

SolarEdge Home Hub Single Phase Inverter - Supported Use Cases for Storage and Backup Installations

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Revision History

Version 1.0 (November 2023)

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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.

Important Notice

Using a configuration in contradiction to the instructions in this document voids the warranty of any SolarEdge equipment.

Introduction

The SolarEdge Home Hub Single Phase Inverter (SExxxxH-RWBxxxx), 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 and supply power as needed. The Inverter, when installed in combination with the "SolarEdge Home Backup Interface" provides backup power during a utility grid failure. The solution is based on the Inverter that manages both the PV system and the battery. This document outlines the allowed use case and installations scenarios of the SolarEdge Home Hub Inverter - Single Phase

For detailed information on the connection between products and the configuration of the relevant products, refer to the SolarEdge [Knowledge Center](#) and the appropriate product installation guides.

Definition of Terms

- **DC coupling:** refers to a case when the inverter is connected to PV and Battery.
- **AC coupling:** refers to cases where multiple inverters are connected in parallel on their AC side, while the PV production of one inverter can charge a battery on another inverter. It also refers to a case when the battery is charged from the grid.
- **Storage-only installations:** refers to systems using one or multiple inverters, at least one with a connected battery, but no Backup Interface (also referred to as "BUI").
- **Backup installations:** refers to systems using one or multiple inverters from which at least one is a Home Hub Single Phase Inverter with a connected battery. In addition, the BUI is installed to disconnect from the grid during a backup operation. For a Single Phase grid, a Single Phase BUI is required. For a three phase grid, a Three Phase BUI is required. **For the allowed Backup Interfaces**, refer to [Storage and Full Home Backup Use Cases table](#).
- **RS485 connections:** the inverter has two separate RS485 communication bus connections:
RS485-2 - labeled on the Inverter board as "RS485-2" - is ONLY used to connect Leader to Follower inverters.
RS485-1 - The Inverter has three RS485-1 terminal block connections on the communications connection board located on the left side of the connection unit. See: <https://knowledge-center.solaredge.com/sites/kc/files/se-home-hub-inverter-single-phase-quick-installation-guide-eu.pdf>
- **Third Party Generators:** a third-party device that can generate AC power according to the applicable grid code. The devices can be third-party PV inverters, Generators, or AC-coupled batteries.

Supported Configurations

The following list provides a high-level illustration of the current and future supported configurations.

- Single Home Hub Inverter Storage and Full Home Backup.
- Multiple Home Hub Single Phase Inverters with Storage.
- SolarEdge Home Hub Single Phase Inverter with a SolarEdge Home Wave Single Phase Inverter.
- SolarEdge Home Hub Single Phase Inverter with a StorEdge Single Phase Inverter.
- Home Hub Single Phase Inverter with Third-Party Inverter, Storage, and Full Home Backup.

For detailed information, supported models, applied performance, and availability refer to [Supported Use Cases](#).

Future Configuration

Single phase hub Inverter on a three phase grid. Using "Three Phase Backup Interface".

For detailed information, supported models, applied performance, and availability refer to [Supported Use Cases](#).

Supported Hub Inverter Models

Inverter Model	Description
SE2500H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 2.5kW
SE3000H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 3kW
SE3680H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 3.68kW
SE4000H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 4kW
SE5000H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 5kW
SE6000H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 6kW
SE8000H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 8kW
SE10000H-RWBMNBF54	SolarEdge Home Hub Inverter - Single Phase, 10kW

Compatible Backup Interface

Use the relevant BUI according to the grid type and the supported configuration as described in the table below.

Manufacturer	Compatible Model	Supported Firmware Version
SolarEdge Home Backup Interface Single Phase for single phase grid	BI-EU1P	Inverters - 4.19 and above
SolarEdge Home Backup Interface Three Phase for three phase grid	BI-EU3P	Pending firmware release

Compatible Battery

Battery Manufacturer	Compatible Models	Supported Firmware Versions
SolarEdge Home Battery 400V for Europe	BAT-10K1P	Inverters - 4.19 and above

Recommended Cables

Cable	Cross-section	Wire type	Maximum Length
DC PV	6mm ²	1000V double isolation	Up to 300m
Battery DC	6-10mm ²	600V double isolation	according to # of batteries
CAN	>0.25mm ²	CAT 5e/6 or twisted pair, 600V insulation	Up to 50m
RS485	>0.25mm ²	CAT 5e/6 or twisted pair, 600V insulation	Up to 50m
AC cables	1-13mm ²	Multi-core, Outer Diameter: 9-21mm	According to local regulations

Communicating Between Multiple Inverters

Using multiple SolarEdge inverters at a site requires one of them to be configured as a Leader and the others as Followers.

