

# StorEdge Three Phase Inverter - System Configurations



## Version History

- **Version 1.6 (October 2022)**
  - Editorial changes
- **Version 1.5 (May 2022)**
  - Added support for SolarEdge Home Battery – Low Voltage
- **Version 1.4 (May 2021)**
  - Added LG Chem RESU12 support
- **Version 1.3 (May 2021)**
  - Added GREENROCK battery
  - Added support of AC-Coupling with up to Three StorEdge Three Phase Inverters
- **Version 1.2 (November 2020)**
  - Editorial changes

## Introduction

The StorEdge solution with the StorEdge three phase inverter can be used for various applications that enable energy independence for system owners, by utilizing a battery to store power and supply power as needed. This Solution is based on and managed by the StorEdge three phase inverter for both PV and battery management. This document describes the supported system configurations and compatible battery models.

## Compatible Batteries

Battery Manufacturer	Compatible Models	Available with Firmware $\geq$ 4.11.xx
SolarEdge Home Battery – Low Voltage	BAT-05K48	4.16.200 and above
LG Chem 	RESU3.3, RESU6.5, RESU10, RESU13	✓
BYD 	Battery-Box LV 3.5, LV 7, 10.5, LV 14	✓
	Battery-Box Premium LVS 4.0, LVS 8.0, LVS 12.0, LVS 16.0, LVS 20.0, LVS 24.0	✓
BlueSky Energy 	GREENROCK 7.5, 10, 12.5, 15 Available in Benelux only	4.12 and higher



### IMPORTANT NOTE

One inverter can only be connected to the same type batteries. Do not connect batteries of different types, or from different manufacturers, to the same inverter.

## Terms definition



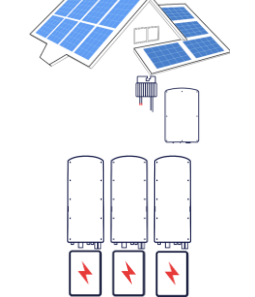

SolarEdge [Smart Energy products](#) can be used with any of the above system configurations. For more information, refer to SolarEdge support site.

The term **AC coupling** refers to the cases where multiple inverters are connected in parallel on their AC side, while PV energy of one inverter can charge a battery on another inverter which has no PV connected. It also refers to a case when the grid can charge the battery connected to the inverter that has no PV.

For best MSC (Maximum self-consumption), it is recommended to connect all inverters using SolarEdge home network or RS485 wired connection. In case this is not possible, it is mandatory to connect production meter on the AC side of one inverter while the RS485 of the meter is connected to the other (leader) inverter.

The term **DC coupling** refers to a case when there is a single inverter with PV and Battery connected to the same inverter.

## System Configurations

Use Case		AC-Coupling	DC-Coupling	Further Details
<b>The Smart StorEdge Configuration</b>		Not applicable	✓	<a href="#">Page 5</a>
<b>More PV-Power with additional SolarEdge PV-Inverter(s)</b>		✓	✓	<a href="#">Page 6</a>
<b>More Battery-Power with up to three StorEdge Inverters</b>		✓	✓	<a href="#">Page 7</a>
<b>Retrofitting using a third-party Power Source</b>		✓	✓	<a href="#">Page 8</a>

