



# **SolarEdge**

## **StorEdge**

# **Installation Guide**

**For Smart Energy Management  
using the StorEdge Interface**

**For Europe, APAC & South Africa**

**Version 1.2**

# Disclaimers

## Important Notice

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The images contained in this document are for illustrative purposes only and may vary depending on product models.

## Emission Compliance

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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.

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# HANDLING AND SAFETY INSTRUCTIONS

During installation, testing and inspection, adherence to all the handling and safety instructions is mandatory. **Failure to do so may result in injury or loss of life and damage to the equipment.**

## Safety Symbols

The following safety symbols are used in this document. Familiarize yourself with the symbols and their meaning before installing or operating the system.

### WARNING!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **injury or loss of life**. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.

### CAUTION!



Denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in **damage or destruction of the product**. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

### NOTE



Denotes additional information about the current subject.

### IMPORTANT SAFETY FEATURE



Denotes information about safety issues.

Disposal requirements under the Waste Electrical and Electronic Equipment (WEEE) regulations:



### NOTE

Discard this product according to local regulations or send it back to SolarEdge.

## IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

### WARNING!



The inverter cover must be opened only after shutting off the inverter ON/OFF switch located at the bottom of the inverter. This disables the DC voltage inside the inverter. Wait five minutes before opening the cover. Otherwise, there is a risk of electric shock from energy stored in the capacitors.

### WARNING!



**For StorEdge interface units with an ON/OFF Switch - The ON/OFF switch shuts off the battery, however does not de-energize the DC lines.**

To reduce all components to safe voltage, disconnect all power sources to the system components prior to any system maintenance procedure:

- Disconnect the AC to both the inverter and StorEdge Interface.
- Turn OFF the inverter ON/OFF switch.
- Turn OFF the StorEdge Interface ON/OFF switch.



**WARNING!**

Do not remove the StorEdge Interface cover before five minutes have elapsed after disconnecting all sources of power, and shutting OFF the inverter and the StorEdge Interface.

**WARNING!**

Before operating the system, ensure that the power cable and wall outlet have been grounded properly.

**WARNING!**

When handling the battery, adhere to all manufacturer safety instructions.

**CAUTION!**

This unit must be operated under the specified operating conditions as described in the technical specifications supplied with the unit.

**NOTE**

The battery used must be NRTL certified.


**NOTE**

For battery decommissioning and disposal, follow the manufacturer requirements and instructions.

**NOTE**

The StorEdge Interface is IP65 rated. Unused connectors and glands should be sealed with the provided seals.

**NOTE**

The  symbol appears at grounding points on the SolarEdge equipment. This symbol may also be used in this manual.

## System Maintenance

Prior to any system maintenance procedure, disconnect all power sources to the system components, as described in this section.

1. Turn OFF the inverter ON/OFF switch, and wait until the LCD indicates that the DC voltage is safe (<50V), or wait five minutes before continuing to the next step.

**WARNING!**

If you cannot see the inverter panel, or if a malfunction is indicated on the LCD panel, wait five minutes for the input capacitors of the inverter to discharge.

2. Turn OFF the inverter Safety Switch (if applicable).
3. Turn OFF the AC switch on the main circuit board.
4. If applicable, turn OFF the StorEdge Interface ON/OFF switch.

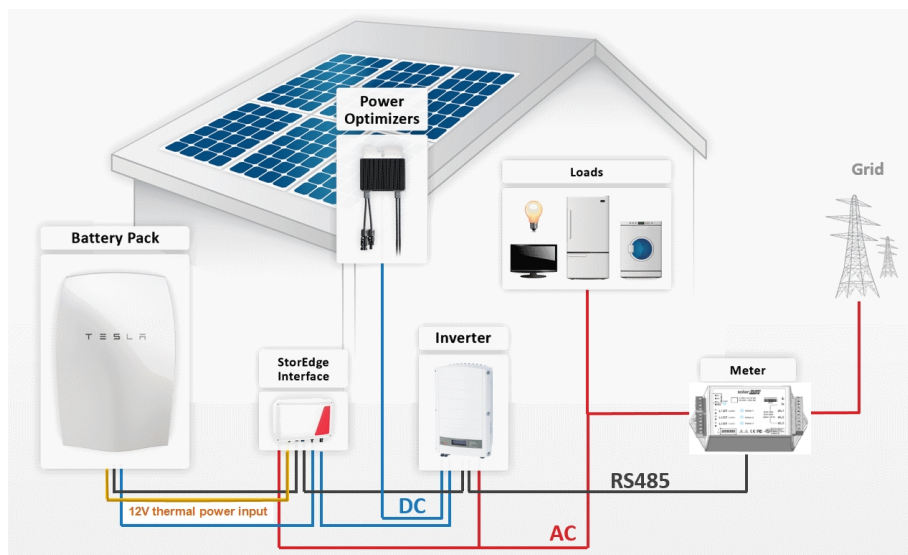
## Chapter 1: Overview

SolarEdge's StorEdge™ solution for Smart Energy Management uses the StorEdge Interface to connect the battery to the inverter.

Power is stored in the battery and can be used for various applications such as maximized self-consumption and time of use profile programming. For backup power, an inverter specifically designed for backup applications is required; this inverter is not in the scope of this document.

## The StorEdge Solution Components

- **The SolarEdge Inverter**
- **The SolarEdge Meter** - The meter is used by the inverter for export/ consumption readings, and for Smart Energy Management applications, such as: export limitation and maximizing self-consumption.
- **The StorEdge Interface** - The StorEdge Interface connects the battery to the inverter through fuses, and supplies control and monitoring signals to the battery for operation.
- **The Battery** - A DC coupled battery designed to work with the SolarEdge system.



**Figure 1: StorEdge system components**

**NOTE**

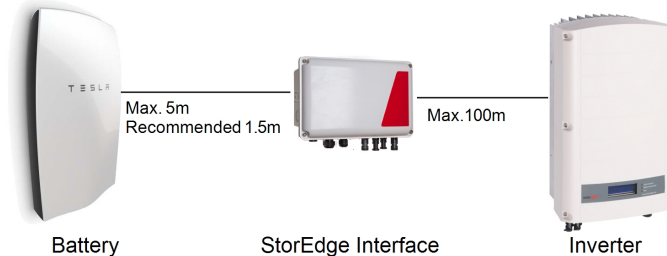
- Only one battery and one interface can be connected to each inverter.
- Additional SolarEdge inverters (without batteries) can be connected with RS485. The inverters will participate in export limitation and maximizing self-consumption (Maximizing self-consumption for multiple inverters supported from Q2 2016).  
Connecting multiple inverters with RS485 master-slave connection requires an *RS485 Expansion Kit* (available from SolarEdge).
- PV modules connected to power optimizers are not mandatory for Time of Use (TOU) profile programming and for backup power.

