

Enphase Storage Troubleshooting Guide 3/3T/10/10T



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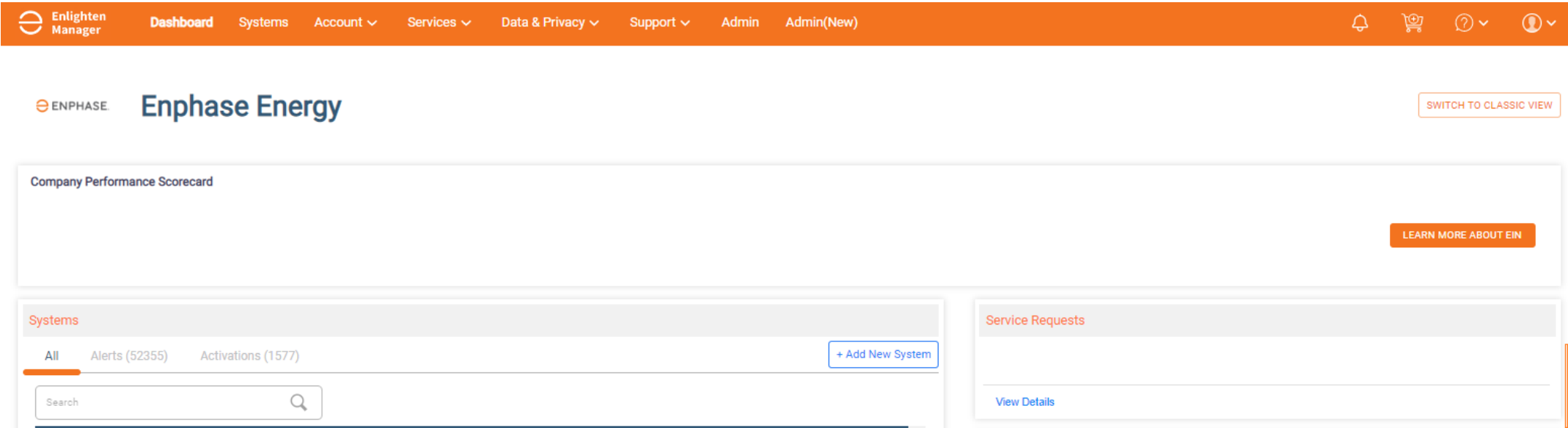
Enphase Installer Portal



Introduction

The Enphase Installer Portal provides tools for installers to design, install, monitor, and manage multiple systems from online devices.

[Log in to the Enphase Installer Portal](#) to access these installer tools.



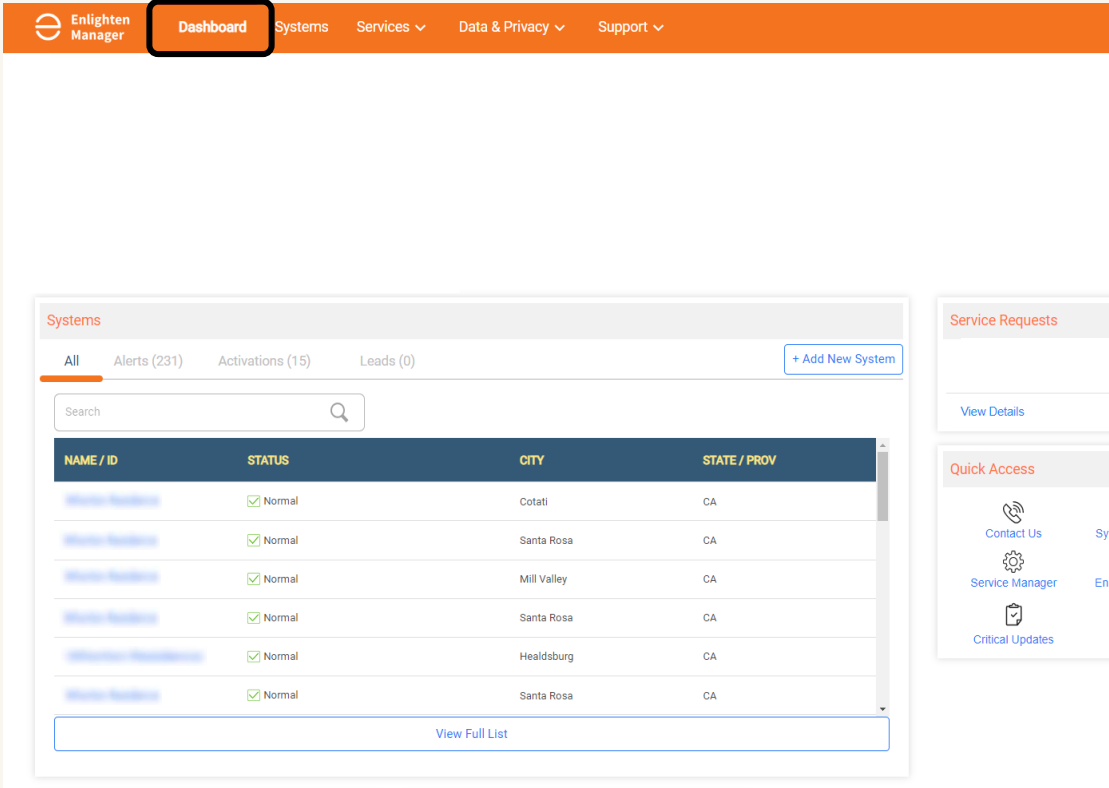
Learning objectives

- Understand the purpose of the Enphase Installer Portal and when to use it
- Understand how to check and update the IQ Gateway software
- Understand how to enable and disable power production
- Understand how to remove, retire, and add microinverters
- Understand the Self Service options in the Enphase Installer Portal
- Understand the System Diagnostics features

Introduction

The Enphase Installer Portal displays an overview of the installer’s customer sites.

The main landing page is called the **Dashboard**.



Enable and disable power production

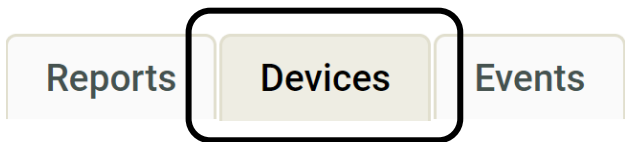
Using one-button standby mode in the Enphase Installer Portal, an installer can remotely disable and enable power production.

This process can be used to prevent power production from the PV system before receiving permission to operate (PTO) from the utility.

To disable power production using a mobile device on-site, see the [Production Standby Mode Application Note](#).

To disable or enable power production using the Enphase Installer Portal for microinverters communicating with an IQ Gateway, refer to the following instructions.

Step 1
Select the **Devices** tab.



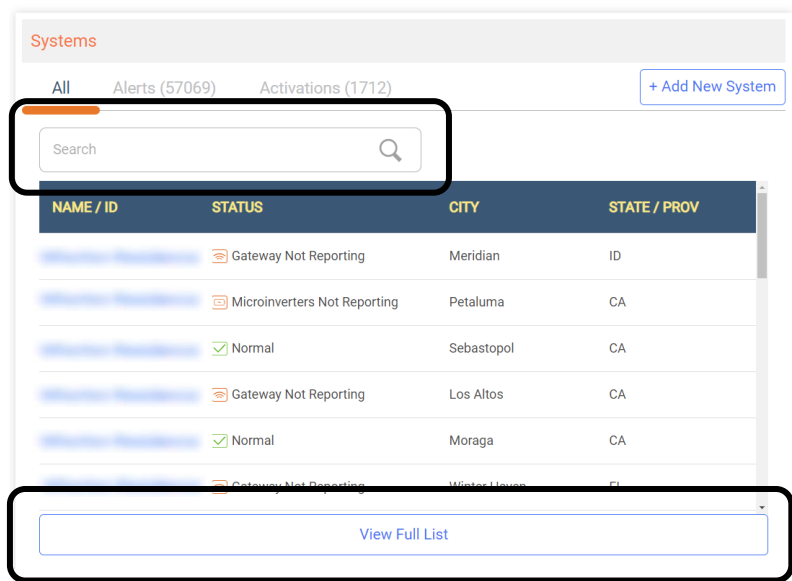
Step 2
Under the **Communication Gateways** list, select the IQ Gateway.

Communication Gateways

| Name | Type | Connection | Cell Modem SKU Type | Cell Modem Plan End Date | Last Report | Status | IQ Battery Storage (Yes/No) |
|--------------------|------|------------|---------------------|--------------------------|-------------------------|--------|-----------------------------|
| Enphase IQ Gateway | | Wi-Fi | CELLMODEM-M1 | 08/04/2027 03:00 AM EDT | 06/14/2023 02:35 PM EDT | Normal | No |

Dashboard overview

From the **Dashboard**, installers can find a site by using the **Search** field or selecting **View Full List**.



| Status | Name | Groups | City | State/Prov | Today | Lifetime | Conn |
|------------|------|---------------------------|---------------|------------|----------|----------|-------|
| All | Name | All | City | State/Prov | Today | Lifetime | |
| Normal | | Consumption CT Enabled | Ellicott City | MD | 19.4 kWh | 7.59 MWh | Wi-Fi |
| Normal | | Consumption CT Enabled | La Puente | CA | 1.27 kWh | 6.69 MWh | Cel |
| Production | | Consumption CT Enabled | La Crescenta | CA | 495 Wh | 26.2 MWh | Wi-Fi |

If **View Full List** is selected, a new page opens, displaying a full list of sites. Installers can use the indicated filters and search fields to refine the search and select a site.

Enable and disable power production

Step 3

To view the power production status, scroll down to **Tasks**.

Step 4

Select **Disable Power Production** or **Enable Power Production**.

Tasks

| | |
|--------------------------|--|
| Check Signal Strength | Check signal strength to measure the Gateway's communication with the microinverters — for example, if the Gateway has been moved or to determine the best location for the Gateway. |
| Scan for New Devices | Device Scanning is inhibited. To re-enable device scanning, please contact Customer Support. |
| Disable Power Production | Power production is enabled on the microinverters communicating with this Gateway. More Info |

The IQ Gateway receives and executes the task within 30 minutes.

Enabling or disabling production on systems using a cellular connection to the Enphase Cloud will take at least an hour.

IQ Batteries do not charge or discharge while power production is disabled.

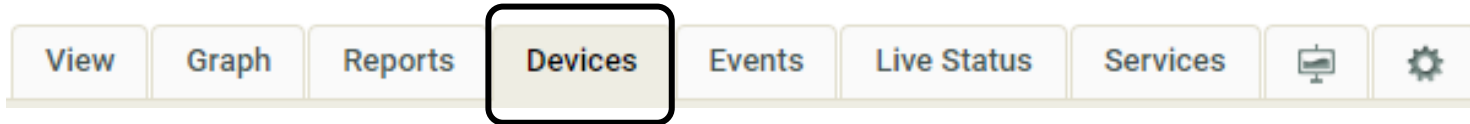
Remove and retire microinverters

If a microinverter is added to a site accidentally, it can be removed. If a microinverter is replaced, it can be retired.

To remove or retire microinverters in the Enphase Installer Portal, refer to the following instructions.

Step 1

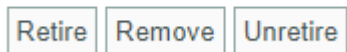
Select the **Devices** tab.



Step 2

Scroll to the **Microinverters** section. The option to **Retire**, **Remove**, or **Unretire** microinverters is displayed.

Microinverters



Remove and retire microinverters

Step 3

Under the **Microinverters** section, a **Serial Number** list is displayed. Select the check box next to the relevant Serial Number.

Microinverters

Showing 1 to 28 of 28 microinverters (filter)

| <input type="checkbox"/> | Serial Number |
|--------------------------|---------------|
| <input type="checkbox"/> | Serial Number |

Step 4

Select **Retire** if the microinverter being retired was on-site. This ensures that the microinverter's historical production data is still available.

Select **Remove** if the microinverter was never on-site to remove all historical data. This issue happens when neighboring microinverters are scanned in by mistake.

Select **Unretire** to correct a retiring mistake.

Microinverters

The IQ Gateway receives and executes these tasks within 30 minutes.

Adding or removing microinverters using a cellular connection from the IQ Gateway to the Enphase Cloud will execute within one hour.

Add microinverters

To add microinverters in the Enphase Installer Portal, refer to the following instructions.

Step 1

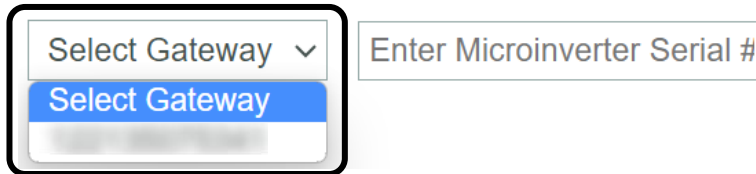
Scroll to the **Add and/or Provision Microinverter** section, located in the **Devices** tab.

Step 2

Open the **Select Gateway** drop-down menu and select the relevant IQ Gateway.

Add and/or Provision Microinverter 

This will add and provision a microinverter; In case if microinverter is already added, only provisioning task is being issued



The screenshot shows a web form with two main input areas. On the left, a dropdown menu labeled 'Select Gateway' is open, displaying a list of gateway options. On the right, there is a text input field labeled 'Enter Microinverter Serial #'. The entire form is enclosed in a light gray border.

Step 3

Enter the new Serial Number in the **Enter Microinverter Serial #** field, then select the relevant microinverter from the drop-down list.

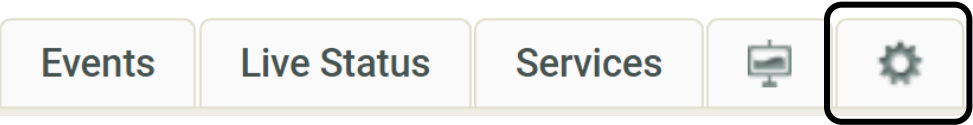
Step 4

Select **Provision**.

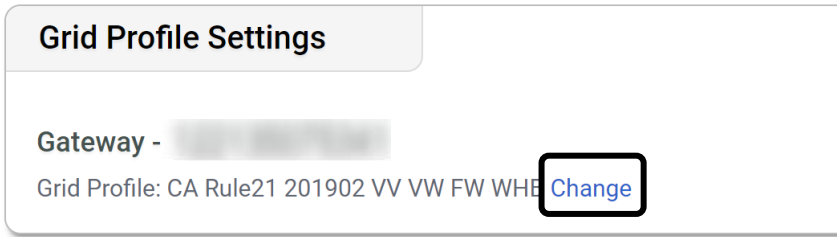
Change Grid Profile Settings

To change a Grid Profile in the Enphase Installer Portal, refer to the following instructions.

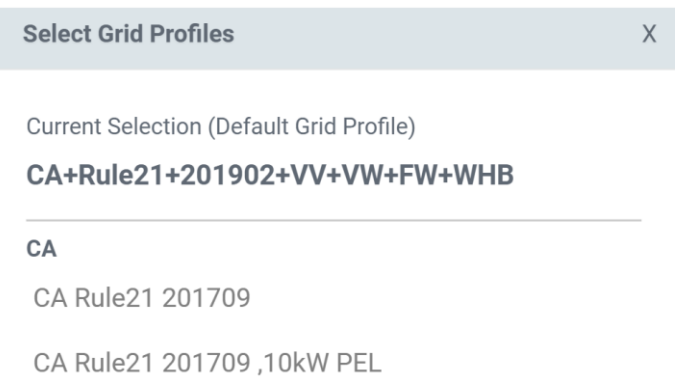
Step 1
Select the **Settings** icon.



Step 2
Scroll to the **Grid Profile Settings** section, then select **Change**.



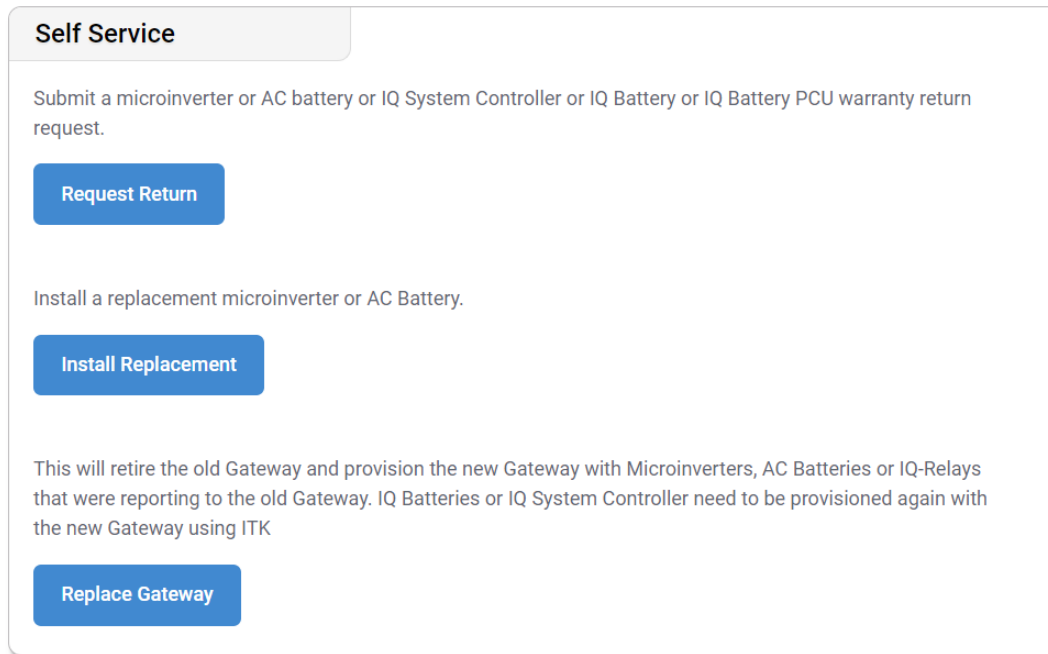
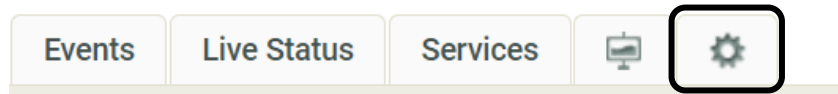
Step 3
Select the new Grid Profile from the drop-down menu, then select **Save**.



Self Service options

The **Self Service** section allows installers to request returns, replace equipment, or replace an IQ Gateway.

Installers can locate the Self Service options by selecting the Settings icon.



Select **Request Return** to submit a request for replacement equipment.

Select **Install Replacement** to retire a defective microinverter or AC Battery, provision new equipment, and update the array map.

Select **Replace Gateway** to automatically retire an old IQ Gateway and provision the new IQ Gateway, including transferring and provisioning microinverters to the new IQ Gateway. The Enphase Installer App is needed to provision the new IQ Gateway to use the storage equipment.

Self Service options: Request Return

To use the **Request Return** option, refer to the following instructions.

Request Return

*Shipment receiver (details of the person who is expected to receive the shipment at shipping address)

Select one

*Shipping address (address where the new replacement device will be shipped)

We are unable to ship to PO Boxes, apologies for any inconvenience.

☐

☐

Select device type

Microinverters

Select device(s)

Enter a serial number ...

Step 1
Select the shipping address from the list provided.

Step 2
Select the device type, enter the device’s serial number, and select the device.

Step 3
Select **Submit**. An Enphase team member will process the request and follow up.

Self Service options: Install Replacement microinverter

Installers can use the **Install Replacement** feature after replacing a microinverter on-site to retire the original unit, provision a new unit, and replace it in the array map.

Install Replacement

Enter original device number

Enter a serial number ...



Enter replacement number

[Replace another device](#)

Submit

Step 1

Enter the original microinverter serial number.

Step 2

Enter the replacement microinverter serial number.

Step 3

Select **Submit**.

Self Service options: Gateway Replacement

To use the **Gateway Replacement** feature, confirm that the new IQ Gateway is reporting, then refer to the following instructions.

- Step 1**

Confirm that the new IQ Gateway is online and connected.
- Step 2**

Select the old IQ Gateway from the drop-down menu.
- Step 3**

Enter the new IQ Gateway serial number.

Gateway Replacement

To replace an Gateway that has reported to Enlighten

- Verify in Enlighten that the system data up-to-date, then disconnect the old Gateway
- Install the new Gateway and ensure that it is reporting to Enlighten
- Select old Gateway the serial number and enter the new Gateway serial number below

Old Gateway

New Gateway

This will retire the old Gateway and provision the new Gateway with Microinverters, AC Batteries or IQ-Relays that were reporting to the old Gateway. IQ Batteries or IQ System Controller need to be provisioned again with the new Gateway using ITK

Replace Gateway

- Step 4**
- Select **Replace Gateway**.

The Gateway Replacement feature is available only if the IQ Gateway is already reporting. This method does not provision IQ Batteries or the IQ System Controller to the new IQ Gateway as it does with microinverters. Provision them on-site using the Enphase Installer App.

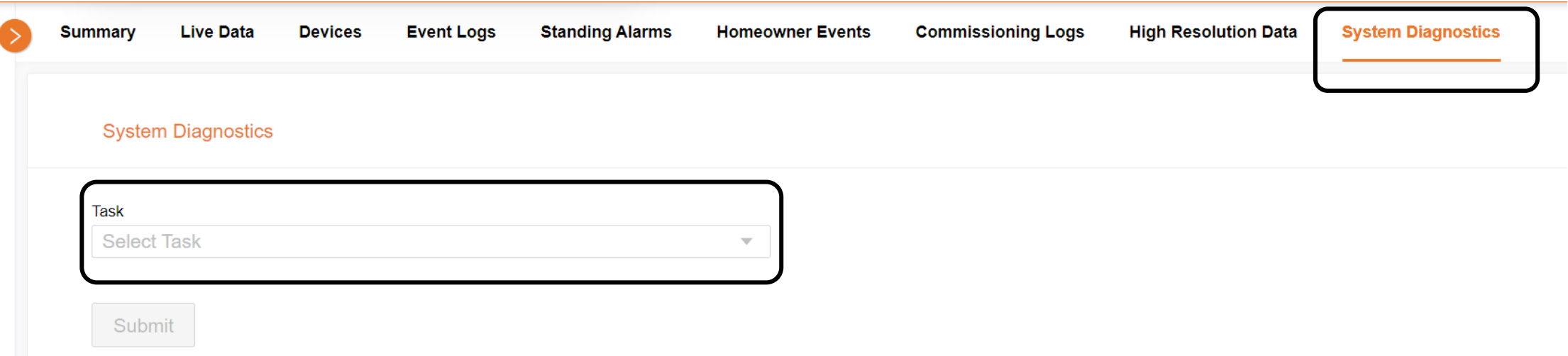
System Diagnostics

The **System Diagnostics** tool provides more Self Service options for IQ Gateway software versions 7.0.93 and up.

