# Cellular Modem Installation Guide

This installation guide describes how to install and set up a GSM cellular modem for use as a communication gateway for the SolarEdge device (inverter or Safety and Monitoring Interface [SMI]).

What's in the Box

- GenPro 20e SQB GSM modem
- GSM antenna
- Universal power supply

- 15-pin / 9-pin serial cable
- 15-pin to 3-wire (RXD,TXD and GND) serial cable

- Modem manufacturer instruction sheet
- This installation guide

Physically Connecting the GSM Cellular Modem

1 Connect the antenna to the modem.

2 Remove the SIM card cover, insert a SIM card into the modem and put the SIM card cover back.

Insertion of the SIM Card
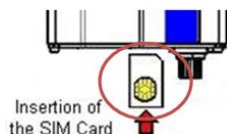
NOTE: A SIM card is not supplied with this product. You must purchase a SIM card and an appropriate GPRS data package from your GSM service provider separately. Confirm with your GSM service provider that the SIM card is unlocked for GPRS data usage.

For an inverter with an external RS232 port, continue to step 3. For other devices, continue to step 4.

3 When using a SolarEdge inverter, connect the modem to the inverter using the RS232 port. Use the 15-pin / 9-pin serial cable provided.
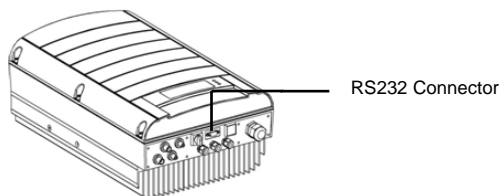

RS232 Connector

Figure 1: Inverter RS232 Connection

Continue to step 8.

4 When using a SolarEdge SMI or an inverter without an external RS232 port, be sure to turn the AC power off and wait five minutes.

5 Open the SolarEdge device cover, as instructed in the device manual.

6 Open gland #1 located on the bottom of the SolarEdge device, as shown in Figure 2. Figure 2 shows the SMI as an example. The procedure is similar for the inverter.
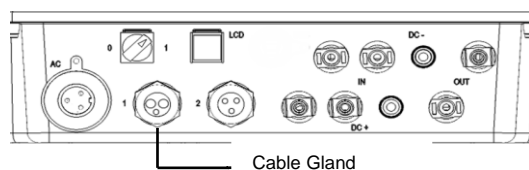

Cable Gland

Figure 2: Cable Gland Location on SMI

The smallest hole is for RS232 cable insertion. The SolarEdge device glands come presealed from the factory. Remove the sealing to insert the cable.

⚠ **CAUTION:**
If a gland is opened and not used, then make sure to reseal it. Otherwise, it may degrade the device's ingress protection and void the warranty.

⚠ **CAUTION:**
The internal side of the gland includes an o-ring, which should be used to ensure proper sealing.

7 Connect the modem to the SolarEdge device through the RS232 connector, which is the nine-pin terminal block connector on the right side of the communication board.
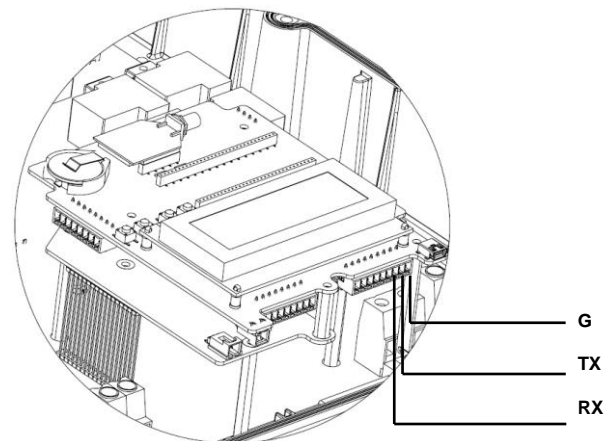

G
TX
RX

Figure 3: GSM Cellular Modem Wire Connection

The GSM kit comes with its dedicated cable. Locate the hole specified for RS232 cable and insert the side without connector of the RS232 cable into the device through the gland. Connect its wires as follows:

- Insert the **Tx**-marked wire into the terminal block **TX** pin.
- Insert the **Rx**-marked wire into the terminal block **RX** pin.
- Insert the **G**-marked wire into the terminal block **G** pin.