## Installation Workflow

When installing the StorEdge system, follow this workflow to ensure all the components are connected and functioning correctly.

Plan the StorEdge system layout:

- The battery and StorEdge Interface will connect to the DC side of the inverter. Since the inverter DC connections are on its left side, it is recommended to position the battery and interface to the left of the inverter to simplify wiring.
- To simplify cable management, a minimum distance of 1.5m between battery and interface is recommended.



**Figure 2: System Layout**

**Step 1 - PV system installation** - modules, power optimizers and inverter(s). Refer to the following chapters of the *SolarEdge Installation Guide* supplied with the inverter and available at

<http://www.solaredge.com/files/pdfs/products/inverters/guides/se-inverter-installation-guide.pdf>:

- Installing the Power Optimizers (if applicable)
- Installing the Inverter
- Connecting the AC and the Strings to the Inverter
- Activating the inverter- as described in the **Commissioning** chapter of the *SolarEdge Installation Guide*, using the activation card supplied with the inverter.
- Upgrading the inverter firmware version, using the upgrade card supplied with the StorEdge Interface.
- Pairing the system - as described in the **Commissioning** chapter of the *SolarEdge Installation Guide*
- Setting Up Communication

**Step 2 - Electricity Meter installation (required for Smart Energy Management)**. Refer to *Meter Installation* on page 7.

**Step 3 - StorEdge Interface installation and connection** as described in *StorEdge Interface Installation* on page 9.

**Step 4 - Connect the battery to the StorEdge Interface and mount the battery<sup>1</sup>**. Refer to the installation information in the manufacturer documentation, and to *Connecting the StorEdge Interface to the Battery Pack* on page 14.

**Step 5 - Configuring the communication between the inverter and the other devices** (meter, battery, etc.). Refer to *Configuring the RS485 Bus for Battery and Meter Connection* on page 19.

**Step 6 - Configuring the StorEdge application**. Refer to *Configuring Maximum Self-consumption* on page 21.

<sup>1</sup>To gain better accessibility to the battery connection panel, it is recommended to connect the battery cables *before* mounting it on the wall.

## Chapter 2: Meter Installation

The StorEdge solution requires connecting a meter for Smart Energy Management applications, such as export limitation and maximizing self-consumption.

The meter type (single or three phase) and number of current transformers (CTs) should be selected per the grid connection and energy management application rather than according to the inverter model. The CTs are supplied with 2m twisted pair wires for connecting the CTs.

To install the SolarEdge meter, refer to the installation guide supplied with it:

<http://www.solaredge.com/files/pdfs/solaredge-meter-installation-guide.pdf>.

The meter is connected to the inverter using RS485.

RS485 wiring specifications:

- Cable type: Min. 3-wire shielded twisted pair (a 4-wire cable may be used)
- Wire cross-section area: 0.2-1 mm<sup>2</sup> / 24-18 AWG (a CAT5 cable may be used)

### NOTE



The inverter RS485 bus should be connected to the battery (via the StorEdge interface) and meter. Connecting multiple inverters (or an external logger) with RS485 master-slave connection requires an RS485 Expansion Kit (available from SolarEdge Refer to [http://www.solaredge.com/files/pdfs/RS485\\_expansion\\_kit\\_installation\\_guide.pdf](http://www.solaredge.com/files/pdfs/RS485_expansion_kit_installation_guide.pdf)).

### ► To connect the meter to the inverter:

1. Remove the seal from one of the openings in communication gland #2 at the bottom of the inverter and insert the RS485 wires from the meter through the opening.

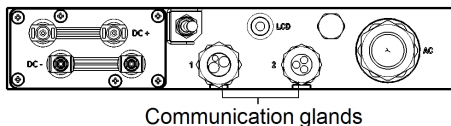


Figure 3: Communication glands

2. Pull out the 9-pin RS485 connector located on the communication board.

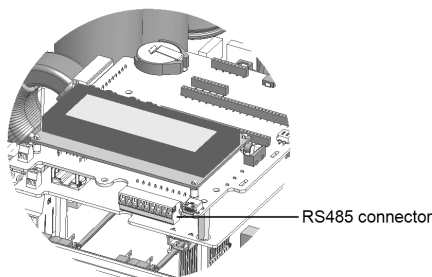
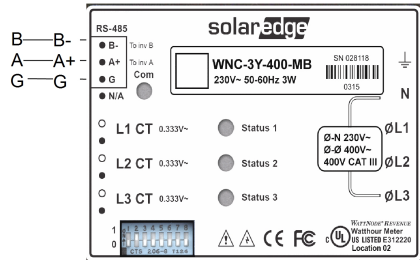
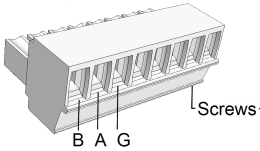


Figure 4: Inverter RS485 connector

3. Connect the wires:

If you have a meter with SolarEdge logo, connect as illustrated below:

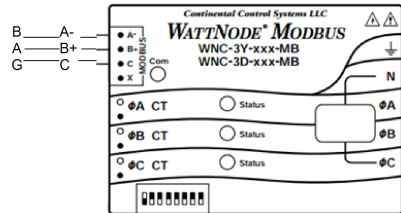
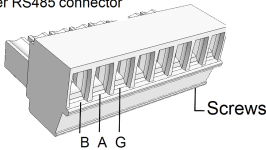
Inverter RS485 connector



**Figure 5: Meter RS485 connections (meter with SolarEdge label)**

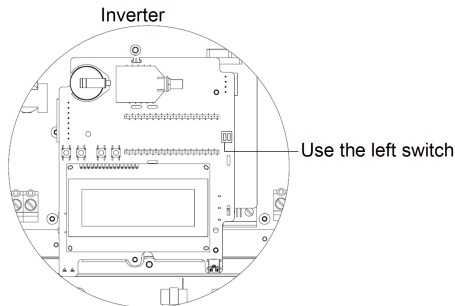
If you have a meter with WattNode logo, connect as illustrated below:

Inverter RS485 connector



**Figure 6: Meter RS485 connections (meter with WattNode label)**

4. If the SolarEdge device is at the end of the RS485 bus, terminate the inverter by switching a termination DIP-switch inside the inverter to ON (top position). The switch is located on the communication board and is marked SW7 as follows:



**Figure 7: RS485 termination switch**

# Chapter 3: StorEdge Interface Installation

## Unpacking and Identifying the Product

An identification label with product specifications is attached to each device.

