



Installation Guide

StorEdge Interface

For the Single Phase Inverter with HD-Wave Technology and SetApp Configuration and LG Chem Batteries

Version 1.1

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The content of these documents is continually reviewed and amended, where necessary. However, discrepancies cannot be excluded. No guarantee is made for the completeness of these documents.

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

Emission Compliance

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.

Revision History

Version 1.1 (September 2019)

- Added *Running a Battery Self-test* on page 21.

Version 1.0 (July 2019)

- First version of this guide

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 Information

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!

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.

WARNING!

The battery must be powered off before and during wiring.

To power off the battery:

1. Turn off the circuit breaker.
2. Turn off the disconnect/auxiliary power switch.



To power the battery back on:

1. Turn on the disconnect/auxiliary power switch.
2. Turn on the circuit breaker.

For details, see *Powering the LG Chem Battery Off and On* on page 24.

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.

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 Inverter** - manages the battery and system energy, in addition to its traditional functionality as a DC-optimized PV inverter.
- **The Energy Meter** - is used by the inverter for export, import, production and 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.
- **One battery** - a DC-coupled battery designed to work with the SolarEdge system.

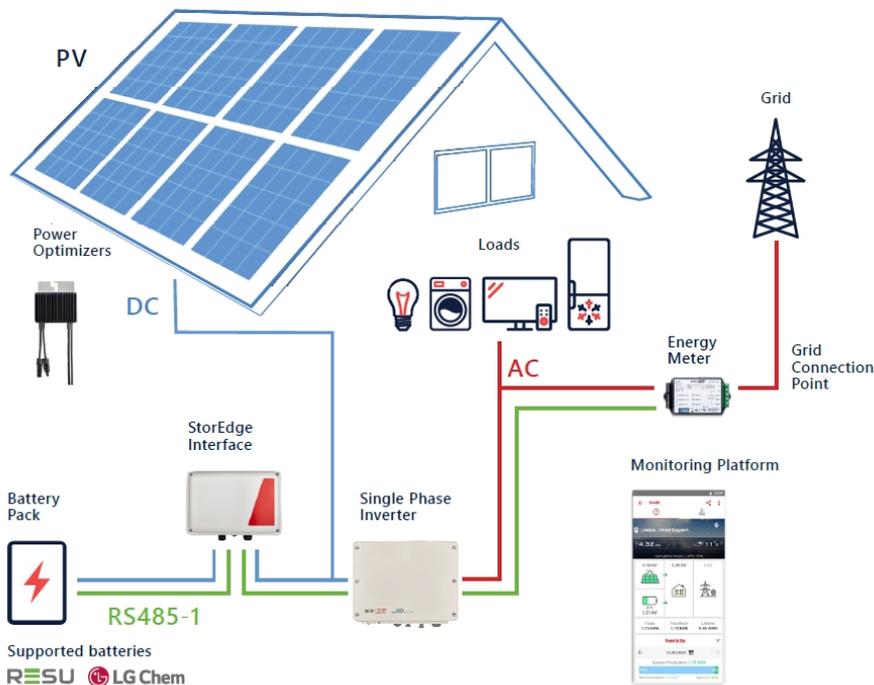


Figure 1: StorEdge system components

NOTE



- Additional SolarEdge inverters (without batteries) can be connected over RS485. The inverters will participate in export limitation and Smart Energy Management.
- PV modules connected to power optimizers are not mandatory for charge/discharge profile programming.

Additional References

This document describes basic system connection and configuration - PV system (power optimizer strings), one inverter, one battery, and one meter.

For additional configuration options refer to the StorEdge Solution Applications - Connection and Configuration Guide, available at:

https://www.solaredge.com/sites/default/files/storedge_applications_connection_and_configuration_guide.pdf



If your inverter has an LCD display (it is not SetApp configurable), refer to this guide for StorEdge Interface installation and configuration:

https://www.solaredge.com/sites/default/files/storedge_interface_installation_with_LG_and_HD_wave.pdf

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.
- The total distance between the battery and the inverter, including StorEdge Interface, should not exceed the maximum distance shown in the figure below:



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 https://www.solaredge.com/sites/default/files/se_hd_wave_inverter_SetApp_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.
- Pairing the system - as described in the **Commissioning** chapter of the *SolarEdge*

Installation Guide

■ Setting Up Communication

Step 2 - Install an Energy Meter (required for Smart Energy Management). See "Connecting the Energy Meter" on page 12.