8 Connect the other side of the RS232 cable to the GSM modem.

9 Connect the power supply to the modem and to an electrical socket.

► Configuring the SolarEdge device using the user buttons:

1 Verify that the SolarEdge device's ON/OFF switch is OFF.

2 Press the LCD Light button once to turn ON the backlight.

> **WARNING!**
>
> ⚠ ```
> D C   V O L T A G E   N O T   S A F E !
> D O   N O T   D I S C O N N E C T !
>   V D C :   7 2 . 0
> ```
> If the SolarEdge device worked properly before this action, the adjacent message is displayed.
>
> This message is displayed until the DC is below the safety voltage threshold. The default safety voltage is 50 V. Do not open the cover or open DC connectors until the voltage is indicated as safe or until at least five minutes have passed.

3 Short press the LCD button to scroll through the informative screens to show the ID status window and verify the CPU firmware version. Verify if it is below or above version 2.250.

```
I D   :   # # # # # # # #   # #
D S P 1 / 2 : 1 . 0 2 1 0 / 1 . 0 0 3 4
C P U : 0 0 0 2 . 0 2 5 0
C o u n t r y : U S A
```

4 The following configuration procedures are performed with the SolarEdge device cover open.

> ⚠ **WARNING!**
>
> Refer to the SolarEdge device manual for instructions about how to open the SolarEdge device cover.

Four buttons for controlling the LCD panel menus are then accessible, as shown below:

- **Esc:** Goes to the beginning of the currently entered parameter or to the previous menu.
- **Up (1):** Goes up one option in a menu.
- **Down (2):** Goes down one option in a menu.
- **Enter (3):** Confirms the entry or selection of a parameter.
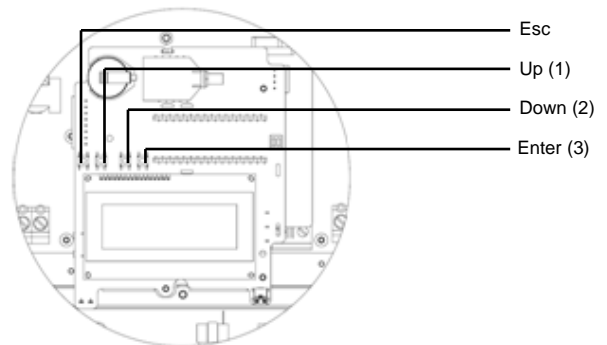

Esc
Up (1)
Down (2)
Enter (3)

Figure 4: LCD Panel Menu Buttons

5 Press the **Enter** button for at least five seconds. The following message is displayed:
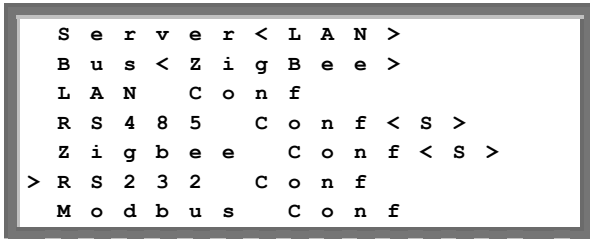
```
   P l e a s e   e n t e r
   P a s s w o r d
      * * * * * * * *
```

The SolarEdge device is now in Setup mode and all its LEDs are lit. The SolarEdge device automatically exits Setup mode if no buttons are pressed for more than two minutes.

6 Use the three right-most buttons inside the SolarEdge device (the **UP-1**, **Down-2** and **Enter-3** buttons), shown above, to type in the following default password: **12312312**.

7 Scroll down to the **Communication** submenu and select it.

For firmware versions above 2.250, continue to step 14. For earlier versions, complete steps 8 through 13 below.

8 Select the **Server** submenu, scroll down to the **RS232** option and select it. The SolarEdge device performs a reset immediately after the selection is made.

9 Repeat steps **5** through **7** to enter Setup mode.

10 Scroll down to the **RS232 Conf** submenu and select it.

Communication Submenu:

```
    S e r v e r < L A N >
    B u s < Z i g B e e >
    L A N    C o n f
    R S 4 8 5    C o n f < S >
    Z i g b e e    C o n f < S >
  > R S 2 3 2    C o n f
    M o d b u s    C o n f
```

11 In the **RS232 Conf** submenu, select **Set Mode** and then select **GSM**. The SolarEdge device performs a reset immediately after the selection is made.

