

## PQ Edge® Power Analyzer Installation Manual

Revision 1



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**WARNING:** Death, serious injury, or fire hazard could result from improper connection or operation of this instrument. Carefully read and understand manual before connecting this instrument.

**AVERTISSEMENT:** Si l'instrument est mal connecté, la mort, des blessures graves, ou un danger d'incendie peuvent s'en suivre. Lisez attentivement le manuel avant de connecter l'instrument.

**WARNUNG:** Der falsche Anschluß dieses Geräts kann Tod, schwere Verletzungen oder Feuer verursachen. Bevor Sie dieses Instrument anschließen, müssen Sie die Anleitung lesen und verstanden haben.

**ADVERTENCIA:** Una conexión incorrecta de este instrumento puede producir la muerte, lesiones graves y riesgo de incendio. Lea y entienda el manual antes de conectar.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be compromised. Installation, service, and maintenance of your PQube 3 must only be done by qualified personnel for electrical installations.

The information contained in this document is subject to change without notice.

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Produced in the United States of America.



Contains Transmitter Module FCC ID: SSSBC118-X

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, the user is 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 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.

To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante

| Symbol  | Meaning  |
|---|--|
|  | Caution. Consult this manual in all cases where this symbol is marked, to find out the nature of the potential hazards and any actions which have to be taken to avoid them. |
|  | Caution. Risk of electric shock  |
|  | Alternating current  |
|  | Alternating current (AC) or direct current (DC)  |
|  | Double or Reinforced insulation  |
|  | Functional earth terminal <u>not</u> relied on for safety  |

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|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Introduction</b>   | <b>8</b>  |
| 1.1      | In the box.....   | 8         |
| 1.2      | Hardware Overview.....  | 8         |
| 1.2.1    | Top of Device   | 9         |
| 1.2.2    | Front of Device   | 10        |
| 1.2.3    | Status LED Blinking Modes   | 10        |
| <b>2</b> | <b>Installation</b>   | <b>11</b> |
| 2.1      | Before you Install.....   | 11        |
| 2.1.1    | Installation in an enclosure                                      | 11        |
| 2.1.2    | Current Sensors (CTs, Rogowski Coils, CTI-1A/CTI-5A)              | 11        |
| 2.1.3    | Power Supply  | 12        |
| 2.1.4    | Network Connection  | 13        |
| 2.1.5    | Download and install the iOS or Android App                       | 14        |
| 2.1.6    | Download and install the Configurator application                 | 15        |
| 2.1.7    | Include overcurrent protection and a disconnecting device         | 15        |
| 2.1.8    | Protect the Operator from the Hazardous Terminals                 | 16        |
| 2.2      | Installation.....   | 16        |
| 2.2.1    | Disconnect mains prior to service and installation.               | 16        |
| 2.2.2    | Mount your PQ Edge properly and securely                          | 17        |
| 2.2.3    | Connect the PQ Edge to the network                                | 17        |
| 2.2.4    | Connecting the Current Sensors                                    | 17        |
| 2.2.5    | Connect PQ Edge to the power supply                               | 20        |
| 2.2.6    | Connecting the ENV2 Environmental Probes (Optional)               | 21        |
| 2.3      | Connect to the PQ Edge via the iOS or Android App.....            | 22        |
| 2.4      | Connect to the PQ Edge via the Webpage .....                      | 23        |
| 2.5      | Wiring Verification.....  | 23        |
| 2.5.1    | Verify Network (Ethernet) and Power Configuration (Voltage Mains) | 23        |
| 2.5.2    | Ensure Voltage and Current readings are correct                   | 28        |
| 2.5.3    | Verify Voltage and Current Phasors                                | 31        |
| <b>3</b> | <b>Configuration</b>  | <b>37</b> |
| 3.1      | Configuring the PQ Edge .....                                     | 38        |
| 3.2      | Installing the Configurator .....                                 | 38        |
| 3.3      | Configuration: General Info .....                                 | 38        |



- 3.4 Configuration: AC Voltage..... 39**
- 3.5 Configuration: AC Currents ..... 41**
  - 3.5.2 Configuration: Network ..... 42
  - 3.5.3 Configuration Email Settings ..... 43
  - 3.5.4 Configuration: Emails from the PQ Edge ..... 44
- 3.6 Applying the configuration to the device..... 45**
  - 3.6.1 Saving the Setup.ini file ..... 45
  - 3.6.2 Method 1: Via the webpage ..... 45
  - 3.6.3 Method 2: Flash Drive and iOS / Android App ..... 46
  - 3.6.4 Method 3: Powerside QubeScan Cloud Platform ..... 48
- 3.7 Verifying configuration ..... 50**
  - 3.7.1 Method 1: Via the iOS or Android App ..... 50
  - 3.7.2 Method 2: Via the webpage ..... 52
- 4 Wiring Diagrams ..... 53**
  - 4.1 Single Phase L1-N..... 53
  - 4.2 Single Phase L1-L2..... 53
  - 4.3 Single phase 3-wire / Split Phase ..... 54
  - 4.4 Delta—3 CTs ..... 54
  - 4.5 Delta—2 CTs ..... 55
  - 4.6 Wye/Star ..... 55
  - 4.7 2.5 Wye/Star..... 56
  - 4.8 Measuring Neutral Current..... 56
- 5 QubeScan ..... 57**
  - 5.1 What is QubeScan?..... 57
  - 5.2 Signing up for QubeScan ..... 57
  - 5.3 Adding your Device to QubeScan..... 61
    - 5.3.1 Retrieve your IoT Token ..... 61
  - 5.4 Provision the device to QubeScan ..... 62
- 6 Operating the PQ Edge ..... 65**
  - 6.1 Viewing and accessing data from the PQ Edge ..... 65
    - 6.1.1 Viewing Data from the Device on the Device’s Webpage ..... 65
  - 6.2 Downloading Device Data..... 69



|            |   |           |
|------------|---|-----------|
| 6.2.1      | Via the webpage   | 69        |
| 6.2.2      | Using a USB flash drive via the iOS or Android App to download historic data, configuration, trends, and events | 70        |
| <b>6.3</b> | <b>Clearing the Device’s Memory .....</b>   | <b>76</b> |
| 6.3.1      | Method 1: Via the webpage   | 76        |
| 6.3.2      | Method 2: Via the iOS or Android App  | 77        |
| <b>7</b>   | <b>Maintenance and Troubleshooting</b>  | <b>79</b> |
| <b>7.1</b> | <b>Updating the Firmware.....</b>   | <b>79</b> |
| 7.1.1      | Method 1: Via a computer and USB Flash Drive  | 79        |
| 7.1.2      | Method 2: Via the webpage   | 79        |
| 7.1.3      | Method 3: Via a USB Drive and the iOS or Android App  | 80        |
| <b>7.2</b> | <b>Ensuring the firmware update was successful .....</b>  | <b>83</b> |
| 7.2.1      | Method 1: Via the webpage   | 83        |
| 7.2.2      | Method 2: Checking the USB Drive  | 83        |
| 7.2.3      | Method 3: Check the current firmware version on the iOS or Android App  | 83        |
| <b>7.3</b> | <b>Decommissioning the Device .....</b>   | <b>84</b> |
| <b>7.4</b> | <b>Reinstalling a Previously Decommissioned device.....</b>   | <b>84</b> |
| <b>7.5</b> | <b>Voltage Readings are Incorrect or not as Expected.....</b>   | <b>85</b> |
| 7.5.1      | Voltage readings are zero   | 85        |
| 7.5.2      | Voltage readings are incorrect  | 85        |
| <b>8</b>   | <b>More Information</b>   | <b>86</b> |
| <b>8.1</b> | <b>Specifications .....</b>   | <b>86</b> |
| <b>8.2</b> | <b>Conductor characteristics .....</b>  | <b>87</b> |
| <b>8.3</b> | <b>Warranty.....</b>  | <b>87</b> |
| 8.3.1      | How to check warranty status  | 87        |
| <b>8.4</b> | <b>Contacting Powerside for Help .....</b>  | <b>87</b> |



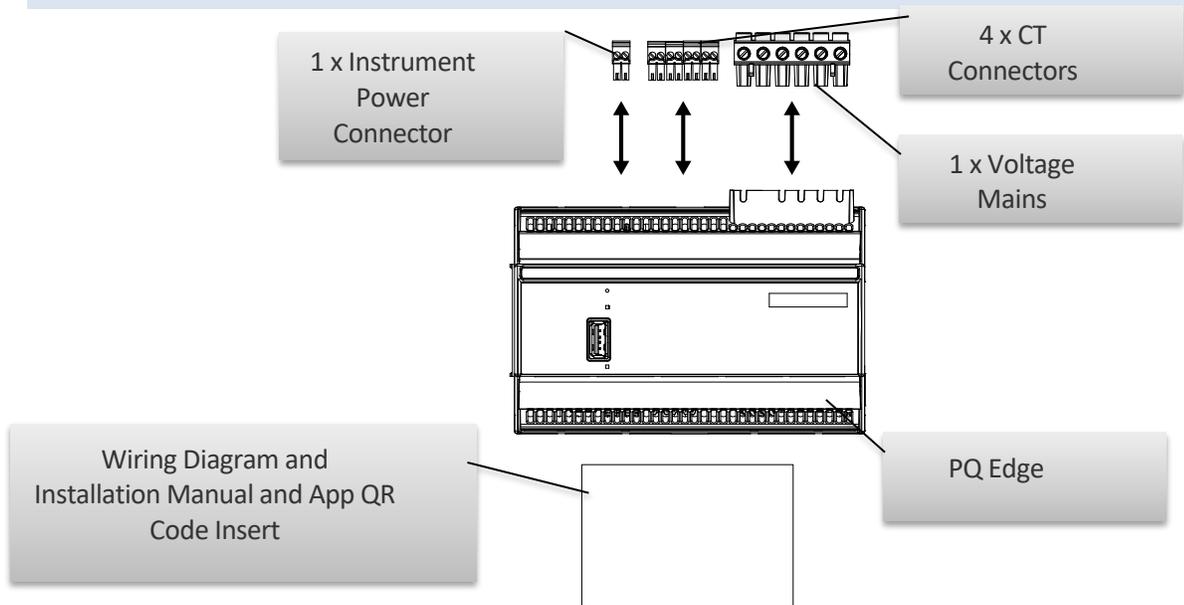
# 1 Introduction

PQ Edge® is a Class A Power Quality Analyzer for both monitoring and diagnosing issues with electric power systems and sensing environmental conditions, helping you to quickly solve problems that impact the quality and reliability of your product or process.

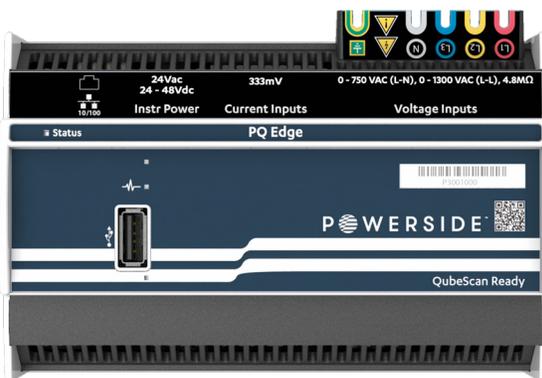
This manual provides instruction on:

- Installing and setting up the PQ Edge
- Downloading and inferring data from the device
- Basic troubleshooting

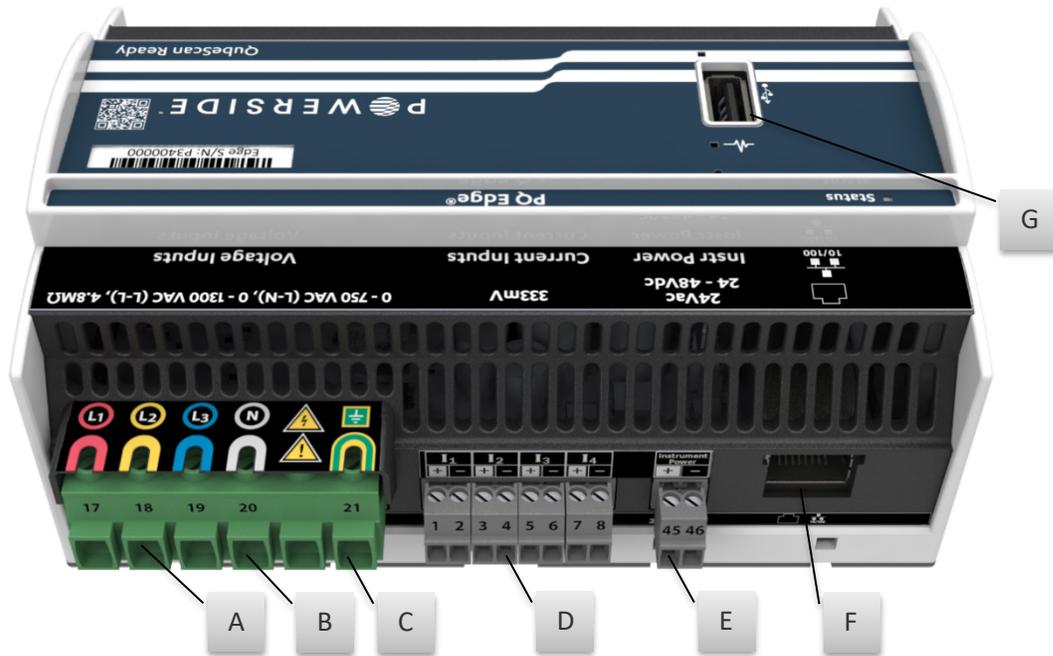
## 1.1 In the box



## 1.2 Hardware Overview

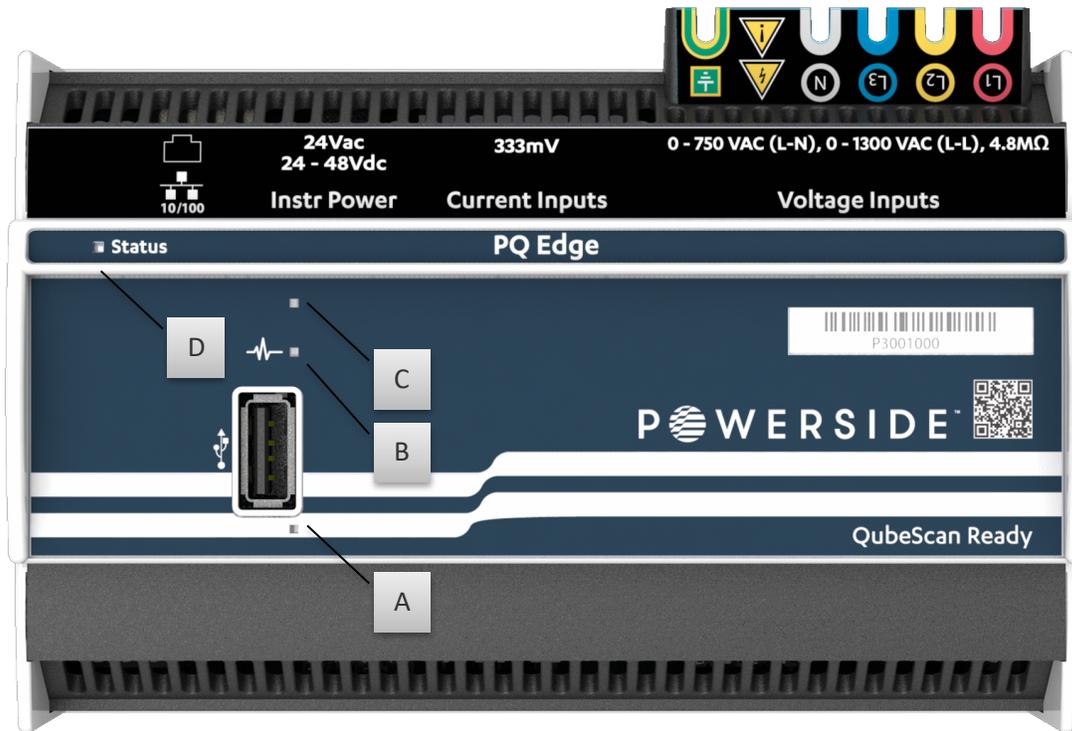


PQ Edge® Power Analyzer is easy to set up and auto-detects power configuration for most installations so you can “plug and go”. It detects the mains frequency, wiring configuration and nominal voltage.



## 1.2.1 Top of Device

- |   |  |  |
|---|--|--|
| A |  | L1, L2, L3, N voltage inputs.  |
| B |  | Neutral terminal—optional depending on your power configuration  |
| C |  | Earth—functional. Used as the reference point for voltage measurements.<br><b>IMPORTANT:</b> This terminal must be properly connected to ground for safety, accuracy, and reliability. |
| D |  | Current Inputs   |
| E |  | Instrument Power - 24 Vac or 24 Vdc to 48 Vdc  |
| F |  | Ethernet port  |
| G |  | USB 2.0 port<br>For use with USB Flash Drive or ENV2 Environmental Probes.   |



### 1.2.2 Front of Device

- A** USB Activity Indicator
- B** Internal Memory Activity Indicator
- C** Reset Pin
- D** Status LED

### 1.2.3 Status LED Blinking Modes

- Pink** Device is booting
- Green** Mains voltage detected
- White** Firmware update in progress
- Orange** Mains voltage missing or power configuration not detected

## 2 Installation

### 2.1 Before you Install

The PQ Edge is a plug and play device, however it can be helpful to consider a few things before installing the device.

#### 2.1.1 Installation in an enclosure

To install your PQ Edge in an enclosure to protect it from the elements, select a UL-listed, CE, CSA, or equivalent enclosure that is appropriate for the purpose. If you plan to use an enclosure of this type, you should review its mechanical compatibility with any optional features of your PQ Edge that you plan to use: optional USB connections, optional temperature-humidity probes, etc.

#### 2.1.2 Current Sensors (CTs, Rogowski Coils, CTI-1A/CTI-5A)

Current sensors allow the Power Analyzer to calculate energy and other parameters as well as allow the user to monitor load current (Amps). There are many different types of current sensors that are compatible with the device.

##### 2.1.2.1 Split-Core Current Transformers (CTs)

Current transformers are sensors that convert the magnetic field of a conductor into a voltage for the Power Analyzer to read as a current. They clamp around the conductor and come in various types such as screw lock type that require you to unscrew to feed the conductor through or a snap-top design that snap into place by hand.

These CTs come in a wide variety of current ratings and precision levels typically ranging from 5A to 6000A. The PQ Edge supports 333 mV CTs.

See [Wiring Diagrams](#) section for details.



##### 2.1.2.2 Flexible Rogowski Coil

Rogowski coils are similar to Split-Core Current Transformers, they convert a magnetic field of a conductor into a voltage. They have a rope style that typically allows for larger conductor sizes and are also used to couple multiple conductors together to get a total current reading.



Rogowski coils are slightly less accurate than Split-Core CTs but offer an even larger current range up to 50,000 Amps. The PQ Edge supports Rogowski coils without the need for an integrator, they can be connected directly to the current terminals.

See [Wiring Diagrams](#) section for details.

### 2.1.2.3 Monitoring the 1A or 5A secondary of existing metering CTs



To monitor the 1 A or 5 A secondary of existing metering CTs, you may need to use the CTI-1A or the CTI-5A module. They have 1 A and 5 A nominal inputs, respectively. The CTI module inputs are installed in series with your 1 A or 5 A secondary circuit. The terminal block on your CTI module is connected to the 0.333 Vac current input channels on your PQ Edge. Each CTI module includes 4 current channels, so you need just one CTI module per PQ Edge.



**WARNING:** When installing CTs with 1 A or 5 A secondaries, take extra precautions to ensure that an open circuit does not develop on the secondary wires. Shorting blocks are typically used to avoid the possibility of an open circuit during installation. CTs must be installed only by qualified personnel for electrical installations.

#### 1 A or 5 A vs. 0.333 Vac secondary, what's the difference?

Most current transformers are designed to have 1 A or 5 A of current flowing through the secondary circuit while full rated current is flowing through the primary circuit.

While installing CTs with 1 A or 5 A secondary, it is imperative that an open circuit does not develop in the secondary. If an open circuit develops while current is flowing through the primary of the CT, a very hazardous open circuit voltage (OCV) will develop across the opening. In this condition, typical OCV values can range from hundreds to thousands of volts.

For this reason, Powerside offers CTs exclusively with 0.333 Vac secondary. Our CTs includes a built-in burden resistor in the secondary circuit so that the current always has a path to flow through. The resistor value is calibrated and tuned to achieve a 0.333 Vac drop across the resistor at full rated current. This 0.333 Vac signal can then be measured using the 2 wires coming out of the CT.

### 2.1.3 Power Supply

The PQ Edge device requires 24 Vac or 24 to 48 Vdc ( $\pm 10\%$ ) connected to its instrument power terminals. Please ensure that this power source is backed up independently and not derived from the same source being monitored by the device. This will allow the device to continue operating in the event of a loss of power and continue to report on events during such an event.

An optional Powerside UPS4 module can also be used with the PQ Edge to provide 30 minutes of power during a power outage.

It should be noted that if an alert is to be reported the network gateway and subsequent connection must remain active during an outage as well as the device.

If the device loses power during an outage it will only report on the alert after power to the device is restored.