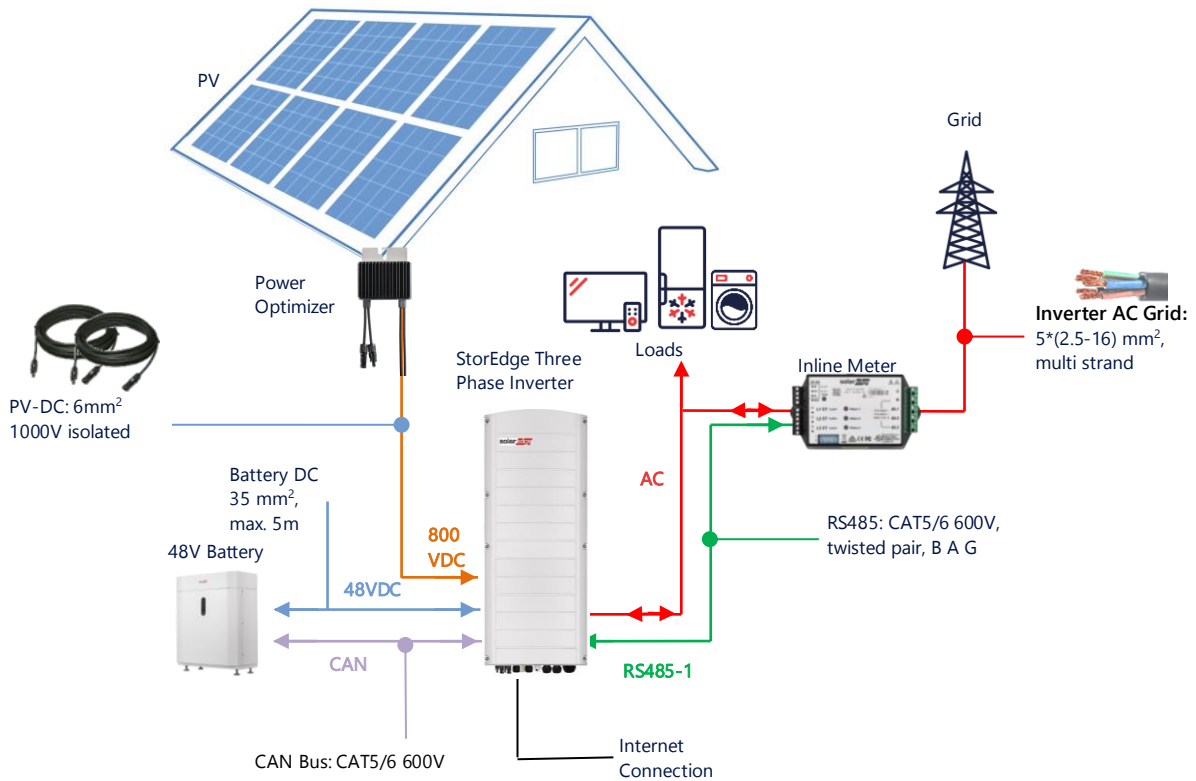
SolarEdge [Smart Energy products](#) can be used with any of the above system configurations.

## General design guidelines and recommended accessories



### IMPORTANT NOTE

Note that, across this document, RS485-1 and RS485-2 can be replaced with SolarEdge Home Network (AKA ENET) if available.



## Recommended cables

	Cross section	Other parameters	Other parameters
DC PV	6mm <sup>2</sup>	1000V isolation	Up to 300 m
Battery DC	35mm <sup>2</sup>	1000V double isolation OD - 11-16.5mm	Up to 5 m
RS485	>0.25mm <sup>2</sup>	CAT5E \ 6 or twisted pair 600V isolation	Up to 50 m
CAN	>0.25mm <sup>2</sup>	CAT5E \ 6 or twisted pair 600V isolation	Up to 50 m
AC cables	2.5-16mm <sup>2</sup>	OD – 15-21mm	According to local regulation Multi strand

When using multiple SolarEdge inverters configuration on site there will be one *leader* and multiple *followers*.

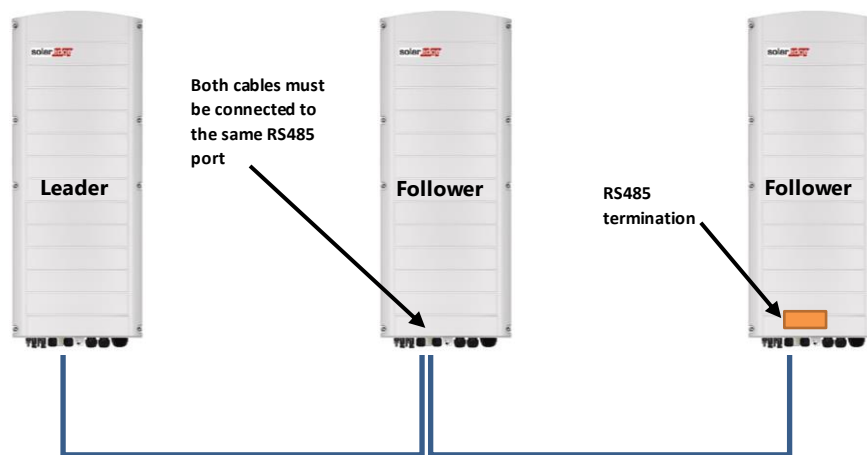
The *leader* is the one connected to the Internet, either through LAN cable to the home router or through LTE module (purchased separately from SolarEdge). The *followers* are the other inverters and they cannot be connected to the Internet, but only through SolarEdge Home Network or the dedicated RS485 to chaining inverters.