12 Repeat steps **5** through **7** to enter Setup mode.

13 Scroll down to the **RS232 Conf** submenu and select it.

Follow steps 14 through 20 for firmware versions above 2.250. For earlier versions, complete steps 17 through 20 below.

14 Select the **Server** submenu, scroll down to the **RS232** option and select it.

15 Scroll down to the **RS232 Conf** submenu and select it.

16 In the **RS232 Conf** submenu, select **Protocol** and then select **GSM Modem**.

17 In the **RS232 Conf** submenu, select **Set Modem Type** and then select **SE GSEG-20E GSM**.

18 In the **RS232 Conf** submenu, select **Set APN** and enter your GSM service provider's Access Point Name (APN). This network address can be obtained by calling your service provider.
Press the **Enter** button for a long press to apply or press the **ESC** button for a long press to abort.

19 In the **RS232 Conf** submenu, select **Set User Name** and enter the user name, if required by the GSM service provider.
Press the **Enter** button for a long press to apply, or press the **ESC** button for a long press to abort.

20 In the **RS232 Conf** submenu, select **Set Password** and then enter the password, if required by the GSM service provider.
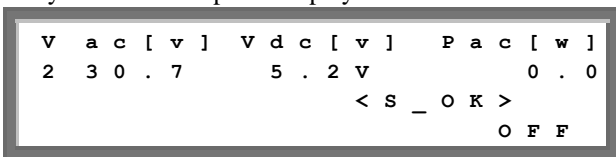Press the **Enter** button for a long press to apply or press the **ESC** button for a long press to abort.

Verifying the Connection

► To verify the connection:

1 Wait for the SolarEdge device to connect to the SolarEdge Monitoring Server. This may take up to two minutes.

2 Verify that the LCD panel displays a window similar to the following:

```
    V a c [ v ]  V d c [ v ]   P a c [ w ]
    2 3 0 . 7      5 . 2 V        0 . 0
                  < S _ O K >
                              O F F
```

- **S_OK:** Verify that S_OK appears on the panel to indicate a functioning connection to the SolarEdge Monitoring Server, which was validated during the last two minutes.

NOTE:

If the **S_OK** indication is not displayed, then perform the following:

- Use another method (unrelated to the SolarEdge device) to check whether the network and modem are operating properly. For example, connect a laptop to the Ethernet modem and connect to the Internet.
- Check the Server Communication status screen by short pressing the LCD button. If the **Modem Disconnected** message (appears only in firmware version 2.250 and above) is displayed, verify the physical connection between the modem and the SolarEdge device or reset the GSM modem.
- Check the Server Communication status screen by short pressing the LCD button. If the **Absent or Locked SIM** message is displayed, check that the SIM card is fully inserted in the right direction.
- Verify with your GSM network provider that the SIM card is not locked for GPRS data usage.
- Verify that there is cellular reception near the GSM modem.
- Check the configuration of the SolarEdge device.

Appendix A – Multiple SolarEdge Devices, RS485 Bus and GSM Modem Connection

This configuration enables you to connect multiple SolarEdge devices through the same bus in a master/slave configuration. In this configuration, only the master is physically connected to the Internet through the GSM modem.
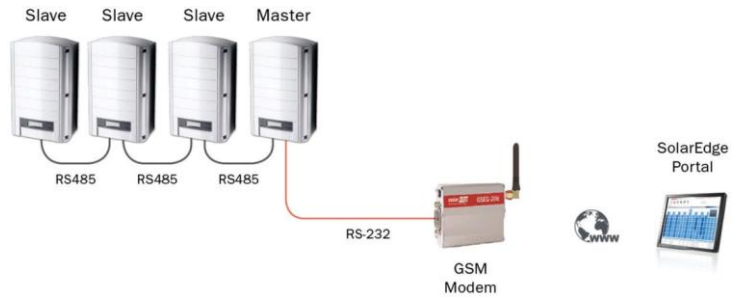

Figure 5: Connecting Multiple SolarEdge devices

Recommended Cable Type and Distance:

- **RS232:**
  - **Cable Type:** Supplied with kit.
  - **Max. Distance:** 15 m / 50 ft (supplied cable plus extension).
- **RS485:**
  - **Cable Type:** Four-conductor cable (with RJ11 connectors for older communication board versions).
  - **Max. Distance:** 1,000 m / 3,000 ft (from the master SolarEdge device).

