Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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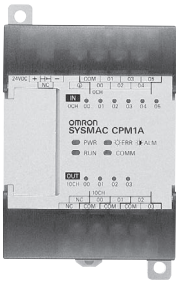
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Compact PLC series

CPM1A

Ultracompact and Economical ... For a Wide Range of Uses
AC or DC power, relay or transistor outputs, sourcing or sinking, etc.

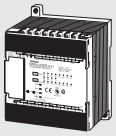
SYSMAC CPM1A



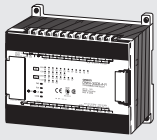
Setting a standard for micro PLCs, the CPM1A packs all basic functions into a compact size. Four CPU sizes are available, each with a choice of AC or DC power, relay or transistor outputs. Select any combination of power supply, output, and the number of I/O points to meet your needs.

AC Power Source CPU Units Depth: 70 mm

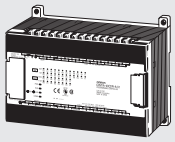
■Relay Output CPU Unit
CPM1A-10CDR-A-V1
■Transistor Output CPU Units
CPM1A-10CDT-A-V1 (Sink)
CPM1A-10CDT1-A-V1 (Source)
●Input points: 6, DC input
●Output points: 4



■Relay Output CPU Unit
CPM1A-20CDR-A-V1
■Transistor Output CPU Units
CPM1A-20CDT-A-V1 (Sink)
CPM1A-20CDT1-A-V1 (Source)
●Input points: 12, DC input
●Output points: 8



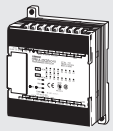
■Relay Output CPU Unit
CPM1A-30CDR-A-V1
● Transistor Output CPU Units
CPM1A-30CDT-A-V1 (Sink)
CPM1A-30CDT1-A-V1 (Source)
●Input points: 18, DC input
●Output points: 12



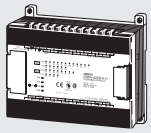
■Relay Output CPU Unit
CPM1A-40CDR-A-V1
■Transistor Output CPU Units
CPM1A-40CDT-A-V1 (Sink)
CPM1A-40CDT1-A-V1 (Source)
●Input points: 24, DC input
●Output points: 16

DC Power Source CPU Units Depth: 50 mm

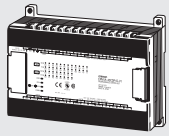
■Relay Output CPU Unit
CPM1A-10CDR-D-V1
■Transistor Output CPU Units
CPM1A-10CDT-D-V1 (Sink)
CPM1A-10CDT1-D-V1 (Source)
●Input points: 6, DC input
●Output points: 4



■Relay Output CPU Unit
CPM1A-20CDR-D-V1
■Transistor Output CPU Units
CPM1A-20CDT-D-V1 (Sink)
CPM1A-20CDT1-D-V1 (Source)
●Input points: 12, DC input
●Output points: 8

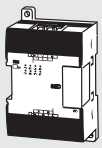


■Relay Output CPU Unit
CPM1A-30CDR-D-V1
■Transistor Output CPU Units
CPM1A-30CDT-D-V1 (Sink)
CPM1A-30CDT1-D-V1 (Source)
●Input points: 18, DC input
●Output points: 12

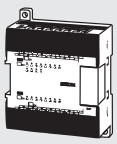


■Relay Output CPU Unit
CPM1A-40CDR-D-V1
■Transistor Output CPU Units
CPM1A-40CDT-D-V1 (Sink)
CPM1A-40CDT1-D-V1 (Source)
●Input points: 24, DC input
●Output points: 16

Expansion I/O Units

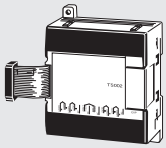


CPM1A-8ED
●Input points: 8, DC input
CPM1A-8ER
●Output points: 8, RY output
CPM1A-8ET
●Output points: 8, TR output (Sink)
CPM1A-8ET1
●Output points: 8, TR output (Source)



CPM1A-20EDR1
●Input points: 12, DC input
●Output points: 8, RY output
CPM1A-20EDT
●Input points: 12, DC input
●Output points: 8, TR output (Sink)
CPM1A-20EDT1
●Input points: 12, DC input
●Output points: 8, TR output (Source)

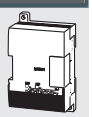
Temperature Sensor Units



CPM1A-TS001
●Thermocouple inputs: 2
CPM1A-TS002
●Thermocouple inputs: 4
CPM1A-TS101
●Pt100 inputs: 2
CPM1A-TS-101-DA
●Pt100 inputs: 2,
Analog outputs: 1
CPM1A-TS102
●Pt100 inputs: 4

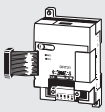
Analog I/O Units

CPM1A-MAD01
(Resolution: 256)
CPM1A-MAD11
(Resolution: 6,000)
2 inputs + 1 output
CPM1A-AD041 (4 inputs)
CPM1A-DA041 (4 outputs)



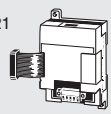
DeviceNet

CPM1A-DRT21
●I/O Link
inputs: 32
●I/O Link
outputs: 32



PROFIBUS-DP

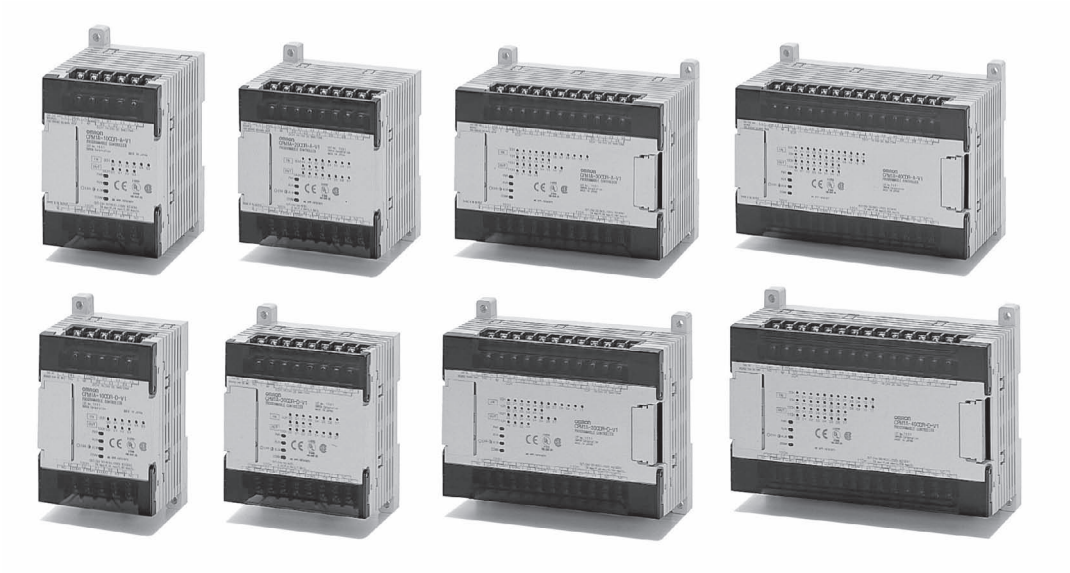
PROFIBUS-DP
I/O Link Unit
CPM1A-PRT21
●I/O Link
inputs: 16
●I/O Link
outputs: 16



CompoBus/S

CompoBus/S
I/O Unit
CPM1A-SRT21
●I/O Link inputs: 8
●I/O Link outputs: 8

Space-saving Integration for Compact machines and Small-scale Control cabinets



- Ultracompact Size

  Ten-I/O-point AC models measure only 90 mm x 66 mm x 70 mm (H x W x D), and contain all basic PLC functions.
- A Wide Variety of Models Handling from 10 to 100 I/O Points

  By combining CPU Units having from 10 to 40 I/O points with 20-I/O-point Expansion I/O Units, CPM1A PLCs can be configured for 10 to 100 I/O points.
- Programming by Programmable Terminal

  Use of the optional Communications Adapter (RS-232C or RS-422 conversion) enables fast Host Link or NT Link communications with an OMRON Programmable Terminal. This makes it possible to program the CPM1A on the PT screen, greatly simplifying maintenance tasks.
- High-speed Processing

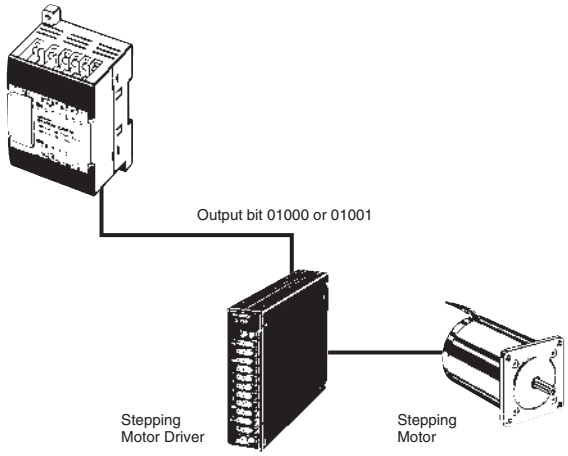
  Processing is fast, e.g., 0.7-μs AND LD / OR LD and 16.3-μs MOV instructions, allowing high-speed execution of even lengthy programs. Integrated interrupt and pulse catch inputs also handle high-speed pulses that occur within one program cycle.
- Versatile Functions in a Compact Body

  A large program capacity and instruction list handle even complicated control tasks with ease.
  - User memory: 2,048 words
  - Data memory: 1,024 words
  - Timer/counter: 128 points
  - Basic instructions: 14 types
  - Application instructions: 79 types
  - Analog setting dials: 2 points (built-in)
- Pulse Output

  CPM1A CPU models with transistor outputs can output pulses with a maximum frequency of 2 kHz. Combining these models with a Stepping Motor Driver or Servo Driver enables easy positioning operation.