## 2.1.4 Network Connection

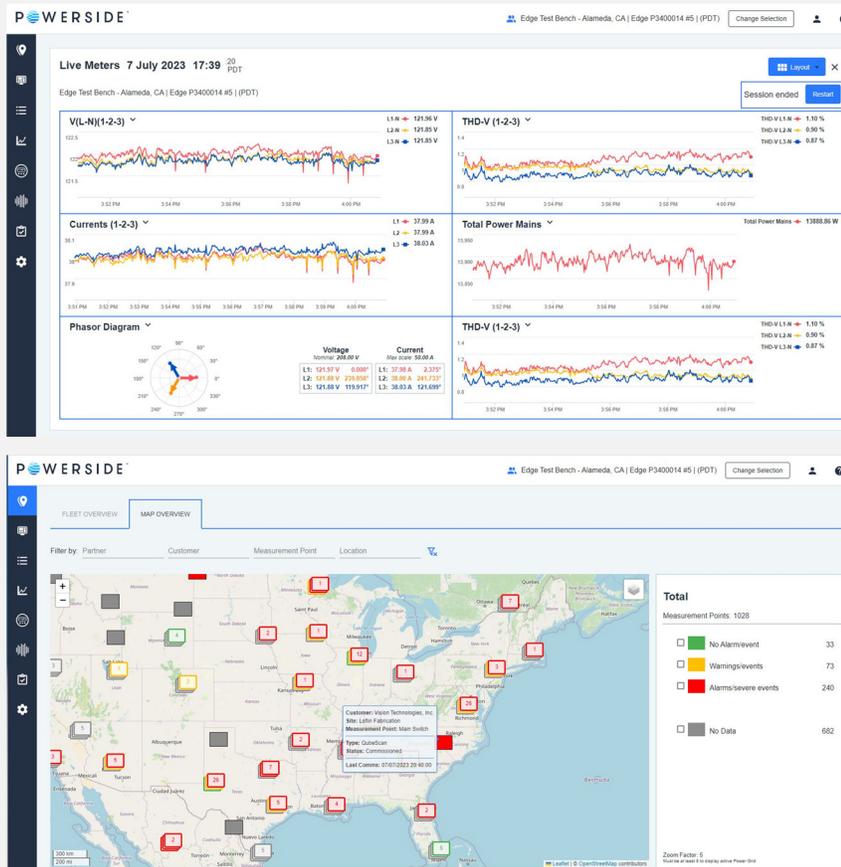
The PQ Edge has an Ethernet port to communicate over TCP/IP. The built-in webserver allows you to view real-time meters on its webpage, and download/upload files including setup and firmware. You can also configure it to send emails. Other protocols supported are Modbus TCP, SNMP, DNP3, BACnet, and FTP. It also connects to the Internet to synchronize time via NTP or SNTP.

In order to communicate over a network the PQ Edge needs a connection to a WAN (wide area network) like a cellular modem or directly via connection to an ISP (Internet service provider) or it needs connection to a LAN (local area network) like an office / industrial network.

The PQ Edge is designed from the ground up to be a cloud connected device accessible via a cloud platform called QubeScan.

The device can operate without a network connection, see [Using a USB flash drive via the iOS or Android App to download historic data, configuration, trends, and events](#) to learn how to download data from an offline device.

## Did you know that the PQ Edge has a free cloud platform that allows you to visualize and download data?



*PQ Edge is configured to communicate with QubeScan out-of-the box. QubeScan is Powerside’s cloud platform that allows you to connect to your PQ Edge, view live data, and produce reports.*

### 2.1.5 Download and install the iOS or Android App

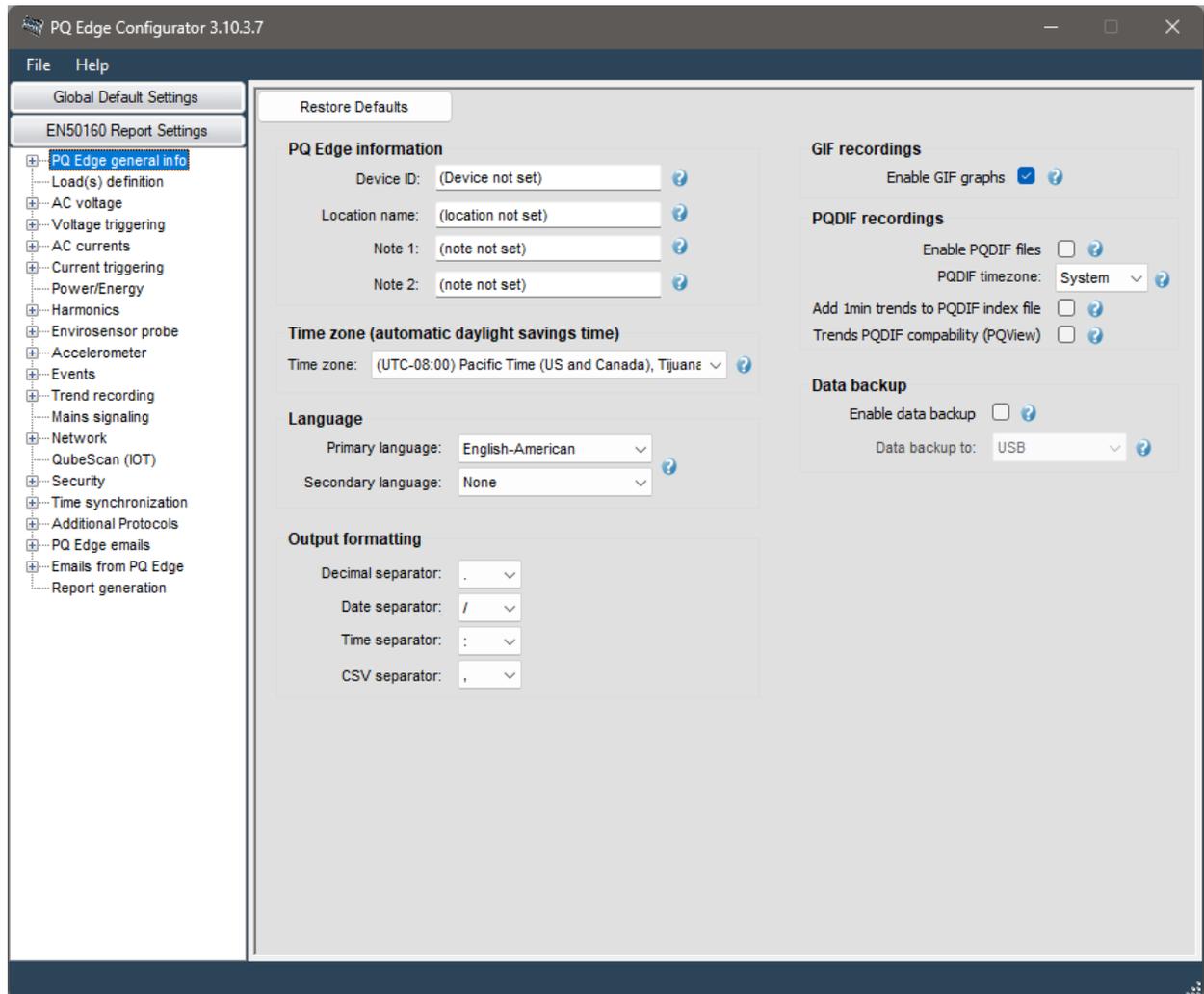
Follow the links below to download the app in a device of your choosing or use the QR code on your mobile device to download and install the App.



## 2.1.6 Download and install the Configurator application

The configurator application is a requirement to setup the device. Follow steps here to download and install the configurator application [Installing the Configurator](#).

The configurator is only compatible with Windows.



## 2.1.7 Include overcurrent protection and a disconnecting device

An external overcurrent protection device, such as a fuse or a circuit breaker, must be installed on each mains connection. The recommended fuse rating is 2 A, 600 Vac, 200 kA IR AC, Time Delay, and Class CC. The device shall be UL Listed, branch circuit type overcurrent protector. You should consult a qualified electrician to determine the overcurrent protection installation.

Your PQ Edge can share the overcurrent protection device with other loads.

An operator-activated disconnecting device, such as a switch or a circuit breaker, must be installed on the mains connections. The recommended disconnecting device rating is 600 Vac/dc, Max 30 A,

SCCR: 200 kA This device must be clearly marked as the disconnecting device for your PQ Edge and must be marked to indicate the disconnection function. Do not install your PQ Edge in such a way that it becomes difficult to operate this disconnecting device. The disconnecting device must not disconnect the earth connection. The disconnecting device should be installed near your PQ Edge, within easy reach of the operator.

## 2.1.8 Protect the Operator from the Hazardous Terminals

**IMPORTANT:** All high-voltage parts must be covered, including the AC power to your device. Install your device so that all the screw terminal blocks are not accessible<sup>1</sup> to the operator. Your device can also be installed without a cover if installed in a lockable UL 508 control panel.



The operator must be protected from the hazardous screw terminal blocks by a barrier. The screw terminal blocks must be made “not accessible,” as defined in UL /IEC 61010-1 6.2, using an enclosure or barrier that meets the rigidity requirements of UL /IEC 61010-1 8.1 and that requires a tool to remove.

## 2.2 Installation

### 2.2.1 Disconnect mains prior to service and installation.

**IMPORTANT:** Your PQ Edge must be installed only by qualified personnel for electrical installations. Always disconnect all mains connections, and verify disconnections, prior to servicing.

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<sup>1</sup> Accessible, as defined in UL 61010-1, means able to be touched with a standard test finger or test pin, when used as specified in UL61010-1 6.2.

In the United States and Canada, the equipment installation shall meet ANSI/NFPA 70, NEC, with CSA C22.1, CEC, Part I or with both as appropriate. In other regions, follow all local installation requirements and regulations.

## 2.2.2 Mount your PQ Edge properly and securely

Your PQ Edge, is designed to be mounted on 35 mm DIN rail.

Simply align the top of the device against the top of the DIN Rail and then push the bottom of the device towards the rail to see it click into place.

To remove the device insert the tip of a flat head screwdriver into the slot in the DIN Rail locking liver and move the screwdriver upward to release the device.



## 2.2.3 Connect the PQ Edge to the network



Connect the ethernet port to an ethernet cable at this stage. Factory default is DHCP this can be changed by following the instructions in [Configuration: Network](#) section.

## 2.2.4 Connecting the Current Sensors

The connectors on the top of the PQ Edge labeled CT Inputs: 333 mV and L1, L2, L3, Earth are removable so you can pre-wire all the connections and connect them to the device after. Refer to the [wiring diagrams](#) section and use the appropriate wiring scheme for your power configuration.

Refer to [Conductor characteristics](#) to find wire gauges accepted by the device.

### 2.2.4.1 Connecting the Current Sensors

The PQ Edge has 4 current sensor inputs that can connect to Split-Core CTs, Rogowski Coils, or transformer secondary CTs via the CTI-1A/CTI-5A.

When installing current transformers, it's crucial to correctly match the voltage inputs and current inputs with their corresponding phases. This means that the L1 voltage input and the L1 current sensor should be connected to the same conductor. Additionally, the orientation (direction it is

facing) of the current transformer (CT) matters - it must be positioned correctly to ensure precise power and energy calculations.

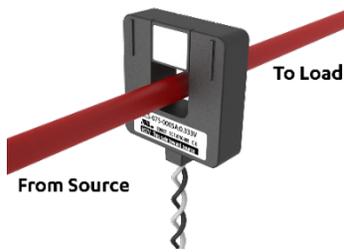
In some cases, connection swapping may occur, such as using the I1 connection for I2 or I3, or inverting the polarity. You can correct these issues with the configurator application see [Fix connection errors](#).

**2.2.4.1.1 Installing and connecting Split-Core Current Transformer (CTs)**

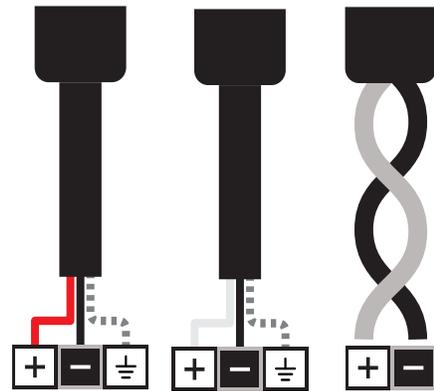
For Powerside CTs, white wires are positive and black wires are negative. Clamp the CT around the conductor. The label faces towards the source as shown.

Insert the CT wires in the CT input connector and screw tightly down to 0.2 Nm 2 in lb of torque.

**Powerside Split-Core CT**



|                               |   |
|-------------------------------|---|
| <b>Polarity</b>               | <i>White / Red Positive (+)<br/>Black Negative (-)<br/>Bare Shield (if present)</i> |
| <b>Installation Direction</b> | <i>Label faces source</i>   |



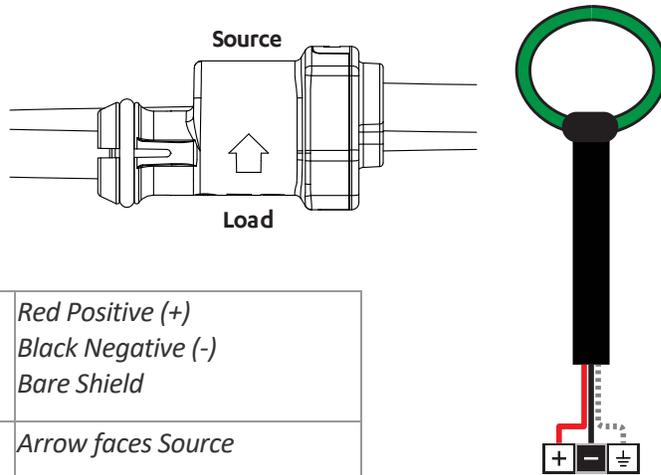
**2.2.4.1.2 Installing and connecting Flexible Rogowski Coil**

For Powerside Rogowski Coils, push down on the flexible coil connector to disconnect the coil, clamp coil around conductor ensuring the coil is normal to the conductor. Use cable ties or similar to ensure the coil is as straight as possible.

Insert the Rogowski coil wires in the CT input connector and screw tightly down to 0.2 Nm 2 in lb.

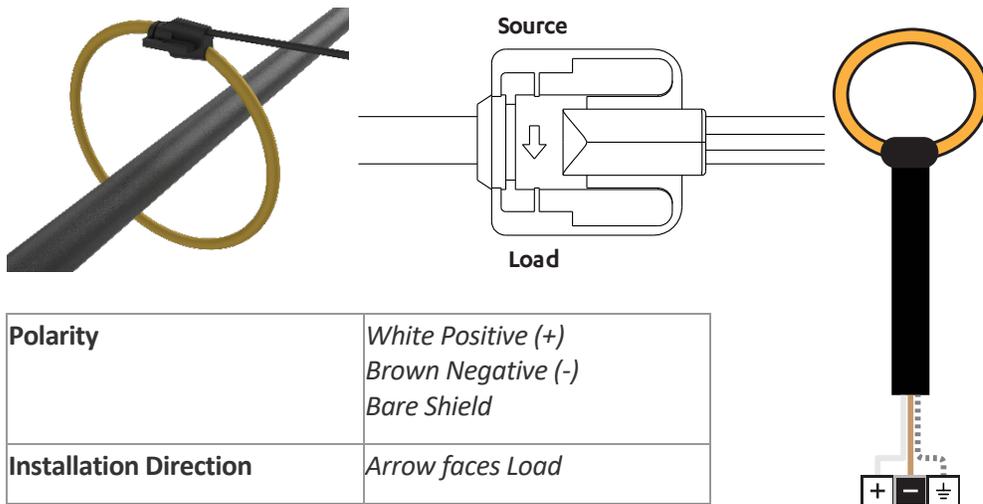
**Green Rogowski Coil**





|                               |  |
|-------------------------------|--|
| <b>Polarity</b>               | <i>Red Positive (+)<br/>Black Negative (-)<br/>Bare Shield</i> |
| <b>Installation Direction</b> | <i>Arrow faces Source</i>                                      |

**Orange Rogowski Coil**

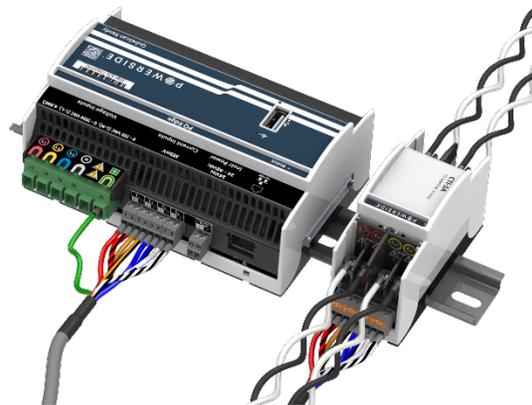


|                               |  |
|-------------------------------|--|
| <b>Polarity</b>               | <i>White Positive (+)<br/>Brown Negative (-)<br/>Bare Shield</i> |
| <b>Installation Direction</b> | <i>Arrow faces Load</i>  |

**2.2.4.1.3 Connecting to the 1A or 5A secondary of existing metering CTs**

If you will be monitoring the 1 A or 5 A secondary of existing metering CTs, you may need to use the CTI-1A or the CTI-5A module. They have 1 A and 5 A nominal inputs, respectively. The CTI module inputs are installed in series with your 1 A or 5 A secondary circuit. The terminal block on your CTI module is connected to the CT Inputs connector. Each CTI module includes 4 current channels.

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Most current transformers are designed to have 1 A or 5 A of current flowing through the secondary circuit while full rated current is flowing through the primary circuit.

While installing CTs with 1 A or 5 A secondary, it is imperative that an open circuit does not develop in the secondary. If an open circuit develops while current is flowing through the primary of the CT, a very hazardous open circuit voltage (OCV) will develop across the opening. In this condition, typical OCV values can range from hundreds to thousands of volts.

For this reason, Powerside offers CTs exclusively with 0.333 Vac secondary. Our CTs includes a built-in burden resistor in the secondary circuit so that the current always has a path to flow through. The resistor value is calibrated and tuned to achieve a 0.333 Vac drop across the resistor at full rated current. This 0.333 Vac signal can then be measured using the 2 wires coming out of the CT.

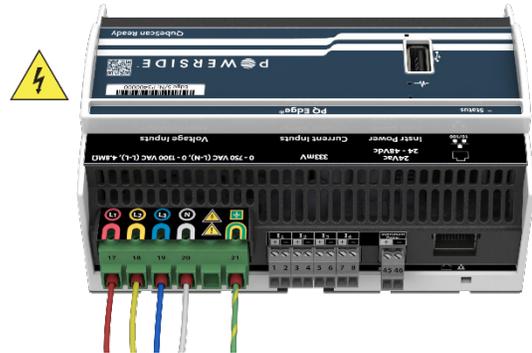
### 2.2.4.2 Connecting to the Voltage Mains

Refer to the [wiring diagrams](#) and use the appropriate wiring scheme for your power configuration.

**IMPORTANT:** Don't forget to install the Earth conductor. The device relies on the Earth conductor for safety, reliability, and accuracy.

You must apply at least 30 Vac to these terminals before PQ Edge will begin recording.

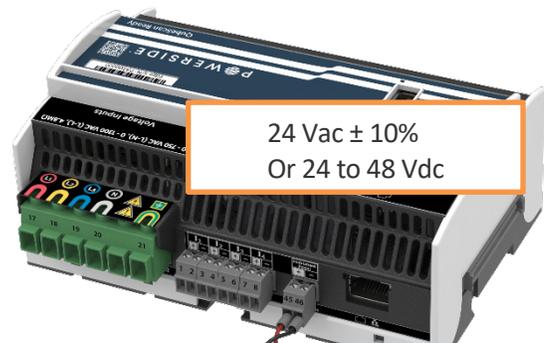
Tighten the screws on the mains voltage terminal block to 0.5 newton-meters (4.4 inch-pounds) of torque. Observe all voltage ratings and limits.



### 2.2.5 Connect PQ Edge to the power supply

 Ensure the power supply for the device is powered down before attempting to connect it to the device. The device requires a backed-up power supply that does not derive from the same source being monitored by the device to allow for the device to continue operating during a loss of power event.

The instrument power terminals (45, 46) on the top of your PQ Edge must be connected to 24 Vac ( $\pm 10\%$ ) or 24 to 48 Vdc ( $\pm 10\%$ ), polarity independent. Tighten screws to 0.6 Nm (5 in lb) of torque.



24 Vac  $\pm 10\%$   
Or 24 to 48 Vdc

0.6 Nm (5 in lb) of  
Torque on screw  
terminals

**WARNING:** Applying voltages outside of this range can cause permanent damage to your device.

Your device provides a minimum of 150 V of transformer-based isolation between these terminals and all other terminals, eliminating any problems with ground loops.

### 2.2.5.1 Pairing with UPS4 Module (Optional)

The UPS4 module connects to a 24 Vac ( $\pm 10\%$ ) or 24 to 48 Vdc ( $\pm 10\%$ ) source. The UPS4 then connects to the PQ Edge from one of the 3 power connectors on the bottom of the UPS 4 to the Instrument Power connector on the top of the PQ Edge see [Connect PQ Edge to the power supply](#).

This module provides a backup power option if you are not using a backed-up power supply.

UPS4 should only be installed in a vented enclosure.



### 2.2.6 Connecting the ENV2 Environmental Probes (Optional)

The ENV2 environmental probe allows your PQ Edge to measure ambient temperature, humidity, and barometric pressure. It also includes an accelerometer to measure shock and vibration.

ENV2 probes interface with the device through a USB cable. Insert the USB connector into the USB slot of the PQ Edge.

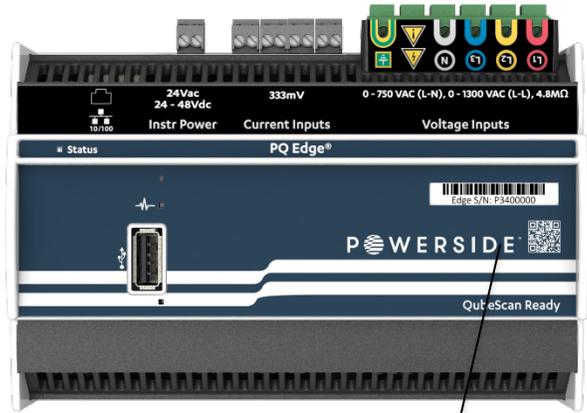
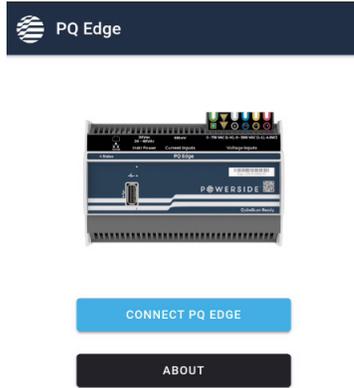
Note: While the ENV2 probe is connected the USB drive can not be used to extract data via a flash drive and can not be used to have a backup drive connected to the PQ Edge.



