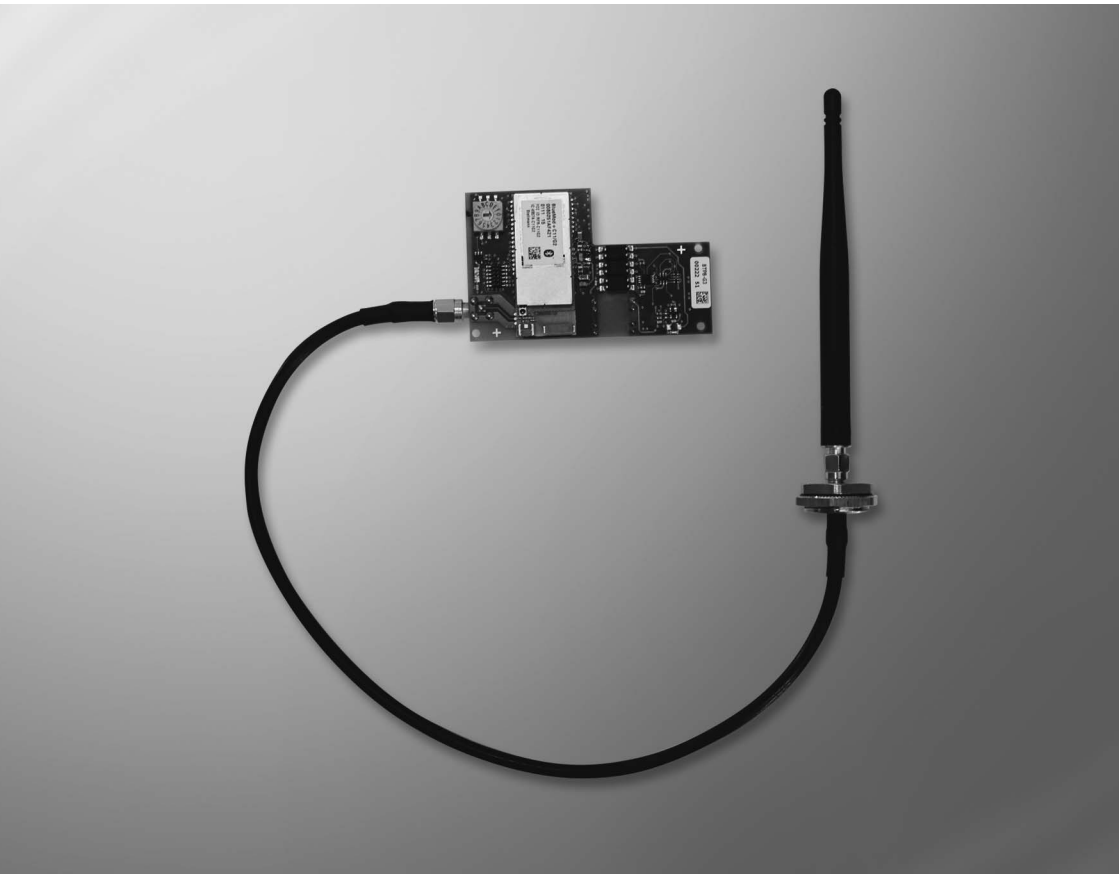
Communication Interface for SMA Inverters

# SMA *BLUETOOTH*® PIGGY-BACK PLUS

**Installation Guide**



BTPB-Ant-IEN111510 | 98-0032110 | Version 1.0

EN

# Table of Contents


**1 Information on this Manual . . . . . 5**

**2 Safety . . . . . 6**

2.1 Appropriate Usage . . . . . 6

2.2 Standards . . . . . 7

2.3 Target Group Qualification . . . . . 7

2.4 Safety Instructions . . . . . 8

**3 Description of the *Bluetooth* Piggy-Back . . . . . 8**

**4 Scope of Supply . . . . . 9**

**5 Identifying the *Bluetooth* Piggy-Back . . . . . 10**

**6 Preparing *Bluetooth* Communication . . . . . 11**

6.1 Detecting a Free NetID . . . . . 11

6.2 Setting the NetID . . . . . 11

**7 Mounting . . . . . 13**

7.1 Installation Site Requirements . . . . . 13

7.2 Installing the *Bluetooth* Piggy-Back . . . . . 13

7.3 Connecting the Antenna to the *Bluetooth* Piggy-Back . . . . . 16

**8 Establishing *Bluetooth* Communication . . . . . 20**

**9 Updating the Firmware . . . . . 21**

**10 Decommissioning . . . . . 22**

10.1 Removing the *Bluetooth* Piggy-Back . . . . . 22

10.2 Disposing of the *Bluetooth* Piggy-Back . . . . . 24

**11 Troubleshooting . . . . . 25**

**12 Technical Data . . . . . 27**
12.1 *Bluetooth* Piggy-Back . . . . . 27
12.2 Antenna . . . . . 28
12.3 Antenna Cable . . . . . 28
**13 Contact . . . . . 29**

# 1 Information on this Manual

## Validity

This manual is valid for the SMA *Bluetooth* Piggy-Back Plus, firmware version 02.00.03.R and higher.

