

Installing the Enphase Communications Kit 2

The Communications Kit 2 (SKU: COMMS-KIT-02) enables wired communication between IQ Gateway, IQ Battery 5P, and IQ System Controller 3/3G.

✓ **NOTE:** The Communications Kit 2 must be installed when an IQ Battery 5P is being used with the IQ Gateway (standalone or integrated into an IQ Combiner 4/4C/3/3C/3-ES/3C-ES) instead of an IQ Combiner 5/5C. The IQ Combiner 5/5C integrates the functionality of the Communications Kit 2 and therefore does not require a standalone Communications Kit 2.

Read and follow all warnings and instructions in this guide. If you need help understanding any of the concepts, terminology, or hazards outlined in these instructions, refer installation to a qualified electrician or installer. These instructions are not meant to be a complete explanation of a renewable energy system. All installations must comply with local codes and standards.

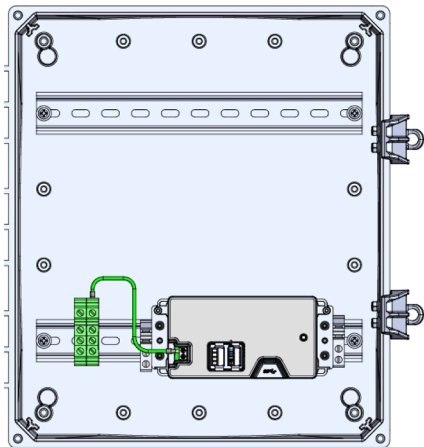


Figure 1: Communications Kit 2 enclosure view

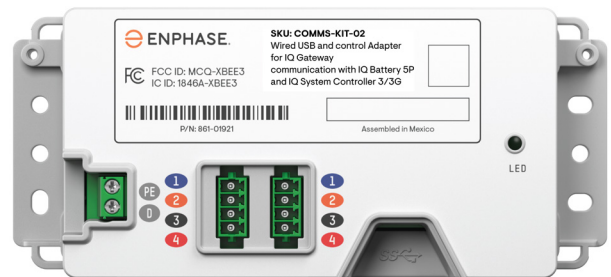


Figure 2: Control adapter

CONTENTS

The Communications Kit 2 enables the IQ Gateway to communicate with the IQ Battery 5P and/or IQ System Controller 3/3G over the control cable.

This kit contains:

- NEMA 3R enclosure with two DIN-rails mounted.
- Control adapter mounted on lower din rail.
- IQ Battery CT (leads must be wired to IQ Combiner terminals, as shown in Section 6 of the [IQ Combiner 4/4C QIG](#). CT must be installed on the aggregate IQ Battery Line 2 wire landing in IQ System Controller 3 for multi-mode systems, IQ Combiner, or panel for grid-interactive systems).
- One - USB Type-C to Type-A cable (40 cm/15 ¾ inch).
- Accessories bag including:
 - Zip ties for wire management.
 - Jumper (for shorting the IQ Gateway L2 and L3 power terminals. Provided with this product for ease of system installation).

✓ **NOTE:** For installation on sites containing the Envoy S Metered, a 3-pin Wago that can fit into ports supporting 14 AWG wires must be purchased separately.

- Two control headers pre-installed on the kit (one extra header provided as a spare).

The USB cable connects the Communications Kit 2 adapter to the IQ Gateway. This also powers the Communications Kit adapter by drawing power from the IQ Gateway.

The Control cable is wired to the detachable headers attached to the adapter.

INSTALLATION

The installation section is divided into three sections.

- 1) Preparation
- 2) Product installation and wiring
- 3) Control (CTRL) wiring between system components and Communications Kit 2



DANGER! Risk of electric shock. All sources to equipment being serviced must be disconnected external to the device. In particular, the storage system may energize conductors, so storage circuits must ALWAYS be isolated via a circuit breaker or disconnected before working on any portion of the system.