To provide backup power, the Leader inverter must be a SolarEdge Home Hub Single Phase Inverter. The Leader Inverter must be connected to a compatible battery and directly to the SolarEdge Monitoring Platform using one of the following options:

- A home router using an Ethernet (LAN) cable (recommended communication option).
- Wirelessly via the built-in Wi-Fi interface. An external antenna is required (purchased separately from SolarEdge). The SolarEdge Wi-Fi Gateway can be used for simple and robust configuration and to expand the wireless range (purchased separately from SolarEdge).
- A plug-in LTE module (purchased separately from SolarEdge).

Follower inverters are connected to the SolarEdge Monitoring via the Leader inverter. To communicate with the Leader inverter, the Follower inverters connect to the Leader inverter via the SolarEdge Modbus protocol using the RS485-2 communication port. For backup installation, the Leader inverter MUST be connected to SolarEdge Home Backup Interface.

For detailed installation instructions, refer to the product [SolarEdge Home Hub Inverter Installation Guide](#).

Connecting to SolarEdge Home Battery 400V

SolarEdge recommends connecting the Inverter and the battery through the integrated SolarEdge Home Network. Alternatively, you can also connect the battery and the inverter using wired communication.

For detailed installation instructions, refer to the [SolarEdge Home Hub Inverter Quick Installation Quick Guide](#) and the [Battery Installation Guide](#).

Connecting to Backup Interface

To enable the backup operation, the following prerequisites must be met:

- BUI must be used.
- The Leader inverter must be a Home Hub Single Phase Inverter connected to the BUI via RS485 communication bus and a 12V power supply line from the Inverter.
- The Leader inverter must be connected to a compatible battery.



NOTE

For detailed installation instructions, refer to [SolarEdge Home Backup Interface, Single Phase Quick Installation Guide](#) and [SolarEdge Home Hub Inverter Quick Installation Quick Guide](#).

Connection of the Rapid Shutdown (RSD) Switch and “Double-feed Supply”

A Rapid Shutdown (RSD) switch is an external switch that remotely turns off the AC of the SolarEdge Home Hub Inverter - Single Phase and reduces the DC Voltage from the PV strings to a safe level.

If a backup operation is activated (default when BUI is connected to the inverter), the inverter starts supplying backup power a few seconds after a grid outage or after the main AC circuit breaker is turned off.

When the main AC circuit breaker is turned off for maintenance operations there is a safety risk since the inverter continues providing backup power to the main load panel.

To prevent the inverter from providing backup power during maintenance operations, the inverter must also be turned off, either through the RSD switch or by switching the P/1/0 switch, of the Inverter or the BUI, to the “0” position.

To provide a quick and reliable shutdown of the backup inverter, SolarEdge recommends connecting a Rapid Shutdown switch which shuts down the inverter and activates SafeDC™, which automatically reduces the voltage in each module to 1 volt when the inverter shuts down.



NOTE

For detailed installation instructions of RSD, refer to the [SolarEdge Home Hub Inverter Quick Installation Quick Guide](#) and [SolarEdge Home Backup Interface, Single Phase Quick Installation Guide](#).

Connecting a Meter

Using Meters in Backup Installations

There are two types of backup installation:

Full home Backup – on this type of installation, ALL home loads are connected on the LOAD side of the BUI (also referred to as the “backup Island”). During grid outages, all home loads can operate. Note that the number of loads that can operate during backup is dependent on the maximum power available during backup.

Partial Home Backup – on this type of installation, SOME of the home loads are connected on the load side of the BUI while other loads are connected on the GRID side of the BUI (also referred to as “outside the backup Island”). During a grid outage only, the loads connected to the LOAD side of the BUI (the backup Island), will operate, while the loads connected to the GRID side will not operate during a grid outage.