## Target Group

This manual is intended for skilled workers. Only qualified personnel are allowed to perform the tasks set forth in this manual (see section 2.3 "Target Group Qualification", page 7).

## Additional Information

Additional information is available at www.SMA.de/en:

| Document title | Document type |
|---|---|
| SMA *Bluetooth* - SMA *Bluetooth*® Wireless Technology in Practice. | Technical information |
| SMA *Bluetooth*® Wireless Technology | Technical description |

## Symbols

| Symbol | Explanation |
|---|---|
| ⚠ 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 that can result in property damage if not avoided. |
| i | Indicates information that is important for a specific topic or objective, but is not safety-relevant. |
| ☐ | Indicates a requirement for meeting a specific goal. |
| ☑ | Desired result. |
| ✖ | Undesired result. Followed by a solution on how to achieve the desired result. |

## Nomenclature

- This manual refers to PV plants and small wind turbine systems collectively as "plants."
- In this manual the SMA *Bluetooth* Piggy-Back Plus is referred to as *Bluetooth* Piggy-Back.

# 2 Safety

## 2.1 Appropriate Usage

The *Bluetooth* Piggy-Back is a communication interface and is used to connect the inverter with other SMA *Bluetooth*-enabled devices. Only skilled workers may install and uninstall the *Bluetooth* Piggy-Back.

The *Bluetooth* Piggy-Back may only be used with the following inverters:

| Photovoltaic inverters | | Wind power inverters |
|---|---|---|
| **Sunny Boy (SB)** | **Sunny Mini Central (SMC)** | **Windy Boy (WB)** |
| SB 700 | SMC 4600A | WB 1100 |
| SB 1100 | SMC 5000 | WB 1100-IT |
| SB 1100E | SMC 5000A | WB 1100E |
| SB 1100LV | SMC 5000A-IT | WB 1100LV |
| SB 1100-IT | SMC 6000 | WB 1100LV-IT |
| SB 1200 | SMC 6000A | WB 1200 |
| SB 1200-IT | SMC 6000A-IT | WB 1200-IT |
| SB 1600TL-10 | SMC 6000A-KR | WB 1700 |
| SB 1700 | SMC 7000HV | WB 1700E |
| SB 1700E | SMC 7000HV-IT | WB 1700-IT |
| SB 1700-IT | SMC 7000HV-11 | WB 2500 |
| SB 2100TL | SMC 7000HV-11/IT | WB 2500-IT |
| SB 2500 | | WB 2800i |
| SB 2500-IT | | |
| SB 2500-KR | | |

| Photovoltaic inverters | | Wind power inverters |
|---|---|---|
| **Sunny Boy (SB)** | **Sunny Mini Central (SMC)** | **Windy Boy (WB)** |
| SB 2800i | SMC 6000TL | WB 3000 |
| SB 3000 | SMC 6000TL-IT | WB 3000-IT |
| SB 3000-IT | SMC 7000TL | WB 3300 |
| SB 3000-KR | SMC 7000TL-IT | WB 3300-IT |
| SB 3300 | SMC 8000TL | WB 3800 |
| SB 3300-IT | SMC 8000TL-IT | WB 3800-IT |
| SB 3300TL HC | SMC 8000TL-KR | WB 5000A |
| SB 3300TL HC-IT | SMC 9000TL-10 | WB 5000A-IT |
| SB 3800 | SMC 9000TL-10/IT | WB 6000A |
| SB 3800-IT | SMC 10000TL-10 | WB 6000A-IT |
| SB 4200TL HC | SMC 10000TL-10/IT | |
| SB 4200TL HC-IT | SMC 11000TL-10 | |
| SB 5000TL HC | SMC 11000TL-10/IT | |
| SB 5000TL HC-IT | SMC 9000TLRP-10 | |
| | SMC 10000TLRP-10 | |
| | SMC 11000TLRP-10 | |

## 2.2 Standards

The *Bluetooth* Piggy-Back complies with the following standards:

- R&TTE 1999 / 5 / EC:
  - EN 300 328-2
  - EN 301 489-17
  - EN 50371
  - EN 60950
  - EN 301489-1

## 2.3 Target Group Qualification

An electrically skilled person has received training and has demonstrated skills and knowledge regarding the functions and operation of the device. An electrically skilled person is trained to deal with the dangers and hazards involved in installing electrical systems.

## 2.4 Safety Instructions

### Electric Shock

There is a risk of lethal electric shock when touching conductive parts of the inverter.

- Prior to performing any work on the inverter, disconnect the inverter on the AC and DC sides (see inverter installation guide).
- Only skilled persons may work on the inverter.

