



Sunny Beam Repeater U Transmission Range Increase for Sunny Beam



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Revision History

Document Number	Rev. No.	Date	By	Description
WebBox-11:SE0806	1.0	Feb, 2006	TP	1st US Release

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1 Notes on this Manual

1.1 Target Group

This documentation is intended for installers and users. It includes a description of the system and instructions for the commissioning and operation of the device. Some of the activities described in this document may only be performed by qualified electricians. They are marked with a danger notice.

1.2 Applicability

This user manual for the repeater applies from Sunny Beam firmware version 2.21US.

1.3 Symbols Used

To ensure optimum use of this manual, note the following explanations of symbols used.

This symbol indicates a note which, if ignored, will make the procedure or operation more difficult.



This symbol indicates a cautionary note. Failure to observe this information may result in damage to the device.



This symbol indicates a danger which, if ignored, could possibly damage the device or lead to serious injury or death.



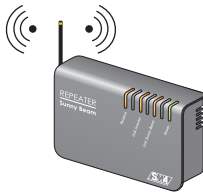
2 The Repeater

2.1 Applications

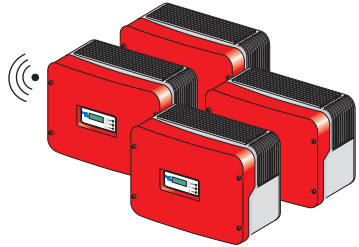
With the repeater, you can increase the Sunny Beam's range in order to reach the inverters under problematic ambient conditions. The repeater can be simply integrated into the existing transmission path from the Sunny Beam to the inverters. The repeater requires a wall socket for the power supply.



Sunny Beam U



Repeater



Inverters

2.2 Functions

Connection to the inverters and to the Sunny Beam via:

- Radio
(up to 325 ft in open air, up to 100 ft in buildings, maximum 4 inverters)

Supported inverters:

- The repeater supports all inverters that the Sunny Beam supports.

Number of inverters supported:

- up to 4

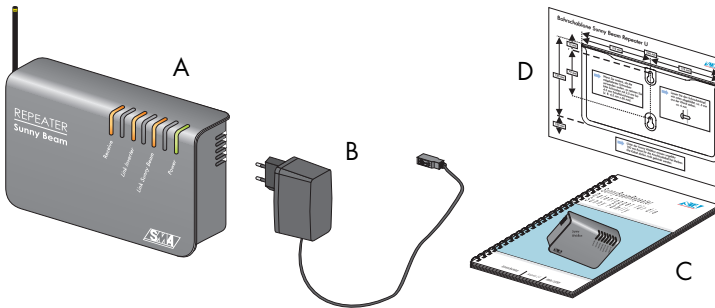
Connection to the power supply via:

- USB plug-in power supply (max. 6 ft)

Display of system states:

- via 4 light-emitting diodes

2.3 Scope of Delivery






- A 1 repeater
- B 1 USB plug-in power supply
- C 1 user manual
- D 1 drilling template

2.4 Identification

2.4.1 Type Plate

You can identify the repeater using the type plate (see figure to the right). The type plate is located on the underside of the repeater.

REPEATER Sunny Beam U		 www.SMA.de	
			
Nennspannung: Nom. Voltage:	5 V DC	Serien Nr.: Serial No.:	1012
		Version: Version:	A1

3 Safety Instructions

Please follow all operating and safety instructions in this manual. Failure to follow these instructions could result in damage to the device and cause personal injury.

Only use the repeater in a dry environment. Otherwise, there is a risk of electric shock.



The repeater must not be opened.



Only use the plug-in power supply delivered with the repeater.



Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



4 Determining the Installation Location

4.1 Requirements

Observe the following ambient conditions for the repeater's installation location.

- Protect the repeater from dust, wet conditions, corrosive substances and vapors.
- The repeater requires a 120 V wall socket for the power supply.
- The ambient temperature must be between 32 °F and 131 °F.

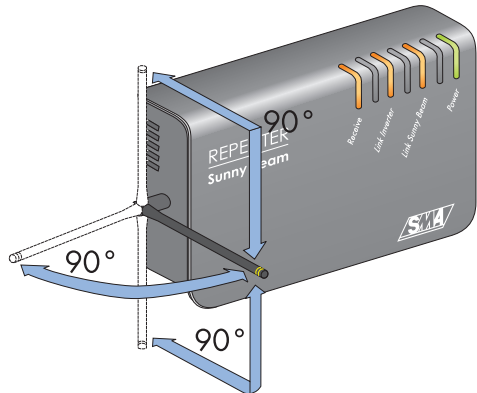
4.2 Handling the Antenna

With the Sunny Beam Repeater's adjustable antenna, you can adjust the alignment of the antenna to suit the local conditions.