Select **System Dashboard** from beneath the upper taskbar.



Select **System Diagnostics**. Then, select the **Task** drop-down menu to view additional options and **Submit**.



System Diagnostics

System Diagnostics

Task

Provision Device

Serial numbers(Multiple serial numbers separated by ,)

Serial numbers(Multiple serial numbers separated by ,)

Submit

System Diagnostics

Task

Enable Or Disable Power Production

Production Mode

Production ON

Submit

Provision Device

From the drop-down menu, select **Provision Device**.

Enter the microinverter's serial number, separated by a comma if there is more than one serial number (not for backup hardware).

Select **Submit**.

Enable or Disable Power Production

From the top drop-down menu, select **Enable Or Disable Power Production**.

From the bottom drop-down menu, select either **Production ON** or **Production OFF**.

Select **Submit**.

To learn when to use this feature, refer to instructions on page 10.

System Diagnostics

System Diagnostics

Task

Change Consumption Meter State ▼

Meter State

Net ▼

Submit

Change Consumption Meter State

From the top drop-down menu, select **Change Consumption Meter State**.

From the bottom drop-down menu, select either **Net** for Load with Solar or **Total** for Load Only.

Select **Submit**.

System Diagnostics

Task

Reboot Gateway ▼

Submit

Reboot IQ Gateway remotely

From the top drop-down menu, select **Reboot Gateway**.

Select **Submit**.

System Diagnostics

After the options are submitted, the requested functions can be seen at the bottom of the page.

After the IQ Gateway has picked up and processed the tasks, the **Completed At** and the **Result** columns populate.

Some requests, such as **Check Tariff** or **Get Zigbee Status** display a **Response** link in the **Result** column to provide relevant information.

System Diagnostics

Task

Select Task

Gateway

Select Gateway

Submit

< 1 > 10 / page

| S No | CREATED | TYPE | GATEWAY | PARAMETER | CREATED BY | COMPLETED AT | RESULT |
|------|--------------------------------|----------------|---------|---|------------|--------------------------------|---------------------------|
| 1 | 2023/01/10 22:44:08 -08:00 PST | Force Update | Gateway | method=POST,uri=/ivp/firmware_manage Request | | 2023/01/10 22:44:27 -08:00 PST | Task complete Response |
| 2 | 2022/10/07 08:39:15 -07:00 PDT | Reboot Gateway | Gateway | | | 2022/10/07 08:40:22 -07:00 PDT | Task complete |

< 1 > 10 / page

Learning check

- Explain the purpose of the Enphase Installer Portal and when to use it
- Explain how to check and update the IQ Gateway software
- Explain how to enable and disable power production
- Explain how to remove, retire, and add microinverters
- Explain the self-serve options in the Enphase Installer Portal
- Explain the System Diagnostics features

Installer certification for IQ Battery and Sunlight Backup systems

Learning objectives

- Understand the requirements to obtain an installer certification
- Understand how to view installer certifications in the Enphase Installer Portal

Installer certification for IQ Battery and Sunlight Backup systems

An installer must be certified to commission or service an IQ Battery and Sunlight Backup systems.

Installers are qualified to commission and service IQ Battery systems if they have obtained the following certifications:

- Individual IQ Battery Installer Certification (earned by at least one person in the company)
- Individual IQ Battery Design Certification (earned by at least one person in the company)

A separate certification is required for IQ8 Microinverters with both Sunlight Backup and IQ Battery Backup systems (not applicable for PV only). For more information, [see the IQ8 training overview](#).

Getting certified

To learn more about the certification process, view FAQs, and start working toward certification, [see the Enphase Storage Installer authorization overview](#).

Installer certification for IQ Battery and Sunlight Backup systems

To view installer certifications, log in to the Enphase Installer Portal and refer to the following instructions.

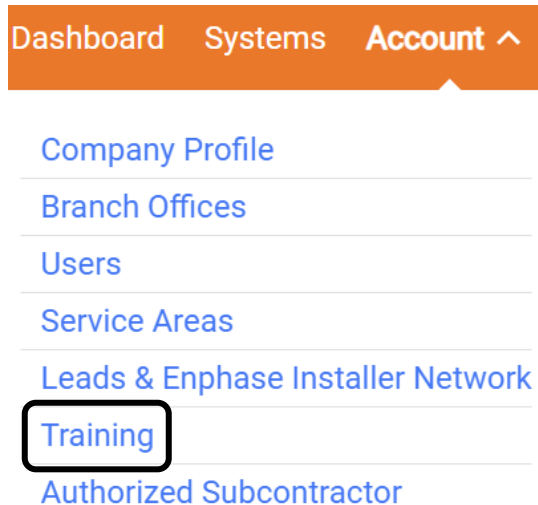
Step 1

Select the **Account** drop-down menu in the top taskbar.



Step 2

Select **Training** from the drop-down menu.

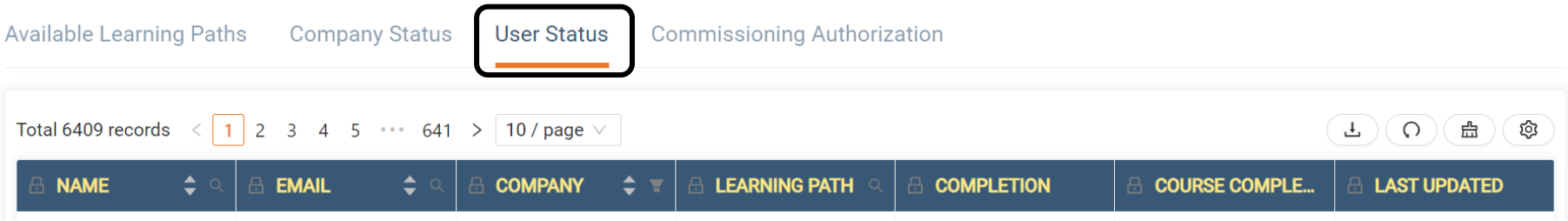


Installer certification for IQ Battery and Sunlight Backup systems

Step 3

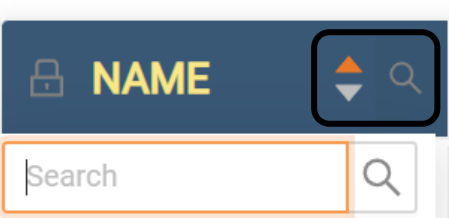
Select **User Status** from the middle taskbar.

A list of installers appears.



Step 4

Use the search icon or filtering options to search for an installer and view the certification status and completed courses.



Filtering is available in the **NAME**, **EMAIL**, and **LEARNING PATH** columns.

Learning check

- Explain the requirements to obtain an installer certification
- Explain how to view installer certifications in the Enphase Installer Portal

Update the IQ Gateway software



Learning objectives

- Understand how to check and update the IQ Gateway software in the Enphase Installer Portal
- Understand how to check and update the IQ Gateway software in the Enphase Installer App

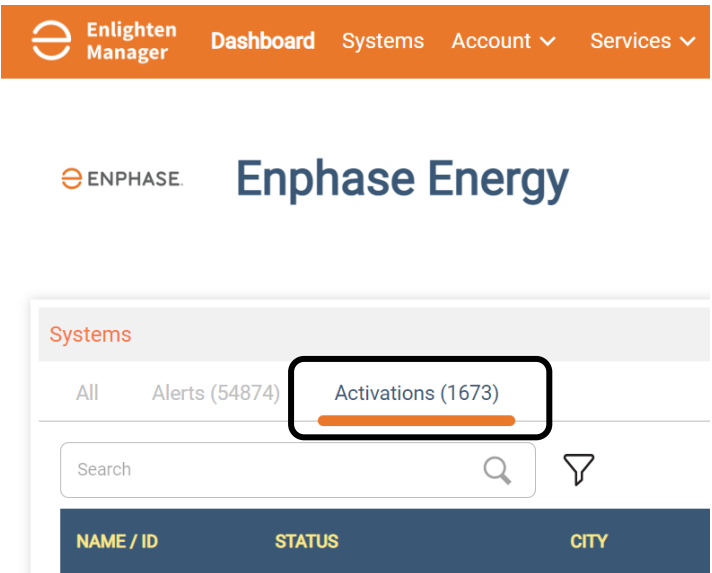
Update IQ Gateway software in the Enphase Installer Portal

An IQ Gateway must be connected to the Internet for software updates.

When updating remotely, the IQ Gateway should be connected to the internet with Wi-Fi or Ethernet. Use the Mobile Connect (cellular) as a backup internet source to avoid update failures.

To view available updates, log in to the Enphase Installer Portal and refer to the following instructions.

Step 1
In **Dashboard**, select the **Activations** tab.



Step 2
Enter the site name in the **Search** field.

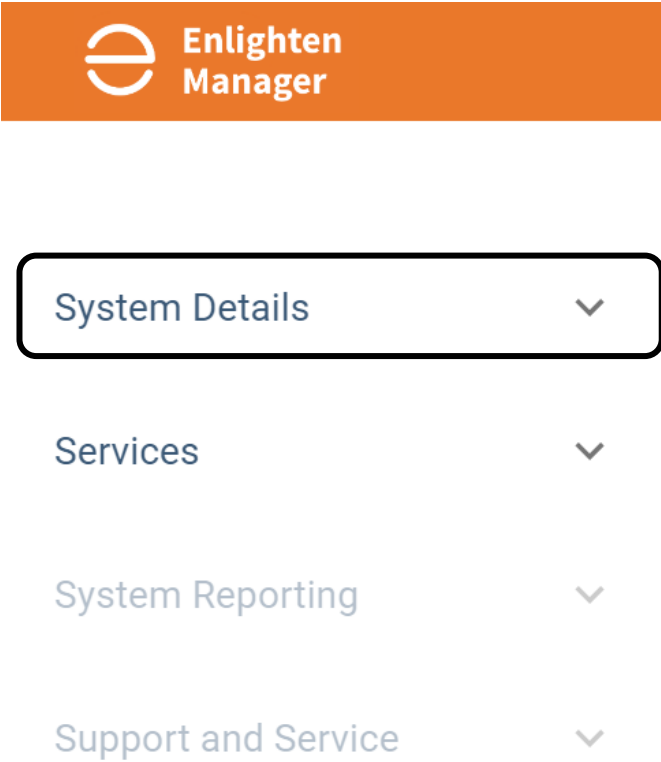


Select the site name from the list.

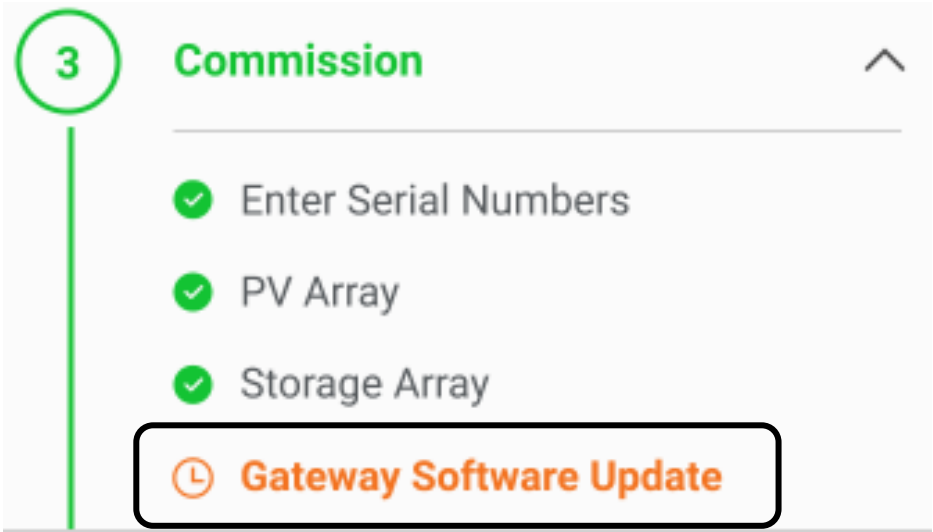
A new page appears.

Update IQ Gateway software in the Enphase Installer Portal

Step 3
Select the **System Details** tab in the left taskbar.



Step 2
Select **Gateway Software Update** from the Commission drop-down menu.



Update IQ Gateway software in the Enphase Installer Portal

Step 4

Check **Reporting Status** to verify that the IQ Gateway is online.

Step 5

If the IQ Gateway has an update available, select the **Update Firmware** option.

If the IQ Gateway does not have an available update, the page displays **Software is up-to-date**.

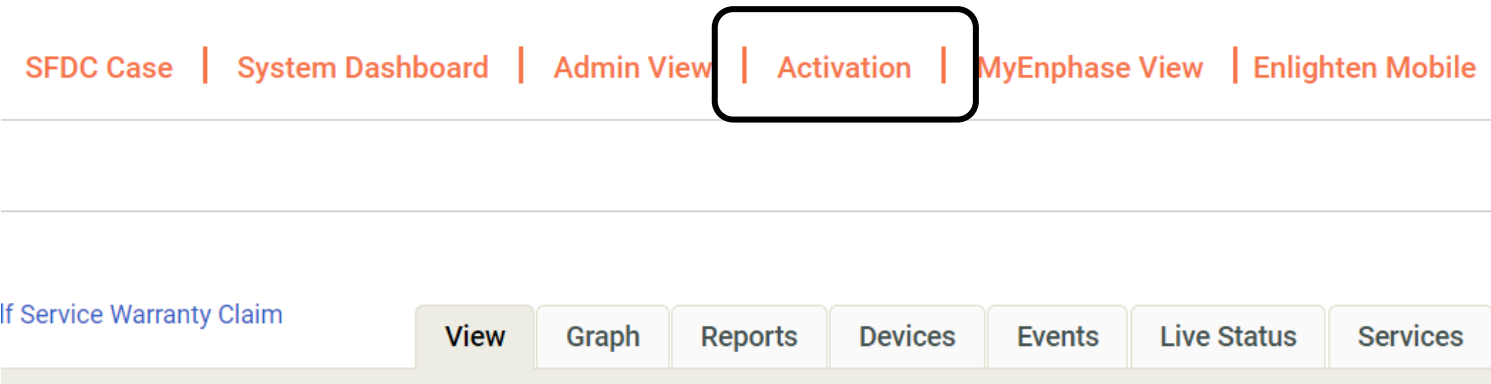
The IQ Gateways connected through Mobile Connect check for tasks once an hour but only report every six hours. As a result, remote requests (such as software updates) can take several hours before receiving confirmation.

The screenshot shows the Enphase Enlighten Manager interface. The top navigation bar includes links for Dashboard, Systems, Support, Account, Services, and Data & Privacy. The main section is titled 'Activations' and includes a sub-header 'Switch to old view' and tabs for List, Reports, Activations, Unmonitored Systems, and Register Unconnected Microinverters. The left sidebar contains a vertical list of steps: 1 Details, 2 Configuration, and 3 Commission. The 'Details' section is expanded, showing a list of items with green checkmarks: Name & Address, System Setup, Permit and Contract Dates, System Access, and Site Notes, Pictures & Docs. The 'Configuration' section is also expanded, showing a list of items with green checkmarks: Device Inventory, System Configuration, Power Controlled System (Optional), Backup Large Appliances (Optional), Auxiliary Contact Configuration, and Production Estimate. The 'Commission' section is expanded, showing a list of items with green checkmarks: Enter Serial Numbers, PV Array, Storage Array, and Gateway Software Update. The main content area displays the 'Gateway Software Upgrade' section for IQ Gateway - 122015012228. It includes a message: 'Please upgrade the Gateway to the recommended version to support the existing/newly added device configurations.' Below this is a highlighted orange button labeled 'Update Firmware to V 7.03.120'. To the right of the button, the 'Gateway Status' is shown: Reporting Status: Device Online, Last Report Date: 11/02/2020 12:25 AM PST, and First Report Date: 04/16/2020 06:09 PM PDT. Below the status, the 'Connectivity Status' is shown: Wi-Fi (Connected), Ethernet, and Cellular.

Update IQ Gateway software in the Enphase Installer Portal

For an alternative method to access the **Activations** page, log in to the Enphase Installer Portal and open the required site.

Select **Activation** from the taskbar above the tabs. The site’s activations are displayed.

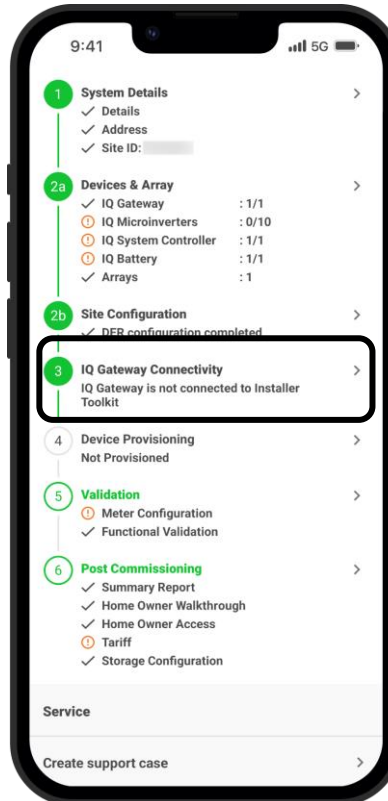


Update IQ Gateway software in the Enphase Installer App

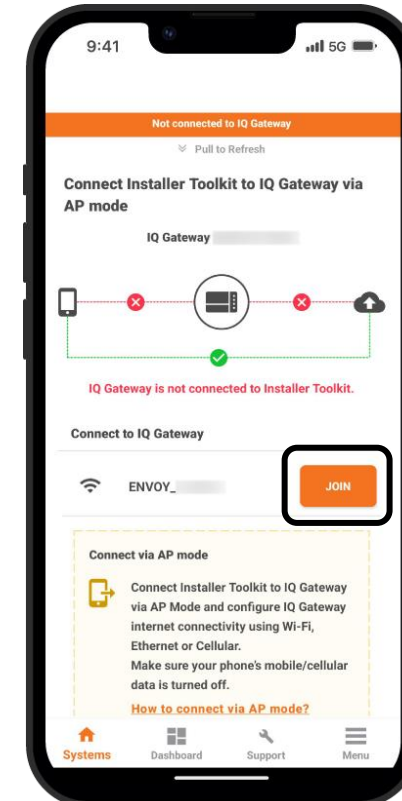


Step 1
After logging in, use the search bar to search for the **SITE NAME** or **SITE ID** of the homeowner.

Select the site.



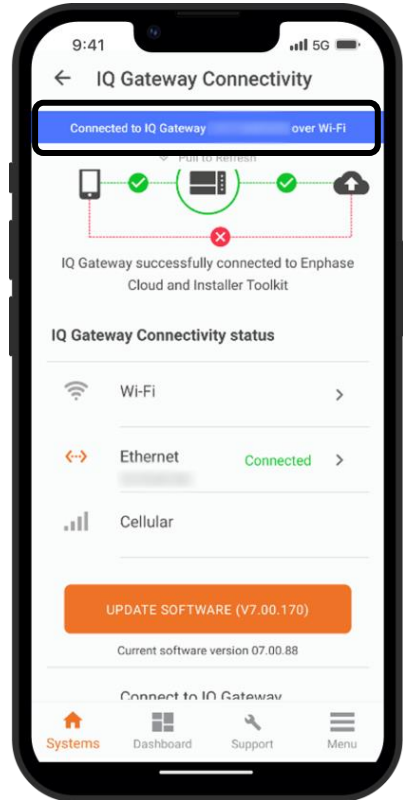
Step 2
Select **IQ Gateway Connectivity**.



Step 3
Turn on AP mode, then select **Join**.

For instructions to turn on AP mode, see [How do I Enable AP mode on the Envoy-S or IQ Gateway?](#)

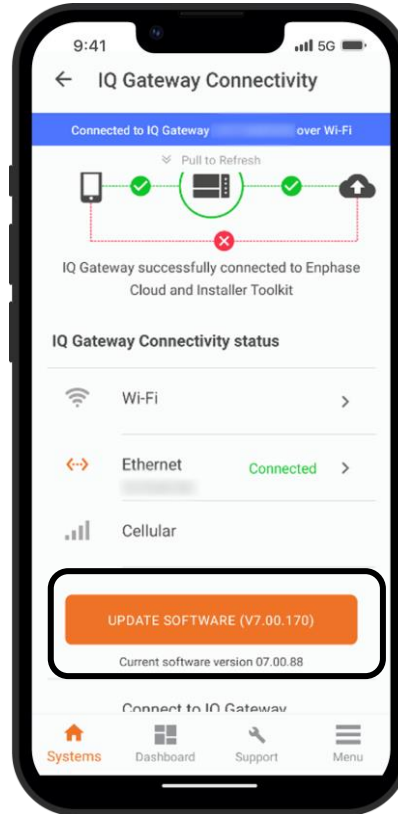
Update IQ Gateway software in the Enphase Installer App



Step 3

Verify that the IQ Gateway is online.

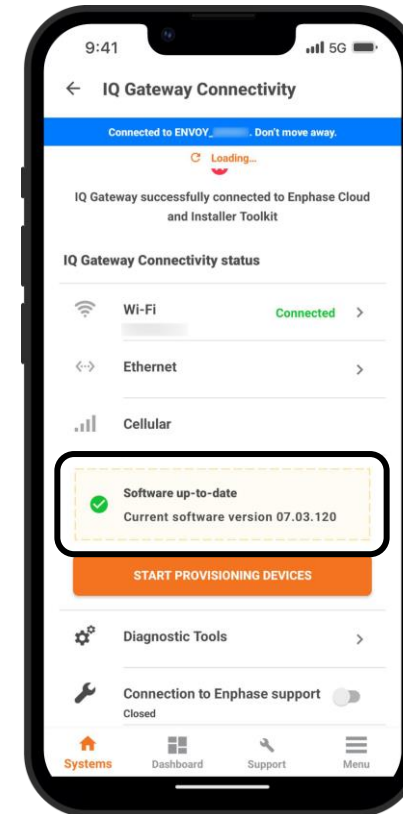
If the banner turns blue, the IQ Gateway is online.



Step 4

If an update is available, the orange button displays the message **Update Software** and the version. Select this option if available.

If this button does not appear, the IQ Gateway does not need an update.



