

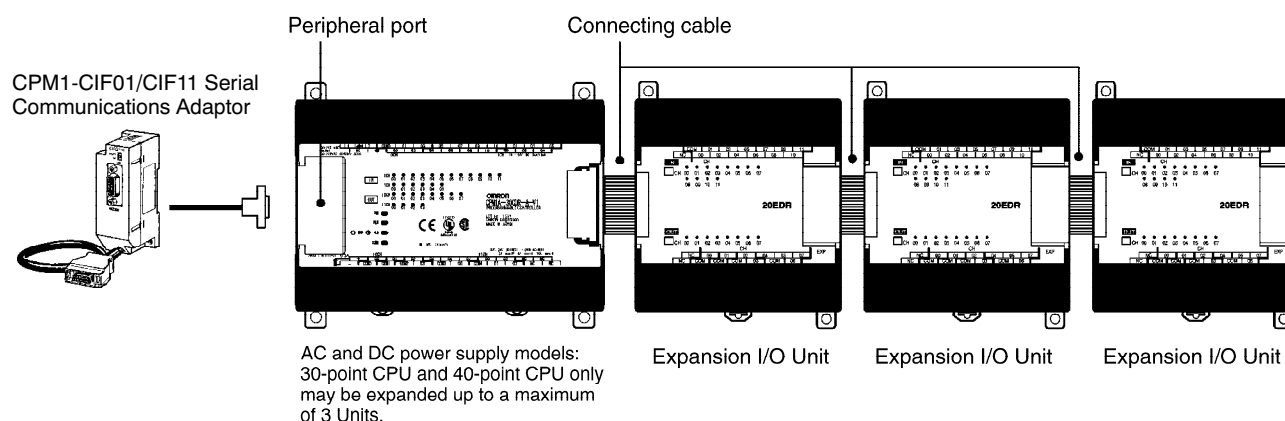
# Micro Programmable Controller CPM1A

The CPM1A series micro controllers solve both basic and semi-complex applications. The brick style models include DC inputs/transistor or relay outputs to meet your design requirements. The base I/O for the CPUs ranges from 10, 20, 30, and 40 I/O points with maximum expansion to 100 I/O. Specialized expansion modules include mixed analog I/O, temperature sensor inputs and serial communications.



- 10, 20, 30 and 40 point I/O CPUs
- Expandable up to 100 I/O points
- Peripheral communications port built in
- DC input models
- Analog expansion modules available
- Temperature sensor input expansion modules available
- Auxiliary 24 VDC supply (AC type only)
- Relay or Transistor outputs
- UL, CSA, CE approvals

## Basic Configuration



# Ordering Information

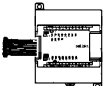
## ■ CPU

**Stock Note:** Shaded models are normally stocked.

| Number of I/O terminals | Inputs       | Outputs   | Power supply | Part number      |                   |                   |
|-------------------------|--------------|-----------|--------------|------------------|-------------------|-------------------|
|                         |              |           |              | Relay output     | Transistor output |                   |
|                         |              |           |              |                  | Sink type         | Source type       |
| 10                      | 6 DC points  | 4 points  | AC           | CPM1A-10CDR-A-V1 | CPM1A-10CDT-A-V1  | CPM1A-10CDT1-A-V1 |
|                         |              |           | DC           | CPM1A-10CDR-D-V1 | CPM1A-10CDT-D-V1  | CPM1A-10CDT1-D-V1 |
| 20                      | 12 DC points | 8 points  | AC           | CPM1A-20CDR-A-V1 | CPM1A-20CDT-A-V1  | CPM1A-20CDT1-A-V1 |
|                         |              |           | DC           | CPM1A-20CDR-D-V1 | CPM1A-20CDT-D-V1  | CPM1A-20CDT1-D-V1 |
| 30                      | 18 DC points | 12 points | AC           | CPM1A-30CDR-A-V1 | CPM1A-30CDT-A-V1  | CPM1A-30CDT1-A-V1 |
|                         |              |           | DC           | CPM1A-30CDR-D-V1 | CPM1A-30CDT-D-V1  | CPM1A-30CDT1-D-V1 |
| 40                      | 24 DC points | 16 points | AC           | CPM1A-40CDR-A-V1 | CPM1A-40CDT-A-V1  | CPM1A-40CDT1-A-V1 |
|                         |              |           | DC           | CPM1A-40CDR-D-V1 | CPM1A-40CDT-D-V1  | CPM1A-40CDT1-D-V1 |

## ■ EXPANSION I/O MODULES

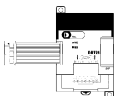
**Stock Note:** Shaded models are normally stocked.

| Description                                                                                      |                                                                                    | Max. number of modules | Inputs | Outputs              | Part number  |  |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------|--------|----------------------|--------------|--|
| 20 I/O points<br>12 inputs,<br>8 outputs                                                         |   | 3 max.<br>(See Note.)  | 24 VDC | Relays               | CPM1A-20EDR1 |  |
|                                                                                                  |                                                                                    |                        | 24 VDC | Sinking transistors  | CPM1A-20EDT  |  |
|                                                                                                  |                                                                                    |                        | 24 VDC | Sourcing transistors | CPM1A-20EDT1 |  |
| 8 inputs                                                                                         |  |                        | 24 VDC | —                    | CPM1A-8ED    |  |
| 8 outputs<br> |                                                                                    |                        | —      | Relays               | CPM1A-8ER    |  |
|                                                                                                  |                                                                                    |                        | —      | Sinking transistors  | CPM1A-8ET    |  |
|                                                                                                  |                                                                                    |                        | —      | Sourcing transistors | CPM1A-8ET1   |  |

Note: A maximum of 3 expansion modules can be used with the following CPUs: 30-point and 40-point with DC inputs.

## ■ DEDICATED I/O MODULES

**Stock Note:** Shaded models are normally stocked.

| Description                                                                                                                                                     |                                        | Max. number of modules | Inputs                               | Outputs                             | Part number                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------|--------------------------------------|-------------------------------------|---------------------------------------------------------------------------|
| Analog I/O Module<br>2 analog inputs (2 words)<br>1 analog output (1 word)<br> |                                        | 3 max.                 | 2 analog inputs                      | 1 analog output                     | CPM1A-MAD01                                                               |
|                                                                                                                                                                 |                                        |                        |                                      |                                     | CPM1A-MAD11                                                               |
| Temperature Sensor Input Modules<br>                                           | Thermocouple inputs                    | 3 max.                 | 2 inputs (Types J and K)             | —                                   | CPM1A-TS001                                                               |
|                                                                                                                                                                 |                                        | 1 max.<br>(See Note.)  | 4 inputs (Types J and K)             |                                     | CPM1A-TS002                                                               |
|                                                                                                                                                                 | Platinum resistance thermometer inputs | 3 max.                 | 2 inputs (Pt100, JPt100)             | 1 analog output                     | CPM1A-TS101                                                               |
|                                                                                                                                                                 |                                        | 3 max.                 | 2 inputs (Pt100, JPt100)             |                                     | CPM1A-TS101-DA                                                            |
|                                                                                                                                                                 |                                        | 1 max.<br>(See Note.)  | 4 inputs (Pt100, JPt100)             | —                                   | CPM1A-TS102                                                               |
|                                                                                                                                                                 |                                        | 1 max.<br>(See Note.)  | 4 inputs (Pt100, JPt100)             |                                     | CPM1A-TS102                                                               |
| CompoBus/S I/O Link Module<br>8 inputs and 8 outputs<br>                       |                                        | 3 max.                 | 8 bits<br>(Inputs from the Master.)  | 8 bits<br>(Outputs to the Master.)  | CPM1A-SRT21                                                               |
|                                                                                                                                                                 |                                        |                        |                                      |                                     | Flat cable, 4-core, 0.75 mm <sup>2</sup> ; 100 m length                   |
|                                                                                                                                                                 |                                        |                        |                                      |                                     | Twisted pair cable, 2-core, 0.75 mm <sup>2</sup> ; available commercially |
| DeviceNet I/O Link Module<br>32 inputs and 32 outputs<br>                      |                                        | 3 max.                 | 32 bits<br>(Inputs from the Master.) | 32 bits<br>(Outputs to the Master.) | CPM1A-DRT21                                                               |
|                                                                                                                                                                 |                                        |                        |                                      |                                     | Omron connector with screws<br>(included with DeviceNet I/O Link Module). |
|                                                                                                                                                                 |                                        |                        |                                      |                                     | Omron Connector for multidrop connections using thick cables.             |
| Profibus-DP Slave Module<br>16 inputs and 16 outputs<br>                       |                                        | 3 max.                 | 16 bits<br>(Inputs from the Master.) | 16 bits<br>(Outputs to the Master.) | CPM1A-PRT21                                                               |
|                                                                                                                                                                 |                                        |                        |                                      |                                     | Shielded twisted pair cable, available commercially                       |

Note: Only one CPM1A-TS002/TS102 Temperature Sensor Input Module can be connected to the CPU. If a CPM1A-TS002/102 is connected to the CPU, only one additional Special I/O Module (other than a CPM1A-TS002/102) or one Expansion I/O Module can be connected to the CPU.

