatibility and instructions: NETWORK SEND - SEND(90) NETWORK RECEIVE - RECV(98)	No	No	No	No	Yes	Yes
Power supply	AC	DC	AC	DC	AC	DC
Internal logic current capacity (for I/O modules)	3.9 A	2.3 A	3.9 A	2.3 A	3.9 A	2.3 A
Built-In RS232C PORT	No	No	Yes	Yes	Yes	Yes

\* A clock is built into the C200H-CPU31-E; the C200H-CPU21-E and C200H-CPU23-E can use the clock built into some of the Memory Packs. (Refer to Standard Parts.)

**C200H Specifications**

Part number	C200H-CPU01-E/CPU03-E	C200H-CPU21-E/CPU23-E	C200H-CPU31-E
<b>Main Control Element</b>	MPU, CMOS, LS-TTL		
<b>Programming languages</b>	Ladder diagram		
<b>Instruction set</b>	145 (12 basic instructions + 133 special instructions)	168 (12 basic instructions + 156 special instructions)	172 (12 basic instructions + 160 special instructions)
<b>Instruction length</b>	1 to 4 words/instruction, 1 address/instruction		
<b>Execution time</b>	0.75 to 2.25 $\mu$ s (basic instructions) 34 to 724 $\mu$ s (function no. instructions)		
<b>I/O control method</b>	Cyclic, programmed, scheduled, and zero-cross refreshing		
<b>Control input signal</b>	START INPUT (in RUN mode, PLC operates when contacts are closed and stops when contacts are opened; 24 VDC, 10 mA)		
<b>Control output signal</b>	RUN OUTPUT; dry contact (contacts are closed while PLC is in RUN mode; maximum switching capacity 2 A, 250 VAC (resistive load, p.f. = 1), 0.5 A, 250 VAC (inductive load, p.f. = 0.4), 2 A, 24 VDC)		
<b>Memory protection</b>	Status of HR bits, AR bits, preset value of counters (CNT), and contents of data memory (DM) are retained during power failure. RAM Pack, battery back-up: Program (including clock function) and data areas protected. RAM Pack, capacitor back-up: Program and data areas protected. EEPROM Pack (without clock function): Data areas protected. EEPROM Pack (with clock function): Clock function and data area protected. C200H-CPU31-E: Program and data areas (including clock function) protected.		
<b>Battery life</b>	4 years at 25°C (77°F); shortened at temperatures higher than 25°C. Replace battery with new one within 1 week when ALARM indicator blinks.		
<b>Self-diagnostics</b>	Errors for CPU failure, Battery, Scan time, Memory failure, I/O bus, I/O verify, Remote I/O, Link error, Special I/O Modules, CPU Bus Modules		
<b>Agency approvals</b>	UL listed, file number: E95399 CSA certified, file number: LR51460		

**Memory**

<b>Memory capacity</b>	6,974 words (with 8K-word memory)		
<b>Internal relay (IR) bits</b>	Standard I/O Modules: 480 (00000 through 02915)		
	I/O Modules mounted to Remote Expansion Racks and Special I/O Modules 3,296 (03000 through 23515)	I/O Modules mounted to Remote Expansion Racks and Special I/O Modules 3,296 (03000 through 23515) Group 2 High-density I/O Modules 320 (03000 through 04915)	
<b>Special Relay (SR) bits</b>	312 (23600 through 25507)		
<b>Temporary relay (TR) bits</b>	8 (TR 0 through 7)		
<b>Holding relay (HR) bits</b>	1,600 (HR 0000 through 9915)		
<b>Auxiliary relay (AR) bits</b>	448 (AR 0000 through 2715)		
<b>Latching relay (LR) bits</b>	1,024 (LR 0000 through 6315)		
<b>Timers/Counters</b>	512 (TIM/CNT 000 through 511) TIMs: 0 through 999.9 s TIMHs: 0 through 99.99 s CNT: 0 through 9999 counts		