### Electrostatic Discharge (ESD)

By touching electronic components you can cause damage to or destroy the inverter through electrostatic discharge (ESD).

- Ground yourself before touching a component by touching the protective conductor (PE) or a non-coated part of the inverter enclosure.
- Avoid coming into contact with components and plug contacts.

# 3 Description of the *Bluetooth* Piggy-Back

The *Bluetooth* Piggy-Back allows you to establish a connection via SMA *Bluetooth* Wireless Technology to other SMA inverters and communication products with SMA *Bluetooth* (e.g., Sunny Explorer, Sunny Beam with *Bluetooth*).

The *Bluetooth* Piggy-Back reads inverter data and sends the data to a communication product with SMA *Bluetooth* Wireless Technology. You can read or configure the inverter data using the communication product.

# 4 Scope of Supply

Check the scope of supply for completeness and any visible external damage. Please contact your dealer if the scope of supply is not complete or you find any damage.

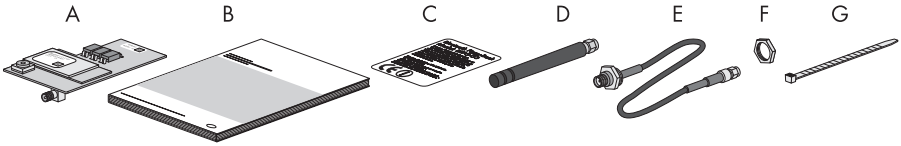


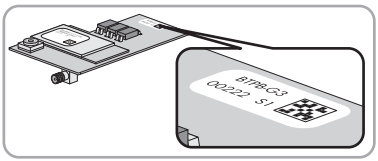

Figure 1: Scope of delivery

| Item | Quantity | Description |
|---|---|---|
| A | 1 | SMA *Bluetooth* Piggy-Back Plus: BTPB-G3 |
| B | 1 | Installation guide |
| C | 1 | Label with FCC certification, IC certification and CE mark |
| D | 1 | Antenna |
| E | 1 | Antenna cable |
| F | 1 | Counter nut for antenna cable |
| G | 1 | Cable tie |

# 5 Identifying the *Bluetooth* Piggy-Back

## Serial Number, Assembly Name, Production Version

You can find the serial number, assembly name and production version of the *Bluetooth* Piggy-Back on the type label. The type label is located on the front of the *Bluetooth* Piggy-Back.




## Firmware Version

The firmware version of the *Bluetooth* Piggy-Back is displayed by means of the communication product, e.g., Sunny Explorer or Sunny Beam with *Bluetooth* (see manual of the communication product).

# 6 Preparing *Bluetooth* Communication

## 6.1 Detecting a Free NetID

The NetID serves to distinguish PV plants with SMA *Bluetooth* in close proximity of each another.

If another plant with SMA *Bluetooth* is located within 500 m of your plant, you will have to detect a free NetID. This way you will prevent setting a NetID for your plant that is already set for by another plant. If no other plant is located within 500 m, you may choose any NetID for your plant.

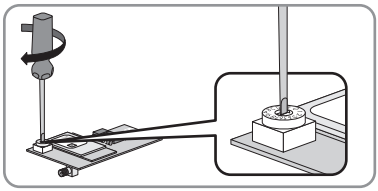
- Detecting a free NetID using the Sunny Explorer software (see Sunny Explorer help).

## 6.2 Setting the NetID

**Requirement:**

☐ A free Net ID has been detected (see section 6.1).

- Use a screwdriver to turn the arrow of the rotary switch to the plant's NetID. Use a screwdriver with a width of 2.5 mm.



## Functions of the NetIDs

| NetID | Function |
|---|---|
| 0 | *Bluetooth* is switched off. |
| 1<br>(status upon delivery) | *Bluetooth* is switched on.<br>The device can connect with **up to 2** of the following communication products:<br>• computer with *Bluetooth* and Sunny Explorer software<br>The device **cannot** establish a connection with the following devices:<br>• inverters with integrated SMA *Bluetooth*<br>• inverters with SMA *Bluetooth* Piggy-Back<br>• Sunny Beam with *Bluetooth*<br>• SMA *Bluetooth* Repeater<br>• SMA *Bluetooth* Repeater Outdoor<br>• SMA Power Injector with *Bluetooth* |
| 2 to 9 and A to F | *Bluetooth* is switched on.<br>The device can connect with all SMA *Bluetooth* products with the same NetID. |

# 7 Mounting

## 7.1 Installation Site Requirements

- Keep a distance of at least 1 m from devices using the 2.4 GHz frequency band (e.g., WLAN devices, microwave ovens, devices with *Bluetooth* Wireless Technology). This will prevent reduced connection quality and data transmission speed.

## 7.2 Installing the *Bluetooth* Piggy-Back

**Requirement:**

☐ The NetID of the plant has been set on the *Bluetooth* Piggy-Back (see section 6.2).

