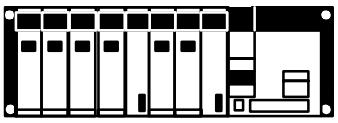
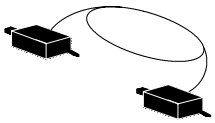
System Configuration

CPU Racks



8-slot Rack (Example)

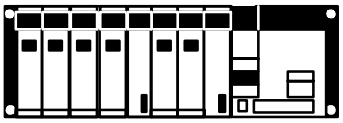
C200H-CN□□1



Connect with C200H-CN□□1 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.

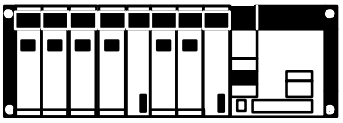
Expansion I/O Racks



8-slot Rack (Example)

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

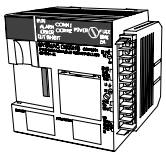
Slave Racks



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

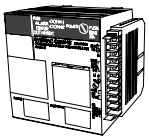


C200HS-CPU31

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

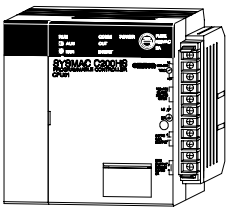
C200H

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

C200HS

EPROM	C200HS-MP16K
EEPROM	C200HS-ME16K

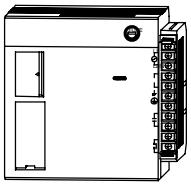
I/O Power Supplies



100/200 VAC: C200H-PS221

24 VAC: C200H-PS211

Remote I/O Slave Modules



100/200 VAC

Optical: C200H-RT001-P

Wired: C200H-RT201

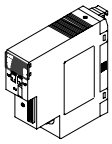
24 VAC

Optical: C200H-RT002-P

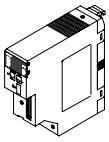
Wired: C200H-RT202

Communications Modules

SYSMAC Link Modules C200HS-SLK12/22



SYSMAC Net Modules C200HS-SNT32



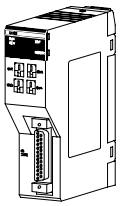
Link Modules

Host Link Modules

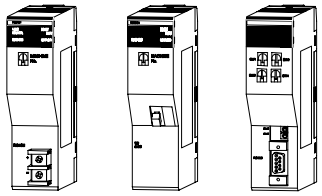
Optical: C200H-LK101-PV1

RS-422: C200H-LK202-V1

RS-232C: C200H-LK201-V1



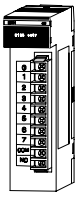
Remote I/O Master Modules **PC Link Modules**



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.

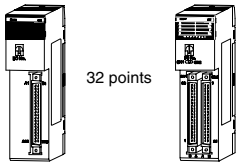


C200HS-INT01

High-Density I/O Modules

(Group-2 Modules)

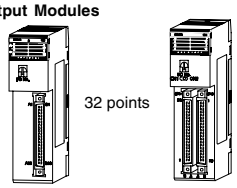
Input Modules



32 points 64 points

C200H-I□□□□

Output Modules



32 points 64 points

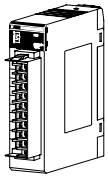
C200H-O□□□□

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

System Configuration

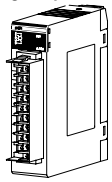
Special I/O Modules

Analog Input Modules



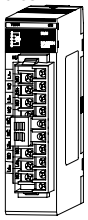
C200H-AD001/002

Analog Output Modules



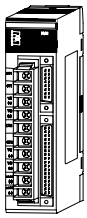
C200H-DA001

Temperature Sensor Modules



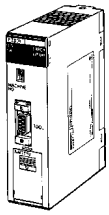
C200H-TS□□□

Temperature Control Modules



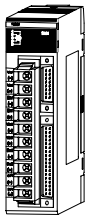
C200H-TC□□□

Fuzzy Logic Module



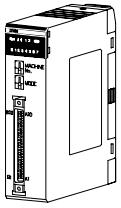
C200H-FZ001

PID Control Modules



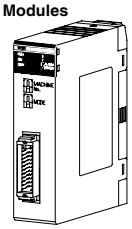
C200H-PID□□

High Speed Counter Modules



C200H-CT□□□

Position Control Modules

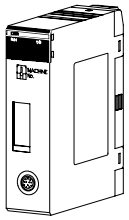


C200H-NC□□□

Cam Position Modules

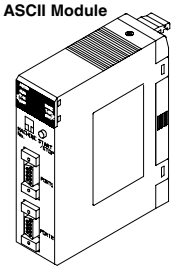
C200H-CP114

ID Sensor Module



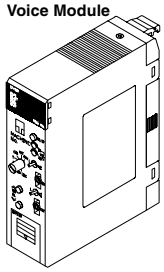
C200H-IDS□□

ASCII Module



C200H-ASC02

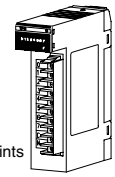
Voice Module



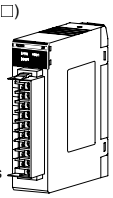
C200H-OV001

I/O Modules

Input Modules (C200H-I□□□□)

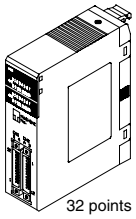


8 points



16 points

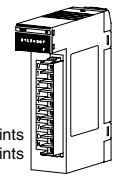
(AC, DC, AC/DC, transistor inputs)



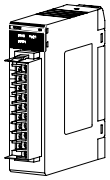
32 points

(Treated as Special I/O Module)

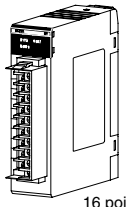
Output Modules (C200H-O□□□□)



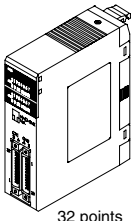
5 points
8 points



12 points



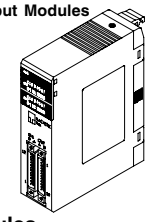
16 points



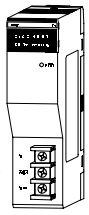
32 points

(Treated as Special I/O Module)

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

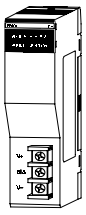


B7A Interface Modules



16 points
Input

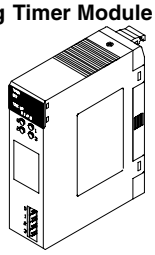
C200H-B7AI1



16 points
Output

C200H-B7AO1

Analog Timer Module

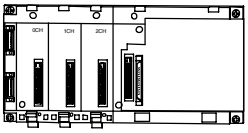


C200H-TM001

Backplanes

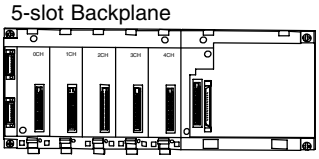
The same Backplanes are used for CPU, Expansion I/O, and Slave Packs.

3-slot Backplane



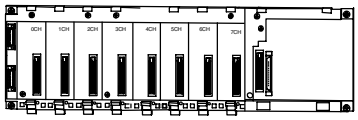
C200H-BC031-V2

5-slot Backplane



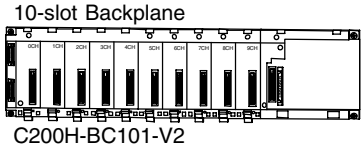
C200H-BC051-V2

8-slot Backplane



C200H-BC081-V2

10-slot Backplane



C200H-BC101-V2

8 Components

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Memory Packs 19
Backplanes 21
Special I/O Modules 22
Discrete Input/Output Modules 65
I/O Wiring Accessories 73
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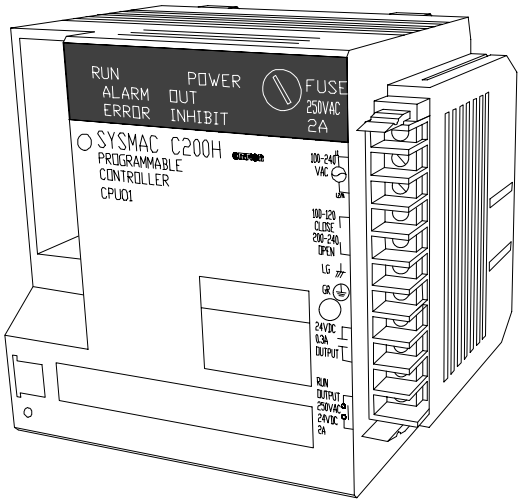
Output Wiring Accessories 81
Remote Expansion 89
Communication Modules 94
Link Adapters 103

CPUs

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

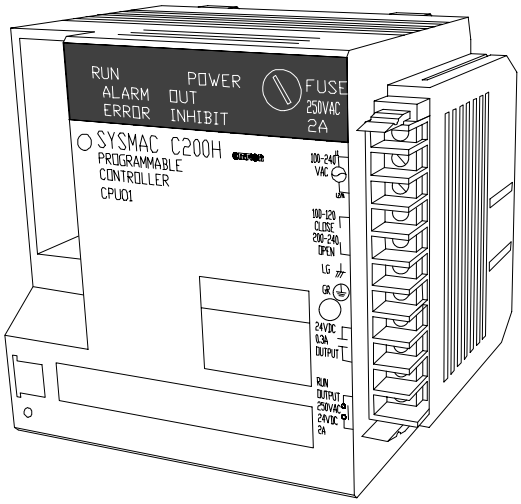
- Built-in 120 VAC (CPU01) or 24 VDC (CPU03) power supply
- Rack-style PLC with 3-, 5-, 8-, 10-slot racks
- Accepts two local expansion racks
- Accepts remote I/O racks

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 μs 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-CPU21-E/CPU23-E CPUs

High Spec, Small Rack Style

The C200H-CPU21-E and C200H-CPU23-E controllers offer increased I/O capacity and the same basic functionality as the OEM versions. In addition, these controllers offer an extended instruction set, clock/calendar option and larger power supplies. With new high-density I/O modules, these CPUs can be expanded to 720 local I/O.

Basic Configuration

Same as CPU01, CPU03 plus the following:

- Built-in 120 VAC (CPU21) or 24 VDC (CPU23) power supply
- Same configuration and I/O as CPU01/CPU03

CPU Features

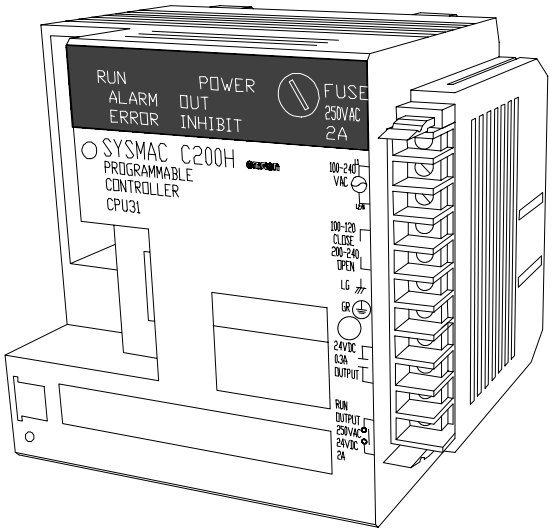
Same as CPU01, CPU03 plus the following:

- Real-time clock/calendar option available
- Larger power supply (CPU21 only) for I/O modules
- Enhanced instruction set (168), including sine/cosine

Special Features

- 32- and 64-pt Group 2 High-density I/O modules

CPUs



C200H-CPU31-E CPU

High-Performance CIM Version

The C200H-CPU31-E controller offers a high-performance CPU especially designed for computer integrated manufacturing environments. The C200H-CPU31-E has all the capabilities of C200H CPU21/CPU23, with clock/calendar as a standard feature. This CPU is used in either SYSMAC NET and/or SYSMAC LINK communication systems.

Basic Configuration

Same as CPU21, CPU23 plus the following:

- Built-in 120 VAC power supply

CPU Features

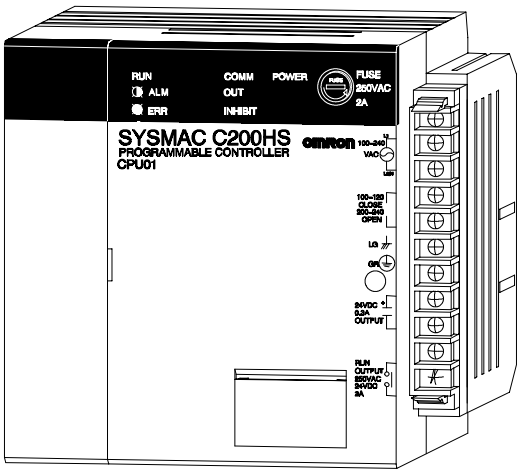
Same as CPU21, CPU23 plus the following:

- Real-time clock/calendar

Special Features

Same as CPU21, CPU23 plus the following:

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



C200HS-CPU01-E/CPU03-E CPUs

High Performance, Small Rack Style

The C200HS-CPU01-E and C200HS-CPU03-E controllers offer some of the same basic functionality as models C200H-CPU21-E/CPU23-E. These controllers have added capabilities ideally suited for high speed machine control, which includes larger memory, larger instruction set, and increased speed.

Basic Configuration

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

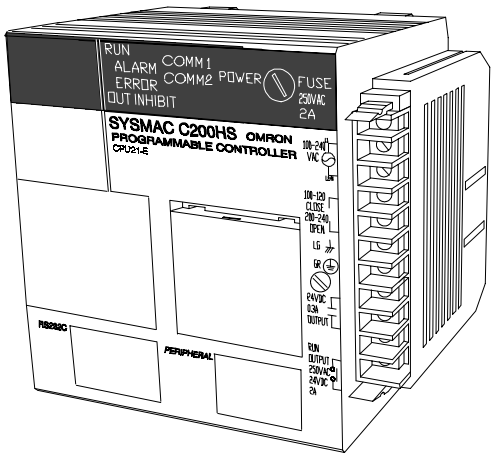
CPU Features

- Built-in 16K ram (including 6144 READ/WRITE data memory bits)
- 0.375-1.313 μs basic instruction execution time
- Built-in clock/calendar
- Enhanced instruction set (239), including PID and Scaling

Special Features

- 8-pt. Interrupt Input Module
- Group 2 High-density Modules

CPUs



C200HS-CPU21-E/CPU23-E CPUs

High Performance, Small Rack Style, Built-in RS-232C Port

The C200HS-CPU21-E and C200HS-CPU23-E controllers offer some of the same basic functionality as models C200H-CPU01-E/CPU03-E. These controllers have the added built-in RS-232C port. Host link communications are possible using the RS-232C port. By using the TXD and RXD instructions, less time consuming RS-232C communications is possible. NT link allows high-speed communications with a Programmable Terminal (PT).

Basic Configuration

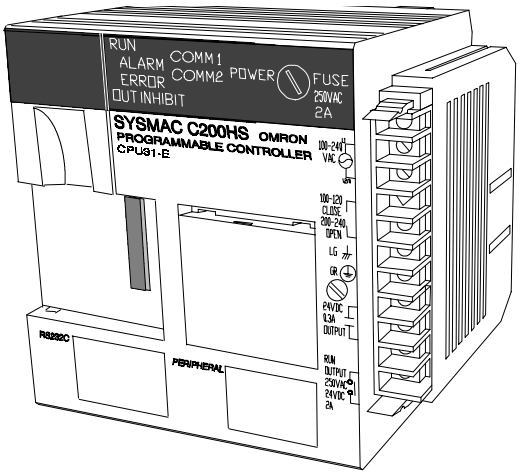
Same as HS-CPU01, HS-CPU03 plus the following:

- 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



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 μs (basic instructions) 34 to 724 μs (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 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 areas 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 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 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 areas 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 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	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

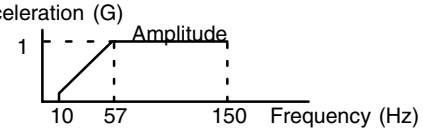
Part number	C200H-CPU01-E/CPU03-E	C200H-CPU21-E/CPU23-E	C200H-CPU31-E	C200HS-CPU01-E/CPU03-E C200HS-CPU21-E/CPU23-E C200HS-CPU31-E/CPU33-E
Data memory (DM) words	Read/write: 1,000 (DM 0000 through 0999) Read only: 1,000 (DM 1000 through 1999) DM area as in Memory Park.			Read/Write: 6144 (DM0000 through 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

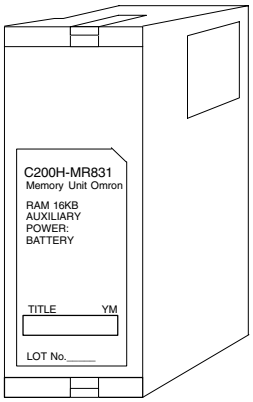
Part number	C200H-CPU01-E/CPU21-E/CPU31-E, C200HS-CPU01-E, C200HS-CPU21-E, C200HS-CPU31-E, C200H-PS221	C200H-CPU23-E, C200HS-CPU03-E, C200HS-CPU23-E, C200HS-CPU33-E, C200H-PS211
Supply voltage	100 to 120/200 to 240 VAC selectable, 50/60 Hz	24 VDC
Operating voltage range	85 to 132/170 to 264 VAC	20.4 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 MΩ 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 ms, 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 track, 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 55°C (0° to 45°C for Programming Console) Storage: -20° to 65°C	
Humidity	35% to 85% (without condensation)	
Atmosphere	Must be free of the following: Corrosive gases; Abrupt temperature changes; Direct sunlight; Dust, salt, or metal filings; Water, oil, or chemicals	
Grounding	Less than 100 Ω	
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)



Memory Packs



General Information

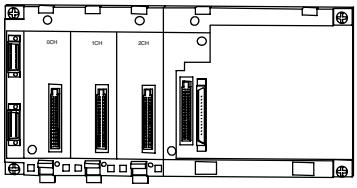
Memory Packs store programs and data for C200H controllers. Select 4 or 8 K word memory packs to match your requirements. To take advantage of the clock/calender option for C200H-CPU21 and -CPU23, select a memory pack with clock. Increase the C200HS built-in RAM with an additional 16 K words of file memory for large processing loads.

Features

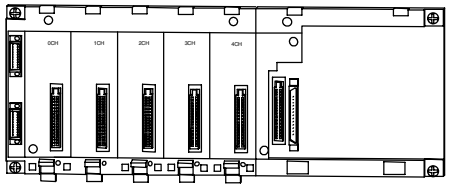
- Three types available: EPROM, EEPROM, RAM
- Optional clock and calender for C200H-CPU21/CPU23
- File memory boards available for C200HS-CPU01/CPU03
- C200HS has built-in RAM memory

Name	Description	Part number
Required Parts		
Memory Packs (Not required for C200HS)	RAM, 4 K words, battery back-up; no clock	**C200H-MR431**
	RAM, 8 K words, battery back-up; no clock	**C200H-MR831**
	RAM, 4 K words, capacitor back-up; no clock	**C200H-MR432**
	RAM, 8 K words, capacitor back-up; no clock	**C200H-MR832**
	RAM, 4 K words, battery back-up; with clock (CPU21, CPU23 only)	**C200H-MR433**
	RAM, 8 K words, battery back-up; with clock (CPU21, CPU23 only)	**C200H-MR833**
	EPROM, 8 K words, no clock	**C200H-MP831**
	EEPROM, 4 K words, no clock	**C200H-ME431**
	EEPROM, 8 K words, no clock	**C200H-ME831**
	EEPROM, 4 K words, battery back-up; with clock (CPU21, CPU23 only)	**C200H-ME432**
	EEPROM, 8 K words, battery back-up; with clock (CPU21, CPU23 only)	**C200H-ME832**
Optional Parts		
File Memory Boards (C200HS only)	EPROM, 16 K words	**C200HS-MP16K**
	EEPROM, 16 K words	**C200HS-ME16K**

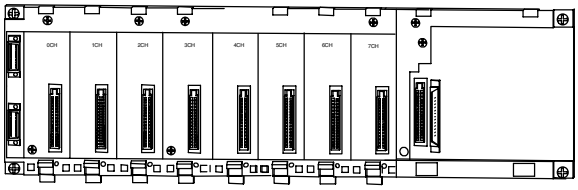
Memory Packs



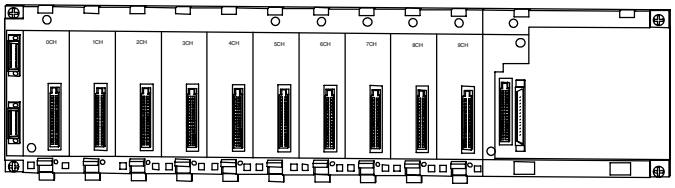
C200H-BC031-V2



C200H-BC051-V2



C200H-BC081-V2



C200H-BC101-V2

C200H Backplanes

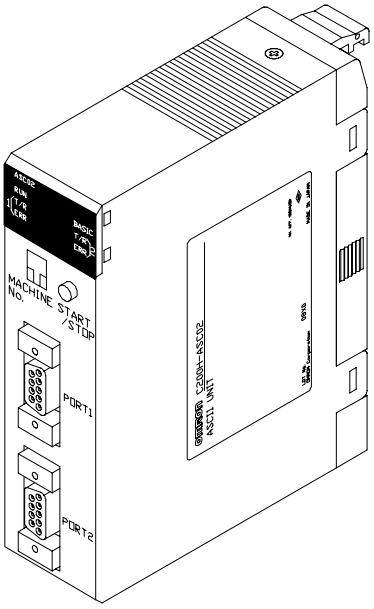
These C200H Backplanes are used for CPU Racks, Local, and Remote Expansion Racks. They are available with 3, 5, 8, and 10 I/O slots. The power supplies for these racks are built into the SYSMAC BUS Remote Slave Modules. The CPU, Power Supply (for Local Expansion Racks), or SYSMAC BUS Remote Slave/Power Supply mounts in the right-most slot of the Rack.

Number of slots	Part number
3 slots	C200H-BC031-V2
5 slots	C200H-BC051-V2
8 slots	C200H-BC081-V2
10 slots	C200H-BC101-V2

ASCII/BASIC Module
C200H-ASC02

1

Two RS-232C ports
Bidirectional serial interface to
- Computers
- Printers
- Bar code readers
- PLCs
- Other ASCII devices



C200H-ASC02

General Information

The ASCII/BASIC Module provides a 24-Kbyte programmable coprocessor module that operates independently of the PLC. Two built-in RS-232C ports provide easy interface to a variety of external devices including other manufacturers' PLCs, computer terminals, operator stations, bar code readers, and any other device utilizing a serial interface. The module is programmable in either BASIC or Assembly providing a platform for complex calculations and algorithms at the PLC level. This includes PID, gas flow calculations and complex math and string manipulation functions. Communications can be initiated by either the module or the PLC.

Features

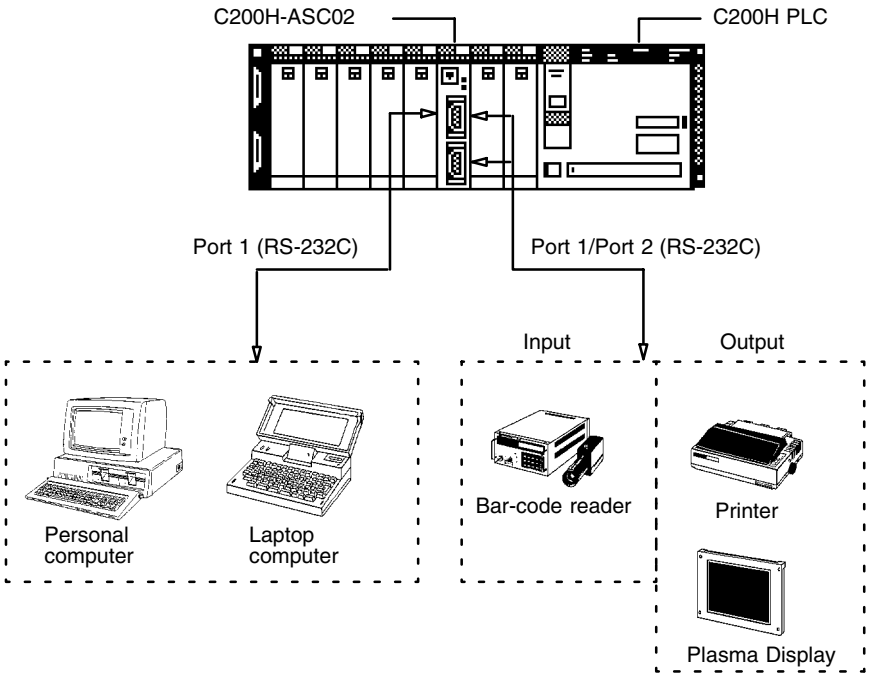
- 24-Kb, battery-backed RAM and 24-Kb EEPROM programmable in BASIC or Assembly languages
- Special commands to initiate communication with the PLC
- Two RS-232C ports, 19,200 baud maximum speed
- Built-in clock/calendar including year, month, day, date, hour, minute, second (accurate to 30 seconds/year)

Specifications

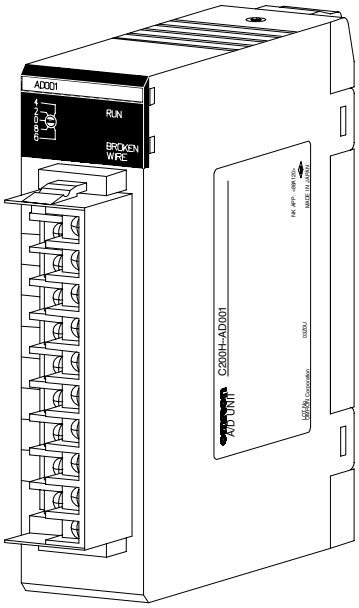
Name	Description	Part number
ASCII/BASIC Module Utility Software	For AT-compatible computers; enables program development, downloading, uploading, etc.	**SYSMATE-ASC91-V1**
Programming Cable	C200H-ASC02 to computer (9-pin RS-232)	C200H-CN229-EU
	C200H-ASC02 to computer (25-pin RS-232)	C200H-CN220-EU

Specifications

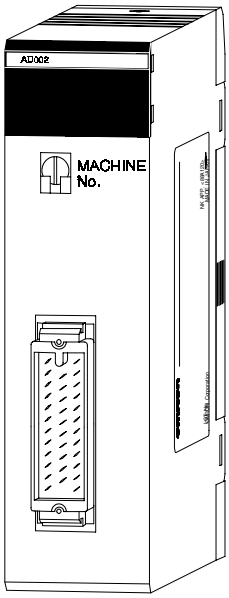
Part number	**C200H-ASC02**
Communication mode	Half duplex
Synchronization	Start-stop
Baud rate	Port 1: 300/600/1200/2400/4800/9600 bps Port 2: 300/600/1200/2400/4800/9600/19,200 bps (switch selectable)
Transmission mode	Point-to-point
Transmission distance	15 m (49 ft) max.
Interface	Conforms to RS-232C. Two ports (D-sub 9-pin connectors)
Memory capacity	24 Kbytes RAM battery backup) 24 Kbytes EEPROM for program storage Multiple program storage capability
Transfer capacity	255 words at a maximum of 20 words per scan
Transfer method	Write/read data exchange I/O data exchange
Clock/calendar	Year, month, day, date, hour, minute, second Programmable leap year Accuracy: month +30 seconds/month at 25°C (77°F)
Diagnostic functions	CPU watchdog timer, battery voltage drop
Battery life	5 years at 25°C (77°F). Battery life is shortened if ASCII Module is used at higher temperatures.
EEPROM	Guaranteed lifetime of 5000 saves
Manual	PLC Module: W165 The manual is included with the software.


C200H-ASC02
C200H PLC
Port 1 (RS-232C)
Port 1/Port 2 (RS-232C)
Input
Output
Personal computer
Laptop computer
Bar-code reader
Printer
Plasma Display

Analog Input Modules
C200H-AD001, C200H-AD002



C200H-AD001



C200H-AD002

General Information

Analog I/O Modules provide an interface to a variety of analog signals including both voltage and current ranges. Both input and output versions are available in a variety of densities.

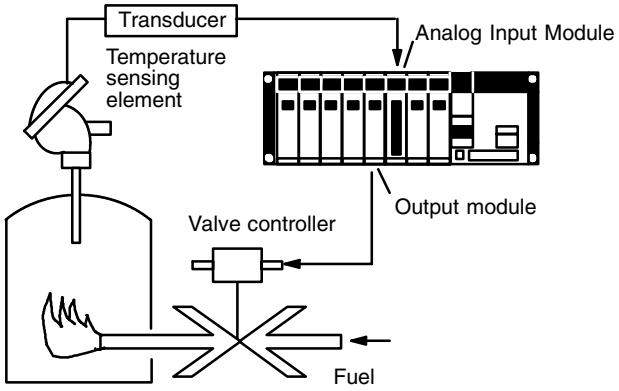
Features

- Cost-effective single-slot modules available with 4 or 8 analog inputs
- Opto-isolated input reliability
- 12-bit resolution
- Selectable ranges include 1 to 5 V, 0 to 10 V, and 4 to 20 mA

Specifications

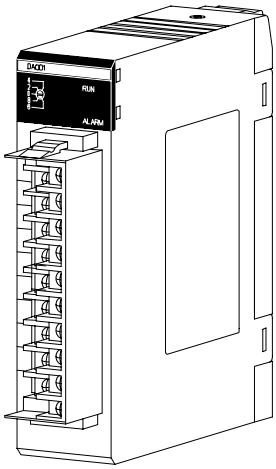
Part number		C200H-AD001	C200H-AD002
Number of points		4	8
Signal ranges	Voltage	1-5 VDC or 0-10 VDC	1-5 V, 0-10 V, -10 to +10 V
	Current	4-20 mA	4-20 mA
Intelligent functions		Input conversion	Input conversion, scaling, average, Peak hold, BCD, Upper and Lower limit alarm
Resolution		12-bit	12-bit
Accuracy		±1.0% maximum full scale, at 0°C –55°C ±0.1% maximum linearity error	±0.6% maximum full scale, at 0°C –55°C, for voltage input ±0.1% maximum linearity error
A/D conversion time		2.5 ms maximum/point	2.5 ms maximum/point
Input impedance	Voltage	1 MΩ minimum	1 MΩ minimum
	Current	250Ω	250Ω
Manual		W127	W229

Typical Application

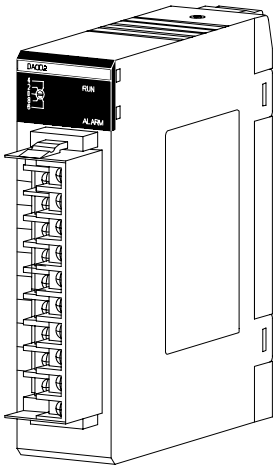


Furnace Control with Analog Input

Analog Output Module
C200H-DA001, C200H-DA002



C200H-DA001



C200H-DA002

General Information

Analog I/O Module provides an interface to a variety of analog devices that accept voltage and current ranges.

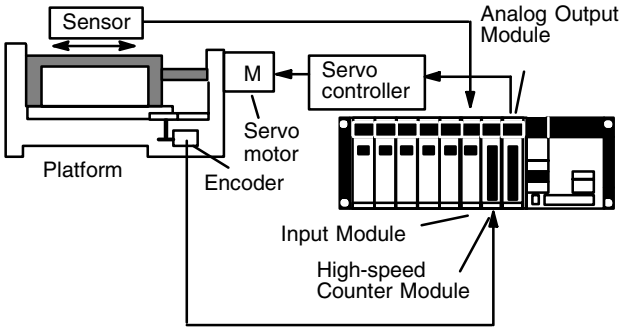
Features

- Cost-effective single-slot module offers two or four analog outputs
- Selectable ranges include 1 to 5 V, 0 to 10 V, -10 to +10 V, and 4 to 20 mA

Specifications

Part number		C200H-DA001	C200H-DA002
Number of output points		2	4
Signal ranges	Voltage	1 to 5 V, 0 to 10 V	-10 to +10 V
	Current	4 to 20 mA	4 to 20 mA
Intelligent functions		Output limit, upper and lower limit alarms, pulse output	–
Resolution	Voltage	12-bit	13-bit
	Current	12-bit	12-bit
Accuracy		±1.0% maximum full scale, at 0°C -55°C	±1.0% maximum full scale, at 0°C -55°C
A/D conversion time		2.5 ms maximum/point	2.5 ms maximum/point
Input impedance	Max. Load	400 Ω	350 Ω
	Max. Load Current	15 mA	10 mA
Manual		W127	W260

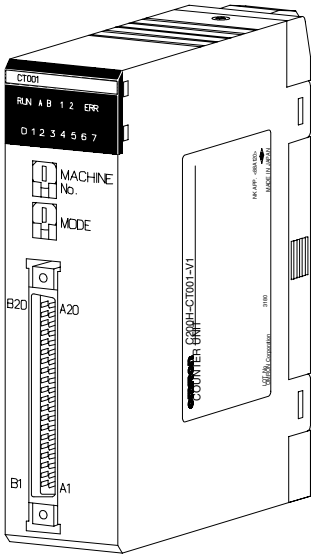
Typical Application



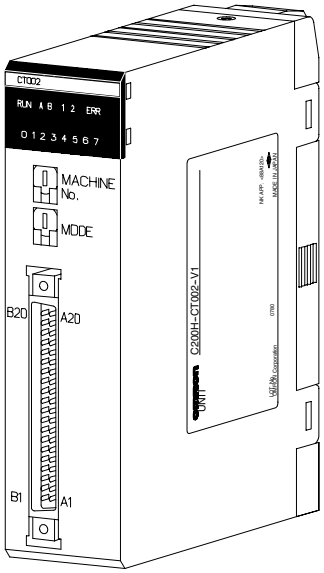
Position Control with Analog Output

High-speed Counter Modules

C200H-CT001-V1,
C200H-CT002



C200H-CT001-V1



C200H-CT002

General Information

The high-speed counter modules provide an interface for applications where the counting speed exceeds the PLCs processing speed. Typical applications include frequency inputs, rotary encoder interface, position control, cut to length, and motion control. Built-in I/O and front panel indicators on the module allow for faster throughput and easy visual monitoring of module status. Interface signals include count inputs, integral outputs, and external resets.

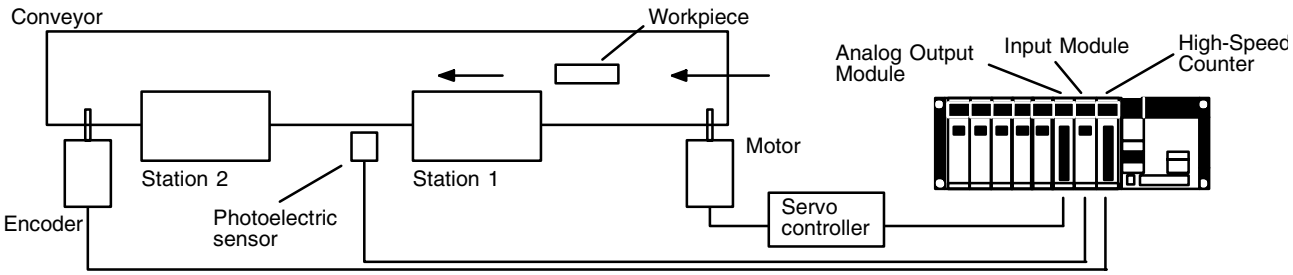
Features

- Three types of input to enable a wide variety of encoder/sensor compatibility
- Can be operated in any one of six modes
- Set values can be changed during operation
- Mode selection made through front panel DIP switches
- Up to eight external outputs

Specifications

Part number	C200H-CT001-V1	C200H-CT002
Number of axes	One per module	
Operating modes	Any of the following six: Linear Preset Latch Circular Gate Sampling	
Count input mode	Differential, phase, up/down, pulse/direction	
Count signal level	5, 12, or 24 VDC (wired for one)	Same as RS-422 line driver (Am26LS31-compatible)
Counting speed	50 kHz max. (depends on encoder when using offset phase inputs)	75 kHz max. (depends on encoder when using offset phase inputs)
Input multiplier	x2, x4 available for offset phase input	
Input signals	Input Z Control input 1 Control input 2	
External outputs	8 total	
I/O (points) required	64 (4 words)	
Manual	W141	

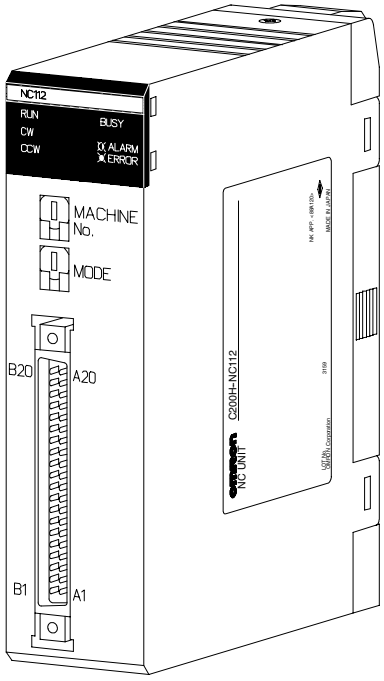
Typical Application



Accessories

Description	Part number
Encoder Adapter	3G2A5-AE001

Single-axis Position Control Module
C200H-NC112



C200H-NC112

General Information

Position control modules provide either a step and direction pulse train or CW/CCW pulse trains to control a single-axis stepper or servo motor driver. Interface signals include CW and CCW limits, origin approach, origin stop, emergency stop, and interrupt signals. Automatic backlash and origin offset functions are now included for precise positioning requirements. Move parameters can be set up in either ladder logic, or by connecting the hand-held programming console, and are stored in battery-backed memory. Extensive diagnostics are also available to the PLC for quick error detection and troubleshooting.

Features

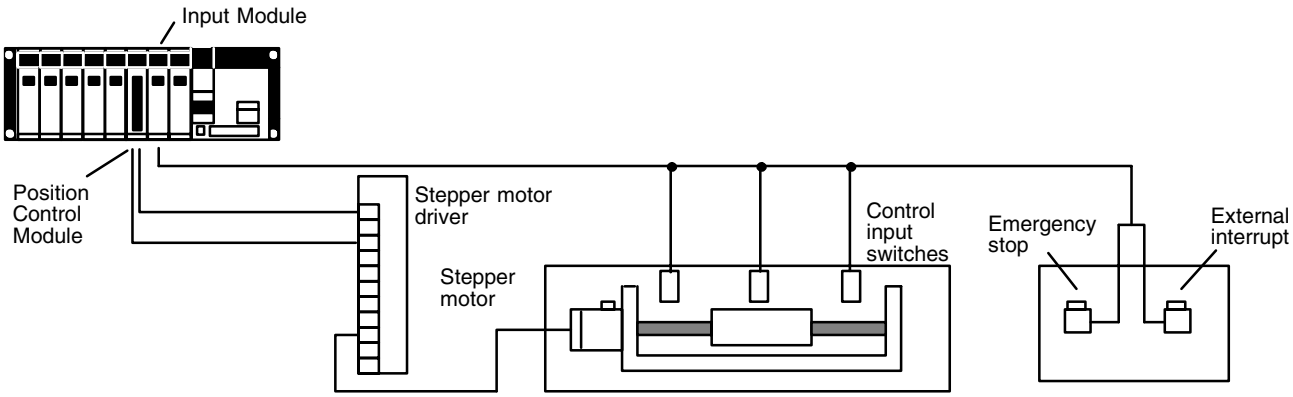
- Pulse output for stepper motor or servo motor driver
- Origin and backlash compensation for precision positioning
- Teach mode or storage of calculated movement parameters
- Internal diagnostics
- External signal interface for CW, CCW, origin, emergency stop, mode, and interrupt
- Parameters, speeds, and positions set in CPU DM area

Specifications

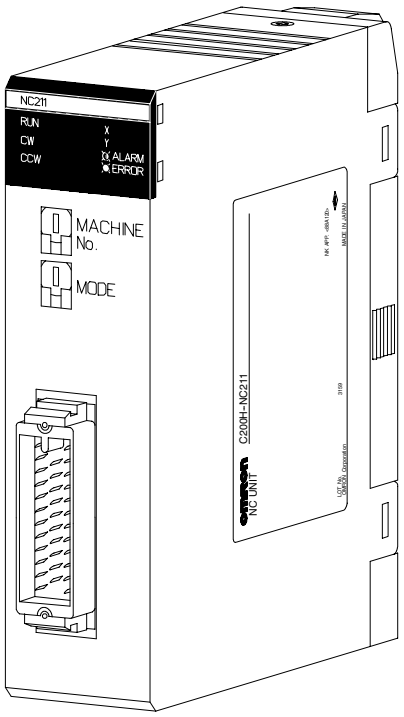
Part number		**C200H-NC112**
Number of axes		One axis per module
Control system		Automatic trapezoidal acceleration/deceleration
Position	**Data points**	53
	Range	-8,388,607 to +8,388,606 pulses
Speed	**Data points**	15
	Range	1 to 250,000 pulses per second
Speed adjustment rate		2 to 2,000 pps/s
Origin search	**Origin proximity**	Selectable; absent, Normally Open, Normally Closed
	Origin signal	Selectable; Normally Open or Normally Closed input
	Origin compensation	0 to 9,999 pulses
	Origin search speed	High speed and proximity speed available
Backlash compensation		0 to 9,999 pulses
Manual operations		High-speed jog, low-speed jog, inching
Manual		W128

Single-axis Position Control Module
C200H-NC112

Typical Application



Two-Axis Position Control Module
C200H-NC211



C200H-NC211

General Information

The two-axis position control module provides signals to control two servo motor drivers either independently or simultaneously. Interface signals include CW and CCW, origin approach, origin, stop, emergency stop, and interrupt signals. Automatic backlash and origin correction functions are now included for precise positioning requirements. Move parameters can be set up in either ladder logic, or by connecting the hand-held Programming Console, and are stored in battery-backed memory. Extensive diagnostics are available through the PLC for quick error detection and troubleshooting.

Features

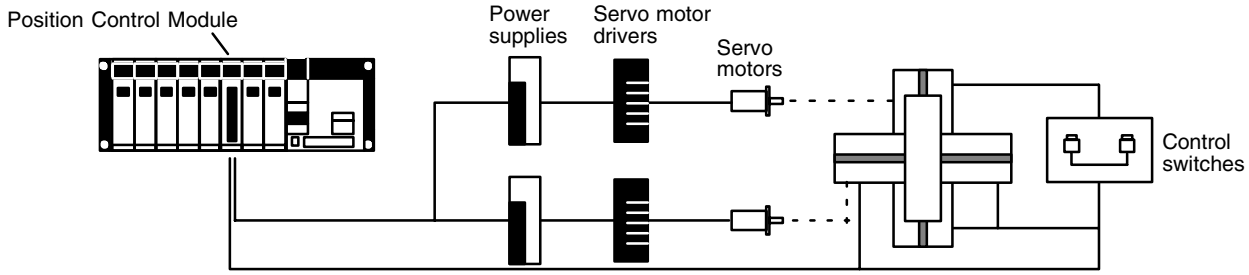
- 2 axes of control
- Provides independent or simultaneous axis control
- Origin and backlash compensation
- Teach mode and external display for fast and efficient programming and diagnostic functions
- Linear interpolation capability

Specifications

Part number		**C200H-NC211**
Number of axes		Two axes per module
Control system		Automatic trapezoidal acceleration/deceleration
Position	**Data points**	53 per axis
	Range	-8,388,607 to +8,388,606 pulses
Speed	**Data points**	15
	Range	1 to 250,000 pulses per second
Acceleration/deceleration		2 to 2,000 pps/1 ms
Origin search	**Origin proximity**	Selectable; absent, Normally Open input, Normally Closed input
Origin search	**Origin signal**	Selectable; Normally Open or Normally Closed input
	Origin compensation	0 to +9,999 pulses
	Origin search speed	Selectable; high speed and proximity speed available Stop at origin signal after proximity signal has turned ON Stop at origin signal after proximity signal has turned OFF
Backlash compensation		0 to 9,999 pulses
Manual operations		High-speed jog, low-speed jog, inch
Manual		W166

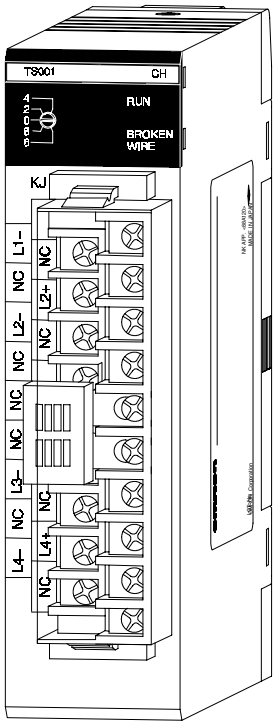
Two-Axis Position Control Module
C200H-NC211

Typical Application



Temperature Sensor Input Modules

C200H-TS001,
C200H-TS101



C200H-TS001

General Information

Monitor up to 4 temperature inputs directly from the PLC rack. Choose thermocouple inputs (types J and K), or platinum RTD inputs. Each module offers multiple ranges and a choice of Fahrenheit or Celsius scaling.

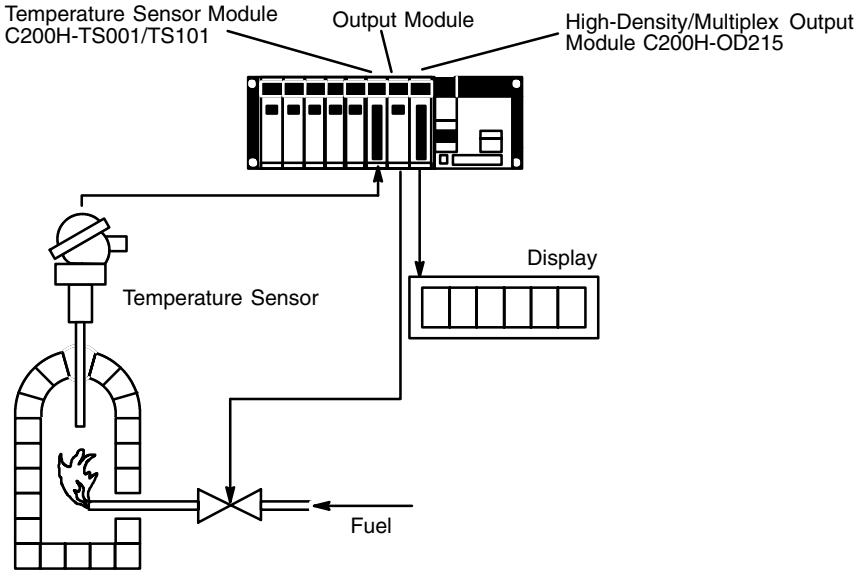
Features

- Available for thermocouple types J and K, or platinum RTD temperature sensors
- Selectable number of inputs
- Wide range of temperature settings

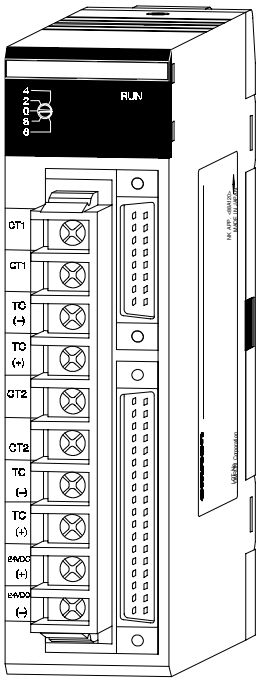
Specifications

Part number	C200H-TS001	CS200H-TS101
Sensing element	Thermocouple: Type K or J selectable	Platinum RTD: Pt = 100 Ω
External input points	4 points max. per module (1, 2, or 4 points selectable)	
Output code to PLC	4-digit BCD	
Accuracy	±(1% Full scale + 1°C) max.	
Conversion time	1.2 sec max. per point	
Conversion cycle	4.8 sec max. at 4 points per module 2.4 sec max. at 2 points per module 1.2 sec max. at 1 point per module	
PLC booting time	Conversion cycle + 1 PLC scan time	
Terminal connections	Terminal block (removable)	
Insulation mode	Non-insulated between terminals. Insulated by photocoupler between terminal block and PLC backplane.	
Diagnostics	Outside range, broken wire, temperature setting error	
Manual	W124	

Typical Application



Temperature Controller Modules
C200H-TC_ _ _



C200H-TC0_ _

General Information

Omron has put two X-Series Temperature Controllers in a single slot module to provide advanced PID control with auto-tuning directly on the PLC rack. Display and set parameters with the C200H-DSC01 Data Setting Console.

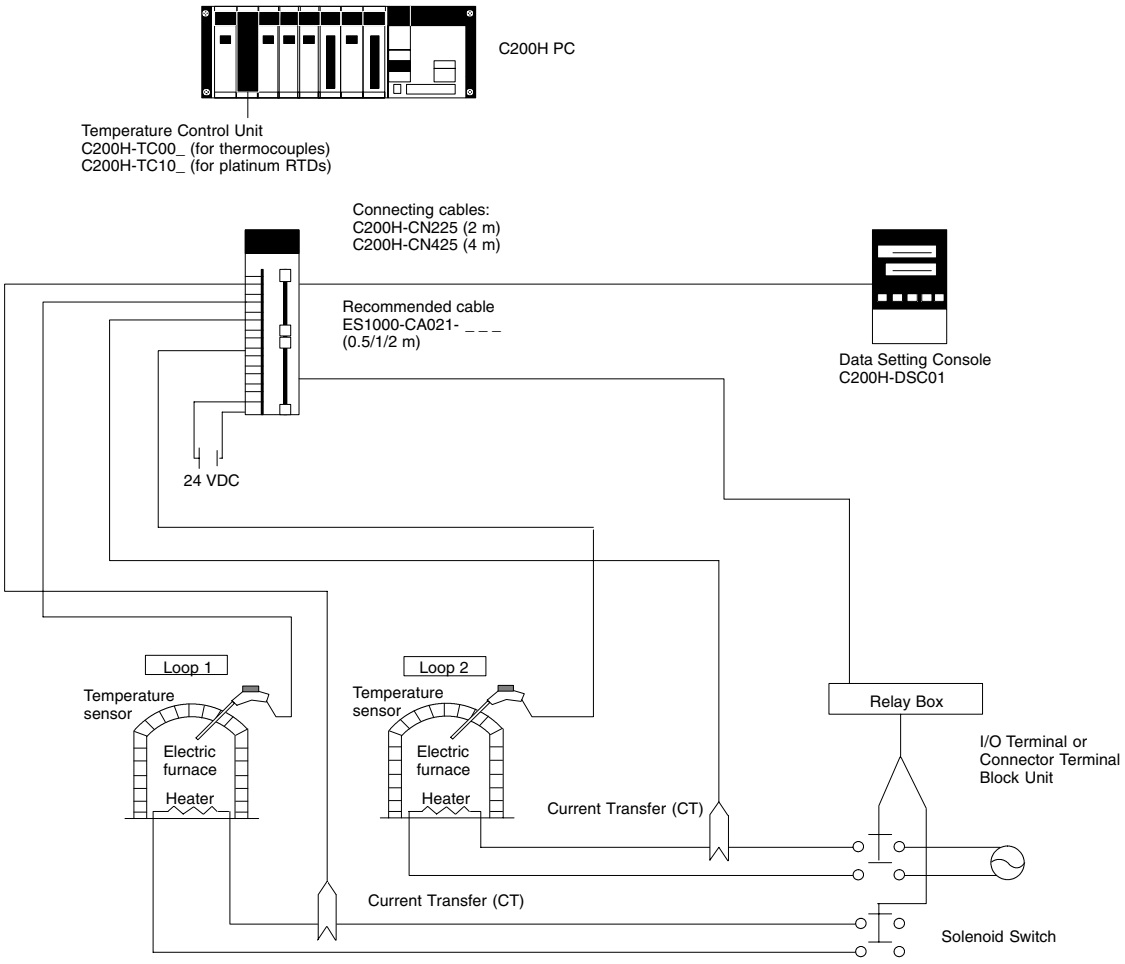
Features

- Auto-tuning of PID constants
- Eight banks of settings data
- Heater burnout detection
- Ten alarm modes
- Thermocouple or RTD inputs
- Transistor, current or voltage outputs
- Optional data setting console

Specifications

Part numbers	C200H-TC0 _ _	C200H-TC1 _ _
Inputs	2 (two independent control loops)	
Temperature sensor inputs	Thermocouple (R, S, K, J, T, E, B, N, L, V)	RTD (JPt 100, Pt 100)
Control mode	PID, ON/OFF (Advanced PID with auto-tuning)	
Setting indication accuracy	±0.5% of set/indication value or ±2°C whichever is larger, ±1 digit max.	±0.5% of set/indication value or ±1°C whichever is larger, ±1 digit max.
Hysteresis	0.0° to 999.9°C/°F (in units of 0.1°C/°F) (during ON/OFF control)	
Proportional band	0.0° to 999.9°C/°F (in units of 0.1°C/°F)	
Integral (reset) time	0 to 9999 s (in units of 1 s)	
Derivative (rate) time	0 to 9999 s (in units of 1 s)	
Control period	1 to 99 s (in units of 1 s)	
Sampling period	500 ms	
Output refresh period	500 ms	
Input shift range	-99.9° to 999.9°C/°F (in units of 0.1°C/°F)	
Alarm output setting range	-999° to 9999°C/°F (in units of 1°C/°F)	-99.9° to 999.9°C/°F (in units of 0.1°C/°F)
Alarm modes	Upper- and lower-limit alarm, upper-limit alarm, lower-limit alarm, upper- and lower-limit range alarm, upper- and lower-limit alarm with standby sequence, upper-limit alarm with standby sequence, lower-limit alarm with standby sequence, absolute-value upper-limit alarm, absolute-value lower-limit alarm	
Manual	W225	

Typical Application



Output Characteristics

Transistor Output (Pulse)
C200H-TC_01

	External supply voltage	24 VDC +10%/15%
	Max. load voltage	24 VDC max.
	Max. load current	100 mA max.
	Residual voltage when ON	3 V max.
	Leakage current when OFF	0.3 mA max.