Application Example

Changing the speed of a stepping motor.

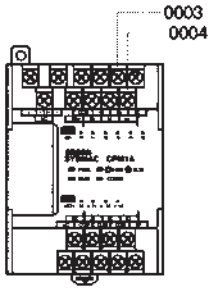


Functions

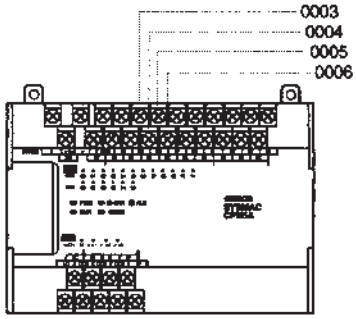
Input Interrupts

There are two input interrupts in the CPM1A 10-point I/O CPU and four in the 20-, 30-, and 40-point I/O CPUs.
Input interrupts are available in two modes.

10-point I/O CPU

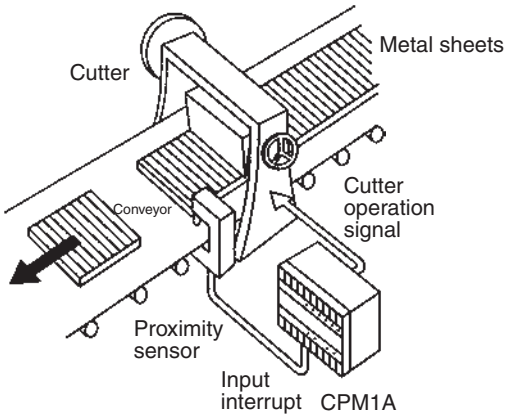


20-, 30- and 40-point I/O CPU



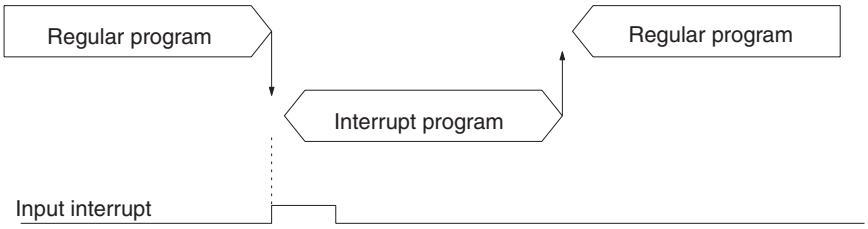
Application Example:

Cutting Metal Sheets to Specified Lengths
The proximity sensor detects the edge of a metal plate to operate the cutter. Metal sheets can be cut continuously to the specified lengths at a high speed.



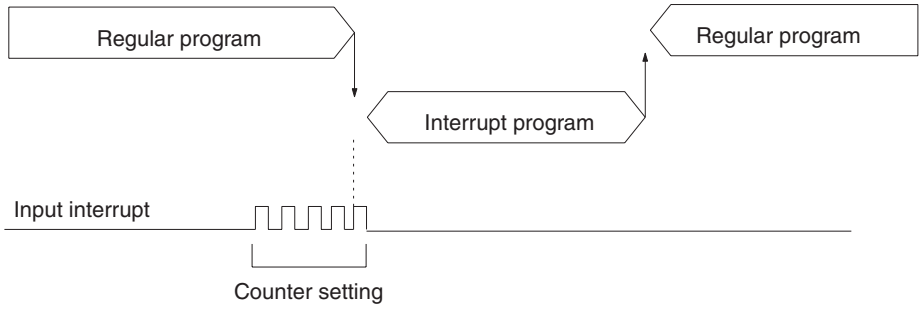
Input Interrupt Mode

If an input interrupt occurs, the regular program shuts down irrelevant of the cycle time, and the interrupt processing program is executed immediately.



Counter Mode

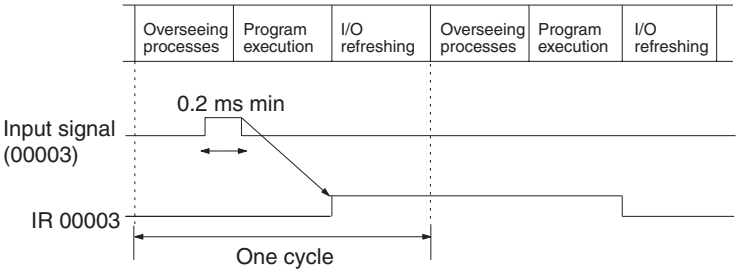
When the number of external signals counted at high speed reaches a specified number of counts, the regular program shuts down, and the interrupt processing program is executed at fixed counts. The count can be set between 0 and 65535.



Quick-response Inputs

There are two quick-response inputs for the CPM1A 10-point I/O CPU and four for the 20-, 30-, and 40-point I/O CPU (shared with the interrupt inputs). Since an internal buffer is provided, the quick-response input function can even detect signals modified within one cycle.

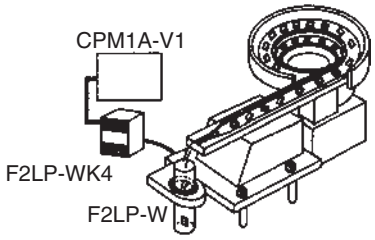
CPU	Input no.	Minimum input pulse width
10-point I/O CPU	00003 to 00004	0.2 ms
20-point, 30-point, 40-point I/O CPU	00003 to 00006	



Application Example:

Calculating the Number of Chips

The metal sensor counts the number of parts that have passed. Steady counting can be achieved even when the input-ON time is short.

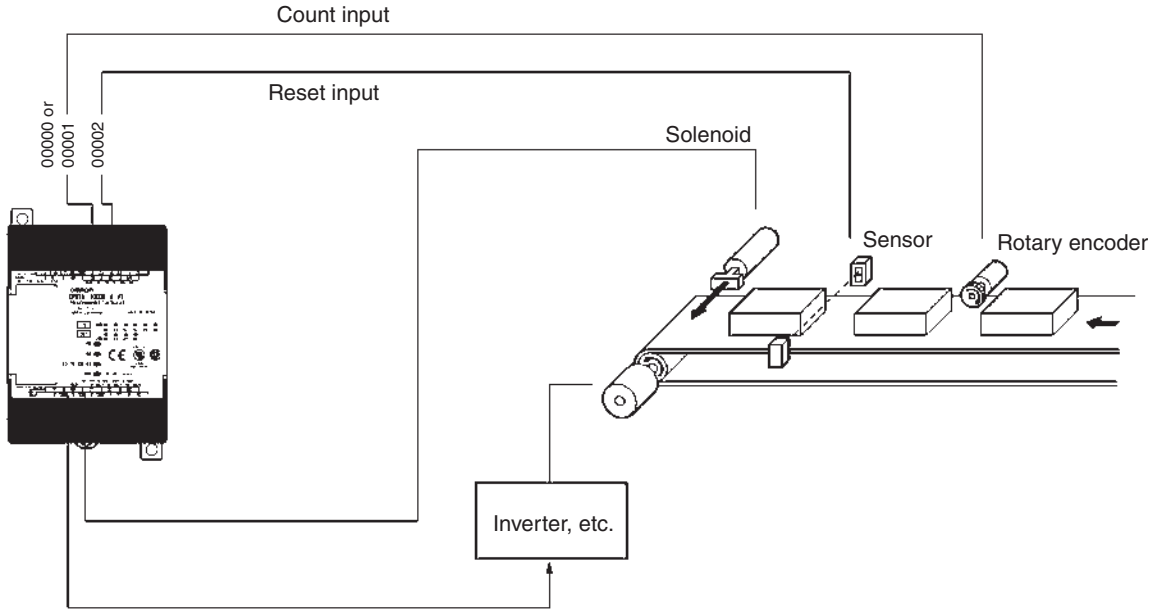


High-speed Counter

The CPM1A has a high-speed counter function that can be used in the incrementing and up/down mode. Using this function together with the input interrupts enables zone comparison control or target value control irrelevant of the cycle time.

Item		Incrementing mode	Up/Down mode
Input no.	00000	Count input	A-phase input
	00001	---	B-phase input
	00002	Reset input	Z-phase input
Input method		Single-phase input	Phase-difference, 4 x inputs
Count frequency		5.0 kHz	2.5 kHz
Count range		0 to 65535	-32767 t0 32767

Note: When using in the incrementing mode, the input 00001 can be used as an input contact.

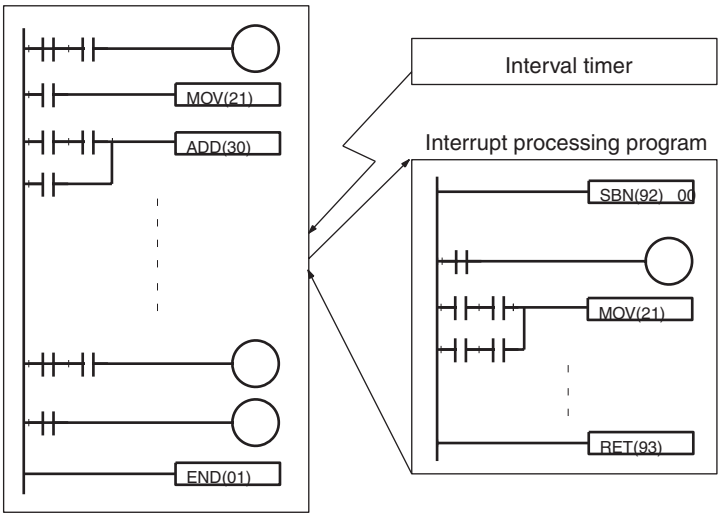


Interval Timer Interrupts

The CPM1A has one interval timer. The interval timer shuts down the regular program irrelevant of the point in the cycle once the time is up, and immediately executes an interrupt processing program. Interval timers are used in the following two modes.