## Important notes

### Wired communication

In case not all the inverters are connected to SolarEdge Home Network, connect the leader and its followers through a dedicated RS485 bus (dedicated RS485 port at the inverter). It is important not to share this RS485 bus with any other RS485 device. Connect such devices (e.g. external meters, smart devices, backup interfaces) through a separate RS485 bus.

#### Leader/ follower: RS 485 connection



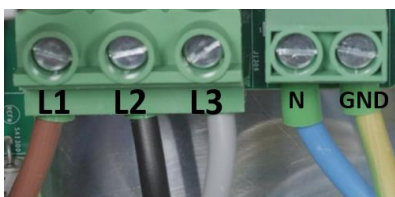
RS485 is a bus connection, which means the wires must be connected from one inverter to the other (starting from the leader); the middle inverters must have 2 cables connected in parallel. Refer to the product installation manual for detailed instructions on leader/follower inverter connections.

### Connection of a meter

- Connect a meter supplied by SolarEdge directly to the leader inverter. It is not recommended to connect the meter to any inverter other than the leader.
- In case there is a 3rd party inverter connected (like on page 8), another meter (preferably SolarEdge) needs to be connected to the 3<sup>rd</sup> party inverter AC output to let the system work in MSC mode.

### Connecting multiple inverters to the same AC grid

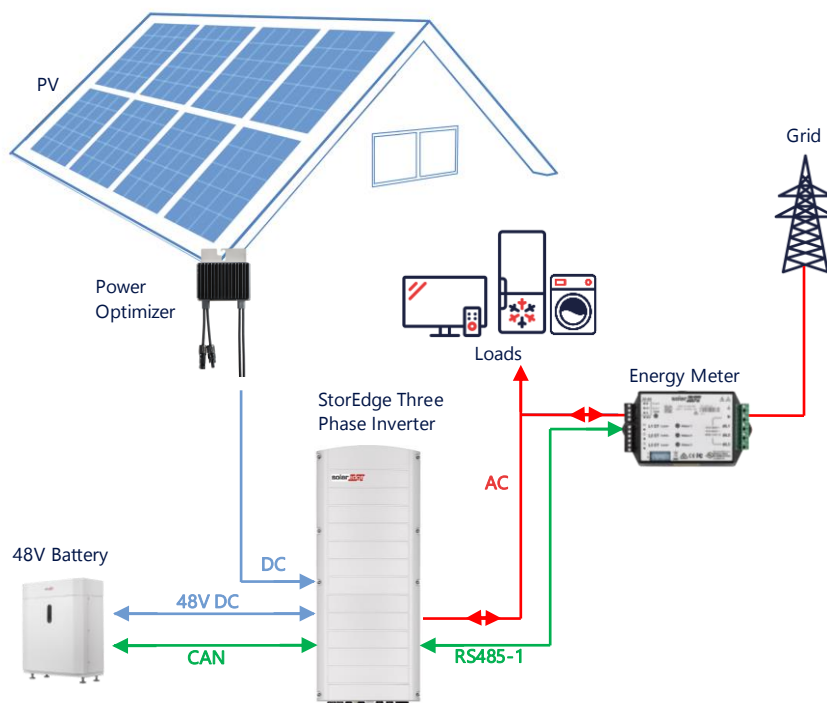
- In case multiple inverters are connected to the same AC grid (e.g. connected in parallel on the AC side), it is mandatory to keep the same connections between the lines. Connect the same line (L1 (R), L2 (S) or L3 (T)) on all the inverters using the same wire.
- Connect GND and Neutral, also in parallel, to the same place at the inverter side.



## System Configuration Options

### DC-Coupled Smart StorEdge Configuration

This configuration is based on one StorEdge three phase inverter and is suitable for most residential systems. The main components are: a StorEdge three phase inverter, a SolarEdge Energy Meter, a compatible 48V Battery and Power Optimizers.



