4th-generation Enphase Energy System best practices

TEB-00318-6.0
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Contents

Overview

This guide covers the best practices for installing and commissioning a 4th-generation Enphase Energy System (IQ Battery 10C, IQ Combiner 6C, and IQ Meter Collar).

Follow these guidelines to avoid issues, speed up commissioning, and ensure reliable, high-quality installations.

Training and documentation

Understanding all aspects of the 4th-generation system is essential to ensure proper installation.

- Before designing, permitting, and installing a 4th-generation system, read the following documents, all available at: https://enphase.com/store/storage/gen4.
    - Enphase Energy System planning with IQ Battery 10C/10CS and IQ Combiner 6C
    - Backup-ready installation in California
    - Installation guides for:
        - IQ Battery 10C
        - IQ Combiner 6C
        - IQ Meter Collar
    - IQ Meter Collar utility approvals
    - Concept of operations: 4th-generation Enphase Energy System with IQ Meter Collar
    - PCS integration in 4th-generation Enphase Energy Systems

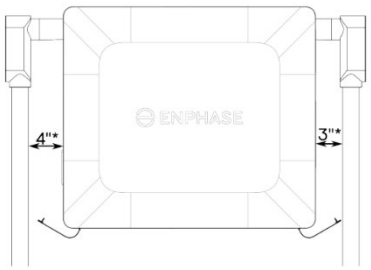
- Ensure that you complete the 4th-generation installation and design certification training is completed to be able to commission the system.
- Review the 4th-generation Enphase Energy System YouTube playlist here.
- Plan and stage all components of the installation ahead of time to avoid costly idle time during installation.

Best practices for installation

The following is a list of key areas where installers should pay special attention to ensure an efficient and reliable installation.

IQ Battery 10C installation

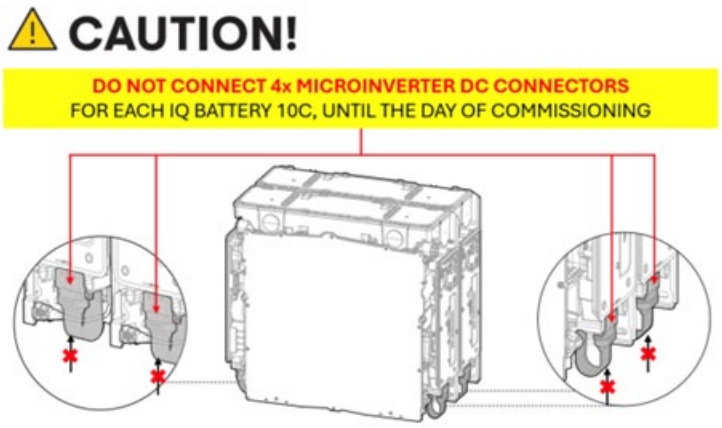
- Plan conduit runs with enough space on either side of the battery to ensure the battery-side doors can swing open. You will need 4 inches of space on the left and 3 inches on the right, as shown below.



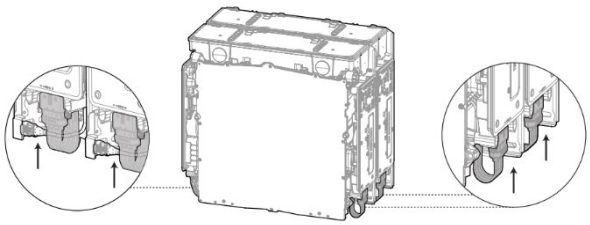
- Size conduits to meet the conduit fill ratio requirements for L1, L2, N, and GROUND wires and the control cable.

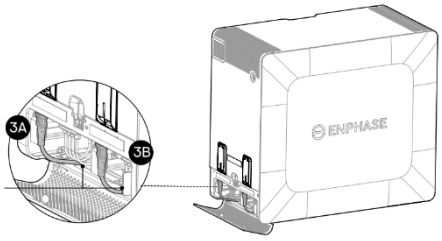
NOTE: The IQ Battery 10C includes both 240 V and 120 V microinverters, unlike earlier Enphase batteries, which only supported 240 V.

- Do not connect the four DC connectors to the Battery 10C Microinverters until the day of commissioning. Each IQ Battery 10C has a total of four DC connectors (two per IQ Battery 5C). Do not connect these unless it is the day of commissioning for these batteries. You can leave the zip tie uncut, or if the zip-tie is already cut, then arrange the DC connectors unplugged, as shown in the following figure.



- Before starting commissioning, plug in the DC connectors to the PCU. Check for water, dust, corrosion, discoloration, or damage before plugging the DC connectors. Blow dry to clean the connector if dust or water is observed before plugging in.





WARNING: Risk of equipment damage - warranty will be deemed void if instructions are not followed exactly.

- Do not leave the control switch ON without completing functional validation.
- Do not leave the control switch on if the AC supply to the batteries is OFF.
- Disconnect DC input connectors if not commissioning or if turning the AC supply OFF to the batteries.

IQ Combiner 6C installation

- Remove the IQ Combiner 6C integrated breaker hold-down kit before installing any required breakers. Once the breakers are installed, the hold-down kit must be fully installed again.

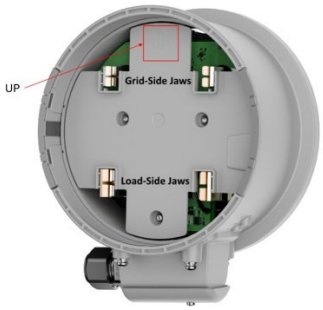
- Use the correct-size tool to drill holes for conduit installation in IQ Combiner 6C. Note that upper-side left or upper-side right conduit entry points are pre-drilled, and the conduit covers for these must be retained for waterproofing. Covers for fans and vents must be in place for water/dust ingress protection.
- Follow local/national codes for the bending radius of conductors landing in the IQ Combiner 6C. You can run conductors over the IQ Gateway.
- Never connect backup loads to the EV charger breaker spot on the IQ Combiner 6C. Use this spot only for 240 V-rated Enphase IQ EV Chargers.

DANGER: Risk for fire or appliance damage. Any 120 V load connected to the EV charger breaker spot may be damaged due to overvoltage.

- Use the IQ Combiner 6C installation guide to plan for Rapid Shutdown and ESS Shutdown initiators as well as various external AC disconnects.
- Ensure that all electrical connections on the breaker and the back feed lugs are properly re-torqued. Loose connections can result in thermal events, potentially compromising system safety and performance. Remove the **Reset Stick** from the combiner before starting commissioning. Refer to the video.

