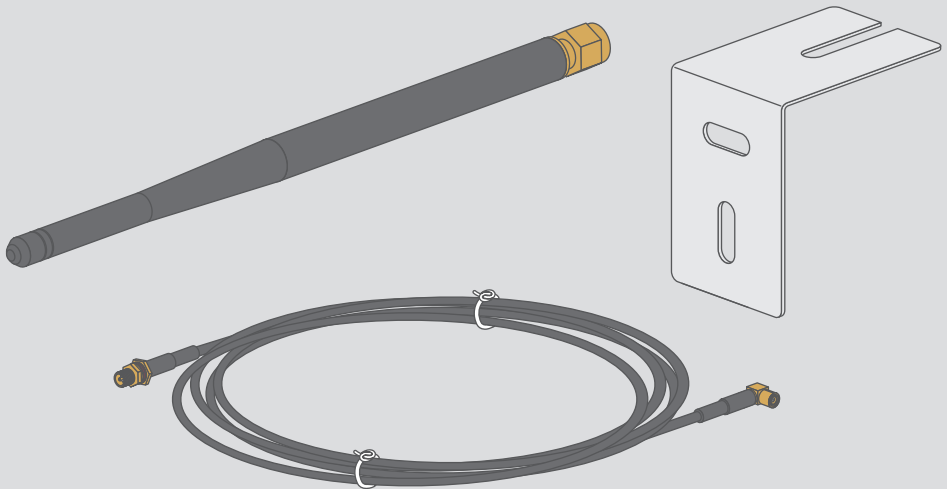


Installation Manual

# ANTENNA EXTENSION KIT

EXTANT-US-40



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Status: 2/17/2020

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# 1 Information on this Document

## 1.1 Validity

This document is valid for:

- EXTANT-US-40 (Antenna Extension Kit)

## 1.2 Target Group

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

- Training in how to deal with the dangers and risks associated with installing and using electrical devices and installations
- Training in the installation and commissioning of electrical devices and installations
- Knowledge of how an inverter works and is operated
- Knowledge of the applicable 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](http://www.SMA-Solar.com).

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

## 1.4 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

## 1.5 Typographies in the Document

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

## 1.6 Designation in the document

Complete designation	Designation in this document
Antenna Extension Kit	Antenna, product
PV system	PV system

## 2 Safety

### 2.1 Intended Use

The Antenna Extension Kit is an accessory set for SMA inverters: By installing the Antenna Extension Kit in an SMA inverter with WLAN interface, the inverter's radio range can be optimized within the WLAN network.

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 product is suitable for indoor and outdoor use.

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

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.

Alterations to the SMA products, e.g., changes or modifications, are only permitted with the express written permission of SMA Solar Technology AG. Unauthorized alterations will void guarantee and warranty claims and in most cases terminate the operating license. SMA Solar Technology AG shall not be held liable for any damage caused by such changes.

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

### SAVE THESE INSTRUCTIONS

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.

#### DANGER

##### **Danger to life due to electric shock from touching an ungrounded product in the event of an error**

A product that is not grounded may be energized in the event of an error. Touching an ungrounded product results in death or serious injury due to electric shock in the event of an error.

- Ensure that the product is integrated in the existing surge protection.

#### CAUTION

##### **Increased electromagnetic radiation through the antenna**

During operation, the antenna produces an electromagnetic field and can interfere with other devices (e.g., pacemakers) due to electromagnetic interference.

- Persons must not remain closer than 20 cm (8 in) to the antenna for long periods of time.

**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 0°C (32°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.

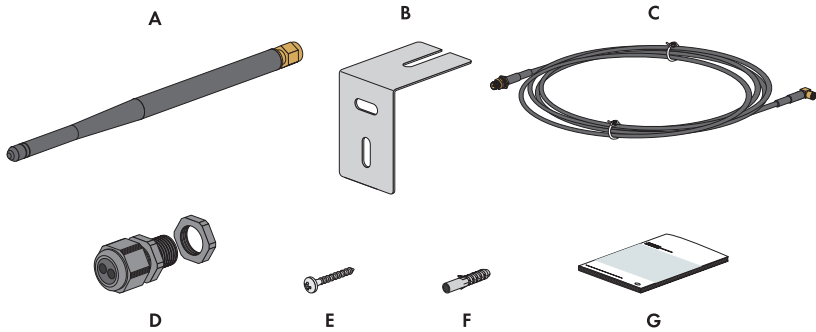


Figure 1: Components included in the scope of delivery

Position	Quantity	Designation
A	1	Antenna
B	1	Antenna bracket
C	1	Antenna cable (3 m (9.8 ft))
D	1	Cable gland with multi-hole seal
E	2	Bolt
F	2	Screw anchors
G	1	Quick reference guide for commissioning

