

neurio

3-Phase Installation Guide



This product must 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

3-Phase Kit

- 1 Current Transformer (CT)
- 1 Wire Tap

Tools

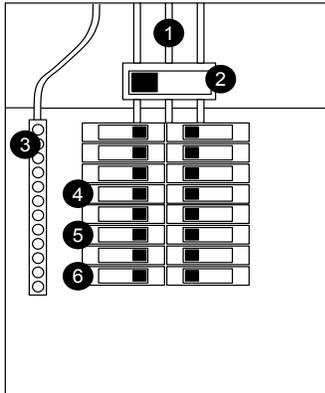
- Multimeter (Optional)
- Phillips #2 Bit and Cordless Drill

1 Turn Off the Main Breaker

Neurio should only be installed when the main breaker in the panel is turned off.

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 15A or 20A Single-pole Breaker on Phase C

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 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 replace it with a jumper wire of equivalent or lower gauge. 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 and blue wires, being sure to use breakers on different phases. We'll call the phase that the red wire connects to Phase B, and the phase that the blue wire connects to Phase C. Alternatively, you can connect the black, red, and blue wires to an empty 3-phase breaker if one is available. For tips on finding breakers on different phases, see Step 4 of the 2-Phase Installation Guide.

5 Connect the Current Transformers

Determine which mains wire feeds the breaker that you connected Neuroio's black wire to (Phase A). Trace the line visually or use your multimeter to find the wire. **Remember that there may be voltage on the high side of the main breaker.**

Clip a CT around the mains wire you found. It should have its white labels **facing away** from the main breaker. Plug this CT into port #1 on Neuroio. Repeat this process for the red and blue wires. The CT on the same phase as the red wire (Phase B) should connect to port #2, and the CT on the blue wire's phase (Phase C) should connect to port #3.

Make sure the three CTs are connected to ports #1, #2, and #3.
The CT on port #1 must be connected to Phase A.
The CT on port #2 must be connected to Phase B.
The CT on port #3 must be connected to Phase C.

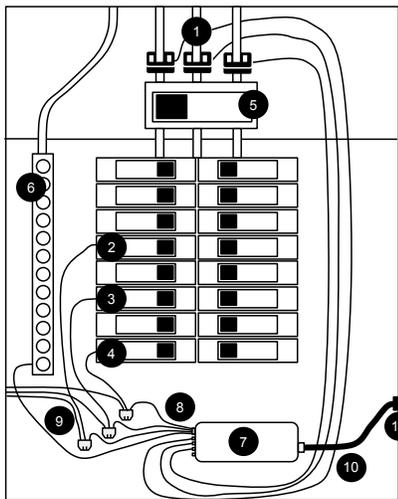
6 Connect the Antenna

Connect the antenna cable to the antenna connector on your 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 3 CTs, Connected to Ports #1, 2, and 3
- 2 15A or 20A Single-pole Breaker on Phase A
- 3 15A or 20A Single-pole Breaker on Phase B
- 4 15A or 20A Single-pole Breaker on Phase C
- 5 Main Breaker
- 6 Neutral Bus Bar
- 7 Neuroio
- 8 Voltage Cable
- 9 3 Wire Taps (optional)
- 10 Antenna cable
- 11 Antenna and antenna mount

You should have three CTs on the mains, each with their labels facing away from the main breaker. The voltage cable should be connected to 3 breakers on different phases and the neutral bus bar.

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 a short chime. If you don't hear these sounds, or if you hear a descending tone, 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 3-phase 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 3-phase installations, this tone is a sign of an installation problem. At least one of Neurio's voltage wires must be moved to a different breaker because it is on the same phase another of Neurio's voltage wires.</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.neur.io



Safety Warnings



Installing Neurio requires working with voltages that are hazardous to human health, and thus must only be done by an electrician or other 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 must 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.