Voltage Output (Pulse)
C200H-TC_02

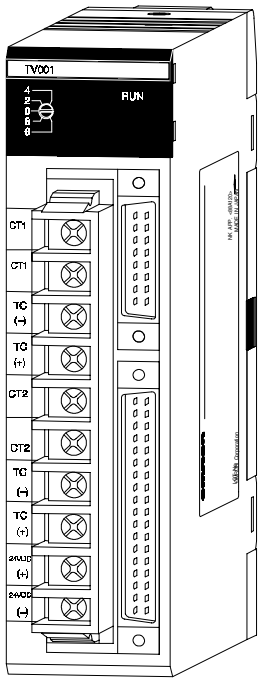
	Output voltage	12 VDC
	Max. load current	40 mA max. (with short-protective circuit)

Current Output (Linear)
C200H-TC_03

	Output current	4 to 20 mA
	Permissible load impedance	600Ωmax.
	Current value accuracy	4 ±0.3 to 20 ±1 mA

Heat/Cool Temperature Controller Modules

C200H-TV_ _ _



C200H-TV001

General Information

Two heat/cool temperature controllers are built into a single slot module. Use them to control processes near ambient temperature or an application with a cooling jacket. These controllers offer PID with auto-advanced tuning of parameters. Use the C200H-DSC01 Data Setting Console to program and monitor settings.

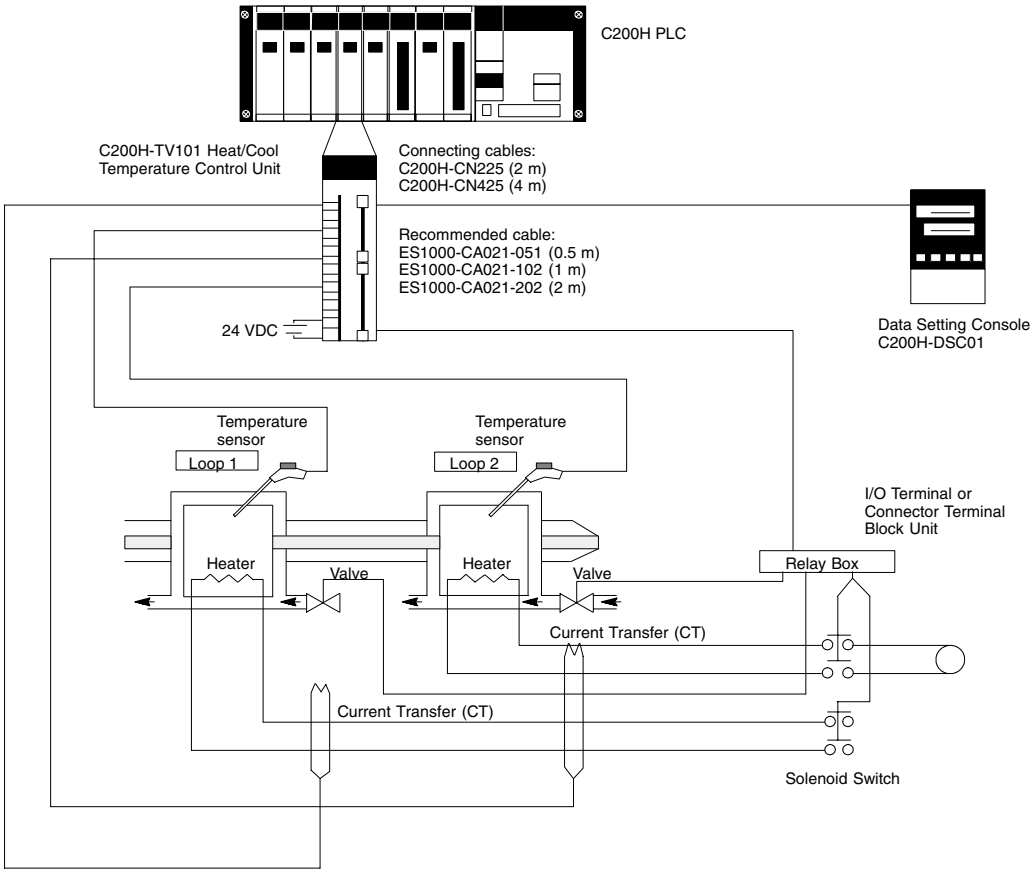
Features

- Auto-tuning of PID parameters
- Heating and cooling in same module
- Eight banks of settings data
- Heater burnout detection alarm
- Ten alarm modes
- Thermocouple or RTD inputs
- Transistor, current or voltage outputs
- Optional data setting console

Specifications

Part numbers	C200H-TV0 _ _	C200H-TV1 _ _
Inputs	2 (two independent control loops)	
Temperature sensor inputs	Thermocouple (R, S, K, J, T, E, B, N, L, V)	RTD (JPt 100, Pt 100)
Control mode	PID, ON/OFF (Advanced PID with auto-tuning)	
Setting indication accuracy	±0.5% of set/indication value or ±2°C whichever is larger, ±1 digit max.	±0.5% of set/indication value or ±1°C whichever is larger, ±1 digit max.
Hysteresis	0.0° to 999.9°C/°F (in units of 0.1°C/°F) (during ON/OFF control)	
Proportional band	0.0° to 999.9°C/°F (in units of 0.1°C/°F)	
Integral (reset) time	0 to 9999 s (in units of 1 s)	
Derivative (rate) time	0 to 9999 s (in units of 1 s)	
Control period	1 to 99 s (in units of 1 s)	
Deadband	-999 to 999.9 s	
Cooling coefficient	0.01 to 99.99	
Sampling period	500 ms	
Output refresh period	500 ms	
Input shift range	-99.9° to 999.9°C/°F (in units of 0.1°C/°F)	
Alarm output setting range	-999° to 9999°C/°F (in units of 1°C/°F)	-99.9° to 999.9°C/°F (in units of 0.1°C/°F)
Manual	W240	

Typical Application



Output Characteristics

Transistor Output (Pulse)
C200H-TV_01

	External supply voltage	24 VDC +10%/-15%
	Max. load voltage	24 VDC (collector supplied voltage) max.
	Max. load current	100 mA max.
	Residual voltage when ON	3 V max.
	Leakage current when OFF	0.3 mA max.

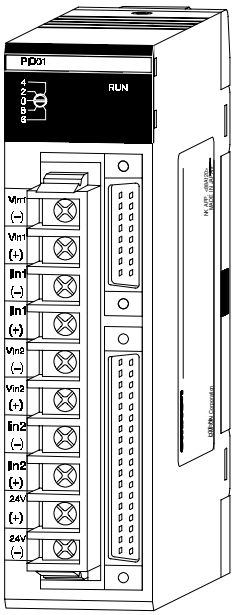
Voltage Output (Pulse)
C200H-TV_02

	Output voltage	12 VDC
	Max. load current	40 mA (with short-protective circuit)

Current Output (Linear)
C200H-TV_03

	Output current	4 to 20 mA
	Permissible load impedance	600Ωmax.
	Current value accuracy	4 ±0.3 to 20 ±1 mA

Two-Loop PID Controller Modules
C200H-PID0_



C200H-PID01

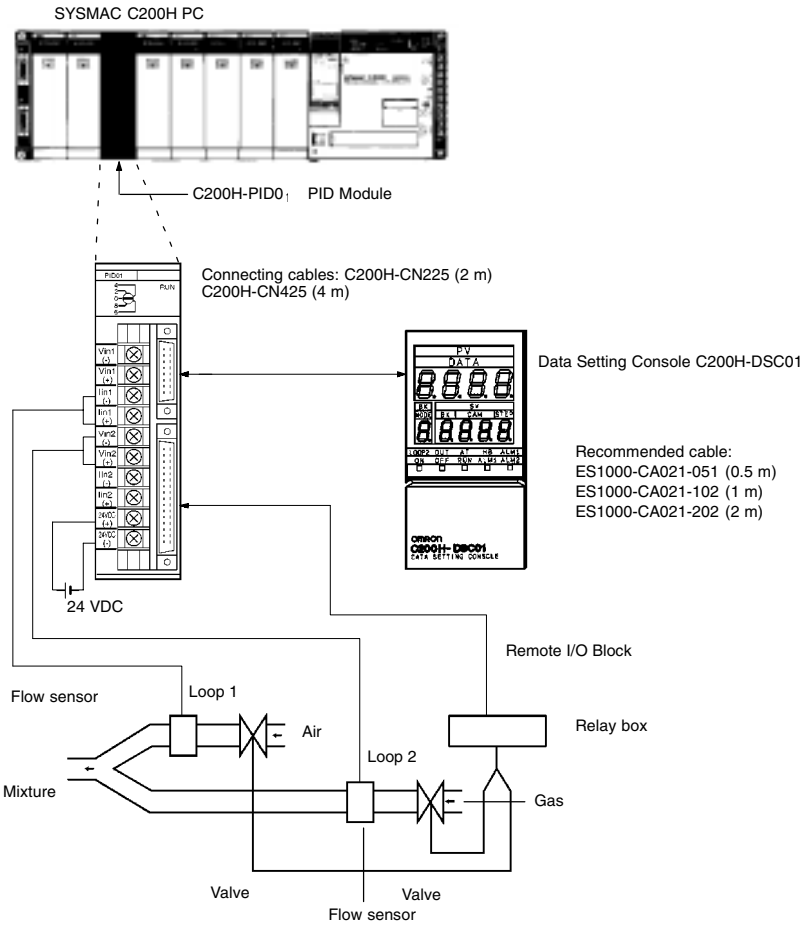
General Information
This module provides two independent PID loops for process control right on the PLC rack. Based on Omron's E5EX-LA process controller the C200H-PID0_ accepts both current and voltage analog inputs for pressure, flow and other measurements. The module can be programmed and controlled from the PLC or Data Setting Console.

Features
- Auto-tuning of PID constants
- High-speed sampling period
- Input noise reduction filter
- Eight banks of settings data
- Optional data setting console
- Transistor, current or voltage outputs

Specifications

Part numbers	C200H-PID0 _
Inputs	2 (two independent control loops)
Input signals	4-20 mA, 1-5 V, 0-5 V, 0-10 V
Control mode	PID, ON/OFF (advanced PID with auto-tuning)
Setting indication accuracy	±0.5% ±1 digit max. The SV and displayed value match. There is no relative error.
Hysteresis	0.0° to 100.0% FS (in units of 0.1% FS)
Alarm hysteresis	0.0° to 100.0% FS (in units of 0.1% FS)
Proportional band	0.0 to 999.9 s (in units of 0.1)
Integral (reset) time	0 to 9999 s (in units of 1 s)
Derivative (rate) time	0 to 9999 s (in units of 1 s)
Control period	1 to 99 s (in units of 1 s)
Sampling period	100 ms
Output refresh period	100 ms
Scaling setting range	-999° to 9999 (Decimal point position is designated by parameter settting)
Digital filter setting range	0 to 100 s (in units of 1 s)
Manual output setting range	-5 to 105%
Manual	W241

Typical Application



Output Characteristics

Transistor Output (Pulse)
C200H-PID01

	External supply voltage	24 VDC +10%/-15%
	Max. load voltage	24 VDC (collector supplied voltage) max.
	Max. load current	100 mA max.
	Residual voltage when ON	3 V max.
	Leakage current when OFF	0.3 mA max.

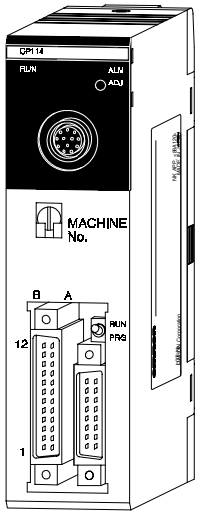
Voltage Output (Pulse)
C200H-PID02

	Output voltage	12 VDC
	Max. load current	40 mA (with short-protective circuit)

Current Output (Linear)
C200H-PID03

	Output current	4 to 20 mA
	Permissible load impedance	600Ωmax.
	Current value accuracy	4 ±0.3 to 20 ±1 mA

Cam Positioner Module
C200H-CP114



C200H-CP114

General Information

The C200H-CP114 Cam Positioner Module simulates a rotating mechanical cam, drum sequencer, or programmable limit switch in a PLC I/O module. The module provides a resolver interface and uses the Data Setting Console for displaying values.

Features

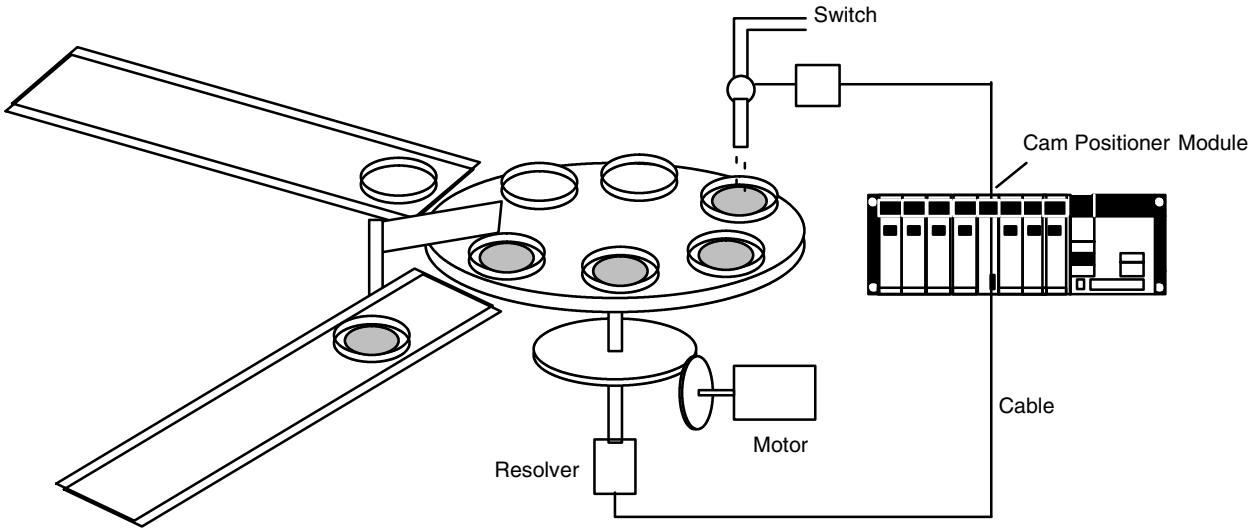
- 16 external and 32 internal cam outputs
- 7 ON/OFF points per cam output
- ON/OFF data can be set or altered by moving the machine
- Uses data setting console for inputting data and displaying values

Specifications

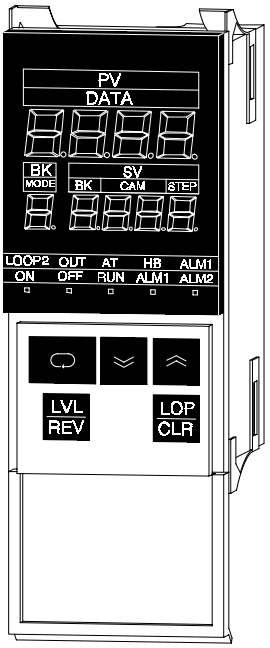
Part number	C200H-CP114
Cam outputs	48 (16 external; 32 internal)
External outputs	NPN transistor; 100 mA switching at 24 VDC
Simultaneous ON points	8 points, max.
Resolvers	3F88L-RS17, 3F88L-RS17T, 3F88L-RS15, 3F88L-RS15W
Resolver response	800 rpm (resolver rpm)
Resolver resolution	1°
Origin adjustment	1° to 359°
Angle detection cycle	200 μs (at a sampling frequency of 5 kHz)
Cam output response time	400 μs (800 rpm)
Manual	W224

NOTE: 3F88L-RS15 and 3F88L-RS15W each require a resolver cable.

Typical Application



Data Setting Console
C200H-DSC01



C200H-DSC01

General Information

The C200H-DSC01 Data Setting Console displays data on its front panel and allows data monitoring and setting when connected to C200H Temperature Controller, Cam Positioner, or PID modules. One Data Setting Console can monitor a single Module. Included with the C200H-DSC01 are mounting brackets, panel decals for modules to identify units and a temperature unit label.

Features

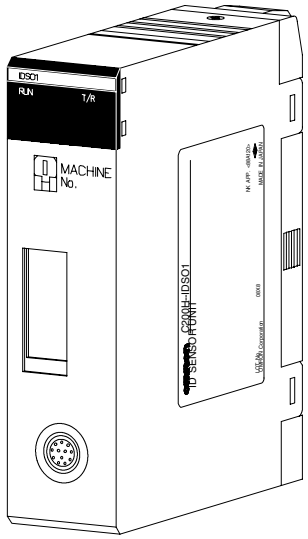
- Fits 1/8 DIN cutouts
- 2 m or 4 m cable
- Change set values, parameters
- Monitor present value, set value and memory bank number as well as output status

Specifications

Part number	C200H-DSC01
Size	1/8 DIN (48 x 96 mm)
Applicable modules	C200H-TC_ _ _, C200H-TV_ _ _, C200H-PID_ _, C200H-CP114
Display data	Set value, present value, bank number, auto-tuning, heater burnout alarm, mode, bank, step, cam number, ON/OFF, run, alarm 1 and 2
Connecting cables	2 m: C200H-CN225 4 m: C200H-CN425
Enclosure rating	IP20 (For NEMA 4 rating, use a Y29-49N cover.)

Radio Frequency Identification (RF ID) Interface Modules

C200H-IDS01/IDS21



C200H-IDS01

General Information

The RF ID Modules provide a direct interface to Omron's V600 and V620 C200H RF ID Sensor Read/Write Heads. The module acts as the controller for Read/Write Heads that exchange data with data carriers using RF technology. Applications include conveyor and pallet storage, product labeling, warehousing applications, and more. Up to 8 Kb of data can be stored on a single data carrier. The interface modules provide a quick and easy interface to the production line PLC using ladder diagram programming.

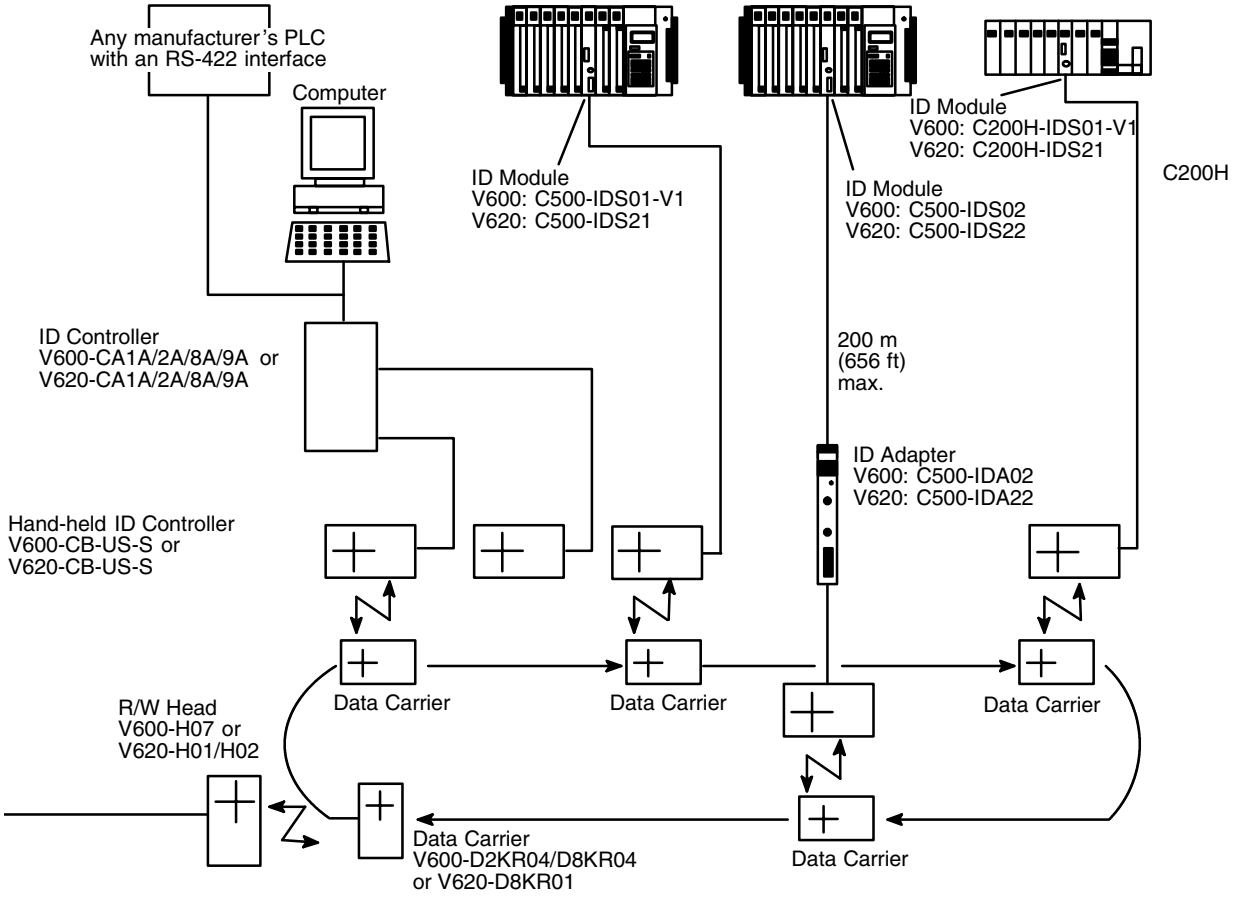
Features

- Provide flexibility in handling individual workpieces or pallets by reading product specifications can be read from ID data carriers (tags)
- Allows up-to-date access information on inventory and material flow
- System consists of an ID controller or SYSMAC C200H-IDS module, Read/Write (R/W) heads, and data carriers (tags)
- Three read/write ranges available
- Direct monitoring from the C200H-IDS module with hand-held programming console

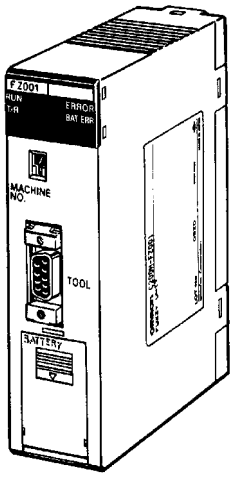
Specifications

Part number		C200H-IDS01-V1	C200H-IDS21
Read/Write Head-to-Data Carrier range		Short-range	Mid- or long-range
Distance from Read/Write Head to PLC		10 m (32.8 feet) maximum	10 m (32.8 feet) maximum
Communications protocol		Special I/O protocol	
Max. Read/Write Heads		1	
Data Carrier (tag)		2 Kbytes and 8 Kbytes, RAM type (internal battery), 8-bit format	
Processing functions	Commands	Six: read, write, auto-read, auto-write, clear all, auto-read/write cancel	
	Transmittable data quantity	Transmission of up to 512 characters (1,024 bytes); 20 characters/transmission	
	Diagnostic functions	CPU watchdog timer; six kinds of errors detectable, including communication error with tag, tag missing error, horizontal parity transmission error; error logging function; storing the above errors (by a super capacitor) in memory	
Monitoring function		Possible with hand-held programming console Cable length: 4 m (13 feet) max. 1-byte read, 1-byte write, consecutive write, test, error record monitor	
Memory backup		Internal capacitor stores only error data for 15 days at 25°C (77°F)	
Power supply		None	
Manual		W153	

Typical Application



Fuzzy Coprocessor Module
C200H-FZ001



C200H-FZ001

General Information

The Fuzzy Coprocessor Module allows state-of-the-art fuzzy inference capabilities to be closely integrated with Omron's large-rack PLCs. In addition to normal ladder logic control, the PLC CPU allows pre-processing and post-processing of fuzzy I/O, which is provided by standard Analog I/O Modules, and/or internal registers in the PLC CPU, using intelligent I/O READ and WRITE instructions in ladder logic.

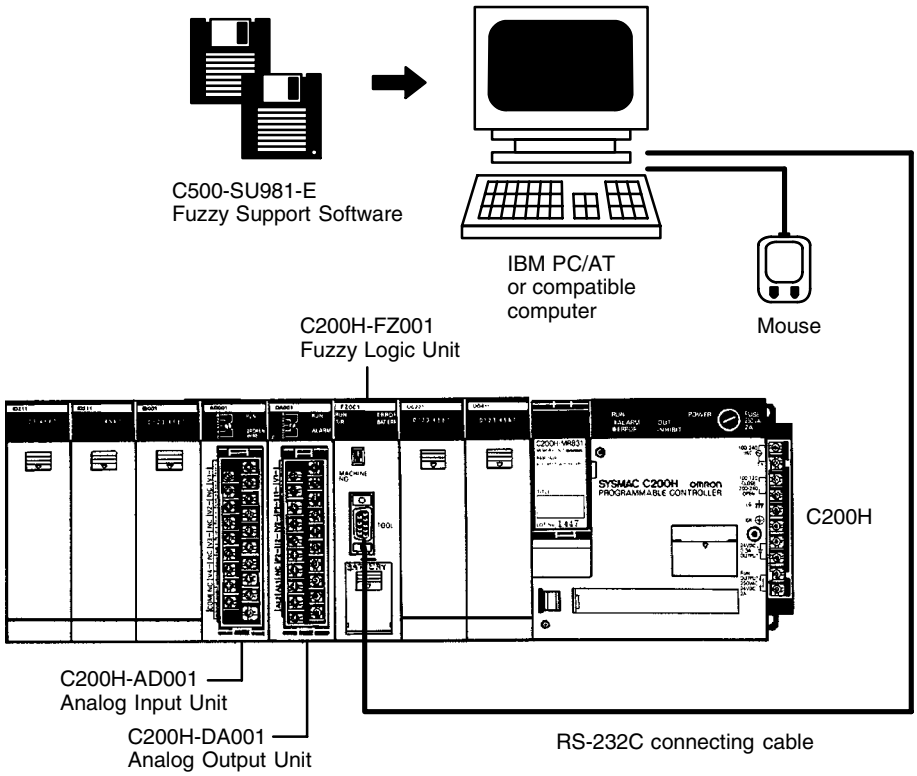
Features

- Up to 8 inputs, 4 outputs
- Up to 128 rules
- User-definable membership functions
- PLC provides pre-processing and post-processing of fuzzy I/O
- Simple integration into existing control systems

Specifications

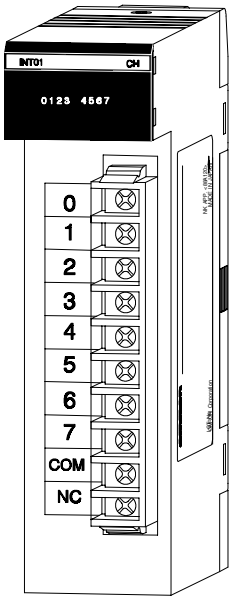
Part number	C200H-FZ001
Rule format	8 conditions, 2 conclusions
Maximum number of rules	128 rules
Inference system	MIN-MAX logic
Inference speed	Max. 125 μs per rule
Inference time formula	(125 μs x number of rules) + 600 μs
Defuzzification method	Centroid
Conditions (IF) section	Continuous-function type, maximum 7 definable points
Conclusion (THEN) section	Discrete-type, 25 sections on horizontal axis, 2048 steps on vertical axis
Inputs	8 maximum, 12 bit/input
Outputs	4 maximum, 12 bit/output
Transmission speeds	Up to 19,200 bps (set by internal switch)
Interface	RS-232C, 1 port
Manual	W208

Typical Application



Note: Do not mount the C200H-FZ001 in the 2 slots next to the CPU on the CPU Rack.

Interrupt Input Module
C200HS-INT01



C200HS-INT01

General Information

The Interrupt Input Module allows real world discrete inputs to interrupt the scan of the main ladder logic program and execute specific interrupt ladder logic. For systems requiring immediate response and fast throughput from field input signals, the Interrupt Input Module can provide fast sub-scan execution and response times. The Module can be configured to provide immediate interrupts and scheduled interrupts which repeat execution on a preset time base. Interrupts can also be configured to interrupt currently executing interrupt logic.

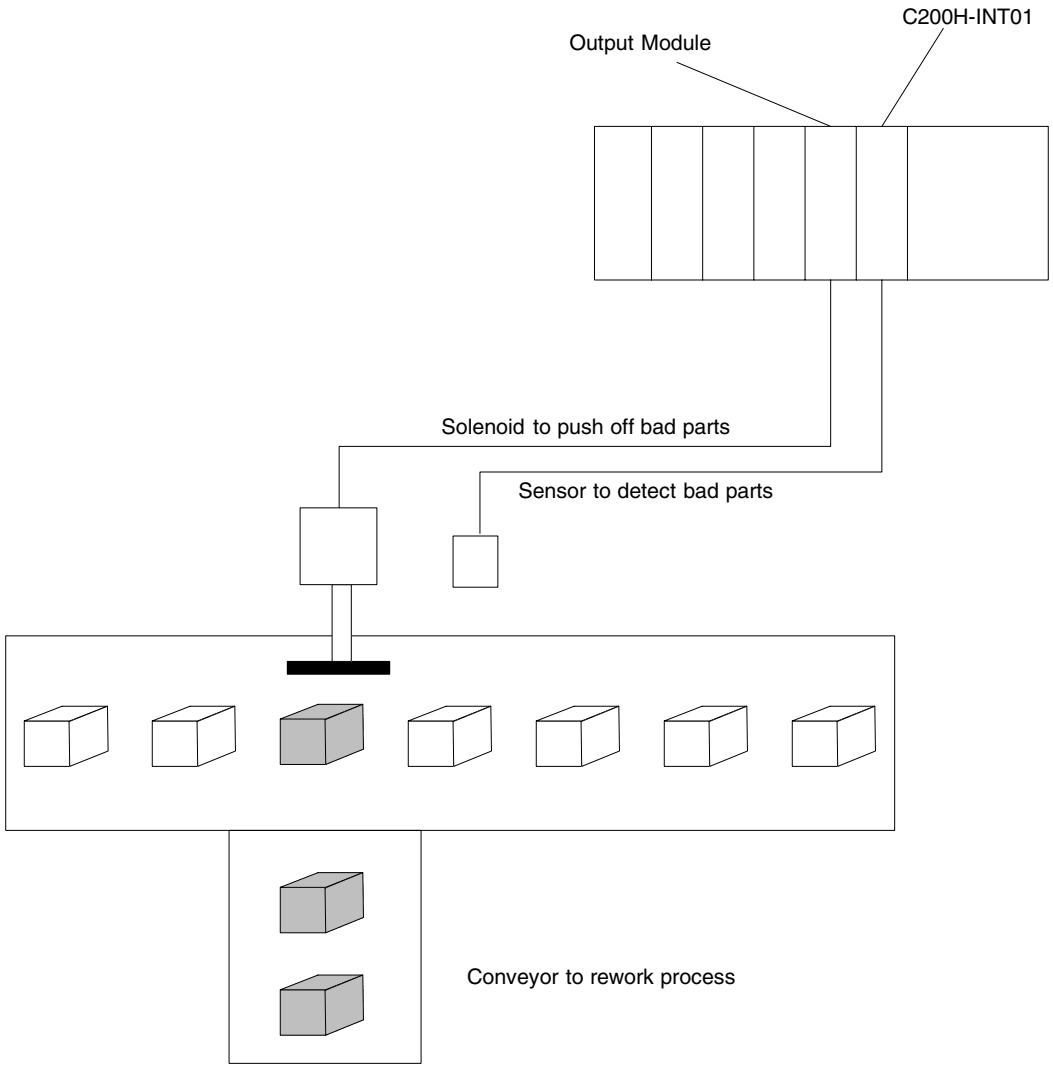
Features

- High-speed immediate or scheduled logic execution
- Provides sub-scan response to field input signals
- Ladder Instructions control and monitor Interrupt Inputs

Specifications

Part number	C200HS-INT01
Points per module	8 isolated
Input voltage	12 to 24 VDC
Input current	13 mA at 24 VDC
Input impedance	1.5 kΩ
ON voltage	10.2 VDC minimum
OFF voltage	3.0 VDC maximum
ON delay	1 ms maximum
OFF delay	1.5 ms maximum
Manual	W263 C200HS Installation Guide

Typical Application



Voice Module
C200H-OV001

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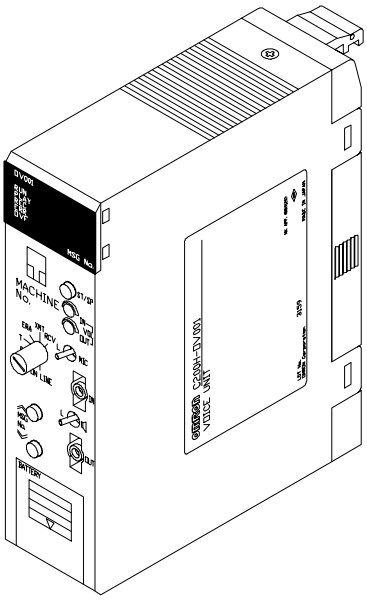
Input Devices
- Computer
- Microphone
- Tape recorder

Output Devices
- Computer
- Printer
- Speaker



C200H-OV001

General Information

Use this module for operator interface messages. Record up to 60 voice messages on site, or use a tape recorder and transfer the messages to the module. Messages can also be uploaded or downloaded through the RS-232C port on the front panel. The built-in speaker enables immediate message verification. Message length and sound quality are selectable.

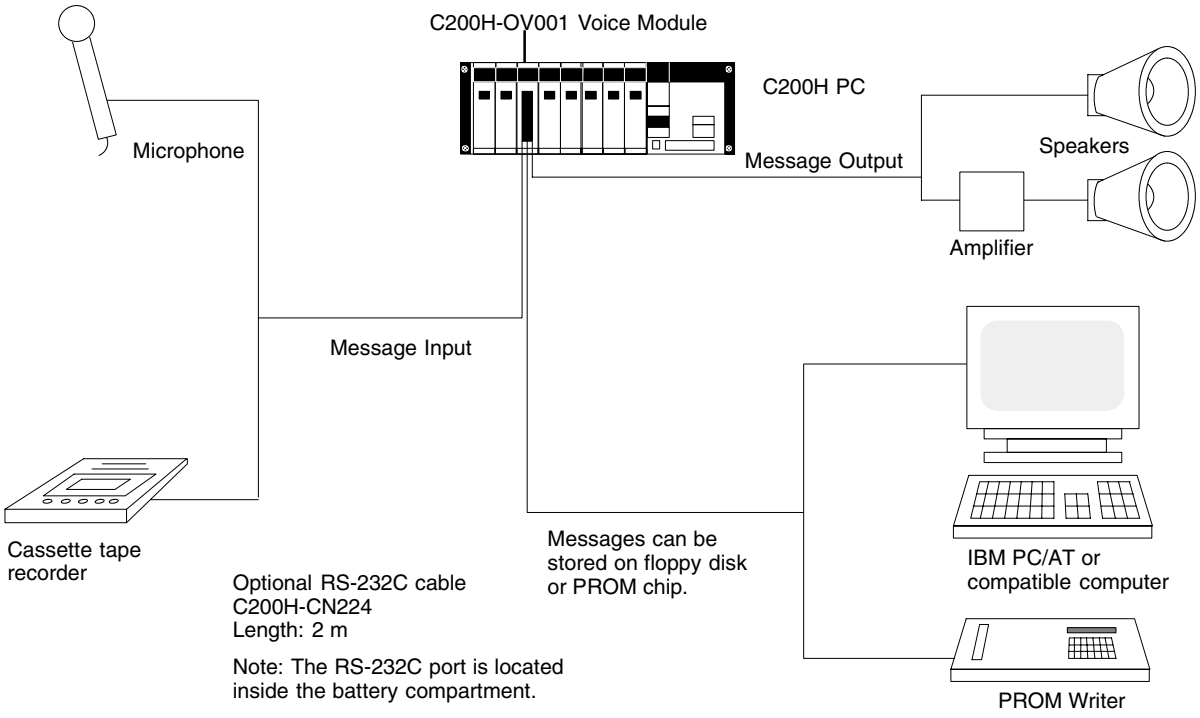
Features

- Microphone jack enables live message broadcast
- Flexible message length
- Messages can be interrupted to start another message
- Messages can be recorded in phrase and word combination formats
- Upload or download messages through the RS-232C port on the front panel

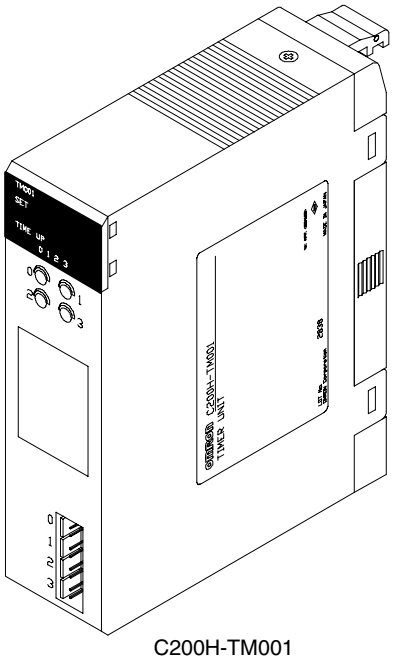
Specifications

Part number		C200H-OV001
Voice synthesis method		Adaptive Differential Pulse-Coded Modulation (ADPCM)
Message recording time		32/48/64 seconds (switch selectable)
Message capacity		60 max.
Message input (switch-selectable)	MIC IN	Microphone input: unbalanced dynamic microphone (600 Ω)
	LINE IN	Tape input: Input impedance: 50 k Ω, unbalanced Maximum input voltage: 3.3 V
Message output (switch-selectable)	SPEAKER OUT	Built–in amplifier output: 0.14 W (8 Ω speaker)
	LINE OUT	External amplifier output: 600 Ω unbalanced transformer output Maximum output voltage: 0.5 V rms (effective value) Both balanced and unbalanced external amplifiers can be connected.
Built–in monitor speaker		Diameter 27 mm, 0.1 W (8 Ω)
Input frequency		32-second recordings: 8 kHz 48-second recordings: 5.3 kHz 64-second recordings: 4 kHz
Output frequency characteristics		32-second recordings: 100 Hz to 3.2 kHz 48/64-second recordings: 100 Hz to 2.2 kHz
Lowpass filter function		Cutoff frequency: 3.2 kHz for 32–second recordings, 2.2 kHz for 48/64–second recordings
Message memory		128K bytes RAM (battery powered)
External communications		RS-232C (Baud rate: 19,200/9,600/4,800/2,400 bps. XON/XOFF: yes/no, CTS/RTS: yes/no)
Self-diagnosis function		CPU watchdog timer, LOW battery voltage detection
Battery life		5 years at 25°C (battery life is shorter for higher temperatures)
Manual		W172

Typical Application



Analog Timer Input Module
C200H-TM001



C200H-TM001

General Information

The analog timer module lets the user adjust timer values without going into the program. The module has four independently set and monitored timers that each have variable ranges. The user may select, by DIP switch, for each point to use front panel variable resistor or external variable resistors. Through internal bit allocation, each timer can be started and paused, allowing for them to be used as cumulative timers.

Features

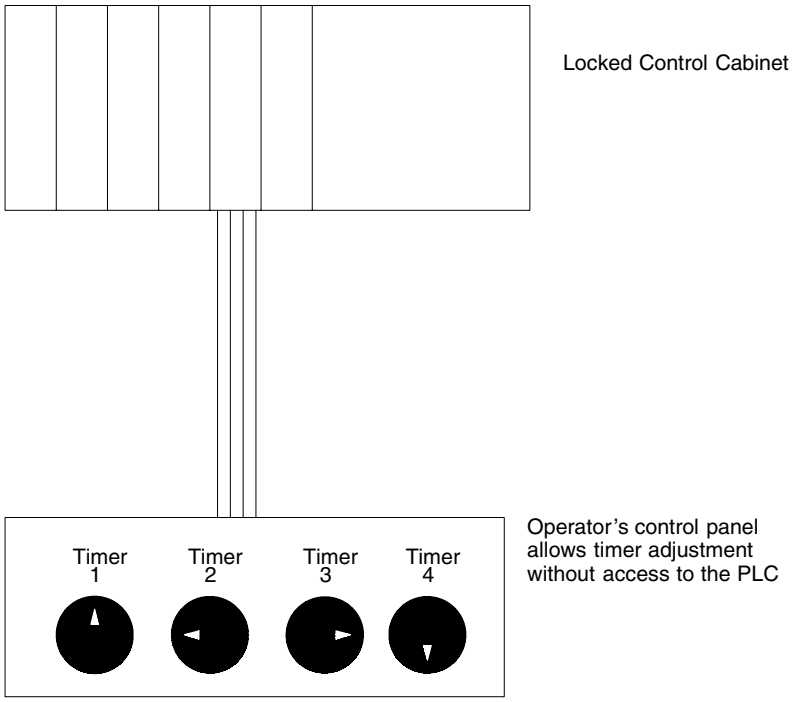
- Four front panel variable resistors are used to set the timers
- Connections available for external variable resistors
- Indicators show operation and time-up status
- Cumulative timer available using pause bits

Specifications

Part number	C200H-TM001
Number of timers	4
Time setting range (DIP switch selectable)	Use the DIP switches to set any of the following 4 ranges: 0.1 to 1 second (typical) 1 to 10 seconds (typical) 10 to 60 seconds (typical) 1 to 10 minutes (typical)
Indicators	SET and TIME UP
Timer pause function	Timing can be paused if specified by program. The timers can be used as cumulative timers.
External variable resistor	External variable resistors can be used to set the time value when the IN/EXT selector is set to EXT.
Manual	C200H Installation Guide: W111

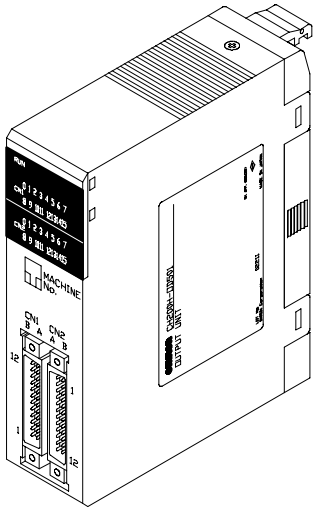
Analog Timer Input Module
C200H-TM001

Typical Application



Group 1 High-density Input Modules

C200H-ID215, C200H-ID501



C200H-ID215
C200H-ID501

General Information

The High-density Input Modules let you pack more I/O points into a single I/O slot for greater space savings. Being treated as Special I/O modules, they do not use standard I/O points. Thus, they increase the overall I/O capacity. They provide 32 discrete input points with selectable response times of 2.5 ms or 15 ms. For even shorter signals, 8 inputs can be designated as quick-response inputs, to receive selectable 1 ms or 4 ms signals. The modules can also be used with Omron's input blocks, reducing wiring between control panels as well as within control panels.

Features

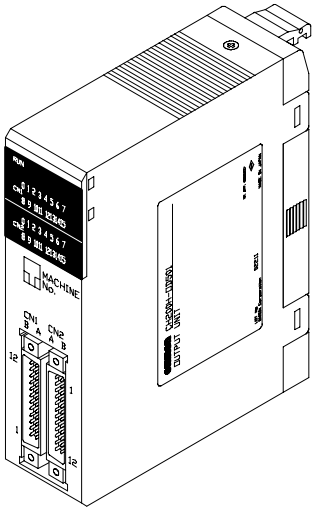
- 8 quick-response inputs available to receive short signals
- Easy cable connection to I/O Block
- Selectable input response time
- Up to 10 special high-density modules per PLC

Specifications

Part number		C200H-ID215	C200H-ID501
Input voltage		24 VDC +10%/-15%	5 VDC ±10%
No. of inputs (per common)		32 pts (8 pts/com, 4 circuits) 8 quick-response points available	32 pts (8 pts/com, 4 circuits) 8 quick-response points available
Input current		4.1 mA, typical	3.5 mA, typical
Operating voltage	ON	14.4 VDC min.	3.0 VDC min.
	OFF	5.0 VDC max.	1.0 VDC max.
Input response time	ON	2.5 ms max./15 ms max. (selectable)	2.5 ms max./15 ms max. (selectable)
	OFF	2.5 ms max./15 ms max. (selectable)	2.5 ms max./15 ms max. (selectable)
Style/External connections		Connector	Connector
Input device requirement		Sinking (NPN)	Sinking (NPN)
Manual		C200H Installation Guide: W111	

Group 1 High-density/Multiplex I/O

C200H-MD115/MD215/
MD501



C200H-MD115
C200H-MD215
C200H-MD501

General Information

The high-density/multiplex mixed Input/Output modules let you pack more I/O points into a single I/O slot for greater space savings. Treated as Special I/O modules, they do not use standard I/O points. Thus, they increase the overall I/O capacity.

In static high-density mode, they provide 16 discrete input points and 16 discrete output points with selectable input response times of 2.5 ms or 15 ms. For even shorter input signals, 8 inputs can be designated as quick-response inputs, to receive selectable 1 ms or 4 ms signals. In this mode, the modules can also be used with Omron's I/O Blocks, reducing wiring between control panels as well as within control panels.

In dynamic multiplex input mode, the modules provide 128 dynamic input points. In this mode they can be used with keyboards, thumbwheel switches, etc.

Features

- Provide 16 inputs and 16 outputs per module in static mode; 128 inputs in dynamic mode
- Easy cable connection to I/O block
- Selectable input response time
- Up to 10 Special I/O modules per PLC
- Provide interface to keyboards, thumbwheel switches, etc. in dynamic mode

Specifications (Static High-density Setting), Input Side (CN2)

Part number		C200H-MD115	C200H-MD215	C200H-MD501
Mounting		CPU Rack: Yes Expansion I/O Rack: Yes Remote I/O Rack: Yes	CPU Rack: Yes Expansion I/O Rack: Yes Remote I/O Rack: Yes	CPU Rack: Yes Expansion I/O Rack: Yes Remote I/O Rack: Yes
Input voltage		12 VDC +10%/-15%	24 VDC ±10%	5 VDC ±10%
No. of inputs (per common)		16 pts (8 pts/com, 2 circuits) 8 quick-response points available	16 pts (8 pts/com, 2 circuits) 8 quick-response points available	16 pts (8 pts/com, 2 circuits) 8 quick-response points available
Input current		4.1 mA, typical	4.1 mA, typical	3.5 mA, typical
Operating voltage	ON	8.0 VDC min.	14.4 VDC min.	3.0 VDC min.
	OFF	3.0 VDC max.	5.0 VDC max.	1.0 VDC max.
Input response time	ON	2.5 ms max./15 ms max. (selectable)	2.5 ms max./15 ms max. (selectable)	2.5 ms max./15 ms max. (selectable)
	OFF	2.5 ms max./15 ms max. (selectable)	2.5 ms max./15 ms max. (selectable)	2.5 ms max./15 ms max. (selectable)
External connections		Connector	Connector	Connector
Input device requirement		Sinking (NPN) or sourcing (PNP)	Sinking (NPN) or sourcing (PNP)	Sinking (NPN) or sourcing (PNP)
Manual		Included in C200H Installation Guide: W111		

Specifications (Static High-density Setting), Output Side (CN1)

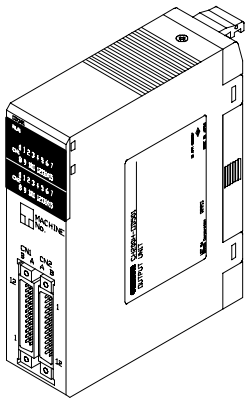
Part number		C200H-MD115	C200H-MD215	C200H-MD501
Max. load current		16 mA 4.5 VDC to 100 mA 26.4 VDC/pt, 800 mA/common, 1.6 A/module	16 mA 4.5 VDC to 100 mA 26.4 VDC/pt, 800 mA/common, 1.6 A/module	35 mA/pt, 280 mA/common, 560 mA/module
Rated load voltage		5 to 24 VDC ±10%	5 to 24 VDC ±10%	5 VDC ±10%
No. of outputs (per common)		16 pts (8 pts/com, 2 circuits)	16 pts (8 pts/com, 2 circuits)	16 pts (8 pts/com, 2 circuits)
Residual voltage		0.7 V max.	0.7 V max.	0.4 V max.
Output response times	ON	0.2 ms max.	0.2 ms max.	0.2 ms max.
	OFF	0.6 ms max.	0.6 ms max.	0.3 ms max.
External connections		Connector	Connector	Connector
Leakage current		0.1 mA max.	0.1 mA max.	0.1 mA max.
Fuse		1 fuse/circuit, 2 circuits (not user-replaceable)		
External power supply		5 to 24 VDC, 45 mA min.	5 to 24 VDC, 45 mA min.	5 VDC, 20 mA min.
Operation		Sinking (NPN)	Sinking (NPN)	Sinking (NPN)

Specifications (Dynamic Multiplex Setting); Input Only

Part number		C200H-MD115	C200H-MD215	C200H-MD501
Input voltage		12 VDC +10%/-15%	24 VDC ±10%	5 VDC ±10%
No. of inputs (per common)		128 pts (64 pts/com, 2 circuits)	128 pts (64 pts/com, 2 circuits)	128 pts (64 pts/com, 2 circuits)
Input current		4.1 mA, typical	4.1 mA, typical	3.5 mA, typical
Operating voltage	ON	8.0 VDC min.	14.4 VDC min.	3.0 VDC min.
	OFF	3.0 VDC max.	5.0 VDC max.	1.0 VDC max.
External connections		Connector	Connector	Connector
Input device requirement		Sinking (NPN)	Sinking (NPN)	Sinking (NPN)

High Density/Multiplex Output Modules

C200H-OD215/OD501



C200H-OD215
C200H-OD501

General Information

The High-density/Multiplex Output Modules let you pack more I/O points into a single I/O slot for greater space savings. Treated as Special I/O modules, they do not use standard I/O points. Thus, they increase the overall I/O capacity. In static high-density mode, they provide 32 discrete output points. In this mode, the modules can also be used with Omron's Output Blocks, reducing wiring between control panels as well as within control panels. In dynamic multiplex mode, the modules provide 128 dynamic output points. In this mode they can be used with numeric displays, etc.