### Configuration using SetApp

#### → Set up communication with the Energy Meter

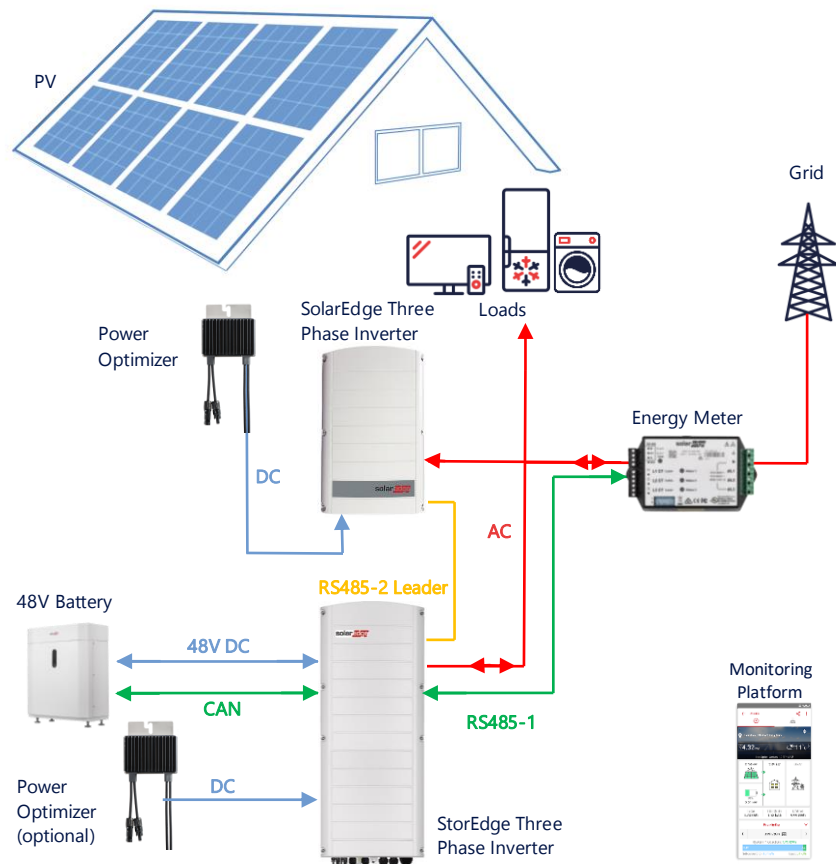
1. Open SetApp and select **Commissioning > Site Communication**.
2. From the **Site Communication** screen, select **RS485-1 > Protocol > Modbus (Multi-Device)**.
3. Return to the previous screen and select **Add Modbus Device > Meter 1**.
4. Select following Meter 1 parameters:
  - **Meter Function > Export+Import (E+I)**
  - **Meter Protocol > SolarEdge**
  - **Device ID > 2**
  - **CT Rating > [set according to the rating of the CT in use]**

#### → Set up communication with the battery

1. From the **Commissioning** screen, select **Site Communication > CAN > [your battery model]**.
2. Run a self-test:
  - Select **Commissioning > Maintenance > Diagnostics > Self-Test > Battery Self-Test > Run Test**.
  - Check that the test results are successful.
3. Configure Maximize Self-consumption (MSC):
  - Select **Commissioning > Power Control > Energy Manager > Energy Control > Maximum Self Consumption (MSC)**.

## AC-Coupling using a SolarEdge PV-Inverter

For sites that already have a SolarEdge inverter installed, the StorEdge three phase inverter can be AC-coupled to an existing SolarEdge three phase PV-inverter.



In addition to the AC-coupling, the StorEdge three phase inverter can also be equipped with PV power optimizers. In case there is no communication between the 2 inverters, in order to work in MSC mode, it is mandatory to connect production meter on the output of the existing inverter and connect its communication to the leader. Please refer to the user guide for detailed connection procedure.