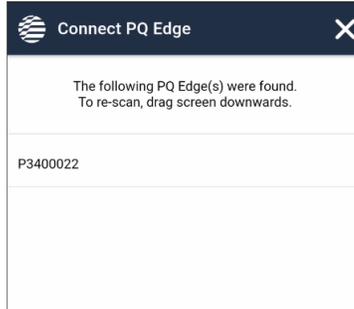
## 2.3 Connect to the PQ Edge via the iOS or Android App

1. Open the PQ Edge app on your mobile device and click **CONNECT PQ EDGE**. While you are within 10 meters (line of sight) from the device. To download the app see [Download and install the iOS or Android App](#).

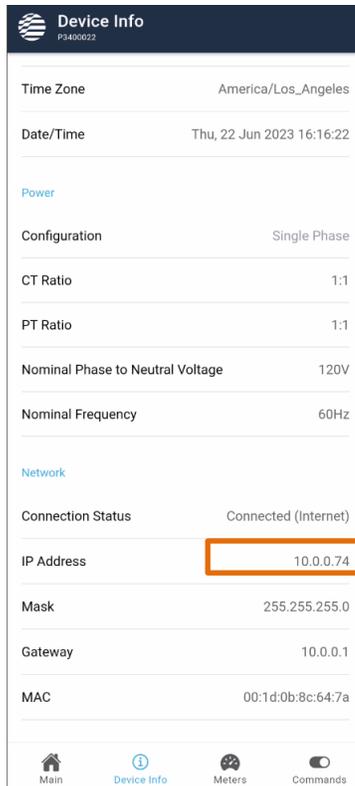
**Note:** You can only have 1 Bluetooth connection to a PQ Edge at a time.



2. Click the serial number of the device you would like to connect to. Your S/N is printed on the front face of the device.



3. You should now be directed to the **Device Info** page that shows basic device information



| Device Info                      |                           |
|----------------------------------|---------------------------|
| Time Zone                        | America/Los_Angeles       |
| Date/Time                        | Thu, 22 Jun 2023 16:16:22 |
| Power                            |                           |
| Configuration                    | Single Phase              |
| CT Ratio                         | 1:1                       |
| PT Ratio                         | 1:1                       |
| Nominal Phase to Neutral Voltage | 120V                      |
| Nominal Frequency                | 60Hz                      |
| Network                          |                           |
| Connection Status                | Connected (Internet)      |
| IP Address                       | 10.0.0.74                 |
| Mask                             | 255.255.255.0             |
| Gateway                          | 10.0.0.1                  |
| MAC                              | 00:1d:0b:8c:64:7a         |

Note the IP address for accessing the device's webpage from your mobile device or computer.

## 2.4 Connect to the PQ Edge via the Webpage

To connect to the PQ Edge via its webpage you need to know its IP address, this can be found on the iOS or Android app in the **Device Info** page under IP Address, see [Connect to the PQ Edge via the iOS or Android App](#). To connect to the PQ Edge and interact with it using its webpage, simply type the IP address into your browser and press enter.

## 2.5 Wiring Verification

This section will walk you through verifying that the physical installation and wiring is correct. After this step you can configure the device and verify that the device is operating correctly remotely if you have remote network access to the device. Physical verification of installation is best done on the Smartphone App.

### 2.5.1 Verify Network (Ethernet) and Power Configuration (Voltage Mains)

The PQ Edge's default setting is to connect to a network via Ethernet, by default it is in DHCP mode, the most common configuration. You can verify it has network connection via the iOS or Android app or via the webpage.

The device also automatically detects the power configuration that the device has been connected to (Delta, Wye) and Nominal Phase to Phase voltage, Nominal Phase to Neutral Voltage, and Nominal Frequency.

### 2.5.1.1 Method 1: Via the iOS or Android App

1. Click on **Device Info** and ensure you have a valid **IP address** and the Connection Status says **“Connected (Internet)”**.



**Are you on a corporate network or cellular network that requires a Static (or Fixed IP)?**

The Windows Application, Configurator allows you to setup such a network. Follow the instructions in the [Configuration: Network](#).

2. Scroll up to the Power section and on the same page, ensure the **Configuration** is detected as the configuration the device is connected to and the **Nominal Phase to Phase Voltage**,

**Nominal Phase to Neutral Voltage and Nominal Frequency are accurate.**

**Device Info**  
P3400023

**General Information**

|                  |                           |
|------------------|---------------------------|
| Firmware Version | 3.10.3.23.07.14           |
| Serial           | P3400023                  |
| Time Zone        | America/Los_Angeles       |
| Date/Time        | Wed, 02 Aug 2023 16:49:27 |

**Power**

|                                  |       |
|----------------------------------|-------|
| Configuration                    | Wye   |
| CT Ratio                         | 100:1 |
| PT Ratio                         | 1:1   |
| Nominal Phase to Phase Voltage   | 208V  |
| Nominal Phase to Neutral Voltage | 120V  |
| Nominal Frequency                | 60Hz  |

**Network**

Main | **Device Info** | Commands

**Are your Power Configuration, Nominal Phase to Phase Voltage, Nominal Phase to Neutral Voltage or Nominal Frequency inaccurate?**

The Windows Application, Configurator allows you to change and 'force' these parameters. See [Configuration: AC Voltage](#).

**2.5.1.2 Method 2: Via the webpage**

1. Once you have the IP address from the App, type it into a browser on a computer or mobile device on the same network. If the webpage is accessible, then the PQ Edge is accessible on your local network. To ensure it has access to the internet, click on **Commands** then click on **Test Connectivity**.

**Are you on a corporate network or cellular network that requires a Static (or Fixed IP)?**

The Windows Application, Configurator allows you to setup such a network. Follow the instructions in the [Configuration: Network](#).

The screenshot shows the PQ Edge web interface. On the left is a navigation menu with items: Status, Meters, Phasors, Events, Trends/Statistics, Diagnostics, and **Commands** (highlighted with an orange box and labeled '1'). The main content area is divided into sections: **Actions & Commands** (with 'Generate' buttons for Daily, Weekly, and Monthly Trends, and a 'Generate Snapshot' button), **Diagnostics** (with 'Send Test E-mail' and 'Test Connectivity' buttons, the latter highlighted with an orange box and labeled '2'), **Advanced** (with buttons for Restart device, Clear data, Reset Energy Accumulators, Reset Peak Measurements, and Request IoT token), and **File Downloads** (with buttons for Present Setup.ini, Log, System Audit, and Diagnostic Files). On the right, there are sections for **Configuration and Logos** (with 'Choose File' and 'Send' buttons for Setup.ini, Screen Logo, and Web/Graph Logo) and **Firmware Update** (with a 'Choose File' and 'Send' button and a note that the update may take 2 minutes).

2. Click **OK**

A dark grey dialog box with white text. It says: "This operation will take a few minutes. Do you want to proceed?". At the bottom right, there are two buttons: "OK" (highlighted with an orange box) and "Cancel".

3. Ensure the device passes and click **OK**

The screenshot shows the 'Test Connectivity' results page. The title is 'Test Connectivity'. Below it is a list of test results, all of which are 'Pass':  
 Physical Link status - Pass  
 Ping 208.67.222.222 - Pass  
 Ping 8.8.8.8 - Pass  
 Ping NTP server north-america.pool.ntp.org - Pass  
 Ping www.google.com - Pass  
 Open socket - Pass  
 Open port 80 - Pass  
 Request index.html page - Pass  
 Connect to www.google.com - Pass  
 Ping IoT server endpoint a25f59c6273kbz-ats.iot.us-east-1.amazonaws.com - Pass  
 Open socket - Pass  
 Open port 8883 - Pass  
 Request index.html page - Pass  
 Connect IoT server endpoint and port - Pass  
 IoT upload status - Pass  
 IoT service status - Pass  
 Connectivity Test: Test OK  
 Request IoT token - Pass  
 At the bottom right, there are two buttons: "Copy" and "OK" (highlighted with an orange box).

- Click **Status**, ensure the **Power Configuration** is detected as the configuration the device is connected to and the **Nominal Phase to Phase Voltage, Nominal Phase to Neutral Voltage** and **Nominal Frequency** are accurate.

|                   |   |   |   |
|-------------------|---|---|---|
| Status            | 1 | <b>Device Information</b>               |   |
| Meters            |   | <i>Location:</i>                        | PSL Engineering Lab   |
| Phasors           |   | <i>Device ID:</i>                       | P3400023  |
| Events            |   | <i>Note 1:</i>                          | Soak Test   |
| Trends/Statistics |   | <i>Note 2:</i>                          | number 1  |
| Diagnostics       |   | <i>Serial Number:</i>                   | P3400023  |
| Commands          |   | <i>Model Number:</i>                    | PQ Edge   |
|                   |   | <i>Firmware Version:</i>                | 3.10.3.23.07.14   |
|                   |   | <i>IP Address:</i>                      | 172.17.5.9  |
|                   |   | <b>Configuration</b>                    |   |
|                   |   | <i>Power Configuration:</i>             | <input checked="" type="checkbox"/> Wye/Star <span style="border: 2px solid orange; padding: 2px;">2</span> |
|                   |   | <i>Nominal Line-to-Neutral Voltage:</i> | 120.1V  |
|                   |   | <i>Nominal Line-to-Line Voltage:</i>    | 208.0V  |
|                   |   | <i>Nominal Frequency:</i>               | 60Hz  |
|                   |   |   | <span style="border: 2px solid orange; padding: 2px;">3</span>  |

**Are your Power Configuration, Nominal Phase to Phase Voltage, Nominal Phase to Neutral Voltage or Nominal Frequency inaccurate?**

The Windows Application, Configurator allows you to change and 'force' these parameters. See [Configuration: AC Voltage](#).

## 2.5.2 Ensure Voltage and Current readings are correct

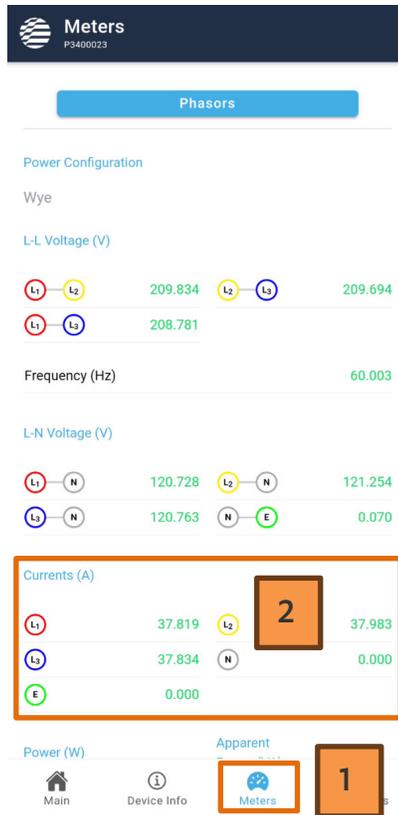
### 2.5.2.1 Method 1: Via the iOS or Android App

1. Tap **Meters**, check to see if the **L-L** and **L-N voltages** and **Frequency (Hz)** are as expected. If the values are not correct then check all connections after safely powering down the mains circuit.

If you have a potential transformer installed then follow steps in [Configuration: AC Voltage](#) to configure it's ratio.



2. Check the current readings, if you see that your current readings are negative and you are not generating power, then the CT may be installed backwards, or it may be wired backwards. See [Connecting the Current Sensors](#) for wiring instructions and see [Fix connection errors](#) to fix this in the configuration of the device without the need to rewire / reinstall the CTs. You will also need to set CT ratios, see [Configuration: AC Currents](#) for more details.



### 2.5.2.2 Method 2: Via the webpage

1. On the **Meters** page check to see if the **L-L** and **L-N voltages** and **Frequency (Hz)** are as expected. If the values are not correct then check all connections after safely powering down the mains circuit.

If you have a potential transformer installed then follow steps in [Configuration: AC Voltage](#) to configure it's ratio.

The screenshot shows the PQ Edge web interface. On the left is a navigation menu with items: Status, Meters (highlighted with a '1' in a box), Phasors, Events, Trends/Statistics, Diagnostics, and Commands. The main content area is titled 'Loads' and contains a 'Mains' button. Below that is a 'Meters' section containing a table of meter readings. A '2' in a box highlights this table.

| Meter                        | Value     |
|------------------------------|-----------|
| L1-N                         | 120.6V    |
| L2-N                         | 121.3V    |
| L3-N                         | 120.8V    |
| N-E                          | 0.07V     |
| L1-L2                        | 209.7V    |
| L2-L3                        | 209.9V    |
| L3-L1                        | 208.6V    |
| I1 Amps                      | 37.785A   |
| I2 Amps                      | 38.002A   |
| I3 Amps                      | 37.849A   |
| N Amp                        | 0.000A    |
| Frequency                    | 60.019Hz  |
| L1-N Voltage Fundamental     | 120.6V    |
| L1 Voltage Fundamental Angle | 0.00deg   |
| L2-N Voltage Fundamental     | 121.3V    |
| L2 Voltage Fundamental Angle | 239.82deg |
| L3-N Voltage Fundamental     | 120.8V    |
| L3 Voltage Fundamental Angle | 119.59deg |
| L1 Current Fundamental       | 37.781A   |
| L1 Current Fundamental Angle | 2.52deg   |
| L2 Current Fundamental       | 37.998A   |
| L2 Current Fundamental Angle | 241.63deg |
| L3 Current Fundamental       | 37.849A   |
| L3 Current Fundamental Angle | 121.43deg |

2. Check the current readings, if you see that your current readings are negative and you are not generating power, then the CT may be installed backwards, or it may be wired backwards. See [Connecting the Current Sensors](#) for wiring instructions and see [Fix connection errors](#) to fix this in the configuration of the device without the need to rewire / reinstall the CTs. You will also need to set CT ratios, see [Configuration: AC Currents](#) for more details.

Status

**Meters**

Phasors

Events

Trends/Statistics

Diagnostics

Commands

**Loads**

Mains

**Meters**

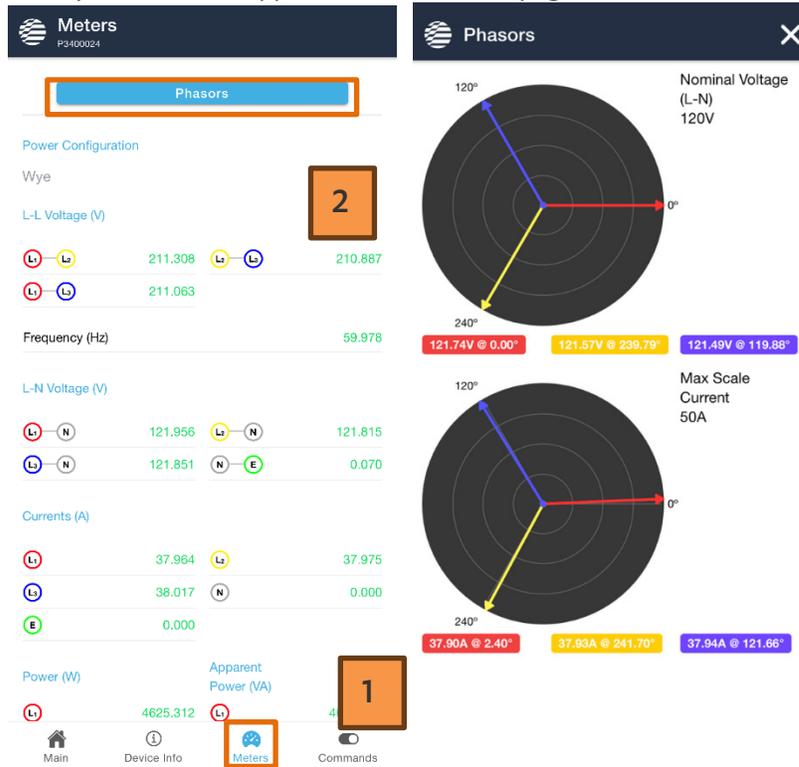
| Meter                        | Value     |
|------------------------------|-----------|
| L1-N                         | 120.6V    |
| L2-N                         | 121.3V    |
| L3-N                         | 120.8V    |
| N-E                          | 0.07V     |
| L1-L2                        | 209.7V    |
| L2-L3                        | 209.9V    |
| L3-L1                        | 208.6V    |
| I1 Amps                      | 37.785A   |
| I2 Amps                      | 38.002A   |
| I3 Amps                      | 37.849A   |
| N Amp                        | 0.000A    |
| Frequency                    | 60.019Hz  |
| L1-N Voltage Fundamental     | 120.6V    |
| L1 Voltage Fundamental Angle | 0.00deg   |
| L2-N Voltage Fundamental     | 121.3V    |
| L2 Voltage Fundamental Angle | 239.82deg |
| L3-N Voltage Fundamental     | 120.8V    |
| L3 Voltage Fundamental Angle | 119.59deg |
| L1 Current Fundamental       | 37.781A   |
| L1 Current Fundamental Angle | 2.52deg   |
| L2 Current Fundamental       | 37.998A   |
| L2 Current Fundamental Angle | 241.63deg |
| L3 Current Fundamental       | 37.849A   |
| L3 Current Fundamental Angle | 121.43deg |

### 2.5.3 Verify Voltage and Current Phasors

Phasors can be an important tool to see if wiring was done correctly. This can be checked on the iOS or Android App or the webpage.

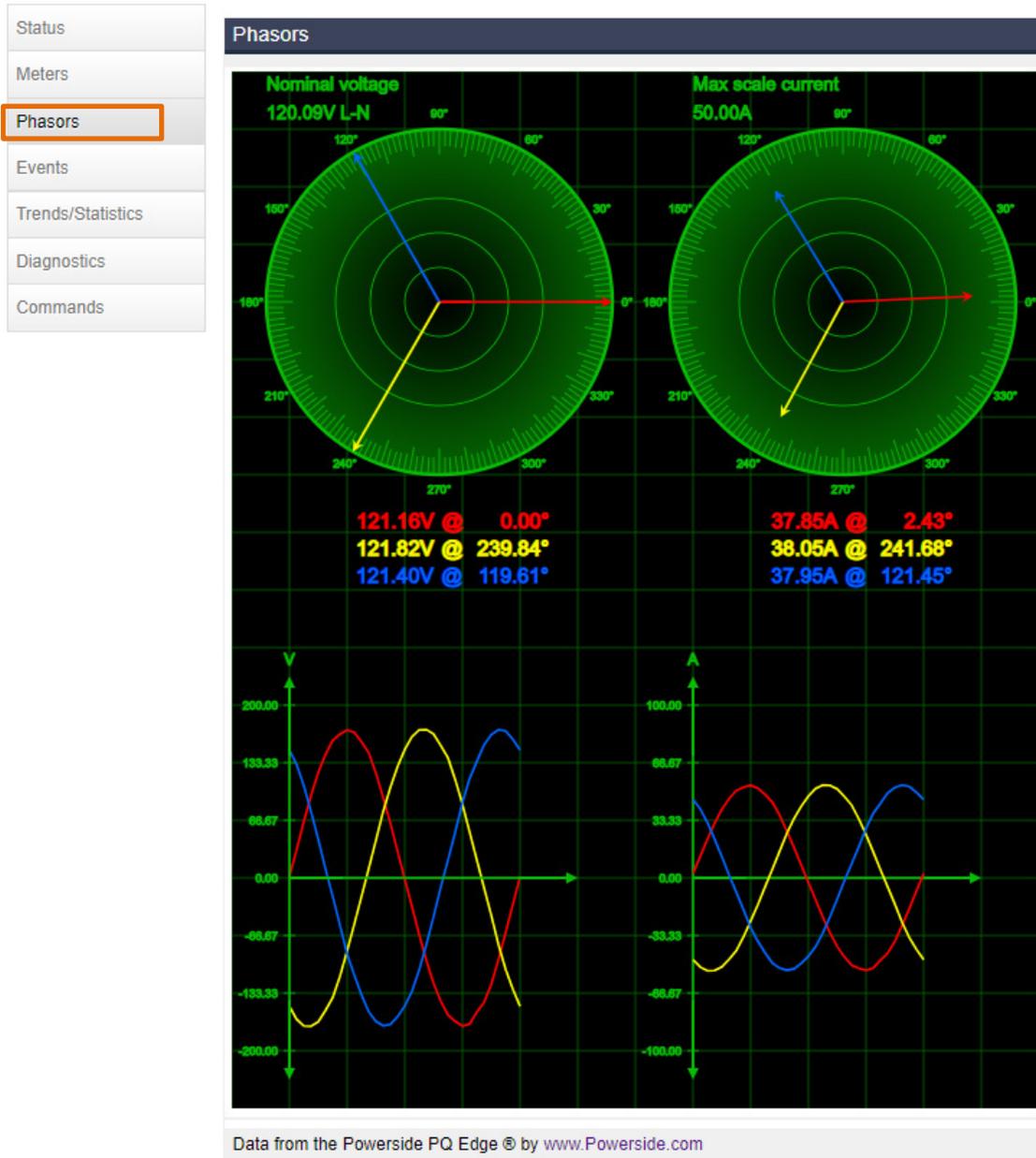
### 2.5.3.1 Method 1: Via the iOS or Android App

Once you are on the app click on the **Meters** page then click on **Phasors**



### 2.5.3.2 Method 2: Via the webpage

Once on the webpage, click on **Phasors**



### 2.5.3.3 Step 1: Check to see if Voltage Phasors are in correct sequence

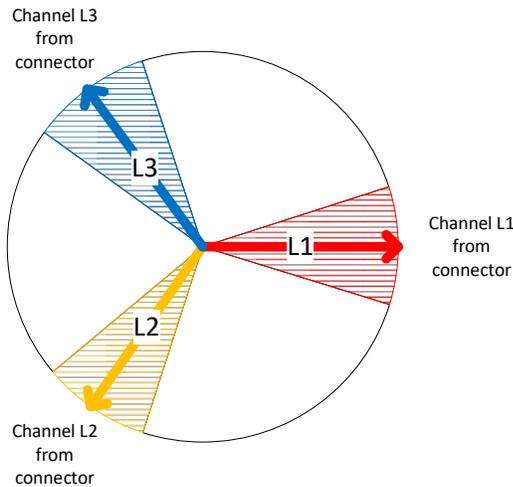
The first step is verifying that your voltage phasors are in the correct sequence. To do this, follow the steps below.