Step 3 - Install and configure the StorEdge Interface. See *StorEdge Interface Installation* on page 13.

Step 4 - Connect the battery to the StorEdge Interface and mount the battery. Refer to the installation information in the manufacturer documentation, and to *Connecting the StorEdge Interface to the Battery* on page 17.

Step 5 - Configure the communication between the inverter and other devices (Energy Meter, battery). See *Setting up Communication with the Battery and Energy Meter* on page 20.

Installation Equipment List

Standard tools can be used during the installation of the SolarEdge system. The following is a recommendation of the equipment needed for installation:

- Allen screwdriver for 5mm screw type for the inverter enclosure screws.
- Allen screwdriver for M5/M6/M8 screw types
- Standard flat-head screwdrivers set
- Non-contact voltage detector
- Cordless drill (with a torque clutch) or screwdriver and bits suitable for the surface on which the inverter and optimizers will be installed. Use of an impact driver is *not* allowed.
- Appropriate mounting hardware (for example: stainless bolts, nuts, and washers) for attaching:
 - the mounting brackets to the mounting surface
 - the power optimizer to the racking (not required for smart modules)
- MC4 crimper
- Wire cutters
- Wire strippers
- Voltmeter
- Mobile phone with latest SetApp version

For installing the communication options, you may also need the following:

- For Ethernet:
 - CAT5/6 twisted pair Ethernet cable with RJ45 connector
 - If using a CAT5/6 cable spool: RJ45 plug and RJ45 crimper
- For RS485 and battery:
 - Four- or six-wire shielded twisted pair cable
 - Watchmaker precision screwdriver set

Chapter 2: Connecting the Energy Meter

For Smart Energy Management applications, such as export limitation and maximizing self-consumption, the StorEdge solution requires an Energy Meter.

To install the Energy Meter, refer to the installation guide supplied with it:

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



For communication, the Energy Meter and the StorEdge Interface use the same RS485-1 port on the inverter's communication board.

Use a 3-wire shielded twisted pair cable, 0.2 (0.2-1) mm² 600V or CAT5.

→ To connect the Energy Meter to the inverter

1. Connect one end of the communication cable to the Energy Meter, as explained in the Energy Meter's installation guide.
2. Open one of the inverter's communication glands and insert the other end of the communication cable through the gland.

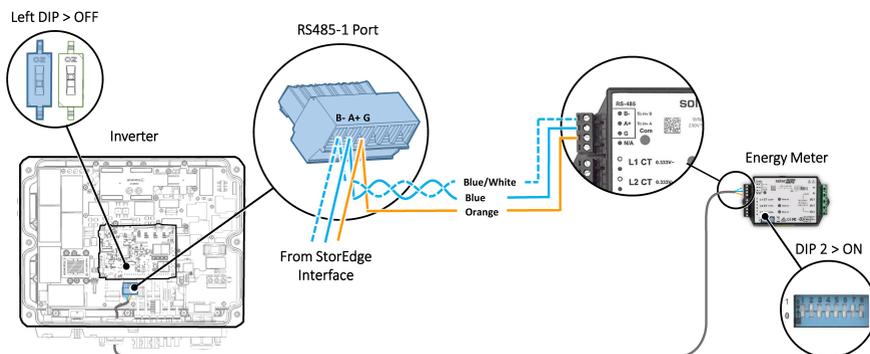


Figure 3: Meter Connection

3. Make sure the RS485-1 DIP switch (the left switch) is OFF.
4. Make sure the Energy Meter's DIP switch 2 is ON.
5. Proceed with connection only after installing the StorEdge Interface, as explained in "Connecting the StorEdge Interface to the Inverter" on page 14.