1 Preparation

- The Communications Kit 2 enclosure should have access to a ground bar.
- Identify your system design from the system wiring section below. The control wiring installation varies based on the system design. You can identify the Communications Kit wiring based on how the system will be wired.
- Identify a vertical location where the enclosure can be mounted. Keep in mind the dimensions of the enclosure when finding a location.
- It is recommended to power down the system before you begin to ensure safety while operating near electrical equipment and power wires.
- Ensure you have the following tools for the installation:
 - Drill bit (required to drill holes for the conduit).
 - Screwdrivers, pliers, and a torque wrench.



- Enphase control cables (sold separately; SKU: CTRL-SC3-NA-01). Use Enphase control cables and headers for control wiring. Enphase control cables are certified under UL-1277, UL-3003, and UL-83. Enphase has validated performance using the Enphase control cables. Enphase cannot guarantee performance when a third-party cable is used.

Control cable torque details:

Cable type	Wire size	Torque
Power cables	18 AWG	0.2 N m (1.77 lb-in.)
Ground cables	18 AWG	0.2 N m (1.77 lb-in.)
Terminal block cables	6 to 24 AWG	0.5 N m (4.42 lb-in.)

2 Product installation and wiring

A) Drill holes to accept the conduit

- The bottom of the Communications Kit enclosure is the best place to drill holes for conduit fittings.

✓ **NOTE:** The control cables and the USB can go together in the same conduit. However when the Communications Kit 2 is installed in a separate enclosure from the IQ Gateway/IQ Combiner variants or Envoy S Metered, the cables used to power the gateway, and the USB cable connecting the gateway to the Communications Kit 2 should be routed through different conduits.

WARNING! Risk of equipment damage. Do not drill conduit holes on the top of the box or at any location that allows moisture ingress.

✓ **NOTE:** Make sure that the holes do not interfere with the internal workings, mechanics, or the deadfront legs in the corners of the Communications Kit 2.

✓ **NOTE:** Best practice is to use a stepped drill bit to make the conduit holes. Using a hole saw may crack the plastic housing. As an alternative, use a sharp chassis punch with caution.

- Use a snap punch or other type of center punch to prevent the drill from wandering. Drill a pilot hole with a smaller drill before using a step drill bit.
- Use only UL-listed rain-tight conduit fitting for wire entry into the enclosure.

B) Planning the wiring:

The control wiring has three basic components:

- The signal wires (blue, orange, black, red) within the control cable.
- The drain cable of the shield (marked as drain in Figure 3).
- Termination resistor.

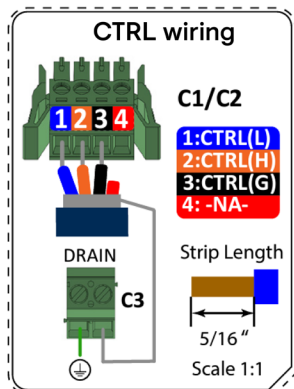


Figure 3: Control header connection

C) Confirm if the Communications Kit 2 is the terminal node

A terminal node is a product (IQ Battery 5P, IQ System Controller 3/3G, or an IQ Gateway/IQ Combiner with a Communications Kit 2) in the EES at the extreme end of the control wiring sequence. The possible sequences for the whole system are defined in section 3 of this document.

If the Communications Kit is a terminal node per our system wiring diagram below, leave the termination header installed on the control header. If the Communications Kit is not the terminal node, remove the termination resistor to prepare the control header for wiring to another node.

D) Strip the cables for the connection

Enphase SKU for control cable: CTRL-SC3-NA-01

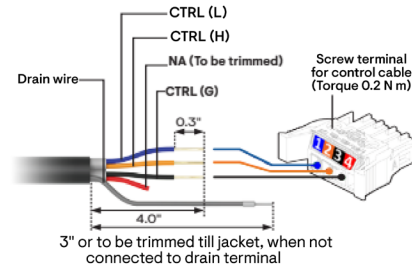


Figure 4: Control cable strip length

E) Routing the control wiring

If the Communications Kit 2 is a non-terminating node, bring the two sets of control wires into the Communications Kit 2 enclosure through the bottom conduits. Use the zip ties provided to hold the leads firmly in place.

If the Communications Kit 2 is a terminating node, then only one wire leads into the Communications Kit enclosure. The other will contain a termination resistor that is pre-installed.