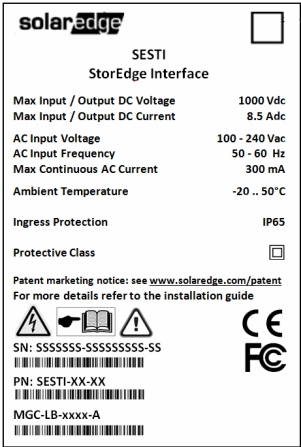


Figure 8: Product label

Check the equipment for damage before starting installation: There are no loose parts. All parts are either mounted or located in the accessory kit. If any damage is found, document the damage, and contact SolarEdge.

## Mounting the StorEdge Interface

1. Determine the StorEdge Interface mounting location, on a wall or pole, as follows:
  - Minimum distance from the battery: 1.5m (5ft)
  - Maximum distance from the battery: 5m (15 ft)
  - Maximum distance from the inverter: 100m (328 ft)
  - Maintain a minimum 20 cm (8”) clearance between the StorEdge Interface and other objects.

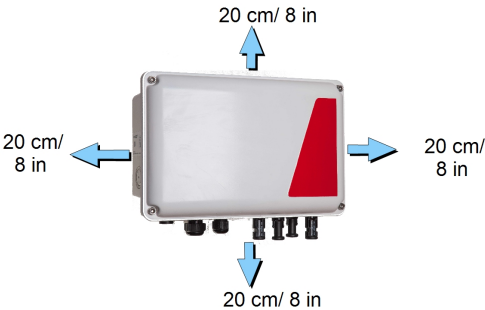
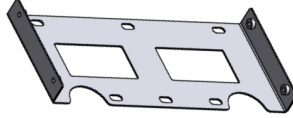


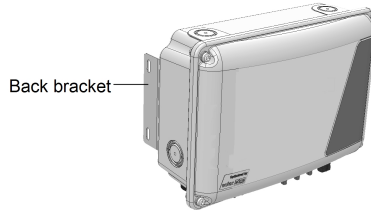
Figure 9: StorEdge Interface clearance

2. Install the bracket with the semi-circles facing down, as shown below. Verify that the bracket is firmly attached to the mounting surface.



**Figure 10: Mounting bracket**

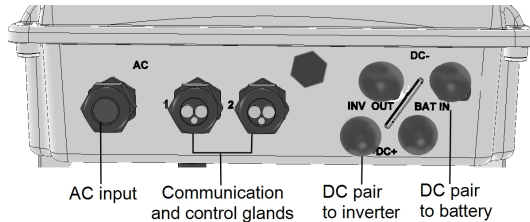
3. Install the interface: Attach the StorEdge interface back brackets to the mounted bracket using the four supplied screws. Tighten the screws with a torque of 9 N\*m / 6.6 lb\*ft.



**Figure 11: The StorEdge Interface**

4. Loosen the 4 Allen screws of the StorEdge Interface and remove the cover.

## Connecting the StorEdge Interface



**Figure 12: StorEdge Interface connectors**

### WARNING!

**For StorEdge interface units with an ON/OFF Switch - The ON/OFF switch shuts off the battery, however does not de-energize the DC lines.**

To reduce all components to safe voltage, disconnect all power sources to the system components prior to any system maintenance procedure:

- Disconnect the AC to both the inverter and StorEdge Interface.
- Turn OFF the inverter ON/OFF switch.
- Turn OFF the StorEdge Interface ON/OFF switch.



## Connecting the StorEdge Interface to the Inverter

### ► To connect to the inverter DC:

1. Prepare one pair of DC cables with MC4 connectors at both ends - male at one end and female at the other end.
2. Connect one end of the cables to the inverter, and connect the other end to the DC+ and DC- input connectors marked **INV OUT**.



#### NOTE

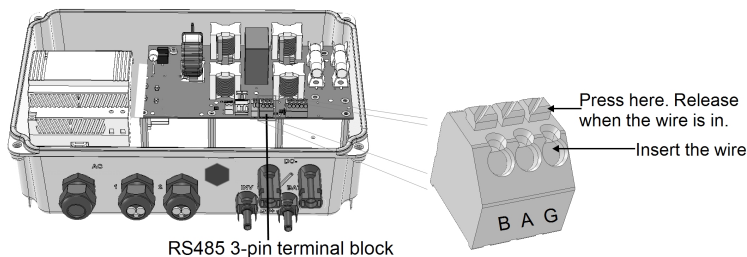
If all the inverter DC inputs are connected to PV strings, use a branch cable (available from SolarEdge) to connect the StorEdge Interface to the inverter DC input.

### ► To connect RS485 communication to the inverter:

RS485 wiring specifications:

- Cable type: Min. 3-wire shielded twisted pair (a 4-wire cable may be used)
  - Wire cross-section area: 0.2- 1 mm<sup>2</sup>/ 24-18 AWG (a CAT5 cable may be used)
1. Connect one end to the RS485 terminal block marked "RS485 to Inv." in the StorEdge Interface:
    - a. Open gland #2.
    - b. Remove the seal from one of the openings and insert the wire through the opening.
    - c. Connect the wire ends in the **A**, **B** and **G** pins (use a twisted pair for A and B): Use a flat blade screwdriver to press the protrusion at the top of the terminal block and open the connection hole; insert the wire and release to spring back and clamp the wire.

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 both A pins (inverter and StorEdge Interface, the same color for both B pins and the same color for both G pins.



**Figure 13: RS485 connector in the StorEdge Interface**

2. Connect the other end of the communication cable to the inverter communication board:



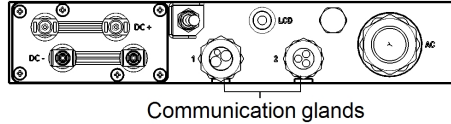
#### NOTE

The wires from the meter and from the StorEdge Interface are inserted into the same pins in the inverter RS485 terminal block. Make sure that the meter wires are not disconnected when inserting the Interface wires.

- a. Open the inverter cover as described in its manual.