### Configuration using SetApp

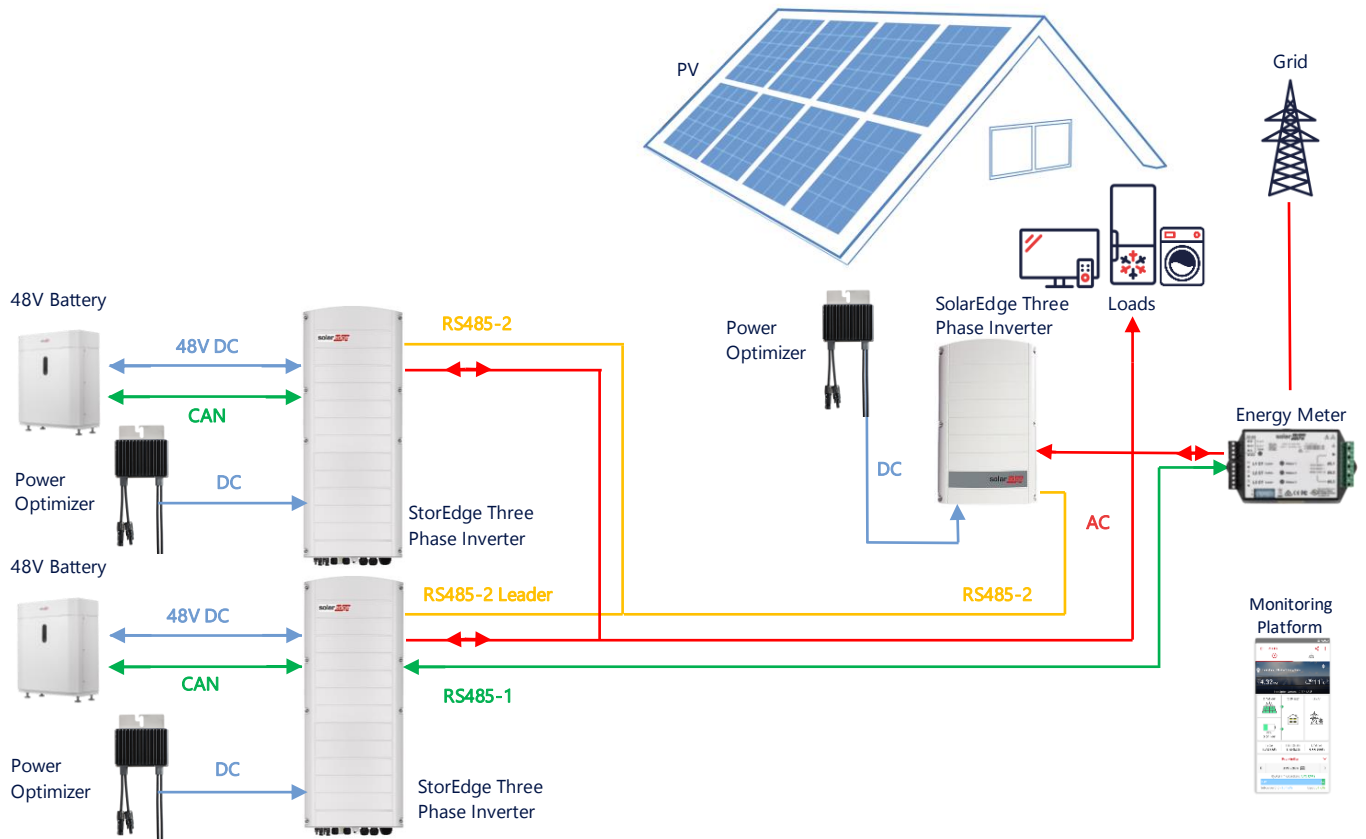
1. Set up communication with the Energy Meter and battery, as explained in *DC-Coupled Smart StorEdge Configuration* on page 5.
2. Set your StorEdge three phase inverter as the Leader:
  - Select **Commissioning > Site Communication > RS485-2 > Protocol > SolarEdge Leader**.
  - Select **RS485-2 > Follower Detect**.
  - Check that the Follower is detected.

### Connection to Monitoring Platform

- Make sure the StorEdge three phase inverter is connected to monitoring platform. For details, see the installation guide.

## AC-Coupling with multiple StorEdge Three Phase Inverters

For sites that require additional storage capacity and power, up to three StorEdge inverters can be used, each connected to a single battery. The batteries connected to each StorEdge inverter can vary. For example, Inverter 1 is connected to a SolarEdge Home Battery, and Inverter 2 and Inverter 3 are connected to a BYD LVS 16.0 battery or supported LG batteries.



Up to three StorEdge Inverters can also have Power Optimizers or can be AC-Coupled to a non-SolarEdge power source, as explained in the below use case. In case three Home Hub inverters are used with other three phase inverter from SolarEdge, the other inverter CANNOT be connected to the leader as a follower. In other words, no more than 3 inverters can be connected on a leader-follower configuration.