F) Connecting the control wires to the control headers

The various ports and other components are shown in Figure 5. There are also wiring diagrams in the following pages that can be referred to for validating the wiring.

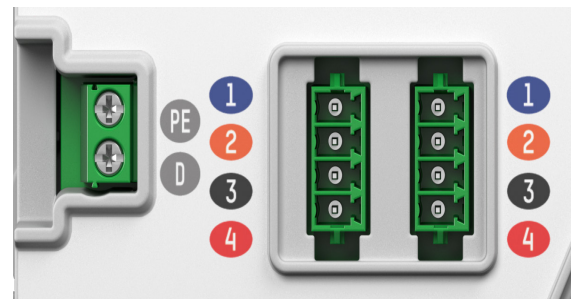


Figure 5: Control header view on control adapter

- Connect the CTRL L (blue) to port 1 on the CTRL header.
- Connect the CTRL H (orange) to port 2 on the CTRL header.
- Connect the CTRL G (black) to port 3 on the CTRL header.
- Trim the NA (red) wire.
- Terminate the drain wire only on one end of the cable (do NOT terminate on both ends). If the terminating end is in the Communications Kit 2, connect it to the drain port on the shield header.

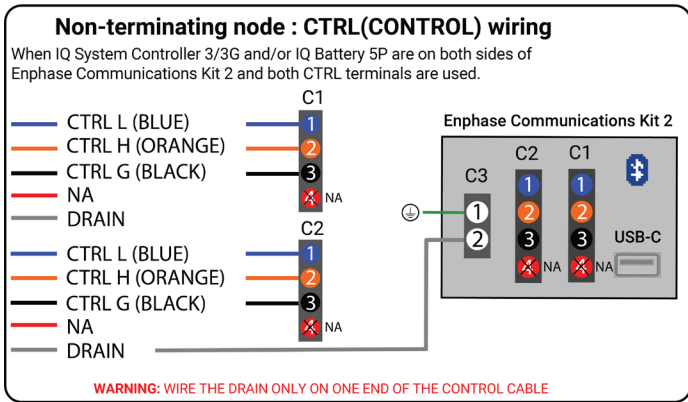


Figure 6: Control wiring for non-terminating node

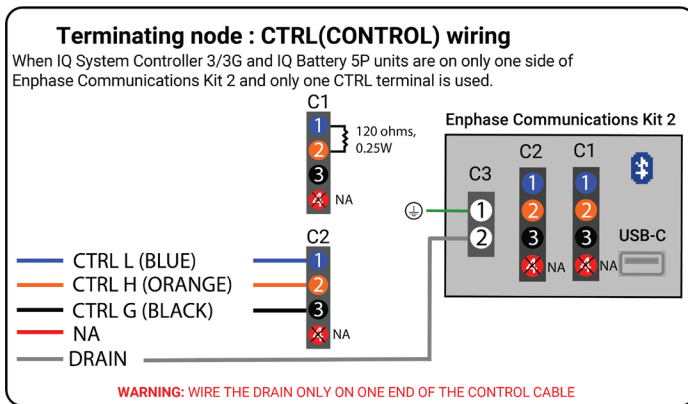


Figure 7: Control wiring for terminating node

G) Grounding the Communications Kit 2

From the potential earth port on the Communications Kit 2, there is a pre-wired cable connected to the pre-installed ground terminal. Draw an appropriately sized wire from a panel/IQ Combiner/IQ System Controller to ground the ground terminal inside the Communication Kit 2.

H) Install CT for IQ Battery metering on the IQ Gateway



WARNING! Ensure the power to the IQ Gateway is turned off via the breaker.



WARNING! Ensure the DC switches of the IQ Batteries are turned off and the AC breaker to the IQ Batteries are turned off.

- Short the L2 and L3 power terminals of the IQ Gateway using a shorting jumper. If this is on an Envoy S Metered installation, short the B and the C ports on the Envoy S Metered using a 3-pin Wago. The ports currently support up to a 14 AWG wire, and a Wago of appropriate size should be chosen.
- Clamp the IQ Battery CT on the line 2 power wire for all branches of IQ Battery 5P (ensure that the L2 power terminal of the IQ Gateway and the L2 power wire from the battery have phase continuity) with the CT arrow pointing toward the load (away from the battery).
- Connect the CT lead wires to the C3 port on the consumption meters on the IQ Gateway. (refer to Figure 9 for the wiring diagram). In case of an Envoy S Metered, connect it to the IC• and IC consumption ports as shown in Figure 8.

