

**Best practices - Planning, installing, and
commissioning an Enphase Energy System with
IQ Battery 5P**

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1 Applicable countries

North America

- USA
- Canada
- Puerto Rico
- Bermuda
- Mexico

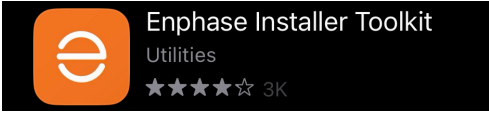
2 Overview

This document describes the best practices to be followed when planning, designing, and installing an Enphase Energy System (third-generation storage) with an IQ Battery 5P. These best practices ensure successful projects and a positive customer experience.

3 Best practices for third-generation storage systems

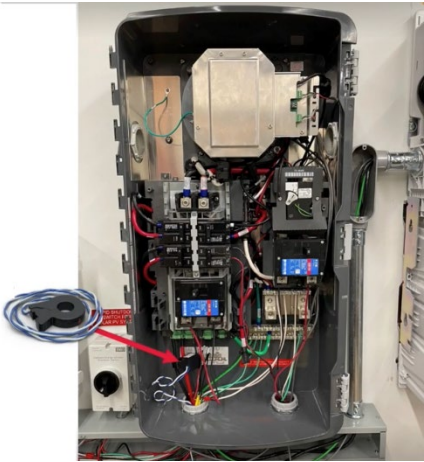
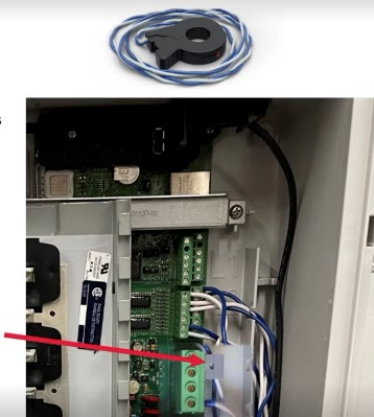
3.1 Pre-install (prepare before going to the installation site)


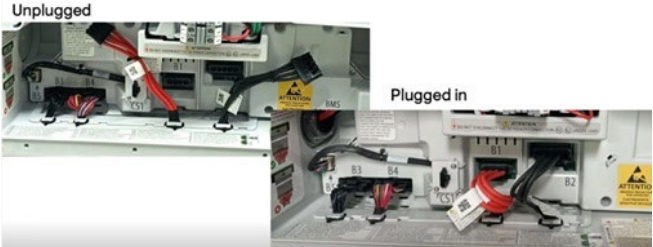
Item	Preparation best practices	Description
1	Always check for critical updates on the Critical updates and commissioning webpage.	Ensure to stay up to date with important information. Refer to Critical updates .
2	Ensure your company and installer are authorized to commission systems by completing the Enphase courses online.	Get the required certifications. Refer to the Enphase training guide . Check your company Training dashboard at My Training .
3	Create a good plan set.	Create a single-line electrical diagram, site equipment location, and bill of materials plan set. Refer to Planning an Enphase Energy System . Use the System builder application to view components, system overview, and important tips. Submit a free Design Review Service request for your first IQ Battery 5P system (request a code from your Enphase representative). Or ask your Enphase representative for Enphase Design and permit services .
4	List of new items to order for IQ Battery 5P systems.	<ul style="list-style-type: none"> • Order Enphase Control Cable. SKU: CTRL-SC3-NA-01 • If not using IQ Combiner 5/5C, order <ul style="list-style-type: none"> ○ One Communications Kit 2. SKU: COMMS-KIT-02 • Order optional battery handles for IQ Battery 5P. SKU: IQBATTERY-HNDL-5

Item	Preparation best practices	Description
5	Choose IQ System Controller 3 or 3G.	Specify the correct IQ System Controller (3 or 3G). IQ System Controller 3G - Up to 40 kWh battery with generator support SKU: SC200G111C240US01 IQ System Controller 3 - Up to 80 kWh battery without generator support SKU: SC200D111C240US01
6	Control cable maximum length and drain wire.	The total control cable length must be less than 75 m (250 feet) and contain drain wire. Use the UL Listed Enphase Control Cable. SKU: CTRL-SC3-NA-01
7	IQ Battery 5P = IQ System Controller 3/3G.	IQ System Controller 3/3G cannot be paired with prior batteries, that is, IQ Battery 3T/10T.
8	Plan for Ethernet connection to IQ Gateway and poor Wi-Fi signals.	Enphase recommends a wired Ethernet connection. If using Wi-Fi, plan for poor signals at IQ Gateway by bringing a Wi-Fi extender that can be installed in the home to improve the Wi-Fi signal and label it “For Enphase Energy System. DO NOT REMOVE.”
9	Download the latest Enphase Installer App.	Always download the latest free version from the Apple App Store or Google Play Store. Search for the Enphase Installer App and download the orange app. Version 3.3x. 
10	Download the latest IQ Gateway software version on the Enphase Installer App.	Before going on-site, while on a good network connection, download the latest IQ Gateway software. Click Menu > Settings and ensure you have the latest software. Download the software if needed.
11	View the general overview playlist of IQ Battery 5P.	Watch the short overview videos for additional preparation.
12	Start the System Activation in the Enphase Installer Portal before going on-site.	Enter system details and device counts, and prebuild the array layout. Save your crew time while they are on-site. Refer to Activations .

