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Installation Guide

RS485 Plug-in

For Europe & APAC

Version 1.0

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This equipment has been tested and found to comply with the limits applied by the local regulations. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

Contents

Chapter 1: Overview

The RS485 provides an additional RS485 port (sometimes referred to as RS485-E) for the inverter and the Commercial Gateway. The kit contains a module which is installed on the inverter or Commercial Gateway communication board and has a 3-pin RS485 terminal block.

The RS485 module allows connecting the inverter directly to 3rd party monitoring systems (Modbus master) or various Modbus slave devices such as batteries and meters, in addition to other inverters. This second RS485 port also enables nested RS485 networks, valuable when setting up a communication network for large sites.

NOTE

When using the RS485 module, the ZigBee and Wi-Fi wireless communication options cannot be used.

A multiple inverter system can be connected to meters, 3rd party gateways and other devices with the additional RS485 port.
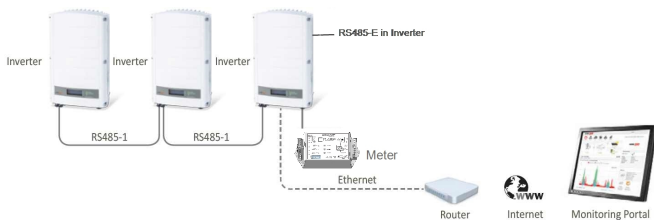
Figure 1: A second RS485 port for multiple inverter systems to interface with Modbus devices

Chapter 2: Installation

Kit Contents

- RS485 module
- Upgrade card
- Cable tie

Software Compatibility and Check

To use the RS485 module, the communication board firmware (CPU) version must be 3.1600 or higher.

→ To check the inverter CPU version:

1. Verify that the inverter has been activated using the activation card supplied with the inverter.

2. Press the LCD light button short presses until the screen below is reached.

```
I D :  # # # # # # # #  # #
D S P 1 / 2 : x . x x x x / x . x x x x
C P U  : 0 0 0 3 . 1 6 0 0
C o u n t r y : X X X X X
```

3. Check the CPU version number. If lower than 3.1600, upgrade the inverter software as described below.
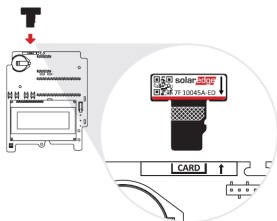
> **NOTE**
>
> Only inverters with version 3.xxxx can be upgraded.

→ To upgrade the inverter software:

1. Disconnect the AC power to the inverter and wait 5 minutes.

2. Open the inverter cover as described in its manual.

3. Insert the firmware upgrade card supplied with the kit into the card slot on the communication board.
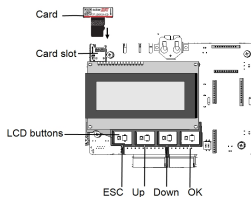
1Ph/3Ph inverters	1Ph inverter (HD-Wave)

Figure 2: Communication board and activation card

4. Turn the AC ON.

> **WARNING!**
>
> ⚠ ELECTRICAL SHOCK HAZARD. Do not touch uninsulated wires when the inverter cover is removed.

5. If upgrade is required, it starts automatically. Wait for the message "Done" to be displayed on the LCD.

6. Verify the correct version.

7. Remove the card from the inverter.

Installing the RS485 Module

The RS485 module can be installed in the inverter and in the Commercial Gateway.

Installing the Module in the Inverter

1. Disconnect the AC power to the inverter and wait 5 minutes.

2. Remove the inverter cover as described in its manual.

3. Open the gland numbered 1 at the bottom of the inverter.
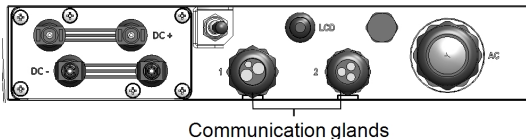

Communication glands

Figure 3: Inverter communication glands

4. Remove the rubber seal from the gland and insert the cable through the gland cover, the seal, and the opened connection of the inverter.

5. Insert the rubber seal with the cable into to the gland body and reconnect the gland to the inverter. Tighten the sealing gland.