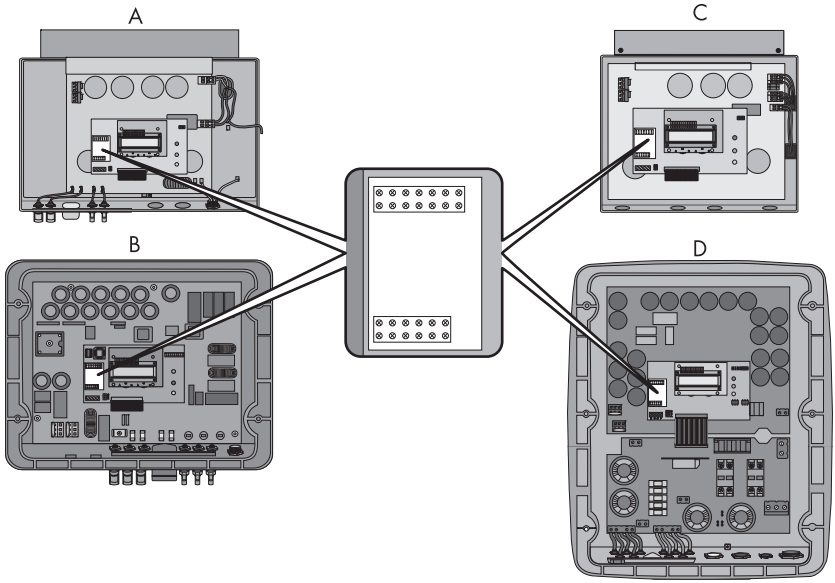



Figure 2: Position of the interface socket

| Item | Inverter* |
|---|---|
| A | From SB 1100 to SB 3000-KR as well as WB 1100 to WB 3000-IT, referred to as **"Enclosure type A"** in the following. |
| B | From SB 3300 to SB 5000TL HC-IT as well as from WB 3300 to WB 3800-IT, referred to as **"Enclosure type B"** in the following. |
| C | SB 700 as well as SB 1100, SB 1100E, SB1100LV, SB1100-IT, WB 1100, WB 1100E, WB 1100LV with the enclosure type of a SB 700, referred to as **"Enclosure type C"** in the following. |
| D | From SMC 4600A to SMC 11000TLRP-10 as well as WB 5000A and WB 6000A, referred to as **"Enclosure type D"** in the following. |

* "From [...] to [...]" refers to the list of supported inverters, see section 2.1.

**⚠ DANGER**

**Risk of lethal electric shock when opening the inverter.**

**Death or serious injuries.**

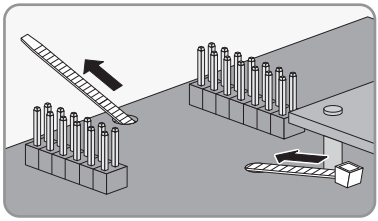
- Disconnect the inverter on the AC and DC side (see inverter installation guide).

***NOTICE***

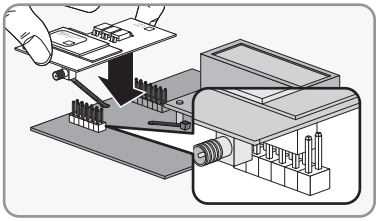
**Electrostatic discharge can damage the inverter.**

- Ground yourself before touching components by touching the protective conductor (PE) or a non-coated part of the inverter enclosure.

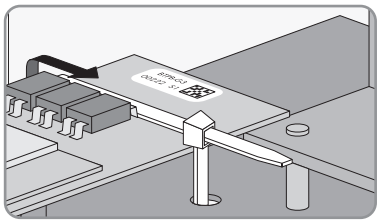
1. Disconnect and open the inverter (see inverter installation guide).
2. If another communication interface is installed on the interface socket, remove the installed communication interface (see communication interface manual).
3. Pass the cable tie through the mounting holes of the display assembly. Make sure to pass the cable tie below the display assembly.



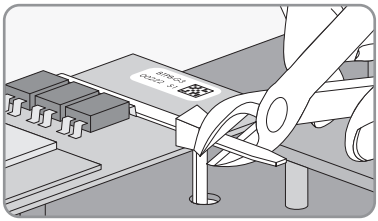
4. Plug the *Bluetooth* Piggy-Back onto the interface socket, aligned to the left. Make sure to leave the two pins on the right side of the lower row of pins free.



5. Fasten the cable tie.



6. Cut off the surplus end of the cable tie and remove it from the inverter.



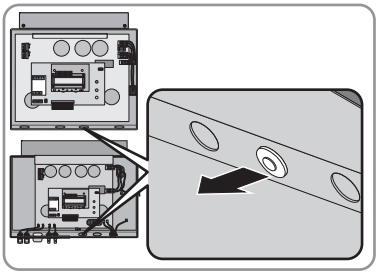
7. Connect the antenna to the *Bluetooth* Piggy-Back (see section 7.3).

