

Commissioning off-grid Enphase Energy System using Enphase Installer App 4.XX

Applicable regions: North America

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Contents

1	Introduction.....	3
2	Applicable countries.....	3
3	Commissioning prerequisite.....	3
4	Training prerequisite.....	3
5	System planning and installation	3
6	Commissioning process	4
7	Revision history.....	18

2. Introduction

This guide provides detailed instructions for commissioning an off-grid site using Enphase devices. It covers the necessary prerequisites, required devices, and the step-by-step commissioning process.

3. Applicable countries

- United States

4. Commissioning prerequisite

Before commissioning, ensure all Enphase devices are available and correctly configured. The following devices are required for commissioning an off-grid site:

- IQ System Controller 3G
- IQ Battery 5P
- IQ8 Microinverters
- Third-party standby generator with generator distribution panel (GDS)/manual transfer switch (MTS)

5. Training prerequisite

In order to commission an off-grid site using the Enphase Installer App, the personnel commissioning the system must have passed the following courses in Enphase University:

- [Enphase Energy System 3.0 installer cert. training featuring IQ Battery 5P](#)
- [Enphase off-grid system training_US](#)
- [Enphase storage generator support](#)


If you have not taken these courses, visit the Enphase University to enroll the following recommended courses:

- [IQ8 Microinverters installer certification training](#)
- [Design with third-generation of Enphase Energy System](#)

6. System planning and installation

Before proceeding with the commissioning process outlined in this guide, it is crucial to ensure that the physical installation of the off-grid Enphase Energy System is completed correctly. For detailed instructions on system configuration and installation best practices, refer to the [Full off-grid/standalone Enphase Energy System](#) technical brief.

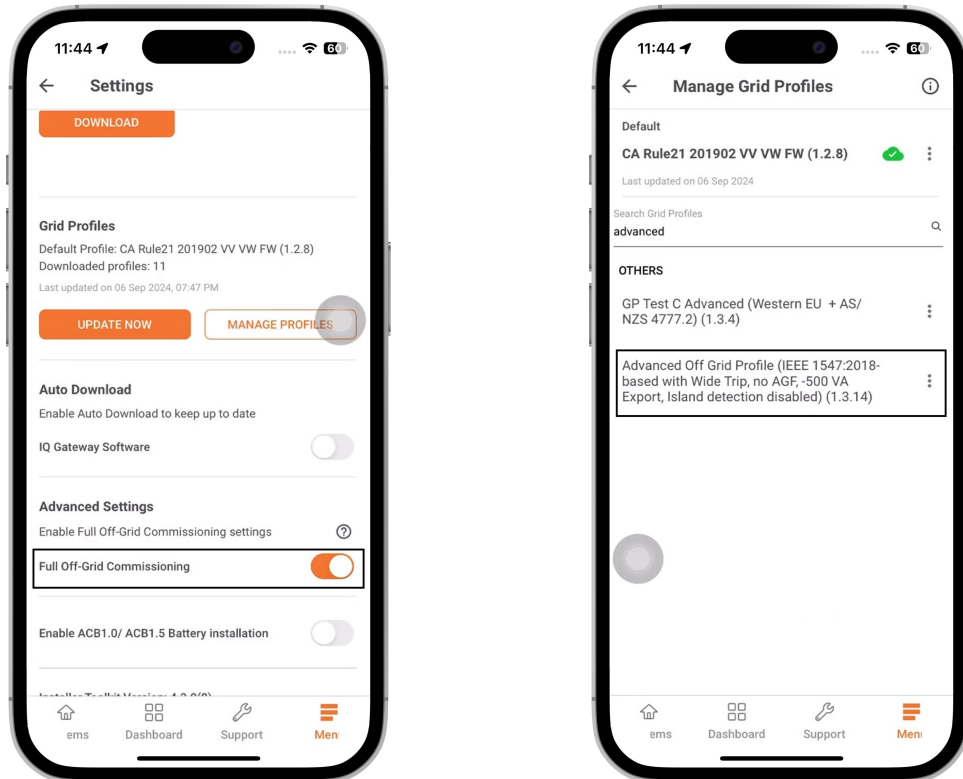
Key points to note are:

