

SMA SENSOR MODULE

MD.SEN-US-40 (PC-SENS.BG1)

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As of: 9/15/2021

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1 Information on this Document

1.1 Validity

This document is valid for:

- SMA Sensor Module (MD.SEN-US-40) with assembly designation "PC-SENS.BG 1" from hardware version A1.

1.2 Target Group

The tasks described in this document must only be performed by qualified persons. Qualified persons must have the following skills:

- Knowledge of how an inverter works and is operated
- Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices and installations
- Training in the installation and commissioning of electrical devices and installations
- Knowledge of all applicable laws, standards and directives
- Knowledge of and compliance with this document and all safety information

1.3 Content and Structure of this Document

This document describes the installation, commissioning and decommissioning of the product.

You will find the latest version of this document and further information on the product in PDF format at www.SMA-Solar.com.

Illustrations in this document are reduced to the essential information and may deviate from the real product.

1.4 Levels of Warning Messages

The following levels of warning messages may occur when handling the product.

 DANGER
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE
Indicates a situation which, if not avoided, can result in property damage.

1.5 Symbols in the Document

Symbol	Explanation
	Information that is important for a specific topic or goal, but is not safety-relevant
	Indicates a requirement for meeting a specific goal
	Desired result
	A problem that might occur
	Example

1.6 Typographical Elements in the Document

Typography	Use	Example
bold	<ul style="list-style-type: none"> • Messages • Terminals • Elements on a user interface • Elements to be selected • Elements to be entered 	<ul style="list-style-type: none"> • Connect the insulated conductors to the terminals X703:1 to X703:6. • Enter 10 in the field Minutes.
>	<ul style="list-style-type: none"> • Connects several elements to be selected 	<ul style="list-style-type: none"> • Select Settings > Date.
[Button] [Key]	<ul style="list-style-type: none"> • Button or key to be selected or pressed 	<ul style="list-style-type: none"> • Select [Enter].
#	<ul style="list-style-type: none"> • Placeholder for variable components (e.g., parameter names) 	<ul style="list-style-type: none"> • Parameter WCtHz.Hz#

1.7 Designations in the Document

Complete designation	Designation in this document
PV system	PV system
SMA Sensor Module	Module, product

2 Safety

2.1 Intended Use

The SMA Sensor Module is a module for SMA inverters. The SMA Sensor Module has different interfaces for connecting various sensors. The SMA Sensor Module converts the signals of the connected sensors and transmits them to the inverter. The sensors are not included in the SMA Sensor Module's scope of delivery.

The SMA Sensor Module has the following interfaces:

- 2 temperature inputs for connecting the temperature sensors (e.g. module temperature sensor, external temperature sensor)
- 1 analog input for voltage or current signals (e.g. of an irradiation sensor)
- 1 supply voltage for a signal source (e.g. of an irradiation sensor)
- 1 SO interface (e.g. for connecting an anemometer or energy meter)

The product must only be installed in the following SMA inverters:

- STP 50-US-40 (Sunny Tripower CORE1-US)
- STP 33-US-41 (Sunny Tripower CORE1-US)
- STP 50-US-41 (Sunny Tripower CORE1-US)
- STP 62-US-41 (Sunny Tripower CORE1-US)
- SB3.0-1SP-US-40 (Sunny Boy 3.0-US)
- SB3.8-1SP-US-40 (Sunny Boy 3.8-US)
- SB5.0-1SP-US-40 (Sunny Boy 5.0-US)
- SB6.0-1SP-US-40 (Sunny Boy 6.0-US)
- SB7.0-1SP-US-40 (Sunny Boy 7.0-US)
- SB7.7-1SP-US-40 (Sunny Boy 7.7-US)
- SB3.0-1TP-US-40 (Sunny Boy 3.0-US)
- SB3.8-1TP-US-40 (Sunny Boy 3.8-US)
- SB5.0-1TP-US-40 (Sunny Boy 5.0-US)
- SB6.0-1TP-US-40 (Sunny Boy 6.0-US)
- SB7.0-1TP-US-40 (Sunny Boy 7.0-US)
- SB7.7-1TP-US-40 (Sunny Boy 7.7-US)
- SB3.0-1SP-US-41 (Sunny Boy 3.0-US)
- SB3.8-1SP-US-41 (Sunny Boy 3.8-US)
- SB5.0-1SP-US-41 (Sunny Boy 5.0-US)
- SB6.0-1SP-US-41 (Sunny Boy 6.0-US)
- SB7.0-1SP-US-41 (Sunny Boy 7.0-US)
- SB7.7-1SP-US-41 (Sunny Boy 7.7-US)

The inverter still complies with the standard after the product has been installed.

The product must only be operated with temperature sensors with a Pt100 measuring shunt or a Pt1000 measuring shunt.

The product must only be operated with irradiation sensors that can output a current signal in the range from 0 mA to 20 mA or 4 mA to 20 mA or a voltage signal in the range from 0 V to +10 V. The product must only be operated with anemometers with impulse output for S0 impulses in accordance with DIN EN 62053-31 (IEC 62053-31).

The product must only be operated with energy meters with S0 interface in accordance with DIN EN 62053-31 (IEC 62053-31).

A list with SMA Sensor Module compatible products is available at www.SMA-Solar.com.

All components must remain within their permitted operating ranges and their installation requirements at all times.

The product is approved for the US and Canadian market.

Use SMA products only in accordance with the information provided in the enclosed documentation and with the locally applicable laws, regulations, standards and directives. Any other application may cause personal injury or property damage.

Any use of the product other than that described in the Intended Use section does not qualify as the intended use.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient, dry place for future reference and observe all instructions contained therein.

This document does not replace and is not intended to replace any local, state, provincial, federal or national laws, regulations or codes applicable to the installation, electrical safety and use of the product. SMA Solar Technology AG assumes no responsibility for the compliance or non-compliance with such laws or codes in connection with the installation of the product.

The type label must remain permanently attached to the product.

2.2 IMPORTANT SAFETY INSTRUCTIONS

Keep the manual for future reference.

