Installing the Enphase IQ Combiner

The Enphase IQ Combiner™ combines up to three AC branch circuits of Enphase IQ Series Microinverters and/or Enphase IQ Batteries. To install the IQ Combiner, read and follow all warnings and instructions in this Guide and in the Enphase IQ Envoy Installation and Operation Manual at: enphase.com/support. Safety warnings are listed on the back of this guide. If you do not fully understand 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 national and local electrical codes. Professional installation is recommended.

The IQ Combiner is an outdoor-rated, NRTL-certified NEMA type 3R, polycarbonate enclosure containing an Enphase IQ Envoy™, circuit breakers, and wiring for IQ Envoy connections.

IMPORTANT: Enphase IQ Envoy, IQ Battery, and IQ Series Microinverters do not communicate with, and should not be used with, previous generation Enphase Microinverters and Envoys. Always use IQ Series Microinverters with an IQ Envoy.

How It Works

IQ Envoy Display and Controls

Track system installation progress with the Enphase Installer Toolkit mobile app. The LEDs on the IQ Envoy are solid green when a function is enabled or performing as expected, flashing when an operation is in progress, or solid amber when troubleshooting with Installer Toolkit is required. For a legend of all LED states, see Troubleshooting.

Preparation

A) Download the Enphase Installer Toolkit mobile app and open it to log in to your Enlighten account. With this app, you can connect to the IQ Envoy to track system installation progress. To download, go to enphase.com/toolkit or scan the QR code at right.

B) Check the box for the following items:
   - Enphase IQ Combiner with IQ Envoy
   - Enphase IQ Combiner Quick Install Guide (this document)

C) Make sure you have the following required items:
   - Plan to use screwdriver, pliers, and torque wrench.
   - Provide overcurrent protection in the load center in accordance with NFPA 70, §705.12.
   - Provide suitable mounting hardware: use screws that are long enough to secure the unit to the vertical mounting surface.
   - Use copper conductors rated for wet locations and sized to meet local code requirements and voltage drop/rise considerations. (Breakers are rated for 14-6 AWG copper, and output lugs are rated for 14-4 AWG copper).
   - Use only UL Listed rain-tight or wet location hubs for wire entry into the enclosure.

D) If you plan to do consumption metering:
   - Make sure you have two split-core consumption metering CTs (order CT-200-SPLIT).
   - Check that there is enough space in the load center to install CTs. Do not install the CTs in a panel where they exceed 75% of the wiring space of any cross-sectional area within the load center.

E) Decide how to connect the IQ Envoy to the Internet: Use Wi-Fi, an Enphase Mobile Connect modem, or Ethernet. Then, make sure you have the following optional items, if not using Wi-Fi:
   - Enphase Mobile Connect modem [order CELLMODEM-01 (3G) or CELLMODEM-03 (4G)]
   - Ethernet over power line communication (PLC) bridge with Ethernet cables (order EPLC-01). You must use a ferrite bead on the Ethernet cable (we recommend Fair-Rite 0431167281).
   - Ethernet cable: 802.3, Cat5E or Cat6, unshielded twisted pair (UTP).
   - Do not use shielded twisted pair (STP) cable. You must use a ferrite bead on the Ethernet cable (we recommend Fair-Rite 0431167281).

F) Create a paper installation map to record device serial numbers and positions in the array. You will scan this map later using Installer Toolkit. You can type it in manually or scan the label on the inside of the IQ Combiner door.

G) Note that installation of the Combiner has two parts. To ensure successful device detection, complete Part 2 after installing any Enphase IQ Microinverters and/or Enphase IQ Battery(ies).

Note: If needed, you can find an installation map at the back of any Enphase Microinverter Quick Install Guide.
INSTALLATION – Part 1

It is a best practice to complete Installation Part 1 before installing Enphase Microinverters and/or Batteries.

1 Choose a location for the IQ Combiner

A) Install the IQ Combiner in a readily accessible location. The best practice is to install at least four feet (1.2 meters) off the ground. However, never install below three feet (0.9 meters) off the ground.

B) Consider the dimensions of the IQ Combiner, easy access, box height, and length of cable when selecting the location. Do not block the vents. The IQ Combiner is rainproof but not watertight.