Additional Required Equipment:

- Four-conductor cable (not supplied by SolarEdge).

This section assumes that GSM modem communication is already configured, as described above.

► **RS485 bus terminations:**

The two SolarEdge devices at the ends of the chain (meaning the first SolarEdge device and the last SolarEdge device) must be terminated by switching a termination dip-switch inside the SolarEdge device to ON. The switch is marked **SW7**, as shown in Figure 6.
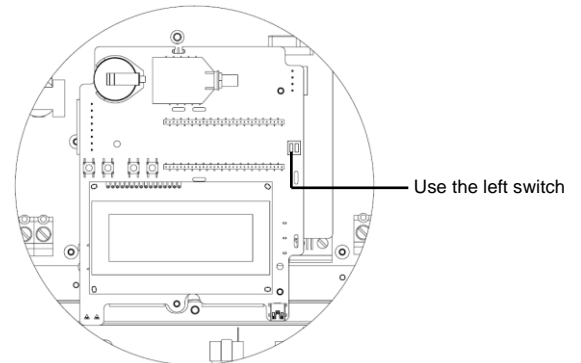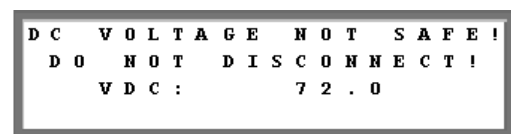
► **Configuring the SolarEdge devices using the user buttons:**

1 First, configure the GSM cellular modem connection, as described above.

For each of the slave SolarEdge devices, perform the remaining steps in this procedure.

Use the left switch

Figure 6: RS485 Termination Switch

2 Verify that the SolarEdge device's ON/OFF switch is OFF.

3 Press the LCD Light button once to turn ON the backlight.

⚠ **WARNING!**

```
D C   V O L T A G E   N O T   S A F E !
D O   N O T   D I S C O N N E C T !
V D C :       7 2 . 0
```
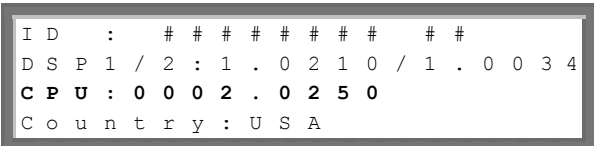
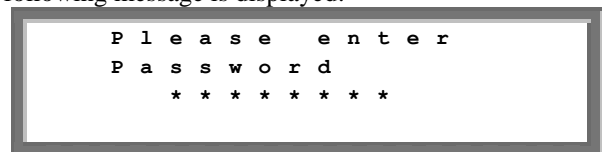If the SolarEdge device worked properly before this action, the adjacent message is displayed.

This message is displayed until the DC is safe. The default safety voltage is 50 V. Do not open the cover or open DC connectors until the voltage is indicated as safe or until at least five minutes have passed.

4 Short press the LCD button to scroll through the informative screens to show the ID status window and verify the CPU firmware version. Verify whether it is below or above version 2.250.

```
I D   :   # # # # # # # #   # #
D S P 1 / 2 : 1 . 0 2 1 0 / 1 . 0 0 3 4
C P U : 0 0 0 2 . 0 2 5 0
C o u n t r y : U S A
```

5 The following configuration procedures are performed with the SolarEdge device cover open.

Four buttons for controlling the LCD panel menus are then accessible, as shown in Figure 4.

- **Esc:** Goes to the beginning of the currently entered parameter or to the previous menu.
- **Up (1):** Goes up one option in a menu.

- **Down (2):** Goes down one option in a menu.
- **Enter (3):** Confirms the entry or selection of a parameter.

6 Press the **Enter** button for at least five seconds. The following message is displayed:

```
P l e a s e   e n t e r
P a s s w o r d
* * * * * * * *
```

The SolarEdge device is now in Setup mode and all its LEDs are lit. The SolarEdge device automatically exits Setup mode if no buttons are pressed for more than two minutes.

7 Use the three right-most buttons inside the SolarEdge device (the **UP-1**, **Down-2** and **Enter-3** buttons), shown above, to type in the following default password: **12312312**.