The antenna may be rotated a maximum of 90 degrees to the front or to the rear. Further rotation damages the cable.



From the vertical position, the Sunny Beam Repeater's antenna can be rotated a maximum of 180 degrees to the front or to the bottom. From the horizontal position, the Sunny Beam's antenna can also be tilted to the left in two steps of 45 degrees, as illustrated to the right.



4.3 Determination Procedure

1. Walk with the Sunny Beam into the range of the inverters and activate the Sunny Beam as described in the Sunny Beam user manual. The inverters must be detected and registered with the Sunny Beam.
2. Check that the inverters are operating.
3. Walk with the Sunny Beam until approximately three meters from the inverters (not closer).
4. Set the data request frequency to the maximum frequency (the minimum selectable interval) via the menu "VIEW OPTIONS/DATA REQUEST FREQ.".



It is important to set the data request frequency back to at least 15 seconds once you have successfully determined the installation locations of the repeater and the Sunny Beam. Lower values (under 15 seconds) should only be set for commissioning purposes (testing the radio connection) and not long-term.

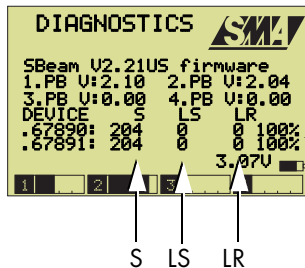
5. Go to the "SETUP/SERVICE/DIAGNOSTICS" menu.
6. Here, you can read the communication quality (see figure below) which is calculated on the basis of the ratio between the lost data packets and the sent data packets.

The registered inverters are listed with the last five digits of the serial number. The following values are also specified:

- "S"= data packets sent
- "LS"= data packets lost on sending
- "LR" = data packets lost on receipt

This is followed by the communication quality calculated in %.

The communication quality specifies the ratio between received and sent data packets of the registered inverters. With a communication quality of 100 %, the signal strength is very good and no data packets are lost.



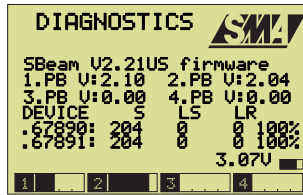
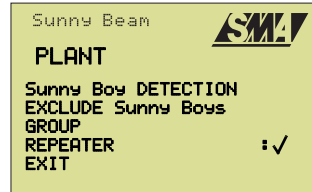
← Communication quality in %

7. Move away with the Sunny Beam towards the desired installation location until the first data packets are shown to be lost under LS or LR. Then move back towards the inverters again until no more data packets are being lost.
8. Install the repeater at this location. First connect the provided USB power supply to the repeater, then plug the power plug into a socket.

The repeater starts up.

All LEDs on the repeater briefly shine green. The repeater starts up. This procedure takes approximately 1 minute.

9. In the Sunny Beam main menu, select **"SETUP/PLANT"** and set a check mark beside the menu item **"REPEATER"**.
10. Select **"EXIT"** repeatedly until the prompt window opens.
11. Select **"Yes"** in the prompt window. The setting is saved.
12. Return to the **"SETUP/SERVICE/DIAGNOSTICS"** menu.



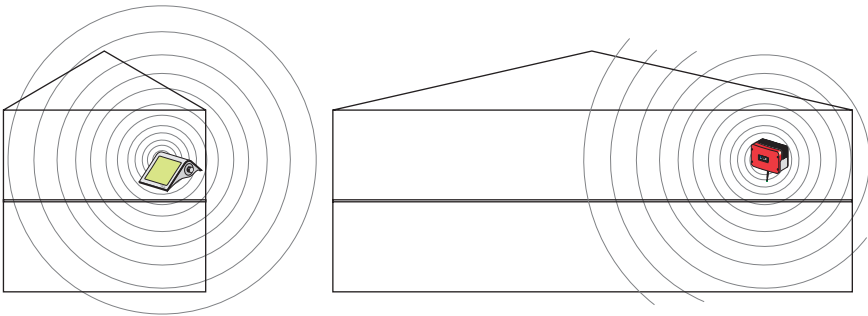
← Communication quality in %

13. You can now walk away with the Sunny Beam towards the desired installation location until the communication quality is still at least 50 %.
14. If you have reached the desired installation location with sufficient communication quality, commissioning is successfully completed at this point.
Set the data request frequency back to a value of at least 15 seconds or higher via the menu **"VIEW OPTIONS/DATA REQUEST FREQ."**.
15. If you cannot yet reach the desired installation location with sufficient communication quality, change the repeater's installation location. Even altering the position by only a few meters may improve the communication quality.
16. After successful commissioning, set the data request frequency back to a value of at least 15 seconds or higher via the menu **"VIEW OPTIONS/DATA REQUEST FREQ."**.

