



Solar PV Monitoring & Analytics

## Datasheet & Installation Guide Ambient Temperature Sensor [MPT 100V]

Internet of Things

Solar Energy



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## MODEL

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MPT 100V

## DATASHEET

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### Introduction

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It is an ambient temperature with or without naturally aspirated, 6-plate radiation shield. Its louvered construction allows air to pass freely through the shield, serving to keep the probe at ambient temperature. The shield's white color reflects solar radiation.

The most effective passive shelter protects temperature sensor from solar radiation and other sources of radiated and reflected heat. It's a multi-plate construction for maximum airflow.

### Specifications

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<b>Construction</b>	UV-stabilized white thermoplastic plates, aluminum mounting bracket, white powder-coated, stainless-steel U-bolt clamp
<b>Plate Diameter</b>	196 mm
<b>Plate Height</b>	110mm
<b>Measuring Range</b>	0 to 100 deg C
<b>Accuracy</b>	± 0.5 deg C
<b>Output</b>	A. 0 – 1 VDC B. 0 – 5 VDC C. 4 – 20 mA D. MODBUS RTU
<b>Supply Voltage</b>	12 to 24 VDC
<b>Housing Electronics</b>	Poly carbonate watertight enclosure Protection: IP-65

### With Radiation Shield

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### Without Radiation Shield

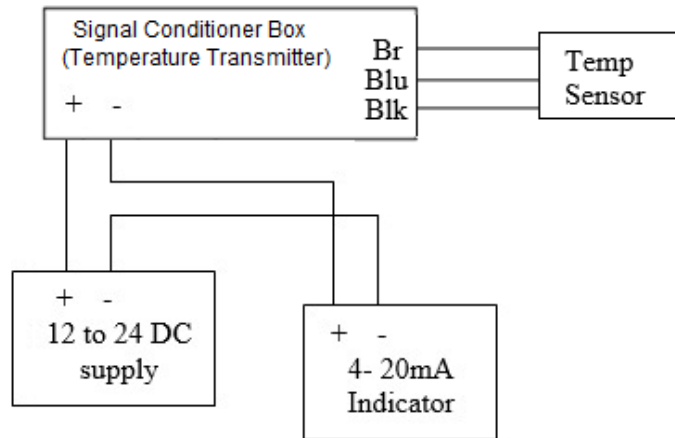
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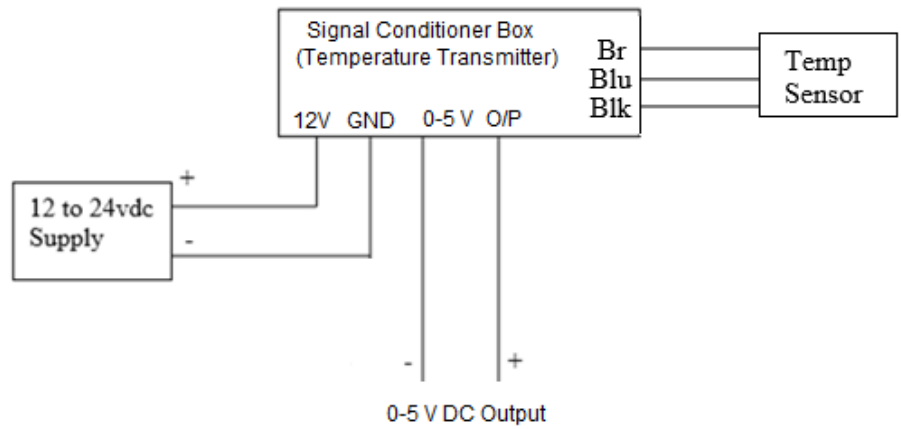
# Wiring Diagram