✓ **NOTE:** Ensure that the jumper is used to short the two L2 terminals on the IQ Gateway to not affect readings from the battery CT.

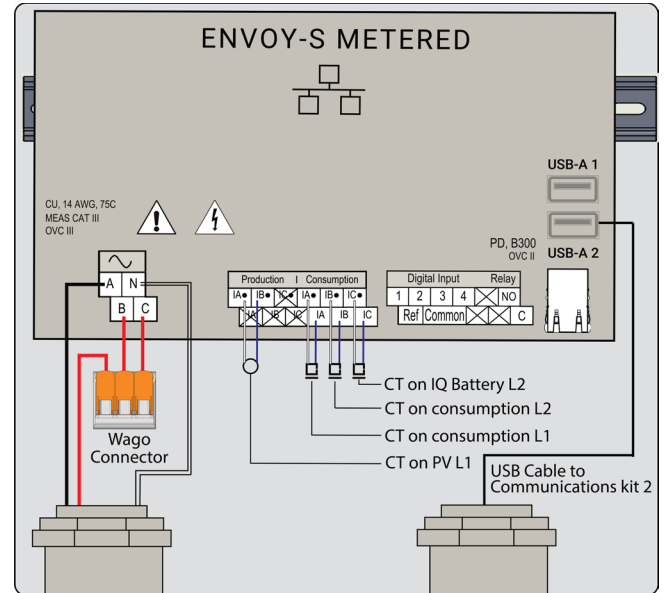


Figure 8: Envoy S Metered wiring

I) USB cable connection

If the IQ Gateway has been installed inside the Communications Kit 2 enclosure, connect the USB cable directly to the USB slot on the IQ Gateway.

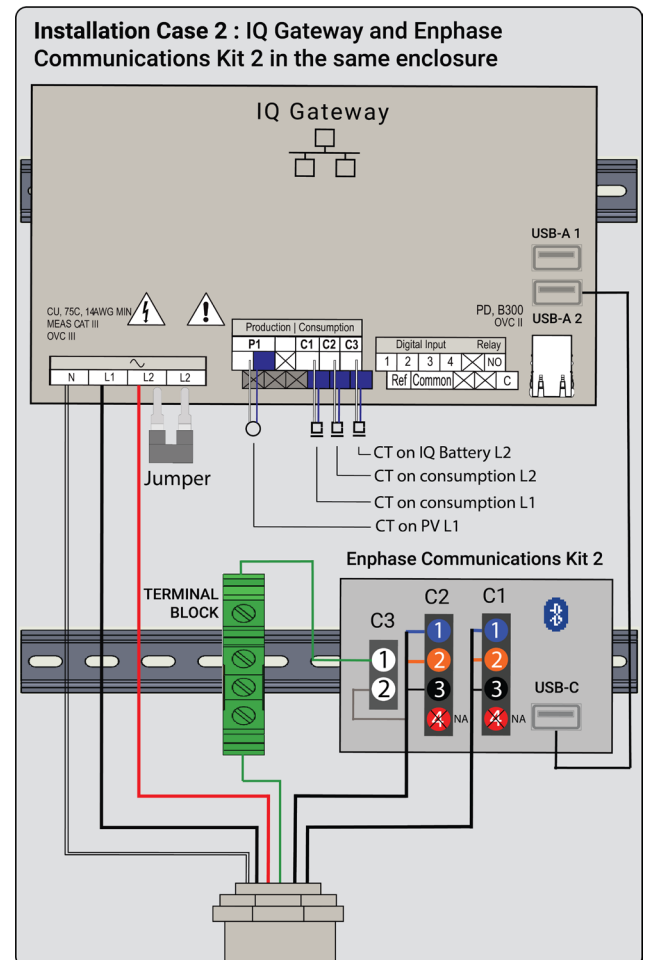


Figure 9: Wiring diagram when the IQ Gateway is installed in the Communications Kit 2 enclosure

✓ **NOTE:** If using IQ Gateway in a different enclosure or a legacy IQ Combiner, ensure that a separate conduit is used so that the USB cable does not use the same conduit as the power lines in the other enclosure.

