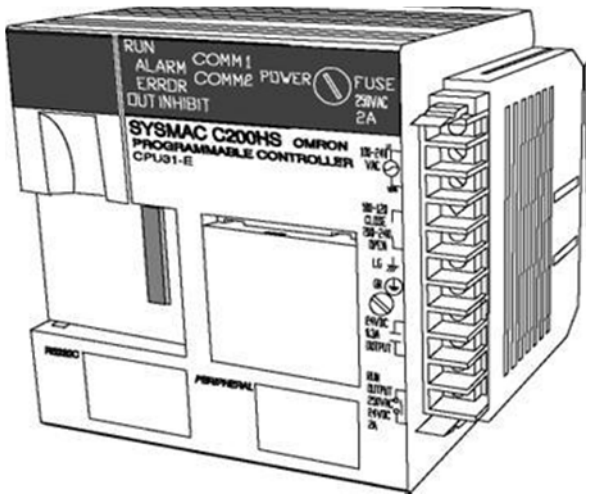
OMRON

SYSMAC - System C200H Series CPUs

C200HS-CPU31-E

C200HS-CPU33-E



Presented by - MRO Electric and Supply Company, Inc.

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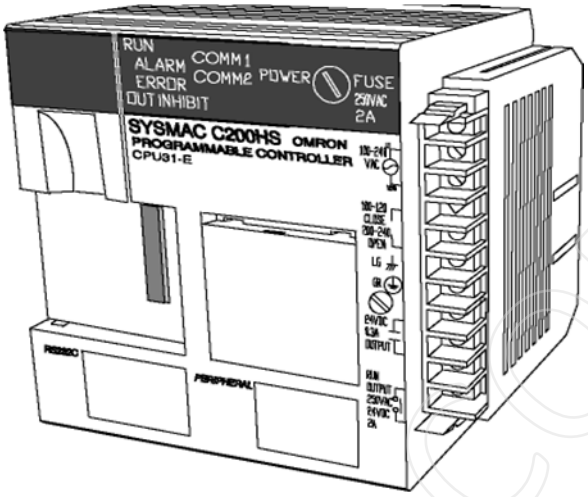


C200HS-CPU31-E/CPU33-E CPUs

High-Performance CIM Version, Built-in RS-232C Port

The C200HS-CPU31-E and C200HS-CPU33-E controller offers the same basic functionality as the C200HS-CPU01-E/CPU03 controllers. This CPU may be used in either SYSMAC NET and/or SYSMAC LINK communication systems. The built-in RS-232C port supports the same communications as the C200HS-CPU21/CPU23.

Basic Configuration

Same as HS-CPU01, HS-CPU03 plus the following:

- Built-in 120 VAC (HS-CPU21) or 24 VDC (HS-CPU03) power supply
- Same configuration and I/O as HS-CPU01/HS-CPU03

CPU Features

Same as HS-CPU01, HS-CPU03 plus the following:

- Built-in RS-232C port

Special Features

Same as HS-CPU01, HS-CPU03 plus the following:

- SYSMAC LINK and SYSMAC NET capabilities. (Requires bus connector from module to PLC communications bus port.

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): 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	No	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(*) **Note** For complete list refer to instruction set section.	No	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(*) **Note** 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
Main Control Element	MPU, CMOS, LS-TTL		
Programming languages	Ladder diagram		
Instruction set	145 (12 basic instructions + 133 special instructions)	168 (12 basic instructions + 156 special instructions)	172 (12 basic instructions + 160 special instructions)
Instruction length	1 to 4 words/instruction, 1 address/instruction		
Execution time	0.75 to 2.25 .s (basic instructions) 34 to 724 .s (function no. 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 retain 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 25C (77F); shortened at temperatures higher than 25C. Replace battery with new one withi 1 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	6,974 words (with 8K-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 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)
Special Relay (SR) bits	312 (23600 through 25507)	
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	

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 .s (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 retaine 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 25C (77F); shortened at temperatures higher than 25C. 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

