

DIN Rail Thermocouple Transmitter MCR-TC Series



Shown
actual size.

\$258
Basic Unit

The MCR-TC universal module features fully configurable sensor inputs and process signal outputs. The MCR-TC is configured by utilizing IBM PC pull-down menu software. The modules EEPROM stores all configuration options. These configuration options are:

- Thermocouple Type
- Signal Output
- Temperature Range
- Sensor Break (Output)
- Scale: C or F

The MCR-TC module configuration software is capable of storing configurations of all of the modules I/O data. A simple print command produces a label for the module's current configuration. The onboard Intel processor is capable of linearizing thermocouples not currently offered.

A highly accurate delta-sigma processor, analog to digital converter, assures precise temperature conversion over a wide or narrow temperature span.

A combination of through hole and surface mount technology provides stable low drift temperature processing even in harsh industrial environments.

Temperature ranges can be programmed to a minimum of 20°C or 36°F. The selectable temperature range can be further fine tuned by the ±5% zero and span calibration adjustment buttons.

Isolation

The MCR-TC modules are available in isolated or nonisolated versions. The isolated MCR-TC modules feature a combination of optical and transformer isolation. The optical isolation provides common mode voltage (CMV) isolation up to 1 KV between the sensor input and process signal output. The module's power supply is isolated from the process signal output by a dc/dc transformer isolation circuit. Isolation permits the use of grounded thermocouples and prevent measurement errors induced by currents developed by potentials on surfaces being monitored.

Surge & Short Circuit Protection

The MCR-TC module is designed for use in industrial environments. Suppressor diodes protect both input and output circuits from wiring errors.

Inputs

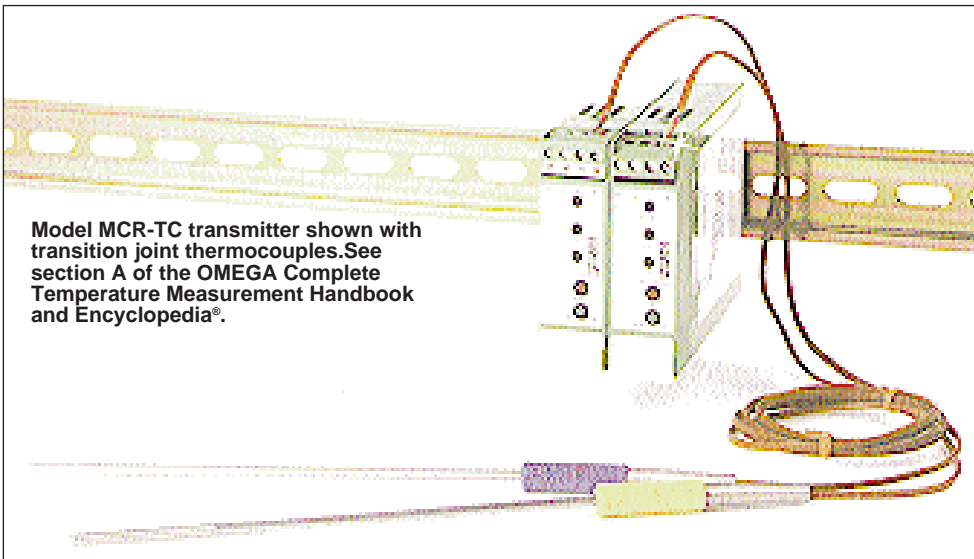
The MCR-TC can accept a wide variety of standard thermocouple types. The isolated module will accept either grounded or ungrounded thermocouples, while the non-isolated module is recommended only for grounded sensors.

The thermocouple sensor input is digitized to a 24-bit resolution and then is read by the on board Intel 8752 microcontroller. The Intel processor is equipped with

- ✓ Four Basic Module Types: Current or Voltage Output, Isolated or Nonisolated
- ✓ Voltage and Current Configurable Outputs: 0-5 V, 0-10 V, ±5 V, ±10 V; 0-20 mA or 4-20 mA
- ✓ J, K, N, T, S, R, B, E, J DIN, T DIN Thermocouples and mV
- ✓ -374 to +3308°F Configurable Range (Min 36°F Span)
- ✓ 0.5°C Accuracy
- ✓ 0.06%FS Repeatability



The MCR series is a complete family of DIN rail signal conditioners for thermocouple, RTD, frequency, current, as well as setpoint alarm, isolation and threshold switch modules



Model MCR-TC transmitter shown with transition joint thermocouples. See section A of the OMEGA Complete Temperature Measurement Handbook and Encyclopedia®.