Features

- Provide 32 outputs per module in static mode
- Easy cable connection to I/O block
- Up to 10 special high-density modules per PLC
- Provide interface to numeric displays, etc. in dynamic mode

Specifications (Static High-density Setting)

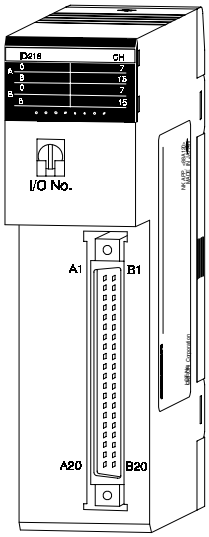
Part number		C200H-OD215	C200H-OD501
Max. load current		16 mA 4.5 VDC to 100 mA 26.4 VDC/pt, 800 mA/common, 3.2 A/module	35 mA/pt, 280 mA/common, 1.12 A/module
Rated load voltage		5 to 24 VDC ±10%	5 VDC ±10%
No. of outputs (per common)		32 pts (8 pts/com, 4 circuits)	32 pts (8 pts/com, 4 circuits)
Residual voltage		0.7 V max.	0.4 V max.
Output response times	ON	0.2 ms max.	0.2 ms max.
	OFF	0.6 ms max.	0.3 ms max.
External connections		Connector	Connector
Leakage current		0.1 mA max.	0.1 mA max.
Fuse		1 fuse/circuit, 4 circuits (not user-replaceable)	
External power supply		5 to 24 VDC, 90 mA min.	5 VDC, 39 mA min.
Operation		Sinking (NPN)	Sinking (NPN)
Manual		W133	

Specifications (Dynamic Multiplex Setting)

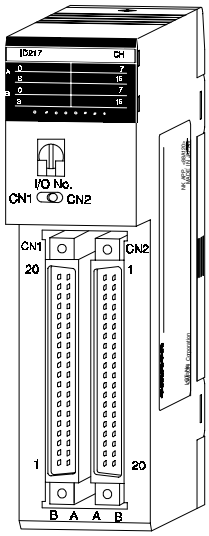
Part number		C200H-OD215	C200H-OD501
Max. load current		100 mA/pt, 800 mA/common, 3.2 A/module	35 mA/pt, 280 mA/common, 1.12 A/module
Rated load voltage		5 to 24 VDC ±10%	5 VDC ±10%
No. of outputs (per common)		128 dynamic pts (64 pts/com, 2 circuits)	128 dynamic pts (64 pts/com, 2 circuits)
Residual voltage		0.7 V max.	0.4 V max.
Output response times	ON	0.2 ms max.	0.2 ms max.
	OFF	0.6 ms max.	0.3 ms max.
External connections		Connector	Connector
Leakage current		0.1 mA max.	0.1 mA max.
Fuse		1 fuse/circuit, 4 circuits (not user-replaceable)	
External power supply		5 to 24 VDC, 90 mA min.	5 VDC, 39 mA min.
Operation		Sinking (NPN)	Sinking (NPN)

Group 2 High-Density Input Modules

C200H-ID216/ID217



C200H-ID216



C200H-ID217

General Information

The High-density input modules for C200H-CPU21,-CPU23,-CPU31 and C200HS CPUs let you pack more I/O points into a single I/O slot for greater space savings. These modules do not use standard I/O points. Thus, they increase the overall I/O capacity. They provide 32 or 64 discrete input points. The modules can be used with Omron's Input Blocks, reducing wiring between control panels as well as within control panels.

Features

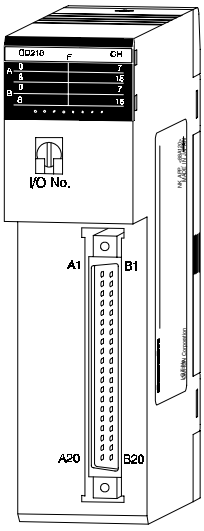
- Easy cable connection to input blocks
- Up to five 64-point modules or 32-point modules per PLC

Specifications

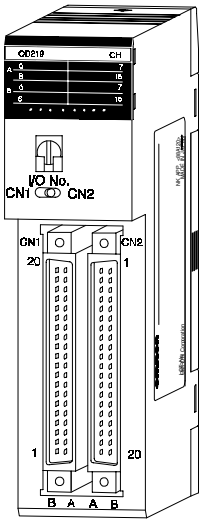
Part number		C200H-ID216	C200H-ID217
Input voltage		24 VDC	24 VDC
No. of inputs (per common)		32 (32 points/com, 1 circuit)	64 (32 points/com, 2 circuits)
Input current		4.1 mA	4.1 mA
Operating voltage	ON	14.4 VDC min.	14.4 VDC min.
	OFF	5.0 VDC max.	5.0 VDC max.
Input response time	ON	1.0 ms max.	1.0 ms max.
	OFF	1.0 ms max.	1.0 ms max.
External connections		Connector	Connector
Input device requirement		Sinking (NPN) or sourcing (PNP)	Sinking (NPN) or sourcing (PNP)

NOTE: High density input modules for C200H-CPU21. -CPU23, -CPU31, and C200HS CPU's only.

Group 2 High-Density Output Modules
C200H-OD218/OD219



C200H-OD218



C200H-OD219

General Information

The high-density output modules for C200H CPU21, -CPU23, -CPU31 and C200HS CPUs let you pack more I/O points into a single I/O slot for greater space savings. These modules do not use standard I/O points. Thus, they increase the overall I/O capacity. They provide 32 or 64 discrete output points. The modules can be used with Omron's output blocks, reducing wiring between control panels as well as within control panels.

Features

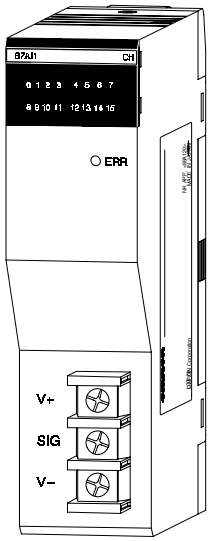
- Easy cable connection to output blocks
- Up to five 64-point modules or 32-point modules per PLC

Specifications

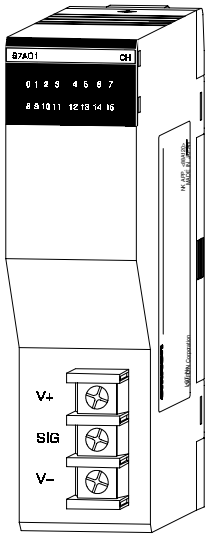
Part number		C200H-OD218	C200H-OD219
Max. load current		16 mA 4.5 VDC to 100 mA 26.4 VDC	16 mA 4.5 VDC to 100 mA 26.4 VDC
Rated load voltage		5 to 24 VDC	5 to 24 VDC
No. of outputs (per common)		32 (32 points/com, 1 circuit)	64 (32 points/com, 2 circuits)
Residual voltage		0.8 V max.	0.8 V max.
Output response times	ON	0.1 ms max.	0.1 ms max.
	OFF	0.4 ms max.	0.4 ms max.
External connections		Connector	Connector
Leakage current		0.1 mA max.	0.1 mA max.
Fuse		3.5 A (not user-replaceable)	Two, 3.5 A (not user-replaceable)
External power supply		5 to 24 VDC, 110 mA min.	5 to 24 VDC, 220 mA min.
Operation		Sinking (NPN)	Sinking (NPN)

NOTE: High density input modules for C200H-CPU21. -CPU23, -CPU31, and C200HS CPU's only.

B7A Interface Modules
C200H-B7AI1/B7AO1



C200H-B7AI1



C200H-B7AO1

General Information

The C200H-B7A Interface Modules reduce wiring from 16 input devices or 16 output devices to a few wires. You save control panel space, wiring time, and man-hours required for installation. These modules can be used with the full range of B7A input and output blocks for 16 I/O. The modules require a power supply, as do the terminal blocks.

Features

- Connect directly to the B7A I/O blocks using a two-conductor wire
- Transmission distance up to 500 m max.
- Used as a standard I/O module with 16 points

Specifications

Part number	C200H-B7AI1	C200H-B7AO1
I/O points	16 or 15 input points with 1 error bit	16 output points
Transmission distance (note)	500 m max.	500 m max.
I/O delay	19.2 ms (typical); 31 ms max.	19.2 ms (typical); 31 ms max.
Current consumption	100 mA, max. at 5 VDC	100 mA, max. at 5 VDC
Power supply	10 mA min. at 12 to 24 VDC ±10%	30 mA min. at 12 to 24 VDC ±10%
Manual	W236	

NOTE: A maximum transmission distance of 500 m is possible if the B7A Interface module and B7A Link Terminal each connect to an external DC power supply with 12 to 24 VDC. A maximum transmission distance of 100 m is possible if a single power supply of 24 VDC ±10% is connected to either the B7A Link Terminal or the interface module.

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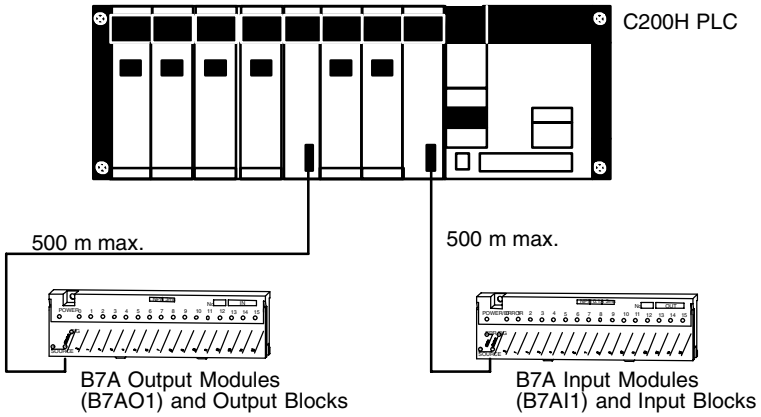
Typical Application



B7A Output Modules
(B7AO1) and Output Blocks

Output Blocks

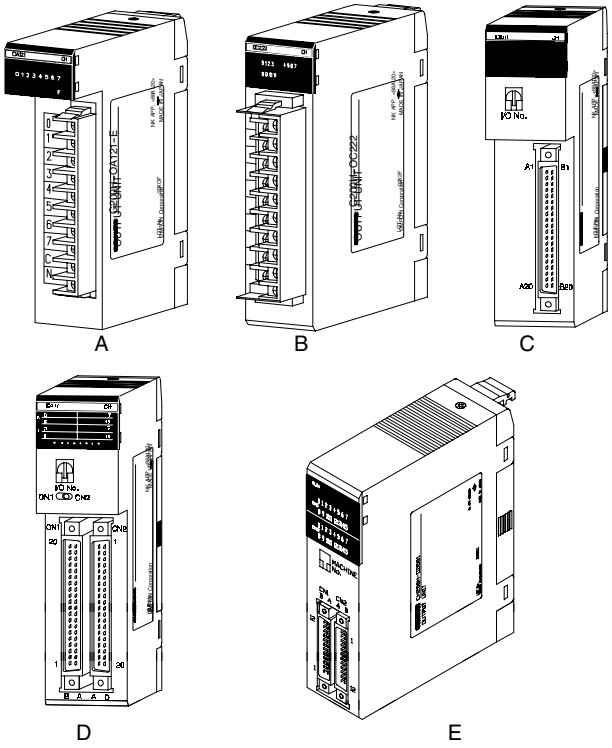
B7A-R6B11
B7A-R6B31
B7A-R6F11
B7A-R6F31
B7A-R6C11
B7A-R6C31
B7A-R6G11
B7A-R6G31

B7A Input Modules
(B7AI1) and Input Blocks

Input Blocks

B7A-T6A1
B7A-T6B1
B7A-T6C1

Note C200H-B7AI1/B7AO1 units cannot connect to a high speed B7A link terminal with transmission delay time of 3 m sec.



General Information

Discrete I/O modules are available in a number of voltages, densities, terminal block, and connector types. Connector-style high-density I/O modules with 32 or 64 discrete I/O points per module have solder connectors included with the module.

Optional wiring methods are available using Omron's I/O blocks, screw terminal, crimp and ribbon connectors, and pre-terminated cables. These versatile high-density configuration options minimize rack space and wiring time. The Omron I/O Blocks provide single-point isolation and up to 5 A current capacity per point. Replaceable relays and solid-state plug-in modules allow easy maintenance.

There are five styles of discrete I/O modules in the C200H family. The profiles of each are shown here. Each module in the following pages is cross-referenced to the module style.

Modules include the appropriate connectors. Replacement connectors and terminal blocks for each style are shown here.

Style	Replacement Connector/Terminal
A	4571022-4, PTC-2103
B	4571023-2, PTC-219
C,D	C500-CE401 Solder, 40-pin C500-CE402 Crimp, 40-pin C500-CE403 Ribbon, 40-pin C500-CE404 Solder, right angle C500-CE405 Crimp, right angle
E	C500-CE241 Solder, 24-pin C500-CE242 Crimp, 24 pin C500-CE243 Ribbon, 24 pin

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Specifications

Part number	C200H-ID001	C200H-ID002
Number of inputs (per common)	8 pts (8 pts/com, 1 circuit)	8 pts (8 pts/com, 1 circuit)
Input voltage	No-voltage contact/NPN output type (negative common)	No-voltage contact/NPN output type positive common)
Input current	7 mA, typical	7 mA, typical
Operating voltage		
ON	14.4 VDC min.	14.4 VDC min.
OFF	5.0 VDC max.	5.0 VDC max.
Input response time		
ON	1.5 ms max.	1.5 ms max.
OFF	1.5 ms max.	1.5 ms max.
Style/External connections	A/Removable terminal block	
Input device requirement	–	–
Manual	C200H Installation Guide: W111	

Specifications

Part number	C200H-ID211	C200H-ID212
Number of inputs (per common)	8 pts (8 pts/com, 1 circuit)	16 pts (16 pts/com, 1 circuit)
Input voltage	12 to 24 VDC +10%/-15%	24 VDC +10%/-15%
Input current	10 mA, 24 VDC	7 mA, typical 24 VDC
Operating voltage		
ON	10.2 VDC min.	14.4 VDC min.
OFF	3.0 VDC max.	5.0 VDC max.
Input response time		
ON	1.5 ms max.	1.5 ms max.
OFF	1.5 ms max.	1.5 ms max.
Style/External connections	A/Removable terminal block	B/Removable terminal block
Input device requirement	Sinking (NPN) or sourcing (PNP)	Sinking (NPN) or sourcing (PNP)
Manual	C200H Installation Guide: W111	

Specifications

Part number	C200H-IA121	C200H-IA122
Number of inputs (per common)	8 pts (8 pts/com, 1 circuit)	16 pts (16 pts/com, 1 circuit)
Input voltage	100 to 120 VAC +10%/-15%	100 to 120 VAC +10%/-15%
Input current	10 mA, 100 VAC	10 mA, 200 VAC
Operating voltage		
ON	60 VAC min	60 VAC min
OFF	20 VAC max	20 VAC max
Input response time		
ON	35 ms max	35 ms max
OFF	55 ms max	55 ms max
Style/External connections	A/Removable terminal block	B/Removable terminal block
Manual	C200H Installation Guide: W111	

Specifications

Part number	C200H-IA221	C200H-IA222
Number of inputs (per common)	8 pts (8 pts/com, 1 circuit)	16 pts (16 pts/com, 1 circuit)
Input voltage	200 to 240 VAC +10%/-15%	200 to 240 VAC +10%/-15%
Input current	10 mA, 100 VAC	10 mA, 200 VAC
Operating voltage		
ON	120 VAC min	120 VAC min
OFF	40 VAC max	40 VAC max
Input response time		
ON	35 ms max	35 ms max
OFF	55 ms max	55 ms max
Style/External connections	A/Removable terminal block	B/Removable terminal block
Manual	C200H Installation Guide: W111	

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Specifications

Part number	C200H-IM211	C200H-IM212
Number of inputs (per common)	8 pts (8 pts/com, 1 circuit)	16 pts (16 pts/com, 1 circuit)
Input voltage	12 to 24 VAC/DC +10%/-15%	24 VAC/DC +10%/-15%
Input current	10 mA, 24 VAC/DC	7 mA, 24 VAC/DC
Operating voltage		
ON	10.2 VAC/DC	14.4 VAC/DC
OFF	3.0 VAC/DC	5.0 VAC/DC
Input response time		
ON	1.5 ms max.	1.5 ms max.
OFF	1.5 ms max.	1.5 ms max.
Style/External connections	A/Removable terminal block	B/Removable terminal block
Type of common	Bipolar common	Bipolar common
Manual	C200H Installation Guide: W111	

Specifications

Part number	C200H-OD211	C200H-OD212
Number of outputs (per common)	12 pts (12 pt/com, 1 circuit)	16 pts (16 pts/com, 1 circuit)
Max. load current	0.3 mA/pt, 2 A/module	0.3 mA/pt, 2 A/module
Rated load voltage	24 VDC ±10%/-15%	24 VDC ±10%/-15%
Min. switching capacity	Residual voltage: 1.4 V max.	Residual voltage: 1.4 V max.
Output response times		
ON	0.2 ms max.	0.2 ms max.
OFF	0.3 ms max.	0.3 ms max.
Style/External connections	B/Removable terminal block	B/Removable terminal block
Leakage current	0.1 mA max.	0.1 mA max.
Fuse	125 V, 5 A	125 V, 8 A
External power supply	24 VDC, 25 mA min.	24 VDC, 35 mA min.
Operation	Sinking (NPN)	Sinking (NPN)
Manual	C200H Installation Guide: W111	

Specifications

Part number	C200H-OD213	C200H-OD214
Number of outputs (per common)	8 pts (8 pts/com, 1 circuit)	8 pts (8 pts/com, 1 circuit)
Max. load current	2.1 A/pt, 5.2 A/module	0.8 A/pt, 2.4 A/module
Rated load voltage	24 VDC ±10%/-15%	24 VDC ±10%/-15%
Min. switching capacity	Residual voltage: 1.4 V max.	Residual voltage: 1.5 V max.
Output response times		
ON	0.2 ms max.	1 ms max.
OFF	0.3 ms max.	1 ms max.
Style/External connections	A/Removeable terminal block	A/Removeable terminal block
Leakage current	0.1 mA max.	0.1 mA max.
Fuse	125 V, 8 A	Short-circuit protection
External power supply	24 VDC, 30 mA min.	24 VDC, 150 mA min.
Operation	Sinking (NPN)	Sourcing (PNP)
Manual	C200H Installation Guide: W111	

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Specifications

Part number	C200H-OD216	C200H-OD217
Number of outputs (per common)	8 pts (8 pts/com, 1 circuit)	12 pts (12 pts/com, 1 circuit)
Max. load current	0.3 A/pt	0.3 A/pt
Rated load voltage	5 to 24 VDC, +10%/-15%	5 to 24 VDC, +10%/-15%
Min. switching capacity	10 mA, 5 VDC	10 mA, 5 VDC
Output response times		
ON	1.5 ms max.	1.5 ms max.
OFF	2 ms max.	2 ms max.
Style/External connections	A/Removeable terminal block	B/Removeable terminal block
Leakage current	0.1 mA max.	0.1 mA max.
Fuse	–	–
External power supply	–	–
Operation	Sourcing (PNP)	Sourcing (PNP)
Manual	C200H Installation Guide: W111	

Specifications

Part number	C200H-OD411
Number of outputs (per common)	8 pts (8 pts/com, 1 circuit)
Max. load current	1 A/pt, (3 A/module)
Rated load voltage	12 to 48 VDC, +10%/-15%
Min. switching capacity	Residual voltage: 1.4 V max.
Output response times	
ON	0.2 ms max.
OFF	0.3 ms max.
Style/External connections	A/Removeable terminal block
Leakage current	0.1 mA max.
Fuse	125 V, 5 A
External power supply	12 to 48 VDC, 30 mA min.
Operation	Sinking (NPN)
Manual	C200H Installation Guide: W111

Specifications

Part number	C200H-OA221	C200H-OA222
Number of outputs (per common)	8 pts (8 pts/com, 1 circuit)	12 pts (8 pts/com, 2 circuits)
Max. load current	1 A/pt, 4 A/module	.3 A/pt, 5 A/module
Rated load voltage	200 to 240 VAC	100 to 240 VAC
Min. switching capacity	Resistance load: 10 mA inductive load: 40 mA 10 VAC	Resistance load: 10 mA inductive load: 40 mA 10 VAC
Output response times		
ON	1 ms max.	1 ms max.
OFF	1/2 load frequency max.	1/2 load frequency max.
Style/External connections	A/Removeable terminal block	B/Removeable terminal block
Leakage current		
200 VAC	6 mA max.	6 mA max.
100 VAC	3 mA max.	3 mA max.
Fuse	250 V, 5 A	250 V, 3 A
External power supply	—	—
Manual	C200H Installation Guide: W111	

Specifications

Part number	C200H-OA121-E
Number of outputs (per common)	8 pts (8 pts/com, 1 circuit)
Max. load current	1 A/pt, 4 A/module
Rated load voltage	100 to 120 VAC
Min. switching capacity	Resistance load: 10 mA inductive load: 40 mA 10 VAC
Output response times	
ON	1 ms max.
OFF	1/2 load frequency max.
Style/External connections	A/Removeable terminal block
Leakage current	
200 VAC	3 mA max.
100 VAC	–
Fuse	125 V, 5 A
External power supply	–
Manual	C200H Installation Guide: W111

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Specifications

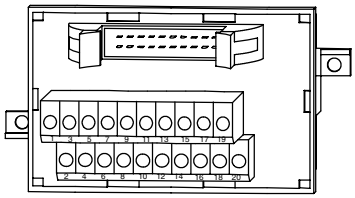
Part number	C200H-OC221	C200H-OC222
Number of outputs (per common)	8 pts (8 pts/com, 1 circuit)	12 pts (12 pt/com, 1 circuit), max. 8 ON simultaneously
Max. load current		
AC	2 A/pt. (p.f. = 1), 2 A/pt. (p.f. = 0.4)	2 A/pt. (p.f. = 1), 2 A/pt. (p.f. = 0.4)
DC	2 A/pt., 8 A/module	2 A/pt., 8 A/module
Rated load voltage	250 VAC, 24 VDC max.	250 VAC, 24 VDC max.
Min. switching capacity	10 mA, 5 VDC	10 mA, 5 VDC
Output response times		
ON	10 ms max.	10 ms max.
OFF	10 ms max.	10 ms max.
Style/External connections	A/Removeable terminal block	B/Removeable terminal block
External power supply	10 mA, 24 VDC/pt	10 mA, 24 VDC/pt
Manual	C200H Installation Guide: W111	

Specifications

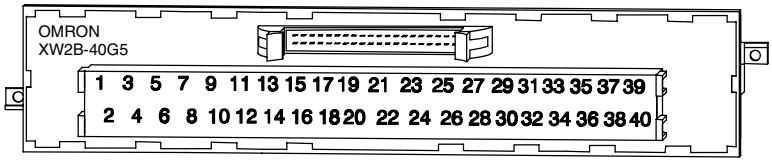
Part number	C200H-OC223	C200H-OC224
Number of outputs (per common)	5 pts (1 pt/com, 5 circuits)	8 pts (1 pt/com, 8 circuits)
Max. load current		
AC	2 A/pt. (p.f. = 1), 2 A/pt. (p.f. = 0.4)	2 A/pt. (p.f. = 1), 2 A/pt. (p.f. = 0.4)
DC	2 A/pt., 8 A/module	2 A/pt., 8 A/module
Rated load voltage	250 VAC, 24 VDC max.	250 VAC, 24 VDC max.
Min. switching capacity	10 mA, 5 VDC	10 mA, 5 VDC
Output response times		
ON	10 ms max.	10 ms max.
OFF	10 ms max.	10 ms max.
Style/External connections	A/Removeable terminal block	A/Removeable terminal block
External power supply	10 mA, 24 VDC/pt	10 mA, 24 VDC/pt
Manual	C200H Installation Guide: W111	

Specifications

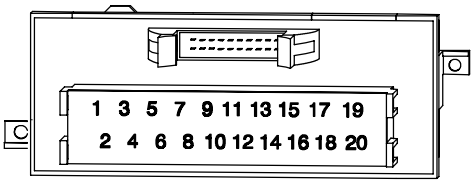
Part number	C200H-OC225
Number of outputs (per common)	16 pts (1 pt/com, 1 circuit), 8 ON simultaneously
Max. load current	
AC	2 A/pt. (p.f. = 1), 2 A/pt. (p.f. = 0.4)
DC	2 A/pt., 8 A/module
Rated load voltage	250 VAC, 24 VDC max.
Min. switching capacity	10 mA, 5 VDC
Output response times	
ON	10 ms max.
OFF	10 ms max.
Style/External connections	B/Removeable terminal block
External power supply	10 mA, 24 VDC/pt
Manual	C200H Installation Guide: W111



XW2B-20G4



XW2B-40G5



XW2B-20G5

General Information

XW2B screw terminals allow clean, single-cable connection to 32-point or 64-point high-density I/O modules. The screw terminals enable easier installation, saving time, reducing system cost, and simplifying maintenance. The screw terminals are available in 20- and 40-point densities. The I/O connecting cables are available in lengths from 1 to 5 meters.

Features

- Available with either M2.4 or M3.5 terminal screws
- Easily mounted to DIN rail or control panel
- Rated for 1 A, 125 VAC or 1 A, 30 VDC

Part Number	Description	Compatible PLC I/O Modules
XW2B-20G4	20-point terminal w/M2.4 screws	C200H-ID215, C200H-OD215, C200H-MD115, C200H-MD215, C200H-MD501, C200H-ID501, C200H-OD501, C500-ID218CN, C500-ID501CN, C500-OD415CN, C500-OD501CN
XW2B-20G5	20-point terminal w/M3.5 screws	
XW2B-40G5-T	40-point terminal w/M3.5 screws (Has two connectors; same as using two XW2B-20G5s)	
XW2B-20G5-D	20-point terminal w/M3.5 screws (Daisy chain application)	
XW2B-40G4	40-point terminal w/M2.4 screws	C200H-ID216, C200H-OD218, C200H-ID217, C200H-OD219, C500-ID114, C500-ID219, C500-OD213
XW2B-40G5	40-point terminal w/M3.5 screws	

For Connecting Cable part numbers, refer to the following page.

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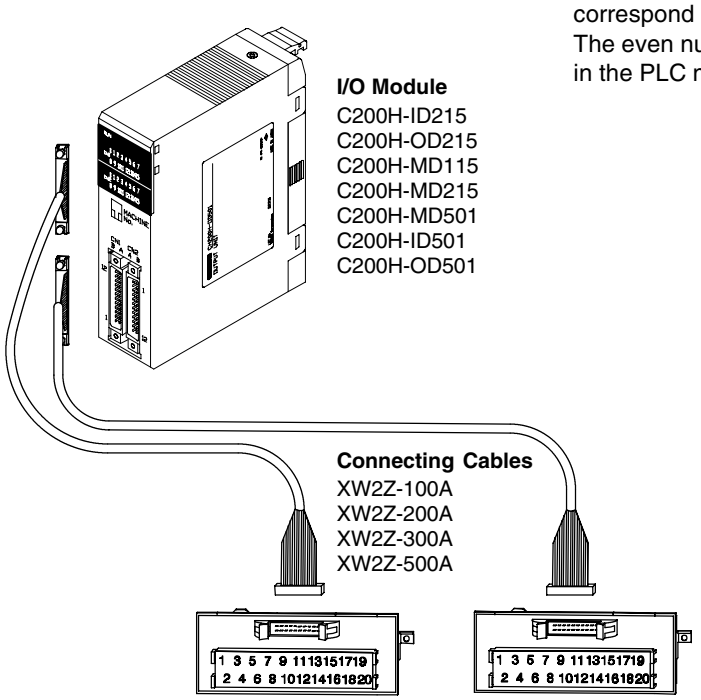
Special 32-point Module

Note The odd numbers on the screw terminals correspond to column A in the PLC module. The even numbers correspond to column B in the PLC module.



I/O Module
C200H-ID215
C200H-OD215
C200H-MD115
C200H-MD215
C200H-MD501
C200H-ID501
C200H-OD501

Connecting Cables
XW2Z-100A
XW2Z-200A
XW2Z-300A
XW2Z-500A

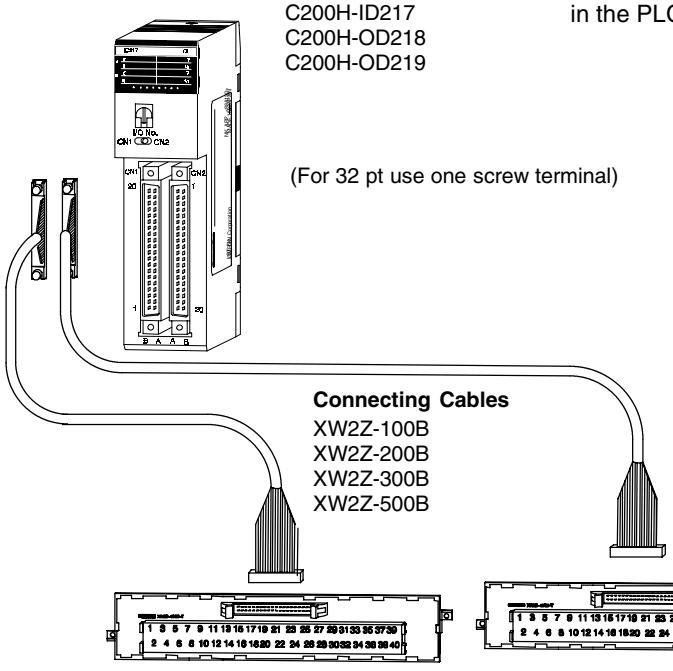
Screw Terminals
XW2B-20G4
XW2B-20G5
XW2B-40G5-T (same as using two XW2B-20G5 Terminals)
XW2B-20G5-D

Group 2
32 and 64-point Module

Note The odd numbers on the screw terminals correspond to column A in the PLC module. The even numbers correspond to column B in the PLC module.

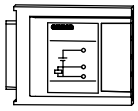
I/O Module
C200H-ID216
C200H-ID217
C200H-OD218
C200H-OD219

(For 32 pt use one screw terminal)

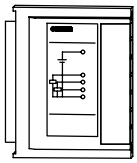


Connecting Cables
XW2Z-100B
XW2Z-200B
XW2Z-300B
XW2Z-500B

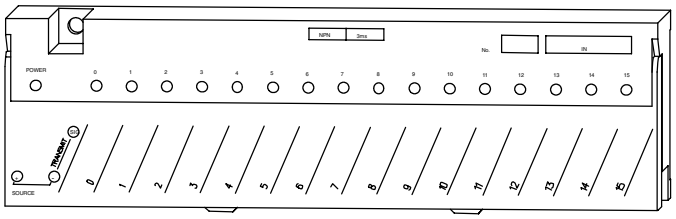
Screw Terminals
XW2B-40G4
XW2B-40G5



B7A-R6A13
B7A-R6A33
B7A-R6A18
B7A-R6A38



B7R-B3A13
B7R-B3A33
B7R-B3A18
B7R-B3A38



B7A-T6A1
B7A-T6B1
B7A-T6A6
B7A-T6B6
B7A-T6C1
B7A-T6C6

General Information

The B7A Output Connectors connect directly to high-density input modules. The connectors communicate to B7A Input Blocks in a remote location by means of two wires. Field input devices are then wired to the input blocks. This reduces wiring between control panels while saving space and wiring time.

Features

- Transmit 16 input signals to high-density input modules over two wires, or 32 input signals over four wires
- Transmission distances of 100 or 500 meters (high-speed I/O delay of 3 ms)
- Both NPN and PNP models available
- LED indicators for easy confirmation of input status
- Small size of 167 mm x 37 mm (6.57 in x 1.45 in) allows installation in small enclosures
- DIN rail or control panel mounting

B7A 16-point Output Connectors

Specifications – Hold Output

Part number	B7A-R6A13	B7A-R6A18
Rated load voltage	5 to 24 VDC	5 to 24 VDC
Rated load current	50 mA max./point	50 mA max./point
Output configuration	NPN open collector	NPN open collector
I/O delay	Normal-speed 19.2 ms	High-speed 3 ms

Specifications – Load OFF

Part number	B7A-R6A33	B7A-R6A38
Rated load voltage	5 to 24 VDC	5 to 24 VDC
Rated load current	50 mA max./point	50 mA max./point
Output configuration	NPN open collector	NPN open collector
I/O delay	Normal-speed 19.2 ms	High-speed 3 ms

All B7A Input Blocks require a 12 to 24 VDC power supply. Omron recommends the S82K family of power supplies. Refer to System Configuration for current consumption and formulas for determining the appropriate power supply requirements.

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B7A 32-point Output Connectors

Specifications – Hold Output

Part number	B7A-R3A13	B7A-R3A18
Rated load voltage	5 to 24 VDC	5 to 24 VDC
Rated load current	50 mA max./point	50 mA max./point
Output configuration	NPN open collector	NPN open collector
I/O delay	Normal-speed 19.2 ms	High-speed 3 ms

Specifications – Load OFF

Part number	B7A-R3A33	B7A-R3A38
Rated load voltage	5 to 24 VDC	5 to 24 VDC
Rated load current	50 mA max./point	50 mA max./point
Output configuration	NPN open collector	NPN open collector
I/O delay	Normal-speed 19.2 ms	High-speed 3 ms

B7A 16-point Input Blocks

Specifications

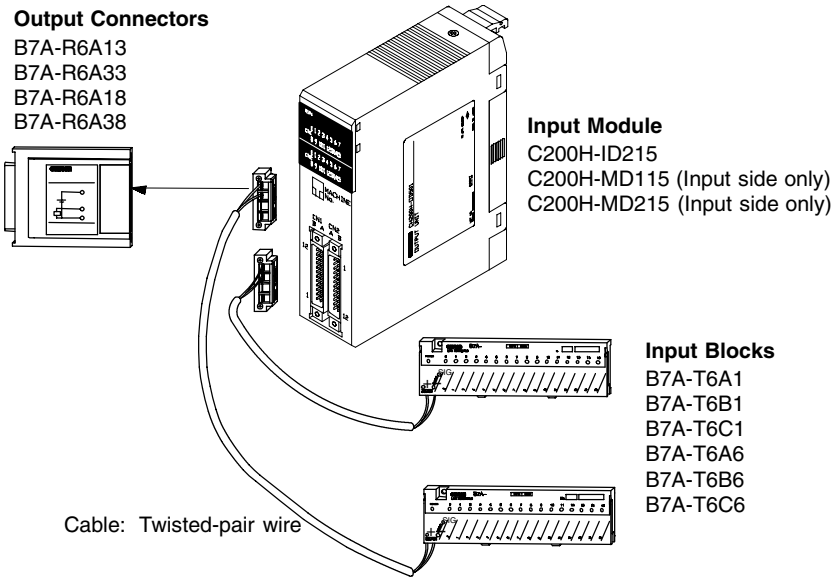
Part number	B7A-T6A1	B7A-T6B1	B7A-T6A6
Input configuration	NPN compatible	NPN compatible	NPN compatible
Input voltage	No-voltage contact, two-wire sensors with DC output, NPN output type	No-voltage contact, two-wire sensors with DC output, NPN output type	No-voltage contact, two-wire sensors with DC output, NPN output type
Input current range	3 to 6 mA	3 to 6 mA	3 to 6 mA
Input voltage range	0 VDC to supply voltage	0 VDC to supply voltage	0 VDC to supply voltage
I/O delay	Normal-speed 19.2 ms	Normal-speed 19.2 ms	High-speed 3 ms
Internal I/O common	– common	± common	– common

Specifications

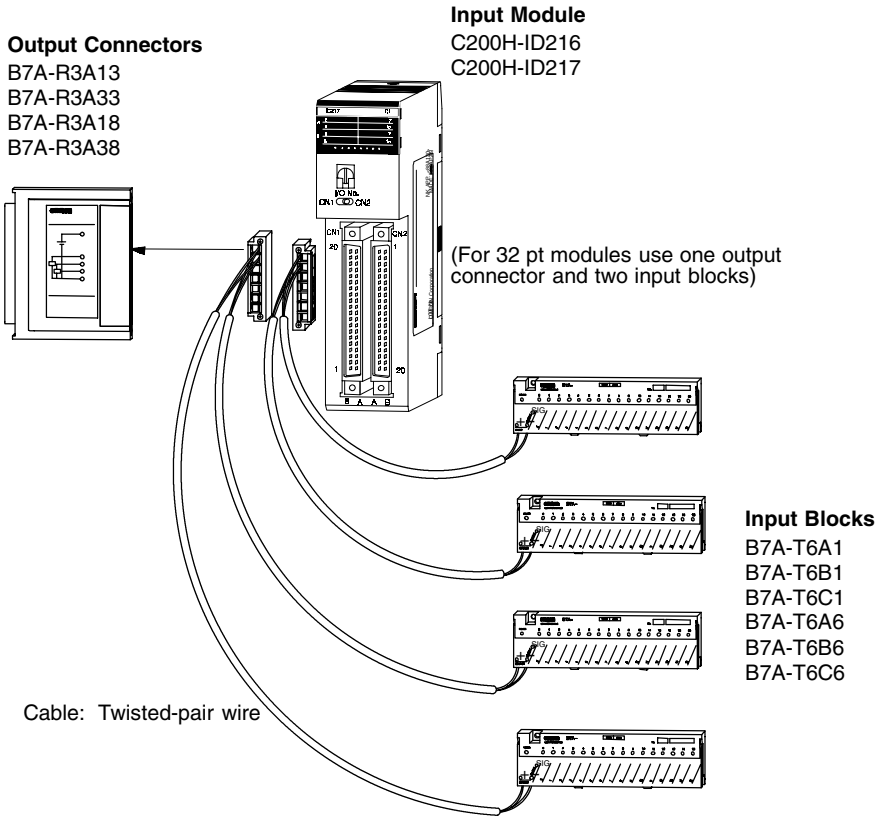
Part number	B7A-T6B6	B7A-T6C1	B7A-T6C6
Input configuration	NPN compatible	PNP compatible	PNP compatible
Input voltage	No-voltage contact, two-wire sensors with DC output, NPN output type	No-voltage contact, two-wire sensors with DC output, PNP output type	No-voltage contact, two-wire sensors with DC output, PNP output type
Input current range	3 to 6 mA	3 to 6 mA	3 to 6 mA
Input voltage range	0 VDC to supply voltage	0 VDC to supply voltage	0 VDC to supply voltage
I/O delay	High-speed 3 ms	Normal-speed 19.2 ms	High-speed 3 ms
Internal I/O common	± common	± common	± common

All B7A Input Blocks require a 24 VDC power supply. Omron recommends the S82K family of power supplies. Refer to Standard Parts for part numbers. Refer to System Configuration for current consumption and formulas for determining the appropriate power supply requirements.

Special 32-point Module

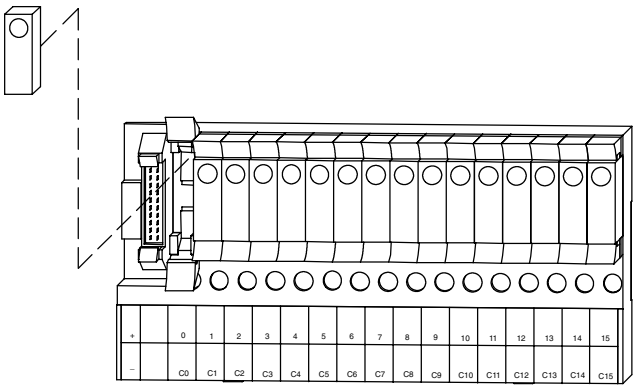


32 and 64-point Modules



Input Wiring Accessories

Removeable
Relay Module



G7TC-I

General Information

Input Blocks connect to Omron's high-density input modules or G71 SYSMAC BUS or wired remote I/O stand-alone slaves. Using the Blocks with High-density Input Modules saves Rack space and reduces total system cost. The Block and Slave combination is a cost effective distributed control system when dealing with a small number of input points at a given location. Both applications provide fully isolated input points.

Features

- Mix and match input modules, either AC or DC relay and SSR
- Blocks available with a wide variety of input voltages 12 VDC, 24 VDC, 110/120 VAC, and 220/240 VAC
- Modules are easily changed for flexibility and servicing
- Built-in surge suppressors and LED indicators
- Mounts easily on DIN Rail

All Remote I/O Blocks require a 24 VDC power supply. Omron recommends the S82K family of power supplies. Refer to System Configuration, for current consumption and formulas for determining the appropriate power supply requirements.

P7TF, G7TC Input Blocks

Specifications

Part number	P7TF-IS16-DC24V	P7TF-IS16-AC110/120V	P7TF-IS16-AC220/240V
No. of points	16	16	16
Input voltage	User-selectable	User-selectable	User-selectable
Supply voltage	24 VDC	24 VDC	24 VDC
Internal circuit	NPN (neg. com.)	NPN (neg. com.)	NPN (neg. com.)
Applicable Input Module part numbers	G7T-1122S-DC24V G3TA-IDZR02S-DC5-24V	G7T-1122S-AC110/120V G3TA-IAZR02S-AC100-240V	G7T-1122S-AC220/240V G3TA-IAZR02S-AC100-240V

Specifications

Part number	G7TC-ID16-DC12V	G7TC-ID16-DC24V	G7TC-IA16-AC110/120V
No. of points	16	16	16
Input voltage	12 VDC	24 VDC	110–120 VAC
Supply voltage	12 VDC	24 VDC	24 VDC
Internal circuit	NPN (neg. com.)	NPN (neg. com.)	NPN (neg. com.)
Input Module part number	G7T-1122S-DC12V	G7T-1122S-DC24V	G7T-1122S-AC110/120V

Specifications

Part number	G7TC-IA16-AC220/240V
No. of points	16
Input voltage	User-selectable
Supply voltage	24 VDC
Internal circuit	NPN (neg. com.)
Input Module part number	G7T-1122S-DC24V

G7T and G3T Relay and SSR Input Modules for G7TC and P7TF Input Blocks

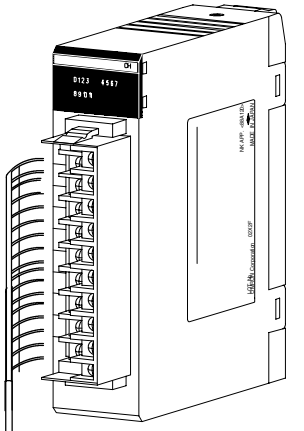
Specifications

Part number	G7T-1122S-DC12V	G7T-1122S-DC24V	G7T-1122S-AC110/120V
Input device	Relay	Relay	Relay
Input voltage	12 VDC	24 VDC	110–120 VAC
Input current	42 mA	21 mA	6.4–7.0 mA
ON time	15 ms	15 ms	15 ms
OFF time	15 ms	15 ms	15 ms

Specifications

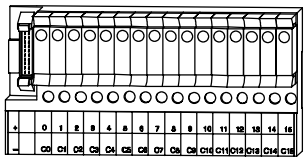
Part number	G7T-1122S-AC220/240V	G3TA-IAZR02S-AC100/240V	G3TA-IDZR02S-DC5-24V
Input device	Relay	Transistor	Transistor
Input voltage	220–240 VAC	100–240 VAC	5–24 VDC
Input current	3.2–3.5 mA	5 mA	5 mA
ON time	15 ms	20 ms	0.5 ms
OFF time	15 ms	20 ms	0.5 ms

16-point Module



Input Module
C200H-ID212
C200H-IM212

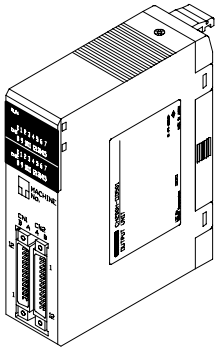
Connecting Cable
G79-Y050C
G79-Y100C
G79-Y150C
G79-Y200C
G79-Y500C



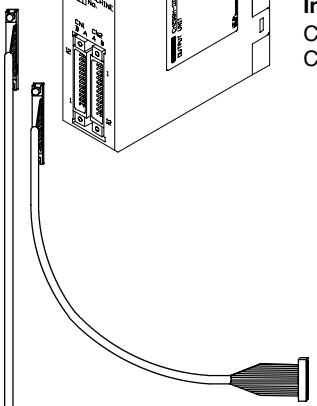
Input Block
G7TC-ID16
G7TC-IA16
P7TF-IS16

Input Wiring Accessories

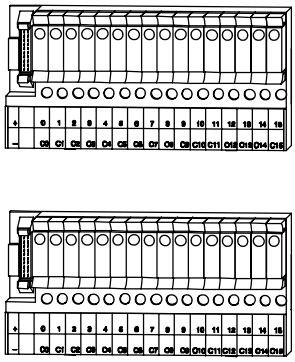
Special 32-point Modules



Input Module
C200H-ID215
C200H-MD215 (Input side only)

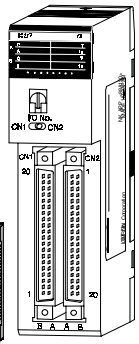


Connecting Cables
G79-100C
G79-150C
G79-200C
G79-300C
G79-500C



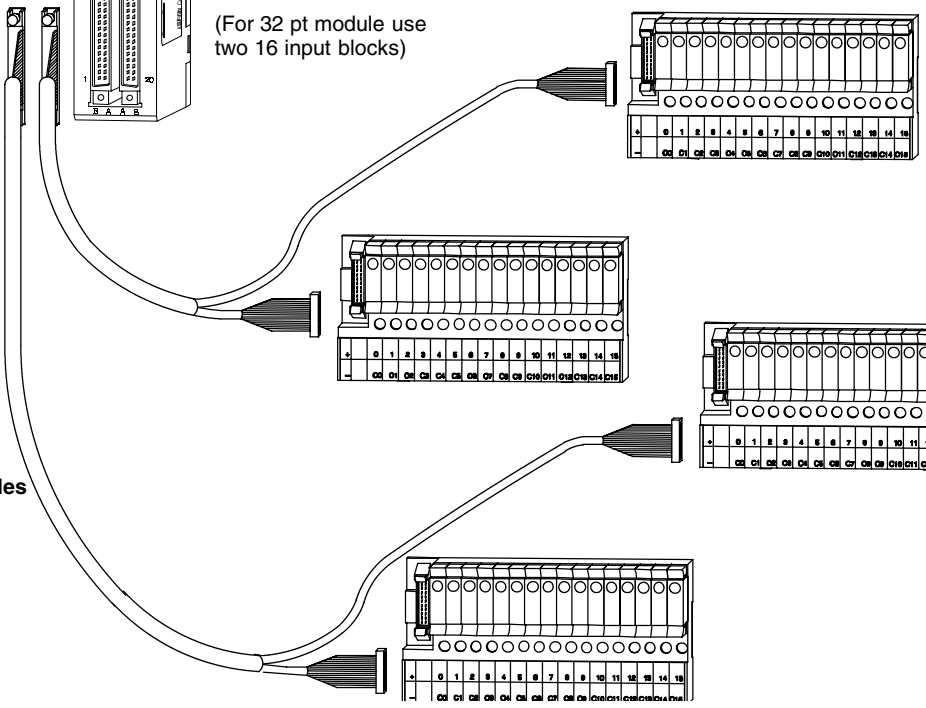
Input Blocks
G7TC-ID16
G7TC-IA16
P7TF-IS16

Group 2 32 and 64-point Modules



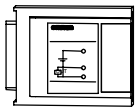
Input Module
C200H-ID216
C200H-ID217

(For 32 pt module use two 16 input blocks)

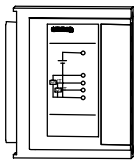


Input Blocks
G7TC-ID16
G7TC-IA16
P7TF-IS16

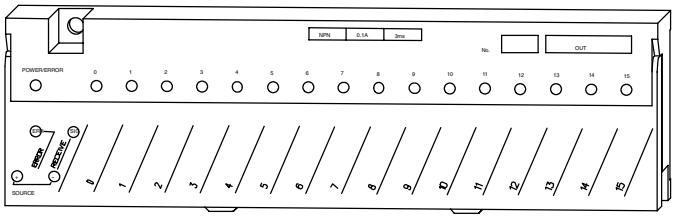
Connecting Cables
G79-I100C-75
G79-I150C-125
G79-I200C-175
G79-I300C-275
G79-I500C-475



B7A-T6E3
B7A-T6E8



B7A-T3E3
B7A-T3E8



B7A-R6B11 B7A-R6C11
B7A-R6B31 B7A-R6C31
B7A-R6B16 B7A-R6C16
B7A-R6B36 B7A-R6C36
B7A-R6F11 B7A-R6G11
B7A-R6F31 B7A-R6G31
B7A-R6F16 B7A-R6G16
B7A-R6F36 B7A-R6G36

General Information

The B7A Input Connectors connect directly to high-density output modules. The connectors communicate to B7A output blocks in a remote location by means of only two wires. Field output devices are then wired to the output blocks. This reduces wiring between control panels while also saving space and wiring time.

1

Features

- Transmit 16 output signals to high-density output modules over two wires, or 32 output signals over four wires.
- Transmission distances of 100 or 500 meters (high-speed I/O delay of 3 ms)
- Rated load of 100 mA, 5 to 24 VDC maximum per point
- Models available with 500 mA maximum per point switching capacity
- Models available with the hold function or load OFF function for signal transmission errors
- LED indicators for easy confirmation of output status and transmission errors
- Small size of 167 x 37 mm (6.57 x 1.45 in.) allows installation in small enclosures
- DIN rail or control panel mounting

B7A 16-Point Input Connectors

Specifications

Part number	B7A-T6E3	B7A-T6E8
Input configuration	NPN compatible	NPN compatible
Input current range	0.6 mA to 1.5 mA	0.6 mA to 1.5 mA
Input voltage range	0 VDC to supply voltage	0 VDC to supply voltage
I/O delay	Normal-speed 19.2 ms	High-speed 3 ms

B7A 32-Point Input Connectors

Specifications

Part number	B7A-T3E3	B7A-T3E8
Input configuration	NPN compatible	NPN compatible
Input current range	0.6 mA to 1.5 mA	0.6 mA to 1.5 mA
Input voltage range	0 VDC to supply voltage	0 VDC to supply voltage
I/O delay	Normal-speed 19.2 ms	High-speed 3 ms

All B7A Output Blocks require a 12- to 24-VDC power supply. Omron recommends the S82K family of power supplies. Refer to System Configuration for current consumption and formulas for determining the appropriate power supply requirements.