This section contains safety information that must be observed at all times when working.

The product has been designed and tested in accordance with international safety requirements. As with all electrical or electronic devices, there are residual risks despite careful construction. To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

DANGER

Danger to life due to electric shock when live components or cables of the inverter are touched

High voltages are present in the conductive components or cables of the inverter. Touching live parts and cables of the inverter results in death or lethal injuries due to electric shock.

- Disconnect the inverter from voltage sources and make sure it cannot be reconnected before working on the device.
- Wear suitable personal protective equipment for all work on the product.

NOTICE**Damage to the enclosure seal in subfreezing conditions**

If you open the inverter when temperatures are below freezing, the enclosure seals can be damaged. This can lead to moisture entering the inverter.

- Only open the inverter if the ambient temperature is not below -5°C (23°F).
- If a layer of ice has formed on the enclosure seal when temperatures are below freezing, remove it prior to opening the inverter (e.g. by melting the ice with warm air).

NOTICE**Damage to the product due to sand, dust and moisture ingress**

Sand, dust and moisture penetration can damage the product and impair its functionality.

- Only open the inverter if the humidity is within the thresholds and the environment is free of sand and dust.
- Do not open the inverter during a dust storm or precipitation.
- Close tightly all enclosure openings.
- Only use listed rain-tight or liquid-tight conduit fittings to attach the conduits to the product.

NOTICE**Damage to the inverter or product due to electrostatic discharge**

Touching electronic components can cause damage to or destroy the inverter or the product through electrostatic discharge.

- Ground yourself before touching any component.

 Electrical installations (for North America)

All installations must conform with the laws, regulations, codes and standards applicable in the jurisdiction of installation (e.g. *National Electrical Code*® ANSI/NFPA 70 or *Canadian Electrical Code*® CSA-C22.1.).

- Before connecting the product to the utility grid, contact your local grid operator. The electrical connection of the product must be carried out by qualified persons only.
- Ensure that the cables or conductors used for electrical connection are not damaged.

3 Scope of Delivery

Check the scope of delivery for completeness and any externally visible damage. Contact your distributor if the scope of delivery is incomplete or damaged.

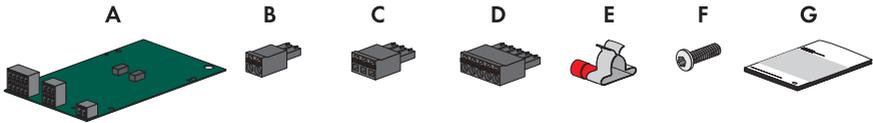


Figure 1: Components included in scope of delivery

Position	Quantity	Designation
A	1	SMA Sensor Module
B	1	2-pole terminal block
C	2	3-pole terminal block
D	2	5-pole terminal block
E	3	Shield clamp with ring terminal lug
F	1	Fastening screw (M5, TX 25)
G	1	Quick Reference Guide

4 Product Overview

4.1 SMA Sensor Module

The SMA Sensor Module is a module for SMA inverters. The SMA Sensor Module has different interfaces for connecting various sensors. The SMA Sensor Module converts the signals of the connected sensors and transmits them to the inverter. The sensors are not included in the SMA Sensor Module's scope of delivery.

The SMA Sensor Module has the following interfaces:

- 2 temperature inputs for connecting the temperature sensors (e.g. module temperature sensor, external temperature sensor)
- 1 analog input for voltage or current signals (e.g. of an irradiation sensor)
- 1 supply voltage for a signal source (e.g. of an irradiation sensor)
- 1 S0 interface (e.g. for connecting an anemometer or energy meter)

The SMA Sensor Module performs the following tasks:

- Receive measured data from Pt100 or Pt1000 temperature sensors
- Receive measured data of an irradiation sensor that can output current or voltage signals as well as provide supply voltage for this irradiation sensor
- Receive measured data of a remote terminal (e.g. anemometer or energy meter)

Design of the Module

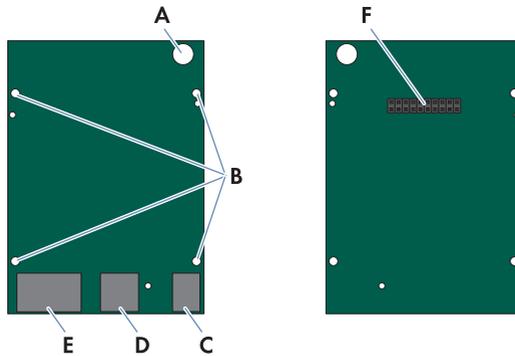


Figure 2: Design of the module

Position	Designation	Explanation
A	-	Opening for the fastening screw
B	-	Openings for the guide pins of the communication assembly
C	S0	Terminal for receiving S0 impulses
D	ANA-IN	Terminal for the analog voltage or current measurement as well as supply voltage of 24 V _{DC}

Position	Designation	Explanation
E	TEMP-IN	Terminals for the temperature measurement
F	-	Connector strip on the back of the module for connection to the communication assembly in the inverter

4.2 Type Label

The type label clearly identifies the product. The type label is located on the front of the product.



Figure 3: Design of the type label

Position	Explanation
A	Device type
B	Serial number
C	Hardware version

You will require the information on the type label to use the product safely and when seeking customer support from Service (see Section 11 "Contact", page 34).

5 Mounting

5.1 Mounting position

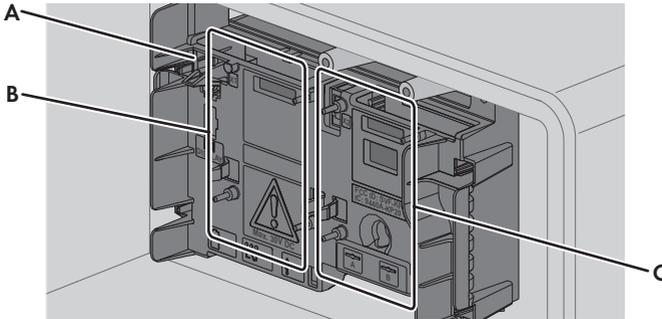


Figure 4: Communication assembly in the inverter with mounting position for the module

Position	Designation
A	Communication assembly
B	Module slot M1 *
C	Module slot M2

* Production resources SMA Solar Technology AG recommends using module slot **M1** for the module.