Item	One-shot mode	Scheduled interrupt mode
Operation	An interrupt is executed only once when the time is up.	Interrupts are executed repeatedly at fixed periods.
Setting time	0.5 ms to 319,968 ms (0.1-ms units)	

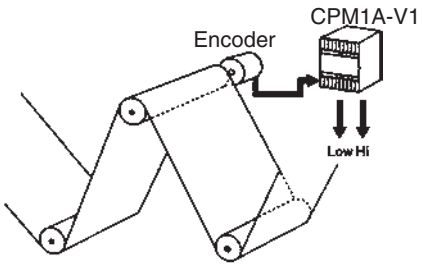
Normal program



Application example

Computing the Sheet Speed

The number of pulse inputs is computed in the interrupt mode at a fixed time to calculate the speed.

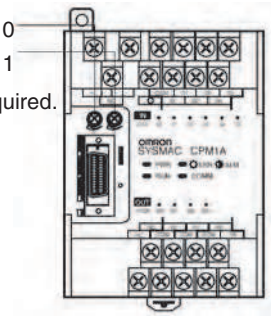


Analog Setting

The CPM1A contains two analog setting controls that can be used for a broad range of analog timer and counter settings. Turning the setting control stores values of 0 to 200 (BCD data) in the SR area.

Analog setting	Storage area	Setting value (BCD)
Analog setting 0	SR 250	0000 to 0200
Analog setting 1	SR 251	

Analog setting 0
Analog setting 1
*Phillips screwdriver is required.

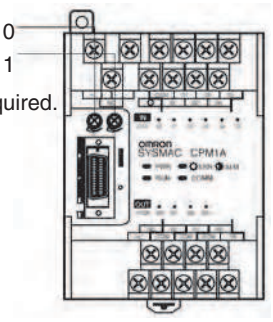


Application Example:

Tact Operation Control of Conveyor Lines

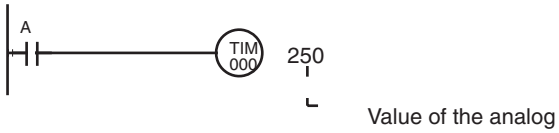
A conveyor can be stopped temporarily as required for assembly processes. When the timer function and limit switches are used in a combination, conveyors can be stopped for a fixed time or can be run at a constant speed for a fixed distance. Fine adjustment of the stopping time can be easily done by using the analog setting controls.

Analog setting 0
Analog setting 1
*Phillips screwdriver is required.



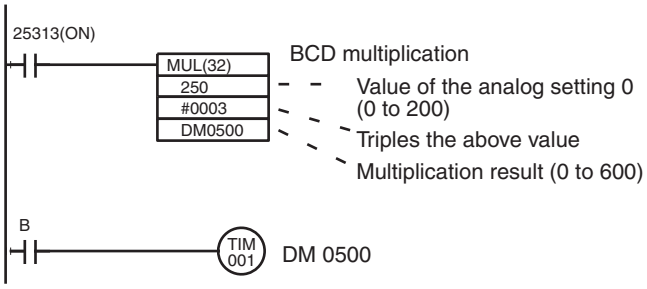
Program Example

1. Analog timer for 0.0 to 20.0 seconds



Value of the analog setting 0 (0 to 200)

2. Analog timer for 0.0 to 60.0 seconds



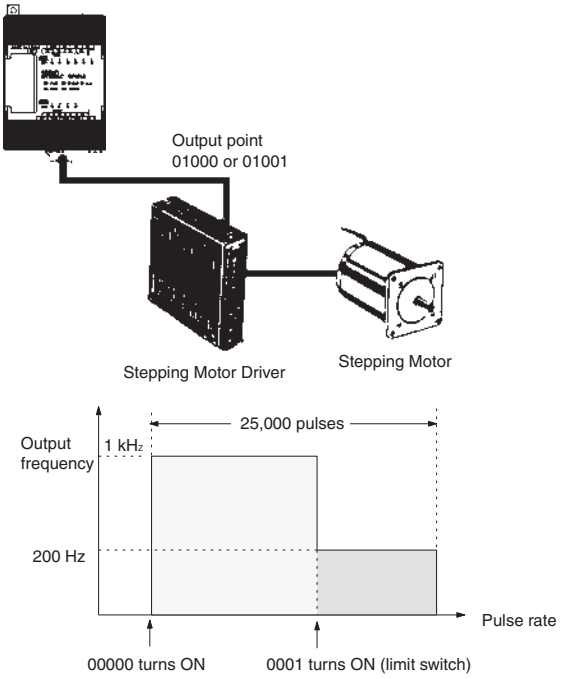
Pulse Output Function

The CPM1A with transistor output has a function that is capable of outputting a pulse of up to 2 kHz.

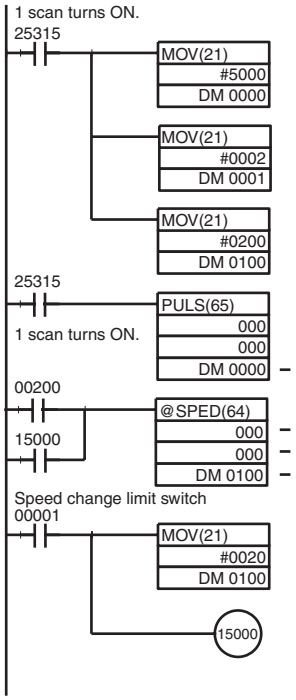
When used in combination with a Stepping Driver or Servodriver, positioning can be easily performed.

Application Example

Changing the speed of the Stepping Motor.



Program Example



Sets the number of output pulses as 25,000 (times) in the data memory area.

DM 0001				DM 0000			
0	0	0	2	5	0	0	0

Sets the initial frequency to 2,000 pulses/second.

Pulse rate setting

Pulse rate (BCD 8 digits)

Frequency conversion:
Output port (output point 01000)
Output mode (single)
Frequency data (x 10 Hz)

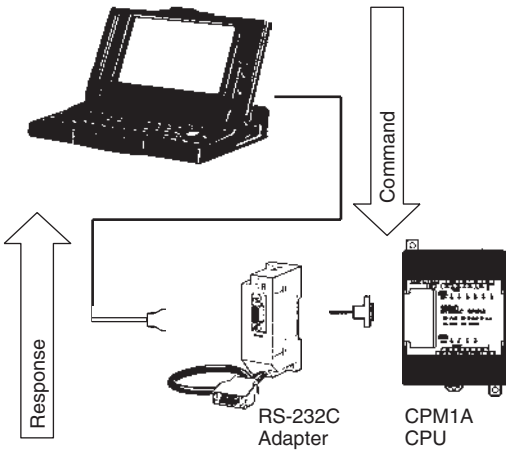
Changes to 200 Hz when the limit switch is turned ON.

Communications

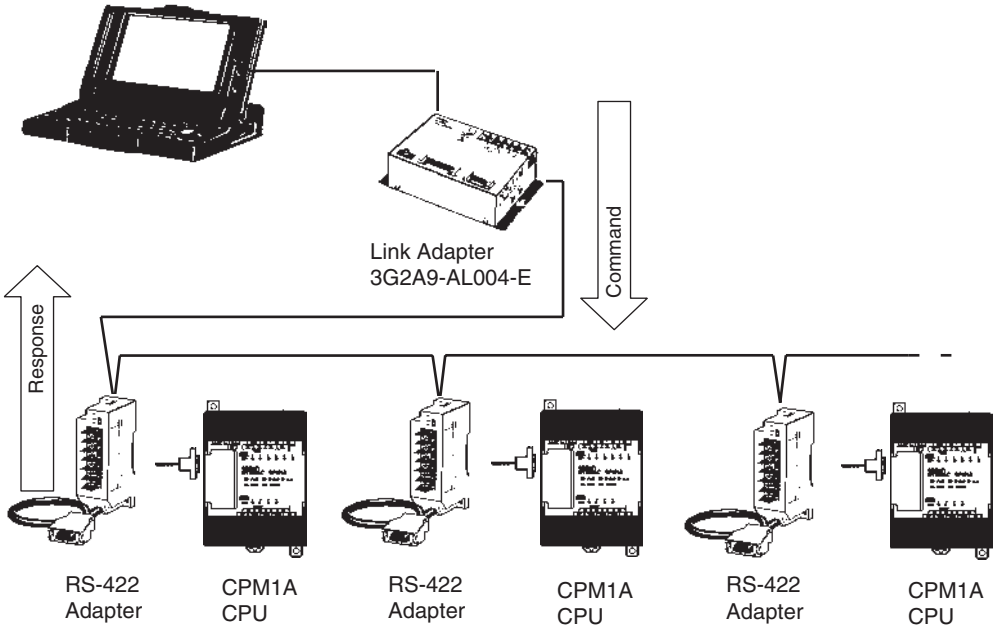
Host Link Communications

CPM1A host link communications consist of interactive procedures whereby the CPM1A returns a response to a command sent from the IBM PC/AT or compatible computer. These communications allow the IBM PC/AT or compatible computer to read and write in the CPM1A's I/O Areas and Data Memory Areas as well as in areas containing the status of various settings.

