



Solar PV Monitoring & Analytics

Datasheet & Installation Guide Module Temperature Sensor [MSPT 100V]

Internet of Things

Solar Energy



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MODEL

MSPT 100V

DATASHEET

Introduction

The module temperature sensor is used by PV plant operators to know the temperature of the modules installed in the array. The module temperature sensor converts this reading into a voltage signal. This signal is sent back to the monitoring device.

As the system operator it's important to know the systems' performance. The module temperature sensor will help to enhance kWh performance by ensuring reliable access to the all necessary data.

Features

- Fast, stable and accurate
- Ip65 enclosure excellent long-term stability
- Onsite two-point calibration
- Loop powered

Applications

- PV module surface temperature measurement
- Weather monitoring systems

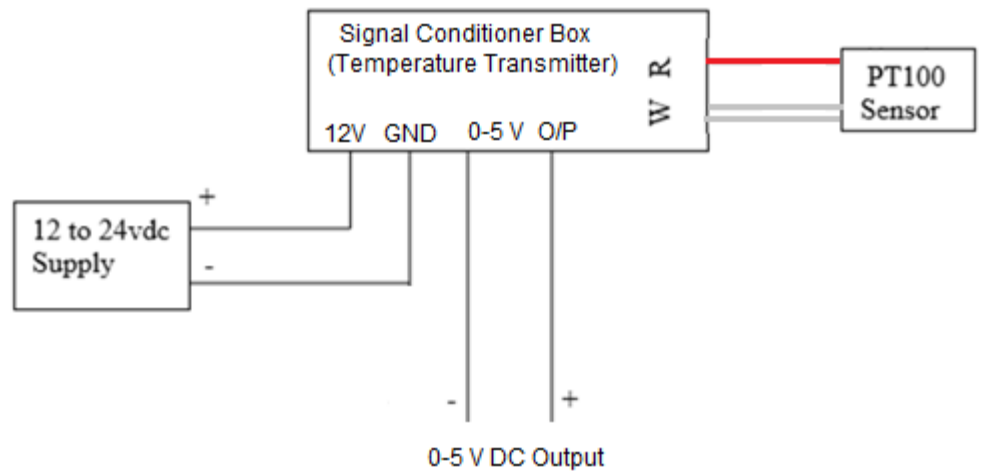
Specifications

Measuring Range	0 to 100 °C
Accuracy	± 0.5 °C
Sensor Type	RTD PT100 Ω
Supply Voltage	12-24 VDC
Output	A. 4 – 20 mA
A, B, C are 3 different models	B. 0 – 5 VDC
	C. MODBUS RTU
Weight	Approx. 150 gms
Sensor Housing	Silicone Rubber Patch
Cable:	3 m PTFE insulated, twisted pair lead, 3 core, 7/0.1mm

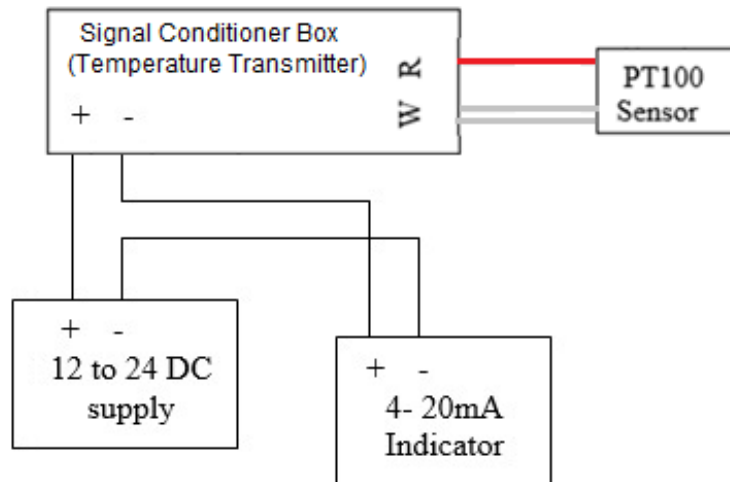


Wiring Diagram

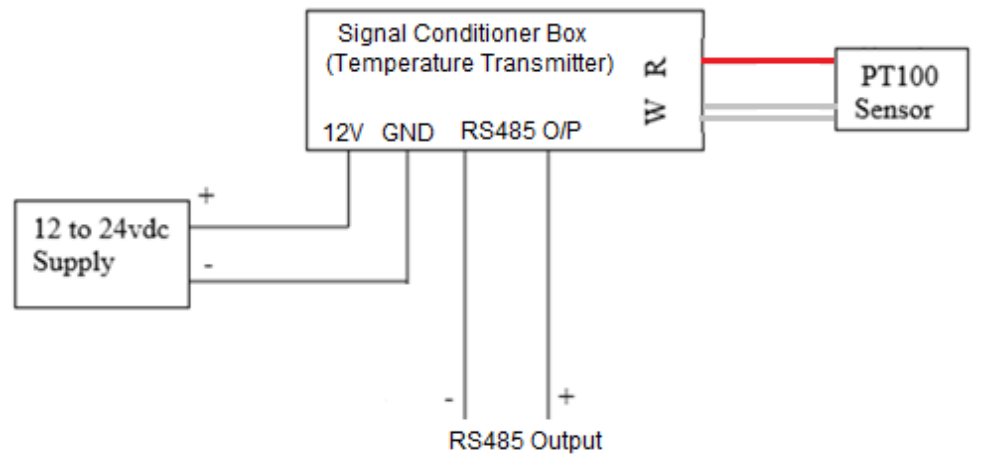
**I/O Specifications for
0-5 V DC Sensor Output**



**I/O Specifications for
4-20 mA Sensor Output**



**RS485 pinout for Sensor with
RS485 Output**



INSTALLATION

Guidelines

The following guidelines are recommended while installation of a Solae Module Temperature:

- This sensor is designed to attach directly to any solar panel. When placed on the center back side of the panel, it accurately measures the temperature of the panel.