1. Voltage Phasors should be in the sequence and angle as shown in **Figure 1 Ideal Voltage Phasor**. You should see the blue phasor in the Blue Zone, the yellow phasor in the Yellow Zone, and the red phasor in the Red Zone. If your phasors are as shown in Figure 1 then you can skip this step. Check to make sure Yellow phasor is in the yellow shaded zone and Blue

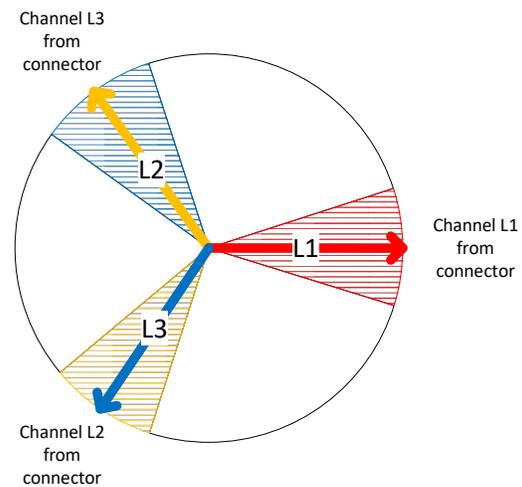
Phasor is in the blue shaded zone as in the ideal figure shown below.

If your voltage phasors **are not** in the shaded zone, then this may be indicative of voltage mains connections being made incorrectly, you could swap the voltage connections physically after safely powering down the breaker upstream from the voltage main connections.

Alternatively you can swap the connectors in the **Fix connection errors** page in the configurator in the AC Voltage page, see [Configuration: AC Voltage](#), see example below.



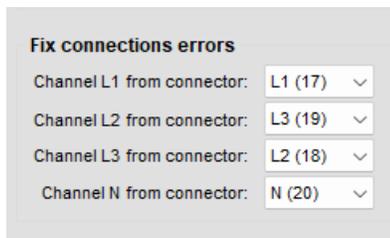
**Figure 1 Ideal Voltage Phasor**



**Figure 2 Example, Problematic Voltage Phasor**

To illustrate this, see **Figure 2**, in this example in the Windows Configurator application, see [Configuring the PQ Edge](#) you would select the following:

- Channel L1 from Connector select L1 (17) since the red arrow is in the red zone
- Channel L2 from Connector select L3 (19) since the yellow arrow is in the blue zone
- Channel L3 from connector select L2 (18) since the blue arrow is in the yellow zone



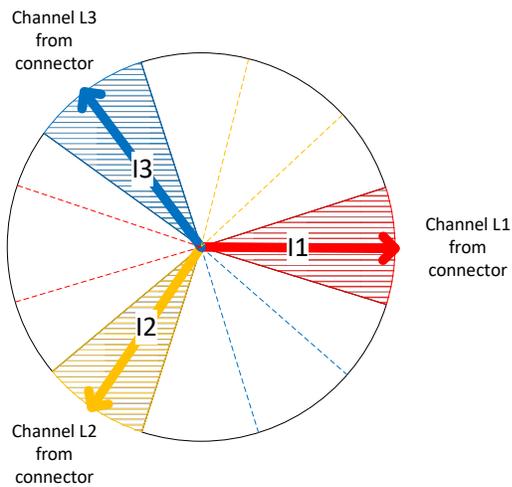
2. Apply the new configuration with the connection errors fixed, see [Applying the configuration to the device](#). After the device has applied the configuration, ensure all 3 voltage phasors are in their respective color shaded zones like **Figure 1**.

If you are unable to fix and see the voltage phasors in the correct orientation then contact Powerside support, see [Contacting Powerside for Help](#).

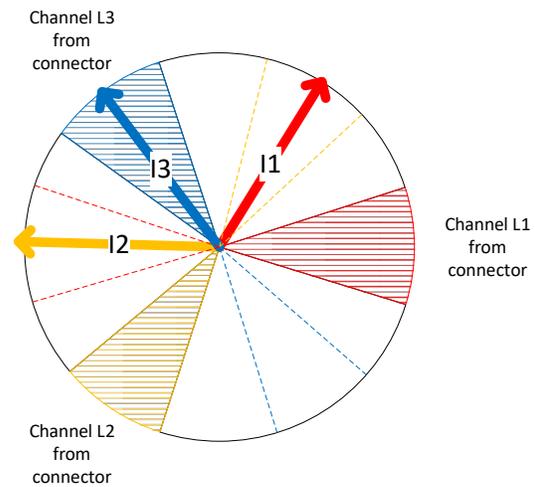
### 2.5.3.4 Step 2: What to look for in your Current Phasors

1. Current Phasors should be in the sequence and angle as shown in **Figure 3 Ideal Current Phasor**. You should see the blue phasor in the Blue Zone, the yellow phasor in the Yellow Zone, and the red phasor in the Red Zone. If your phasors are as shown in Figure 3 then you can skip this step. If not then your CT polarity could be incorrect (positive is in negative and negative is in positive terminal) or your CTs are swapped ie: I2 is in I3 and I3 is in I2.

You could check your wiring and recheck the phasors, or alternatively you can follow the steps below to use the configurator program to fix connection errors.



**Figure 3 Ideal Current Phasor**



**Figure 4 Example Current Phasor**

Identify any phasors in the shaded zone shown in the example below, if there are phasors in the region opposite to the shaded zone then they should be reversed or flipped by checking the Invert checkbox next to the appropriate Channel from connector field in the **Fix connection errors** area in the AC Currents page in the configurator to match **Figure 3**, see [Configuration: AC Currents](#).

In the example shown in **Figure 4**

- Channel I1 from connector would be I3 as that would be inverted and is now in the shaded region
- Channel I2 from connector would be I2 as that is in the shaded region
- Channel I3 from connector would be I1 as that would be inverted in step 1 and is now in the shaded region

**Fix connection errors**

Invert ?

Channel I1 from connector: I3 (5,6)

Channel I2 from connector: I2 (3,4)

Channel I3 from connector: I1 (1,2)

2. Reapply the configuration and ensure that the current phasors match the ideal case of **Figure 3**.

### What is the effect of inverting a CT connection in Fix Connection Errors?

The device will reverse the polarity of the CT connection, the same as rewiring the CT physically on the device. To use this, simply check the box next to the channel that you want to invert.

**Fix connection errors** Invert

Channel I1 from connector: I1 (1,2)

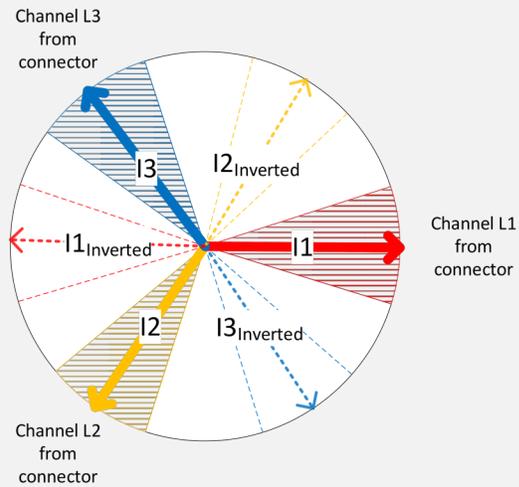
Channel I2 from connector: I2 (3,4)

Channel I3 from connector: I3 (5,6)

Channel I4 from connector: I4 (7,8)

PQ Edge Connector numbers shown in parenthesis

If inverted the Phasor vector flips 180°, see below



### What is the effect of swapping a CT connection in Fix Connection Errors?

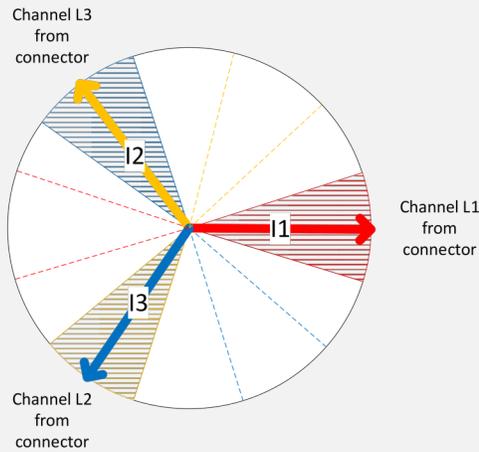
The device will swap the signal in one current input with another, for example the input on I2 can be treated as the input for I3. This has the same effect as rewiring the CT physically on the device. To swap I2 and I3 you would select I2 for Channel I3 from connector and select I3 for Channel I2 from connector as below:

**Fix connection errors** Invert ?

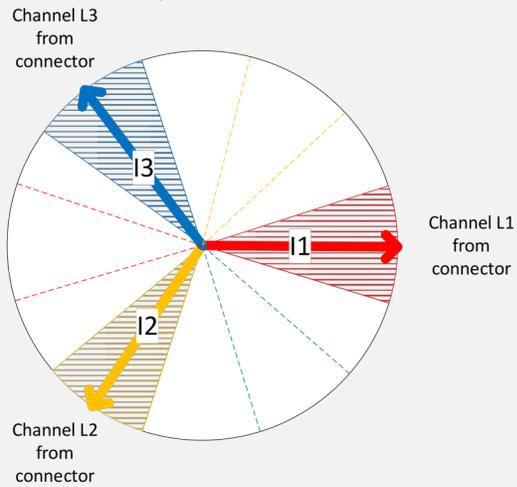
|                            |          |                          |
|----------------------------|----------|--------------------------|
| Channel I1 from connector: | I1 (1,2) | <input type="checkbox"/> |
| Channel I2 from connector: | I3 (5,6) | <input type="checkbox"/> |
| Channel I3 from connector: | I2 (3,4) | <input type="checkbox"/> |
| Channel I4 from connector: | I4 (7,8) | <input type="checkbox"/> |

PQ Edge Connector numbers shown in parenthesis

#### Before Swap:



#### After Swap:



# 3 Configuration

## 3.1 Configuring the PQ Edge

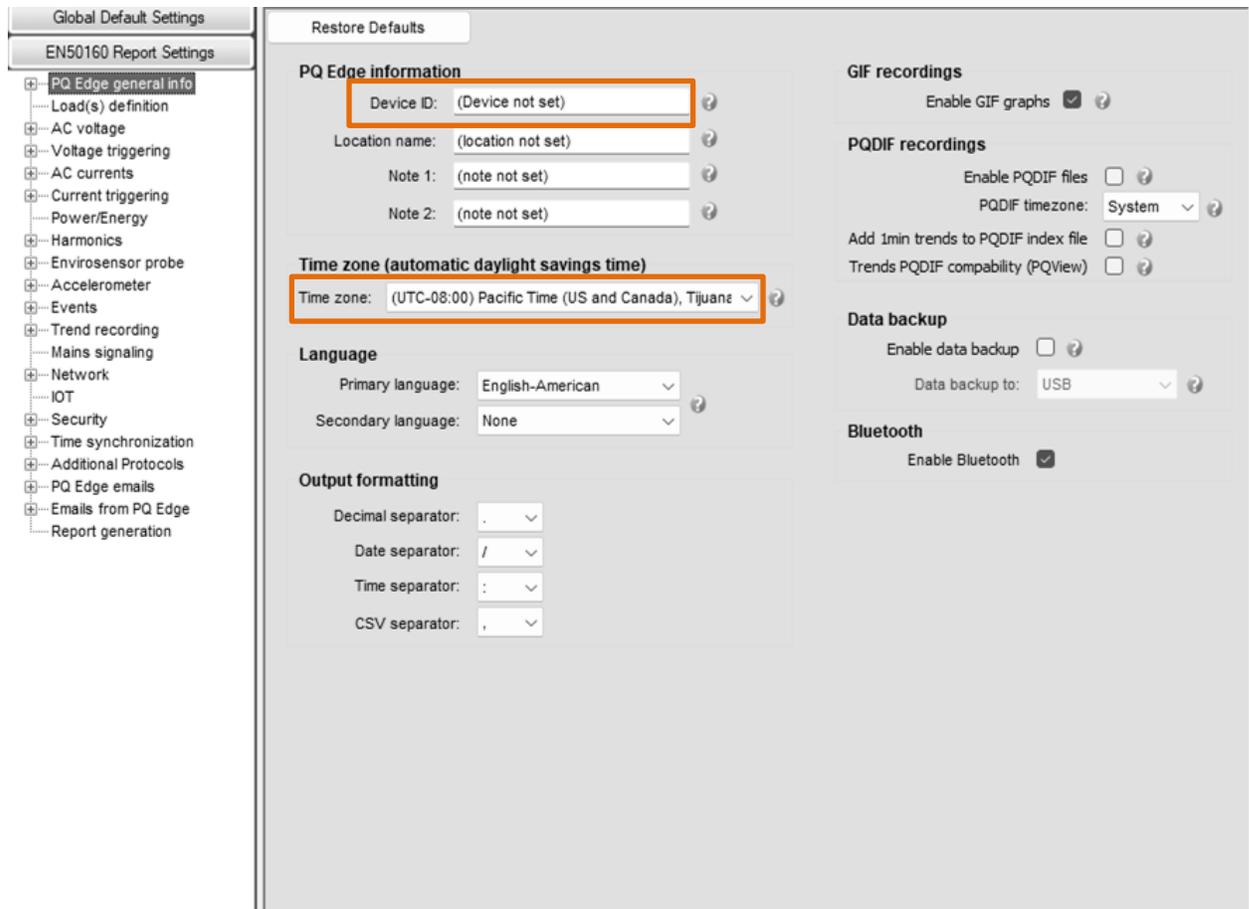
To configure the PQ Edge you will need a Windows Computer with the PQ Edge configurator installed. The PQ Edge configurator can be downloaded here: <https://powerside.my.site.com/helpcenter/s/article/PQ-Edge-Configurator>

## 3.2 Installing the Configurator

The configurator is a standalone executable application. Download the Configurator zip file and drag and drop or extract the file to a desired location on your computer. No software installation is required.

Note: When you first start the application click **More Info**, then click **Run anyway**

## 3.3 Configuration: General Info



1. Enter a **Device ID**, this can be a name unique to the device that allows you to identify it, the device ID will be present on any reports the device produces and can be an easy way to identify the device.
2. Select a **Time zone**. This is important since the device will timestamp all data using this time zone.

## 3.4 Configuration: AC Voltage

The screenshot shows the configuration interface for AC Voltage. The left sidebar lists various settings, with 'AC voltage' selected. The main content area is divided into several sections:

- Power configuration:** Includes dropdowns for Power configuration (set to AUTO), Nominal phase to phase voltage (set to AUTO), Nominal phase to neutral voltage (set to AUTO), and Nominal frequency (set to AUTO).
- Voltage recordings:** Includes dropdowns for Record phase to phase channels (set to AUTO) and Record phase to neutral channels (set to AUTO).
- Voltage connections:** Includes a text input for Potential transformer ratio (set to 1:1).
- Advanced:** Includes checkboxes for Record voltage unbalance (checked), Record 10 second frequency (checked), and Record 2-9kHz conducted emissions (checked), along with a dropdown for Unbalance calculation method (set to IEC).
- Flicker:** Includes a checkbox for Record Flicker (checked) and a dropdown for Flicker frequency filter (set to 60Hz).
- Fix connections errors:** Includes dropdowns for Channel L1 from connector (set to L1 (17)), Channel L2 from connector (set to L2 (18)), Channel L3 from connector (set to L3 (19)), and Channel N from connector (set to N (20)).

The AUTO detection of the wiring configuration, nominal voltage, and nominal frequency is a unique feature of the PQ Edge. In certain rare cases, you will need to set those settings manually. See the 3 paragraphs below.

Also, you will be able to fix wire connection errors (e.g. swap assignments of L1, L2, L3, or N to the device terminals).

### 3.4.1.1 Setting Power Configuration manually (optional)

In certain rare cases, you will manually set the Power Configuration (see [Ensure your power configuration is detected appropriately](#) section). See [Wiring Diagrams](#) for detailed sample wiring diagrams to help you determine which power configuration is correct.

### 3.4.1.2 Setting Nominal Ph-Ph or Ph-N Voltages manually (optional)

The AUTO detect function sets the nominal voltages to the most common nominal worldwide. See also [Ensure Voltage readings are correct](#).

In certain cases, you will need to set the **Nominal phase to phase voltage** and **Nominal phase to neutral voltage** manually.

### 3.4.1.3 Setting Nominal Frequency manually (optional)

The AUTO detect function sets the Nominal Frequency to 50Hz or 60Hz. Detected frequency can be seen on the web status page or via the iOS or Android app. In certain cases, you can manually set the frequency.

### 3.4.1.4 Setting Potential transformer ratio

The default ratio is 1:1. This is used when mains voltage is directly applied to the PQ Edge mains voltage terminals (e.g. 120V, 480V, 600V...).

For measuring higher voltage levels, you connect the device to the secondary of a potential transformer (PT). In this case, you have to specify the "PT ratio" (e.g. for a 13kV to 100V measurement transformer, the a ratio will be 13000:100, or 130:1).

### 3.4.1.5 Fix connection errors

Voltage connections L1, L2, L3, N can be fixed here without the need for physically re-wiring the device. If in [What to look for in your Voltage and Current Phasors](#) section you noticed that the voltage phasors are out of sequence, then there is a chance that your voltage connections were made incorrectly. Start by changing L2 and L3 by selecting **Channel L2 from connector** as L3 and **Channel L3 from connector** as L2. Recheck the phasor after saving the configuration to the device, see [Verify Voltage and Current Phasors](#). If the phasors are still out of order then flip a different set of connectors till you have made the correct connections.

## 3.5 Configuration: AC Currents

Global Default Settings

EN50160 Report Settings

- PQ Edge general info
  - Load(s) definition
  - AC voltage
  - Voltage triggering
  - AC currents
  - Current triggering
    - Power/Energy
  - Harmonics
  - Envirosensor probe
  - Accelerometer
  - Events
  - Trend recording
  - Mains signaling
  - Network
    - IOT
  - Security
  - Time synchronization
  - Additional Protocols
  - PQ Edge emails
    - Emails from PQ Edge
    - Report generation

Restore Defaults

**Current connections** ?

|             | Transformer type | CT model     | Ratio     |
|-------------|------------------|--------------|-----------|
| I1, I2, I3: | CT               | Custom Ratio | 5:0.333 ? |
| Neutral:    | CT               |              | 1:1       |

**Fix connection errors** Invert ?

- Channel I1 from connector: I1 (1,2)
- Channel I2 from connector: I2 (3,4)
- Channel I3 from connector: I3 (5,6)
- Channel I4 from connector: I4 (7,8)

PQ Edge Connector numbers shown in parenthesis

**Current channels labels**

- I1: I1 Amps
- I2: I2 Amps
- I3: I3 Amps

**Current recordings**

- Record phase current: AUTO ?
- Record neutral current: AUTO
- Record current unbalance:

**Current computation**

Calculate remaining current channel: OFF ?

### 3.5.1.1 Setting current connections

This is where the rating of the CT is entered for the 4 current channels. You can either choose from the list of Powerside branded CT models (“CT model” drop down list) or define the ratio explicitly in the “Ratio” field.

Note: the device accepts voltage output CTs. The CT rating and ratios are typically published on a label on the CT or are mentioned in the CT datasheet. As an example, a Powerside brand “50A” rated CT will have an associated ratio of “50:0.333”.

### 3.5.1.2 Fix CT connection errors

#### 3.5.1.2.1 CT to channel mismatch (Current channels out of sequence)

Current connections I1, I2, I3, I4 can be fixed here without the need for physically re-wiring the device. If in [What to look for in your Voltage and Current Phasors](#) section you noticed that the current phasors are out of sequence, then there is a chance that your current connections were made incorrectly. Start by changing I2 and I3 by selecting **Channel I2 from connector** as I3 and **Channel I3 from connector** as I2. Recheck the phasor after saving the configuration to the device, see [Verify](#)

[Voltage and Current Phasors](#). If the phasors are still out of order then flip a different set of connectors till you have made the correct connections.