- **System components:** Ensure all required components are installed, including IQ8 Series Microinverter, IQ Battery 5P, IQ System Controller 3G, and a supported standby generator.
 - **Generator connection:** The generator output must be connected to both the utility and generator input of the IQ System Controller, using either a generator distribution panel (GDP) or a manual transfer switch (MTS).
 - **Current transformer (CT) installation:**
 - Install one pair of Consumption CTs on the microgrid interconnection device (MID).
 - Install one pair of generator CTs on the generator circuit.
 - Install the battery CT on the L2 conductor of the battery circuit.
-  **NOTE:** During off-grid commissioning, the Enphase Installer App will automatically enable the Production and Consumption CTs without verifying their correct placement. Therefore, it is crucial to ensure that the CTs are positioned accurately.
- **Internet connectivity:** Ensure the system has internet access via Wi-Fi or Ethernet, with an Enphase Mobile Connect cellular modem for backup.
 - **System sizing:** Follow the sizing guidelines provided in the technical brief to ensure proper system performance and generator protection.

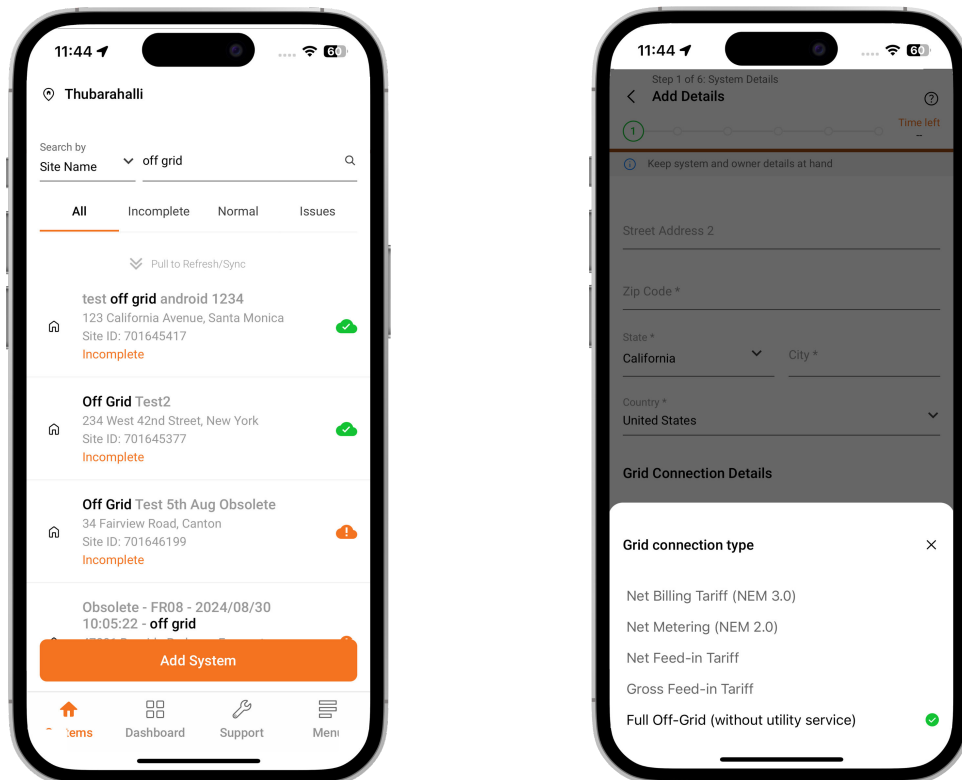
Prior to commissioning, thoroughly review the complete [technical brief](#) to fully understand the physical installation requirements and best practices.

7. Commissioning process

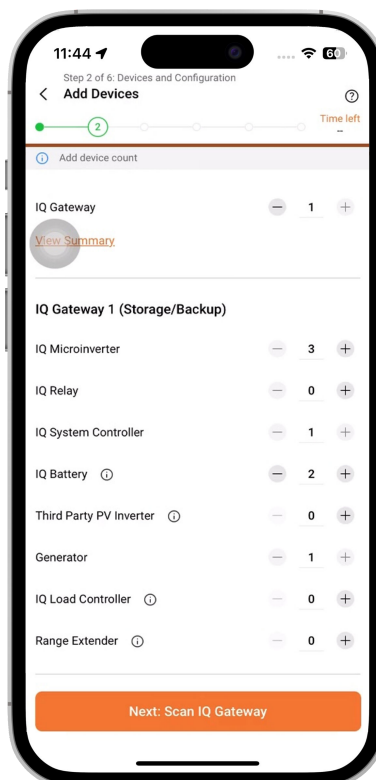
1. Go to **Menu > Settings** and toggle Full Off-Grid Commissioning. Ensure the off-grid commissioning grid profile is downloaded in the app.