Tools and Materials Needed

Please make sure you have all the necessary material as mentioned below:

- Wrench or pliers
- Wire cutters and stripper
- Multi meter
- Wire ties and tabs
- Electrical Tapes to cover the wire

Location Recommendation

Use the following guidelines to determine the best location for mounting the module surface temperature Sensor

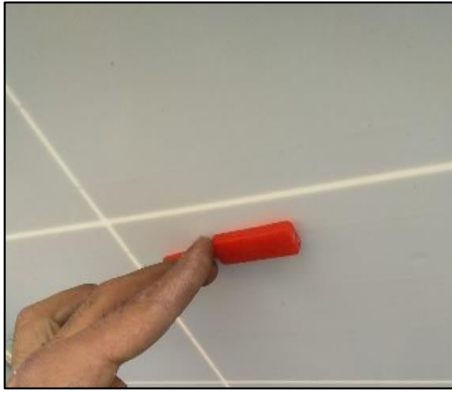
- Select a PV module that remains un-shaded throughout the day.
- For best operation, this sensor housing should be mounted flat against the surface to be measured.

Mounting

Observe the following requirements regarding the mounting location of the module temperature sensor:

- Select a PV module that remains un-shaded throughout the day.
- Prior to installation of the PV temperature sensor onto the PV panel, the installation area of the panel back should be thoroughly cleaned until it is greaseless, dry, and dust-free. This cleaning will ensure a good bond between sensor and panel and allow for accurate panel temperature readings.
- Affix the module temperature sensor to the panel back using the thermally conductive adhesive provided.
- Press the sensor firmly against the surface.
- Do not attempt to extend or shorten the pre-assembled 2m cable.
- Tie the sensor cable off in a way that does not pull on the sensor

Example Installations



Calibration

- If using Modbus sensor then the PV Module Temperature Sensor is factory calibrated.
- If using analog output sensor then use the following info to calibrate:
 - **Output:** 0 - 5 V_{DC} (0- 100 deg C)
 - **Temperature** in deg C = 20 * Sensor Output voltage (in Volt)
 - **Output:** 4-20mA (0- 100 deg C)
 - **Temperature** in deg C = 6.25 * (Output in mA - 4)
- If using RTD output then the sensor needs to be read as per this table: [Link](#)
- If the cable length is insufficient for the installation, additional cable can be added to the existing cable. If this is done, an accuracy de-rating factor must be added to the overall temperature accuracy of this sensor.

It is highly recommended that the calibration be checked annually

Logger Connections

- For ANALOG output connections (Voltage or Current) , please search for '*Installation Guide – Analog Sensors*' on: <https://trackso.in/trackso-installation-manuals/>
- For MODBUS output connections, please search for '*Installation Guide – MODBUS Sensors*' on: <https://trackso.in/trackso-installation-manuals/>

Sensor Maintenance

- It is recommended that the accuracy of the sensor is verified every 12 months.

Yearly maintenance

- Check all the electrical connections. Check cables for damage caused by accident or by rodents.
- Inspect cable quality, inspect cable glands, inspect mounting position, inspect cable, clean instrument, clean cable, inspect levelling, change instrument tilt in case this is out of specification, inspect mounting connection, inspect interior of dome for condensation and take necessary corrective actions.
- When operating multiple instruments in a network TrackSo recommends keeping procedures simple and having a few spare instruments to act as replacements during service and recalibrations.

Troubleshooting

A problem with a temperature sensor is normally detected through an error in temperature indication. Since all of temperature indication errors are not caused by the temperature sensor, it is necessary to accurately grasp what is causing the problem. The most frequent problem causes would be connection issues, breakage or defects in the insulation of the RTD sensor.

Situation	Comments
The sensor signal / output is unrealistically high or low.	<ul style="list-style-type: none">• Check if the right calibration factor is entered into the algorithm.• Check the condition of the wiring at the logger.• Check the cable condition looking for cable breaks.• Check for local heat sources affecting your readings
The sensor signal shows unexpected variations	<ul style="list-style-type: none">• Check the presence of strong sources of electromagnetic radiation (radar, radio etc.)• Check the condition of the shielding.• Check the condition of the sensor cable.• Check if the cable is not moving during the measurement
Output is 0 or 103 deg C	<ul style="list-style-type: none">• Check -ve and +ve leads are correct and connected properly• Physically inspect RTD sensor for damage• Resolve Sensor Break/Open circuit errors• Test faulty resistance thermometer with a multimeter. The resistance of the sensor can also be identified by measuring the measurement resistance across red and white wire of the sensor. The nominal resistance equals 100 Ω (at 0 degrees). Normal reading at room temperature should be in range of 107.793-109.735Ω

References

- Troubleshooting method for Temperature sensor- [Link](#)

Disclaimer

This sensor is a low-cost alternative to the Class 1/Class 2 sensors of the same type. Since this sensor fall under no class, there will be some variation in the real vs. expected values. If you wish to minimise the error/deviation in output values, we recommend that you purchase Class 1/Class 2 sensor.

Please note this product is not manufactured by TrackSo, but sold by TrackSo, warranties are only to the limits extended by the original manufacturer.

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Warranty

Applicable Warranty Term & Conditions is available on - <https://trackso.in/warranty/>

Repair - For all returns for repair or warranty claims, the customer must fill out a "Service Form". The form is available from our website at <https://trackso.in/service-form/>. A completed form must be submitted online. TrackSo is unable to process any returns for repair or warranty until this form is received. If the form is not received within three days of product receipt or is incomplete, the product will be returned to the customer at the customer's expense.

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