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B7A 16-point (100-mA Switching Capacity) Output Blocks

Specifications

Part number	B7A-R6B11	B7A-R6B31	B7A-R6B16
Output configuration	NPN open collector	NPN open collector	NPN open collector
Rated load voltage	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC
Rated load current	100 mA max./point	100 mA max./point	100 mA max./point
I/O delay	Normal-speed 19.2 ms	Normal-speed 19.2 ms	High-speed 3 ms
Internal I/O common	+ common	+ common	+ common
Error processing	Hold	Load OFF	Hold

Specifications

Part number	B7A-R6B36	B7A-R6F11	B7A-R6F31
Output configuration	NPN open collector	PNP open collector	PNP open collector
Rated load voltage	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC
Rated load current	100 mA max./point	100 mA max./point	100 mA max./point
I/O delay	High-speed 3 ms	Normal-speed 19.2 ms	Normal-speed 19.2 ms
Internal I/O common	+ common	– common	– common
Error processing	Load OFF	Hold	Load OFF

Specifications

Part number	B7A-R6F16	B7A-R6F36
Output configuration	PNP open collector	PNP open collector
Rated load voltage	5 to 24 VDC	5 to 24 VDC
Rated load current	100 mA max./point	100 mA max./point
I/O delay	High-speed 3 ms	High-speed 3 ms
Internal I/O common	– common	– common
Error processing	Hold	Load OFF

B7A 16-point (500-mA Switching Capacity) Output Blocks

Specifications

Part number	B7A-R6C11	B7A-R6C31	B7A-R6C16
Output configuration	NPN open collector	NPN open collector	NPN open collector
Rated load voltage	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC
Rated load current	500 mA max./point	500 mA max./point	500 mA max./point
I/O delay	Normal-speed 19.2 ms	Normal-speed 19.2 ms	High-speed 3 ms
Internal I/O common	+ common	+ common	+ common
Error processing	Hold	Load OFF	Hold

Specifications

Part number	B7A-R6C36	B7A-R6G11	B7A-R6G31
Output configuration	NPN open collector	PNP open collector	PNP open collector
Rated load voltage	5 to 24 VDC	5 to 24 VDC	5 to 24 VDC
Rated load current	500 mA max./point	500 mA max./point	500 mA max./point
I/O delay	High-speed 3 ms	Normal-speed 19.2 ms	Normal-speed 19.2 ms
Internal I/O common	+ common	– common	– common
Error processing	Load OFF	Hold	Load OFF

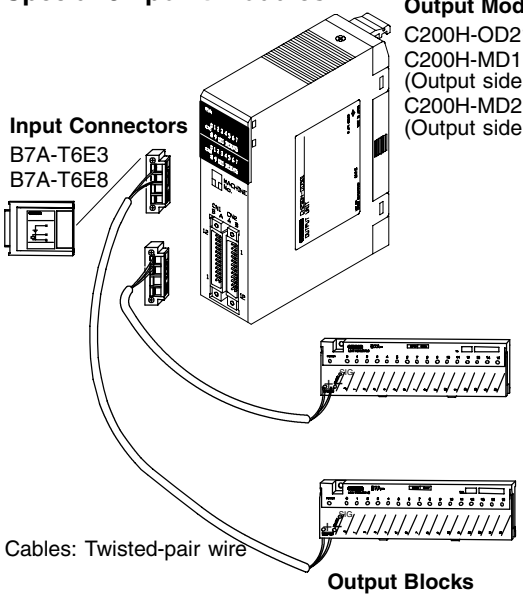
Specifications

Part number	B7A-R6G16	B7A-R6G36
Output configuration	PNP open collector	PNP open collector
Rated load voltage	5 to 24 VDC	5 to 24 VDC
Rated load current	500 mA max./point	500 mA max./point
I/O delay	High-speed 3 ms	High-speed 3 ms
Internal I/O common	– common	– common
Error processing	Hold	Load OFF

Special 32-point Modules

Output Module
C200H-OD215
C200H-MD115
(Output side only)
C200H-MD215
(Output side only)

Input Connectors
B7A-T6E3
B7A-T6E8



Cables: Twisted-pair wire

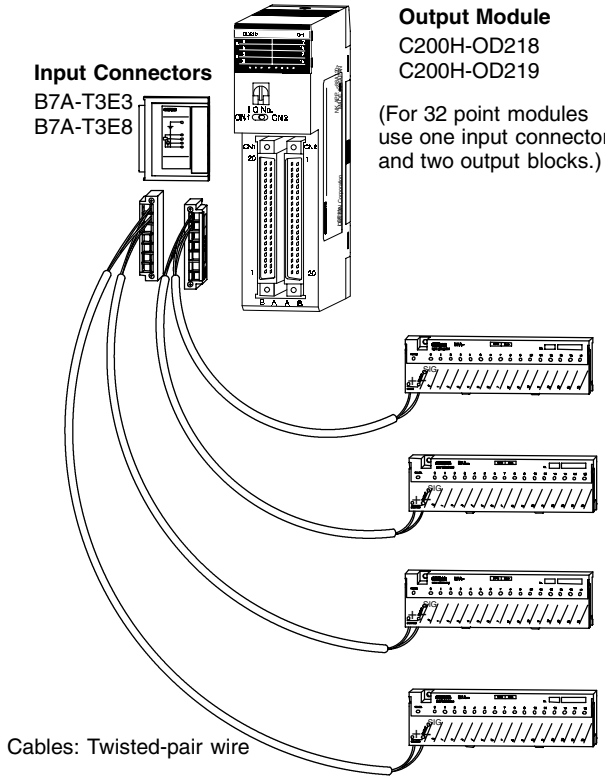
Output Blocks
B7A-R6B11 B7A-R6C11
B7A-R6B31 B7A-R6C31
B7A-R6F11 B7A-R6G11
B7A-R6F31 B7A-R6G31
B7A-R6B16 B7A-R6C16
B7A-R6B36 B7A-R6C36
B7A-R6F16 B7A-R6G16
B7A-R6F36 B7A-R6G36

Group 2
32 and 64-point Modules

Output Module
C200H-OD218
C200H-OD219

(For 32 point modules use one input connector and two output blocks.)

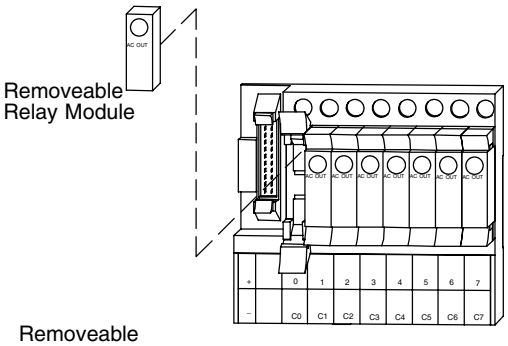
Input Connectors
B7A-T3E3
B7A-T3E8



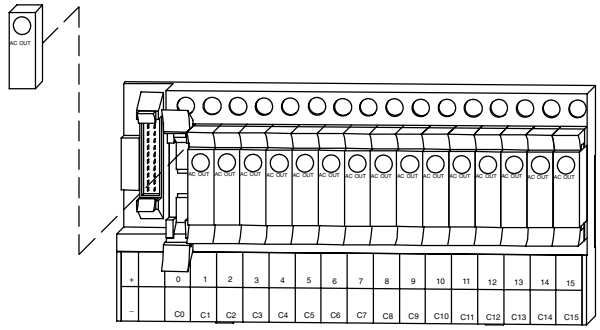
Cables: Twisted-pair wire

Output Blocks
B7A-R6B11 B7A-R6C11
B7A-R6B31 B7A-R6C31
B7A-R6F11 B7A-R6G11
B7A-R6F31 B7A-R6G31
B7A-R6B16 B7A-R6C16
B7A-R6B36 B7A-R6C36
B7A-R6F16 B7A-R6G16
B7A-R6F36 B7A-R6G36

Output Wiring Accessories



G7TC-OC08



G7TC-OC16

General Information

Output blocks connect to Omron's high-density output modules or G71 SYSMAC BUS or wired remote output stand-alone slaves. Using the blocks with high-density output modules saves rack space and reduces total system cost. The block and slave combination is a cost-effective distributed control system when dealing with a small number of output points at a given location. Both applications provide fully isolated output points with large switching capacities.

Features

- 8 and 16-point blocks available
- Mix and match output modules, AC and DC relay or SSR isolated
- 5-A switching capacity
- Modules are easily changed for flexibility and servicing
- Built-in surge suppressers and LED indicators
- Mounts easily on DIN rail

P7TF, G7TC Output Blocks

Specifications

Part number	P7TF-OS16-DC12V	P7TF-OS08-DC12V	P7TF-OS16-DC24V
No. of points	16	8	16
Switching capacity	User-selected	User-selected	User-selected
Current consumption	80 mA, 12 VDC	40 mA, 12 VDC	80 mA, 24 VDC
Internal circuit	NPN (pos. com.)	NPN (pos. com.)	NPN (pos. com.)
Applicable relay module part numbers	G7T-1112S-DC12V G7T-1012S-DC12V	G7T-1112S-DC12V G7T-1012S-DC12V	G7T-1112S-DC24V G7T-1012S-DC24V G3TA-OA202S-DC24V G3TA-ODX02S-DC24V G3TA-OD201S-DC24V

Specifications

Part number	P7TF-OS16-1-DC24V	P7TF-OS08-DC24V	P7TF-OS08-1-DC24V
No. of points	16	8	8
Switching capacity	User-selected	User-selected	User-selected
Current consumption	80 mA, 24 VDC	40 mA, 12 VDC	40 mA, 12 VDC
Internal circuit	PNP (neg. com.)	NPN (pos. com.)	PNP (neg. com.)
Applicable relay module part numbers	G7T-1112S-DC24V G7T-1012S-DC24V G3TA-OA202S-DC24V G3TA-ODX02S-DC24V G3TA-OD201S-DC24V	G7T-1112S-DC24V G7T-1012S-DC24V G3TA-OA202S-DC24V G3TA-ODX02S-DC24V G3TA-OD201S-DC24V	G7T-1112S-DC24V G7T-1012S-DC24V G3TA-OA202S-DC24V G3TA-ODX02S-DC24V G3TA-OD201S-DC24V

Specifications

Part number	G7TC-OC16-DC12V	G7TC-OC16-DC24V	G7TC-OC16-1-DC24V
No. of points	16	16	16
Max. switching current	5 A	5 A	5 A
Max. switching voltage	250 VAC, 125 VDC	250 VAC, 125 VDC	250 VAC, 125 VDC
Max. switching power	12 W, DC; 440 VA, AC	12 W, DC; 440 VA, AC	12 W, DC; 440 VA, AC
Current consumption	752 mA, 12 VDC	416 mA, 24 VDC	416 mA, 24 VDC
Internal circuit	NPN (pos. com.)	NPN (pos. com.)	PNP (neg. com.)
Relay module part number	G7T-1112S-DC12V	G7T-1112S-DC24V	G7T-1112S-DC24V

Specifications

Part number	G7TC-OC08-DC24V	G7TC-OC08-1-DC24V
No. of points	8	8
Max. switching current	5 A	5 A
Max. switching voltage	250 VAC, 125 VDC	250 VAC, 125 VDC
Max. switching power	12 W, DC; 440 VA, AC	12 W, DC; 440 VA, AC
Current consumption	208 mA, 24 VDC	208 mA, 24 VDC
Internal circuit	NPN (pos. com.)	PNP (neg. com.)
Relay module part number	G7T-1112S-DC24V	G7T-1112S-DC24V

G7T and G3TA Relay and SSR Output Modules for G7TC and P7TF Output Blocks

Specifications

Part number	G7T-1112S-DC12V	G7T-1112S-DC24V
Output type	NO Relay	NO Relay
Input voltage	12 VDC	24 VDC
Max. switching current	5 A	5 A
Max. switching voltage	250 VAC, 125 VDC	250 VAC, 125 VDC
Max. switching power	12 W, DC; 440 VA, AC	12 W, DC; 440 VA, AC
ON time	15 ms	15 ms
OFF time	15 ms	15 ms

Specifications

Part number	G7T-1012S-DC12V	G7T-1012S-DC24V
Output type	NC Relay	NC Relay
Input voltage	12 VDC	24 VDC
Max. switching current	5 A	5 A
Max. switching voltage	250 VAC, 125 VDC	250 VAC, 125 VDC
Max. switching power	12 W, DC; 440 VA, AC	12 W, DC; 440 VA, AC
ON time	15 ms	15 ms
OFF time	15 ms	15 ms

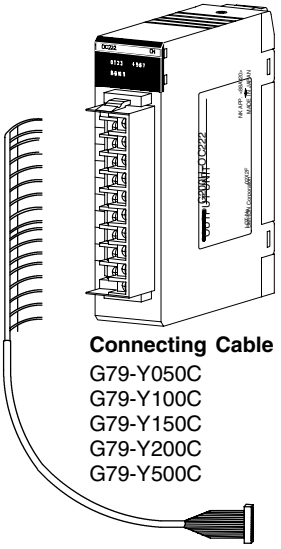
Specifications

Part number	G3TA-ODX02S-DC24V	G3TA-OD201S-DC24V
Output type	Transistor	Transistor
Input voltage	24 VDC	24 VDC
Load current	2 A	40 to 200 VDC
Load voltage	4-60 VDC	1 A
ON time	0.5 ms	2 ms
OFF time	2 ms	2 ms

Specifications

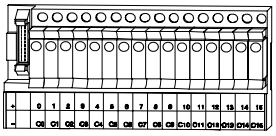
Part number	G3TA-OA202SZ-DC24V
Output type	Triac
Input voltage	24 VDC
Load voltage	2 A
Load current	75 to 264 VDC
ON time	1/2 of power supply cycle + 1 ms
OFF time	1/2 of power supply cycle + 1 ms

16-point Modules



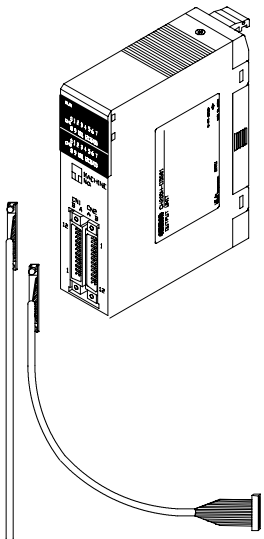
Output Module
C200H-OC225
C200H-OD212

Connecting Cable
G79-Y050C
G79-Y100C
G79-Y150C
G79-Y200C
G79-Y500C



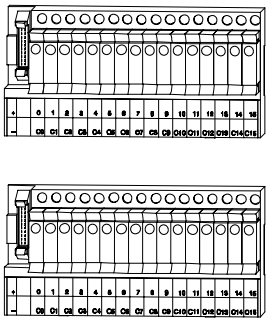
Output Block
G7TC-OC16
P7TF-OS16

32-point Modules



Output Module
C200H-MD115 (Output side only)
C200H-MD215 (Output side only)
C200H-OD215

Connecting Cables
G79-100C G79-300C
G79-150C G79-500C
G79-200C

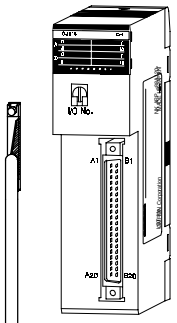


Output Blocks
G7TC-OC16
P7TF-OS16

Output Wiring Accessories

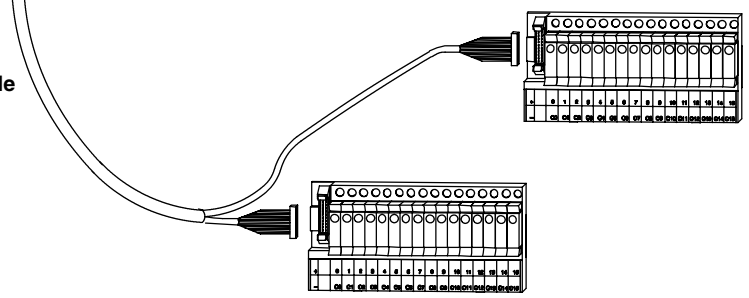
Group 2
32-point Modules
for CPU21/23/31/HS

Output Module
C200H-OD218



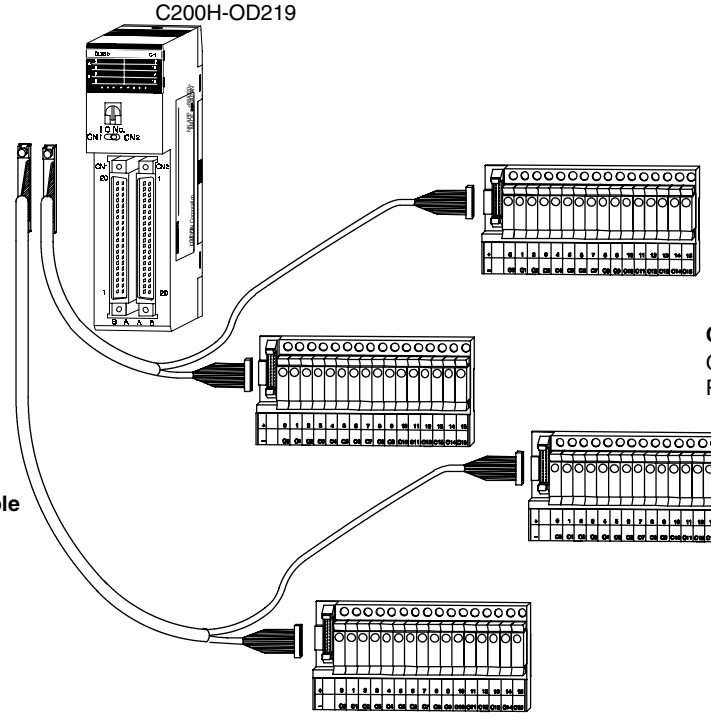
Output Blocks
G7TC-OC16
P7TF-OS16

Connecting Cable
G79-O100C-75
G79-O150C-125
G79-O200C-175
G79-O300C-275
G79-O500C-475



Group2
64-point Modules
for CPU 21/23/31/HS

Output Module
C200H-OD219

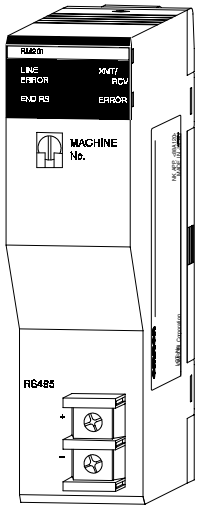


Output Blocks
G7TC-OC16
P7TF-OS16

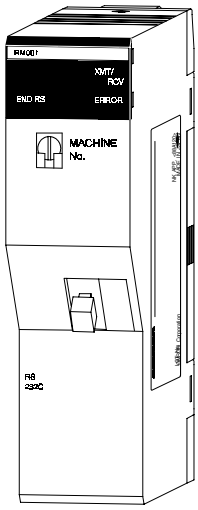
Connecting Cable
G79-O100C-75
G79-O150C-125
G79-O200C-175
G79-O300C-275
G79-O500C-475

SYSMAC BUS Remote Master and Slave Modules

C200H-RM201, C200H-RM001-P
C200H-RT001-P, C200H-RT002-P
C200H-RT201, C200H-RT202



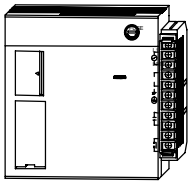
C200H-RM201



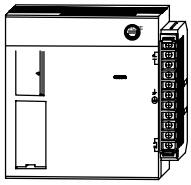
C200H-RM001

SYSMAC BUS Remote Master Modules

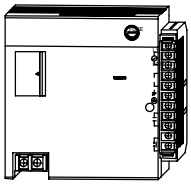
The SYSMAC BUS remote master modules expand the PLC system and provide the communication interface to SYSMAC BUS remote I/O systems. Each remote master module can control several remote expansion racks including C500 remote expansion racks and C200H remote expansion racks. In addition, fiber-optic remote master modules can also control SYSMAC BUS fiber-optic remote I/O blocks. Wired remote master modules can also control SYSMAC BUS wired remote I/O blocks, analog I/O blocks, programmable terminals, and third party devices. Multiple SYSMAC BUS masters can be used in a single PLC. The modules are C200H I/O modules, and can be installed in the CPU rack or local expansion rack.



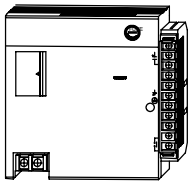
C200H-RT001-P



C200H-RT002-P



C200H-RT201



C200H-RT202

SYSMAC BUS Remote Slave Modules

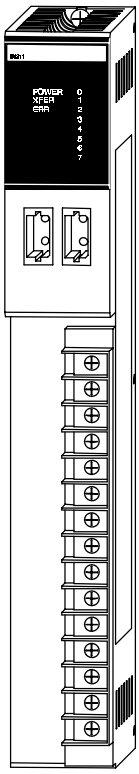
These remote slave modules connect C200H remote expansion racks to the SYSMAC BUS remote master module. Both fiber-optic and twisted pair versions are available. The module mounts in the right-most slot of the remote expansion rack. The power supply is also built-in. Multiple racks can be connected to a single master module.

Remote Master Modules

	Transmission media	Part number
	Fiber-optic cable	**C200H-RM001-P**
	Twisted pair conductor	**C200H-RM201**

Remote Slave/Power Supply Modules

Power Suppy	Transmission media	Part number
120 VAC	Fiber-optic cable	**C200H-RT001-P**
24 VDC	Fiber-optic cable	**C200H-RT002-P**
120 VAC	Twisted pair conductor	**C200H-RT201**
24 VDC	Twisted pair conductor	**C200H-RT202**



General Information

SYSMAC BUS fiber-optic remote I/O blocks can be connected to SYSMAC BUS fiber-optic remote I/O systems to provide a smaller number of I/O points at remote locations. Each SYSMAC BUS fiber-optic remote I/O block provides 8 input or output points.

Features

- Uses standard Omron fiber-optic cables and connectors
- Simple cable configuration and termination in the field

SYSMAC BUS Fiber-optic Remote Input Blocks

Specifications

Part number	3G5A2-ID001-(P)E	3G5A2-IA121-(P)E	3G5A2-IA221-(P)E
Input voltage	No-voltage contacts	100 VAC +10%/-15% 50/60 Hz	200 VAC +10%/-15% 50/60 Hz
Input impedance	—	9.7 kΩ (50 Hz) 8 kΩ (60 Hz)	22 kΩ (50 Hz) 18 kΩ (60 Hz)
Input current	10 mA typical	10 mA typical (at 100 VAC)	10 mA typical (at 100 VAC)
ON delay time	10 ms max.	10 ms max.	10 ms max.
OFF delay time	15 ms max.	15 ms max.	15 ms max.
Number of circuits	8 pts. (per common)	8 pts. (per common)	8 pts. (per common)
ON voltage	—	60 VAC min.	120 VAC min.
OFF voltage	—	20 VAC max.	40 VAC max.
Power supply voltage	120 VAC	120 VAC	120 VAC
Power consumption	25 VA max.	20 VA max.	20 VA max.

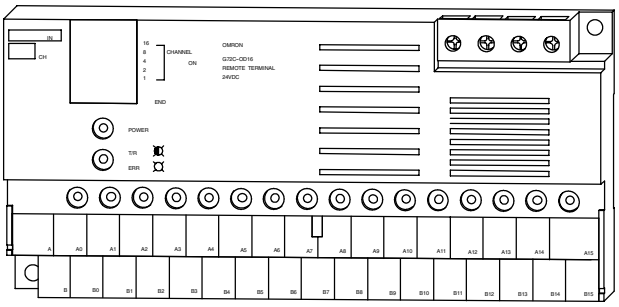
Specifications

Part number	3G5A2-IM211-(P)E
Input voltage	12 to 24 VAC/DC +10%/-15%
Input impedance	1.8 kΩ
Input current	10 mA typical (at 24 VDC)
ON delay time	10 ms max.
OFF delay time	15 ms max.
Number of circuits	8 pts. (per common)
ON voltage	10.2 VDC min.
OFF voltage	3.0 VDC max.
Power supply voltage	120 VAC
Power consumption	20 VA max.

SYSMAC BUS Fiber-optic Remote Output Blocks

Specifications

Part number	3G5A2-OC221-(P)E	3G5A2-OD411-(P)E	3G5A2-OA222-(P)E
Max. switching capacity	Resistive: 2 A, 250 VAC (p.f. = 1) 2 A, 24 VDC Inductive: 0.5 A, 250 VAC (p.f. = 0.4)	0.3 A, 12 to 48 VDC +10%/15%,	1 A, 120/240 VAC +10%/-15%
Min. switching capacity	100 mA, 5 VDC	—	10 mA, 100 VAC
Leakage current	—	100 μA max.	3 mA max. (at 100 VAC)
Saturation voltage	—	1.5 V max.	1.2 V max.
ON delay time	15 ms max.	0.2 ms max.	1 ms max.
OFF delay time	15 ms max.	0.3 ms max.	Max. 1/2 of load frequency
Number of circuits	8 pts. (per common)	8 pts. (per common)	8 pts. (per common)
Service life	Electrical: 300,000 operations (resistive load) 100,000 operations (inductive load) Mechanical: 50,000,000 operations	—	—
Fuse capacity	—	—	250 V, 5 A
Power supply voltage	120/240 VAC	120/240 VAC	120/240 VAC
Power consumption	20 VA max.	20 VA max.	20 VA max.



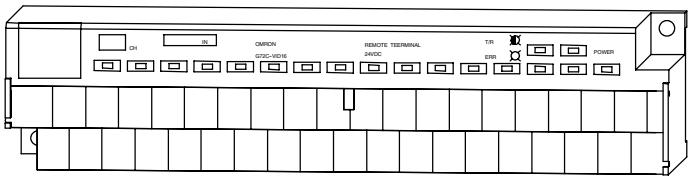
G72C-ID16-DC24V
G72C-OD16-DC24V

General Information

The remote I/O blocks integrate the functions of the remote I/O stand-alone slave and the I/O block. The remote I/O blocks connect to SYSMAC BUS wired remote I/O systems.

Features

- Cost-effective distribution to 16 I/O points
- LED indicators for power, transmission, errors, and I/O status
- DIN Rail or control panel mounting



G72C-VID16-DC24V
G72C-VOC16-DC24V

Specifications – Input

Part number	G72C-ID16-DC24V	G72C-VID16-DC24V
Points	16 (8/com.)	16 (16/com.)
Required supply voltage	200 mA, 24 VDC	200 mA, 24 VDC
Internal circuit	NPN (pos. com.)	NPN (pos. com.)
Device	Transistor	Transistor
Input current	9.7 mA/pt.	9.7 mA/pt.
Input voltage	24 VDC	24 VDC
ON time	1.5 ms	1.5 ms
OFF Time	1.5 ms	1.5 ms

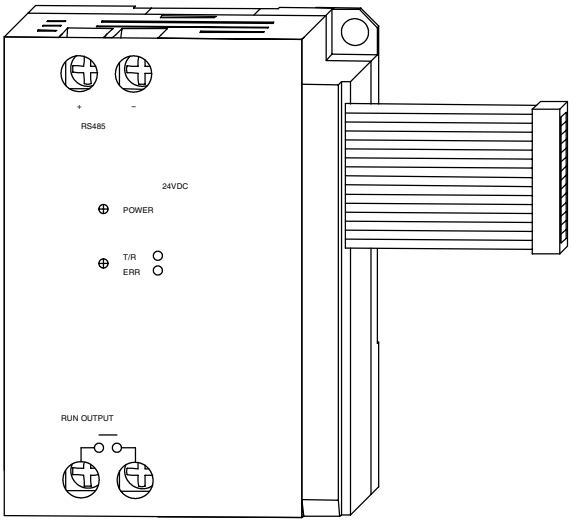
Specifications – Output

Part number	G72C-OD16-DC24V	G72C-VOD16-DC24V
Points	16 (8/com.)	16 (16/com.)
Switching capacity	0.3 A/pt., 24 VDC	0.3 A/pt. (2.4 A total), 24 VDC
Required supply voltage	200 mA, 24 VDC	200 mA, 24 VDC
Internal circuit	NPN (pos. com.)	NPN (neg. com.)
Device	Transistor	Transistor

All Remote I/O Blocks require a 24 VDC power supply. Omron recommends the S82K family of power supplies.

SYSMAC BUS Wired Remote I/O Stand-Alone Slaves

G71



General Information

Remote I/O stand-alone slaves connect to SYSMAC BUS wired remote I/O systems. The remote stand-alone slave connects directly to I/O blocks.

Features

- Remote I/O stand-alone slave and block combinations offer flexible system design
- Compatible with C-series and CV-series PLCs
- Can be located closer to field I/O devices, effectively reducing wiring costs, and lowering the cost of the distributed control system
- LED indicators for power, transmission, and errors
- DIN rail or control panel mounting

Specifications – Input

Part number	G71-IC16-DC24V
Points	16 (8/com.)
Input voltage	24 VDC
Input current	6.7 mA/pt.
ON time	9 ms, max.
OFF time	14.5 ms, max.
ON voltage	15 VDC, max.
OFF voltage	5.6 VDC, max.
Internal circuit	NPN (pos. com.)

Specifications – Output

Part number	G71-OD16-DC24V
Points	16 (8/com.)
Input voltage	24 VDC
Output current	30 mA/pt.
Residual voltage	1.2 V, max.
Leakage current	100 μA, max.
Internal circuit	NPN (neg. com.)

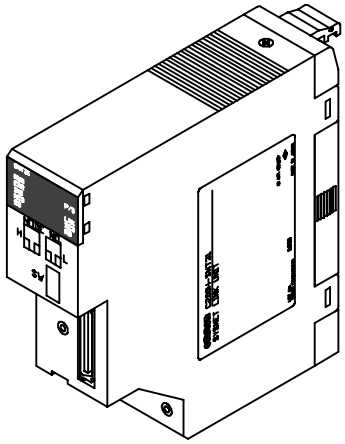
Specifications

Part number	G71-IC16-DC24V	G71-OD16-DC24V
Applicable I/O Blocks	G7TC-IA16, G7TC-ID16, P7TF-IS16	G7TC-OC16, G7TC-OC08, P7TF-OS16, P7TF-OS08

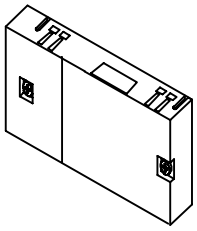
All Remote I/O blocks require a 24 VDC power supply. Omron recommends the S82K family of power supplies.

SYSMAC NET Interface Module

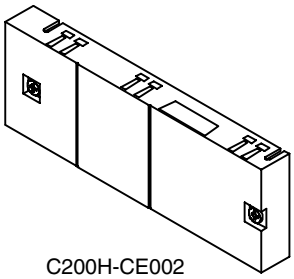
C200HS-SNT32



C200HS-SNT32



C200H-CE001



C200H-CE002

General Information

The C200HS-SNT32 SYSMAC NET interface module connects the PLC to Omron's fiber-optic token ring LAN. A direct connection to the dual media, automatic loopback fiber-optic network is provided on the front of the module. An external power supply connection provides a pass through communications option in case of PLC or module failure.

Features

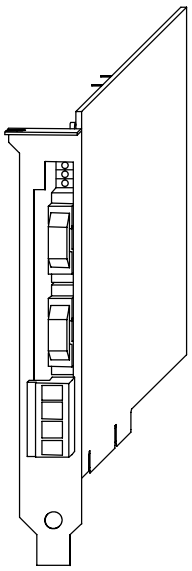
- Direct fiber-optic dual media connection in a single module
- External indicators for operating mode and diagnostics
- External power supply connection for pass through communications

Specifications

Part number	C200HS-SNT32
Number of modules per PLC	2 maximum with C200H-CPU31-E or C200HS-CPU31-E
Module mounting location	rack, right two slots
Module type	Special I/O module
Communication styles Datagram service Data link	SEND, RECEIVE Automatic peer-to-peer
Datagram size	2k bytes maximum per command
Data link size	3,854 words maximum
SYSMAC NET connection	Two Omron S3200-COCH62M fiber-optic connectors
Fiber-optic cable	Omron HPCF, PCF
External rotary switches	Set unit address and node address
External indicators	RUN, power supply, error, communication detect, data
RAS (reliability, assurance, safety) functions:	Automatic loopback, node bypass (with external power supply), internode tests, watchdog timer, CRCCITT error detection, error log
Required connectors	One module: C200H-CE001; two modules: C200H-CE002
Manual	W114
	Refer to this catalog for information about SYSMAC NET fiber-optic token ring LAN and the network functionality, performance, and configuration.

SYSMAC NET Network Support Board

S3200-NSB11-E



S3200-NSB11-E

General Information

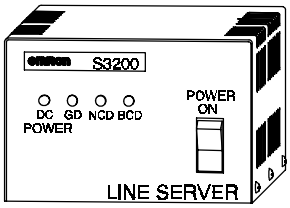
The S3200-NSB11-E network support board is an ISA bus computer interface card for SYSMAC NET. The network support board provides high-speed, high-capacity communications between computers linked to a SYSMAC NET network and the PLCs on that network. The board can be used as a high-speed interface for third party software allowing communications at speeds more than one hundred times faster than average serial communication. Fiber-optic communications allow high noise immunity and reliable transfer of data between PLCs and computers.

Features

- High-speed data transfer between PLCs and personal computers
- Redundant fiber-optic communications - 2 independent loops
- Automatic loopback

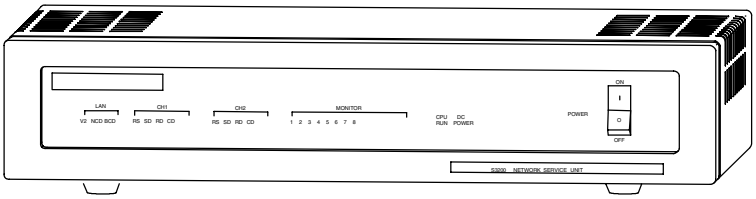
Specifications

Part number	S3200-NSB11-E
Data transmission speed	2 Mbps
Distance between nodes	1 km max.
Number of nodes	126 per network
Message length	2 K bytes maximum per message
Bus type	ISA (IBM PC/AT)
Media	200 micron fiber-optic cable
Number of boards per computer	One
External connection	External back-up power source



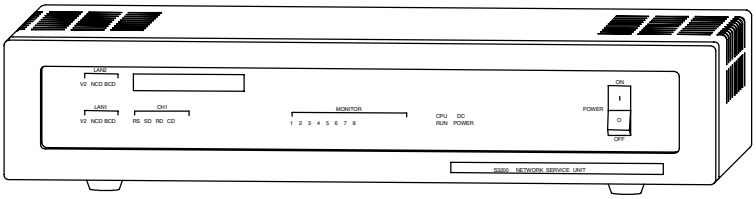
Line Server: S3200-LSU03-01E

The S3200-LSU03-01E Line Server is responsible for monitoring the health of the network. The line server provides the token and maintains the network, and coordinates the loopback functionality of the SYSMAC NET network. Additional line servers used as repeaters in situations where distances greater than 1 km are required.



Network Service Unit: S3200-NSUA1-00E

The S3200-NSUA1-00E Network Service Unit is used to connect serial communication devices to the SYSMAC NET network. The unit converts between serial and fiber-optic signals, allowing intelligent devices such as mainframe computers, robots, CNC machines, or bar code systems access to other devices on the network. The unit is available with two RS-232C ports or one RS-232C and one RS-422 port. Synchronous or asynchronous communication may be selected at speeds of 1200 to 9600 baud.

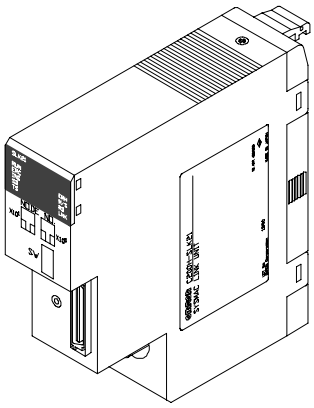


Local Bridge: S3200-NSUG4-00E

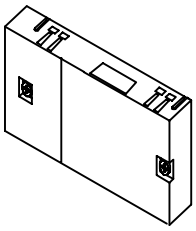
The S3200-NSUG4-00E Local Bridge is used to inter-connect two individual SYSMAC NET loops. The bridge allows nodes on separate SYSMAC NET loops to communicate. Each loop can support up to twenty bridges.

SYSMAC LINK Fiber-optic Module

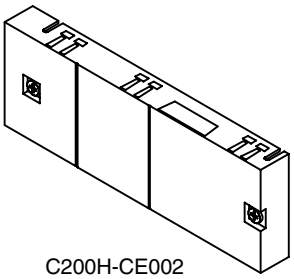
C200HS-SLK12



C200HS-SLK12



C200H-CE001



C200H-CE002

General Information

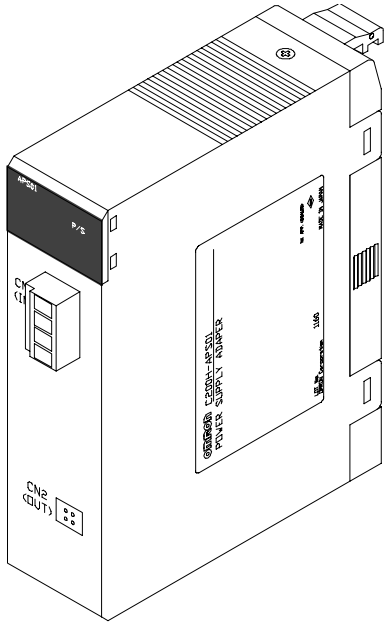
The C200HS-SLK12 SYSMAC LINK fiber-optic module connects the PLC to the SYSMAC LINK fiber-optic token bus peer-to-peer communications network. An external power supply option provides direct pass-through communications in case of module or PLC failure.

Features

- Direct fiber-optic connection
- Back-up power supply connection for pass-through communications
- Token bus with floating master for reliability and network integrity
- External indicators for operating mode and diagnostics

Specifications

Part number	C200HS-SLK12
Number of modules per PLC	2 maximum with C200H-CPU31-E or C200HS-CPU31-E (including co-axial and fiber-optic modules)
Module mounting location	CPU rack, right two slots
Module type	Special I/O Module
Communication styles CPU bus link bits Data read/write Automatic and manual data link	 Error, set up, status, and error indication SEND, RECEIVE, DELIVER commands Peer-to-peer
Data read/write size	512 bytes maximum per command
Data link size	2,966 words per network 918 words with a C200H connected
Data link words per node	254 CIO and 254 DM words maximum
SYSMAC LINK connection	2 - Omron S3200-COCF2011 Fiber-optic Connectors
External rotary switches	Set unit address and node address
External indicators	RUN, power supply, communication error, PLC error, communication detect, polling Module, transfer, receive, test, Data Link
External connector	RJ11 for C1000H-APS01 Auxiliary Power Supply
RAS (reliability, assurance, safety) functions	Automatic polling Module backup, self diagnostics, watchdog timer, CRCCITT error detection, error log
Required connectors	One module: C200H-CE001; two modules: C200H-CE002
Manual	W174
	Refer to this catalog for information about SYSMAC LINK Token Bus functionality, performance, and configuration.



C200H-APS01

General Information

The C200H-APS01 auxilliary power supply provides back-up power to the SYSMAC LINK fiber-optic interface module in case of module or PLC failure. The power supply provides pass-through communications capability allowing the rest of the Network to function normally.

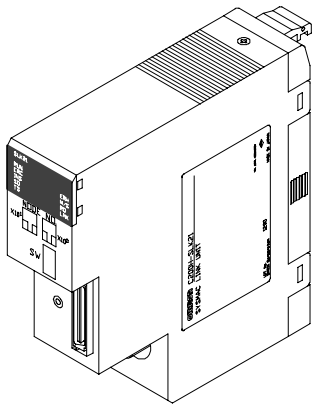
Features

- Provides an auxilliary power source for two SYSMAC LINK fiber-optic modules
- Provides pass-through communications for added reliability
- Ready-made cables for easy connection to the SYSMAC LINK modules

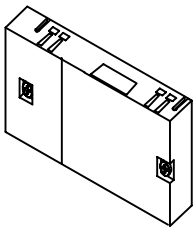
Specifications

Part number	**C200H-APS01**
Number of modules supported	Two fiber-optic SYSMAC LINK
Input voltage	100 to 120 or 200 to 240 VAC
Operating voltage range	85 to 132 or 170 to 264 VAC
External connections	Back-up AC power terminals, 2 power supplies
External indicators	Power supply indicator lit when AC power is supplied
Cable	RJ11 from power supply to C200H-SLK11; two included
Mounting location	Power supply mounted next to SLK11 module
Manual	W212

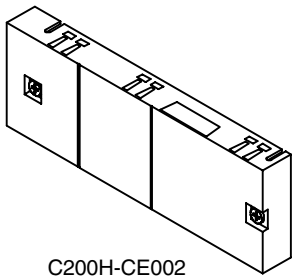
SYSMAC LINK Co-axial Module
C200HS-SLK22



C200HS-SLK22



C200H-CE001



C200H-CE002

General Information

The C200HS-SLK22 SYSMAC LINK module connects the PLC to the SYSMAC LINK token bus peer-to-peer communications network. A pass through coaxial cable connection is provided on the front of the module.

Features

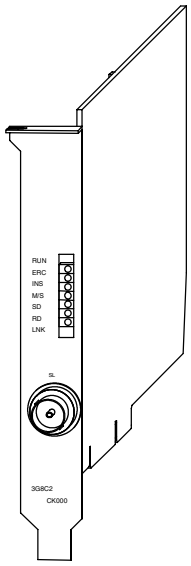
- Co-axial cable pass-through connection
- Token Bus with floating master provides network integrity and reliability
- External indicators for operating mode and diagnostics

Specifications

Part number	C200HS-SLK22
Number of modules per PLC	2 maximum with C200H-CPU31-E or C200HS-CPU31-E (including co-axial and fiber-optic modules)
Module mounting location	CPU rack
Module type	Special I/O module
Communication styles CPU bus link bits Data read/write Automatic and manual data link	 Error, set up, status, and error indication SEND, RECEIVE, DELIVER commands peer-to-peer
Data read/write size	512 bytes maximum per command
Data link size	2,966 words per network 918 words with a C200H connected
Data link words per node	254 CIO and 254 DM words maximum
SYSMAC LINK connection	BNC coaxial connectors to Omron F connector
External rotary switches	Set unit address and node address
External indicators	RUN, power supply, communication error, PLC error, communication detect, polling module, transfer, receive, test, data link
RAS (reliability, assurance safety) functions	Automatic polling module backup, self diagnostics, watchdog timer, CRCCITT error
Required connectors	One module: C200H-CE001; two modules: C200H-CE002
Manual	W174
	Refer to this catalog for information about SYSMAC LINK Token Bus functionality, performance, and configuration.

SYSMAC LINK Co-Axial Network Support Board

3G8F5-SLK21-E



3G8F5-SLK21-E

General Information

The 3G8F5-SLK21-E SYSMAC LINK support board is an ISA bus computer interface card for SYSMAC LINK. The board provides high-speed, high-capacity communications between computers linked to a SYSMAC LINK network and the PLCs on that network. The board can be used as a high-speed interface for third party software allowing communications at speeds more than one hundred times faster than average serial communication.

Features

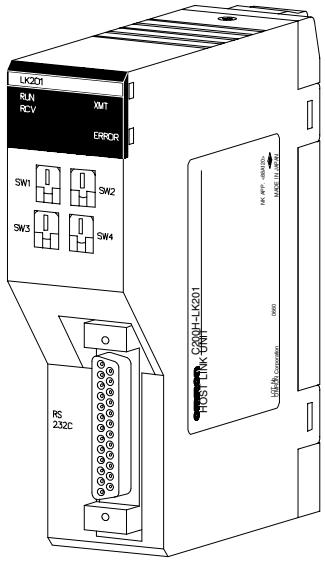
- High-speed data transfer between PLCs and personal computers
- Distributed control with data link

Specifications

Part number	3G8F5-SLK21-E
Data transmission speed	2 Mbps
Message length	512 bytes max.
Media	Co-axial cable
Bus type	ISA (IBM PC/AT)
Data link words	2966 words max., 918 max. with C200H in Data Link
Link functions	Data Link read/write service

SYSMAC WAY Host Link Module

C200H-LK101-PV1, C200H-LK201-V1, C200H-LK202-V1



C200H-LK201-V1

General Information

Host Link allows any computer to communicate to a single (RS-232C), or multiple (RS-422) Omron PLCs. Multiple system levels can be connected to the same PLC with up to 32 PLCs connected to one computer. Omron's Host Link protocol is well-defined and available for custom software driver development and operator interface connection to Omron PLCs. Most major operator interface companies have Host Link interfaces and drivers available. Host Link systems allow using Omron's Ladder Support Software (LSS) to program and monitor any PLC in the system.

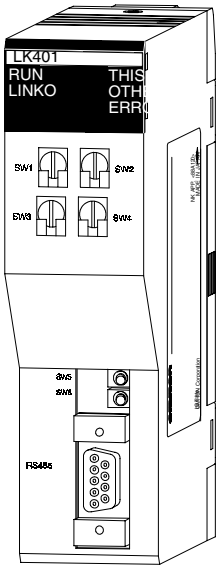
The Host Link protocol is common to all Omron PLCs including the C20, K-type, Block-style H-type, CQM1, C200H, C1000H, C2000H, and CV-series PLCs.

Features

- Up to 32 PLCs can be connected to a single host computer
- Twisted pair or fiber-optic transmission media

Specifications

Number of modules per PLC	2 max.
Module mounting location	CPU rack or expansion rack
Module type	Special I/O module
Communication ports	1 RS-232C, 25 pin female (C200H-LK201) 1 RS-422 (C200H-LK202) 1 fiber port (C200H-LK101-P)
Communication method	Half or full duplex
Band rate	300, 600,1200, 2400, 4800, 9600, 19,200 or 38,400 bps (switch-selectable)
Stop bits	1 or 2
Parity	Even, odd
Data bits	ASCII (7 bits) or JIS (8 bits)
CT's signal control	X on X off control
Retry on interrupted transmission	Transmission delay time setting 0 to 510 ms
Front panel indicators	Run, error, send, receive
Manual	W143



C200H-LK401

General Information

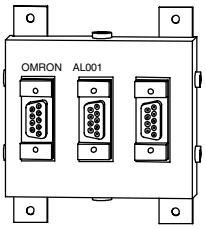
PC Link is a peer-to-peer communication system allowing high-speed transfer of data between PLCs over long distances. Both small and large rack PLCs can be connected to the same system. Standard link adapters are available for fiber-optic media and longer transmission distances. No special programming is required to transfer data and multi-level systems can be connected to a single PLC.

Features

- High-speed data transfer between up to 32 PLCs
- No special programming required
- Muti-level capability

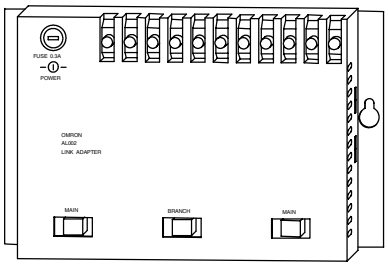
Specifications

Part number	**C200H-LK401**					
Communication method	Peer-to-peer					
Network topology	Multi-drop using Omron link adapters					
Number of nodes	PLC of polling link	Single-level		Multilevel		
	C200H, C1000H, C2000H	32		16		
	C500	8		8		
Transimission media	Twisted pair; fiber-optic when using Omron link adapters					
Distance	500 m (1640 ft) total cable length (without fiber-optic links), including branch lines Distances can be extended using link adapters					
Transmission speed	128 kbps					
Protocol	Omron PC Link, RS-485					
PLC interfaces	C200H, C500, C1000H, C2000H					
Data transfer capacity (bits/node)	PLC of polling link	2 links	3–4 links	5–8 links	9–16 links	17–32 links
	C200H, C1000H, C2000H	512	256	128	64	32
	C500	256	128	64	—	—
Diagnostic functions	CPU watchdog timer, CRC transmission error check					
Manual	W135					



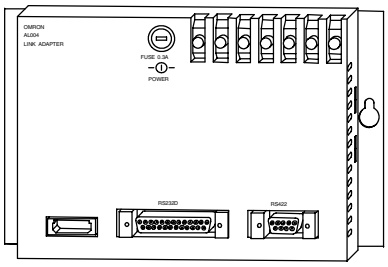
3G2A9-AL001

The 3G2A9-AL001 Link Adapter is used to branch cable for RS-422 cable drops to linkable modules. This adapter can be used for SYSMAC WAY Host Link or any other linkable modules.



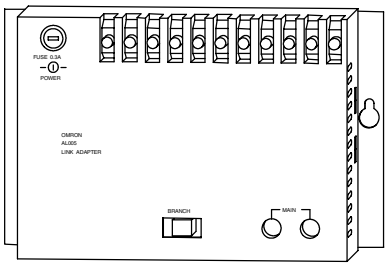
3G2A9-AL002-E/AL002-PE

The 3G2A9-AL002 Link Adapters are used to branch for drops to linkable PLC Modules using fiber-optic cable.



3G2A9-AL004-E/AL004-PE

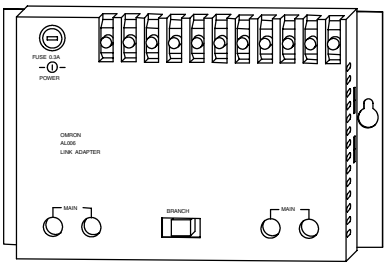
The 3G2A9-AL004 Link Adapters are used to convert RS-232C or RS-422 to fiber-optic cable. This adapter can be used to convert an RS-232C port from a computer to RS-422 or fiber-optic cable.



3G2A9-AL005-E/AL005-PE

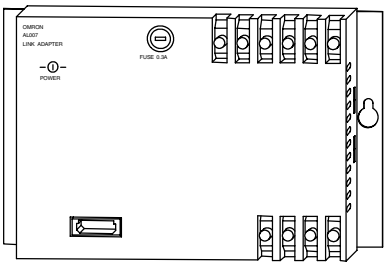
The 3G2A9-AL005 Link Adapters are used to convert between plastic fiber-optic Cable (APF or PCF) and glass crystal fiber-optic cable (AGF).

Link Adapters



3G2A9-AL006-E/AL006-PE

The 3G2A9-AL006 Link Adapters are used to convert between plastic fiber-optic Cable (APF or PCF) and glass crystal fiber-optic cable. The adapter also has an extra branch for a glass crystal fiber-optic cable drop.



B500-AL007-P

The B500-AL007-P Link Adapter is used to convert between fiber-optic cable and RS-485. This adapter is used for SYSMAC BUS wired remote I/O systems only.

