

# neurio

## 2-Phase Solar Installation Guide\*



**CAUTION:** It is highly recommended that this product be installed by an electrician or other qualified professional. Before following this guide, please read and review the safety warnings provided at the end of this guide.



### Got Everything?

#### Neurio Sensor Box

- Neuroio Sensor W1
- Voltage Cable
- Antenna
- Antenna Cable
- 2 Current Transformers (CTs)
- 2 Wire Taps
- 2 Self-Drilling Screws
- 2 Antenna Mounts

#### Solar Kit

- 2 Cable Ties
- 1 Jumper Wire
- 2 Current Transformers (CTs)
- 1 Wire Tap
- 1 Jumper Wire

#### Tools

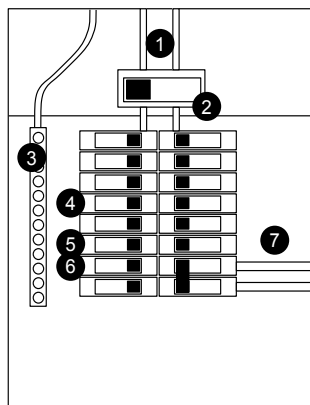
- Multimeter
- Phillips #2 Bit and Cordless Drill

### 1 Turn Off the Main Breaker

Neurio should only be installed when the main breaker in the panel is turned off. Use a multimeter to confirm that your Solar Panels are turned off, and there is no longer high voltage in the panel.

### 2 Check the Panel

Take the cover off the panel. It should look something like this:



- 1 Mains Service Wires
- 2 Main Breaker
- 3 Neutral Bus Bar
- 4 15A or 20A Single-pole Breaker on Phase A
- 5 15A or 20A Single-pole Breaker on Phase B
- 6 Another 15A or 20A Single-pole Breaker on Phase B
- 7 2 Solar Wires

You might also have to remove a service entrance cover on the high side of the main breaker to access the mains wires. **Remember that there may be voltage on the high side of the main breaker.**

### 3 Mount Neuroio

The leads on the CTs are 4ft long, and the voltage cables are 2ft long. Try to find a location that's within 4ft of the mains service wires and solar wires, and 2ft of the breakers and the neutral bus bar. Make sure there's enough room on either side of Neuroio to connect the CTs, voltage cable, and antenna cable.

Once you've found your location, drill the two self-drilling mounting screws into the panel to mount Neuroio.

### 4 Connect the Voltage Cable

Plug the voltage cable to the matching connector port on Neuroio.

Take the white wire and connect it to the neutral bus bar.

If an empty breaker is available, connect Neuroio's black wire to it. If no breakers are available, disconnect the wire from an occupied 15A or 20A breaker, and use the included wire tap to connect the jumper wire, Neuroio's black wire, and the original wire back to this breaker. Let's call this phase Phase A. Repeat for the red wire, being sure to use a breaker on a different phase. We'll call this second phase Phase B. Then connect the blue wire to another breaker that is on the same phase as the red wire (Phase B). For tips on finding breakers on different and matching phases, see Step 4 of the 2-Phase Installation Guide.

## 5 Connect the Current Transformers

Clip a current transformer around each of the two mains wires and around each of the two solar wires. Each of the four CTs should be connected with their white labels **facing away** from the breakers.

**Remember that there may be voltage on the high side of the main breaker.**

Determine which mains wire feeds the same phase that Neuroio's black wire is connected to. Trace the line visually, or use your multimeter to find the wire. Plug the CT on this mains wire into port #1 on Neuroio. Plug the CT that is around the other mains wire into port #2 on Neuroio.

Determine which solar wire connects to the same phase as Neuroio's blue voltage wire. Trace the line visually or use your multimeter to find the wire. Plug the CT on this solar wire into port #3 on Neuroio. Plug the CT that is around the other solar wire into port #4 on Neuroio.

Make sure the two CTs on the mains are connected to ports #1 and #2.  
The two CTs on the solar wires should connect to ports #3 and #4.

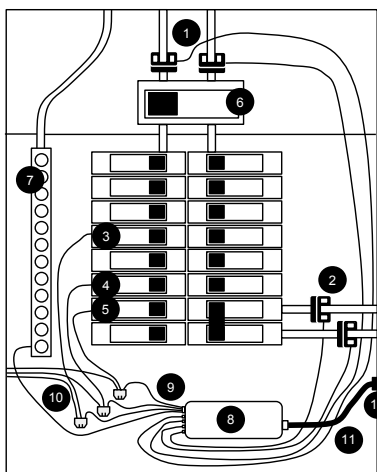
## 6 Connect the Antenna

Connect the antenna cable to the antenna connector on the Neuroio. Feed the other end of the antenna cable through either the 0.5" or 0.75" antenna mount. Use whichever size matches the knockouts in your panel. Fasten the antenna cable onto the mount using the nut that is supplied on the cable. Then connect your antenna to the antenna cable.

