

Device for closing dead zones with SMA  $\mathit{Bluetooth}^{\circledR}$  Wireless Technology

# **SMA BLUETOOTH REPEATER**

Installation Manual



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## 1 Information on this Manual

# Validity

This manual is valid for the SMA Bluetooth Repeater, firmware version V 0.18R, 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 2.2 "Target Group Qualification", page 7).

#### Additional Information

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

Document Title	Document Type
SMA Bluetooth® Wireless Technology	Technical Description
SMA Bluetooth® Wireless Technology in Practice	Technical Information

### **Symbols**

Symbol	Explanation
<b>▲</b> DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
<b>▲</b> WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
<b>▲</b> 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.
<b>I</b>	Desired result.
×	A problem that could occur.

# Typography

Typography	Explanation	Example	
"light"	Designates elements in a software user interface or on a display or mentions device connections.	terface or on a display or "Energy" field.	
bold	Designates elements that can be selected or entered in a software user interface or on a display.	Select Settings.     Enter 10 in the "Minutes" field.	
>	Designates multiple elements that should be selected in a software user interface or on a display.	Select Settings > Date.	
[Button/key]	Designates buttons or keys that should be selected or pressed.	Select [Next].	

### Nomenclature

This manual refers to PV plants and small wind turbine systems collectively as "plants".

# 2 Safety

#### 2.1 Intended Use

The SMA Bluetooth Repeater may only be used with the following SMA Solar Technology AG products:

- All SMA communication products with Bluetooth
- All inverters with SMA Bluetooth Piggy-Back upgrade
- All inverters with SMA Bluetooth Piggy-Back Plus upgrade
- Inverters with integrated Bluetooth:
  - SB (Sunny Boy) 3000TL-20/SB 4000TL-20/SB 5000TL-20: from software package 2.06
  - SB 3000TL-21/SB 4000TL-21/SB 5000TL-21
  - SB 2000HF-30/SB 2500HF-30/SB 3000HF-30
  - STP (Sunny Tripower) 10000TL-10/STP 12000TL-10/STP 15000TL-10/STP 17000TL-10

Only use the SMA Bluetooth Repeater indoors.

# lacksquare

#### Information for France

In France, the SMA *Bluetooth* Repeater is only to be operated inside buildings due to the legal regulations.

Only skilled workers may install and uninstall the SMA Bluetooth Repeater.

Only use the SMA *Bluetooth* Repeater in accordance with the information provided in the enclosed documentation. Any other use can result in personal injury or property damage.

The enclosed documentation is a part of this product.

- Read and follow the documentation for the correct and optimum use of the SMA Bluetooth Repeater.
- Keep the documentation in a convenient place at all times.

# 2.2 Target Group Qualification

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

## 2.3 Safety Instructions

#### **Electric Shock**

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 manual).
- Only skilled workers may work on the inverter.

#### Electrostatic Discharge (ESD)

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

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

# 3 SMA Bluetooth Repeater

# 3.1 Range of Usage

The SMA Bluetooth Repeater is used to close dead zones under unfavorable installation conditions between SMA Solar Technology AG devices with Bluetooth Wireless Technology or to improve poor wireless connections.

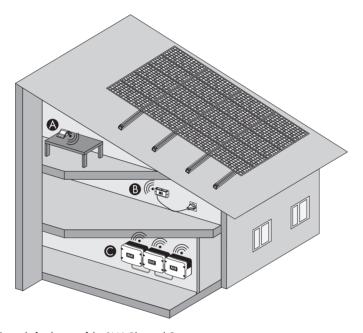


Figure 1: Example for the use of the SMA Bluetooth Repeater

Position	Description	
Α	Communication device (here: Sunny Beam with Bluetooth)	
В	SMA Bluetooth Repeater	
С	SMA Solar Technology AG inverter with Bluetooth	

#### 3.2 Function Overview

- Connection to SMA devices with Bluetooth Wireless Technology via Bluetooth Class 1.
- Maximum range of up to 100 m in free-field conditions with direct visual contact. In closed rooms the range is dependent on several factors.