5.2 Installing the Module

NOTICE

Damage to the product due to sand, dust and moisture ingress

Sand, dust and moisture penetration can damage the product and impair its functionality.

- Only open the inverter if the humidity is within the thresholds and the environment is free of sand and dust.
- Do not open the inverter during a dust storm or precipitation.
- Close tightly all enclosure openings.
- Only use listed rain-tight or liquid-tight conduit fittings to attach the conduits to the product.



Maximum number of modules of the same device type per inverter

You can only use a maximum of 1 SMA Sensor Module per inverter.

Procedure:

1.

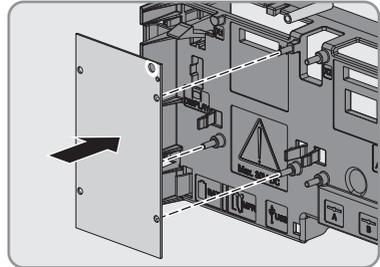
⚠ DANGER**Danger to life due to high voltages of the PV array**

When exposed to sunlight, the PV array generates dangerous DC voltage, which is present in the DC conductors and the live components of the inverter. Touching the DC conductors or the live components can lead to lethal electric shocks.

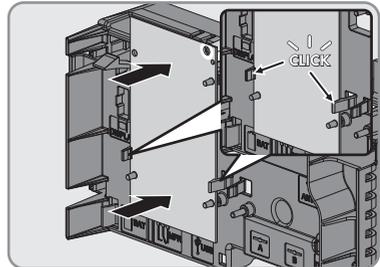
- Prior to performing any work on the inverter, always disconnect the inverter from voltage sources on the AC and DC sides as described in the inverter manual. When doing so, note that even if the DC load-break is switched off, there will be dangerous direct voltage present in the DC conductors of the inverter.

2. To achieve an optimum WLAN range, the module should ideally be installed on module slot **M1**. Perform the following steps:

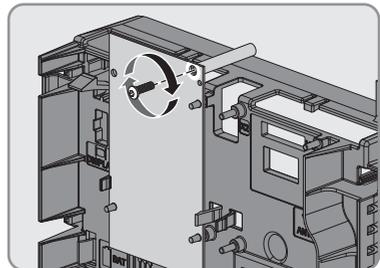
- Guide the 3 guide pins on the communication assembly through the holes in the module. The holes in which the guide pins must be inserted depend on the module slot.



- Carefully push the module down on the upper edge and on the connection sockets at the same time (1) until it audibly snaps into both side locking tabs of the communication assembly (2). The connector strip on the back of the module is automatically pushed into the socket terminal strip of the communication assembly.



3. Tighten the fastening screw with a Torx screwdriver (TX 25) on the module (torque: 1.5 Nm (13 in-lb)). This additionally fixes the module in place and grounds it in the inverter enclosure.



6 Connection

6.1 Cable Requirements

i UV resistance of connection cables

Connection cables to be laid outdoors must be UV-resistant or routed in a UV-resistant cable channel.

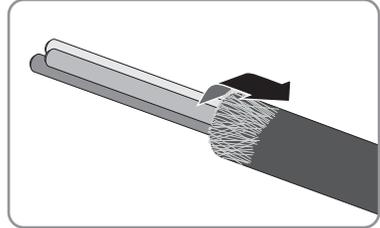
Cable type	Requirements
Cable for shielding the analog input and the temperature inputs	<input type="checkbox"/> Number of conductors: 1 <input type="checkbox"/> Conductor cross-section: 1.5 mm ² (16 AWG) <input type="checkbox"/> Cable length: 120 mm (4.71 in)
Connection cables for temperature inputs	<input type="checkbox"/> Number of insulated conductors for tolerance $\pm 2^{\circ}\text{C}$ ($\pm 3.6^{\circ}\text{F}$): at least two <input type="checkbox"/> Number of insulated conductors for tolerance $\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$): at least four <input type="checkbox"/> Shielding: yes <input type="checkbox"/> Conductor cross-section with four-conductor connection technology: at least $4 \times 0.25 \text{ mm}^2$ (24 AWG) <input type="checkbox"/> Maximum cable length for four-conductor connection technology: 20 m (65 ft) <input type="checkbox"/> Conductor cross-section for two-conductor connection technology: at least $2 \times 0.25 \text{ mm}^2$ (24 AWG) <input type="checkbox"/> Maximum cable length for two-conductor connection technology: 2.5 m (8 ft) <input type="checkbox"/> External cable diameter: 4.5 mm to 7.0 mm (0.18 in to 0.28 in)
Connection cable for analog input	<input type="checkbox"/> Number of conductors: at least 2 <input type="checkbox"/> Shielding: yes <input type="checkbox"/> Conductor cross-section: 0.2 mm ² to 1.5 mm ² (32 AWG to 16 AWG) <input type="checkbox"/> Maximum cable length: 30 m (98 ft)
Connection cable for S0 interface	<input type="checkbox"/> Number of conductors: 2 <input type="checkbox"/> Shielding: yes <input type="checkbox"/> Conductor cross-section: 0.2 mm ² to 1.5 mm ² (32 AWG to 16 AWG) <input type="checkbox"/> Maximum cable length: 30 m (98 ft)

6.2 Preparing the Connection Cable

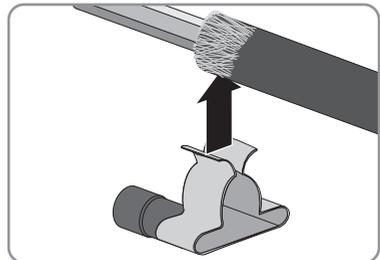
Prepare each connection cable for connection and the cable for shielding the analog input and the temperature inputs in accordance with the following procedure for connection to the multipole terminal blocks.