1

**C200HS Specifications**

Part number	C200HS-CPU01-E/CPU03-E	C200HS-CPU21-E/CPU23-E	C200HS-CPU31-E CPU33-E
Main Control Element	MPU, CMOS, LS-TTL		
Programming languages	Ladder diagram		
Instruction set	239 (14 basic instructions + 225 special instructions)	239 (14 basic instructions + 225 special instructions)	243 (14 basic instructions + 299 special instructions)
Instruction length	1 to 4 words/instruction, 1 address/instruction		
Execution time	0.375-1.313 μs (basic instructions)		
I/O control method	Cyclic, programmed, scheduled, and zero-cross refreshing		
Control input signal	START INPUT (in RUN mode, PLC operates when contacts are closed and stops when contacts are opened; 24 VDC, 10 mA)		
Control output signal	RUN OUTPUT; dry contact (contacts are closed while PLC is in RUN mode; maximum switching capacity 2 A, 250 VAC (resistive load, p.f. = 1), 0.5 A, 250 VAC (inductive load, p.f. = 0.4), 2 A, 24 VDC)		
Memory protection	Status of HR bits, AR bits, preset value of counters (CNT), and contents of data memory (DM) are retained during power failure. RAM Pack, battery back-up: Program (including clock function) and data areas protected. RAM Pack, capacitor back-up: Program and data areas protected. EEPROM Pack (without clock function): Data areas protected. EEPROM Pack (with clock function): Clock function and data area protected. C200H-CPU31-E: Program and data areas (including clock function) protected.		
Battery life	4 years at 25°C (77°F); shortened at temperatures higher than 25°C. Replace battery with new one within week when ALARM indicator blinks.		
Self-diagnostics	Errors for CPU failure, Battery, Scan time, Memory failure, I/O bus, I/O verify, Remote I/O, Link error, Special I/O Modules, CPU Bus Modules		
Agency approvals	UL listed, file number: E95399 CSA certified, file number: LR51460		

**Memory**

Memory capacity	15.2k words (with 16k word memory)
Internal relay (IR) bits	Standard I/O Modules: 480 (00000 through 02915) I/O Modules mounted to Remote Expansion Racks and Special I/O Modules 6688 (03000 through 23515, 30000-51115) Group 2 High-density I/O Modules 320 (03000 through 04915)
Special Relay (SR) bits	1016 (23600 through 25507 and 25600 through 29915)
Temporary relay (TR) bits	8 (TR 0 through 7)
Holding relay (HR) bits	1,600 (HR 0000 through 9915)
Auxiliary relay (AR) bits	448 (AR 0000 through 2715)
Latching relay (LR) bits	1,024 (LR 0000 through 6315)
Timers/Counters	512 (TIM/CNT 000 through 511) TIMs: 0 through 999.9 s TIMHs: 0 through 99.99 s CNT: 0 through 9999 counts



**C200H/C200HS Specifications**

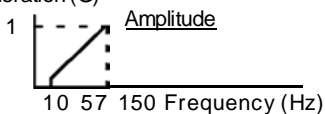
Part number	C200H-CPU01-E/CPU03-E	C200H-CPU21-E/CPU23-E	C200H-CPU31-E	C200HS-CPU01-E/CPU03-E C200HS-CPU21-E/CPU23-E C200HS-CPU31-E/CPU33-E
<b>Data memory (DM) words</b>	Read/write: 1,000 (DM 0000 through 0999) Read only: 1,000 (DM 1000 through 1999) DM area as in Memory Park.			Read/Write: 6144 (DM0000 through 6143) Read only: 512 (6144 through 6655) 3000 Word max. (DM7000 through 9999)
<b>Program check</b>	Program check (executed on start of RUN operation): END missing, Instruction errors, (Program can be checked by Programming Console, GPC, or LSS at three levels.)			

