SolarEdge Home Hub Inverter – Three Phase System Configurations (Storage mode)

Version History

- **Version 1.1 (April 2023)**
  - Official release
- **Version 1.0 (November 2022)**
  - Initial release

Introduction

The *SolarEdge Home Hub Inverter – Three Phase*, or "SolarEdge Home Hub Inverter", or "the 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 SolarEdge Home Hub Inverter – Three Phase for both PV and battery management. This document describes the supported system configurations and compatible battery models. *SolarEdge Home Hub Inverter – Three Phase*, is capable of providing backup power during utility grid outage. For more information on supported configurations refer to the relevant installation manual.

This document describes only the supported configurations for the battery and the PV connections.

Compatible Battery

Battery Manufacturer	Compatible Models	Supported Firmware Version ≥ 4.16.xx
SolarEdge Home Battery -48V	BAT-05K48M0B-01, BAT-0548M0B-02	4.16.2xx and following versions

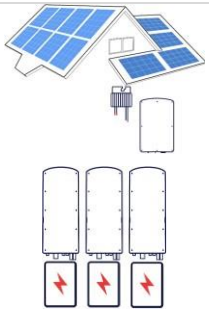
Terms Definition

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 mandatory to connect a 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 an inverter with PV and Battery connected to it.

System Configurations

Use Case		AC-Coupling	DC-Coupling	Further Details
The Basic SolarEdge Home Configuration		Not applicable	✓	Page 5
More PV-Power with additional SolarEdge PV-Inverter(s)		✓	✓	Page 6
More Battery-Power with up to three Home Hub Inverters Three Phase		✓	✓	Page 7
Retrofitting using a third-party Power Source		✓	✓	Page 8

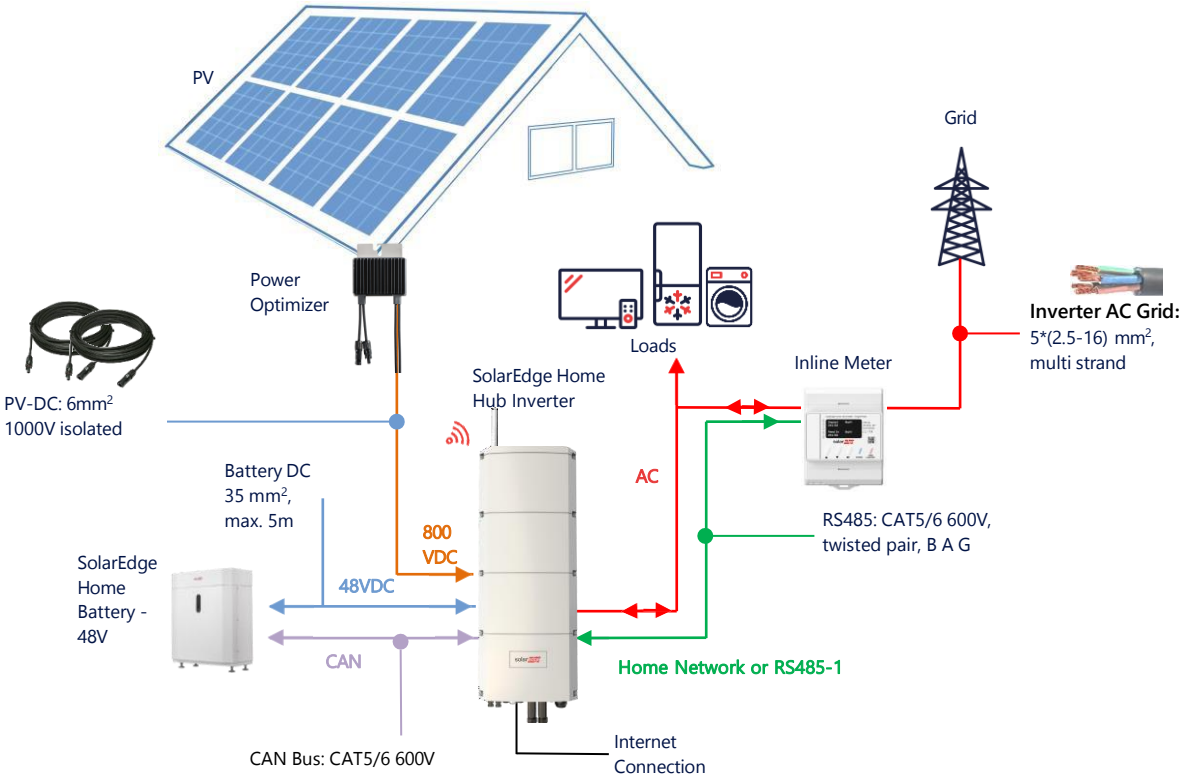
SolarEdge Smart Energy products can be used with any of the above system configurations.