NOTE: You must mount the Combiner within 15 degrees of vertical.

2 Prepare the IQ Combiner

A) If needed, reposition the mounting feet. You can adjust each of the four mounting feet to several different positions. Adjust as desired for the mounting location.

B) Open the enclosure door. Pinch the top of the hinge rod using a needle-nosed pliers. Slide the door up and away to remove it. Set the door aside for later reattachment.

C) Mount the IQ Combiner on a vertical surface, using supplied washers to protect the feet.

D) Remove the clear plastic deadfront and keep the screws and washers in a safe place (for example, inside the removed enclosure door).

E) Locate and remove the Spare Parts and XA-SLOT bags.

3 Remove an Unused Circuit Breaker (optional)

The combiner includes three 20 A, 2-pole circuit breakers for combining inputs and one single-pole 5A breaker for the 5A AC outlet. If required by local jurisdiction, you can remove unused 2-pole breaker(s) and install a blanking plate. Every IQ Combiner comes with a blanking plate with screws.

If you do not need to remove circuit breaker(s), skip this step.

A) Use a straight blade screwdriver to completely loosen the busbar side of the Line 1 and Line 2 terminal blocks (gray).

B) Remove the load wire(s), if any, on the breaker you want to remove.

C) Loosen the busbar lug(s) of only the breaker you want to remove.

D) Release the DIN rail locking tabs of all breakers.

E) Rock the breaker/busbar assembly to the left to release it from the DIN rail, and remove the breaker.

F) Rock the breakers back to the right so they are seated back on the DIN Rail.

G) Lock all of the breaker DIN rail locking tabs.

H) Tighten the busbar side of the Line 1 and Line 2 terminal blocks (gray) to 14 in-lbs (1.6 Nm).

I) Verify that all busbar connections are tight.

J) Position the blanking plate onto the dead front over the location of the removed breaker.

K) Use a screwdriver and the two provided screws to secure the plate into place.

Note: If needed, you can request a cover for the 5A AC outlet from enphase.com/en-us/support/contact.

4 Drill Hole(s) to Accept Conduit

A) A label on the outside of the IQ Combiner indicates the best location to make a hole or holes to accept conduit fittings. Locate this label.

Best Practice: Use a stepped drill bit for making the conduit holes. Using a hole saw may crack the plastic housing. As an alternative, use a sharp chassis punch with caution. Drill only at the label location. Do not drill a hole in any other location on the IQ Combiner.

Note: The label template has three holes, but most applications require only two.

B) Use the provided label as a template for typical conduit placement. The center of the holes on the label are marked with a “+”.

C) 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.

D) Remove the label after drilling.

E) Use only UL-listed rain-tight or wet location hubs for wire entry into the enclosure.

Warning! Do not drill conduit holes on the top of the box or at any location that allows moisture ingress. This voids the warranty for the IQ Combiner and the IQ Envoy.
**5 Wire the Output Connections**

A) Use conductors sized per local code requirements (output lug is rated for 14 to 4 AWG copper conductors for combined output) taking into consideration the voltage drop/rise and upstream breaker or fuse.
B) The two DIN rail terminal blocks above the circuit breakers are the output connections. Install L1 into the lower terminal block and L2 into the upper terminal block.
C) Torque to 14 in-lbs (1.6 Nm).
D) Connect the neutral (white) to the neutral busbar.
E) Connect the ground (green or green/yellow) to the "Ground" busbar and torque to 45 in-lbs (5 Nm).

**WIRING REFERENCE**
The following lists tightening torque, allowable wire size, and type for field-wiring terminals:
- 20 in-lbs tightening torque for circuit breaker connections
- 14 in-lbs tightening torque for combined output connections
- 45 in-lbs tightening torque for large neutral and ground busbar screws (1/0-14 AWG)
- 20 in-lbs tightening torque for small neutral and ground busbar screws (6-14 AWG)
- 14 to 6 AWG for branch inputs
- 14 to 4 AWG for combined output
- Wire type: 75°C or higher copper conductors, rated for wet locations

**6 Wire Inputs from the AC Branch Circuits**
The combiner comes with three 20A circuit breakers (16A continuous) to which you must wire the device AC branch circuits.
A) Use copper conductors sized to meet local code requirements and voltage drop/rise considerations: 14 to 6 AWG copper for branch inputs.
B) Bring in the wires from each AC branch circuit.