**Power Supply Specifications**

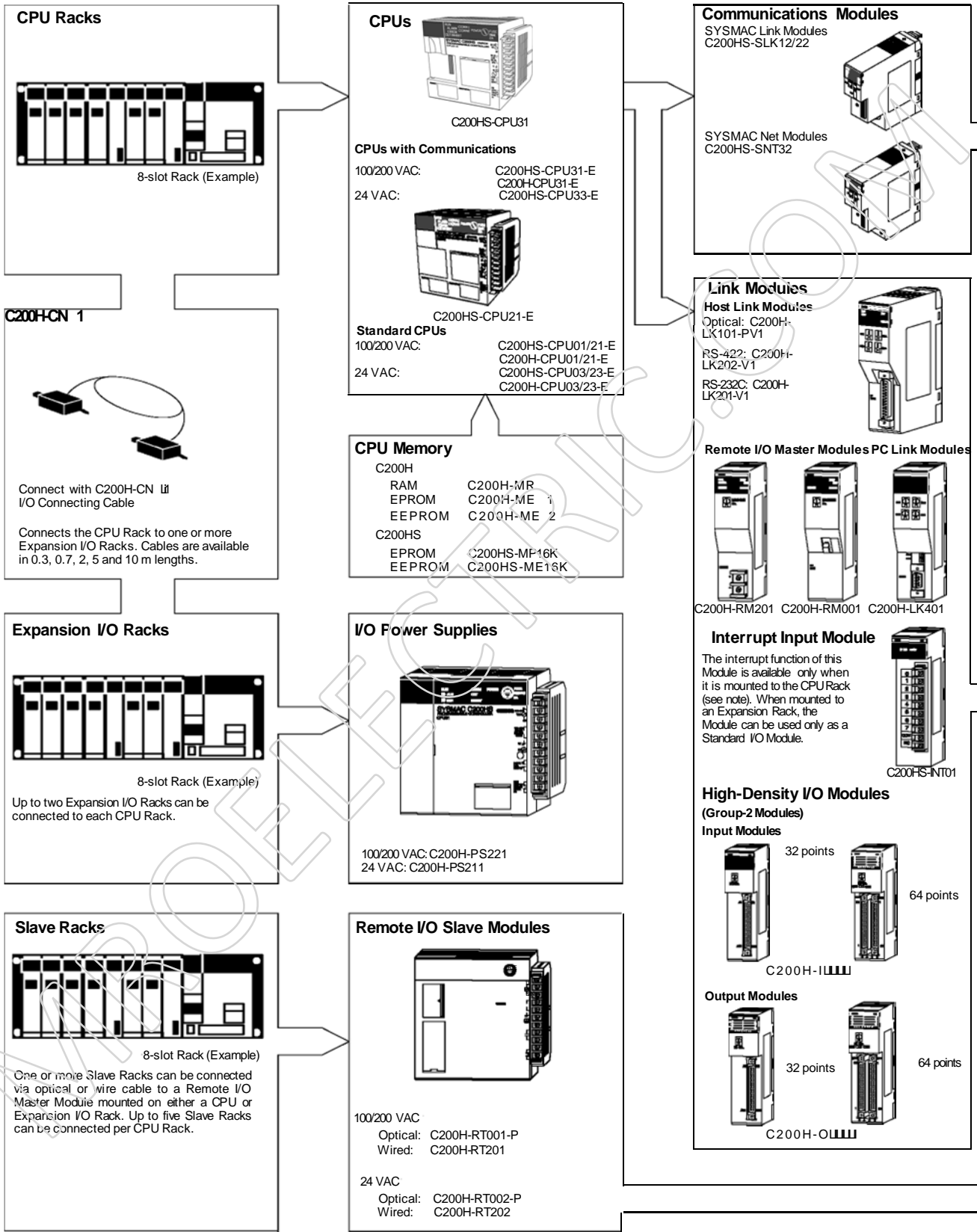
Part number	C200H-CPU01-E/CPU21-E/CPU31-E, C200HS-CPU01-E, C200HS-CPU21-E, C200HS-CPU31-E, C200H-PS221	C200H-CPU23-E, C200HS-CPU03-E, C200HS-CPU23-E, C200HS-CPU33-E, C200H-PS211
<b>Supply voltage</b>	100 to 120/200 to 240 VAC selectable, 50/60 Hz	24 VDC
<b>Operating voltage range</b>	85 to 132/170 to 264 VAC	20.4 to 26.4 VDC
<b>Power consumption</b>	100 VA max.	50 W max.
<b>Surge current</b>	30 A max.	30 A max.
<b>Output capacity</b>	CPU01-E, 3 A, 5 VDC (1.6 A supplied to I/O Modules) CPU-21-E: 4.6 A, 5 VDC (3.2 A supplied to I/O Modules) CPU-31-E: 4.6 A, 5 VDC (3.0 A supplied to I/O Modules) HS-CPU01-E, HS-CPU21-E, HS-CPU31-E 4.6 A, 5 VDC (3.9 A supplied to I/O Modules) Expansion I/O Rack: 3 A, 5 VDC (2.7 A supplied to I/O Modules)	CPU03-E: 3 A, 5 VDC (1.6 A supplied to I/O Modules) CPU-23-E: 3 A, 5 VDC (1.6 A supplied to I/O Modules) HS-CPU03-E, HS-CPU23-E, HS-CPU33-E: 3 A, 5 VDC (2.3 A supplied to I/O Modules) Expansion I/O Rack: 3 A, 5 VDC (2.7 A supplied to I/O Modules)
<b>Fuse</b>	2 A, 250 V, 5.2 dia. x 20 (MF51NR)	2 A, 125 V, 5.2 dia. x 20 (MF51NR)
<b>Input power supply</b>	0.3 A, 24 VDC +10%/-20%	—
