Thermocouple Module (ROC800-Series)

The Thermocouple (T/C) Input module for the ROC800-Series Remote Operations Controller (ROC800) provide the ROC with the ability to monitor various thermocouple sensors. The T/C module may be placed in any I/O slot on the ROC800.

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 terminal block.

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

Installation and replacement of these modules is easily accomplished by removing the two captive screws accessible from the front of the unit. Modules are both hot-swappable (they can be removed and another module of the same kind installed when the unit is powered) and hot-pluggable (they can be installed directly into unused module slots when the unit is powered). The modules are also self-identifying, which means that ROCLINK™ 800 Configuration Software recognizes the module without user intervention.

The T/C module has fixed terminal blocks for improved thermal compensation. The terminal blocks can accommodate 12 to 22 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 the backplane and the Central Processor Unit (CPU).

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

Thermocouple Wiring

DOC0512B

D301573X012

EMERSON™

Process Management
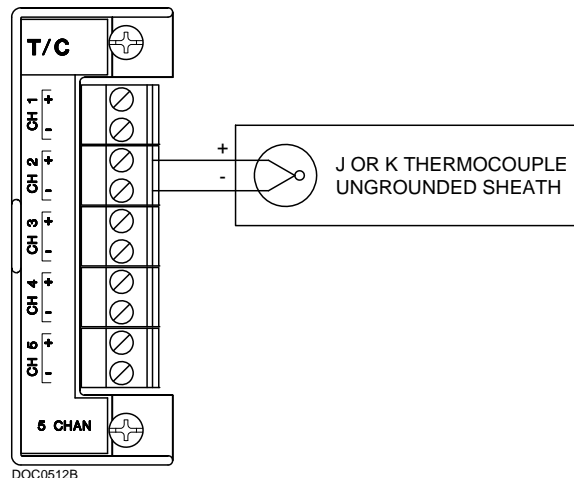
J and K Type Thermocouple Input Module Specifications

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: Five channels.

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

Input Temperature Range:
J Type: –100 to 1200°C (–328 to 2192°F).
K Type: –100 to 1372°C (–121 to 2500°F).

Maximum Overload: (Input + to Input –) ±6 V dc, continuous.

Minimum Scan Period: 150 milliseconds for all channels.

Absolute Accuracy[1] at 25°C (77°F): 1°C (33.8°F) typical; 3°C (35.6°F) maximum.

Absolute Accuracy[1] Over Operating Temp: 7°C (42.8°F) 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 to 9999.0°C (9999.0°F).

POWER CONSUMPTION

Main power supply loading at the Battery Terminals (at 12.0 V dc): 84 mA typical.

WIRING

12 to 22 AWG at the removable terminal block.

ISOLATION

Field to Logic: 2500 V dc, 1 minute minimum.

Field to Power: 2500 V dc, 1 minute minimum.

Module to Module: 2500 V dc, 1 minute minimum.

WEIGHT

59.0 g (2.08 oz).

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/sec^2 @ 10-150 Hz.

Mechanical Shock: IEC68-2-27; 11 mSec, 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 ROC800-Series unit in which they are installed.

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

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