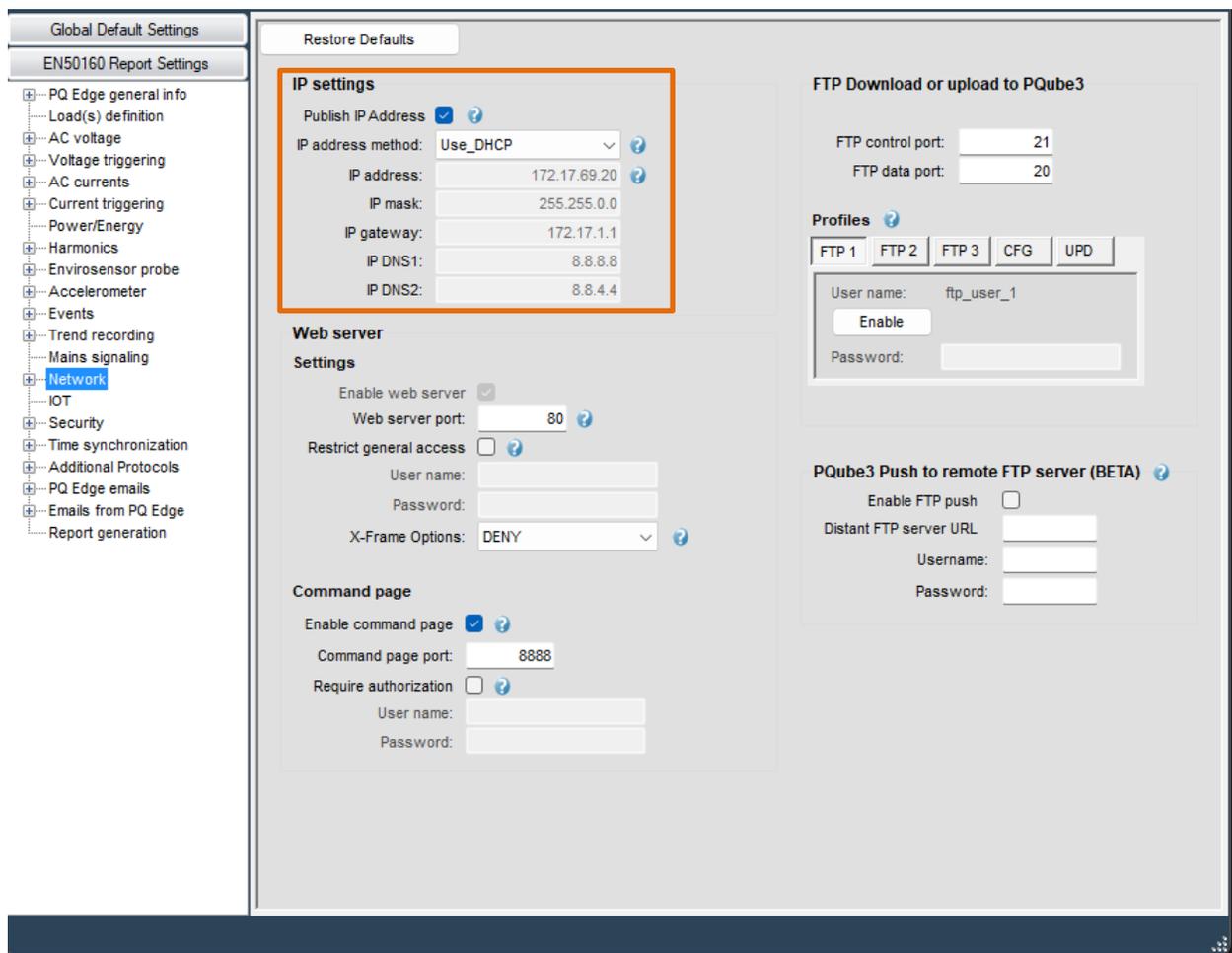
### 3.5.1.2.2 CT direction reversed (Current polarity)

If active power values are reported as negative (and the measurement point does not export power), then the current sensors could be installed backwards or the cables could be installed wrongly (positive to negative and vice versa).

To fix this you can follow the directions in [Connecting the Current Sensors](#) or you can select the invert option for current phasors that should be aligned with their corresponding voltage phasor.

Note: see also [Verify Voltage and Current Phasors](#).

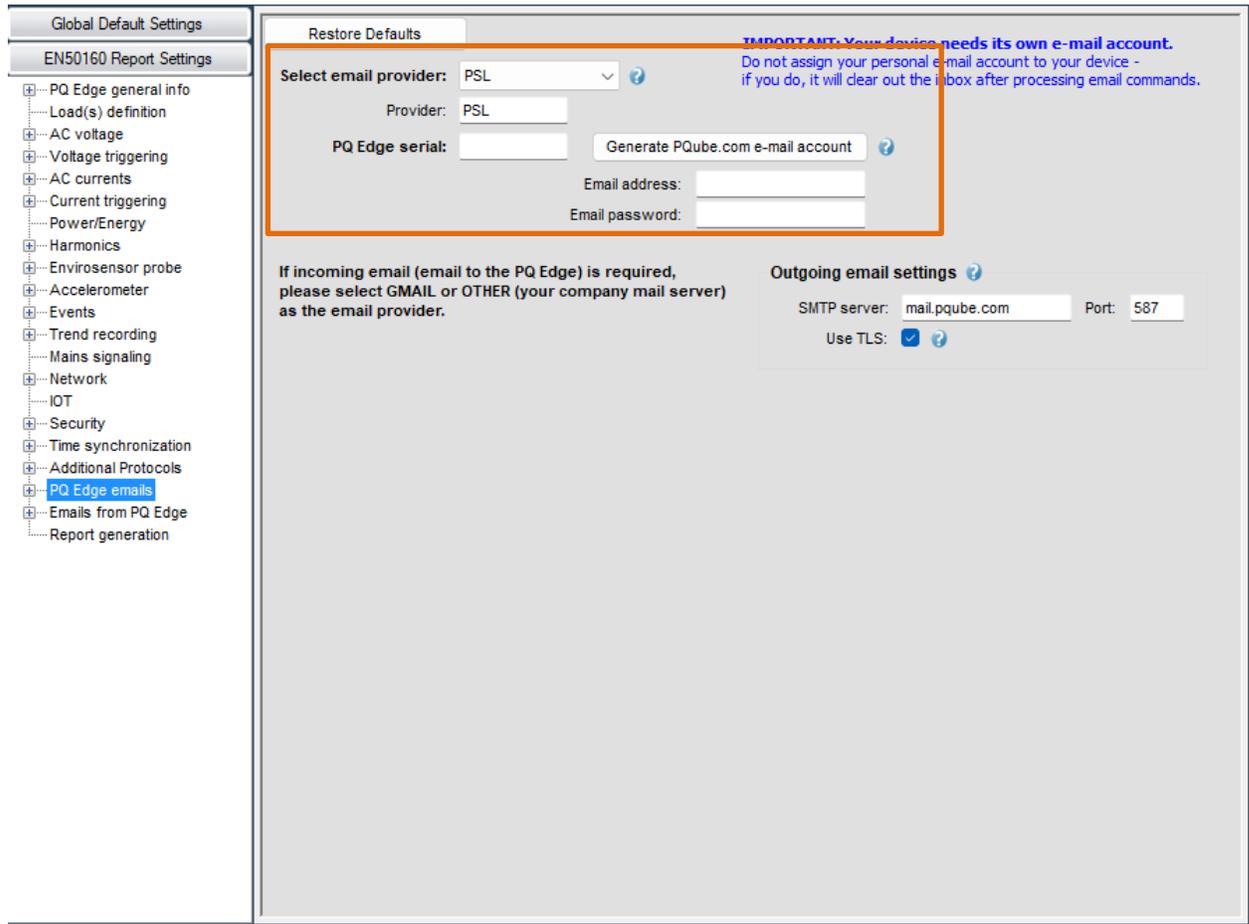
## 3.5.2 Configuration: Network



### 3.5.2.1 Setting IP Settings

The device is set to connect to a network via its ethernet port via DHCP, if a static or fixed IP is required, then change the **IP address method** to Use\_Fixed\_IP and specify an **IP address**, **IP mask** (Subnet mask), **IP gateway** (Gateway), **IP DNS1**, **IP DNS2**.

### 3.5.3 Configuration Email Settings



The device is capable of emailing you when an event is detected or send you a daily, weekly report. In order to email you the device needs to have its own email address/account (this email appears in your inbox as the sender of the email) . You have a few options to configure an email for the device, once configured proceed to the [Configuration: Emails from the PQ Edge](#) section to set up email addresses that the device should email.

#### 3.5.3.1 PSL Email (Powerside Email)

You can create an email address for the device by entering your serial number in the **PQ Edge serial** field and clicking on **Generate PQube.com email account**. An email and password will be generated automatically.

#### 3.5.3.2 Gmail Email

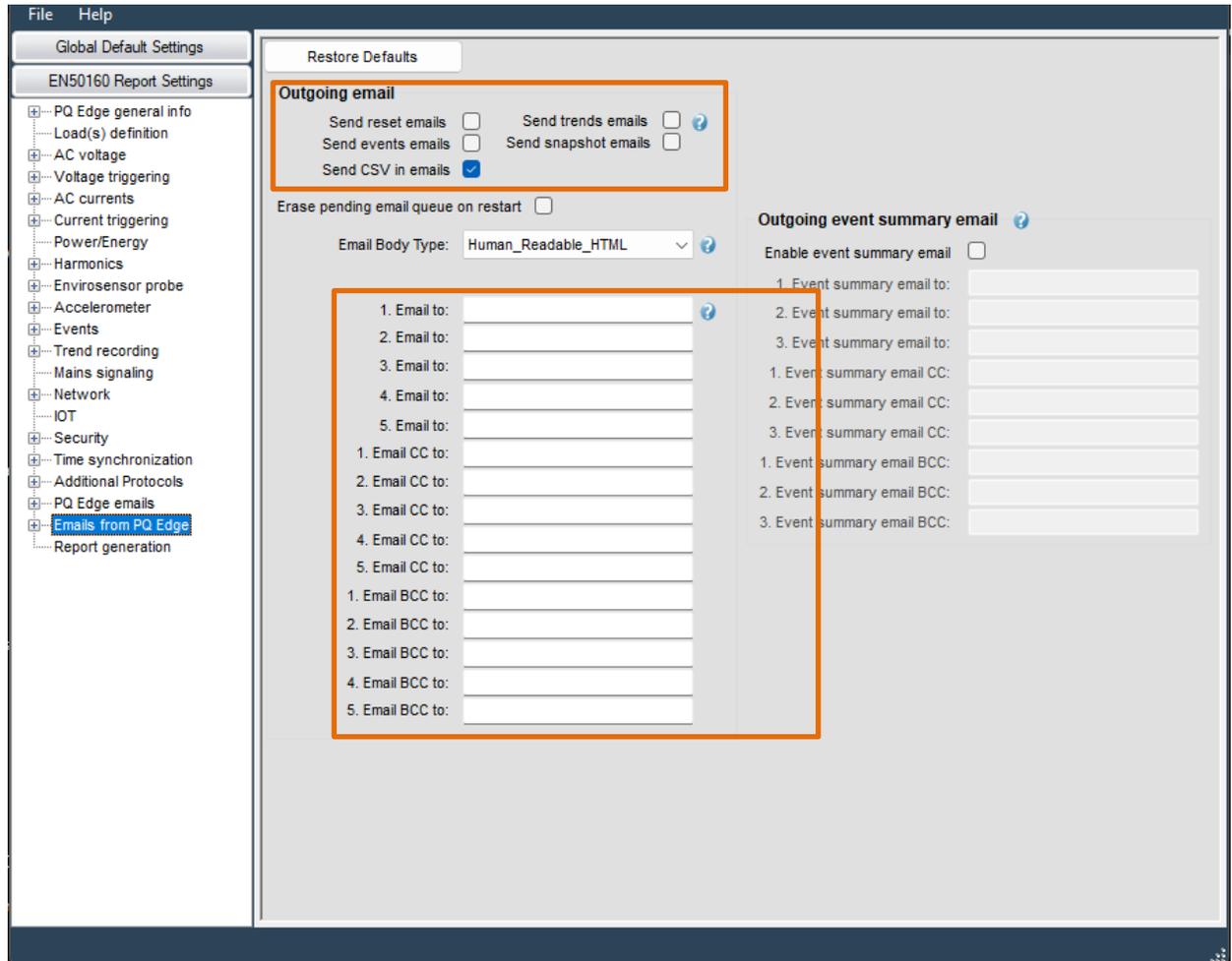
Enter your email address, for password enter the 16-digit App password generated by Google. To create this, [sign in to your Google Account](#), select security, and then select App Passwords.

Note that 2-step verification is mandatory by google to select App passwords.

### 3.5.3.3 Other Email

Enter an **Email address** and **Email password**, enter **SMTP Server** and **Port** number. The device supports the Use of TLS security, check the **Use TLS** box as required.

### 3.5.4 Configuration: Emails from the PQ Edge



This page allows you to set which alerts you would like via email and to which recipients the device should email.

Check boxes for which emails you would like to receive in the **Outgoing email** section. The device can send reset emails, events emails, trends emails, and snapshots.

Checking the box labeled **Send CSV in emails** has the device attach a Comma Separated Values file that can be opened in a spreadsheet software such as Microsoft Excel or similar.

Enter up to 15 emails in the **to**, **CC**, and **BCC** fields.

## 3.6 Applying the configuration to the device

### 3.6.1 Saving the Setup.ini file

1. Once the configuration is finalized in the PQ Edge Configurator application.
2. Click **File** and Click **Save As**

### 3.6.2 Method 1: Via the webpage

You must be on a mobile device or computer on the same network as your PQ Edge to access its webpage.

1. Enter the IP address of your PQ Edge using your Internet browser.  
Note: see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device.
2. Navigate to the **Commands** page

The screenshot shows the PQ Edge Configurator web interface. On the left is a navigation menu with items: Status, Meters, Phasors, Events, Trends/Statistics, Diagnostics, and Commands. The 'Commands' item is highlighted with an orange box and a '1' in a box. The main content area is divided into two sections. The top section is 'Actions & Commands' with buttons for 'Generate Daily Trends', 'Generate Weekly Trends', 'Generate Monthly Trends', and 'Generate Snapshot'. The bottom section is 'Configuration and Logos' with a '2' in a box. It contains two file selection areas: 'Choose a Setup.ini file:' with a 'Choose File' button (boxed with '2') and a 'Send' button (boxed with '3'); and 'Web/Graph Logo (location.gif)' with a 'Choose File' button and a 'Send' button. A 'Firmware Update' section is visible at the bottom.

3. Click **Choose File** under Choose a Setup.ini file in the Configuration and Logos section
4. Select the file created in [Saving the Setup.ini file](#)
5. Click **Send**

- The device shows that the new Setup.ini file was uploaded and show what was different compared to the existing file, click **Apply uploaded Setup.ini**

Success: Setup.ini uploaded

Compare files     Compare files side-by-side

| Present Setup.ini  | Uploaded Setup.ini  |
|--|---|
| 1 ; ----- PQ Edge from Powerside.  | 1 ; ----- PQube 3 from Powerside.   |
| 2 ; ----- www.powerside.com  | 2 ; ----- www.powerside.com   |
| 3 ; ----- PQ Edge Version 3.10   | 3 ; ----- PQube 3 Version 3.10  |
| 4 ; ----- Assign a unique identifier for your PQ Edge  | 4 ; ----- Assign a unique identifier for your PQube 3   |
| 5 PQube_ID="P3400022"  | 5 PQube_ID="(PQube_ID not set)"   |
| 6 ; ----- Describe the place where your PQ Edge is installed   | 6 ; ----- Describe the place where your PQube 3 is installed  |
| 7 Location_Name="PSL"  | 7 Location_Name="(location not set)"  |
| 8 ; ----- Optional additional information about your PQ Edge   | 8 ; ----- Optional additional information about your PQube 3  |
| 9 Note_1="LAB"   | 9 Note_1="(note not set)"   |
| 10 Note_2="Left + 4"   | 10 Note_2="(note not set)"  |
| 11 ; ----- Valid Values: AUTO, Single_Phase_L1_N, Single_Phase_L1_L2, Star Wve, Delta, Split Phase, NO MAINS | 11 ; ----- Valid Values: AUTO, Single_Phase_L1_N, Single_Phase_L1_L2, Star Wve, Delta, Split Phase, 2.5 Wve, NO MAINS |

Keep present Setup.ini

Apply uploaded Setup.ini

The device restarts and the new file is applied.

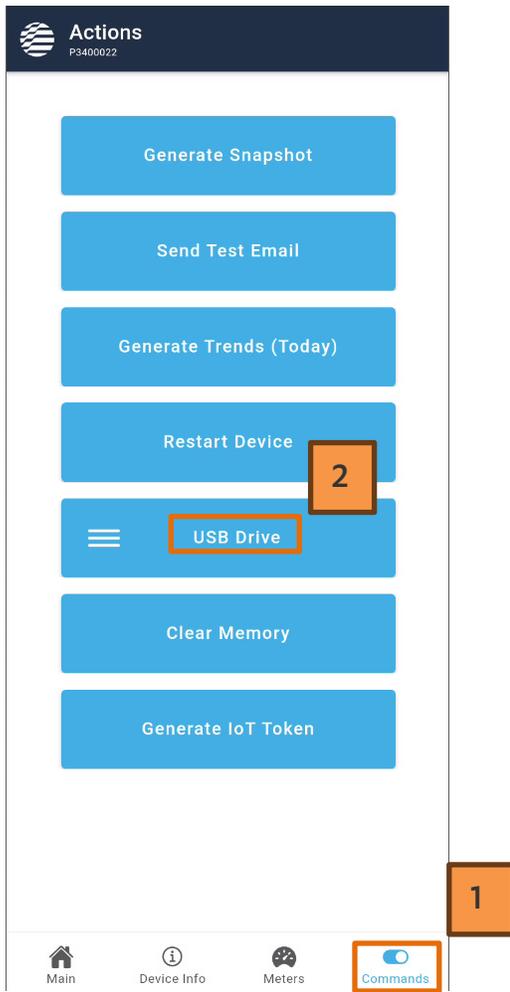
### 3.6.3 Method 2: Flash Drive and iOS / Android App

If you have physical access to the device, you can use a USB Flash Drive to apply the new configuration to the device.

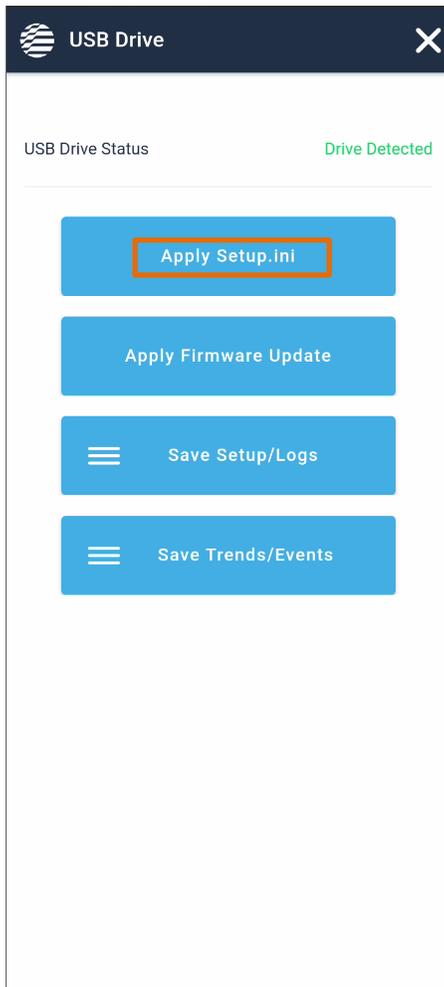
- Copy the file created in [Saving the Setup.ini file](#) to a flash drive.
- Insert the flash drive into the PQ Edge's USB Port.



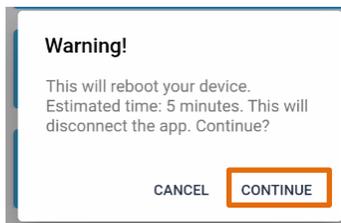
3. In the PQ Edge app on iOS / Android navigate to the **Commands** page then tap **USB Drive**



#### 4. Click **Apply Setup.ini**



#### 5. Click **CONTINUE**



### 3.6.4 Method 3: QubeScan Cloud Platform

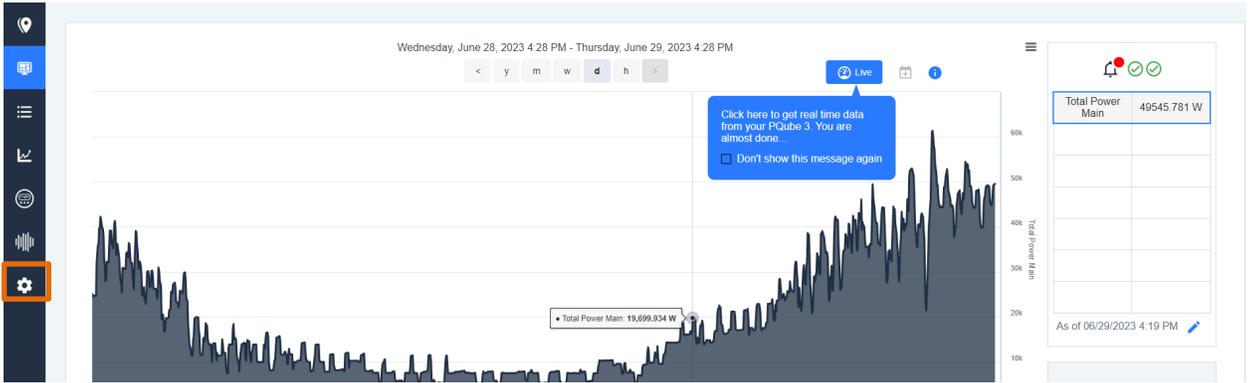
If you haven't signed up for QubeScan see [Signing up for QubeScan](#) after signing up make sure to [Provision the device in QubeScan](#).