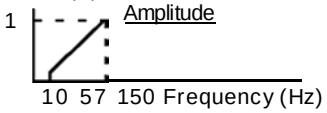
Part number	C200H-CPU01-E/CPU03-E	C200H-CPU21-E/CPU23-E	C200H-CPU31-E	C200HS-CPU01-E/CPU03-E C200HS-CPU21-E/CPU23-E C200HS-CPU31-E/CPU33-E
Data memory (DM) words	Read/write: 1,000 (DM 0000 through 0999) Read only: 1,000 (DM 1000 through 1999) DM area as in Memory Park.			Read/Write: 6144 (DM0000 through 6143) Read only: 512 (6144 through 6655) 3000 Word max. (DM7000 through 9999)
Program check	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
Supply voltage	100 to 120/200 to 240 VAC selectable, 50/60 Hz	24 VDC
Operating voltage range	85 to 132/170 to 264 VAC	20.4 to 26.4 VDC
Power consumption	100 VA max.	50 W max.
Surge current	30 A max.	30 A max.
Output capacity	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)
Fuse	2 A, 250 V, 5.2 dia. x 20 (MF51NR)	2 A, 125 V, 5.2 dia. x 20 (MF51NR)
Input power supply	0.3 A, 24 VDC +10%/-20%	—
Insulation resistance*	20 M between AC terminals and the GR terminal at 500 VDC	
Dielectric strength*	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.	
Noise immunity	1,500 Vp-p, pulse width: 100 ns to 1 s, rise time: 1 ns (by noise simulator)	
Vibration**	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 ck, tra 2 to 55 Hz, 0.3 G, in X, Y, and Z directions, for 20 minutes each)	
Shock	10 G in X, Y, and Z directions, 3 times each	
Ambient temperature	Operating: 0 to 55C (0 to 45C for Programming Console) Storage: -20 to 65C	
Humidity	35% to 85% (without condensation)	
Atmosphere	Must be free of the following: Corrosive gases; Abrupt temperature changes; Direct sunlight; Dust, salt, or meta l filings; Water, oil, or chemicals	
Grounding	Less than 100	
Enclosure rating	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)

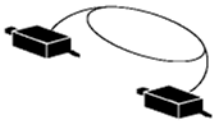


System Configuration

CPU Racks

8-slot Rack (Example)

C200H-CN 1



Connect with C200H-CN LIL
I/O Connecting Cable

Connects the CPU Rack to one or more Expansion I/O Racks. Cables are available in 0.3, 0.7, 2, 5 and 10 m lengths.

Expansion I/O Racks

8-slot Rack (Example)

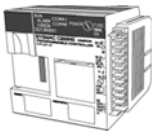
Up to two Expansion I/O Racks can be connected to each CPU Rack.

Slave Racks

8-slot Rack (Example)

One or more Slave Racks can be connected via optical or wire cable to a Remote I/O Master Module mounted on either a CPU or Expansion I/O Rack. Up to five Slave Racks can be connected per CPU Rack.

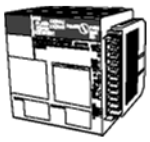
CPUs



C200HS-CPU31

CPUs with Communications

100/200 VAC: C200HS-CPU31-E
C200H-CPU31-E
24 VAC: C200HS-CPU33-E



C200HS-CPU21-E

Standard CPUs

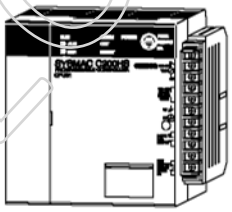
100/200 VAC: C200HS-CPU01/21-E
C200H-CPU01/21-E
24 VAC: C200HS-CPU03/23-E
C200H-CPU03/23-E

CPU Memory

C200H
- RAM C200H-MR
- EPROM C200H-ME 1
- EEPROM C200H-ME 2

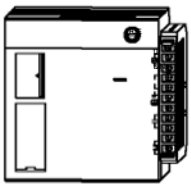
C200HS
- EPROM C200HS-MP16K
- EEPROM C200HS-ME16K

I/O Power Supplies



100/200 VAC: C200H-PS221
24 VAC: C200H-PS211

Remote I/O Slave Modules

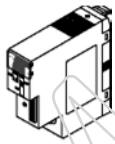


100/200 VAC
- Optical: C200H-RT001-P
- Wired: C200H-RT201

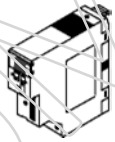
24 VAC
- Optical: C200H-RT002-P
- Wired: C200H-RT202

Communications Modules

SYSMAC Link Modules
C200HS-SLK12/22

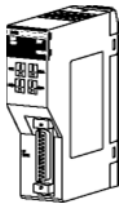


SYSMAC Net Modules
C200HS-SNT32

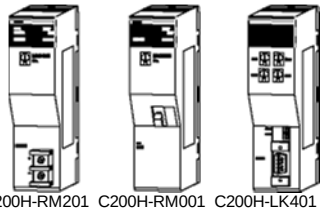


Link Modules

Host Link Modules
Optical: C200H-LK101-PV1
RS-422: C200H-LK202-V1
RS-232C: C200H-LK201-V1



Remote I/O Master Modules PC Link Modules



C200H-RM201 C200H-RM001 C200H-LK401

Interrupt Input Module

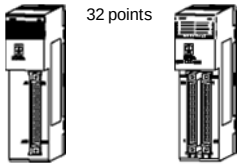
The interrupt function of this Module is available only when it is mounted to the CPU Rack (see note). When mounted to an Expansion Rack, the Module can be used only as a Standard I/O Module.

