



## Overview

The CS250DM is a PT-1000 Class-A air temperature sensor for temperature gradient and stability analysis. This sensor delivers extremely accurate and precise air temperature data that is necessary for IEC 61724 Class-A solar monitoring

applications and Delta Temperature ( $\Delta T$ ) calculations. It also includes a digital Modbus RS-485 output, ensuring data quality over long cable lengths.

## Benefits and Features

- ▶ High accuracy and precision
- ▶ Exceeds IEC 61724-1 standards for ambient air temperature measurements
- ▶ Exceeds EPA standards for  $\Delta T$  measurements
- ▶ Digital Modbus RS-485 output ensuring data quality over long cable lengths
- ▶ Best-in-class noise protection and isolation meet IEC Class 4 standards
- ▶ NIST-traceable, serialized calibration certificate supplied with every sensor

## Technical Description

The CS250DM uses a precision PT-1000 class A platinum resistor thermometer (PRT) to provide the highest level of accuracy. The cable includes a Campbell Scientific precision analog-to-digital, smart-sensor module for making the measurements. The module design is optimized for the class A PRT that minimizes self-heating and lead-wire resistance.

Measurement electronics are surge protected with 1200 V isolation and environmentally protected with a rugged overmolding with an IP65 rating.

When exposed to sunlight, the CS250DM should be housed in the RAD06 6-plate radiation shield.

## Specifications

Measurement Uncertainty	$\pm 0.3^{\circ}\text{C}$
Element Stem Material	316L stainless steel sheathed
Surge Protection	1200 V isolation
Supply Voltage	5 to 30 Vdc

Power Draw	15 mA
Temperature Coefficient	TCR = 3850 ppm/K
Stem Diameter	0.32 cm (0.125 in.)
Overall Stem Length	6.35 cm (2.5 in.)

Sensor Dimensions 17.15 x 11.13 x 6.05 cm (6.75 x 4.38 x 2.38 in.)

Sensor Weight 90.7 g (0.2 lb)

### Sensing Element

Precision 1000 ohm Class A platinum (PT1000)

Accuracy  $\pm(0.15 + 0.002t)^\circ\text{C}$

Long-Term Stability Maximum  $R_o$  drift = 0.04% after 1000 hours at 400°C

Measurement Temperature Range  $-75^\circ$  to  $+250^\circ\text{C}$

Time Constant 15 seconds in 5 m/s wind

### Communications

Protocol 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)

### Cable (Sensor Head to DM Board)

Wire Size and Type 24 AWG (7/32,RT38) copper

Insulation Type PFA insulated (Teflon®)

Insulation Rating  $-75^\circ$  to  $+250^\circ\text{C}$

Sheath Thin PFA sheathed overall

Number of Cores 3

Physical Properties Good abrasion and moisture resistance

Overall Diameter 2.1 mm (0.08 in.)

### Cable (DM Board to PT)

Wire Size and Type 24 AWG (7/32) tinned copper

Insulation Type PVC

UL AWM 10012 1000V 105°C

Filler Fibrillated polypropylene as required for uniform round construction

Drain 24 AWG (7/32) tinned copper (cabled, touching foil)

Shield Aluminum/Mylar (100% coverage, 25% minimum overlap, foil facing in)

Nominal Wire Diameter 0.61 mm (0.024 in.)

For comprehensive details, visit: [www.campbellsci.eu/cs250dm](http://www.campbellsci.eu/cs250dm) 



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