Procedure:

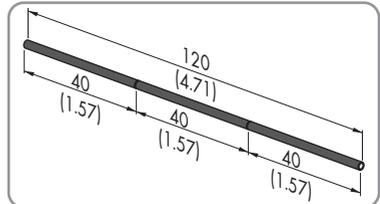
1. Strip 40 mm (1.57 in) of cable sheath from the end of the connection cable to which the multipole terminal block is to be attached. Make sure that no pieces of cable are dropped into the inverter.
2. Trim the cable shield to a length of 15 mm (0.59 in) and fold it over the cable sheath.



3. Press the shield clamp onto the cable shield. The cable shield must be clamped under the shield clamp as completely as possible.



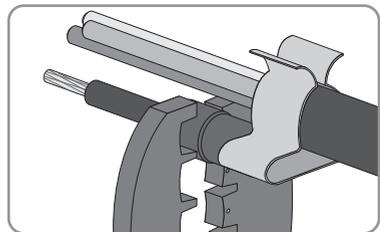
4. For each connection cable, cut 40 mm (1.57 in) from the 120 mm (4.71 in) cable for shielding.



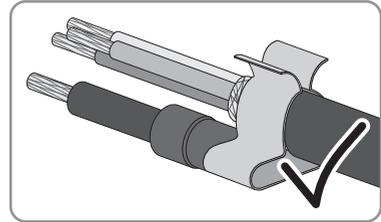
5. Remove 6 mm (0.24 in) of cable sheath from both ends of each piece of cable and strip off 6 mm (0.24 in) of the insulation of each conductor.



6. Attach each cable piece for shielding to a shield clamp. To do so, plug one end of each cable piece into the ring terminal lug of the shield clamp and crimp using a crimping tool.



7. Strip off 6 mm (0.24 in) of the conductor insulation from each of the connection cable conductors.
 8. Trim unneeded insulated conductors of the connection cable flush with the cable sheath.
- The connection cable and the cable for shielding have been prepared for connection.



6.3 Preparing the Enclosure Opening on the Inverter

i Electrical installations

All electrical installations must be carried out in accordance with the local standards and the *National Electrical Code*® ANSI/NFPA 70 or the *Canadian Electrical Code*® CSA C22.1.

Additionally required material (not included in the scope of delivery):

- Desired number of connection cables (see Section 6.1 "Cable Requirements", page 15)
- If not yet present: 1 conduit: 25.4 mm (1 in)
- If not yet present: 1 rain-tight conduit fitting for wet locations complying with UL 514B: 25.4 mm (1 in)

Procedure:

1. Make sure that the inverter has been disconnected and is secured against reconnection (see the inverter manual).
2. Push the sealing plug out of the enclosure opening and retain it for later decommissioning.
3. Insert the conduit fitting into the opening and tighten from the inside using the counter nut.
4. Attach the conduit to the enclosure opening.
5. Lead the connection cable through the conduit into the inverter.

6.4 Connecting the Temperature Sensor

You can connect 1 outside temperature sensor and 1 module temperature sensor each to the module. The measured values from the temperature sensors are shown on the user interface of the inverter.

Additionally required material (not included in the scope of delivery):

- Up to 2 temperature sensors
- Up to 2 connection cables (see Section 6.1, page 15)

Requirements:

- The temperature sensor must be technically suitable for connection to the temperature input (see Section 9, page 31).

- The connection cable must be prepared for connection to the multipole terminal block (see Section 6.2, page 15).

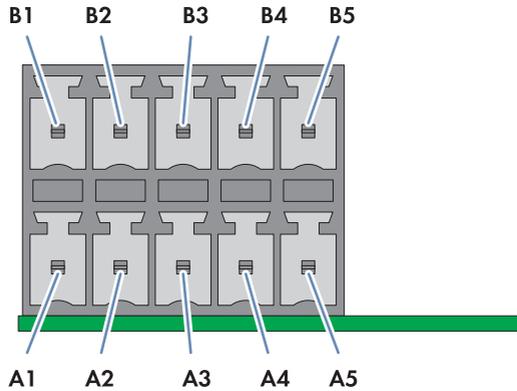


Figure 5: Pin assignment for terminal **TEMP-IN**

Temperature input	Pin	Signal	Explanation
External temperature	A1	GND	Shield ground
	A2	I+	Current output
	A3	V+	Voltage input
	A4	V-	Voltage return
	A5	I-	Current return
Module temperature	B1	GND	Shield ground
	B2	I+	Current output
	B3	V+	Voltage input
	B4	V-	Voltage return
	B5	I-	Current return

Circuitry overviews:

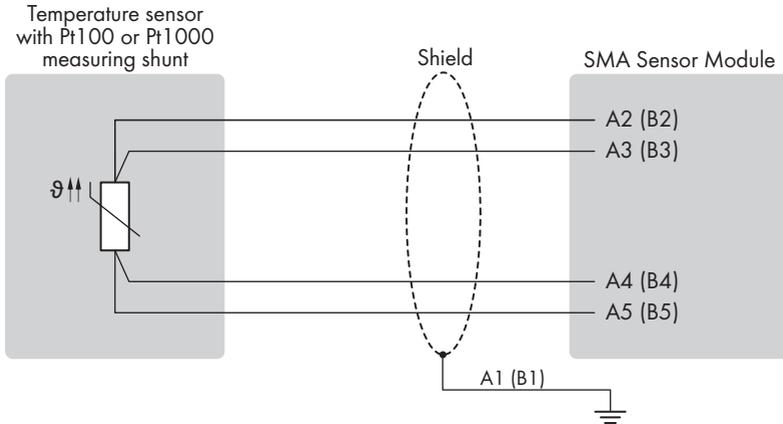


Figure 6: Connection of a temperature sensor with four-conductor connection technology

