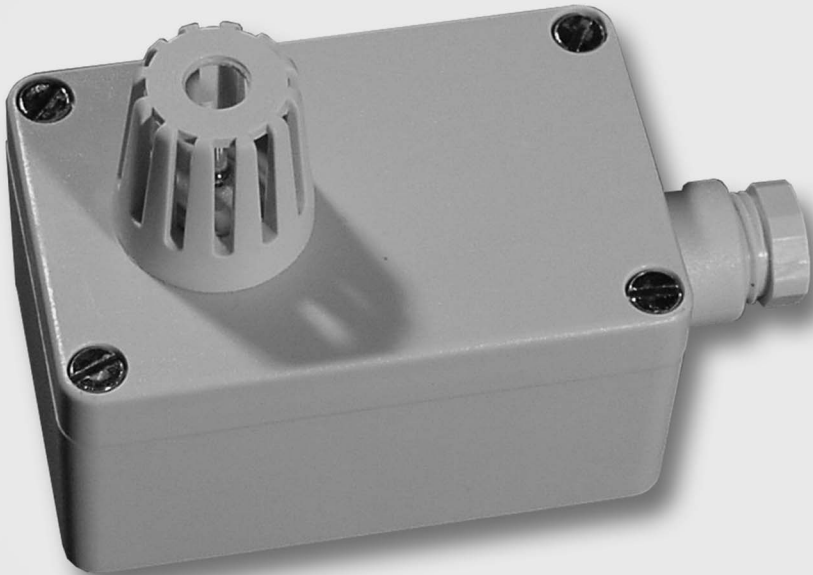




Ambient Temperature Sensor
TEMPESENSOR-AMBIENT
Installation Guide



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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions for TEMPESENSOR-AMBIENT system monitoring, that must be followed during installation and maintenance of the system monitoring.

The TEMPESENSOR-AMBIENT is designed and tested according to international safety requirements, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the TEMPESENSOR-AMBIENT. To reduce the risk of personal injury and to ensure the safe installation and operation of the TEMPESENSOR-AMBIENT, you must carefully read and follow all instructions, cautions and warnings in this installation guide.

Warnings in this document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the SMA equipment and/or other equipment connected to the SMA equipment or personal injury.



DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Other Symbols in this document

In addition to the safety and hazard symbols described on the previous pages, the following symbol is also used in this installation guide:



Information

This symbol accompanies notes that call attention to supplementary information that you must know and use to ensure optimal operation of the system.

General Warnings



General Warnings

All electrical installations must be done in accordance with the local and *National Electrical Code*® ANSI/NFPA 70 or the *Canadian Electrical Code*® CSA C22.1. This document does not and is not intended to replace any local, state, provincial, federal or national laws, regulation or codes applicable to the installation and use of the system monitoring, including without limitation applicable electrical safety codes. All installations must conform with the laws, regulations, codes and standards applicable in the jurisdiction of installation. SMA assumes no responsibility for the compliance or noncompliance with such laws or codes in connection with the installation of the system monitoring.

Before installing or using the TEMPENSOR-AMBIENT, read all of the instructions, cautions, and warnings on the TEMPENSOR-AMBIENT in this installation guide.

Before connecting the TEMPENSOR-AMBIENT to the electrical utility grid, contact the local utility company. This connection must be made only by qualified personnel.

Wiring of the TEMPENSOR-AMBIENT must be made by qualified personnel only.

Table of Contents

- 1 Notes on this Guide 9**
- 1.1 Area of Validity 9
- 1.2 Target Group 9
- 1.3 Nomenclature 9
- 2 Safety 10**
- 2.1 Appropriate Usage 10
- 2.2 Safety Instructions 10
- 3 Scope of Delivery 11**
- 4 Mounting 12**
- 4.1 Selecting the Mounting Location 12
- 4.2 Mounting the Ambient Temperature Sensor 12
- 5 Electrical Connection 13**
- 5.1 Connecting Cables to the Ambient Temperature Sensor 14
- 5.2 Connecting the Ambient Temperature Sensor to the Sunny SensorBox 15
- 6 Decommissioning 17**
- 6.1 Disassembling the ambient temperature sensor 17
- 6.2 Disposing of the Ambient Temperature Sensor 17
- 7 Technical Data 18**
- 8 Contact 19**

1 Notes on this Guide

This guide describes the installation and commissioning of the ambient temperature sensor. Keep this guide in a convenient place for future reference

1.1 Area of Validity

This guide applies to the TEMPENSOR-AMBIENT upgrade kit.