1:1 Host Link Communications



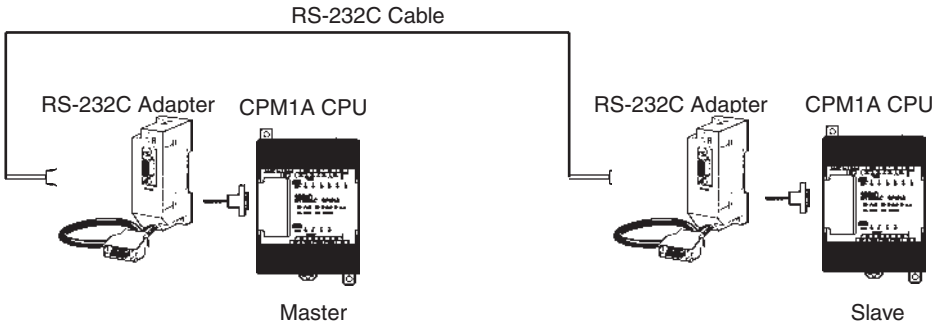
1:n Host Link Communications

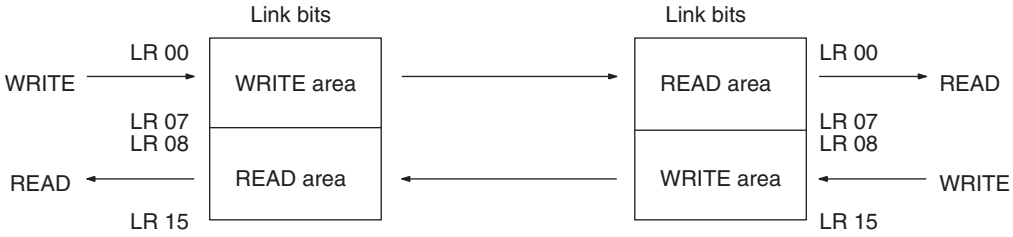


1:1 Links

With a 1:1 link, two CPM1As or a CPM1A and CQM1 or C200H□ are connected 1:1 with one side as the Master and the other as the Slave to provide an I/O link of a maximum of 256 points (LR 0000 to LR 1515).

Example of a 1:1 Link between CPM1As



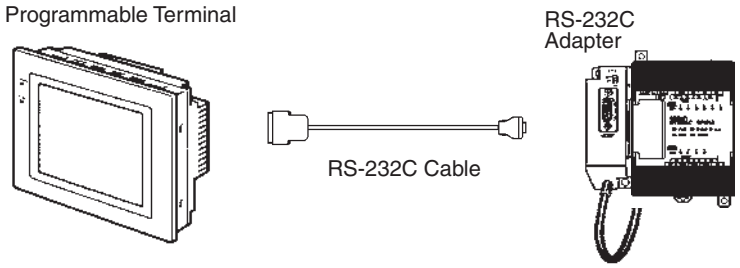


Limitations of the CPM1A 1:1 Link

CPM1A I/O links are limited to 16 words (LR 00 to LR 15). Therefore, use these 16 words (LR 00 to LR 15) on the CQM1 or C200H□ side when forming 1:1 links with a CQM1 or C200H□.

NT Links

High-speed communications can be achieved by providing a direct access through the use of the NT Link between the CPM1A and Programmable Terminal.



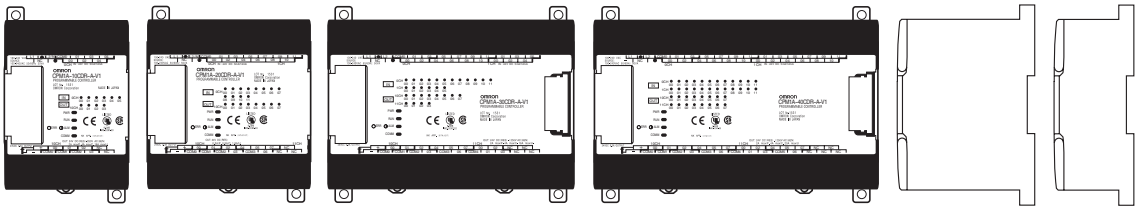
System Configuration

CPM1A Line-up

CPU with AC Power Supply • DC input • RY output / TR output
CPU with DC Power Supply • DC input • RY output / TR output

AC Power Supply Type

DC Power Supply Type



10 I/O points (Expansion not possible)

20 I/O points (Expansion not possible)

30 I/O points

40 I/O points

Expansion I/O Unit
• DC input
• RY output/TR output

Expansion I/O Unit
• DC input
• RY output/TR output

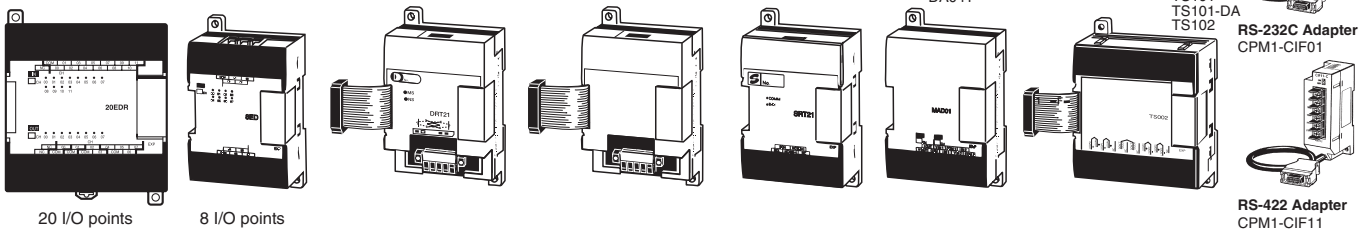
DeviceNet I/O Link Unit
CPM1A-DRT21

PROFIBUS-DP I/O Link Unit
CPM1A-PRT21

CompoBus/S I/O Link Unit
CPM1A-SRT21

Analog I/O Unit
CPM1A-MAD01
-MAD11
-AD041
-DA041

Temperature Sensor Units
CPM1A- TS001
TS002
TS101
TS101-DA
TS102



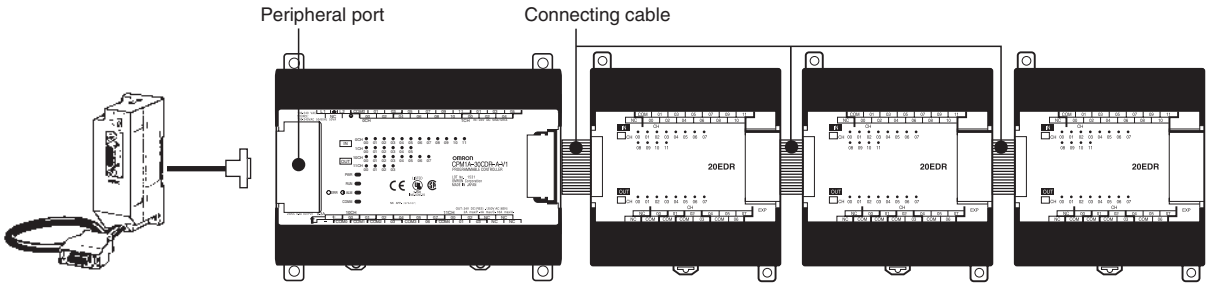
20 I/O points

8 I/O points

RS-232C Adapter
CPM1-CIF01

RS-422 Adapter
CPM1-CIF11

CPM1A System Configuration



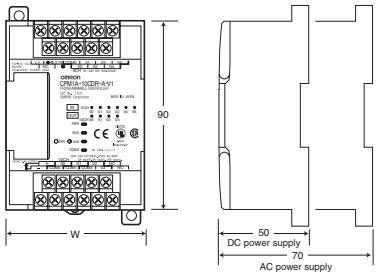
Both AC and DC power supplies.
30-point CPU and 40-point CPU only.
May be expanded up to a maximum of 3 Units.