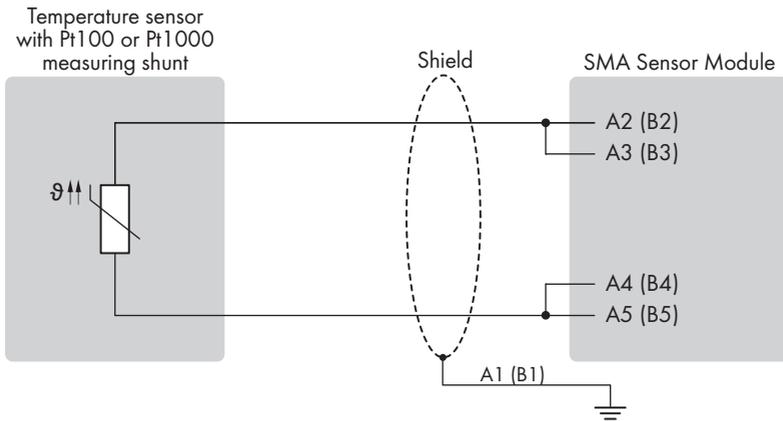
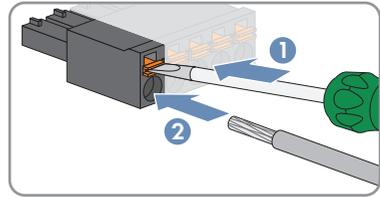


Figure 7: Connection of a temperature sensor with two-conductor connection technology

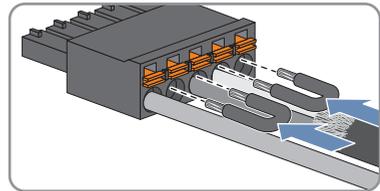
Procedure:

1. Connect the connection cable to the temperature sensor (see the manual from manufacturer). Trim the unneeded insulated conductors up to the cable shield and note down the conductor colors.

2. On the 5-pole terminal block, unlock the terminal position 1 using a suitable tool (1) and plug the conductor of the cable piece for shielding into this terminal position (2).



3. For connection to the module using two-conductor connection technology, perform the following steps:
 - On the 5-pole terminal block, unlock the terminal positions 3 and 4 using a suitable tool and plug the conductors of the connection cable into these terminal positions. Observe the pin assignment.
 - On the 5-pole terminal block, bridge the terminal positions 2 and 3 as well as the terminal positions 4 and 5.



4. For connection to the module using four-conductor connection technology, unlock the terminal positions 2, 3, 4, and 5 on the 5-pole terminal block using a suitable tool and plug the conductors of the connection cable into these terminal positions. Observe the pin assignment.
5. To connect the outside temperature sensor, plug the 5-pole terminal block into pin row A on terminal **TEMP-IN**.
6. To connect the module temperature sensor, plug the 5-pole terminal block into pin row B on terminal **TEMP-IN**.
7. If no further connections are required on the module or in the inverter, close the inverter and commission it (see the inverter manual).
8. If necessary, configure the temperature sensor (see Section 7.2, page 26).

6.5 Connecting an Irradiation Sensor

You can connect a maximum of 1 irradiation sensor to the module.

Additionally required material (not included in the scope of delivery):

- 1 irradiation sensor
- 1 connection cable (see Section 6.1, page 15)

Requirements:

- The irradiation sensor must be technically suitable for connection to the analog input (see Section 9, page 31).
- The connection cable must be prepared for connection to the multipole terminal block (see Section 6.2, page 15).

Pin assignment:

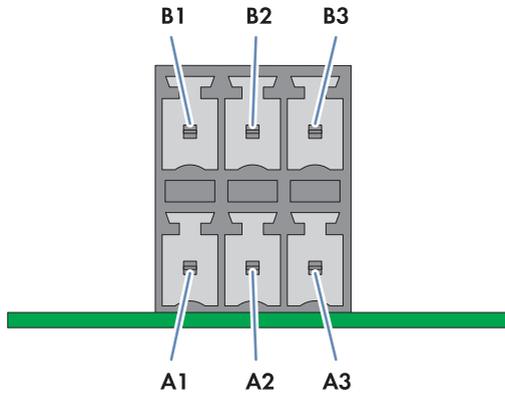


Figure 8: Pin assignment for terminal **ANA-IN**

Pin	Signal	Explanation
B1	V+	Voltage input
B2	I+	Current input
B3	GND	Reference potential of the supply voltage
A1	SHIELD	Shield ground
A2	24V	Supply voltage 24V DC
A3	GND	Reference potential of the supply voltage

Circuitry overviews:

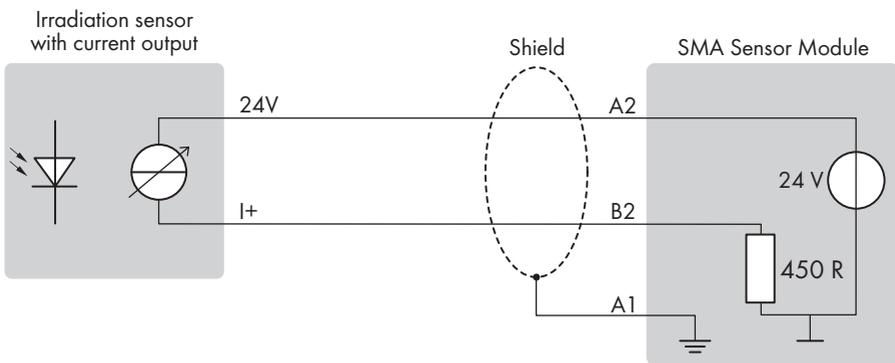


Figure 9: Connection of an irradiation sensor with current output

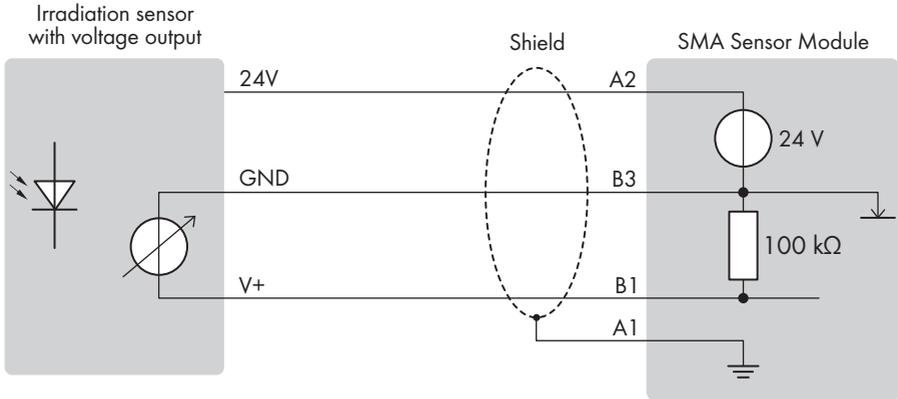
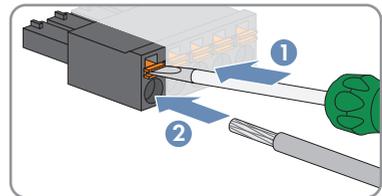