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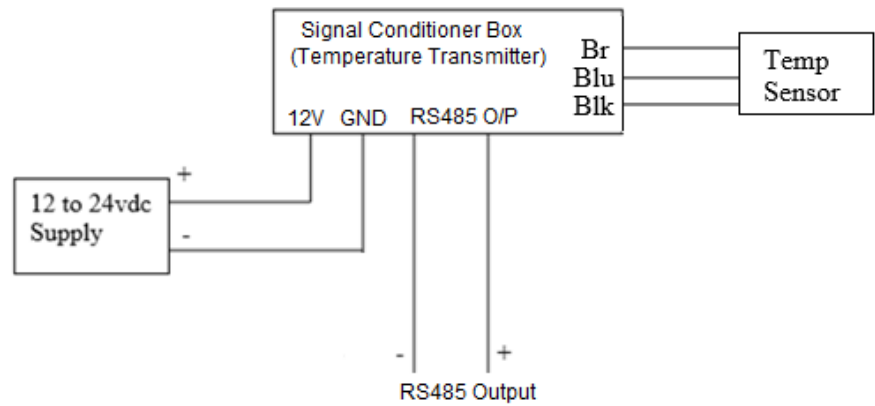
**I/O Specifications for  
4-20 mA Sensor Output**



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



**RS485 pinout for  
Sensor with RS485 Output**



## INSTALLATION

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### Guidelines

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The ambient temperature sensor can be installed anywhere in the vicinity of the PV array. It is recommended to place the Ambient Temperature Sensor on the north side (in the northern hemisphere) of the array, otherwise you must provide array shading setback

### Tools and Materials Needed

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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

Might be needed for mounting:

- Hammer
- Drill with 3/16 in drill bit (4.7 mm) to drill pilot holes
- Adjustable wrench or 11/32 in. wrench and 7/16 in

### Location Recommendation

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

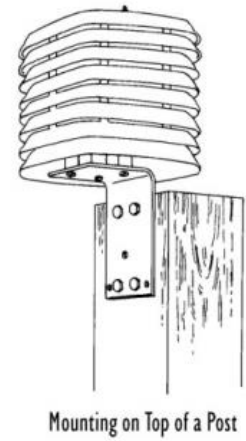
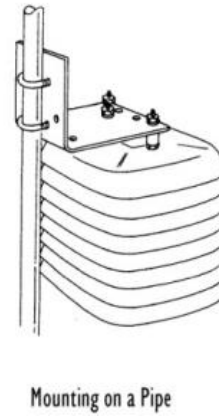
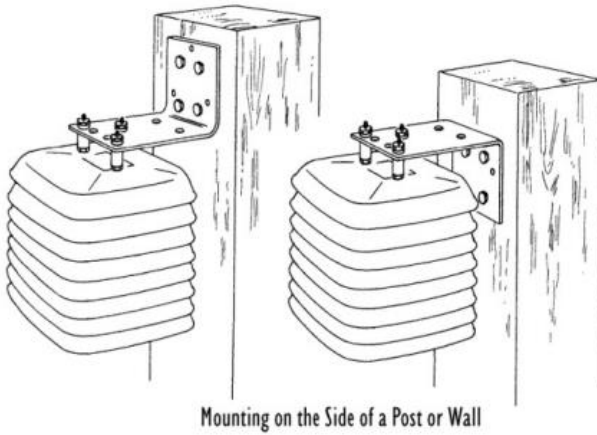
- It works best when in a location with a steady breeze. Mount away from fences, buildings, trees, or other obstructions.
- Do not install over or near sprinklers.
- If attaching to a building, the preferred location is the north side in the northern hemisphere and the south side in the southern hemisphere.