9 System Configuration

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System Configuration

General Information

The System Configuration section describes the various PLC system configurations possible and assists in selecting the necessary components to complete a required parts list. Specific details about configuring PLC systems are described throughout the section. System Configuration Worksheets have also been provided to simplify the configuration and parts selection. Some basic control system application information is required in order to select the proper components.

- Number of I/O
- Type of I/O: discrete, analog, special I/O, interrupt and communications
- Distribution of I/O: Local or remote I/O requirements, location of I/O and number of I/O required at each location
- Communication system requirements
- Man-machine interface requirements

There are several system configurations that are possible with the C200H system. The following paragraphs briefly describe the types of possible C200H system configurations.

Additional configuration and technical information can be found in the detailed product manuals. Refer to Section 6 of this catalog for a list of publications.

Local I/O Systems

Local I/O System configurations are designed to accommodate large amounts of I/O that are located within 12 meters (39 ft.) of the CPU Rack. The CPU rack can be expanded with two additional racks to accommodate large amounts of I/O. Several different configurations are possible depending on the distance and I/O requirements of the system.

- CPU Rack only
- CPU Rack and Local Expansion Racks

Remote I/O Systems

Remote I/O systems are used in applications requiring I/O to be located at long distances from the CPU. In a C200H system, remote I/O are counted separately from local I/O, allowing expansion up to 512 remote I/O points. Multiple remote I/O systems can be added to a single PLC for additional configuration flexibility. These systems are available in fiber-optic and wired (twisted pair) versions. This section includes configuration information for the following:

- SYSMAC BUS Fiber-optic Remote I/O System
- SYSMAC BUS Wired Remote I/O System

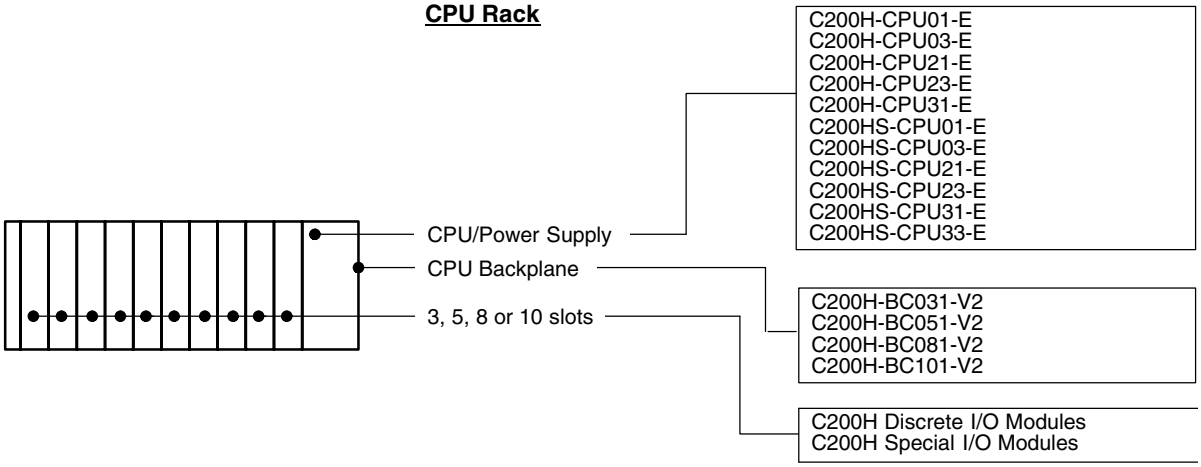
General Information

The following configurations describe the guidelines for building a system from the components listed in the Standard Parts section.

Features

- 3-, 5-, 8-, or 10-slot CPU racks
- CPUs with 120/240 VAC or 24 VDC power supplies
- RAM, EPROM, or EEPROM memory available
- 3-, 5-, 8-, or 10-slot expansion I/O racks
- Up to two local expansion I/O racks can be added with I/O connecting cables for a maximum of 880 I/O

CPU Rack

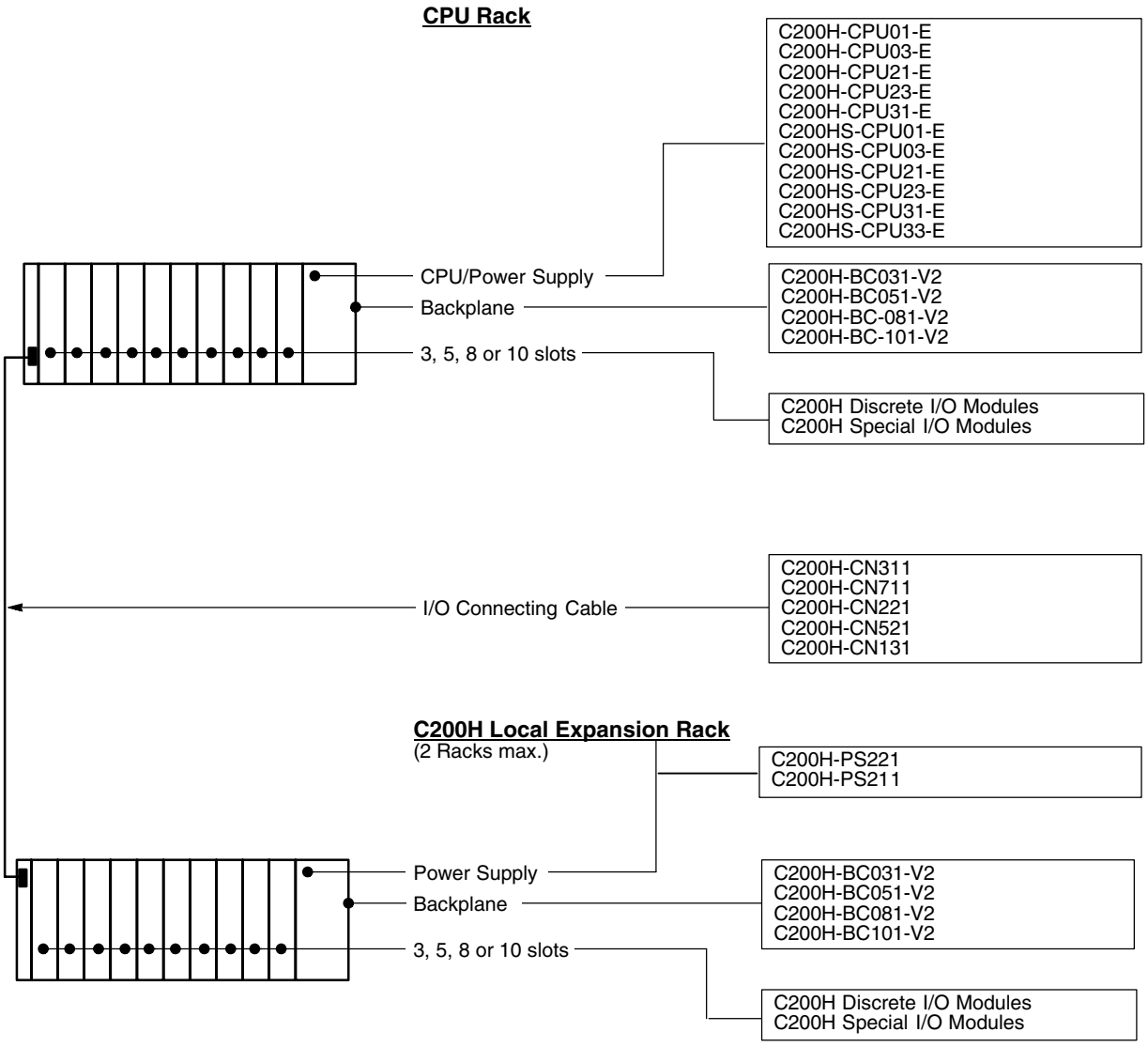


2

General Information

Use this configuration when:

- Connecting up to 2 local expansion racks.
- Up to 880 local remote I/O are allowed.



Configuring C200H Remote I/O Systems

There are a number of guidelines to be followed when configuring remote I/O for a C200H PLC system. Because Omron offers a true family of PLCs, C200H can use expansion I/O racks and I/O modules from C500 large-rack style PLC's as well as C200H style racks and I/O modules. Two SYSMAC BUS fiber-optic or wired remote I/O systems can be added to a C200H PLC. The following tables provide guidelines and limits that must be considered when adding remote I/O systems to a PLC.

SYSMAC BUS Remote I/O System

Multiple SYSMAC BUS remote I/O systems can be added to a C200H PLC. These general guidelines must be followed:

Max. masters per PLC	2 fiber or wired
Max. remote expansion racks per master	5 (5 remote racks per PLC max., regardless of number of masters)
Max. I/O points (words) per master	512 (32 words)
Max. points per PLC	512
Distances	Wire: 200 m (656 ft.) total distance APF Fiber: 20 m (65 ft.) between nodes PCF Fiber 200 m (656 ft.) between nodes HPCF Fiber 100 m (328 ft.) between nodes

Configurations

The following pages provide additional configuration information for:

- SYSMAC BUS fiber-optic remote I/O systems
- SYSMAC BUS wired remote I/O systems

For additional information regarding configuring, extended distances, addresses and general information, refer to the following manual:

SYSMAC BUS Remote I/O Manual	W120

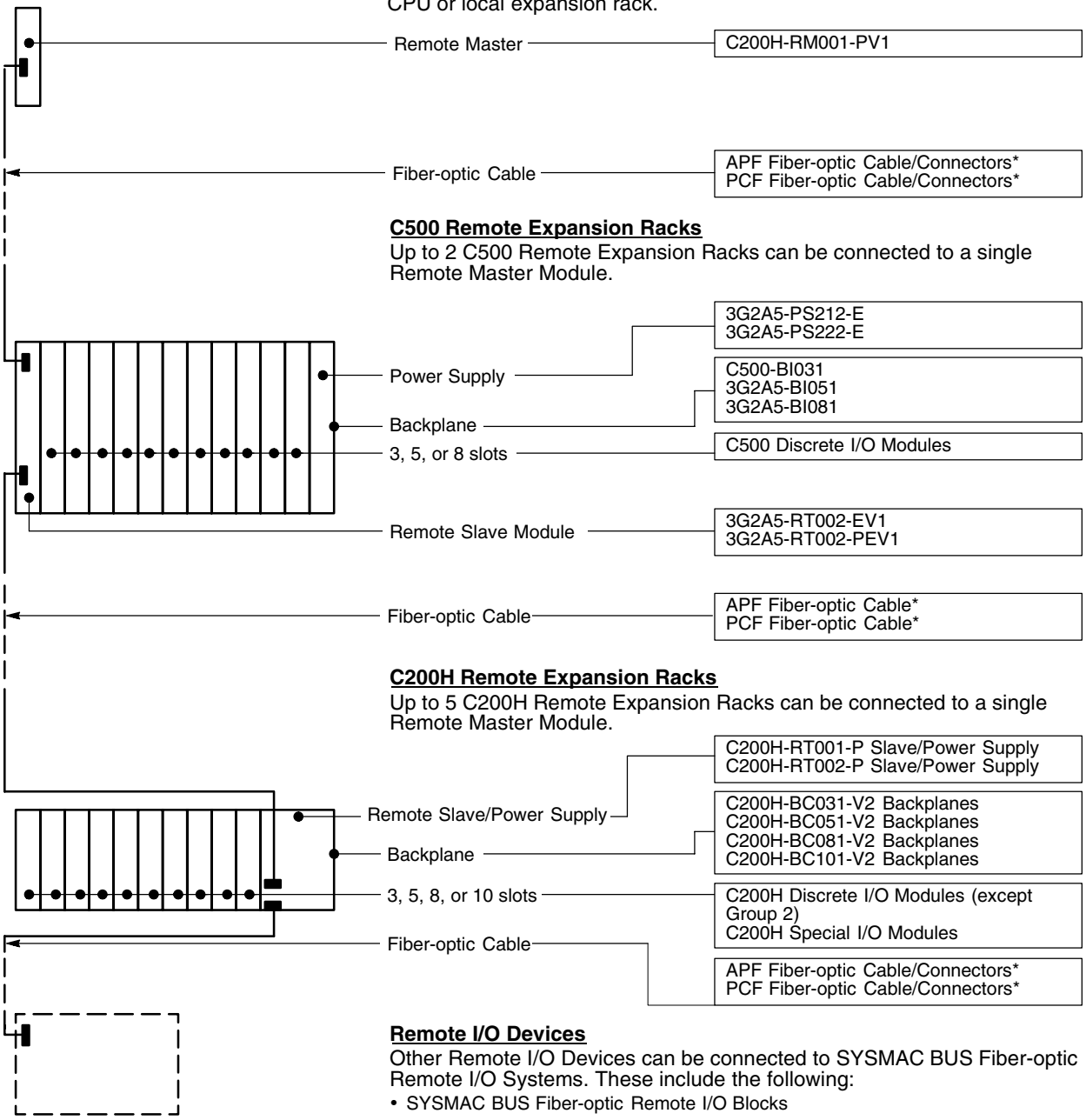
2

General Information

The following information can be used to configure SYSMAC BUS fiber-optic remote I/O systems connected to a PLC. Multiple remote I/O systems may be added to a single PLC. A fiber-optic remote I/O system consists of a remote master module, remote expansion racks, and Remote I/O devices, and fiber-optic cable and connectors.

Remote Master Module

Each remote I/O subsystem has a master module that is mounted in the CPU or local expansion rack.



Remote I/O Devices

Other Remote I/O Devices can be connected to SYSMAC BUS Fiber-optic Remote I/O Systems. These include the following:

- SYSMAC BUS Fiber-optic Remote I/O Blocks

Configuring SYSMAC BUS Fiber-optic Remote I/O Systems

When Configuring a SYSMAC BUS fiber-optic remote I/O system:

- A total of 32 words (512 bits) can be connected to a single Remote master.
- The following table indicates the number of I/O allowed for each Remote expansion rack and I/O device.

	No. of words	No. of I/O points
C500 Remote Expansion Racks	Depends on I/O Modules mounted*	
C200H Remote Expansion Racks	Depends on I/O Modules mounted*	
Fiber-optic Remote I/O Blocks	1 (0.5)*	8

*Refer to the SYSMAC BUS Remote I/O System Manual (Cat. No. W120) for additional configuration information.

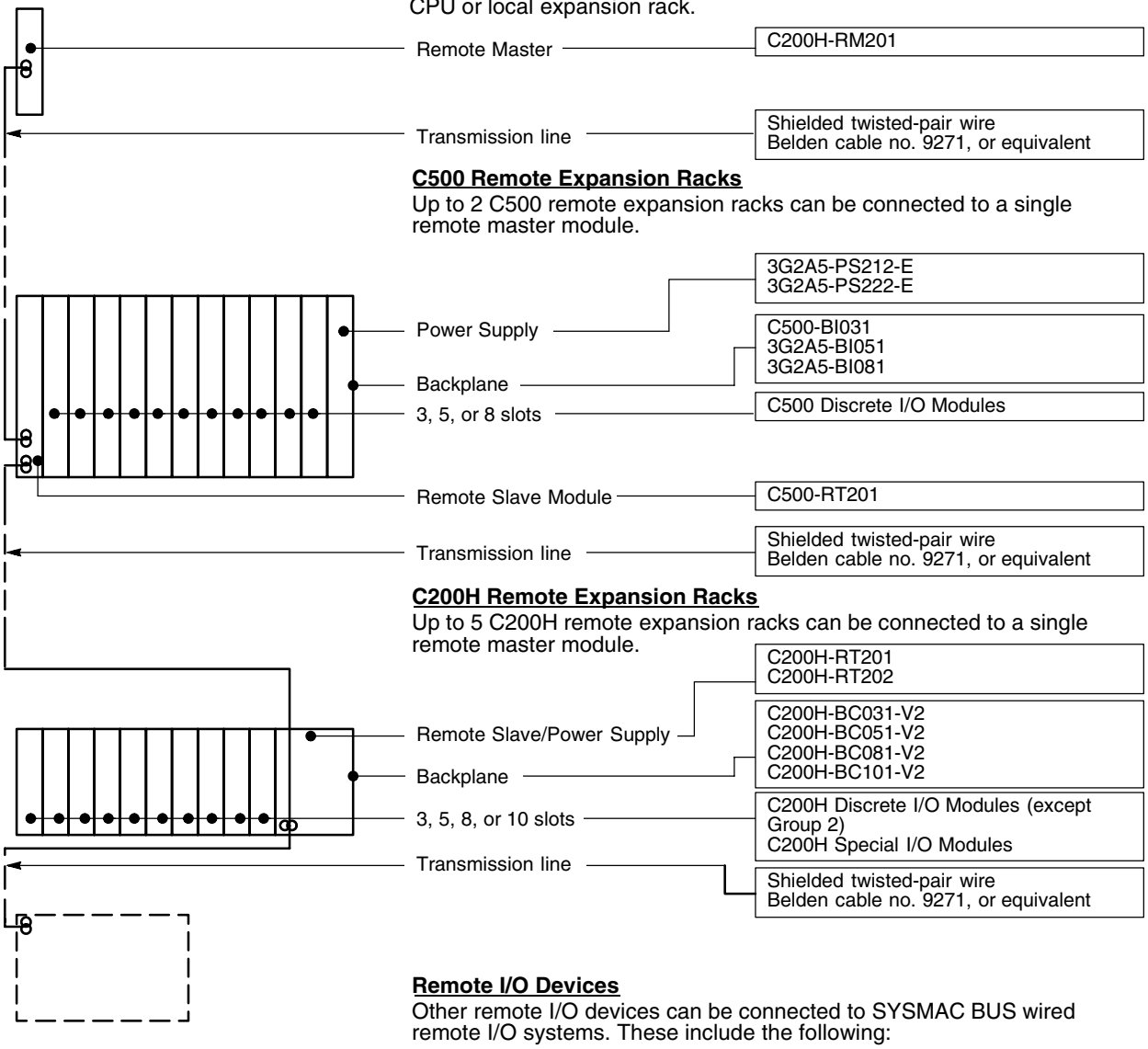
2

General Information

The following information can be used to configure SYSMAC BUS wired remote I/O systems connected to a PLC. Multiple remote I/O systems may be added to a single PLC. A wired remote I/O system consists of a remote master module, remote expansion racks, and remote I/O devices, and wire.

Remote Master Module

Each remote I/O subsystem has a master module that is mounted in the CPU or local expansion rack.



C500 Remote Expansion Racks

Up to 2 C500 remote expansion racks can be connected to a single remote master module.

C200H Remote Expansion Racks

Up to 5 C200H remote expansion racks can be connected to a single remote master module.

Remote I/O Devices

Other remote I/O devices can be connected to SYSMAC BUS wired remote I/O systems. These include the following:

- G7 Remote I/O Blocks and stand-alone slaves
- K3FS Remote Analog I/O Blocks
- NT20M, NT600M, NT2000M Programmable Terminals
- Third Party Devices: air valves, AC variable frequency drives, etc.

Configuring SYSMAC BUS Wired Remote I/O Systems

When configuring a SYSMAC BUS wired remote I/O network:

- A total of 32 words (512 bits) can be connected to a single Remote master.
- The following table indicates the number of I/O required for each remote rack and remote I/O device.

	No. of words	No. of I/O points
C500H Remote Expansion Rack	Depends on I/O Modules mounted*	
C200H Remote Expansion Rack	Depends on I/O Modules mounted*	
G7 Remote I/O Block	1	16
NT20M Programmable Terminal	4	64
NT600M Programmable Terminal	4	64
K3FS Remote Analog I/O Block	1	16
Other devices	Specific to the device	

*Refer to the SYSMAC BUS Remote I/O System Manual (Cat. No. W120) for additional configuration information.

Rack Configurations

The following table summarizes the components required to form each type of rack in the different configurations. The number of each component required for the System is given in parentheses. The following combinations form the basic racks to which the other modules indicated in the first part of this section can be added.

Configuration	CPU Rack	Connecting cable	Local Expansion Rack
	CPU Backplane		Expansion Backplane
CPU Rack only	C200H-BC031-V2 C200H-BC051-V2 C200H-BC081-V2 C200H-BC101-V2 (one)	Not needed	Not needed
CPU Rack with Single Local Expansion Rack	C200H-BC031-V2 C200H-BC051-V2 C200H-BC081-V2 C200H-BC101-V2 (one)	C200H-CN___1	C200H-BC031-V2 C200H-BC051-V2 C200H-BC081-V2 C200H-BC101-V2 (one)
CPU Rack and Local Expansion Racks	C200H-BC031-V2 C200H-BC051-V2 C200H-BC081-V2 C200H-BC101-V2 (one)	C200H-CN___1 (one for each Local Expansion Rack)	C200H-BC031-V2 C200H-BC051-V2 C200H-BC081-V2 C200H-BC101-V2 (one for each Local Expansion Rack)

Mounting Locations

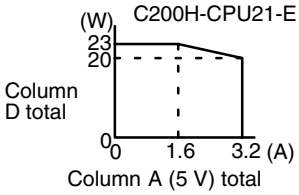
The following table below summarizes the Modules that can be mounted to CPU, CPU Expansion, Local Expansion, and Remote Expansion Racks. For detailed information about the Modules listed below, refer to the manual for the individual Module.

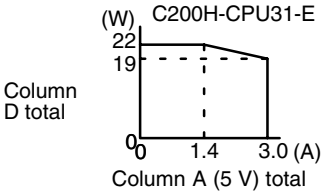
Module	CPU Rack	Local Expansion Racks	SYSMAC BUS Remote Expansion Racks	Remarks
C200H-ASC02 ASCII/BASIC	Yes	Yes	Yes	Up to 10 Special I/O modules can be used with any C200H CPU. Refer to the following pages to determine rack current capacities.
C200H-AD001 C200H-AD002 C200H-DA001 Analog I/O Modules	Yes	Yes	Yes	
C200H-CT001 C200H-CT002 High-speed Counters	Yes	Yes	Yes	
C200H-NC112 C200H-NC211 Position Control Modules	Yes	Yes	Yes	
C200H-TS001 C200H-TS101 Temperature Sensor Module	Yes	Yes	Yes	
C200H-TC_ _ _ C200H-TV_ _ _ Temperature Controller Modules	Yes	Yes	Yes	
C200H-PID PID Module	Yes	Yes	Yes	
C200H-CP114 Cam Positioner	Yes	Yes	Yes	
C200H-ID501-V1 C200H-ID521 RFID Modules	Yes	Yes	Yes	
C200H-FZ001 Fuzzy Interference	Yes	Yes	No	
C200HS-INT01 (C200HS only)	Yes	No	No	Requires HS CPU and –V2 Backplane. 1 module max.
C200H-OV001 Voice output	Yes	Yes	Yes	Up to 10 Special I/O modules can be used with any C200H CPU. Refer to the following pages to determine rack current capacities.
C200H-TM001 Analog Timer Module	Yes	Yes	Yes	
Special High Density I/O Modules	Yes	Yes	Yes	
Group 2 High-Density I/O Modules	Yes	Yes	No	CPU 21/23/31/HS CPUs only up to five 64 pt. or ten 32 pt. modules.
C200H-B7AI1 C200H-B7A01 B7A Interface	Yes	Yes	Yes	
Discrete I/O Modules	Yes	Yes	Yes	
SYSMAC NET Modules (CPU 31 only)	Yes	No	No	C200H-CPU31-E only (up to 2 modules total).
SYSMAC LINK Modules (CPU 31 only)	Yes	No	No	
SYSMAC BUS Remote Master Modules	Yes	Yes	No	
SYSMAC BUS I/O Link Modules	Yes	Yes	No	
C200H-LK201-V1 C200H-LK202-V1 Host Link Modules	Yes	Yes	No	

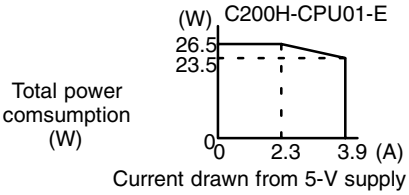
Rack Current Capacity

The total current capacity for each rack is indicated in the following table, according to CPU, Power Supply, Remote Slave Module model. The internal circuitry of the built-in power supply is divided into three separate circuits. Each of these circuits must be calculated separately first, then collectively. Be sure each of the circuits is within the specification.

Rack		Current available			
		A (5 V)	B (26 V)	C (24 V)	D (total)
CPU Rack	C200H-CPU01-E	1.6 A	0.6 A	0.8 A	23 W
	C200H-CPU03-E	1.6 A	0.6 A	–	18 W
	C200H-CPU21-E	3.2 A	0.6 A	0.8 A	20-23 W*
	C200H-CPU23-E	1.6 A	0.6 A	–	18 W
	C200H-CPU31-E	3.0 A	0.6 A	0.8 A	19-22 W*
	C200HS-CPU01-E	3.9 A	0.6 A	0.8 A	23.5-26.5 W*
	C200HS-CPU03-E	2.3 A	0.6 A	–	21.5 W
	C200HS-CPU21-E	3.9 A	0.6 A	0.8 A	23.5-26.6 W*
	C200HS-CPU23-E	2.3 A	0.6 A	–	21.5 W
	C200HS-CPU31-E	3.9 A	0.6 A	0.8 A	23.5-26.6 W*
	C200HS-CPU33-E	2.3 A	0.6 A	–	21.5 W
Local Expansion Rack	C200H-PS221	2.7 A	0.6 A	0.8 A	28 W
	C200H-PS211	2.7 A	0.6 A	–	23 W
Remote Expansion Rack	C200H-RT001-P	2.7 A	0.6 A	0.8 A	28 W
	C200H-RT002-P	2.7 A	0.6 A	–	23 W
	C200H-RT201	2.7 A	0.6 A	0.8 A	28 W
	C200H-RT202	2.7 A	0.6 A	–	23 W







*In the C200H-CPU21-E and C200H-CPU31-E, and C200HS-CPU01-E the available total (column D) depends upon the current of column A (5 V), as shown.

Column A (5 V)

The maximum column A (5 V) current consumption of each module in the PLC system is shown in the tables that follow. Be sure the total column A current consumption of all the I/O modules planned for any one rack does not exceed the column A current capacity of that rack.

Column B (26 V)

The maximum column B (26 V) current consumption of each module in the PLC system is shown in the tables that follow. Be sure the total column B current consumption of all the I/O modules planned for any one rack does not exceed the column B current capacity of that rack.

Column C (24 V)

The maximum column C (24 V) current consumption of each Module in the PLC system is shown in the tables that follow. Be sure the total column C current consumption of all the I/O Modules planned for any one Rack does not exceed the column C current capacity of that Rack.

Column D (Total Capacity)

Use the following formula to confirm that the total does not exceed column D (the total capacity for the power supply):

$$A \times 5 + B \times 26 + C \times 24 \leq D$$

Where,

A = the total current consumption from the column A tables above.

B = the total current consumption from the column B tables above.

C = the total current consumption from the column C tables above.

D = the column D data from the tables above.

Modules

The maximum current consumption of each module is shown in the following tables.

Special I/O Modules

Description	Part number	Consumption
ASCII/BASIC Coprocessor		
PLC Module (Rack-mount); RAM, EEPROM	C200H-ASC02	0.20 A
Analog Input Modules		
4 pts.; 1 to 5 V, 0 to 10 V, 4 to 20 mA	C200H-AD001	0.55 A
8 pts.; 1 to 5 V, 0 to 10 V, ±10 V, 4 to 20 mA	C200H-AD002	0.45 A
Analog Output Module		
2 pts.; 1 to 5 V, 0 to 10 V, 4 to 20 mA	C200H-DA001	0.65 A
High-speed Counters		
	C200H-CT001-V1	0.30 A
	C200H-CT002	0.30 A
1-axis Position Control		
	C200H-NC112	0.15 A
2-axis Position Control		
	C200H-NC211	0.50A
Temperature Sensor Modules		
	C200H-TS001	0.45 A
	C200H-TS101	0.45 A
Temperature Controller Modules		
Thermocouple Input	C200H-TC00_	0.33 A
RTD Input	C200H-TC10_	0.33 A
Heat/Cool Temperature Controller Modules		
Thermocouple Input	C200H-TV00_	0.33 A
RTD Input	C200H-TV10_	0.33 A
PID Modules		
	C200H-PID0_	0.33 A
Cam Positioner		
	C200H-CP114	0.30 A
Radio Frequency Identification Systems (V600 Short-range RF ID Systems)		
PLC Module (Rack-mount)	C200H-IDS01-V1	0.25A
Radio Frequency Identification Systems (V620 Long-range RF ID Systems)		
PLC Module (Rack-mount)	C200H-IDS21	0.25A
Fuzzy Coprocessor		
	C200H-FZ001	0.30 A
Interrupt Input Module (C200HS only)		
	C200HS-INT01	0.20 A
Voice Output Module		
	C200H-OV001	0.30 A
Analog Timer Input Module		
	C200H-TM001	0.60 A
High-density Input		
	C200H-ID215	0.13 A
	C200H-ID501	0.13 A
High-density Mixed		
	C200H-MD115	0.18 A
	C200H-MD215	0.18 A
	C200H-MD501	0.18 A
High-density Output		
	C200H-OD215	0.22 A

Current Consumption

Description	Part number	Consumption
High-density Output		
	C200H-OD501	0.22 A
B7A Interface Modules		
	C200H-B7AI1	0.10 A
	C200H-B7AO1	0.10 A

Discrete Input Modules

Voltage	Points (/common)	Part number	Consumption
No Voltage Contact Input			
No voltage contact/NPN output type	8 (8/common)	C200H-ID001	0.01 A
No voltage contact/PNP output type	8 (8/common)	C200H-ID002	0.01 A
DC Inputs			
12 to 24 VDC	8 (8/common)	C200H-ID211	0.01 A
24 VDC	16 (16/common)	C200H-ID212	0.01 A
24 VDC	32 (32/common)	C200H-ID216*	0.1 A
24 VDC	64 (32/common)	C200H-ID217*	0.12 A
AC Inputs			
100 to 120 VAC	8 (8/common)	C200H-IA121	0.01 A
100 to 120 VAC	16 (16/common)	C200H-IA122	0.01 A
200 to 240 VAC	8 (8/common)	C200H-IA221	0.01 A
200 to 240 VAC	16 (16/common)	C200H-IA222	0.01 A
AC/DC Inputs			
12 to 24 VAC/VDC	8 (8/common)	C200H-IM211	0.01 A
24 VAC/VDC	16 (16/common)	C200H-IM212	0.01 A

*CPU21, CPU23, CPU31 and HS only (Group 2)

Discrete Output Modules

Current/voltage	Points (/common)	Part number	Consumption
Transistor Outputs			
0.3 A, 24 VDC	12 (12/common)	C200H-OD211	0.16 A
0.3 A, 24 VDC	16 (16/common)	C200H-OD212	0.18 A
2.1 A, 24 VDC	8 (8/common)	C200H-OD213	0.14 A
0.8 A, 24 VDC	8 (8/common)	C200H-OD214	0.14 A
0.3 A, 5 to 24 VDC	8 (8/common)	C200H-OD216	0.01 A
0.3 A, 12 to 24 VDC	12 (12/common)	C200H-OD217	0.01 A
4.5 to 26.4 VDC	32 (32/common)	C200H-OD218*	0.18 A
4.5 to 26.4 VDC	64 (32/common)	C200H-OD219*	0.27 A
1 A, 12 to 24 VDC	8 (8/common)	C200H-OD411	0.14 A
*CPU21, CPU23, CPU31 and HS only (Group 2)			
Triac Outputs			
120 VAC	–	C200H-OA121-E	0.14 A
250 VAC	–	C200H-OA221	0.2A
250 VAC	–	C200H-OA222	0.14A
Relay Outputs			
24 VDC/250 VAC	5 (independant commons)	C200H-OC221	0.01 A
24 VDC/250 VAC	8 (independant commons)	C200H-OC222	0.01 A
24 VDC/250 VAC	8 (8/common)	C200H-OC223	0.01 A
24 VDC/250 VAC	12 (12/common)	C200H-OC224	0.01 A
24 VDC/250 VAC	16 (16/common)	C200H-OC225	0.05 A

Communication Modules

Module	Part number	Consumption
SYSMAC NET	C200HS-SNT32	1 A
SYSMAC LINK	C200HS-SLK12, C200HS-SLK22	0.8 A each
SYSMAC WAY Host Link Module	C200H-LK101-P, C200H-LK201, C200H-LK202	0.25 A each
SYSMAC BUS Fiber-optic Master	C200H-RM001-PV1	0.2 A
SYSMAC BUS Wired Master	C200H-RM201	0.25 A
SYSMAC BUS Fiber-optic Slave	C200H-RT002-P	02.7 A
SYSMAC BUS Wired Slave	C200H-RT201	0.1 A
SYSMAC BUS Wired Slave	C200H-RT202	0.08 A
PC Link	C200H-LK401	0.35 A

Column B (26 V)

The maximum column B (26 V) current consumption of each module in the PLC system is shown in the table that follows. Be sure the total column B current consumption of all the I/O modules planned for any one rack does not exceed the column B current capacity of the rack.

Module	Part number	Consumption
Discrete Output Modules		
Relay Output (Current draw with eight bits on simultaneously)	C200H-OC221	0.075 A
	C200H-OC222	0.075 A
	C200H-OC223	0.075 A
	C200H-OC224	0.075 A
	C200H-OC225	0.075 A
	C200H-OC216	0.075 A
	C200H-OC217	0.075 A
Special I/O Modules		
RF ID	C200H-IDS01-V1	0.12 A
	C200H-IDS21	0.12 A

Column C (24 V)

The maximum column C (24 V) current consumption of each module in the PLC system is shown in the table that follows. Be sure the total column C current consumption of all the I/O Modules planned for any one Rack does not exceed the column C current capacity of the Rack.

Module	Part number	Consumption
Discrete Input Modules		
No Voltage Contact Input	C200H-ID001	0.06 A
	C200H-ID002	0.06 A
Other devices connected to the external 24 VDC power supply		Total of devices

Column D (Total Capacity)

Use the following formula to confirm that the total does not exceed column D (the total capacity for the power supply):

$$A \times 5 + B \times 26 + C \times 24 \leq D$$

Where,
A = the total current consumption from the column A tables above.
B = the total current consumption from the column B tables above.
C = the total current consumption from the column C tables above.
D = the column D data from the tables above.

Input Wiring Accessories

B7A Output Connectors/B7A Input Blocks

Module part number	Consumption
B7A-R6A13	0.04 A max.
B7A-R6A33	0.04 A max.
B7A-R6A18	0.04 A max.
B7A-R6A38	0.04 A max.
B7A-R3A13	0.06 A max.
B7A-R3A33	0.06 A max.
B7A-R3A18	0.06 A max.
B7A-R3A38	0.06 A max.
B7A-T6A1	0.12 A max. when all Input points are turned on. Excludes exterior sensor unit.
B7A-T6B1	0.12 A max. when all Input points are turned on. Excludes exterior sensor unit.
B7A-T6C1	0.12 A max. when all Input points are turned on. Excludes exterior sensor unit.
B7A-T6A6	0.12 A max. when all Input points are turned on. Excludes exterior sensor unit.
B7A-T6B6	0.12 A max. when all Input points are turned on. Excludes exterior sensor unit.
B7A-T6C6	0.12 A max. when all Input points are turned on. Excludes exterior sensor unit.

P7TF, G7TC Input Blocks

Module part number	Consumption
G7T-1122S-DC12V	0.042 A
G7T-1122S-DC24V	0.021 A
G7T-1122S-AC110/120V	0.0064-0.007 A
G7T-1122S-AC220/240V	0.0032-0.0035 A
G3TA-IAZR02S-AC100-240V	0.005 A
G3TA-IDZR02S-DC5-24V	0.005 A

The power supply requirements are calculated as follows:

80 mA + M + D + I = C

80 mA: current required by Input Block

M: Total current of Input Modules

D: input device current (sensor, etc.)

I: interface device (G71, PLC Input Module, etc.) current

C: required current capacity of power supply

Output Wiring Accessories

B7A Input Connectors/B7A Output Blocks

Module part number	Consumption
B7A-T6E3	0.06 A max.
B7A-T6E8	0.06 A max.
B7A-T3E3	0.1 A max.
B7A-T3E8	0.1 A max.
B7A-R6B11	0.08 A max.
B7A-R6B31	0.08 A max.
B7A-R6B16	0.08 A max.
B7A-R6B36	0.08 A max.
B7A-R6F11	0.08 A max.
B7A-R6F31	0.08 A max.
B7A-R6F16	0.08 A max.
B7A-R6F36	0.08 A max.
B7A-R6C11	0.1 A max.
B7A-R6C31	0.1 A max.
B7A-R6C16	0.1 A max.
B7A-R6C36	0.1 A max.
B7A-R6G11	0.1 A max.
B7A-R6G31	0.1 A max.
B7A-R6G16	0.1 A max.
B7A-R6G36	0.1 A max.

P7TF, G7TC Output Blocks

Module part number	Consumption
G7T-1112S-DC12V	0.042A
G7T-1112S-DC24V	0.021 A
G7T-1012S-DC12V	0.042 A
G7T-1012S-DC24V	0.021 A
G3TA-OA202SZ-DC24V	0.016 A
G3TA-ODX02S-DC24V	0.005 A
G3TA-OD201S-DC24V	0.005 A

The power supply requirements are calculated as follows:

40/80 mA + M + I = C
40/80 mA: current required by 8/16-point Output Block
M: Total current of Output Modules
I: interface device (G71, PLC Output Module, etc.) current
C: required current capacity of the Power Supply

Remote I/O Stand-alone Slaves

G71 SYSMAC BUS Wired Remote I/O Stand-alone Slave

Slave	Consumption
Input G71-IC16-DC24V	40 mA + (6.7 mA x no. of inputs)
Output G71-OD-DC24V	40 mA

General Information

To assist in selection of system components, a series of system configuration worksheets have been provided. These worksheets are intended to assist the system designer in determining:

- Required system components and part numbers
- Total I/O requirements
- Power consumption of modules

The worksheets are used in conjunction with the Standard Parts section and the Configuration section of this catalog. The worksheets provided can be duplicated as needed for full system configuration. Separate worksheets are provided for:

- CPU Rack
- Local Expansion Rack
- SYSMAC BUS Remote I/O System

CPU Rack									
Required Parts							**Qty.**	**Part number(s) selected**	
	CPU						1		
	CPU Backplane						1		
	Slots	**Current consumption**				**Pts.**			
		A	B	C	D				
	1						1		
	2						1		
	3						1		
	4						1		
	5						1		
	6						1		
	7						1		
	8						1		
	9						1		
	10						1		
Optional Parts									

Local Expansion Rack									
Required Parts							**Qty.**	**Part number(s) selected**	
	Power Supply						1		
	Expansion Backplane (3, 5, 8, or 10 slots)						1		
	Slots	**Current consumption**				**Pts.**			
		A	B	C	D		1		
	1						1		
	2						1		
	3						1		
	4						1		
	5						1		
	6						1		
	7						1		
	8						1		
	9						1		
	10						1		
Required for single Local Expansion Rack									
	I/O Cable for single Local Expansion Rack (1 for each Rack)						1		

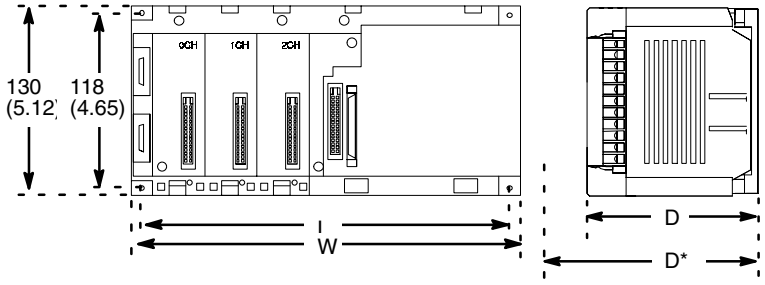
SYSMAC BUS C500 Remote Expansion Rack							Fiber-optic	Wired
Required Parts						**Qty.**	**Part number(s) selected**	
	Remote Master Module must be mounted in CPU, or Local Expansion Rack							
	Power Supply					1		
	Expansion Backplane (3, 5, or 8 slots)					1		
	Slots	**Current consumption**				**Pts.**		
		A	B	C	D			
	1					1		
	2					1		
	3					1		
	4					1		
	5					1		
	6					1		
	7					1		
	8					1		
	9	Remote Slave Module				—	1	
Required for Fiber-optic System								
	Fiber-optic Cable					1		
	Fiber-optic Connector					2		
Required for Wired System								
	Twisted-pair wire					1	Commercially available	

SYSMAC BUS C200H Remote Expansion Rack							Fiber-optic Wired	
Required Parts						**Qty.**	**Part number(s) selected**	
	Remote Master Module must be mounted in CPU, or Local Expansion Rack							
	Power Supply/Remote Slave Module					1		
	Expansion Backplane (3, 5, 8, or 10 slots)					1		
	Slots	**Current consumption**				**Pts.**		
		A	B	C	D			
	1					1		
	2					1		
	3					1		
	4					1		
	5					1		
	6					1		
	7					1		
	8					1		
	9					1		
	10					1		
Required for Fiber-optic System								
	Fiber-optic Cable					1		
	Fiber-optic Connector					2		
Required for Wired System								
	Twisted-pair wire					1	Commercially available	
SYSMAC BUS Remote I/O Devices								
	Device					**I/O words**		

Peripheral Devices				
	Software or Device	**Part number(s) selected**		
	Ladder Support Software	1		
	Peripheral Port Cable	1		
	Programming Console	1		
	Programming Console Cable	1		
	Graphic Programming Console	1		
	Memory Pack	1		
	NT Programmable Terminals	1		
	Software	1		
	Data Access Console	1		

Unit: mm (inches)

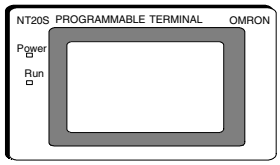
CPU Backplanes



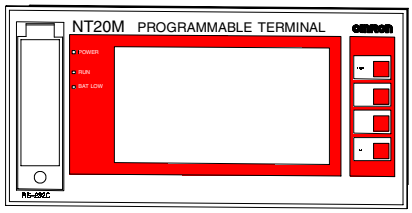
Part number	Slots	L	W	D (CPU alone) and D* (CPU with programming console mounted)
C200H-BC031-V2	3	246 (9.7)	260 (10.2)	D: C200H-CPU01-E/CPU03-E/CPU21-E/CPU23-E: 118 (4.65) C200H-H-CPU031-E: 143 (5.63) C200H-HS-CPU01-E/CPU03-E: 113 (4.45) C200H-HS-CPU21-E/CPU23-E/CPU31-E/CPU33-E: 138 (5.43)
C200H-BC051-V2	5	316 (12.4)	330 (13)	
C200H-BC081-V2	8	421 (16.6)	435 (17.1)	
C200H-BC101-V2	10	491 (19.3)	505 (19.9)	D*: C200H-CPU01/CPU03/CPU21/CPU23: 148 (5.83)

10 Operator Interfaces

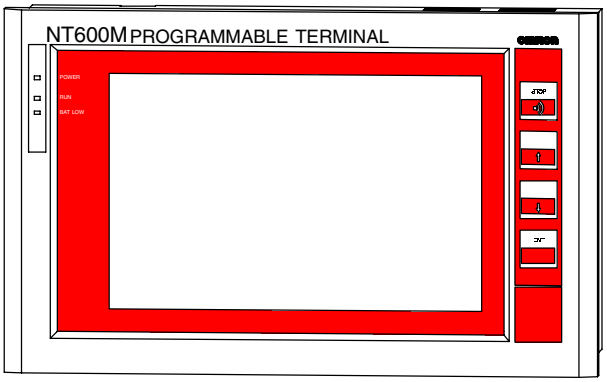
Programmable Terminals 132
Data Access Console 136



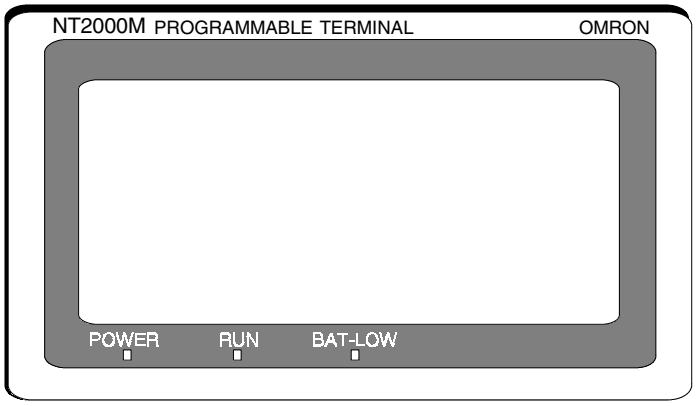
NT20S



NT20M-DT



NT600M-DT



NT2000M

General Information

Omron's NT-series Programmable Terminals combine the latest in flat panel technology and software innovation to meet the most demanding man-machine interface requirements. Flexible configuration, multi-function software capability, and advanced hardware design make the NT-series the best choice for the widest variety of industrial applications. The NT-series Programmable Terminals provide the combined functionality of several devices, including programmable message display, alarm annunciator, operator control station, and graphics display station. These functions are all centralized in a single flexible device that offers immediate access to machinery status or production line information. The NT-series can also eliminate the need for hundreds of pushbuttons, warning lights, thumbwheel switches, message displays and digital readouts and save the cost of installing, maintaining and replacing those devices. The simplicity and accessibility of our NT-series allows you to perform data collection, process monitoring, operator control and alarm verification with certainty.

Features

- Programming software required to configure, edit, upload, and download screens
- Plug-in communications modules allow several interface options
- Installed and wired, requires only 3.5 inches of depth to help reduce panel size
- Touch screen or function key types allow for the best application fit

Specifications: NT20M and NT20S

Display Screen	Dot matrix STN LCD panel with 4.4 x 2.2 inches display area
Resolution	256 x 128 resolution
Backlight	Cold cathode tube
Dimensions	
NT20M-DT	164H x 220W x 82D mm (6.5 x 8.7 x 3.3 in.)
NT20M-DN NT20-FK201	110H x 220W x 82D mm (4.33 x 8.7 x 3.3 in.)
NT20S	110H x 190W x 53.3D mm (4.33 x 7.48 x 2.11 in.)
Display capabilities	250 screens maximum, overlapping and continuous functions (chain)

Specifications: NT600M

Display Screen	Dot matrix STN LCD Panel with 8.1 x 5.1 inches display area
Resolution	640 x 400 resolution
Backlight	Cold cathode tube
Dimensions	
NT600M-DT	198H x 325W x 105D mm (7.8 x 12.8 x 4.1 in.)
NT600M-DF	238H x 325W x 105D mm (7.8 x 12.8 x 4.1 in.)
Display capabilities	1000 screens maximum, overlapping and continuous functions (chain)

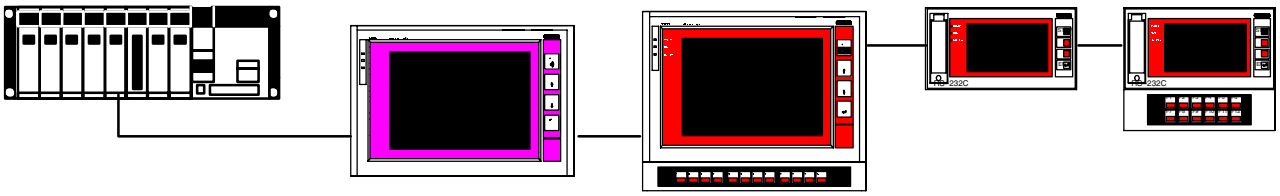
Specifications: NT2000M

Display Screen	Dot matrix STN LCD Panel with bi-color red or white display, 275 x 138 mm (10.83 x 5.43 in.)
Resolution	256 x 128 resolution
Backlight	Cold cathode tube
Dimensions	
NT2000MT-DT131	232.5H x 365W x 77D mm (9.15 x 14.37 x 3.03 in.)
NT2000M-DN131	232.5H x 365W x 77D mm (9.15 x 14.37 x 3.03 in.)
Display capabilities	250 screens maximum, overlapping and continuous functions (chain)

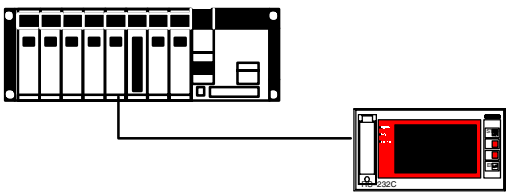
Communications

Connecting to SYSMAC WAY Host Link (NT20S)

Connecting to SYSMAC BUS Wired Remote I/O (NT20M, NT600M, and NT2000M)



Connecting to C200H Backplane (NT20M, NT600M, and NT2000M)



Programmable Terminals

Description	Part number
NT20S	
Touch panel LCD – color biege	**NT20S-ST121**
Touch panel LCD – color black	**NT20S-ST121B**
NT20M	
Touch screen terminal, no memory	**NT20M-DT121-V2**
Touch screen terminal, no memory, bi-color backlight	**NT20M-DT131**
Non-touch screen, no memory, bi-color backlight	**NT20M-DN131**
Non-touch screen, no memory	**NT20M-DN121-V2**
12 Function key unit	**NT20M-FK210**
NT600M	
Touch screen terminal, no memory, LCD display	**NT600M-DT122**
Touch screen terminal, no memory, Electroluminescent display	**NT600M-DT211**
Function key terminal, no memory, LCD display	**NT600M-DF122**
Non-touch screen terminal, no memory, Electroluminescent display	**NT600M-DN211**
12 Function key unit for NT600M-DN211	**NT600M-FK210**
Card with empty socket	**NT600M-MP251**
Card with 64K RAM	**NT600M-MR641**
Card with 128K RAM	**NT600M-MR151**
Card with 128K RAM	**NT600M-MR151**
Card with 256K RAM	**NT600M-MR251**
System ROM for NT600M	**NT600M-SMR01-E**
System ROM for NT600M	**NT600M-SMR02-E**
NT2000M	
Touch screen terminal, no memory, bi-color backlight	**NT2000M-DT131**
Non-touch screen, no memory, bi-color backlight	**NT2000M-DN131**
System key unit for remote operation	**NT-FK200**

Interface Modules and Accessories

Description	Part number	Required System ROM
NT20M and NT2000M		
RS-232C interface module	**NT600M-LK201**	**NT20M-SMR01-E**
RS-422 interface module	**NT600M-LK202**	**NT20M-SMR01-E**
Host Link interface module	**NT600M-LK201**	**NT20M-SMR01-E**
SYSMAC BUS interface (wired)	**NT600M-RT121**	**NT20M-SMR01-E**
C200H Expansion I/O Interface	**NT600M-LB121**	**NT20M-SMR02-E**
Host Link Interface Definable Addressing	**NT600M-LK201**	**NT20M-SMR31-E**
C200H Expansion I/O Interface Definable Addressing	**NT600M-LB122**	**NT20M-SMR32-E**
Backlight unit for NT20M-DT131 and NT20M-DN131	**NT20M-CFL01**	
Backlight unit for NT2000M-DT131 and NT2000M-DN131	**NT2000M-CFL01**	
Cable for programming the terminal	**CV500-CN228**	
Cover for NT20M-DT	**NT20M-KBA01**	
Cover for NT20M-DN	**NT20M-KBA02**	
Non-glare sheets	**NT20M-KBA03**	
Oil and waterproof covers	**NT20M-KBA04**	
Key Sheet replacement for NT20M-DN	**NT20M-CKF01**	

Interface Modules and Accessories continued

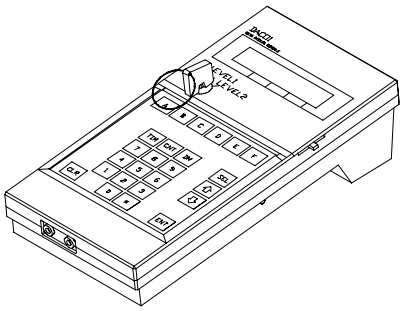
Description	Part number	Required System ROM
NT600M		
RS-232C/Host Link interface module	**NT600M-LK201**	**NT-600M-SMR01-EV1**
RS-422 interface module	**NT600M-LK202**	**NT-600M-SMR01-EV1**
SYSMAC BUS interface (wired)	**NT600M-RT121**	**NT-600M-SMR01-EV1**
C200H BUS interface	**NT600M-LB121**	**NT-600M-SMR02-EV1**
Host Link direct addressing	**NT600M-LK201**	**NT-600M-SMR31-E**
C200H BUS direct addressing	**NT600M-LB122**	**NT-600M-SMR32-E**
Cover for NT600M-DT	**NT600M-KBA01**	
Cover for NT600M-DF	**NT600M-KBA02**	
Non-glare sheet	**NT600M-KNA03**	
Oil and water proof cover	**NT600M-KBA04**	
Key Sheet replacement for NT600M-DF	**NT600M-CKF01**	
Common Accessories		
Expansion I/O Connecting Cable; 30 cm	**C200H-CN311**	
Expansion I/O Connecting Cable; 70 cm	**C200H-CN711**	
Expansion I/O Connecting Cable; 2 m	**C200H-CN221**	
Expansion I/O Connecting Cable; 5 m	**C200H-CN521**	
Expansion I/O Connecting Cable; 10 m	**C200H-CN131**	
NT Series Host Interface Unit Direct Connection Manual	**V015-E1-1**	
NT Series RS-232C/RS-422 Interface Unit Operation Manual	**V016-E1-1**	
NT20M and NT2000M Operation Manual	**V001-E1-2**	
NT600M Operation Manual	**V002-E1-2**	
Host Interface Units Operation Manual	**V003-E1-3**	
Support Software, 3.5 and 5.25 inch disks	**NT20M-ZASAT-EV4**	
Programming Cable, PT to computer (9-pin RS-232)	**C200H-CN229-EU**	
Programming Cable, PT to computer (25-pin RS-232)	**C200H-CN220-EU**	

Memory Chips for NT20M and NT200M

Type	Memory chips	Part number
SRAM	32K 128K	**RAM-22-15** **RAM-13-10**
EPROM	64K 128K	**ROM-KD-B** **ROM-13-12B**
EEPROM	32K	**EE22-20**

Screen Data Memory Boards (required for NT600M)

Memory capacity	Type	Part number
Depends on memory chip	IC socket type	**NT600M-MP251**
64K	SRAM	**NT600M-MR641**
128K	SRAM	**NT600M-MR151**
256K	SRAM	**NT600M-MR251**



General Information

Omron's Data Access Console provides on-line monitoring and alteration of data in the PLC's data memory, I/O and internal relay and special relay areas. Two levels of accessibility allow secure areas of data as well as password protection. The DAC displays messages when alarm or message instructions are used in programming.
The Data Access Console can be used with the C20, K-type, block-style H-type, C200H, C1000H, and C2000H PLCs.