Find a 0.5" or 0.75" knockout that is within reach of your Neuroio using the included antenna cable. Most of the 0.5" and 0.75" knockouts will have an inner knockout and an outer ring. For either size, you only need to remove the inner knockout and should leave the outer ring in place. Use a screwdriver to remove the inner knockout. Feed the antenna mount through the knockout until it clips into position. For more detailed instructions and pictures, refer to Step 6 of the 2-Phase Installation Guide.

## 7 Check Your Work

Now the panel should look something like this:



- 1 Mains Service Wires and 2 CTs, Connected to Ports #1 and #2
- 2 2 Solar Wires and 2 CTs, Connected to Ports #3 and #4
- 3 15A or 20A Single-pole Breaker on Phase A
- 4 15A or 20A Single-pole Breaker on Phase B
- 5 Another 15A or 20A Single-pole Breaker on Phase B
- 6 Main Breaker
- 7 Neutral Bus Bar
- 8 Neuroio
- 9 Voltage Cable
- 10 3 Wire taps (optional)
- 11 Antenna cable
- 12 Antenna and antenna mount

You should have two CTs on the mains and two CTs on the solar wires, all with their labels facing away from the breakers. The voltage cable should be connected to 3 breakers and the neutral bus bar. If everything looks correct, you can use the cable ties to organize and secure the wiring.

## 8 Close the Panel

Replace the cover on the panel and use the supplied Neuroio breaker sticker to indicate which breaker Neuroio's black, Phase A wire is connected to. Once the panel is closed and labelled, you can turn the main breaker back on.

You're almost done! Refer to the next section, Installation Validation, to make sure that Neuroio is installed correctly. After that, the homeowner just has to follow the Welcome Guide to connect their Neuroio sensor to their Neuroio account.

## 9 Installation Validation

After installing Neurio and before the homeowner has connected it to the WiFi network:

You should hear 3 short beeps, followed by one descending tone and a short chime. Otherwise, check the installation to make sure everything is connected properly.

Neurio must only be powered on when the breaker panel is closed, so you can turn Neurio on and off by flipping the breaker that its black, Phase A wire is connected to. This breaker should be labelled on the breaker panel.

When powered on, Neurio will play the following tones to indicate its status in sequential order:

Tone	Indication	Description
Short Beeps	Voltage Check	One beep for each voltage wire that is connected. <i>For solar installations, there should be 3 beeps to indicate that the black, red, and blue wires are all connected.</i>
Falling Tone	Voltage Warning (conditional)	Indicates that two or more of Neurio's voltage wires are connected to breakers on the same phase. <i>For solar installations, this tone is expected and is not a sign of an installation problem. It is necessary to connect two wires to breakers on the same phase for solar installations.</i>
Short Chime	Neurio's WiFi Network Started	Neurio has started hosting its own WiFi network. The homeowner can join this network to configure Neurio and connect it to the homeowner's own WiFi network.
Long Chime	Neurio Join Network Succeeded	Neurio successfully joined the homeowner's WiFi network.
Falling Tone	Neurio Join Network Failed	Neurio was unable to join the homeowner's WiFi network. Neurio will now start hosting its own WiFi network again to allow the homeowner to re-connect to Neurio and re-enter the WiFi credentials.

If Neurio is connected to the WiFi network, you should also hear a long chime one minute after the short chime.

For additional troubleshooting advice and support, visit [support.neurio.io](https://support.neurio.io)



### Safety Warnings



Installing Neurio requires working with voltages that are hazardous to human health, and thus should only be done by a qualified professional. Installations should be performed in accordance with the applicable electrical code for the region in which Neurio is being installed. Whenever possible, power should be disconnected upstream from the installation location before attempting installation of Neurio. If power cannot be disconnected, high voltages may still be present, and caution must be taken to avoid injury. If Neurio is not used as instructed, its protection mechanisms may be impaired.

Rules:

1. Installations should be performed by a qualified professional.
2. Do not use Neurio with voltages that exceed 240V.
3. Only install Neurio in approved breaker panels or enclosures.
4. Neurio must not be exposed to moisture, direct sunlight, extremely low or high temperatures, and conductive pollution. Consult the User Manual for Neurio's acceptable operating environment.
5. Neurio must be installed in a location that limits access to only qualified personnel.