### Configuration using SetApp

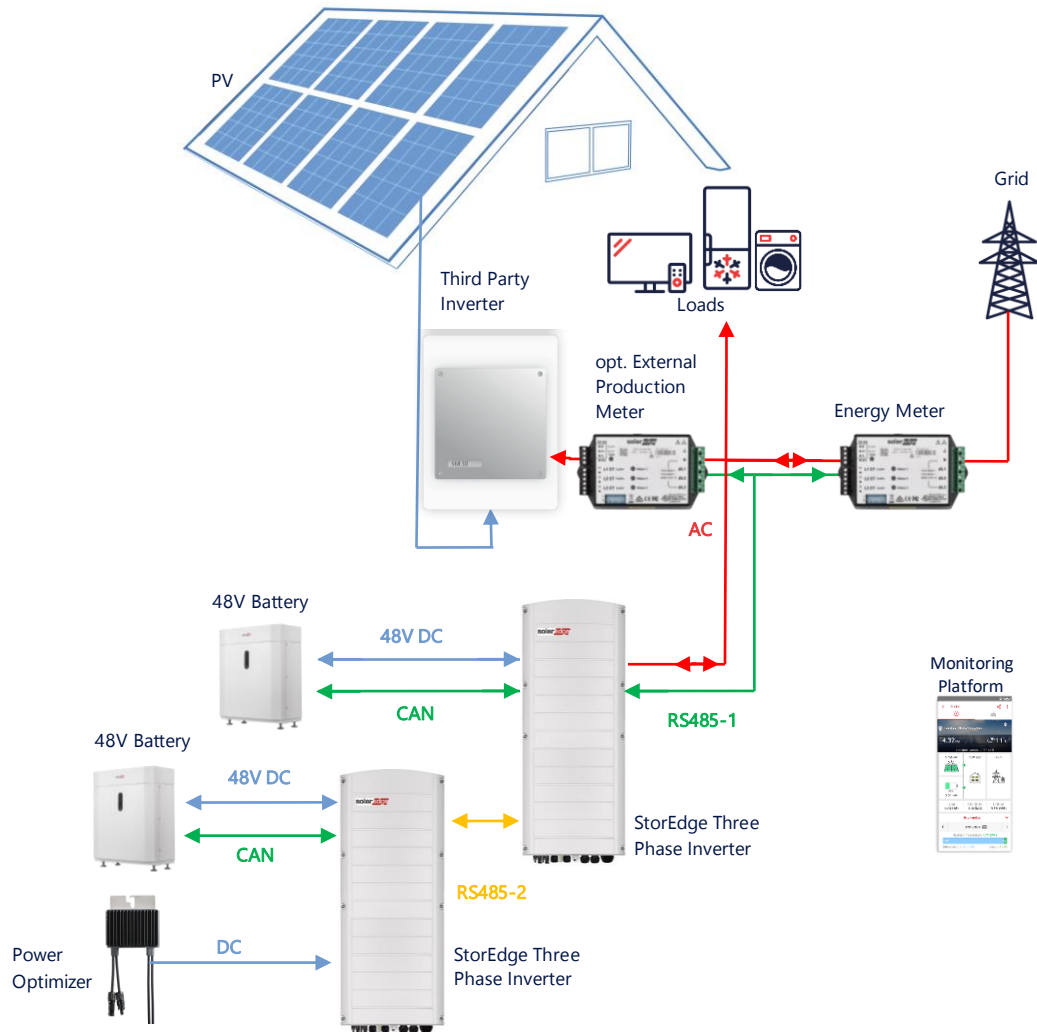
1. Set up communication with the Energy Meter and battery, as explained in *DC-Coupled Smart StorEdge Configuration* on page 5.
2. Set the StorEdge three phase inverter connected to the Energy Meter as the Leader:
  - Select **Commissioning > RS485-2 > Protocol > SolarEdge Leader**.
  - Select **RS485-2 > Follower Detect**.
  - Check that all Followers are detected.

### Connection to Monitoring Platform

- Make sure the Leader StorEdge three phase inverter is connected to monitoring platform. For details, see the installation guide.

## AC-Coupling using a Third-party Power Source

For sites that already have a power source, e.g. a third-party solar inverter or a CHP Unit, the StorEdge Three Phase Inverter can be AC-coupled to an existing power source.



In addition to the AC-Coupling, the StorEdge three phase inverter can also be equipped with PV power optimizers.

