

# Pulse I/O Board CQM1H-PLB21

The Pulse I/O Board is an Inner Board that supports two pulse inputs and two pulse outputs.

## Pulse Inputs

- The two pulse inputs to high-speed counters count pulses at up to 50 kHz (signal phase) or 25 kHz (differential phase). Interrupt can be created based on the counter present values (PV).

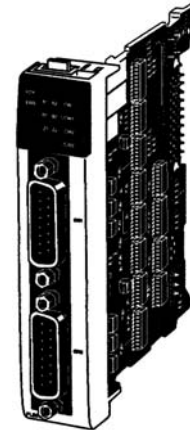
## Interrupts

The Board can execute an interrupt subroutine when the counter PV matches a specified target value (target value comparison) or falls within a specified comparison range (range comparison.)

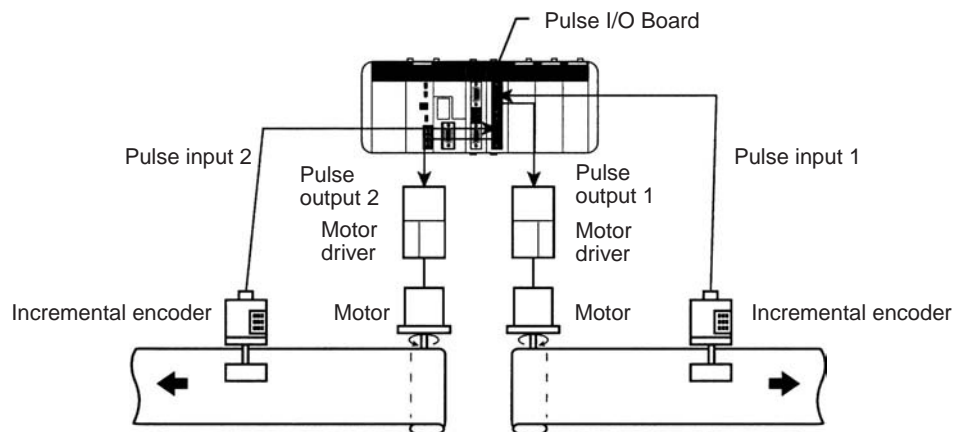
## Pulse Outputs 1 and 2

Two 10 Hz to 50 kHz pulses can be output. Both fixed and variable duty factors can be used.

- The fixed duty factor can be used to change the output frequency (accelerate or decelerate) from 10 Hz to 50 kHz smoothly.
- The variable duty factor performs using a duty factor ranging from 1% to 99%. Variable duty factor pulses can be used for applications such as time-proportional control.



## Example System Configuration



# Specifications

Item	Specifications
Name	Pulse I/O Board
Model number	CQM1H-PLB21
Applicable CPU Units	CQM1H-CPU51/61
Unit classification	CQM1H-series Inner Board
Mounting locations/No. of Boards	One in Inner Board slot 2 (right slot)
Pulse inputs	2 inputs
Pulse outputs	2 outputs
Current consumption (Supplied from Power Supply Unit)	5 V DC, 160 mA max.
Dimensions	25 × 110 × 107 mm (W × H × D)
Weight	90 g max.
Standard accessories	Two XM2D-1501 Plugs and two XM2S-1511 Hoods (OMRON)

## ■ Pulse Input (High-speed Counter) Specifications

### Pulse Input Function

Item	Specifications	
Number of counters	2 counters (ports)	
Input Modes (Set for each port in the PLC Setup.)	Differential phase input      Pulse/Direction input      Up/Down pulse input	
Input method	Phase difference multiple of 4 (Fixed)      Single-phase pulse + direction      Single-phase input x 2	
Count frequency	25 kHz      50 kHz      50 kHz	
Count values	Linear counting: -8388608 to 8388607 BCD Ring counting: 00000000 to 00064999 BCD	
Control method	Target value comparison	Register up to 48 target values and interrupt subroutine numbers.
	Range comparison	Register up to 8 upper limits, lower limits, and interrupt subroutine numbers.

### Pulse Input Specifications

Item	Specifications
Number of pulse inputs	2 inputs (Ports 1 and 2 = Pulses 1 and 2)
Signal names	Encoder input A, encoder input B, pulse input Z
Input voltage	Switched by means of connector pins (Can be specified separately for phases A, B, and Z.) 12 V DC±10%      24 V DC±10%
Input current	Phases A and B      Phase Z      Phases A and B      Phase Z 5 mA typical      12 mA typical      5 mA typical      12 mA typical
ON voltage	10.2 V DC min.      20.4 V DC min.
OFF voltage	3.0 V DC min.      4.0 V DC min.

## ■ Pulse Output Specifications

### Pulse Output Function

Pulse output function is determined by the output method, as indicated below.

Item	Fixed duty factor			Variable duty factor
	Without trapezoidal acceleration/ deceleration	With trapezoidal acceleration/deceleration		
		Same acceleration/ deceleration rates	Separate acceleration/ deceleration rates	
Instruction	PULS(65)/SPED(64)	PLS2(—)	PULS(65)/ ACC(—)	PWM(—)
Output frequency	10 Hz to 50 kHz (10 Hz to 20 kHz for stepping motor)	0 Hz to 50 kHz	100 Hz to 50 kHz	91.6 Hz, 1.5 kHz, 5.9 kHz
Output frequency pitch	1 or 10 Hz	10 Hz		---
Duty factor	50% fixed			1 to 99%
Number of output pulses	1 to 16,777,215			---
Acceleration/ deceleration rate	---	10 Hz to 2 kHz (every 4.08 ms)		---

### Output Specifications

Item	Specifications
Number of pulse outputs	2 outputs (Ports 1 and 2 = Pulse outputs 1 and 2)
Signal names	CW and CCW pulse output
Max. output frequency	50 kHz (20 kHz with stepping motor connected.)
External power supply	5 V DC±5% 30 mA min.; 24 V DC <sup>+10%</sup> / <sub>-15%</sub> 30 mA min.
Max. switching capacity	NPN open collector, 30 mA/5 to 24 V DC±10%
Min. switching capacity	NPN open collector, 7 mA/5 to 24 V DC±10%
Leakage current	0.1 mA max.
Residual voltage	0.4 V max.