## Mounting

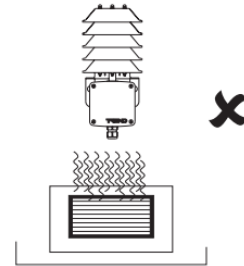
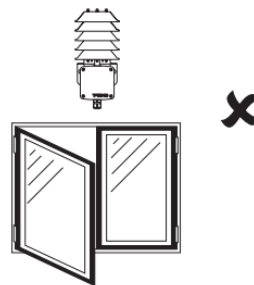
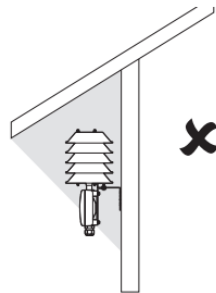
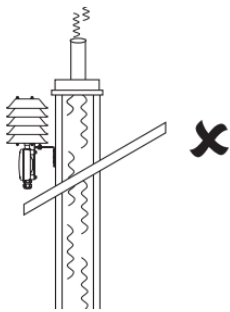
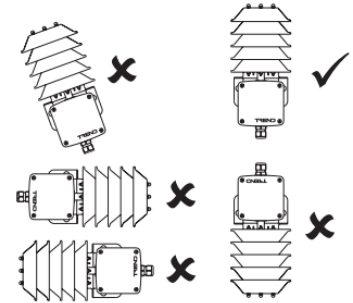
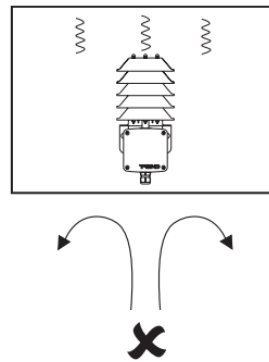
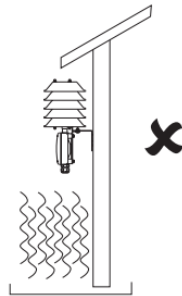
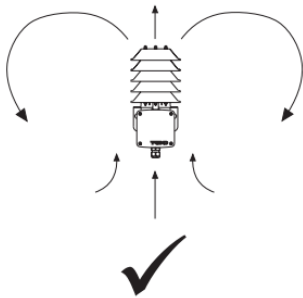
Observe the following requirements regarding the mounting location of the module temperature sensor.

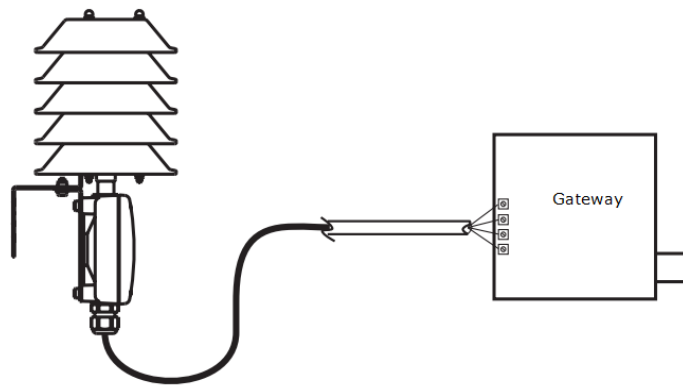
The Solar Radiation Shield may be mounted in three orientations.

- On the side of a wooden post or a wall
- On a metal pipe with outside diameter between 1 in. and 1-1/4 in. (25 mm and 31 mm)
- On top of a wood post



## Orientation





## Example Installations



## Calibration

- If using Modbus sensor, then the Ambient Temperature is factory calibrated.
- If using analog output sensor then use the following info to calibrate:
  - **Output:** 0 - 5 V<sub>DC</sub> (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)

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

- Over time, the sensing element may become covered in dust. The dust can be removed using compressed air.
- The effectiveness of the Radiation Shield will be reduced if the surfaces of the shield become dirty. Wipe the surfaces of the shield using a damp cloth to remove dirt, debris, etc.
- Keep areas between Radiation Shield plates free of debris that may obstruct air flow e.g., leaves, twigs, webs.

- Under no circumstances should water or cleansing agents be used on the sensing elements.
- DO NOT remove nesting insects or animals by spraying insect killer of any kind into the Radiation Shield because this may damage the sensors and the Radiation Shield.

#### Yearly maintenance

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

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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"> <li>• Check if the right calibration factor is entered into the algorithm.</li> <li>• Check the condition of the wiring at the logger.</li> <li>• Check the cable condition looking for cable breaks.</li> <li>• Check for local heat sources affecting your readings</li> </ul>
The sensor signal shows unexpected variations	<ul style="list-style-type: none"> <li>• Check the presence of strong sources of electromagnetic radiation (radar, radio etc.)</li> <li>• Check the condition of the shielding.</li> <li>• Check the condition of the sensor cable.</li> <li>• Check if the cable is not moving during the measurement</li> </ul>
Output is 0 or 103 deg C	<ul style="list-style-type: none"> <li>• Check -ve and +ve leads are correct and connected properly</li> <li>• Physically inspect RTD sensor for damage</li> <li>• Resolve Sensor Break/Open circuit errors</li> <li>• 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 <math>\Omega</math> (at 0 degrees). Normal reading at room temperature should be in range of 107.793-109.735<math>\Omega</math></li> </ul>

#### References

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



## Disclaimer

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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

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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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