1. Go to [QubeScan](#) via a browser on your computer or mobile device.
2. Log in to QubeScan

- Click the  button next to the device you want to configure



- Click the  icon on the left side



- Click **DEVICE CONFIGURATION**

POWERSIDE®

QubeScan Demo Fleet - Alameda, California | ACME Energy Site California | (PDT) Change Selection

**MAINTENANCE**

TREND ALERTS    DEVICE ACCESS    **DEVICE CONFIGURATION**

Include Disabled + Create Trend Alert

| Parameter           | Alarm Low | Warning Low | Warning High | Alarm High | Min. sustain time (mins) | Alarm Disabled           |
|---------------------|-----------|-------------|--------------|------------|--------------------------|--------------------------|
| Total Power Main    | 1         |             | 6000         | 10000      | 30                       | <input type="checkbox"/> |
| Voltage Harmonic HS |           |             | 3.0          | 5.0        | 10                       | <input type="checkbox"/> |

- Drag and drop the Setup.ini file in the **[Upload Configuration Area]** or click the **[Upload Configuration Area]** to select a file for upload

POWERSIDE®

QubeScan Demo Fleet - Alameda, California | ACME Energy Site California | (PDT) Change Selection

**MAINTENANCE**

TREND ALERTS    DEVICE ACCESS    **DEVICE CONFIGURATION**

Download Config

No config

**[Upload Configuration Area]**

Click in this area to select the configuration file to upload

Or

Drag and drop the configuration file (setup.ini) here

## 7. Click **Send Config**

The screenshot shows the Powerside web interface for device configuration. The 'Send Config' button is highlighted with a red box. The interface displays configuration details for a device, including a 'Current configuration (read only)' section and a 'New configuration (setup ini) ready to be sent to the device' section.

```

1+; ----- PQ Edge from Powerside.
2+; ----- www.powerside.com
3+; ----- PQ Edge Version 3.10
4+;
5+;-----
6+[PQube_Information]
7+;-----
8+; ----- Assign a unique identifier for your PQ Edge
9+PQube_ID="(PQube_ID not set)"
10+;
11+; ----- Describe the place where your PQ Edge is installed
12+Location_Name="(location not set)"
13+;
14+; ----- Optional additional information about your PQ Edge
15+Note_1="(note not set)"
16+Note_2="(note not set)"
17+;
18+; ----- Valid Values: AUTO, Single_Phase_L1_N, Single_Phase_L1_L2, Star, Wye, Delta, Split_Phase, NO_MAINS
19+; ----- AUTO sets the power configuration depending on the voltages that are applied to the PQ Edge AC
20+; ----- Choose NO_MAINS to enable data recording using a fixed sampling rate. No mains AC voltage is rec
21+Power_Configuration=AUTO
22+;
23+; ----- Label of the Time zone region where your PQ Edge is located (America/Los Angeles, Europe/Paris.
  
```

## 3.7 Verifying configuration

Once your configuration is uploaded and applied to the device, see [Applying the configuration to the device](#).

After the configuration is applied, it is advisable to make sure a few parameters are correct such as date and time and to test email communication to make sure that is functioning.

This can be done via the Webpage or the iOS or Android App

### 3.7.1 Method 1: Via the iOS or Android App

1. Navigate to the **Device Info** page and check the Date / Time to make sure it is correct for your timezone

**Device Info**  
P3400022

**General Information**

|                  |                           |
|------------------|---------------------------|
| Firmware Version | daily_0_6_202_32_10       |
| Serial           | P3400022                  |
| Time Zone        | America/Los_Angeles       |
| Date/Time        | Thu, 29 Jun 2023 16:42:34 |

**Power**

|                                  |              |
|----------------------------------|--------------|
| Configuration                    | Single Phase |
| CT Ratio                         | 1:1          |
| PT Ratio                         | 1:1          |
| Nominal Phase to Neutral Voltage | 120V         |
| Nominal Frequency                | 60Hz         |

**Network**

|                   |                      |
|-------------------|----------------------|
| Connection Status | Connected (Internet) |
| IP Address        | 172.17.4.201         |

Navigation icons: Main, Device Info, Meters, Commands

If this is incorrect set the correct timezone in [Configuration: General Info](#)

2. Check the **Power** section and check the **Configuration** field to ensure the power configuration is correct, check the CT Ratio, PT Ratio, Nominal Phase to Neutral Voltage, and Nominal Frequency.

If any of these are incorrect see section [Configuration: AC Voltage](#) or see section [Configuration: AC Currents](#) to correct this information.

3. In the same **Device Info** page scroll down to the **Network** section  
Ensure the **Connection Status** is Connected (Internet), ensure the **IP address** is correct.
4. If an email has been configured then click on **Commands** and click **Send Test Email**.

### 3.7.2 Method 2: Via the webpage

1. Go to the IP address of the device, see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device.

The screenshot displays the PQ Edge web interface. At the top, the header includes the PQ Edge logo, the text "(PQube\_ID not set) - (location not set)", and the Powerside logo. Below the header is a navigation menu with options: Status, Meters, Phasors, Events, Trends/Statistics, Diagnostics, and Commands. The main content area is divided into three sections: Device Information, Configuration, and Time.

| Device Information |                       |
|--------------------|-----------------------|
| Location:          | (location not set)    |
| Device ID:         | (PQube_ID not set)    |
| Note 1:            | (note not set)        |
| Note 2:            | (note not set)        |
| Serial Number:     | P3400022              |
| Model Number:      | PQ Edge               |
| Firmware Version:  | daily_06_20_2023_2103 |
| IP Address:        | 172.17.4.201          |

| Configuration                    |   |
|----------------------------------|---|
| Power Configuration:             | <input checked="" type="checkbox"/> Single Phase L1-N |
| Nominal Line-to-Neutral Voltage: | 120.0V  |
| Nominal Frequency:               | 60Hz  |
| Potential Transformer Ratio:     | 1:1   |
| Current Transformer Ratio:       | 1:1   |

| Time  |                              |
|-------|------------------------------|
| Time: | Thu Jun 29 16:53:29 2023 PDT |

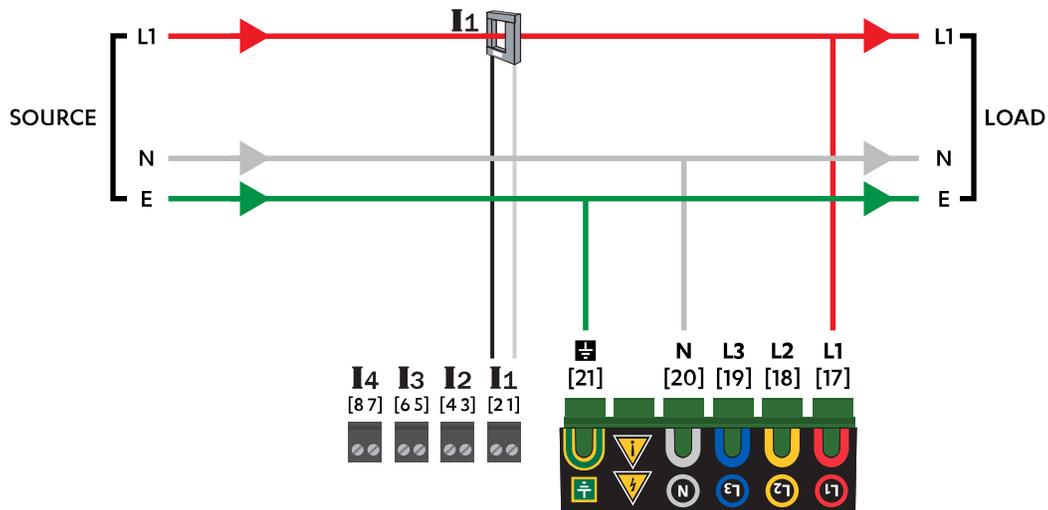
Data from the Powerside PQ Edge © by [www.Powerside.com](http://www.Powerside.com)

2. Click on **Status** check **Time** to make sure it is correct for your timezone  
If this is incorrect set the correct timzeone in [Configuration: General Info](#)
3. Check the **Status** section and check the **Configuration** field to ensure the **Power Configuration** is correct check the **Current Transformer Ratio, Potential Transformer Ratio, Nominal Phase to Neutral Voltage, and Nominal Frequency**.  
If any of these are incorrect see section [Configuration: AC Voltage](#) or see section [Configuration: AC Curents](#) to correct this information.
4. If an email has been configured then click on **Commands** and click **Send Test Email**.

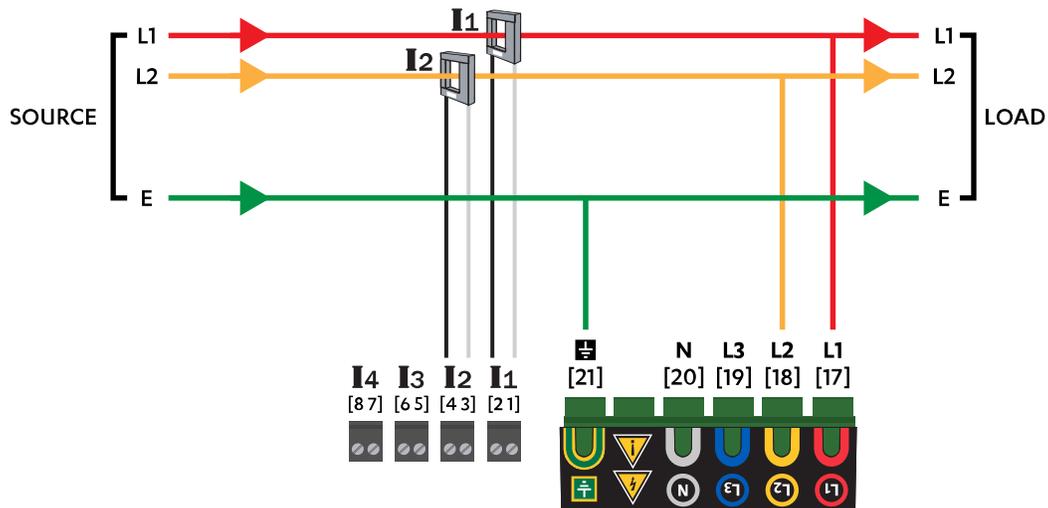
## 4 Wiring Diagrams

Refer to [Connecting the Current Sensors](#) for details on which direction to install the current sensors.

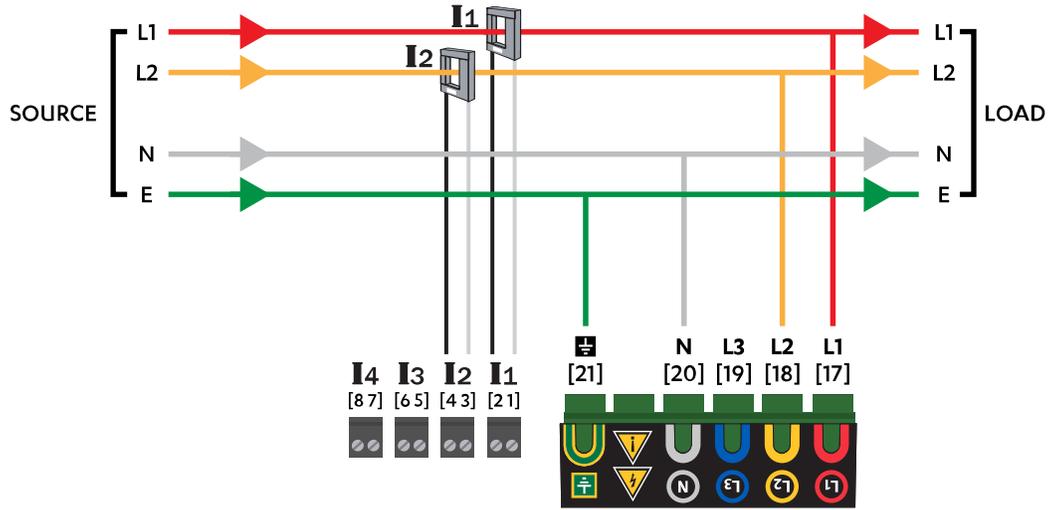
### 4.1 Single Phase L1-N



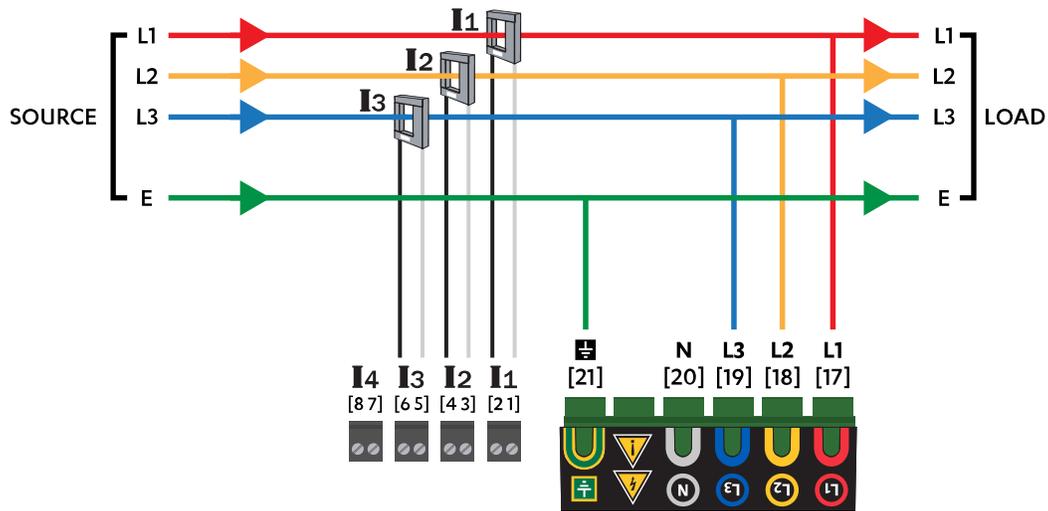
### 4.2 Single Phase L1-L2



### 4.3 Single phase 3-wire / Split Phase

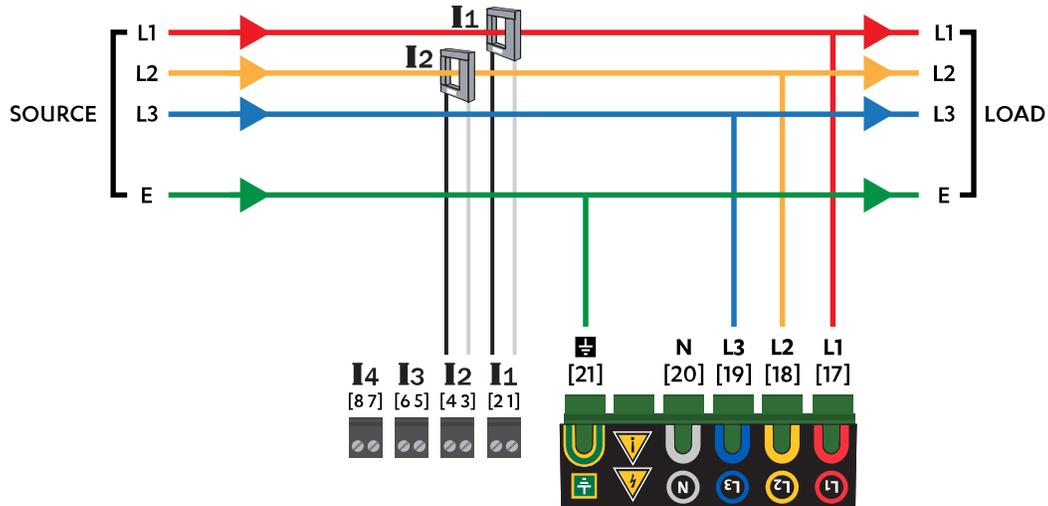


### 4.4 Delta—3 CTs

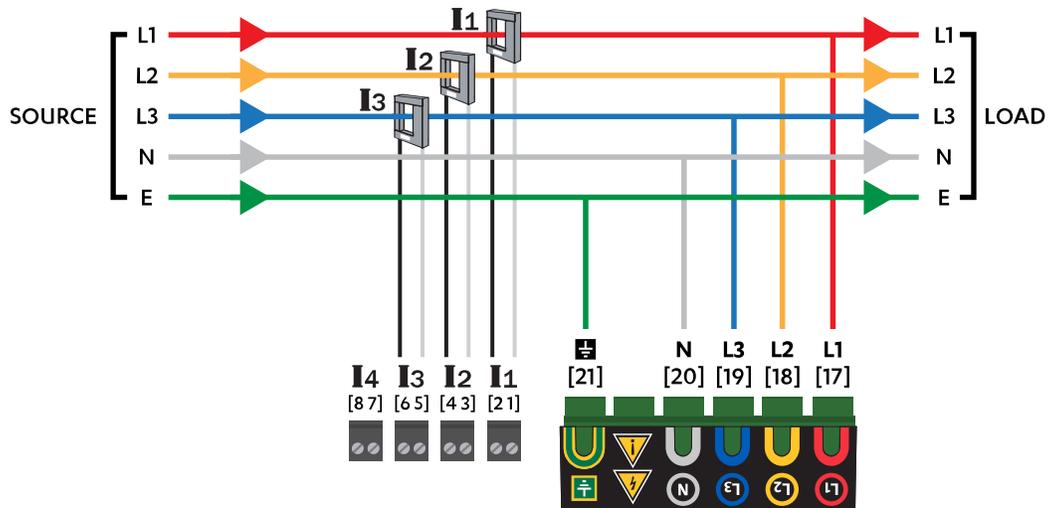


## 4.5 Delta—2 CTs

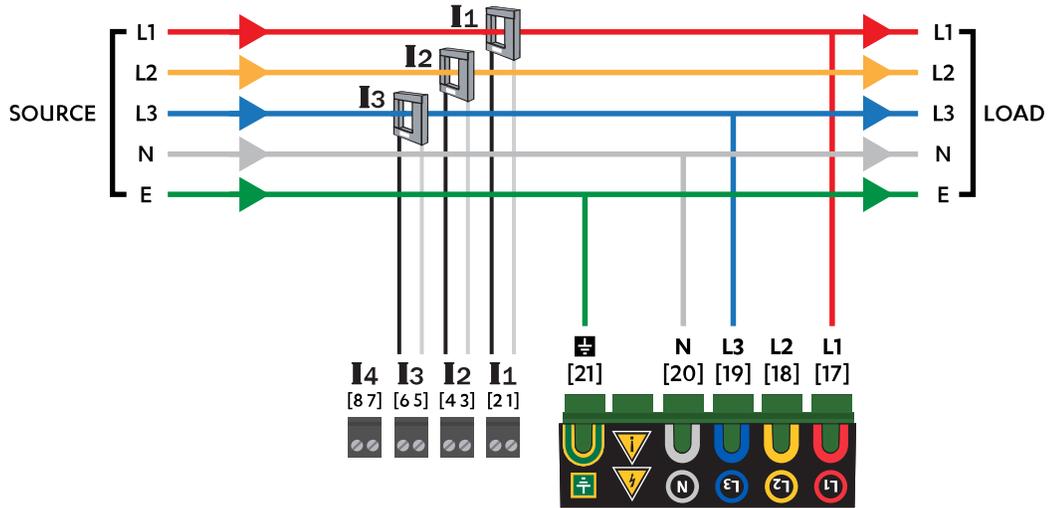
Note: Device calculates current on remaining channel



## 4.6 Wye/Star

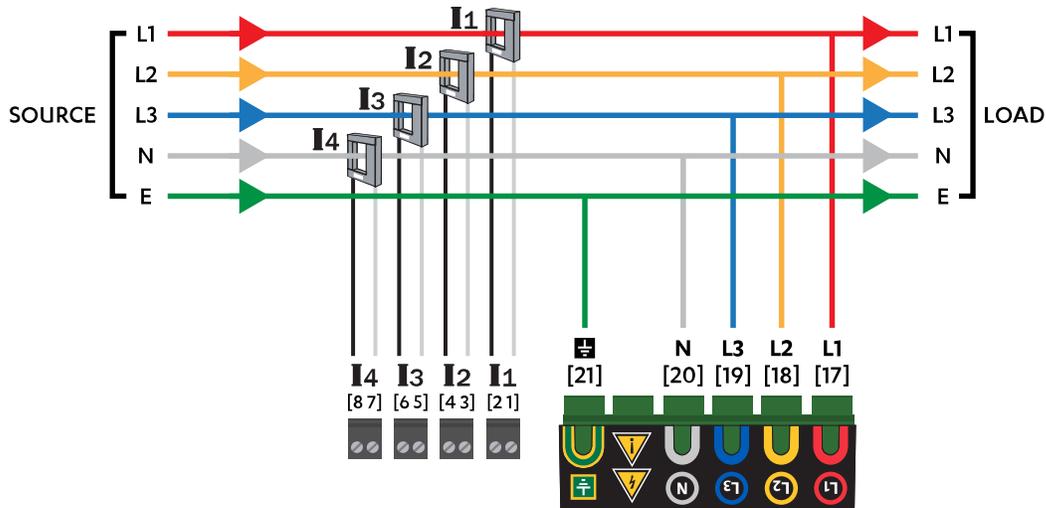


## 4.7 2.5 Wye/Star



## 4.8 Measuring Neutral Current

This applies to any power configuration with Neutral conductor accessible



# 5 QubeScan

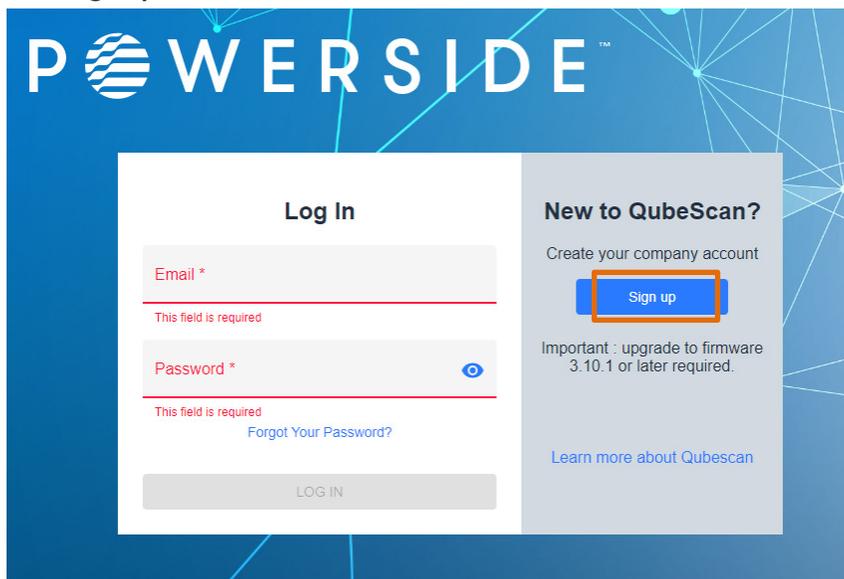
## 5.1 What is QubeScan?