## ■ PERIPHERAL DEVICES

**Stock Note:** Shaded models are normally stocked.

| Product             | Description                                                        | Part number   |
|---------------------|--------------------------------------------------------------------|---------------|
| Programming console | Hand-held programming console with cable attached, 2 m length      | CQM1-PRO01-E  |
|                     | Hand-held programming console with back light (cable not included) | C200H-PRO27-E |
| Connecting cable    | Connects C200H programming console to peripheral port, 2 m length  | C200H-CN222   |
|                     | Connects C200H programming console to peripheral port, 4 m length  | C200H-CN422   |

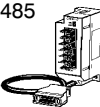
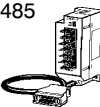
## ■ SUPPORT SOFTWARE

**Stock Note:** Shaded models are normally stocked.

| Product           | Functions                                                                            | Part number       |
|-------------------|--------------------------------------------------------------------------------------|-------------------|
| CX-Programmer Jr. | Windows-based programming software; reduced instruction set and networking commands. | WS02-CXPC1-EJ-V__ |
| CX-Programmer     | Full programming software package programs micro, small and larger controllers.      | WS02-CXPC1-E-V__  |

## ■ COMMUNICATIONS ADAPTERS AND CABLES

**Stock Note:** Shaded models are normally stocked.

| Description                                                                                                | Function                                                                     | Part number          |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------|
| RS-232C adapter<br>       | Converts data communications from peripheral port for RS-232C devices.       | CPM1-CIF01           |
| RS-232C cable<br>         | RS-232C to RS-232C; PC connection for program download; cable length 2 m     | C200H-CN229-EU       |
|                                                                                                            |                                                                              | CBL-202*             |
|                                                                                                            | RS-232C to RS-232C for PLC communication; cable length 2 m                   | C200H-CN320-EU       |
|                                                                                                            |                                                                              | CBL-804*             |
|                                                                                                            | Communication cable for NT31C (port B only)                                  | 50 cm NT31C-CN510-EU |
|                                                                                                            |                                                                              | 3 m NT31C-CN320-EU   |
|                                                                                                            |                                                                              | 5 m NT31C-CN520-EU   |
| RS-422/RS-485 adapter<br> | Converts data communications from peripheral port for RS-422/RS-485 devices. | CPM1-CIF11           |

\* Available in Canada only.

## ■ PROGRAM TRANSFER EQUIPMENT

**Stock Note:** Shaded models are normally stocked.

| Product               | Description                                                                      | Part number       |
|-----------------------|----------------------------------------------------------------------------------|-------------------|
| Expansion Memory Unit | Uploads and downloads program and setup memory areas to and from the controller. | CPM1-EMU01-V1     |
| EEPROM (256 kbits)    | Used with the Expansion Memory Unit                                              | EEPROM-CPM1-EMU01 |

## ■ MANUALS

| Product            | Description                                          | Part number |
|--------------------|------------------------------------------------------|-------------|
| Operation manual   | CPM1A programmable controllers operation manual      | W317        |
| Programming manual | CPM1/CPM1A/CPM2A/CPM2C/SRM1 (-V2) programming manual | W353        |

# Specifications

## ■ GENERAL SPECIFICATIONS

|                                     |                              |                                                                                                                                                        |              |              |              |
|-------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|
| Input type                          |                              | DC input                                                                                                                                               |              |              |              |
| CPU type                            |                              | 10-point I/O                                                                                                                                           | 20-point I/O | 30-point I/O | 40-point I/O |
| Power supply voltage/fre-<br>quency | AC power supply              | 100 to 240 VAC, 50/60 Hz                                                                                                                               |              |              |              |
|                                     | DC power supply              | 24 VDC                                                                                                                                                 |              |              |              |
| Operating voltage range             | AC power supply              | 85 to 264 VAC                                                                                                                                          |              |              |              |
|                                     | DC power supply              | 20.4 to 26.4 VDC                                                                                                                                       |              |              |              |
| Power consumption                   | AC power supply              | 30 VA max.                                                                                                                                             |              | 60 VA max.   |              |
|                                     | DC power supply              | 6 W max.                                                                                                                                               |              | 20 W max.    |              |
| Inrush current                      |                              | 30 A max.                                                                                                                                              |              | 60 A max.    |              |
| External power supply (AC only)     | Power supply voltage         | 24 VDC                                                                                                                                                 |              |              |              |
|                                     | Power supply output capacity | 200 mA                                                                                                                                                 |              | 300 mA       |              |
| Insulation resistance               |                              | 20 MΩ min. at 500 VDC between the AC terminals and the protective earth terminal.                                                                      |              |              |              |
| Dielectric strength                 |                              | 2,300 VAC 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)<br>1500 Vp-p, pulse width 0.1 to 1 μs, rise time: 1 ns (via noise simulation)                             |              |              |              |
| Vibration resistance                |                              | 10 to 57 Hz with an amplitude of 0.075 mm, and 57 to 150 Hz with an acceleration of 1.5 G in the X, Y, and Z directions for 10 sweeps of minutes each. |              |              |              |
| Shock resistance                    |                              | 147 m/s <sup>2</sup> in the X, Y and Z directions 3 times each.                                                                                        |              |              |              |
| Ambient temperature                 | Operating                    | 0°C to 55°C (32°F to 131°F)                                                                                                                            |              |              |              |
|                                     | Storage                      | -20°C to 75°C (-4°F to 167°F)                                                                                                                          |              |              |              |
| Ambient humidity                    | Operating                    | 10% to 90% RH no condensation                                                                                                                          |              |              |              |
| Ambient environment                 | Operating                    | With no corrosive gas                                                                                                                                  |              |              |              |
| Terminal screw size                 |                              | M3                                                                                                                                                     |              |              |              |
| Power supply holding time           |                              | 10 ms min. for AC models, and 2 ms min. for DC models                                                                                                  |              |              |              |
| CPU Weight                          | AC models                    | 400 g max.                                                                                                                                             | 500 g max..  | 600 g max..  | 700 g max.   |
|                                     | DC models                    | 300 g max.                                                                                                                                             | 400 g max.   | 500 g max.   | 600 g max.   |
| Expansion Weight                    |                              | Units with 20 I/O points:                                                                                                                              |              | 300 g max.   |              |
|                                     |                              | Units with 8 output points:                                                                                                                            |              | 250 g max.   |              |
|                                     |                              | Units with 8 input points:                                                                                                                             |              | 200 g max.   |              |
|                                     |                              | MAD01 Analog I/O unit:                                                                                                                                 |              | 150 g max.   |              |
|                                     |                              | MAD11 Analog I/O unit:                                                                                                                                 |              | 250 g max.   |              |
|                                     |                              | Temperature sensor units:                                                                                                                              |              | 250 g max.   |              |
|                                     |                              | CompoBus/S I/O link unit:                                                                                                                              |              | 200 g max.   |              |
|                                     |                              | DeviceNet I/O link unit:                                                                                                                               |              | 200 g max.   |              |
|                                     |                              | Profibus-DP slave unit:                                                                                                                                |              | 125 g        |              |

## ■ CHARACTERISTICS

|                                          |                           |                                                                                                                                                                                                                                                                                                       |                                             |                                                    |                                                     |
|------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|-----------------------------------------------------|
| Input type                               |                           | DC input                                                                                                                                                                                                                                                                                              |                                             |                                                    |                                                     |
| CPU type                                 |                           | 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                                                                                                                                                                                                                                                                                           |                                             |                                                    |                                                     |
| User data memory                         |                           | 1,024 words                                                                                                                                                                                                                                                                                           |                                             |                                                    |                                                     |
| Maximum I/O points                       | CPU only                  | 10 points<br>(6 input/<br>4 output points)                                                                                                                                                                                                                                                            | 20 points<br>(12 input/<br>8 output points) | 30 points<br>(18 input/<br>12 output points)       | 40 points<br>(24 input/<br>16 output points)        |
|                                          | With Expansion I/O Module | —                                                                                                                                                                                                                                                                                                     | —                                           | Up to 90 points<br>(54 input/<br>36 output points) | Up to 100 points<br>(60 input/<br>40 output points) |
| Memory protection                        |                           | Maintains the contents of the HR, AR, Counter and Data Memory Areas.                                                                                                                                                                                                                                  |                                             |                                                    |                                                     |
| Memory backup                            |                           | Flash memory: User program, data memory (Read only) and PLC setup area are backed up without a battery.<br>Super capacitor: Data memory (Read/Write), holding bits, auxiliary memory bits, counter values, error log area are backed up by a capacitor for 20-days 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)<br>Incremental mode: 0 to 65535 (16-bit)<br>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.                                                                                                                                                                                                                                 |                                             |                                                    |                                                     |
| Interrupt processing: External interrupt |                           | 2 points (Response time of 0.3 ms max.)                                                                                                                                                                                                                                                               | 4 points (Response time of 0.3 ms max.)     |                                                    |                                                     |
| Analog settings                          |                           | 2 points: (0 to 200 BCD)                                                                                                                                                                                                                                                                              |                                             |                                                    |                                                     |

## ■ I/O ALLOCATION

|                          |            |                                                                                                                                           |
|--------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Input bits               |            | 00000 to 00915; words not used for input or output bits can be used for work bits.                                                        |
| Output bits              |            | 01000 to 01915; words not used for input or output bits can be used for work bits.                                                        |
| Work bits (IR Area)      |            | 512: IR 20000 to IR 23115 (IR 200 to IR 231)                                                                                              |
| Special 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<br>100-ms timer: TIM 000 to TIM 127<br>10-ms timer: TIM 000 to TIM 127<br>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)                                                                                                            |

## ■ I/O SPECIFICATIONS

### CPU DC Input

| Item                    | Specifications                                   | Circuit |
|-------------------------|--------------------------------------------------|---------|
| Input voltage           | 24 VDC +10%/−15%                                 |         |
| Input impedance         | IN0000 to IN0002: 2 kΩ<br>Others: 4.7 kΩ         |         |
| Input current (typical) | IN0000 to IN0002: 12 mA<br>Others: 5 mA          |         |
| ON voltage              | 14.4 VDC min.                                    |         |
| OFF voltage             | 5.0 VDC max.                                     |         |
| ON delay (See Note 1)   | 1 to 128 ms max.<br>(default: 8 ms) (See Note 1) |         |
| OFF delay (See Note 1)  | 1 to 128 ms max.<br>(default: 8 ms) (See Note 1) |         |