For more information, scan this QR code

General Design Guidelines and Recommended Accessories

IMPORTANT NOTE

Note that, across this document, RS485-1 can be replaced with SolarEdge Home Network if available. Note that SolarEdge Home Network cannot be used to connect between Inverters.



Recommended Cables

	Cross-section	Cable Type	Maximum Length
DC PV	6mm²	1000V isolation	Up to 300m
Battery DC	35mm²	1000V double isolation OD - 11-16.5mm	Up to 5m
RS485	>0.25mm²	CAT5E \ 6 or twisted pair 600V isolation	Up to 50m
CAN	>0.25mm²	CAT5E \ 6 or twisted pair 600V isolation	Up to 50m
AC cables	2.5-16mm²	OD – 15-21mm	According to local regulation Multi strand

Using multiple SolarEdge inverters on one site requires one of them to be the *leader* and all the others to be *followers.*

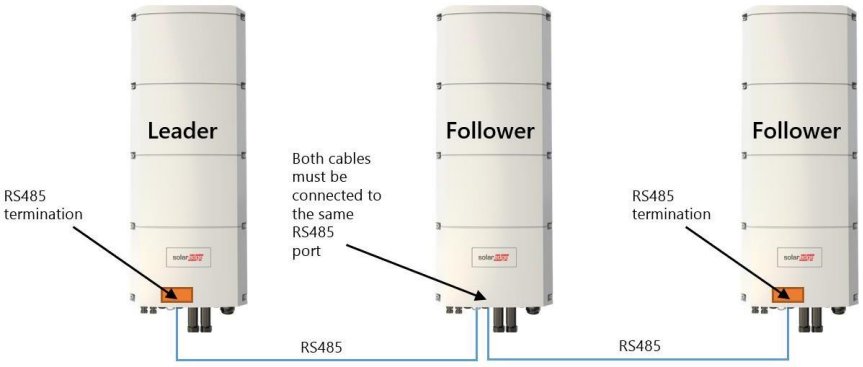
The *leader* is the one connected to the Internet, either through Wi-Fi (with or without Wi-Fi Gateway), or through a LAN cable to the home router, or through LTE module (purchased separately from SolarEdge). The *followers* are the other inverters, not connected to the Internet directly, but only connected with the Leader through the dedicated RS485-2 connection.

Important Notes

Wired Communication

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: RS485 connection



Note: The Leader can also be in the middle.

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

When connecting multiple inverters in storage mode, there is no preference for which of the inverters will be the leader. It is possible to connect a Home Wave inverter as the leader and a Home Hub inverter(s) as follower(s) and vice-versa.

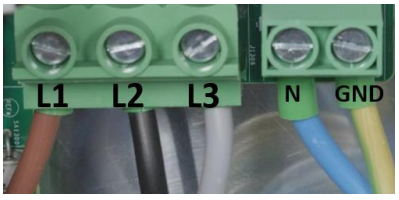
When the inverters are supposed to work in backup mode, only the Home Hub inverter can be connected as the leader.

Connection of a Meter

- Connect a meter, purchased from SolarEdge or from other vendors approved 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 3rd party inverter AC output to let the system work in MSC mode.

Connecting Multiple Inverters to the Same AC Grid

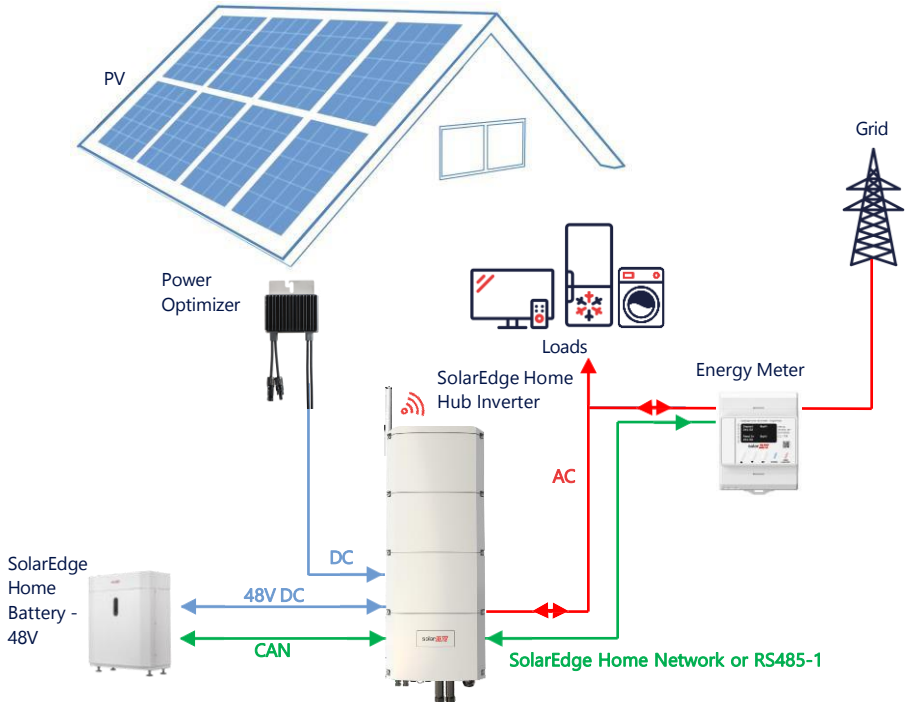
- In case multiple inverters are connected to the same AC grid (e.g. connected in parallel on the AC side), it is mandatory to keep the same connections between the lines. Connect the same line (L1 (R), L2 (S) or L3 (T)) on all the inverters using the same wire.
- Connect GND and Neutral, also in parallel,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