Chapter 3: StorEdge Interface Installation

Unpacking and Identifying the Product

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

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:
 - Maximum total distance between the battery and the inverter, including StorEdge Interface: 100 m (330 ft).
 - Maintain a minimum 20 cm (8") clearance between the StorEdge Interface and other objects.

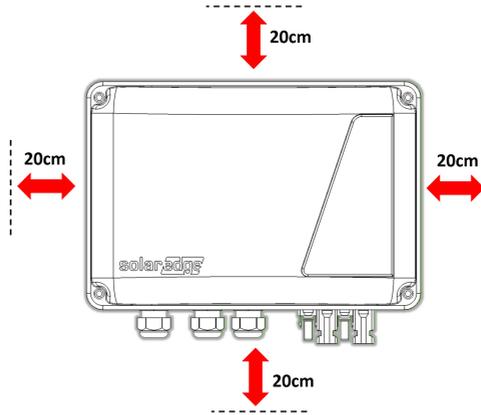


Figure 4: StorEdge Interface clearance

2. Install the bracket. Verify that the bracket is firmly attached to the mounting surface.

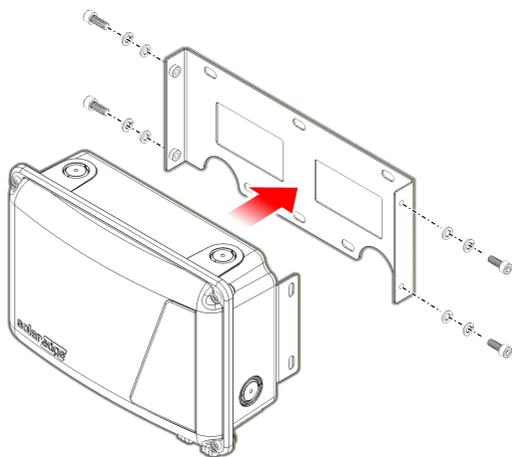


Figure 5: Mounting the StorEdge Interface

3. Attach the StorEdge interface back brackets to the mounting bracket using the four supplied bolts. Tighten the bolts with a torque of $9 \text{ N}\cdot\text{m}$ / $6.6 \text{ lb}\cdot\text{ft}$.
4. Loosen the four Allen screws of the StorEdge Interface cover and remove the cover.

Connecting the StorEdge Interface

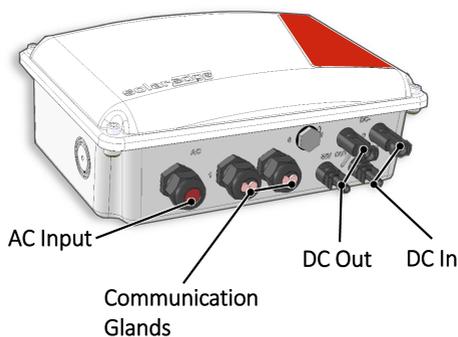


Figure 6: StorEdge Interface connectors

Connecting the StorEdge Interface to the Inverter

For communication, the Energy Meter and the StorEdge Interface use the same RS485-1 port on the inverter's communication board.

Use a communication cable with the following specifications:

- Cable type: Min. 3-wire shielded twisted pair (a shielded Ethernet cable (CAT5/5e STP) may be used)
- Wire cross-section area: 0.2- 1 mm²/ 24-18 AWG (a CAT5 cable may be used)

→ 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**.

	<p>NOTE</p> <p>If all the inverter DC inputs are connected to PV strings, use a branch cable to connect the StorEdge Interface to the inverter DC input.</p>
--	---

→ To connect RS485 communication between the inverter and StorEdge Interface:

1. Connect one end of the communication cable to the RS485 terminal block in the StorEdge Interface (see *Figure 7*):
 - a. Open a communication gland.
 - b. Remove the seal from one of the openings and insert the cable through the opening.
 - c. Connect the wires to the **B-**, **A+** and **G** pins (use a twisted pair for A+ and B-). Use a screwdriver to release the wire clamps on the terminal block.