IQ Meter Collar installation

- The IQ Meter Collar can be installed in a separate meter pan, where the utility has not approved it, or under the utility meter, where the utility has approved it. Refer to the utility approvals web page here.
- For installation under the utility meter, you must scan the IQ Meter Collar in the Enphase Installer App and connect the control cable before you leave the collar in the plastic bag for the utility.
- The IQ Meter Collar should be installed with the side embossed ‘UP’ on the top and the junction box on the bottom. The grid supply must enter the collar from the top to ensure that the built-in Consumption CTs are oriented correctly.



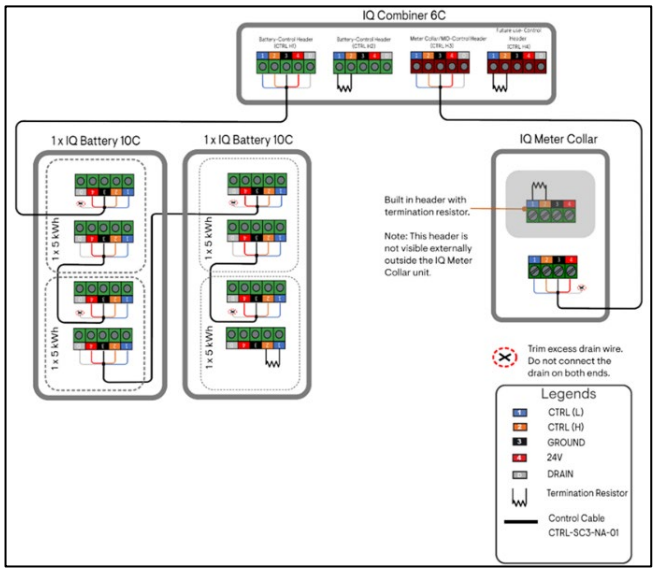
NOTE: If the IQ Meter Collar is installed upside-down, the NEMA 3R rating will be compromised. If installed upside-down, indoors, the grid supply must still be connected to the side marked ‘UP’, i.e., the grid-side jaws, to ensure the built-in Consumption CTs are oriented correctly.

Control cable and header installation

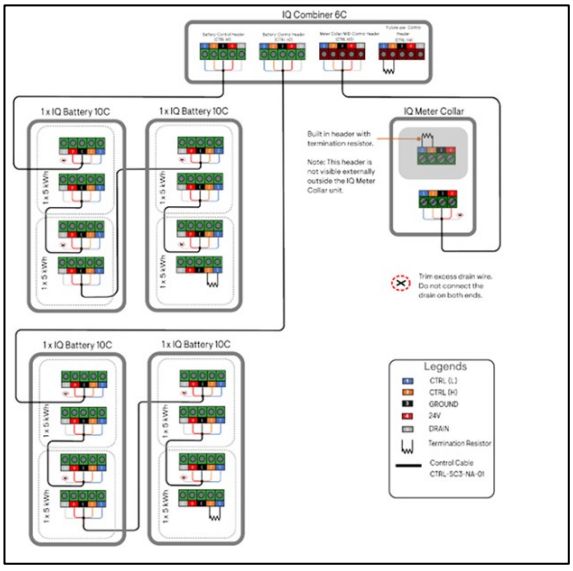
Follow the steps to connect the control cable:

- Insert the control header into the control port and ensure it is fully seated and latched.
- Strip and terminate wires into headers before connecting to ports.
- Ensure the drain wire is landed only on one end for each segment of the CAN control cable. The red, blue, and orange wires must be connected to all control connectors.

NOTE: The IQ8BN Microinverters in the IQ Battery 10C generate the 24 VDC supply. Connect the red wire carrying this supply to all battery, combiner, and IQ Meter Collar control connectors to ensure the IQ Meter Collar receives 24 V power.

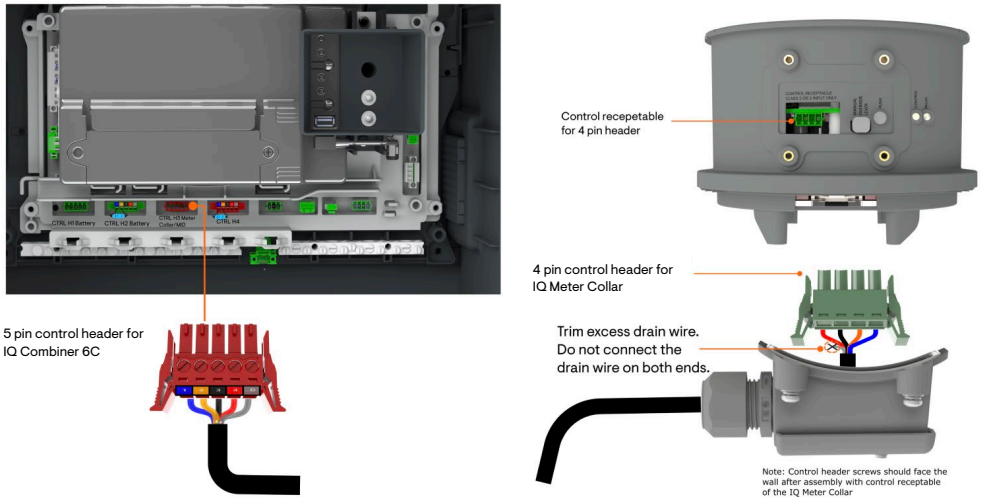


1 × control connector used for the battery in the IQ Combiner

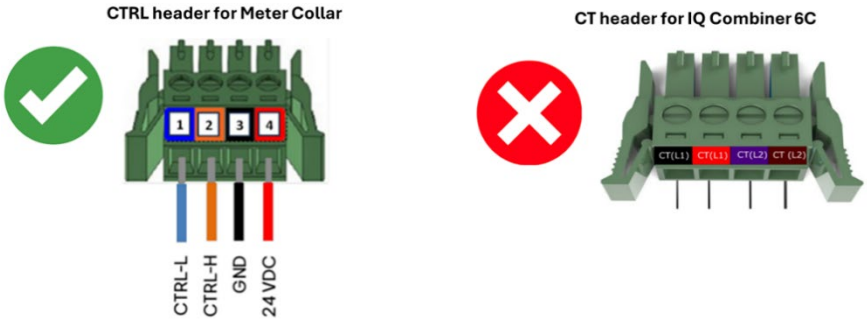


2 × control connectors used for the battery in the IQ Combiner

- Battery control wiring (two resistors): One resistor in the unused control connector of the IQ Combiner 6C, and the other in the last IQ Battery in the daisy chain. If both control connectors on the IQ Combiner 6C are used, install the resistors in the batteries at each end of the daisy chain.
- IQ Meter Collar control wiring (one resistor): One visible resistor in the unused red control connector on the IQ Combiner 6C. The other termination resistor is built into the IQ Meter Collar.
- Ensure you use a 4-pin header for the IQ Meter Collar, and a 5-pin header for the IQ Combiner 6C.
- For the IQ Meter Collar, orient the header so the screw heads face the meter socket before insertion.