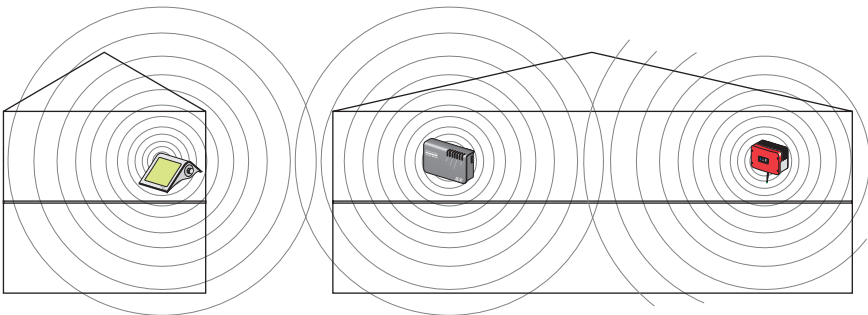
4.4 Exemplary Installations

4.4.1 From Building to Building

If the radio connection from building to building is insufficient due to the buildings being too far apart, or because of excessive attenuation, you can use the repeater to bridge a transmission gap, or to improve a poor radio connection.



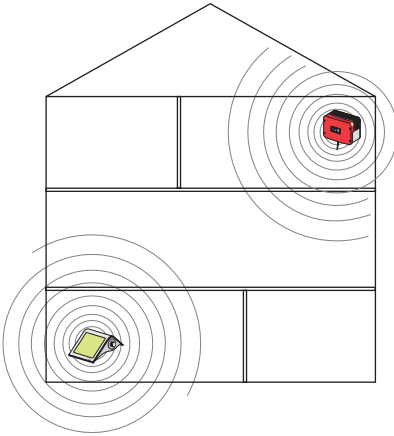
Transmission gap (without repeater)



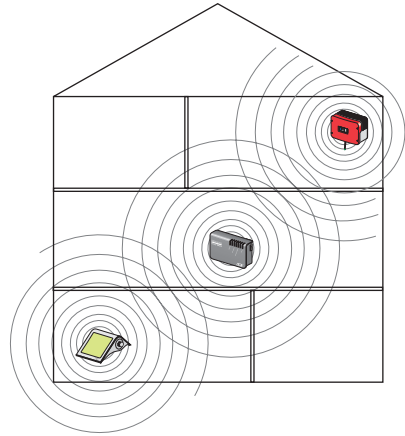
Bridging the transmission gap with the repeater

4.4.2 From Floor to Floor

If the radio connection within a building is insufficient due to the devices being too far apart, or because of excessive attenuation through ceilings and walls, you can use the repeater to bridge a transmission gap, or to improve a poor radio connection.



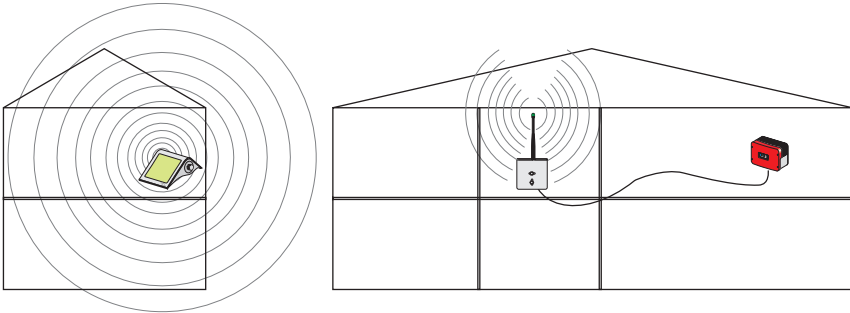
Transmission gap
(without repeater)



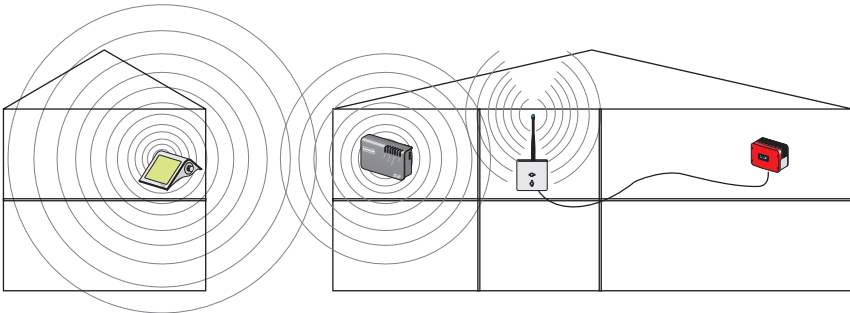
Bridging the transmission gap
(with repeater)

4.4.3 From Building to Building with External Antenna Kit

You can also use the repeater in conjunction with the external antenna kit from SMA. With the external antenna kit, comprising an antenna bracket and extension cable, you can bridge walls or ceilings.