Step 5

The update can take up to 30 minutes.

The Enphase Installer App displays a message after transferring the mobile software files. The IQ Gateway reboots, and AP mode turns off automatically.

The update is now complete.

Update IQ Gateway software in the Enphase Installer App

If the update fails, refer to page 57 to power cycle the IQ Gateway.

Then, restart the mobile device. After the IQ Gateway and mobile device restart, reconnect to the IQ Gateway and try the update again.

Learning check

- Explain how to check and update IQ Gateway software in the Enphase Installer App
- Explain how to check and update IQ Gateway software in the Enphase Installer Portal

Request an RMA



Learning objectives

- Understand how to request an RMA in the Enphase Installer App
- Understand how to request an RMA in the Enphase Service Manager

Request an RMA

If all appropriate troubleshooting has been completed without resolution, installers can submit an RMA request on the hardware.

Installers can log in to the [Enphase Service Manager](#) or the [Enphase Installer Portal](#) to submit an RMA request.

When submitting an RMA request, installers must provide all troubleshooting details such as steps performed, voltages found in testing, and images of the test locations. If steps are incomplete or missing, the RMA will be denied.

[See the Enphase YouTube training video](#) to learn more about RMA requests.

Request an RMA in the Enphase Installer App

To request an RMA in the Enphase Installer App, refer to the following instructions.

Step 1

Log in to the Enphase Installer App and open the site.

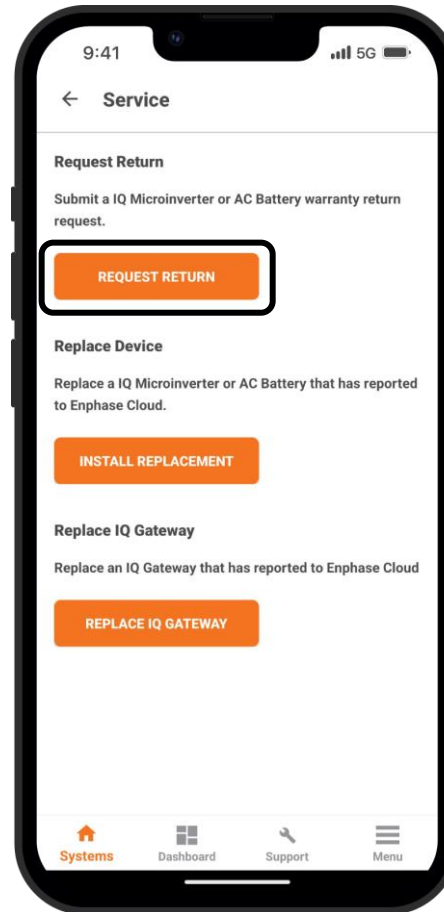
Step 2

Scroll to the **Service** section and select **Request return and Install replacement**.

Step 3

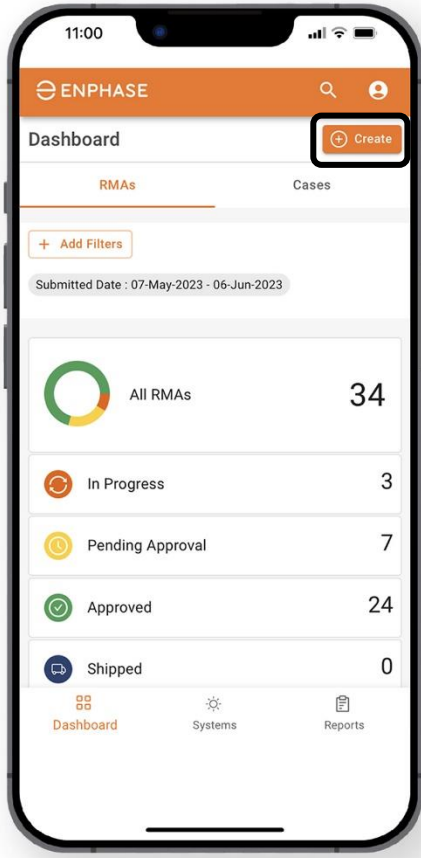
Select **REQUEST RETURN**.

For additional instructions, see the [Self service return and replacement tech brief](#).



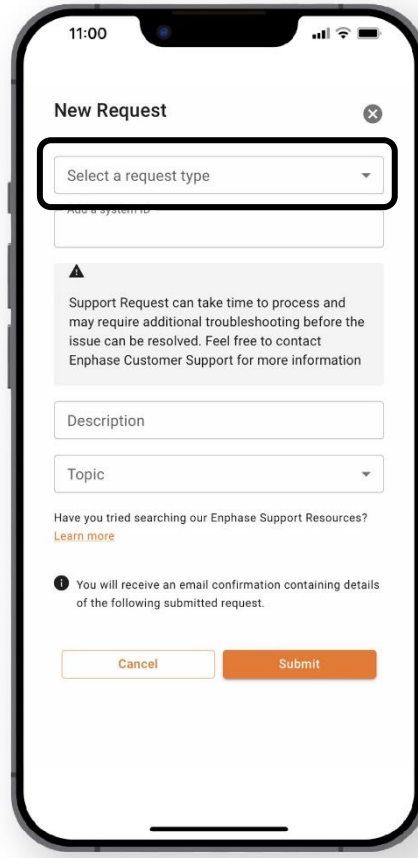
Request an RMA in the Enphase Service Manager

After signing into the Enphase Service Manager, installers can create new RMAs from the **Dashboard**.

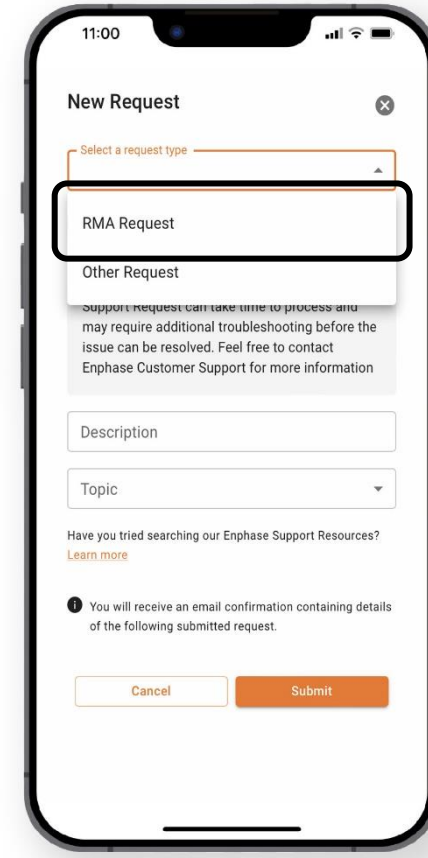


Step 1
Select **Create**
in the upper-
right corner.

The **New Request** form appears.



Step 2
From the
Select a
request type
drop-down
menu, select
RMA Request.



Request an RMA in the Enphase Service Manager

Step 3
Enter the Site ID and a description of the request in the provided fields.

Step 4
Select the **Topic** drop-down menu.

Step 5
Select a topic relevant to the RMA request, then select **Submit**.

A confirmation email is sent automatically.

Learning check

- Explain how to request an RMA in the Enphase Installer App
- Explain how to request an RMA in the Enphase Service Manager

Troubleshooting IQ Gateway issues



Learning objectives

- Understand all IQ Gateway LED indications
- Understand how to power cycle an IQ Gateway
- Understand how to troubleshoot an IQ Gateway with inactive LEDs
- Understand how to troubleshoot an IQ Gateway that is continuously rebooting
- Understand how to troubleshoot AP mode not broadcasting
- Understand how to troubleshoot a Mobile Connect
- Understand how to troubleshoot an offline IQ Gateway when using a Wi-Fi extender
- Understand tips for staying connected on a mesh Wi-Fi network

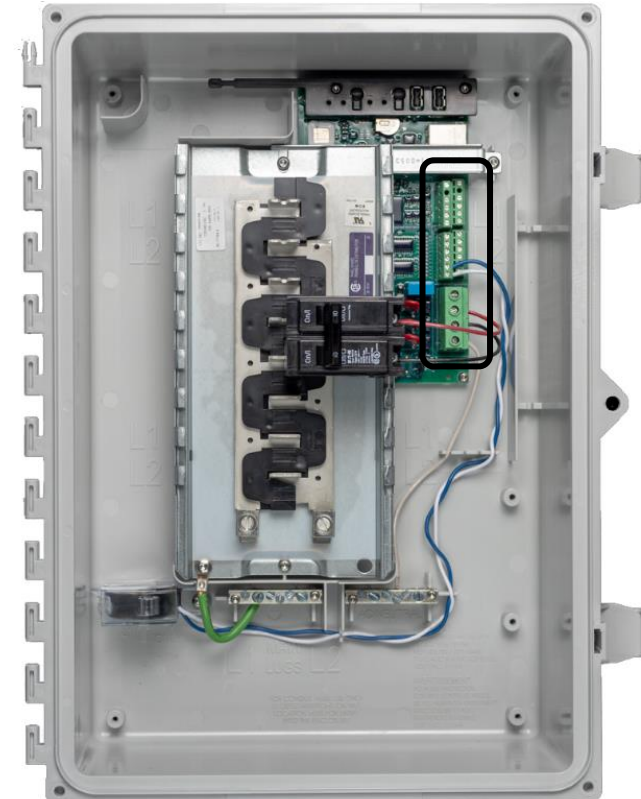
IQ Combiner Gateway vs standalone IQ Gateway

The IQ Combiner box uses the same IQ Gateway setup as the standalone IQ Gateway.

Standalone IQ Gateway



IQ Combiner



The IQ Gateway in the IQ Combiner box does not have black plastic casing and is rotated 90 degrees.

IQ Gateway: LEDs and buttons

The IQ Gateway has four LED indicators and two buttons.

Refer to the following pages to understand what each LED indicator and button means.

IQ Combiner LED and button arrangement



Standalone IQ Gateway LED and button arrangement







IQ Gateway: LEDs and buttons

LED indicators on the IQ Gateway (Envoy S)




Enphase Cloud communication LED

-  Green when an internet connection is available and connected to the Enphase Cloud
-  Flashing green when attempting to connect to the Enphase Cloud
-  Solid amber when connected to the local network only i.e., no internet
-  Off if no network is available

IQ Gateway: LEDs and buttons



AP mode LED

 Green when AP mode is enabled and the Gateway's Wi-Fi network is available.

 Off when AP mode is disabled.

Off is default unless the AP mode is enabled.



AP mode button






Starts the Gateway's wireless Access Point (AP) to connect a mobile phone directly.

*The AP mode button also provides WPS to pair the IQ Gateway to a wireless network without homeowner credentials.

IQ Gateway: LEDs and buttons



Power production LED

-  Green light when all microinverters are producing power.
-  Flashing green when an upgrade of the microinverters is in progress.
-  Amber if one or more microinverters stop producing power.
-  Flashing amber when microinverters are not yet detected.
-  Off if all the microinverters stop producing or communicating.

IQ Gateway: LEDs and buttons



Device communication LED

..... Flashing green when the Gateway is scanning for microinverters.

—— Green when all microinverters at the site are communicating with the Gateway.

—— Amber if one or more microinverters are not communicating with the Gateway.

—— Off if all the microinverters are not communicating with the Gateway.

IQ Gateway: LEDs and buttons



Device scan button

Only used by the installer during installation or to configure the system.

Starts/stops a 15-minute scan for devices over the power line.

All LED's



Flashing green when a software upgrade is in progress.



Flashing amber when IQ Gateway is booting up.

*While the device scan button is an available option, it is recommended to use the Enphase Installer App to scan the specific serial numbers and provision.

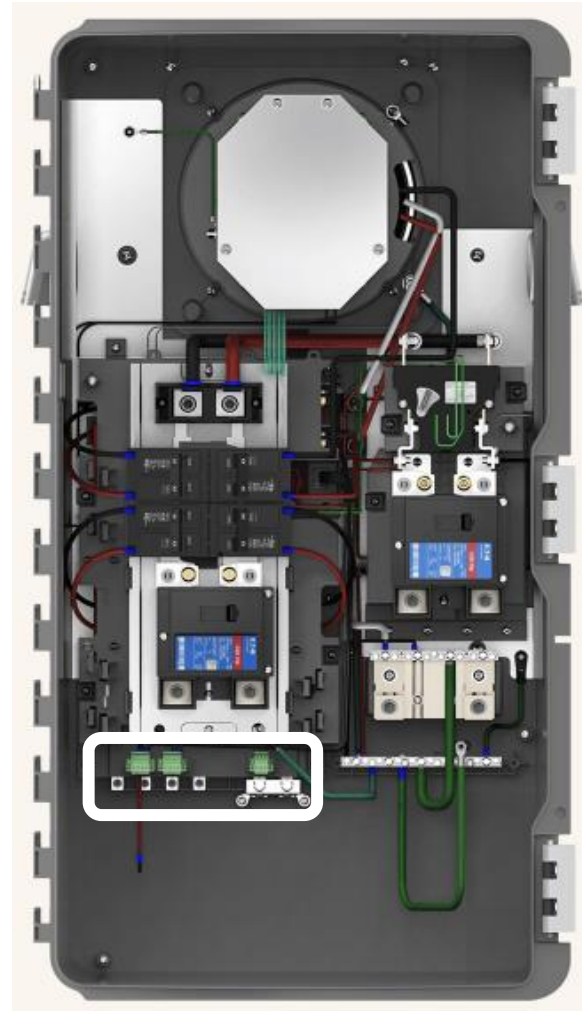
Identifying IQ System Controller 1 vs. IQ System Controller 2

Beyond checking the sticker on the inside of the door, the easiest way to differentiate between the IQ System Controller 1 and IQ System Controller 2 is to check the number of green wire terminals at the bottom of the system controller.

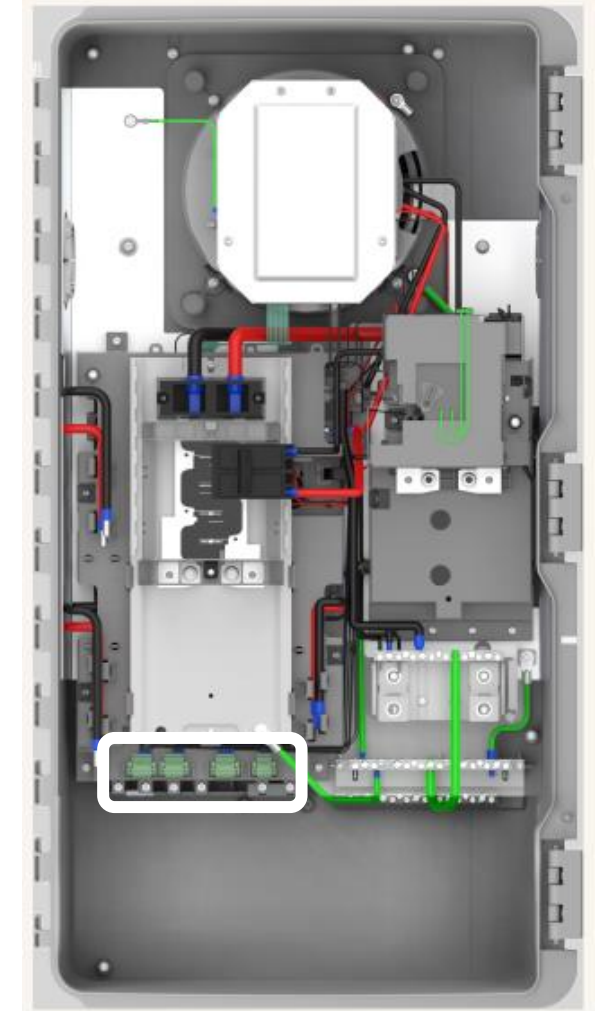
The IQ System Controller 1 has 3 green terminal blocks, as shown on the left.

The IQ System Controller 2 has 4 green terminal blocks, as shown on the right.

Generation 1



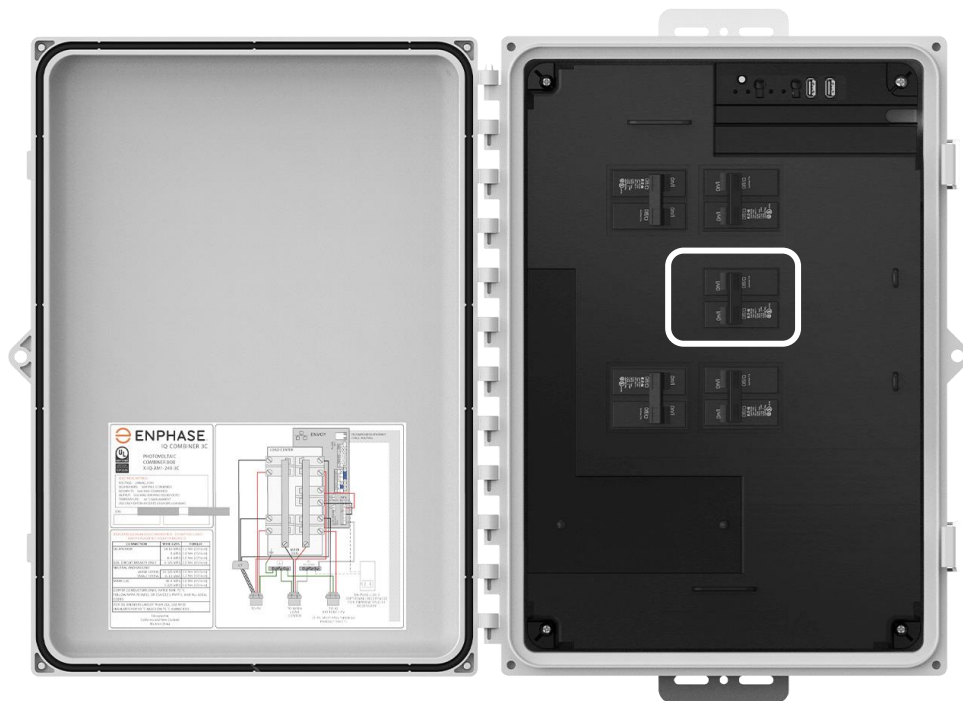
Generation 2



IQ Gateway: IQ System Controller 1 power cycle

The IQ Gateway breaker is inside the IQ Combiner for PV and IQ System Controller 1 installations.

To power cycle the IQ Gateway, follow these steps:



Step 1

Switch the breaker to power OFF the IQ Gateway.

Step 2

Wait for five minutes, then switch the breaker again to restore power.

IQ Gateway: IQ System Controller 2 power cycle

For installations using the IQ System Controller 2, the IQ Gateway breaker should be relocated to the system controller.

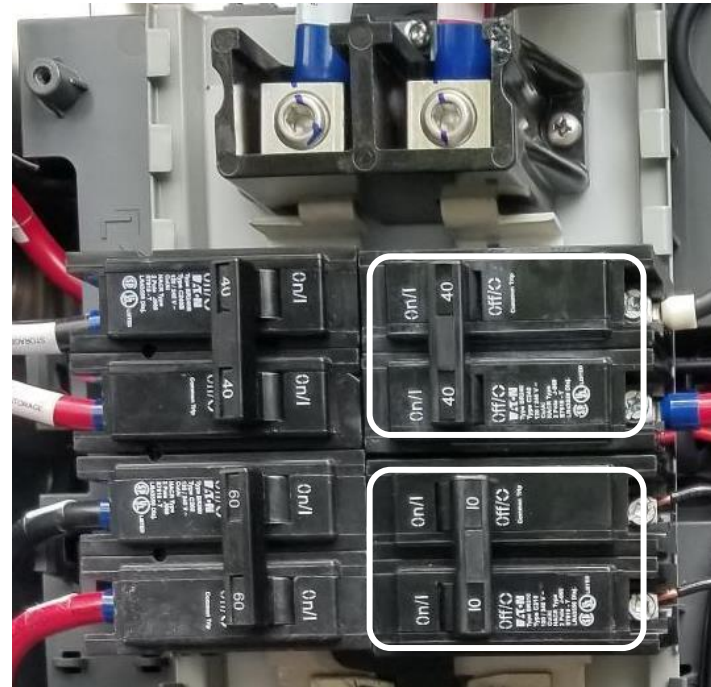
To power cycle the IQ Gateway, follow these steps:

Step 1

Switch the breaker to power OFF the IQ Gateway.

Step 2

Wait for five minutes, then switch the breaker again to restore power.



The IQ Gateway on the outer 20 A poles of the 4-pole breaker is in the upper right of the System Controller.

The IQ Gateway with a 10 A breaker is in the lower right of the System Controller.

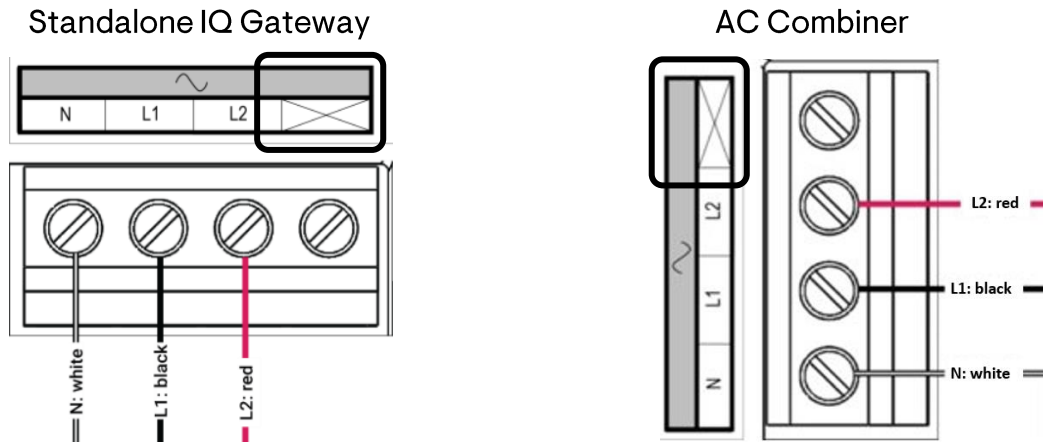
IQ Gateway troubleshooting: Inactive LEDs

If the IQ Gateway LEDs do not light up, refer to the following instructions.