- Ensure you use the 4-pin header provided with the IQ Meter Collar and not the CT header provided with the IQ Combiner 6C. The CT header has the letter ‘CT’ on all terminals.

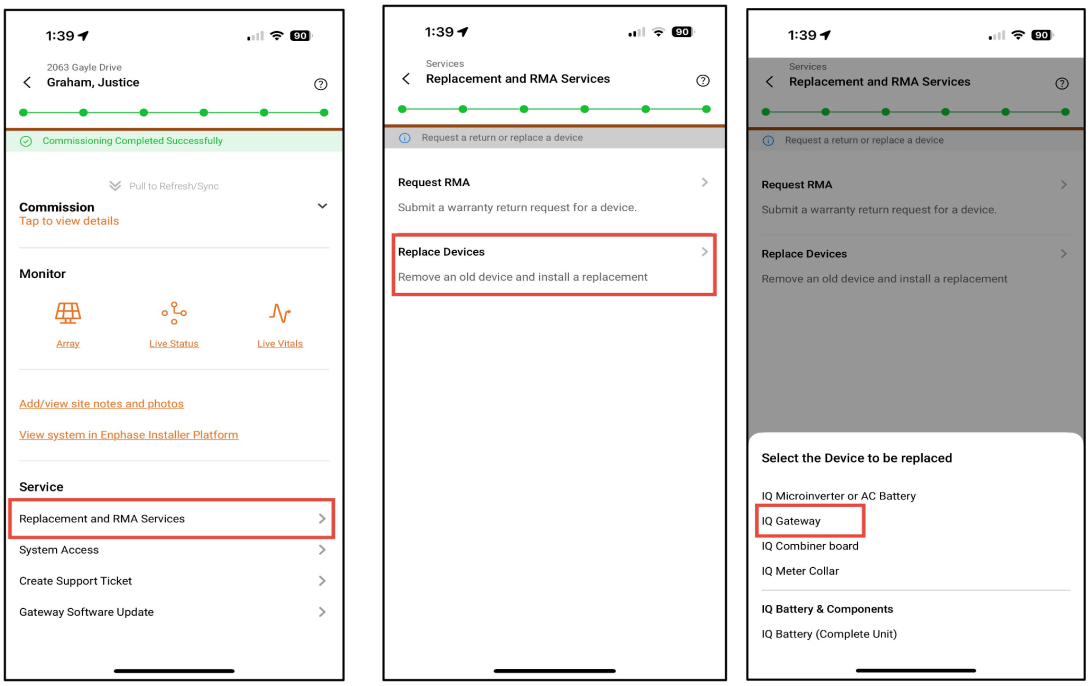


- If you are not installing the control header, tape it to the inside of the junction box and leave it in an appropriate area on site where it is not misplaced/lost.

Best practices for commissioning with the Enphase Installer App

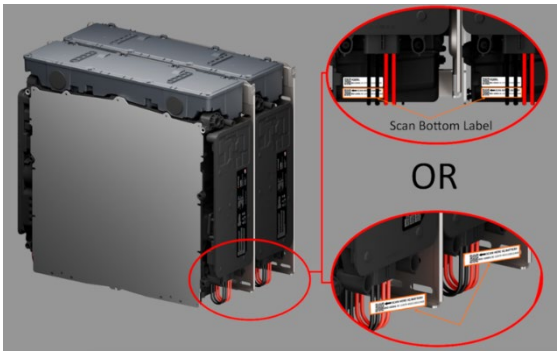
Using the gateway replacement feature in the Enphase Installer App

For retrofit sites, use the Gateway replacement process for battery addition in the Enphase Installer App.



Scan the correct IQ Battery serial number

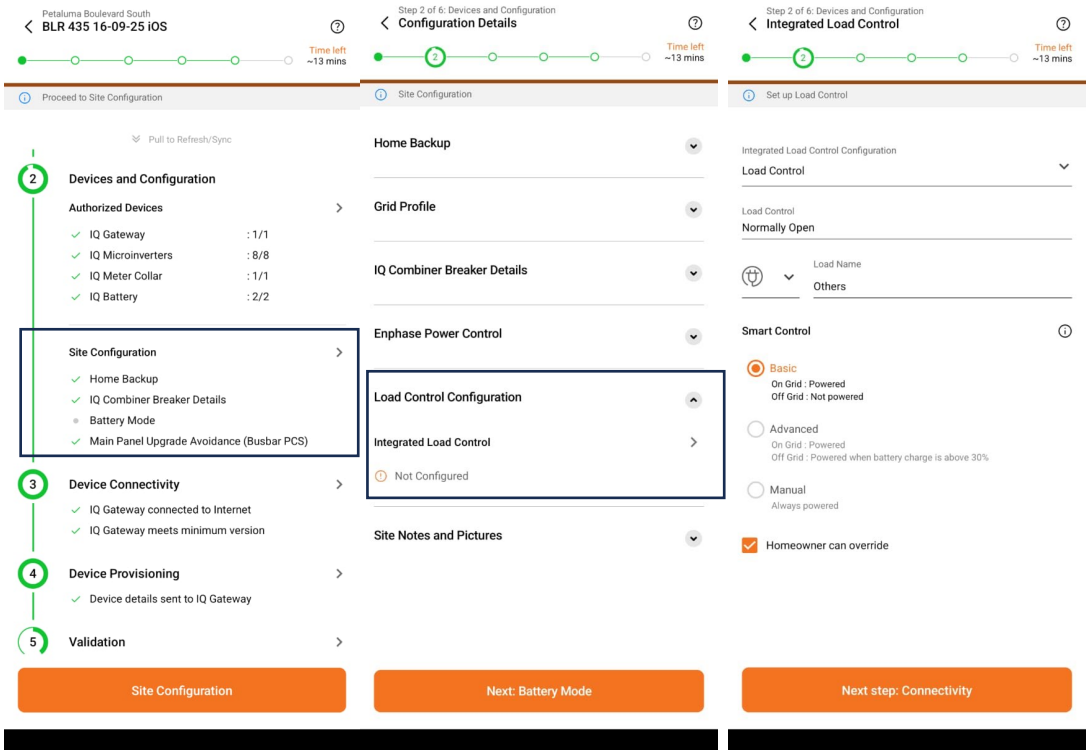
Ensure to scan the battery serial number sticker. Several stickers may be present in the location of the battery serial number.



