

## Legal Provisions

Copyright © 2016 SMA Solar Technology America LLC. All rights reserved.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, be it electronic, mechanical, photographic, magnetic or otherwise, without the prior written permission of SMA Solar Technology America LLC.

Neither SMA Solar Technology America LLC nor SMA Solar Technology Canada Inc. makes representations, express or implied, with respect to this documentation or any of the equipment and/or software it may describe, including (with no limitation) any implied warranties of utility, merchantability, or fitness for any particular purpose. All such warranties are expressly disclaimed. Neither SMA Solar Technology America LLC nor its distributors or dealers nor SMA Solar Technology Canada Inc. nor its distributors or dealers shall be liable for any indirect, incidental, or consequential damages under any circumstances.

(The exclusion of implied warranties may not apply in all cases under some statutes, and thus the above exclusion may not apply.)

Specifications are subject to change without notice. Every attempt has been made to make this document complete, accurate and up-to-date. Readers are cautioned, however, that product improvements and field usage experience may cause SMA Solar Technology America LLC and/or SMA Solar Technology Canada Inc. to make changes to these specifications without advance notice, or per contract provisions in those cases where a supply agreement requires advance notice. SMA shall not be responsible for any damages, including indirect, incidental or consequential damages, caused by reliance on the material presented, including, but not limited to, omissions, typographical errors, arithmetical errors or listing errors in the content material.

### Software licenses

The licenses for the used software modules can be called up on the user interface of the product.

### Trademarks

All trademarks are recognized, even if not explicitly identified as such. Missing designations do not mean that a product or brand is not a registered trademark.

Modbus® is a registered trademark of Schneider Electric and is licensed by the Modbus Organization, Inc.

QR Code is a registered trademark of DENSO WAVE INCORPORATED.

Phillips® and Pozidriv® are registered trademarks of Phillips Screw Company.

Torx® is a registered trademark of Acument Global Technologies, Inc.

#### **SMA Solar Technology America LLC**

6020 West Oaks Blvd.

Suite 300 Rocklin, CA 95765 U.S.A.

#### **SMA Solar Technology Canada Inc.**

2425 Matheson Blvd. E

7th Floor

Mississauga, ON L4W 5K4

Canada

## Important Safety Instructions

### SAVE THESE INSTRUCTIONS

This manual contains important instructions for the following products:





- EXTANT-US-40 (Antenna Extension Kit)

This manual must be followed when using this product.

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

### 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.



Symbol	Description
	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 is used to address practices not related to personal injury.


This manual must be followed when using this product.

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

### 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.

Symbol	Description
	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.

Symbol	Description
 <b>CAUTION</b>	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
<b>NOTICE</b>	NOTICE is used to address practices not related to personal injury.

## General Warnings

### WARNING

All electrical installations must be carried out in accordance with the local electrical standards and the *National Electrical Code*® ANSI/NFPA 70 or the *Canadian Electrical Code*® CSA C22.1. 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 and use of the product, 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 non-compliance with such laws or codes in connection with the installation of the product.

The product contains no user-serviceable parts.

For all repair and maintenance, always return the unit to an authorized SMA Service Center.

Before installing or using the product, read all of the instructions, cautions, and warnings in this manual.

Wiring of the product must be made by qualified personnel only.

## Table of Contents

<b>1</b>	<b>Information on this Document .....</b>	<b>7</b>
1.1	Validity .....	7
1.2	Target group .....	7
1.3	Symbols .....	7
1.4	Typographies .....	7
1.5	Nomenclature .....	8
<b>2</b>	<b>Safety .....</b>	<b>9</b>
2.1	Intended Use .....	9
2.2	Safety Information .....	9
2.3	Supported Products .....	10
<b>3</b>	<b>Scope of Delivery .....</b>	<b>11</b>
<b>4</b>	<b>Mounting .....</b>	<b>12</b>
4.1	Mounting Position and Cable Route .....	12
4.2	Mounting the Antenna .....	13
<b>5</b>	<b>Troubleshooting .....</b>	<b>17</b>
<b>6</b>	<b>Decommissioning .....</b>	<b>18</b>
6.1	Removing the Antenna .....	18
6.2	Disposing of the Product .....	18
<b>7</b>	<b>Contact .....</b>	<b>19</b>

# 1 Information on this Document

## 1.1 Validity

This document is valid for the Antenna Extension Kit (Product “EXTANT-US-40”).