If the IQ Gateway has not been installed inside the Communications Kit 2 enclosure or this is being used to upgrade an IQ Combiner 3 or 4 system to work with IQ Battery 5P and IQ System Controller 3/3G, then draw the USB cable outside the Communications Kit 2 enclosure and into the enclosure housing the IQ Gateway.

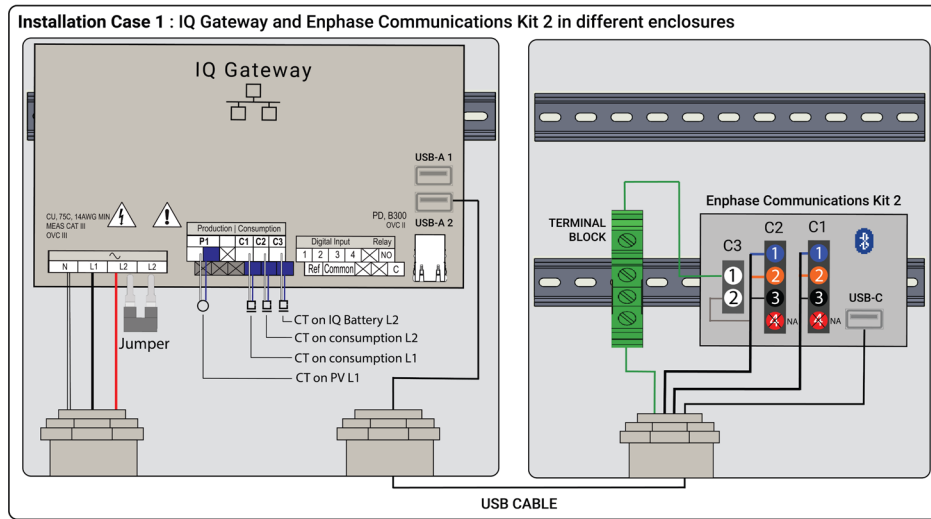


Figure 10: Wiring diagram when the IQ Gateway is installed in a different enclosure

3 Control (CTRL) wiring between system components and Communications Kit 2

When installing the control wiring for the system, refer to the following wiring sequences to best understand the termination resistor header position, control wiring order, and drain wire termination location.

The sequences below do not affect the functioning of the Communications Kit 2. They are the possible sequences that can occur, given the potential limitations of the physical location the site is installed.

The choice of the sequence will indicate the location of the termination node, which will have to be kept track of to wire the product correctly.

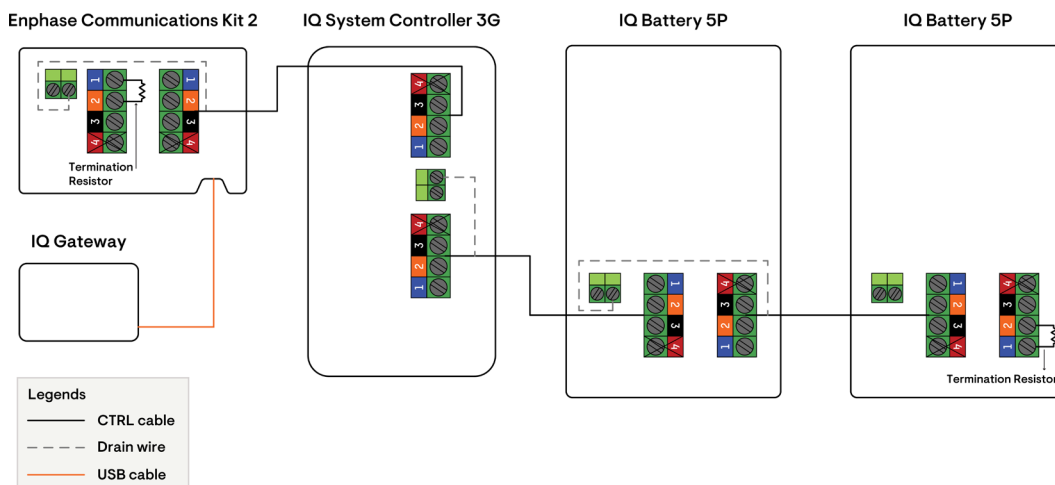
✓ **NOTE:** Total length of control wiring across the system should not exceed 250 feet to ensure the system operates as per specifications.