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

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

2. When IN0000 to IN0006 are used for the high-speed counter inputs, the delays are as shown below:

| Input            | Increment mode                                                                      | Differential phase mode |
|------------------|-------------------------------------------------------------------------------------|-------------------------|
| IN0000 (A-phase) | 5 kHz                                                                               | 2.5 kHz                 |
| IN0001 (B-phase) | Normal input                                                                        |                         |
| IN0002 (Z-phase) | ON: 100 μs max. OFF: 500 μs max.                                                    |                         |
| IN0003 to IN0006 | 0.3 ms max. (From the time of input ON until the interrupt subroutine is executed.) |                         |

## Expansion I/O Unit

| Item                    | Specifications                                 | Circuit |
|-------------------------|------------------------------------------------|---------|
| Input voltage           | 24 VDC, +10%/−15%                              |         |
| Input impedance         | 4.7 kΩ                                         |         |
| Input current (typical) | 5 mA                                           |         |
| ON voltage              | 14.4 VDC min.                                  |         |
| OFF voltage             | 5.0 VDC max.                                   |         |
| ON delay                | 1 to 128 ms max.<br>(default: 8 ms) (See Note) |         |
| OFF delay               | 1 to 128 ms max.<br>(default: 8 ms) (See Note) |         |

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 SPECIFICATIONS (CPU AND EXPANSION I/O MODULES)

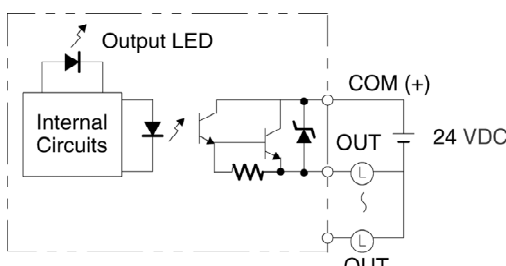
## Relay Output

| Item                       |            |                 | Specifications                                               | Circuit                                         |
|----------------------------|------------|-----------------|--------------------------------------------------------------|-------------------------------------------------|
| Maximum switching capacity |            |                 | 2 A, 250 VAC (cos $\phi$ = 1)<br>2 A, 24 VDC<br>(4 A/common) | <p>Maximum<br/>250 VAC: 2 A<br/>24 VDC: 2 A</p> |
| Minimum switching capacity |            |                 | 10 mA, 5 VDC                                                 |                                                 |
| Relay service life         | Electrical | Resistance load | 150,000 times                                                |                                                 |
|                            |            | Inductive load  | 100,000 times                                                |                                                 |
|                            | Mechanical |                 | 20 million times                                             |                                                 |
| ON delay                   |            |                 | 15 ms max.                                                   |                                                 |
| OFF delay                  |            |                 | 15 ms max.                                                   |                                                 |

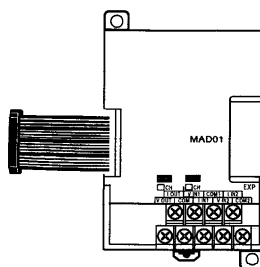
# Transistor Outputs (Sinking)

| Item                    | Specifications                                                                                                                                                              |                            |                            |                            |                                              |                                                             |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------------------------|-------------------------------------------------------------|
|                         | CPM1A-10CDT-□(-V1)                                                                                                                                                          | CPM1A-20CDT-□(-V1)         | CPM1A-30CDT-□(-V1)         | CPM1A-40CDT-□(-V1)         | CPM1A-20EDT                                  | CPM1A-8ET                                                   |
| Max. switching capacity | 24 VDC +10%/-15%, 0.3 A/point (See note)                                                                                                                                    |                            |                            |                            |                                              | 4.5 to 30 VDC<br>0.2 A (See note 2.)<br>0.3 A (See note 3.) |
|                         | 0.9 A/Unit                                                                                                                                                                  | 0.9 A/common<br>1.8 A/Unit | 0.9 A/common<br>2.7 A/Unit | 0.9 A/common<br>3.6 A/Unit | 0.9 A/common<br>1.8 A/Unit                   |                                                             |
| Leakage current         | 0.1 mA max.                                                                                                                                                                 |                            |                            |                            |                                              |                                                             |
| Residual voltage        | 1.5 V max.                                                                                                                                                                  |                            |                            |                            |                                              |                                                             |
| ON delay                | 0.1 ms max.                                                                                                                                                                 |                            |                            |                            |                                              |                                                             |
| OFF delay               | OUT01000/01001: 0.2 ms max. (load current: 100 to 300 mA)<br>0.5 ms max. (load current: 5 to 100 mA)<br><br>Other than OUT01000/01001: 1 ms max. (load current 5 to 300 mA) |                            |                            |                            | 1 ms max.<br>(24 VDC +10%/-15%, 5 to 300 mA) |                                                             |
| Fuse                    | V1 CPUs: No fuse<br>Expansion I/O Units and Pre-V1 CPUs: 1.25 A/common (cannot be replaced by the user)                                                                     |                            |                            |                            |                                              |                                                             |
| Circuit configuration   |                                                                                                                                                                             |                            |                            |                            |                                              |                                                             |

# Transistor Outputs (Sourcing)

| Item                    | Specifications                                                                                                                                                              |                            |                            |                            |                                             |                                                             |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------|----------------------------|---------------------------------------------|-------------------------------------------------------------|
|                         | CPM1A-10CDT1-□(-V1)                                                                                                                                                         | CPM1A-20CDT1-□(-V1)        | CPM1A-30CDT1-□(-V1)        | CPM1A-40CDT1-□(-V1)        | CPM1A-20EDT1                                | CPM1A-8ET1                                                  |
| Max. switching capacity | 24 VDC +10%/-15%, 0.3 A/point (See note)                                                                                                                                    |                            |                            |                            |                                             | 4.5 to 30 VDC<br>0.2 A (See note 2.)<br>0.3 A (See note 3.) |
|                         | 0.9 A/Unit                                                                                                                                                                  | 0.9 A/common<br>1.8 A/Unit | 0.9 A/common<br>2.7 A/Unit | 0.9 A/common<br>3.6 A/Unit | 0.9 A/common<br>1.8 A/Unit                  |                                                             |
| Leakage current         | 0.1 mA max.                                                                                                                                                                 |                            |                            |                            |                                             |                                                             |
| Residual voltage        | 1.5 V max.                                                                                                                                                                  |                            |                            |                            |                                             |                                                             |
| ON delay                | 0.1 ms max.                                                                                                                                                                 |                            |                            |                            |                                             |                                                             |
| OFF delay               | OUT01000/01001: 0.2 ms max. (load current: 100 to 300 mA)<br>0.5 ms max. (load current: 5 to 100 mA)<br><br>Other than OUT01000/01001: 1 ms max. (load current 5 to 300 mA) |                            |                            |                            | 1 ms max.<br>(24 VDC +10%/-5%, 5 to 300 mA) |                                                             |
| Fuse                    | V1 CPUs: No fuse<br>Expansion I/O Units and Pre-V1 CPUs: 1.25 A/common (cannot be replaced by the user)                                                                     |                            |                            |                            |                                             |                                                             |
| Circuit configuration   |                                                                                         |                            |                            |                            |                                             |                                                             |

Note: When using the OUT01000 or OUT01001 as a pulse output, connect dummy resistors as required to set the load current to 0.1 to 0.2 A. If the load current is below 0.1 A, the ON-to-OFF response time will become longer and high-speed pulse will not be output. On the other hand, if the load current is above 0.2 A, the transistor may generate heat and components may be damaged.



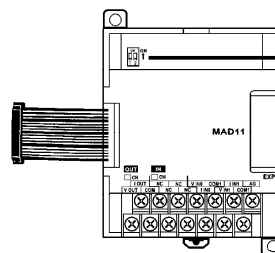
## ■ ANALOG I/O MODULE

### CPM1A-MAD01 Specifications

| Item                           |                                         | Specification                                                                                                  |             |
|--------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------|
| Model                          |                                         | CPM1A-MAD01                                                                                                    |             |
| I/O type                       |                                         | Voltage                                                                                                        | Current     |
| Analog inputs                  | Number of inputs                        | 2                                                                                                              |             |
|                                | Input signal range                      | 0 to 10 V or 1 to 5 V                                                                                          | 4 to 20 mA  |
|                                | Maximum rated input                     | ±15 V                                                                                                          | ±30 mA      |
|                                | External input impedance                | 1 MΩ min.                                                                                                      | 250 Ω rated |
|                                | Resolution                              | 1/256                                                                                                          |             |
|                                | Overall precision                       | 1.0% of full scale                                                                                             |             |
|                                | Converted A/D data                      | 8-bit binary                                                                                                   |             |
| Analog output<br>(See Note 1.) | Number of outputs                       | 1                                                                                                              |             |
|                                | Output signal range                     | 0 to 10 V or -10 to 10 V                                                                                       | 4 to 20 mA  |
|                                | External output max. current            | 5 mA                                                                                                           | —           |
|                                | External output allowed load resistance | —                                                                                                              | 350 Ω       |
|                                | Resolution                              | 1/256 (1/512 when the output signal range is -10 to 10 V.)                                                     |             |
|                                | Overall precision                       | 1.0% of full scale                                                                                             |             |
|                                | Data setting                            | 8-bit binary with sign bit                                                                                     |             |
| Conversion time (See Note 2.)  |                                         | 10 ms/Unit max.                                                                                                |             |
| Isolation method               |                                         | Photocoupler isolation between I/O terminals and PC<br>(There is no isolation between the analog I/O signals.) |             |

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.

