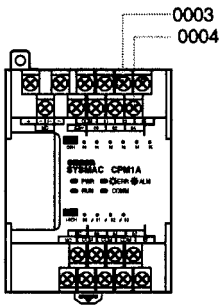


# Functions

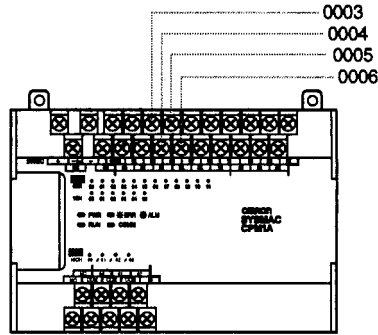
## ■ Input Interrupts

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

10-point I/O CPU



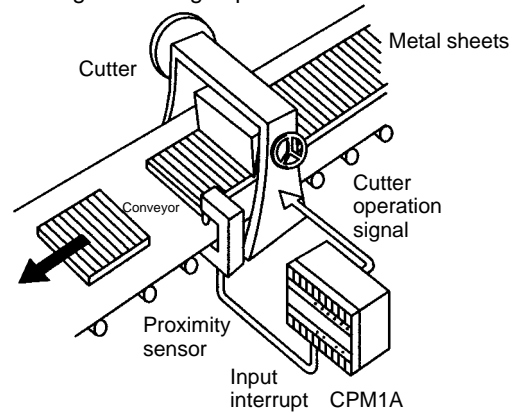
20-, 30-, and 40-point I/O CPU



### Application Example:

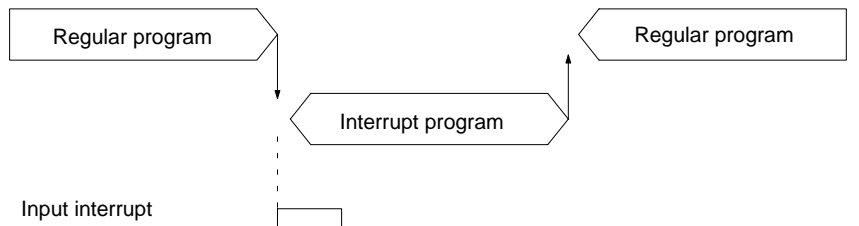
#### Cutting Metal Sheets to Specified Lengths

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



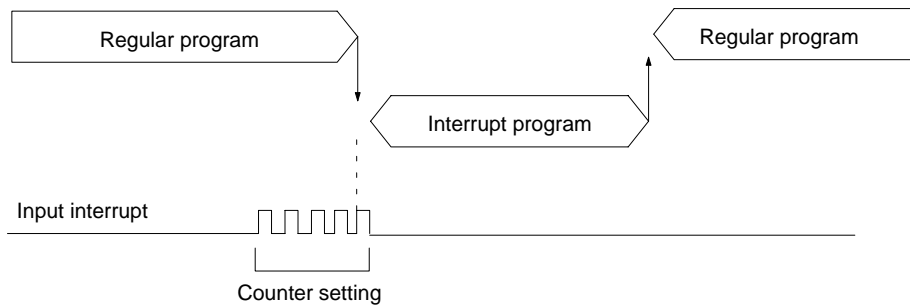
### Input Interrupt Mode

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



### Counter Mode

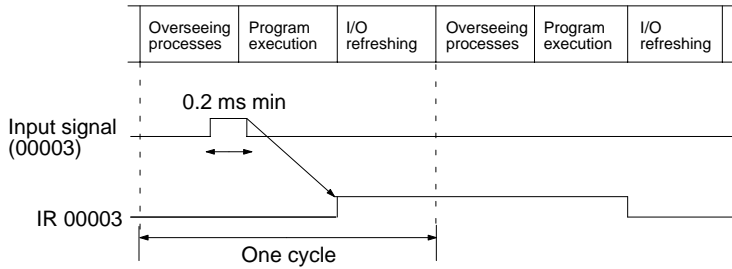
When the number of external signals counted at high speed reaches a specified number of counts, the regular program shuts down, and the interrupt processing program is executed at fixed counts. The count can be set between 0 and 65535.



