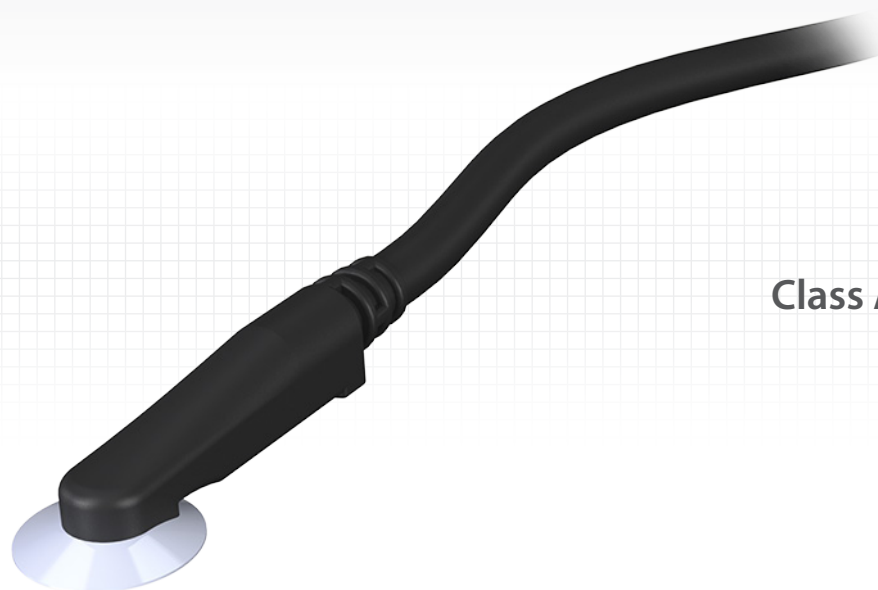




CS240DM

Class A PRT Back-of-Module Temperature Sensor with Digital RS-485 Output



**Proven,
Rugged Design**
Class A accuracy at any cable length

Overview

The CS240DM is a best-in-class smart sensor with a rugged, surface-mountable, platinum resistive thermometer (PRT) that measures back-of-module temperature on solar photovoltaic (PV) panels. The CS240DM includes a new Campbell Scientific

precision analog-to-digital, smart-sensor module for making back-of-module temperature measurements that are among the most accurate available today.

Benefits and Features

- › Best-in-class measurement accuracy and technology
- › Modbus RTU RS-485 digital serial communications
- › Precision PT1000 Class A sensing element
- › Compliant with IEC 60751, DIN EN 60751
- › Calibration certification NIST traceable
- › Purchased with any cable length
- › Rugged design proven in over 4,000 installations worldwide

Technical Description

The CS240DM consists of a PT1000 Class A PRT encased in an aluminum disk. The disk protects the PRT, particularly during installation when pulled through conduit, and promotes heat transfer from the surface while minimizing convective heat loss to the surroundings. An adhesive tab on the disk fastens the CS240DM to the measurement surface. If the temperature may exceed 70°C, Kapton tape is also required to secure the probe.

The precision analog-to-digital, smart-sensor module is based on the CR1000X. The module design is optimized for the Class A PRT that minimizes self-heating and lead-wire resistance. Measurement electronics are surge protected, include 1200 V isolation,

and are environmentally protected with a rugged over-molding featuring an IP65 rating. Data is differentially transmitted in cabling that is well suited for industrial energy applications with excellent noise rejection and high voltage, NEC outdoor, UV, UL, and NEC ratings.