Expansion I/O Unit

Expansion I/O Unit

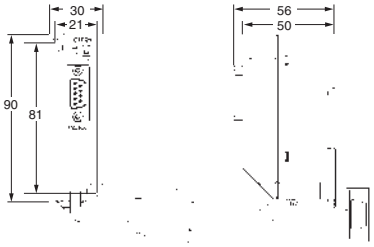
Expansion I/O Unit

External Dimensions

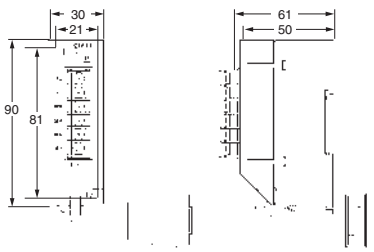


Model	W (mm)
CPM1A-10CD□-A-V1	66
CPM1A-10CD□-D-V1	
CPM1A-20CD□-A-V1	86
CPM1A-20CD□-D-V1	
CPM1A-30CD□-A-V1	130
CPM1A-30CD□-D-V1	
CPM1A-40CD□-A-V1	150
CPM1A-40CD□-D-V1	
CPM1A-20ED□	86 (depth: 50 mm)
CPM1A-8E□/SRT21	66 (depth: 50 mm)
CPM1A-MAD01/TS101-DA	66 (depth: 50 mm)
CPM1A-TS□□□/MAD11	86 (depth: 50 mm)
CPM1A-DRT21/PRT21	66 (depth: 50 mm)
CPM1A-AD041/DA041	86 (depth: 50 mm)

CPM1-CIF01

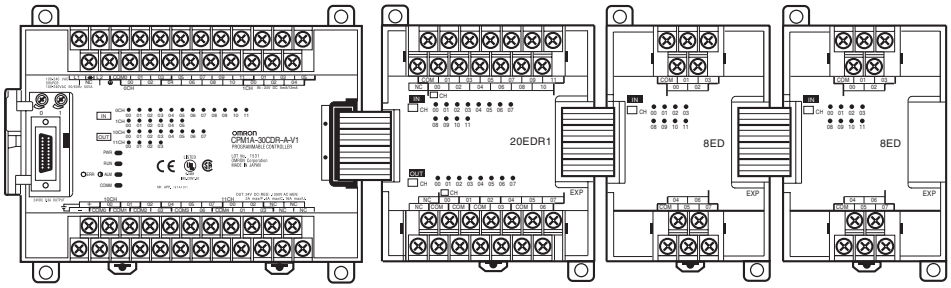


CPM1-CIF11



CPM1A System Configuration Example

A maximum of three Expansion I/O Units can be connected to the CPU Unit. Note that each 4-Channel Analog I/O Unit is counted as two Expansion Units (Group 2 Units, see Table 2).



CPU Unit | Expansion I/O Unit | Expansion I/O Unit | Expansion I/O Unit

Connection Groups for Expansion Units

Group 1 (G1)	Group 2 (G2)
Expansion I/O Units, Analog I/O Unit, CompoBus/S I/O LInk Unit PROFIBUS-DP I/O Link Unit DeviceNet I/O Link Unit CPM1A-TS001/101(-DA)	CPM1A-TS002/102 CPM1A-AD041/DA041

In addition to the CPU Unit, Expansion Units from the groups indicated in the above table can be combined as shown below.

Possible Expansion Unit Combinations

Expansion Unit 1	Expansion Unit 2	Expansion Unit 3
G1	G1	G1
G2	G1	---

Note: 1. Expansion Units 1, 2, and 3 can be mounted in any order.

2. Only one Expansion Unit can be mounted if an NT-AL001 is connected to the RS-232C port.

DC Power Supply-type CPM1A Power Consumption

Use the list below for calculating CPM1A power capacity. The CPM2C-PA201 AC Power Supply Unit provides 15 watts of power, so the remainder of the PLC power can be used as service power for sensors or other components.

CPM1A CPU Unit	Power Consumption (W)	Expandability
CPM1A-10CDR-D-V1	3.5	Not possible
CPM1A-20CDR-D-V1	4.5	Not possible
CPM1A-30CDR-D-V1	5.5	
CPM1A-40CDR-D-V1	6.5	
CPM1A-10CDT/T1-D-V1	3	Not possible
CPM1A-20CDT/T1-D-V1	3.5	Not possible
CPM1A-30CDT/T1-D-V1	4	
CPM1A-40CDT/T1-D-V1	4.5	

Add the following power consumption when using Expansion Units.

CPM1A CPU Unit	Power Consumption (W)
CPM1A-20EDR1	2.5
CPM1A-20EDT/T1	1.5
CPM1A-8ED	1
CPM1A-8ER	2
CPM1A-8ET/T1	1
CPM1A-SRT21/DRT21/PRT21	1
CPM1A-MAD01/MAD11	3.5
CPM1A-TS001/TS101(-DA)	3
CPM1A-TS002/TS102	3
CPM1A-AD041	3
CPM1A-DA041	3.3

The power consumption for the CPU Unit includes that of the Programming Console, RS-232C Adaptor, etc.

Specifications

General Specifications

Item		10-point I/O	20-point I/O	30-point I/O	40-point I/O
Power supply vol tage/frequency	AC power supply	100 to 240 V AC, 50/60 Hz			
	DC power supply	24 V DC			
Operating voltage range	AC power supply	85 to 264 V AC			
	DC power supply	20.4 to 26.4 V DC			
Power consumption	AC power supply	30 V AC max.		60 V AC max.	
	DC power supply	(See below.)			
Inrush current		30 A max.		60 A max.	
External power supply (AC only)	Power supply voltage	24 V DC			
	Power supply output capacity	200 mA		300 mA	
Insulation resistance		20 MΩ min. at 500 V DC between the AC terminals and the protective earth terminal.			
Dielectric strength		2,300 V AC at 50/60 Hz for one minute with a leakage current of 10 mA max. between all the external AC terminals and the protective earth terminal.			
Noise resistance		Conforms to IEC61000-4-4, 2 kV (power lines)			
Vibration resistance		10 to 57 Hz with an amplitude of 0.075 mm, and 57 to 150 Hz with an acceleration of 9.8 m/s^2 in the X, Y, and Z directions for 80 minutes each (i.e. swept for 8 minutes, 10 times).			
Shock resistance		147 m/s^2 in the X, Y and Z directions 3 times each.			
Ambient temperature (operating)		0° to 55°C			
Ambient humidity (operating)		10% to 90% (no condensation)			
Ambient environment (operating)		With no corrosive gas			
Ambient temperature (storage)		–20° to 75°C			
Terminal screw size		M3			
Power supply holding time		10 ms min. for AC models, and 2 ms min. for DC models			
Weight		AC model: 400 g max. DC model: 300 g max.	AC model: 500 g max. DC model: 400 g max.	AC model: 600 g max. DC model: 500 g max.	AC model: 700 g max. DC model: 600 g max.

Note: The specifications of the Expansion I/O Unit are the same as for the CPU except that the power is supplied from the CPU and the weight is 300 g.

Performance Specifications

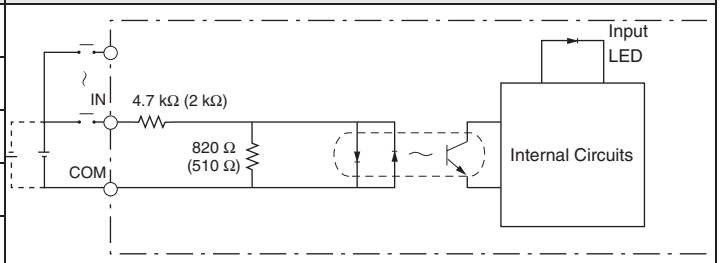
Item		10-point I/O	20-point I/O	30-point I/O	40-point I/O
Control method		Stored program method			
I/O control method		Combination of the cyclic scan and immediate refresh processing methods.			
Programming language		Ladder diagram			
Instruction word		1 step per instruction, 1 to 5 words per instruction			
Types of instructions	Basic instructions	14 types			
	Special instructions	79 types, 139 instructions			
Instruction execution time	Basic instructions	0.72 to 16.2 μs			
	Special instructions	MOV instruction = 16.3 μs			
Program capacity		2,048 words			
Maximum I/O points	CPU only	10 points (6 input/4 output points)	20 points (12 input/8 output points)	30 points (18 input/12 output points)	40 points (24 input/16 output points)
	With Expansion I/O Unit	---	---	90 points (54 input/36 output points)	100 points (60 input/40 output points)
Input bits		00000 to 00915 (Words 0 to 9)			
Output bits		01000 to 01915 (Words 10 to 19)			
Work bits (IR Area)		512: IR 20000 to IR 23115 (IR 200 to IR 231)			
System bits (SR Area)		384: SR 23200 to SR 25515 (SR 232 to SR 255)			
Temporary bits (TR Area)		8: TR 0 to TR 7			
Holding bits (HR Area)		320: HR 0000 to HR 1915 (HR 00 to HR 19)			
Auxiliary bits (AR Area)		256: AR 0000 to AR 1515 (AR 00 to AR 15)			
Link bits (LR Area)		256: LR 0000 to LR 1515 (LR 00 to LR 15)			
Timers/Counters		128:TIM/CNT 000 to 127 100-ms timer: TIM 000 to TIM 127 10-ms timer: TIM 000 to TIM 127 Decremental counter, reversible counter			
Data memory	Read/Write	1,024 words (DM 0000 to DM 1023)			
	Read only	512 words (DM 6144 to DM 6655)			
Interrupt processing: External interrupt		2 points (Response time of 0.3 ms max.)	4 points (Response time of 0.3 ms max.)		
Memory protection		Maintains the contents of the HR, AR, Counter and Data Memory Areas.			
Memory backup		Flash memory:User program, data memory (Read only) (Non-battery powered storage) Super capacitor:Data memory (Read/Write), holding bits, auxiliary memory bits, counter (20-day storage at an ambient temperature of 25° C)			
Self-diagnostic function		CPU error (watchdog timer), memory errors, I/O bus errors			
Program check		No END instruction, programming errors (constantly checked during operation)			
Pulse output		1 point: 2 kHz			
High-speed counter		1 point:Single phase at 5 kHz or two-phase at 2.5 kHz (linear counting method) Incremental mode: 0 to 65535 (16-bit) Decremental mode:–32767 to 32767 (16-bit) 1 point:Single phase at 5 kHz or two-phase at 2.5 kHz (linear counting method) Incremental mode: 0 to 65535 (16-bit) Decremental mode:–32767 to 32767 (16-bit)			
Quick-response inputs		Together with the external interrupt input (minimum pulse width of 0.2 ms)			
Input time constant		Can be set at 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, or 128 ms.			
Analog settings		2 points: (0 to 200)			

Note: Bits that are not used for the I/O bits can be used as work bits.