**Note:** Enphase IQ Series Microinverters use a two-wire system and do not use a Neutral. The IQ Envoy still requires a Neutral from the load center.

C) Connect the ground (green or green/yellow) to the ground busbar.
D) If an AC Battery branch circuit is installed, connect the neutral (white) from that circuit to the neutral busbar. Torque to 45 in-lbs (5 Nm).
E) Pass the L1 conductors from each PV branch circuit through the production CT in the same direction as the arrow on the side of the CT.

**Note:** Do not pass conductors from AC Battery branch circuits through the production CT. This will distort production readings.

F) Connect L1 and L2 (usually one black and one red) from each AC branch circuit (PV and/or battery) to the circuit breakers.
G) Torque to 20 in-lbs (2.4 Nm).

**Warning!** Observe bend radius requirements when routing wires.

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**Diagram**: Refer to the diagram on the Combiner door for color detail.
Install CTs for Consumption Metering (optional)

The IQ Envoy inside the IQ Combiner is pre-wired at the terminal blocks for power and production metering connections. One solid-core current transformer (CT) is provided for revenue grade production metering. You can install two optional split-core CTs to provide consumption metering. To do this, you must create a protected route using conduit for the CT wires from the main load center to the IQ Envoy. If you need to extend the wires, refer to the Enphase IQ Envoy Installation and Operation Manual at: enphase.com/support.

Note: Because of variance in load center design and main power feed, there may not always be enough space to install consumption metering CTs.

A) Make sure that the main load center wires are de-energized until you have secured the CT wires in the terminal blocks.
B) Before running the CT wires through the conduit, use colored tape to mark one of the CTs and the free end of its wires.
C) For the marked CT wires, connect the white and blue wires to the white and blue "C1" terminals.
D) For the unmarked CT wires, connect the white and blue wires to the white and blue "C2" terminals.
E) Tighten all connections to 5 in-lbs.
F) Clamp the marked CT on the load center feed wire Line 1 (matching the Envoy's "L1" voltage terminal) with the CT arrow pointing toward the load (away from the grid).
G) Clamp the unmarked CT on the load center feed wire Line 2 (matching the Envoy's "L2" voltage terminal) with the CT arrow pointing toward the load (away from the grid).

Notes:
- It is important to match CT and sense voltage phases. To properly measure power and energy, CT inputs must align with the respective voltage inputs. Be sure to consistently identify and match the two AC lines at two points: the main load center feed and the Envoy. Wire colors (typically black and red) may not always consistently identify Lines 1 and 2. If in doubt, use a multimeter to check.
- Because of variance in load center design and main power feed, there may not always be enough space to install consumption metering CTs.

DANGER! Risk of electrocution! Do not install CTs when current is flowing in the sensed circuit. Always install CT wires in the terminal blocks before energizing the sensed circuit.

Notes:
- Risk of electric shock. Always de-energize the load center before beginning wiring.
**INSTALLATION — Part 2**

You must complete Installation Part 2 after installing any Enphase IQ Microinverters and/or Enphase Batteries.

9 Detect Devices

Use one of the following methods to detect devices (Enphase IQ Microinverters and/or Enphase Batteries):

Method A  // Provision devices with Installer Toolkit

Use the Installer Toolkit mobile app to configure the IQ Envoy with the serial numbers of the installed devices.

A ) Launch the Installer Toolkit app and tap View Systems.
B ) Select the system you are working with, or tap [+] to add a system.
C ) Connect to the IQ Envoy with your mobile device (smart phone or tablet) to the IQ Envoy. The AP Mode LED lights solid green when the network is available.
   · On the Envoy, if the AP Mode LED is not lit, press the AP Mode button.
   · On your mobile device, go to Settings and join the Wi-Fi network “Envoy_nnnnnn” (where “nnnnnn” represents the final six digits of the IQ Envoy serial number).

D ) If the serial number for the Envoy you are installing is not displayed on the System Overview screen, tap the [+] next to the word “Envoy”. When the app displays the serial number of the Envoy, tap it to add it to the system.
E ) Following the on-screen instructions to create the arrays and scan the serial numbers from the installation map.
F ) Tap the Connect button. This provisions the scanned devices on the Envoy.
G ) When prompted, confirm the number of devices that you installed.
H ) If your system is in Hawaii or in a region that does not use the Factory-Installed Grid Profile, select and apply a grid profile to the devices.