## 7.3 Connecting the Antenna to the *Bluetooth* Piggy-Back

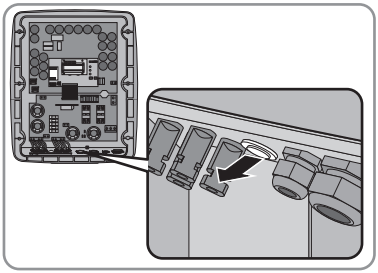
**Requirement:**

☐ You have installed the *Bluetooth* Piggy-Back in the inverter (see section 7.2).

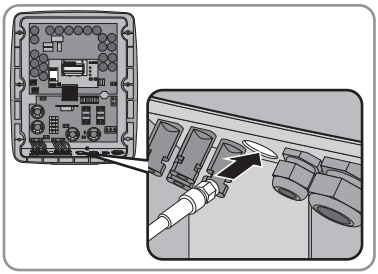
1. For inverters with enclosure type A and enclosure type C: press the filler-plug in the middle out of the enclosure opening.



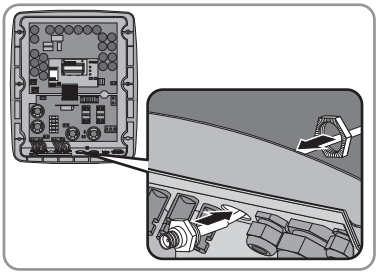
2. For inverters with enclosure type B and with enclosure type D: press the left filler-plug out of the inverter's enclosure opening.



3. Insert the antenna cable with the cable end and the plug through the enclosure opening into the inverter.



4. Attach the counter nut onto the antenna cable with the serrated edges facing towards the inverter enclosure.



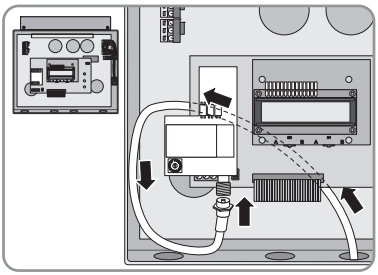
5. First tighten the counter nut by hand, then screw it onto the antenna cable's thread with a torque of 9 Nm. Spanner size of the torque wrench: 26 mm.
6. Install the antenna cable in the inverter:

**NOTICE**

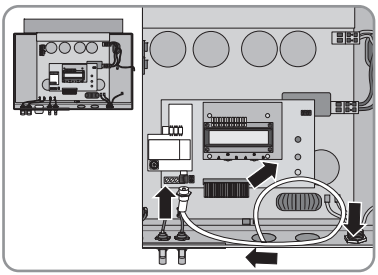
**The antenna cable can be damaged.**

- Do not bend the antenna cable.
- Keep the antenna cable away from heat-conducting component parts.

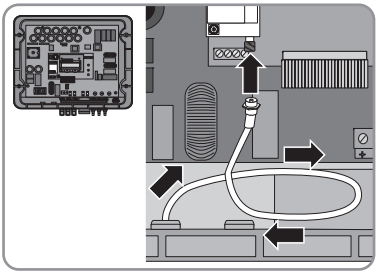
- For inverters with enclosure type C: pass the antenna cable below the display assembly. Pass the antenna cable along the left edge of the inverter enclosure towards the antenna connection of the *Bluetooth* Piggy-Back.



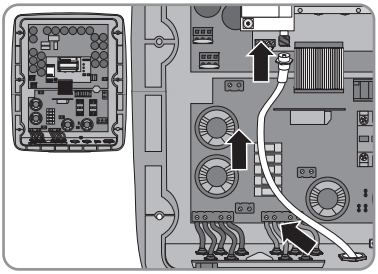
- For inverters with enclosure type A: pass the antenna cable to the right over the display assembly. Pass the antenna cable towards the antenna connection of the *Bluetooth* Piggy-Back in a loop.



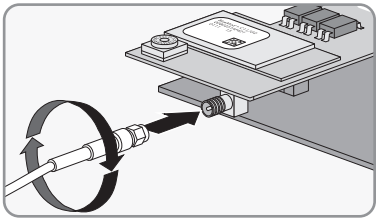
- For inverters with enclosure type B: pass the antenna cable along the lower edge of the inverter enclosure. Pass the antenna cable towards the antenna connection of the *Bluetooth* Piggy-Back in a loop.



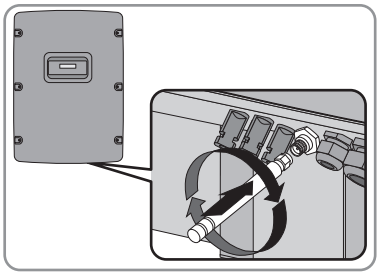
- For inverters with enclosure type D: pass the antenna cable towards the antenna connection of the *Bluetooth* Piggy-Back.