# 3.3 Device Overview

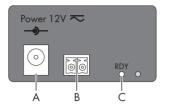




Figure 2: Overview of the device elements

Position	Description
Α	Plug-in power supply connection (AC)
В	DC source connection (e.g. Power Modul, see section 12 "Accessories", page 28)
С	"RDY" LED for power supply (green)
D	"MODE" rotary switch
Е	"NetID" rotary switch
F	Bluetooth LED (blue)
G	Connection quality LEDs (yellow)

# 4 Unpacking

# 4.1 Scope of Delivery

Check the delivery for completeness and for any visible damage. Please contact your retailer if the delivery is incomplete or you find any damage.

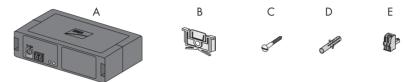


Figure 3: Components included in delivery

Position	Quantity	Description	
Α	1	SMA Bluetooth Repeater	
В	1	Bracket for wall mounting or top-hat rail mounting	
		(Is connected to the rear side of the SMA <i>Bluetooth</i> Repeater for delivery)	
С	1	Screw	
D	1	Screw anchor	
Е	1	2-pole plug for the connection of the power supply via the Power Modul	

# 4.2 Identifying the SMA Bluetooth Repeater

You can identify the SMA *Bluetooth* Repeater via the type label. The type label is on the right-hand side of the SMA *Bluetooth* Repeater.

# 5 Mounting

### 5.1 Selecting the Mounting Location

Observe the requirements for the mounting location or installation location:

- $\square$  The mounting location is indoors.
- ☐ The device is protected against dust, moisture and corrosive substances at the mounting location.
- ☐ Minimum clearances have been observed.

#### **Minimum Clearances:**

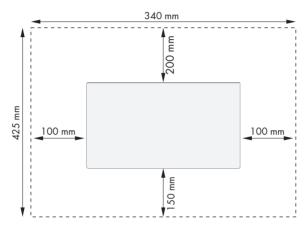


Figure 4: Minimum clearances to be observed

- If you are using a plug-in power supply, select a mounting location close to a socket-outlet.
- If you are using the Power Modul, observe the maximum cable length of 10 m for the power supply.
- Keep a distance of at least 1 m from devices that use the 2.4 GHz frequency band, e.g. WLAN
  devices or microwave ovens. This will prevent reduced connection quality and data transmission
  speed.

### **Determining the Mounting Location or Installation Location**

Determine the mounting location or installation location by changing the distance between the SMA *Bluetooth* Repeater and the devices with critical connection quality until all devices show at least a good connection quality.

#### Requirements:

The "MODE" rotary switch is at position "0" (see section 7.1 "Setting the MODE", page 18).
The "NetID" rotary switch is set to the NetID of the plant (see section 7.2 "Setting the
NetID", page 18).

### **A** DANGER

#### 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 manual).
- Only skilled workers may work on the inverter.
- Decommission the plant (see the manual of the inverter and of the communication product).
   Thus, you ensure that the SMA Bluetooth Repeater is integrated into the SMA Bluetooth network at the point where the dead zone thus improving the Bluetooth connection at that point.
- 2. Position the SMA Bluetooth Repeater half way between the devices with a critical connection quality.
- 3. Connect the power supply (see section 6 "Electrical Connection", page 16).
- 4. Recommission the plant (see the manual of the inverter and of the communication product).
- 5. Repeat the plant search with the communication device (see the communication product manual, e.g. Sunny Beam with Bluetooth, Sunny Explorer).
- 6. Check that the connection quality for all devices is at least "good". For this, all devices must be in their usual positions (e.g. the Sunny Beam may not be held directly in front of the SMA Bluetooth Repeater):