## ■ Quick-response Inputs

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

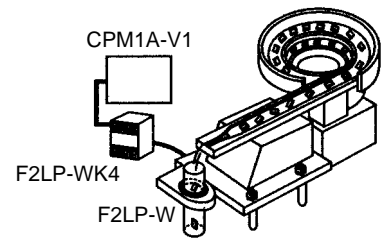
CPU	Input no.	Minimum input pulse width
10-point I/O CPU	00003 to 00004	0.2 ms
20-point, 30-point, 40-point I/O CPU	00003 to 00006	



### Application Example:

#### Calculating the Number of Chips

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

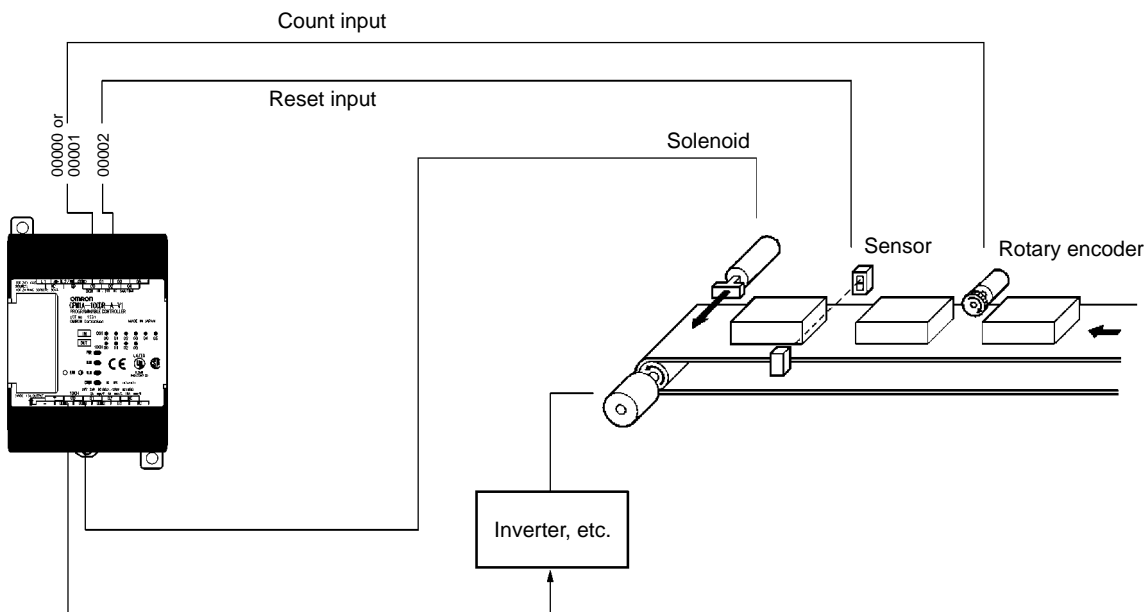


## ■ High-speed Counter

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

Item	Incrementing mode	Up/Down mode
Input no.	00000	Count input
	00001	---
	00002	Reset 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.