Figure 10: Connection of an irradiation sensor with voltage output

Procedure:

1. Connect the connection cable to the irradiation sensor (see the manual from manufacturer). Trim the unneeded insulated conductors up to the cable shield and note down the conductor colors.
2. Depending on the irradiation sensor and the pin assignment of pin row A, identify the terminal positions on the first 3-pole terminal block that are required for connecting the connection cable.
3. On the first 3-pole terminal block, unlock the required terminal positions using a suitable tool (1) and plug the conductors into these terminal positions (2).



4. On the second 3-pole terminal block, unlock the terminal position 1 using a suitable tool and plug the conductor of the cable piece for shielding into this terminal position.
5. When using the supply voltage provided by the module, perform the following additional steps for the second 3-pole terminal block:
 - Unlock terminal position 2 using a suitable tool and plug the insulated conductor for supply voltage into this terminal position.
 - Unlock terminal position 3 using a suitable tool and plug the insulated conductor for the reference potential of the supply voltage into this terminal position.
6. Plug the first 3-pole terminal block into pin row A on terminal **ANA-IN**.
7. Plug the second 3-pole terminal block into pin row B on terminal **ANA-IN**.
8. If no further connections are required on the module or in the inverter, close the inverter and commission it (see the inverter manual).
9. Configure the irradiation sensor (see Section 7.3, page 27).

6.6 Connecting the Anemometer or Energy Meter

You can connect a maximum of 1 remote terminal with S0 impulse output to the module, e.g. 1 anemometer or 1 energy meter.

Additionally required material (not included in the scope of delivery):

- 1 anemometer or energy meter with impulse output for S0 impulses to DIN EN 62053-31 (IEC 62053-31)
- 1 connection cable (see Section 6.1, page 15)

Pin assignment:

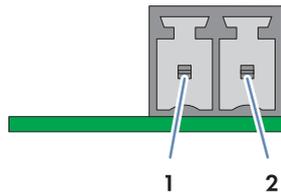


Figure 11: Pin assignment for terminal **S0-IN**

Pin	Signal	Explanation
1	S0-	Input for S0 signal
2	S0+	Current-supplying output for supplying the S0 signal

Circuitry overview:

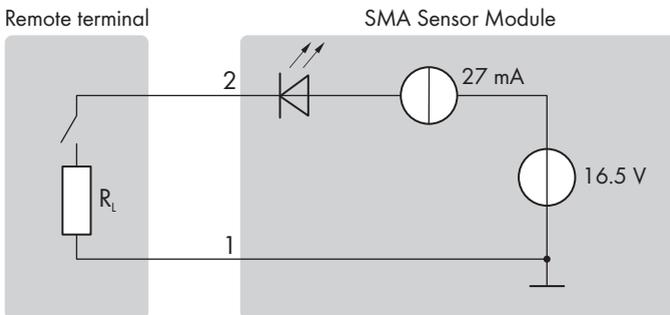
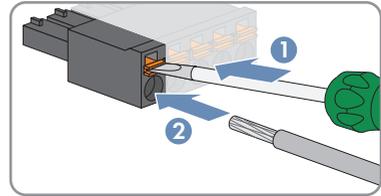


Figure 12: Circuitry overview for the connection of a remote terminal to the S0 interface

Procedure:

1. Connect the connection cable to the remote terminal and write down the conductor colors (see the manual from manufacturer).
2. Connect the connection cable to the 2-pole terminal block:

- 40 mm (1.57 in) Peel cable sheath. Make sure that no pieces of cable are dropped into the inverter.
- Strip off the conductor insulation by 6 mm (0.24 in).
- On the 2-pole terminal block, unlock the required terminal positions using a suitable tool (1) and plug the conductors of the connection cable into these terminal positions (2). Observe the pin assignment.



3. Plug the 2-pole terminal block into pin the row on terminal **SO-IN**.
4. If no further connections are required on the module or in the inverter, close the inverter and commission it (see the inverter manual).
5. Configure anemometer or energy meter (see Section 7.1, page 25).

7 Configuration

7.1 Configuring the Anemometer or Energy Meter

You must configure the S0 input of the module depending on the signal source used (anemometer or energy meter). To ensure that correct measured values are displayed, you must set the number of pulses per second.

You can make the settings via the device parameters or using the installation assistant.

Settings via device parameters

In the following table, you will find all parameters that are needed to set the S0 interface.

Object name	Parameter	Display group	Settings
In- Out.S0Ifln.Func	Function of the S0 input	Device > Inputs/outputs > S0 input > Function	<ul style="list-style-type: none"> S0 energy meter (S0EnMtr) S0 sensor for wind speed (S0Wnd)
Metering.Totk- WhSet	S0 meter reading (total yield)	Device > Measured value > Total yield S0 energy meter	<ul style="list-style-type: none"> 0 kWh to 4294967294 kWh
Meter- ing.S0kWh	S0 pulses / kWh	Device > Measured values > S0 pulses / kWh:	<ul style="list-style-type: none"> 500 to 10000
Env.S0WndSpd	S0 pulses per m/s	Meteorology > Environment > S0 pulses per m/s	<ul style="list-style-type: none"> 0.500 to 6.000

Procedure:

1. Activate the user interface of the inverter.
2. Log into the user interface as an **Installer**.
3. Call up the menu **Device parameters**.
4. Click on **[Edit parameters]**.
5. Expand the display group that contains the parameter.
6. Set the parameter.
7. Select **[Save all]** to save the settings.

