

Multiple Inverter Backup - Application Note

Version History

- Version 1.0 – April 2021

Introduction

The multiple inverters backup (MIB) feature allows AC power stacking for on-grid and backup applications with up to three SolarEdge inverters (see *Supported Inverters* below).

When on-grid, the inverters will work together as part of the Smart Energy Management system to maximize self-consumption or participate in time-of-use profiling (for the Energy Hub inverters only).

When in backup, the inverters will synchronize their produced AC waveform, and each inverter will contribute to stabilizing the waveform to allow for smooth operation in backup and support extensive load switching, such as turning on HVAC systems.

The Energy Meter installed in the Backup Interfaces will serve as the consumption meter for the MIB system.

System Requirements

Supported Inverters

- Single phase Energy Hub inverter with Prism technology (Energy Hub inverter)
- Single phase inverter with HD-Wave technology and SetApp configuration (HD-Wave inverter)

The leader inverter must be an Energy Hub inverter, connected to the Backup Interface. The follower inverters can be either Energy Hub or HD-Wave inverters. The maximum number of inverters that can participate in the MIB operation is three.

Firmware Version

Minimum inverter FW release: 4.12.

All inverters must have the latest FW version installed. See *Update the Inverter FW* below.

Supported Batteries

For Energy Hub inverters only: RESU10H, single and double capacity

PV Configuration

All inverters must be connected to PV modules.

With PV modules connected to all Energy Hub inverters, the system will ensure a better and longer backup by utilizing the increased efficiency of the DC-coupled architecture and use any excess PV power to charge the batteries.

Before You Begin



WARNING!

Before checking any physical connections between the system components, power off the system as explained in the documentation that comes with the components (inverters, Backup Interface, batteries, etc.)

1. Make sure all system components are installed and connected according to their respective installation guides.
2. Make sure the RS485 bus communication between the inverters is connected as explained in *Connecting Multiple Inverters through RS485* in the Energy Hub inverter's installation guide:
<https://www.solaredge.com/sites/default/files/se-single-phase-energy-hub-prism-technology-installation-guide-na.pdf>
3. Turn on the ON/OFF/P and DC safety switches of all inverters.
4. Turn on the ON/OFF switch of the Backup Interface.

Commissioning

Update the Inverter FW

1. Connect to one of the inverters in your system using SetApp:
 - a. Run SetApp on your mobile device.
 - b. Scan the QR code on the inverter casing.
2. After the FW upgrade starts, tap **Connect to Another Device** to start FW upgrade on the other inverters.

Select the Country Settings and Pair with Power Optimizers

1. Follow the instructions in the Energy Hub inverter's installation guide to:
 - a. Select the country settings
 - b. Pair the inverter with power optimizers
2. After the pairing starts, tap **Disconnect from Device**.
3. Connect to the next inverter and repeat the above steps.

Configure the Battery

Perform this step for each Energy Hub inverter in your system that has a battery connected to it.

1. Connect to the inverter using SetApp.
2. Configure the battery and run a battery self-test, as explained in *Activating, Commissioning and Configuring the System* in the Energy Hub inverter installation guide.

Set Leader and Follower Inverters

1. Connect using SetApp to the Energy Hub inverter with the RS485 connection to the Backup Interface.
2. Set this inverter as leader:
 - a. Select **Commissioning > Site Commissioning**.
 - b. Select **RS485-2 > Modbus (Multi-Device)**.
 - c. Select **RS485-2 > SolarEdge > SolarEdge Leader**.
3. Set the other inverters as followers:
 - a. Select **RS485-2 > Detect Followers**.
 - b. Verify that the follower inverters have been detected.

Configure Backup

For each Energy Hub inverter that has a battery connected to it:

1. Connect to the inverter using SetApp.
2. Select **Commissioning > Power Control > Energy Manager > Backup Configuration > Backup > Enable**.
3. Set backup reserve by selecting **Commissioning > Power Control > Energy Manager > Backup Configuration > Backup Reserve**.

Perform a Backup Test

1. Turn off AC supply to the Backup Interface:
 - **BI-E model** - Turn off the main circuit breaker of the Backup Interface by pulling down the lever on the Backup Interface cover.
 - **BI-N model** – On the main service panel, turn off the AC circuit breaker feeding the Backup Interface.
2. Connect to each inverter in turn via SetApp and on the **Status** screen, check that they are producing power.

MIB Power and Current Capabilities

The Energy Hub inverter can provide continuous power and current as specified under **Output – AC Backup** in this datasheet:

<https://www.solaredge.com/sites/default/files/se-single-phase-energy-hub-inverter-prism-technology-datasheet-na.pdf>

The HD-Wave inverter can provide continuous power and current according to their Rated AC Power Output @240V and Maximum Continuous Output Current @240V specified in its datasheet:

<https://www.solaredge.com/sites/default/files/se-hd-wave-single-phase-inverter-with-setapp-datasheet-na.pdf>

The SolarEdge MIB system can provide continuous power up to the sum of nameplate of the inverters, of which the system is comprised. The surge current capabilities of the system are identical to the continuous current capabilities of the inverters. This allows to supply the maximum amount of continuous power to the loads.