System Configuration Options

DC-Coupled Smart Home Hub Configuration

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



Configuration Using SetApp

In case the system and the meter do not support SolarEdge Home Network, please use the following procedure.

→ Set up communication with the Energy Meter

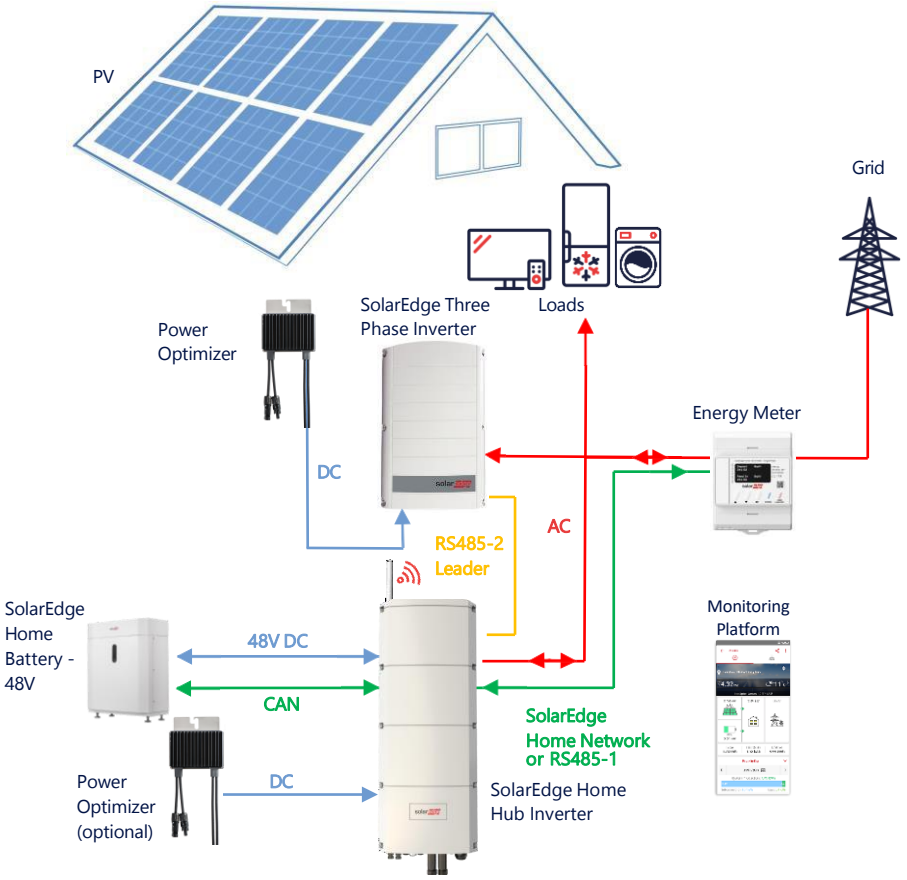
1. Open SetApp and select **Commissioning > Site Communication**.
2. From the **Site Communication** screen, select **RS485-1 > Protocol > Modbus (Multi-Device)**.
3. Return to the previous screen and select **Add Modbus Device > Meter 1**.
4. Select following Meter 1 parameters:
   - **Meter Function > 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 Home Hub Inverter Three Phase can be AC-coupled to an existing SolarEdge three phase PV-inverter.



- In addition to AC-coupling, the SolarEdge Home Hub Inverter – Three Phase 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 a production meter on the output of the existing inverter and connect its communication to the leader. It is not recommended to connect the meter to any inverter other than the leader.