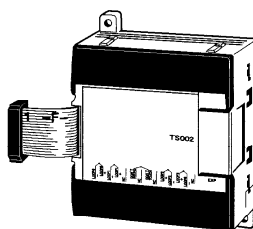


### CPM1A-MAD11 Specifications

| Item             |                                           |           | Specification                                                                                                                         |                          |
|------------------|-------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Model            |                                           |           | CPM1A-MAD11                                                                                                                           |                          |
| I/O type         |                                           |           | Voltage                                                                                                                               | Current                  |
| Analog inputs    | Number of inputs                          |           | 2 inputs (2 words allocated)                                                                                                          |                          |
|                  | Input signal range                        |           | 0 to 5 VDC, 1 to 5 VDC<br>0 to 10 VDC, -10 to 10 VDC                                                                                  | 0 to 20 mA or 4 to 20 mA |
|                  | Maximum rated input                       |           | ±15 V                                                                                                                                 | ±30 mA                   |
|                  | External input impedance                  |           | 1 MΩ min.                                                                                                                             | 250 Ω                    |
|                  | Resolution                                |           | 1/6000 (full scale)                                                                                                                   |                          |
|                  | Overall accuracy                          | 25°C      | 0.3% full scale                                                                                                                       | 0.4% full scale          |
|                  |                                           | 0 to 55°C | 0.6% full scale                                                                                                                       | 0.8% full scale          |
|                  | Converted A/D data                        |           | 16-bit binary (4-digit hexadecimal)<br>Full scale for -10 to 10 V: F448 to 0BB8 Hex<br>Full scale for other ranges: 0000 to 1770 Hex  |                          |
|                  | Averaging function                        |           | Supported (Settable for individual inputs via DIP switch)                                                                             |                          |
|                  | Open-circuit detection function           |           | Supported                                                                                                                             |                          |
| Analog output    | Number of outputs                         |           | 1 output (1 word allocated)                                                                                                           |                          |
|                  | Output signal range                       |           | 1 to 5 VDC, 0 to 10 VDC, or<br>-10 to 10 VDC                                                                                          | 0 to 20 mA or 4 to 20 mA |
|                  | Allowable external output load resistance |           | 1 kΩ min.                                                                                                                             | 600 Ω max.               |
|                  | External output impedance                 |           | 0.5 Ω max.                                                                                                                            | —                        |
|                  | Resolution                                |           | 1/6000 (full scale)                                                                                                                   |                          |
|                  | Overall accuracy                          | 25°C      | 0.4% full scale                                                                                                                       |                          |
|                  |                                           | 0 to 55°C | 0.8% full scale                                                                                                                       |                          |
|                  | Set data (D/A conversion)                 |           | 16-bit binary (4-digit hexadecimal)<br>Full scales for -10 to 10 V: F448 to 0BB8 Hex<br>Full scale for other ranges: 0000 to 1770 Hex |                          |
| Conversion time  |                                           |           | 2 ms/point (6 ms/all points)                                                                                                          |                          |
| Isolation method |                                           |           | Photocoupler isolation between analog I/O terminals and internal circuits.<br>No isolation between analog I/O signals.                |                          |

## ■ TEMPERATURE SENSOR MODULES

By connecting a Temperature Sensor Module (CPM1A-TS001/TS002/TS101/TS101A/TS102) to the CPM1A, inputs can be received from thermocouples or temperature-resistance thermometers. Inputs converted to binary data (4-digit hexadecimal) and stored in the IR area.



### Specifications

| Item                        | Specification                                                                      |                                                                                    |                                                                 |
|-----------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Model                       | CPM1A-TS001/TS002                                                                  | CPM1A-TS101/TS102                                                                  | CPM1A-TS101-DA                                                  |
| Number of inputs            | TS001: 2; TS002: 4                                                                 | TS101: 2; TS102: 4                                                                 | 2                                                               |
| Input types<br>(See Note 1) | Thermocouple types K or J, selectable                                              | Platinum resistance thermometer types Pt100 and JPt1100, selectable                |                                                                 |
| Input resolution            | 0.1°C in 2's complement format                                                     | 0.1°C in 2's complement format                                                     |                                                                 |
| Input accuracy              | ±0.5% or ±2% of the stored value whichever is larger ±1 digit max.<br>(See Note 2) | ±0.5% or ±1% of the stored value whichever is larger ±1 digit max.<br>(See Note 2) | 1.0% max. full scale                                            |
| Number of outputs           | None                                                                               | None                                                                               | 1                                                               |
| Output types                | —                                                                                  | —                                                                                  | Voltage or current output                                       |
| Output resolution           | —                                                                                  | —                                                                                  | 1/256 (0 to 10 V)<br>1/512 (-10 to +10 V)<br>1/256 (4 to 20 mA) |
| Output accuracy             | —                                                                                  | —                                                                                  | 1.0% max. full scale                                            |
| Conversion cycle            | 250 ms for all points                                                              |                                                                                    | 60 ms max. for all points                                       |
| Converted temperature data  | Binary data (4-digit hexadecimal)                                                  |                                                                                    | Binary data (8-digit hexadecimal)                               |
| Isolation method            | Photocoupler isolation between I/O terminals and the PLC                           |                                                                                    |                                                                 |

Note: 1. The same input type must be used for all inputs.

2. Accuracy for K thermocouples at temperatures less than -100°C: ±4°C ± 1 digit max.

### Input Temperature Ranges for CPM1A-TS001/TS002

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

| Thermocouple input | Range (°C)   | Range (°F)   |
|--------------------|--------------|--------------|
| Type K             | -200 to 1300 | -300 to 2300 |
|                    | 0.0 to 500.0 | 0.0 to 900.0 |
| Type J             | -100 to 850  | -100 to 1500 |
|                    | 0.0 to 400.0 | 0.0 to 750.0 |

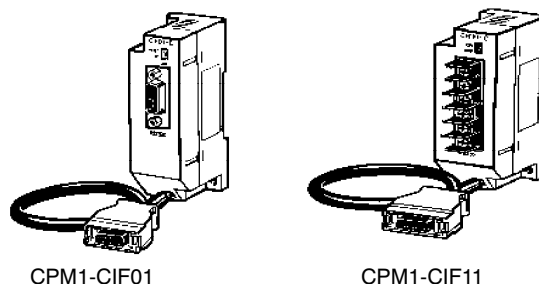
### Input Temperature Ranges for CPM1A-TS101/TS101DA/TS102

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

| Platinum RTD input | Range (°C)      | Range (°F)     |
|--------------------|-----------------|----------------|
| Pt100              | -200.0 to 650.0 | -300 to 1200.0 |
| JPt100             | -200.0 to 650.0 | -300 to 1200.0 |

## ■ COMMUNICATIONS ADAPTER

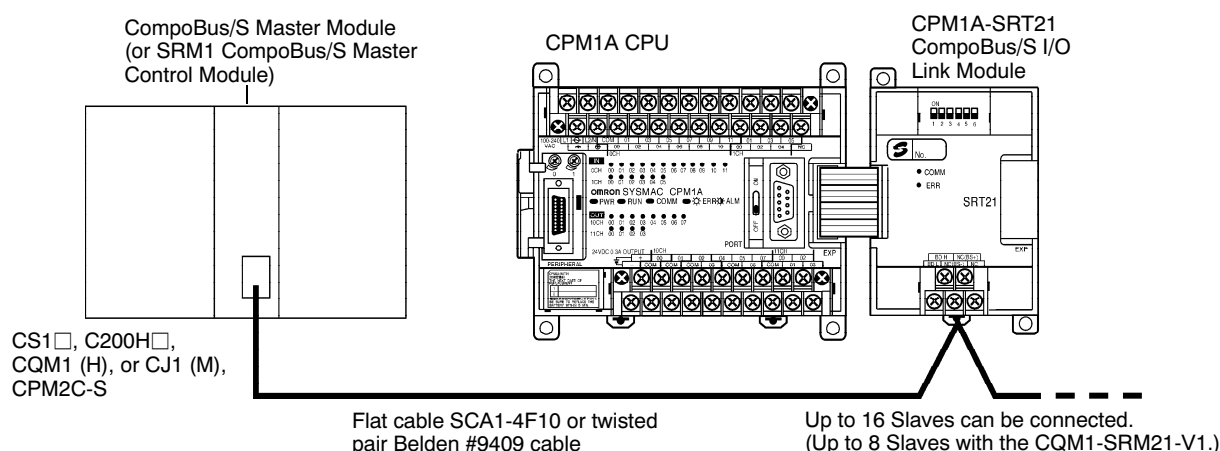
### RS-232C Adapter and RS-422 Adapter



|                      |           |                                                                                                                                                                               |                                                                                            |
|----------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Model                |           | CPM1-CIF01                                                                                                                                                                    | CPM1-CIF11                                                                                 |
| Functions            |           | Level conversion between the CMOS level (CPU side) and the RS-232C (peripheral device side)                                                                                   | Level conversion between the CMOS level (CPU side) and the RS-422 (peripheral device side) |
| Insulation           |           | 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.                                                                                                                                                 |                                                                                            |
| Power consumption    |           | 0.3 A max.                                                                                                                                                                    |                                                                                            |
| Transmission speed   |           | 38.4 kbits/s max.                                                                                                                                                             |                                                                                            |
| Vibration resistance |           | 10 to 57 Hz with an amplitude of 0.075 mm, and 57 to 150 Hz with an acceleration of 1 G in the X, Y and Z directions for 80 minutes each (i.e. for 8 minutes each, 10 times). |                                                                                            |
| Shock resistance     |           | 1.5 G in the X, Y and Z directions 3 times each.                                                                                                                              |                                                                                            |
| Ambient temperature  | Operating | 0°C to 55°C (32°F to 131°F)                                                                                                                                                   | 0°C to 55°C (32°F to 131°F)                                                                |
|                      | Storage   | -20°C to 75°C (-4°F to 167°F)                                                                                                                                                 | -20°C to 75°C (-4°F to 167°F)                                                              |
| Ambient humidity     | Operating | 10% to 90% RH (with no condensation)                                                                                                                                          |                                                                                            |
| Ambient environment  | Operating | With no corrosive gas                                                                                                                                                         |                                                                                            |
| Weight               |           | 200 g max.                                                                                                                                                                    |                                                                                            |

## ■ COMPOBUS/S I/O LINK MODULE

The CPM1A controller can function as a Slave to a CompoBus/S Master Module (or SRM1 CompoBus/S Master Control Module) when a CPM1A-SRT21 CompoBus/S I/O Link Module is connected. The CompoBus/S I/O Link Module establishes an I/O link of 8 inputs and 8 outputs between the Master Module and the CPM1A. Up to 3 Expansion I/O Modules or Expansion Modules can be connected to a CPM1A CPU.



