Neurio Sensor W1™
User Guide

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1.0 Neurio Sensor W1

The Neurio Sensor W1 is a WiFi-enabled electricity sensor that measures whole-home consumption, and transmits that data to the Neurio Cloud. It utilizes split-core current transformers, and so can be quickly installed in a breaker panel by an electrician or other qualified professional.

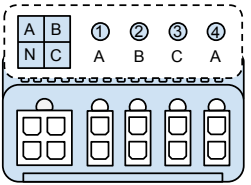
The Neurio Sensor is intended for use in residential or light commercial locations. It is a monitor only, and should not be used for billing purposes. It should not be used in mission-critical applications, or any instance where its failure could endanger human life.

1.1 Features

- Monitors instantaneous demand and total electricity consumption of the entire home
- Transfers data to the Neurio Cloud using WiFi
- Quickly installs in a breaker panel
- Certified for use in Canada, the United States, and Europe
- Supports all common worldwide residential and light commercial voltage configurations

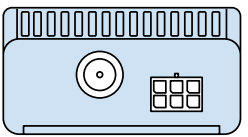
1.2 Meet the Neurio Sensor

Below is a quick guide to your new Neurio Sensor. For more detailed information, see the Installation Guide and Welcome Guide included in the box, and support.neur.io for videos, FAQs and troubleshooting tips.



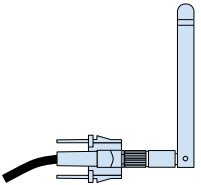
Voltage and Current Ports

On one end of the Neurio Sensor, you'll find the voltage and current ports. There is one voltage port, and four current ports. The markings above the current ports show their relation to the wires on the voltage cable. For instance, Current Port 1 works with Phase A on the voltage cable.



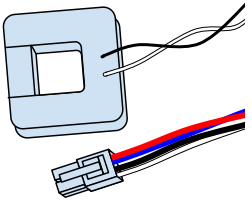
Antenna and Expansion Ports

On the other end, you'll find the Antenna and Expansion Ports. The Expansion Port allows the Neurio Sensor to control other devices.



Antenna Cable and Mount

The Neurio Sensor's antenna mount allows you to maximize wireless range by placing the antenna outside the breaker panel, even if your panel is flush-mounted in the wall.

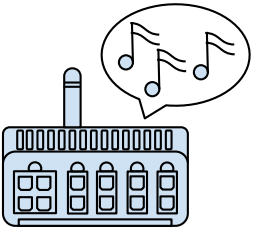


Current Transformers and Voltage Cable

The Neurio Sensor uses these to measure the energy consumption of your home. Installing these correctly is important for accurate measurements, so follow the directions carefully!

The voltage cable has 4 wires on it. Depending on your installation, not all wires may be necessary.

Wire Color	Connection
Black	Phase A
Red	Phase B
Blue	Phase C
White	Neutral



The Buzzer

The Neurio Sensor has a buzzer so it can tell you how it's doing. even when it's tucked away inside your breaker panel. It'll use the buzzer to tell you when it's started it's own network, joined your home network, or thinks there was an installation problem. It's talkative at first, but will quiet down once everything's up and running.

Below is your Neurio-to-English Phrasebook. More detail on using these chirps is provided in the Installation Guide and Welcome Guide.

On Start-up	
1 short beep	One voltage connection detected
2 short beeps	Two voltage connections detected
3 short beeps	Thee voltage connections detected
Falling Tone	Voltage Connection Warning

WiFi	
Short Chime	Neurio started it's WiFi Network
Long Chime	Neurio joined your WiFi Network
Falling Tone	Neurio failed to join your WiFi Network

2.0 Installation and Configuration

2.1 Safety

Installing the Neurio Sensor 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 the Neurio Sensor is being installed. Whenever possible, power should be disconnected upstream from the installation location before attempting installation of the Neurio Sensor. If power cannot be disconnected, high voltages may still be present, and caution must be taken to avoid injury. If the Neurio Sensor is not used as instructed, its protection mechanisms may be impaired.

Rules:

1. Installation must be performed by a qualified professional.
2. Do not use the Neurio Sensor with voltages that exceed 240V line to neutral.
3. Only install the Neurio Sensor in approved breaker panels or enclosures.

4. The Neurio Sensor must not be exposed to moisture, direct sunlight, extremely low or high temperatures, and conductive pollution. Consult section 2.5 for the Neurio Sensor's acceptable operating environment.
5. The Neurio Sensor must be installed in a location that limits access to only qualified personnel.