The Device Communications LED lights solid green if all provisioned devices are communicating or solid amber if any devices are not communicating.

Method B  // Discover devices with Installer Toolkit

Use the Installer Toolkit mobile app to set the number of devices the IQ Envoy should search for on the power line.

A ) Connect to the IQ Envoy with your mobile device (smart phone or tablet) to the IQ Envoy. The AP Mode LED lights solid green when the network is available.
   · On the Envoy, if the AP Mode LED is not lit, press the AP Mode button.
   · On your mobile device, go to Settings and join the Wi-Fi network “Envoy_nnnnnn” (where “nnnnnn” represents the final six digits of the IQ Envoy serial number).
B ) Launch Installer Toolkit and tap Connect to an Envoy.
C ) When prompted, enter the number of devices that you installed.
D ) If your system is in Hawaii or in a region that does not use the Factory-Installed Grid Profile, select and apply a grid profile to the devices.
E ) When prompted to start a device scan, tap OK.

With both methods

If the Device Communications LED remains solid amber, see Troubleshooting.

10 Verify System Configuration

While still connected to the IQ Envoy with Installer Toolkit, check the Overview screen for the following:

A ) Confirm that the expected number of devices are detected and communicating.
B ) Check that the new profile is set on all the devices. Setting the profile may take up to 5 minutes for a typical system.
C ) Tap the Meters button.
D ) Tap Production Meter and follow the on-screen instructions to enable the Production Meter.
E ) If you installed consumption metering CT(s), tap Consumption Meter and follow the on-screen instructions to enable the Consumption Meter.
F ) Return to the Overview screen and verify the meter reading(s).

If you used Installer Toolkit to detect devices, the Power Production LED lights solid green when all expected microinverters are producing power. If you did not use Installer Toolkit, it lights solid green if all communicating microinverters are producing power. It flashes green when devices are upgrading. Check Installer Toolkit for production status details. If the Power Production LED remains solid amber, see Troubleshooting.
Connect to Enlighten

This section describes using the IQ Envoy integrated Wi-Fi or the Mobile Connect modem. For information about using Ethernet and/or PLC bridges, refer to the Enphase IQ Envoy Installation and Operation Manual at: enphase.com/support.

Method A // Integrated Wi-Fi

Requires a wireless router with an Internet connection.

A) On the Envoy, verify that no Ethernet cable is plugged into the RJ45 port.
B) If the router supports WPS, press and hold the WPS button on the wireless router for a few seconds. On most routers, a WPS indicator begins flashing.
C) If you are using the Installer Toolkit mobile app, tap the Network button, tap Wi-Fi, and then tap your network from the list of available networks. If the wireless router does not support WPS, you may be prompted to enter a password.

The Network Communications LED \( \uparrow \) begins flashing green. Within three minutes the Network Communications LED lights solid green, indicating a successful connection to Enlighten. If the Network Communications LED remains off or lights solid amber, see Troubleshooting 3.

Method B // Enphase Mobile Connect Modem

(Order CELLMODEM-01 separately)

A) Connect the antenna(s) to the modem, and mount the modem as described in the Enphase Mobile Connect Installation Guide.
B) First, connect the USB cable to the IQ Envoy and then connect the mini-USB connector to the modem. If receiving power from the IQ Envoy, the modem power LED lights.

Within three minutes the Network Communications LED lights solid green, indicating a successful connection to Enlighten. If the Network Communications LED remains off or lights solid amber, see Troubleshooting in the Enphase Mobile Connect Installation Guide.

Method C // Power Line Communication Bridges

(Order EPLC-01 separately)

Requires a broadband router with an Internet connection.

A) Plug one of the bridges into the AC outlet in the IQ Combiner.
B) Place the ferrite bead on the cable, near one end, and close the latch.
C) Plug the cable end with the ferrite into the IQ Envoy Ethernet port, and secure a tie wrap on the cable on each side of the ferrite bead.
D) Tighten an additional tie wrap around the ferrite bead.
E) Trim any tie wrap excess.
F) Plug the other end of the Ethernet cable into the bridge.
G) Plug the other bridge into an AC outlet near the broadband router.
H) Connect one end of a second Ethernet cable to the second bridge, and connect the other end of the cable into the broadband router.