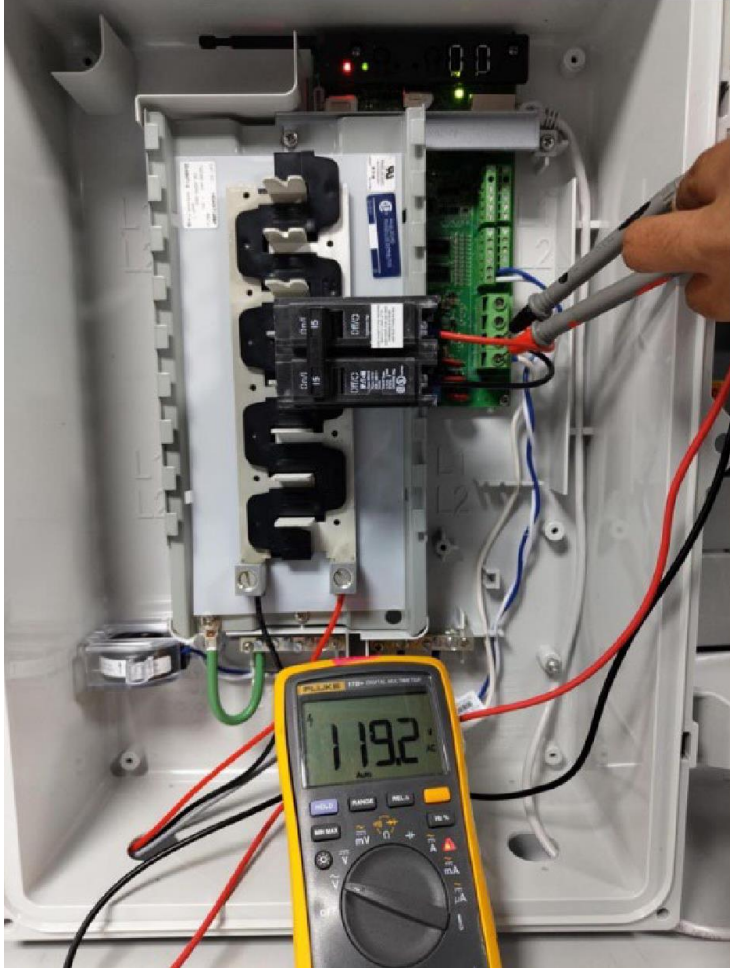
Step 1

Verify that the wiring for the IQ Gateway is correct, as shown below.

The lug indicated is NOT meant to be used during installation. Verify that the lug is not in use, as it can cause power issues to the IQ Gateway.



IQ Gateway troubleshooting: Inactive LEDs



Step 2

Test the voltages at the IQ Gateway terminal block, as shown.

Testing must last between 30 and 60 seconds to verify if the voltage fluctuates.

The voltage must measure 120 VAC ($\pm 10\%$ across Line 1 to Neutral) and 240 VAC ($\pm 10\%$ across Line 1 and Line 2).

If the voltmeter does not read the correct voltages, power cycle the IQ Gateway.

Test voltages again. If the voltage still fluctuates greatly, refer to the instructions on page 62.

IQ Gateway troubleshooting: Inactive LEDs

Step 3

After the correct voltage reaches the IQ Gateway, a green LED light appears behind the USB ports.

It can take up to 30 seconds for the green LED to appear.

If correct voltages are present on the terminal block but the LEDs do not light up, power cycle the IQ Gateway.

If correct voltages are present on the terminal block but the LEDs do not light up even after the power cycle, request an RMA.

IQ Gateway troubleshooting: Inactive LEDs additional tips

Have issues troubleshooting inactive LEDs? Refer to the following additional tips.

If the voltmeter does not read the correct voltages, backtrack each connection and check the voltage at the breaker.

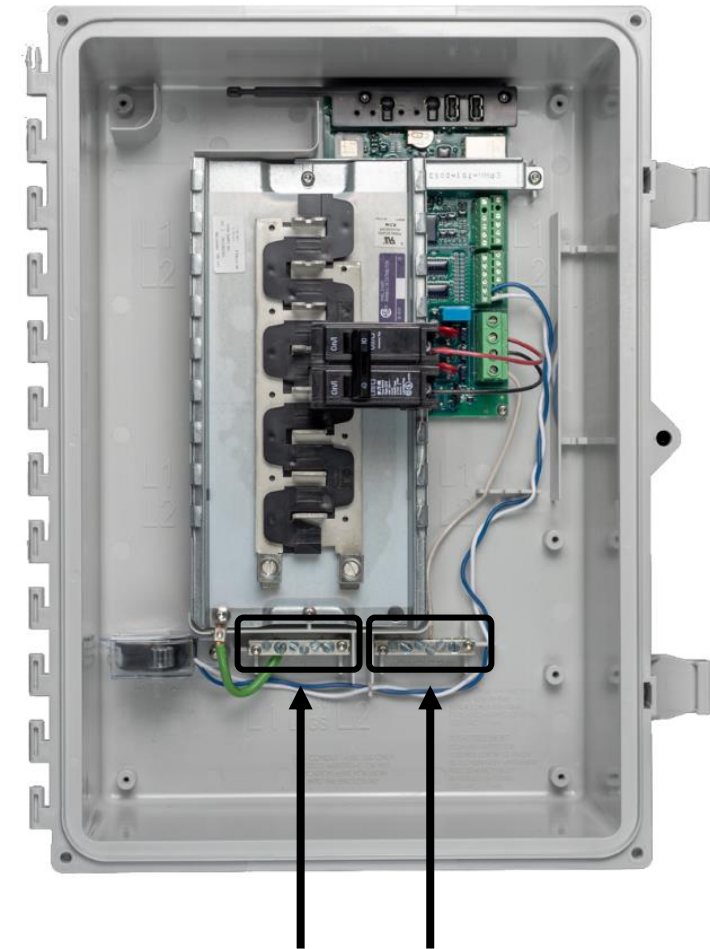
Continue this process until the issue is found. After the issue is resolved, test the voltages.

If the voltages vary greatly when testing Line 1 or 2 to Neutral, then the issue is likely in the Neutral.

Confirm that the Neutral and Ground wires run to the combiner.

To test the Neutral, create a jumper between the Neutral bar and the Ground bar, then retest. If the voltages stabilize, backtrack the Neutral to determine where the issue is.

After the issue is resolved, remove the jumper and test the voltages.



Ground bar Neutral bar

IQ Gateway troubleshooting: Continuously rebooting

IQ Gateway may continuously reboot, possibly displaying green LEDs before flashing amber.

If the IQ Gateway software was recently updated, the IQ Gateway will reboot several times before stabilizing. During an active software update, you will see the four lights of the IQ Gateway cascading from one side to the other while it updates.

The older the software version is, the more updates and reboots happen.

If the issue persists for more than 30 minutes, refer to the instructions provided in the following pages.

IQ Gateway troubleshooting: Continuously rebooting

Step 1

Test to verify that the IQ Gateway receives correct and consistent voltages.

If the IQ Gateway continuously stabilizes and displays green LEDs for five minutes or more before rebooting, refer to step 2A.

If the IQ Gateway continuously reboots but does not stabilize and display green LEDs for at least five minutes, refer to step 2B.

Step 2A

If the IQ Gateway continuously stabilizes and displays green LEDs for five minutes or more before rebooting, contact Enphase Support.

Step 2B

If the IQ Gateway continuously reboots but does not stabilize and display green LEDs for at least five minutes, power cycle the IQ Gateway.

If the IQ Gateway does not stabilize and remains in an active state, the issue cannot be resolved remotely, and an RMA is required.

Ensure the voltages found in testing are included in the RMA request, with images showing where it was tested.

IQ Gateway troubleshooting: AP mode not broadcasting a Wi-Fi network

For installers and homeowners to perform limited tasks, the IQ Gateway broadcasts its own Wi-Fi network.

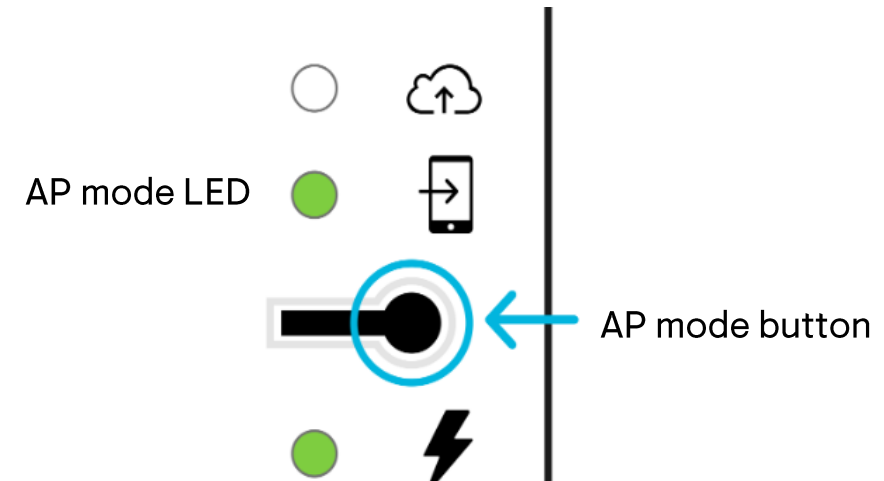
Step 1

Verify that the IQ Gateway is powered ON by checking for active LEDs.

If the LEDs are inactive, refer to instructions on page 59 to troubleshoot.

Step 2

Briefly press (do not hold) the AP mode button. The AP mode LED will illuminate green.



IQ Gateway troubleshooting: AP mode not broadcasting a Wi-Fi network

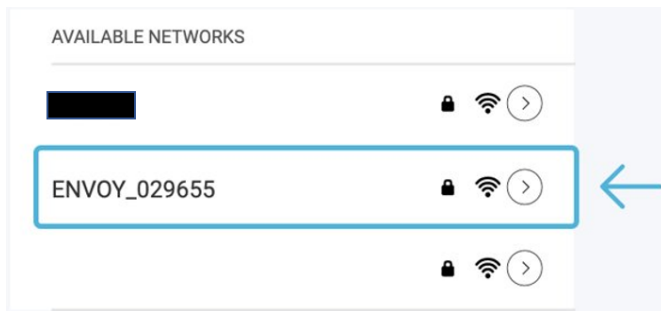
Step 3

Stay close to the IQ Gateway, open the **Settings** on a mobile device, and select **Wi-Fi**.

From the list of available networks, select the option that looks similar to the network name below:

ENVOY_xxxxxx

The last six digits of the network is the IQ Gateway serial number.



No connection?

If the AP mode LED is active, but the IQ Gateway network name does not appear, power cycle the IQ Gateway.

After the IQ Gateway has rebooted, press the AP mode button again and check for the IQ Gateway Wi-Fi network on a mobile device.

Still no connection?

If the issue persists, try these directions again with another mobile device.

If multiple mobile devices do not display the IQ Gateway network name, request an RMA.

Describe all troubleshooting details in the RMA request, including images of the IQ Gateway showing AP mode active and screenshots of the Wi-Fi network list.

IQ Gateway troubleshooting: Mobile Connect

If the IQ Gateway Mobile Connect is not working, verify that the software is updated to 7.3.120 or later. Then, refer to the following instructions.

Step 1

Verify that the Mobile Connect LEDs are illuminated.

Having issues?

If no Mobile Connect LEDs are lit, verify that the IQ Gateway is powered ON.

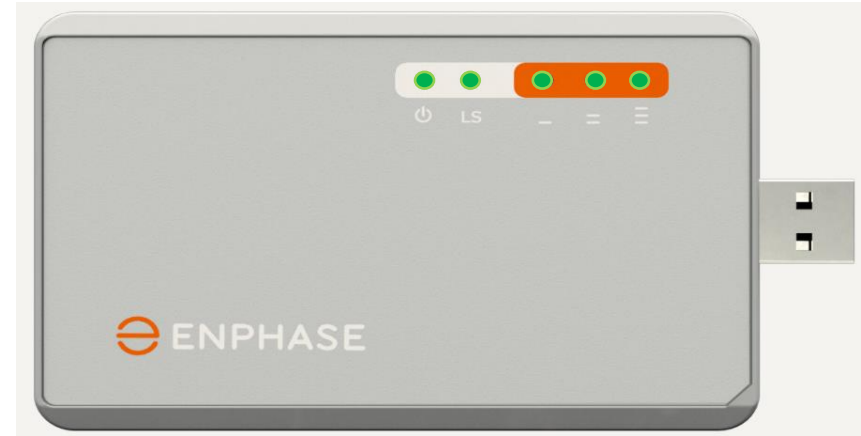
If the IQ Gateway is powered ON, power OFF the IQ Gateway. Wait at least five minutes, then power back ON. Check the Mobile Connect LEDs again.

If they are illuminated, proceed to step 2 on page 68.

Still having issues?

If no Mobile Connect LEDs illuminate after rebooting the IQ Gateway, plug the Mobile Connect into the other IQ Gateway USB port. If both ports are in use, swap the two devices plugged into them.

If one USB port fails to provide power to the Mobile Connect or Communications Kit, request an RMA. If the Mobile Connect fails to boot up in both USB ports, then a replacement Mobile Connect is required.



IQ Gateway troubleshooting: Mobile Connect

Step 2

Verify the cellular signal for the area by checking the cell modem.



The blue Multitech modem uses only AT&T.

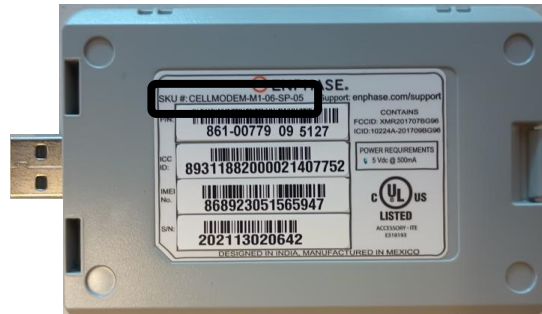
SKU: Cellmodem-M1



The grey Enphase modem uses different cellular signals.

To determine the cellular signal the modem uses, check the SKU on the sticker on the back.

Cellmodem-M1-06-AT-05 uses AT&T
Cellmodem-M1-06-SP-05 uses T-Mobile/Sprint



Open [FCC Mobile LTE Coverage Map](#), [OpenSignal](#), or [Cellmapper](#), and select the correct mobile service provider to view the appropriate map for the provider.

If the cellular signal is weak, inform the homeowner and remind them that Mobile Connect is recommended as backup internet source only.

IQ Gateway troubleshooting: Offline when using a Wi-Fi Extender

If the IQ Gateway is reporting offline when it should be connected to a Wi-Fi extender, refer to the following instructions.

Step 1

Verify that the Wi-Fi extender is powered ON. If required, see the Wi-Fi extender's instruction manual.

Step 2

Verify that the Wi-Fi extender is connected to the main Wi-Fi network, and connection shows at least three bars.

Step 3

Verify that the Wi-Fi extender's network is within range of the IQ Gateway. Then, verify that the IQ Gateway Wi-Fi is connected to the Network extender's network. The Wi-Fi extender's network usually includes **_EXT**.



NETGEAR95_EXT

IQ Gateway troubleshooting: Maintaining connection to a mesh network

Because mesh networks constantly rotate IP addresses on their connection points, IQ Gateways may lose connection.

Mesh networks include and are not limited to Netgear's Orbi system, Google's Nest system, Linksys' Atlas system, TP-Link's Deco, and Eero.

Some mesh networks have the option to disable mesh roaming, which allows devices to move between Wi-Fi nodes for connected devices. To disable mesh roaming, follow these steps:

Step 1

Power down all mesh nodes except the mesh node closest to the IQ Gateway.

Step 2

Delete the previous network from the IQ Gateway list of known networks.

Step 3

Connect the IQ Gateway to the remaining mesh node's network.

IQ Gateway troubleshooting: Maintaining connection to a mesh network

Step 4

After the IQ Gateway is connected, open the mesh network settings and disable mesh roaming for the IQ Gateway.

Step 5

Reconnect the other mesh nodes to restore the mesh network.

For information about disabling mesh networks, see the mesh network's documentation or contact the mesh network devices' manufacturer directly.

IQ Gateway troubleshooting: Maintaining connection to a mesh network

Here are some additional mesh network tips.

Some mesh network Wi-Fi nodes and Wi-Fi extenders have an Ethernet port to run an Ethernet cable from the IQ Gateway to the node. This prevents the loss of connection due to the switching of IQ Gateway between nodes.

Mesh-compatible Wi-Fi extenders can also be added to connect the IQ Gateway to Wi-Fi or Ethernet.



Learning check

- Explain all IQ Gateway LED indications
- Explain how to power cycle an IQ Gateway
- Explain how to troubleshoot an IQ Gateway with inactive LEDs
- Explain how to troubleshoot an IQ Gateway that is continuously rebooting
- Explain how to troubleshoot AP mode not broadcasting
- Explain how to troubleshoot a Mobile Connect
- Explain how to troubleshoot an offline IQ Gateway when using a Wi-Fi extender
- Explain some tips for staying connected on a mesh Wi-Fi network

Communications Kit Troubleshooting



Learning objectives

- Understand how to remotely troubleshoot the Communications Kit
- Understand how to troubleshoot the Communications Kit on-site
- Understand how to troubleshoot no LEDs on the Zigbee Stick
- Understand how to troubleshoot Zigbee Extender issues
- Understand how to troubleshoot Communications Kit distance issues

Remotely troubleshooting the Communications Kit

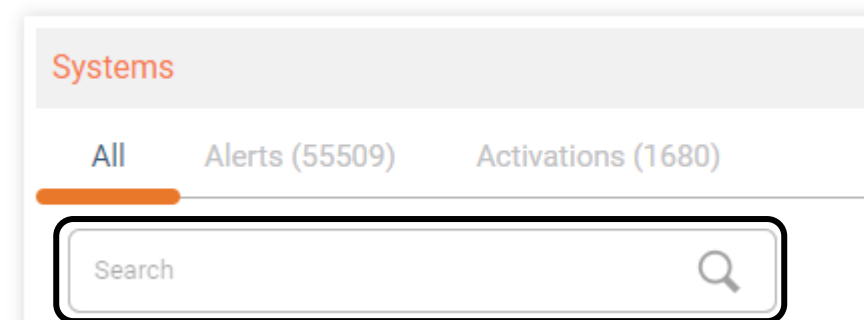
The Communications Kit enables Zigbee wireless communication between the IQ Battery, IQ System Controller, and the IQ Gateway.

To determine if the Communications Kit is the source of the issue, log in to the Enphase Installer Portal and follow these steps:

Step 1

Find the site using the **Search** field.

Select the site when it appears.



Step 2

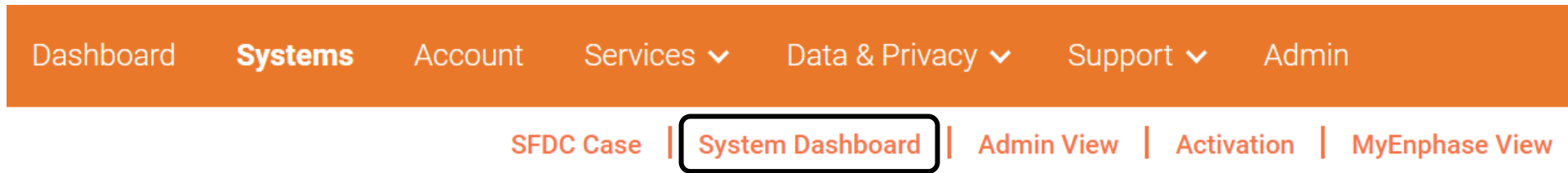
To verify that PV reporting is current, select the **Devices** tab and check the **Last Report Date**.

If the last PV report is not current, then the IQ Gateway may still be syncing data. Refresh the page after an hour.

Remotely troubleshooting the Communications Kit

Step 3

Select **System Dashboard**. The **Summary** page appears.



Step 4

Verify that the IQ Gateway is reporting and data is caught up by checking the **Last Report** data.



If the **DATE CAUGHT UP TO** data is current, but the data for PV and other equipment is not current, this is not a Communications Kit issue. Contact Enphase Support to resolve this.

Remotely troubleshooting the Communications Kit

Step 5

Compare the **Last Report** date from the **IQ Gateway** section, the **IQ System Controller** section, and the **IQ Batteries** section.

IQ System Controller

| Serial No | Status | RSSI 2.4GHz | Operation Mode | App FW | Last Report |
|-----------|---------------------------------|-------------|------------------------------------|--------------------|--------------------------------|
| | System controller Not Reporting | (-54 dBm) | Grid Connected - IQ Batteries C... | 2.0.5229_rel/22.13 | 2023/06/08 17:33:04 -04:00 EDT |

IQ Batteries(No. of IQ Batteries: 3)

| Operation Mode | Led Status | Phase | SoC | App FW | No of Microinverters | Not Reporting | Last Report |
|----------------------------|--------------------------------------|-------|-----|--------------------|----------------------|---------------|----------------------------|
| Multi-mode On Grid, Idle | Battery capacity is between: 75-100% | L1(A) | | 2.0.5663_rel/22.13 | 4 | 4 | 2023/06/08 17:28:37 -04... |
| Multi-mode On Grid, Dis... | Discharging | L1(A) | | 2.0.5663_rel/22.13 | 4 | 4 | 2023/06/08 17:32:39 -04... |
| Multi-mode On Grid, Idle | Battery capacity is between: 75-100% | L1(A) | | 2.0.5663_rel/22.13 | 4 | 4 | 2023/06/08 17:29:14 -04... |

While the IQ Gateway is reporting caught-up data, verify that the IQ System Controller and IQ Batteries stopped reporting at approximately the same time. If only one unit is affected, it is not a Communications Kit issue.

This applies to all backup hardware. This can apply to Sunlight Backup as well, if relevant.

Remotely troubleshooting the Communications Kit

If the IQ Battery, IQ System Controller, and IQ Gateway stopped reporting at approximately the same time, refer to the following instructions.

Step 6

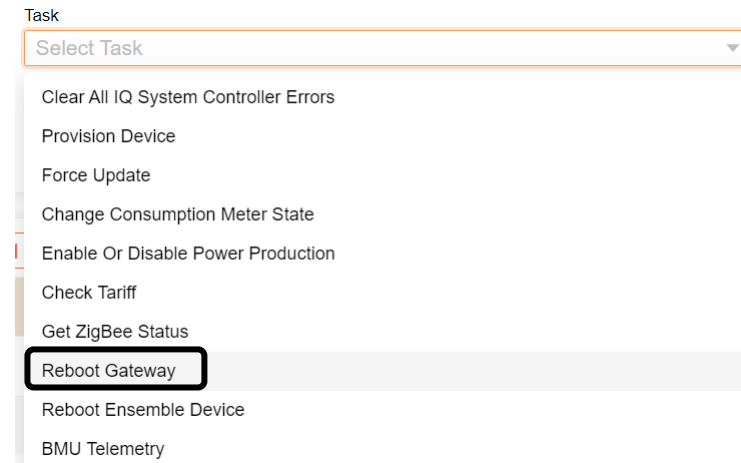
From the System Dashboard, select **System Diagnostics** in the top-right corner.