Sensor Break Detection: 4-20 mA units only (3 mA or 22 mA); software programmable
Response Time: 1.7 Hz
Zero & Span Adjustments: ±5% FS; software programmable
General Specifications
Power: 20-30 V dc
Current Consumption: ≤80 mA
Isolation (Isolated Versions): 1 kV common mode
Operating Temperature: -20 to 65°C (-4 to 149°F)
Storage Temperature: -30 to 85°C (-22 to 185°F)

an integrated memory that contains programming, sequencing, scaling and linearization routines. Once programmed, all user configurations are stored in the microcontrollers EEPROM (Electrically Erasable Read Only Memory). All user configurations are retained in the EEPROM even after the 24 Vdc module power supply is disconnected.

The MCR-TC module input circuit detects several types of sensor fault conditions. They are:

- sensor wire break (open circuit)
- sensor wire short

Upon any sensor fault condition, the red MODE LED will remain constantly in the ON state until the fault is corrected.

Computer Configuration

To configure the MCR-TC temperature signal conditioning module MCR-CONF must be used. The MCR-CONF includes a programming manual, software and interface cable.

Any standard IBM PC or compatible computer with an Intel 80286 microprocessor is capable of operating the MCR-CONF software. An EGA or VGA color graphic card, serial port COM1 or COM2, 384 kbytes of free memory and DOS versions 3.2 or higher are the remaining software/hardware requirements.

The MCR-TC programming manual provides a comprehensive step-by-step guide on how to load and operate the MCR-CONF software, using easy pull-down menus.

Specifications

INPUT

Minimum Temperature Span Setting: 20°C (36°F), software adjustable

Accuracy: ≤0.06% FS

Resolution of Output Signal: 12-Bit

Repeatability: ≤0.06% FS

Input Protection: Surge suppressing diodes

OUTPUT

Lead Line Resistance or Burden: ≤500Ω current units >1 KΩ voltage units

Output Types: Current 0-20 mA, 4-20 mA; Voltage: 0-5 V, ±5 V, 0-10 V, ±10 V; software programmable

Open Circuit/Fault: ±5 V Open circuit: 5.5 V; 0-20 mA Open circuit: 22 mA.

±10 V Open circuit: 11 V; 4-20 mA Open circuit: 3 mA. 0-5 V Open circuit: 5.5 V; 4-20 mA Open circuit: 22 mA. 0-10 V Open circuit: 11 V; software programmable.

Output Protection: Surge suppressing diodes

Input Type	Range, °F	Range, °C
J	-346 to 2192°F	-210 to 1200°C
K	-328 to 2502°F	-200 to 1372°C
T	-328 to 752°F	-200 to 400°C
E	-374 to 1832°F	-226 to 1000°C
R, S	-58 to 3214°F	-50 to 1768°C
B	140 to 3308°F	40 to 1820°C
N	-328 to 2372°F	-200 to 1300°C
J DIN	-112 to 1652°F	-80 to 900°C
T DIN	-328 to 1112°F	-200 to 600°C

U.S. AND CANADA

For sales and service, call:

1-800-82-66342SM
1-800-TC-OMEGA

For technical assistance, call:

1-800-327-4333SM
1-800-DAS-IEEE

To Order (Specify Model Number)

Model Number	Price	Description
MCR-TC/U/NC	\$258	Nonisolated, voltage output
MCR-TC/I/NC	258	Nonisolated, current output
MCR-TC/U-E/NC	338	Isolated, voltage output
MCR-TC/I-E/NC	338	Isolated, current output

Ordering Example: MCR-TC/I/NC universal thermocouple transmitter, nonisolated, with current output, \$258.

Accessories

Model Number	Price	Description
MCR-CONF-9	\$155	Programming software for IBM PC, supplied with 9-pin D-sub serial cable and 3.5 inch disks