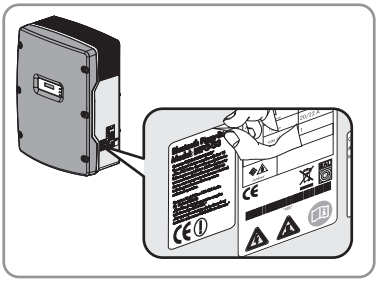
7. Screw the antenna cable plug to the antenna connection by hand without tools.



8. Close the inverter (see inverter installation guide).
9. Screw the antenna onto the antenna cable by hand without tools.



10. Attach the label with the FCC and IC certifications and CE mark to the right side of the inverter enclosure, close to the type label.



# 8 Establishing *Bluetooth* Communication

**Requirement:**

- ☐ Free NetID has been detected (see section 6.1).
- ☐ The NetID of the plant has been set on the *Bluetooth* Piggy-Back (see section 6.2).
- ☐ You have installed the *Bluetooth* Piggy-Back in the inverter (see section 7.2).

  **or**

- ☐ The *Bluetooth* Piggy-Back is pre-installed in the inverter.
- ☐ The antenna has been connected to the *Bluetooth* Piggy-Back (see section 7.3).

1. Commission the communication product (e.g., Sunny Explorer, Sunny Beam with *Bluetooth*; see manual of the communication product).
2. Commission the inverter with *Bluetooth* Piggy-Back (see inverter installation manual).
3. If the inverter with *Bluetooth* Piggy-Back has a different password than the plant, change the password of the inverter with *Bluetooth* Piggy-Back to the plant password using the Sunny Explorer software (see Sunny Explorer help).

☑ The *Bluetooth* Piggy-Back is establishing a connection to other devices with SMA *Bluetooth*. You can read or configure the inverter data using the communication product.

**Using the *Bluetooth* Piggy-Back in France**

In France there a restriction for maximum *Bluetooth* transmission power.

If you use the inverter with *Bluetooth* Piggy-Back in France, the French standard must have been set on the inverter, so the *Bluetooth* Piggy-Back will reduce its transmission power. You can see the default standard to which the inverter was set on the inverter's type label and on the included supplementary document with the factory settings.

- If the inverter has not been configured for the French standard, set the French standard using the Sunny Explorer software, for example (see Sunny Explorer software, "Settings > Grid monitoring > Country standard").

# 9 Updating the Firmware

You can update the firmware of the *Bluetooth* Piggy-Back using the Sunny Explorer software. The *Bluetooth* Piggy-Back remains in the inverter while the update is being performed.

**Requirement:**

☐ The inverter's feed-in power is at least 50 W.

1. Update firmware using Sunny Explorer (see Sunny Explorer help).
2. Restart Sunny Explorer.

# 10 Decommissioning

## 10.1 Removing the *Bluetooth* Piggy-Back

**⚠ DANGER**

**Risk of lethal electric shock when opening the inverter.**

**Death or serious injuries.**

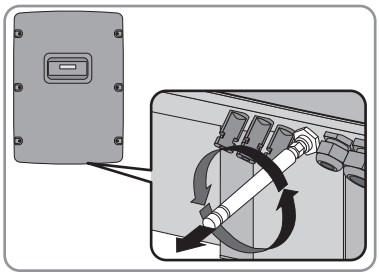
- Disconnect the inverter on the AC and DC side (see inverter installation guide).

***NOTICE***

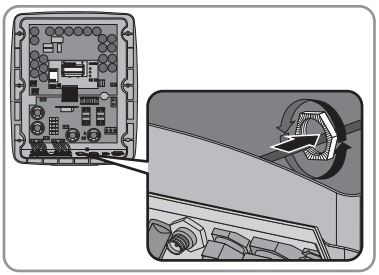
**Electrostatic discharge can damage the inverter.**

- Ground yourself before touching components by touching the protective conductor (PE) or a non-coated part of the inverter enclosure.

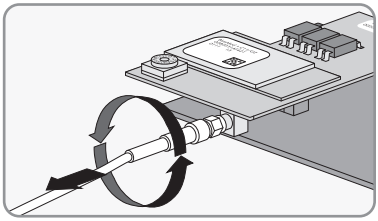
3. Unscrew the antenna from the antenna cable.



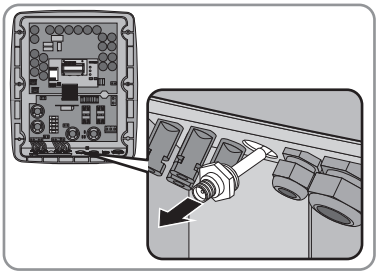
4. Disconnect and open the inverter (see inverter installation guide).
5. Unscrew the counter nut from the thread of the antenna cable.