✓ **NOTE:** Ensure that the following guidelines are followed to avoid system failures during commissioning:

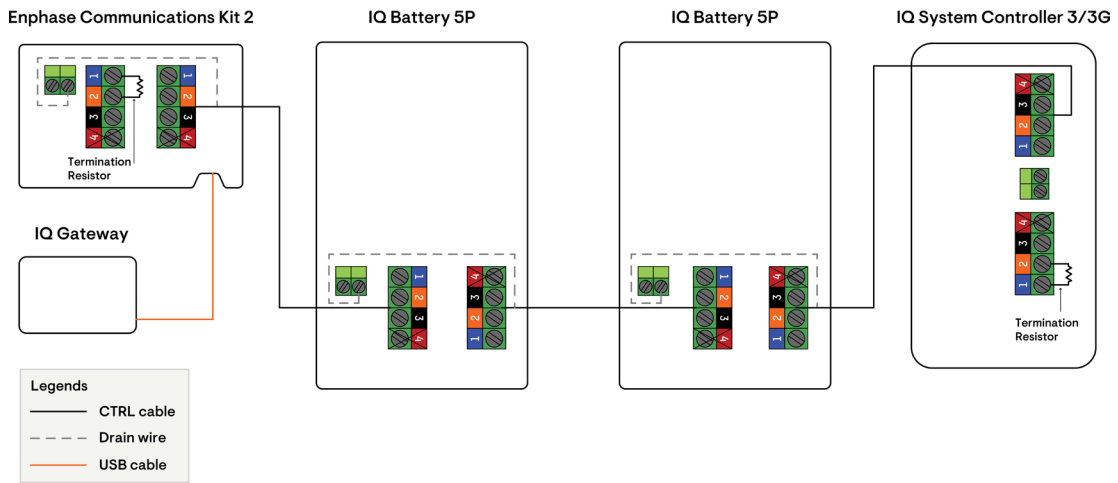
- One header with a termination resistor should be installed on each component at the extreme end of the control network.
- The drain wire should only be terminated on one end of the control wiring between system components.
- It is recommended that the drain wire be terminated at the component from which the control wiring for the section is initiated.
- The same conduits can be used for power and control wire routing only when using Enphase CTRL cable, CTRL-SC3-NA-01.

The following are the five common wiring sequences:

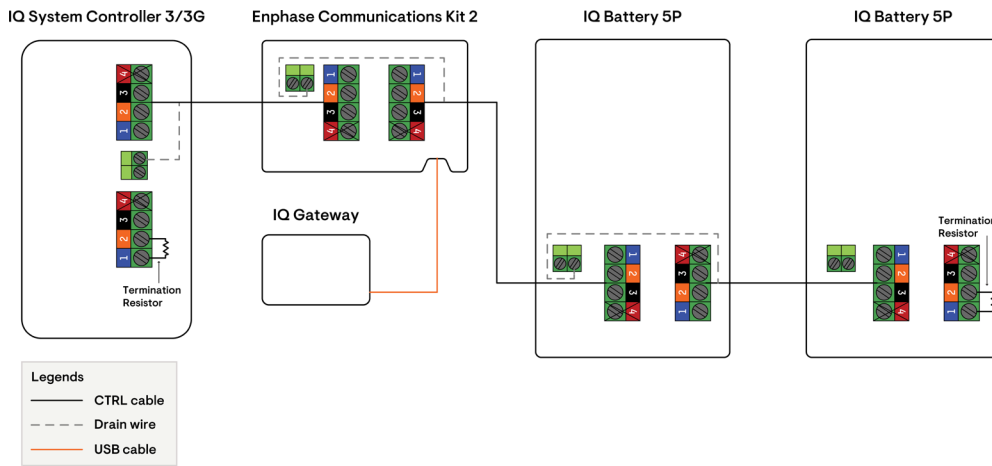
Sequence 1: Enphase Communications Kit 2 - IQ System Controller 3G - IQ Battery(s) 5P



