EX1048

48-channel Precision Thermocouple Instrument

Overview

The EX1048 precision thermocouple instrument combines all of the features necessary to address your most demanding temperature measurement applications in an easy to use package. Exceptional temperature accuracy and stability are available in this scalable, standalone 1U module that can be directly connected to your Ethernet network.

Ethernet connectivity also means that instrument installation and set-up has never been easier. Simply plug-in a standard network cable and start taking data. An integrated web page provides a convenient way to instantly verify communications and instrument functionality, while industry standard VXI*plug&play* drivers provide a familiar application programming interface to reduce integration and program development time.

Multiple devices are easily integrated and synchronized through our built-in dedicated Trigger Bus™, also allowing easy synchronization with VXIbus instrumentation. The EX1048 also provides an ideal solution for distributed measurement applications by reducing cabling and installation expense.

Features

- High-density, Compact (1U) Precision Thermocouple Measurement Instrument
- Extensive Integrated Signal Conditioning and Filtering
- Direct Ethernet 10/100 Base-T Network Connectivity
- End-to-End Self-calibration
- 1000 Samples/Second/Channel Scan Rate
- Accepts All Standard Thermocouple Types Including J, K, T, E, S, B, R, N
- Independent Open Thermocouple Detection per Channel

Features

Analog Inputs: Sampling rates up to 1000 Sa/s/channel will address even the most demanding applications. Each input incorporates an independent signal conditioning path with software selectable 4 Hz and 1 kHz filters for maximum flexibility. Complete channel independence ensures data integrity regardless of sample speed or input overload conditions.

Self-calibration: Internal end-to-end calibration is provided for each signal path on a programmable basis. A highly accurate calibration source provides reference signals that are applied prior to analog filtering and gain circuits to compensate for drift, aging, or temperature variations. The self-calibration is simple and quick, affording the user the convenience of performing it as often as desired.

Open Thermocouple Detection: Each channel is configured with open thermocouple detection functionality, providing a continual indication of the channel's status. The detection mechanism is embedded in the signal conditioning circuitry, and will accurately provide an open circuit indication in the event of a broken or intermittent thermocouple.

Cold Junction Compensation: The heart of any truly accurate thermocouple measurement system is the CJC implementation. The EX1048 combines multiple precision thermistors, a significant thermal mass, and careful parts placement to provide world class measurement performance.

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Specifications

Channels:	48 Differential Inputs
Functions:	J, K, T, E, S, R, B, N, mV
Sampling Rate:	1000 Sa/s per channel maximum
Temperature Resolution:	0.01 ˚C
Temperature Accuracy:	See Table
Temperature Noise:	0.08 ˚Cpp typical (J, K, T, E)
Voltage Input Range:	±66 mV
Voltage Resolution:	1 µV
Voltage Accuracy:	±(0.05% + 10 µV) - With Self Calibration ±(0.1% + 30 µV) - Without Self Calibration
Voltage Offset Stability:	1 µV/ºC typical
Voltage Gain Stability:	25 ppm/ºC typical
Input Impedance:	40 MΩ Differential
Input Bias Current:	7.5 nA typical
Common Mode Input Range:	±10 V

CMRR:

Filter	dc	(50/60) Hz
4 Hz	100 dB min.	140 dB typ, 120 dB min.
1 kHz	100 dB min.	100 dB typ, 80 dB min.

Filter:	4 Hz, 1 kHz (Selectable per channel)
Input Protection:	±35 V
Network Connection:	10/100 Base-T
Input Connector:	Cu-Cu mini-TC Jack
Operating Temperature:	0 ˚C to 50 ˚C
Power Input:	(90-264) Vac, (50/60) Hz, 25 VA max.
Dimensions:	1.75" H x 17.5" W x 14.4" D

Enhanced Thermocouple Accuracy

	-100 °C	0 °C	100 °C	300 °C	500 °C	700 °C	900 °C	1100 °C	1400 °C
Type J	±0.60 °C	±0.45 °C	±0.45°C	±0.50 °C	±0.60 °C	±0.65 °C	±0.75 °C	±0.90 °C	----
Type K	±0.70 °C	±0.50 °C	±0.50 °C	±0.60 °C	±0.65 °C	±0.75 °C	±0.90 °C	±1.10 °C	----
Type T	±0.75 °C	±0.50 °C	±0.45 °C	±0.45 °C	----	----	----	----	----
Type E	±0.60 °C	±0.45 °C	±0.40 °C	±0.45 °C	±0.50 °C	±0.60 °C	±0.75 °C	----	----
Type S	----	±2.00 °C	±1.50 °C	±1.30 °C	±1.30 °C	±1.30 °C	±1.40 °C	±1.40 °C	±1.50 °C
Type R	----	±2.00 °C	±1.50 °C	±1.20 °C	±1.20 °C	±1.20 °C	±1.20 °C	±1.30 °C	±1.40 °C
Type B	----	----	----	±3.30 °C	±2.10 °C	±1.60 °C	±1.40 °C	±1.30 °C	±1.30 °C
Type N	±0.80 °C	±0.60 °C	±0.55 °C	±0.55 °C	±0.60 °C	±0.70 °C	±0.80 °C	±0.95 °C	----

Conditions:
Guaranteed maximum limits. Typical errors are approximately 1/2 of maximum.
<30 days, ±2 °C from last self calibration
15 °C - 35 °C, 1 year from full calibration
30 minute warm-up
Exclusive of thermocouple errors
Exclusive of noise
Vcm = 0

Ordering Information

Model EX1048:	48-channel Precision Thermocouple Instrument
Option 30:	Screw Terminal Connections

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