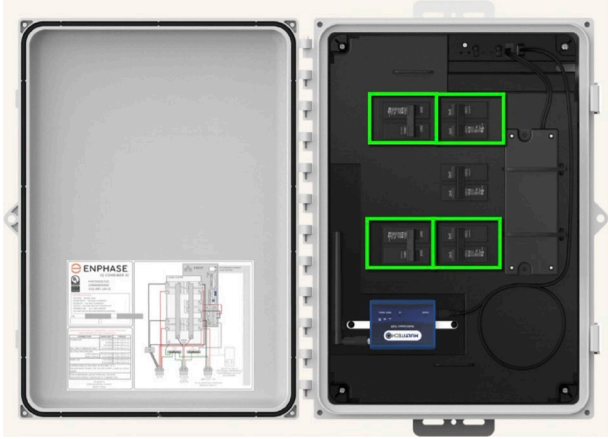
3.2 Installation – Best practices on the job site

Item	Installation best practices	Description
1	Always check for critical updates on the commissioning webpage.	Ensure to stay up to date with important information. Refer to Critical updates .
2	Ensure correct metering current transformer (CT) installation.	<p>1. Place the Consumption CTs on the grid side of the IQ System Controller and not on the load side.</p> <p>2. Place the Production CT on Line 1 circuits on the load side of the Consumption CTs.</p> <p>3. Place the battery CT on the Line 2 circuit(s) of all IQ Battery circuits connected to the IQ System Controller.</p> <p>4. Ensure the CT inputs on the gateway match the L1 and L2 phasing of the gateway power input.</p> <p>5. Check CT arrows.</p> <ul style="list-style-type: none"> a. Consumption CT arrows must always point from the grid to the home loads. b. Production CT arrow must always point from the PV to the loads. c. Battery CT arrow must always point from the battery to the loads. <p>6. If using generator integration, install two extra CTs on the generator input circuits and connect parallel with the Consumption CTs. SKU: CT-200-CLAMP or CT-200-SPLIT.</p> <p>7. Check whether the CT wiring to the IQ Gateway and color coding is correct:</p> <div> <p>The diagram shows a vertical meter rack with two main sections: 'Production' and 'Consumption'. The 'Production' section contains a terminal labeled 'P1'. The 'Consumption' section contains three terminals labeled 'C1', 'C2', and 'C3'. Four current transformers (CTs) are shown with their respective wiring: a blue CT is connected to 'P1' and labeled 'CT on PV L1'; a blue CT is connected to 'C1' and labeled 'CT on consumption L1'; a red CT is connected to 'C2' and labeled 'CT on consumption L2'; and a purple CT is connected to 'C3' and labeled 'CT on consumption L2'. Arrows on the CTs indicate the direction of current flow.</p> </div> <p>Take the CT Essentials course at Enphase University.</p> <p>Refer to the Guidelines for current transformer (CT) installation tech brief for more information.</p>

Item	Installation best practices	Description
3	Install the battery CT correctly.	 <ul style="list-style-type: none"> • Required at every IQ Battery 5P site (grid-tied only) • Battery CT can be installed anywhere (raceway through, load center, and so on) • Backup site, IQ System Controller 3 typical • One battery CT around L2 circuits All battery L2 circuits pass through one CT • Arrow points away from battery • Included with IQ Combiner 5 or Communications Kit 2
4	Ensure the L1 and L2 jumpers are installed properly on the gateway.	<p>Battery CT-IQ Gateway wiring</p>  <p>In IQ Gateway, wire to the sixth or uppermost terminals (wiring is similar to Consumption CTs)</p> <ul style="list-style-type: none"> • Jumper from Terminal 2 to Terminal 3 <ul style="list-style-type: none"> ○ Voltage reference for battery CT ○ Leave the jumper in place as you land the L1 and L2 wires