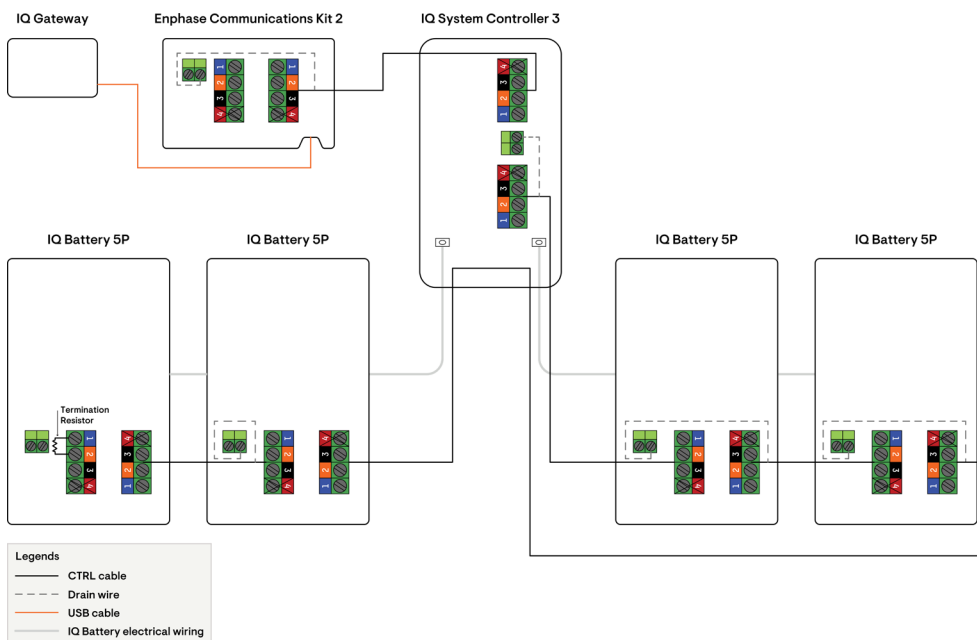
Sequence 2: Enphase Communications Kit 2 - IQ Battery(s) 5P - IQ System Controller 3/3G



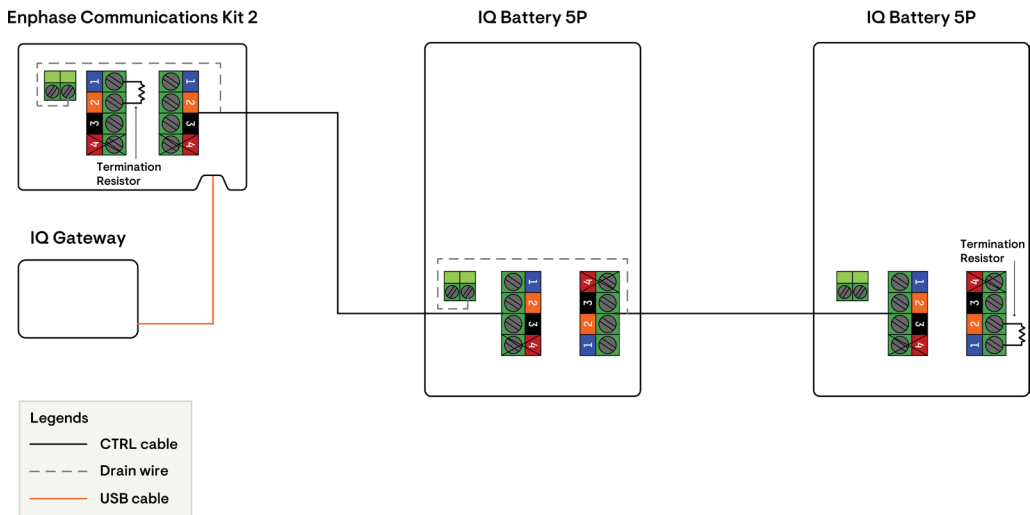
Sequence 3: IQ System Controller 3/3G - Enphase Communications Kit 2 - IQ Battery(s) 5P