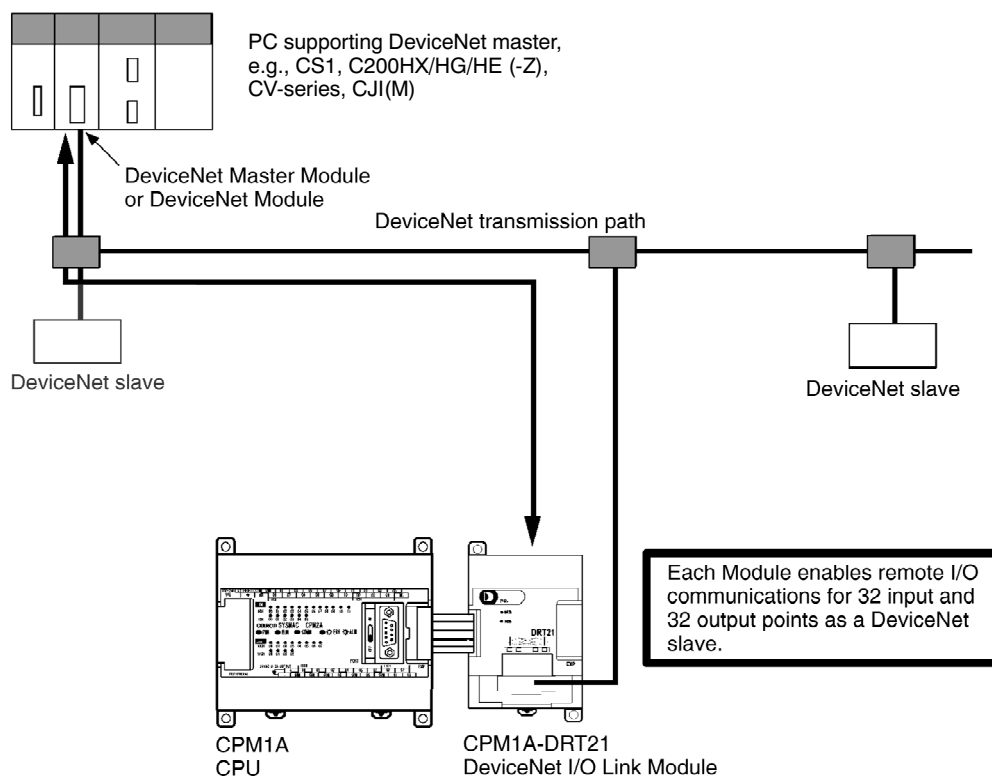
### Specifications

|                                              |                                                                                                                |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Model                                        | CPM1A-SRT21                                                                                                    |
| 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<br>(Allocated in the same way as other Expansion I/O Modules or Expansion Modules) |
| Node number setting                          | Set using the DIP switch.                                                                                      |

Note: See the CompoBus/S section of Omron's *Remote I/O and Wiring Solutions Catalog (GC RIO1)* for more details on CompoBus/S communications.

## ■ DEVICENET I/O LINK MODULE

The CPM1A controller can function as slaves to a DeviceNet Master when a DeviceNet I/O Link Module is connected. The DeviceNet I/O Link Module establishes an I/O link of 32 inputs and 32 outputs between the master and the controller. A maximum of 3 DeviceNet I/O Link Modules can be connected to a CPM1A to create I/O Links for up to 192 points (96 inputs and 96 outputs).

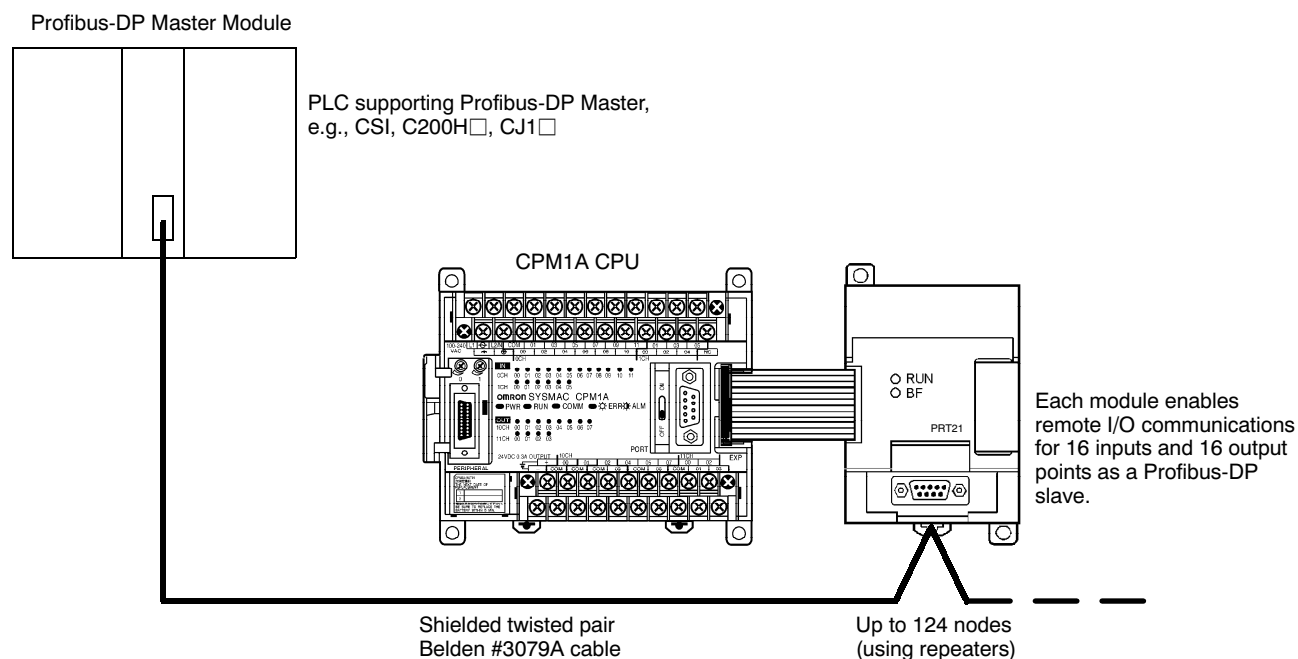


### Specifications

| Item                                             | Specification                                                                                                 |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Model number                                     | CPM1A-DRT21                                                                                                   |
| Master/slave                                     | DeviceNet Slave                                                                                               |
| Number of I/O points                             | 32 input points, 32 output points                                                                             |
| Number of words allocated in CPU Unit I/O memory | 2 input words, 2 output words<br>(Allocated in the same way as Expansion I/O Units and other Expansion Units) |
| Node number setting                              | Set using the rotary switches<br>(Set before turning ON the CPU's power supply.)                              |

## ■ PROFIBUS-DP SLAVE MODULE

The CPM1A-V1 controller can function as a slave to a Profibus-DP Master Module when a CMP1A-PRT Profibus-DP Slave Module is connected. The Profibus-DP Slave Module establishes an I/O link of 16 inputs and 16 outputs between the master and the controller. A maximum of 3 Profibus-DP Slave Modules can be connected to a CPM1A or CPM2A to create I/O links for up to 96 points (48 inputs and 48 outputs).