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6. Connect the RS485 module in its place on the communication board, as shown below. Follow these guidelines:

   - Use the marking on the communication board to plug in the module with the correct orientation.
   - Insert the module such that all pins are correctly positioned in the communication board socket, and no pins are left out of their socket.
   - Make sure that the module is firmly in place.
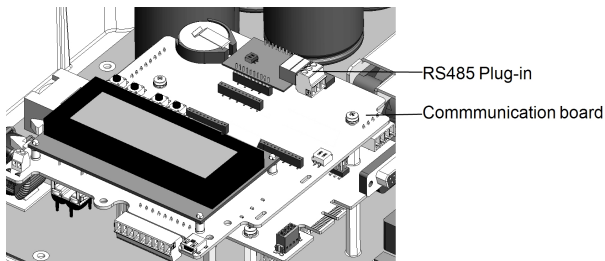

RS485 Plug-in

Commmunication board

Figure 4: RS485 module installed on the communication board

7. Route the cable towards the module along the communication board side.

8. Loosen the screws of pins A(+), B(-), and G on the 3-pin terminal block.
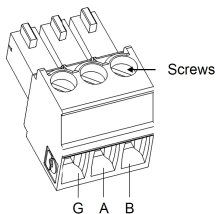
Figure 5: RS485 3-pin terminal block

9. Insert the wire ends into the **G**, **A** and **B** pins shown above. Use four- or six-wire twisted pair cable for this connection. You can use any color wire for each of the **A**, **B** and **G** connections, as long as the same color wire is used for all A pins, the same color for all B pins and the same color for all G pins.

10. For creating an RS485 bus - connect all B, A and G pins in all the devices. The following figure shows this connection scheme when connecting a bus of inverters:
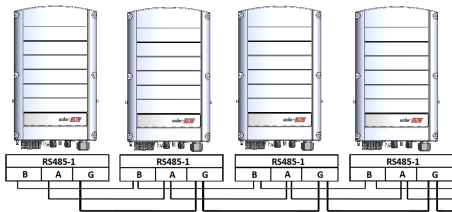

Figure 6: Connecting the inverters in a bus

> **NOTE**
>
> Do not cross-connect B, A and G wires.

11. Tighten the terminal block screws.

12. Tighten the cable to the communication board using the cable tie.
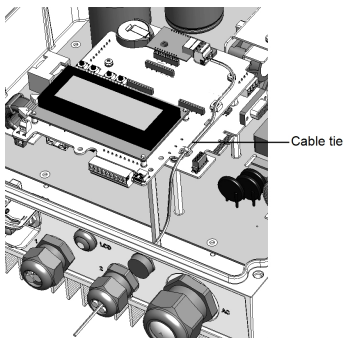

Cable tie

Figure 7: RS485 cable connected

13. Check that the wires are fully inserted and cannot be pulled out easily.

14. Terminate the first and last devices in the chain by switching a termination DIP-switch to ON:

   ◢ The inverter that contains the expansion module should be terminated by switching ON the DIP switch on the module.

⬛ For other devices, the switch located on the communication board and marked SW7 should be terminated.
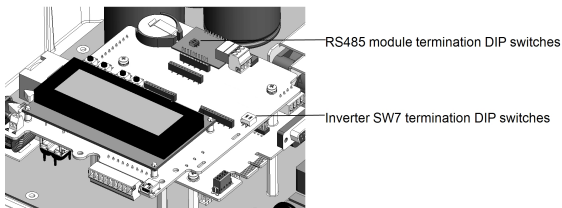

Figure 8: RS485 termination DIP switches

NOTE

Only the first and last SolarEdge devices in the chain should be terminated. The other devices in the chain should have the termination switch OFF (down position).

Installing the Module in the Commercial Gateway

1. Remove the Commercial Gateway cover: Insert a flat screwdriver into the grooves on the side of the Commercial Gateway to release the clasps and carefully remove the cover.

LCD board

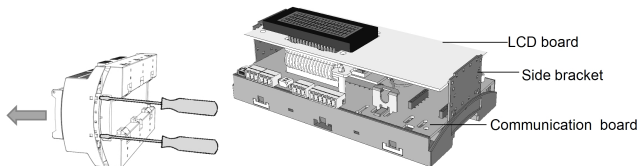Side bracket

Communication board

Figure 9: Removing the Commercial Gateway cover

2. Pull the two Commercial Gateway side brackets to release the LCD board and access the communication board.

3. Connect the RS485 module to the socket marked "ZB" on the communication board. Make sure all the pins are located correctly in the socket.
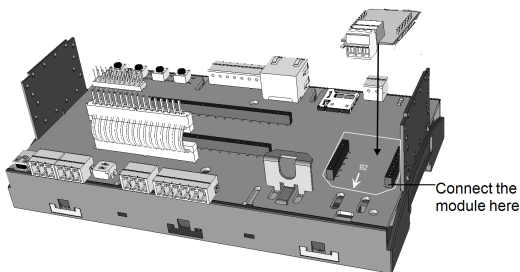
Connect the
module here