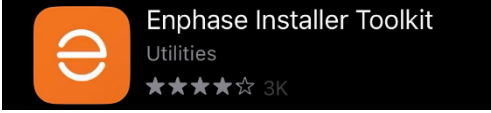
Item	Installation best practices	Description
5	Ensure correct control cable wiring.	<p>Control cable principles:</p> <ol style="list-style-type: none"> 1. Follow the guidelines in the IQ Battery 5P Quick Install Guide for various system configurations (refer to Pages 24-28). 2. Ensure the conduit can accommodate the size of the control cable. The control cable is equivalent to about #2 AWG. 3. The system control cable bus must have only two termination resistors, one on each end. Not more than two. 4. The resistor must be wired to correct terminals 1: CTRL (L) and terminals 2: CTRL (H) of the green terminal header. 5. Do not connect two control cable conductors to a single terminal header port. Do not double-lug. 6. Green terminal headers must be correctly plugged in and latched. 7. Control cable conductors must be landed on correct terminals 1, 2, and 3. 8. The drain wire must be landed only on one end of each control cable segment. <p> DANGER: Safety issue - Landing both ends could create a ground fault path in parallel to the EGC.</p> <ol style="list-style-type: none"> 9. Use tie wraps to secure control cables to reduce strain on terminal headers. 10. Watch the short video for additional training on the control cable.
6	Plug in the IQ Battery 5P DC circuit connections after all other wiring is complete.	<ol style="list-style-type: none"> 1. Carefully unscrew and open the battery wiring area cover. 2. cPlug in both positive (red) and negative (black) battery circuit connectors. 

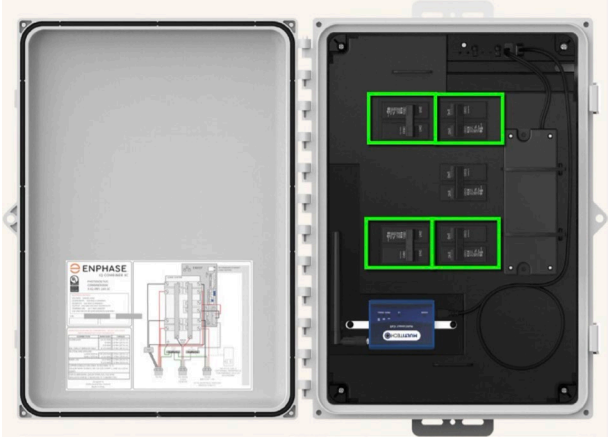
Item	Installation best practices	Description
7	Enphase System Shutdown Switch/rapid shutdown switch wiring.	<ul style="list-style-type: none"> Follow the color coding for Enphase System Shutdown Switch (rapid shutdown switch) wiring. Do not wire the Enphase System Shutdown Switch (rapid shutdown device) while the IQ System Controller is energized. No co-location: SSD wiring must not be in the same conduit as AC power conductors. This is crucial to avoid interference and maintain system integrity. Mandatory separation: Ensure a minimum of 2 inches separation between the SSD wiring conduit and the mains/load/distributed energy resource (DER) wiring conduit.
8	Make an Ethernet connection to IQ Gateway and plan for poor Wi-Fi signals.	Enphase recommends a wired Ethernet connection. If using Wi-Fi and have poor signals at IQ Gateway, install a Wi-Fi extender in the home to improve the Wi-Fi signal and label it "For Enphase Energy System. DO NOT REMOVE."
9	Mobile Connect and broadband (Ethernet or Wi-Fi) connections required.	Ensure to connect and install a Mobile Connect before commissioning, in addition to an Ethernet or Wi-Fi connection.
10	Use battery handles to help lift IQ Battery 5P units into place.	Bring IQ Battery 5P handles to each job. Part Number: IQBATTERY-HNDL-5.
11	Before hanging, pre-drill conduit holes if IQ Battery 5P units are to be mounted next to each other.	Before hanging the batteries, pre-drill conduit holes in IQ Battery 5P if two units are mounted closer than 6 inches next to each other.
12	Ensure conduit bushings, wires, and conductors do not interfere with IQ System Controller or IQ Combiner dead fronts and door latches.	When bringing conduits into the IQ System Controller and IQ Combiner and routing conductors inside of these products, ensure they do not interfere with the dead front or door latches. Before drilling conduit holes, ensure the dead front foot does not interfere with the conduit bushings.
13	Conduit entry - Follow installation guides.	<ol style="list-style-type: none"> For the IQ System Controller, do not enter the conduit from the back or top. For IQ Combiner, do not enter the conduit from the top. If using the Enphase System Shutdown Switch (rapid shutdown device), do not enter the conduit from the top.
14	Use the correct tools and torque wrenches.	Do not use impact tools to remove or fasten electrical connection points and cover fasteners. Follow all torque specifications found in installation guides, especially on the load and grid terminals in the IQ System Controller.
15	Use copper conductors.	Use copper conductors to connect to terminals in the IQ System Controller or battery. Do not use aluminum conductors.

