ArmorPoint I/O Counter Modules

Choose the ArmorPoint I/O high-speed counters when you need:

- **Intelligent counter modules** with their own microprocessors and I/O that are capable of reacting to high-frequency input signals up to 1 MHz.
- **Signals received at the inputs** to be filtered, decoded, and counted.
- **A pulse width modulated signal.** (1738-VHSC24M23 only)
- **Count and rate values** that can be used to activate up to two embedded outputs in less than 1 ms (1738-VHSC24M23 only).
- **Signals that are also processed** to generate rate and time-between pulses (pulse interval) data.

Counter Modules Specifications

	1738-IJM23	1738-VHSC24M23
Number of Counters	1	1
Keyswitch Position	2	2
Output Groups	—	1 group of 2
Input Frequency, Max.	1.0 MHz counter and encoder X1 configurations (no filter) 500 kHz encoder X2 configuration (no filter) 250 kHz encoder X4 configuration (no filter)	1.0 MHz counter and encoder X1 configurations (no filter) 500 kHz encoder X2 configuration (no filter) 250 kHz encoder X4 configuration (no filter)
Voltage, On-State Input, Nom.	5V dc	24V dc
Output Delay Time, OFF to ON	—	25 μs (load dependent)∗
Current, On-State Input, Min.	≥5 mA	≥5 mA
PointBus Current (mA)	160	110
Power Dissipation, Max.	1.1 W @ rated load	1.9 W @ rated load

∗OFF to ON delay is time from a valid output "on" signal to output energization.

The counter modules serve as signal conditioners and function blocks, i.e., counters, between the customer process signals on the mounting base and the POINTBus backplane containing the command information. The three main functional blocks are the customer digital I/O interface, the counter ASIC, and the microprocessor.

The counter modules accept feedback from:

- encoders (single-ended or differential)
- pulse generators
- mechanical limit switches
- frequencies up to 1 MHz

A filter is available with four settings:

- 50 Hz
- 500 Hz
- 5 kHz
- 50 kHz

This filter can be turned off to achieve the fastest counting rate.

The input voltage range is 5V dc (1738-IJM23) or 15-24V dc (1738 -VHSC24M23). The module returns the count (or frequency) in the form of a 24-bit binary number (0 to 16,777,215) expressed in a 32-bit word. Each counter has a user-selectable preset and rollover value associated with it.

The counter modules operate in the following modes:

- counter mode - read incoming single-phase pulses, return a binary count
- encoder mode - read incoming two-phase quadrature pulses, return a binary count
- period/rate mode - count internal clocks during the on period, return a frequency (1738-VHSC24M23 outputs are updated only at the end of the period)
- continuous/rate mode - count internal clocks during the on period, return a frequency (1738-VHSC24M23 outputs are updated continuously during this period)
- rate measurement mode - read pulses during the sample period, return a frequency
- pulse width modulation (PWM) mode - generate a pulse width modulated signal (1738-VHSC24M23)
- pulse generator mode - generates a pulse of defined width, returns width and quantity of trigger (1738-VHSC24M23 only)

The operation of the counter and encoder modes is nearly identical. The difference between the two modes is in the type of feedback (one-phase versus two-phase) for the count direction (up or down). In encoder mode, a transition is expected on the B input for counting to proceed in a direction, whereas, in counter mode, the B input may be left at a static level. All operating modes are selected by writing appropriate configuration data to the module.

1738-IJM23 Specifications

	1738-IJM23
Voltage Category/Type, Input	—
Current, Off-State Input, Max.	≤0.250 mA
Voltage, Off-State Input, Max.	≤1.25V dc
Current, On-State Input, Max.	25.7 mA @ 6V dc 19.1 mA @ 5V dc
Voltage, On-State Input, Min.	≥2.6V dc
Voltage, On-State Input, Max.	≥2.6V dc
Input Filter Selections, per A/B/Z group	Off 10 μs (50 kHz) 100 μs (5 kHz) 1.0 ms (500 Hz) 10.0 ms (50 Hz)
Keyswitch Position	2
Thermal Dissipation, Max.	3.75 BTU/hr @ rated load
Isolation Voltage, Min.	Prequalified at 1250V ac/rms between: System side Chassis ground A/B/Z inputs
External DC Power Supply Voltage, Nom.	No additional external power required to power module.

ArmorPoint Analog Module Cables

Cat. No.	Recommended Patchcord (double-ended)	Recommended Male Cordset (single-ended)
1738-IE2CM12	—	—
1738-IE2VM12	—	—
1738-OE2CM12	—	—
1738-OE2VM12	—	—

ArmorPoint AC and Relay Module Cables

Cat. No.	Recommended Patchcord (double-ended)	Recommended Male Cordset (single-ended)
1738-OW4M12	889D-F4ACDM-x	889D-M4AC-y
1738-OW4M12AC4	889R-F4AERM-x	889R-M4AE-y
1738-IA2M12AC3	889R-F3AERM-x	889R-M3AEA-y
1738-IA2M12AC4	889R-F4AERM-x	889R-M4AE-y
1738-OA2M12AC3	889R-F3AERM-x	889R-M3AEA-y

x = length in meters (1, 2, 3, 5, and 10 standard).
y = length in meters (2, 5, and 10 standard).

ArmorPoint Specialty Module Cables

Cat. No.	Recommended Patchcord (double-ended)	Recommended Male Cordset (single-ended)
1738-232ASCM12	889D-F4ACDM-x	889D-M4AC-y
1738-485ASCM12		
1738-IR2M12		
1738-VHSC24M23	889M-F12AHMU-z	—
1738-IJM23		
1738-SSIM23		

x = length in meters (1, 2, 3, 5, and 10 standard).
y = length in meters (2, 5, and 10 standard).
z = length in meters (1, 2, and 3 standard).

Power Supply Distance Rating

Modules are placed to the right of the power supply. Each ArmorPoint I/O module can be placed in any of the slots to the right of the power supply until the usable backplane current of that supply has been exhausted. An adapter provides 1 A current to the POINTBus. The 1738-EP24DC provides up to 1.3 A and I/O modules require from 75 mA (typical for the digital and analog I/O modules) up to 220 mA or more.

POINTBus Current Requirements

Cat. No.	POINTBus Current Requirements
1738-IB2M12	75 mA
1738-IB4xxx	
1738-IB8xxx	
1738-IV4xxx	
1738-IV8xxx	
1738-OB2EM12	
1738-OB2EPM12	
1738-OB4Exxx	
1738-OB8Exxx	
1738-OV4EM12	
1738-OW4xxx	90 mA
1738-IE2CM12	75 mA
1738-OE2CM12	
1738-IE2VM12	
1738-OE2VM12	
1738-IA2xxx	
1738-OA2xxx	
1738-IJM23	160 mA
1738-SSIM23	110 mA
1738-IR2M12	220 mA
1738-IT2IM12	175 mA
1738-VHSC24M23	180 mA
1738-232ASCM12	75 mA
1738-485ASCM12	

Mounting the ArmorPoint I/O System

You can panel mount the ArmorPoint I/O system in the horizontal or vertical orientation.

ArmorPoint I/O with 1738-ADN12, -ADN18, -ADN18P, -ADNX, -ACNR, -AENT, -APB Mounting Dimensions