You can find the latest version of this document at [www.SMA-Solar.com](http://www.SMA-Solar.com).

## 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 Symbols

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

## 1.4 Typographies

Typography	Use	Example
<b>bold</b>	<ul style="list-style-type: none"> <li>• Display texts</li> <li>• Elements on a user interface</li> <li>• Terminals</li> <li>• Elements to be selected</li> <li>• Elements to be entered</li> </ul>	<ul style="list-style-type: none"> <li>• The value can be found in the field <b>Energy</b>.</li> <li>• Select <b>Settings</b>.</li> <li>• Enter <b>10</b> in the field <b>Minutes</b>.</li> </ul>
<b>&gt;</b>	<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>
<b>[Button]</b> <b>[Key]</b>	<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>[Next]</b>.</li> </ul>

## 1.5 Nomenclature

Complete designation	Designation in this document
SMA Solar Technology America LLC	SMA
SMA Solar Technology Canada Inc.	
Antenna Extension Kit	Antenna, product
PV system	PV system



## 2 Safety

### 2.1 Intended Use

The Antenna Extension Kit is an accessory set for one SMA inverter and optimizes the SMA inverter's WLAN radio range.

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

The product is suitable for indoor and outdoor use.

Use this product only in accordance with the information provided in the enclosed documentation and with the locally applicable standards and directives. Any other application may cause personal injury or property damage.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of SMA. Unauthorized alterations will void guarantee and warranty claims and in most cases terminate the operating license. SMA 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 appropriate.

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

### 2.2 Safety Information

This section contains safety information that must be observed at all times when working on or with the product.

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 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. If you unplug the terminal plate with the connected DC conductors from **DC-in** slot under load, an electric arc may occur, which can cause an electric shock and burns.

- 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 of the inverter is switched off, there will be dangerous direct voltage present in the DC conductors on the **DC-in** connecting terminal plate in the Connection Unit of the inverter.

#### 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 overvoltage 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 seals on the enclosure lids in subfreezing conditions**

If you open the enclosure lid of the Connection Unit when temperatures are below freezing, the enclosure lid seal could be damaged. As a result, moisture can get into the Connection Unit.

- Only open the enclosure lid of the Connection Unit if the ambient temperature is at least 0°C (32°F) and there is no frost.
- If the enclosure lid of the Connection Unit has to be opened at temperatures below freezing, any ice formation on the seal has to be removed (e.g. by melting it with warm air) before the opening of the enclosure lid. Observe the applicable safety regulations.

**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.

**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.

- Before connecting the inverter to the utility grid, contact your local grid operator. The electrical connection of the inverter must be carried out by qualified persons only.
- Ensure that no cables used for electrical connection are damaged.

## 2.3 Supported Products

The Antenna Extension Kit must only be installed in the following SMA inverters:

- 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)

