

RTD and T/C Modules (ROC800-Series)

Resistance Temperature Detector (RTD) and Thermocouple (T/C) Input modules for the ROC800-Series Remote Operations Controller provide the ROC with the ability to monitor various RTD or thermocouple sensors. The maximum number of modules that a ROC809 can support is nine.

The need for fuses has been eliminated on the Input/Output (I/O) modules through the extensive use of current-limiting short-circuit protection and surge protection techniques. This results in less maintenance for remote locations. The I/O modules are self-resetting after a fault clears.

These modules can be installed in any module slot. Modules can easily be installed or removed from the module slots at any time by removing the two captive screws accessible from the front of the unit. Modules are hot-swappable, meaning the module can be removed and another module of the same type can be installed under power. The modules are hot-pluggable, meaning they may be installed directly into unused module slots under power. The modules are also self-identifying via ROCLINK™ 800 Configuration Software.

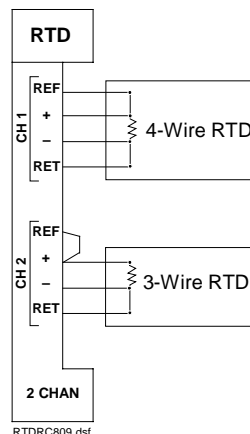
All modules have removable terminal blocks for convenient wiring and servicing. The terminal blocks can accommodate a wide range of wire gauges up to 12 American Wire Gauge (AWG).

The modules each have their own integrated short-circuit protected isolated power supply. This power supply allows the field circuitry to be completely isolated from backplane and the Central Processor Unit (CPU).

Each module provides isolation from other modules and the backplane, including power and signal isolation.

RTD Inputs

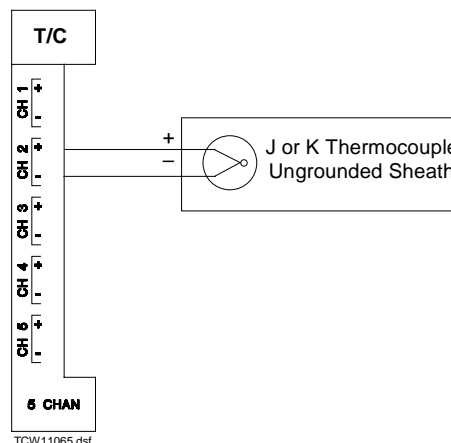
The RTD input module monitors the temperature signal from an RTD sensor within a fixed range. The RTD input module provides two channels for measuring the resistance of 2-wire, 3-wire or 4-wire, 100-ohm, platinum RTD sensors with an alpha equal to 0.00385 or 0.00392 $\Omega/\Omega/^\circ\text{C}$.



RTD Wiring

Thermocouple Inputs

The Thermocouple (T/C) input module provides five channels for measuring millivolt signals from ungrounded J or K type thermocouples. Individual channels on the module can be independently designated, in the ROCLINK 800 Configuration Software, as either J or K input channels. Installation cost is reduced as the T/C module provides cold junction compensation at the module level. No special terminal or isothermal block is required, because the thermocouple is wired directly to the module's removable terminal block.



Thermocouple Wiring

RTD Input Module Specifications

FIELD WIRING TERMINALS

Terminal	Label	Definition
1	REF	CH1 Constant Current +
2	+	CH1 Positive RTD
3	-	CH1 Negative RTD
4	RET	CH1 Constant Current -
5	N/A	Not Used
6	REF	CH2 Constant Current +
7	+	CH2 Positive RTD
8	-	CH2 Negative RTD
9	RET	CH2 Constant Current -
10	N/A	Not Used

INPUT

Quantity: 2 channels.

Type: 2, 3 or 4-wire, 100 Ω, platinum type RTD, using a 24 bit A/D connector.

Sensing Range: -50 to 350°C (-58 to 662°F).

Full Range Deflection: DIN 43760 standard.