Product	"Good" connection quality
SMA Bluetooth Repeater	1 blue and 2 yellow LEDs are on
Sunny Boy of the type SB x000TL-2x and SB xx00HF-30, Sunny Tripower of the type STP 1x000TL-10	At least 2 rings are shown in the inverter display
SMA inverter of other types with SMA Bluetooth Piggy-Back or SMA Bluetooth Piggy-Back Plus	Check whether the connection quality improves through the use of the SMA <i>Bluetooth</i> Repeater
Communication device (e.g. Sunny Beam with Bluetooth)	See the respective manual
Sunny Explorer	Move the mouse cursor over the radio symbol at the lower right of the user interface

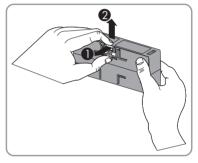
- The connection quality of all devices is at least "good". Mount or install the SMA Bluetooth Repeater at this location.
- ★ The connection quality of all devices is not at least "good"?

- Position the SMA Bluetooth Repeater at another location and re-check the connection qualities.
- If necessary install additional SMA Bluetooth Repeaters.

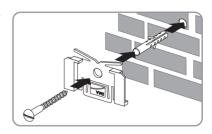
# 5.2 Mounting the SMA Bluetooth Repeater on the wall.

#### Mounting accessories required:

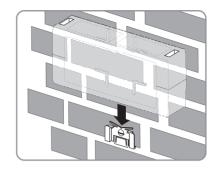
- 1 Bracket
- 1 Screw
- 1 Screw anchor
- Remove the bracket from the guide rail on the rear side of the SMA Bluetooth Repeater. Lift the bracket via the strap and press against the guide rail.



- Mark the drill hole. Observe the distances between the drill hole and the enclosure sides.
- 70 mm 70 mm 15 mm
- Drill a hole with a diameter of 6 mm at the position marked.
- Affix the bracket to the wall using the screw anchor and the screw. Align the bracket so that both pins point upwards and the SMA logo faces to the front.



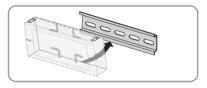
- Plug the SMA Bluetooth Repeater from the top onto the bracket. Observe the orientation of the SMA logo on the enclosure.
- ☑ The SMA Bluetooth Repeater snaps audibly into place.



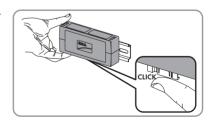
# 5.3 Mounting the SMA Bluetooth Repeater to a top-hat rail

#### Mounting accessories required:

- 1 Bracket
- Pull the bracket using the strap and pull it out of the guide rail on the rear side of the SMA Bluetooth Repeater until only half of the bracket is still locked in place. The bracket slightly protrudes over the enclosure edge.
- 2. Hook the SMA Bluetooth Repeater from below onto the top-hat rail.



- 3. Push the SMA *Bluetooth* Repeater upwards onto the top-hat rail.
- 4. Push the SMA Bluetooth Repeater downwards.
- 5. Push the bracket into the guide rail until the bracket completely snaps into place.



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### 6 Electrical Connection

# 6.1 Connect the SMA *Bluetooth* Repeater to the power supply using the plug-in power supply

### **A** WARNING

16

#### Danger of fire due to incorrect plug-in power supply

Technically unsuitable plug-in power supplies may cause a short circuit or a fire.

- Use the plug-in power supply intended as an accessory for the SMA Bluetooth Repeater.
- Connect the country-specific socket-outlet adapter to the plug-in power supply; it snaps into
  place when inserted correctly.
- Insert the plug-in power supply plug into the "Power 12V" terminal of the SMA Bluetooth Repeater.
- 3. Plug the plug-in power supply mains plug into the socket-outlet.
- ☑ The "RDY" LED on the SMA Bluetooth Repeater lights up. The SMA Bluetooth Repeater is connected to the power supply.
- ★ The "RDY" LED is not lit or is blinking?
  - See section 10.1 "Power Supply", page 22.