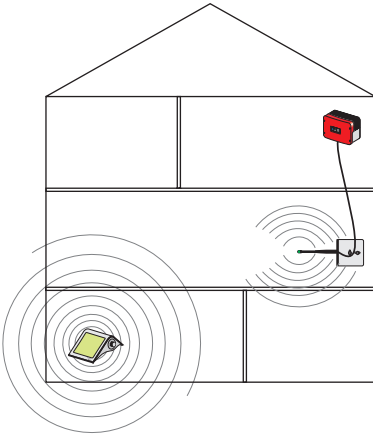
Transmission gap (without repeater)



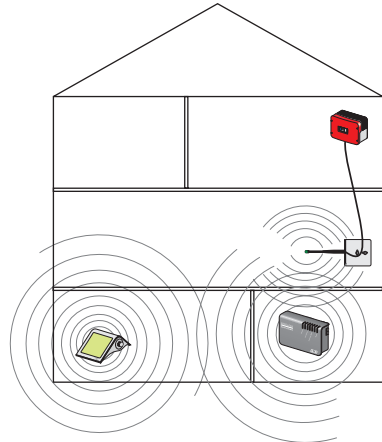
Bridging the transmission gap with the repeater

4.4.4 From Floor to Floor with External Antenna Kit

You can also extend the external antenna kit with the repeater within a building. You can bridge walls and ceilings with the external antenna kit. With the repeater, you can then bridge any transmission gap that may still exist.



Transmission gap
(without repeater)



Bridging the transmission gap
(with repeater)

5 Installation

Only install the repeater once you have determined the appropriate installation location as described in section 4 "Determining the Installation Location" (Page 13).



The repeater can be used as a tabletop or wall-mounted device. If you choose to mount the device on a wall, you can either mount it directly on the wall or on DIN rails.

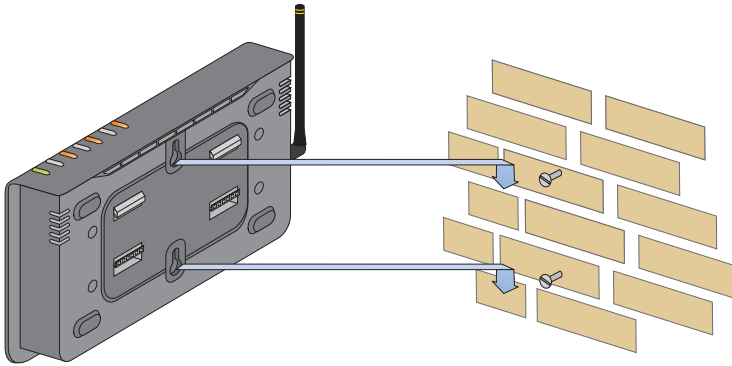
5.1 Tabletop Device

If you use the repeater as a tabletop device, follow the points below:

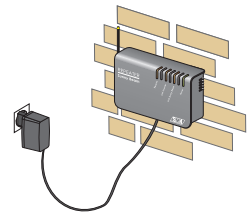
- Do not cover the repeater. This can cause the device to overheat.
- Lay the USB power supply cable in such a manner that its weight does not cause it to disconnect.
- Lay the cable properly so that there is no risk of persons tripping over it.

5.2 Wall Mounting

1. Pull the USB power supply plug out of the socket.
2. Pull the USB plug out of the repeater.
3. Use the drilling template to determine the position of the repeater on the wall. Observe the USB power supply's cable length.
4. Mark the position of the drill holes.
5. Drill the holes and install the screws. Use screws with a shank diameter of 0.13 inch to 0.17 inch.
6. Leave about 0.25 inch clearance between the screw head and the wall.
7. Hang the repeater on the screws (see figure).