- Full home backup: In this type of installation, the internal Export/Import meter of the BUI must be used. No need for an external E/I meter to be connected.
- Partial home backup: For partial home backup, connect selected loads to the grid side (outside the backup island) of the BUI (labeled “GRID”) these loads will not operate during backup. **A separate SolarEdge meter must be installed** as an export/import meter at the grid connection point to control the system. This meter must communicate with the Leader inverter via SolarEdge Home Network (“Home Network”) or via RS485 port.
- Third-party generators: If third-party generators are used in the system, connect all third-party generators to the GRID side (outside the backup island) of the BUI (labeled “GRID”). A separate SolarEdge meter must be installed as an export/import meter, at the grid connection point, to control the system. To correctly display the production of the

third-party generators in the monitoring platform, a **single** production meter must communicate with the Leader inverter via SolarEdge Home Network or via the RS485 port. In this case, all third-party generators must be aggregated on their AC side to be connected to the production meter. Connecting a third-party generator not through the production meter is dangerous and can cause system components to malfunction.

Unless a specific firmware version enables connecting third-party generators within the backup Island (Load side of the BUI), it is forbidden to install third-party generators within the backup island - third-party generators must be connected to the Grid side of the Backup Interface.

Using Meters in Storage-only Installations

A SolarEdge meter must be installed as an export/import meter at the grid connection point to control the system. This meter must communicate with the Leader inverter via SolarEdge Home Network ("Home Network") or via the dedicated RS485 port.

If a third-party generator is used, an additional SolarEdge meter **MUST** be installed at the AC output of the third-party generator as an "ext. production meter" to correctly display the production in the monitoring platform. This meter must communicate with the Leader inverter via the SolarEdge Home Network ("Home Network") or via RS485 over the export/import meter. Meters connected via RS485 are configured with SolarEdge SetApp on the RS485-1 bus of the Leader inverter. In this case, all third-party generators must be aggregated on their AC side to be connected to the production meter.



IMPORTANT NOTE

Connecting a third-party generator not through the production meter can cause system components to malfunction.

Connecting Multiple Inverters to the Same AC Grid

When installing multiple inverters, all inverters, and the BUI must have the same phase sequence and consistent phase mapping.

Figure 1 shows the AC wire terminals of an inverter.

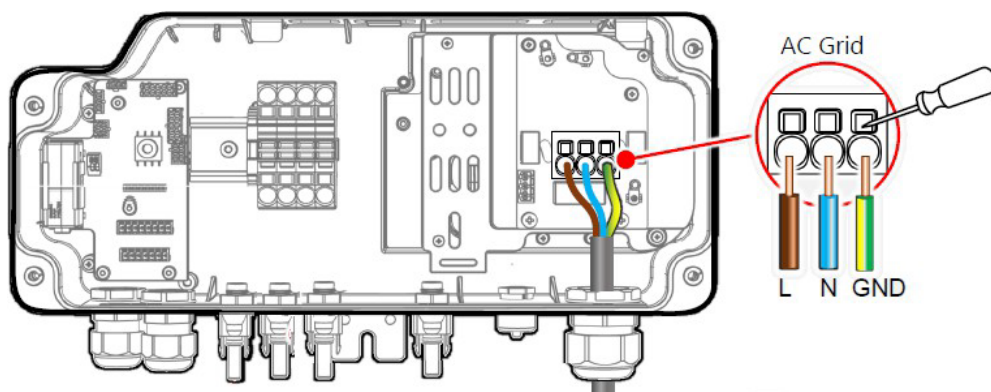


Figure 1 Inverter AC Wire Terminals

Supported Use Cases

The following table provides a compatibility matrix for combinations of inverters, batteries, and backup options.

Note that all use cases are applicable to full and partial home backup. For simplicity, the following figures illustrate full home backup, but partial home backup is also allowed.



IMPORTANT NOTES

Unless specifically written, all configurations below, assume that the grid is a single phase grid and that the BUI in use is the single phase backup Interface.

Failure to follow the configuration instructions provided in this section will void the warranty coverage.