Checklist - before energizing and provisioning the system

Follow this checklist to avoid issues during energizing and provisioning the system.

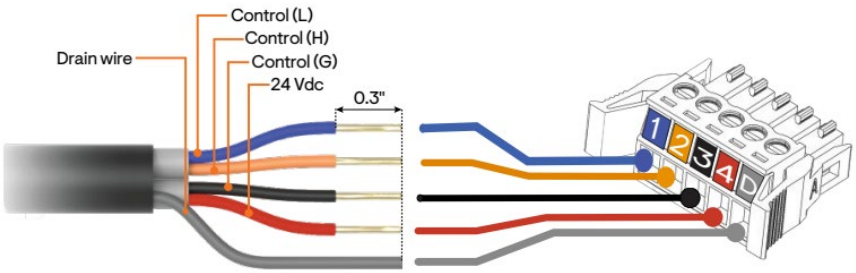
☐ **Configure load controller:** Configure the load controller in step 2 to ensure that the load controller relays are closed and home loads wired to the load controller are powered on.



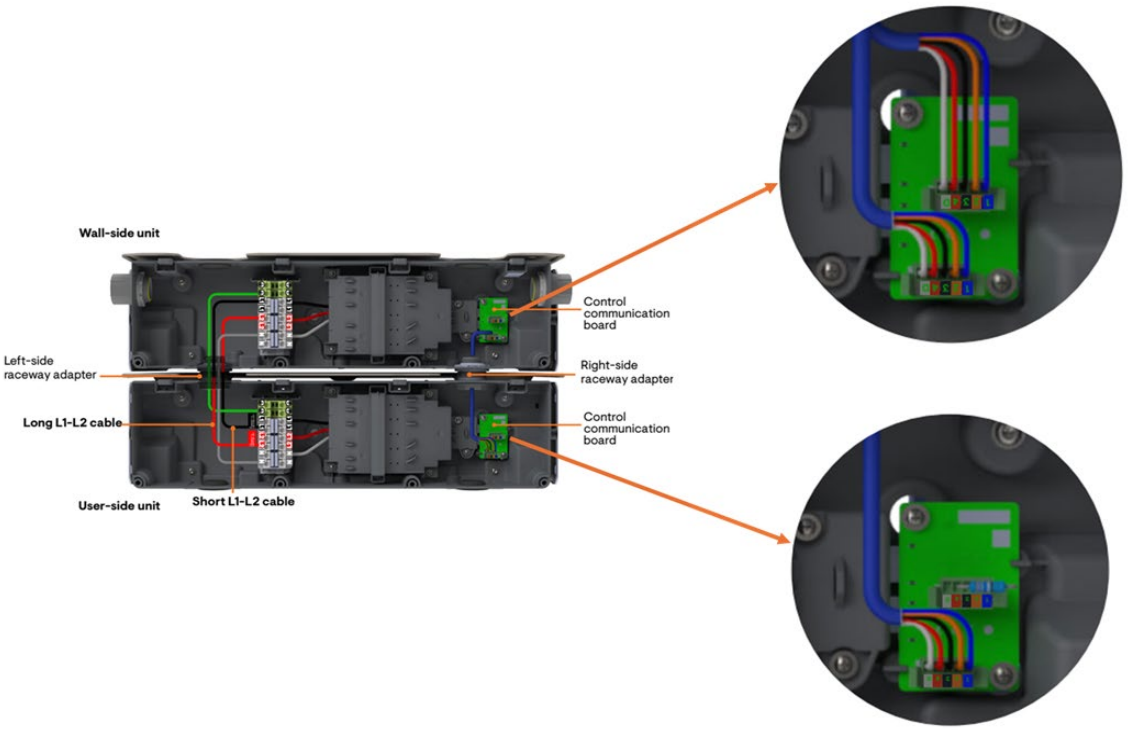
NOTE: The load controller can be configured through the Enphase Installer App while on-site or remotely. If you have forgotten to configure it on the site, you can use the Enphase Installer App to configure the load controller remotely.

☐ **Check the control cable connections.** The control cable is meant for use with 24 VDC and for communication purposes. Wire to the header as per color coding and as stated below. Torque to 1.8 in-lb or 0.2 N m. A two-finger pull test on the wires is a good way to ensure they are not loose.

- 24 VDC to the red #4 terminal.
- Control ground to the black #3 terminal.
- Control L to the blue #1 terminal.
- Control H to the orange #2 terminal.
- Drain wire to the grey #D terminal only on one end for each segment of the control cable.

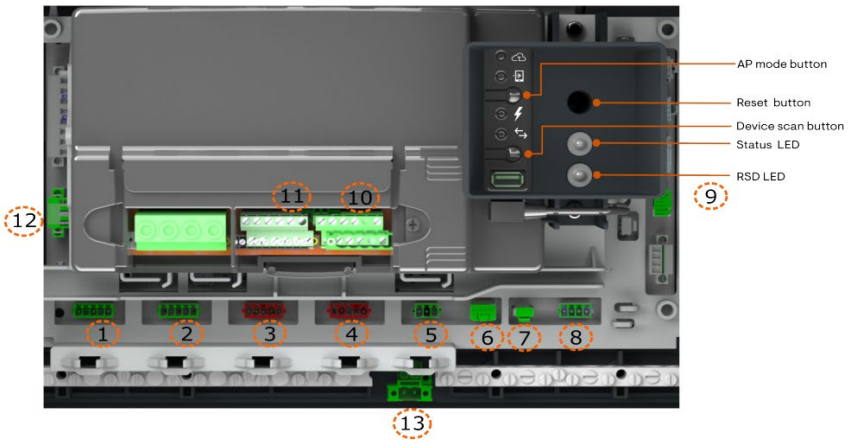


DANGER: Do not miswire the 24 VDC and control ground wires on the control headers. Risk of fire and equipment damage. Miswiring the 24 VDC and control ground can damage the control communication board in the IQ Batteries.



DANGER: Do not connect the control wires to AC voltage. Risk of electric shock, fire, and equipment damage.

Header #13 in the IQ Combiner 6C is the AC sense header and must not be connected to the control wiring. Only connect control wires to headers #1, #2, #3, and #4.