Please refer to the user guide for detailed connection procedure.

Configuration Using SetApp

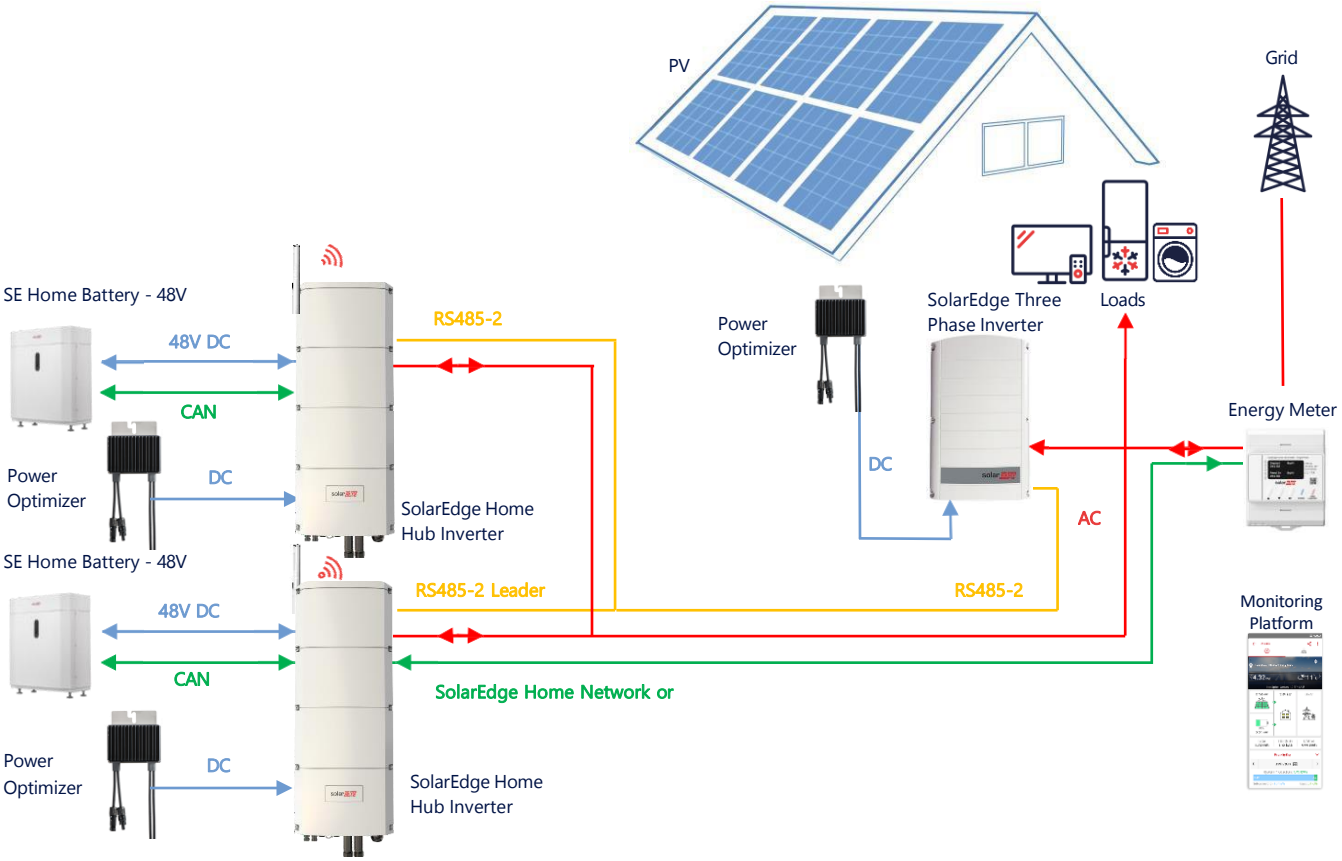
1. Set up communication with the Energy Meter and battery, as explained in DC-Coupled Smart Home Hub Configuration on page 5.
2. Set your Home Hub Inverter Three Phase as the Leader:
   - Select **Commissioning > Site Communication > RS485-2 > Protocol > SolarEdge Leader**.
   - Select **RS485-2 > Follower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

Connection to Monitoring Platform

- Make sure the Home Hub Inverter Three Phase is connected to monitoring platform. For details, see the installation guide.

AC-Coupling with Multiple Home Hub Inverters Three Phase

For sites that require additional storage capacity and power, up to three Home Hub inverters can be used, each connected to a single battery. The batteries connected to each Home Hub 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 (not shown on the diagram below).