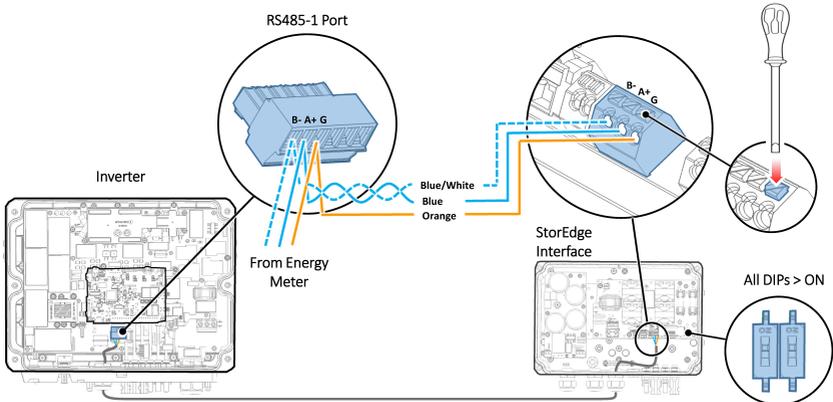


Figure 7: Communication cable connection - Inverter to StorEdge Interface

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

board:

- 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.
- c. Remove the 6-pin connector from the RS485-1 port on the communication board.
- d. Loosen the screws of the three leftmost openings on the connector (RS485-1 port).
- e. Twist the communication wires of the StorEdge Interface and of the Energy Meter together (B with B, A with A, G with G).
- f. Insert the twisted wires into the connector and tighten them with the screws.
- g. Check that the wires are fully inserted and cannot be pulled out easily.

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 1-2mm².

→ To connect to AC:

1. Turn OFF the AC power source to be connected to the StorEdge Interface.
2. Remove the StorEdge Interface's 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 the wire ends into the AC terminal block (L, N, G). Use a screwdriver to release the wire clamps on the terminal block.

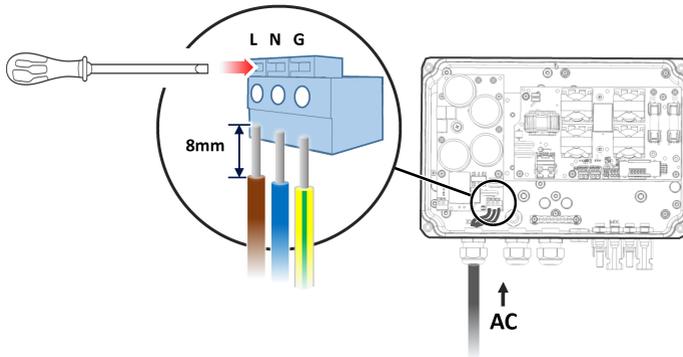


Figure 8: AC connection

Connecting the StorEdge Interface to the Battery

WARNING!

The battery must be powered off before and during wiring.

To power off the battery:

1. Turn off the circuit breaker.
2. Turn off the disconnect/auxiliary power switch.



To power the battery back on:

1. Turn on the disconnect/auxiliary power switch.
2. Turn on the circuit breaker.

For details, see *Powering the LG Chem Battery Off and On* on page 24.

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.

In addition, follow these guidelines:

- Make sure the battery's circuit breaker switch is OFF.
- For easy access to battery connectors, it is recommended to connect the cables to the battery and to set all battery DIP switches to their correct positions *before* mounting the battery.
- Measure the necessary length between the StorEdge Interface and the battery for all cables.

- Mark polarity on DC cables.
- Mount the battery.
- Connect all the wires to the battery connection panel.
- Connect to the StorEdge Interface .
- Tie and wrap the cables to avoid pulling them out during mounting.

For additional information, refer to

http://www.solaredge.com/sites/default/files/storedge_interface_wiring_quick_guide_and_on_site_checklist_for_lg_batteries.pdf.



→ To connect the battery and the StorEdge Interface:

1. Connect a communication cable between the StorEdge Interface and the battery.
 - Use a 5-wire shielded twisted pair cable with a cross section of 0.2 (0.2 - 1.5) mm². A CAT5 600V insulated cable can also be used.
 - Use a screwdriver to release the wire clamps on the terminal block.