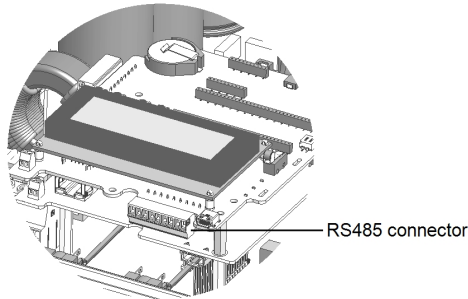


- b. Remove the seal from one of the openings in the communication gland and insert the wire through the opening.



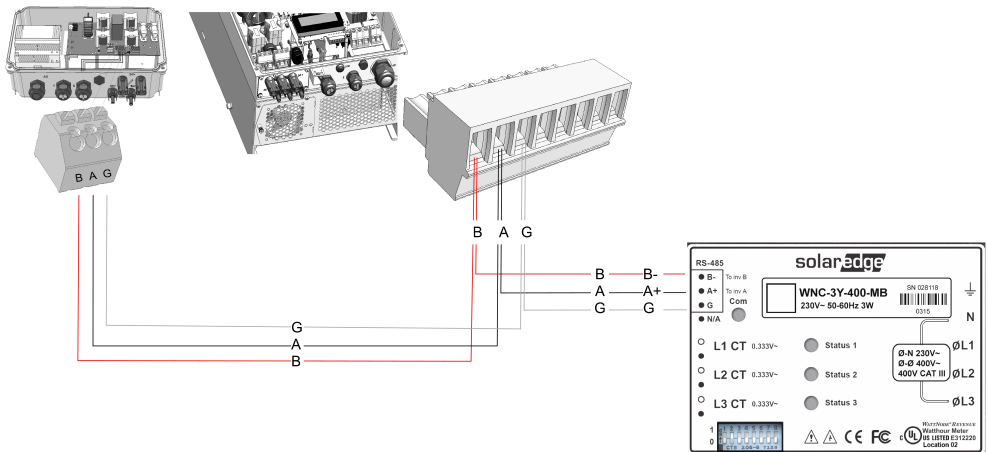
**Figure 14: Communication glands**

- c. Pull out the 9-pin RS485 terminal block connector, as shown below:



**Figure 15: Inverter RS485 terminal block**

- d. Loosen the screws of pins A(+), B(-), and G on the left of the RS485 terminal block.
  - e. Insert the wire ends into the **G**, **A** and **B** pins.
3. Check that the wires are fully inserted and cannot be pulled out easily.



**Figure 16: Connections to the inverter (and meter)**

## Connecting the StorEdge Interface to AC



### NOTE

The AC is used for auxiliary power only and does not carry high power.

Use a three-wire cable with a cross section of  $1\text{-}2\text{mm}^2$ .

#### ► To connect to AC:

1. Turn OFF the AC power source to be connected to the interface.
2. Remove the interface AC sealing gland.
3. Strip off 5/16" (8mm) of the AC cable insulation and expose two line wires and one grounding wire.
4. Insert two wire ends into the AC terminals (L, N). Fasten the screws with a torque of  $0.67\text{ N}\cdot\text{m}$  /  $0.5\text{ lb}\cdot\text{ft}$ .

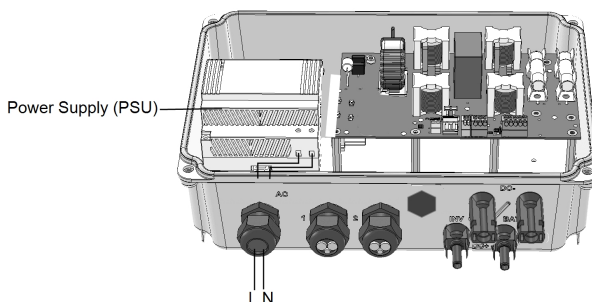


Figure 17: AC and grounding connections

5. Connect the grounding wire to the grounding terminal (bus-bar). You can use the bus-bar to connect the battery grounding cable.

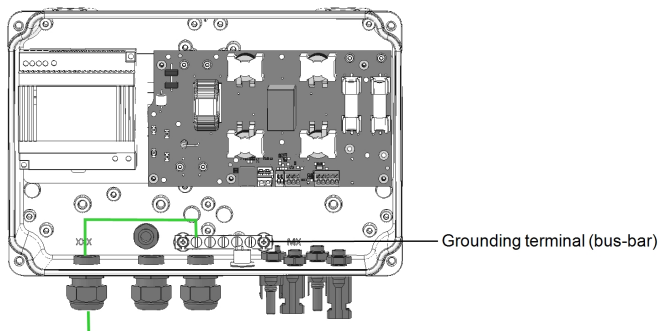


Figure 18: StorEdge Interface grounding

## Connecting the StorEdge Interface to the Battery Pack

Before installing the battery pack according to the instructions provided by the battery manufacturer, connect the battery to the StorEdge Interface as described in this section.

Follow these guidelines:

- For easy access to battery connectors, it is recommended to connect the cables to the battery and to set all the battery DIP switches to their correct positions while the battery is still on the ground. The following procedure is recommended:
  - a. Connect all the wires to the battery connection panel
  - b. Mount the battery
  - c. Connect to the StorEdge Interface.
- Measure the necessary length between the StorEdge Interface and the battery for all cables.
- Tie and wrap the cables to avoid pulling them out during mounting.
- Be sure to adhere to all safety cautions and information in the battery documentation.

► **To connect the battery pack and the interface:**

1. Prepare cables and connect as described in the following table:

Recommended cable type (min-max cross section)	StorEdge Interface connection	Tesla battery connection	Connection method
DC			
One pair of PV DC cables with a cross section of 6 (4-6)mm <sup>2</sup> , 600V insulated, with MC4 connectors at one end.	BAT DC +	DC +	
	BAT DC -	DC -	
12V thermal power input			
2-wire shielded twisted pair cable with cross section of 1.5 (0.1-2.5) mm <sup>2</sup> , 600V insulated	Battery Thermal V- (black)	THERMAL -	Push the lever to open the connection, insert the wire and release the lever when the wire is clamped.
	Battery Thermal V+ (red)	THERMAL +	
Control and monitoring			
5-wire shielded twisted pair cable with a cross section of 0.2 (0.2-1.5) mm <sup>2</sup> . A CAT5 600V insulated cable can also be used.	5-pin communication terminal block:	communication port 1 (located closer to the DIP switches):	Press the protrusion at the top of the terminal block to open the connection hole, insert the wire and release to spring back and clamp the wire.
	En (Enable)	ENABLE	
	V+	LOGIC +	
	G (RS485)	LOGIC -	
	B (RS485) <sup>1</sup>	COM LO <sup>1</sup>	
	A (RS485)	COM HI	
		Modbus DIP switch setting: <ul style="list-style-type: none"><li>◦ S2, S6: Left</li><li>◦ S1, S5: DOWN</li><li>◦ S3, S4: UP</li></ul> ID DIP switch setting: All (1,2,3) to the right (0 position)	Refer to <i>Figure 19</i> and <i>Figure 20</i>
Battery grounding			
	Optionally connect to the second grounding spring terminal (see figure <i>Figure 17</i> )	Grounding lug	

2. Close the interface cover: Attach the cover and secure it by tightening the four screws with a torque of 1.2 N\*m / 0.9 ft.\*lb.