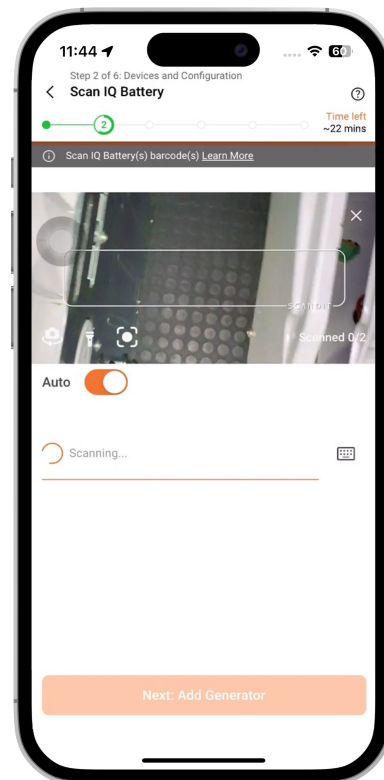
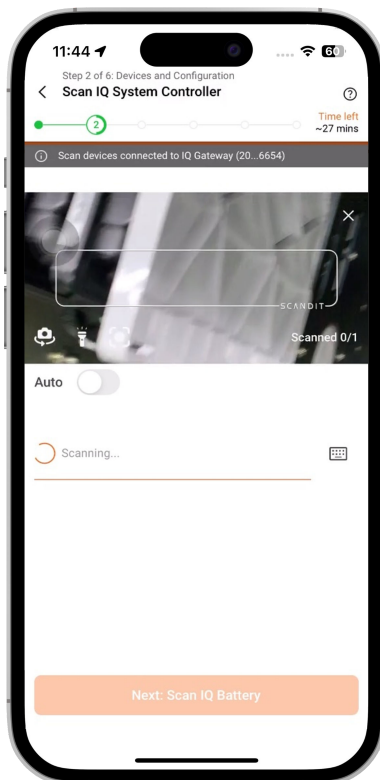
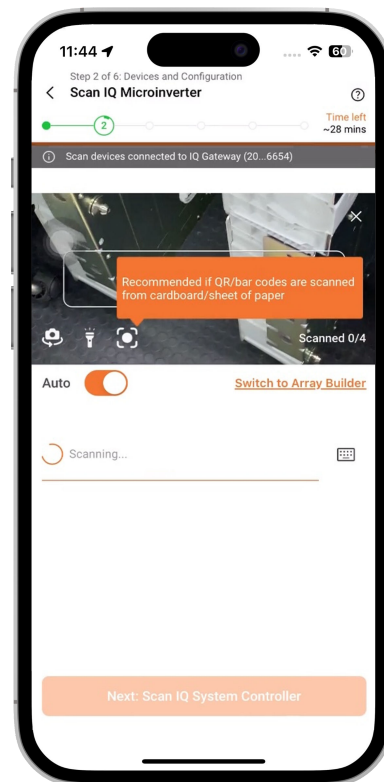
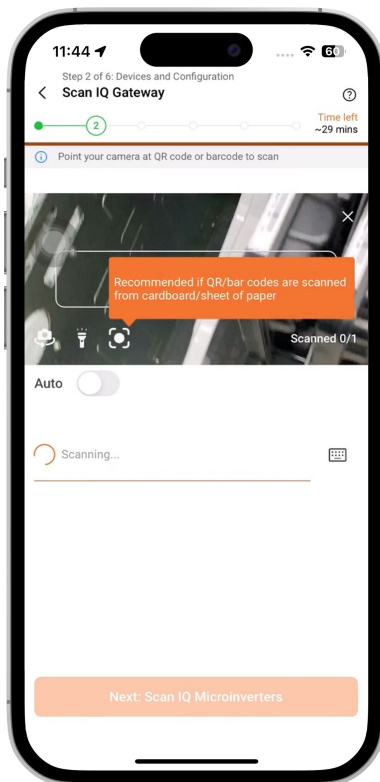
2. Create a new system. Select **Full Off-Grid (without utility services)** in Grid connection type while creating a new site.