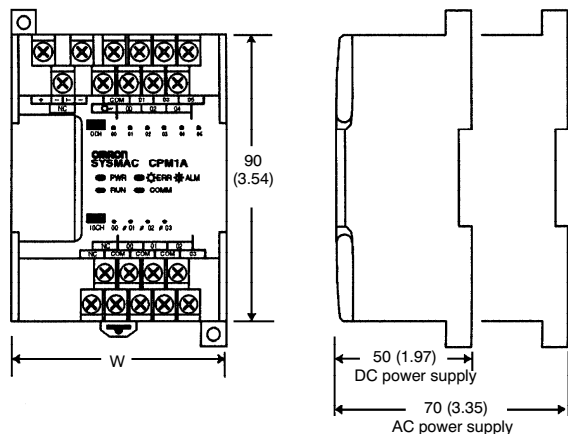
### Specifications

|                     |                               |
|---------------------|-------------------------------|
| Storage temperature | -20 to +75°C                  |
| Ambient temperature | 0 to +55°C                    |
| Ambient humidity    | 10 to 90% (non-condensing)    |
| EMC compliance      | EN 50081-2, EN 61131-2        |
| Current consumption | 100 mA from the PLC I/O bus   |
| Weight              | 125 g (typical)               |
| Control data        | From CPU to unit: none        |
| Status data         | From unit to CPU: none        |
| I/O data (in bytes) | 2 bytes input, 2 bytes output |

# Dimensions

Unit: mm (inch)

## ■ CPU, EXPANSION I/O AND SPECIAL I/O MODULES

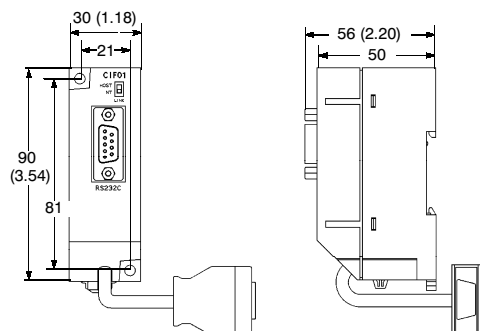


| Model              | W          |
|--------------------|------------|
| CPM1A-10CD□-A/D-V1 | 66 (2.60)  |
| CPM1A-20CD□-A/D-V1 | 86 (3.39)  |
| CPM1A-30CD□-A/D-V1 | 130 (5.12) |
| CPM1A-40CD□-A/D-V1 | 150 (5.91) |
| CPM1A-20ED□        | 86 (3.39)  |
| CPM1A-8E□          | 66 (2.60)  |
| CPM1A-SRT21        | 66 (2.60)  |
| CPM1A-MAD01        | 66 (2.60)  |
| CPM1A-TS□□□        | 86 (3.39)  |
| CPM1A-MAD11        | 86 (3.39)  |
| CPM1A-DRT21        | 66 (2.60)  |
| CPM1A-PRT21        | 66 (2.60)  |

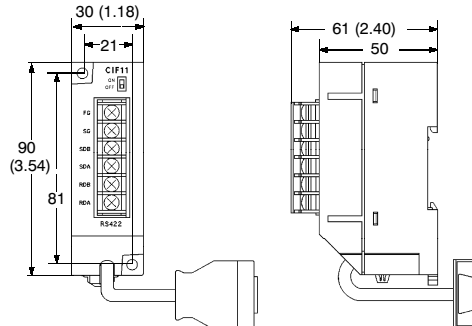
Unit: mm (inch)

## ■ COMMUNICATION ADAPTER MODULES

### CPM1-CIF01

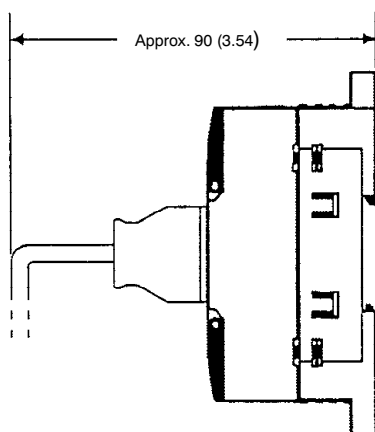


### CPM1-CIF11

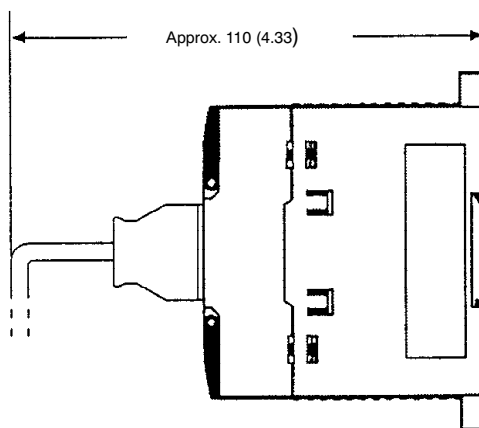


## ■ DIMENSIONS WITH PERIPHERAL DEVICES ATTACHED

### CPU with DC Power Supply



### CPU with AC Power Supply



# Functions

## ■ CONFIGURATION

The CPM1A CPUs feature a compact, one-piece construction that includes 10, 20, 30 or 40 built-in I/O terminals. Three output models are available: Relay outputs, sinking (NPN) transistor output and sourcing (PNP) transistor output.

### Expansion

Up to three Expansion I/O Modules can be connected to a 30-point or 40-point CPU to add an extra 8 or 20 I/O points for each, for a maximum of up to 100 I/O points.

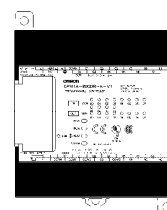
### Dedicated I/O Modules

Up to 3 Analog I/O Modules or Temperature Sensor Input Modules can be used with 30-point and 40-point CPUs. Each analog I/O module provides 2 analog inputs and 1 analog output, so a maximum of 6 analog inputs and 3 analog outputs can be achieved by connecting 3 Analog I/O Modules. Each Temperature Sensor Module provides two temperature sensor inputs from either thermocouples or platinum resistance thermometers. Up to 6 inputs can be connected.

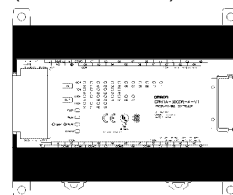
CPM1A-10CD□-□-V1  
(10 I/O terminals)



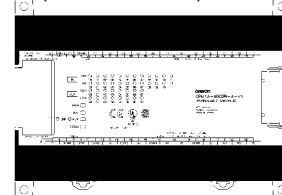
CPM1A-20CD□-□-V1  
(20 I/O terminals)



CPM1A-30CD□-□-V1  
(30 I/O terminals)



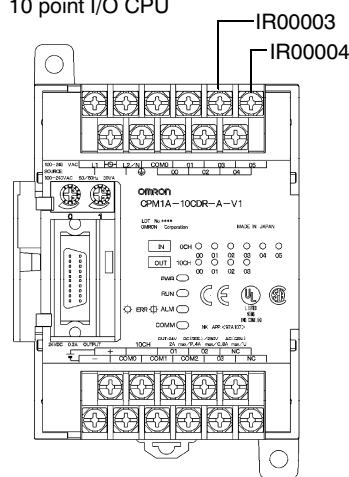
CPM1A-40CD□-□-V1  
(40 I/O terminals)



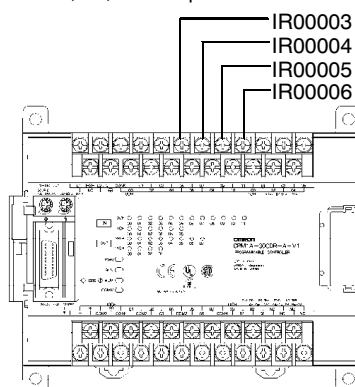
## ■ INTERRUPT INPUTS

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. In addition to normal interrupt inputs, the CPM1A has a counter mode that counts high-speed input signals and triggers interrupts at fixed count multiples.

10 point I/O CPU



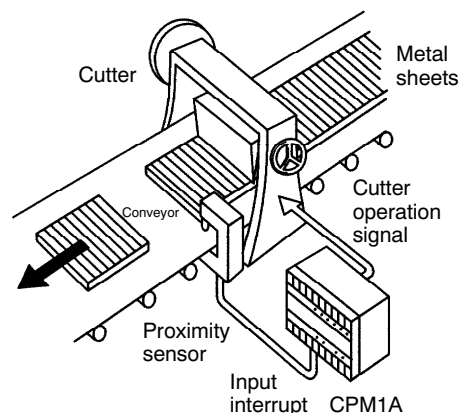
20, 30, and 40 point I/O CPU



### Application Example:

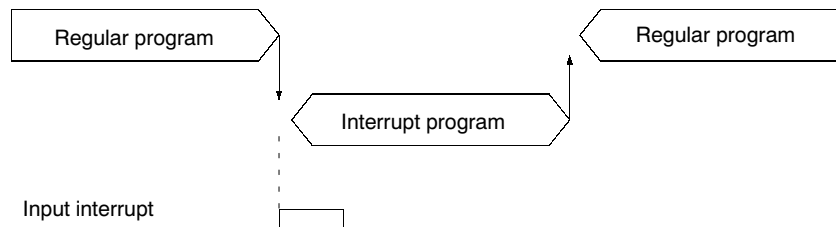
#### Cutting Metal Sheets to Specified Lengths

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.



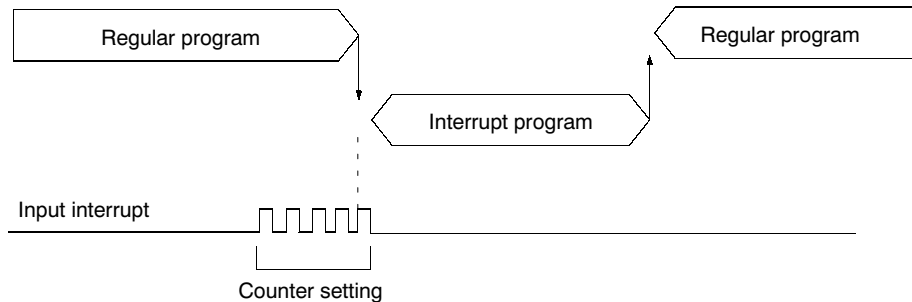
## Input Interrupt Mode

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

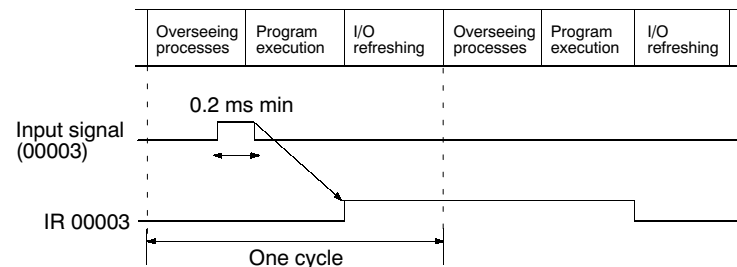
When the number of external signals counted at high speed reaches a specified number of counts, the regular program shuts down, and the interrupt processing program is executed at fixed counts. The count can be set between 0 and 65535.