<b>Insulation resistance*</b>	20 M. between AC terminals and the GR terminal at 500 VDC	
<b>Dielectric strength*</b>	2,000 VAC, 50/60 Hz for 1 minute between AC terminals and housing 500 VAC, 50/60 Hz for 1 minute between DC terminals and housing. Leakage current: 10 mA max.	
<b>Noise immunity</b>	1,500 Vp-p, pulse width: 100 ns to 1 ns, rise time: 1 ns (by noise simulator)	
<b>Vibration**</b>	Mechanical durability: 10 to 35 Hz, 1 mm double amplitude (2.5 G) in X, Y, and Z directions, for 2 hours each (When mounted on DIN track, 16.7 Hz, 1 mm double amplitude (0.5 G) in X, Y, and Z directions, for 1 hour each ) Malfunction durability: 2 to 55 Hz, 2 G, in X, Y, and Z directions, for 20 minutes each (When mounted on DIN tra 2 to 55 Hz, 0.3 G, in X, Y, and Z directions, for 20 minutes each)	
<b>Shock</b>	10 G in X, Y, and Z directions, 3 times each	
<b>Ambient temperature</b>	Operating: 0 to 55C (0 to 45C for Programming Console) Storage: -20 to 65 C	
<b>Humidity</b>	35% to 85% (without condensation)	
<b>Atmosphere</b>	Must be free of the following: Corrosive gases; Abrupt temperature changes; Direct sunlight; Dust, salt, or metal filings; Water, oil, or chemicals	
<b>Grounding</b>	Less than 100 .	
<b>Enclosure rating</b>	IEC IP30 (mounted in a panel)	