1.2 Target Group

This guide is for qualified electrically skilled persons. Qualified electrically skilled persons are sufficiently trained and have proven capabilities and knowledge for the construction and operation of this device. Qualified electrically skilled persons are trained to deal with the dangers and hazards involved in installing electrical systems.

1.3 Nomenclature

Within this document, SMA America Production, LLC and SMA Solar Technology Canada Inc. are referred to in the following as SMA.

2 Safety

2.1 Appropriate Usage

The TEMPENSOR-AMBIENT ambient temperature sensor consists of a PT100 measuring resistor that is accommodated in a NEMA 3 plastic enclosure. The TEMPENSOR-AMBIENT temperature sensor enables a measurement in a 4-cable system. The measurement range of the ambient temperature sensor is between $-22\text{ }^{\circ}\text{F}$ ($-30\text{ }^{\circ}\text{C}$) and $+176\text{ }^{\circ}\text{F}$ ($+80\text{ }^{\circ}\text{C}$). The sensor is to be connected to the Sunny SensorBox for further processing of the ambient data.

The ambient temperature sensor is suitable for use only with original SMA accessories or with accessories recommended by SMA.

Appropriate usage also includes observing all further documentation relating to this device and its components.

2.2 Safety Instructions

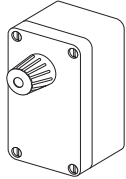
NOTICE

Overvoltage through lightning strike.

Fire and damage of connected devices possible.

- Integrate the TEMPENSOR-AMBIENT into the existing lightning protection.

3 Scope of Delivery



A



B



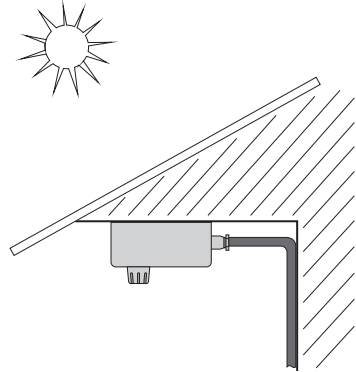
C

Position	Quantity	Description
A	1	TEMPSENSOR-AMBIENT (ambient temperature sensor)
B	2	Screw
C	2	Screw anchor

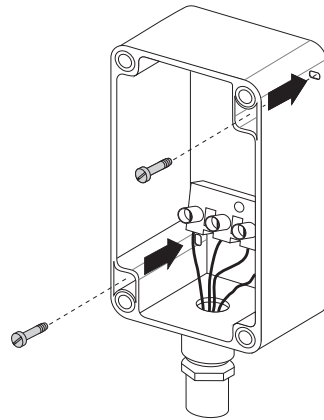
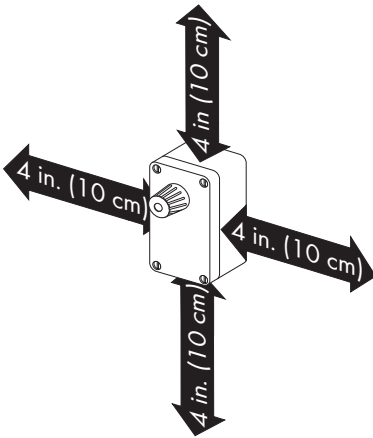
4 Mounting

4.1 Selecting the Mounting Location

- The ambient temperature sensor may not be assembled with the cable gland facing upwards in order to prevent water from accumulating on the cable gland.
- Protect the ambient temperature sensor from severe contamination and spray.
- See adjacent image for recommended alignment of the ambient temperature sensor.
- Select an installation location which is in shade throughout the entire day.
- Make sure that heat cannot accumulate at the installation site.
- Observe the maximum cable length of 98 ft. (30 m).



4.2 Mounting the Ambient Temperature Sensor



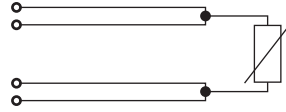
1. Undo four bolts on the ambient temperature sensor enclosure and remove the lid.
 2. Determine and mark out the mounting location. Ensure that the mounting space is observed (see figure).
 3. Fasten the ambient temperature sensor enclosure using the screws supplied.
- The ambient temperature sensor is mounted.