Up to three Home Hub Inverters can also have Power Optimizers or can be AC-Coupled to a non-SolarEdge power source. 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 Home Hub Configuration* on page 5.
2. Set the Home Hub Inverter Three Phase as the Leader:

Set up communication with the battery

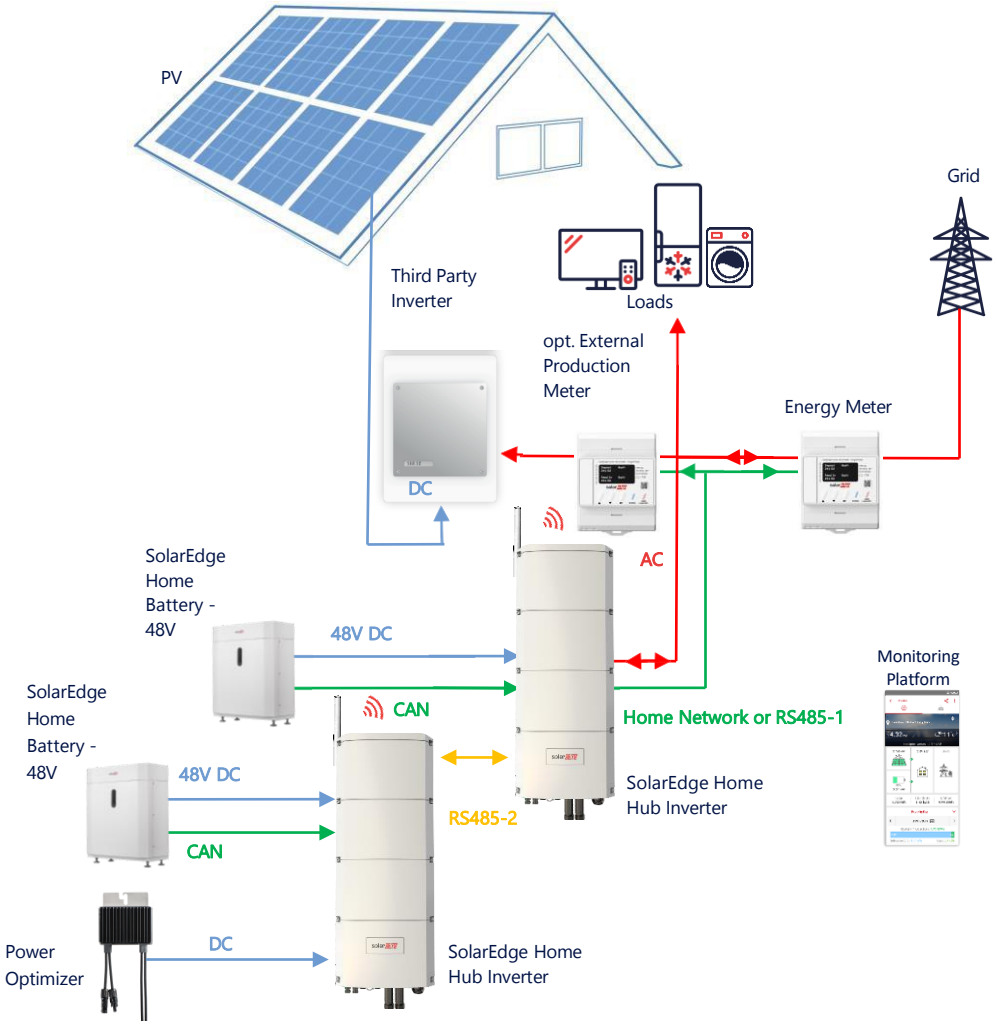
- Set up communication with the battery, as explained in DC-Coupled Smart Home Hub Configuration on page 5.

Connection to Monitoring Platform

- Make sure the Leader Home Hub Inverter Three Phase 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 Home Hub Inverter Three Phase can be AC-coupled to an existing power source. On this configuration, export limit is not supported.



In addition to the AC-Coupling, the Home Hub Inverter Three Phase can also be equipped with PV power optimizers.

Configuration Using SetApp

→ Set up Communication with the Energy Meter

In case the system and the meter do not support SolarEdge Home Network, please use the following procedure:

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 Home Hub Configuration* on page 5.

Connection to Monitoring Platform

Make sure the Home Hub Inverter Three Phase is connected to monitoring platform. For details, see the installation guide.

Compatibility Information

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

	Maximize Self-consumption	Profile Programming**	Export Limitation	Zero Export Limitation
Smart SolarEdge Home Hub Inverter – Three Phase Configuration	✓	✓	✓	✓
Smart Energy	✓	✓	✓	×*
AC-Coupled 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.

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.