Configuration ^{1 2}	Leader	No. of Follower Inverters	Follower Inverter types	Batteries per Inverter	Maximum AC Power in Backup Mode	Refer to:
Single Inverter	SolarEdge Home Hub Single Phase	NA	NA	1-3 SolarEdge Home Batteries 400V	<p>Current release.</p> <ul style="list-style-type: none"> Battery only: 5000W per single connected battery. Up to 7500W for two or three batteries. The rated max backup power of the Inverter must not be exceeded. PV + battery: up to the maximum rated power of the inverter in backup mode. <p>Future release.</p> <ul style="list-style-type: none"> Battery only: 5000W per connected battery. The rated max backup power of the Inverter must not be exceeded. PV + battery: up to the maximum rated power of the inverter in backup mode. 	Single Home Hub Single Phase Inverter with Storage and Full Home Backup
Multiple Inverters	SolarEdge Home Hub Single Phase Batteries: 1-3 SolarEdge Home Batteries 400V	Up to two inverters from the supported models	SolarEdge Home Hub Single Phase Inverter (SExxxxH-RWBMNBF54)	1-3 SolarEdge Home Batteries 400V	<p>Current release.</p> <ul style="list-style-type: none"> Battery only: 5000W per single connected battery. Up to 7500W for two or three batteries. The rated max backup power of the Inverter must not be exceeded. 	Multiple Home Hub Single Phase Inverters with Storage and Full Home Backup
			SolarEdge Home Wave Single Phase Inverter (SExxxxH-RW000BEN4)	1-3 SolarEdge Home Batteries 400V	<ul style="list-style-type: none"> PV + battery: up to the maximum rated power of the inverter in backup mode. <p>Future release.</p> <ul style="list-style-type: none"> Battery only: 5000W per connected battery. The rated max backup power of the Inverter must not be exceeded. 	SolarEdge Home Hub Single Phase Inverter with a SolarEdge Home Wave Single Phase Inverter
			StorEdge Single Phase Inverter with HD-Wave Technology (SExxxxH-RWSxxBxx4)	1-3 SolarEdge Home Batteries 400V	<ul style="list-style-type: none"> PV + battery: up to the maximum rated power of the inverter in backup mode. 	SolarEdge Home Hub Single Phase Inverter with a StorEdge Single Phase Inverter
Third Party Generators	SolarEdge Home Hub Single Phase Batteries: 1-3 SolarEdge Home Batteries 400V	Any number of 3rd party inverters, generators, legacy SolarEdge inverters, and AC coupled Storage systems, that are not connected to the Leader on a Leader-Follower configuration. All these Inverters and generators MUST be connected to a single production meter that will be connected to the Leader Inverter.	Third-party inverters, generators, legacy SolarEdge inverters, and AC coupled Storage systems must be connected only on the grid side of the BUI	NA	<p>Current release.</p> <ul style="list-style-type: none"> Battery only: 5000W per single connected battery. Up to 7500W for two or three batteries. The rated max backup power of the Inverter must not be exceeded. PV + battery: up to the maximum rated power of the inverter in backup mode. <p>Future release.</p> <ul style="list-style-type: none"> Battery only: 5000W per connected battery. The rated max backup power of the Inverter must not be exceeded. PV + battery: up to the maximum rated power of the inverter in backup mode. <p>Third-party inverters, generators, legacy SolarEdge inverters, and AC coupled Storage systems will not produce during backup.</p>	Home Hub Single Phase Inverter with Third-Party Inverter, Storage, and Full Home Backup

¹ Any of the configurations in the table may be installed with PV, Storage, EV chargers or Smart Devices.

² Any of the listed configurations is available in PV-only or Storage modes, also for the appropriate inverters that are not producing during backup.

Configuration ^{1 2}	Leader	No. of Follower Inverters	Follower Inverter types	Batteries per Inverter	Maximum AC Power in Backup Mode	Refer to:
Single phase backup Inverter on a three phase grid. Using "Three Phase Backup Interface"	SolarEdge Home Hub Single Phase Batteries: 1-3 SolarEdge Home Batteries 400V	Up to two inverters from the supported models	supported models: SExxxxH-RWBMNBF54 SExxxxH-RW000BEN4 SExxxxH-RWSxxBxx4	1-3 SolarEdge Home Batteries 400V	Current release Not supported. Future release. <ul style="list-style-type: none"> Battery only: 5000W per connected battery. The rated max backup power of the Inverter must not be exceeded. PV + battery: up to the maximum rated power of the inverter in backup mode. 	Single phase backup Inverter on a three phase grid. Using "Three Phase Backup Interface"

Single Home Hub Inverter with Storage and Full Home Backup

In this configuration, the inverter with the BUI provides homeowners with backup power for full home backup in the event of grid outage. SolarEdge Smart Energy network optimizes the energy flow to the home loads, maximizing the amount of solar power produced, stored, and consumed.

The BUI connects to the inverters and battery(s), automatically, controlling disconnection of house loads from the grid during power failures to provide backup power to full home loads.

Figure 2 shows a configuration diagram of a single inverter with full home backup and smart energy devices.