### 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.

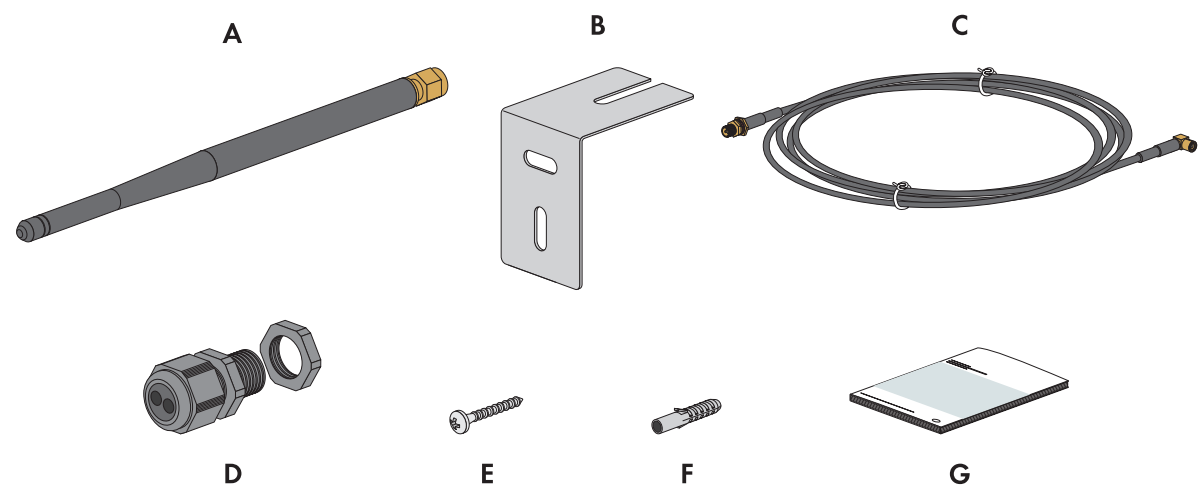


Figure 1: Components included in the scope of delivery

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 and Cable Route

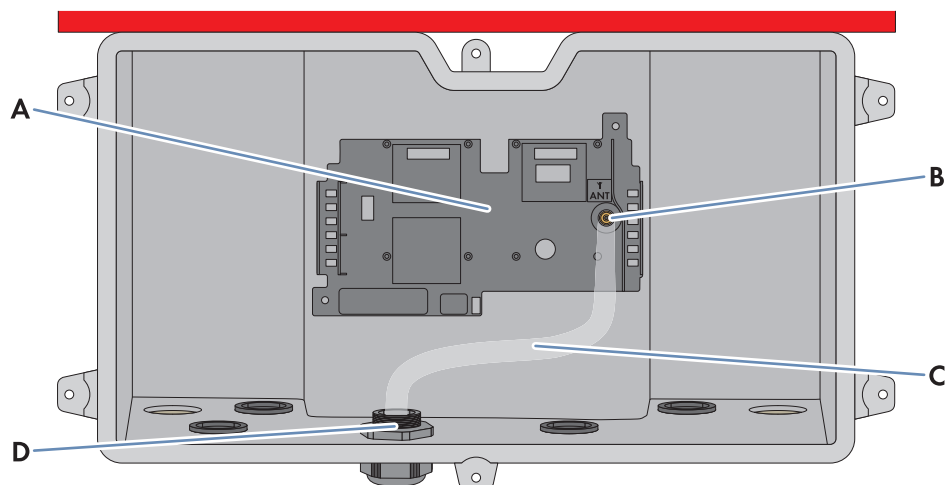


Figure 2: Mounting position and cable route in the inverter with the lower enclosure lid open

Position	Designation
A	Communication assembly
B	Pin connector <b>ANT.</b> ⚡ for connecting the antenna cable
C	Cable route
D	Enclosure opening on the inverter with sealing plug