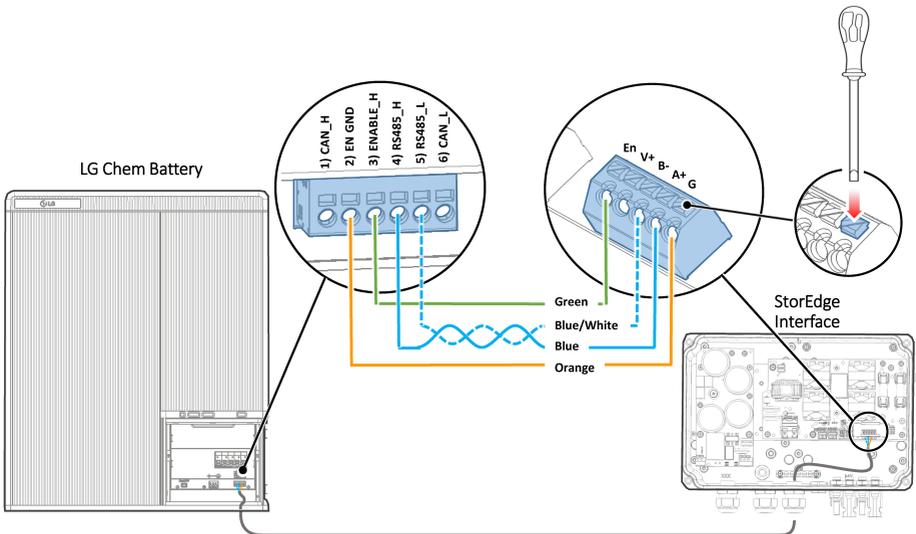


Figure 9: Communication cable connection - LG Chem Battery to StorEdge Interface

2. Connect DC cables between the StorEdge Interface and the battery.
 - Use a pair of PV DC cables with a cross section of 6 (4-6) mm², 600V insulated, with MC4 connectors at one end.

WARNING!

Make sure to connect the power cables at correct polarity. Connecting the power cables at reverse polarity may result in damage to the inverter or battery.

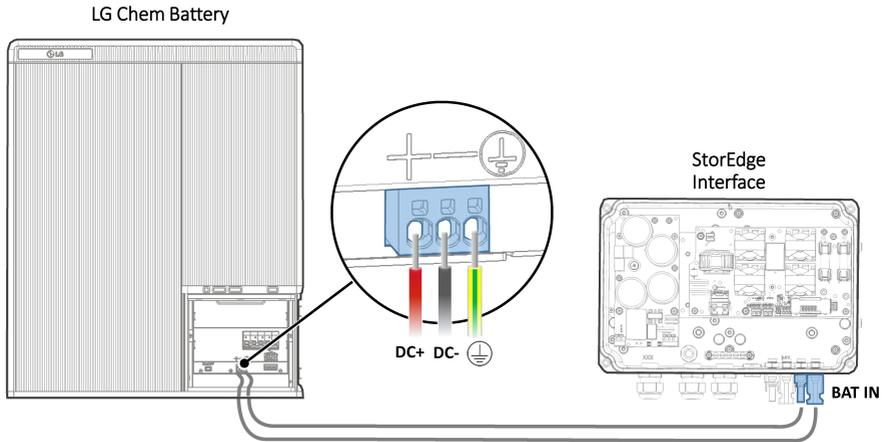


Figure 10: DC cable connection - LG Chem Battery to StorEdge Interface

3. Make sure the battery is properly grounded.
4. Close the StorEdge Interface cover and fasten it with the four screws with a torque of 1.2 N*m / 0.9 ft.*lb.

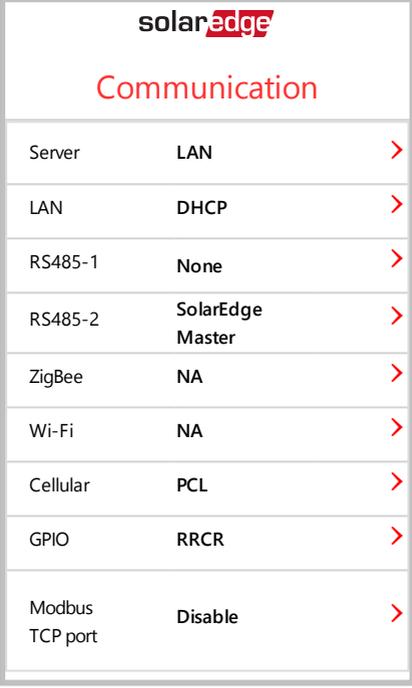
Chapter 4: System Configuration

This chapter describes how to configure your StorEdge system by setting up the communication between the system components and setting up the required application.