Within three minutes the Network Communications LED \( \uparrow \) lights solid green, indicating a successful connection to the Internet and to Enlighten.

Note: If you do not use the 5A AC outlet in the Combiner, you can request a cover for the outlet from enphase.com/en-us/support/contact.

Send System Summary Report

When you have completed your system setup, you can generate and email a summary report.

A) From Installer Toolkit, tap Done in the upper-right corner of the screen to disconnect from the Envoy. Installer Toolkit will ask if you want to view a summary report.
B) Tap View Report. The report displays IQ Envoy and system information with a list of device serial numbers, their last power reports, and information about the grid profile applied to the microinverters.
C) Tap to email the report to your office as a record of successful system installation or to the utility for evidence of grid profile settings.

Re-torque Connections and Secure the Door

A) Turn off power to IQ Combiner at the main load center. Verify that all power is removed from the system before attempting any wiring.
B) Open the IQ Combiner door.
C) Remove the clear plastic dead front, and keep the screws and washers in a safe place.
D) Measure voltage L1 to L2, L1 to N, and L2 to N to make sure there is no voltage present.
E) Re-torque all field wiring connections, and busbar side of output terminal blocks (if a breaker was removed), one hour after first torque.

Activate Monitoring

Register the IQ Envoy in Enlighten (enlighten.enphaseenergy.com).

Method A // If the IQ Envoy is associated with a system in Installer Toolkit

A) On your mobile device, go to Settings and disconnect from the Envoy’s AP Wi-Fi network.
B) Return to the Installer Toolkit app and tap the Sync button on the System Overview screen.
C) When you have access to a computer, log in to Enlighten and select the system name from the Activation List on the dashboard.
D) From the activation form, open Array Builder.

If you used Installer Toolkit to build arrays and scan device serial numbers, the array(s) are built—make any necessary adjustments in Array Builder.

If you did NOT use Installer Toolkit to build arrays and scan device serial numbers, create the virtual array in Array Builder using the installation map as your reference. (You may need to wait if the devices have not yet reported to Enlighten.)

Method B // If the IQ Envoy is NOT associated with a system in Installer Toolkit

A) Log into Enlighten and click Add a New System from the dashboard.
B) Enter the System, Installer, Owner, and Location information.
C) Enter the IQ Envoy serial number.
D) Click Save to submit the form.
E) After the devices have reported to Enlighten, open Array Builder from the activation form, and create the virtual array, using the installation map as your reference.
**TROUBLESHOOTING**

### LED overview

<table>
<thead>
<tr>
<th>LED</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Flashing amber in unison</td>
<td>The IQ Envoy is booting up</td>
</tr>
<tr>
<td></td>
<td>Flashing green sequentially</td>
<td>Software upgrade in progress</td>
</tr>
<tr>
<td><img src="image" alt="Network communications LED" /></td>
<td>Solid green</td>
<td>Communicating with Enlighten</td>
</tr>
<tr>
<td></td>
<td>Flashing green sequentially</td>
<td>WPS connection in progress, or IQ Envoy is attempting to connect to Enlighten</td>
</tr>
<tr>
<td></td>
<td>Solid amber</td>
<td>Local network connection only</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No network connection</td>
</tr>
<tr>
<td><img src="image" alt="AP mode LED" /></td>
<td>Solid green</td>
<td>AP mode enabled: IQ Envoy Wi-Fi network available</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>AP mode disabled: IQ Envoy Wi-Fi network unavailable</td>
</tr>
<tr>
<td><img src="image" alt="Power production LED" /></td>
<td>Solid green</td>
<td>All communicating microinverters are producing</td>
</tr>
<tr>
<td></td>
<td>Flashing green</td>
<td>Microinverter upgrade in progress</td>
</tr>
<tr>
<td></td>
<td>Solid Amber</td>
<td>At least one microinverter is not producing</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Microinverters are not communicating (low light or night time)</td>
</tr>
<tr>
<td><img src="image" alt="Device communications LED" /></td>
<td>Solid Green</td>
<td>All devices are communicating</td>
</tr>
<tr>
<td></td>
<td>Flashing Green</td>
<td>Device scan in progress</td>
</tr>
<tr>
<td></td>
<td>Solid Amber</td>
<td>At least one device is not communicating (low light or night time)</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>Devices are not communicating (low light or night time)</td>
</tr>
</tbody>
</table>

### Device detection issues

If the Device Communications LED ( ) lights solid amber, it may be a result of low light levels. If there isn’t enough sunlight to power up the microinverters, they can’t communicate with the Envoy.