#### 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.

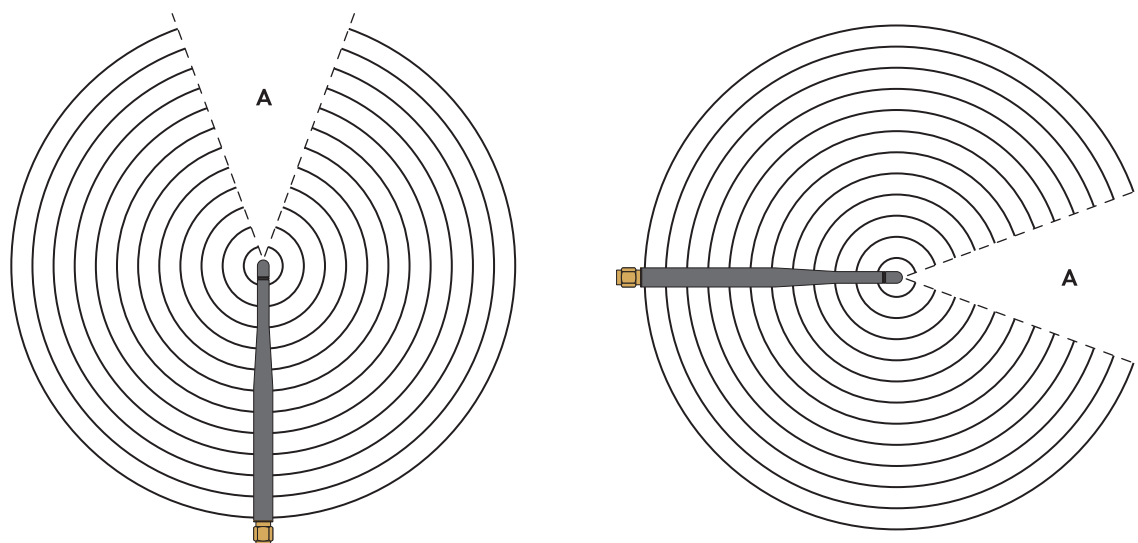


Figure 3: Radio waves emitting from the antenna

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 inverter due to moisture ingress during electrical installation

- Never open the inverter when it is raining or snowing, or the humidity is over 95%.
- For attaching the conduits to the enclosure, only use UL-listed rain-tight conduit fittings or UL-listed conduit fittings for wet locations complying with UL514B.
- Seal all unused openings tightly.

#### **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.

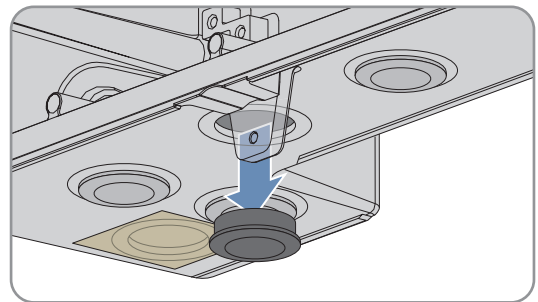
**Procedure:**1. **DANGER****Danger to life due to high voltages of the PV array**

When exposed to sunlight, the PV array generates dangerous direct voltage. Touching the DC conductors can lead to lethal electric shocks. Even if the DC load-break switch of the inverter is in the **O**, position, there will be dangerous direct voltage present in the DC conductors and on the **DC-in** connecting terminal plate in the Connection Unit of the inverter.

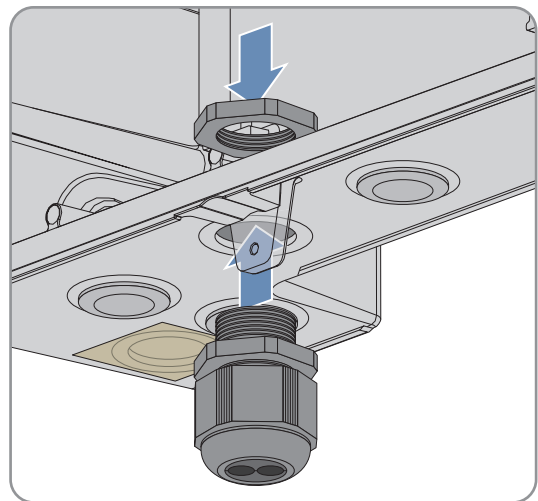
- Prior to performing any work on the inverter, always disconnect the inverter from voltage sources on the AC and DC sides and secure it against reconnection (see the inverter manual).
- Leave the **DC-in** connecting terminal plate plugged into the Connection Unit of the inverter and only touch it on the black enclosure.
- Do not remove the DC cable from the connecting terminal plate.

## 2. Attaching the cable gland on the inverter:

- Push the sealing plug from the inside out of the second hole from the left in the inverter enclosure and retain it for future decommissioning.

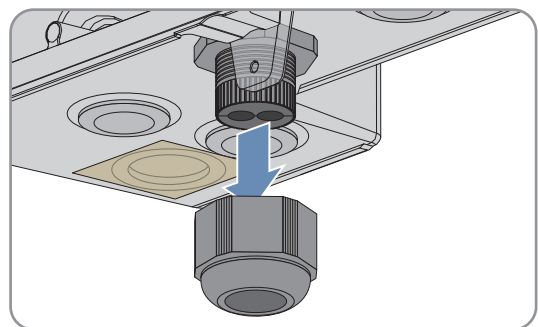


- Unscrew the counter nut from the supplied cable gland.
- Screw the cable gland with the counter nut on the inverter enclosure opening.