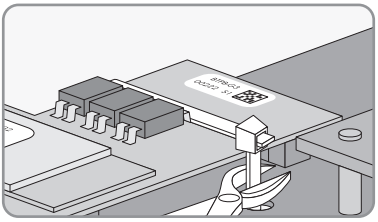
6. Unscrew the antenna cable plug from the antenna connection of the *Bluetooth* Piggy-Back.



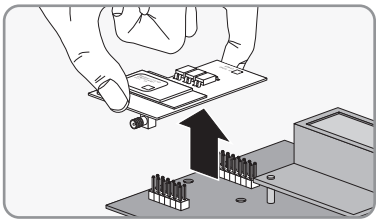
7. Pull the antenna cable out of the inverter through the enclosure opening.



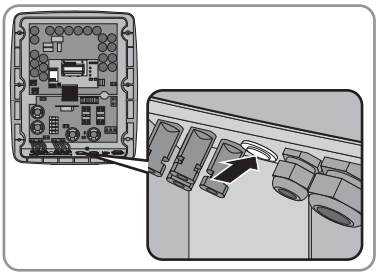
8. Cut the cable tie and remove it from inverter.



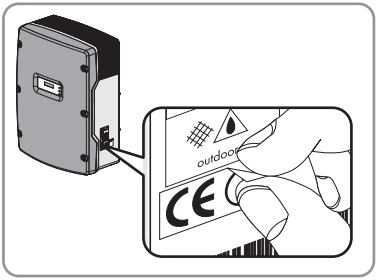
9. Remove the *Bluetooth* Piggy-Back from the interface socket.



10. Close the enclosure opening with the filler-plug.



11. Close the inverter (see inverter installation guide).
12. Remove the label with the FCC and IC certifications and the CE mark from the inverter.




## 10.2 Disposing of the *Bluetooth* Piggy-Back

- Observe the disposal regulations for electronic waste that apply at the installation site when disposing of the *Bluetooth* Piggy-Back.
- In order to have us dispose of the *Bluetooth* Piggy-Back, send the *Bluetooth* Piggy-Back back to SMA Solar Technology AG at your own cost, labeled "ZUR ENTSORGUNG" ("FOR DISPOSAL").

# 11 Troubleshooting

| Problem | Cause | Measure |
|---|---|---|
| The inverter with *Bluetooth* Piggy-Back is not shown by the communication product. | The inverter with *Bluetooth* Piggy-Back has not been commissioned. | • Commission the inverter with *Bluetooth* Piggy-Back (see inverter installation guide). |
| | The inverter with *Bluetooth* Piggy-Back is not in feed-in operation. | • Wait until the inverter switches to feed-in operation. |
| | The *Bluetooth* Piggy-Back has not been installed correctly on the interface socket. | • Ensure that the *Bluetooth* Piggy-Back has been correctly installed on the interface socket (see section7.2). |
| | NetID "0" is set on the *Bluetooth* Piggy-Back. | • Set the NetID of the plant on the *Bluetooth* Piggy-Back (see section 6.2). |
| | NetID "1" is set on the *Bluetooth* Piggy-Back. | • Set another NetID on the *Bluetooth* Piggy-Back. |

| Problem | Cause | Measure |
|---|---|---|
| The connection between the inverter with the *Bluetooth* Piggy-Back and the communication product is disturbed. | The distance between the inverter with *Bluetooth* Piggy-Back and the communication product is too large. | • Decrease the distance between the inverter with *Bluetooth* Piggy-Back and the communication product.<br>• If required, use an SMA *Bluetooth* Repeater to cover the dead zones. |
| | The *Bluetooth* radio waves are being weakened by obstacles (e.g., walls, ceilings, doors). | • Position the communication product in such a manner as to prevent obstacles from disturbing the *Bluetooth* radio waves.<br>• If required, use an SMA *Bluetooth* Repeater to cover the dead zones. |
| | The distance between the inverter with *Bluetooth* Piggy-Back and other devices using the 2.4 GHz frequency band is too small. | • Make sure that the requirements for the installation site of the inverter with *Bluetooth* Piggy-Back are met (see section 7.1). |
| | The antenna has not been connected correctly to the *Bluetooth* Piggy-Back. | • Ensure that the antenna is screwed onto the antenna cable correctly (see section 7.3). |
| | | • Ensure that the antenna cable plug is correctly screwed onto the antenna connection of the *Bluetooth* Piggy-Back (see section 7.3). |
| The *Bluetooth* Piggy-Back firmware cannot be updated. | The inverter's feed-in power is less than 50 W. | • Only update the firmware if the feed-in power is at least 50 W. |

# 12 Technical Data

## 12.1 *Bluetooth* Piggy-Back

### Mechanical Data

| | |
|---|---|
| Width x length | 50 mm x 81 mm |
| Weight | 60 g |

### Communication

| | |
|---|---|
| Communication interface | *Bluetooth* |
| Maximum free-field communication range when installed, if inverter lid is closed and antenna is connected | 100 m |