If there is sufficient daylight for the microinverters to power up, the issue may be that the Envoy is having difficulty communicating over the power lines. To troubleshoot this issue:

- Check the Installer Toolkit mobile app to see which devices are not communicating.
- Check that the circuit breaker(s) in the IQ Combiner for the PV array are in the “ON” position.
- Verify that the PV modules are connected to the microinverters.
- Verify the PV module DC voltage is within the allowable range for the microinverter.

### Power production issues

If the Power Production LED ( ) lights solid amber, check the Installer Toolkit mobile app to see which microinverters are not producing:

- If none of the microinverters are producing power, there may be a grid or wiring issue. First, verify that there is proper input voltage and frequency from the utility. Next, check the breaker and wiring, starting at the load center.
- If all of the non-productive microinverters are on the same branch, check the breaker and wiring starting at the junction box for the affected branch.
- If only one or scattered microinverters are not producing power, first check to see that the AC connectors are fully seated. Next, check that each module is providing the required startup voltage for the microinverter (22V). A PV module that is failing or that is undersized may not generate enough power for AC conversion.

### Internet connection issues

If you are using Wi-Fi and the Network Communications LED ( ) remains off:

- The WPS connection window may have timed out. Retry the connection steps.
- Make sure that the broadband router is operational by checking that other devices at the site can access the network.
- Be aware that metal enclosures or obstructions impede wireless communication.
- If you cannot see your router or access point in the list on the Envoy, or cannot maintain a connection, it may be necessary to add a wireless repeater to extend the network range.

If you are using Wi-Fi and the Network Communications LED ( ) lights solid amber, make sure that the broadband router is connected to the Internet by checking that other devices at the site can access the Internet.

If you are using the Enphase Mobile Connect modem and the Network Communications LED ( ) remains off or lights solid amber, see Troubleshooting in the Enphase Mobile Connect Installation Guide.

For any connection method, you can troubleshoot network issues with the Installer Toolkit mobile app by tapping the button, then *Diagnostic Tools*.

If you replace the broadband router, configure the IQ Envoy Wi-Fi settings for the new Wireless Network Name (SSID) and password, or use the WPS function described in Installation Step 11.

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**Loss of AC to a single branch of microinverters**

If a single branch of microinverters is not producing, it may indicate loss of AC to the branch.

Using a multi-meter set to AC, refer to the figure below and test for the following values:

- Test point A to test point B. The result should be around 240 VAC.
- Test point C to the screws on the load-side breaker screws (D). The result should be around 120 VAC.
- Test point C to test point D. The result should be around 120 VAC.
- If not, check the supply wiring.
- If not, there may be a problem with the wiring from the panel.

**Inoperable IQ Envoy (all LEDs off)**

If the IQ Envoy is not receiving power, all LEDs will be off.

Using a multi-meter set to AC, refer to the figure below and test for the following values:

- Test point A to test point C. The result should be around 120 VAC.
- Test point C to test point E. The result should be around 120 VAC.
- Test point C to test point G. The result should be around 120 VAC.
- Test point C to test point H. The result should be around 120 VAC.

If not, contact Enphase Customer Support (enphase.com/en-us/support/contact).

**Inoperable IQ Envoy and no AC to branch**

If a single branch of microinverters is not producing and the IQ Envoy LEDs are off, do the following:

Using a multi-meter set to AC, refer to the figure below and test for the following values:

- Test point C to test point E. The result should be around 120 VAC.
- Test point C to test point F. The result should be around 120 VAC.
- Test point C to test point G. The result should be around 120 VAC.
- Test point C to test point H. The result should be around 120 VAC.

If not, there may be a problem with the wiring from the panel.

