ACTIONI/Q®
Q500
Loop Powered Multi-Channel Isolator

Q500-1B00 (1 channel)
Q500-2B00 (2 channel)
Q500-4B00 (4 channel)

Provides up to 4 Isolated DC Current Outputs in Proportion to the Input Currents

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- ■ Up to 4 Loop Isolators in a Single Package
- ■ Prevents Ground Loops
- ■ High Density DIN Rail Mounting

- ■ SnapLoc™ Plug-in Terminals
- ■ ASIC Technology

Description

The Q500 is a DIN rail mount, loop-powered isolator with single, dual or quad (4) channel capability. Each channel accepts a 0-20mA or 4-20mA input and outputs a proportional 0-20mA or 4-20mA signal. The Q500 provides 1800VDC signal isolation from input to output and channel to channel.

All ActionI/Q modules feature SnapLoc plug-in screw terminals for easy installation and low Mean-Time-To-Repair (MTTR). Two or more modules can slide together and interlock for solid, high density mounting. This is accomplished by removing either the foot or the adjacent unit's faceplate (for right-hand side or left-hand side mounting, respectively). The module to be attached will easily slide on to the side of the mounted unit.

Application

Loop-powered isolators are used to isolate process signals transmitted between field instrumentation, Programmable Logic Controllers (PLC), Distributed Control Systems (DCS) and Data Acquisition Systems (DAS). Outputs from these systems can also drive one or more isolator channels of the Q500. Field devices such as flow, level or temperature transmitters can also drive a Q500 isolator channel. The 1800VDC isolation capability prevents ground loops from causing errors in 4-20mA current signals and can reduce susceptibility to Radio Frequency Interference (RFI). Isolation also provides protection from high voltages and current spikes which can damage expensive Supervisory Control And Data Acquisition (SCADA) equipment, such as a PLC or DCS.

Operation

The Q500 operates as a loop-powered isolator, with each channel deriving its power from the input loop current, 0(4)-20mA. The effective load of a Q500 isolator channel on a loop is 300 ohms plus the output load resistance. For example, if the load on an output of the Q500 is 500 ohms, then the current loop connected to the input would need to drive 300 ohms plus 500 ohms (i.e. 800 ohms) at a maximum current of 20mA, or 800 ohms x 20mA which equals 16.0V.

The Q500 is protected from reverse input polarity and output short circuit. A span pot is provided for each channel in order to calibrate the output to the load.

Calibration

1. Connect the input to a calibrated milliamp source. Connect the output to the actual device or to a load (between 100 and 500 ohms) equivalent to the actual device. Monitor the output current with a milliamp meter in series with the load or monitor the voltage across the load.

2. Set the calibrator to 20mA and adjust the span potentiometer for 20mA output.

3. Set the calibrator to 4mA and confirm that the output is 4mA.

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Specifications

Input Range:

0(4) to 20mA, 30VDC max, each channel

Voltage Drop: 6V (300 ohms), plus output load

Output Range:

0(4) to 20mA,

Drive: 10V or 500 ohms maximum @ 20mA, 100 ohms minimum

Output Accuracy:

Better than $\pm$0.2% of full-scale, including linearity, hysteresis and repeatability, maximum

Linearity:

0.1% of span typical, from 4 to 20mA at 250ohm load

Stability:

$\pm$0.02%/^{o}C of span max. for full-scale and zero

Load Regulation:

$\pm$0.1% of span, typical per 10 ohm change

Common Mode Rejection Ratio:

$\geq$ 100dB (DC to 60Hz)

Isolation:

1800VDC, input to output and channel to channel.

ESD Susceptibility:

Capable of meeting IEC 801-2 level 3 (8kV)

Response Time:

50mSec typical, 100mSec max 10 to 90% (each channel)

Temperature:

Operating: -40 to 80°C (-40 to 176°F)

Storage: -40 to 80°C (-40 to 176°F)

Humidity (non-condensing):

25 to 95% (@40°C)

Wire Terminals:

Socketed screw terminals for 12-22 AWG
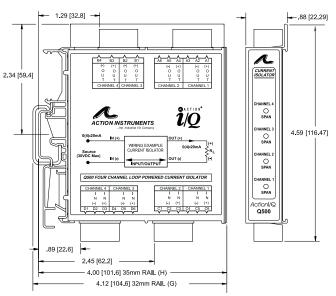
Weight:

0.34lbs

Agency Approvals:

UL recognized per standard UL508 (File No.E99775).

CE conformance per EMC directive 89/336/EEC and Low voltage 73/23/EEC.

Q500-1B Terminals

Terminal	Connection	Terminal	Connection
A1	Channel 1 Output (+)	C1	Not Connected
A2	Channel 1 Output (-)	C2	Not Connected
A3	Not Connected	C3	Not Connected
A4	Not Connected	C4	Not Connected
A5	Not Connected	C5	Channel 1 Input (-)
A6	Not Connected	C6	Channel 1 Input (+)

Q500-2B Terminals

Terminal	Connection	Terminal	Connection
A1	Channel 1 Output (+)	C1	Not Connected
A2	Channel 1 Output (-)	C2	Channel 2 Input (-)
A3	Not Connected	C3	Channel 2 Input (+)
A4	Channel 2 Output (+)	C4	Not Connected
A5	Channel 2 Output (-)	C5	Channel 1 Input (-)
A6	Not Connected	C6	Channel 1 Input (+)

Q500-4B Terminals

Terminal	Connection	Terminal	Connection
A1	Channel 1 Output (+)	C1	Not Connected
A2	Channel 1 Output (-)	C2	Channel 2 Input (-)
A3	Not Connected	C3	Channel 2 Input (+)
A4	Channel 2 Output (+)	C4	Not Connected
A5	Channel 2 Output (-)	C5	Channel 1 Input (-)
A6	Not Connected	C6	Channel 1 Input (+)
B1	Channel 3 Output (+)	D1	Not Connected
B2	Channel 3 Output (-)	D2	Channel 4 Input (-)
B3	Channel 4 Output (+)	D3	Channel 4 Input (+)
B4	Channel 4 Output (-)	D4	Not Connected
		D5	Channel 3 Input (-)
		D6	Channel 3 Input (+)

Ordering Information

Models & Accessories

Specify:

1. Model:

    Q500-1B00, Single (1) Channel,

    Q500-2B00, Dual (2) Channel, or

    Q500-4B00, Quad (4) Channel

    Loop-Powered Isolator

2. Accessories: (see Accessories)

Accessories

ActionI/Q modules 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

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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