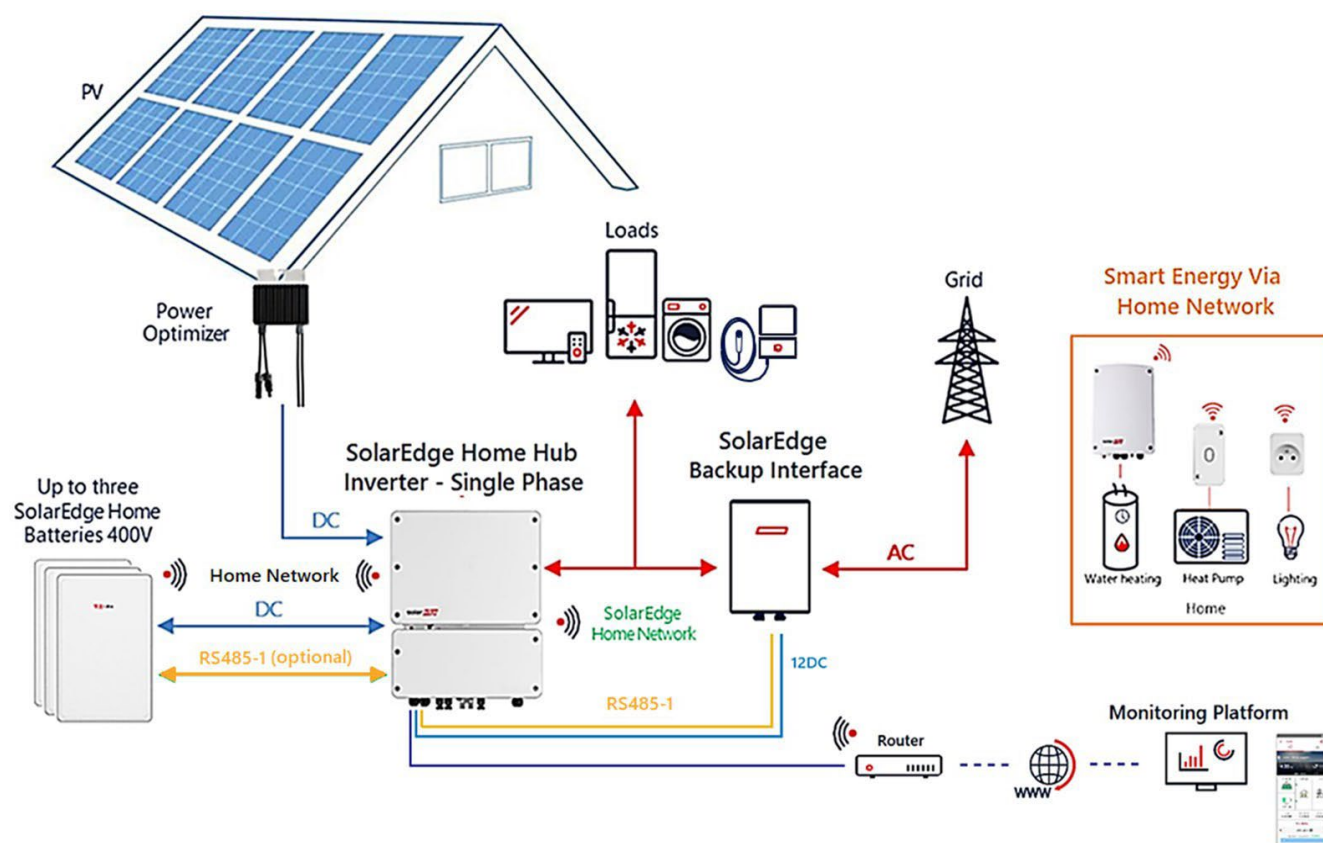


Figure 2 Single Home Hub Inverter with Storage and Full Home Backup

Multiple Home Hub Single Phase Inverters with Storage and Full Home Backup

In this configuration, the inverters with the BUI, provide homeowners with backup power for either full home loads in the event of grid outage.

The BUI connects to the inverters and battery(s), automatically, controlling disconnection of house loads from the grid during power failures to provide backup power to full home loads.

Figure 3 shows a configuration diagram of multiple Inverters with storage and full home backup.