Setting up Communication with the Battery and Energy Meter

→ To set up communication with the battery:

1. Power on the system, as explained in "Connecting and Powering Systems with a DC Disconnect Switch" on page 25.
2. Access SetApp and select **Commissioning** → **Communication**.



solar ^{edge}		
Communication		
Server	LAN	>
LAN	DHCP	>
RS485-1	None	>
RS485-2	SolarEdge Master	>
ZigBee	NA	>
Wi-Fi	NA	>
Cellular	PCL	>
GPIO	RRCR	>
Modbus TCP port	Disable	>

3. From the **Communication** screen, select **RS485-1** → **Protocol** → **Modbus (Multi-Device)**.
4. Return to the previous screen and select **Add Modbus Device** → **Battery**:
5. Verify the battery information by selecting **Battery 1** → **Battery Information**:

→ To set up communication with the Energy Meter:

If you are setting up communication with the meter before the battery, first perform Steps 1-3 on page 20. After that, proceed with the steps below.

1. In the **RS485-1** screen, select **Add Modbus Device → Meter**.
2. Set the Energy Meter's **CT Rating** according to the CT specifications. If the CT rating value returns to 0, check communication with the CT.
3. Select **Meter 1 → Meter Function → Export+Import (E+I)**.

Configuring StorEdge Applications

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

Maximize Self-consumption (MSC)

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).

→ To set up maximize self-consumption:

1. Access SetApp and select **Commissioning → Power Control**.
2. Select **Energy Manager → Energy Control → Maximum Self Consumption**.

Running a Battery Self-test

Run a battery self-test to check the battery's charge and discharge functionality.

→ To run a battery self-test:

1. Make sure the battery's circuit breaker switch is ON.
2. Switch the inverter ON/OFF/P switch to ON.
3. In SetApp, select **Commissioning → Maintenance → Diagnostics → Self-Test → Battery Self-Test → Run Test**.
4. Wait for all tests to complete and check the results in the summary table.
If any of the tests have failed, see the table below for possible solutions:

Test Results	Solution
Charge failed	Check that the power and communication cables between the battery and inverter are properly connected.
Discharge failed	Check that the power and communication cables between the battery and inverter are properly connected.
Communication	Check that the communication cables between the battery and inverter are properly connected.
Inverter switch is off	Switch the inverter ON/OFF/P switch to ON.

→ To show the last test results:

- Select **Commissioning** → **Maintenance** → **Diagnostics** → **Self-Test** → **Battery Self-Test** → **Show Last Results**.

Appendix A: Troubleshooting

This appendix describes how to troubleshoot StorEdge-related errors.

StorEdge Interface LEDs

LED location	Functionality	Troubleshooting
Left main board LED	ON-	Power is supplied to the main board
	OFF - No power to the main board	<ul style="list-style-type: none"> • Check that the AC cable is connected to the power supply unit (PSU). • Check the cable connection between the PSU and the main board.
Green LED on the power supply unit (PSU)	ON	PSU output is OK
	OFF - No power	Check the AC cable connection.

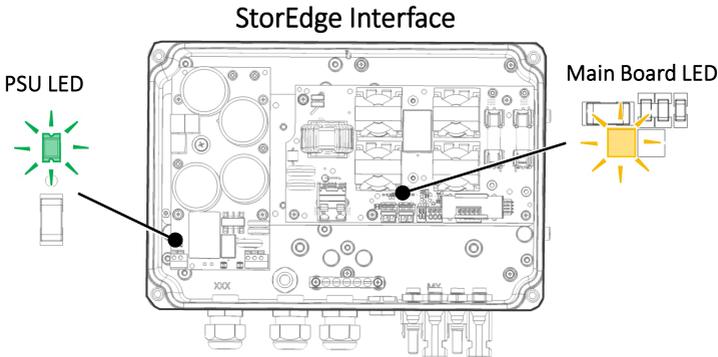


Figure 11: LED locations

Appendix B: Powering the LG Chem Battery Off and On

The LG Chem battery must be powered off and on at different stages of the inverter installation.