5 Electrical Connection



4-wire system

To offset measuring errors that occur due to cable resistance, connect the temperature sensor via the 4-wire system. This type of connection ensures that the current feed and voltage measurement are performed by separate pair cables. The length of the cable must not exceed 98 ft. (30 m).



Cabling Recommendations

NOTICE

Ingress of moisture in the ambient temperature sensor.

Damage to the ambient temperature sensor possible.

- Only use a cable with a diameter of at least $\frac{3}{16}$ in. (4.5 mm) for the connection of the ambient temperature sensor.

When working outdoors, ensure that no rain or snow enters the open ambient temperature sensor.

The cable length and quality have an effect on the signal quality. To achieve a good quality signal, observe the following instructions regarding cabling:

Outdoors

For outdoors, use a cable with the following key properties:

- Cross-section: minimum $4 \times 0.25 \text{ mm}^2$, minimum 4 x AWC 24
- External cable diameter: minimum $\frac{3}{16}$ in. (4.5 mm), maximum $\frac{9}{32}$ in. (7 mm)
- UV-resistant

SMA recommends the following cable types:

- Lapp cable: UNITRONIC S-LiYY 1 Y 4 x 0.34 mm^2
- Lapp cable UL-listed: UNITRONIC S-LiYY 1 Y 4 x 0.34 mm^2

Indoors

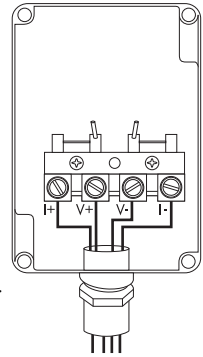
You can use a non UV-resistant cable with the above mentioned key properties, if you protect the cable against UV radiation by using a corresponding cable channel.

SMA recommends the following cable types:

- Lapp cable: Unitronic LiYY 4 x 0.5 mm^2
- Lapp cable UL-listed: UNITRONIC LiYY UL/CSA 4 x AWG22/7
- Helukabel: TRONIC LiYY 4 x 0.5 mm^2

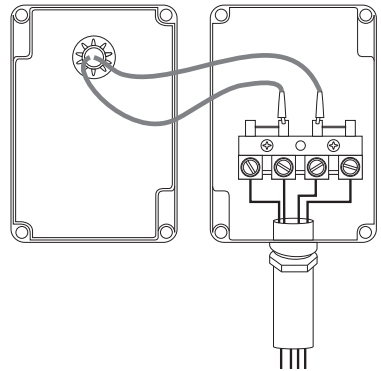
5.1 Connecting Cables to the Ambient Temperature Sensor

1. Undo the screws on the ambient temperature sensor enclosure and remove the lid.
2. Unscrew the cable gland on the ambient temperature sensor.
3. Remove the small interior protection plates. Make sure that the interior seal does not fall out.
4. Screw the cable gland halfway onto the enclosure.
5. Pull the cables through the cable gland of the ambient temperature sensor.
6. Connect the 4-wire system to the screw terminals, see image on the right.
7. Note the color of the wires:



I+ _____
 V+ _____
 V- _____
 I- _____

8. Turn the cable gland of the ambient temperature sensor hand-tight in the enclosure of the ambient temperature sensor (torque: $7 \frac{5}{64}$ in-lbs. (0.8 Nm)).
 9. Connect the plug from the lid of the ambient temperature sensor with the screw terminals, see image on the right. The polarity of the cables is user-defined.
 10. Fasten the lid of the ambient temperature sensor to the enclosure using the screws.
- The cable is connected to the ambient temperature sensor.



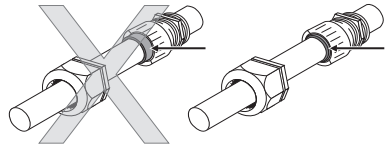
5.2 Connecting the Ambient Temperature Sensor to the Sunny SensorBox

The ambient temperature sensor is connected at terminal "F6: TmpAmb" of the Sunny SensorBox. Proceed as follows:

NOTICE

Ingress of moisture in the Sunny SensorBox.
Possible damage to the Sunny SensorBox.

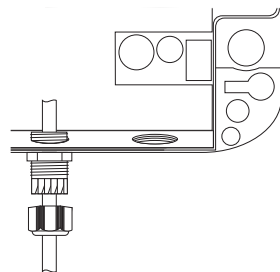
- Ensure that the seal fits correctly into the cable gland when inserting and removing the cable through the cable gland.