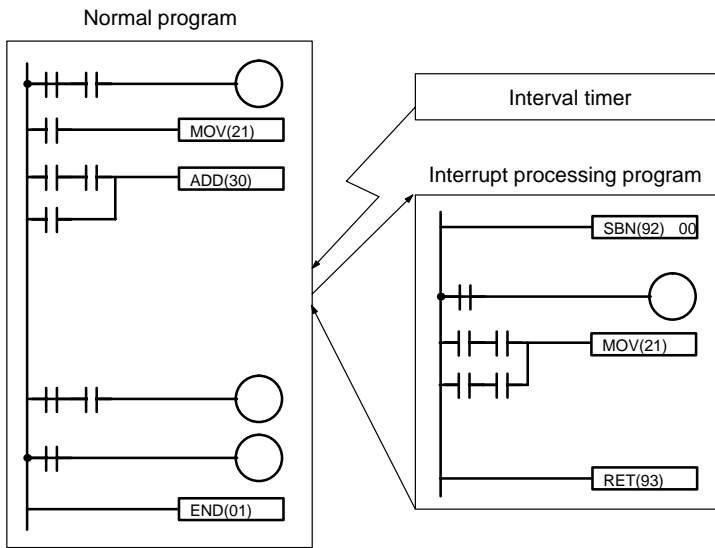


# Functions

## ■ Interval Timer Interrupts

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

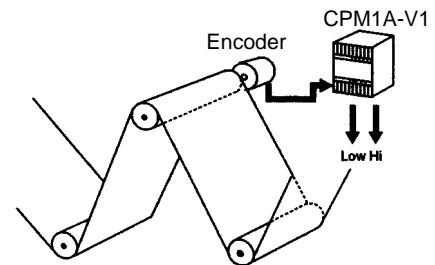
Item	One-shot mode	Scheduled interrupt mode
Operation	An interrupt is executed only once when the time is up.	Interrupts are executed repeatedly at fixed periods.
Setting time	0.5 ms to 319,968 ms (0.1-ms units)	



### Application Example:

#### Computing the Sheet Speed

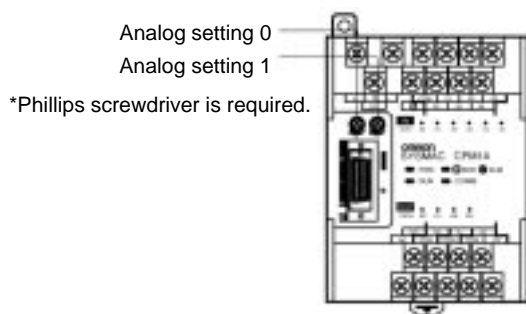
The number of pulse inputs is computed in the interrupt mode at a fixed time to calculate the speed.



## ■ 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.

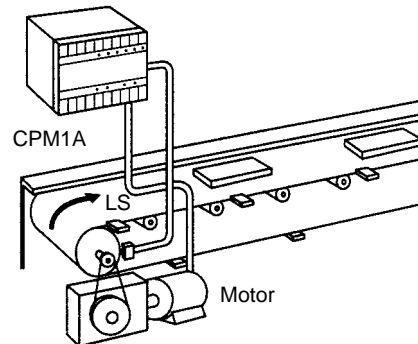
Analog setting	Storage area	Setting value (BCD)
Analog setting 0	SR 250	0000 to 0200
Analog setting 1	SR 251	



### Application Example:

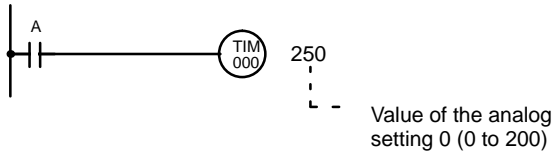
#### Tact Operation Control of Conveyor Lines

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.