For firmware versions above 2.250, continue to step 12. For earlier versions, complete steps 9 through 11 below.

8 Scroll down to the **Communication** submenu and select it.

9 Select the **Bus** submenu. Scroll down and select **RS485 Slave**. The SolarEdge device performs a reset immediately after the selection is made.

Bus Submenu:

```
    Z i g b e e   P 2 P
    Z i g b e e   M P
    R S 4 8 5   M a s t e r
  > R S 4 8 5   S l a v e
    N o n e
```

10 Repeat steps **6** through **8** above to enter Setup mode.

11 Select the **Server** submenu, scroll down to the **RS485** option and select it. The SolarEdge device performs a reset immediately after the selection is made.

Communication Submenu:

```
  > S e r v e r < L A N >
    B u s < Z i g B e e >
    L A N   C o n f
    R S 4 8 5   C o n f < S >
    Z i g b e e   C o n f < S >
    R S 2 3 2   C o n f
    M o d b u s   C o n f
```

This concludes the setting of the slave SolarEdge devices for firmware versions earlier than 2.250.

Follow steps 12 through 16 for firmware versions above 2.250.

12 Select the **Server** submenu, scroll down to the **RS485** option and select it.

Communication Submenu:

```
  > S e r v e r < L A N >
    L A N   C o n f
    R S 4 8 5 - 1   C o n f < S >
    R S 4 8 5 - 2   C o n f < S >
    Z I G B E E   C o n f < S >
    R S 2 3 2   C o n f
```

13 Select the **RS485-X Conf** (the port that is physically connected to the daisy chain) submenu option.

14 Select the **Device Type** submenu and set it to **SolarEdge**.

RS485-X Submenu:

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

15 Select the **Protocol** submenu and set it to **Slave**.

16 Press the **ESC** button repeatedly to exit the Setup menu or wait for the device to automatically exit Setup mode if no buttons are pressed for more than two minutes.

This concludes the slave device configuration using the LCD button for firmware version 2.250 and above.

For the master (main) SolarEdge device, perform the following steps:

1 Repeat steps **2** through **8**, as described above in the Slave Configuration section to enter Setup mode.

For firmware versions above 2.250, continue to step 7. For earlier versions, complete steps 2 through 6 below.

2 Select the **Bus** submenu. Scroll down and select **RS485 Master**. The SolarEdge device performs a reset immediately after the selection is made.

Bus Submenu:

```
    Z i g b e e   P 2 P
    Z i g b e e   M P
  > R S 4 8 5   M a s t e r
    R S 4 8 5   S l a v e
    N o n e
```

3 Repeat steps **6** through **8** above in the Slave Configuration section to enter Setup mode.

4 Scroll down to the **RS485 Conf** submenu and select it. Select the **Master Set** option and select **Enable**. The SolarEdge device performs a reset immediately after the selection is made.

Communication Submenu:

```
    S e r v e r < L A N >
    B u s < Z i g B e e >
    L A N   C o n f
  > R S 4 8 5   C o n f < S >
    Z i g b e e   C o n f < S >
    R S 2 3 2   C o n f
    M o d b u s   C o n f
```

5 Repeat steps **6** through **8** as described above in the Slave Configuration section to enter Setup mode.

6 Scroll down to the **RS485 Conf** submenu and select it.

Communication Submenu:

```
    S e r v e r < L A N >
    B u s < Z i g B e e >
    L A N   C o n f
  > R S 4 8 5   C o n f < S >
    Z i g b e e   C o n f < S >
    R S 2 3 2   C o n f
    M o d b u s   C o n f
```

Follow steps 7 through 11 for firmware versions above 2.250. For earlier versions, complete steps 10 through 11 below.

7 Select the **RS485-X Conf** (the port that is physically connected to the daisy chain) submenu option.

8 Select the **Device Type** submenu and set it to **SolarEdge**.

RS485-X Submenu:

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

9 Select the **Protocol** submenu and set it to **Master**.

10 Select the **Slave Detect** option and select **Yes**. A **Detecting Slaves** message is shown during the detection process.

The master should report the correct number of slaves on the LCD screen. If it does not, verify the connections and terminations.

11 Press the **ESC** button repeatedly to exit the Setup menu.

This concludes the multi-SolarEdge device setup using the user buttons.

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