LG Chem batteries are available with either of the following two types of powering mechanism design:

- With the **disconnect switch** (requires Firmware version 3.24xx or later):

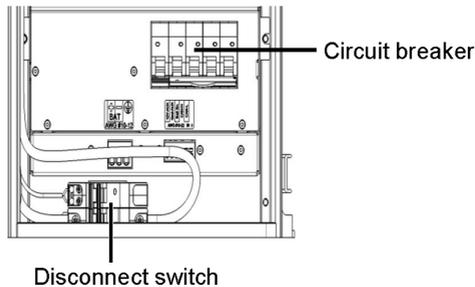


Figure 12: LG Chem battery - disconnect switch

- With the **auxiliary power switch**:

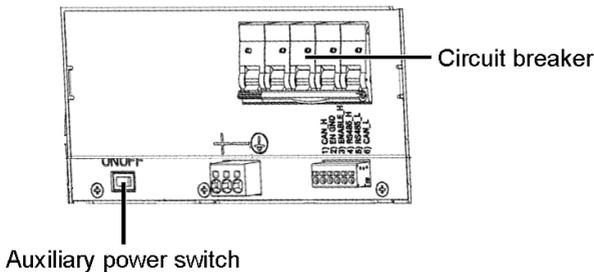


Figure 13: LG Chem battery - auxiliary switch

➔ To power off the battery:

1. Turn off the circuit breaker.
2. Turn off the disconnect/auxiliary power switch.

➔ To power the battery back on:

1. Turn on the disconnect/auxiliary power switch.
2. Turn on the circuit breaker.

Appendix C: Connecting and Powering Systems with a DC Disconnect Switch

To power off/on a StorEdge system that includes a Single Phase Inverter with HD-Wave Technology and a DC disconnect switch (external or integrated), do the following:

→ **To power off:**

1. Switch the inverter's ON/OFF/P switch to OFF.
2. Wait for the red LED to turn off.
3. Switch off the battery's circuit breaker and then the disconnect/auxiliary switch.
4. Disconnect the StorEdge Interface from power supply.
5. Switch off the DC disconnect switch.
6. Turn off AC to the inverter.

→ **To power on:**

1. Turn on AC to the inverter.
2. Switch on the DC disconnect switch.
3. Reconnect the StorEdge Interface to power supply.
4. Switch on the battery's disconnect/auxiliary switch and then the circuit breaker.
5. Switch the inverter's ON/OFF/P switch to ON.

Guidelines for Installing an External DC Disconnect Switch

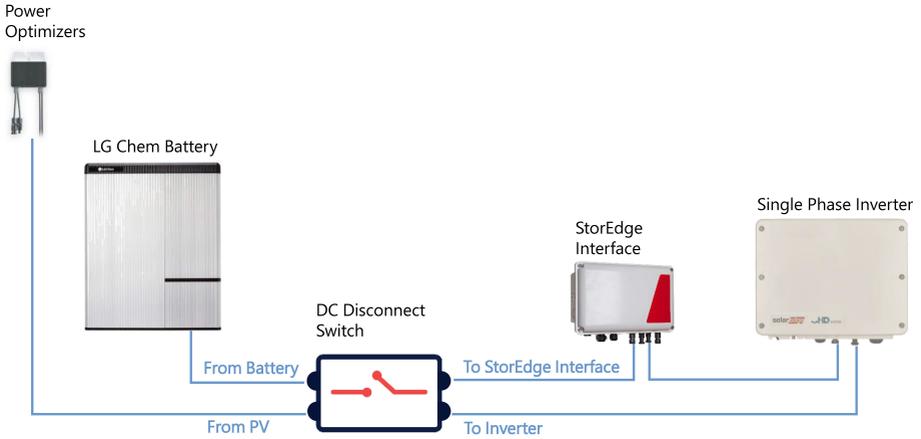


Figure 14: External DC Disconnect Switch

When installing an external DC disconnect switch, follow these guidelines:

- The switch must have separate DC+ and DC- connectors for the battery and optimizer cables.
- The switch must be able to handle the maximum currents specified in the inverter and StorEdge Interface specifications.
- Maintain the maximum distance between the StorEdge Interface and inverter prescribed by the local regulations or the SolarEdge specifications - the shortest distance of the two.

