

Q438-0000



ACTIONI/Q[®] Q438

DC Powered Potentiometer Input Signal Conditioner

Provides a DC Output in Proportion
to a Potentiometer Input



- Accepts Potentiometers from 100 Ohms to 100k Ohms
- Wide Ranging Zero and Span
- ASIC Technology

- High Density DIN Rail Mounting
- Flexible DC Power Supply 9 to 30VDC
- SnapLoc™ Plug-in Terminals

Description

The Q438 is a DIN rail mount, potentiometer input signal conditioner with 1800VDC isolation between DC power and the input/output circuitry. The input provides a constant voltage and is designed to accept any three-wire potentiometer from 100 ohms to 100k ohms. The field configurable output is switch selectable providing a 0-5V, 0-10V, 0-1mA, 0-20mA or 4-20mA DC signal. Wide ranging, precision zero and span pots, used in conjunction with DIP switches, allow 80% adjustability of offset and gain to transmit a full scale output from any 20% portion of the potentiometer input.

Application

The Q438 is useful in transmitting process control setpoints to remote PID controllers or interfacing position or level sensors to data acquisition and control systems. The high density DIN rail mounting offers an extremely compact solution for saving valuable panel space.

Configuration

In a valve positioning application a potentiometer is sometimes used as a feedback signal. Quite often a wide open valve is only a 25% turn of the feedback potentiometer. The Q438 can easily be adjusted with the zero and span to provide a fullscale output signal (e.g. 4-20mA) representing 0-25% or even 50-75% of the potentiometer input.

Unless otherwise specified, the factory presets the Model Q438 as follows:

Input Range: 0 to 100%
Output: 4 to 20mA

For other output ranges, refer to Tables 1 and 2 to reconfigure switches SW1 and SW2 for the desired input and output ranges.

WARNING: Do not change switch settings with power applied. Severe damage will result!

Calibration

Note: For best results, calibration should be performed with the intended output load, in the operating environment, mounted on a DIN rail, allowing at least one hour for thermal equilibrium of the system.

1. With power disconnected, set the output and input switch selectors (SW1 and SW2) to the desired ranges (see Tables 1 and 2).

2. Connect the input to a potentiometer. Connect the output to the actual device load (or a load approximately equivalent to the actual device load value) and apply power.

Note: To maximize thermal stability, final calibration should be performed in the operating installation, allowing approximately 1 to 2 hours for warm up and thermal equilibrium of the system.

3. Set the input to the desired minimum and adjust the zero potentiometer for the desired minimum output.

4. Set the input to the desired maximum and adjust the span potentiometer for the desired maximum output.

5. Repeat steps 3 and 4, if necessary.

Table 1: Input Range Settings

Span	Selector SW2					
	1	2	3	4	5	6
20 - 100%						
45 - 100%	■					
(default) 85 - 100%		■				
Offset	1	2	3	4	5	6
(default) 0 - 20%						
20 - 45%				■		
45 - 65%			■			
65 - 80%			■	■		

Key: ■ = 1 = ON or Closed

Table 2: Output Range Settings

Output	Selector SW1							
	1	2	3	4	5	6	7	8
0 to +5V	■	■	■	■				
0 to +10V	■	■	■	■				
0 to 1mA	■	■	■	■				
(default) 4 to 20mA					■	■	■	
0 to 20mA					■	■	■	

Key: ■ = 1 = ON or Closed

Specifications

Potentiometer Input:

- End-to-end Resistance: 100 ohms up to 100k ohms
- Input Impedance: >1M ohms
- Input Excitation: 500mV, 5mA maximum drive.
- Zero Turn-Up: 80% of full scale input
- Span Turn-Down: 80% of full scale input

Output:

- Voltage:
 - Output: 0-5V, 0-10V
 - Source Impedance: <10 ohms
 - Drive: 10mA, max. (1k ohms min. @10V)
- Current Output:
 - Output: 0-1mA, 0-20mA, 4-20mA
 - Source Impedance: >100k ohms
 - Compliance:
 - 0-1mA; 7.5V, max. (7.5k ohms, max.)
 - 0-20mA; 12V, max. (600 ohms, max.)
 - 4-20mA; 12V, max. (600 ohms, max.)