Configuration with the help of the installation assistant

Procedure:

1. Open the user interface Calling Up the Inverter User Interface.
2. Log in as **Installer**.
3. Start the installation assistant Starting the Installation Assistant.
4. In the context menu, select **[Starting the installation assistant]**.
5. Select **[Save and next]** until you reach the **S0 interface** step.
6. Select the function of the S0 interface and make the settings.
7. Select **[Save and next]**.

7.2 Configuring the Temperature Sensor

If temperature sensors for module temperature and/or ambient temperature are connected, the inverter automatically detects the type of temperature sensors connected and activates the measurement mode. You can configure the display of the temperature display on the start page of the user interface in the event of an error (e.g. sensor not connected, measurement interrupted, sensor defective).

You can carry out the configuration via the device parameters or using the installation assistant. The following setting values are available:

Activated (IsOn)

In the event of an error, the corresponding temperature display is hidden on the start page of the user interface.

Automatic (Auto)

In the event of an error, the corresponding faulty temperature display is indicated with a red symbol on the start page of the user interface.

Settings via device parameters

The following table lists the parameters that you can use to configure the temperature display in the event of an error.

Object name	Parameter	Display group	Settings
Env.Tmp-Val.Func	Activating measurement of ambient temperature	Meteorology > Environment > Temperature > Function	<ul style="list-style-type: none"> Activated (IsOn) Automatic (Auto)
Mdul.Tmp-Val.Func	Activating the measurement of the module temperature	Meteorology > PV module > Temperature > Function	<ul style="list-style-type: none"> Activated (IsOn) Automatic (Auto)

Procedure:

1. Activate the user interface of the inverter.
2. Log into the user interface as an **Installer**.
3. Call up the menu **Device parameters**.
4. Click on **[Edit parameters]**.
5. Expand the display group that contains the parameter.
6. Check the parameters and modify them if necessary.
7. Select **[Save all]** to save the settings.

Test using the installation assistant

Procedure:

1. Open the user interface Calling Up the Inverter User Interface.
2. Log in as **Installer**.
3. Start the installation assistant Starting the Installation Assistant.

4. In the context menu, select **[Starting the installation assistant]**.
5. Select **[Save and next]** until you reach the **Irradiation temperature** step.
6. Under **Module temperature** and **External temperature**, select the required setting value for the temperature display in the event of an error.

7.3 Configuring the Irradiation Sensor

You must set the irradiation sensor to current or voltage operation depending on the connection type (current or voltage) and configure the characteristic curve of the irradiation sensor.

You can set the current or voltage operation and configure the characteristic curve via the device parameters or using the installation assistant.

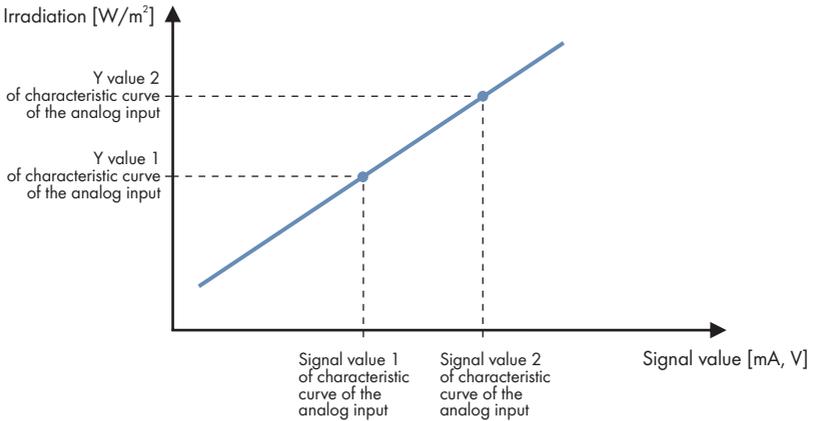


Figure 13: Characteristic curves of an irradiation sensor (example)

Settings via device parameters

In the following table, you will find all parameters that are needed to set the characteristic curve.

Object name	Parameter	Display group	Settings
InOut.AnIn.Func	Function of the analog input	Device > Inputs/outputs > Analog input > Function	<ul style="list-style-type: none"> • Irradiation sensor 0 to 20 mA (InsolSns20mA) • Irradiation sensor 0 to 10 V (InsolSns10V)
InOut.AnIn.Sig-Val1NoUnt	Signal value 1 of characteristic curve of the analog input	Device > Inputs/outputs > Analog input > Signal value 1	<ul style="list-style-type: none"> • 0.00 to 20.00 V or mA
InOut.AnIn.Sig-Val2NoUnt	Signal value 2 of characteristic curve of the analog input	Device > Inputs/outputs > Analog input > Signal value 2	<ul style="list-style-type: none"> • 0.00 to 20.00 V or mA

Object name	Parameter	Display group	Settings
In- Out.AnIn.YVal1- NoUnt	Y value 1 of charac- teristic curve of the analog input	Device > Inputs/outputs > Analog input > Y value 1	• 0.000 to 1500.000 W/m ²
In- Out.AnIn.YVal2- NoUnt	Y value 2 of charac- teristic curve of the analog input	Device > Inputs/outputs > Analog input > Y value 2	• 0.000 to 1500.000 W/m ²

Procedure:

1. Activate the user interface of the inverter.
2. Log into the user interface as an **Installer**.
3. Call up the menu **Device parameters**.
4. Click on **[Edit parameters]**.
5. Expand the display group that contains the parameter.
6. Set the parameter.
7. Select **[Save all]** to save the settings.

Configuration with the help of the installation assistant**Procedure:**

1. Open the user interface Calling Up the Inverter User Interface.
2. Log in as **Installer**.
3. Start the installation assistant Starting the Installation Assistant.
4. In the context menu, select **[Starting the installation assistant]**.
5. Select **[Save and next]** until you reach the **Irradiation temperature** step.
6. Select the function of the analog input and set the signal values and Y values of the characteristic curve of the irradiation sensor.