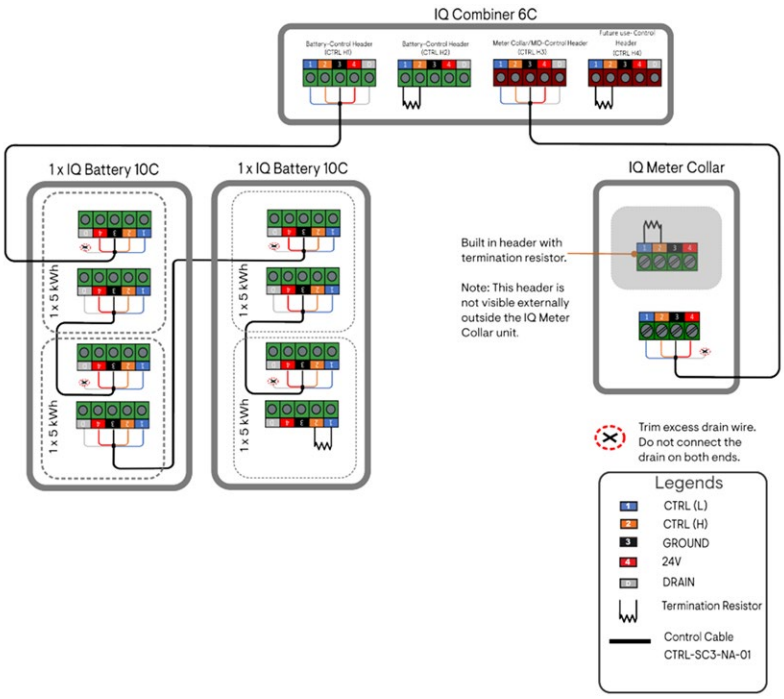


☐ **Control wiring check between the components**

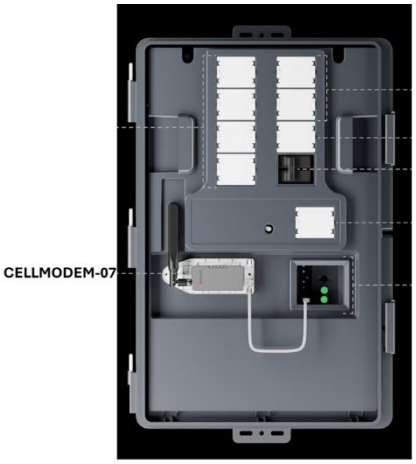
- Drain wire is landed only on one end for each segment of the control cable.
- The black, red, blue, and orange wires must be connected to all control connectors.

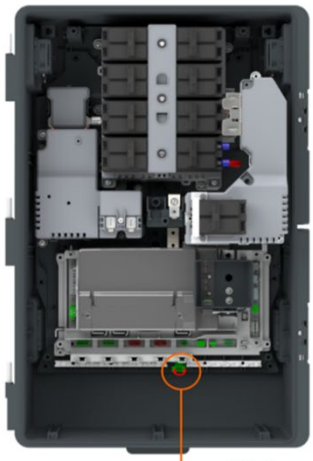
- Your system must have three visible termination resistors.

Follow the control cable wiring between components as shown in the following image.



☐ **Ensure CELL MODEM is plugged in:** Ensure the combiner dead front is installed and the cellular modem is connected to the USB port. The system will check for cellular connectivity during provisioning.



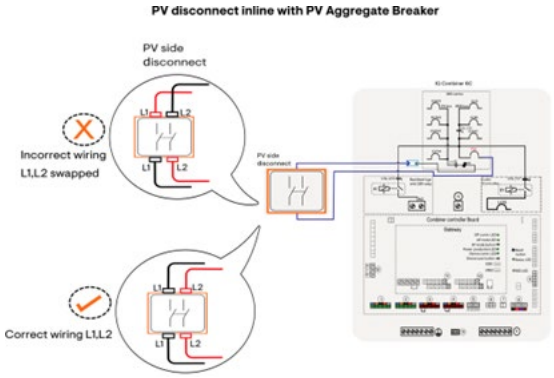


AC Sense Header: Ensure the pre-installed jumper wire is in place, or if using an external disconnect, make sure it is in the ON position.

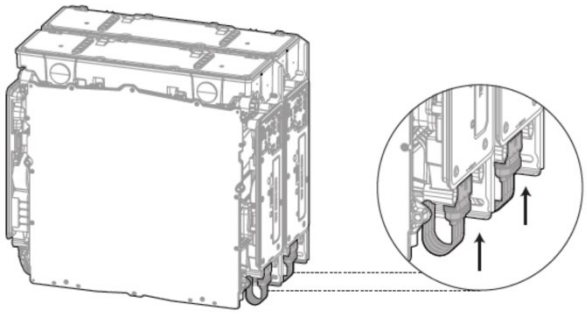
☐ **AC sense header:** In the AC sense header in IQ Combiner 6C, ensure the pre-installed jumper wire is firmly in place, or if using an external disconnect, make sure it's in the ON position.

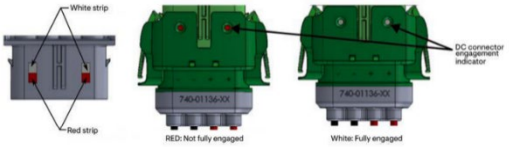
NOTE: The AC sense header supports a maximum conductor size of 12 AWG.

☐ (Only if applicable) Ensure that the PV disconnect inline with PV aggregate breaker is wired correctly. Do not swap L1 and L2 wires. Swapping these may lead to incorrect Rapid Shutdown triggering on the site and delays during commissioning.



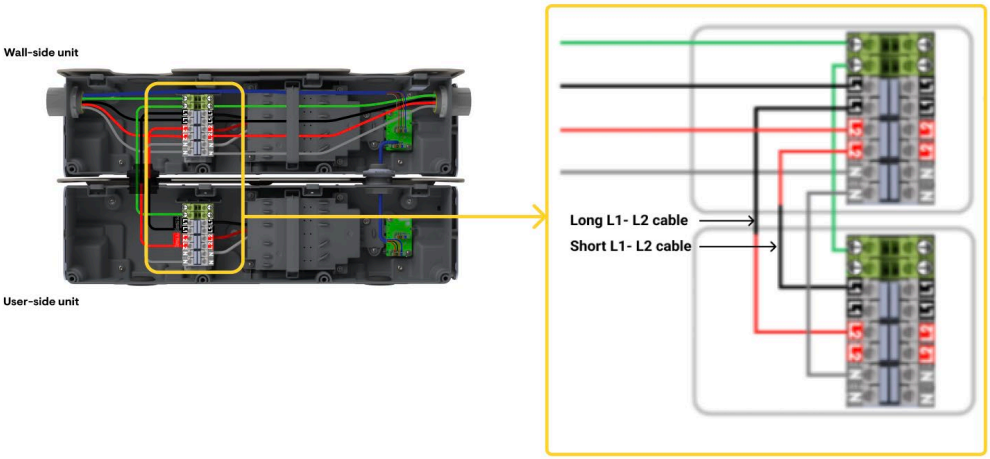
☐ **DC connectors:** On the day of commissioning, connect DC connectors to all microinverters in IQ Batteries before installing the outer/ID cover. When the DC connectors are correctly inserted, a solid click will be heard.