## 4 Mounting

### 4.1 Mounting position

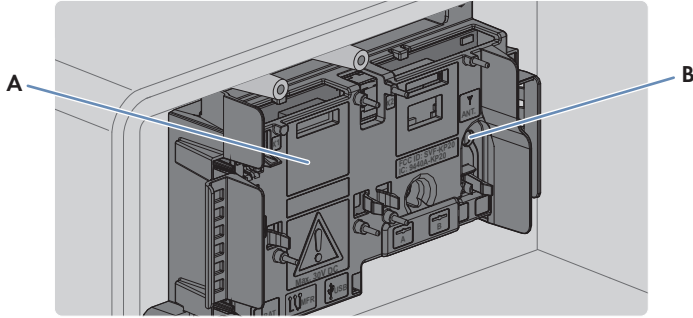


Figure 2: Communication assembly in the inverter with mounting position for the antenna

Position	Designation
A	Communication assembly
B	Pin connector <b>ANT.</b> Y for connecting the antenna cable

#### Mounting location:

#### **⚠ CAUTION**

##### **Increased electromagnetic radiation through the antenna**

During operation, the antenna produces an electromagnetic field and can interfere with other devices (e.g., pacemakers) due to electromagnetic interference.

- Persons must not remain closer than 20 cm (8 in) to the antenna for long periods of time.

The mounting location of the antenna is crucial for the quality of the wireless connection. Radio waves are emitted in circles from the longitudinal side of the antenna. A circular dead spot begins at the tip of the antenna. If you place the receiver in this dead spot, the receiver cannot receive any radio waves from the antenna.

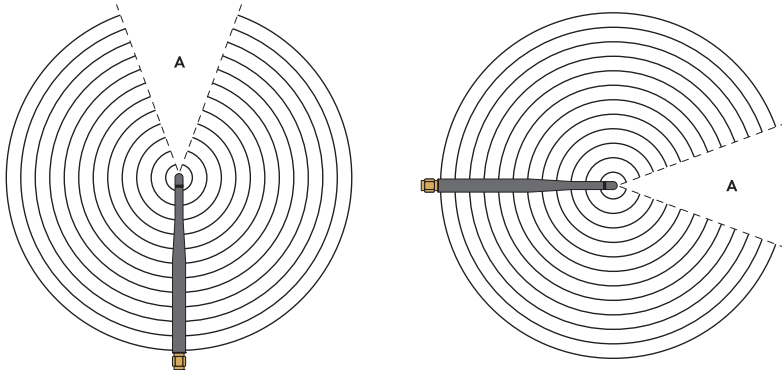


Figure 3: Radio waves emitting from the antenna

Position	Explanation
A	Dead spot

**Requirements for the Mounting Location:**

- An antenna cable length of 3 m (9.8 ft) must be observed. The antenna cable must not be extended.
- The antenna cable must be placed in such a way that the minimum bending radius of 35 mm (1.38 in) is maintained.
- The receiver must not be in the dead spot of the antenna.

## 4.2 Mounting the Antenna

**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.

**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.

**Procedure:**

1.

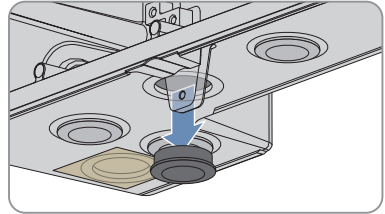
**⚠ DANGER****Danger to life due to high voltages of the PV array**

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.