I/O Specifications

Input Circuit

CPU

Item	Specifications	Circuit
Input voltage	24 V DC +10%/–15%	
Input impedance	IN00000 to IN00002: 2 kΩ Others: 4.7 kΩ	
Input current (typical)	IN00000 to IN00002: 12 mA Others: 5 mA	
ON voltage	14.4 V DC min.	
OFF voltage	5.0 V DC max.	
ON delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	
OFF delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	

Note: The polarity of the input power supply can be either positive or negative.
Resistance values in parentheses are for inputs IN00000 to IN00002.

Note: 1. The actual ON/OFF delay includes a digital filter with a time constant of 1, 2, 4, 8, 16, 32, 64, or 128 ms (default: 8 ms).

2. The delays for IN00000 to IN00002 are as follows when used for the high-speed counter.

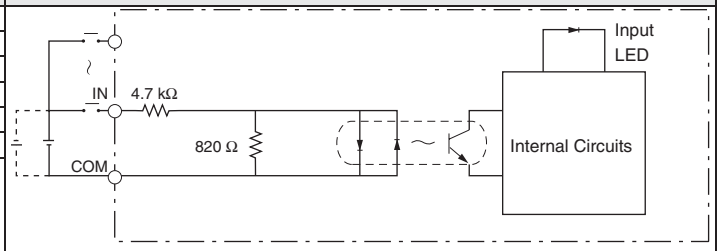
Input	Increment mode	Differential phase mode
IN00000 (A-phase)	5 kHz	2.5 kHz
IN00001 (B-phase)	Normal input	
IN00002 (Z-phase)	ON: 100 μs max. OFF: 500 μs max.	

3. The delays for IN00003 to IN00006 are as follows when used for the high-speed counter.

Delay	0.3 ms max. (From the time of input ON until the interrupt subroutine is executed.)*1

*1 For detailed specifications of expansion I/O units, see page 68.

Expansion I/O Unit

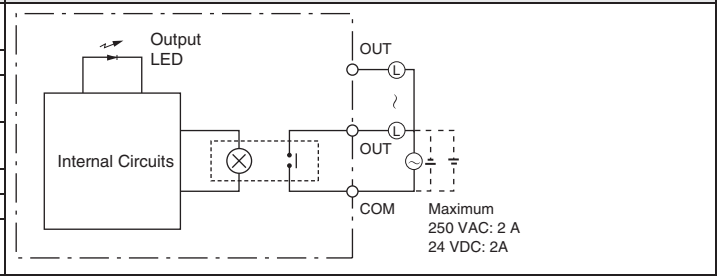
Item	Specifications	Circuit
Input voltage	24 V DC +10%/–15%	
Input impedance	4.7 kΩ	
Input current (typical)	5 mA	
ON voltage	14.4 V DC min.	
OFF voltage	5.0 V DC max.	
ON delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	
OFF delay (see note 1)	1 to 128 ms max. (default: 8 ms) (see note 1)	

Note: The polarity of the input power supply can be either positive or negative.

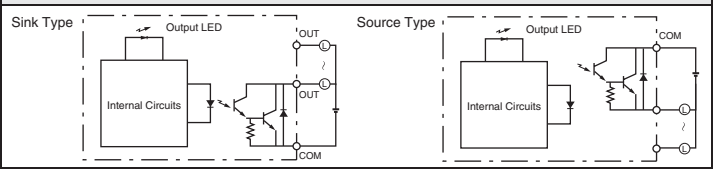
Note: The actual ON/OFF delay includes an input constant of 1, 2, 4, 8, 16, 32, 64, or 128 ms (default: 8 ms).

Output Circuit

CPU and Expansion I/O Unit
Relay Output

Item			Specifications	Circuit
Maximum switching capacity			250 V AC/2 A (cosϕ =1) 24 V DC/2 A (4 A/common)	
Minimum switching capacity			5 V DC, 10 mA	
Relay service life	Electrical	Resistive load	150,000 times (at 24 V DC)	
		Inductive load	100,000 times (at 200 V AC, cosϕ =0.4)	
	Mechanical		20 million times	
ON delay			15 ms max.	
OFF delay			15 ms max.	

Transistor Output (Sink Type/Source Type) (CPU/Expansion I/O Unit)

Item	Specifications	Circuit
Maximum switching capacity	24 V DC +10%/–15%, 300 mA (see note 1)	
Leakage current	0.1 mA max.	
Residual voltage	1.5 V max.	
ON delay	0.1 ms max.	
OFF delay	1 ms max. (see note 2)	

Note: 1. The maximum switching capacity of the CPM1A with transistor outputs (sink type and source type) is limited to the currents shown in the following table for the common and for the Unit.

Item	10CDT-V1/ 10CDT1-A-V1/D-V1	20CDT-D-V1/ 20CDT1-A-V1/D-V1	30CDT-D-V1/ 30CDT1-A-V1/D-V1	40CDT-D-V1/ 40CDT1-A-V1/D-V1	20EDT/20EDT1	CPM1A-8ET/8ET1
Max. switching capacity	0.9 A/Unit	0.9 A/common 1.8 A/Unit	0.9 A/common 2.7 A/Unit	0.9 A/common 3.6 A/Unit	0.9 A/common 1.8 A/Unit	

2. When using the pulse output function of the CPM1A with transistor outputs (sink type and source type):
The output current must be between 100 to 200 mA when using the output 01000 or 01001 as a pulse output with the maximum frequency of 2 kHz.
The off-delay of outpus 01000 and 01001 will vary depending on the output current.

Load current	OFF delay
100 to 200 mA	0.2 ms max.
0 to 300 mA except for the above range	0.5 ms max.

Analog I/O Unit

Item		CPM1A-MAD01		CPM1A-MAD11		CPM1A-AD041		CPM1A-DA041	
		Voltage I/O	Current I/O	Voltage I/O	Current I/O	Voltage I/O	Current I/O	Voltage I/O	Current I/O
Analog inputs	Number of inputs	2		2 (allocated 2 words)		4 (allocated 4 words in + 2 words out)			
	Input signal ranges	0 to 10 V or 1 to 5 V	4 to 20 mA	0 to 5 V, 1 to 5 V, 0 to 10 V, –10 to 10 V	0 to 20 mA, 4 to 20 mA	0 to 5 V, 1 to 5 V, 0 to 10 V, –10 to 10 V	0 to 20 mA, 4 to 20 mA		
	Maximum rated input	±15 V	±30 mA	±15 V	±30 mA	±15 V	±30 mA		
	External input impedance	1 MΩ min.	250 Ω rated	1 MΩ min.	250 Ω	1 MΩ min.	250 Ω		
	Resolution	1/256		1/6,000 (full scale)		1/6,000 (full scale)			
	Overall precision	1.0% of full scale		25°C:±0.3% of full scale	25°C:±0.4% of full scale	25°C:±0.3% of full scale	25°C:±0.4% of full scale		
				0 to 55°C:±0.6% of full scale	0 to 55°C:±0.8% of full scale	0 to 55°C:±0.6% of full scale	0 to 55°C:±0.8% of full scale		
	Converted A/D data	8-bit binary data Full scale = 0000 to 00FF Hex		Binary data (4-digit hexadecimal) –10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale		Binary data (4-digit hexadecimal) –10 to 10 V: F448 to 0BB8 Hex full scale Other:0000 to 1770 Hex full scale			
	Averaging	---		Supported (set for each input with DIP switch)		Supported (set for each input with DIP switch)			
	Disconnection detection	---		Supported		Supported			
Analog output (See note 1.)	Number of outputs	1		1 (1 word allocated)				4 (4 words allocated)	
	Output signal ranges	0 to 10 V or –10 to 10 V	4 to 20 mA	1 to 5 V, 0 to 10 V, –10 to 10 V	0 to 20 mA, 4 to 20 mA			1 to 5 V, 0 to 10 V, –10 to 10 V	0 to 20 mA, 4 to 20 mA
	External output allowed load resistance	2 kΩ min.	350 Ω max.	1 kΩ min.	600 Ω max.			1 kΩ min.	600 Ω max.
	External output impedance	---		0.5 Ω max.	---			0.5 Ω max.	---
	Resolution	1/256 (1/512 when the output signal range is –10 to 10 V.)		1/6,000 (full scale)				1/6,000 (full scale)	
	Overall precision	1.0% of full scale		25°C:±0.4% of full scale				25°C:±0.4% of full scale	
				0 to 55°C:±0.8% of full scale				0 to 55°C:±0.8% of full scale	
	D/A data setting	8-bit plus sign binary data -10 to 10 V output range: Full scale = 80FF to 00FF Hex 4 to 20 mA output range: Full scale = 0000 to 00FF Hex		Binary data (hexadecimal, 4-digit) –10 to 10 V output range: Full scale = F448 to 0BB8 Hex Other output ranges: Full scale = 0000 to 1770 Hex				Binary data (hexadecimal, 4-digit) –10 to 10 V output range: Full scale = F448 to 0BB8 Hex Other output ranges: Full scale = 0000 to 1770 Hex	
Conversion time		10 ms/Unit max. (See note 2.)		2 ms/point		2 ms/point		2 ms/point	
Isolation method		Photocoupler isolation between I/O terminals and PC (There is no isolation between the analog I/O signals.)		Photocoupler isolation between analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)		Photocoupler isolation between analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)		Photocoupler isolation between analog I/O and internal circuits. (Individual analog I/O signals are not isolated.)	