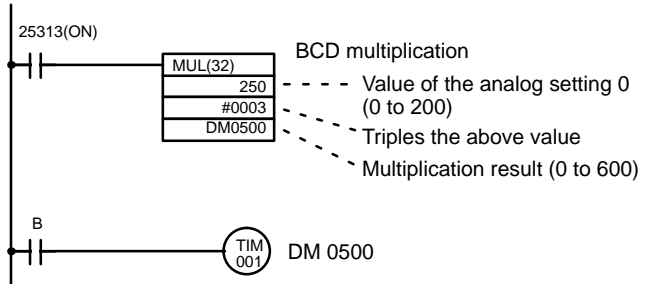


## Program Example

1. Analog timer for 0.0 to 20.0 seconds



2. Analog timer for 0.0 to 60.0 seconds



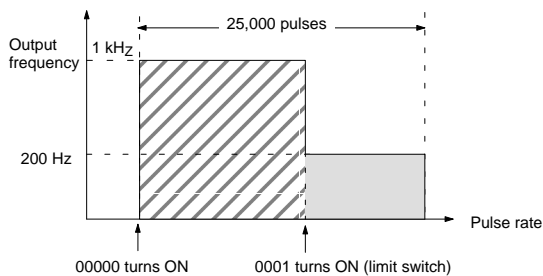
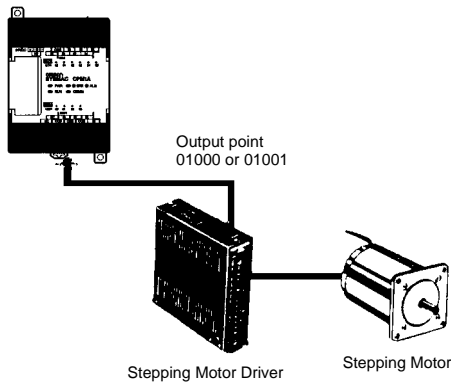
## ■ Pulse Output Function

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

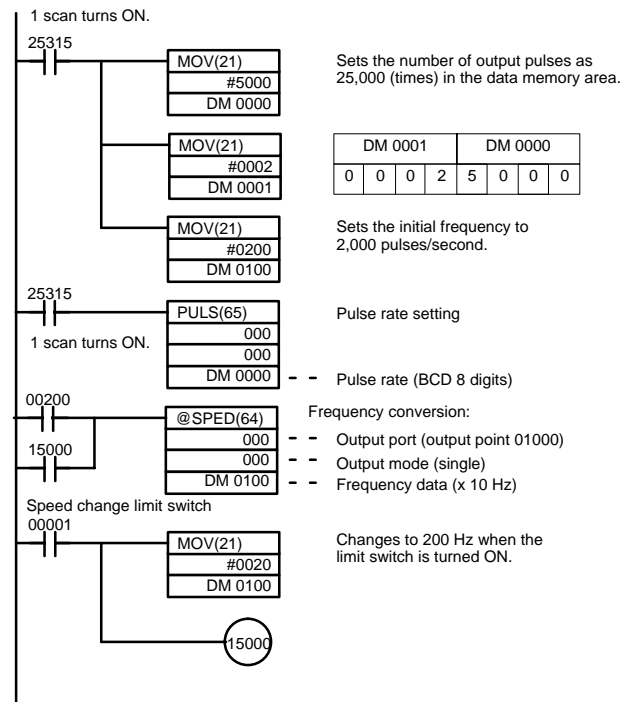
When used in combination with a Stepping Driver or Servodriver, positioning can be easily performed.

## Application Example

Changing the speed of the Stepping Motor.