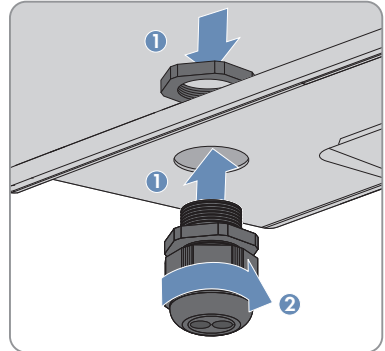
- Prior to performing any work on the inverter, always disconnect the inverter from voltage sources on the AC and DC sides as described in the inverter manual. When doing so, note that even if the DC load-break is switched off, there will be dangerous direct voltage present in the DC conductors of the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

2. If necessary, attach the cable gland to the inverter:

- Push the sealing plug from the inside out of the enclosure opening and retain it for later decommissioning.

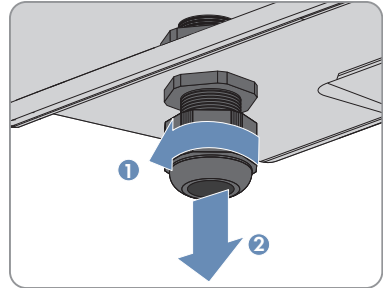


- Unscrew the counter nut from the supplied cable gland.
- Tighten the cable gland with the counter nut on the inverter enclosure opening.

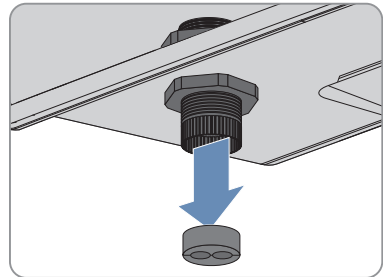


3. Connecting the antenna cable plug:

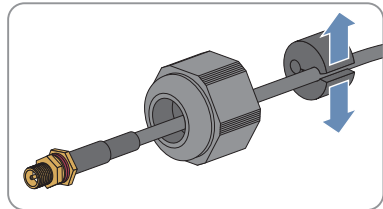
- Unscrew the swivel nut from the cable gland.



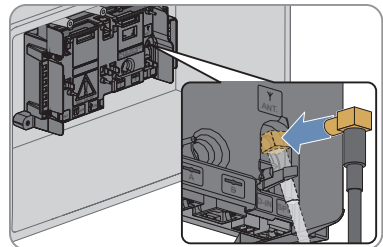
- Remove the two-hole cable support sleeve from the cable gland.



- Route the antenna cable with the cable end with the plug through the swivel nut and the desired hole of the two-hole cable support sleeve.



- Push the two-cable support sleeve along with the antenna cable back into the cable gland. Ensure that any unused openings of the two-hole cable support sleeve are sealed with sealing plugs.
- Screw the swivel nut of the cable gland on loosely.
- Remove the protective cover of pin connector **ANT. Y** on the communication assembly (if present).
- Insert the plug of the antenna cable into the pin connector **ANT. Y** on the communication assembly until it snaps into place. Observe the prescribed cable route (see Section 4.1, page 10).



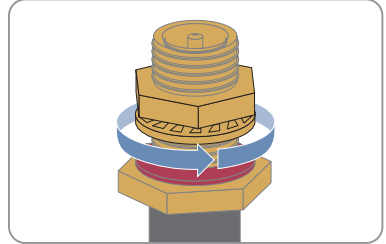
- Fasten the swivel nut on the cable gland hand-tight. This will secure the antenna cable.

4. Installing the antenna bracket:

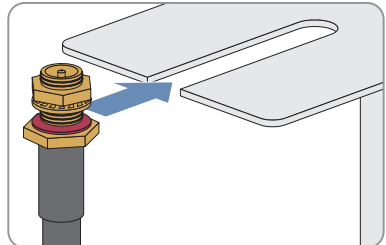
- Considering the dead spot of the antenna, move the antenna bracket to the desired position on the wall and hold it firmly.
- Mark positions of drill holes if necessary and drill two holes with 6 mm (0.24 in) diameter each at the marked points and insert screw anchors.
- Attach the antenna bracket to the wall with the screws.

5. Attaching the antenna cable and the antenna to the antenna bracket:

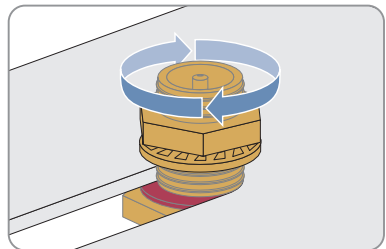
- On the antenna cable, unscrew the counter nut approx. 5 mm (0.2 in) from the plug.