3. Add devices in the device inventory page.



4. Scan all device's serial numbers and add generator details.



11:44

Step 2 of 6: Devices and Configuration

< Add Generator ⓘ

Time left ~24 mins

ⓘ Ensure generator frequency is less than 62 Hz

Generator Kohler

Model 14RESAL

Serial Number Kohler-14Resal

Max Continuous Gen Amps (up to 64A) * 32

Max Generator Efficiency Set Point * 100

Min Generator Efficiency Set Point * 5

Generator Nameplate Rating (in kW) * 14.0

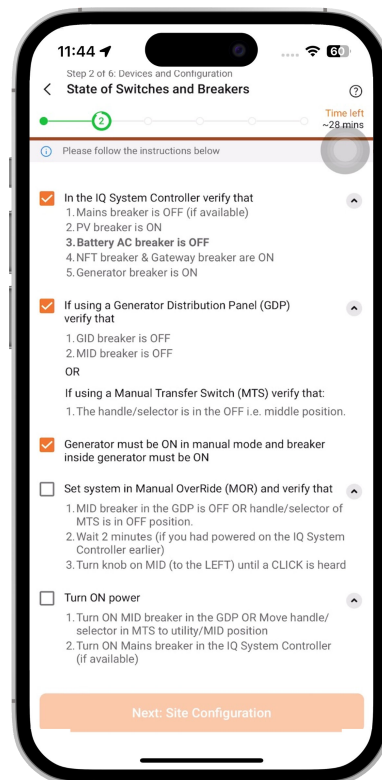
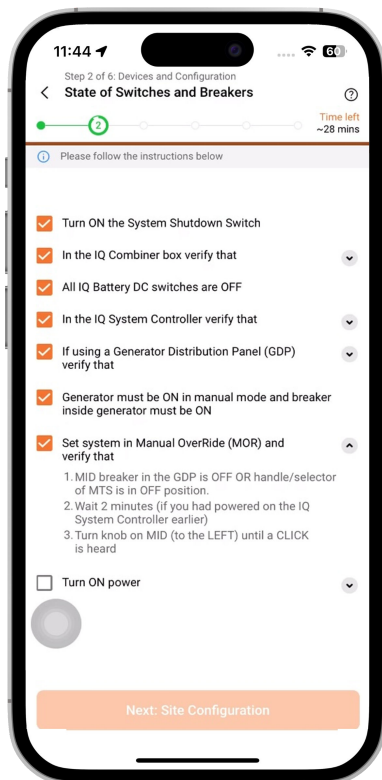
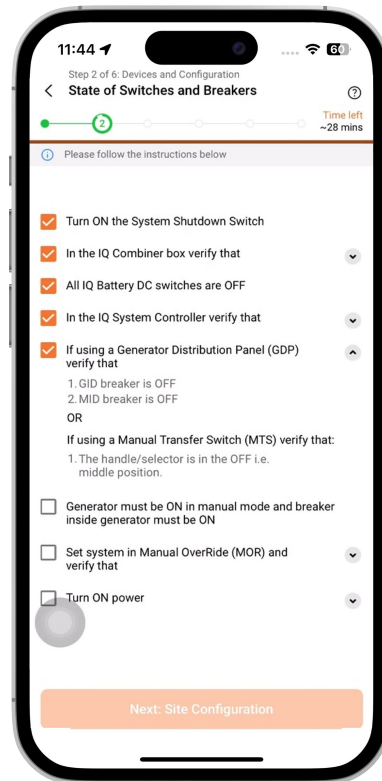
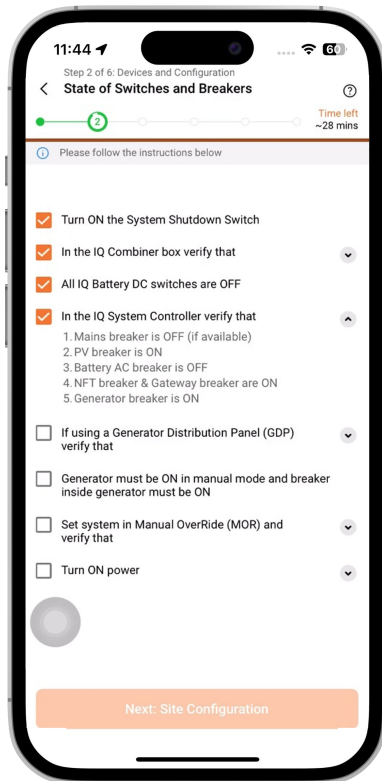
Generator Type * Standby

Start Type * Auto

Next: State of Switches and Breakers

5. Follow the instructions on the screen for different devices; instructions are also provided below for easy reference. Successful off-grid commissioning requires the devices to be configured exactly as stated herein. Follow all instructions carefully to avoid microgrid collapses. Ensure the devices in the system are configured as following:

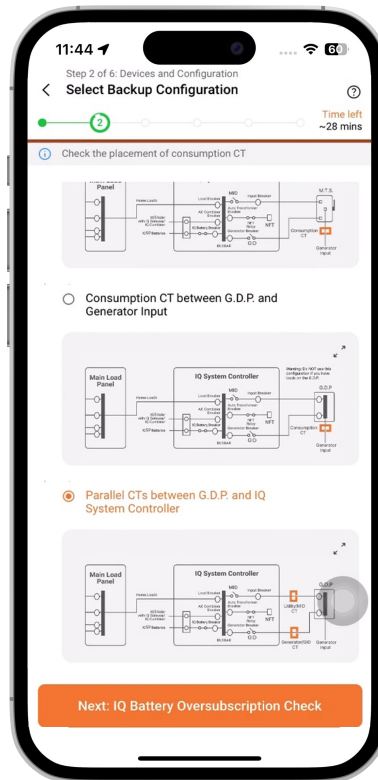
- a. Turn ON the System Shutdown Switch
- b. In the IQ Combiner box, verify that
 - All PV branch circuit breakers are OFF
 - Gateway L1 and L2 connected to IQ System Controller quad breaker
- c. All IQ Battery DC switches are OFF
- d. In the IQ System Controller, verify that
 - The main breaker is OFF
 - The PV breaker is ON
 - Battery AC breaker is OFF
 - The NFT breaker and gateway breaker are ON
 - The generator breaker is ON
- e. If using a generator distribution panel (GDP) verify that
 - The GID breaker is OFF
 - The MID breaker is OFF
- f. If using a manual transfer switch (MTS), verify that the handle/selector is in the OFF i.e., middle position
- g. The generator must be ON in manual mode, and the breaker inside the generator must be ON
- h. Set the system in Manual OverRide (MOR) and verify that
 - The MID breaker in the GDP is OFF
 - Wait for 2 minutes (if you had powered on the IQ System Controller earlier)
 - Turn the knob on MID (to the LEFT) until a CLICK is heard
- i. Turn ON power
 - Turn ON the MID breaker in the GDP
 - Turn ON the mains breaker in the IQ System Controller (If available)



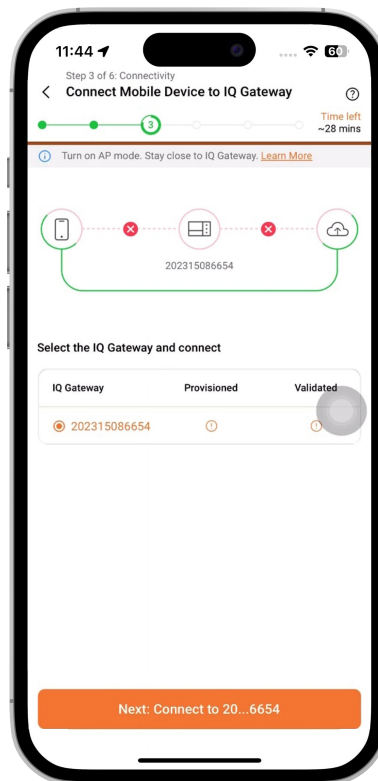
6. Site configuration: Select the backup configuration based on the actual installation.



WARNING: Do not use a single pair of consumption CTs between GDP and generator input if you have any loads in your GDP.



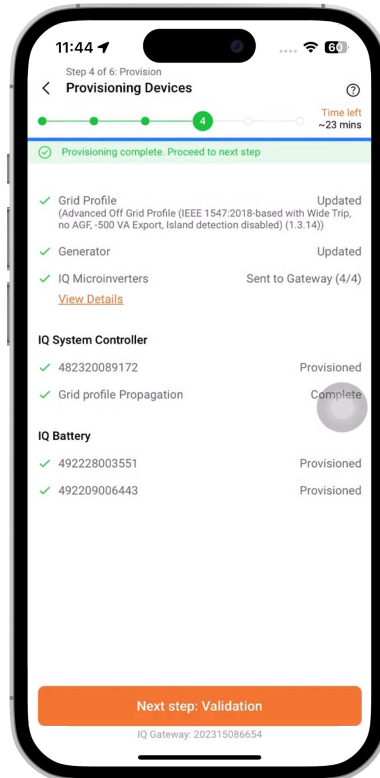
7. Gateway connectivity: Connect to the IQ Gateway. The Enphase Installer App will suggest a gateway upgrade if the minimum version check fails.