11 Peripheral Devices

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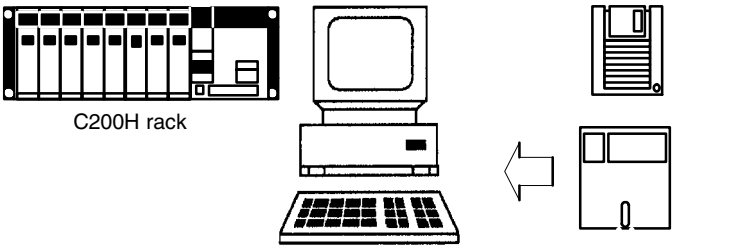
Factory Intelligent Terminal, PROM Writer, Printer Interface . . . 141
Programmable Terminal Support Software 142



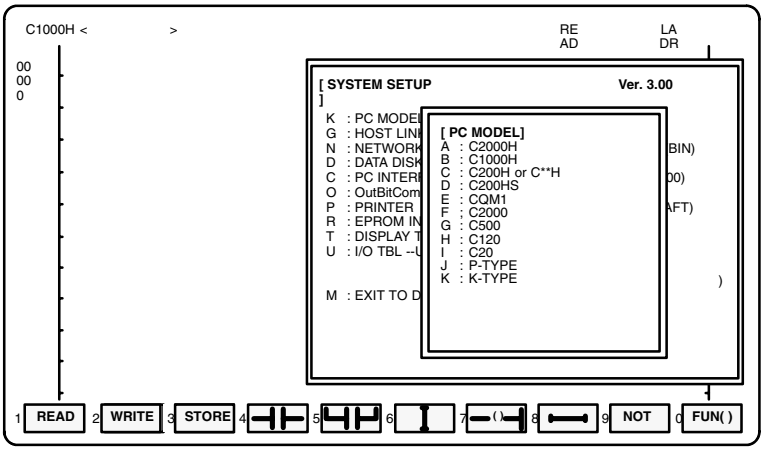
PLC Setup

The LSS provides two different means to set the operating parameters in the PLC Setup, which determine the basic operating environment for the C200H. For standard settings you can take advantage of the speed and ease of menu settings, or you can use direct bit settings in the DM PLC Setup Area to make for detailed settings for sophisticated applications.

Ladder Support Software (LSS)

C200H programming and monitoring can be handled easily using an IBM PC/AT or compatible computer running OMRON's LSS. The LSS is the most powerful programming device for C200H. Besides creating programs, the LSS can be used to generate all kinds of lists, create I/O, line, and block comments, print out ladder programs in mnemonic form or as ladder diagrams, store programs on disk, etc.

Programming



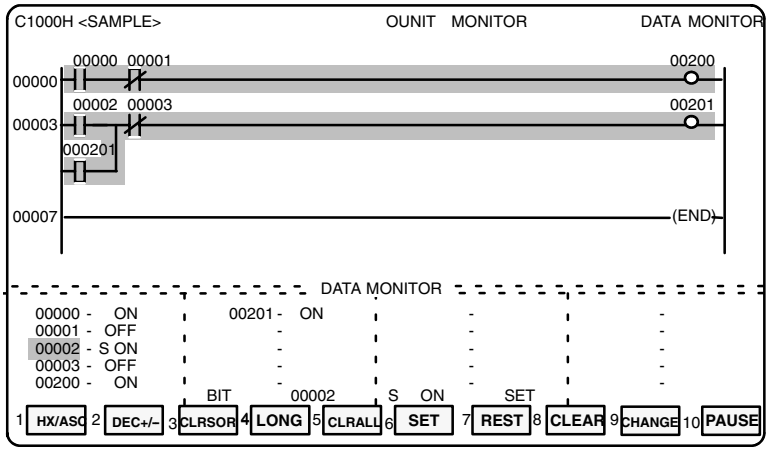
Programming

The LSS provides fast and easy programming operations based on function keys and instruction function codes that make it easy to input, search through, and edit ladder diagrams. You can also use the LSS to edit the program in the PLC online in MONITOR or PROGRAM mode to make file program adjustments during actual test runs.

Monitoring and Operation Control

You can not only monitor bit status in the ladder diagram, specified I/O status, word content, or DM content, but you can also control status or memory contents during monitoring operations to control the CQM1 or to aid in debugging the program.

Monitoring



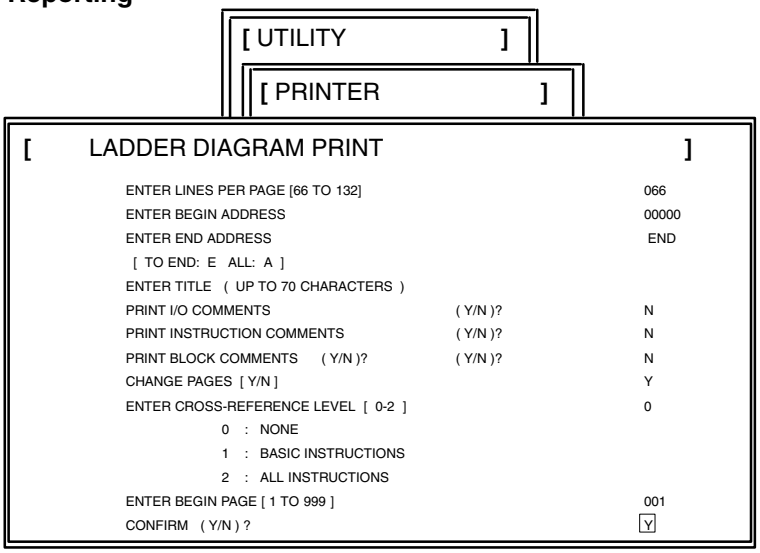
Comments

Three forms of comments are available to aid in programming, debugging, troubleshooting, and program management. I/O comments let you keep track of I/O applications; block comments can be used to tell what instruction blocks (e.g., output instructions) are being used for; and line comments can be used to provide more detailed information on sections of the program.

New Differential Monitor

Ensure accurate detection of ON-to-OFF or OFF-to-ON transition bits in the C200HS memory.

Reporting

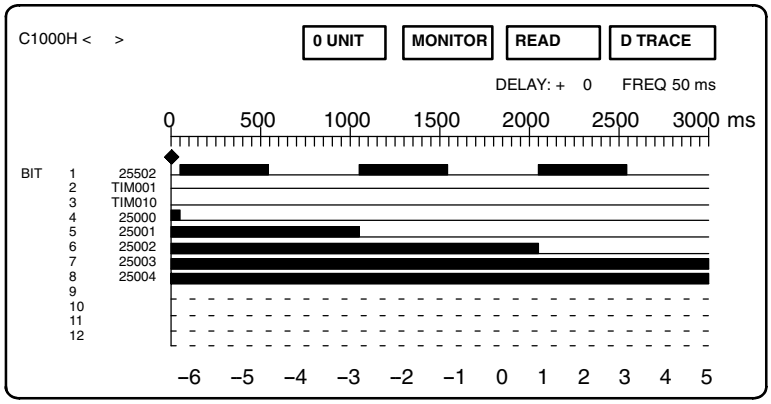


Reporting
User configurable for custom printouts. Print out complete of partial programs in ladder or mnemonics. Selectively choose which tables and cross references are to be included and documentation.

Debugging
In addition to syntactical program checks, you can use any of a number of LSS to debug your ladder-diagram programs before and during trial operation, including step-by-step execution or block execution, as well as any of the monitoring or tracing operations.

Data Management
Programs, DM data, trace results, PLC Setups, I/O tables, and other forms of data can be easily transferred around the system or to and from data disks to achieve a complete data management system.
In addition, LSS3 easily saves and retrieves partial programs for simple creation of a library of commonly used sections of code.

Tracing



Tracing
Debugging, monitoring, and system management are greatly aided by tracing operations that record the status of executed instructions or the contents of specified memory bits/words. Trace result can be stored for later analysis or archiving.

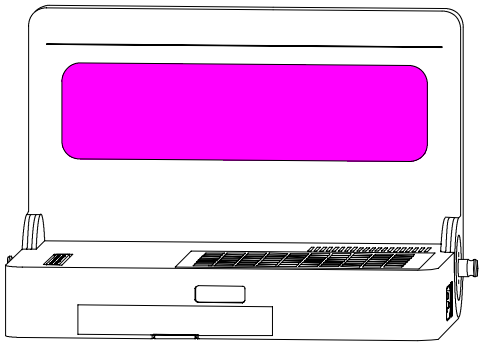
4

LSS Ordering Information

Description	Part number	
Single-user license	C500-Y9LS11-EV3	
5-user license	C500-Y9LS15-EV3	
10-user license	C500-Y9LS10-EV3	
Programming Cable	Built-In Host Link Port to computer (9-pin RS-232)	C200HS-CN220-EU
	Built-In Host Link Port to computer (25-pin RS-232)	C200HS-CN229-EU
	C200H-LK201 to computer (9-pin RS-232)	C500-CN221-EU
	C200H-LK201 to computer (25-pin RS-232)	C500-CN222-EU

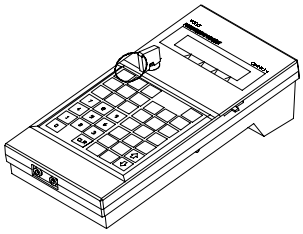
System Information

PLCs supported	C**K, C**H, CQM1, C200H, C200HS, C500, C1000H, C2000H
Communications supported	SYSMAC NET, SYSMAC LINK, HOST LINK
Computer requirements	IBM-PC XT/AT or fully compatible computer
Specifications	
RAM capacity	At least 640 KB RAM
Free work disk capacity	At least 3MD of free disk space
Floppy disk drive	Either a 5.25 or 3.5 double density drive, Communication port 1 or 2, with RS-232C or RS-422
Video	Color/monochrome monitor (CGA, EGA, VGA, MDA)



Graphic Programming Console: 3G2C5-GPC03-E/GPC04-E

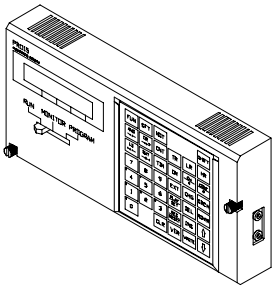
The Graphic Programming Console has a 32K-word memory and is a complete programming, monitoring and debugging tool. The GPC has a backlit LCD display and function key panel for programming and montioring mnemonics or ladder logic. The GPC can also communicate over SYSMAC NET or SYSMAC LINK Networks by being connected to any PLC running on either Network. The GPC is available in 110-VAC and 220-VAC versions.



Programming Console: C200H-PRO27-E

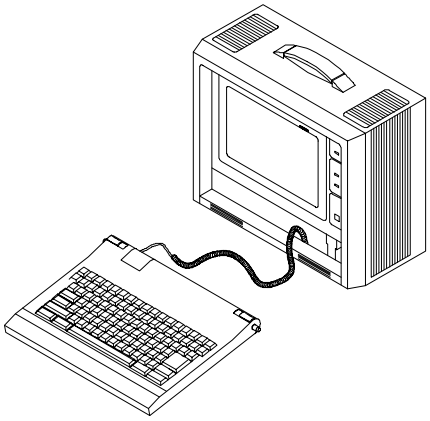
The C200H-PRO27-E is a complete on-line and off-line programming and monitoring hand-held console. The C200H-PRO27-E comes with an LCD display with LED illumination, 16 characters x 2 lines, adjustable sound and contrast.

In addition to programming and monitoring with the Programming Console, users can verify programs, compare and create I/O tables, monitor multiple I/O, force set/reset bits, and choose from Run, Monitor, Debug, or Program modes.



Programming Console: 3G2A6-PRO15-E

All of the functions are identical to C200H-PRO27-E. The 3G2A6-PRO15-E mounts directly to the CPU.

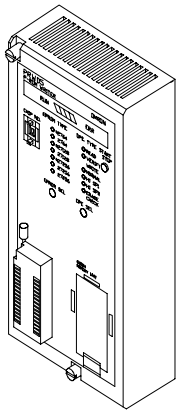


Factory Intelligent Terminal (FIT10-SET11E)

Compatible with all C-Series PLCs, the FIT combines the functions of several peripherals into one. In addition to programming functions, the FIT incorporates a PROM writer and two 3.5-inch floppy disk drives, plus interfaces for printers and other devices. The FIT allows program loading, editing, and monitoring of any C-series PLC. Easy-to-use editing functions include cut/paste/move, and pull-down window menus. The FIT lets you transfer programs, data memory contents and ladder diagram comments quickly. Powerful diagnostic and debugging capabilities include data trace, timing charts, and I/O monitoring. Even with all its capabilities the FIT is small enough and light enough to take on-site for trial operation and system debugging.

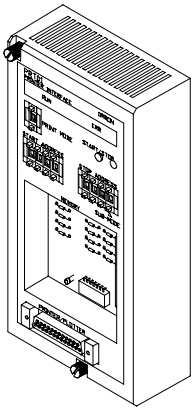
The large plasma screen shows 9 inputs and one output across and 11 ladder rungs and 1 message line or 30 mnemonic programming lines or 120 line comments, as well as a function key template for easy use. The FIT has one each of RS-232C and RS-422 ports.

FIT can be used with the C20, K-type, block-style H-type, C200H, C1000H, and C2000H PLCs.



PROM Writer: C500-PRW06

Compatible with all C-series PLCs, Omron's PROM writer is used to write data from the program memory (UM), holding relay (HR), timer/counter (TC), data memory (DM) and auxiliary relay (AR) areas to an EPROM chip or C200H Memory Pack. You then have a permanent copy of the program or data and can make further copies of the same data if it is required by another PLC of the same model. The PROM writer can be attached either directly to the PLC or through the GPC.
The PROM Writer can be used with the C20, K-type, Block-style H-type, C200H, C1000H, and C2000H PLCs.



Printer Interface: 3G2A5-PRT01-E

With the Printer Interface, you can easily print various lists, such as program lists, cross-reference lists, and error lists. Desktop program debugging is easier because the program and error lists can be printed out in both mnemonics format and ladder diagram format. You can see at a glance the I/Os, TIM/CNTs, etc. that are used by printing out the cross-reference list for the program. In addition, you can print the contents of the data memory (DM) area, which will greatly help you manage and check the process the PLC performs.
The Printer Interface can be used with the C20, K-type, block-style H-type, C200H, C1000H, and C2000H PLCs. Refer to Standard Parts for the proper memory pack.

General Information

Programmable Terminal Support Software allows the user to configure messages, operator prompts, alarms, touch switches, indicators, simple graphics, or any combination of these to provide the best overview of the machine or process to the operator. Control programming is accomplished using relay ladder logic (RLL) for SYSMAC BUS and Host Link interfaces, or ASCII characters for RS-232C and RS-422 configurations.

Features

- Design, upload, and download Programmable Terminal screens
- IBM-PC XT/AT, or fully compatible computer
- Either a 5.25” or 3.5” double density disk drive
- A hard disk with at least 3 MB of free disk space
- At least 640 Kb RAM
- PC-DOS, MS-DOS, or equivalent (version 3.2 or higher)
- Communication port 1 or 2, with RS-232C or RS-422
- Color/monochrome monitor (CGA, EGA, VGA, MDA)
- Edit and copy screen layouts
- Save screen files to disk
- Configure screen messages, graphics, data display, touch switches (touch-type only), and indicator lamps

System Requirements

Part number	NT20M-ZASAT-EV4
System disk	3.5 inch, 2DD and 5 inch, 2HD
Applicable computers	IBM PC/AT or IBM PC/AT compatible
DOS version	MS-DOS Version 3.2 or later
Floppy disk drives necessary	1 minimum
RAM	640 Kbytes minmum
Graphic monitor	VGA
Communication settings	Baud rate: 9,600 bps Stop bits: 1 bit Data length: 8 bits Parity: None The Intel HEX file format can be used.
PROM writer	Commercially available PROM writer

12 Communication Systems

System Applications 144
SYSMAC NET Token Ring Network 146
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Communication Systems

Plantwide Information Management and Control Networks

Omron's advanced plantwide information management networks let you harness the power of valuable manufacturing and production data stored throughout your plant and turn it into a competitive advantage. Omron's fiber-optic based SYSMAC NET communications network links your supervisory computers and factory controllers in a seamless, high-speed, high-capacity network. Twin fiber-optic cables, automatic loopback, and a token ring configuration provide a reliable, deterministic interface to a variety of information systems.

SYSMAC NET's fast, 2 Mbps transmission speed and 2 Kb message size moves large amounts of data quickly.

Distributed Control Networks

By more tightly integrating their control systems, many manufacturers have been able to increase productivity and manufacturing flexibility. Omron's SYSMAC LINK distributed control network provides a high speed (2 Mbps) link for exchanging critical production data between supervisory computers and programmable controllers in real time.

The token bus peer-to-peer network uses noise resistant fiber-optic or low cost co-axial cable media for reliable, deterministic communications. A special data link feature provides an easy to set up, shared memory system for even tighter integration between multiple controls and computers.

Man-Machine Interface Networks

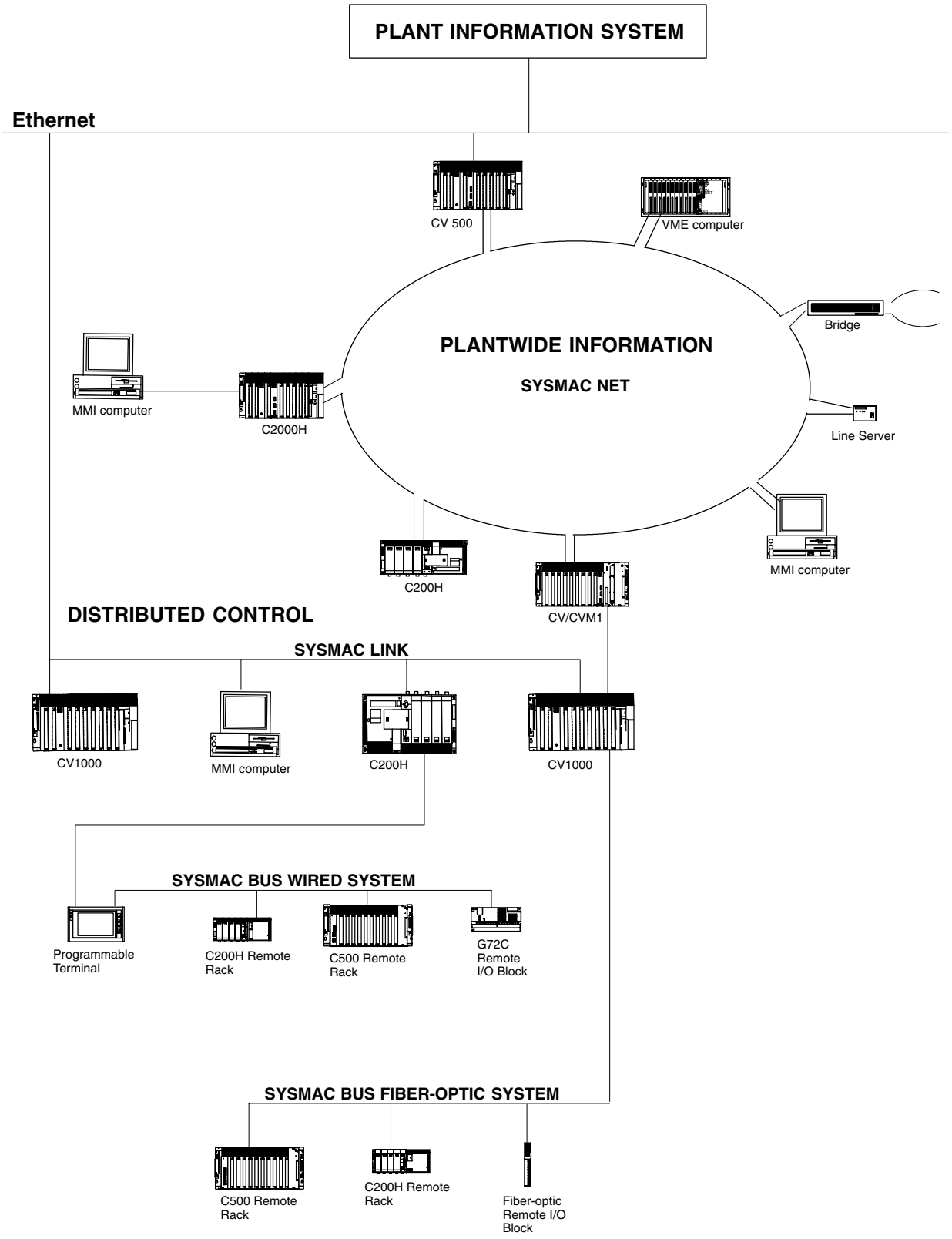
Omron's SYSMAC WAY Host Link serial network provides an ideal interface for today's data-hungry data acquisition and control software, or local operator interface. Multiple man-machine interfaces (MMI) can be connected to a PLC using the Host Link module.

Drivers for this openly available protocol have been developed for all major third-party operator interface and control software packages and operator interface devices.

High-Speed Distributed I/O Systems

Omron's SYSMAC BUS remote I/O system significantly lower wiring and maintenance costs. The high speed (187.5 Kpbs) system connect CPUs and distant I/O using low-cost twisted pair wiring or fiber-optic cables. Built-in diagnostics and status indicators simplify troubleshooting and maintenance.

Remote expansion racks, remote I/O blocks, programmable terminals, AC drives, pneumatic valves, and other devices can be connected to provide cost-effective distribution of I/O systems.


PLANT INFORMATION SYSTEM
Ethernet
CV 500
VME computer
Bridge
PLANTWIDE INFORMATION
SYSMAC NET
MMI computer
C2000H
Line Server
C200H
MMI computer
CV/CVM1
DISTRIBUTED CONTROL
SYSMAC LINK
CV1000
MMI computer
C200H
CV1000
SYSMAC BUS WIRED SYSTEM
Programmable Terminal
C200H Remote Rack
C500 Remote Rack
G72C Remote I/O Block
SYSMAC BUS FIBER-OPTIC SYSTEM
C500 Remote Rack
C200H Remote Rack
Fiber-optic Remote I/O Block

General Information

SYSMAC NET is a fiber-optic token ring network designed to transfer large amounts of data between PLCs, IBM PC/AT-compatible computers, VME computers, and any ASCII RS-232C devices. Network Bridges are also available to connect more than one SYSMAC NET loop. Any node in the network can initiate communications using simple program instructions. Fiber-optic transmission media provides reliable long distance communications in harsh environments. Automatic loopback, extensive diagnostics, and network utility software provide added reliability and ease of configuration.

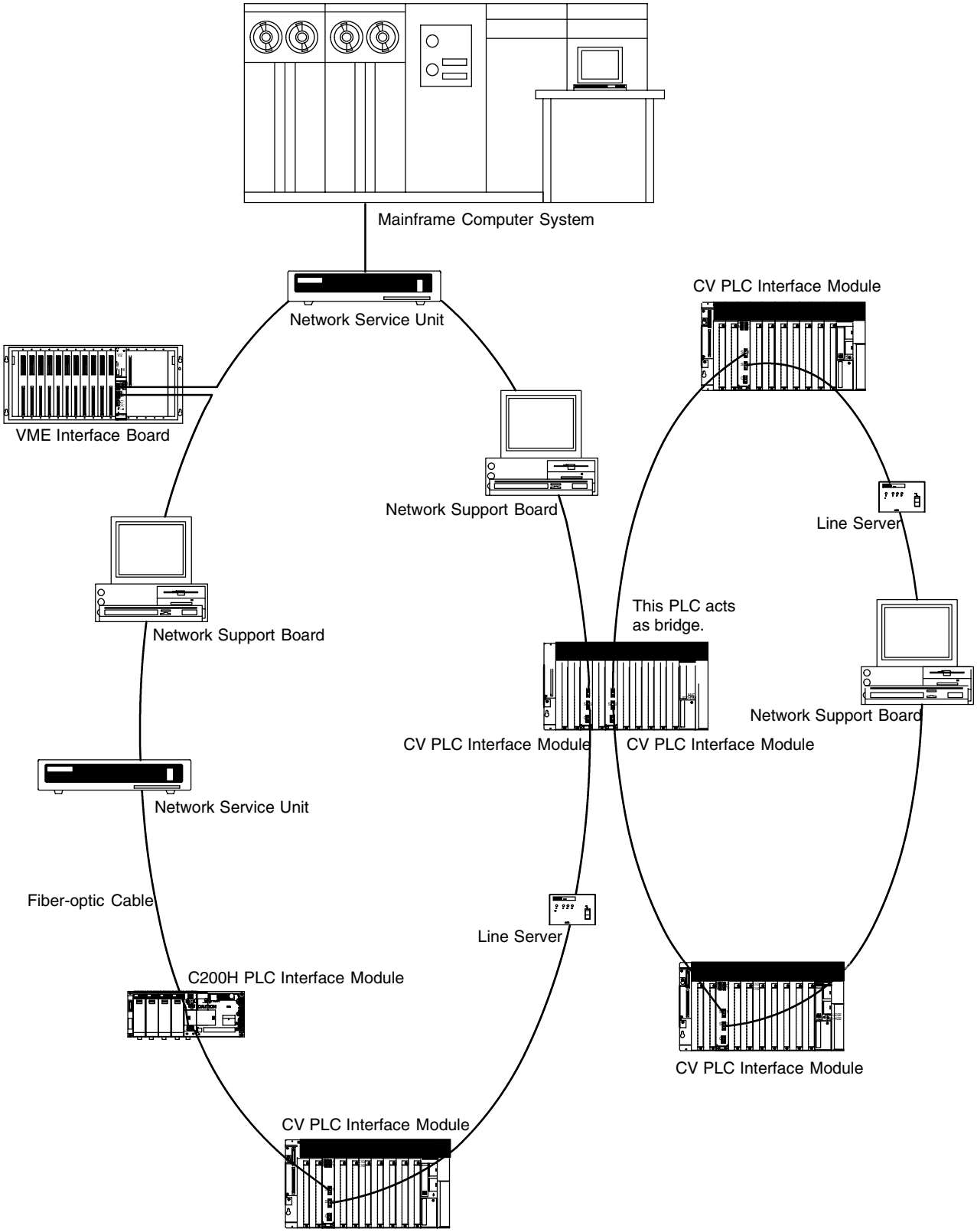
- Token ring fiber-optic network with backloop redundancy
- Interface to PLCs, IBM PC/IBM PC/AT-compatible computers, VME computers, or any ASCII device
- TCP/IP protocol, 2 Mbps transmission speed

The following guidelines should be taken into account when configuring a SYSMAC NET network:

- At least one SYSMAC NET module per PLC system, two maximum per C200H System
- One SYSMAC NET Network Service board per computer
- One Line Server per network

Specifications

Network topology	Fiber-optic token ring
Number of nodes	126 nodes per loop
Transmission media	200μ HPCF duplex fiber-optic cable
Distance between nodes	800 m (0.5 mile), 3 km (1.8 miles) with repeater
Transmission speed	2 Mbps
Protocol	TCP/IP
PLC interfaces	C200H, C500, C1000H, C2000H, CVM1, CV500, CV1000, CV2000
Message size	2 Kb maximum
Network Service Boards	AT bus, VME bus
Network Service Units	Serial computer interface, SYSMAC NET Bridge
Diagnostics	Automatic loopback, node bypass with UPS, self-diagnostic functions, error detection, network utility software


Mainframe Computer System
Network Service Unit
CV PLC Interface Module
VME Interface Board
Network Support Board
Line Server
Network Support Board
This PLC acts as bridge.
CV PLC Interface Module
CV PLC Interface Module
Network Support Board
Network Service Unit
Fiber-optic Cable
Line Server
C200H PLC Interface Module
CV PLC Interface Module
CV PLC Interface Module

SYSMAC LINK is a high-speed token bus network designed to transfer large amounts of control data in real time between small and large rack PLCs. A variety of methods can be used to initiate communications between nodes; automatic data link allows transfer of data without any special programming; custom data link tables can be used for special data transfers between nodes. Each node can initiate transfers in send/receive mode using ladder logic instructions. This also allows each PLC to control communications and network data handling. Any node can be monitored or programmed using the Factory Intelligent Terminal (FIT) connected to a node on the network.

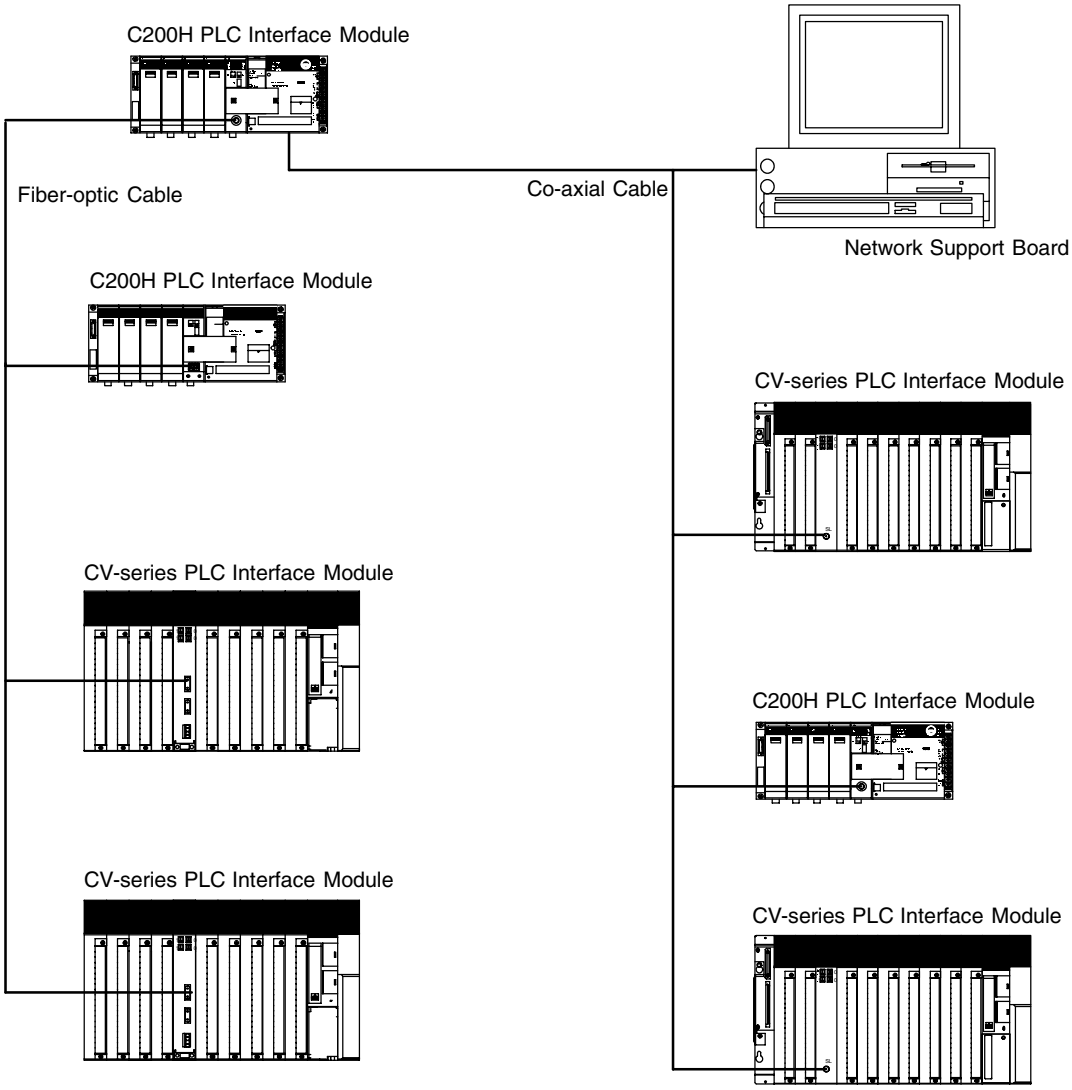
- High-speed token bus communications
- Large amounts of data transfered between PLCs or computers in a single command
- Automatic data link, custom data link, and peer-to-peer event communications options
- Send and receive instructions for PLC-initiated communications
- SYSMAC LINK can be connected to CV, C200H, C1000H, or C2000H simplex systems

The following guidelines should be taken into account when configuring a SYSMAC LINK network:

- At least one SYSMAC LINK module per PLC system
- One SYSMAC LINK Network Support Board per computer (co-axial only)

Specifications

Network topology	Token bus
Number of nodes	62 nodes per network
Transmission media	Wire: 75Ω impedance co-axial cable Fiber-optic: 200 μ HPCF duplex fiber-optic cable
Distance	Wire: 1 km (0.62 mile) total Fiber-optic: 800 m (0.5 mile) between nodes, 10 km (6.2 miles) total
Transmission speed	2 Mbps
Functions	Send, Receive, Deliver commands with FINS support (CV PLCs), automatic and custom data link
PLC interfaces	C200H, C1000H, C2000H, CVM1, CV500, CV1000, CV2000
Message size	512 bytes (256 words) maximum
Data link capacity per node	Link relay area: 64 words (128 bytes) Data memory area: 254 words (508 bytes)
Data link capacity per network	
C200H	918 words max.
C1000H, C2000H	2966 words max.
CV500, CV1000	2966 words max.
Diagnostics	Transmission path backup (fiber-optic backloop), failed node bypass, polling link backup, self-diagnostic and echo-back test, watchdog timer, error detection


C200H PLC Interface Module
Fiber-optic Cable
Co-axial Cable
Network Support Board
C200H PLC Interface Module
CV-series PLC Interface Module
CV-series PLC Interface Module
C200H PLC Interface Module
CV-series PLC Interface Module
CV-series PLC Interface Module

Communication Systems

Host Link allows any computer to communicate with one (RS-232C), or several (RS-422) Omron PLCs. Multiple system levels can be connected to the same PLC with up to 32 PLCs connnected to one computer. Omron's Host Link protocol is well defined and available for custom software driver development and operator interface connection to Omron PLCs. Most major operator interface companies have Host Link interfaces and drivers available. Host Link systems allow using Ladder Support Software (LSS) to program and monitor any PLC in the system.

The Host Link protocol is common to all Omron PLCs including the C20, K-type, Block-style H-type, C200H, C1000H, C2000H, and CV-series PLCs.

- Up to 32 PLCs can be connected to a single host computer
- Twisted pair or fiber-optic transmission media

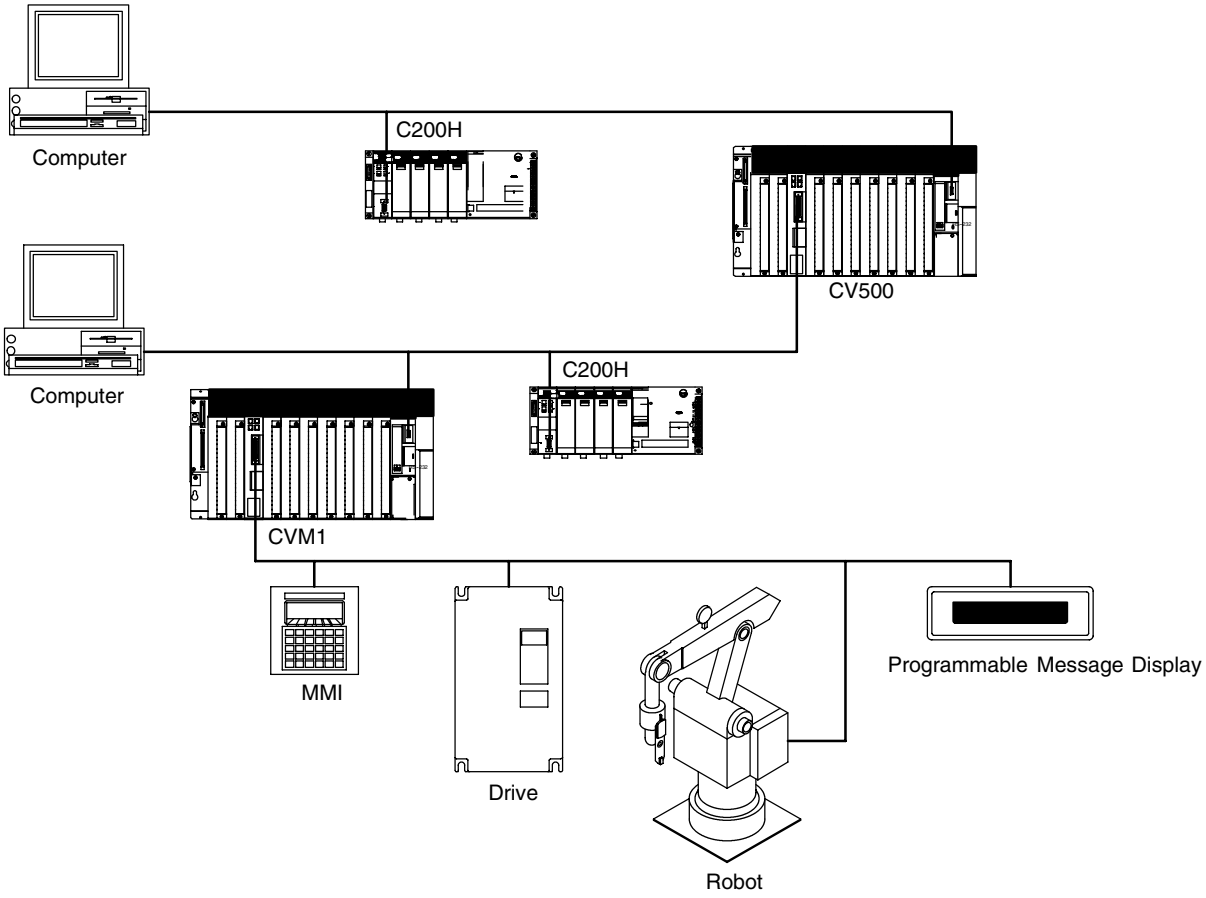
The following guidelines should be taken into account when configuring a Host Link system:

- The computer must have one serial port available
- If a fiber-optic, or RS-422 Host Link module is used, Link Adapters must be included in the system

Specifications

Communications protocol	Software: Omron host link protocol Hardware: RS-232C, RS-422 multi-drop; fiber-optic, or combination using Omron Link Adapters
Synchronization	Start-stop (1 or 2 stop bits)
Distance	RS-232C: 15 m (49 ft.) maximum RS-422: 10 m (32.8 ft.) maximum for any one cable Distances can be extended using Link Adapters
Transmission speed	300, 600, 1200, 2400, 4800, 9600, 19,200 bps (switch-selectable)
PLC interfaces	C20, K-type, Block-style H-type (built-in), C200H, C500, C1000H, C2000H, CVM1, CV500, CV1000, CV2000
Character code	ASCII (7 bits) or JIS (8 bits)
Error check	Parity and frame check sum
Functions	Program upload/download, PLC status control, error handling, read (any) memory area, write (any) memory area, read timer/counter, write timer/counter, etc.

System Configuration



General Information

PC Link is a peer-to-peer communication system allowing high-speed transfer of data between PLCs over long distances. Both small and large rack PLCs can be connected to the same system. Standard Link Adapters are available for fiber-optic media and longer transmission distances. No special programming is required to transfer data and multi-level systems can be connected to a single PLC.

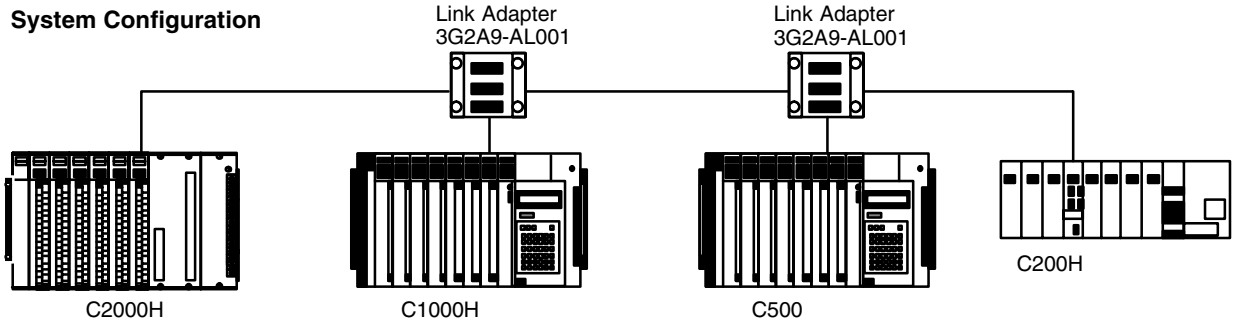
Features

- High-speed data transfer between up to 32 PLCs
- No special programming required
- Multi-level capability

Specifications

Communication method	Peer-to-peer					
Network topology	Multi-drop using Omron Link Adapters					
Number of nodes	PLC of polling link	Single-level	Multi-level			
	C200H, C1000H, C2000H	32	16			
	C500	8	8			
Transmission media	Twisted pair; fiber-optic when using Omron Link Adapters					
Distance	500 m (1640 ft) total cable length (without fiber-optic links), including branch lines Distances can be extended using Link Adapters					
Transmission speed	128 kbps					
Protocol	Omron PC Link, RS-485					
PLC interfaces	C200H, C500, C1000H, C2000H					
Data transfer capacity (bits/node)	PLC of polling link	2 links	3–4 links	5–8 links	9–16 links	17–32 links
	C200H, C1000H, C2000H	512	256	128	64	32
	C500	256	128	64	—	—
Diagnostic functions	CPU watchdog timer, CRC transmission error check					

System Configuration



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General Information

The SYSMAC BUS Remote I/O system is ideal for distribution of I/O and other devices at long distances from the CPU. Multiple remote I/O systems can be connected to a single CPU allowing maximum configuration flexibility.

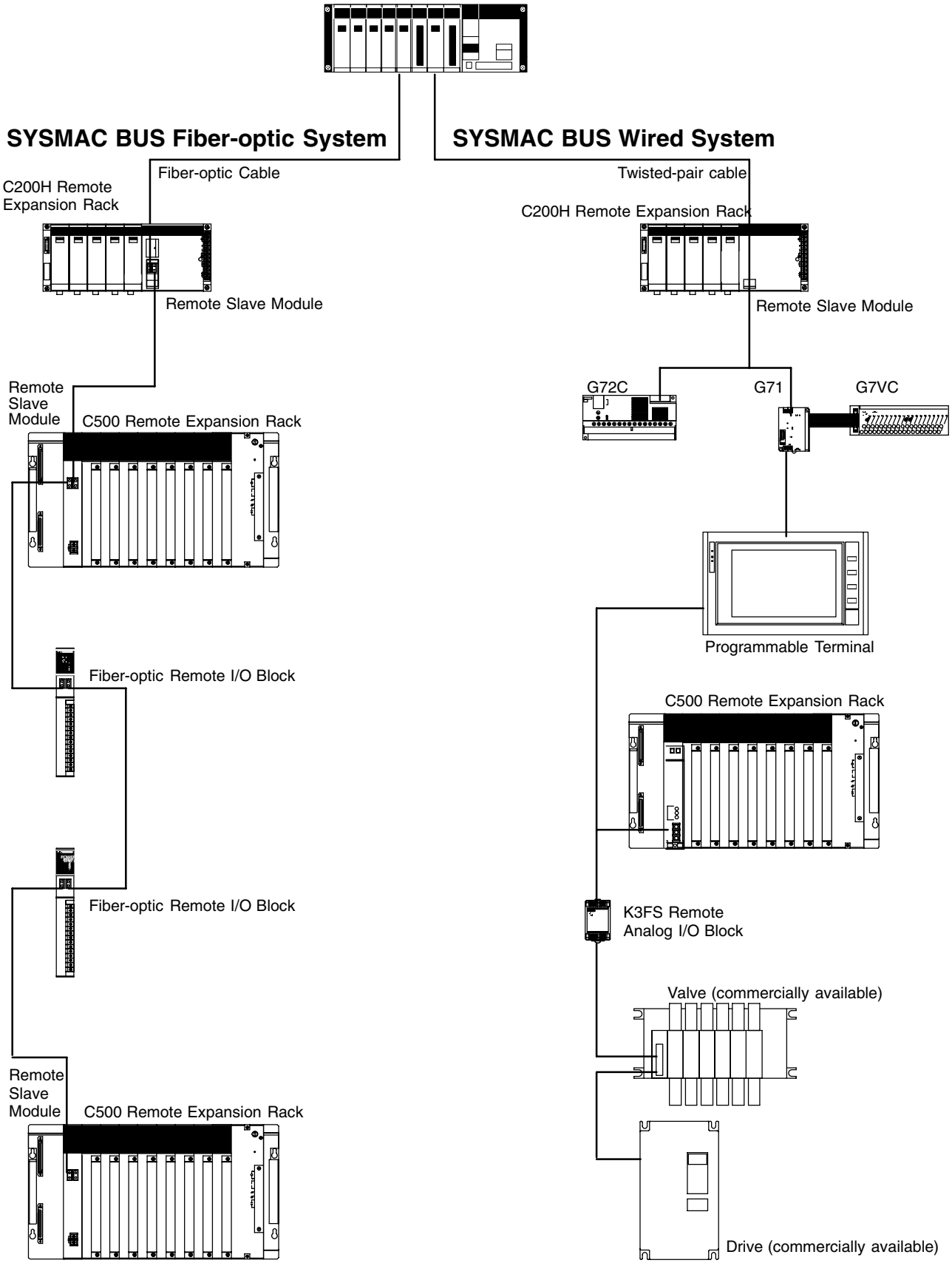
A SYSMAC BUS Remote I/O system consists of a Remote Master and one or more Remote Slave modules. Both small and large rack-style I/O can be mixed in the same remote I/O system. Remote terminal blocks allow for distribution of 8- and 16-point I/O blocks in a wired remote I/O system. Stand-alone fiber-optic I/O modules allow distribution of 8-point I/O blocks in a fiber-optic remote I/O system. I/O Link modules allow connection of a K-type PLC to a fiber-optic remote I/O system. Special link adapters are available for extended distances and mixing media types.

Features

- Wired twisted pair or fiber-optic cable versions
- Variety of I/O styles and types in a given remote I/O system
- RS-485 communications at 187.5 Kbps
- Connect C200H I/O, C500 I/O, G7 remote I/O terminals, programmable terminals

Specifications

PLC	C200H-RM001/RM002
Masters per PLC	2
Remote expansion racks per master	5 Slaves per PLC max
Remote I/O devices per master	Up to 32
I/O points per master	512
I/O points per PLC	512

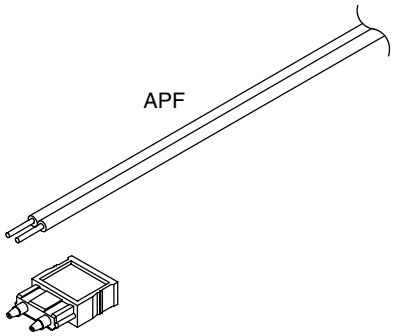

SYSMAC BUS Fiber-optic System
SYSMAC BUS Wired System
Fiber-optic Cable
Twisted-pair cable
C200H Remote Expansion Rack
C200H Remote Expansion Rack
Remote Slave Module
Remote Slave Module
Remote Slave Module
G72C
G71
G7VC
C500 Remote Expansion Rack
Programmable Terminal
Fiber-optic Remote I/O Block
C500 Remote Expansion Rack
Fiber-optic Remote I/O Block
K3FS Remote Analog I/O Block
Valve (commercially available)
Remote Slave Module
C500 Remote Expansion Rack
Drive (commercially available)

General Information

Omron pioneered the use of fiber-optics for factory floor communicaitons in 1985 by introducing standard fiber-optic interfaces for Remote I/O and all Omron industrial communicaitons networks. Fiber-optic communications offer distinct advantages over conventional wiring, including electrical noise immunity and increased transmission distances.