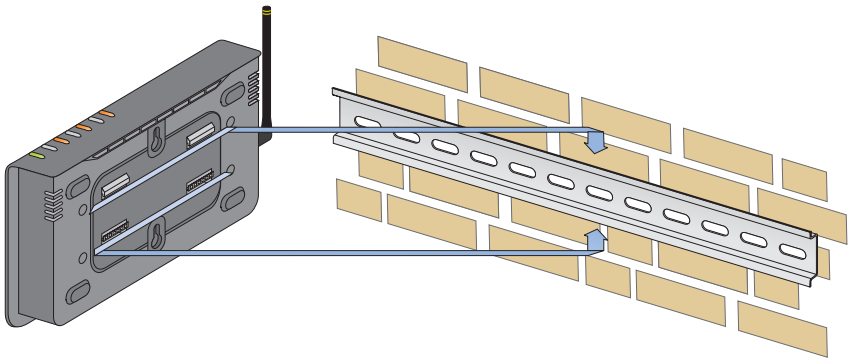


8. Plug the USB power supply's USB plug into the socket on the lower edge of the repeater's housing.
9. Then plug the USB power supply's plug into the socket. All LEDs on the repeater briefly shine green. The repeater starts up. This procedure takes approximately 1 minute.

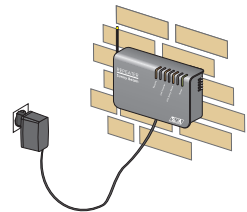


5.3 Top Hat Rail Installation

1. Pull the USB power supply plug out of the socket.
2. Pull the USB plug out of the repeater.
3. Fasten a top hat rail onto the wall. Observe the USB power supply's cable length.
4. Hook both lower retainers of the repeater under the lower edge of the top hat rail.
5. Push the repeater upwards.
6. Hook the repeater's two upper catches over the upper edge of the top hat rail.



7. Plug the USB power supply's USB plug into the socket on the lower edge of the repeater's housing.
8. Then plug the USB power supply's plug into the socket.
All LEDs on the repeater briefly shine green. The repeater starts up. This procedure takes approximately 1 minute.

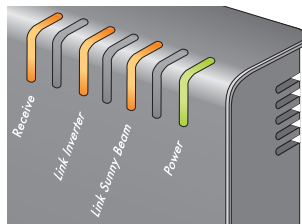


6 Explanation of the LEDs

The repeater has 4 LEDs, with which the status of the device can be ascertained. The repeater is equipped with the following LEDs:

- Receive
- Link Inverter (connection to the inverter)
- Link Sunny Beam (connection to the Sunny Beam)
- Power (power supply)

This section explains the repeater's various light signals and flash signals.



LED	Status/Color	Display
Receive	flashes orange	Data are being received.
	off	No data are being received.
Link Inverter	shines orange	The repeater has received data from the inverter.
	off	The repeater is not receiving any data from the inverter.
Link Sunny Beam	shines orange	The repeater has received data from the Sunny Beam.
	off	The repeater is not receiving any data from the Sunny Beam.
Power	shines green	The power supply is ok.
	off	(All LEDs are off), no power supply is present.

7 Maintenance and Cleaning

7.1 Maintenance

The repeater does not require maintenance.

7.2 Cleaning

Use a soft, damp cloth to clean your repeater. Make sure that the cloth is made of scratch-free material so that the surface of the repeater will not be damaged.

If there is a considerable amount of dirt, you can also use a mild, non-corrosive cleaning agent.

8 Decommissioning

8.1 Disassembly

Pull the USB plug-in power supply's plug out of the socket. Then pull the USB plug out of the repeater.

8.2 Packaging for Shipment

When returning the device to us, be sure to use packaging which adequately protects the device from damage during transport (if possible, the original packaging).

8.3 Disposal

Dispose of the repeater at an authorized disposal company.

9 Technical Data

Operation

Supported Devices The Sunny Beam Repeater U (FCCID: SVFSBEAMREPU) operates only with the Sunny Beam U (FCCID: SVFSUNNYBEAMU) and the SBEAMPB2-01 (FCCID: SVFSPB2).

Dimensions

Size 8.85 x 5.12 x 2.24 inches (width x height x depth)
Vertically, the repeater requires an additional space of approximately 6 inches for the cables.

Weight 1.65 lb

Power supply

USB plug-in power supply input voltage 100 V to 240 V, 47 Hz to 63 Hz
output voltage 5 V

Environmental conditions for operation

Ambient temperature 32 °F to 131 °F

Relative humidity 5 % to 95 %, non-condensing

10 Contact

If you have any questions or queries, please contact us. A team of qualified engineers and technicians is at your disposal.

Help us to help you by having the following information ready when you call us:

- Type of inverters and serial numbers
- Serial number of the repeater
- Serial number and firmware version of the Sunny Beam U



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