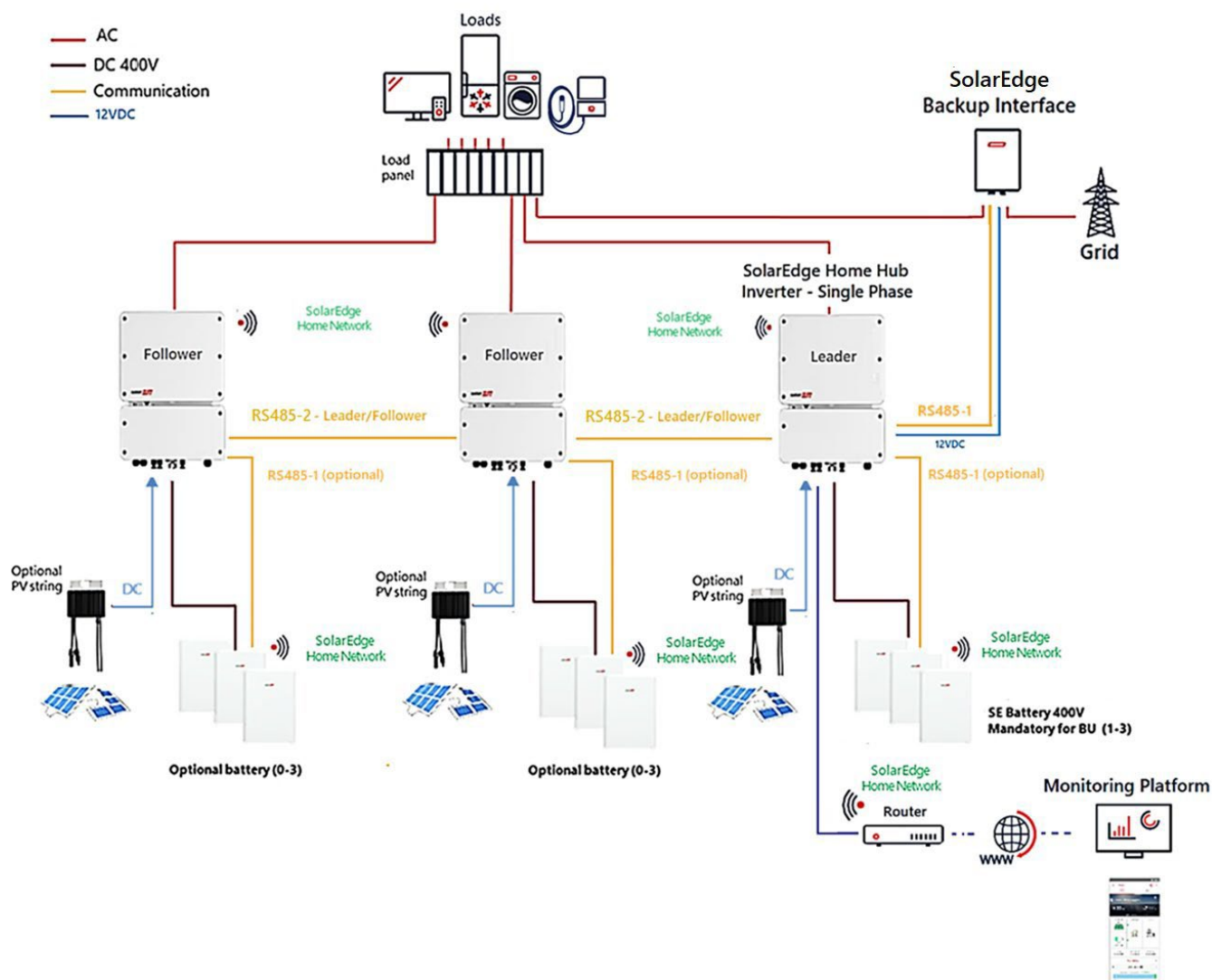


Figure 3 Multiple Home Hub Single Phase Inverters with Storage and Full Home Backup

Home Hub Single Phase Inverter with Third-Party Generators, Storage, and Full Home Backup

In this configuration, a SolarEdge Inverter, BUI, and battery(s) are added to an existing Third-party inverter.

The SolarEdge inverter connected to the BUI, provides homeowners with backup power for either full home loads in the event of grid interruption.

The BUI connects to the SolarEdge inverter and battery(s), automatically, controlling the disconnection of house loads from the grid during power outage to provide backup power to home loads.

Figure 4 shows a backup configuration with a home hub Inverter, third-party generators, PV, and storage.



NOTE

Third-party generators do not generate any power during backup power operation and must be connected to the grid side of the BUI. The third party generators must be connected to a single production meter on their AC side.

The external E/I meter and the Ext Production Meter must be installed at the grid connection point. The meter integrated within the backup interface must be disabled in SetApp. Make sure to carefully follow the SetApp commissioning process.

