Apter Power

Installation Instructions

High-Speed Counter Module

(Catalog Number 1746-HSCE)

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High-Speed Counter Module Overview

The High-Speed Counter Module, Catalog Number 1746-HSCE is an SLC 500 family compatible device except with the 1747-ASB Remote I/O Adapter Module. It can be used with SLC™ 5/02 (and above) processors.

The module's bidirectional counting ability allows it to detect movement in either direction. In addition, x2 and x4 counting modes are provided to fully use the capabilities of high-resolution quadrature encoders.

High-speed inputs from quadrature encoders and various high-speed switches are supported. Accepting input pulse frequencies of up to 50k Hz allows precise control of fast motions.

In addition, an Accumulated Counter, the module provides a Rate Counter to determine Rate Measurement by indicating the pulse input frequency in Hz. (See the block diagram on page 6.) The Rate Measurement is determined by accumulating input pulses over a fixed period of time. You set the Rate Period to best match your application requirements.

Background Rate calculation is provided in Sequencer and Range Modes. This operation accepts input rates up to 32,767 Hz. The dynamically configurable Rate Period ranges from 10 ms to 2.55 seconds.

The module's four current sink (open collector) outputs can be controlled in the user program or the module.

Control of the counter reset is configured through user-set parameters. The counter can be reset from any combination of the Z input, Limit Switch input, or Soft Reset control bits.

Module operation is determined by selections made in the Setup and Control Word (M0:e.1). Setting the Function Control bit to 1 triggers the module to start the proper pulse counter, rate measurement, and output control functions. Many parameters are dynamic and can be changed without disrupting counter operation.

The module's block diagram is shown on page 6. Inputs from the terminal block enter the diagram at the left, outputs to the terminal block exit at the right. M0 and Output file parameters from the SLC enter the logic blocks from the top. Input file data to the SLC exit the logic blocks from the bottom.

Specifications

General

Description	Specification
Operating Temperature	0° C to +60° C (+32° F to +140° F)
Storage Temperature	-40° C to +85° C (-40° F to +185° F)
Humidity	5 to 95% without condensation
Backplane Current Consumption (power supply loading)	320 mA at +5V dc 0 mA at +24V dc
Maximum Cable Length(1)	305 m (1000 ft)
Agency Certification (when product or packaging is marked)	• CSA certified • CSA Class I, Division 2 Groups A, B, C, D • UL® listed • CE marked for all applicable directives

(1) Belden 9503 or equivalent

Inputs A, B, and Z

	Differential (Switch 1 on)	Single Ended (Switch 1 off)
Input Voltage	±5V dc	0 to 5V dc(2)
On-State Voltage	2.8 to 4.5V dc	3.1 to 5.5V dc
Off-State Voltage	-5.5 to 0.8V dc	0 to 0.8V dc
Max Off-State Leakage Current	100 µA	600 µA
Input Current (mA)	2.5 mA at 2.8V dc 7.5 mA at 4.5V dc	2.5 mA at 3.1V dc 7.5 mA at 5.5V dc
Nominal Input Impedance	700Ω	825Ω
Min. Pulse Width	10 µs	
Min. Phase Separation(1)	4.5 µs	
Max. Input Frequency Sequencer and Range Rate	 50k Hz 32.767k Hz	
Isolation (from backplane)	1500 volts	

(1) 12 and 24 volts must be used with a pull-up resistor.

(2) Channel A to channel B.

Limit Switch Input

	5V dc	12V dc	24V dc
On-State Voltage	3.8 to 5.4V dc	9.4 to 16.5V dc	16.5 to 30V dc
Off-State Voltage	0 to 1.2V dc	0 to 2.4V dc	0 to 3.9V dc
Input Current minimum nominal maximum	 4.6 mA 6.8 mA 9.2 mA		
Max. Off-State Leakage Current	1 mA (all ranges)		
Isolation (from backplane)	1500 volts		

Outputs (Open Collector, Sinking)

	4.5 to 10V dc (Switch 2 on)	10 to 30V dc (Switch 2 off)
Max. On-State Output Current	16 mA at 4.5V dc 40 mA at 10V dc	40 mA at 10V dc 125 mA at 30V dc
Max. On-State Voltage Drop	0.4V dc	1.0V dc
Max. Off-State Leakage Current	100 µA	
Isolation (from backplane)	1500 volts	