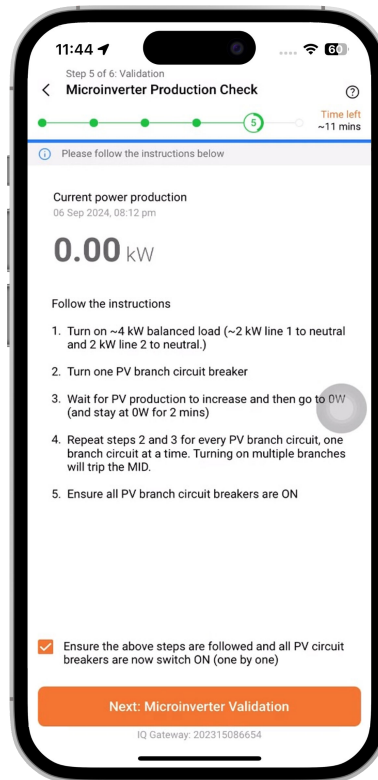
8. Provisioning: Initiate provisioning and wait until the devices are provisioned. The Enphase Installer App will show instructions on how to troubleshoot errors if the provisioning fails.



NOTE: Ensure the grid profile shown on the screen is the “Advanced Off Grid Profile”. This grid profile is mandatory for stable off-grid operation of energy systems. This grid profile will be auto-selected by the Enphase Installer App and should not be changed.

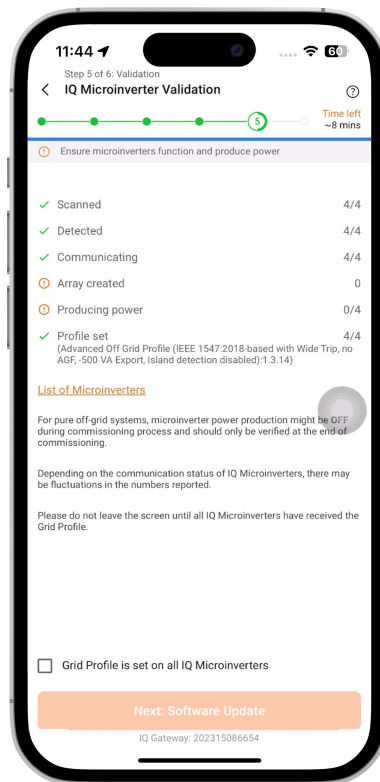


9. As soon as IQ Batteries are provisioned, the Enphase Installer App will auto-enable Production, Consumption, and Storage CTs. Ensure the CTs are placed correctly.
10. Microinverter production check: The microinverter branch circuits must be switched ON individually. Wait for PV production to increase and return to zero before turning ON the next branch circuit. Follow the instructions in the app.



- ✓ **NOTE:** During provisioning, it is expected that the number of microinverters detected varies as branch circuits are switched.
- ✓ **NOTE:** The Enphase Installer App will disable microinverter power production at the end after all branch circuit breakers are on. Microinverters producing power should therefore be zero at the end. Power production will be enabled by the app later in the commissioning workflow.