<sup>1</sup> Must be twisted pair

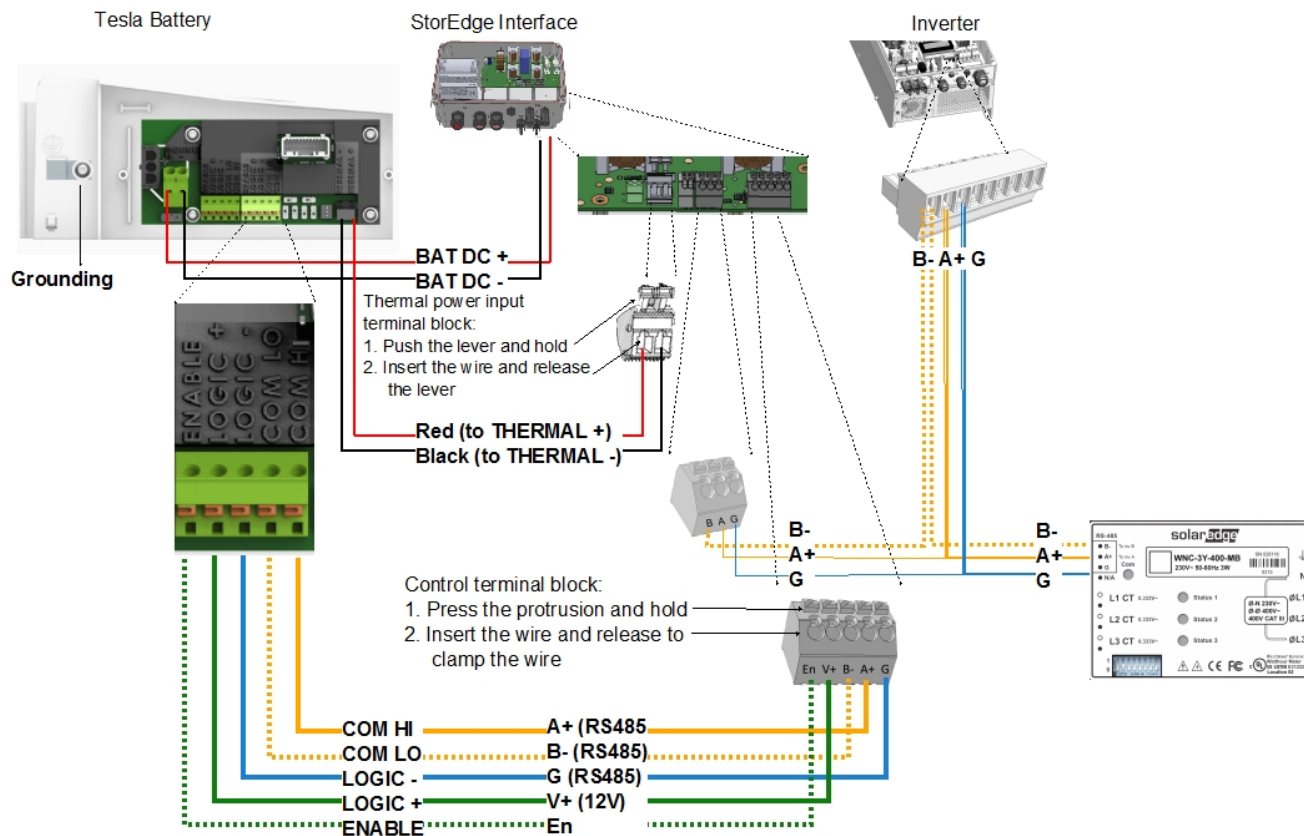


Figure 19: StorEdge Interface Connections

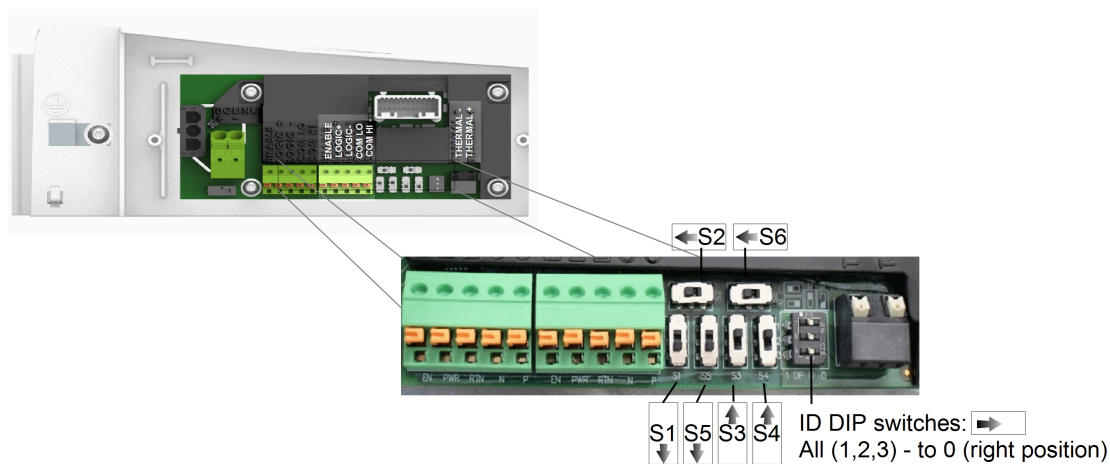


Figure 20: Battery DIP switches

## Chapter 4: System Configuration

This chapter describes how to configure your StorEdge system by setting up the communication between the system components and setting up the required application. To use the StorEdge applications, the inverter communication board firmware (CPU) version must be 3.xxxx and later. If you have an inverter with CPU version 2.xxxx, contact SolarEdge support.