8 Decommissioning

8.1 Removing the Module

⚠ DANGER

Danger to life due to high voltages of the PV array

When exposed to sunlight, the PV array generates dangerous DC voltage, which is present in the DC conductors and the live components of the inverter. Touching the DC conductors or the live components can lead to lethal electric shocks.

- Prior to performing any work on the inverter, always disconnect the inverter from voltage sources on the AC and DC sides as described in the inverter manual. When doing so, note that even if the DC load-break is switched off, there will be dangerous direct voltage present in the DC conductors of the inverter.

NOTICE

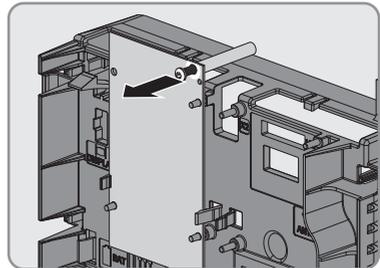
Damage to the product due to sand, dust and moisture ingress

Sand, dust and moisture penetration can damage the product and impair its functionality.

- Only open the inverter if the humidity is within the thresholds and the environment is free of sand and dust.
- Do not open the inverter during a dust storm or precipitation.
- Close tightly all enclosure openings.
- Only use listed rain-tight or liquid-tight conduit fittings to attach the conduits to the product.

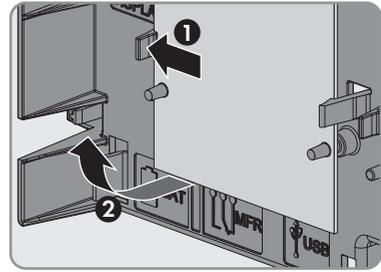
Procedure:

1. Remove the enclosure lid of the DC Connection Unit. Unscrew all screws with a Torx screwdriver (TX25) and remove the enclosure lid carefully forward.
2. Set the screws and the enclosure lid aside and store safely.
3. Remove all connecting terminal plates from the used connection sockets of the module.
4. Unscrew the fastening screw on the module using a Torx screwdriver (TX 25).

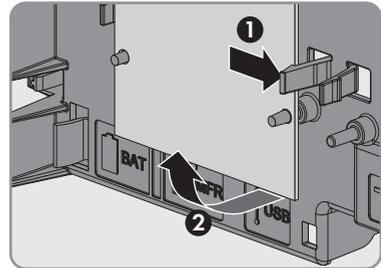


5. Remove the module:

- Press the right or left locking tab of the communication assembly slightly outwards and pull the module slightly forwards holding the lower end until the module is released from the interlock of the locking tab.



- Grab the module by the upper and lower edge with one hand.
- Slightly press the second locking tab outwards using the other hand and pull the module slightly forwards on the lower end until the module is released from the interlock of the locking tab.



- Remove the module from its slot by pulling it forwards.

6. Remove the conduit and the connection cables from the inverter.

7. Close the inverter and, if necessary, recommission it (see inverter manual).

8.2 Packing the Product for Shipment

- Pack the product for shipping. Use the original packaging or packaging that is suitable for the weight and size of the product.

8.3 Disposing of the Product

- Dispose of the product in accordance with the locally applicable disposal regulations for electronic waste.

9 Technical Data

General Data

Mounting location	In the inverter
Voltage supply	Via the inverter

Mechanical data

Width x height x depth	60 mm x 105 mm x 33 mm (2.4 in x 4.1 in x 1.3 in)
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Ambient conditions for storage/transport

Ambient temperature	-40°C to +70°C (-40°F to +158°F)
Relative humidity, non-condensing	4% to 100%
Maximum height above mean sea level	3000 m (9842 ft)

Ambient conditions during operation

Ambient temperature	-40°C to +85°C (-40°F to +185°F)
Relative humidity, non-condensing	4% to 100%
Maximum height above mean sea level	3000 m (9842 ft)

Temperature inputs

Quantity	2
Measuring shunt	Platinum sensor Pt100, platinum sensor Pt1000
Type of measurement	Two-conductor connection technology, four-conductor connection technology
Measurement range	-40°C to +85°C (-40°F to +185°F)
Typical measurement accuracy	±0.3°C (±0.54°F) when measured with four-conductor connection technology
Maximum measurement error	±1.7°C (±3.06°F) when measured with four-conductor connection technology
Maximum cable length	20 m (65 ft) when measured with four-conductor connection technology 2.5 m (8 ft) when measured with two-conductor connection technology

Analog input / current or voltage input

Quantity	1
Measurement range of the voltage input	0 V to 10 V

Input resistance of the voltage input	100 k Ω
Measurement range of the current input	0 mA to 20 mA
Load resistance of the current input	450 Ω
Typical measurement accuracy	± 0.3 %
Maximum measurement error	+2.0 %
Maximum cable length	30 m (98 ft)

Supply voltage for irradiation sensor

Quantity	1
Output voltage	24 V _{DC}
Maximum power consumption	600 mW

S0 interface

Standard	EN 62053-31 (IEC 62053-31)
Number of wires	2-conductor connection
Maximum cable length	30 m (98 ft)
Maximum output current at 1 Ω load	27 mA
Output current at 800 Ω load	≥ 10 mA
Maximum open-circuit voltage	16.5 V

10 Compliance Information

FCC Compliance

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications made to this equipment not expressly approved by SMA Solar Technology AG may void the FCC authorization to operate this equipment.

11 Contact

If you have technical problems with our products, please contact the SMA Service Line. The following data is required in order to provide you with the necessary assistance:

- Inverters:
 - Serial number
 - Firmware version
 - Special country-specific settings (if available)
- Detailed description of the problem
- Cables and sensors used
- Module:
 - Serial number
 - Hardware version

You can find your country's contact information at:



<https://go.sma.de/service>

FC CAN ICES-3 (B)/NMB-3 (B)



www.SMA-Solar.com