11. Ensure the profile is set for all microinverters in the microinverter validation screen.

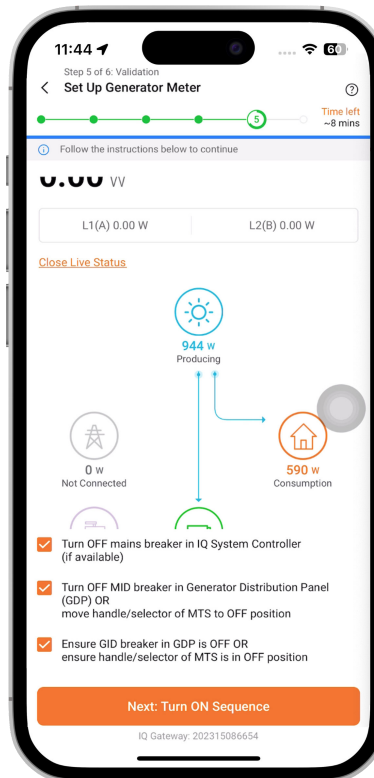
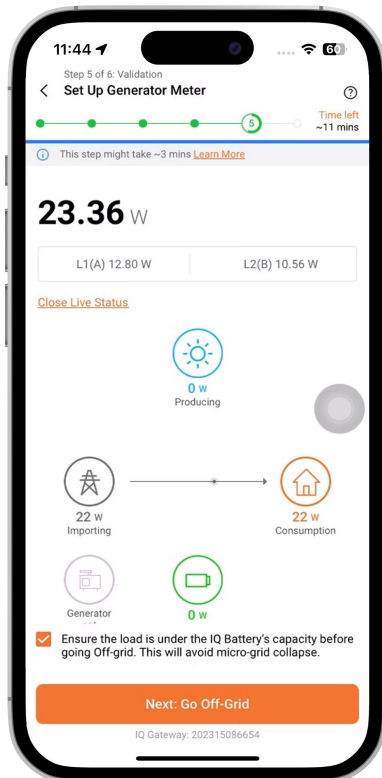
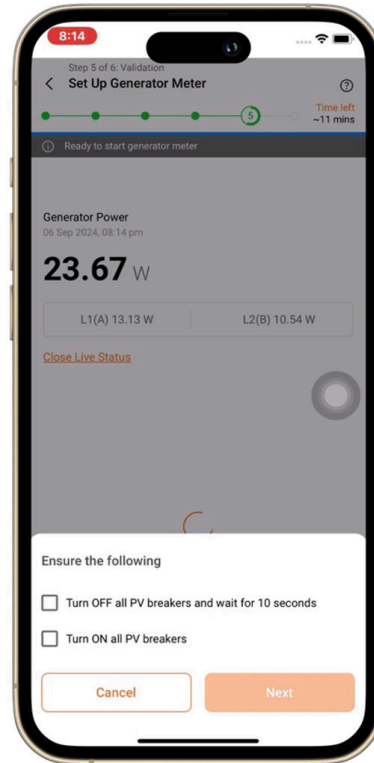
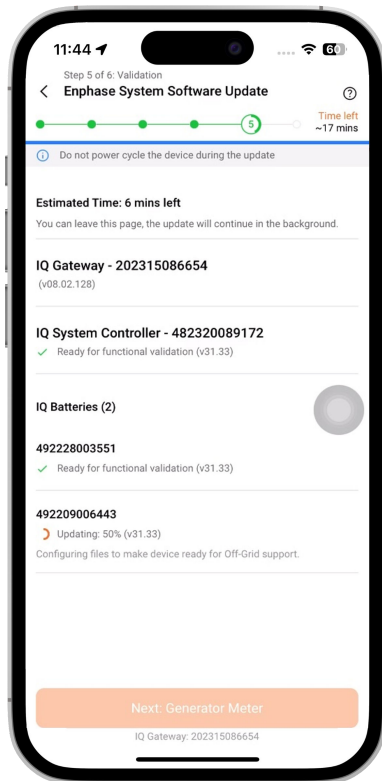