### Upgrading the Inverter Firmware Version

Upgrade the inverter firmware using the card supplied with the StorEdge Interface.

#### ► To upgrade the inverter firmware:

1. Make sure the inverter has been activated using the card supplied with the inverter.
2. If applicable - make sure the ON/OFF switch of the StorEdge Interface is OFF.
3. Make sure the ON/OFF switch of the inverter is OFF.
4. Insert the card into the communication board slot marked "CARD".

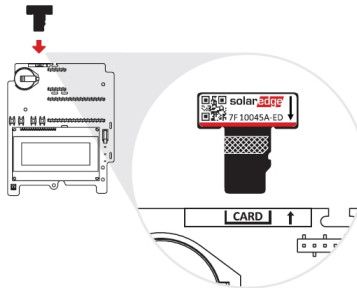


Figure 21: Inserting the upgrade card

5. Turn on the AC to the StorEdge Interface.
6. Turn on the AC to the inverter.



#### **WARNING!**

ELECTRICAL SHOCK HAZARD. Do not touch uninsulated wires when the inverter cover is removed.

7. Enter the inverter Setup mode: Press the internal Enter button for 5-10 seconds and release. Enter the password **12312312**.
8. Select **Maintenance → SW Upgrade – SD Card**. The LCD shows: Running Script... → Done!  
If the LCD shows: Script error, contact SolarEdge Support.

## Configuring the RS485 Bus for Battery and Meter Connection

This section describes how to set up the RS485 communication between the inverter, meter, StorEdge Interface, and battery.

### ► To configure the RS485 bus:

1. Select **Communication** → **RS485-1 Conf** → **Device Type** → **Multi Devices**. A list of devices is displayed.

```
Device Type <MLT>
Meter 1 <--->
Meter 2 <--->
Battery 1 <--->
```

2. Select **Meter 2**. The meter configuration screen is displayed:

```
Device Type <MTR>
Protocol <WN>
Device ID <2>
CT Rating <0>
Meter Func. <None>
```

3. Configure the meter:
  - a. Select **Device Type** → **Revenue Meter**
  - b. Select **Protocol** → **WattNode**
  - c. Verify that **Device ID** is set to **2**.
  - d. Set the CT value that appears on the CT label: **CT Rating** → **<xxxxA>**.  
If CT resets to 0, check the communication as described in step b below.
  - e. For a meter installed at the grid connection point select **Meter Func.** → **Export+Import**.

```
Export+Import
Export
Consumption
Production
Import
None
```

The selected option is displayed in the RS485 Conf screen as **<E+I>**.

4. Select **Battery 1**. The battery configuration screen is displayed:

```
Device Type <BAT>
Protocol <T74>
Device ID <24>
Battery Info < >
```

5. Select **Device Type** → **Battery Pack**.



6. Select **Battery Info** and check the battery information:

```
SN: <serial #>
Model: <XXXXXX>
Rated PWR[kWH]: N/A
FW Ver. <XXXXXX>
```

► **To verify the connection:**

1. Turn the StorEdge Interface ON/OFF switch to ON.
2. Press the inverter external LCD light button to display the status screens one after the other:
  - a. Check the RS485 communication status:

```
Dev Prot ##
RS485-1<MLT> <02><02>
```

- The number under **Prot** (protocol) should display the number of *configured* devices.
- The number under **##** should display the number of *communicating* devices.

The above screen shows an example of 2 devices on the same bus (e.g. meter and battery). If RGM is pre-installed, and a battery and an external meter are also installed, the screen should show <3><3>.

If the number of devices under Prot does not match the number under ##, refer to *Troubleshooting* on page 24

- b. Check the meter(s): In the meter(s) status screen check that the status is **OK**. The following is an example of the status of an Export (or Export+Import) meter:

```
Export Meter
Status: <OK>
<Error Message>
Total [Wh]: XXXXXXXX
```

If **Comm. Error** appears, refer to *Troubleshooting* on page 24.

- c. Check the battery information: identification, charging status and power, and the operating mode.

```
BSN: XXXXXXXXXXXX ID: 24
SOE: 89% PWR: 0W
Total: 0Wh
State: Idle
```

If **Comm. Error** appears, refer to *Troubleshooting* on page 24.

## Configuring Maximum Self-consumption

This section describes the StorEdge applications and how to configure the system per application.

### Maximize Self-consumption

In this mode, the battery is automatically charged and discharged to meet consumption needs.

The battery has two states:

- OFF – the battery is in standby
- ON – the battery is controlled for maximized self-consumption

Battery OFF periods can be configured to extend battery lifetime by minimizing the number of shallow discharges (for example at nighttime or during the winter).

### Profile Programming (for time of use arbitrage)

In this mode, the StorEdge system operates according to a configured charge/ discharge profile. This application is covered in a separate application note available at

[http://www.solaredge.com/files/pdfs/StorEdge\\_TOU\\_profile\\_programming.pdf](http://www.solaredge.com/files/pdfs/StorEdge_TOU_profile_programming.pdf).

#### ► To set up max. self-consumption:

1. Enter Setup mode, scroll down to the **Power Control** menu and select it. A menu similar to the following is displayed:

```
Grid Control <En>
Energy Manager
RRCR Conf.
Reactive Pwr Conf.
Active Pwr Conf.
Phase Balance <Dis>
Wakeup Conf.
P ( f )
Advanced
Load Defaults
```

2. Select **Energy Manager**. The following screen is displayed:

```
Limit Control <Dis>
Energy Ctrl <Dis>
```

**Limit Control:** For power limitation (including export limitation) configuration. This option can be used in parallel to energy control. For more information refer to

[http://www.solaredge.com/files/pdfs/products/feed-in\\_limitation\\_application\\_note.pdf](http://www.solaredge.com/files/pdfs/products/feed-in_limitation_application_note.pdf).

**Energy Control:** The method by which to manage the energy.

3. Select **Energy Ctrl..** The following is displayed, showing the SolarEdge applications:

```
Max Self-consume
Time of Use
Disable
```

**Max Self-consume (MSC):** Maximize Self-consumption .

**Time of Use (TOU):** Profile Programming.

**Disable:** No energy control, that is, the battery is not used.

1. Select **Max Self-Consume**. The Energy Manager screen changes to display the following:

```
Limit Control <Dis>
Energy Ctrl <MSC>
Set Operation
Storage Control
```

2. Optionally, set the battery OFF periods as follows:
  - a. Select **Set Operation**. A list is displayed, allowing 12 monthly profile setup:

```
Jan <ON>
Feb <ON>
Mar <ON>
Apr <ON>
```

- b. Select a month. A list of options is displayed.

```
Start Time <00:00>
End Time <00:00>
Always ON
Always OFF
```

- c. Select one of the options:
  - Select **Always OFF** to avoid battery usage entirely (for example during winter)
  - Set **Start Time** and **End Time** to set battery usage in specific hours and avoid usage during specific hours throughout the month (for example at night). This sets the periods during which the battery will be in the OFF state.
  - Select **Always ON** to use battery at all times for charging/ discharging.