## ■ QUICK-RESPONSE INPUTS

Quick-response inputs can detect input signals with a pulse width as short as 0.2 ms regardless of their timing during the scan cycle. Quick-response inputs and interrupt inputs use the same input terminals.

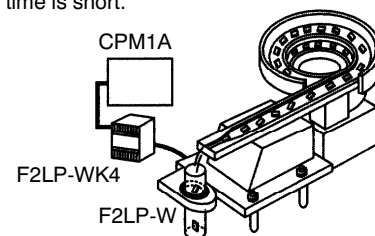
| CPU                                  | Input no.      | Minimum input pulse width |
|--------------------------------------|----------------|---------------------------|
| 10 point I/O CPU                     | 00003 to 00004 | 0.2 ms                    |
| 20 point, 30 point, 40 point I/O CPU | 00003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

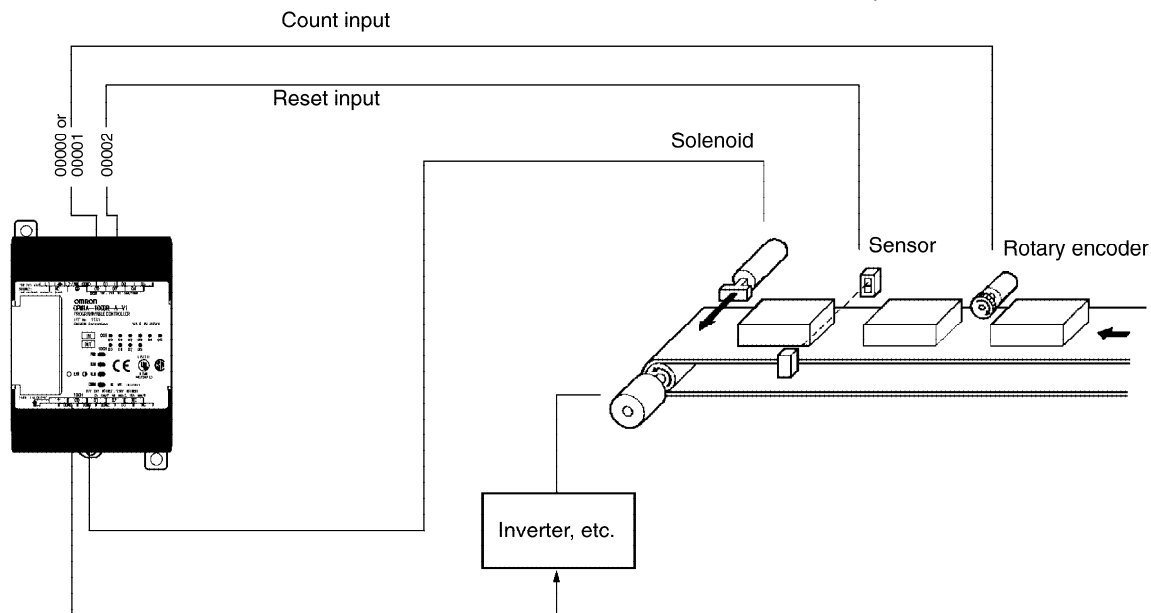


## ■ HIGH-SPEED COUNTER

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.

| Counting mode   |       | 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× inputs |
| Count frequency |       | 5.0 kHz            | 2.5 kHz                     |
| Count range     |       | 0 to 65535         | −32767 to 32767             |

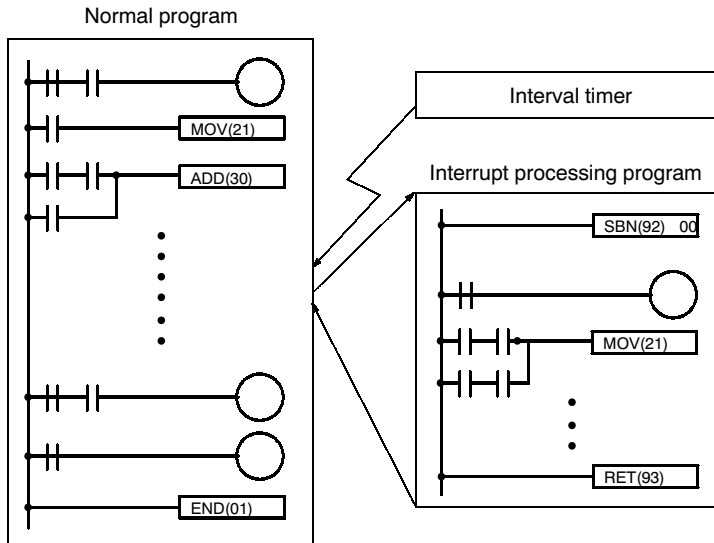
Note: When using in the incrementing mode, the input 00001 can be used as an input contact.



## ■ INTERVAL TIMER INTERRUPTS

The CPM1A has one interval timer. The interval timer shuts down the regular program regardless 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.

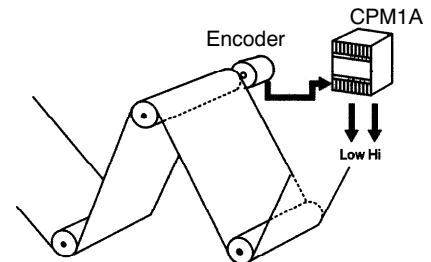
| Item         | One-shot mode                                           | Scheduled interrupt mode                             |
|--------------|---------------------------------------------------------|------------------------------------------------------|
| Operation    | An interrupt is executed 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)                     |                                                      |



### Application Example:

#### Computing the Sheet Speed

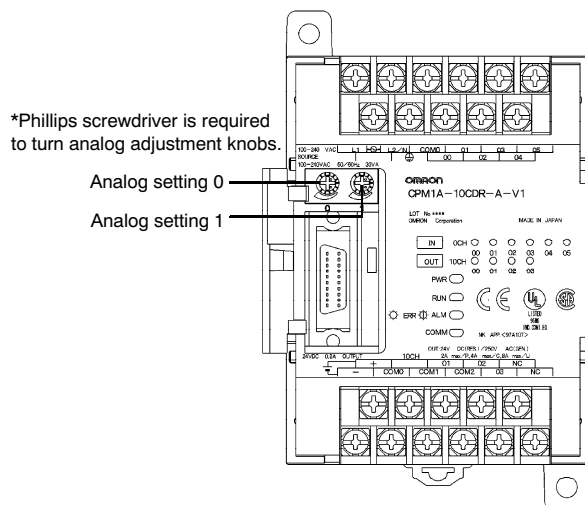
The number of pulse inputs is computed in the interrupt mode at a fixed time to calculate the speed.



## ■ 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.

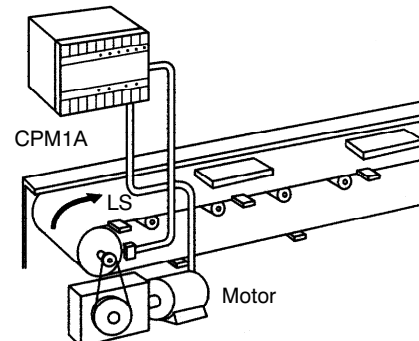
| Analog setting   | Storage area | Setting value (BCD) |
|------------------|--------------|---------------------|
| Analog setting 0 | SR 250       | 0000 to 0200        |
| Analog setting 1 | SR 251       |                     |



### Application Example:

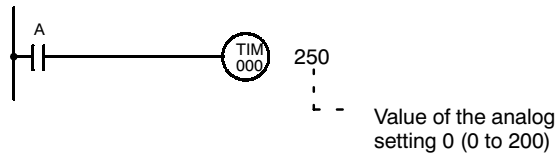
#### Tact Operation Control of Conveyor Lines

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.

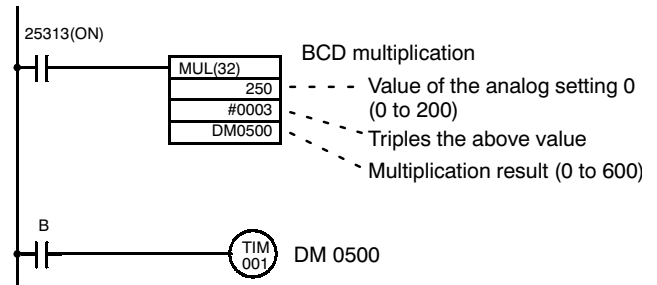


## Program Example

1. Analog timer for 0.0 to 20.0 seconds



2. Analog timer for 0.0 to 60.0 seconds



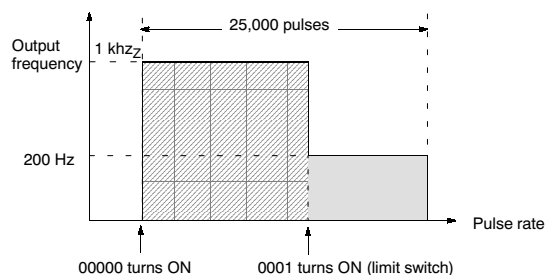
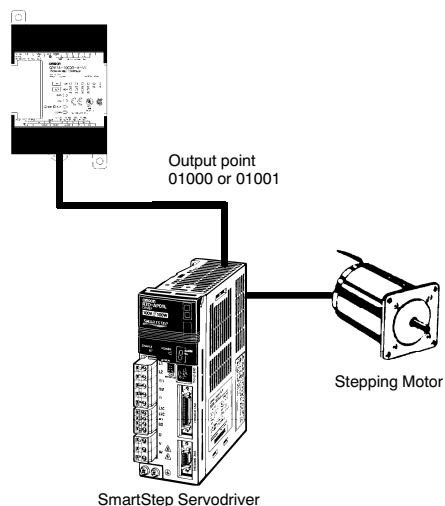
## PULSE OUTPUT FUNCTION

The CPM1A transistor output models have an output function capable of outputting a pulse of 20 Hz to 2 kHz (single-phase output).