Figure 10: Connecting the module to the Commercial Gateway

4. Loosen the screws of pins A(+), B(-), and G on the RS485 3-pin terminal block.

5. Insert the wire ends into the **G**, **A** and **B** pins shown above. Use Four- or six-wire twisted pair cable for this connection. You can use any color wire for each of the **A**, **B** and **G** connections, as long as the same color wire is used for all A pins, the same color for all B pins and the same color for all G pins.

6. For creating an RS485 bus - connect all B, A and G pins in all devices.

> **NOTE**
>
> Do not cross-connect B, A and G wires.

7. Terminate the first and last device in the chain by switching a termination DIP switch to ON:

- The Commercial Gateway that contains the expansion module should be terminated by switching ON the DIP switch on the module.
- For other devices, the switch located on the communication board and marked SW7 should be terminated.

> **NOTE**
>
> Only the first and last SolarEdge devices in the chain should be terminated. The other inverters in the chain should have the termination switch OFF (down position).

8. Carefully return the Commercial Gateway LCD board to its location.

9. Carefully re-install the Commercial Gateway cover.

RS485 Configuration to Master

SolarEdge protocol configuration is supported on all RS485 buses simultaneously. The inverter/Commercial Gateway can be:

- Master on one bus and slave on the other
- Master on both buses (dual master)
- Slave on both buses

The RS485 enables the connection of up to 16 RS485 buses with up to 32 devices each in a daisy chain configuration for communications in commercial installations.

→ To configure RS485 communications of the additional bus:

1. If the master device is an inverter - verify that the inverter ON/OFF switch is OFF.

2. Turn ON the AC to the inverter/Commercial Gateway.

> WARNING!
>
> ⚠ ELECTRICAL SHOCK HAZARD. Do not touch uninsulated wires when the inverter cover is removed.

3. Press the Enter button for at least 5 seconds, and enter the password (12312312).

4. Select **Communication ➔ Server ➔ RS485**.

5. Select **Communication ➔ RS485-E Conf.➔ Enable**. The following is displayed:

```
Enabling RS485-E
Interface. Verify
module is inserted.
Continue?
```

6. Press Enter to continue. The following is displayed:

```
D e v i c e   T y p e   < S E >
P r o t o c o l   < S >
D e v i c e   I D   < 1 >
D i s a b l e
```

7. The default protocol is slave. To configure as master select **Protocol ➔ Master**.

    The Slave Detect and Slave List menus are added to the screen.

```
D e v i c e   T y p e   < S E >
P r o t o c o l   < S >
D e v i c e   I D   < 1 >
S l a v e   D e t e c t
S l a v e   L i s t
D i s a b l e
```

8. Select **Slave Detect**.

    The system starts automatic detection of the SolarEdge slave devices connected to the master device. The master device should report the correct number of slaves. If it does not, refer to the RS485 troubleshooting section below.

Troubleshooting

Troubleshooting RS485 Communication

1. If the message **Master Not Found** appears, check the connections to the master device and fix if required.

2. If after slave detection the number of slaves displayed in the master under **RS485-X Conf ➔ Slave Detect** is smaller than the actual number of slaves, use one of the following methods to identify missing slaves and troubleshoot connectivity problems:

   - Use the **Long slave Detect** to retry connecting to slaves
   - Analyze the **Slave List** to check for missing slaves, and check their connection

   Refer to https://www.solaredge.com/sites/default/files/troubleshooting_undetected_RS485_devices.pdf

Appendix A: RS485 Specifications

FUNCTIONAL		Unit
Maximum number of slave inverters connected on the RS485 bus	31	
Maximum number of interconnected RS485 buses	16	
Maximum number of Smart Energy Management devices on the RS485 bus	Up to 1 battery; Up to 2 meters	
Maximum RS485 cable length	1000/ 3300	m/ ft
INSTALLATION SPECIFICATIONS		
Dimensions (L x W)	33 x 25/ 1.3 x 1	mm/ in
Operating Temperature	-40 to 85/ -40 to 185	°C/°F

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