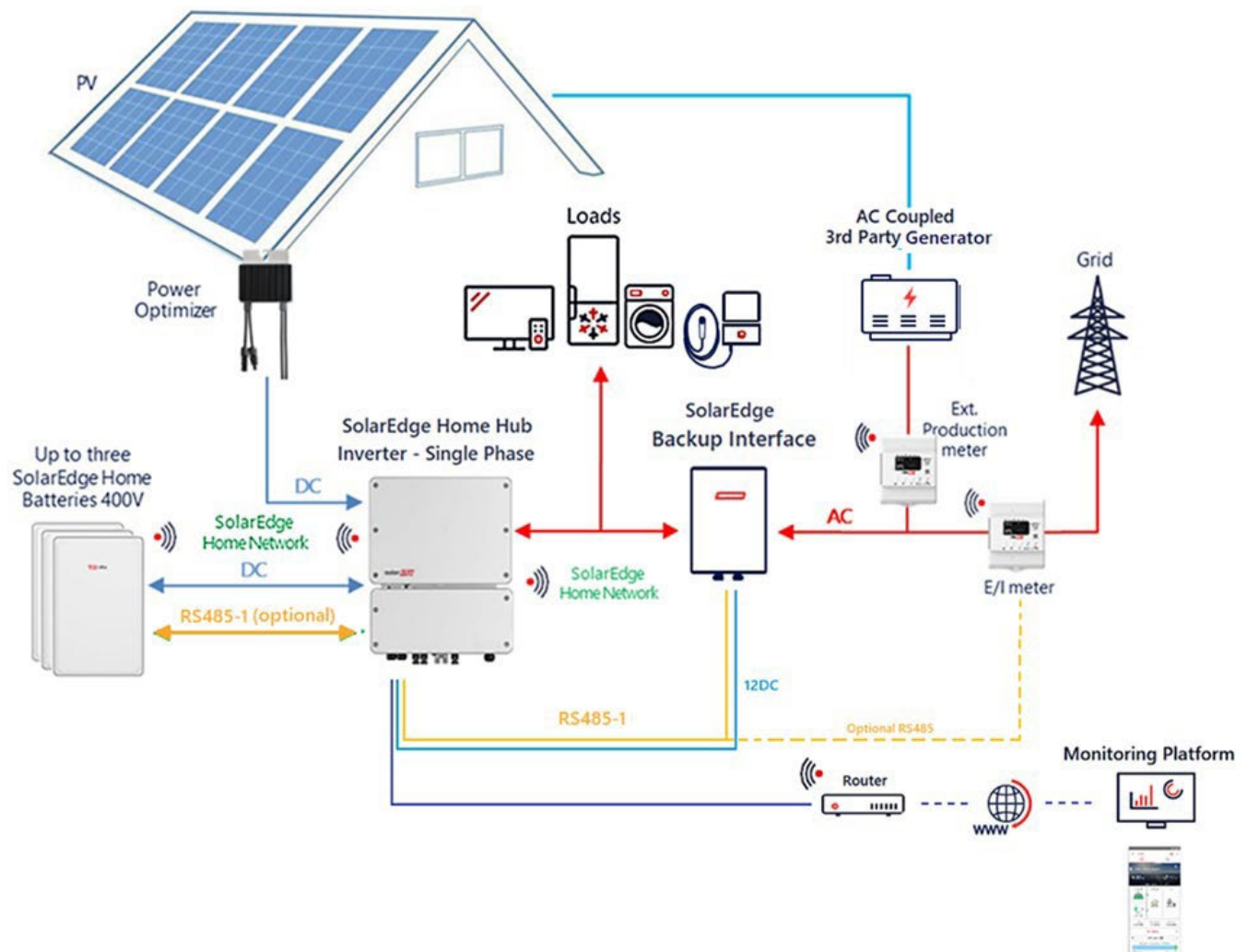


Figure 4 Home Hub Single Phase Inverter with Third-Party Generators, Storage, and Full Home Backup

Home Hub Single Phase Inverter with Partial Backup

In this configuration, the inverter with the BUI provides homeowners with backup power for partial home loads (loads that are within the island network) in the event of a grid outage.

The BUI connects to the inverters and battery(s), automatically, controlling the disconnection of house loads from the grid during power failures to provide backup power to partial home loads.

Figure 5 shows a backup configuration for partial backup.



NOTE

When configured using SetApp, the integrated import/export meter of the backup interface cannot be used with a partial backup power solution.

Instead, an external import/export meter must be installed at the grid connection point and the meter integrated with the backup interface needs to be disabled in SetApp. Make sure to carefully follow the SetApp commissioning process.

