

μSMART SERIES

TEMPERATURE SENSORS



Monitor Sensors manufacture a range of Temperature sensors for various environmental applications ranging from measurement of ambient conditions, crop temperature monitoring through to cattle comfort (heat stress) analysis. Standard sensors use a miniature diode connected transistor sensor mounted either at the end of a 4 mm diameter stainless steel tube projecting from the electronic sensor housing or on an extension cable for attachment to plants or tree canopies.

Other non-standard sensor types such as thermocouples, RTDs and precision quartz sensors are available for high temperature, process and laboratory applications. The sensing element is connected to a microprocessor controlled electronics package and provides an output in 0.01 deg C steps in low-resolution mode. A higher resolution providing steps of 0.002 deg C is available with appropriate sensors. Resolution depends on type of sensor and the span selected. (The above resolution figures are for standard configurations only).

The microprocessor provides a host of features such as control and alarm outputs, 16-bit resolution (1 part in 65,000) and dual output signals. Each unit is provided with a multi-point calibration curve for maximum accuracy across the range. With most systems, changeover of a sensor means either recalibration of the system or resetting of parameters in the data logger or other data collection devices. The μSmart sensor eliminates this requirement as the on-board microprocessor ensures that all sensor types exhibit the same electronic specifications, and thus have identical performance characteristics.

Sensors conform to global algorithm in all output modes and for operation in digital, voltage or current mode, sensors are supplied with individual calibration certificates to enable software conversion to engineering units. In serial mode, the sensor reports in engineering units and the global algorithm is implemented internally.

Features

- Low power Consumption
- Stainless Steel Housing
- Weatherproof Construction
- Robust design
- Frequency, Voltage or Serial data output
- 2 control/Alarm-output
- Multiple Calibration points
- Independent/Stand-alone Operation
- Customer configured alarm/Control Set-points

Applications

- Atmospheric Pressure Monitoring
- Automatic Weather Stations
- Meteorological
 - Animal & Human Comfort
- Horticulture & Agriculture
- Laboratory - high accuracy
- Temperature Measurement
 - Micro Climate Studies
 - Equipment Control

Air Temperature Sensor - Model TA1

The Air Temperature sensor measures ambient air temperature and is mounted in an upright position in a sensor shelter (Models: SS4/SS5) or a conventional Stevenson Screen.

Soil Temperature Sensor - Model TS1

Soil temperature sensors are identical to the model TA1 except for extra cable to allow the sensor to be buried in the soil at the required depth.

Grass Temperature Sensor - Model TG1

Grass temperature sensors have a white painted metal flag attached to the sensor element. This simulates the radiation and thermal lag characteristics of the glass/alcohol grass minimum thermometer.

Leaf Temperature Sensor - Model TL1

Leaf temperature sensors are similar in design to air temperature sensors but the sensing element is extended from the body using a 1 metre long PVC covered twin core cable. The sensor element measures 4 mm x 2 mm x 1 mm and should be thermally coupled to the leaf or other surface using "Blue Tac" or a similar dry adhesive. The sensor body length is 160 mm and 25 mm in diameter.

Black Globe Temperature Sensor - Model TB1

This temperature sensor monitors the effects of direct solar radiation on an exposed surface. The sensor is located inside a 160 mm diameter copper globe coated with a special matt black finish. This sensor is intended for use with ambient air temperature and relative humidity sensors to monitor animal and human comfort factors. The TB1 can also monitor the

direct radiation on metal surfaces such as railway lines.

Water Temperature Sensors - Model TW1

The TW1 is a fully sealed and immersible sensor for water monitoring applications. The sensor is mounted in a stainless steel body with copper heat sink to monitor water temperature. The TW1 is available in 2 sizes: length 257 mm/OD 37 mm and length 220 mm/OD 32 mm.

4 Channel Temperature Sensor- Model TM2/3/4

The TT1 offer up to 4 serial data channels of temperature information that can be used in any of the applications the individual temperature sensors would be used. The individual Thermistor heads are matched to ensure the calibration of the sensor is as close as possible to the individual sensor specification.

General Specifications:

Accuracy:	$\pm 0.1^{\circ}\text{C}$ (all individual sensors) $\pm 0.1^{\circ}\text{C TM1}$ $<\pm 0.05^{\circ}\text{C}$ with high precision platinum resistance probe.		
Resolution:	0.01 $^{\circ}\text{C}$ Low 0.002 $^{\circ}\text{C}$ High		
Temperature Range:	-20 $^{\circ}\text{C}$ to +60 $^{\circ}\text{C}$ (Custom ranges are available)		
Humidity Range:	0-100%		
Measurement Units:	Degree Celsius/Degrees Fahrenheit (Software selectable)		
Sensor Type:	Surface mounted transistor (individual sensors) Matched thermistors (TT2 heads) (Other options available)		
Data Output:	Serial data ASCII format. Plus, either Voltage 0-1 volt, 0-2.5 or 0-4 volts Frequency +5 volt pulse 2-10 Hz Note: serial output only on TM1)		
Options:	4-20 ma Output (Not available on TM1)		
Power Supply:	5-28 v DC unregulated		
Current Drain:	<1.5 ma		
Weight (unpacked):	230 grams (except for the TB1, which is <500 grams)		
Dimensions:	Length 225 mm	Diameter 25 mm	
Standard Cable Lengths:	TA1 0.8 m TL1 4.0 m	TS1 4.0 m TB1 4.0 m	TG1 4.0 m TW1 2.0 m
Associated Products:	SS4 & SS6 SS1 TA1 AWS1 SI8 SL(x)	Sensor Shelters Mini Sensor Shelter Wet & Dry Temperature Sensor Automatic Weather Station Interface module for RS232 Data Logger various options Water Quality Station	

Quality Assurance

Monitor Sensors' products are manufactured under a third party accredited ISO9002 System.