### Connections

| | |
|---|---|
| Number of 10-pin socket connectors | 1 |
| Number of 14-pin socket connectors | 1 |
| Number of 1-pin reverse polarity sub-miniature A-socket | 1 |

### Ambient Conditions

| | |
|---|---|
| Ambient temperature | − 40 °C ... +85 °C |
| Relative humidity* | 5 % ... 95 % |
| Maximum height** | 3 000 m |

* Non-condensing

** Above mean sea level

## 12.2 Antenna

### Mechanical Data

| | |
|---|---|
| Diameter x length | 10 mm x 130 mm |
| Weight | 12 g |

### Ambient Conditions

| | |
|---|---|
| Ambient temperature | – 40 °C ... +85 °C |
| Relative humidity | 5 % ... 95 % |
| Maximum height | 3 000 m |
| Degree of protection* | IP65 |

* Degree of protection according to DIN EN 60529

### Connections

| | |
|---|---|
| Number of 1-pin reverse polarity sub-miniature A-socket | 1 |

## 12.3 Antenna Cable

### Mechanical Data

| | |
|---|---|
| Diameter x length | 5 mm x 420 mm |
| Weight | 51 g |

### Ambient Conditions

| | |
|---|---|
| Ambient temperature | – 40 °C ... +85 °C |
| Relative humidity | 5 % ... 95 % |
| Maximum height | 3 000 m |

### Connections

| | |
|---|---|
| Number of 1-pin reverse polarity sub-miniature A-socket | 1 |
| Number of 1-pin reverse polarity sub-miniature A panel jack | 1 |

# 13 Contact

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

- type and serial number of the inverter
- communication interface serial number
- type and serial number or version of the communication device (e.g., Sunny Beam, Sunny Explorer)
- detailed description of the problem

**SMA Solar Technology AG**

Sonnenallee 1

34266 Niestetal, Germany

www.SMA.de

**SMA Serviceline**

| | |
|---|---|
| Inverters: | +49 561 9522 1499 |
| Communication: | +49 561 9522 2499 |
| Fax: | +49 561 9522 4699 |
| E-Mail: | Serviceline@SMA.de |

## Exclusion of liability

The general terms and conditions of delivery of SMA Solar Technology AG shall apply.

The content of these documents is continually checked and amended, where necessary. However, discrepancies cannot be excluded. No guarantee is made for the completeness of these documents. The latest version is available online at www.SMA.de or from the usual sales channels.

Guarantee or liability claims for damages of any kind are excluded if they are caused by one or more of the following:

- Damages during transportation
- Improper or inappropriate use of the product
- Operating the product in an unintended environment
- Operating the product whilst ignoring relevant, statutory safety regulations in the deployment location
- Ignoring safety warnings and instructions contained in all documents relevant to the product
- Operating the product under incorrect safety or protection conditions
- Altering the product or supplied software without authority
- The product malfunctions due to operating attached or neighboring devices beyond statutory limit values
- In case of unforeseen calamity or force majeure

The use of supplied software produced by SMA Solar Technology AG is subject to the following conditions:

- SMA Solar Technology AG rejects any liability for direct or indirect damages arising from the use of software developed by SMA Solar Technology AG. This also applies to the provision or non-provision of support activities.
- Supplied software not developed by SMA Solar Technology AG is subject to the respective licensing and liability agreements of the manufacturer.

## SMA Factory Warranty

The current guarantee conditions come enclosed with your device. These are also available online at www.SMA.de and can be downloaded or are available on paper from the usual sales channels if required.

## Trademarks

All trademarks are recognized even if these are not marked separately. Missing designations do not mean that a product or brand is not a registered trademark.

The *Bluetooth*® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by SMA Solar Technology AG is under license.

**SMA Solar Technology AG**

Sonnenallee 1

34266 Niestetal

Germany

Tel. +49 561 9522-0

Fax +49 561 9522-100

www.SMA.de

E-Mail: info@SMA.de

## SMA Solar Technology

# www.SMA-Solar.com

**SMA Solar Technology AG**
www.SMA.de
**SMA America, LLC**
www.SMA-America.com
**SMA Technology Australia Pty., Ltd.**
www.SMA-Australia.com.au
**SMA Benelux SPRL**
www.SMA-Benelux.com
**SMA Beijing Commercial Co., Ltd.**
www.SMA-China.com
**SMA Czech Republic s.r.o.**
www.SMA-Czech.com
**SMA France S.A.S.**
www.SMA-France.com
**SMA Hellas AE**
www.SMA-Hellas.com
**SMA Ibérica Tecnología Solar, S.L.**
www.SMA-Iberica.com
**SMA Italia S.r.l.**
www.SMA-Italia.com
**SMA Technology Korea Co., Ltd.**
www.SMA-Korea.com