## Starting-up the System

Upon installation and configuration completion, the power optimizers should be paired to the inverter. Perform pairing as described in this section.

1. Close the inverter cover as described in its manual.
2. Perform pairing: Press and hold down the inverter LCD button for about **10 seconds**. The following message is displayed:

```
Keep holding button
for pairing, release
to enter menu...
Remaining: 3 sec
```

Keep holding for 5 seconds until the following is displayed:

```
Pairing
Turn Switch To On
```

3. Turn the inverter ON/OFF switch to ON within 5 seconds. If you wait longer than 5 seconds the inverter exits the pairing mode. The following message is displayed indicating that the inverter is performing the pairing:

```
Pairing
Remaining [sec]:180
```

- Wait for the completion of the pairing (remaining seconds is 0). If pairing fails, an error is displayed. In this case, repeat the pairing steps. If the problem persists, contact SolarEdge Support. When pairing succeeds, the following message is displayed:

Pairing

Pairing Completed

The system startup process begins:

Since the inverter is ON, the power optimizers start producing power and the inverter starts converting AC.



#### NOTE

When you turn ON the inverter ON/OFF switch, the DC cables carry a high voltage and the power optimizers no longer output a safe 1V output.

When the inverter starts converting power after the initial connection to the AC, the inverter enters Standby mode until its working voltage is reached. This mode is indicated by the flickering green inverter LED.

While the inverter is in Standby mode, it monitors the grid and verifies correct grid voltage and frequency. The following message is displayed:

Waking Up...

Remaining: 051 Sec

The countdown indicates the seconds remaining until entering the Production mode. This time is in accordance with local regulations and is typically between three to five minutes.

When countdown is complete, the inverter enters Production mode and produces power. The steadily lit green inverter LED indicates this mode.

- If applicable, turn ON the StorEdge Interface ON/OFF switch.

# Appendix A: Troubleshooting

This appendix describes how to troubleshoot StorEdge related errors.

## Communication Troubleshooting

When a battery and a meter are connected (2 devices connected to the same bus), the following should appear in the Communication status screen:

```

Dev Prot ##
RS485-1 <MLT> <02> <02>
ZigBee <---> <---> <--->

```

## Device type, number and protocol are displayed incorrectly

If one or more of the following occurs, the meter(s) or the battery are not communicating with the inverter:

- **MLT** (Multi) is not displayed as the device type (under Dev)
- The number of devices under **Prot** (protocol) or under **##** does not match the number of connected devices
- The number under **Prot** (configured devices) does not match the number under **##** (communicating devices)

Check the following:

- The meter and battery configuration is as described in *Configuring the RS485 Bus for Battery and Meter Connection* on page 19.
- The wiring between the StorEdge Interface, the battery and the meter is correct (refer to *Figure 19*).
- There are no loose connections at any of the system components connectors.

## Troubleshooting Ethernet Communication

When using Ethernet communication, use the **Server Communication Status** window to identify the location of the error:

```

Server: LAN <S_OK>
Status: <OK>
xxxxxxx
<ERROR MESSAGE>

```

xxxxxxx is a string of 1s and 0s showing an eight-bit communication connection status. 1 indicates OK and 0 indicates an error.

Bit Location	Error Message	Cause and Troubleshooting
1st	LAN Disconnected	Physical connection fault. Check the cable pin-out assignment and cable connection. Refer to .
2nd	DHCP Failed, or Invalid DHCP Config	IP settings issue. Check the router and inverter configuration. Consult your network IT.
3rd	Gateway Ping Failed	Ping to router failed. Check the physical

Bit Location	Error Message	Cause and Troubleshooting
		connection to the switch/router. Check that the link LED at the router /switch is lit (indicating phy-link). If OK - contact your network IT, otherwise replace the cable or change it from cross to straight connection.
4th	G Server Ping Failed	Ping to google.com failed. Connect a laptop and check for internet connection. If internet access is unavailable, contact your IT admin or your internet provider. For Wi-Fi networks, ensure that username and password are as defined in the internet provider AP/router.
5th	Server x Ping Failed	Ping or connection to SolarEdge server failed.. Check the SolarEdge server address, under <b>LAN Conf</b> submenu: Address: prod.solaredge.com Port: 22222 Check with your network administrator whether a firewall or another device is blocking transmission.
6th		
7th		
8th	Tcp Connect. Failed	

Meter Troubleshooting

When a meter is connected, there will be a status screen for each meter function. The following is an example of the export meter function status:

```
Export Meter
Status: <OK>
<Error Message>
Total [Wh] :XXXXXXXX
```

<OK> is not displayed

If <OK> is not displayed in the Status line of the status screens, the meter is not communicating with the inverter communication board. Check the following:

- There are no loose connections at the inverter communication board and at the meter.
- The wiring between the 4-pin terminal block on the meter and the RS485 terminal block on the StorEdge Interface is correct (refer to Figure 19).

An error message is displayed

If **Error 185 Meter Comm. Error** is displayed in the meter status screen, verify proper connection of:

- The RS485 cables and connectors
- The AC connection of the meter

Total [Wh] Import value is not advancing

If the inverter is not producing power, and there is power consumption by the loads, the Total [Wh] value should be changing.

If the Total [Wh] value of the Import meter displays a steady value although the site is consuming power, check the following:

- The meter status LEDs are lit. If the LEDs are all OFF, the meter is not connected to a power source.
  - Check the meter AC connection (10-pin terminal block)
  - Check that the meter breaker is ON
- There are no loose connections at the 10-pin AC wiring of the meter.
- The CT black and white cables are correctly connected to the 6-pin connector on the meter:
  - White CT wire is connected to A white
  - Black CT wire is connected to A black
- CT direction is towards the grid and the green power LEDs are ON. If the LEDs are not green indicating import power - the CTs are reversed.