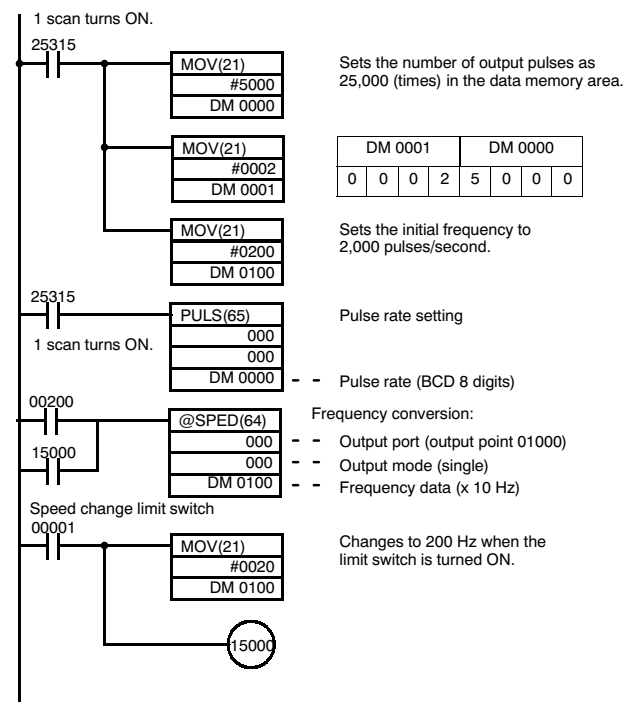
When used in combination with a Stepping Driver or SmartStep Servodriver, positioning can be easily performed.

### Application Example

Changing the speed of the Stepping Motor.



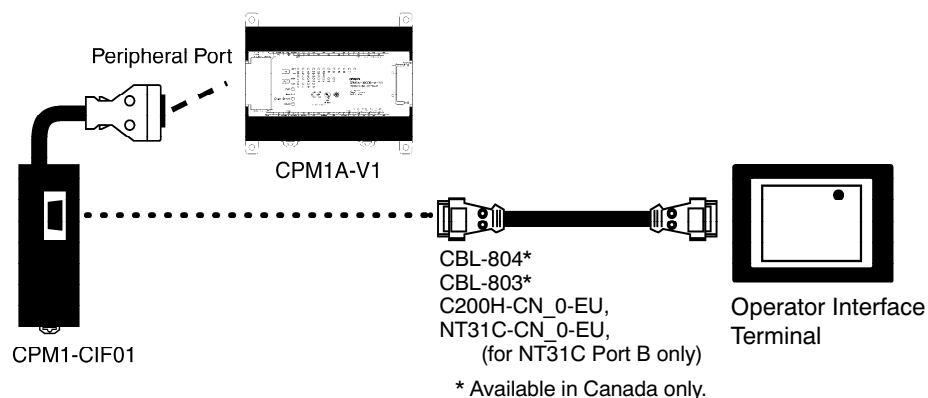
## Program Example



# Communications

## ■ NT LINK FOR PROGRAMMABLE TERMINALS

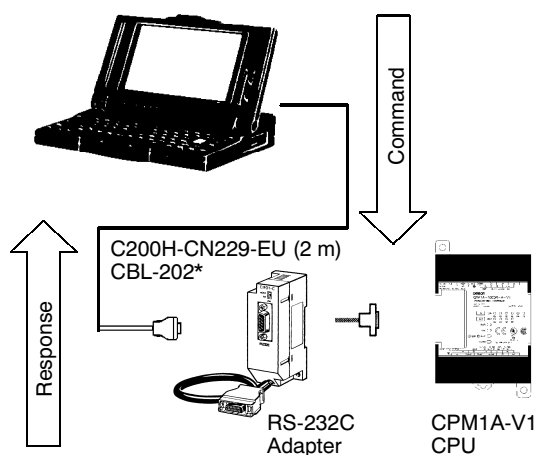
Use Omron's high-speed NT Link for real-time communications between the CPM1A and a Programmable Terminal.



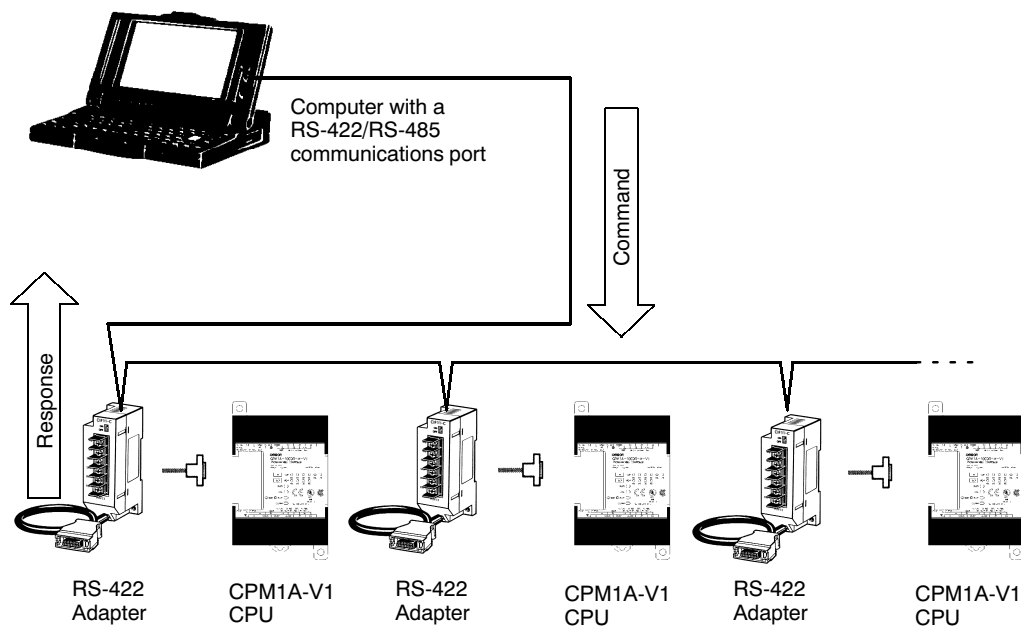
## ■ HOST LINK COMMUNICATIONS

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



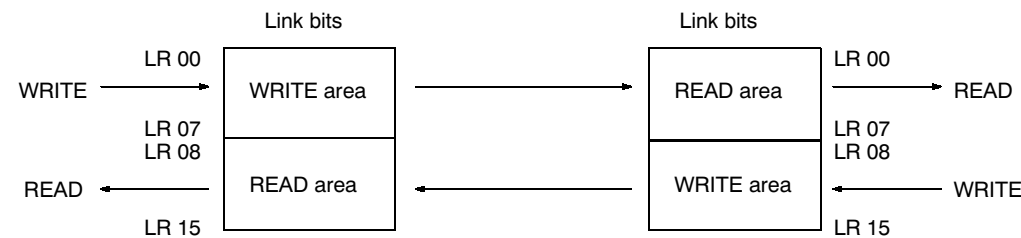
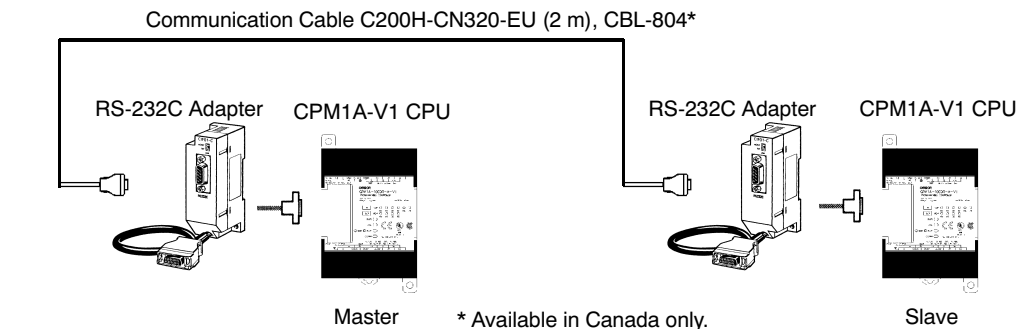
## 1:N Host Link Communications



## 1:1 CONNECTIONS FOR DATA EXCHANGE

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

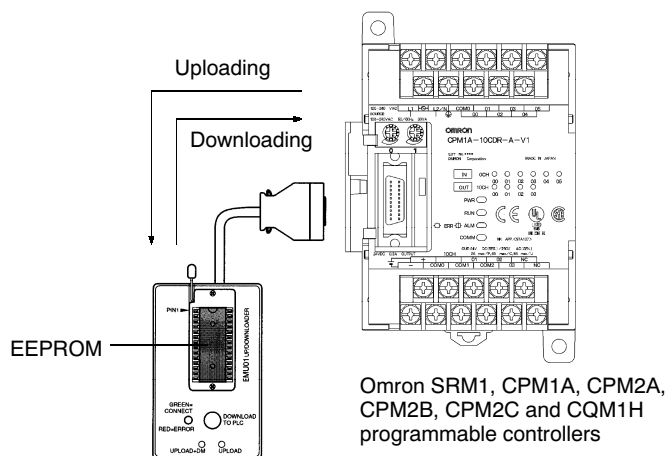


### Limitations of the CPM1A 1:1 Link

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□.

## PROGRAM TRANSFER UNIT

Use Omron's EEPROM program transfer unit to update programs in machines or program multiple controllers with the same program. The CPM1-EMU01-V1 Expansion Memory Unit connects to the peripheral port of micro and small PLCs.



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