Step 7

From the **Task** drop-down, select **Reboot Gateway**, then **Submit**.

When the task is processed and completed, it displays the time and date of completion in the **System Diagnostics** list.



Remotely troubleshooting the Communications Kit

Task

Select Task

Submit

Clear All IQ System Controller Errors

Provision Device

Force Update

Change Consumption Meter State

Enable Or Disable Power Production

Check Tariff

Get ZigBee Status

Reboot Gateway

Reboot Ensemble Device

BMU Telemetry

Step 8
When the reboot is completed, select **Get Zigbee Status** from the **Task** drop-down menu.

Select **Submit**.

| COMPLETED AT | RESULT |
|--------------------------------|----------------------------------|
| 2023/01/09 14:02:53 -08:00 PST | Successful. See the @enphase.com |
| 2023/01/09 12:58:05 -08:00 PST | Successful. See the @enphase.com |
| 2023/01/02 11:37:06 -08:00 PST | Successful. See the @enphase.com |
| 2022/11/14 14:57:46 -08:00 PST | Successful. See the @enphase.com |
| 2022/08/04 19:24:42 -07:00 PDT | Task complete Response |
| 2022/08/03 09:15:41 -07:00 PDT | Successful. See the @enphase.com |
| 2022/01/21 11:00:44 -08:00 PST | Successful. See the @enphase.com |
| 2022/01/21 11:00:50 -08:00 PST | Successful. See the @enphase.com |
| 2022/01/21 11:00:54 -08:00 PST | Successful. See the @enphase.com |
| 2022/01/21 11:00:57 -08:00 PST | Successful. See the @enphase.com |

Step 9
When the task is completed, select **Response**.

Remotely troubleshooting the Communications Kit

Step 10

In the response, check the values of the first two statements, *zb is_device_connected* and *zb is_init_done*.

If the values are **false**, on-site troubleshooting is required for the Communications Kit.

If the values are **true**, the reboot may have fixed the issue. Proceed to step 11.

Step 11

Check the value of the third statement, *zb serial_number*.

If the value contains all zeroes, reboot the IQ Gateway.

If the issue persists, contact Enphase Support.

If the values of the first two statements are **true** and the value of the third statement is not zeroes, allow 12-24 hours for the IQ Gateway to report.

Response

```
{
  "state": {
    "zb is_device_connected": true
    "zb is_init_done": true
    "zb serial_number": "00:00:00:00:00:00:00:00"
    "Zigbee_PowerLevel": -255
    "zb firmware ver": "0x0"
    "zb channel_num": "0x00"
    "zb pan_id": "0x00 0x00"
    "zb ext_pan_id":
      "0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00"
    "zb error_rate": "0"
    "zb dongle_serial_number": ""
    "zb max_pyld_size": 255
    "zb num_joined_nodes": 0
    "zb joined_nodes": []
    "zb 15.4 is_device_connected": true
  }
}
```

Troubleshooting the Communications Kit on-site

A Communications Kit enables wireless communication between the IQ Battery, IQ System Controller, and IQ Gateway.

Step 1






Power cycle the IQ Gateway.

Step 2

Connect the Enphase Installer App to the IQ Gateway. Refer to instructions on page 36.

Step 3

Open the site and check for error messages pertaining to the Communications kit.

- | | |
|---|--|
|  No Cell Modem detected |  Cell Modem detected |
|  No Comms Kit detected | |
|  Wi-Fi or Ethernet detected |  Wi-Fi or Ethernet detected |

Proceed to **Device Provisioning**.

Troubleshooting the Communications Kit on-site

Step 4

Select **Device Provisioning**. While it is commissioning, the Communications Kit will show as **No Communications Kit Detected**.

After the process is complete, continue with the following steps.

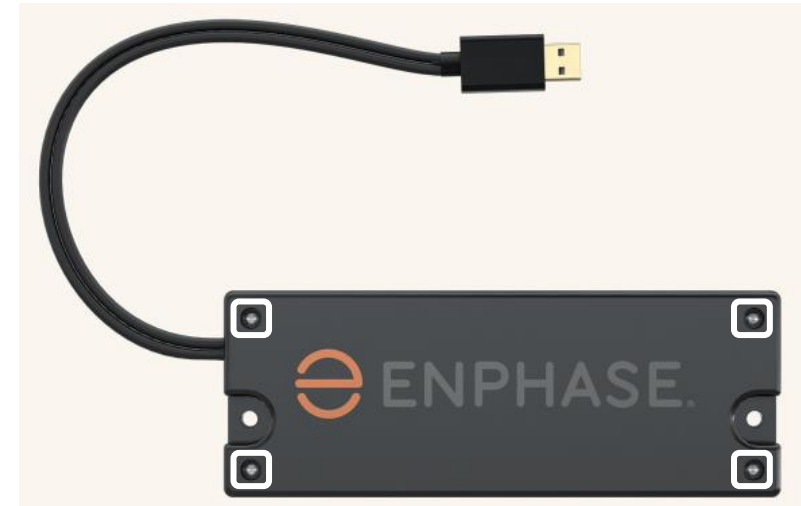
Step 5

If the Communications Kit is still in the black casing, open the black casing using a T10 bit. Then remove the Green 2.4 GHz Zigbee stick inside. Unplug the Communications Kit's USB from the IQ Gateway USB port.

Plug the Green 2.4 GHz Zigbee stick directly into the IQ Gateway USB port and retest, assuming an extender is not being used.

If the Communications Kit is already plugged directly into the IQ Gateway, check the Zigbee stick LEDs. If they are ON, remove the Zigbee stick, plug it back in, and retest step 3.

If no LEDs are lit, refer to instructions on page 85.



Troubleshooting the Communications Kit on-site

Step 5

Move the Zigbee stick to another USB port by swapping it with the Mobile Connect, then retest step 3.

Step 6

Try a spare Communications Kit, if available. If not, contact Enphase Support.

If the spare Communications Kit works, reseal the original Communications Kit and contact Enphase Support while on-site to attempt recovery.

It is best practice to bring a spare Communications Kit on-site to resolve defective Communications Kit issues without making a second trip to obtain a replacement.

Zigbee stick: No LEDs

If the Zigbee stick LEDs are not lit when plugged in, refer to the following instructions.

Step 1

Power cycle the IQ Gateway.

Step 2

Unplug the Zigbee stick from the IQ Gateway USB port and plug it back in.

Having issues?

If the Zigbee stick LEDs remain OFF, move it to another USB port by swapping it with the Mobile Connect. If the Zigbee stick LEDs turn ON, check to confirm that the Mobile Connect LEDs are also ON.

If the Zigbee stick LEDs turn ON but the Mobile Connect LEDs do not turn ON when swapped, submit an IQ Gateway RMA request in the Enphase Installer Portal or Enphase Service Manager.

If the Mobile Connect LEDs turn ON but the Zigbee stick LEDs do not turn ON when swapped, insert the Zigbee stick into a computer USB port. If the LEDs remain OFF, contact Enphase Support to request an RMA for the Communications Kit.

It is best practice to bring a spare Communications Kit on-site to resolve defective Communications Kit issues without making a second trip to obtain a replacement.

Communications Kit troubleshooting:

Zigbee Wireless Range Extender

A Communications Kit enables wireless communication between the IQ Battery, IQ System Controller, and IQ Gateway.

In some cases, installers have encountered sites trying to use a Zigbee Wireless Range Extender instead of the 2.4 GHz Zigbee Stick found in the black case of the Communications Kit. Zigbee Wireless Range Extenders, such as the one pictured below, have the following SKU printed on the label.

SKU: COMMS-24-EXT-01



The Zigbee Wireless Range Extender should be placed between the Communications Kit and the IQ System Controller or IQ Batteries to resolve distance issues. However, this does not resolve penetration issues.

The Zigbee Wireless Range Extender does not function as a replacement for the Zigbee stick.

Addressing Communications Kit distance issues

To resolve distance issues between the Communications Kit, IQ System Controller, and IQ Batteries, refer to the following information.

See the [Enphase Designing a Zigbee Network tech brief](#) to plan sites for hardware installation and the [Zigbee Wireless Range Test](#) that should be performed before installation.

To learn about the unique challenges of different on-site installation variations and combinations, see the [Enphase Zigbee range extension FAQ](#).

The Zigbee Wireless Range Extender is used when an IQ Gateway is within sight of the IQ System-Controller or IQ Batteries but is outside the recommended range.

Do not use Zigbee Wireless Range Extenders for obstacles such as walls or corners between the hardware components as signal penetration is a difficult situation to overcome. A 5 V, 1 A USB wall charger should be used with this product.



Addressing Communications Kit distance issues

If the IQ Gateway cannot be relocated closer to the IQ System Controller and IQ Batteries, there are options to get the Communications Kit relocated instead.

A [Fiber Extender](#) is a USB Extender for distances of over 250 meters. This is useful in configurations such as ground-mounted systems with an IQ System Controller and IQ Batteries on-site.

A [USB Extender over Ethernet](#) is a USB 2.0 Extender for distances up to 80 meters. At least one end of the extender must have a power plug.

A Shielded USB 2.0 cable that is less than 3 meters can also be used.

If IQ8 microinverters are installed, the IQ Gateway breaker must be wired inside the IQ-System Controller 2, allowing 50 feet for the run. PLC monitoring must be precise enough to allow for correct microgrid functionality. The wiring cannot exceed 50 feet to maintain stable Zigbee communications.



Addressing Communications Kit penetration issues

To resolve penetration issues between the Communications Kit, IQ System Controller, and IQ Batteries, refer to the information below.

Penetration issues occur most frequently when an IQ Gateway is located outside of a home and IQ Batteries are located inside. There is no extension available for IQ Batteries.

To relocate the Communications Kit, refer to instructions on page 87.

To extend the IQ System Controller Zigbee Antenna, installers must use a five-meter External IQ System Controller Antenna.

Hercules WS.02 2.4GHz Permanent Mount Antenna CFD-200



To relocate the Communications Kit at a short distance, such as on the other side of a wall, a simple USB extender is recommended.

Learning check

- Explain how to remotely troubleshoot the Communications Kit
- Explain how to troubleshoot the Communications Kit on-site using the Enphase Installer App
- Explain how to troubleshoot no LEDs on the Zigbee Stick
- Explain how to troubleshoot Zigbee Extender issues
- Explain how to troubleshoot Communications Kit distance issues

Troubleshooting IQ System Controller issues

Learning objectives

- Understand how to troubleshoot IQ System Controller not reporting
- Understand how to troubleshoot issues with Zigbee broadcasting through Bluetooth
- Understand how to perform an IQ System Controller power cycle
- Understand how to reprovision IQ System Controller
- Understand how to troubleshoot IQ System Controller rapid shutdown issues
- Understand how to troubleshoot PV breaker issues

IQ System Controller: Error identification

Errors with the IQ System Controller may show as **IQ System Controller Not Reporting** or **IQ System Controller Issue**.

This error is due to the IQ Gateway failing to report normally and can be caused by an error within the IQ System Controller.

In this example, the IQ System Controller is showing a specific error **System controller Common Bus Voltage Imbalance**.

Showing 1 to 1 of 1 events

1

| Status | Impact | Device | Event Name | Started |
|---------|--------|----------------------|--|-----------------------------------|
| Current | | | All | |
| Current | | IQ System Controller | System controller Common Bus Voltage Imbalance | Sun October 08, 2023 08:38 PM EDT |

However, on the **Devices** page, **System controller Not Reporting** displays. Refer to page 100 to identify specific IQ System Controller errors.

IQ Batteries

| Serial Number | Part Number | Phase | ID | Created | Last Report | DMIR | Processor Load | Status | Gateway |
|---------------|---------------|-------|----------|---------------------------|---------------------------------|------------------|--------------------|---------|--------------|
| | 830-00750-r32 | L1(A) | 82285901 | 2023-08-11 10:43:02 -0400 | 2023/10/09 08:33:33 -0400 (EDT) | 546-00002-01-v01 | 2.0.5663_rel/22.13 | 1 Issue | 202241009677 |
| | 830-00750-r32 | L1(A) | 82285907 | 2023-08-11 10:43:03 -0400 | 2023/10/09 08:37:39 -0400 (EDT) | 546-00002-01-v01 | 2.0.5663_rel/22.13 | 1 Issue | 202241009677 |
| 122241002431 | 830-00750-r34 | L1(A) | 82285912 | 2023-08-11 10:43:04 -0400 | 2023/10/09 08:33:54 -0400 (EDT) | 546-00002-01-v01 | 2.0.5663_rel/22.13 | 1 Issue | 202241009677 |

IQ System Controller

| Serial Number | Part Number | ID | Created | Last Report | DMIR | Processor Load | Status | Gateway |
|---------------|---------------|----------|---------------------------|---------------------------------|------------------|--------------------|---------------------------------|--------------|
| | 865-00376-r31 | 82285917 | 2023-08-11 10:43:05 -0400 | 2023/10/08 20:42:02 -0400 (EDT) | 546-00008-01-v01 | 2.0.5229_rel/22.13 | System controller Not Reporting | 202241009677 |

IQ System Controller power cycle

To perform an IQ System Controller power cycle, notify the system owner of an upcoming brief power outage, then refer to the following instructions.

Do not turn OFF the IQ combiner or PV breaker in the IQ System Controller.

Step 1: Power down the Enphase Energy System

- A. Turn OFF the System Shutdown Switch.
- B. Turn OFF the DC disconnect switches on all IQ Batteries.
- C. Turn OFF the switch or breaker inside the generator, if any.
- D. Open the breakers in the following sequence: IQ Battery breaker > DER/Generator breaker > Mains breaker > PV branch breakers in IQ Combiner > NFT breaker.
The Mains breaker could be outside the IQ System Controller, towards the grid power supply.
- E. Wait for at least one minute while the IQ System Controller opens the relays controlling the IQ Battery, PV modules, generator, and NFT.
If the IQ System Controller is used as the main service equipment, turning OFF the Mains breaker will cut off the power to the home.

IQ System Controller power cycle

Step 2: Restore power to the Enphase Energy System

- A. Close the breakers in sequence: NFT breaker > PV branch breakers in IQ combiner > Mains breaker > DER/Generator breaker > IQ Battery breaker
 - B. Turn ON the DC switches on all IQ Batteries.
 - C. Turn ON the switch/breaker inside the generator, if any.
 - D. Turn ON the System Shutdown Switch. The IQ System Controller closes the relays controlling the IQ Battery, PV, generator, and NFT.
- The system exits shutdown only when power from PV modules or the grid is available.

Failure to correctly follow IQ System Controller power cycling steps can cause stress to the storage system components and introduce errors that require assistance from Enphase Customer Support.

IQ System Controller: Check Zigbee broadcasting through Bluetooth

To check Bluetooth signal using phone or tablet, refer to the following instructions.

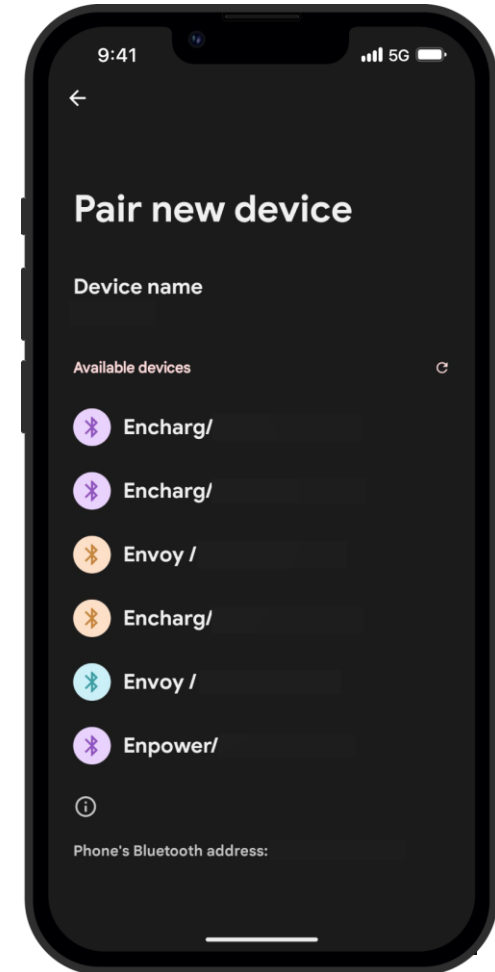
For iOS devices, [download the Digi Xbee Mobile app](#). The app is also available from Google Play but is not required for Android devices.

For Android mobile devices not using the Digi Xbee Mobile app, look for Bluetooth devices using the device manufacturer's guidance. This can be done by searching for Bluetooth devices from the settings menu.

Open the app and begin a scan. If many devices are visible, use the **Filter by name** tool at the bottom of the screen to narrow down the search results. Enphase devices should be displayed as seen in the image to the right. Devices appear as **Device type/serial number**.

If multiple batteries show the same serial number, contact Enphase Support. Do not power cycle the batteries.

In the list of available devices, IQ Gateway is displayed as **Envoy**, IQ Battery is displayed as **Encharge**, and IQ System Controller is displayed as **Enpower**.



IQ System Controller not reporting

If the IQ Gateway LEDs are lit and only the IQ System Controller is not reporting to the IQ Gateway after checking for updates, refer to the following instructions.

Step 1

Compare the **Last Report** date between the **IQ Gateway**, **IQ System Controller**, and **IQ Batteries** sections.

Verify that the IQ System Controller is the only unit that stopped reporting while the IQ Gateway, IQ Batteries (if present), and PV are currently reporting with caught-up data. If it is only affecting one unit, it is not a Communications Kit issue. This applies to all backup hardware, including Sunlight Backup.

IQ System Controller

| Serial No | Status | RSSI 2.4GHz | Operation Mode | App FW | Last Report |
|-----------|---------------------------------|-------------|------------------------------------|--------------------|--------------------------------|
| | System controller Not Reporting | (-43 dBm) | Grid Connected - IQ Batteries C... | 1.5.4780_rel/22.10 | 2023/06/23 18:38:41 -06:00 MDT |

IQ Batteries(No. of IQ Batteries: 7)

| Operation Mode | Led Status | Phase | SoC | App FW | No of Microinverters | Not Reporting | Last Report |
|-------------------------|--------------------------------------|-------|-----|--------------------|----------------------|---------------|----------------------------|
| Grid Mode Unknown, Idle | Battery capacity is between: 75-100% | L1(A) | 80% | 2.0.5663_rel/22.13 | 4 | 0 | 2023/06/29 07:52:56 -06... |
| Grid Mode Unknown, Idle | Battery capacity is between: 75-100% | L1(A) | 79% | 2.0.5663_rel/22.13 | 4 | 0 | 2023/06/29 07:53:04 -06... |
| Grid Mode Unknown, Idle | Battery capacity is between: 75-100% | L1(A) | 81% | 2.0.5663_rel/22.13 | 4 | 0 | 2023/06/29 07:53:05 -06... |
| Grid Mode Unknown, Idle | Battery capacity is between: 50-75% | L1(A) | 70% | 2.0.5663_rel/22.13 | 4 | 0 | 2023/06/29 07:50:50 -06... |
| Grid Mode Unknown, Idle | Battery capacity is between: 75-100% | L1(A) | 80% | 2.0.5663_rel/22.13 | 4 | 0 | 2023/06/29 07:49:47 -06... |
| Grid Mode Unknown, Idle | Battery capacity is between: 75-100% | L1(A) | 81% | 2.0.5663_rel/22.13 | 4 | 0 | 2023/06/29 07:54:41 -06... |
| Grid Mode Unknown, Idle | Battery capacity is between: 75-100% | L1(A) | 81% | 2.0.5663_rel/22.13 | 4 | 0 | 2023/06/29 07:54:44 -06... |

When the IQ System Controller is not reporting, the **Operation Mode** shows **Grid Mode Unknown**.

IQ System Controller not reporting

Step 2

Remove the Zigbee stick from the Communications Kit and connect directly to an IQ Gateway USB port, assuming the site is not using a USB extender if this has not been done already. This is the best practice for all sites.

Step 3

Check the Bluetooth signal at the IQ System Controller and note if it is transmitting or not.

Step 4

Power cycle the IQ System Controller. If multiple batteries show the same serial number, contact Enphase Support. **Do not power down devices before calling.**

Step 5

After power cycling, retire and reprovision the IQ System Controller using the Enphase Installer App.

Reprovisioning IQ System Controller

To reprovision an IQ System Controller, refer to the following instructions.

Step 1

Power cycle the IQ System Controller, unless already completed.

Step 2

Verify that the IQ System Controller's Bluetooth is visible on the installer's mobile device. If so, proceed to Step 3.

If the IQ System Controller is not displayed in the mobile device's Bluetooth options, power cycle the IQ System Controller again. If the issue persists, remove the IQ System Controller dead front and confirm that the Zigbee antenna shown to the right is intact, secured to the top of the IQ System Controller, and seated properly to the E3 board. If the issue persists, contact Enphase Support.

Step 3

Open the Enphase Installer App, then open the site page. Navigate to Step 4 and remove the IQ System Controller and all IQ Batteries. Then, scan again.


If the unit in question does not show as **Provisioned**, repeat Step 3. If the issue persists after three attempts, contact Enphase Support.




IQ System Controller: Rapid shutdown error identification

In some cases, the IQ System Controller may show an error indicating a possible issue with the Rapid Shutdown system.

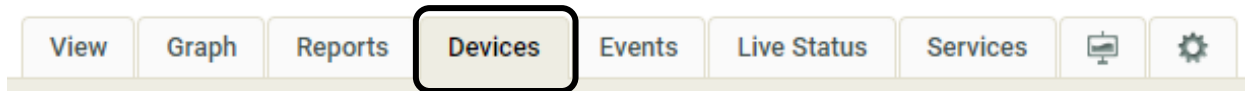
This can occur whether the Rapid Shutdown system is engaged or not engaged. If this error occurs, the IQ System Controller will display **Manual Override** in the Installer Portal system Dashboard.