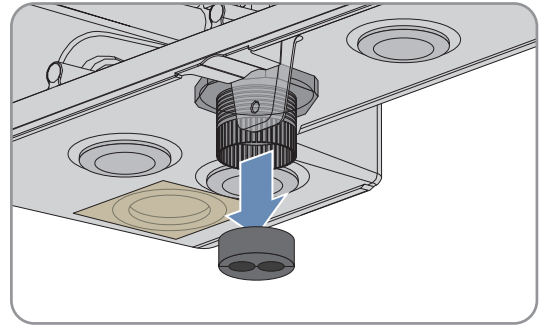


## 3. Connecting the antenna cable plug:

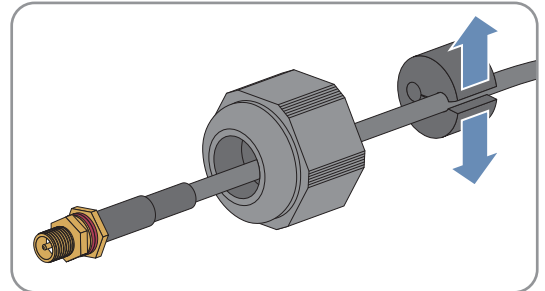
- Unscrew the swivel nut from the cable gland.



- Press the multi-hole seal out of the cable gland from the inside.



- Route the antenna cable with the cable end with the plug through the swivel nut and the desired hole of the multi-hole seal.



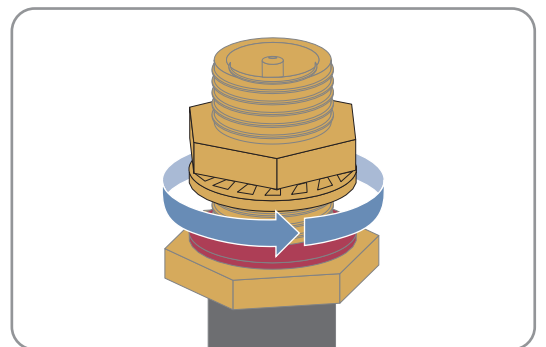
- Push the multi-hole seal along with the antenna cable back into the cable gland. Ensure that any unused openings of the multi-hole seal are sealed with sealing plugs.
- Screw the swivel nut of the cable gland on loosely.
- Remove the protective cover of pin connector **ANT. Y** on the communication 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 12).
- Fasten the swivel nut on the cable gland hand-tight. This will secure the antenna cable.

#### 4. Installing the antenna bracket:

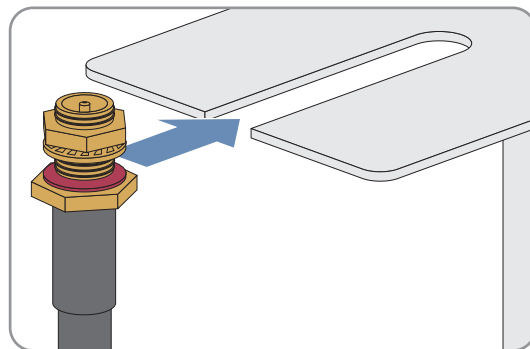
- Considering the dead spot of the antenna, move the antenna bracket to the desired position on the wall and hold it firmly.
- Mark positions of drill holes if necessary and drill two holes with 6 mm (0.24 in) diameter each at the marked points and insert screw anchors.
- Attach the antenna bracket to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

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

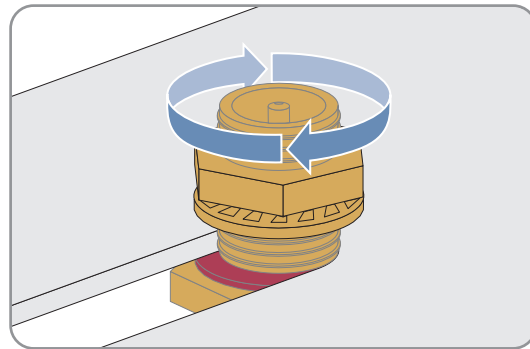
- On the antenna cable, unscrew the counter nut approx. 5 mm (0.2 in) from the plug.