Note: 1. The voltage output and current output can be used at the same time, but the total output current cannot exceed 21 mA.
2. The conversion time is the total time for 2 analog inputs and 1 analog output.

Temperature Sensor Units

By mounting a Temperature Sensor Unit (CPM1A-TS001/TS002/TS101/TS102) to the PLC, input can be obtained from a thermocouple or platinum resistance thermometer, and temperature measurements can be converted to binary data (4-digit hexadecimal) and cyclically updated in the input area of the CPU Unit.

Specifications

Item	Specifications	
Model	CPM1A-TS001/002	CPM1A-TS101/102
Number of inputs	2 (TS001), 4 (TS002)	2 (TS101), 4 (TS102)
Input types	Thermocouple K, J switchable (**Note:** Same type for all input points.)	Pt100, JPt100 switchable (**Note:** Same type for all input points.)
Indication accuracy	The larger of ±0.5% of the indicated value and ±2°C ±1 digit max.	[The larger of ±0.5%of the indicated value and ±1°C] ±1 digit max.
Conversion time	250 ms/2 points (TS001, TS101); 250 ms/4 points (TS002, TS102)	
Converted temperature data	Binary (4-digit hexadecimal)	
Isolation method	Photocoupler isolation between the temperature input signals.	

Note: The indication accuracy when using a K-type thermocouple for temperatures less than –100°C is ±4°C ±1 digit max.

Input Temperature Ranges for CPM1A-TS001/002

The rotary switch can be used to make of the following range and input type settings for CPM1A-TS001/002 models.

Input type	Range (°C)	Range (°F)
K	–200 to 1300	–300 to 2300
	0.0 to 500.0	0.0 to 900.0
J	–100 to 850	–100 to 1500
	0.0 to 400.0	0.0 to 750.0

Input Temperature Ranges for CPM1A-TS101/102

The rotary switch can be used to make of the following range and input type settings for CPM1A-TS101/102 models.

Input type	Range (°C)	Range (°F)
Pt100	–200.0 to 650.0	–300 to 1200.0
JPt100	–200.0 to 650.0	–300 to 1200.0

Specifications CPM1A-TS101-DA

Item	Specifications
Model	CPM1A-TS101-DA
Number of inputs	2
Input types	Pt100
Temperature range	-40 to 250°C
Converted temperature data	16-bit, 2's complement, 0.1°C resolution
Indication accuracy	1.0% of full scale max.
Number of outputs	1
Output type	0 to 10 V, -10 to 10 V, 4 to 20 mA
Load resistance	2 kΩ min. (voltage output), 500Ω max. (current output)
Output resolution	8 bit + sign (1/256, 1/512 for -10 to 10 V)
Output accuracy	1.0% of full scale max.
Conversion time	60 ms (all channels)
Isolation method	Photocoupler isolation between I/O signals and PLC

DeviceNet I/O Link Unit - CPM1A-DRT21

By connecting the DeviceNet I/O Link Unit (CPM1A-DRT21), the CPM1A can function as the slave of a DeviceNet Master Unit.
In this configuration, 32 input- and 32 output bits are exchanged with the Master Unit.

Specifications

Item	Specification
Master/slave	DeviceNet Slave
Number of I/O points allocated to Master	Input: 32 points / Output: 32 points
Number of words allocated from CPM1A's I/O memory	Input: 2 words / Output: 2 words (Allocated in the same way as other Expansion Units).
Node address setting method	Set using DIP switch.

PROFIBUS-DP I/O Link Unit - CPM1A-PRT21

By connecting the PROFIBUS-DP I/O Link Unit (CPM1A-PRT21), the CPM1A can function as the slave of any PROFIBUS-DP Master Unit.
In this configuration, 16 input- and 16 output bits are exchanged with the Master unit.

Specifications

Item	Specification
Master/slave	PROFIBUS-DP slave (OC_0658.GSD)
Number of I/O points allocated to Master	Input: 16 points / Output: 16 points (Intel/Motorola format selectable by DIP switch)
Number of words allocated from CPM1A's I/O memory	Input: 1 word / Output: 1 word (Allocated in the same way as other Expansion Units).
Node address setting method	0-99 using 2 rotary switches

CompoBus/S I/O Link Unit - CPM1A-SRT21

Specifications

Item	Specification
Master/Slave	CompoBus/S Slave
Number of I/O bits	8 input bits, 8 output bits
Number of words occupied in CPM2A I/O memory	1 input word, 1 output word (Allocated in the same way as other Expansion Units).
Node number setting	Set using the DIP switch. (Set before turning ON power for the CPU Unit.)

Communications Adapter Specifications CPM1-CIF01/CIF11

RS-232C Adapter and RS-422 Adapter

Item	Specifications	
	CPM1-CIF01	CPM1-CIF11
Functions	Level conversion between the CMOS level (CPU side) and the RS-232C level (peripheral device side)	Level conversion between the CMOS level (CPU side) and the RS-422 level (peripheral device side)
Isolation (all in this line)	The RS-232C (peripheral device side) is insulated by a DC/DC converter and photocoupler.	The RS-422 (peripheral device side) is insulated by a DC/DC converter and photocoupler.
Power supply	Power is supplied by the CPU.	
Weight	200 g max.	

Expansion Memory Unit CPM1A-EMU01-V1

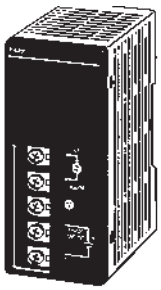
The CPM1-EMU01-V1 offers simple onsite transfer of user programs and data memory.

Item	Specifications
Supported PLCs	CPM1, CPM1A, CPM2A, CPM2C, SRM1(-V2), CQM1, CQM1H
Read/write memory areas	User Program: 15.2 kWords max. Data memory: DM 6144 to DM 6655
Espansion instructions	18 instructions
EEPROM	256-Kbit EEPROM, ATMEL: AT28C256, OMRON: EEROM-JD
Current consumption	130 mA max.
Dimensions (not including cables or connectors)	57 x 92 x 38 mm (W x H x D)
Weight	200 g max. (not including EEPROM)

Specifications

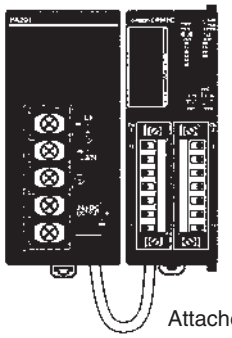
CPM2C-PA201 AC Power Supply Unit

- The CPM2C-PA201 is a slim and compact AC Power Supply Unit of the same shape as the CPM2C's CPU Unit. It can be connected simply using the connecting cable (23 cm) provided. It can also be used for CPM1A and CPM2A CPU Units and as display power supply (wired by the user).

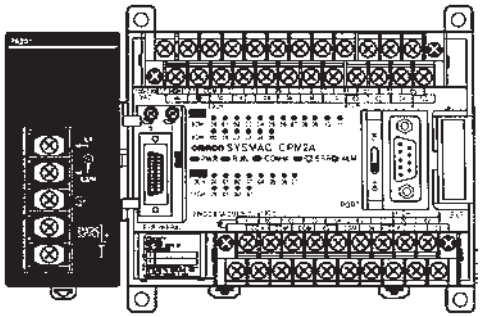


Service power supply for external devices such as sensors (24 V).