## Program Example



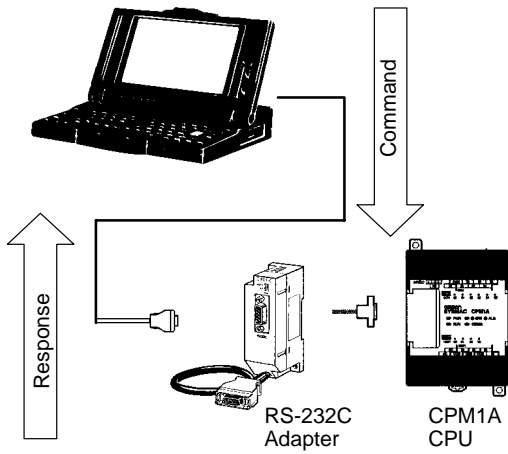
# Functions

## ■ Communications

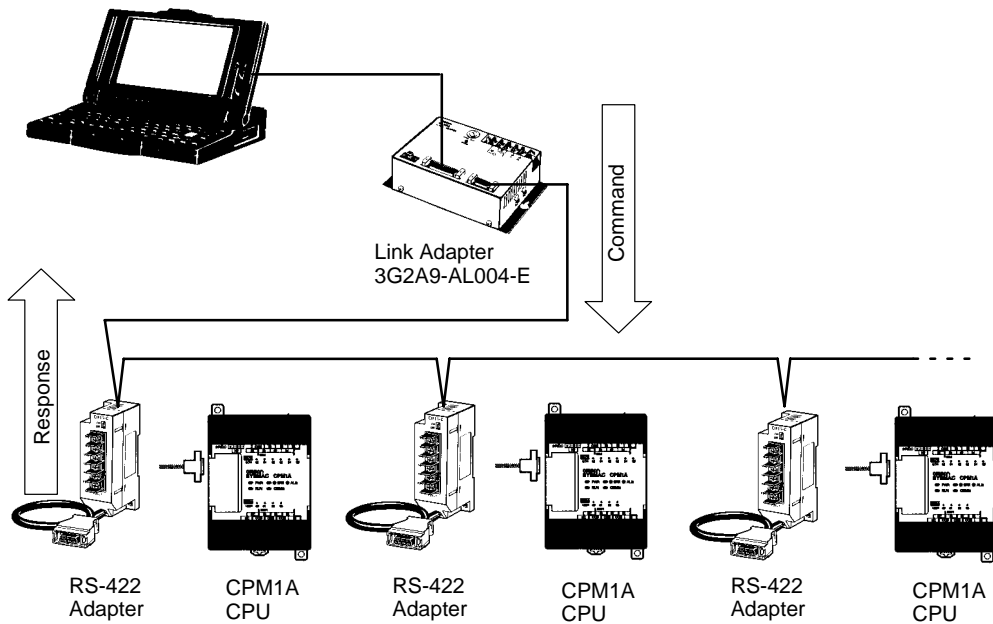
### Host Link Communications

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

#### 1:1 Host Link Communications



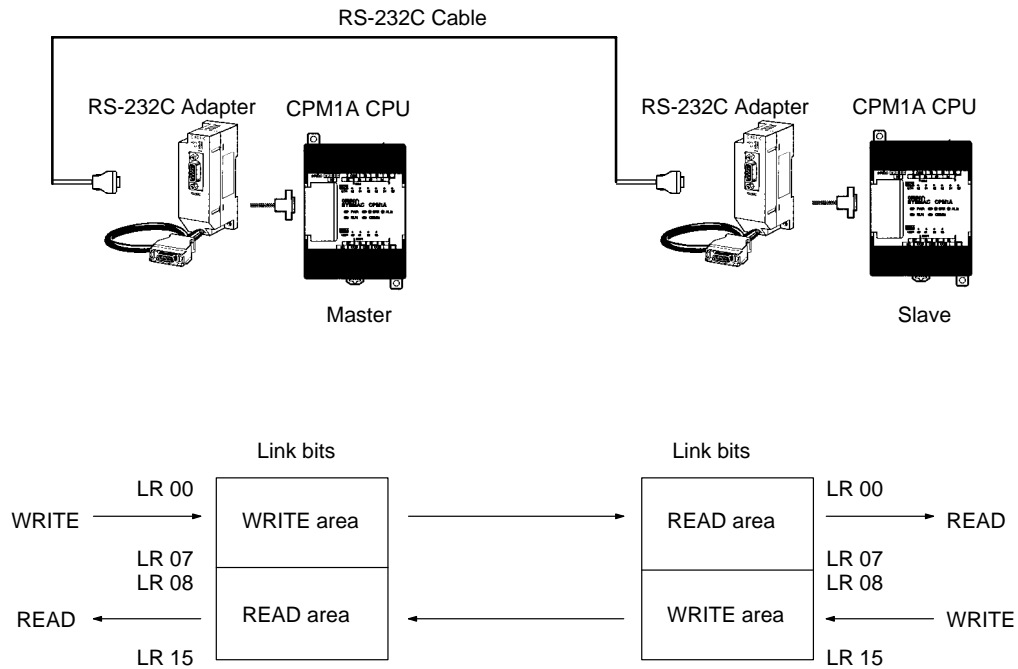
#### 1:n Host Link Communications



## 1:1 Links

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

### Example of a 1:1 Link between CPM1As



### Limitations of the CPM1A 1:1 Link

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

## NT Links

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