The CS240DM provides PV stakeholders with highly accurate back-of-module temperature, even at long cable lengths, for use in power-performance modeling and simulation of solar energy applications. Back-of-module temperature is critical for any evaluation of effective irradiance and power conversion.

questions & quotes: +61 (0)7 4401 7700

www.campbellsci.com.au/cs240dm



Ordering Information

Surface-Mount Temperature Probe

CS240DM PT1000 Class A, back-of- module temperature sensor with digital Modbus output

Standard Options (choose one)

- S1 17 ft (5 m) cable with pigtails.
- S2 50 ft (15 m) cable with quick connect and pigtails
- S3 150 ft (45 m) cable with quick connect and pigtails
- S4 Sensor head only with quick connect
- U Cable with user-defined length and quick connect. Must choose a cable termination option (see below)

Cable Termination Options

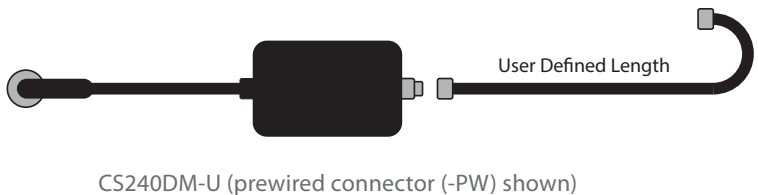
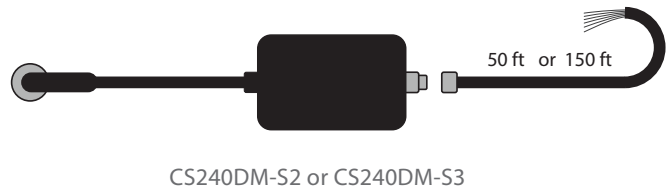
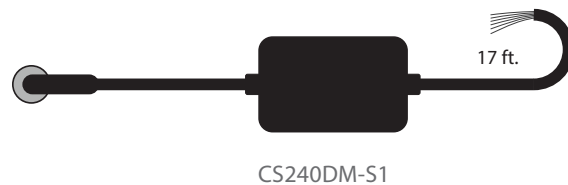
- PT Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW Cable terminates in a connector for attachment to a prewired enclosure.

Temperature Calibration

- NC No calibration
- CC Setup and fee for 2-point calibration

Common Accessories and Replacement Cables

- 27015** Heat-resistant Kapton tape with silicone adhesive
- CS240DMCBL-L** Replacement cable with user-defined length and quick connect. Enter length, in feet, after the -L. Must choose a cable termination option (see above)
- CS240DM3TPCBL-L** 3-Twisted Pair Shielded Cable with user-defined length and quick connect. Enter length, in feet, after the -L. Must choose a cable termination option (see above)



Specifications

Sensing Element

- Precision 1000 ohm Class A platinum sensing element (PT1000)
- Accuracy: $\pm (0.15 + 0.002t)$
- Long-term stability: maximum R_0 drift 0.04% after 1000 h at 400 °C
- Measurement Temperature Range: -40° to 135°C

Surge Protection

- 1200 V isolation

Communications

- Modbus RTU Protocol over RS-485
- Format: 8 data bits, 1 stop bit, even parity as default, user-configurable
- Baud Rate: 19,200 bps as default, user configurable
- Modbus ID: last two digits of serial number as default, user configurable

Physical

- Disk Material: anodized aluminum
- Disk Diameter: 2.54 cm (1.0 in)
- Overall Probe Length: 6.35 cm (2.5 in)
- Weight: 90.7 g with 3.2 m cable (0.2 lb with 10.5 ft cable)

Overmolded Joint Dimensions

Width	Height	Length
1.12 cm (0.44 in)	1.47 cm (0.58 in)	5.72 cm (2.25 in)

Cable

- High flex construction with jacket for pulling through conduit
- Jacket Material: black semi-gloss PVC, UL VW-1 sunlight resistant for outdoor use
- Agency approvals include UL AWM Style 2463 and NEC/CEC CMX outdoor
- Weld spatter and oil resistant
- Nominal Wire Diameter: 0.61 mm (0.024 in)

Compliance Information

- Approvals: UL AWM 2586 1000 V 105°C; CSA AWM 600 V 105°C FT
- Conforms with Electromagnetic Compatibility Directive (EMC)
- Conforms with the Restriction of Hazardous Substances Directive (RoHS2)
- View the EU Declaration of Conformity document at: www.campbellsci.com/cs240dm, www.campbellsci.com/cs240dmcbl-l, or www.campbellsci.com/cs240dm3tpcbl-l



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