

# 240 Series cryogenic temperature sensor input modules

## Distributed temperature measurement for large applications


The new 240 Series offers a convenient, modular input solution for precision monitoring of cryogenic temperature sensors in applications employing distributed PLC-based control.

Lake Shore benchtop cryogenic instruments are trusted throughout the world for precision temperature measurement—now that same measurement performance can be achieved in widely distributed high-energy physics applications like particle accelerators and fusion reactors as well as other large industrial sites.

Model 240-8P



The ideal companion to



**Cernox™**

The most accurate thin film sensor for use in magnetic and radiation environments



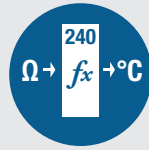
Model 240-2P



Integrates seamlessly with industry-leading Lake Shore Cernox™ RTDs, platinum RTDs and DT 670 silicon diodes, providing the ideal solution for performing temperature measurements over a PLC network



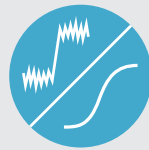
Native support for PROFIBUS, allowing this module to be integrated into a wide range of PLC networks



Temperature values are communicated directly with the PLC master device, removing the need to use additional costly analog conversion equipment or complex PLC programming to generate temperature values



Measurement circuitry based on Lake Shore's industry leading benchtop instruments, allowing for longer cable runs between sensor and module; ideal for applications where sensors must be located in hazardous environments



Normal mode with EMF-cancellation and signal filtering for the best measurement possible or high-speed mode for the fastest notification of a temperature change.



A high-quality OLED display on the front of the unit provides helpful status and measurement data; this is in addition to being able to access this information via the PLC network or the local USB connection



Convenient pluggable connectors allow individual sensors to be disconnected for maintenance without losing readings from other sensors on the same module



Easy DIN rail mounting with integrated rear connections allowing power and fieldbus communications to be shared between modules

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### Specifications (preliminary)

#### Analog input

Sensor inputs: 2 (240-2P) or 8 (240-8P)

Measurement type: 4-lead

Sensor compatibility: RTDs (e.g., Cernox™, platinum) and diodes

	NTC RTDs (e.g., Cernox)	PTC RTDs (e.g., platinum)	Diodes
Sensor units	Ohms (Ω)		Volts (V)
Measurement range	0 to 100 kΩ	0 to 1 kΩ	0 to 7.5 V
Excitation current	9 ranges Autorange: 1 mA 300 μA 100 μA 30 μA 10 μA 3 μA 1 μA 300 nA 100 nA	1 mA	10 μA

#### Thermometry

Temperature conversion: Lake Shore calibration curves (\*.340 format)

Temperature reporting: Kelvin (K), Celsius (C), Fahrenheit (F)

Measurement performance:

	Measurement resolution	Electronic accuracy
2 K (with CX-1050)	0.06 mK	±0.57 mK
4.2 K (with CX-1050)	0.2 mK	±2.1 mK
4.2 K (with DT-670)	0.6 mK	±15 mK
77 K (with PT-103)	47 mK	±104 mK

#### Digital I/O—PROFIBUS

Protocol: DP-V0

Baud rates: 9.6k, 19.2 k, 45.45 k, 93.75 k, 187.5 k, 500 k, 1.5 M, 3 M, 6 M, 12 M (auto-baud rate detect)

Reading data format: Single precision float (4 bytes)

Connector: Terminal block (RS-485, 2-wire)

#### Digital I/O—USB

Function: Emulated standard RS-232 serial

Connector: USB Micro-B

#### Data reporting values

Available units: Kelvin (K), Celsius (C), Fahrenheit (F), Ohms (Ω), Volts (V)

Update rate:

	240-2P	240-8P
Normal mode	100 ms	400 ms
High-speed mode	1 to 100 ms	Not available

#### Management

Configuration software: MeasureLink™ (free download via USB)

Supported OS: Windows 7, 8, 10

Front OLED display: 2 dedicated readings for 240-2P, 2 cycled readings for 240-8P

OLED display resolution: 5 digits

LED annunciators: module status, communication status

#### Power supply

Requirements: 24 ±10% VDC, 250 mA max, 100 mA typical

Connection: Backplane/pluggable terminal block

Protection: overvoltage, undervoltage, reversed polarity

#### Physical

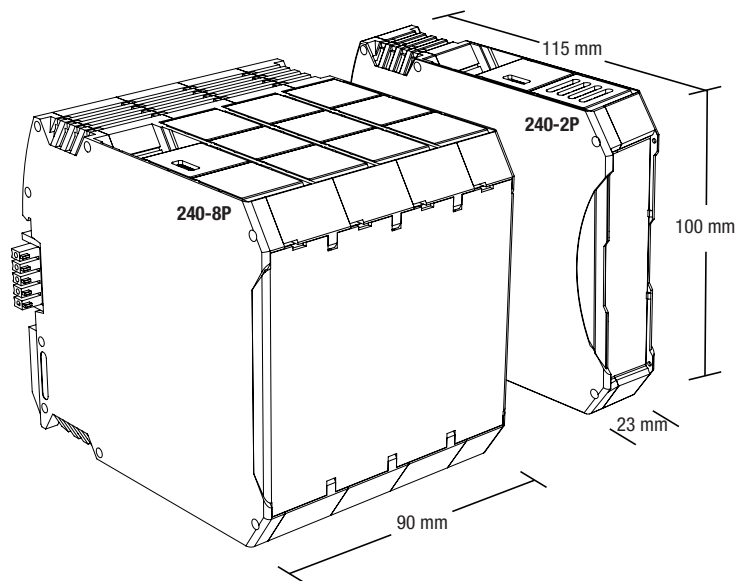
Case: plastic, polyamide

Mounting: DIN rail

Protective rating: IP20

Wire connections: Pluggable terminal blocks

	240-2P	240-8P
Length	115 mm	115 mm
Height	100 mm	100 mm
Width	23 mm	90 mm
Weight	120 g	300 g



#### Environmental

Compliance: RoHS, CE

Operating temperature: 15 °C to 35 °C at rated accuracy, -20 °C to +50 °C at reduced accuracy

Storage temperature: -30 °C to +85 °C

Relative humidity: 0 to 70% up to 35 °C at rated accuracy, up to 95% non-condensing at reduced accuracy

### Ordering information

#### Part number Description

240-2P	2-input cryogenic temperature sensor input module
240-8P	8-input cryogenic temperature sensor input module

#### Accessories/options

240-ACC-KIT	240 Series accessory kit. Contains items needed for configuration of one or more 240 modules. Includes: 240 Series manual, 240 Series quick start guide, USB cable, flash drive containing product data and software, 240 Series screwdriver, 2 spare power, 4 spare sensor, and 2 spare backplane connectors.
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All specifications are subject to change without notice