 IQ System Controller

| Serial No | Status | RSSI 2.4GHz | Operation Mode | App FW | Last Report |
|-----------|---------------------------------|---|-----------------|--------------------|--------------------------------|
| | System controller Not Reporting |  (-23 dBm) | Manual Override | 2.0.4780_rel/22.10 | 2023/06/26 21:38:37 -07:00 MST |

Refer to the instructions below to confirm the issue.

Step 1
Select the **Devices** tab.



IQ System Controller: Rapid shutdown error identification

Step 2

Scroll to the **IQ System Controller** section and select the Serial Number.

IQ System Controller

| Serial Number | Part Number | ID |
|-------------------------|---------------|----------|
| <div>482251014094</div> | 865-00376-r31 | 77878804 |

Step 3

Scroll to the **Events** section and select the **System controller Rapid Shutdown** event.

Showing 1 to 1 of 1 events

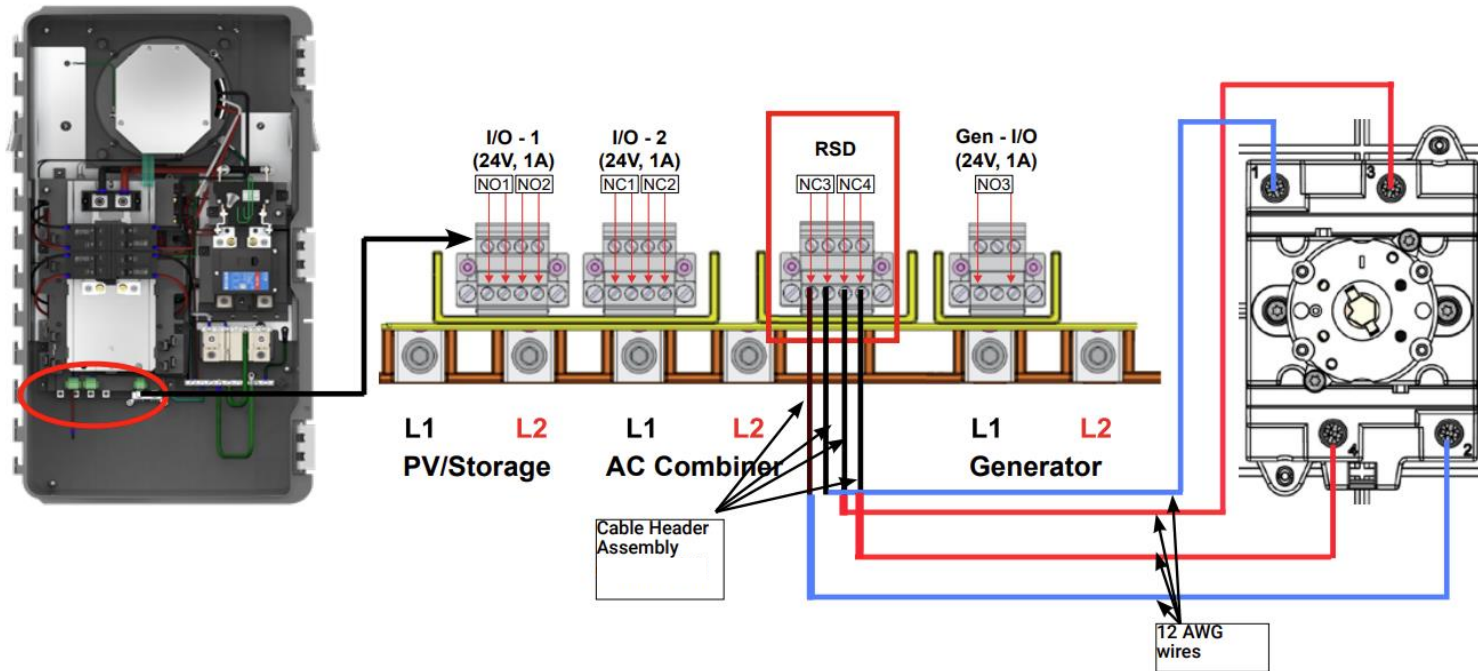
1

| Status | Impact | Device | Event Name | Started |
|---------|--------|-----------------------------------|----------------------------------|--------------------------------|
| Current | | | All | |
| Current | | IQ System Controller 482251014094 | System controller Rapid Shutdown | Thu June 08, 2023 11:00 AM MST |

IQ System Controller: Rapid shutdown wiring

The Rapid Shutdown Switch (RSD) is required for systems with IQ8 Microinverters only.

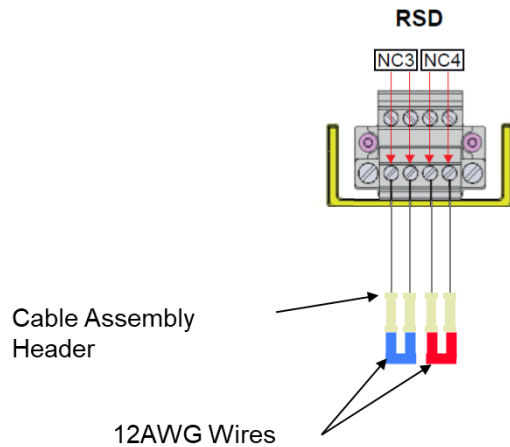
The RSD terminals should be connected to the RSD as shown.



IQ System Controller: Rapid shutdown wiring

Systems without IQ8 microinverters do not require an RSD.

Install jumpers to wire the NC3 terminals together and the NC4 terminals together.



Jumpered RSD terminal

IQ System Controller stuck in rapid shutdown: Part 2

To test rapid shutdown equipment, refer to the following instructions.

Step 1

Turn OFF the RSD.

Step 2

Verify if the 240 VAC from the utility is present on the grid side of the IQ System Controller.

Step 3

Set the multimeter to measure DC voltage.

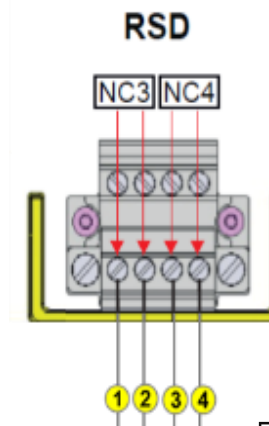
Step 4

Measure the RSD terminal test points 1 and 2. Take a picture showing the meter reading and the probes on the test points. The multimeter should read 3.3 VDC.

Step 5

Measure the RSD terminal test points 3 and 4. Take a picture showing the meter reading and the probes on the test points. The multimeter should read 3.3 VDC.

If so, proceed to further testing. If not, refer to instructions on page 108.



IQ System Controller stuck in rapid shutdown: Part 1

If the IQ System Controller does not come out of the rapid shutdown state, the installer should test the wiring.

To test the Rapid Shutdown Switch (RSD) wiring, follow these steps:

Step 1

Ensure the switch on the RSD is in the ON position.

Step 2

Set the multimeter to test for continuity.

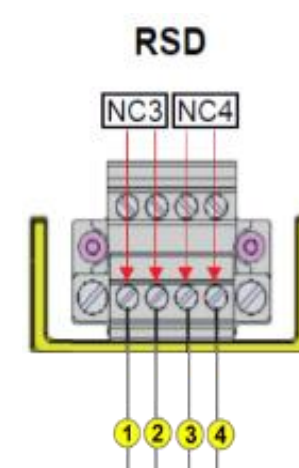
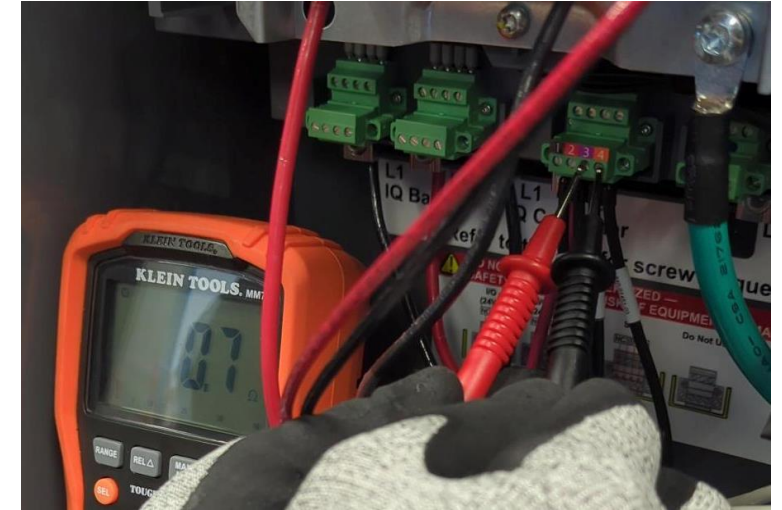
Step 3

Measure the RSD terminal test points 1 and 2, which should return positive continuity. Take a picture showing the meter reading and the probes on the test points.

Step 4

Measure the RSD terminal test points 3 and 4, which should return positive continuity. Take a picture showing the meter reading and the probes on the test points.

If either or both tests fail, check the wiring between the terminal and the RSD. If the wiring is correct, proceed to the next page.



IQ System Controller stuck in rapid shutdown: Part 3

If the IQ System Controller does not come out of the rapid shutdown state after testing equipment and wiring, refer to the following instructions to test the E3 board.

Step 1

Keep the Rapid Shutdown Switch in the OFF position. Remove the E3 board cover using a T20 bit.

Step 2

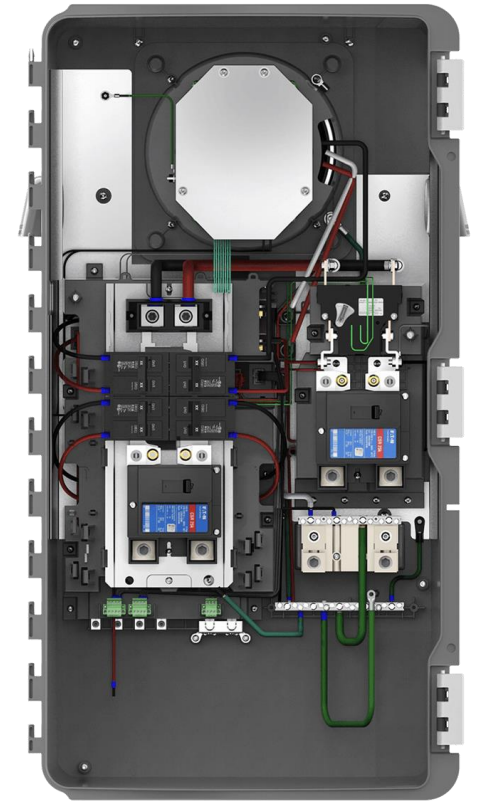
Set the multimeter to measure DC voltage.

Step 3

Measure between points 1 and 3 (black and red wires). Take a picture showing the meter reading and the probes on the test points. The multimeter should read 0 VDC.

Step 4

Measure between points 2 and 3 (green and red wires). Take a picture showing the meter reading and the probes on the test points. The multimeter should read 3.3 VDC.



IQ System Controller stuck in rapid shutdown: Part 3



Step 5

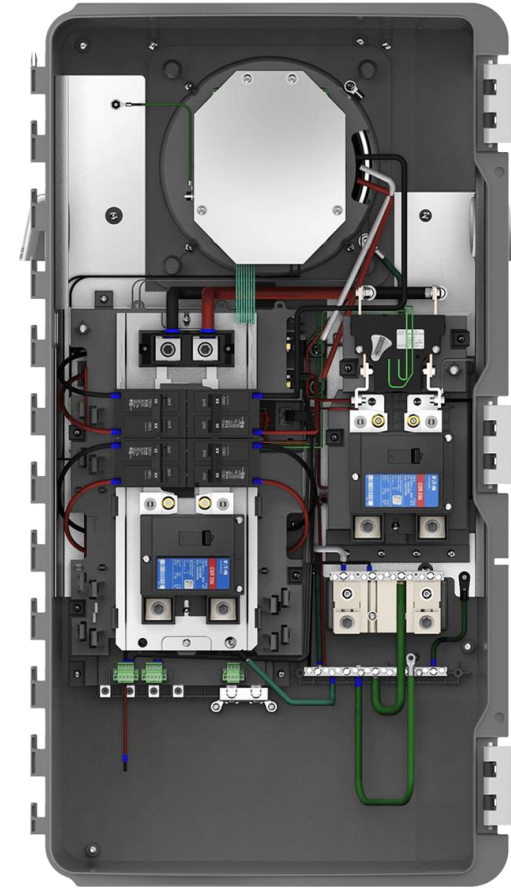
Verify if the white and red connectors are fully seated.
Take a picture of the entire E3 board as shown.

IQ System Controller stuck in rapid shutdown: Part 4

If the voltages are nominal on the RSD but not on the E3 board, look for the ESUB to E3 connector sequencing and wire continuity.

If voltages are nominal on the E3 board (0 VDC between points 1 and 3, and 3.3 VDC between points 2 and 3) but not on the RSD (continuity checks), verify the RSD terminal to ESUB board continuity.

If voltages are not nominal on both the E3 board and the RSD, there is likely an ESUB issue, which will need to be replaced. Enphase usually performs the replacement. Contact Enphase Support for assistance.



IQ System Controller: System controller PV Breaker Open

If **System controller PV Breaker Open** is displayed in the Enphase Installer Portal, on-site personnel should verify the following items.

Showing 1 to 1 of 1 events

| Status | Impact | Device | Event Name |
|---------|--------|--------|-----------------------------------|
| Current | | | All |
| Current | | | System controller PV Breaker Open |

- If the PV output is connected directly to the common bus or PV breaker

This can be an issue if the error is seen even when the PV system is producing power. PV should be wired to the AC Combiner lugs at the bottom of the System Controller, not directly to the PV breaker. Terminals can be identified on the back panel of the IQ System Controller.

- If the L1 and L2 wires are swapped

L1 and L2 wires should be consistent among all components.

IQ System Controller: System Controller PV Breaker Open

- **If commissioning took place recently**

If the site was commissioned in the last two to three days, the breaker might be open from commissioning.

- **If there is an open, tripped, damaged, or defective breaker present**

For any errors other than PV Breaker Open or rapid shutdown, contact Enphase Support.

IQ System Controller: Diagnosing a faulty breaker

To perform a PV breaker health check, refer to the following instructions.

Confirm that the PV is wired to the PV lugs at the bottom of the IQ System Controller as indicated.

Step 1

Power down the unit completely:

1. Switch OFF the Battery DC.
2. Switch OFF the Battery AC breaker and NFT breaker inside the IQ System Controller.
3. Open all the PV breakers inside the IQ Combiner Box.
4. Open the generator breaker, if present.
5. Open the feeder breaker to IQ System Controller and open the PV breaker.

Wait at least five minutes after confirming that there is no power before testing.



IQ System Controller: Diagnosing a faulty breaker

Step 2

Put the multimeter in continuity mode, then check the continuity between the PV Breaker L1 and the Common bus L1 terminals.

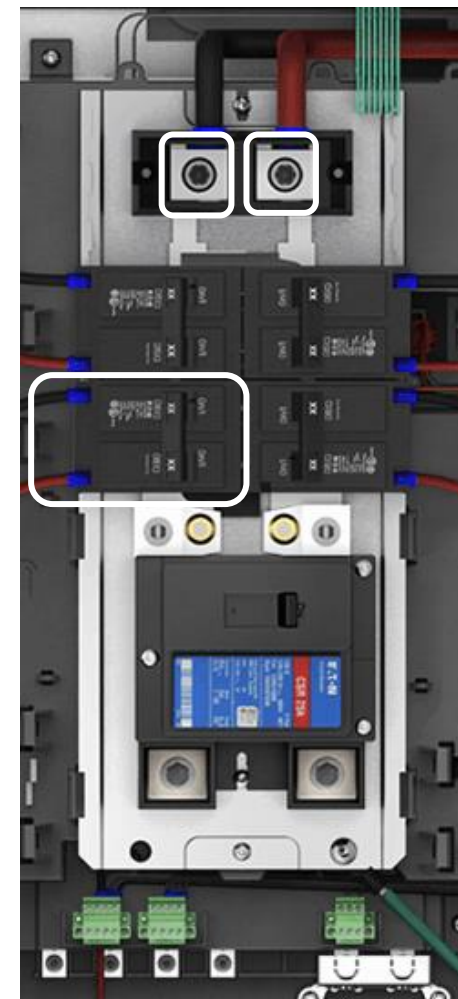
Step 3

Check the continuity between the PV breaker L2 and the Common bus L2.

If either or both steps 2 and 3 show continuity, the PV breaker is faulty and needs a replacement.

Common bus
L1 and L2

PV Breakers



IQ System Controller: Diagnosing a faulty breaker

Step 4

Turn ON the PV breaker.

Check the continuity from the breaker L1 to the Common bus L1 terminals.

Step 5

Check the continuity from the PV breaker L2 to the Common bus L2 terminals.

If either or both steps 4 and 5 do not show continuity, then the PV breaker is faulty and needs a replacement.

Common bus
L1 and L2

PV Breakers



Learning check

- Explain how to troubleshoot IQ System Controller not reporting
- Explain how to troubleshoot issues with Zigbee broadcasting through Bluetooth
- Explain how to perform an IQ System Controller power cycle
- Explain how to reprovision an IQ System Controller
- Explain how to troubleshoot IQ System Controller rapid shutdown issues
- Explain how to troubleshoot PV Breaker issues

IQ Battery troubleshooting





Learning objectives

- Understand all IQ Battery LED indications
- Understand how to power cycle an IQ Battery
- Understand how to troubleshoot IQ Batteries not reporting
- Understand how to troubleshoot IQ Batteries not powering up
- Understand how to check Zigbee broadcasting through Bluetooth
- Understand how to reprovision an IQ Battery
- Understand how to troubleshoot IQ Battery PCU not reporting
- Understand how to troubleshoot IQ Batteries not charging or discharging

IQ Battery: LED indications





IQ Battery LED statuses and what they indicate are described below.

During installation and commissioning

| LED state | LED color | IQ Battery status |
|----------------|---|--|
| Flashing blue |  | Booting up after installation, paired with an IQ Gateway, and awaiting verification from the Enphase Cloud |
| Flashing green |  | Verification complete |





IQ Battery: LED indications

Post commissioning

| LED state | LED color | IQ Battery status |
|-------------------------|---|--|
| Solid blue or green |  | Idle (not charging or discharging); the color transitions from blue to green as the charge level of the IQ Battery increases |
| Slowly flashing blue |  | Discharging |
| Slowly flashing green |  | Charging |
| Rapidly flashing yellow |  | Starting up or trying to establish communication with the IQ Gateway |

IQ Battery: LED indications

Post commissioning

| LED state | LED color | IQ Battery status |
|-----------------------------------|---|--|
| Flashing red in a sequence of two |  | In an error state (may require on-site inspection) |
| Solid yellow |  | Not operating due to high temperature |
| Slowly flashing yellow |  | Sleep mode |
| Off |  | Not operating |

IQ Battery: Check Zigbee broadcasting through Bluetooth

To check Bluetooth signal using a phone or tablet, refer to the following instructions.

For **iOS devices**, [download the Digi Xbee Mobile app](#). The app is also available on Google Play but is not required for Android devices.

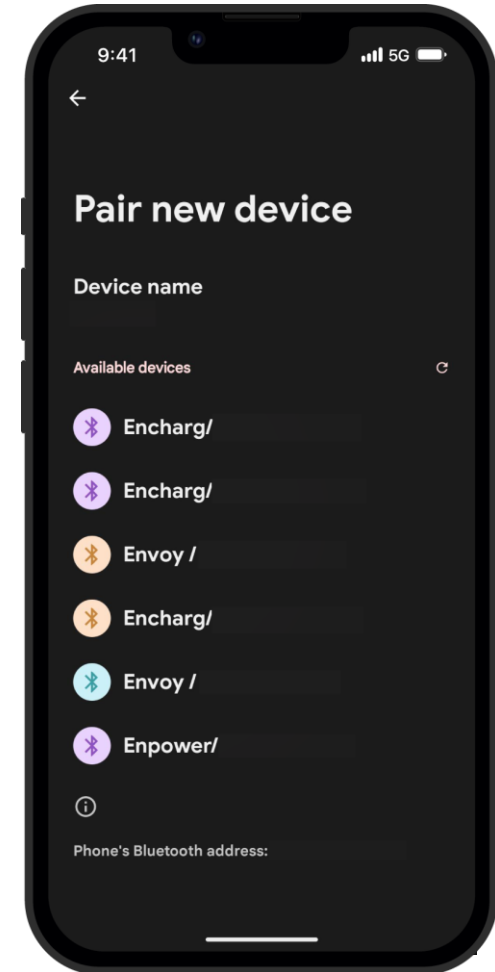
To use the app, open it and begin a scan. If many devices are visible, use the **Filter by name** tool at the bottom of the screen to narrow down the search results. Enphase devices should be displayed as seen in the image to the right. Devices appear as **Device type/serial number**.

For Android devices not using the Digi Xbee Mobile app, look for Bluetooth devices using the device manufacturer's guidance. This can be done by searching for Bluetooth devices from the settings menu.



If multiple batteries show the same serial number, contact Enphase Support. Do not power cycle the IQ Batteries.

In the list of available devices, IQ Gateway is displayed as **Envoy**, IQ Battery is displayed as **Encharge**, and IQ System Controller is displayed as **Enpower**.



IQ Battery: Power cycle

To power cycle an IQ Battery, refer to the following instructions.

Step 1

Turn OFF the DC switches. The IQ Battery LEDs flash red as they are still receiving AC power.



Take extra care to turn the knob the correct way. Turning the knob the incorrect way can break the switch, which is not covered by warranty.

Step 2

Turn OFF the IQ Battery breaker. Verify that the IQ Battery LEDs turn OFF.

Step 3

When the IQ Battery LEDs turn OFF, wait for five minutes.

Step 4

After five minutes, turn ON the IQ Battery breaker and wait for the red IQ Battery LED to flash. It flashes for 90 seconds.

Step 5

Turn ON the DC switches.



Do not operate the DC switch when the IQ Battery breaker is in the OFF position.

IQ System Controller 1 Battery LEDs








IQ System Controller 1 Battery LEDs





IQ Battery not reporting


If the IQ Gateway LEDs are lit and only one or more IQ Batteries are not reporting as shown in the Enphase Installer Portal, refer to the following instructions.