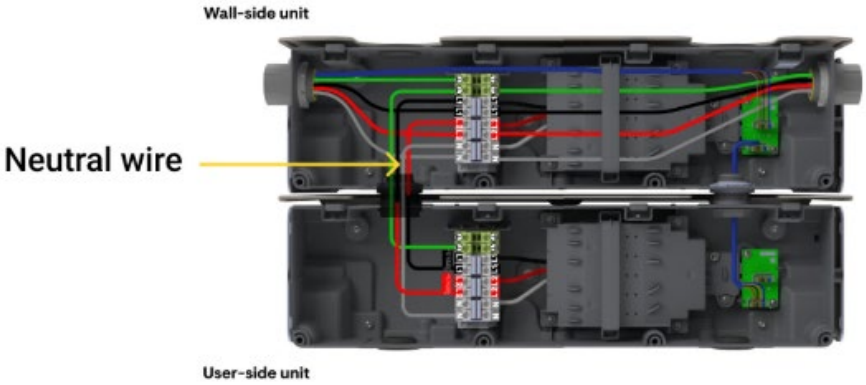


Ensure the indicators on the DC connectors show a white color.

☐ **Interconnect cable in batteries:** Ensure that the interconnect cable between each 5 kWh battery unit has been installed properly. Torque to 22.1 in-lb or 2.5 N m.



☐ **Neutral wire in batteries:** Ensure to connect the neutral (N) wire to all IQ Battery 10C units.



☐ **Turn ON IQ Battery:** Press and hold the DC switch on each battery for 5 seconds.

Provisioning may fail if the switch is not pressed for at least 5 seconds.

If you are not sure whether you pressed the switch for 5 seconds, check the LED.

If the LED is OFF

Turn ON: Press the DC switch for 5 seconds or until the LED turns blue or green.
LED blinks green, turns off, and then lights up blue or green in ~5 seconds.

If the LED is ON

- Turn OFF: Press the DC switch for 5 seconds.
  LED flashes red. Wait ~30 seconds for the LED to turn off.

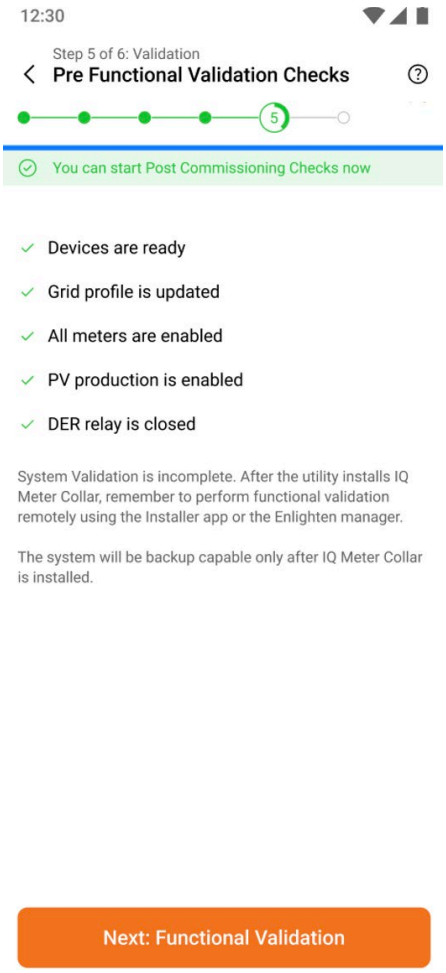
⚠ **WARNING**: Do not press the switch while the LED flashes red.

- Turn ON: Press the DC switch for 5 seconds or until the LED turns blue or green.
  LED blinks green, turns off, and then lights up blue or green in ~5 seconds.

Completing commissioning without the IQ Meter Collar

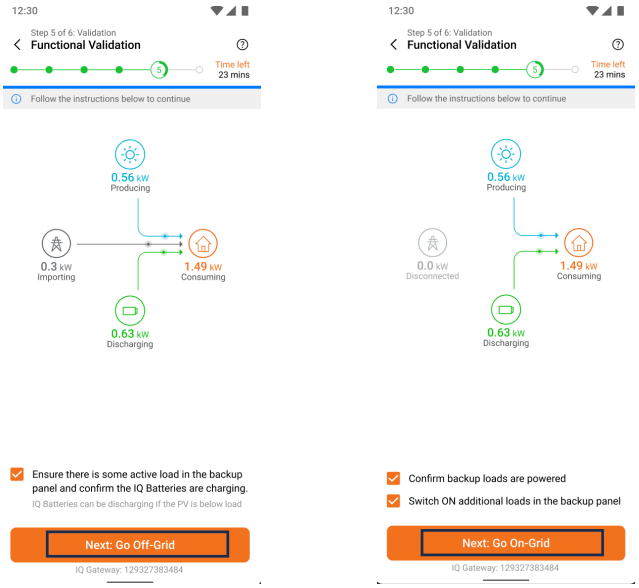
- You must complete commissioning of the IQ Meter Collar in the Enphase Installer App, even if the IQ Meter Collar is not installed under the utility meter, as long as the meter collar is connected via the control cables.
- Ensure that you complete the following steps in the Enphase Installer App before leaving the site:
  - Provisioning
  - Meter validation
  - Pre-functional validation checks (Refer to the image below)

  Completing the commissioning steps till the end of the **Pre Functional Validation Checks** ensures smooth commissioning completion once the utility has installed the meter collar.