Maximum Overload: (Input + to Input -) ±6 Volts DC, continuous.

Temperature Coefficient: alpha of 0.00385 or 0.00392 (software selectable).

INPUT

Minimum Scan Period: 64 msec, both channels.

Absolute Accuracy¹ at 25°C (77°F): 0.03% of reading, maximum.

Absolute Accuracy¹ Over Operating Temp: 0.38% of full scale.

POWER CONSUMPTION

Main power supply loading at 13.25 Volts DC at the Battery Terminals: 65 mA maximum.

WIRING

12 AWG at the removable terminal block.

ISOLATION

Field to Logic: 2500 Volts DC, 1 minute minimum.

Field to Power: 2500 Volts DC, 1 minute minimum.

Module to Module: 2500 Volts DC, 1 minute minimum.

WEIGHT

70 g (2.47 oz).

1. Absolute Accuracy Includes: Linearity, Hysteresis, Repeatability, Stability, Gain, and Offset error.

J and K Type Thermocouple Input Module Specifications

FIELD WIRING TERMINALS

Terminal	Label	Definition
1	CH 1+	CH1 Positive
2	CH 1-	CH1 Negative
3	CH 2+	CH2 Positive
4	CH 2-	CH2 Negative
5	CH 3+	CH3 Positive
6	CH 3-	CH3 Negative
7	CH 4+	CH4 Positive
8	CH 4-	CH4 Negative
9	CH 5+	CH5 Positive
10	CH 5-	CH5 Negative

INPUT

Quantity: 5 channels.

Type: J & K Type ungrounded Thermocouple sensors. Software selectable on a per channel basis.

Input Temperature Range:

J Type: -200 to 1200°C (-328 to 2192°F).

K Type: -100 to 1372°C (-121 to 2500°F).

Maximum Overload: (Input + to Input -) ±6 Volts DC, continuous.

Minimum Scan Period: 150 mSec for all channels.

Absolute Accuracy¹ at 25°C (77°F): 1°C typical.

Absolute Accuracy¹ at 25°C (77°F): 2°C maximum.

Absolute Accuracy¹ Over Operating Temp: 6°C maximum.

COLD JUNCTION COMPENSATION

Cold junction is measured and corrected on a per channel basis.

OPEN CIRCUIT DETECTION

On detection of no thermocouple present, the reading is forced above 1500 °C (2732 °F).

POWER CONSUMPTION

Main power supply loading at the Battery Terminals (at 12.0 Volts DC):

Typical : 84 mA.

WIRING

12 AWG at the removable terminal block.

ISOLATION

Field to Logic: 2500 Volts DC, 1 minute minimum.

Field to Power: 2500 Volts DC, 1 minute minimum.

Module to Module: 2500 Volts DC, 1 minute minimum.

WEIGHT

59.0 g (2.08 oz).

1. Absolute Accuracy Includes: Linearity, Hysteresis, Repeatability, Stability, Gain, and Offset error.

Module Common Specifications

ENVIRONMENTAL

Operating Temp: -40 to 85°C (-40 to 185°F).

Storage Temp: -55 to 100°C (-67 to 212°F).

Relative Humidity: IEC68-2-3; 5-95% non-condensing.

Vibration: IEC68-2-6; 0.15 mm/sec² @ 10-150 Hz.

Mechanical Shock: IEC68-2-27; 11 ms, sinusoidal 50 Gs non-operating, 15 Gs operating.

Thermal Shock: IEC68-2-14; Air to air from -20 to 85°C (-4 to 185°F).

DIMENSIONS

All I/O modules for the ROC800-Series unit have the same dimensions and are designed to fit in any module slot.

26 mm W by 133 mm H by 75 mm D (1.04 in. W by 5.25 in. H by 2.96 in. D).

APPROVALS

These modules carry the same approvals as the ROC809 unit. See Specification Sheet 6:ROC809.

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