 IQ Batteries(No. of IQ Batteries: 12)

| Serial No | Status | RSSI 2.4 GHz |
|-----------|-----------------------|---|
| | Battery Not Reporting |  (-78 dBm) |
| | Battery Not Reporting |  (-76 dBm) |
| | Battery Not Reporting |  (-60 dBm) |
| | |  (-60 dBm) |

67 Microinverters
12 IQ Batteries
1 IQ System Controller
1 Gateway  Wi-Fi
Medora, IL

87°F 

 Battery Not Reporting

 On Grid

Step 1
Open the Communications Kit and remove the green Zigbee stick. Connect it directly to an IQ Gateway USB port, if this has not been done already. This is the best practice for all sites.

Step 2
Confirm that the IQ Battery in question is powered up and the LEDs are lit.

Step 3
Check and make note if the unit in question is transmitting a Bluetooth signal.

Step 4
Power cycle the IQ Battery in question and IQ Gateway. Check for the Bluetooth signal after reapplying power.

IQ Battery not reporting

Step 5

If there is no Bluetooth signal after power cycling the battery, contact Enphase Support.

If the battery is broadcasting a Bluetooth signal, reprovision the battery using the Enphase Installer App.

Step 6

If reprovisioning the battery fails, contact Enphase Support.

Reprovision IQ Battery

To reprovision an IQ Battery, refer to the following instructions.

Step 1

Power cycle the IQ Battery.

Step 2

Verify if the IQ Battery is showing in the Bluetooth settings of a mobile device or tablet. If not, contact Enphase Support.

Step 3

If the IQ Battery is showing in the Bluetooth settings of a mobile device or tablet, log in to the Enphase Installer Portal. Open the site page and navigate to Step 2a of the **Activations** page.

Step 4

Remove the IQ System Controller and all IQ Batteries, then scan again.

If all devices do not show as **Provisioned**, repeat this step until they show. If the issue persists after three attempts, contact Enphase Support.

No AC voltage to IQ Batteries

[Access the IQ Battery Quick Install Guide](#) for more information on the following instructions.

Step 1

Confirm that the IQ Battery breaker is switched ON and AC voltage is present at the breaker using a voltage meter.

Step 2

Check for AC voltage at the lugs at the bottom of the IQ System Controller, where the IQ Batteries are wired in. See the interior label at the top right.

If voltage is present at the breaker, but not at the lugs, the relay is open. Ensure that both Production and Consumption meters are enabled. The Consumption meter **MUST** be set to Load with Solar (NET). If the relay is still open, contact Enphase Support.

Step 3

If the site has an AC disconnect for the IQ Batteries, test the AC voltage before and after the disconnect to determine if the fuse is blown.

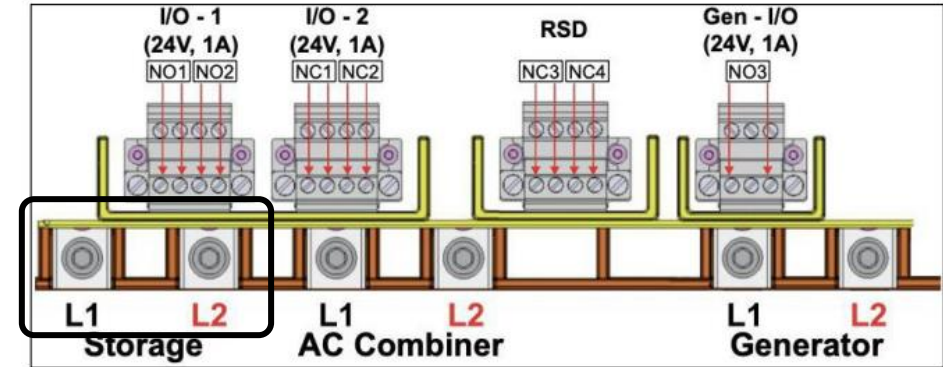


Figure 1: Auxiliary contact labeling and usage



No AC voltage to IQ Batteries

Step 4

If the site has an IQ Battery combiner panel, test voltages going in and out of this unit.

Step 5

Take AC voltage readings at the entrance and exit of each IQ Battery to confirm if it is making it to all units, as shown in the bottom right image.

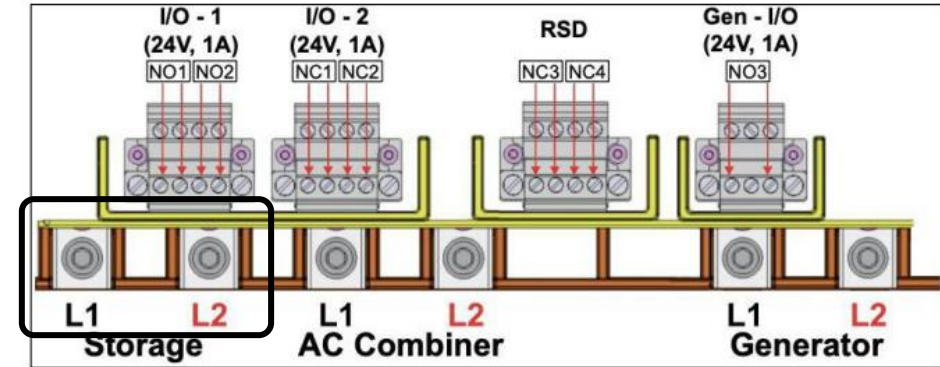


Figure 1: Auxiliary contact labeling and usage



Individual IQ Battery not powering up

[Access the Battery Quick Install Guide](#) for more information on the following instructions.

Step 1

Check if AC voltage is going into the unit using a voltmeter. If voltage is not present, backtrack to the first instance of AC voltage and resolve. After it is resolved, test again.

When testing, the IQ Battery should receive approximately 120 VAC Line 1 to ground, 120 VAC Line 2 to ground, and 240 VAC Line 1 to 2.

Ensure you are testing the voltage for at least 30 seconds to ensure stability.

Step 2

If the unit is getting the correct AC voltage, power cycle the unit for at least five minutes.

If the issue persists, contact Enphase Support. Ensure you have pictures of the testing showing both wiring and voltage measurements.

IQ Battery PCU not reporting

Enphase automatically identifies and attempts recovery when one or more microinverters stop reporting in the IQ Batteries.

Enphase attempts an automatic remote recovery and determines the troubleshooting steps.

This process results in either a BMU board replacement or a PCU replacement. Currently, board replacements are only handled by the Enphase Field Service Team (FST). Installers can handle PCU replacements. Currently, when a site experiences such an error, Enphase attempts to remotely recover it first, then reaches out. Contacting Enphase Support for this issue is not required.

| Status | No of Microinverters | Not Reporting |
|---------|----------------------|---------------|
| Normal | 4 | 0 |
| Error | 4 | 1 |
| Warning | 4 | 1 |
| Normal | 4 | 0 |
| Normal | 4 | 0 |
| Normal | 4 | 0 |
| Normal | 4 | 0 |
| Normal | 4 | 0 |
| Normal | 4 | 0 |
| Warning | 4 | 1 |
| Normal | 4 | 0 |

Batteries not charging or discharging

There are many reasons why the batteries may not be charging or discharging.

Here are a few reasons to look for:

- **Production or Consumption Meters not correctly setup or configured**
If meters are disabled or if the Consumption meter settings are not set to **Load with Solar**, the batteries do not charge or discharge. If the meters are incorrectly placed or configured, it impacts the system's ability to perform correctly. See the Current Transformer (CT) Troubleshooting section.
- **Tariff settings not correct for expected behavior**
Refer to instructions on pages 15-17 in the [Enphase storage system owner's guide](#) for more information.
- **Tariff settings mismatched between IQ Gateway and Enphase Installer Portal**
This occurs when the Enphase Installer App connects to the IQ Gateway with a tariff setting different from the one it is currently using. The IQ Gateway is updated, but the update is not reported. If this occurs, toggle the battery settings between **Self-Consumption** and **Full Backup**. This realigns the settings.

Batteries not charging or discharging

- **Storm Guard has been activated**
This can change the system's behavior during extreme weather alerts.
- **Loss of communication between devices**
If the IQ Gateway loses communication with the IQ System Controller or IQ Batteries for more than 12 hours, the system becomes grid-tied and does not operate as expected.
- **Loss of AC Voltage to IQ Batteries**
- **Insufficient sunlight for PV to supply home and charge batteries**

For any other concerns about charge/discharge behaviors, contact Enphase Support.

Learning check

- Explain all IQ Battery LED indications
- Explain how to power cycle an IQ Battery
- Explain how to troubleshoot IQ Batteries not reporting
- Explain how to troubleshoot IQ Batteries not powering up
- Explain how to check Zigbee broadcasting through Bluetooth
- Explain how to reprovision an IQ Battery
- Explain how to troubleshoot IQ Battery PCU not reporting
- Explain how to troubleshoot IQ Batteries not charging or discharging

Current Transformer (CT) Troubleshooting



Current Transformers: Installation guidelines

[Access the guidelines for current transformer installation](#) to learn more information on the following section.

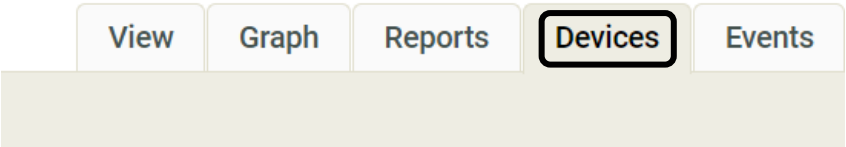
Learning objectives

- Understand how to check and change load type settings
- Understand how to check and reverse CT Polarity
- Understand how to identify and handle meter issues
- Understand acceptable negative Consumption Meter values
- Understand how to troubleshoot Production Meter issues
- Understand how to troubleshoot incorrect Consumption CT settings
- Understand how to troubleshoot consumption CT Polarity issues
- Understand how to troubleshoot Consumption Meter Dual PV systems
- Understand how to troubleshoot when Consumption mirrors Production

Consumption settings: Load with Solar vs Load Only

To view and adjust Consumption CT settings, log in to the Enphase Installer Portal and open the relevant site.

Step 1
Select the **Devices** tab.



Step 2
Select the meter in the **Consumption Meter** section.

Consumption Meter

| Meter Type | Part Number | Serial Number |
|--|-------------|---------------|
| Enphase Integrated Consumption Meter Single-Phase (L-L) | | |

Consumption settings: Load with Solar vs Load Only

Battery Backup and Sunlight Backup sites must be configured to **Load with Solar production** and cannot be configured to **Load Only**.

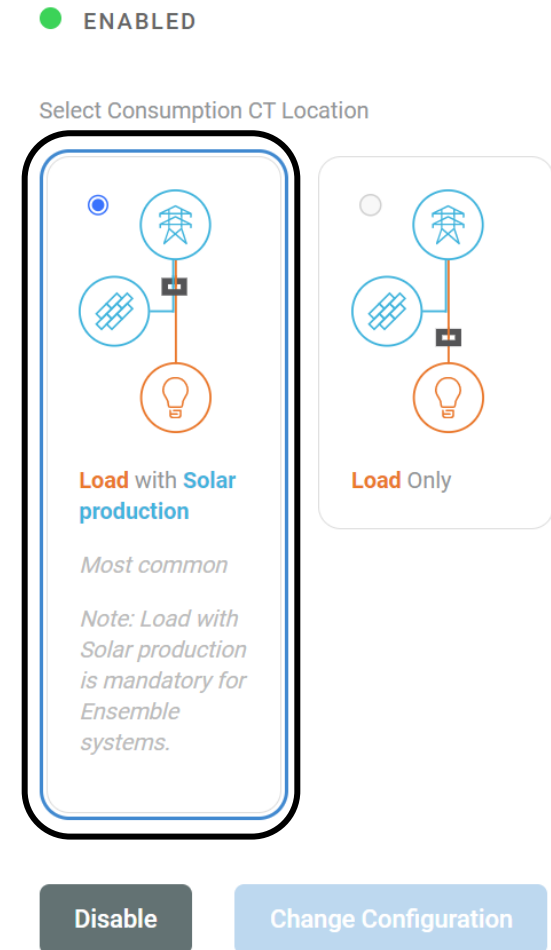
Step 3

Select **Load with Solar production** or **Load Only**, then select **Enable**.

Select **Save**. The Enable option turns into a **Disable** option.

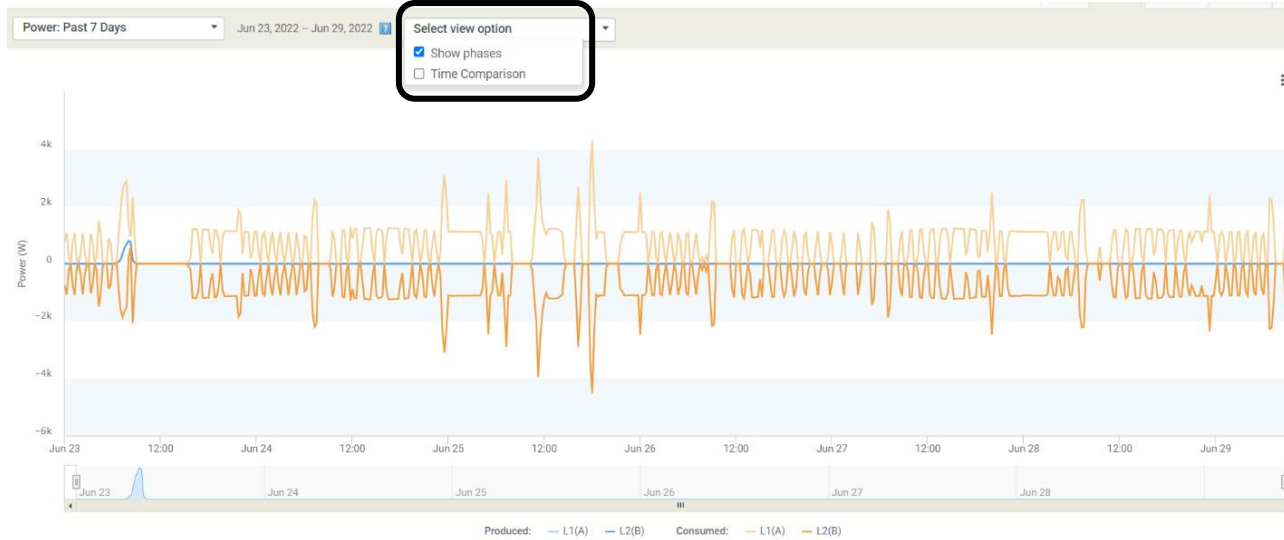
To change the configuration, select the other settings, then select **Change Configuration**. For instance, if the Consumption CT is set to **Load Only**, select **Load with Solar Production** to change the configuration.

For sites using a Mobile Connect, this process takes six to 12 hours to report and complete.



Check CT polarity

To confirm if there is an issue with CT polarity, log in to the Enphase Installer Portal and refer to the following instructions.



If you cannot see the **Show phases** option, follow these instructions:

1. Select **Settings**.
2. Scroll to **Energy and Power Display**.
3. From the options shown, switch the readings from **Microinverter Measurements** to **Meter Measurements**.
4. Select **Save**.
5. Go back to the **Graph** tab and try again.

Step 1

From the **Systems** tab, select the relevant system.

Step 2

Select the **Graph** tab.

Step 3

Select **Show phases** from the **Select view option** drop-down menu and check for negative readings.

If the production or consumption readings are consistently negative, this is an indication that one or both lines may be incorrectly installed.

Check load type setting

Before reversing the CT polarity, it is key to ensure the system is on the correct load type setting.

Load Only provides only the consumption details of the home.

Load with Solar provides load consumption of the home, minus solar energy generation.

For sites with IQ Battery Backup or Sunlight Backup, the system must be set to **Load with Solar** for accurate measurements.

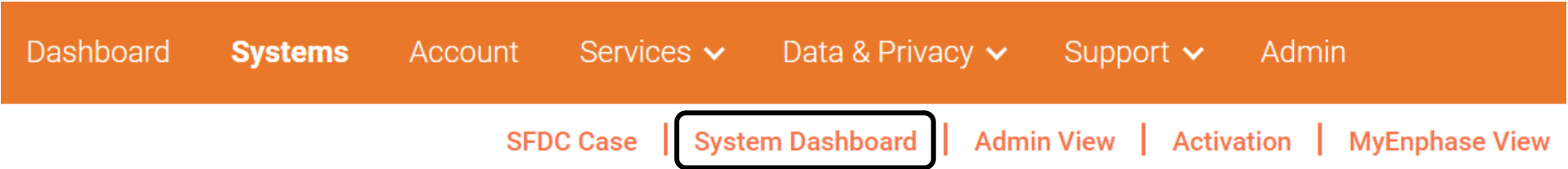
Check software version

Before reversing polarity on the CTs, the installer must first confirm that the software version on the IQ Gateway is updated to version 7.01.04 or later.

To check the current software version on the IQ Gateway, follow these steps:

Step 1
Open the Enphase Installer Portal and select the relevant site.

Step 2
Select **System Dashboard**. The **Summary** page opens.



The software version is located in the **IQ Gateway** section.

SW VERSION D7.3.517.230328

Acceptable negative Consumption Meter values

The Enphase Installer Portal Meter graph should never be negative, with one exception.

Negative values are acceptable during IQ Battery discharge only.

When evaluating meter information in the Graph tab, select the **Show Phases** option at the top of the graph to evaluate the combined data vs the per-line data.



☐ Show Phases

During discharge, one line is positive, and another is negative. This is expected with all battery systems.

Acceptable negative Consumption Meter values

Because the loads are never perfectly balanced, during battery discharge one line is positive and the other is negative.



Refer to the example below.

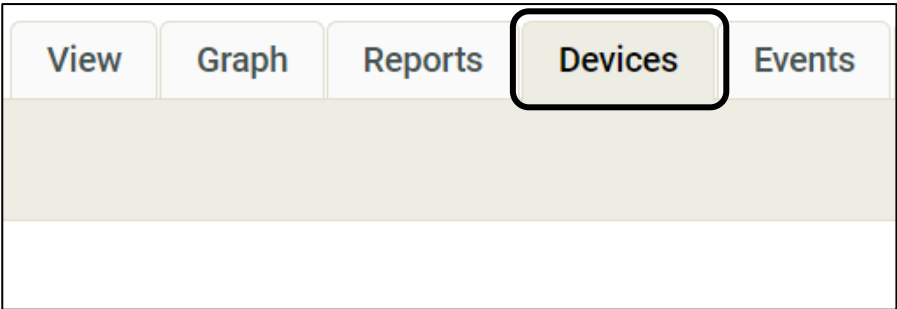
Line 1 draws 1000 W, and line 2 draws 500 W. Because the batteries discharge evenly, they discharge 1000 W to both lines.

Because there is now a surplus of 500 W on line 2, the extra discharge is sent to the grid, creating a small amount of export.

As indicated on the left in two instances, when the discharge stops, the consumption lines return to a positive value.

Reverse CT polarity

To reverse CT polarity, refer to the following instructions.





Step 1
Select the **Devices** tab.

Production Meter

| Meter Type | Part Number | Serial Number | Lifetime Energy  | Last Report | Status |
|--|---------------|---------------|---|-------------------------|--|
| Enphase Integrated Production Meter Single-Phase (L-L) | 800-00555-r03 | | 21.3 MWh | 03/28/2023 11:25 AM PDT |  Normal |

Consumption Meter

| Meter Type | Part Number | Serial Number | Config Type | Lifetime Energy  | Last Report | Status |
|---|---------------|---------------|----------------------------|--|-------------------------|--|
| Enphase Integrated Consumption Meter Single-Phase (L-L) | 800-00555-r03 | | Load with Solar production | 204 MWh | 03/28/2023 11:25 AM PDT |  Normal |

Step 2
Select the relevant Production or Consumption Meter, as shown on the left.

The **CT Summary** page opens.

Reverse CT polarity

● ENABLED

Disable

[Reverse Polarity](#)

Step 3

Select Reverse Polarity.

A pop-up appears.

Switch the polarity

Select the Line(s) for which you want to reverse the polarity:

☐ L1 Phase

☐ L2 Phase

Cancel

[Switch the polarity](#)

Step 4

Select the relevant phase, then select **Switch the polarity**.

The polarity of the selected CT reverses.

After reversing CT polarity in the Enphase Installer Portal, all recorded data is no longer valid. Make sure to change the meter start date to the day following the reversal. For example, if the CT polarity is reversed on January 1, 2023, the start date should be set to January 2, 2023.

Identifying and handling meter issues on-site

CTs may be accidentally misconfigured in several ways. Using the Enphase Installer App to prevent or correct issues is the best practice.

To prevent CT issues, installers should first use the Enphase Installer App Meter Wizard.

The Meter Wizard does not catch certain issues:

- Missing production from the Production CT
- Dual solar system locations
- Miswiring (mixing color with location when extending Consumption)
- Size of meter input (400 A vs 200 A); Our CTs are rated only for 200 A inputs

Visit the Enphase YouTube training series to learn more:

- Learn how to [enable the Production meter](#).
- Learn how to [enable the Consumption meter](#).
- Learn about [troubleshooting CT Issues](#).

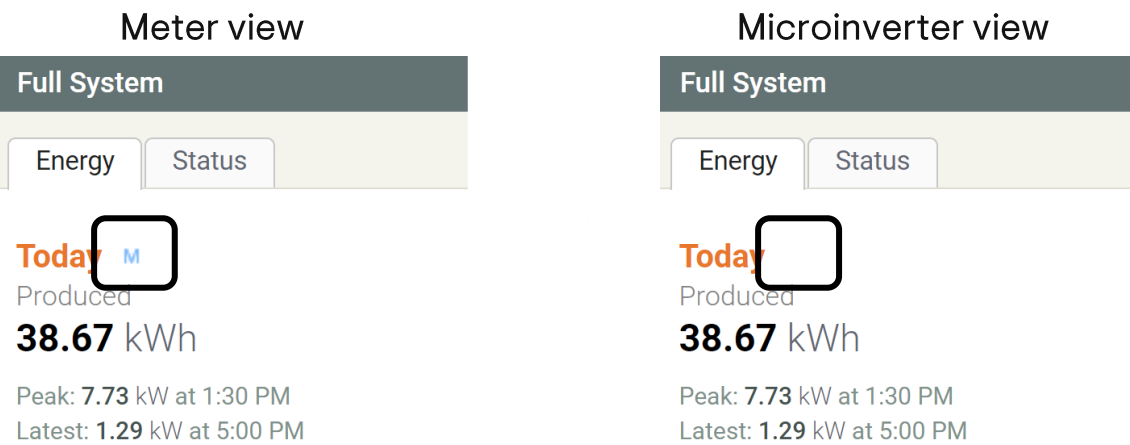
Identifying meter issues in the Enphase Installer Portal

When examining Meter data versus Microinverter data, the first step is to verify the meter configuration by checking the Production CTs.