2.2 Installation Instructions

Note that different installation instructions are provided for split-phase, three-phase and solar systems. If your Neurio Sensor came with an Expansion Kit for 3-phase or solar, follow the instructions provided in the kit. Otherwise, follow the Installation Guide included in the Neurio Sensor box. These instructions are also available at support.neur.io.

2.3 Configuring the Neurio Sensor and Creating an Account

Instructions for configuring the Neurio Sensor are included in the Welcome Guide or at support.neur.io. Once that's complete, you can create your account by going to my.neur.io.

2.4 Installation External to Breaker Panel

If there is insufficient room to install the Neurio Sensor within the breaker panel, it can be installed externally inside an approved metallic enclosure with equivalent characteristics to a breaker panel. Follow the procedure for installation internal to the circuit breaker panel, but install the Neurio Sensor inside the secondary enclosure, and the CTs in your main breaker panel. Ensure that the connection made between the secondary enclosure and your breaker panel conforms to the electrical code for your region.

3.0 Specifications

3.1 Models

W1	Neurio Sensor
W1-S	Neurio Sensor with Solar Expansion Kit
W1-3P	Neurio Sensor with 3-Phase Expansion Kit

3.1 Ratings

Voltage	110-240VAC
Voltage Fluctuations	±10% of nominal voltage
Overvoltage	Overvoltage Category II
Frequency	50-60Hz
Power	2W

3.2 Monitoring

Out of the box, the Neurio Sensor can be used in the following scenarios:

North American Split Phase	
Typically found in detached houses	
Line to Neutral Voltage	120V
Line to Line Voltage	240V
Frequency	60Hz
Max Current	264A per phase

North American Dual Phase	
Typically found in apartments	
Line to Neutral Voltage	120V
Line to Line Voltage	208V
Frequency	60Hz
Max Current	264A per phase

European Single Phase	
Typically found in apartments and houses	
Line to Neutral Voltage	220-240V
Frequency	50Hz
Max Current	264A per phase

With an Expansion Kit, Neurio can also support:

North American or European Three Phase	
Typically found in detached houses or commercial buildings	
Line to Neutral Voltage	120-240V
Line to Line Voltage	208-415V
Frequency	50 or 60Hz
Max Current	264A per phase

Single Phase with Solar	
Typically found in detached houses	
Line to Neutral Voltage	220-240V
Frequency	50Hz
Current	264A per phase

Split-Phase with Solar	
Typically found in detached houses	
Line to Neutral Voltage	120V
Line to Line Voltage	240V
Frequency	60Hz
Current	264A per phase

Three-Phase with Single-Phase Solar	
Typically found in detached houses	
Line to Neutral Voltage	110-240V
Line to Line Voltage	208-415V
Frequency	50 or 60Hz
Current	264A per phase

3.3 Performance

Accuracy	Power	1%
	Energy	1%
Resolution	Power	1W
	Energy	1Wh
Measurement Frequency		1Hz

3.4 Radio

Standard	WiFi (802.11b/g/n)
Frequency	2.4GHz
Max Transmit Power	19dBm
Min Receive Sensitivity	-97dBm

3.5 Environment

Operating Temperature	5C to 45C
Storage Temperature	0C to 60C
Humidity Range	0-80% RH
Max Altitude	2000m
Pollution Degree	2

3.6 Compliance

Safety Certification	TUV, CE
Safety Standard	CAN/CSA C22.2 No. 61010-1:2012, UL 61010-1:2012, IEC 61010-1, EN 61010-1
Radio	FCC, IC, ETSI
FCC ID	W72-W1
IC ID	8253A-W1
Measurement Category	3

FCC Class B Part 15

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Neurio Technology Inc. may void the user's authority to operate the equipment.

IC RSS 210

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC/IC RF Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this equipment must be installed to provide a separation distance of at least 8 inches (20cm) from all persons.

Cet équipement est conforme à l'exposition aux radiations de FCC et d'Industrie Canada établies pour un environnement non contrôlé. L'antenne (s) utilisé pour cet équipement doit être installé pour fournir une distance d'au moins 20cm à partir de toutes les personnes.

CE Compliance

The Neurio Sensor W1 complies with the following CE directives:

Low Voltage Equipment (LVD)
Radio and Telecommunications Terminal Equipment (RTTE)
Electromagnetic Compatibility (EMC)

For the complete CE Self Declaration, see support.neur.io.

3.7 Manufacturing

Designed by Neurio Technology Inc
515 – 88 East Pender St
Vancouver, BC, Canada
Made in Canada

100.00027A.A 12/2014