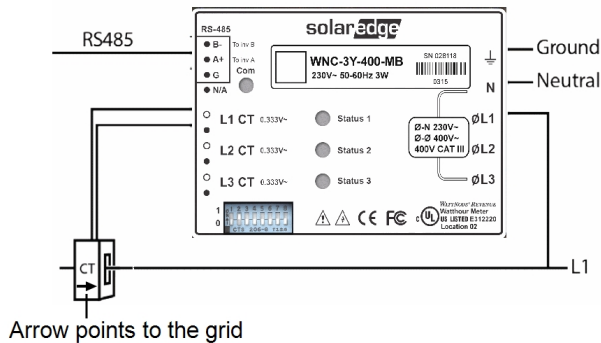


Figure 22: Meter with CT

## Battery Troubleshooting

The State line in the battery status screen should display one of the following: Charging, Discharging, Idle, Off, Init.:

```
BSN: XXXXXXXXXX ID: 24
SOE: 89% PWR: 0W
Total: 0Wh
State: Idle
```

- If **Error 186 Battery Comm. Error** appears, the battery communication is disconnected. Check the following:
  - The RS485 control connection to the battery
  - The DIP switches settings on the battery:
    - S1, S5: Down
    - S3, S4: Left
    - S2, S6: Left
  - The ID DIP switches setting on the battery - All should be set to the right (0) position
- If the state **Idle** is displayed instead of Charging/Discharging, check the following:
  - The system configuration
  - The DC connection

## StorEdge Interface LEDs

LED location	Functionality	Troubleshooting
12V IN (left of the main board)	ON - 12V (or 13V) is supplied to the main board	N/A
	OFF - No power to the main board	<ul style="list-style-type: none"> <li>Check AC cable is connected to the the PSU.</li> <li>Check green LED indication on the PSU</li> <li>Check the cable connection between the PSU and the main board</li> </ul>
12V OUT (right of the main board)	ON - 12V (or 13V) is supplied to the battery (thermal and logic)	N/A
	OFF - No power supply to the battery	<ul style="list-style-type: none"> <li>Check that the 12V IN LED is lit</li> <li>Make sure all Control connections between the inverter and battery are correct</li> <li>Check the RS485 cable to the inverter and battery</li> <li>Check the 12V (thermal and logic) voltages to the battery</li> </ul>
DC LO (red LED on the power supply)	PSU output is low	Check the AC cable connection
DC OK (green LED on the power supply)	PSU output is OK	N/A



## Appendix B: StorEdge Interface Technical Specifications

		Unit
<b>BATTERY DC INPUT</b>		
Number of Batteries per Interface <sup>1</sup>	1	
Max Input Voltage	1000	Vdc
Max Input Current	8.5	Adc
DC Fuses on Plus and Minus	12A (field replaceable)	
<b>ADDITIONAL FEATURES</b>		
Battery Communication Interface	RS485	
Meter Communication Interface	RS485	
Battery auxiliary power (thermal and control)	Yes, 12V / 53W	
Pollution degree classification (inside/ outside)	2/ 3	
Maximum altitude rating	2000	m
Overvoltage Category	III	
<b>STOREDGE INTERFACE POWER SUPPLY</b>		
AC Input Voltage (Nominal)	220 / 230	Vac
AC Input Voltage Range	184 - 264.5	Vac
AC Frequency (Nominal)	50 / 60 ± 5	Hz
Max AC Input Current	300	mA
<b>INSTALLATION SPECIFICATIONS</b>		
AC input gland cable diameter / wire cross section	6-13mm / 1-2.5mm <sup>2</sup>	
DC input (from the battery)	1 MC4 pair	
DC output (to the inverter)	1 MC4 pair	
Dimensions (HxWxD)	206.6 x 316 x 117.5	mm
Weight	3	kg
Min - Max Operating Temperature	-20 to +50	°C
Humidity (non-condensing)	<95%	
Protection Rating	IP65 (Outdoor and Indoor)	
Installation	Wall mounted	

<sup>1</sup>For more batteries per Interface, contact SolarEdge.

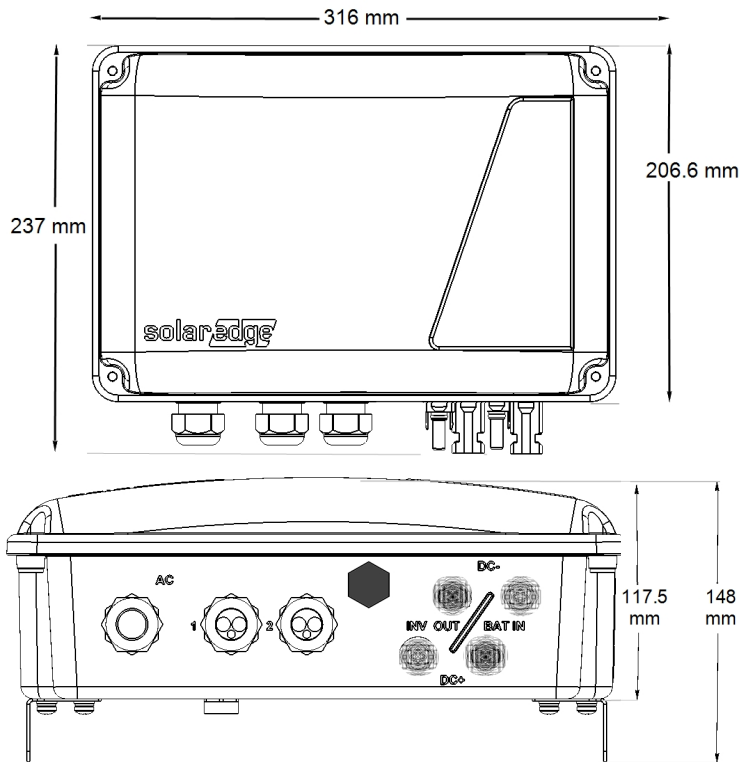


Figure 23: StorEdge Interface dimensions

If you have technical queries concerning our products, please contact our support through SolarEdge service portal:

<http://www.solaredge.com/groups/support/services>

Australia (+61)	1800 465 567
Belgium (+32)	080073041
China (+86)	186-0166-3934
France (+33)	0800917410
Germany (+49)	089-45459730
Italy (+39)	800 784 824
Japan (+81)	03-6261-1274
US & Canada (+1)	510-498-3200
United Kingdom(+44)	0800 028 1183
Greece (+30)	0800-125574
Israel(+972)	073 240-3122
Netherlands (+31)	08000221089
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MAN-01-00249-1.2

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