If the Production CTs are incorrectly installed, the Consumption data will also be incorrect.

Do NOT try to troubleshoot Consumption CTs if Production CTs are incorrect.

The **M** to the right of **Today** in the right-hand **Energy** column indicates that the **Meter view** is displayed. If M is missing, the **Microinverter view** is displayed, which does not display the **Show Phases** feature.

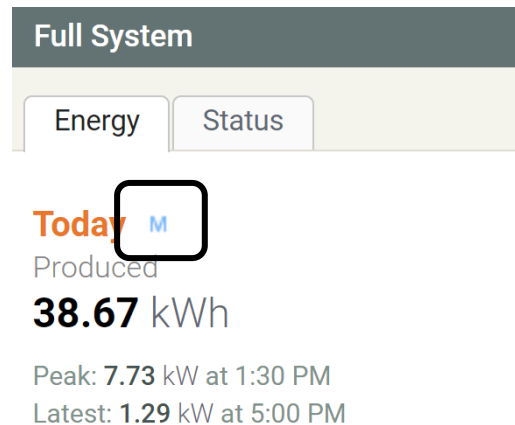


Option 1: Identifying Production meter issues using the Enphase Installer Portal

To toggle between the **Meter view** and **Microinverter view** in the Installer Portal, refer to the following instructions.

Step 1

Check the currently displayed view.



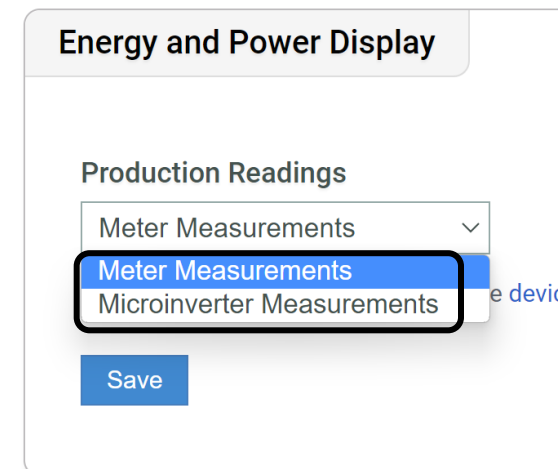
Step 2

Select the **Settings** icon.



Step 3

Scroll to the **Energy and Power Display** section and select the required view from the drop-down menu.



Select **Save**.

Option 1: Identifying Production meter issues using the Enphase Installer Portal

Step 4

Navigate back to the **View** tab.

The bottom-left corner displays the reported Microinverter production, while the right-side **Energy** column shows the Meter production (assuming it is set to show meter values).



Option 2: Identifying Production meter issues using the Enphase Installer Portal

To toggle between **Meter view** and **Microinverter view** in the Installer Portal, refer to the following instructions.

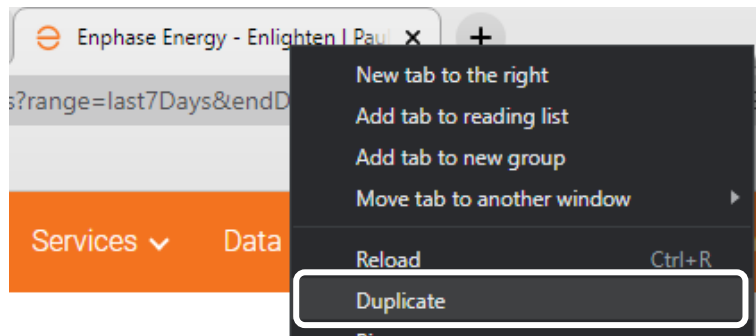
Step 1

Select the **Graph** tab.



Step 2

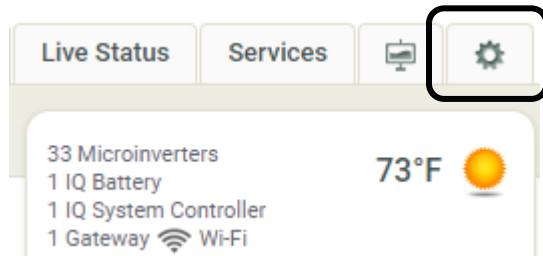
In the URL field, right-click and select **Duplicate**.



Option 2: Identifying Production meter issues using the Enphase Installer Portal

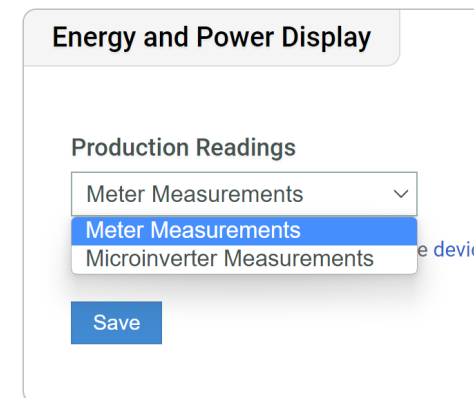
Step 3

In the new browser window, select the **Settings** icon.



Step 4

Scroll to the **Energy and Power Display** section and select the other option in the **Production Readings** drop-down menu, then select **Save** and navigate back to the **Graph** tab.



Installers can toggle between the two browsers to see the differences in production values of the Meter and the Microinverters. The readings are not exact, but they are close to the true value.

Production meter missing production

If the Production meter is not showing all microinverter production, refer to the following instructions.

Step 1

Check for multiple IQ Gateways on-site.

If the site has multiple IQ Gateways, confirm if all IQ Gateways are metered with Production meters enabled.

If one IQ Gateway is not metered or Production is not enabled, the Production meter numbers will be low.

Step 2

Open the Enphase Installer Portal in two separate browser windows to toggle between Meter view and Microinverter view.

Production meter missing Production

Compare the production values for both **Meter view** and **Microinverter view**.



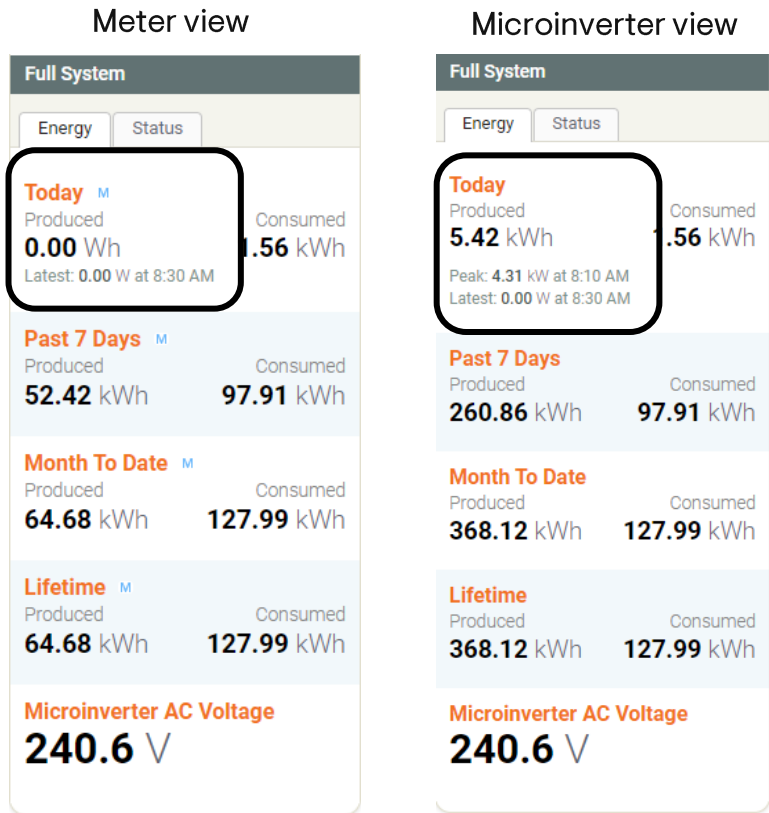
There is always a slight variance due to the accuracy differences between Meters and Microinverters.

However, in this example, the Production meter displays 1.01 kWh, less than a third of the 3.38 kWh of production the Microinverters report.

This kind of issue can only be resolved on-site by correcting the wiring through the Production CT. Check if the wiring is in the wrong direction or if the Production CT is missing some of the Line 1 production lines.

Production meter value zero

If the meter shows a zero microinverter production value when comparing the Production Meter values to the Microinverter production values, refer to the following information.



If the Production Meter has wiring through it, there are some conditions that may result in the meter showing a 0 microinverter production value:

- If Line 2 is run through the meter instead of Line 1
- If wires run in the wrong direction through the Production CT
- If both Line 1 and Line 2 run through the Production CT

In this case, the Enphase Installer Portal graph and Meter view production show no production values. They do NOT show negative production values.

To attempt the resolution remotely, reverse the polarity of the Production CT lines. Wait for 24-48 hours and compare again. If the issue is still not corrected, then a site visit is required to physically fix it. To eliminate any confusion, restore the settings back to normal by reversing it again.

Production meter value zero

If Line 2 is run through the meter instead of Line 1, or if wires run in the wrong direction through the Production CT, reverse the Production meter polarity.

As the meter tracks only one line, select both Line 1 and Line 2 for reversal.

After you select both lines for reversal and submit, the page displays the **Initiated** task.

Initiated

[Reverse Polarity](#)

Current running task(s): Initiated reverse polarity task for Line(s): L1, L2

After the reversal is complete, the task shows as **Completed**.

Completed

[Reverse Polarity](#)

Polarity has been reversed remotely for Line(s): L1, L2

Wait for 24-48 hours to recheck the meter vs. microinverter numbers. If the issue persists, an on-site visit is required to correct the wiring. To eliminate any confusion, change the reversal back to normal.

Consumption CT setting incorrect

If the IQ Gateway settings are set to Load with Solar when the Consumption CTs are installed in a Load Only configuration, refer to the information below.

● ENABLED

Select Consumption CT Location

Load with Solar production

Most common

Note: Load with Solar production is mandatory for Ensemble systems.

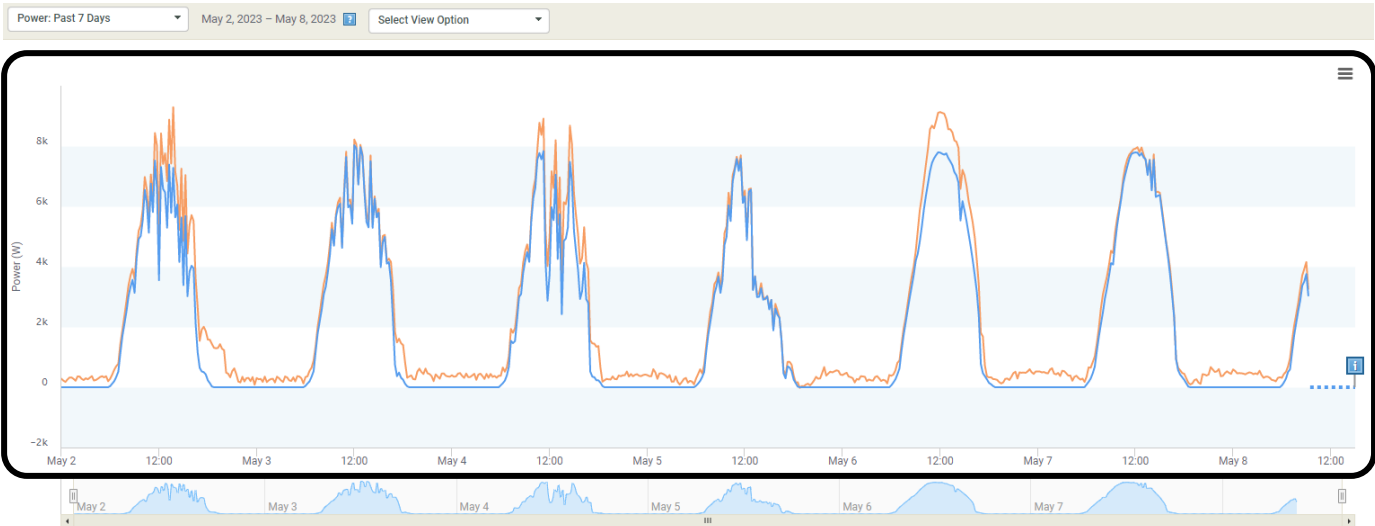
Load Only

Disable

Change Configuration

In the **Load with Solar** setting, the IQ Gateway subtracts Production from Consumption, displaying true Consumption and Grid Export values.

If excess Production does not flow out through Consumption CTs, the Consumption graph line follows the Production line, staying above it by the actual home Consumption value.



Consumption CT setting incorrect

If the IQ Gateway settings are set to **Load with Solar production** when the Consumption CTs are installed in a **Load Only** configuration, refer to the following instructions.

Step 1

Check the **GRID PROFILE**.

System

GRID PROFILE
PREPA 2017 SERIE S/IQ



If it is set to **No Export**, the Production graph line follows the Consumption graph line, as Production is reduced to match the site's Consumption.

Step 2

Check Consumption settings to confirm if **Load with Solar production** is enabled.

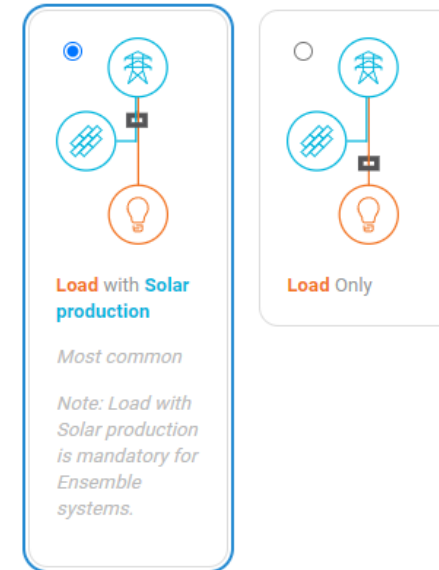
Step 3

If troubleshooting a system without storage, change the setting to **Load Only** and wait 48 hours to confirm that the issue is resolved.

Both Battery Backup and Sunlight Backup sites are required to be in a **Load with Solar** configuration. If the system is a backup, an installer must visit the site to move the Consumption CTs to a **Load with Solar** configuration.

● ENABLED

Select Consumption CT Location



Disable

Change Configuration

Consumption CT polarity issue

If one or both Consumption CTs are connected to the incorrect lines (Line 1 on Line 2, and Line 2 on Line 1) or pointed in the wrong direction (not towards the loads), a polarity issue occurs.

Check the night data in the graph tab, displaying data when solar is not producing.

Confirm that the IQ Batteries are not discharging. During this time, the site should only be importing from the grid, which should not show negatives (exporting).

In the example below, the orange consumption line goes below the 0 axis each night. To confirm that both lines show the same behavior, click **Show Phases** from the drop-down menu.



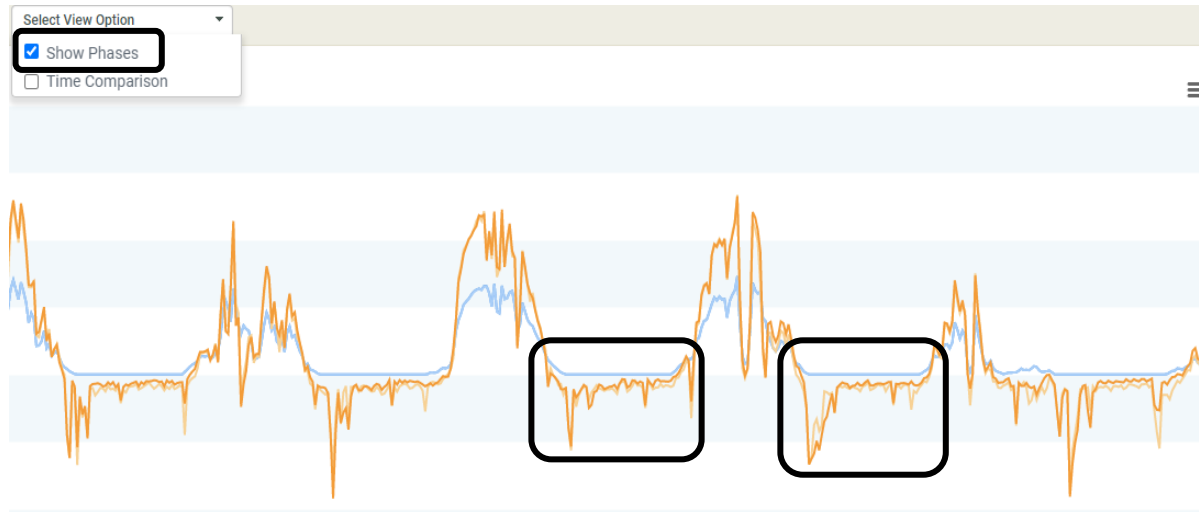
Consumption CT polarity issue

In this example, both lines are negative at night, and there is no battery discharge.

Without a source of power, the site should only be getting power from the grid. Because the importing power is displayed as the exporting power, the polarity must be reversed either remotely or on-site.

If both lines are negative, the installer should reverse the CT polarity on both lines. If only one line is negative, reverse the polarity on that specific line. Refer to the legend at the bottom of the graph to identify Line 1 and Line 2.

Wait for 24-48 hours to confirm whether the issue is resolved.



Consumption meter dual PV system



If a home that has two solar systems shows negative consumption during the daytime when the Production Meter is aligned with Microinverter values, refer to the following information.

If a homeowner has multiple solar systems with the power production of both systems flowing out through the Consumption CTs, the backup system's IQ Gateway cannot account for both systems' production data. This occurs due to an IQ Gateway limitation of only providing information about the specific system it monitors.

In this example, a homeowner has two IQ Gateways. There are two possible issues causing the negative consumption during the daytime:

- Production CTs are capturing the values for both systems
- Production meter(s) are not capturing all production

Because both the meter and microinverter values are within tolerance, it is not a Production CT issue. In this case, the Consumption CTs on the backup IQ Gateway capture the production export from both systems.

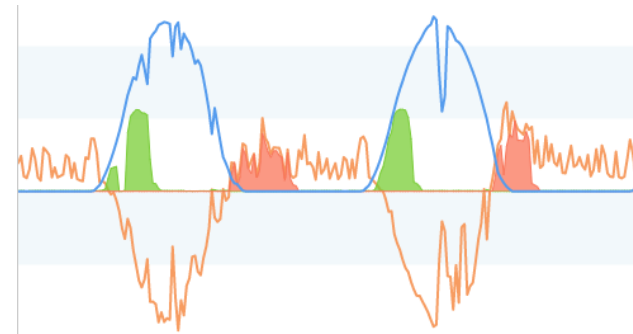
40 Microinverters
2 Gateway  2 - Ethernet
San Diego, CA
 System Normal

Meter View

Today M
Produced
160.64 kWh

Microinverter View

Today
Produced
161.38 kWh



Consumption meter dual PV system

In the previous example, both the meter and microinverter values are within tolerance, so there is no Production CT issue. If both systems export excess Production to the grid through Consumption CTs, refer to the information below.

Option 1

Relocate the Consumption CTs to capture the home loads with only the backup system's production. This is possible only if the second system is connected by a tap between the MSP and the meter.

Option 2

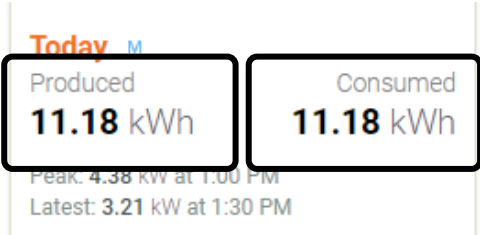
Wire another set of Consumption CTs into the backup IQ Gateway and connect them to the two production PV lines on the non-backup PV system.

To view a wiring diagram, refer to the [Planning an Enphase Energy System Tech Brief](#).

Consumption mirrors production

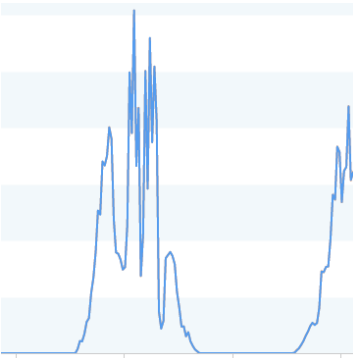
If the Consumption CT is enabled when it is not actually installed, or it is not installed in the correct location, refer to the information below.

If the production and consumption values match each other, the Consumption CTs are most likely either not installed or not wired into the correct location on the IQ Gateway.

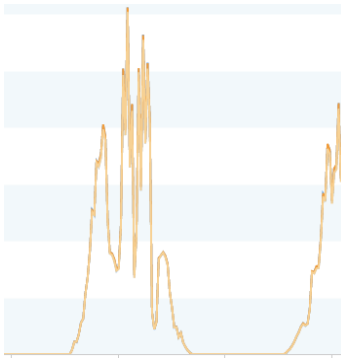


Mirroring occurs when production and consumption match each other.

Show Phases unselected



Show Phases selected



Other consumption meter issues

The previous slides include the most common meter errors. However, there are many other commonly experienced issues as well.

Some on-site issues that are difficult to identify remotely are listed below.

- Multiple sets of CT wires or extended wires that are incorrectly combined
- CT clasps loose, broken, or not closed
- Damaged capacitor behind the terminal block
- Wires connected to incorrect locations on the terminal block

If the installer experiences any type of meter issues other than the examples provided in this troubleshooting guide, complete the following items before contacting Enphase Support.

- Comprehensive evaluation of on-site wiring
- Full use of Enphase Installer App Meter Wizard to determine error

Learning check

- Explain how to check and change load type setting
- Explain how to check and reverse CT Polarity
- Explain how to identify and handle meter issues
- Explain acceptable negative Consumption Meter values
- Explain how to troubleshoot Production Meter issues
- Explain how to troubleshoot incorrect Consumption CT settings
- Explain how to troubleshoot consumption CT Polarity issues
- Explain how to troubleshoot Consumption Meter Dual PV systems
- Explain how to troubleshoot when Consumption mirrors Production

Thank you



| REVISION | DATE | DESCRIPTION |
|---------------|----------------|-----------------|
| ING-00007-1.0 | September 2023 | Initial version |



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