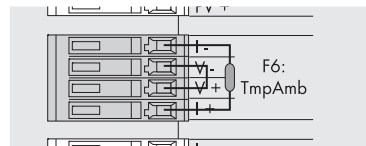
Damage to the Sunny SensorBox due to porous rubber seals.

The rubber gasket in the Sunny SensorBox lid becomes porous over the course of time, and will no longer provide a tight seal if the Sunny SensorBox is opened. If you open the Sunny SensorBox after an operating time of more than 5 years, e.g. for upgrading the device, the rubber gasket in the Sunny SensorBox lid must be replaced with a new one. In this event, order a replacement seal prior to maintenance work.

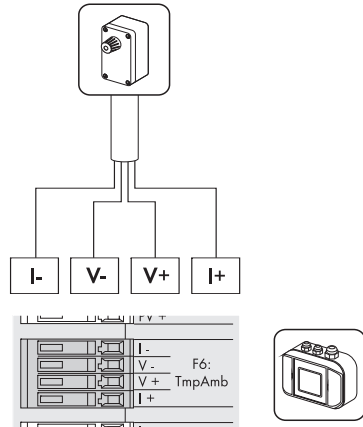
1. Open the lateral flaps of the Sunny SensorBox using the recesses.
2. Undo the screws in the corners of the Sunny SensorBox and open the enclosure lid towards the left. The lid is connected to the lower shell by hooks.
3. Unscrew the cable gland sleeve nut on the bottom center of the Sunny SensorBox and remove the filler-plug.
4. Route the ambient temperature sensor cable through the sleeve nut and fasten the cable glands of the Sunny SensorBox.



5. Remove the resistor and the bridge at terminal "F6: TmpAmb" in the Sunny SensorBox.



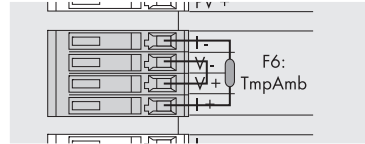
6. Connect the ambient temperature sensor to the terminal "F6: TmpAmb" of the Sunny SensorBox. Note the indicated colors of the insulated conductors (see page 14).
 7. Check that the cable gland grommet is correctly in place.
 8. Turn the locking nut hand-tight on the cable gland to fasten the cable (Torque: $7\frac{5}{64}$ in-lbs. (0.8 Nm)).
 9. Lay the cable using suitable fixing material.
 10. Place the Sunny SensorBox enclosure lid on the lower enclosure shell.
 11. Turn the screws hand-tight (torque: $8\frac{7}{8}$ in-lbs. (1 Nm)) in the lower enclosure shell.
- The ambient temperature sensor is connected to the Sunny SensorBox.



6 Decommissioning

6.1 Disassembling the ambient temperature sensor

1. Remove the ambient temperature sensor cable from the Sunny SensorBox.
2. Plug the resistor (100 Ohm) and the bridge to terminal "F6: TmpAmb" in the Sunny SensorBox.



3. Undo the screws on the ambient temperature sensor enclosure and remove the lid.
 4. Remove the enclosure from the wall.
- The ambient temperature sensor is disassembled.

6.2 Disposing of the Ambient Temperature Sensor

At the end of its life cycle, dispose of the ambient temperature sensor in accordance with the applicable disposal regulations for electronic waste at the installation location at the time. Alternatively, return it labeled as "ZUR ENTSORGUNG" ("for disposal") to SMA, at your own expense.

7 Technical Data

General Data

Width x height x depth	4 in. x 2 ³ / ₆₄ in. x 2 ⁴¹ / ₆₄ in. (100 mm x 52 mm x 67 mm)
Measuring resistor	PT100
Mounting location	outdoors

Environmental Conditions

Ambient temperature	- 22 °F ... +176 °F (- 30 °C ... +80 °C)
Degree of protection	NEMA 3

Connection cable¹⁾

Maximum cable length	98 ft. (30 m)
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Measurement Range and Tolerances

Tolerance	Maximum ± 1.26 °F (± 0.7 °C) (Class B)
Measuring range	- 22 °F ... +176 °F (- 30 °C ... +80 °C)

¹⁾not included in SMA scope of delivery.

8 Contact

If you have technical problems concerning our products, contact the SMA Serviceline. We need the following information in order to provide you with the necessary assistance:

- Ambient temperature sensor model
- Sunny SensorBox firmware version
- Sunny WebBox firmware version
- Measured values of the ambient temperature sensor

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