Accuracy (Including Linearity, Hysteresis):

±0.1% maximum at 25°C

Stability:

<±0.05%/°C maximum of full scale range

Response Time (10 to 90%):

<200mSec., typical.

Common Mode Rejection:

120dB @ DC, >100dB @ 60Hz

Isolation:

1800VDC between line power and input, output

EMC Compliance (CE Mark):

- Emissions: EN50081-1
- Immunity: EN50082-2
- Safety: EN50178

LED Indication (green):

Active DC power

Humidity (Non-Condensing):

- Operating: 15 to 95% @ 45°C
- Soak: 90% for 24 hours @ 65°C

Temperature Range:

- Operating: 0 to 55°C (32 to 131°F)
- Storage: -25 to 70°C (-13 to 158°F)

Power:

- Consumption: 1.5W typical, 2.5W max
- Range: 9 to 30VDC

Weight:

0.48 lbs

Agency Approvals:

- UL recognized per standard UL508 (File No. E99775)
- CE Compliance per EMCdirective 89/3/36 EEC and Low Voltage 73/23/EEC.

Terminal	Connection	Terminal	Connection
A1	DC Output (+)	C1	Not Used
A2	DC Output (-)	C2	Not Used
A3	Not Used	C3	Pot. Case Ground
A4	Not Used	C4	Pot. Input (fully CCW)
A5	DC Power (+)	C5	Pot. Input Wiper
A6	DC Power (-)	C6	Pot. Input (fully CW)

Ordering Information

Models And Accessories

Specify:

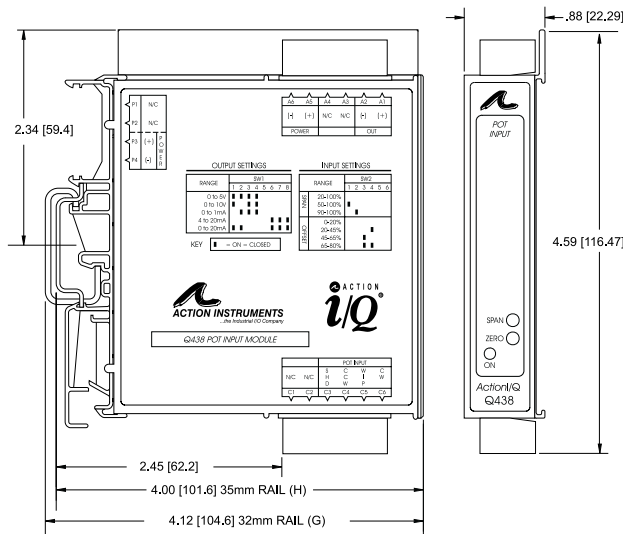
- Model: **Q438-0000**
- Specify optional I/QRail, type and quantity.
- Optional Custom Factory Calibration; specify **C620** with desired input and output range
- Accessories: (see Accessories)

Accessories

Action/I/Q modules will mount on standard TS32 (model MD02) or TS35 (model MD03) DIN Rail. In addition, the following accessories are available:

- MD02** TS32 DIN rail
- MD03** TS35 x 7.5 DIN rail
- IQRL-D002** 2 Position I/QRail & DIN rail
- IQRL-D004** 4 Position I/QRail & DIN rail
- IQRL-D008** 8 Position I/QRail & DIN rail
- WV905** 24VDC Power Supply (0.5Amp)
- H910** 24VDC Power Supply (1Amp)
- H915** 24VDC Power Supply (2.3Amp)

Dimensions



Printed on recycled paper

Factory Assistance

For additional information on calibration, operation and installation contact our Technical Services Group:

703-669-1318

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