Item	Installation best practices	Description
16	Connect batteries and PV circuits to lugs in the IQ System Controller.	Always land battery and PV circuits on the bottom lugs in the IQ System Controller, not directly on the breakers.
17	Always connect all IQ8 Microinverter circuits to the bottom lugs in the IQ System Controller.	Always connect all IQ8 Microinverter circuits to the bottom lugs in the IQ System Controller. Do not land IQ8 Microinverter circuits to the backup load panel or directly to the breaker in the IQ System Controller.
18	Do not turn off PV using the breaker inside the IQ System Controller.	Always shut the PV at the AC combiner or PV subpanel. 

3.3 Commissioning - Best practices on the job site (starting up and configuring system)

Item	Commissioning best practices	Description
1	Always check for critical updates on the commissioning webpage.	Ensure to stay up to date with important information. Refer to Critical updates .
2	Watch these videos for help with commissioning.	Commissioning Playlist IQ Battery 5P Full commissioning video
3	Ensure your company and installer are authorized to commission systems by completing the Enphase courses online.	Get the required certifications. Refer to the Enphase training guide . Check your company Training dashboard in the link My Training .
4	Download the latest Enphase Installer App.	Latest Enphase Installer App version is 3.31.0.

Item	Commissioning best practices	Description
		Download the free version from the Apple App Store or Google Play Store. Search for the Enphase Installer App and download the orange app: 
5	Inside the Enphase Installer App, download the latest IQ Gateway software version.	Before going on-site, while on a good network connection, download the latest IQ Gateway software. Click Menu > Settings and ensure the software is up to date. Click Download if needed.
6	Do not connect to IQ Gateway AP mode until prompted to do so by the Enphase Installer App.	In Step 2, connect the Enphase Installer App to the Enphase cloud through the cellular network and ensure that the Enphase Installer App is not yet connected to gateway AP mode while scanning the device's serial number bar codes with the camera.
7	Use the camera to scan the PV microinverter serial number barcodes.	Always scan the PV microinverter serial numbers from the sticker map with a camera instead of using the power line communications (PLC) scan feature on the IQ Gateway.
8	Be patient and follow the Enphase Installer App instructions.	Take your time, have patience, and follow the steps in order. Do not skip or jump around steps if possible. Read the prompts and think before clicking.
9	Enphase Support USA: (877) 797-4743 Option 2	Have the Enphase Support number handy to contact our support experts when you need help.
10	Check the following if you are having issues with a smartphone-to-gateway AP mode connection.	Ensure the phone is not running an active VPN connection. <ul style="list-style-type: none"> • On Apple iOS, turn off Wi-Fi Assist mode at the bottom of Settings > Cellular menu. • On Android, turn off Adaptive Wi-Fi in Settings > Connections > Wi-Fi > ADVANCED menu. Ensure the phone is not trying to auto-connect to a local Wi-Fi network. Forget the network or turn off auto-connect on networks.

Item	Commissioning best practices	Description
11	Do not turn off PV using the breaker inside the IQ System Controller.	<p>Always shut off PV circuits at IQ Combiner or PV subpanel.</p> 
12	If metering data is zero, check IQ Gateway power wiring.	IQ Gateway requires L1, L2, and N connections. If there is no neutral connection, meter data reads zero.
13	For Retrofit sites with existing IQ Gateway, If you need to replace IQ Gateway, use the correct replacement feature in the Enphase Installer App.	<p>Replace IQ Gateway</p> <p>Remove/Install devices</p> <ol style="list-style-type: none"> 1. Disconnect the old Gateway from the system. 2. Wire the new IQ Gateway. 3. Power it up. <p>In the Enphase Installer App,</p> <ol style="list-style-type: none"> 4. Ensure your user account has access to the Enphase Installer App for the original system. 5. Open the site. 6. Ensure the phone is not connected to the gateway through AP mode. 7. Scroll to the bottom of the screen, tap Request return and Install a Replacement, and select Replace IQ Gateway.
14	Commissioning blocker: Mobile Connect and broadband (Ethernet or Wi-Fi) connections are required.	Mobile Connect must be connected to IQ Gateway and broadband (Ethernet or Wi-Fi) to perform commissioning.
15	Make an Ethernet connection to IQ Gateway, and plan for poor Wi-Fi signals.	Enphase recommends a wired Ethernet connection. If using Wi-Fi and have poor signals at IQ Gateway, install a Wi-Fi extender in the home to improve the Wi-Fi signal and label it “For Enphase Energy System. DO NOT REMOVE.”
16	Report issues with the Enphase Installer App.	Report problems encountered in the app by sending the Enphase Installer App log files and a note of the issue. Go to Support (scroll to the bottom of the support menu) and click Report a Problem in the App .

Revision history

Revision	Date	Description
TEB-00077-1.0	January 2024	Initial release.