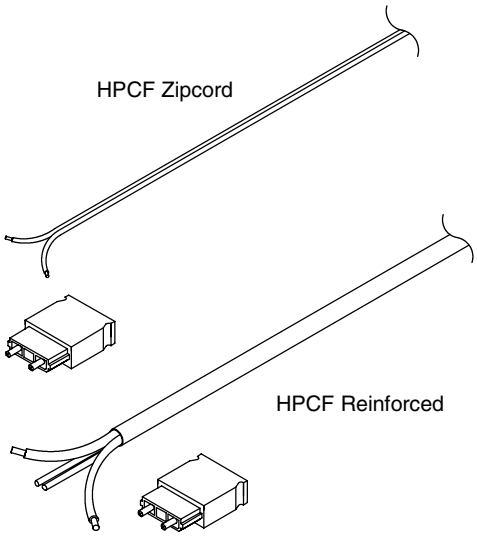
Recent developments in fiber-optic and communications technology have provided a variety of cost-effective and easy-to-install solutions. Simple field termination, lower cable costs and a variety of fiber-optic cable types allow for the effective use of fiber-optic communications in most industrial applications.

Omron offers a variety of standard direct-connect fiber-optic modules for fiber-optic communications. Two types of modules are available: -P suffix types are for use with APF, HPCF and PCF Cable types. Non -P suffix types are for use with HPCF and PCF Cable types. Both of these module types accept the fiber-optic cable directly. No adapter is needed.



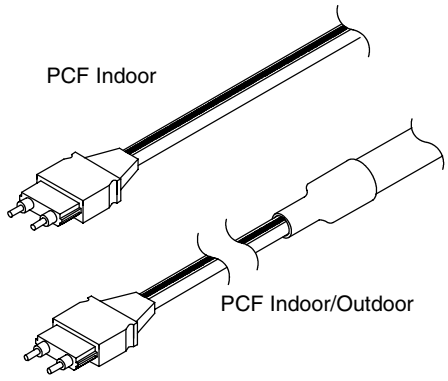
All Plastic Fiber (APF)

All Plastic Fiber is ideal for short transmission distances up to 20 meters in remote I/O, or Host Link communications. Field termination requires no special tools or skills. APF requires the use of -P modules. The connectors used with APF are the 3G5A2 connectors.



Hard Plastic-clad Fiber (HPCF)

Hard Plastic-clad Fiber has a 200 micron core cable for maximum distances of up to 200 meters without repeaters. It is available in both a zipcord style and a reinforced plastic-jacketed style with stress relief for pulling through conduit. A termination tool kit is required for field terminations. Bulk cable lengths up to 1 km are available. The connectors used with HPCF are the S3200 connectors.



Plastic-clad Fiber (PCF)

Plastic-clad Fiber is a high performance fiber allowing maximum distances of up to 800 meters (0.5 mile) without repeaters. Pre-terminated lengths from 0.1 to 800 meters are available. Connector bodies can be easily removed for running cable through ducts, then re-assembled.

All Glass Crystal Fiber (AGF)

Special cable and configurations are available for longer distance requirements, up to 3 km. The maximum transmission distance with each type of fiber-optic cable is determined by the kind of Remote I/O or Host Link modules used. These modules either have a -P or no -P in the part number. The table below shows maximum transmission distances. Longer distances are possible using standard repeaters.

System Compatibility

The following table shows which Fiber-optic Cable can be used with each system. The table also shows the maximum length of each Cable.

Fiber-optic Cable	APF	HPCF	PCF
SYSMAC BUS with -P modules	20 m (65 ft.)	100 m (328 ft.)	200 m (656 ft.)
SYSMAC BUS with non -P modules	—	200 m (656 ft.)	800 m (0.5 mile)
SYSMAC WAY with -P modules (C-series only)	20 m (65 ft.)	100 m (328 ft.)	200 m (656 ft.)
SYSMAC WAY with non -P modules (C-series only)	—	200 m (656 ft.)	800 m (0.5 mile)
SYSMAC NET	—	800 m (0.5 mile)	1000 m (0.62 mile)

S3200 Connectors

S3200 is the part number prefix. Refer to Standard Parts for complete part numbers.

	SYSMAC NET	SYSMAC LINK	SYSMAC WAY	SYSMAC BUS/2	SYSMAC BUS
C200H	COCF2511	COCF2511	COCH82	—	COCH82
C1000H, C2000H	COCH62M	COCF2011	COCH82	—	COCH82
CVM1, CV500, CV1000, CV2000	COCF2011	COCF2011	COCF2011	COCF2011	COCF2011
SYSMAC NET Network Support Board	COCH62M	—	—	—	—
SYSMAC NET Line Server	COCH62M	—	—	—	—
SYSMAC NET Bridge	COCH62M	—	—	—	—
SYSMAC NET Network Service Unit	COCH62M	—	—	—	—
SYSMAC NET VME Interface	COCH62M	—	—	—	—

3G5A2 Connectors (-P modules only)

3G5A2 is the part number prefix. B500 part number prefixes are equivalent to 3G5A2 prefixes. Refer to Standard Parts for complete part numbers.

	SYSMAC WAY	SYSMAC BUS
C200H	CO001, CO002	CO001, CO002
C1000H, C2000H	CO001, CO002	CO001, CO002
CVM1, CV500, CV1000, CV2000	—	CO001, CO002

Name	Description	Part Number
All Plastic Fiber-optic (APF) Cable		
Fiber-optic Cable	20 m (65.6 ft.), without connectors	**B500-PF212**
Fiber-optic Connectors	Brown, for cable 0 to 10 m (0 to 32.8 ft.) long (includes 2)	**3G5A2-CO001**
	Black, for cable 8 to 20 m (0 to 65.6 ft.) long (includes 2)	**3G5A2-CO002**
Hard Plastic-Clad Fiber-optic (HPCF) Cable		
Fiber-optic Cable	50 m (164 ft.), without connectors	**FCS-HCR-LB-501**
	100 m (328 ft.), without connectors	**FCS-HCR-LB-102**
	500 m (0.31 mile), without connectors	**FCS-HCR-LB-502**
	1 km (0.62 mile), without connectors	**FCS-HCR-LB-103**
	Zipcord style, orange, 50 m (164 ft.), without connectors	**FCS-HCR-CO-501**
Fiber-optic Connectors	SYSMAC BUS or SYSMAC WAY only	**S3200-COCH82**
	SYSMAC BUS/2 (all PLCs), SYSMAC LINK (other than C200H)	**S3200-COCF2011**
	SYSMAC NET (other than C200H)	**S3200-COCH62M**
	SYSMAC NET, LINK (C200H only)	**S3200-COCF2511**
In-line Fiber-optic Connectors	SYSMAC NET In-line male connector	**S3200-COCF62M**
	SYSMAC NET In-line female connector	**S3200-COCF62F**
	SYSMAC LINK In-line adapter	**S3200-COIAT2000**
Termination Kit	For HPCF Cable	**FCS-CAK6230-US**
Plastic-Clad Fiber-optic (PCF) Cable		
Indoor Fiber-optic Cable	10 cm (0.32 ft.), with connectors	**3G5A2-OF011**
	1 m (3.2 ft.), with connectors	**3G5A2-OF101**
	2 m (6.56 ft.), with connectors	**3G5A2-OF201**
	3 m (9.8 ft.), with connectors	**3G5A2-OF301**
	5 m (16.4 ft.), with connectors	**3G5A2-OF501**
	10 m (32.8 ft.), with connectors	**3G5A2-OF111**
	20 m (65.6 ft.), with connectors	**3G5A2-OF211**
	30 m (98 ft.), with connectors	**3G5A2-OF311**
	50 m (164 ft.), with connectors	**3G5A2-OF511**
Indoor/Outdoor Fiber-optic Cable	100 m (328 ft.), with connectors	**3G5A2-OF002-100M**
	200 m (656 ft.), with connectors	**3G5A2-OF002-200M**
	400 m (0.25 mile), with connectors	**3G5A2-OF002-400M**
	800 m (0.5 mile), with connectors	**3G5A2-OF002-800M**

Communication Systems

13 Standard Parts

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Standard Parts

CPU Rack

Name	Description	Part number
Required Parts		
CPU	C200H AC power supply	C200H-CPU01-E
	C200H DC power supply	C200H-CPU03-E
	C200H AC power supply	C200H-CPU21-E
	C200H DC power supply	C200H-CPU23-E
	C200H AC power supply with clock; SYSMAC NET/LINK capable	C200H-CPU31-E
	C200HS AC power supply	C200HS-CPU01-E
	C200HS DC power supply	C200HS-CPU03-E
	C200HS AC power supply, RS-232C Port	C200HS-CPU21-E
	C200HS DC power supply, RS-232C Port	C200HS-CPU23-E
	C200HS AC power supply, SYSMAC NET/LINK capable, RS-232C Port	C200HS-CPU31-E
	C200HS DC power supply, SYSMAC NET/LINK capable, RS-232C Port	C200HS-CPU33-E
CPU Backplane	3-slot backplane	C200H-BC031-V2
	5-slot backplane	C200H-BC051-V2
	8–slot backplane	C200H-BC081-V2
	10-slot backplane	C200H-BC101-V2
Memory Packs (Not required for C200HS)	RAM, 4 K words, battery back-up; no clock	C200H-MR431
	RAM, 8 K words, battery back-up; no clock	C200H-MR831
	RAM, 4 K words, capacitor back-up; no clock	C200H-MR432
	RAM, 8 K words, capacitor back-up; no clock	C200H-MR832
	RAM, 4 K words, battery back-up; with clock (CPU21, CPU23 only)	C200H-MR433
	RAM, 8 K words, battery back-up; with clock (CPU21, CPU23 only)	C200H-MR833
	EPROM, 8 K words, no clock	C200H-MP831
	EEPROM, 4 K words, no clock	C200H-ME431
	EEPROM, 8 K words, no clock	C200H-ME831
	EEPROM, 4 K words, battery back-up; with clock (CPU21, CPU23 only)	C200H-ME432
	EEPROM, 8 K words, battery back-up; with clock (CPU21, CPU23 only)	C200H-ME832
Optional Parts		
File Memory Boards (C200HS only)	EPROM, 16K words	C200HS-MP16K
	EEPROM, 16K words	C200HS-ME16K

Local Expansion Rack

Name	Description	Part number
Required Parts		
CPU Backplane	3-slot backplane	C200H-BC031-V2
	5-slot backplane	C200H-BC051-V2
	8–slot backplane	C200H-BC081-V2
	10-slot backplane	C200H-BC101-V2
Power supply	24 VDC	C200H-PS211
	120/240 VAC	C200H-PS221
Local Expansion I/O Connecting Cable	30 cm (11.8 in.)	C200H-CN311
	70 cm (2.3 ft.)	C200H-CN711
	2 m (6.6 ft.)	C200H-CN221
	5 m (16.4 ft.)	C200H-CN521
	10 m (32.8 ft.)	C200H-CN131

Name	Description	Part number
Back-up Battery	Replacement for memory	C200H-BAT09
I/O Simulator	For programming and debugging, requires ID001; 8 inputs	C200H-ETL01
Space Module	For I/O Module slots	C200H-SP001
Backplane Connector Cover	For I/O Module connectors	3G2A5-COV02
I/O Terminal Block Cover	For 10-pin I/O Terminal Blocks	C200H-COV02
	For 19-pin I/O Terminal Blocks	C200H-COV03
	For 5- and 8-point Modules	C200H-COV11
DIN Rail Adapter Kit	For mounting Backplane to DIN rail (includes two pieces)	C200H-DIN01
DIN Rail	Track, 50 cm (1.6 ft.)	PFP-50N
	Track, 1 m (3.2 ft.)	PFP-100N
	End Plate	PFP-M
	Spacer	PFP-S
Backplane Isolating Panel	For 3-slot Backplane	C200H-ATT31
	For 5-slot Backplane	C200H-ATT51
	For 8-slot Backplane	C200H-ATT81
I/O Mounting Bracket	For 3-slot rack	C200H-ATT33
	For 5-slot rack	C200H-ATT53
	For 8-slot rack	C200H-ATT83

SYSMAC BUS Remote I/O Control Modules

Name	Description	Part number
SYSMAC BUS Remote Master Modules		
Remote Master	Fiber-optic: APF, PCF, HPCF (1 port)	C200H-RM001-P
	Wired	C200H-RM201
C200H SYSMAC BUS Remote Expansion Rack Backplanes and Power Supply/Slaves		
Backplane	3-slot	C200H-BC031-V2
	5-slot	C200H-BC051-V2
	8-slot	C200H-BC081-V2
	10-slot	C200H-BC101-V2
Power Supply/Remote Slave	Fiber-optic: APF, PCF, HPCF (1 port) 120 VAC	C200H-RT001-P
	Fiber-optic: APF, PCF, HPCF (1 port) 24 VDC	C200H-RT002-P
	Wired, 120 VAC	C200H-RT201
	Wired, 24 VDC	C200H-RT202
C500 SYSMAC BUS Remote Expansion Rack Backplanes, Power Supplies and Slaves		
Backplane	3 I/O slots	C500-BL031
	5 I/O slots	3G2A5-BI051
	8 I/O slots	3G2A5-BI081
Power Supply	120/240 VAC	3G2A5-PS222-E
	24 VDC	3G2A5-PS212-E
Remote Slave Module	Fiber-optic: PCF, HPCF (1 port)	3G2A5-RT001-EV1
	Fiber-optic: APF, PCF, HPCF (1 port)	3G2A5-RT001-PEV1
	Fiber-optic: PCF, HPCF (2 ports)	3G2A5-RT002-EV1
	Fiber-optic: APF, PCF, HPCF (2 ports)	3G2A5-RT002-PEV1
	Wired	C500-RT201

SYSMAC BUS Remote I/O Devices

SYSMAC BUS Fiber-optic Remote I/O Blocks

Description	Fiber-optic Cable type	Points	Part number
120 VAC input	PCF, HPCF	8	3G5A2-IA121-E
240 VAC input	PCF, HPCF	8	3G5A2-IA221-E
Non-voltage contact input	PCF, HPCF	8	3G5A2-ID001-E
Non-voltage contact input	APF, PCF, HPCF	8	3G5A2-ID001-PE
12 to 24 VAC/DC input	PCF, HPCF	8	3G5A2-IM211-E
Triac output, 120 VAC	PCF, HPCF	8	3G5A2-OA121-E
Triac output, 1 A, 85 to 250 VAC	PCF, HPCF	8	3G5A2-OA222-E
Relay output, 2 A, 24 VDC/250 VAC	PCF, HPCF	8	3G5A2-OC221-E
Relay output, 2 A, 24 VDC/250 VAC	APF, PCF, HPCF	8	3G5A2-OC221-PE
Transistor output, 0.3 A, 12 to 48 VDC	PCF, HPCF	8	3G5A2-OD411-E
Transistor output, 0.3 A, 12 to 48 VDC	APF, PCF, HPCF	8	3G5A2-OD411-PE

G72C SYSMAC BUS Remote I/O Blocks

Power supply	Input voltage/ Switching capacity	Internal circuit	Points	Part number
SYSMAC BUS Remote Input Blocks				
24 VDC (200 mA, max.)	9.7 mA, 24 VDC/pt	NPN, positive common	16	G72C-ID16-DC24V
24 VDC (200 mA, max.)	9.7 mA, 24 VDC/pt	PNP, negative common	16	G72C-ID16-1-DC24V
24 VDC (200 mA, max.)	9.7 mA, 24 VDC/pt	NPN, positive common	16	G72C-VID16-DC24
SYSMAC BUS Remote Output Blocks				
24 VDC (200 mA, max.)	0.3 A, 24 VDC/point	NPN, positive common	16	G72C-OD16-DC24V
24 VDC (200 mA, max.)	0.3 A, 24 VDC/point	PNP, negative common	16	G72C-OD16-1-DC24V
24 VDC (200 mA, max.)	0.3 A, 24 VDC/point 2.4 A/Terminal	NPN, negative common	16	G72C-VOD16-DC24

G71 SYSMAC BUS Remote Stand-alone Slaves

These Interfaces are used with the G7TC, G7VC, and P7TF I/O Blocks (1 Block/Interface).

Power supply	Internal circuit	Points	Part number
SYSMAC BUS Remote Input Stand-alone Slave			
24 VDC (200 mA, max.) supplied through Input Block		16	G71-IC16-DC24V
SYSMAC BUS Remote Output Stand-alone Slave			
24 VDC (500 mA, max.) supplied through Output Block		16	G71-OD16-DC24V

Standard Parts

Description	Part number
ASCII/BASIC Coprocessor	
PLC module (rack-mount); EEPROM; RS-232C	C200H-ASC02
ASCII/BASIC module Utility Software	SYSMATE-ASC91-V1
Battery set for PLC module	C200H-BAT09
Analog Input Modules	
4 pts.; 4 to 20 mA, 1 to 5 V, 0 to 10V	C200H-AD001
2 pts.; 0 to 10 V	C200H-AD002
Analog Output Modules	
2 pts.; 4 to 20 mA, 1 to 5 V, 0 to 10V	C200H-DA001
High-speed Counter	
PLC module (rack-mount); up to 50 kHz; up to 5 m	C200H-CT001-V1
PLC module (rack-mount); up to 75 kHz; up to 25 m	C200H-CT002
1-axis Position Control	
PLC module (rack-mount); 1 axis	C200H-NC112
2-axis Position Control	
PLC module (rack-mount); 2 axis	C200H-NC211
Temperature Sensor Input Modules	
PLC module (rack-mount); type J and K thermocouples	C200H-TS001
PLC module (rack-mount); platinum RTD	C200H-TS101
Temperature Controller Modules	
PLC modules (rack-mount) Thermocouple	C200H-TC001/002/003
PLC modules (rack-mount) platinum RTD	C200H-TC101/102/103
Heat/Cool Temperature Controller Modules	
PLC modules (rack-mount) Thermocouple	C200H-TV001/002/003
PLC modules (rack-mount) platinum RTD	C200H-TV101/102/103
PID Control	
PLC modules (rack-mount)	C200H-PID-01/02/03
Voice	
PLC module (rack-mount)	C200H-OV001
RS-232C cable for message transfer between module and computer	C200H-CN224
Analog Timer Input Module	
PLC module (rack-mount); 4 timers, externally set values	C200H-TM001
Variable resistor connector cable	C4K-CN223

Description	Part number
Cam Positioner	
PLC module (rack-mount)	C200H-CP114
Resolver with 1 m (3.28 ft.) cable	3F88L-RS17
Resolver cable, 3 m (9.84 ft.)	3F88L-CR003C
Resolver cable, 5 m (16.4 ft.)	3F88L-CR005C
Resolver cable, 10 m (32.8 ft.)	3F88L-CR010C
Resolver cable, 20 m (65.6 ft.)	3F88L-CR020C
Resolver shaft coupler	3F88L-RL10
Radio Frequency Identification Systems (V600 Short-range RF ID Systems)	
PLC module (rack-mount)	C200H-IDS01-V1
Radio Frequency Identification Systems (V620 Long-range RF ID Systems)	
PLC module (rack-mount)	C200H-IDS21
Interrupt Input	
PLC module, (rack-mount); 8 inputs, 12 to 24 VDC (C200HS CPU only)	C200HS-INT01
Fuzzy Inferencing Coprocessor	
PLC module, (rack-mount); 8 inputs, 2 outputs	C200HS-FZ001

Special High-density I/O Modules

Voltage	Points (/common)	Part number
5 VDC TTL	32 (8/common, 4 circuits), 8 points can be quick-reponse	C200H-ID501
24 VDC	32 (8/common, 4 circuits), 8 points can be quick-reponse	C200H-ID215
5 VDC TTL	32 (8/common, 4 circuits), or 128 multiplexed, selectable	C200H-OD501
24 VDC	32 (8/common, 4 circuits), or 128 multiplexed, selectable	C200H-OD215
Input: 5 VDC Output: 5 VDC	16 inputs & 16 outputs (8/common, 2 circuits each), or 128 dynamic multiplexed inputs, selectable; 8 points can be quick-reponse in static mode	C200H-MD501
Input: 12 VDC Output: 5 to 24 VDC	16 inputs & 16 outputs (8/common, 2 circuits each), or 128 dynamic multiplexed inputs, selectable; 8 points can be quick-reponse in static mode	C200H-MD115
Input: 24 VDC Output: 5 to 24 VDC	16 inputs & 16 outputs (8/common, 2 circuits each), or 128 dynamic multiplexed inputs, selectable; 8 points can be quick-reponse in static mode	C200H–MD215

Group 2 High-Density I/O Modules for CPU21, CPU23, CPU31, and HS only

Voltage	Description	Part number
24 VDC	32 (32/common, 1 circuit)	C200H-ID216
24 VDC	64 (32/common, 2 circuits)	C200H-ID217
4.5 VDC to 26.4 VDC	32 (32/common, 1 circuit)	C200H-OD218
4.5 VDC to 26.4 VDC	64 (32/common, 2 circuits)	C200H-OD219

Discrete Input Modules

Voltage	Points (/common)	Part number
DC Inputs		
12 to 24 VDC	8 (8/common, 1 circuit)	C200H-ID211
24 VDC	16 (16/common, 1 circuit)	C200H-ID212
AC Inputs		
100 to 120 VAC	8 (8/common, 1 circuit)	C200H-IA121
100 to 120 VAC	16 (16/common, 1 circuit)	C200H-IA122
200 to 240 VAC	8 (8/common, 1 circuit)	C200H-IA221
200 to 240 VAC	16 (16/common, 1 circuit)	C200H-IA222
AC/DC Inputs		
12 to 24 VAC/VDC	8 (8/common, 1 circuit)	C200H-IM211
24 VAC/VDC	16 (16/common, 1 circuit)	C200H-IM212

Discrete Output Modules

Current/voltage	Points (/common)	Part number
Transistor Outputs		
0.3 A, 5 to 24 VDC	8 (8/common, 1 circuit), PNP	C200H-OD216
0.3 A, 12 to 24 VDC	12 (12/common, 1 circuit), PNP	C200H-OD217
1 A, 12 to 24 VDC	8 (8/common, 1 circuit)	C200H-OD411
0.3 A, 24 VDC	12 (12/common, 1 circuit)	C200H-OD211
0.3 A, 24 VDC	16 (16/common, 1 circuit)	C200H-OD212
0.8 A, 24 VDC	8 (8/common, 1 circuit)	C200H-OD214
2.1 A, 24 VDC	8 (8/common, 1 circuit)	C200H-OD213
Triac Outputs		
120 VAC	8 (8/common, 1 circuit)	C200H-OA121-E
250 VAC	8 (8/common, 1 circuit)	C200H-OA221
250 VAC	12 (12/common, 1 circuit)	C200H-OA222
Relay Outputs		
24 VDC/250 VAC	5 (independent commons)	C200H-OC223
24 VDC/250 VAC	8 (independent commons)	C200H-OC224
24 VDC/250 VAC	8 (8/common, 1 circuit)	C200H-OC221
24 VDC/250 VAC	12 (12/common, 1 circuit)	C200H-OC222
24 VDC/250 VAC	16 (16/common, 1 circuit)	C200H-OC225

I/O Module Accessories

Name	Description	Part number
I/O Terminal BLock Cover	For 10 pin I/O Terminal Blocks	C200H-COV02
	For 19 pin I/O Terminal Blocks	C200H-COV03
	For 5- and 8- point Modules	C200H-COV11
Connector	24-pin, solder type, straight	C500-CE241
	24-pin, crimp type	C500-CE242
	24-pin, for ribbon cable	C500-CE243
	24-pin, solder type, 90° angle	C500-CE244
	40-pin, solder type, straight	C500-CE401
	40-pin, crimp type	C500-CE402
	40-pin, for ribbon cable	C500-CE403
	40-pin, solder type, 90° angle	C500-CE404
	RS-232C, 25 pins	0020756-4, RS-232 connector
	RS-422, 9 pins	0020757-2, RS-422 connector
Connector Cover	RS-232C, 25 pins	0020758-0, RS-232 cover
	RS-422, 9 pins	0020759-9, RS-422 cover

XW2B Screw Terminals

Description	Screw size	Part number
Blocks for 32-point I/O Modules		
20 terminals	M2.4	XW2B-20G4
20 terminals	M3.5	XW2B-20G5
40 terminals (2 connectors)	M3.5	XW2B-40G5-T
20 terminals (daisy chain applications)	M3.5	XW2B-20G5-D
Blocks for 64-point I/O Modules		
40 terminals	M2.4	XW2B-40G4
40 terminals	M3.5	XW2B-40G5

Connecting Cables for XW2B Screw Terminals

Description	Length	Part number
For 32-point blocks	1 m (3.28 ft.)	XW2Z-100A
	2 m (6.56 ft.)	XW2Z-200A
	3 m (9.84 ft.)	XW2Z-300A
	5 m (16.4 ft.)	XW2Z-500A
For 64-point blocks	1 m (3.28 ft.)	XW2Z-100B
	2 m (6.56 ft.)	XW2Z-200B
	3 m (9.84 ft.)	XW2Z-300B
	5 m (16.4 ft.)	XW2Z-500B

Output Connectors, Input Blocks

B7A Output Connectors

Rated load voltage	Rated load current	Output configuration	I/O delay	Error processing	Points	Part number
5 to 24 VDC	50 mA max./point	NPN open collector	Normal-speed 19.2 ms	Hold	16	B7A-R6A13
5 to 24 VDC	50 mA max./point	NPN open collector	Normal-speed 19.2 ms	Load OFF	16	B7A-R6A33
5 to 24 VDC	50 mA max./point	NPN open collector	High-speed 3 ms	Hold	16	B7A-R6A18
5 to 24 VDC	50 mA max./point	NPN open collector	High-speed 3 ms	Load OFF	16	B7A-R6A38
5 to 24 VDC	50 mA max./point	NPN open collector	Normal-speed 19.2 ms	Hold	32	B7A-R3A13
5 to 24 VDC	50 mA max./point	NPN open collector	Normal-speed 19.2 ms	Load OFF	32	B7A-R3A33
5 to 24 VDC	50 mA max./point	NPN open collector	High-speed 3 ms	Hold	32	B7A-R3A18
5 to 24 VDC	50 mA max./point	NPN open collector	High-speed 3 ms	Load OFF	32	B7A-R3A38

B7A Input Blocks

Input configuration	Input voltage	Input current range	Input voltage range	I/O delay	Common	Pts	Part number
NPN compatible	No-voltage contact, two-wire sensors with DC output, NPN output type	3 to 6 mA	0 VDC to supply voltage	Normal-speed 19.2 ms	– common	16	B7A-T6A1
NPN compatible	No-voltage contact, two-wire sensors with DC output, NPN output type	3 to 6 mA	0 VDC to supply voltage	Normal-speed 19.2 ms	± common	16	B7A-T6B1
NPN compatible	No-voltage contact, two-wire sensors with DC output, NPN output type	3 to 6 mA	0 VDC to supply voltage	High-speed 3 ms	– common	16	B7A-T6C1
NPN compatible	No-voltage contact, two-wire sensors with DC output, NPN output type	3 to 6 mA	0 VDC to supply voltage	High-speed 3 ms	± common	16	B7A-T6A6
PNP compatible	No-voltage contact, two-wire sensors with DC output, NPN output type	3 to 6 mA	0 VDC to supply voltage	High-speed 3 ms	± common	16	B7A-T6B6
PNP compatible	No-voltage contact, two-wire sensors with DC output, NPN output type	3 to 6 mA	0 VDC to supply voltage	High-speed 3 ms	± common	16	B7A-T6C6

P7TF Input Block Base without Modules

Internal circuit	Points	Part number
NPN, negative common	16	P7TF-IS16-DC24V

Modules are available with 24 VDC, 5–24 VDC, 100–120 VAC, 200–240 VAC, and 100–240 VAC rated input voltages.

G7T, and G3TA Relay and SSR Input Modules

These relay and SSR modules are for use with G7TC and P7TF Input Blocks.

Name	Input voltage	Internal circuit	Part number
Input relay	100/120 VAC	NO	G7T-1122S-AC100/110V
Input relay	200/240 VAC	NO	G7T-1122S-AC200/220V
Input relay	12 VDC	NO	G7T-1122S-DC12V
Input relay	24 VDC	NO	G7T-1122S-DC24V
Input SSR	100 to 240 VAC	NO	G3TA-IAZR02S-AC100/240V
Input SSR	5 to 24 VDC	NO	G3TA-IDZR02S-DC5-24V

G7TC Input Blocks with Modules

Power supply	Input voltage	Internal circuit	Points	Part number
24 VDC*	100/120 VAC	NPN, negative common	16	G7TC-IA16-AC100/110V
24 VDC*	200/240 VAC	NPN, negative common	16	G7TC-IA16-AC200/220V
24 VDC*	24 VDC	NPN, negative common	16	G7TC-ID16-DC24V

*Using G71 Remote Interface

Input Connectors, Output Blocks

B7A Input Connectors

Input configuration	Input voltage	Input current range	Input voltage range	I/O delay	Pts	Part number
NPN compatible	No-voltage contact, three wire NPN	0.6 mA to 1.5 mA	0 VDC to supply voltage	Normal-speed 19.2 ms	16	B7A-T6E3
NPN compatible	No-voltage contact, three wire NPN	0.6 mA to 1.5 mA	0 VDC to supply voltage	High-speed 3 ms	16	B7A-T6E8
NPN compatible	No-voltage contact, three wire NPN	0.6 mA to 1.5 mA	0 VDC to supply voltage	Normal-speed 19.2 ms	32	B7A-T3E3
NPN compatible	No-voltage contact, three wire NPN	0.6 mA to 1.5 mA	0 VDC to supply voltage	High-speed 3 ms	32	B7A-T3E8

B7A Output Blocks

Output configuration	Rated load voltage	Rated load current	I/O delay	Common	Error processing	Pts	Part number
NPN open collector	5 to 24 VDC	100 mA max./point	Normal-speed 19.2 ms	+common	Hold	16	B7A-R6B11
NPN open collector	5 to 24 VDC	100 mA max./point	Normal-speed 19.2 ms	+common	Load OFF	16	B7A-R6B31
NPN open collector	5 to 24 VDC	100 mA max./point	High-speed 3 ms	+common	Hold	16	B7A-R6B16
NPN open collector	5 to 24 VDC	100 mA max./point	High-speed 3 ms	+common	Load OFF	16	B7A-R6B36
PNP open collector	5 to 24 VDC	100 mA max./point	Normal-speed 19.2 ms	– common	Hold	16	B7A-R6F11
PNP open collector	5 to 24 VDC	100 mA max./point	Normal-speed 19.2 ms	– common	Load OFF	16	B7A-R6F31
PNP open collector	5 to 24 VDC	100 mA max./point	High-speed 3 ms	– common	Hold	16	B7A-R6F16
PNP open collector	5 to 24 VDC	100 mA max./point	High-speed 3 ms	– common	Load OFF	16	B7A-R6F36
NPN open collector	5 to 24 VDC	500 mA max./point	Normal-speed 19.2 ms	+ common	Hold	16	B7A-R6C11
NPN open collector	5 to 24 VDC	500 mA max./point	Normal-speed 19.2 ms	+ common	Load OFF	16	B7A-R6C31
NPN open collector	5 to 24 VDC	500 mA max./point	High-speed 3 ms	+ common	Hold	16	B7A-R6C16
NPN open collector	5 to 24 VDC	500 mA max./point	High-speed 3 ms	+ common	Load OFF	16	B7A-R6C36
PNP open collector	5 to 24 VDC	500 mA max./point	Normal-speed 19.2 ms	– common	Hold	16	B7A-R6G11
PNP open collector	5 to 24 VDC	500 mA max./point	Normal-speed 19.2 ms	– common	Load OFF	16	B7A-R6G31
PNP open collector	5 to 24 VDC	500 mA max./point	High-speed 3 ms	– common	Hold	16	B7A-R6G16
PNP open collector	5 to 24 VDC	500 mA max./point	High-speed 3 ms	– common	Load OFF	16	B7A-R6G36

Standard Parts

P7TF Output Block Base without Modules

Internal circuit	Points	Part number
NPN, positive common	8	P7TF-OS08
PNP, negative common	8	P7TF-OS08-1
NPN, positive common	16	P7TF-OS16
PNP, negative common	16	P7TF-OS16-1

Modules are available with 12 VDC, and 24 VDC rated input voltages.

G7T, and G3TA Relay and SSR Output Modules

These relay and SSR modules are for use with G7TC and P7TF Output Blocks.

Description	Input voltage	Switching capacity	Internal circuit	Part number
Output Relay	12 VDC	5 A, 125 VDC/250 VAC	NC	G7T-1012S DC12V
Output Relay	24 VDC	5 A, 125 VDC/250 VAC	NC	G7T-1012S DC24V
Output Relay	12 VDC	5 A, 125 VDC/250 VAC	NO	G7T-1112S-DC12V
Output Relay	24 VDC	5 A, 125 VDC/250 VAC	NO	G7T-1112S-DC24V
Output SSR, triac	12 VDC	2 A, 75 to 250 VAC	NO	G3TA-OA202SZ-DC12V
Output SSR, triac	24 VDC	2 A, 75 to 250 VAC	NO	G3TA-OA202SZ-DC24V
Output SSR, transistor	24 VDC	2 A, 4 to 60 VDC	NO	G3TA-ODX02S-DC24V
Output SSR, transistor	24 VDC	1 A, 40 to 200 VAC	NO	G3TA-OD201S-DC24V

G77-S Short-circuit Output Module

This module is for use with G7TC and P7TF Output Blocks.

Description	Part number
Short-circuiting output module for direct connection of load to output block	G77-S

G7TC Output Blocks with Modules

Coil voltage	Switching capacity	Internal circuit	Points	Part number
12 VDC	5 A, 125 VDC/250 VAC	NPN, positive common	8	G7TC-OC08-DC12V
24 VDC	5 A, 125 VDC/250 VAC	NPN, positive common	8	G7TC-OC08-DC24V
12 VDC	5 A, 125 VDC/250 VAC	NPN, positive common	16	G7TC-OC16-DC12V
24 VDC	5 A, 125 VDC/250 VAC	NPN, positive common	16	G7TC-OC16-DC24V
24 VDC	5 A, 125 VDC/250 VAC	PNP, negative common	16	G7TC-OC16-1-DC24V

Connecting Cables, Shorting Bar

Name	Description	Part number
Spade Connector I/O Block Cable	50 cm (1.6 ft.)	G79-Y050C
	1 m (3.3 ft.)	G79-Y100C
	1.5 m (4.9 ft.)	G79-Y150C
	2 m (6.6 ft.)	G79-Y200C
	5 m (16.5 ft.)	G79-Y500C
Quick-connect I/O Block Cable (24 pins)	For 1 Block, 1 m (3.3 ft.)	G79-100C
	For 1 Block, 1.5 m (4.9 ft.)	G79-150C
	For 1 Block, 2 m (6.6 ft.)	G79-200C
	For 1 Block, 2 m (6.6 ft.)	G79-300C
	For 1 Block, 5 m (16.5 ft.)	G79-500C
Quick-connect Input Block Cable (40 pins)	For 2 Blocks, 1 m (3.3 ft.)	G79-I100C-75
	For 2 Blocks, 1.5 m (3.3 ft.)	G79-I150C-125
	For 2 Blocks, 2 m (6.6 ft.)	G79-I200C-175
	For 2 Blocks, 3 m (6.6 ft.)	G79-I300C-275
	For 2 Blocks, 5 m (16.5 ft.)	G79-I500C-475
Quick-connect Output Block Cable (40 pins)	For 2 Blocks, 1 m (3.3 ft.)	G79-O100C-75
	For 2 Blocks, 1.5 m (3.3 ft.)	G79-O150C-125
	For 2 Blocks, 2 m (6.6 ft.)	G79-O200C-175
	For 2 Blocks, 3 m (6.6 ft.)	G79-O300C-275
	For 2 Blocks, 5 m (16.5 ft.)	G79-O500C-475
Shorting Bar	Short circuits 2 to 4 adjacent terminals	G78-04

Panel-mount, Stand-alone Power Supplies

Output	Input	Part number
5 VDC, 1.5 A	85 to 132 VAC	S82K-0705
5 VDC, 2.5 A	85 to 132 VAC	S82K-0105
12 VDC, 0.6 A	85 to 132 VAC	S82K-0712
12 VDC, 1.2 A	85 to 132 VAC	S82K-0112
12 VDC, 2.5 A	85 to 132 VAC	S82K-0312
24 VDC, 0.3 A	85 to 132 VAC	S82K-0724
24 VDC, 0.6 A	85 to 132 VAC	S82K-0124
24 VDC, 1.3 A	85 to 132 VAC	S82K-0324
24 VDC, 2.1 A	85 to 132 VAC	S82K-0524
24 VDC, 4.6 A	85 to 132/170 to 264 VAC	S82H-3024
24 VDC, 7 A	85 to 132/170 to 264 VAC	S82G-1524

Description	Part number
SYSMAC NET	
PLC module (rack-mount)	C200HS-SNT32
Power supply adapter for 1 SYSMAC NET module (rack-mount PLC module) for 2 SYSMAC NET modules	C200H-APS01 C200H-APS02
Cable to connect for APS01 Power supply adapter for APS02	C200H-CN001 C200H-CN002
SYSMAC NET LINK for 1 SYSMAC NET module Power supply adapter for 2 SYSMAC NET modules	C200H-CE001 C200H-CE002
Line server, 24 VDC	S3200-LSU03-01E
IBM PC/AT interface board	S3200-NSB11-E
RS-232C interface, 24 VDC	S3200-NSUA1-00E
Bridge, DC-powered	S3200-NSUG4-00E
VME interface board	3G8B3-CL001
FIT interface board	FIT10-IF401
SYSMAC LINK	
PLC module (rack-mount), fiber-optic; bus connector required	C200HS-SLK12
PLC module (rack-mount), coaxial; bus connector required	C200HS-SLK22
SYSMAC NET LINK for 1 SYSMAC LINK module Power supply adapter for 2 SYSMAC LINK modules	C200H-CE001 C200H-CE002
75-ohm terminator for coaxial module	C1000H-TER01
Connector, F-type for coaxial module	C1000H-CE001
Connector cover for coaxial module	C1000H-COV01
SYSMAC WAY Host Link	
PLC module (rack-mount), fiber optic APF, PCF, HPCF	C200H-LK101-P
PLC module (rack-mount), RS-422	C200H-LK202
PLC module (rack-mount), RS-232C	C200H-LK201
PC Link PLC module (rack-mount), RS-485 (twisted pair)	C200H-LK401

Link Adapters

Cable type	Part number
PC Link SYSMAC WAY Host Link	
3 RS-422	3G2A9-AL001
SYSMAC BUS Fiber-optic Remote I/O, PC Link, SYSMAC WAY Host Link	
3 fiber-optic: PCF, HPCF	3G2A9-AL002-E
3 fiber-optic: APF, PCF, HPCF	3G2A9-AL002-PE
1 fiber-optic: PCF, HPCF, 1 RS-232C, 1 RS-422	3G2A9-AL004-E
1 fiber-optic: APF, PCF, HPCF, 1 RS-232C, 1 RS-422	3G2A9-AL004-PE
2 fiber-optic: PCF, HPCF to AGF	3G2A9-AL005-E
2 fiber-optic: APF, PCF, HPCF to AGF	3G2A9-AL005-PE
3 fiber-optic: AGF trunk, PCF, HPCF branches	3G2A9-AL006-E
3 fiber-optic: AGF trunk, APF, PCF, HPCF branches	3G2A9-AL006-PE
SYSMAC BUS Wired Remote I/O	
RS-485 to fiber-optic: APF, PCF, HPCF	B500-AL007-P
SYSMAC NET	
3 fiber-optic: HPCF	B700-AL001

Description	Part number
SYSMATE LSS	
Ladder diagram programming software for AT-compatible computers (3.5” and 5.25” disks), all C-Series PLCs: Single user license	C500-Y9LS11-EV3
Ladder diagram programming software for AT-compatible computers (3.5” and 5.25” disks), all C-Series PLCs: Five user license	C500-Y9LS15-EV3
Ladder diagram programming software for AT-compatible computers (3.5” and 5.25” disks), all C-Series PLCs: Ten user license	C500-Y9LS10-EV3
Programming Cable	
Built-In Host Link Port to computer (9-pin RS-232)	C200HS-CN220-EU
Built-In Host Link Port to computer (25-pin RS-232)	C200HS-CN229-EU
C200H-LK201 to computer (9-pin RS-232)	C500-CN221-EU
C200H-LK201 to computer (25-pin RS-232)	C500-CN222-EU
Graphic Programming Console	
All C-Series PLCs, requires memory pack; 120 VAC	3G2C5-GPC03-E
All C-Series PLCs, requires memory pack; 240 VAC	3G2C5-GPC04-E
Carrying case, nylon	3G2C5-CS001
Memory pack for C20, P-type, C120, C500	C500-MP303-EV2
Memory pack for K-type, Block-style H-type, C200H, C1000H, C2000H	3G2C5-MP304-EV3
Peripheral interface unit to PLC CPU	C200H IP006
Peripheral interface cable, 2 m	3G2A2-CN221
Peripheral interface cable, 10 m	3G2A5-CN131
CRT interface	3G2C5-GDI01
Replacement key sheet for GPC	Key sheet of 3G2C5-GPC03
Factory Intelligent Terminal	
Set includes FIT, system disks, and FIT MS-DOS disk	FIT10-SET11-E
MS-DOS floppy disk	FIT10-MF001-E
System floppy disk	FIT10-MF101-EV4
Peripheral interface to PLC CPU	C200H IP006
Peripheral interface cable, 2 m	3G2A2-CN221
Peripheral interface cable, 10 m	3G2A5-CN131
SYSMAC NET interface board for FIT	FIT10-IF401
ASCII/BASIC Module Utility Software	
For AT-compatible computers; enables program development, downloading, uploading, etc.	SYSMATE-ASC91-V1
Programming Cable C200H-ASC02 to computer (9-pin RS-232)	C200H-CN229-EU
Programming Cable C200H-ASC02 to computer (25-pin RS-232)	C200H-CN220-EU
Programming Console	
Console (CPU-mount) with back-lit LCD	3G2A5-PRO13-E
Extension cable for PRO13-E, 1 m (3.28 ft.)	3G2C7-CN122
Console (Desk-top, panel-mount) with back-lit LCD, requires cable and interface	C200H-PRO27-E
PRO27 interface	C500-AP003
PRO27 extension cable, 2 m	C200H-CN222
PRO27 extension cable, 4 m	C200H-CN422
PRO27 panel-mounting bracket	C200H-ATT01
PROM Writer	
All C-Series PLCs	C500-PRW06
Printer Interface	
All C-Series PLCs, requires memory pack	3G2A5-PRT01-E
Memory pack, C500	C500-MP102-EV3
Memory pack, C1000H, C2000H	3G2A5-MP103-EV3
Printer cable, RS-232C	SCY-CN201
Cassette Interface	
All C-series PLCs	3G2A5-CMT01-E

Name	Description	Part number
All Plastic Fiber-optic (APF) Cable		
Fiber-optic cable	20 m (65.6 ft.), without connectors	B500-PF212
Fiber-optic connectors	Brown, for cable 0 to 10 m (0 to 32.8 ft.) long (set of 2)	3G5A2-CO001
	Black, for cable 8 to 20 m (0 to 65.6 ft.) long (set of 2)	3G5A2-CO002
Hard Plastic-Clad Fiber-optic (HPCF) Cable		
Fiber-optic cable	50 m (164 ft.), without connectors	FCS-HCR-LB-501
	100 m (328 ft.), without connectors	FCS-HCR-LB-102
	500 m (0.31 mile), without connectors	FCS-HCR-LB-502
	1 km (0.62 mile), without connectors	FCS-HCR-LB-103
	Zipcord style, orange, 50 m (164 ft.), without connectors	FCS-HCR-CO-501
Fiber-optic connectors	SYSMAC BUS or SYSMAC WAY only	S3200-COCH82
	SYSMAC BUS/2 (all PLCs), SYSMAC LINK (other than C200H)	S3200-COCF2011
	SYSMAC NET (other than C200H)	S3200-COCH62M
	SYSMAC NET, LINK (C200H only)	S3200-COCF2511
	SYSMAC NET in-line male	S3200-COCF62M
	SYSMAC NET in-line female	S3200-COCF62F
Termination kit	For HPCF cable	FCS-CAK6230-US
Plastic-Clad Fiber-optic (PCF) Cable		
Indoor fiber-optic cable	10 cm (0.32 ft.), with connectors	3G5A2-OF011
	1 m (3.2 ft.), with connectors	3G5A2-OF101
	2 m (6.56 ft.), with connectors	3G5A2-OF201
	3 m (9.8 ft.), with connectors	3G5A2-OF301
	5 m (16.4 ft.), with connectors	3G5A2-OF501
	10 m (32.8 ft.), with connectors	3G5A2-OF111
	20 m (65.6 ft.), with connectors	3G5A2-OF211
	30 m (98 ft.), with connectors	3G5A2-OF311
	50 m (164 ft.), with connectors	3G5A2-OF511
Indoor/Outdoor fiber-optic cable	100 m (328 ft.), with connectors	3G5A2-OF002–100M
	200 m (656 ft.), with connectors	3G5A2-OF002–200M
	400 m (0.25 mile), with connectors	3G5A2-OF002–400M
	800 m (0.5 mile), with connectors	3G5A2-OF002–800M

PLC Installation, Operation

Title	Subtitle	Cat. No.
C200H PLCs	Installation Guide	W111
	Operation Manual	W130
C200HS PLCs	Installation Guide	W236
	Operation Manual	W235

Special I/O Modules

Title	Subtitle	Cat. No.
ASC02 ASCII/BASIC Module	Operation Manual	W165
Analog I/O Modules	Operation Guide	W127
8-pt Analog Input Module	Operation Manual	W229
Temperature Sensor Input Module	Operation Guide	W124
Temperature Controller Module	Operation Manual	W225
Heat/Cool Temperature Controller Module	Operation Manual	W240
PID Process Controller Module	Operation Manual	W241
Cam Positioner Module	Operation Manual	W224
CT001-V1, CT002 High-speed Counter Modules	Operation Manual	W141
NC111 Position Control Module	Operation Manual	W137
NC112 Position Control Module	Operation Manual	W128
NC221 Position Control Module	Operation Manual	W166
RF ID Interface Modules	Operation Guide	W153
OV001 Voice Output Module	Operation Manual	W172

Peripheral Devices

Software manuals (such as for SYSMATE LSS and Programmable Terminal Support Software) are available only with a Software or site-license purchase.

Title	Subtitle	Cat. No.
FIT	Operation Manual	W150
Graphic Programming Console	Operation Manual	W084
PROM Writer	Operation Guide	W155
Printer Interface	Operation Guide	W107
Cassette Interface	User's Manual	W064

Communication Systems

Title	Subtitle	Cat. No.
SYSMAC NET	System Manual	W178
SYSMAC NET Line Server	Installation Guide	W161
SYSMAC NET Module	Operation Manual	W114
SYSMAC NET RS-232C Interface (Network Service Unit)	Operation Manual	W160
SYSMAC NET IBM AT Interface Board	Operation Manual	W161
SYSMAC NET Fiber-optic Cable	Installation Guide	W156
SYSMAC NET Bridge	Installation Guide	W159
C-series SYSMAC LINK	System Manual	W174
CV-series SYSMAC LINK	System Manual	W212
CV-series PLCs Host LINK	System Manual	W143
SYSMAC BUS Fiber-optic Remote I/O	System Manual	W136
SYSMAC BUS Wired Remote I/O	System Manual	W120
C-, CV-series Fiber-optic Cable	Installation Guide	W152
Link Adapters	Installation Guide	W123

Reference

Title	Subtitle	Cat. No.
Programming instructions, programming console operations	Reference Manual	W184

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Instruction Set

Overview

The C200HS instruction set offers easy-to-program interrupts that allow high-speed response outside the normal scan cycle. There are many step-saving instructions, such as a macro similar to ones that are programmed into computers.

Many application-specific instructions are available to simplify position and speed control, process control, and input/output to operator displays. There are 52 “expansion instructions” that can be used to customize the instruction set to suit your application needs. Up to 18 of these expansion instructions can be substituted for other instructions that may not be needed in a program.

To Input PLC Instructions

A PLC instruction is input either by pressing the corresponding Programming Console key(s) (e.g., LD, AND, OR, NOT) or by using function codes. To input an instruction with its function code, press FUN, the function code, and the WRITE. Refer to the pages listed programming and instruction details.

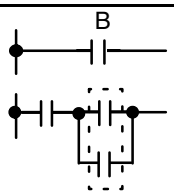
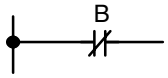
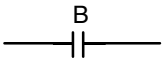
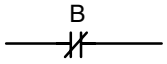
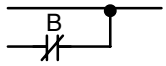
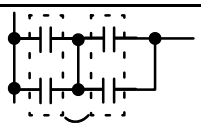
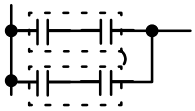
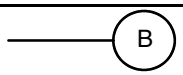
Differentiated Instructions

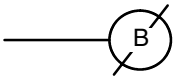
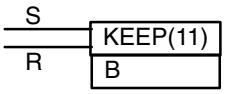
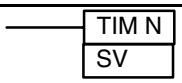
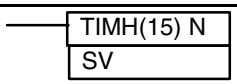
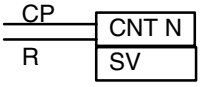
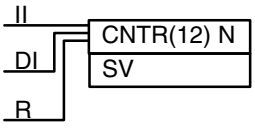
An instruction marked with @ can be used as a differentiated instruction that will be executed only once each time the instruction executing condition is turned ON.

Using Expansion Instructions

All shaded instructions are expansion instructions. Those marked with an asterisk do not have default function numbers. Before using any expansion instruction (marked with an asterisk and within shaded boxes), it is necessary to set the function number for the expansion instruction. The following 18 function codes can be replaced with expansion instructions using LSS or the programming console: 17, 18, 19, 47, 48, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 87, 88, and 89.