StorEdge Interface Technical Specifications

	SESTI-S4	Unit
BATTERY DC INPUT		
Number of Batteries per Interface	1	
Compatible Batteries	LG Chem RESU7H, LG Chem RESU10H	
Compatible Inverters	Single Phase Inverters with HD-Wave Technology	
Max Input Voltage	1000	Vdc
Max Input Current	17.5	Adc
DC Fuses on Plus and Minus	25A (field replaceable)	
ADDITIONAL FEATURES		
Battery Communication Interface	RS485	
Meter Communication Interface	RS485	
Battery auxiliary power (thermal and control)	No	
STOREDGE INTERFACE POWER SUPPLY		
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	10	mA
INSTALLATION SPECIFICATIONS		
AC input gland cable diameter / wire cross section	6-13mm / 1-2.5mm ²	
DC input (from the battery)	1 MC4 pair	
Dimensions (HxWxD)	206.6 x 316 x 117.5	mm
Weight	3	kg
Min - Max Operating Temperature	-20 to +60	°C
Protection Rating	IP65	
Installation	Wall mounted	

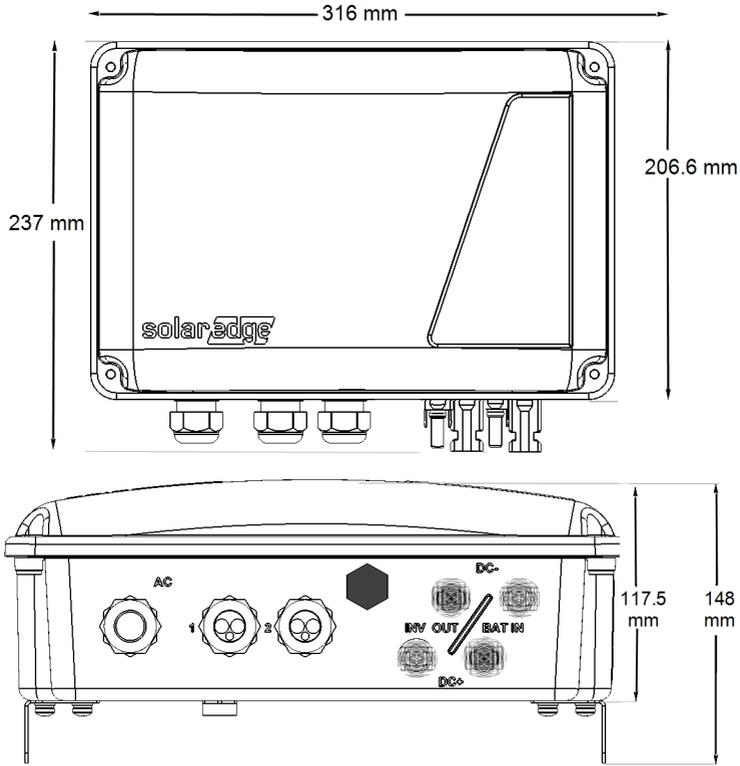


Figure 15: StorEdge Interface dimensions

Support Contact Information

If you have technical problems concerning SolarEdge products, please contact us:



<https://www.solaredge.com/service/support>

Before contact, make sure to have the following information at hand:

- Model and serial number of the product in question.
- The error indicated on the product SetApp mobile application or on the monitoring platform or by the LEDs, if there is such an indication.
- System configuration information, including the type and number of modules connected and the number and length of strings.
- The communication method to the SolarEdge server, if the site is connected.
- The product's software version as it appears in the status screen.

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