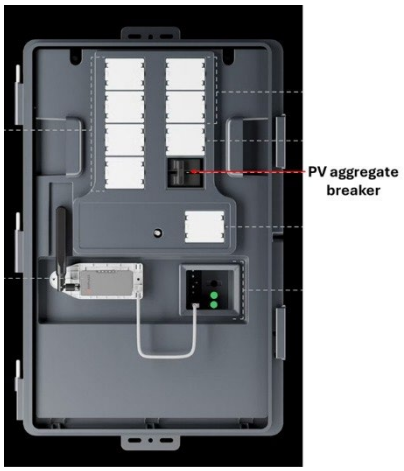


Validating grid transitions in Enphase Installer App

- Always use the **Go Off-Grid** and **Go On-Grid** buttons to validate grid transitions during the functional validation step. Do not use the main breaker to test grid transitions.



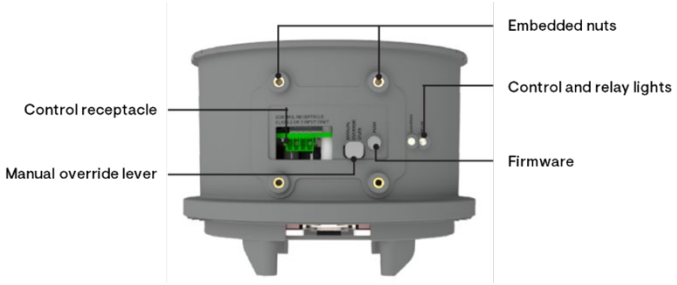
- If the MID relay is stuck, causing grid transition delays, or if you are unable to start functional validation due to the **System is Off-Grid** error on the Enphase installer App, follow the steps below. These are also provided in the Enphase Installer app (v 4.8.5 or higher).
    - Turn OFF PV aggregate breaker in the IQ Combiner 6C.



    - Loosen the cable gland or conduit fittings at the junction box below the IQ Meter Collar.
    - Unscrew and detach the junction box from the IQ Meter Collar.
    - Check if there is excess control cable in the junction box. Excess cable can press against the Manual Override (MOR) Lever and cause the MID relay to be stuck closed.

    - Check if the control cable is exiting from the right of the junction box. There is a higher risk of the cable pressing the MOR Lever.

- Pull down the MOR lever on the IQ Meter Collar.



⚠ Inform the homeowner that the system will lose power.

- Push the MOR lever into the unit. This will close the MID relay and restore power to the system.
- Press and hold the push button on the Meter Collar until both LEDs turn solid RED (at least 15 seconds) to reset the Meter Collar.
- Screw in the junction box.
- Remove slack by gently pulling excess cable out of the cable gland (if using a cable gland), and finally tighten the cable gland.
- Turn ON PV aggregate breaker in the IQ Combiner 6C.

Contact Enphase Support for help if in doubt regarding the instructions stated above or if these instructions are not helpful.

Troubleshooting control wiring

- If the IQ Meter Collar update fails or there is no 24 V power on the IQ Meter Collar, check the control (CTRL) wiring at the IQ Meter Collar.

⚠ **WARNING**: Always use the 4-pin connector with the control header in the IQ Meter Collar. Using a 5-pin connector can damage the equipment.

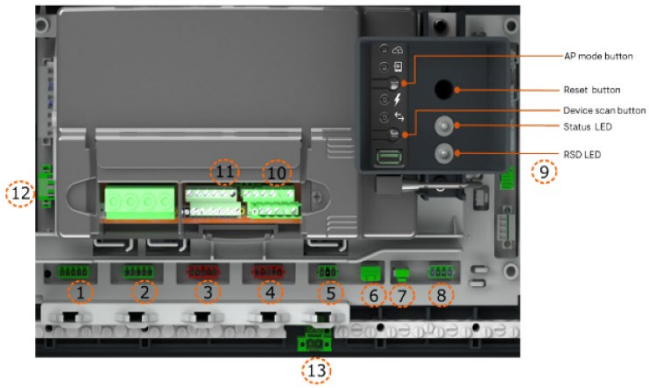
⚠ **WARNING**: Do not force the 4-pin connector into the control header. You could misalign the connector, leading to equipment damage and a lack of communication.

- Detach the control male connector from the header at the bottom of the IQ Meter Collar (after removing the junction box). You can measure voltages on the top screws.

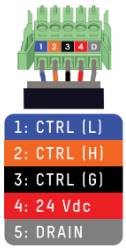
~2.5 VDC – Blue (1) to black (3)
~2.5 VDC – Orange (2) to black (3)

>20 VDC – Red (4) to black (3), with battery DC switches turned ON

- If you have CAN wiring or 24 V power issues with batteries, check the control wiring at IQ Combiner 6C.



Detach the battery control male connector from headers #1 and #2 in the image above. You can measure voltages on the top screws.

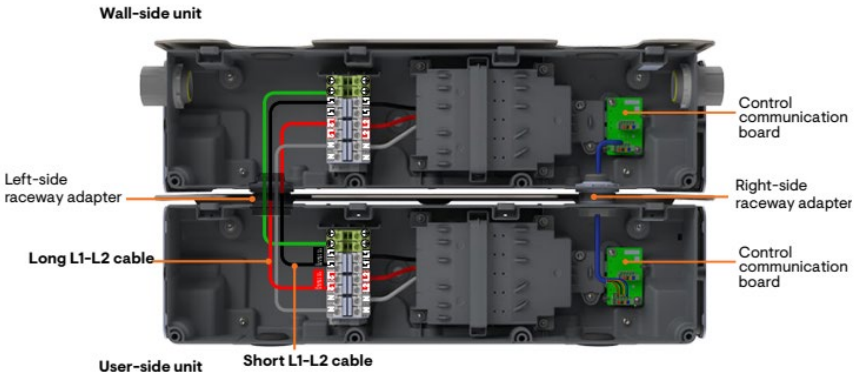


~2.5 VDC – Blue (1) to black (3)
~2.5 VDC – Orange (2) to black (3)

>20 VDC – Red (4) to black (3), with battery DC switches turned ON

If the voltages are not as expected, the control wire between batteries and the IQ Combiner 6C may be damaged.

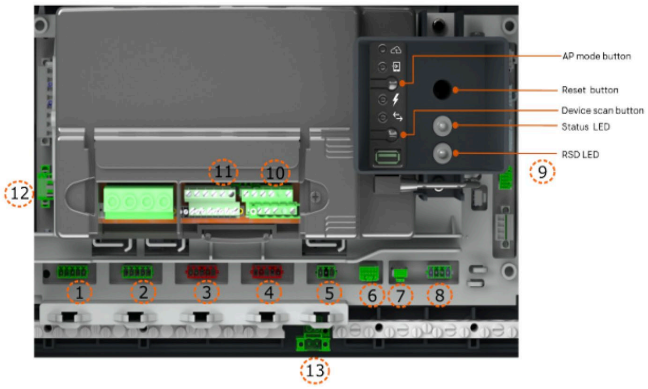
- Repeat the above measurements on the control male connectors in the IQ Battery 10C units. These are plugged into the control communication boards.