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**Test Points**

[Diagram showing test points A to H]
SAFETY

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS
This guide contains important instructions that you must follow during installation and maintenance of the IQ Combiner.

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 particularly important for optimal system operation. Follow instructions carefully. |

Safety Instructions

- **DANGER**: Risk of electric shock. Risk of fire. Do not attempt to repair the IQ Envoy; it contains no user-serviceable parts. Tampering with or opening the IQ Envoy will void the warranty. Warranty void if cover removed. If the IQ Envoy fails, contact Enphase Customer Support for assistance (enphase.com/en-us/support/contact).

- **DANGER**: Risk of electrocution! Do not install CTs when current flowing in the sensed circuit. Always install CT wires in the terminal blocks before energizing the sensed circuit.

- **DANGER**: Risk of electric shock. Do not use Enphase equipment in a manner not specified by the manufacturer. Doing so may cause death or injury to persons, or damage to equipment.

- **DANGER**: Risk of electric shock. Be aware that installation of this equipment includes risk of electric shock. Do not install the IQ Combiner without first removing AC power from the Enphase System. Ensure the power coming from the microinverters is de-energized before servicing or installing.

- **DANGER**: Risk of electric shock. Risk of fire. Only qualified personnel should troubleshoot, install, or replace the IQ Combiner.

- **DANGER**: Risk of electric shock. Improper servicing of the IQ Combiner or its components may result in a risk of shock, fire, or explosion. To reduce these risks, disconnect all wiring before attempting any maintenance or cleaning.

- **DANGER**: Risk of electric shock. Always de-energize the AC branch circuit before servicing. While connectors are rated for disconnect under load, it is a best practice to de-energize before disconnecting.

- **DANGER**: Risk of electric shock. Risk of fire. Only use electrical system components approved for wet locations.

- **DANGER**: Risk of electric shock. Risk of fire. Ensure that all wiring is correct and that none of the wires are pinched or damaged.

- **DANGER**: Risk of electric shock. Risk of fire. Do not work alone. Someone should be in the range of your voice or close enough to come to your aid when you work with or near electrical equipment. Remove rings, bracelets, necklaces, watches etc. when working with batteries, photovoltaic modules or other electrical equipment.

- **DANGER**: Risk of electric shock. Risk of fire. Before making any connections verify that the circuit breakers are in the off position. Double check all wiring before applying power.

- **DANGER**: Risk of electric shock. Risk of fire. Do not wire unused terminals or terminal blocks on the IQ Envoy.

- **DANGER**: Risk of arcing over time. You must re-torque all field wiring connections after one hour.

- **WARNING**: Before installing or using the IQ Combiner, read all instructions and cautionary markings in the technical description and on the equipment.

- **WARNING**: Use the circuit breakers in the Enphase IQ Combiner only for serving Enphase equipment. No other loads are allowed.

- **WARNING**: This unit is not provided with a GFDI device. This inverter or charge controller must be used with an external GFDI device as required by the Article 690 of the National Electrical Code for the installation location.

- **WARNING**: The IQ Combiner has a pre-installed heat shield attached to the enclosure door. Do not remove the heat shield.

- **WARNING**: This product is intended for operation in an environment having a maximum ambient temperature of 46°C (115°F).

- **NOTE**: Perform all wiring in accordance with all applicable local electrical codes, with the Canadian Electrical Code, Part I, and with the National Electrical Code (NEC), ANSI/NFPA 70.

- **NOTE**: Protection against lightning and resulting voltage surge must be in accordance with local standards.

- **NOTE**: Using unapproved attachments or accessories could result in damage or injury.

- **NOTE**: Install the IQ Combiner in the field with 75°C or higher copper conductors sized per local code requirements and voltage drop/rise considerations.

- **NOTE**: Use Class 1 wiring methods for field wiring connections to terminals of a Class 2 circuit. Use 14 to 6 AWG wire for branch circuits and 14 to 4 AWG for output circuits. Select the wire gauge used based on the protection provided by the circuit breakers/fuses. Overcurrent protection must be installed as part of the system installation.

- **NOTE**: To ensure optimal reliability and to meet warranty requirements, the Enphase IQ Combiner must be installed according to the instructions in this manual.

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.

Enphase Customer Support: enphase.com/en-us/support/contact