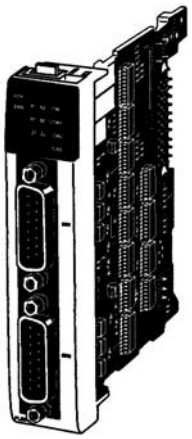
Pulse I/O Board
CQM1H-PLB21

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

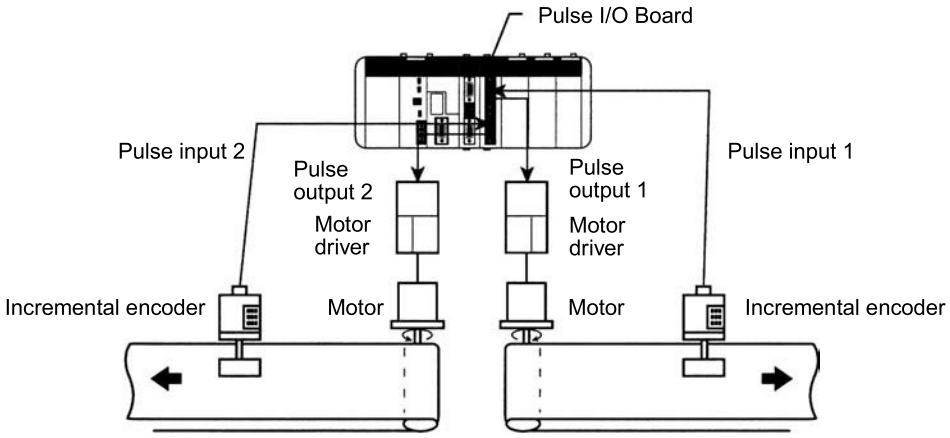
The Board can execute an interrupt subroutine when the counter PV matches a specified target value (target value comparison) or falls within a specified comparison range (range comparison.)

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 $^{+10\%}/_{-15\%}$ 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.