Sequence 4: Enphase Communications Kit 2 - IQ System Controller 3 - IQ Battery(s) 5P



Sequence 5: Enphase Communications Kit 2 - IQ Battery(s) 5P



Here is a table providing termination resistor locations for the above sequences:

CONTROL WIRING SEQUENCE	TERMINATION RESISTOR LOCATION
Enphase Communications Kit 2 - IQ System Controller 3G - IQ Battery(s) 5P	<ul style="list-style-type: none"> Enphase Communications Kit 2 Last IQ Battery 5P in the daisy chain
Enphase Communications Kit 2 - IQ Battery(s) 5P - IQ System Controller 3/3G	<ul style="list-style-type: none"> Enphase Communications Kit 2 IQ System Controller 3/3G
IQ System Controller 3/3G - Enphase Communications Kit 2 - IQ Battery(s) 5P	<ul style="list-style-type: none"> IQ System Controller 3/3G Last IQ Battery 5P in the daisy chain
Enphase Communications Kit 2 - IQ System Controller 3 - IQ Battery(s) 5P	<ul style="list-style-type: none"> Enphase Communications Kit 2 Last IQ Battery 5P in the daisy chain
Enphase Communications Kit 2 - IQ Battery(s) 5P	<ul style="list-style-type: none"> Enphase Communications Kit 2 Last IQ Battery 5P in the daisy chain

4 Connecting to IQ Gateway software

The Communications Kit 2 needs IQ Gateway software version 8.1 or higher to work with other Enphase Energy System components.

- A) Download the Enphase Installer App mobile application from iOS App Store or Android Play Store and open it to log in to your Enphase Installer App account. This app lets you connect to the IQ Gateway to track system installation progress. You may also download the app from the Enphase website at enphase.com/toolkit.
- B) Log in to the Enphase Installer App on your mobile device and download the latest version of IQ Gateway software. Go to the “Settings” tab in the Enphase Installer App and use the “Update Now” button under IQ Gateway Software.
- C) After the IQ Gateway update to version 8.1 or higher, connect the Communications Kit 2 to the IQ Gateway to ensure that it is identified as a component at this site along with other components of the Enphase Energy System.
- D) Verify the devices are connected by navigating to:
“Devices” > “IQ Battery” > <serial number> or
“Devices” > “IQ System Controller” > <serial number>

The LED on Communications Kit 2 indicates the connectivity status.

The various LED states are below:

LED state	Event
Red	ERROR (Control or BUS error)
Blinking green	Communications Kit firm-ware update
Green	Communications Kit is operational
Blue	No USB communication

FCC Statement: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
 - Increase the separation between the equipment and the receiver.
 - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 - Consult the dealer or an experienced radio/TV technician for help.
- Changes or modifications not expressly approved by the party responsible for compliance may void the user’s authority to operate the equipment.




This Class B digital apparatus complies with Industry Canada ICES-003.

SAFETY





IMPORTANT SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS.

Follow these important instructions during the installation and maintenance of the Communications Kit 2.

Safety and advisory symbols

	DANGER: This indicates a hazardous situation, which if not avoided, will result in death or serious injury.
	WARNING: This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.
	NOTE: This indicates information essential for optimal system operation. Follow instructions carefully.

Safety instructions

	DANGER: Risk of electric shock. Risk of fire. Only qualified personnel should troubleshoot, install, or add parts to the IQ Gateway.
	DANGER: Risk of electric shock. Risk of fire. Ensure that all wiring is correct and that none of the wires are pinched or damaged.
	NOTE: Do not attempt to repair the Communications Kit 2. It contains no user-serviceable parts. If the equipment fails, contact Enphase customer support for assistance or replacement equipment.
	NOTE: Using unapproved attachments or accessories could result in damage or injury.

Revision history

REVISION	DATE	DESCRIPTION
140-00320-02	July 2023	Envoy S Metered wiring instruction included
140-00320-01	May 2023	Initial release

Enphase customer support: <https://enphase.com/contact/support>