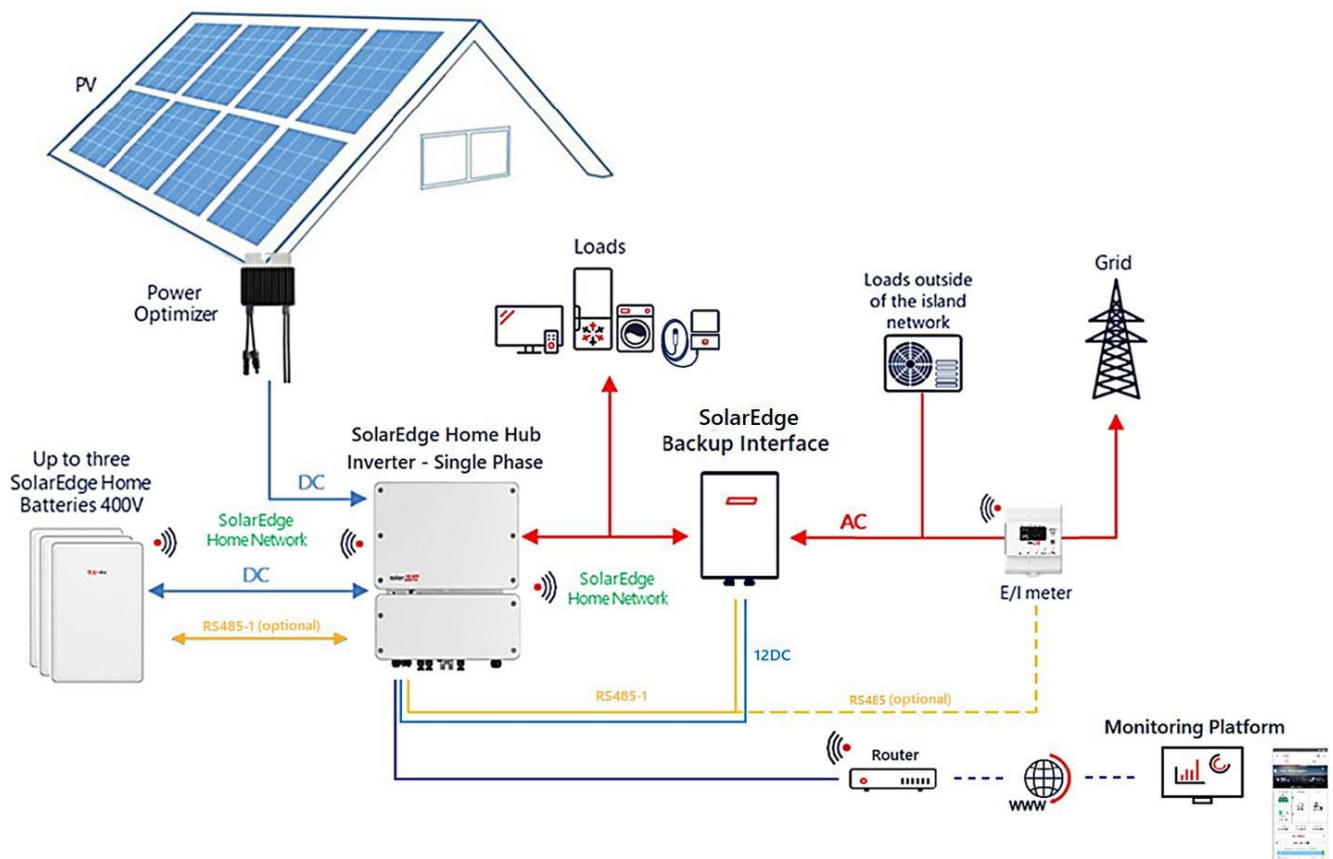


Figure 5 Home Hub Single Phase Inverter with Partial Backup

Support Contact Information

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



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

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

- The model and serial number of the product in question.
- The error is indicated on the LEDs, the SetApp mobile application, or on the monitoring platform, 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 method of communication with the SolarEdge server if the site is connected.
- The product's software version appears in the ID status screen.

To view YouTube videos for installing, wiring, and commissioning SolarEdge Inverters please click the links or scan the following QR codes:

For more information on Installation:

<https://youtu.be/pjuo7KjRHxc>



For more information on Wiring:

https://youtu.be/o_EgCnL_r38



For more information on Commissioning:

https://youtu.be/_JoiC4_H8sk