QubeScan is Powerside’s cloud platform that allows you to view and analyze power quality data of your fleet of PQube3 or PQ Edge. More info on QubeScan is available here: <https://powerside.com/products/software-solutions/qubescan-monitoring-software/>



## 5.2 Signing up for QubeScan

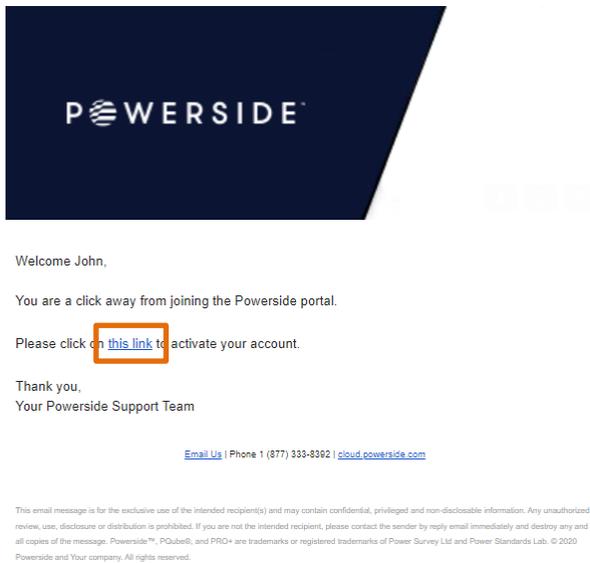
1. Go to <https://www.cloud.powerside.com/qubescan>
2. Click **Sign up**



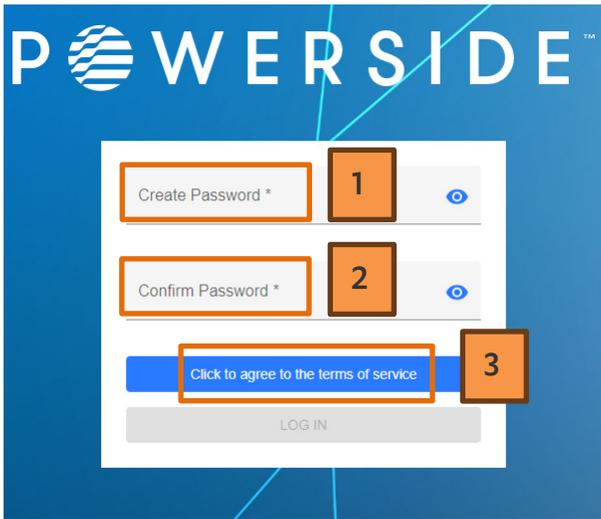
3. Enter your information and click **SIGN UP**

4. You should see a prompt that your account has been created, click **Ok**

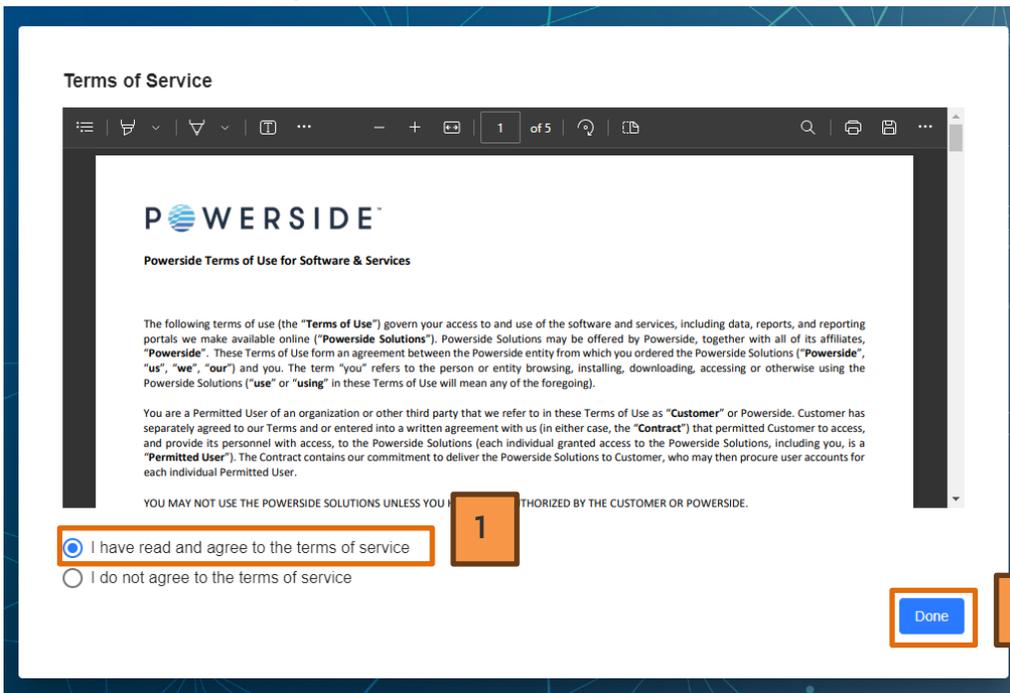
5. You should receive an email, click **this link** to activate your account



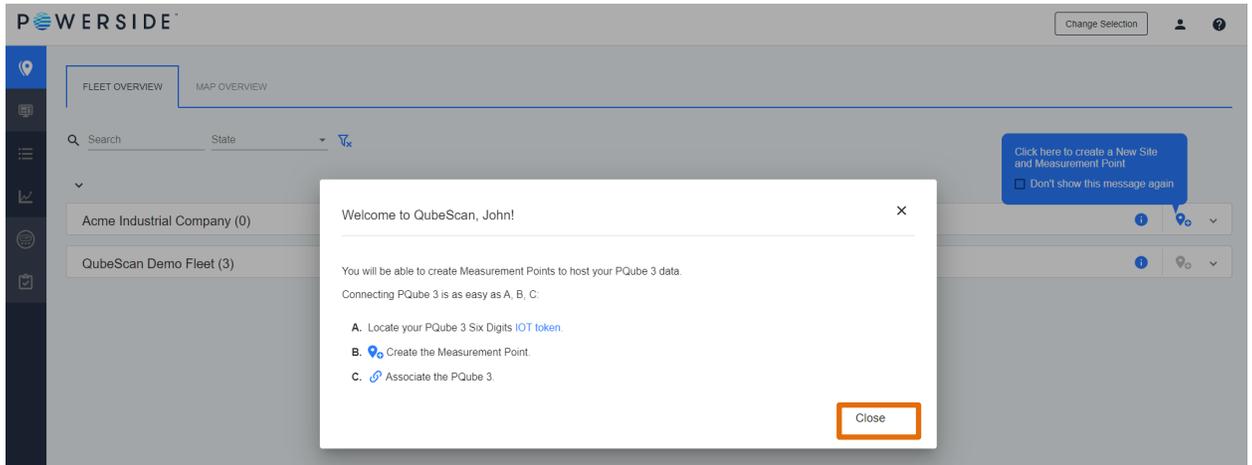
6. Create a password by entering it in the **Create Password** and **Confirm Password** fields then click **Click to agree to the terms of service**



7. Select **I have read and agree to the terms of service** and click **Done**



## 8. Click Close

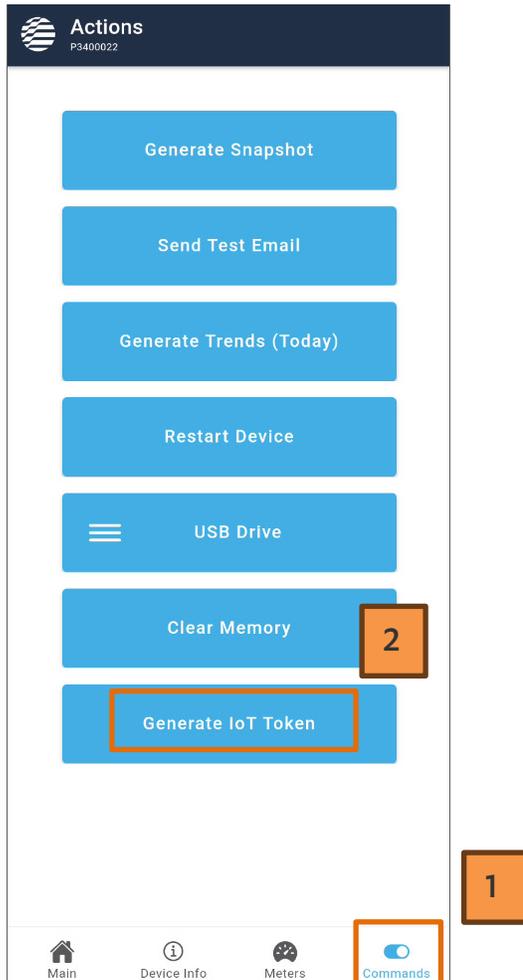


## 5.3 Adding your Device to QubeScan

### 5.3.1 Retrieve your IoT Token

#### 5.3.1.1 Via the iOS or Android App

1. Open the **Commands** page, then click **Generate IoT Token**



2. Your IoT Token will be generated, take note of this for steps listed in [Onboard the device to QubeScan](#)

#### 5.3.1.2 Via the webpage

1. Go to the device's webpage by typing its IP address into a browser on a computer or mobile device see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device.

- Go to the **Commands** page and then click **Request IoT token**

The screenshot shows the PQ Edge web interface. At the top, it says 'PQ Edge® POWERSIDE' and '(PQube\_ID not set) - (location not set)'. On the left is a navigation menu with 'Commands' selected. The main area is divided into 'Actions & Commands' and 'Configuration and Logos'. Under 'Advanced' in 'Actions & Commands', the 'Request IoT token' button is highlighted with an orange box and a '2' in a box. The 'Commands' tab in the left menu is also highlighted with an orange box and a '1' in a box.

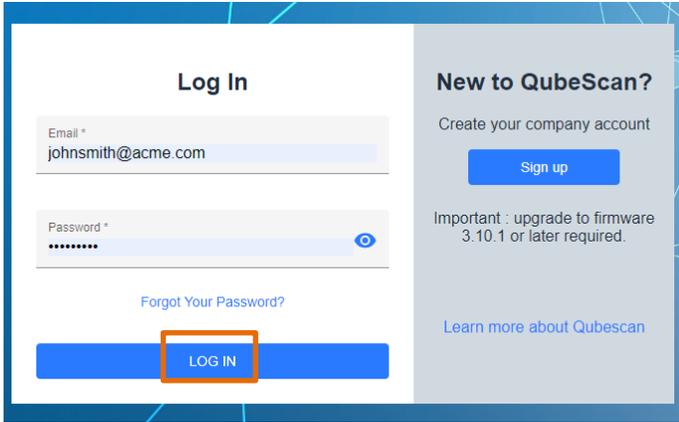
- Your browser may ask you if you would like to proceed, click **OK**

The screenshot shows a browser confirmation dialog box with the text: "This operation will take a few minutes. Do you want to proceed?". There are two buttons: "OK" and "Cancel". The "OK" button is highlighted with an orange box.

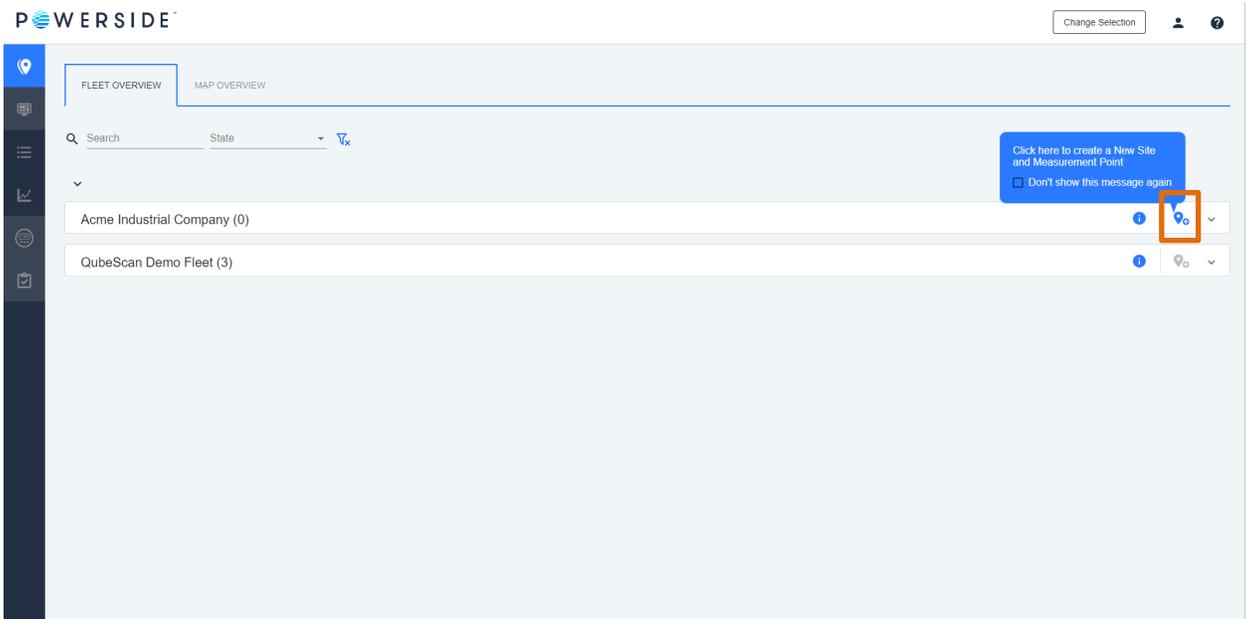
- Your IoT Token will be generated, take note of this for steps listed in [Provision the device in QubeScan](#)

## 5.4 Onboard the device to QubeScan

- Ensure you have IoT token, see [Retrieve your IoT Token](#).
- Sign in to [QubeScan](#) by logging in with credentials that were made in section [Signing up for QubeScan](#) and click **LOG IN**



3. Click the  icon



4. Enter information and click **Create**

5. Click 

| MEASUREMENT POINT       | LOCATION                   | STATE                | PENDING ALARMS | ONLINE STATUS  |
|-------------------------|----------------------------|----------------------|----------------|--|
| Alameda Main Point      | Alameda, CA, United States | Pending Installation |                |  |
| QubeScan Demo Fleet (3) |                            |                      |                | <input type="checkbox"/> Don't show this message again |

6. Enter IoT Token from steps [Retrieve your IoT Token](#) and click **Associate**

# 6 Operating the PQ Edge

## 6.1 Viewing and accessing data from the PQ Edge

The device is capable of exporting historic data in a number of formats such as:

- Gif files
- PQDIF files
- CSV format

Live data can be viewed on the mobile app on iOS or Android via or on the webpage. See [Via the iOS or Android App](#) or [Via the webpage](#).

Note: Historic data can also be viewed on the QubeScan cloud platform on a web browser on a computer or mobile device. See [What is QubeScan?](#)

### 6.1.1 Viewing Data from the Device on the Device’s Webpage

Go to the IP address of the device using a web browser on a computer or mobile device, see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device.

#### 6.1.1.1 Meters

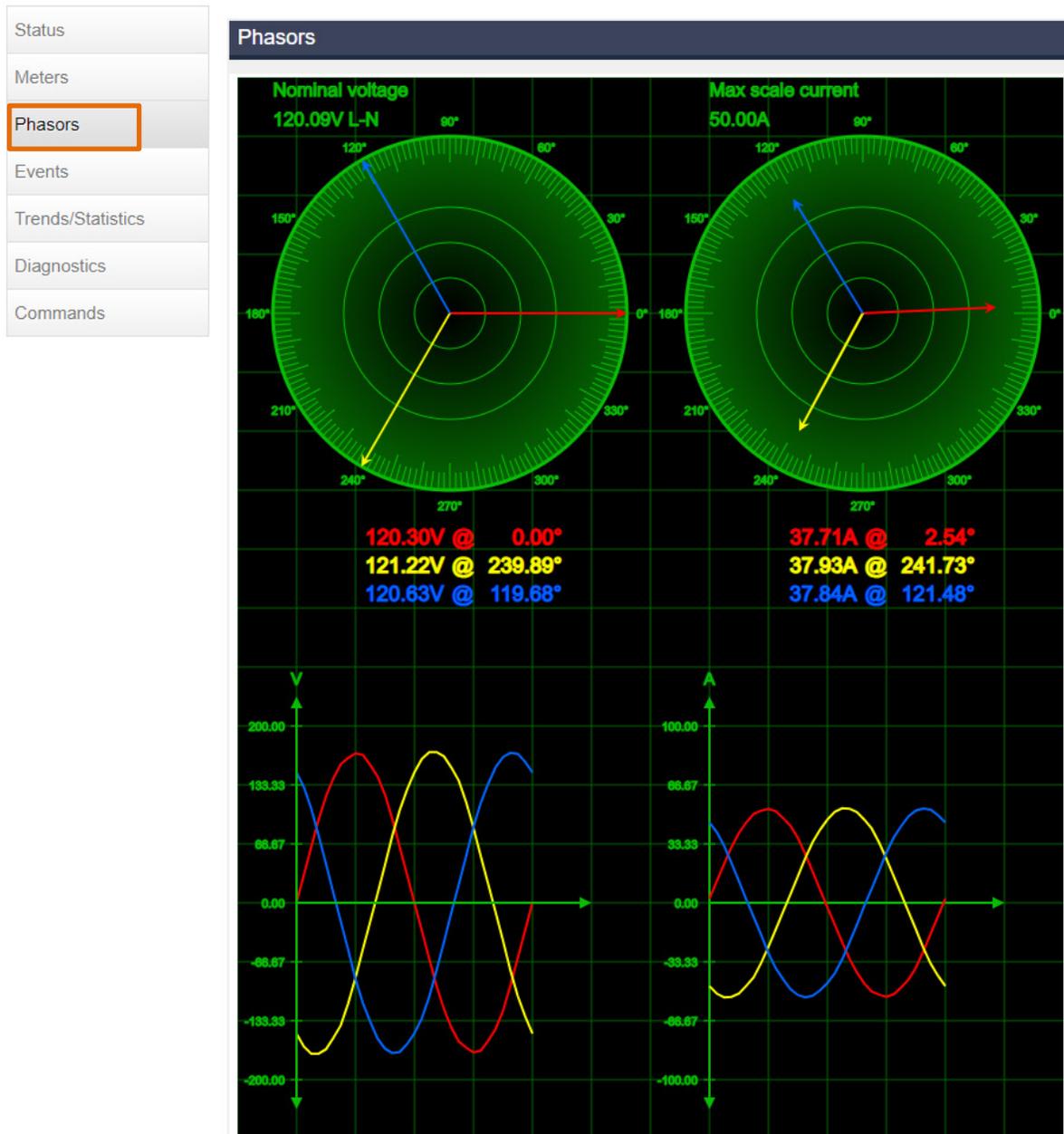
Click on **Meters** on the device’s webpage to view

| Meter                    | Value    |
|--------------------------|----------|
| L1-N                     | 120.7V   |
| L2-N                     | 121.3V   |
| L3-N                     | 120.7V   |
| N-E                      | 0.07V    |
| L1-L2                    | 209.8V   |
| L2-L3                    | 209.7V   |
| L3-L1                    | 208.6V   |
| I1 Amps                  | 37.777A  |
| I2 Amps                  | 37.956A  |
| I3 Amps                  | 37.842A  |
| N Amp                    | 0.000A   |
| Frequency                | 60.003Hz |
| L1-N Voltage Fundamental | 120.6V   |

The **Meters** shows you instantaneous values that the device sees which includes voltages, current, energy and power, Class A, and harmonics.

### 6.1.1.2 Phasors

Click on **Phasors** on the device’s webpage to view live phasors from the device.



The phasors page contains an instantaneous phasor for both voltage and current as well as instantaneous waveforms for both voltage and current.

### 6.1.1.3 Events

An event occurs when the device sees an irregularity in the circuit it is monitoring, to view events.