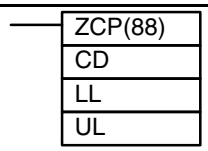
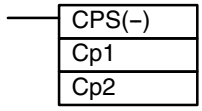
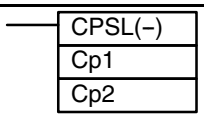
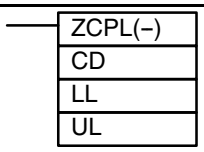
Mnemonic	Function Code	Mnemonic	Function Code	Mnemonic	Function Code	Mnemonic	Function Code
ASFT	17	BCNT	67	DBSL	—	NEGL	—
SCAN	18	BCMP	68	DSW	—	PID	—
MCMP	19	APR	69	FCS	—	RXD	—
LMSG	47	TTIM	87	FPD	—	SBBL	—
TERM	48	ZCP	88	HEX	—	SCL	—
CMPL	60	INT	89	HKY	—	SRCH	—
MPRF	61	7SEG	—	MAX	—	SUM	—
XFRB	62	ADBL	—	MBS	—	TKY	—
LINE	63	AVG	—	MBSL	—	TXD	—
COLM	64	CPS	—	MIN	—	XDMR	—
SEC	65	CPSL	—	MTR	—	ZCPL	—
HMS	66	DBS	—	NEG	—		—

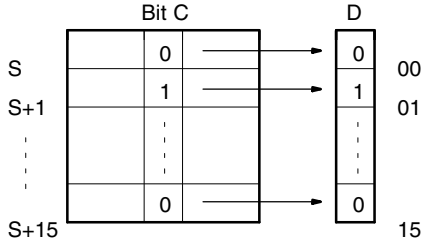
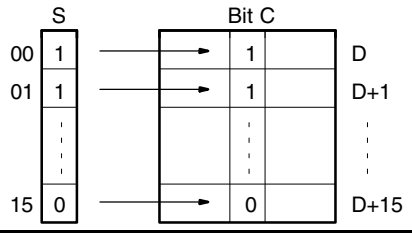
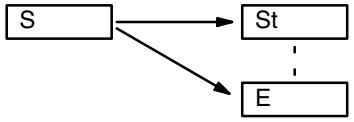
Name Mnemonic	Symbol	Function	Operands	CPU
Load LD		Used to start instruction line with status of designated bit. Used to define a logic block for use with AND LD and OR LD.	**B:** IR SR HR AR TC LR TR	All models
Load NOT LD NOT		Used to start instruction line with inverse of designated bit.	**B:** IR SR HR AR TC LR	All models
AND AND		Logically ANDs status of designated bit with execution condition.	**B:** IR SR HR AR TC LR	All models
AND NOT AND NOT		Logically ANDs inverse of designated bit with execution condition.	**B:** IR SR HR AR TC LR	All models
OR OR		Logically ORs status of designated bit with execution condition.	**B**: IR SR HR AR TC LR	All models
OR NOT OR NOT		Logically ORs inverse of designated bit with execution condition.	**B:** IR SR HR AR TC LR	All models
AND Load AND LD		Logically ANDs results of preceding blocks.	None	All models
OR Load OR LD		Logically ORs results of preceding blocks.	None	All models
Output OUT		Turns ON B for ON execution condition; turns OFF B for OFF execution condition.	**B:** IR SR HR AR LR TR	All models

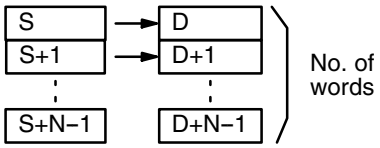
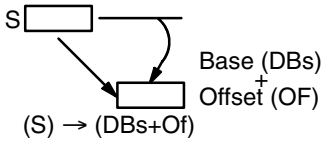
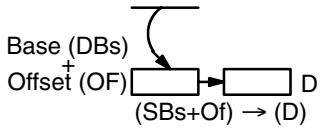
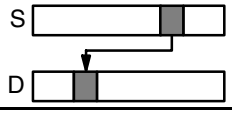
Name Mnemonic	Symbol	Function	Operands		CPU
RESET RESET		Turns B OFF for ON execution condition and remains OFF when execution condition returns to OFF	**B:** IR SR AR HR LR		HS-CPU01 HS-CPU03
SET SET		Turns B OFF for ON execution condition and remains OFF when execution condition returns to OFF	**B:** IR SR AR HR LR		HS-CPU01 HS-CPU03
Output NOT OUT NOT		Turns B OFF for ON execution condition; turns B ON for OFF execution condition (i.e., inverts operation).	**B:** IR SR HR AR LR		All models
No Operation NOP (00)	None	Nothing is executed and program moves to next instruction.	None		All models
End END(01)		Required at the end of the program.	None		All models
Latching Relay KEEP(11)		Defines a bit (B) as a latch controlled by set (S) and reset (R) inputs.	**B:** IR HR AR LR		All models
Timer TIM		ON-delay (decrementing) timer operation. Set value: 999.9 s; accuracy: +0/−0.1 s. Same TC bit cannot be assigned to more than one timer/counter. The TC bit is input as a constant.	**N:** TC	**SV**: IR HR AR DM LR #	All models
High-speed Timer TIMH(15)		A high-speed, ON-delay (decrementing) timer. SV: 0.01 to 99.99 s; accuracy: +0/−0.1 s. Must not be assigned the same TC bit as another timer or counter. The TC bit is input as a constant.	**N:** TC	**SV:** IR SR HR AR DM LR #	All models
Counter CNT		A decrementing counter. SV: 0 to 9999; CP: count pulse; R: reset input. The TC bit is input as a constant.	**N:** TC	**SV:** IR HR AR DM LR #	All models
Reversible Counter CNTR (12)		Increases or decreases PV by one whenever the increment input (II) or decrement input (DI) signals, respectively, go from OFF to ON. SV: 0 to 9999; R: reset input. Must not access the same TC bit as another timer/counter.	**N:** TC	**SV:** IR SR HR AR DM LR #	All models

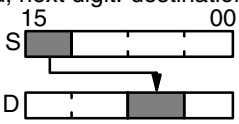
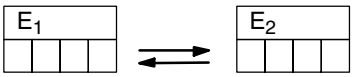
Name Mnemonic	Symbol	Function	Operands	CPU
Differentiate Up DIFU(13) **Differentiate Down** DIFD(14)	DIFU(13) B DIFD(14) B	DIFU turns ON the designated bit (B) for one scan on the rising edge of the input signal; DIFD turns ON the bit for one scan on the trailing edge.	**B:** IR HR AR LR	All models
Interlock IL(02) **Interlock Clear** ILC(03)	IL(02) ILC(03)	If interlock condition is OFF, all outputs are turned OFF and all timer PVs reset between this IL(02) and the next ILC(03). Other instructions are treated as NOP; counter PVs are maintained.	None	All models
Jump JMP(04) **Jump End** JME(05)	JMP(04) N JME(05) N	If jump condition is OFF, all instructions between JMP(04) and the corresponding JME(05) are ignored. Corresponding JME is one of same number; 01 through 99 only usable once per program (direct jumps); 00 may be used as many times as necessary, but instructions between JMP 00 and JME 00 treated as NOP, increasing scan time compared to other jumps.	**N:** 00 to 99	All models
Totalizing Timer TTIM (87)	TTIM(87) N SV RB	Incrementing timer that increments PV every 0.1 s to time between 0.1s to 999.9 s. Accuracy is +0.0/-0.1 sec. Will time as long as execution condition is ON until it reaches SV or until RB turns ON to reset timer.	**N:** TC **SV: (word, BCD)** IR AR DM HR LR **RB:** IR SR AR HR LR	HS-CPU01 HS-CPU03

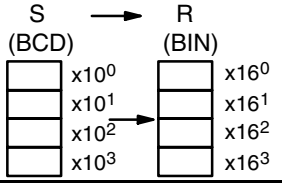
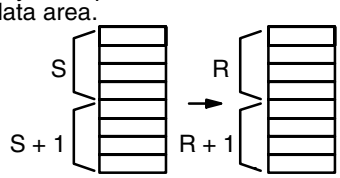
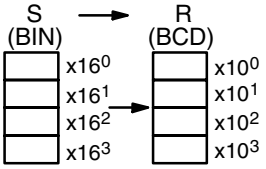
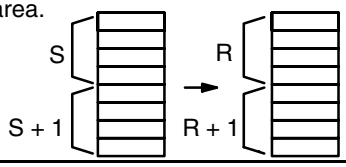
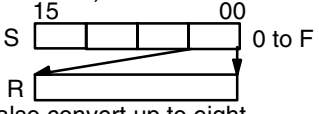
Name Mnemonic	Symbol	Function	Operands			CPU
Multi-word Compare (@)MCMP(19)	MCMP(19) S1 S2 D	Compares the data within a block of 16 words of 4-digit hexadecimal data (S_1 to S_1+15) with that in another block of 16 words (S_2 to S_2+15) on a word-by-word basis. If the words are not in agreement, the bit corresponding to unmatched words turns ON in the result word, D. Bits corresponding to words that are equal are turned OFF.	**S1:** IR SR HR AR LR TC DM	**S2:** IR SR HR AR LR TC DM	**D:** IR SR HR AR LR TC DM	CPU21 CPU23 CPU31 HS-CPU's
Compare (@)CMP(20)	CMP(20) Cp1 Cp2	Compares two sets of four-digit hexadecimal data (Cp1 and Cp2) and outputs result to GR, EQ, and LE. Cp1 > Cp2 → GR Cp1 = Cp2 → EQ Cp1 < Cp2 → LE	**Cp1/Cp2:** IR SR HR AR TC DM LR #			All models
Double Compare CMPL(60)	CMPL(60) S1 S2	Compares the 8-digit hexadecimal values in words S_1+1 and S_1 with the values in S_2+1 and S_2, and indicates the result using the Greater Than, Less Than, and Equal Flags in the AR area. S_1+1 and S_2+1 are regarded as the most significant data in each pair of words.	**S1/S2** IR SR HR AR LR TC DM			CPU21 CPU23 CPU31 HS-CPU's
Block Compare BCMP(68)	BCMP(68) S CB R	Compares 1-word binary value (S) with 16 ranges in comparison table (CB: starting word of comparison block). If value falls within any ranges, corresponding bits of result word (R) will set. The comparison block must all be in the same data area. Lower limit Upper limit S: CB/CB+1 → 1; CB+2/CB+3 → 0; CB+4/CB+5 → 1; CB+30/CB+31 → 0 Lower limit ≤ S ≤ Upper limit → 1	**S:** IR SR HR AR TC DM LR #	**CB:** IR SR HR TC DM LR	**R:** IR HR AR TC DM LR	All models HS-CPU's
Table Compare (@)TCMP(85)	TCMP(85) S TB R	Compares four-digit hexadecimal value (S) with values in table consisting of 16 words (TB: First word of comparison table). If value equals any values, corresponding bits of result word (R) are set. The entire table must be in the same data area. S → TB/TB+1/…/TB+14/TB+15; R: 0/1/…/0/1 1:agreement 0:disagreement	**S:** IR SR HR AR TC DM LR #	**TB/R:** IR HR AR TC DM LR		All models

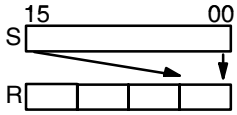
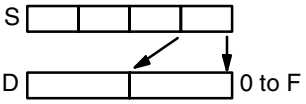
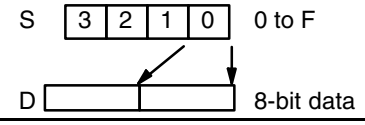
Name Mnemonic	Symbol	Function	Operands			CPU
Area Range Compare (@) ZCP (88)		Compares a word to a range defined by Lower and Upper Limits and outputs the result to GR, EQ and LE flags.	**CD:** IR SR HR AR TC DM LR #	**LL:** IR SR HR AR TC DM LR #	**UL:** IR SR HR AR TC DM LR #	HS-CPU's
Signed binary compare CPS (*)		Compares two 16-bit (4-digit) signed binary values and outputs the result to GR, EQ and LE flags.	**Cp1:** IR SR HR AR TC DM LR #	**Cp2:** IR SR HR AR TC DM LR #		HS-CPU's
Double signed binary compare CPSL (*)		Compares two 32-bit (8-DIGIT) signed binary values and outputs the result to GR, EQ and LE flags.	**Cp1:** IR SR AR DM HR TC LR	**Cp2:** IR SR AR DM HR TC LR		HS-CPU's
Double area range compare ZCPL (*)		Compares an 8-digit value to a range and outputs the result to GR, EQ and LE flags.	**CD:** IR SR HR AR TC DM LR	**LL:** IR SR HR AR TC DM LR	**UL:** IR SR HR AR TC DM LR	HS-CPU's

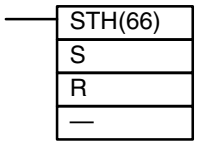
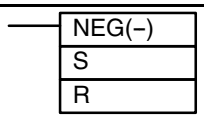
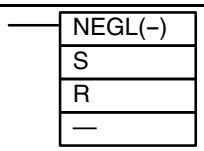
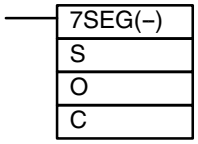
Name Mnemonic	Symbol	Function	Operands			CPU
Move (@)MOV(21)	MOV(21) S D	Transfers source data (S) (word or four-digit constant) to destination word (D).	**S:** IR SR HR AR TC DM LR #	**D:** IR HR AR DM LR		All models
Move NOT (@)MVN(22)	MVN(22) S D	Inverts source data (S) (word or four-digit constant) and then transfers it to destination word (D).	**S:** IR SR HR AR TC DM LR #	**D:** IR HR AR DM LR		All models
Column-to-Word (@)CTW(63)	CTW(63) S C D	Fetches data from the same numbered bit (C) in 16 consecutive words (where S is the address of the first source word), and creates a 4-digit word by consecutively placing the data in the bits of the destination word, D. The bit from word S is placed into bit 00 of D, the bit from word S+1 is placed into bit 01, etc. 	**S:** IR SR HR AR LR TC DM	**C:** IR SR HR AR LR TC DM #	**D:** IR SR HR AR LR TC DM	CPU21 CPU23 CPU31
Column-to-Line (@)LINE(63)	LINE(63) S C D					HS-CPU's
Word-to-Column (@)WTC(64)	WTC(64) S D C	Places bit data from the source word (S), consecutively into the same numbered bits of the 16 consecutive destination words (where D is the address of the first destination word). Bit 00 from word S is placed into bit C of word D, bit 01 from word S is placed into bit C of word D+1, etc. 	**S:** IR SR HR AR LR TC DM	**D:** IR SR HR AR LR TC DM	**C:** IR SR HR AR LR TC DM #	CPU21 CPU23 CPU31
Line-to-Column (@)COLM(64)	COLM(64) S D C					HS-CPU's
Block Set (@)BSET(71)	BSET(71) S St E	Copies content of one word or constant (S) to several consecutive words (starting word (St) through ending word (E)). St and E must be in the same data area. 	**St/E:** IR HR AR TC DM LR	**S:** IR SR HR AR TC DM LR #		All models

Name Mnemonic	Symbol	Function	Operands			CPU
Transfer Bits (@XFRB(62)	XFER(62) C S D	Copies the status of up to 255 specified source bits to the specified destination bits.	**C:** IR SR AR DM TC HR LR #	**S:** IR SR AR DM HR LR	**D:** IR SR AR DM HR LR	HS-CPU's
Block Transfer (@)XFER(70)	XFER(70) N S D	Moves content of several consecutive source words (S: starting source word; N: number of transfer words) to consecutive destination words (D: starting destination word). All source words must be in the same data area, as must all destination words. Transfers can be within one or between two data areas, but the source words and destination word must not overlap. 	**N:** IR SR HR AR TC DM LR #	**S:** IR HR AR TC DM LR	**D:** IR SR HR AR TC DM LR #	All models
Single Word Distribute (@)DIST(80)	DIST(80) S DBs Of	Moves one word of source data (S) to destination word whose address is given by destination base word (DBs) plus offset (Of). 	**S:** IR SR HR AR TC DM LR #	**DBs:** IR HR AR TC DM LR	**Of:** IR HR AR TC DM LR #	All models
Data Collect (@)COLL(81)	COLL(81) SBs Of D	Extracts data from source word and writes it to destination word (D). Source word is determined by adding offset (Of) to source base word (SBs). 	**SBs:** IR SR HR AR TC DM LR	**Of:** IR HR AR TC DM LR #	**D:** IR HR AR TC DM LR	All models
Move Bit (@)MOVB(82)	MOVB(82) S Bi D	Transfers designated bit of source word or constant (S) to designated bit of destination word (D). Rightmost two digits of bit designator (Bi) designate the source bit; leftmost two, the destination bit. 	**S:** IR SR HR AR DM LR #	**Bi:** IR HR AR TC DM LR #	**D:** IR HR AR DM LR	All models

Name Mnemonic	Symbol	Function	Operands			CPU
Move Digit (@)MOVD(83)	MOVD(83) S Di D	Moves hexadecimal content of specified four-bit source digit(s) (S: source word) to specified destination digit(s) (D: destination word) for up to four digits. Source and destination digits specified in Digit Designator (Di) digits (rightmost digit: source digit; next digit to left: number of digits to be moved; next digit: destination digit). 	**S:** IR SR HR AR TC DM LR #	**Di:** IR HR AR TC DM LR #	**D:** IR SR HR AR TC DM LR	All models
Data Exchange (@)XCHG(73)	XCHG(73) E1 E2	Exchanges contents of two different words (E1 and E2). 	**E1/E2:** IR HR AR TC DM LR			All models

Name Mnemonic	Symbol	Function	Operands			CPU
BCD to Binary (@)BIN(23)	BIN(23) S R	Converts four-digit, BCD data in source word (S) into 16-bit binary data, and outputs converted data to result word (R). 	**S:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR		All models
Double BCD to Double Binary (@)BINL(58)	BINL(58) S R	Converts BCD value in two source words (S: starting word) into binary and outputs converted data to two result words (R: starting word). All words for any one operand must be in the same data area. 	**S:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR		All models C1000H C2000H
Binary to BCD (@)BCD(24)	BCD(24) S R	Converts binary data in source word (S) into BCD, and outputs converted data to result word (R). 	**S:** IR SR HR AR DM LR	**R:** IR HR AR DM LR		All models
Double Binary to Double BCD (@)BCDL(59)	BCDL(59) S R	Converts binary value in two source words (S: starting word) into eight digits of BCD data, and outputs converted data to two result words (R: starting result word). Both words for any one operand must be in the same data area. 	**S:** IR SR HR AR DM LR	**R:** IR HR AR DM LR		All models C1000H C2000H
4 to 16 Decoder (@)MLPX(76)	MLPX(76) S Di R	Converts up to four hexadecimal digits in source word (S) into decimal values from 0 to 15 and turns ON, in result word(s) (R), bit(s) whose position corresponds to converted value. Digits to be converted designated by Di (rightmost digit: indicates the first digit; next digit to left: gives the number of digits minus 1).  Can also convert up to eight hexadecimal digits and turn ON corresponding bits in result words R to R+15.	**S:** IR SR HR AR TC DM LR	**Di:** IR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
8 to 256 Decoder (@)MLPX(76)						HS-CPU's

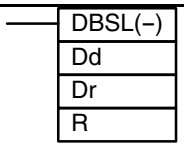
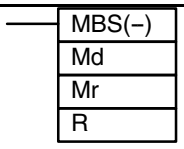
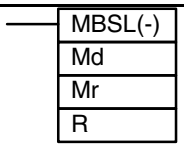
Name Mnemonic	Symbol	Function	Operands			CPU
16 to 4 Encoder (@)DMPX(77)	DMPX(77) S R Di	Determines position of highest ON bit in source word(s) (starting word: S) and turns ON corresponding bit(s) in result word (R). Digits to receive converted value are designated by Di (rightmost digit: indicates the first digit; next digit to left: gives number of words to be converted minus 1).  Can also determine the position of highest ON bit in one or two groups of 16 words and write the ON bits position (00 to FF) to byte(s) in R.	**S:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR	**Di:** IR HR AR TC DM LR #	All models
256 to 8 Encoder (@)DMPX(77)						HS-CPU's
7-Segment Decoder (@)SDEC(78)	SDEC(78) S Di D	Converts hexadecimal values from source word (S) to data for seven-segment display. Results placed in consecutive half words starting at the first destination word (D). Di designates digit and destination details (rightmost digit: gives the first digit to be converted; next digit to the left: number of digits to be converted minus 1; next digit: 1 = transfer first digit to left half of first destination word, 0 = transfer to right half).  	**S:** IR SR HR AR TC DM LR	**Di:** IR HR AR TC DM LR #	**D:** IR HR AR DM LR	All models
ASCII Code Convert (@)ASC(86)	ASC(86) S Di D	Converts hexadecimal values from source word (S) to eight-bit ASCII code starting at leftmost or rightmost half of starting destination word (D). Rightmost digit of Di designates first source digit; the next digit to the left, the number of digits; the next digit, the rightmost (1) or leftmost (0) half of the first destination word; and the leftmost digit even (1) or odd (0) parity.  	**S:** IR SR HR AR TC DM LR	**Di:** IR HR TC DM LR #	**D:** IR HR DM LR	All models
ASCII to Hex (@)HEX(*)	HEX (–) S Di D	Converts ASCII data to hexadecimal data.	**S:** IR SR HR AR TC DM LR	**Di:** IR SR HR AR TC DM LR	**D:** IR SR HR AR TC DM LR	HS-CPU's
Hours-to-Seconds (@)HTS(65)	HTS(65) S R —	Converts a time given in hours/minutes/seconds (S and S+1) to an equivalent time in seconds only (R and R+1). S and S+1 must be BCD and within one data area. R and R+1 must also be within one data area.	**S:** IR SR HR AR LR TC DM	**R:** IR SR HR AR LR TC DM	**—:** Not used	CPU21 CPU23 CPU31 HS-CPU's

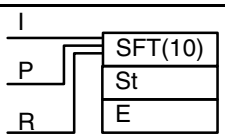
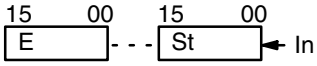
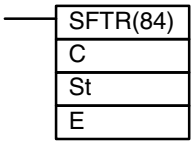
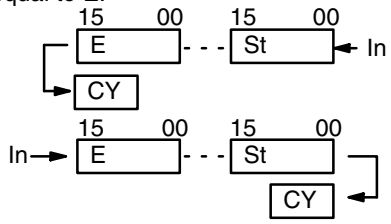
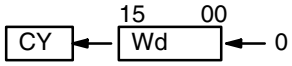
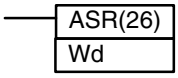
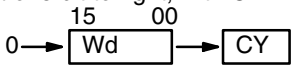
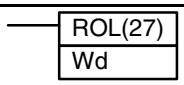
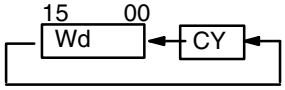
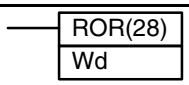
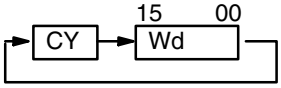
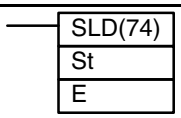
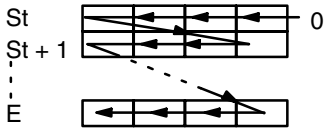
Name Mnemonic	Symbol	Function	Operands			CPU
Seconds-to-Hours (@)STH(66)		Converts a time given in seconds (S and S+1) to an equivalent time in hours/minutes/seconds (R and R+1). S and S+1 must be BCD between 0 and 35,999,999, and within the same data area. R and R+1 must also be within one data area.	**S:** IR SR HR AR LR TC DM	**R:** IR SR HR AR LR TC DM	**—:** Not used	CPU21 CPU23 CPU31 HS-CPU's
2's Complement (@)NEG(*)		Converts the four digit hexadecimal content of the source word to its 2's complement and outputs the result to R	**S:** IR SR AR DM HR TC LR #	**R:** IR SR AR DM HR LR		HS-CPU's
Double 2's Complement (@)NEGL(*)		Converts the eight-digit hexadecimal content of the source word to its 2's complement and outputs the result to R.	**S:** IR SR AR DM HR TC LR	**R:** IR SR AR DM HR LR		HS-CPU's
7-Segment Display Output 7SEG(*)		Converts 4- or 8- BCD data to 7-segment display format and then outputs the converted data.	**S:** IR SR AR DM HR TC LR	**O:** IR SR AR HR LR	**C:** 000 to 007	HS-CPU's

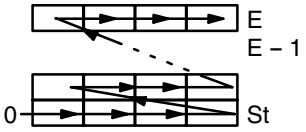
Name Mnemonic	Symbol	Function	Operands		CPU
Increment (@)INC(38)	INC(38) Wd	Increments four-digit BCD word (Wd) by one, without affecting carry (CY).	**Wd:** IR HR AR DM LR		All models
Decrement (@)DEC(39)	DEC(39) Wd	Decrements four-digit BCD word by 1, without affecting carry (CY).	**Wd:** IR HR AR DM LR		All models
Set Carry (@)STC(40)	STC(40)	Sets carry flag (i.e., turns CY ON).	None		All models
Clear Carry (@)CLC(41)	CLC(41)	CLC clears carry flag (i.e, turns CY OFF).	None		All models
BCD Add (@)ADD(30)	ADD(30) Au Ad R	Adds two four-digit BCD values (Au and Ad) and content of CY, and outputs result to specified result word (R). Au + Ad + CY → CY R	**Au/Ad:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Double BCD Add (@)ADDL(54)	ADDL(54) Au Ad R	Adds two eight-digit values (2 words each) and content of CY, and outputs result to specified result words. All words for any one operand must be in the same data area. Au+1 Au + Ad+1 Ad + CY → CY R+1 R	**Au/Ad:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR	All models
BCD Subtract (@)SUB(31)	SUB(31) Mi Su R	Subtracts both four-digit BCD subtrahend (Su) and content of CY from four-digit BCD minuend (Mi) and outputs result to specified result word (R). Mi − Su − CY → CY R	**Mi/Su:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Double BCD Subtract (@)SUBL(55)	SUBL(55) Mi Su R	Subtracts both eight-digit BCD subtrahend and content of CY from eight-digit BCD minuend and outputs result to specified result words. All words for any one operand must be in the same data area. Mi+1 Mi − Su+1 Su − CY → CY R+1 R	**Mi/Su:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR	All models
BCD Multiply (@)MUL(32)	MUL(32) Md Mr R	Multiplies four-digit BCD multiplicand (Md) and four-digit BCD multiplier (Mr) and outputs result to specified result words (R and R + 1). R and R + 1 must be in the same data area. Md × Mr → R + 1 R	**Md/Mr:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models

Name Mnemonic	Symbol	Function	Operands		CPU
Double BCD Multiply (@)MULL(56)	MULL(56) Md Mr R	Multiplies eight-digit BCD multiplicand and eight-digit BCD multiplier and outputs result to specified result words. All words for any one operand must be in the same data area. Md+1 | Md × Mr+1 | Mr → R + 3 | R + 2 | R + 1 | R	**Md/Mr:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR	All models
BCD Divide (@)DIV(33)	DIV(33) Dd Dr R	Divides four-digit BCD dividend (Dd) by four-digit BCD divisor (Dr) and outputs result to specified result words. R receives quotient; R + 1 receives remainder. R and R + 1 must be in the same data area. Dd ÷ Dr → R + 1 | R	**Dd/Dr:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Double BCD Divide (@)DIVL(57)	DIVL(57) Dd Dr R	Divides eight-digit BCD dividend by eight-digit BCD divisor and outputs result to specified result words. All words for any one operand must be in the same data area. Dd+1 | Dd ÷ Dr+1 | Dr → Quotient R + 1 | R Remainder R + 3 | R + 2	**Dd/Dr:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR	All models
Floating Point Divide (@)FDIV(79)	FDIV(79) Dd Dr R	Divides one floating point value by another and outputs floating point result. Rightmost seven digits of each set of two words (eight digits) are used for mantissa, and leftmost digit used for the exponent and its sign. Dd+1 | Dd ÷ Dr+1 | Dr → R + 1 | R	**Dd/Dr:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR	All models
Square Root (@)ROOT(72)	ROOT(72) Sq R	Computes square root of eight-digit BCD value (Sq and Sq + 1) and outputs truncated four-digit integer result to specified result word (R). Sq and Sq + 1 must be in the same data area. √ Sq+1 | Sq R	**Sq:** IR SR HR AR TC DM LR	**R:** IR HR AR DM LR	All models

Name Mnemonic	Symbol	Function	Operands		CPU
Binary Add (@)ADB(50)	ADB(50) Au Ad R	Adds four-digit augend (Au), four-digit addend (Ad), and content of CY and outputs result to specified result word (R). Au + Ad + CY → CY R	**Au/Ad:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Binary Subtract (@)SBB(51)	SBB(51) Mi Su R	Subtracts four-digit hexadecimal subtrahend (Su) and content of carry from four-digit hexadecimal minuend (Mi) and outputs result to specified result word (R). Mi − Su − CY → CY R	**Mi/Su:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Binary Multiply (@)MLB(52)	MLB(52) Md Mr R	Multiplies four-digit hexadecimal multiplicand (Md) by four-digit multiplier (Mr) and outputs eight-digit hexadecimal result to specified result words (R and R + 1). R and R + 1 must be in the same data area. Md × Mr → R + 1 R	**Md/Mr:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Binary Divide (@)DVB(53)	DVB(53) Dd Dr R	Divides four-digit hexadecimal dividend (Dd) by four-digit divisor (Dr) and outputs result to designated result words (R and R + 1). R and R + 1 must be in the same data area. Dd ÷ Dr → R + 1 R	**Dd/Dr:** IR SR HR AR TC DM LR #	**R:** IR HR AR LR	All models
Double Binary ADD (@)ADBL(*)	ADBL(−) Au Ad R	Adds two 8-digit binary valves (normal or signed data) and outputs the result to R and R+1.	**Au:** IR SR AR DM HR LR	**Ad:** IR SR AR D M HR LR	**R:** IR SR AR D M HR LR	HS-CPU's
Double Binary Subtract (@)SBBL(*)	SBBL(−) Mi Su R	Subtracts an 8-digit binary valves (normal or signed data) from another and outputs the result to R and R+1.	**Mi:** IR SR AR DM HR TC LR	**Su:** IR SR AR D M HR TC LR	**R:** IR SR AR D M HR LR	HS-CPU's
Signed Binary Divide (@)DBS(*)	DBS(−) Dd Dr R	Divides one 16-bit signed binary valve by another and outputs the 32-bit signed result to R+1 and R	**Dd:** IR SR AR DM HR TC LR #	**Dr:** IR SR AR D M HR TC LR #	**R:** IR SR AR D M HR LR	HS-CPU's

Name Mnemonic	Symbol	Function	Operands			CPU
Double Signed Binary Divide (@)DBSL(*)		Divides one 32-bit signed binary valve by another and outputs the 64-bit signed binary result to R+3 through R	**Dd:** IR SR AR DM HR TC LR #	**Dr:** IR SR AR D M HR TC LR #	**R:** IR SR AR D M HR LR	HS-CPU's
Signed Binary Multiply (@)MBS(*)		Multiplies the signed binary content of two words and outputs the 8-digit signed binary result to R+1 and R	**Md:** IR SR AR DM HR TC LR #	**Mr:** IR SR AR D M HR TC LR #	**R:** IR SR AR D M HR LR	HS-CPU's
Double Signed Binary Multiply (@)MBSL(*)		Multiplies two 32-bit (8-digit) signed binary values and outputs the 16-digit signed result to R+3 through R.	**Md:** IR SR AR DM HR TC LR	**Mr:** IR SR AR D M HR TC LR	**R:** IR SR AR D M HR LR	HS-CPU's

Name Mnemonic	Symbol	Function	Operands	CPU
Shift Register SFT(10)		Creates a bit shift register from the starting word (St) through the ending word (E). I: input bit; P: shift pulse; R: reset input. St must be less than or equal to E and St and E must be in the same data area. 	**St/E:** IR HR AR LR	All models
Reversible Shift Register (@)SFTR(84)		Shifts data in specified word or series of words to either left or right. Starting (St) and ending words (E) must be specified. Control word (C) contains shift direction, reset input, and data input. St and E must be in the same data area and St must be less than or equal to E. 	**St/E/C:** IR HR AR TC DM LR	All models
Arithmetic Shift Left (@)ASL(25)		Shifts each bit in single word (Wd) of data one bit to left, with CY. 	**Wd:** IR HR AR DM LR	All models
Arithmetic Shift Right (@)ASR(26)		Shifts each bit in single word (Wd) of data one bit to right, with CY. 	**Wd:** IR HR AR DM LR	All models
Rotate Left (@)ROL(27)		Rotates bits in single word (Wd) of data one bit to left, with carry (CY). 	**Wd:** IR HR AR DM LR	All models
Rotate Right (@)ROR(28)		Rotates bits in single word (Wd) of data one bit to right, with carry (CY). 	**Wd:** IR HR AR DM LR	All models
One Digit Shift Left (@)SLD(74)		Left shifts data between starting (St) and ending (E) words by one digit (four bits). St and E must be in the same data area. 	**St/E:** IR HR AR DM LR	All models

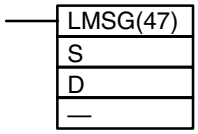
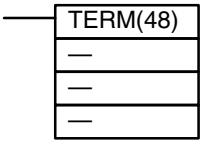
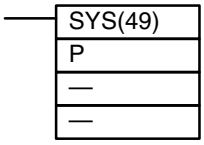
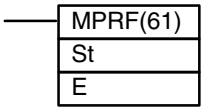
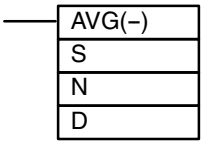
Name Mnemonic	Symbol	Function	Operands		CPU
One Digit Shift Right (@)SRD(75)	SRD(75) E St	Right shifts data between starting (St) and ending (E) words by one digit (four bits). St and E must be in the same data area. 	**St/E:** IR HR AR DM LR		All models
Word Shift (@)WSFT(16)	WSFT(16) St E	Left shifts data between starting (St) and ending (E) words in word units, writing zeros into starting word. St must be less than or equal to E and St and E must be in the same data area.	**St/E:** IR HR AR DM LR		All models
Reversible Word Shift (@)RWS(17)	RWS(17) C St E	Creates and controls a reversible asynchronous word shift register between St and E. This register only shifts words when the next word in the register is zero, e.g., if no words in the register contain zero, nothing is shifted. Also, only one word is shifted for each word in the register that contains zero. When the contents of a word are shifted to the next word, the original word's contents are set to zero. In essence, when the register is shifted, each zero word in the register trades places with the next word. The shift direction (i.e. whether the next word is the next higher or the next lower word) is designated in C. C is also used to reset the register. All of any portion of the register can be reset by designating the desired portion with St and E.	**C** IR HR AR DM LR #	**St/E:** IR HR AR DM LR	CPU21 CPU23 CPU31 HS-CPU's

Name Mnemonic	Symbol	Function	Operands		CPU
Complement (@)COM(29)	COM(29) Wd	Inverts bit status of one word (Wd) of data. Wd → $\overline{Wd}$	**Wd:** IR HR AR DM LR		All models
Logical AND (@)ANDW(34)	ANDW(34) I1 I2 R	Logically ANDs two 16-bit input words (I1 and I2) and sets corresponding bit in result word (R) if corresponding bits in input words are both are ON.	**I1/I2:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Logical OR (@)ORW(35)	ORW(35) I1 I2 R	Logically ORs two 16-bit input words (I1 and I2) and sets corresponding bit in result word (R) if one or both of corresponding bits in input data are ON.	**I1/I2:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Exclusive OR (@)XORW(36)	XORW(36) I1 I2 R	Exclusively ORs two 16-bit input words (I1 and I2) and sets bit in result (R) word when corresponding bits in input words differ in status.	**I1/I2:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models
Exclusive NOR (@)XNRW(37)	XNRW(37) I1 I2 R	Exclusively NORs two 16-bit input words (I1 and I2) and sets bit in result word (R) when corresponding bits in input words are same in status.	**I1/I2:** IR SR HR AR TC DM LR #	**R:** IR HR AR DM LR	All models

Name Mnemonic	Symbol	Function	Operands			CPU
Subroutine Define SBS(91)	SBS(91) N	Calls and executes subroutine N.	**N:** 00 to 99			All models
Subroutine Entry SBN(92)	SBN(92) N	Marks start of subroutine N.	**N:** 00 to 99			All models
Subroutine Return RET(93)	RET(93)	Marks the end of a subroutine and returns control to main program.	None			All models
Macro (@)MCRO(99)	XNRW(37) I1 I2 R	Calls and executes a subroutine replacing I/O words but keeping the same subroutine structure.	**N:** 00 to 99	**I1:** IR SR AR DM HR TC LR	**O1:** IR SR AR DM HR LR	HS-CPU's

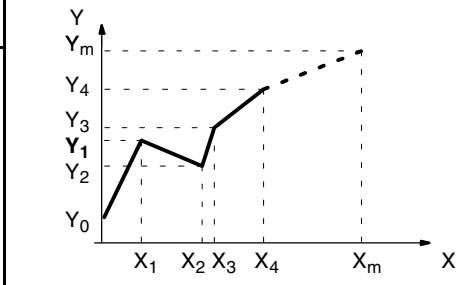
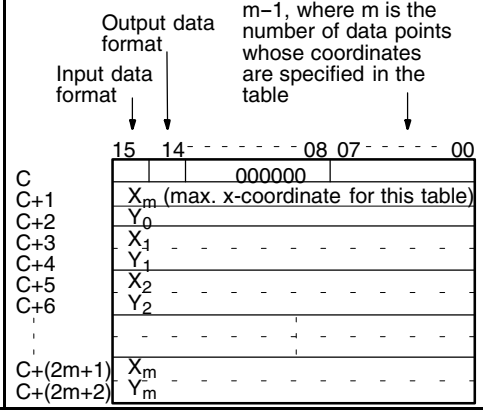
Name Mnemonic	Symbol	Function	Operands	CPU
Step Define STEP(08)	STEP(08) B	When used with a control bit (B), defines the start of a new step and resets the previous step. When used without N, defines the end of step execution.	**B:** IR HR AR LR	All models
Step Start SNXT(09)	SNXT(09) B	Used with a control bit (B) to indicate the end of the step, reset the step, and start the next step.	**B:** IR HR AR LR	All models

Name Mnemonic	Symbol	Function	Operands			CPU
Failure Alarm and Reset FAL(06)	FAL(06) N	FAL is displayed on a programming device. When N is 01 to 99, an error that will not stop the CPU is indicated by outputting N (the FAL number) to the FAL output area. If N is 00, any data in the FAL output area is cleared and any other FAL number recorded in memory replaces it. The same FAL numbers are used for both FAL(06) and FALS(07).	**N:** 00 to 99			All models
Severe Failure Alarm FALS(07)	FALS(07) N	An error is indicated by outputting N to the FAL output area and the CPU is stopped. The same FAL numbers are used for both FAL(06) and FALS(07).	**N:** 01 to 99			All models
Message Display (@)MSG(46)	MSG(46) FM	Displays on the Programming Console, GPC, or FIT 8 words of ASCII code starting from FM. All 8 words must be in the same data area. FM: A B / C D FM+ 7: O P ABCD.....OP	**FM:** IR HR AR TC DM LR #			All models
Bit Counter BCNT(67)	BCNT(67) N SB R	Counts number of ON bits in one or more words (SB: source beginning word) and outputs result to specified word (R). N: number of words to be counted . All words to be counted must be in the same data area.	**N:** IR SR HR AR TC DM LR	**SB:** IR SR HR AR TC DM LR	**R:** IR HR AR TC DM LR	All models HS-CPU's
Interrupt Control (@)FUN(89)	FUN(89) CC N D	Controls interrupts. CC: control code (defines the process); N: Interrupt Module unit number (004: scheduled interrupt); D: control data.	**CC:** 000 to 002	**N:** 000 to 004	**D:** IR HR AR TC DM LR #	All models HS-CPU's
Watchdog Timer Refresh (@)WDT(94)	WDT(94) T	Sets the maximum and minimum limits for the watchdog timer (normally 0 to 130 ms). New limits: Maximum time = 130 + (100 x T) Minimum time = 130 + (100 x (T−1))	**T:** 0 to 63			All models
I/O Refresh (@)IORF(97)	IORF(97) St E	Refreshes all I/O words between the start (St) and end (E) words. Only I/O words may be designated. Normally these words are refreshed only once per scan, but refreshing words before use in an instruction can increase execution speed. St must be less than or equal to E.	**St/E:** IR			All models
Scan Time (@)SCAN(18)	SCAN(18) Mi — —	Sets the minimum scan time, Mi, in tenths of milliseconds. The possible setting range is from 0 to 999.0 ms. If the actual scan time is less than the time set using SCAN(18), the CPU will wait until the designated time has elapsed before starting the next scan.	**Mi:** IR SR HR AR LR TC DM #	**—:** Not used		CPU21 CPU23 CPU31 HS-CPU's

Name Mnemonic	Symbol	Function	Operands			CPU
Long Message (@)LMSG(47)		Outputs a 32-character message to either a Programming Console, or a device connected via the RS-232C interface. The output message must be in ASCII beginning at address S. The destination of the message is designated in D: 000 specifies that the message is to be output to the GPC; 001 specifies the RS-232C interface, starting with the leftmost byte; and 002 specifies the RS-232C interface, starting from the rightmost byte.	**S:** IR HR AR LR TC DM	**D:** #000 #001 #002	—: Not used.	CPU21 CPU23 CPU31 HS-CPU's
Terminal Mode (@)TERM(48)		When the execution condition is ON, the Programming Console operation mode is changed to TERMINAL mode. There is no program command available to change the mode back to CONSOLE mode. Pressing the CHNG key on the Programming Console manually toggles between the two modes.	**—:** Not used			CPU21 CPU23 CPU31 HS-CPU's
Set System (@)SYS(49)		SYS(49) must be programmed at program address 00001 with LD AR 1001 at program address 00000. The leftmost 8 bits of P must contain A3. The status of bits 00, 01, 06, and 07 are used to control the 4 operating parameters described below. If bit 00 of P is ON, the battery check will be excluded from system error checks. If bit 01 of P is ON, the PC will enter MONITOR mode at startup, unless a Programming Console connected to the CPU is not set to MONITOR. If bit 06 of P is ON, the Force Status Hold Bit (SR 25211) will be effective at startup. If bit 07 of P is ON, the I/O Status Hold Bit (SR 25212) will be effective at startup.	**P:** #	**—:** Not used		CPU21 CPU23 CPU31
High-density I/O Refresh MPRF(61)		Refreshes I/O words allocated to the IR area Group 2 High-density I/O Modules with I/O numbers St through E.This will be in addition to the normal I/O refresh performed during the CPU's scan. MPRF(61) can be used to refresh the I/O words allocated to the IR area High-density I/O Modules (IR 030 to IR 049) only. Normally these words are refreshed only once per scan, but refreshing words before use in an instruction can increase execution speed. St must be less than or equal to E.	**St/E:** # (0000 to 0009)			CPU21 CPU23 CPU31 HS-CPU's
Trace Memory Sample TRSM(45)		Used in the program to mark locations where specified data is to be stored in TRACE memory. Used with LSS only.	Not used			HS-CPU's
Average Valve AVG(*)		Adds the specified number of hexadecimal words and computes the mean value. Rounds off the 4-digit past the decimal point.	**S:** IR SR AR DM HR TC LR	**N:** IR SR AR DM HR TC LR #	**D:** IR SR AR DM HR LR	HS-CPU's

Name Mnemonic	Symbol	Function	Operands			CPU
Digital Switch Input DSW(*)	DSW(–) IW OW R	Inputs 4- or 8- digit BCD data from a digital switch.	**IW:** IR SR AR HR LR	**OW:** IR SR AR HR LR	**R:** IR SR AR DM HR LR	HS-CPU's
Frame Check Sum FCS(*)	ECS(–) C R1 D	Checks for errors in data transmitted by a host link command.	**C:** IR SR AR DM HR LR	**R1:** IR SR AR DM HR TC LR	**D:** IR SR AR DM HR LR	HS-CPU's
Failure Point Detect FPD(*)	FPD(–) C T D	Finds errors within an instruction block. Used to monitor the time between the execution of FPD(-) and a diagnostic output. If time exceed T a non-fatal error is generated.	**C:** #	**T:** BCD IR SR AR DM HR TC LR #	**D:** IR AR DM HR LR	HS-CPU's
Find Maximum (@)MAX(*)	MAX(–) C R1 D	Finds the maximum value in specified data area and outputs that value to another word.	**C:** IR SR AR DM HR LR	**R1:** IR SR AR DM HR TC LR	**D:** IR SR AR DM HR LR	HS-CPU's
Find Minimum (@)MIN(*)	MIN(–) C R1 D	Finds the minimum value in specified data area and outputs that value to another word.	**C:** IR SR AR DM HR LR	**R1:** IR SR AR DM HR TC LR	**D:** IR SR AR DM HR LR	HS-CPU's
Matrix Input (@)MTR(*)	MTR(–) IW OW D	Inputs data from an 8 input point X 8 output point matrix and records that data in D through D+3.	**IW:** IR SR AR HR LR	**OW:** IR SR AR HR LR	**D:** IR AR DM HR LR	HS-CPU's
PID Control (@)PID(*)	PID(–) S C D	PID control is performed according to the operand and PID parameters that are present.	**S:** IR SR AR DM HR LR	**C:** IR SR DM HR LR	**D:** IR SR AR DM HR LR	HS-CPU's
Receive (@)RXD(*)	RXD(–) D C N	Receive data via a communications port.	**D:** IR SR AR DM HR TC LR	**C:** IR SR AR DM HR TC LR #	**N:** IR SR AR DM HR TC LR	HS-CPU's

Name Mnemonic	Symbol	Function	Operands			CPU
Scaling (@)SCL(*)	SCL(–) S P1 R	Performs a scaling conversion on the calculated value.	**S:** IR SR AR DM HR TC LR #	**P1:** IR SR AR DM HR TC LR	**R:** IR SR AR DM HR LR	HS-CPU's
Data Search (@)SRCH(*)	SRCH(–) N R1 C	Searches the specified range of memory for the specified data. Outputs the word address(es) of words in the range that contain the data.	**N:** IR SR AR DM HR TC LR #	**R1:** IR SR AR DM HR TC LR	**C:** IR SR AR DM HR LR	HS-CPU's
Sum Calculate (@)SUM(*)	SUM(–) C R1 D	Computes the sum of the contents of the words in the specified range of memory.	**N:** IR SR AR DM HR TC LR #	**R1:** IR SR AR DM HR TC LR	**D:** IR SR AR DM HR LR	HS-CPU's
Ten Key Input (@)TKY(*)	TKY(–) IW* D1 D2	Inputs 8 digits of BCD data from a 10-key keypad.	**IW:** IR SR AR HR LR	**D1:** IR SR AR DM HR LR	**D1:** IR SR AR DM HR LR	HS-CPU's
Transmit (@)TXD(*)	TXD(–) S C N	Sends data via a communications ports.	**S:** IR SR AR DM HR TC LR	**C:** IR SR AR DM HR TC LR #	**N:** IR SR AR DM HR TC LR #	HS-CPU's
Expansion DM Read (@)XDMR(*)	XDMR(–) N S D	The contents of the designated number of words of the fixed expansion DM data are read and output to the destination word.	**N:** IR SR AR DM HR TC LR #	**S:** IR SR AR DM HR TC LR #	**D:** IR SR AR DM HR LR	HS-CPU's

Name Mnemonic	Symbol	Function	Operands			CPU
Value Calculate (@)VCAL(69)	VCAL(69) C S D	Calculates the cosine, or sine of the given degree value, or determines the y-coordinate of the given x value in a previously established line graph. For the sine and cosine conversions, S is entered in BCD as an angle (in the range 0.0 to 90.0 degrees). When calculating the y-coordinate in a graph, S gives the address of the value of the x-coordinate. The calculated data is transferred to the destination word (D). Sine and cosine results are given in BCD. Line graph coordinate calculations (interpolation) can be in BCD or BIN. The data in the control word (C) determines which operation is performed. If C is entered as a constant with a value of 0000 or 0001, the sine or cosine, respectively, of the source data value is calculated. If C is entered as a word designation, it gives the address of the first word of the data table for the line graph. The value of the first two digits gives m−1, where m is the number of data points for which coordinates are given on the line graph. Bits 14 and 15, respectively, specify the output and input data formats (0 indicates BCD, 1 indicates binary).   	**C:** IR SR HR AR LR TC DM #	**S:** IR SR HR AR LR TC DM	**D:** IR SR HR AR LR TC DM	CPU21 CPU23 CPU31
Arithmetic Process (@)APR(*)	APR(−) C S D					HS-CPU's

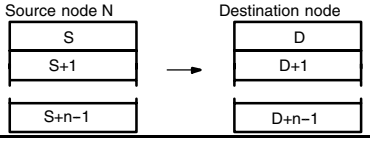
Name Mnemonic	Symbol	Function	Operands		CPU
SYSMAC NET SYSMAC LINK Write (@)SEND(90)	SEND(90) S D C	Transfers data from n source words (S is the starting word) to the destination words (D is the first address) in node N of the specified network (in a SYSMAC LINK or SYSMAC NET System). The format of the control words varies depending on the type of system. In both types of systems, the first control word (C) gives the number of words to be transferred. For SYSMAC NET Systems, in word C+1, bit 14 specifies the system (0 for system 1, and 1 for system 0), and the rightmost 7 bits define the network number. The left half of word C+2 specifies the destination port (00: NSB, 01/02: NSU), and the right half specifies the destination node number. If the destination node number is set to 0, data is transmitted to all nodes. For SYSMAC LINK Systems, the right half of C+1 specifies the response monitoring time (default 00: 2 s, FF: monitoring disabled), the next digit to the left gives the maximum number of re-transmissions (0 to 15) that the PC will attempt if no response signal is received. Bit 13 specifies whether a response is needed (0) or not (1), and bit 14 specifies the system number (0 for system 1, and 1 for system 0). The right half of C+2 gives the destination node number. If this is set to 0, the data will be sent to all nodes.	**S:** IR SR HR AR TC DM LR	**D/C**: IR HR AR TC DM LR	CPU31 HS-CPU31 HS-CPU33

SYSMAC NET

C	n: no. of words to be transmitted (0 to 1000)		
C+1	0X00	0000	Network no. (0 to 127)
C+2	Destination port no.		Destination node no. (0 to 126)

SYSMAC LINK

C	n: no. of words to be transmitted, 0 to 1000		
C+1	0XX0	Re-trans missions	Response monitor time (0.1 to 25.4 s)
C+2	0000	0000	Destination node no. (0 to 62)



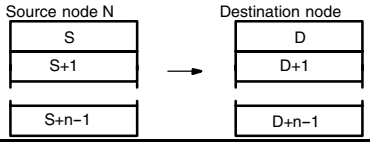
Name Mnemonic	Symbol	Function	Operands		CPU
SYSMAC NET SYSMAC LINK Read (@)RECV(98)	RECV(98) S D C	Transfers data from the source words (S is the first word) from node N of the specified network (in a SYSMAC LINK or SYSMAC NET System) to the destination words starting at D. The format of the control words varies depending on the type of system. In both types of systems, the first control word (C) gives the number of words to be transferred. For SYSMAC NET Systems, in the second word (C+1), bit 14 specifies the system (0 for system 1, and 1 for system 0), and the rightmost 7 bits define the network number. The left half of word C+2 specifies the source port (00: NSB, 01/02: NSU), and the right half specifies the source node number. For SYSMAC LINK Systems, the right half of C+1 specifies the response monitoring time (default 00: 2 s, FF: monitoring disabled), the next digit to the left gives the maximum number of re-transmissions (0 to 15) that the PC will attempt if no response signal is received. Bit 13 specifies whether a response is needed (0) or not (1), and bit 14 specifies the system number (0 for system 1, and 1 for system 0). The right half of C+2 gives the source node number.	**S:** IR SR HR AR TC DM LR	**D/C:** IR HR AR TC DM LR	CPU31 HS-CPU31 HS-CPU33

SYSMAC NET

C	n: no. of words to be transmitted (0 to 1000)		
C+1	0X00	0000	Network no. (0 to 127)
C+2	Source port no. (NSB: 00, NSU: 01/02)		Source node no. (0 to 126)

SYSMAC LINK

C	n: no. of words to be transmitted, 0 to 1000		
C+1	0XX0	Re-trans missions	Response monitor time (0.1 to 25.4 s)
C+2	0000	0000	Source node no. (0 to 62)



NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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