# 6.2 Connecting the SMA Bluetooth Repeater to the power supply using the Power Modul

## **▲** 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 manual).

#### NOTICE

#### Electrostatic discharge can damage the inverter

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

#### Requirement:

- ☐ The Power Modul is installed in the inverter (see Power Modul manual).
- 1. Disconnect and open the inverter (see inverter installation manual).
- 2. Open the spring terminals of the 2-pole plug.
- 3. Connect the insulated conductors to the spring terminals. For this purpose, the polarity is arbitrary.
- 4. Close the spring terminals.
- 5. Recommission the inverter with installed Power Modul (see inverter manual).
- 6. Insert the 2-pole plug into the "Power 12V" terminal on the SMA Bluetooth Repeater.
- ☑ The "RDY" LED on the SMA Bluetooth Repeater lights up. The SMA Bluetooth Repeater is connected to the power supply.
- ★ The "RDY" LED is not lit or is blinking?
  - See section 10.1 "Power Supply", page 22.

# 7 Settings

### 7.1 Setting the MODE

The "MODE" rotary switch is set to the position "0" for delivery. Other positions are not permitted and are intended for SMA Service only.

If the "MODE" rotary switch is not set to the correct position, turn the arrow of the "MODE" rotary switch to the correct position using a 2.5 mm screwdriver.

### 7.2 Setting the NetID

Plants with SMA Bluetooth operating in close proximity to one another are distinguished by their individual NetID. All devices in a plant must have the same NetID. You can set the SMA Bluetooth Repeater to the NetID of your plant using the "NetID" rotary switch.

Assignment of the rotary switch positions*		
NetID	Function	
0	Bluetooth is switched off.	
1	Bluetooth is switched on.	
(Status upon delivery)	The device can connect to a maximum of 2 communication products. The device cannot establish a connection to other inverters or SMA Bluetooth Repeaters.	
2 to 9 and A to F	Bluetooth is switched on.	
	The device can interlink with all SMA <i>Bluetooth</i> products having the same NetID.	

See section 10.2 for information on the status of the Bluetooth LEDs.

# i

#### NetID 1 is possible for plants with 1 inverter

You may leave the default NetID set to 1 in your inverter if your *Bluetooth* plant consists of the following products:

- Maximum 1 inverter
- Maximum 1 computer with Bluetooth and the Sunny Explorer software
- Maximum 1 Sunny Beam of the type BEAM-BT-11.GR1

#### or

- Maximum 1 inverter
- Maximum 2 Sunny Beams of the type BEAM-BT-11.GR1

In all other cases you must determine a free NetID (see Sunny Explorer Help).

- If the plant NetID is not known, read off the NetID from one of the devices in the plant (e.g. Sunny WebBox with Bluetooth or inverter with Bluetooth).
- Use a 2.5 mm screwdriver to turn the arrow of the "NetID" rotary switch to the plant NetID.

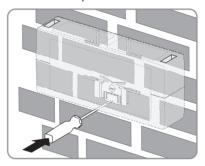
### 8 Maintenance and Care

- Regularly check whether the SMA Bluetooth Repeater is externally damaged or soiled.
- If the SMA Bluetooth Repeater is externally damaged to a degree that impairs correct functioning, replace the SMA Bluetooth Repeater.
- If the SMA Bluetooth Repeater is soiled, clean the SMA Bluetooth Repeater using only a slightly damp cloth. Only use a non-abrasive and non-acidic cleaning agent.

# 9 Decommissioning

# 9.1 Detaching the SMA Bluetooth Repeater from the wall

- 1. Disconnect the SMA Bluetooth Repeater from the power supply.
- If the SMA Bluetooth Repeater is connected to the plug-in power supply, pull the mains plug
  from the socket-outlet and remove the plug-in power supply plug from the
  SMA Bluetooth Repeater.
- If the SMA Bluetooth Repeater is connected to the Power Modul, disconnect and open the
  inverter with installed Power Modul (see inverter installation manual) and remove the
  2-pole plug from the "Power 12V" terminal on the SMA Bluetooth Repeater.
- 2. Push the SMA Bluetooth Repeater upwards and use a screwdriver to press it against the bracket.



- 3. Slide the SMA Bluetooth Repeater upwards away from the bracket.
- 4. Unscrew the screw from the wall and remove the bracket.
- If the SMA Bluetooth Repeater was connected to the Power Modul, remove the cable connection from the Power Modul (see Power Modul manual).