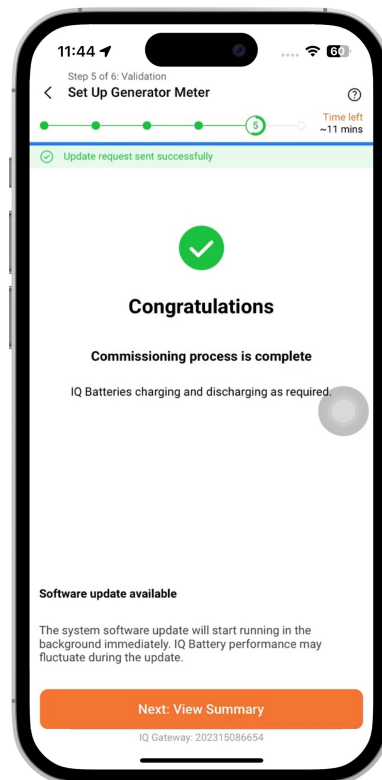
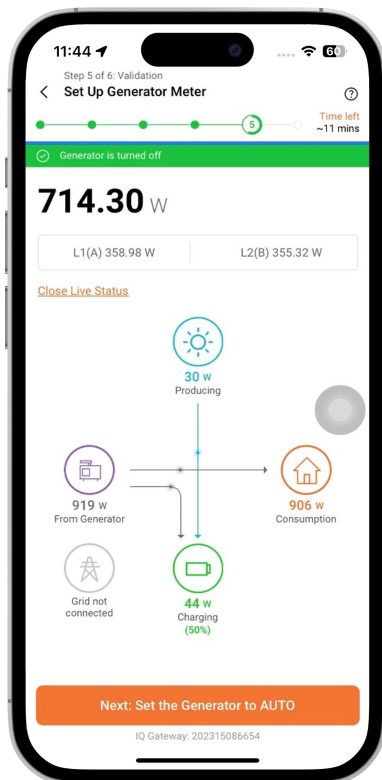
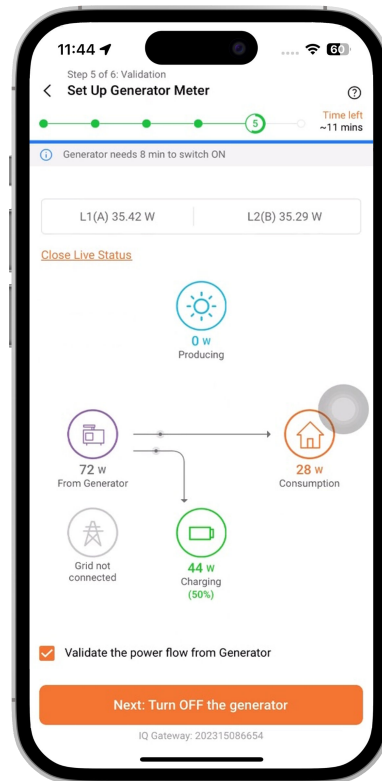
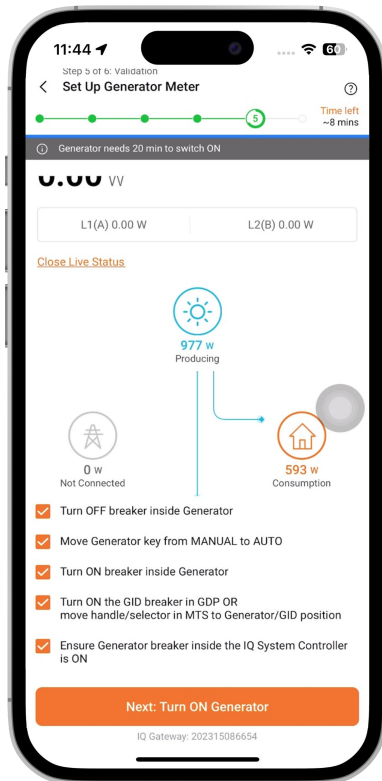
12. Generator meter: Proceed to validate the generator meter after completing the Enphase Energy System software update. Follow the instructions on the screen to enable the generator meter.

- a. Turn OFF all PV breakers and wait for 10 seconds
- b. Turn ON all PV breakers
- c. Tap **Next**
- d. Ensure the load is under the IQ Battery's capacity before going off-grid. This will avoid micro-grid collapse.
- e. Tap **Next: Go Off-Grid** to power up the home from PV and IQ Battery
- f. Follow the instructions to turn on the generator
 - Turn OFF the mains breaker in the IQ System Controller (if available)
 - Turn OFF the MID breaker in the generator distribution panel (GDP) OR move the handle/selector of MTS to the OFF position
 - Move the generator key from MANUAL to AUTO
 - Ensure the GID breaker in GDP is OFF OR ensure the handle/selector of MTS is in the OFF position
 - Turn OFF the generator breaker inside the generator
 - Turn ON the generator breaker inside the generator
 - Turn ON the GID breaker in GDP OR move the handle/selector in MTS to the generator/GID position
 - Ensure the generator breaker inside the IQ System Controller is ON
 - Tap **Next: Turn ON Generator**
- g. Validate the power flow from the generator
- h. Tap **Turn OFF the generator**
- i. Tap **Next: Set the Generator to AUTO**

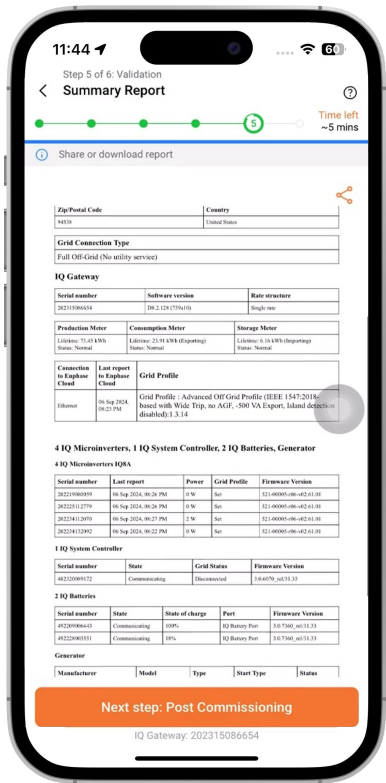


NOTE: Wait till the microinverter production when you are tapping the button to turn off the generator.





13. Summary report: Tap **Next: View Summary** to see and download the summary report.



8. Revision history

Revision	Date	Description
TEB-00203-1.0	November 2024	Initial release.