**Note** \*Disconnect the LG terminal of the Power Supply Module from the GR terminal when performing insulation and dielectric strength tests. If the tests are performed with the LG and GR terminals short-circuited, the internal components will be damaged. Do not conduct a dielectric strength test on the C200H-CPU03-E, C200H-CPU23-E, C200H-PS211, C200H-RT002-P, or C200H-RT202 modules. The power supply input line and internal circuit of the 24 VDC power supply are not isolated from each other. If a dielectric strength test is conducted, the power supply will be damaged.

\*\*Acceleration (G)



# System Configuration



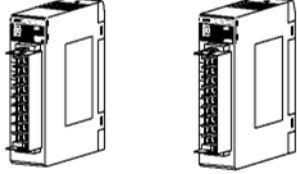
**Note:** Only one Interrupt Input Module can be used with a CPU.



# System Configuration

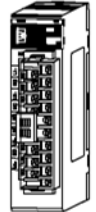
## Special I/O Modules

Analog Input Modules Analog Output Modules



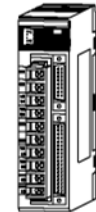
C200H-AD001/002 C200H-DA001

Temperature Sensor Modules



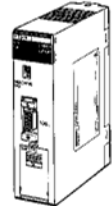
C200H-TS001

Temperature Control Modules



C200H-TC001

Fuzzy Logic Module



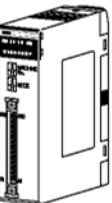
C200H-FZ001

PID Control Modules



C200H-PID01

High Speed Counter Modules



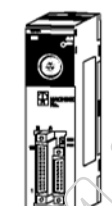
C200H-CT001

Position Control Modules



C200H-NCL01

Cam Position Modules



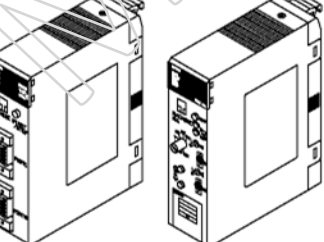
C200H-CP114

ID Sensor Module



C200H-IDS01

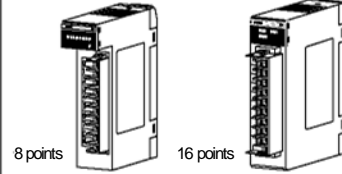
ASCII Module Voice Module



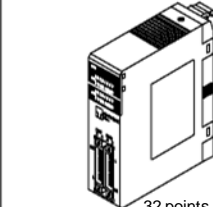
C200H-ASC02 C200H-OV001

## I/O Modules

Input Modules (C200H-I0000)

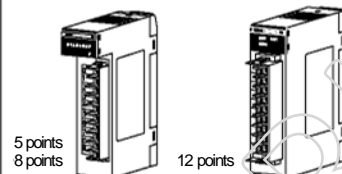


8 points 16 points  
(AC, DC, AC/DC, transistor inputs)

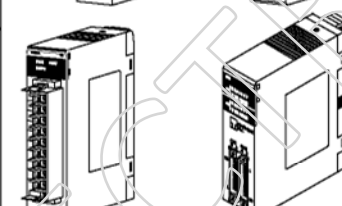


32 points  
(Treated as Special I/O Module)

Output Modules (C200H-O0000)



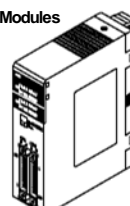
5 points 12 points



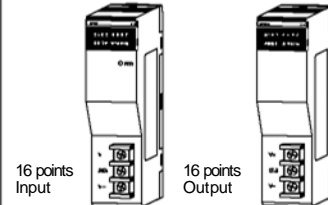
16 points 32 points  
(Treated as Special I/O Module)

DC Input Transistor Output Modules

C200H-M0001  
(16 inputs and 16 outputs; treated as Special I/O Module.)

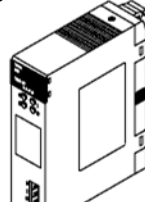


B7A Interface Modules



16 points Input 16 points Output  
C200H-B7A11 C200H-B7A01

Analog Timer Module

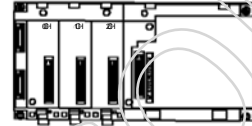


C200H-TM001

## Backplanes

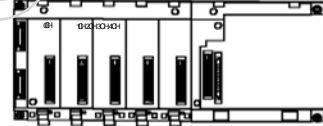
The same Backplanes are used for CPU, Expansion I/O, and Slave Packs.

3-slot Backplane



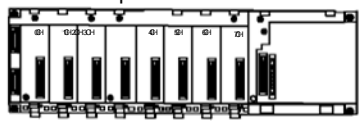
C200H-BC031-V2

5-slot Backplane



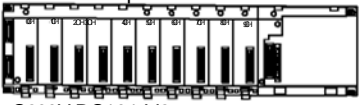
C200H-BC051-V2

8-slot Backplane



C200H-BC081-V2

10-slot Backplane



C200H-BC101-V2