### 9.2 Detaching the SMA Bluetooth Repeater from the top-hat rail

- 1. Disconnect the SMA Bluetooth Repeater from the power supply.
- If the SMA Bluetooth Repeater is connected to the plug-in power supply, pull the mains plug from the socket-outlet and remove the plug-in power supply plug from the SMA Bluetooth Repeater.
- If the SMA Bluetooth Repeater is connected to the Power Modul, disconnect and open the
  inverter with installed Power Modul (see inverter installation manual) and remove the
  2-pole plug from the "Power 12V" terminal on the SMA Bluetooth Repeater.
- Push the SMA Bluetooth Repeater downwards and use a screwdriver to press it against the bracket. Pull the bracket downwards and remove.



Tilt the lower edge of the SMA Bluetooth Repeater forwards



 Remove the SMA Bluetooth Repeater upwards from the top-hat rail.



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If the SMA Bluetooth Repeater was connected to the Power Modul, remove the cable connection from the Power Modul (see Power Modul manual).

# 9.3 Disposing of the SMA Bluetooth Repeater

- Observe the disposal regulations for electronic waste that apply at the installation site when disposing of the SMA Bluetooth Repeater.
- To have SMA Solar Technology AG dispose of the SMA Bluetooth Repeater:
  - Use packaging which adequately protects the device from damage during transport.
     Hint: If available, use the original packaging.
  - Send the SMA Bluetooth Repeater back to SMA Solar Technology AG at your own cost with the information "ZUR ENTSORGUNG" ("FOR DISPOSAL").

# 10 Troubleshooting

# 10.1 Power Supply

"RDY" LED			
Status	Meaning	Measure	
Glows green continuously	The power supply is good. The SMA Bluetooth Repeater is operating.	None	
Flashes green and all other LED are unlit.	Power supply is marginal.  The SMA Bluetooth Repeater is operating.	If you are using a plug-in power supply:  Use only the plug-in power supply that is intended as an accessory for the SMA Bluetooth Repeater.  If you are using the Power Modul:  If you are using the SMA cable included in the delivery:  Contact the SMA Serviceline.  If you are using a different cable:  Improve the power supply via one of the following measures:  Shorten the cable.  Choose a larger cable cross-section.	
Flashes green and all other LEDs are flashing	The SMA Bluetooth Repeater firmware is defective.	Contact the SMA Serviceline.	

sure  u are using a plug-in power supply:  k whether the wall plug is supplying icity.  Connect a different device to the socketoutlet, for example.
k whether the wall plug is supplying icity.  Connect a different device to the socket-
If the socket-outlet is providing electricity, then either the plug-in power supply or the SMA Bluetooth Repeater is defective.  Replace the plug-in power supply.  Replace the SMA Bluetooth Repeater.  The are using the Power Modul:  If you are using the SMA cable included in the delivery:  Contact the SMA Serviceline.  If you are using a different cable:  Check the wiring.  If the wiring is correct, either the Power Modul or the SMA Bluetooth Repeater is defective.  Contact the SMA Serviceline.
1 1 1

## 10.2 Connection Quality

The SMA Bluetooth Repeater can only display the connection quality if it is integrated into an existing SMA Bluetooth network. The Bluetooth network is only established by master devices  $^*$ . A device always shows the connection quality to the device that established the connection to it.

Bluetooth LEDs			
Status		Measure	
Blue LED	Yellow LEDs	Connection quality	
Permanently on	3 LEDs are permanently lit	Very good	None
	2 LEDs are permanently lit	Good	None
	1 LED is permanently lit	Unreliable	Change the position of the SMA Bluetooth Repeater.     or
	<ul><li>SSS</li><li>3 LEDs are not lit</li></ul>	Critical	Install additional     SMA Bluetooth Repeaters.
⊗ Off	⊗⊗⊗ 3 LEDs are not lit	The SMA Bluetooth Repeater is not connected to the Bluetooth network.  There is no device with the	Check the NetID. Change the position of the SMA Bluetooth Repeater or install additional SMA Bluetooth Repeaters.
		same NetID within the radio range.	
		The SMA Bluetooth network has not been established. Network establishment is only triggered by masters, e.g. communication products.	Commission a master in the SMA Bluetooth network.
	3 LEDs flashing	The "NetID" rotary switch is set to position "]" or "0".	Set the "NetID" rotary switch to the NetID of your plant (see section 7.2).

