



Q510-0xxx (2 Channel)  
Q510-4xxx (4 Channel)

# ACTIONI/Q® Q510

## Loop Powered Multi-Channel RTD Input Isolating, 2-Wire Transmitter

Provides 2 or 4 Current Loop Outputs  
in Proportion to the PT100 Ohm RTD Inputs



- Up to 4 Two-Wire Transmitters in a Single Package
- Output Linear to Input Temperature
- Standard Input Ranges

- High Density DIN Rail Mounting
- SnapLoc™ Plug-in Terminals
- Output Loop Powered from 10 to 35VDC

### Description

The Q510 is a DIN rail mount, RTD Input, dual or quad channel two-wire transmitter. Each channel accepts an RTD input and provides an output loop powered 4-20mA signal, linear to the temperature input. Each channel is an independent transmitter with 600VDC channel to channel isolation.

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 (remove either the foot, or the adjacent unit's faceplate for right-hand side or left-hand hand side mounting, respectively). The module to be attached will easily slide on to the side of the mounted unit.

### Application

RTD input, two-wire transmitters are used to convert a specific temperature range into a regulated 4-20mA signal. Two-wire transmitters are primarily used in remote locations near the sensor since they reduce the probability of signal errors and save wiring costs by utilizing the two power wires to send the 4-20mA signal. The current signal is usually sensed by a control system or displayed for an operator.

Typically, several RTDs are used to measure temperatures in a vessel or cell. The lead wires can run a short distance to a panel, or farther with the use of shielded wire, without errors caused by noise or lead resistance in the wires. These sensor wires are then terminated at the two-wire transmitter and converted into a 4-20mA signal which is highly immune to noise and not affected by lead resistance, both of which can cause significant errors in voltage signals transmitted over long distances.

### Operation

The Q510 operates as a two-wire transmitter; each channel derives its power from a (10-35VDC) source connected in series with the 4-20mA output loop. Typically a 24VDC source is used, allowing 14VDC (700 ohms @ 20mA) for other devices connected in series in the current loop. The outputs of the Q510 are protected from reverse polarity. Zero and span pots are provided for each channel to calibrate the output to the input RTD. Standard input temperature ranges (see Table) are calibrated to the rated accuracy. One range per module; two or four channels per module.

### Calibration

1. Connect the input to a calibrated three-wire resistance source (not a resistance simulator). Connect the output in series to a voltage source capable of supplying at least 20mA and a milliamp current meter.

2. Set the calibrator to the specified minimum temperature resistance value and adjust the zero potentiometer for 4mA output.

Note: The voltage source ( $V_s$ ) connected to the output must be sufficient to accommodate all other device loads ( $R_L$ ) in the current loop:

$$V_s \geq 10V + 0.02 \times R_L$$

3. Set the calibrator to the specified maximum temperature resistance value and adjust the span potentiometer for 20mA output.

4. Repeat steps 2 and 3, as necessary.

Q510 Ranges			
2 Channel Models	4 Channel Models	Inputs	Outputs
Q510-0B01	Q510-4B01	0 to 100° C	4-20mA
Q510-0B02	Q510-4B02	0 to 150° C	4-20mA
Q510-0B03	Q510-4B03	0 to 200° C	4-20mA
Q510-0B04	Q510-4B04	0 to 250° C	4-20mA
Q510-0B05	Q510-4B05	0 to 500° C	4-20mA
Q510-0B06	Q510-4B06	0 to 200° F	4-20mA
Q510-0B07	Q510-4B07	0 to 300° F	4-20mA
Q510-0B08	Q510-4B08	0 to 400° F	4-20mA
Q510-0B09	Q510-4B09	0 to 500° F	4-20mA
Q510-0B10	Q510-4B10	0 to 1000° F	4-20mA

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## Specifications

### Input:

Accepts two or four, 3-wire Pt100 RTDs (alpha = 0.00385 Ohms/Ohm/°C)  
Ranges: see Table

### Input Excitation:

0.8mA, typical, each channel

### Input Leadwire Effect:

<1% of full scale output, max. @40Ohms max./ lead

### Output Range:

4-20mA

### Supply Voltage Range:

10 to 35VDC, each channel

### Output Accuracy:

≤ 0.1% of full-scale input typical, ≤0.4% max., including linearity, repeatability and hysteresis

### Adjustability:

Front accessed 10 turn pot., ±2% of span for zero and span, typical.

### Stability:

≤ 0.025%/°C of full-scale maximum for full-scale and zero

### ESD Susceptibility:

Meets IEC 801-2 level 2 (4kV)

### Response Time:

50mSec typical (10 to 90%)

## Q510 (2 Channel) Terminals

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

## Ordering Information

### Models & Accessories

#### Specify:

1. Model: **Q510** (see Table)
2. Channels: 2 or 4
3. Input Range: (see Table)
4. Accessories: (see Accessories)

### Accessories

Action/IQ 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  
**WV905** 24VDC Power Supply (500mA)  
**H910** 24VDC Power Supply (1 Amp)  
**H915** 24VDC Power Supply (2.3 A)

### Temperature:

Operating: -40 to 80°C (-40 to 176°F)

Storage: -40 to 80°C (-40 to 176°F)

### Humidity (non-condensing):

Operating: 15 to 90% @45°C

### Wire Terminals:

Socketed screw terminals for 12-22 AWG

### Weight:

0.34lbs

### Agency Approvals:

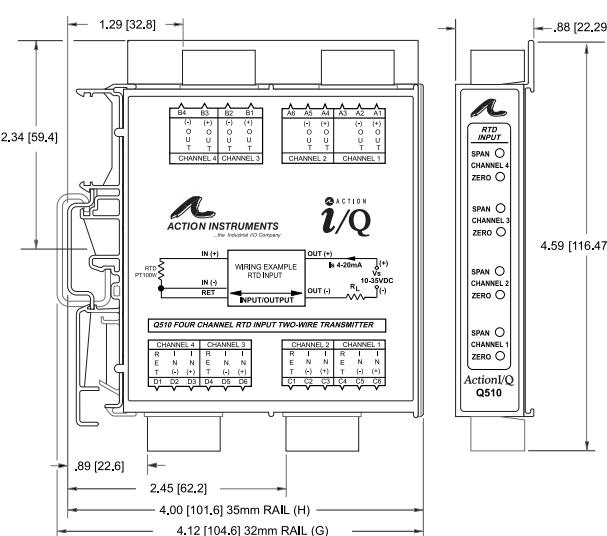
CSA certified per standard C22.2 (File No. LR42272).

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

## Q510 (4 Channel) Terminals

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

## Dimensions



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## Factory Assistance

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

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