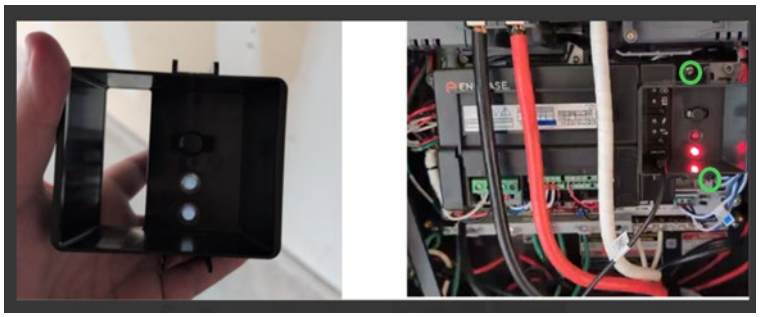
- If the voltages are not as expected, you may have a damaged control wire between battery units.

Troubleshooting gateway issues in IQ Combiner 6C

- When using the gateway AP mode and device scan buttons to open a tunnel, avoid touching the reset button. Touching this can cause a gateway and controller board reboot and delay troubleshooting.



- In a rare scenario, if all gateway LEDs are continuously blinking red, remove the Reset Stick from the IQ Combiner 6C when prompted, before starting the commissioning process. Refer to this video. You can also work with Enphase Support to receive a replacement part and replace the plastic housing of the reset button.
    - Remove the IQ Combiner 6C dead front.
    - Undo the 2 screws (located where the image shows green circles) and remove the plastic housing with the reset button, as shown below.
    - Follow instructions from Enphase Support to install the replacement part.



Post commissioning

Waiting for the utility to install the Meter Collar and no Permission to Operate (PTO)

- Enphase recommends leaving the battery breakers and battery DC switches on. The batteries will maintain their state of charge (SoC) at ~5% and will not be discharged until the IQ Meter Collar is installed.
- If the utility requires the batteries to be turned OFF, unplug the DC input connectors from all the microinverters on the battery (four DC input connectors per IQ Battery 10C). AC power does not need to be turned OFF.
- You will need to visit the site to turn the batteries back ON. Connect the DC connector to each PCU. Plug in the DC connectors to the PCU. Check for water, dust, corrosion, discoloration, or damage before plugging the DC connectors. Blow dry to clean the connector if dust or water is observed before plugging in.
- Turn ON: Press the DC switch for 5 seconds or until the LED turns blue or green. LED blinks green, turns off, and then lights up blue or green in ~5 seconds.
- Do not turn off the battery AC breakers in the IQ Combiner 6C or the breaker supplying the IQ Combiner 6C from the backup panel.

IQ Meter Collar or Consumption CTs are installed, and no permission to operate (PTO)

- Unplug the DC input connector from all the microinverters on the battery. (4 DC input connectors per IQ Battery 10C). AC power does not need to be turned OFF.
- You will need to visit the site to turn the batteries back ON. Connect the DC connector to each PCU. Plug in the DC connectors to the PCU. Check for water, dust, corrosion, discoloration, or damage before plugging the DC connectors. Blow dry to clean the connector if dust or water is observed before plugging in.
- Turn ON: Press the DC switch for 5 seconds or until the LED turns blue or green. LED blinks green, turns off, and then lights up blue or green in ~5 seconds.
- Do not turn off the battery AC breakers in the IQ Combiner 6C or the breaker supplying the IQ Combiner 6C from the backup panel.

Turning batteries OFF

Follow the procedure below if turning the battery OFF due to no PTO:
Unplug the DC input connector from all the microinverters on the battery. (4 DC input connectors per IQ Battery 10C). AC power does not need to be turned OFF.

Enter service testing

Often utilities require on-site testing to demonstrate that the system follows the requisite enter service time. Enphase's system is fully configured and compliant with grid profiles after functional validation. Ensure you finish functional validation before doing any testing with utilities, especially tests requiring demonstration of enter service times.

An example of such a test is disconnecting the utility power from the IQ Meter Collar and reconnecting it. In this scenario, the utility would expect the IQ Meter Collar to go back on the grid

after allowing the entire service time to pass. Doing this test before functional validation completes may fail to comply with the intended enter service times.

Avoid reconnecting the Enphase Installer App with the gateway once functional validation is done. Doing this may put the system back into commissioning mode, wherein it may not comply with the utility's interconnection parameters, like enter service timing, and so on.

Revision history

Revision	Date	Description
TEB-00318-6.0	February 2026	Added instructions for completing commissioning without the IQ Meter Collar.
TEB-00318-5.0	November 2025	Added • Warning not to press the battery control switch when the LED is flashing red. • Warning not to leave the control switch turned on without an AC supply connected to batteries and without completing functional validation. • Warning to hold the switch for 5 seconds to avoid microinverters being on and causing battery deep discharge. • Battery turn-off instructions added to the post-commissioning step. • Instructions to remove DC connectors for turning OFF IQ Battery. • Instructions to remove the combiner reset stick before commissioning. • Recommendation to reach out to Enphase Support if the MID relay is stuck.
TEB-00318-4.0	September 2025	Added • Instructions to troubleshoot gateway issues. • Instructions to use the collar header and not the CT header for collar control wiring. • Instructions to configure the load controller. • Instructions to plug in the cell modem before provisioning. • Images added for gateway replacement flow. • Added a checklist item for load control configuration.
TEB-00318-3.0	September 2025	Added • Instructions to not turn off the AC breakers when no PTO. • Check to avoid 24 VDC and ground miswiring. • Guidance to keep connectors plugged in for DC and DC switch when not energized to ensure NEMA 3R rating. • The issue with the meter collar update may be due to misalignment of the 4-pin connector.
TEB-00318-2.0	August 2025	Added • Reformatted content to make a checklist.

		• Info on where to find battery serial numbers for scanning. • Reminder to wire N to batteries. • Warning not to use the 5-pin connector with a collar. • Red wire connection to all equipment and three visible termination resistors for control wiring. • Shorting the wire on the unused AC sense header in IQ Combiner 6. • Warnings not to connect the control cable to AC voltage. • Instructions to check the voltage on the battery control headers. • Image for keep-out areas next to the battery cover.
TEB-00318-1.0	August 2025	Initial release.