## Configuration using SetApp

### → Set up communication with the Energy Meter

1. Open SetApp and select **Commissioning > Site Communication**.
2. From the **Site Communication** screen, select **RS485-1 > Protocol > Modbus (Multi-Device)**.
3. Return to the previous screen and select **Add Modbus Device > Meter**.
4. Select the following Meter 2 parameters:
  - **Meter Function > External Production**
  - **Meter Protocol > SolarEdge**
  - **Device ID > 1**
  - **CT Rating > [set according to the rating of the CT in use]**

### → Set up communication with the battery

Set up communication with the battery, as explained in *DC-Coupled Smart StorEdge Configuration* on page 5.

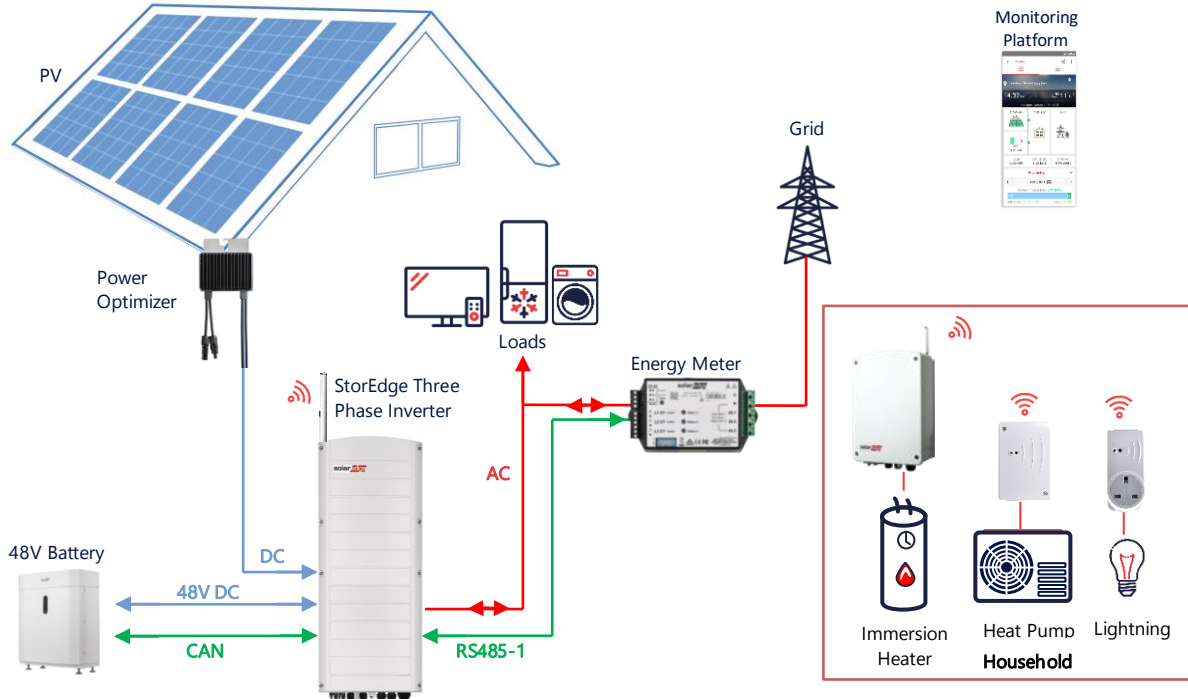


## Connection to Monitoring Platform

- Make sure the StorEdge three phase inverter is connected to monitoring platform. For details, see the [installation guide](#).

## Combination with Smart Energy Products

SolarEdge [Smart Energy products](#) can be used with any of the above system configurations.



## Configuration using SetApp

- Set up communication with the Energy Meter and battery, as explained in *DC-Coupled Smart StorEdge Configuration* on page 5.
- Configure your Smart Energy devices, as explained in the installation guide that comes with the device, or visit our [SolarEdgePV](#) YouTube channel.

## Connection to Monitoring Platform

- Make sure the StorEdge three phase inverter is connected to monitoring platform. For details, see the installation guide.

## Compatibility Information

The following table lists the StorEdge applications that can be used for each system configuration:

	Maximize Self-consumption	StorEdge Profile Programming**	Export Limitation	Zero Export Limitation
Smart StorEdge Configuration	✓	✓	✓	✓
Smart Energy	✓	✓	✓	✗*
AC-Coupled StorEdge Systems	✓	✗	✓	✗*

\* These applications require a certain amount of Export power in order to work, due to the control accuracy of Smart Energy components or external power sources.

\*\* \*\* For further and detailed configuration please visit SolarEdge website.

## 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.