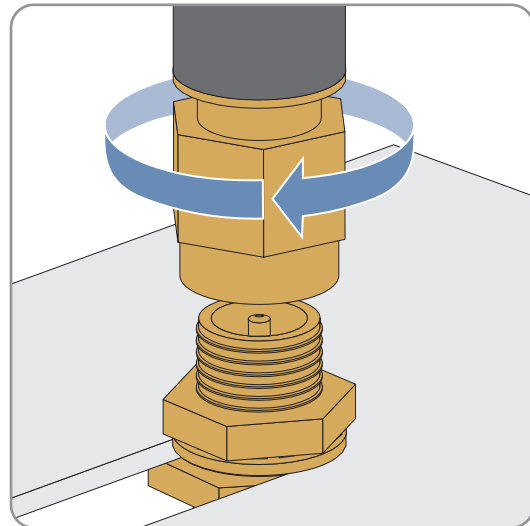
- Lead the antenna cable plug from the antenna bracket's slot. In doing so, make sure that the washer and the counter nut are on the outside of the antenna bracket and that the antenna cable is not kinked or twisted.



- 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 overvoltage 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 measure
The radio range has not improved despite the antenna.	<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>– Access the web server of the inverter and log in as <b>installer</b>.</li><li>– Select <b>Instantaneous values &gt; System Configuration &gt; WLAN &gt; Antenna Type</b>.</li><li>– Check whether the value <b>External Antenna</b> is set. If the value <b>External Antenna</b> is not set, set the antenna type (see inverter user 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 (see Section 4.1 "Mounting Position and Cable Route", page 12).</li></ul>

## 6 Decommissioning

### 6.1 Removing the Antenna

#### Required tools:

- ☐ Long-nosed pliers


#### Procedure:

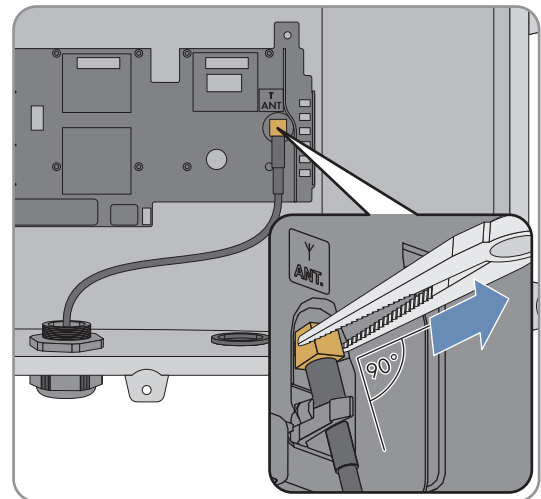
1. ** DANGER**

#### **Danger to life due to high voltages of the PV array**

When exposed to sunlight, the PV array generates dangerous direct voltage. Touching the DC conductors can lead to lethal electric shocks. Even if the DC load-break switch of the inverter is in the **O**, position, there will be dangerous direct voltage present in the DC conductors and on the **DC-in** connecting terminal plate in the Connection Unit of the inverter.

- Prior to performing any work on the inverter, always disconnect the inverter from voltage sources on the AC and DC sides and secure it against reconnection (see the inverter manual).
- Leave the **DC-in** connecting terminal plate plugged into the Connection Unit of the inverter and only touch it on the black enclosure.
- Do not remove the DC cable from the connecting terminal plate.

2. Pull the antenna cable plug out of pin connector **ANT**.  of the communication assembly using long-nosed pliers. Ensure that the antenna cable is pulled out at 90° 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. Remove the cable gland and antenna cable from the inverter.
6. 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. We require the following information in order to provide you with the necessary assistance:

- Inverters:
  - Serial number
  - Firmware version
  - Special country-specific settings (if applicable)
- Detailed description of the problem

United States/ Estados Unidos	SMA Solar Technology America LLC Rocklin, CA	Toll free for USA, Canada and Puerto Rico / Llamada gratuita en EE. UU., Canadá y Puerto Rico: +1 877-MY-SMATech (+1 877-697-6283) International / Internacional: +1 916 625-0870
Canada/ Canadá	SMA Solar Technology Canada Inc. Mississauga	Toll free for Canada / gratuit pour le Canada: +1 877-MY-SMATech (+1 877-697-6283)