C200HS-INT01

High-Density I/O Modules

(Group-2 Modules)

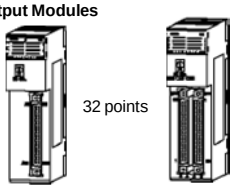
Input Modules



32 points 64 points

C200H-IDLLLL

Output Modules



32 points 64 points

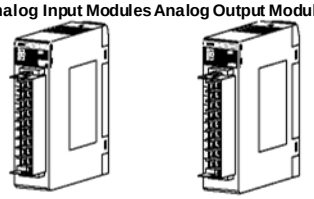
C200H-ODLLLL

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

System Configuration

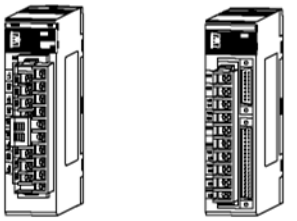
Special I/O Modules

Analog Input Modules **Analog Output Modules**



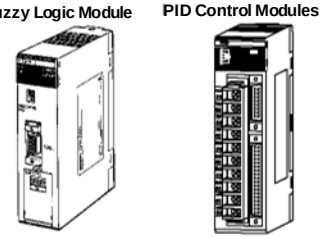
C200H-AD001/002 C200H-DA001

Temperature Sensor Modules **Temperature Control Modules**



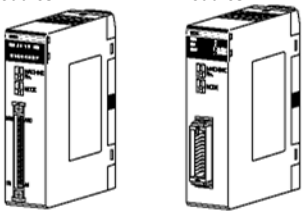
C200H-TSLLL C200H-TCLLL

Fuzzy Logic Module **PID Control Modules**



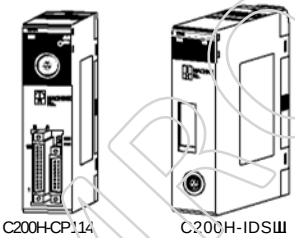
C200H-FZ001 C200H-PIDLL

High Speed Counter Modules **Position Control Modules**



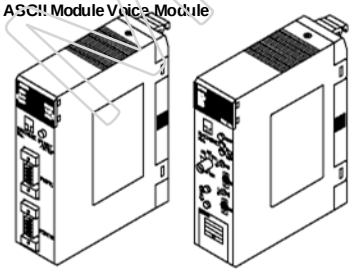
C200H-CTLLL C200H-NCLLL

Cam Position Modules **ID Sensor Module**



C200H-CP114 C200H-IDSLL

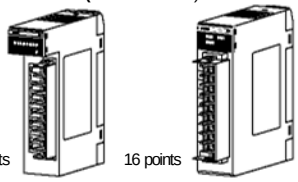
ASCII Module Voice Module



C200H-ASC02 C200H-OV001

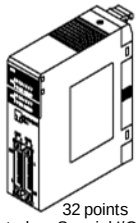
I/O Modules

Input Modules (C200H-ILLLL)



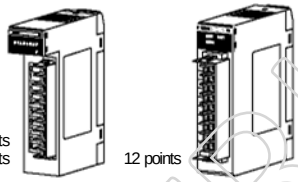
8 points 16 points

(AC, DC, AC/DC, transistor inputs)

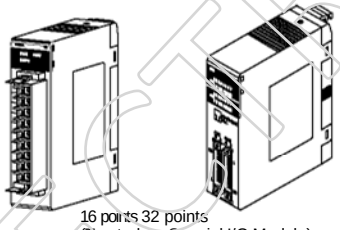


32 points
(Treated as Special I/O Module)

Output Modules (C200H-OLLLL)

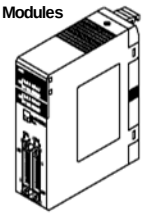


5 points
8 points 12 points

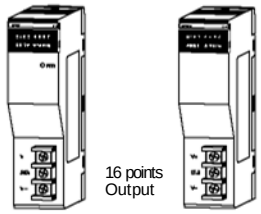


16 points 32 points
(Treated as Special I/O Module)

DC Input/Transistor Output Modules C200H-MDLLL (16 inputs and 16 outputs; treated as Special I/O Module.)



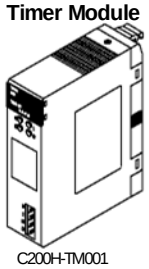
B7A Interface Modules



16 points Input 16 points Output

C200H-B7AI1 C200H-B7AO1

Analog Timer Module

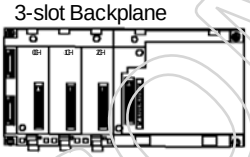


C200H-TM001

Backplanes

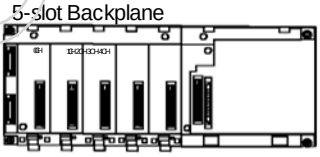
The same Backplanes are used for CPU, Expansion I/O, and Slave Packs.

3-slot Backplane



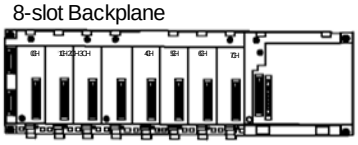
C200H-BC031-V2

5-slot Backplane



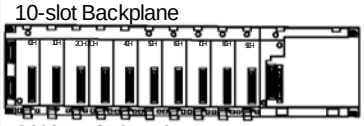
C200H-BC051-V2

8-slot Backplane



C200H-BC081-V2

10-slot Backplane



C200H-BC101-V2