AC Power Supply Unit



AC Power Supply Unit

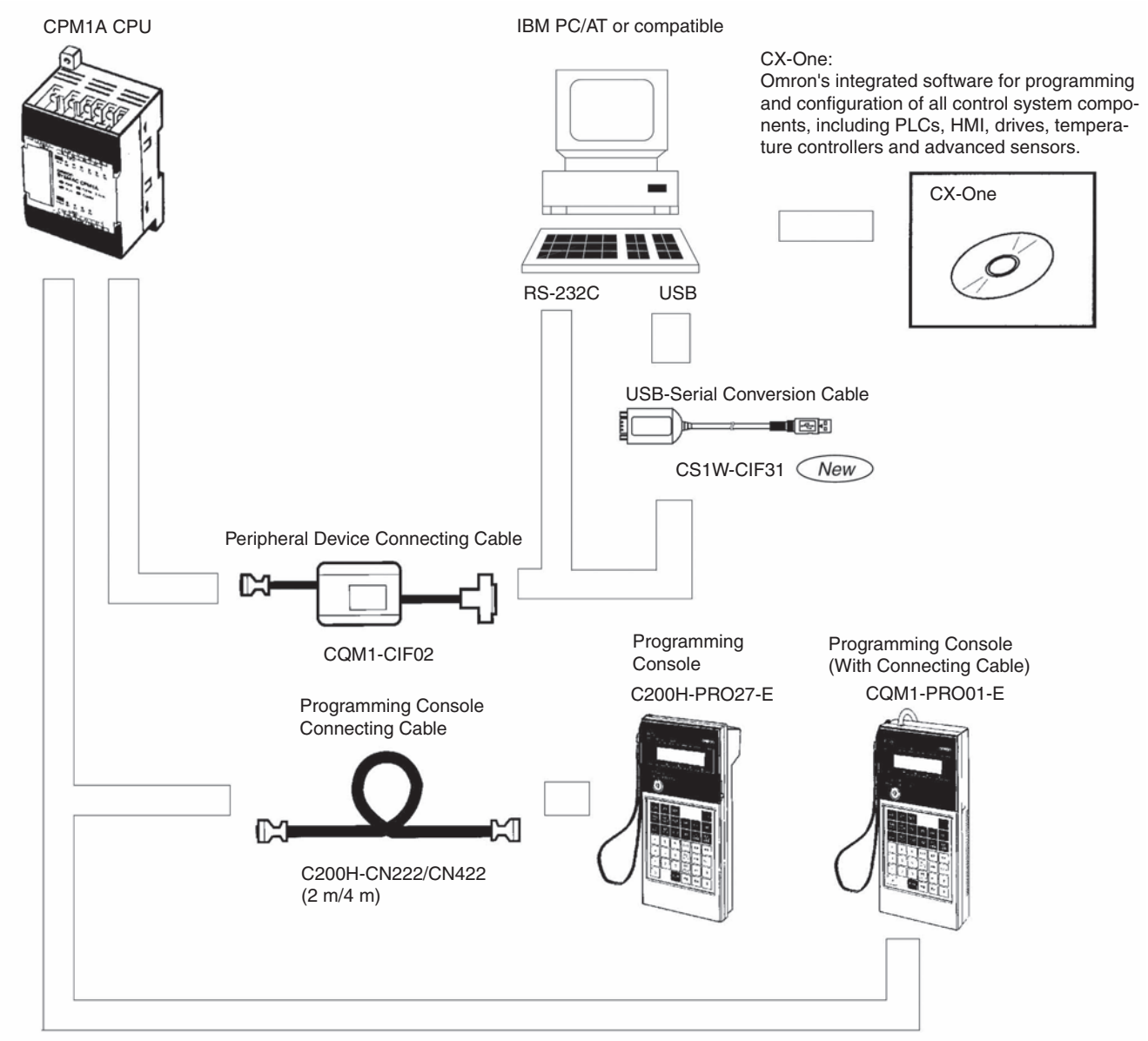


Attached connecting cable

Item			Specification
Rated output			15 W
Output voltage			24 V
Output current			600 mA
Efficiency			75% min. (at rated output)
Input conditions	Rated voltage		100 to 240 V AC
	Allowable voltage range		85 to 264 V AC
	Frequency		47 to 63 Hz
	Current	100 V	0.4 A
		200 V	0.2 A
	Leakage current	100 V	0.5 mA max. (at rated output)
		200 V	1 mA max. (at rated output)
	Inrush current	100 V	15 A max. (at 25°C cold start)
		200 V	30 A max. (at 25°C cold start)

Item		Specification
Output characteristics	Output voltage accuracy	10%/–15% (including input, load, and temperature fluctuations)
	Minimum output current	30 mA
	Ripple noise voltage	2% (p-p) max.
	Input fluctuation	0.75% max.
	Load fluctuation	4% max.
	Temperature fluctuation	0.05%/°C max.
	Startup time	300 ms max. (at input voltage of 100 V AC or 200 V AC and the rated output)
	Output hold time	10 ms (at input voltage of 100 V AC or 200 V AC and the rated output)
Overcurrent protection		Self-resetting, operates at 105% to 335% of the rated current, suspended and independent operation
Overvoltage protection		None
Ambient operating temperature		0° to 55°C
Ambient storage temperature		–20° to 75°C (no condensation or icing)
Ambient operating humidity		10% to 90% (no condensation)
Dielectric strength		2,000 V for 1 min between all inputs and GR Leakage current: 10 mA 3,000 V for 1 min between all inputs and all outputs Leakage current: 10 mA 1,000 V for 1 min between all outputs and GR Leakage current: 10 mA
Insulation resistance		100 MΩ min. at 500 V DC between all outputs and any input, and between all outputs and GR
Vibration resistance		10 to 57 Hz, amplitude, 57 to 150 Hz, acceleration: 9.8 m/s^2 in X, Y, and Z directions for 80 minutes according (Time coefficient: 8 minutes × coefficient factor 10 = total time 80 min.)
Shock resistance		147 m/s^2 3 times each in X, Y, and Z directions
Noise terminal voltage		FCC class A
Weight		250 g max.

Peripheral Devices



CPM1A Ordering Information

International Standards

The products shown in the attached tables are those that conform to the UL, CSA, cULus, cUL, NK, Lloyd's Register, and EC Directives as of September 2003.
(U: UL, C: CSA, UC: cULus, CU: cUL, N: NK, L: Lloyd, CE: EC Directives)
Please contact OMRON representative for application conditions.

CPU Units

Name	Power supply	Output method	Input points	Output points	Model	Standards
10-point I/O	AC power supply	Relay output	6 points	4 points	CPM1A-10CDR-A-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-10CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-10CDT1-A-V1	
	DC power supply	Relay output			CPM1A-10CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-10CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-10CDT1-D-V1	
20-point I/O	AC power supply	Relay output	12 points	8 points	CPM1A-20CDR-A-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-20CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-20CDT1-A-V1	
	DC power supply	Relay output			CPM1A-20CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-20CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-20CDT1-D-V1	
30-point I/O	AC power supply	Relay output	18 points	12 points	CPM1A-30CDR-A-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-30CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-30CDT1-A-V1	
	DC power supply	Relay output			CPM1A-30CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-30CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-30CDT1-D-V1	
40-point I/O	AC power supply	Relay output	24 points	16 points	CPM1A-40CDR-A-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-40CDT-A-V1	U, C, CE
		Transistor output (source type)			CPM1A-40CDT1-A-V1	
	DC power supply	Relay output			CPM1A-40CDR-D-V1	U, C, N, L, CE
		Transistor output (sink type)			CPM1A-40CDT-D-V1	U, C, CE, N
		Transistor output (source type)			CPM1A-40CDT1-D-V1	

Expansion Units and Expansion I/O Units

Unit	Input/Output type	Inputs	Outputs	Model	Standards
Expansion I/O Units	Relay	24	16	CPM1A-40EDR	CE, N
	Transistor (sinking)			CPM1A-40EDT	CE, N
	Transistor (sourcing)			CPM1A-40EDT1	CE, N
	Relay	12	8	CPM1A-20EDR1	U, C, CE, N
	Transistor (sinking)			CPM1A-20EDT	U, C, CE, N
	Transistor (sourcing)			CPM1A-20EDT1	U, C, CE, N
	---	8	---	CPM1A-8ED	U, C, CE, N
	Relay	---	8	CPM1A-8ER	U, C, CE, N
	Transistor (sinking)	---	8	CPM1A-8ET	U, C, CE, N
	Transistor (sourcing)			CPM1A-8ET1	U, C, L, CE, N
Analog I/O Unit	Analog (resolution: 1/256)	2	1	CPM1A-MAD01	U, C, CE, N
	Analog (resolution: 1/6000)	2	1	CPM1A-MAD11	U, C, CE, N
	Analog (resolution: 1/6000)	4	---	CPM1A-AD041	U, C, CE
	Analog (resolution: 1/6000)	---	4	CPM1A-DA041	U, C, CE
DeviceNet I/O Link Unit	---	I/O Link of 32 input bits and 32 output bits		CPM1A-DRT21	U, C, CE, N
PROFIBUS-DP I/O Link Unit	---	I/O Link of 16 input bits and 16 output bits		CPM1A-PRT21	CE
CompoBus/S I/O Link Unit	---	I/O Link of 8 input bits and 8 output bits		CPM1A-SRT21	U, C, CE, N
Temperature Sensor Units	2 thermocouple inputs			CPM1A-TS001	U, C, CE, N
	4 thermocouple inputs			CPM1A-TS002	U, C, CE, N
	2 platinum resistance thermometer inputs			CPM1A-TS101	U, C, CE, N
	4 platinum resistance thermometer inputs			CPM1A-TS102	U, C, CE, N
	2 Platinum resistance thermometer inputs (-40 to 250 °C) and one output (-10 to 10V, 4 to 20 mA)			CPM1A-TS101-DA	U, C, L, CE

RS-232C Adapter, RS-422 Adapter, Connecting Cable, Link Adapter

Name	Function	Model	Standards
RS-232C Adapter	Converts peripheral port levels.	CPM1-CIF01	N, L, CE
RS-422 Adapter		CPM1-CIF11	
Connecting Cable	3.3-m cable used to connect IBM PC/AT or compatible personal computers.	CQM1-CIF02	U, C, N, L, CE
Link Adapter	Converts RS-232C and RS-422 levels.	3G2A9-AL004-E	---

Programming Consoles and Cables

Product		Model	Standards
Programming Console (2-m cable attached)		CQM1-PRO01-E	U, C, N, CE
Programming Console (Requires separate cable. See below.)		C200H-PRO27-E	U, C, N, CE
Connecting Cable for C200H-PRO27-E	2-m cable	C200H-CN222	N
	4-m cable	C200H-CN422	---

Support Software

Product	Functions	Model	Standards
CX-One	Omron's integrated software for programming and configuration of all control system components, including PLCs, HMI, drives, temperature controllers and advanced sensors.	CX-ONE-AL□□C-E[*1]	---

[*1] □□ = Number of licenses (01, 03, 10)

Product	Model	Standards
Expansion Memory Unit	CPM1-EMU01-V1	---
EEPROM (256 K)	EEROM-JD	---

Power Supply Unit

Unit	Input	Output	Model	Standards
Power Supply	100 to 240 V AC	24 V DC/600 mA	CPM2C-PA201	U, C, CE

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