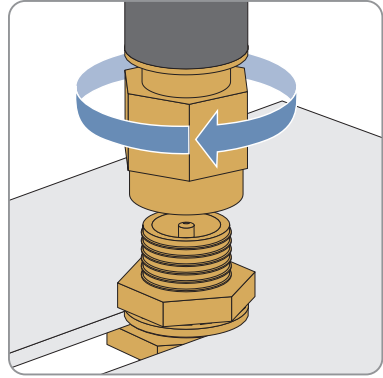
- Lead the antenna cable plug from the antenna bracket's slot. In doing so, make sure that the washer and the counter nut are on the outside of the antenna bracket and that the antenna cable is not kinked or twisted.



- Tighten the counter nut.



- Hand-tighten the antenna on the antenna extension cable plug.



6.

**⚠ DANGER****Danger to life due to electric shock from touching an ungrounded product**

Touching an ungrounded product can cause a lethal electric shock.

- Ensure that the product is integrated in the existing surge protection.

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

- The antenna is automatically recognized and activated by the inverter.

## 5 Troubleshooting

Problem	Cause and corrective measures
<p>The radio range has not improved despite the antenna.</p>	<p>The problem can be caused by one of the following:</p> <ul style="list-style-type: none"> <li>• The inverter has not recognized the antenna automatically.</li> <li>• The antenna is not installed correctly or an unapproved antenna has been used.</li> <li>• The receiver is placed in the dead spot.</li> </ul> <p><b>Corrective measures:</b></p> <ul style="list-style-type: none"> <li>• Ensure that the antenna has been recognized by the inverter:               <ul style="list-style-type: none"> <li>– Log in to the user interface of the inverter as <b>Installer</b> (see the inverter manual).</li> <li>– <b>Instantaneous values &gt; Plant communication &gt; WLAN.</b></li> <li>– Check whether the parameter <b>Antenna Type</b> is set on <b>External Antenna</b>. If the value <b>External Antenna</b> is not set, set the antenna type (see inverter manual).</li> </ul> </li> <li>• Ensure that the antenna of type "EXTANT-US-40" is installed correctly and that only the supplied antenna cable was used.</li> <li>• Ensure that the receiver is not placed in the dead spot.</li> </ul>



## 6 Decommissioning

### 6.1 Removing the Antenna

#### Required tools:

- Long-nosed pliers

#### Procedure:

1.

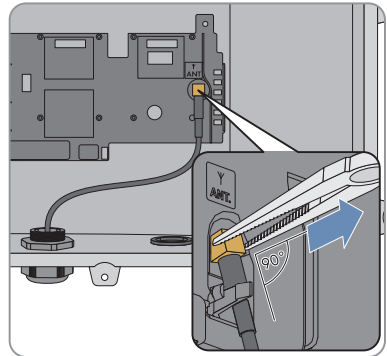
#### ⚠ DANGER

#### 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. Pull the antenna cable plug out of pin connector **ANT.** using long-nosed pliers.  $\Upsilon$  of the communication assembly using long-nosed pliers. Ensure that the antenna cable is pulled out at  $90^\circ$  to the communication assembly so that the plug does not get caught.



3. Unscrew the swivel nut from the cable gland.
4. Unscrew and remove the counter nut of the cable gland.
5. If necessary, remove the cable gland and antenna cable from the inverter.
6. If necessary, seal the enclosure opening of the inverter with the corresponding sealing plug.
7. Close the inverter and recommission it (see inverter manual).
8. At the antenna bracket, unscrew the antenna from the antenna cable plug.
9. Unscrew the counter nut from the plug of the antenna cable.
10. Remove the antenna cable from the antenna bracket.
11. Remove the screws of the antenna bracket.
12. Unscrew and remove the antenna bracket.

## 6.2 Disposing of the Product

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

## 7 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
  - Special country-specific settings (if available)
- Detailed description of the problem
- Module:
  - Serial number
  - Hardware version

United States	SMA Solar Technology America LLC Rocklin, CA	Toll free for USA and US Territories +1 877-MY-SMATech (+1 877-697-6283) International: +1 916 625-0870
Canada	SMA Solar Technology Canada Inc. Mississauga	Toll free for Canada / Sans frais pour le Canada : +1 877-MY-SMATech (+1 877-697-6283)
México	SMA Solar Technology de México Mexico City	Internacional: +1 916 625-0870