<sup>\*</sup>Master is a network engineering term. In a network, a master is a device that requests other devices (slaves) to receive or send data, for example. All communication products (e.g. Sunny Explorer, Sunny Beam with Bluetooth) are masters in an SMA Bluetooth network.

Bluetooth LEDs			
Status		Measure	
Blue LED	Yellow LEDs	Connection quality	
flashes and the "RDY" LED flashes	3 LEDs flashing	The SMA Bluetooth Repeater firmware is defective.	Contact the SMA Serviceline.
green			

# 11 Technical Data

# 11.1 SMA Bluetooth Repeater

#### General Data

Width x height x depth	142 mm x 40 mm x 76 mm
Weight	144 g
Mounting location	indoors
Mounting type	Top-hat rail/wall mounting bracket
Status display	LEDs
Degree of protection (IP)*	IP20

<sup>\*</sup> According to IEC 60529

# **Power Supply**

AC power supply	Plug-in power supply	
Power supply DC	Power Modul	
AC input voltage	12 V 24 V	
Tolerance value for AC input voltage	± 10%	
Frequency of AC input voltage	50 Hz / 60 Hz	
DC input voltage	12 V 24 V	
Tolerance value for DC input voltage	± 20%	
Typical power consumption	0.8 W	
Maximum power consumption	1.2 W	

# **Environmental Conditions in Operation**

Ambient temperature	-20°C +65°C
Relative humidity, non condensing	5% 95%
Altitude above mean sea level (MSL)	0 m 3 000 m

### **Ambient Conditions during Storage/Transport**

Ambient temperature	-40°C +70°C
Relative humidity, non condensing	10% 95%
Altitude above mean sea level (MSL)	0 m 3 000 m

#### Communication

Inverter	Bluetooth
Data logger	Bluetooth
Range in open air	≤ 100 m

# 11.2 Plug-in Power Supply (CINCON, TRG30R 120)

### Mechanical Data

Width x Height x Depth	107.8 mm x 57.5 mm x 33.5 mm	
Weight	300 g	

# **Power Supply**

Voltage	100 V – 240 V AC, 50 Hz / 60 Hz
Nominal current	0.8 A

# 12 Accessories

You will find the corresponding accessories and spare parts for your product in the following overview.

If required, you can order these at SMA Solar Technology AG or your retailer.

Description	Brief description	SMA order number
Plug-in power supply for Europe, USA and Canada	Plug-in power supply for SMA Bluetooth Repeater, Sunny WebBox, SMA Power Injector with Bluetooth, RS485-Power Injector and Wireless-Set 485-01/02	PWRSUPPLY
Plug-in power supply for Australia and Korea	Plug-in power supply for SMA Bluetooth Repeater, Sunny WebBox, SMA Power Injector with Bluetooth, RS485-Power Injector and Wireless-Set 485-01/02	PWRSUPPLY/AU/KR
Power Modul	Module for the power supply of the SMA <i>Bluetooth</i> Repeater via the inverter.	PWRM-10-NR

### 13 Contact

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

- Type, serial number and firmware version of the inverter
- Serial number of the communication product
- Firmware version or software version of the communication product
- Serial number and firmware version of the SMA Bluetooth Repeater

### **SMA Solar Technology AG**

Sonnenallee 1 34266 Niestetal, Germany www.SMA.de

#### **SMA Serviceline**

 Inverters
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 561
 9522
 1499

 Communication:
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 561
 9522
 2499

 Fax:
 +49
 561
 9522
 4699

 F-Mail:
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- · 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

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- 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.

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