1. Click on **Events** then click on **File List** for the month you want to see events for.

| 2023 PQ Edge Events |        |                           |
|---------------------|--------|---------------------------|
| Month               | Events | Files                     |
| 2023/07             | 843    | <a href="#">File List</a> |
| 2023/06             | 573    | <a href="#">File List</a> |

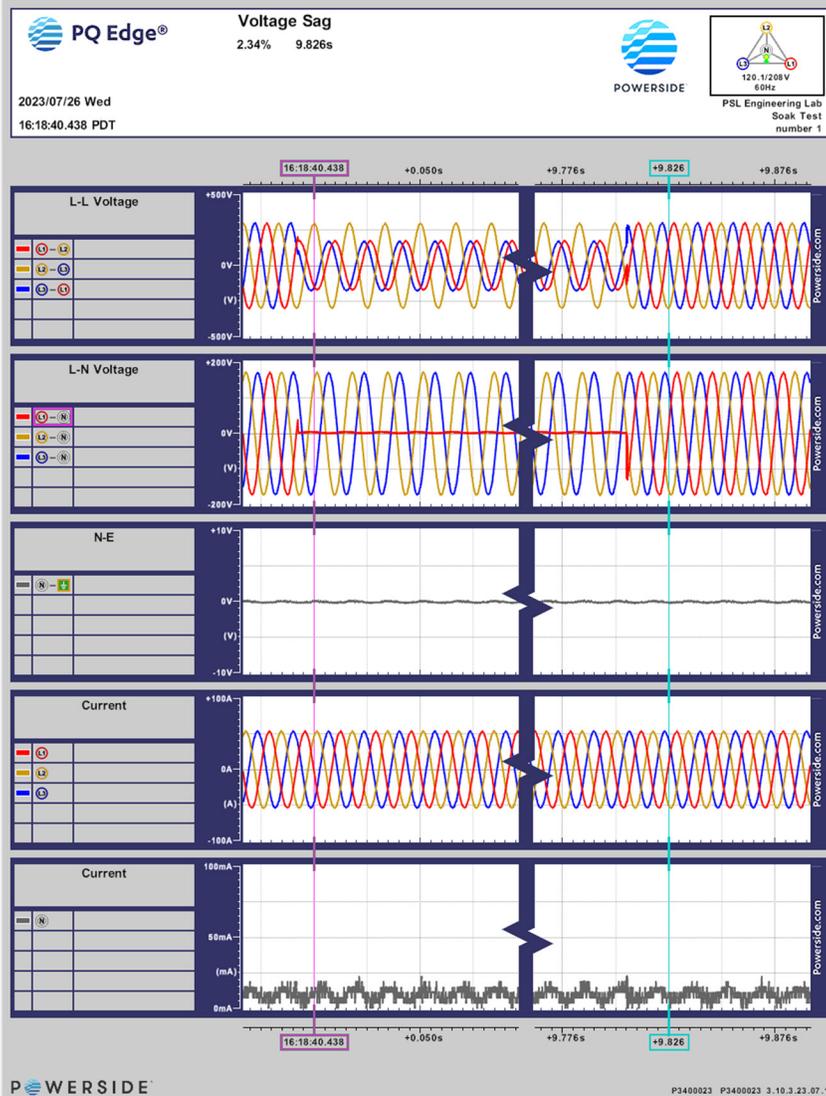
2. The device will list all the events that have occurred for that month along with type of event such as Voltage Sag. Click on to view more details.

| 2023/07 PQ Edge Events |                    |             |           |                     |       |
|------------------------|--------------------|-------------|-----------|---------------------|-------|
| Date                   | Time               | Type        | Magnitude | Duration in Seconds | Files |
| 2023/07/26             | T 16:18:40:438 PDT | Voltage Sag | 2.34%     | 9.826               |       |
| 2023/07/26             | T 16:14:23:778 PDT | Snapshot    | ---       | ---                 |       |
| 2023/07/26             | T 15:20:35:998 PDT | Voltage Sag | 2.34%     | 9.824               |       |
| 2023/07/26             | T 15:00:29:934 PDT | Snapshot    | ---       | ---                 |       |
| 2023/07/26             | T 14:22:31:156 PDT | Voltage Sag | 2.34%     | 9.822               |       |
| 2023/07/26             | T 13:24:26:242 PDT | Voltage Sag | 2.34%     | 9.827               |       |
| 2023/07/26             | T 12:26:21:753 PDT | Voltage Sag | 2.34%     | 9.824               |       |
| 2023/07/26             | T 12:00:29:966 PDT | Snapshot    | ---       | ---                 |       |
| 2023/07/26             | T 11:28:17:186 PDT | Voltage Sag | 2.31%     | 9.823               |       |
| 2023/07/26             | T 10:30:12:561 PDT | Voltage Sag | 2.31%     | 9.821               |       |

3. Each event has corresponding graphs, PQDIF files, spreadsheets and summaries that are accessible here

| PSL Engineering Lab<br>2023/07/26 (T 16:18:40.438 PDT) Voltage Sag  |  |  |   |
|---|--|--|---|
| Graphs  | PODIF  | Spreadsheets   | Summaries   |
| <a href="#">P3400023_2023-07-26_T_16-18-40-438_Voltage_Sag_RMS.gif</a><br><a href="#">P3400023_2023-07-26_T_16-18-40-438_Voltage_Sag_Waveform.gif</a> | <a href="#">P3400023_2023-07-26_T_16-18-40-438_Voltage_Sag_PODIF.pdf</a> | <a href="#">P3400023_2023-07-26_T_16-18-40-438_Voltage_Sag_RMS_Beg.csv</a><br><a href="#">P3400023_2023-07-26_T_16-18-40-438_Voltage_Sag_RMS_End.csv</a><br><a href="#">P3400023_2023-07-26_T_16-18-40-438_Voltage_Sag_Waveform_Beg.csv</a><br><a href="#">P3400023_2023-07-26_T_16-18-40-438_Voltage_Sag_Waveform_End.csv</a> | <a href="#">P3400023_Event.htm</a><br><a href="#">P3400023_Event.txt</a><br><a href="#">P3400023_Event.xml</a><br><a href="#">P3400023_EventSummary.txt</a> |

## Did you know that your device requires no software to view data?



The device generates gif files that can be opened on most computers and mobile devices without any software. They contain almost everything you might need to know about an event that has occurred. These files can also be emailed to you each time an event is detected so you can forward this information to the correct people with ease.

### 6.1.1.4 Trends

Trends can be viewed to help understand the quality of the power the device is monitoring.

1. Click on **Trends / Statistics** then click on **File List** for the period you want to see trends for

|                   |                            |                          |                           |
|-------------------|----------------------------|--------------------------|---------------------------|
| Status            | <b>2023 PQ Edge Trends</b> |                          |                           |
| Meters            | <b>Month</b>               | <b>Trends/Statistics</b> | <b>Files</b>              |
| Phasors           | 2023/07                    | 27                       | <a href="#">File List</a> |
| Events            | 2023/06                    | 19                       | <a href="#">File List</a> |
| Trends/Statistics | 2023 Weekly                | 6                        | <a href="#">File List</a> |
| Diagnostics       |                            |                          |                           |
| Commands          |                            |                          |                           |

2. Each period has graphs, PQDIF files, spreadsheets, and summaries that contain valuable information about the period selected

| PSL Engineering Lab<br>Monthly Trends and Statistics  |   |  |  |
|---|---|--|--|
| Graphs  | PQDIF   | Spreadsheets   | Summaries  |
| <a href="#">P3400023_2023-07_Flickers_Trends.gif</a><br><a href="#">P3400023_2023-07_ITIC_Chart.gif</a><br><a href="#">P3400023_2023-07_Individual_Currents_Trends.gif</a><br><a href="#">P3400023_2023-07_Individual_Powers_Trends.gif</a><br><a href="#">P3400023_2023-07_L-L_Voltages_Trends.gif</a><br><a href="#">P3400023_2023-07_L-N_Voltages_Trends.gif</a><br><a href="#">P3400023_2023-07_Powers_Trends.gif</a><br><a href="#">P3400023_2023-07_THD-Unbalances_Trends.gif</a><br><a href="#">P3400023_2023-07_Voltage-Currents_Trends.gif</a> | <a href="#">P3400023_2023-07_Trends-Stats_PQDIF.pqd</a> | <a href="#">P3400023_2023-07_Statistics.csv</a><br><a href="#">P3400023_2023-07_Trends.csv</a><br><a href="#">P3400023_2023-07_Trends_Part_1.csv</a><br><a href="#">P3400023_2023-07_Trends_Part_2.csv</a> | <a href="#">P3400023_2023-07_TrendStat.htm</a><br><a href="#">P3400023_2023-07_TrendStat.txt</a><br><a href="#">P3400023_2023-07_TrendStat.xml</a> |

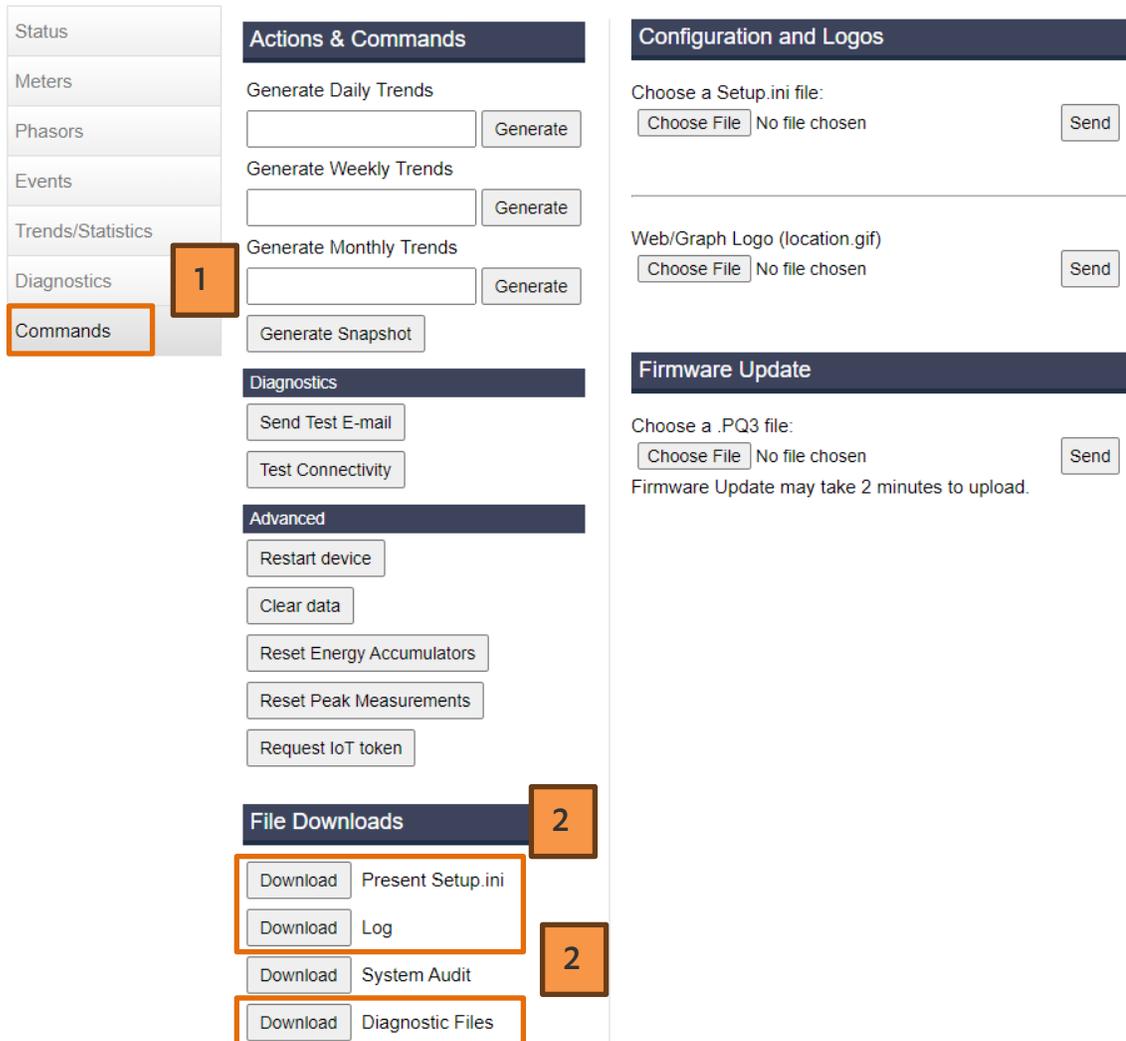
## 6.2 Downloading Device Data

### 6.2.1 Via the webpage

The webpage can be used to download the Setup.ini configuration file, logs and diagnostic files, it can also be used to view data from the device, see [Viewing Data from the Device on the Device's Webpage](#).

1. Go to the IP address of the device using a web browser on a computer or mobile device see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device.

2. Click on **Commands**

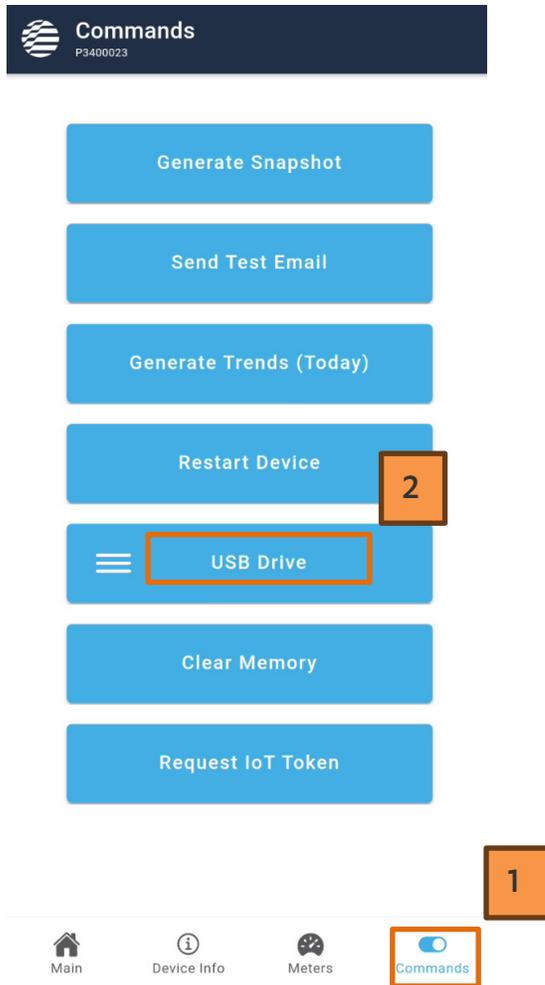


3. Download files from the device as required.

- a. **Present Setup.ini** contains the current configuration for this device. See [Configuring the PQ Edge](#) for more details.
- b. **Log** contains a text file that details device activity, it can be requested by Powerside support to help diagnose issues.
- c. **Diagnostic Files** contains everything required by Powerside support to help diagnose an issue including a system audit file, current Setup.ini, and log.

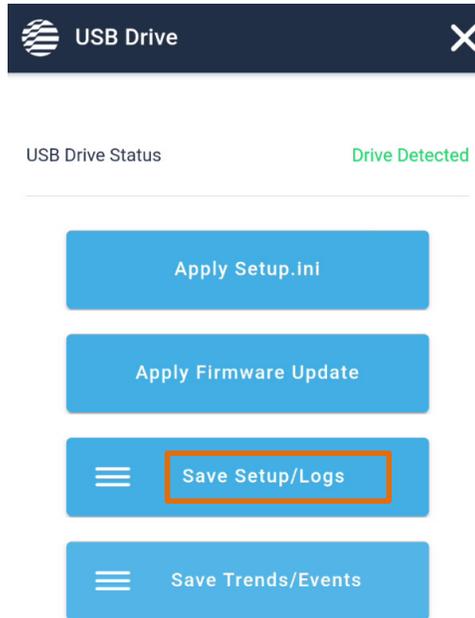
### 6.2.2 Using a USB flash drive via the iOS or Android App to download historic data, configuration, trends, and events

1. Connect to the PQ Edge Device via the iOS or Android app. See for details [Connect to the PQ Edge via the iOS or Android App](#).
2. Tap **Commands** then tap **USB DRIVE**

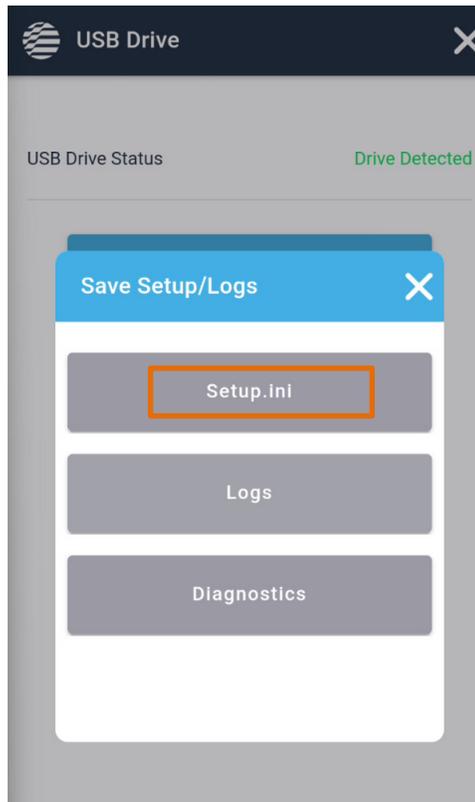


3. Download files from the device to the USB flash drive as required.
  - a. To Download the **Setup.ini** configuration of the device as it is

i. Tap **Save Setup / Logs**

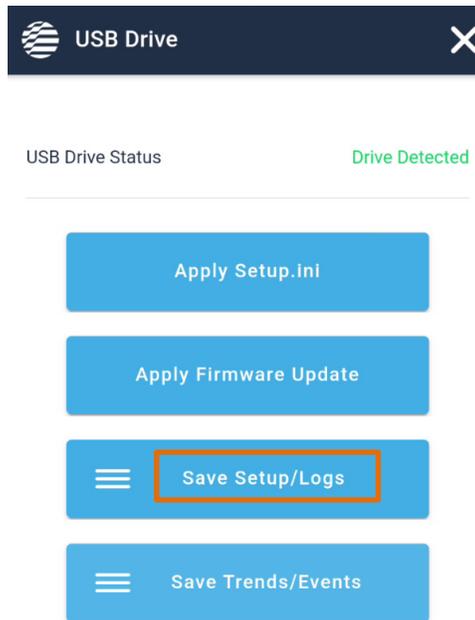


ii. Tap **Setup.ini** after the action has been initiated the app will say "Action Success!" click **Dismiss**

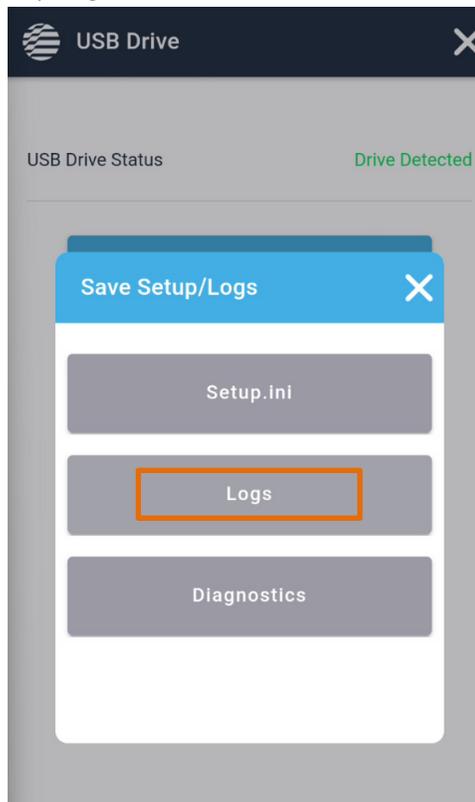


b. To Download **Logs** from the device

i. Tap **Save Setup / Logs**

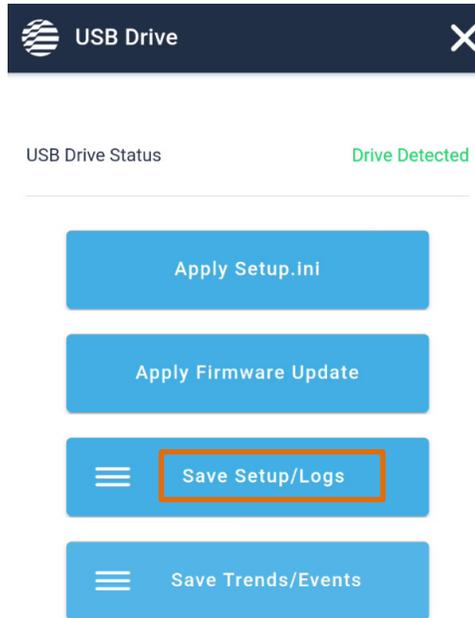


ii. Tap **Logs**

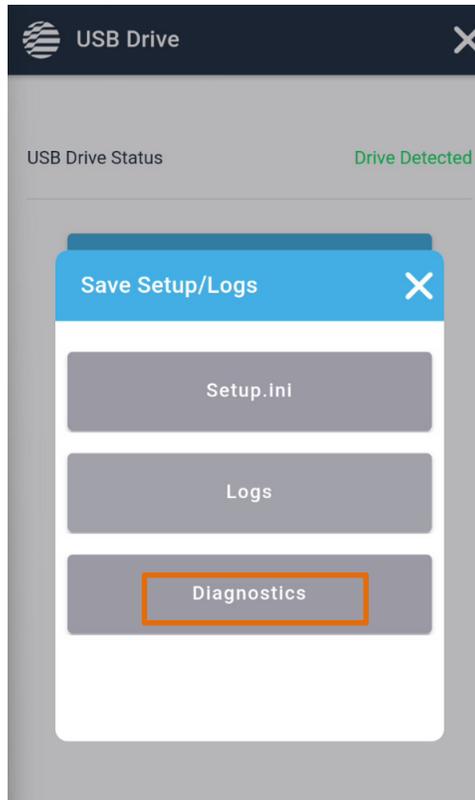


c. To Download **Diagnostic** files from the device

i. Tap **Save Setup / Logs**

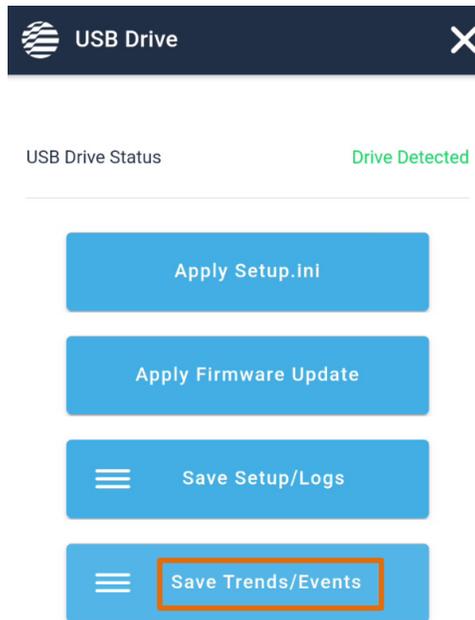


ii. Tap **Diagnostics**

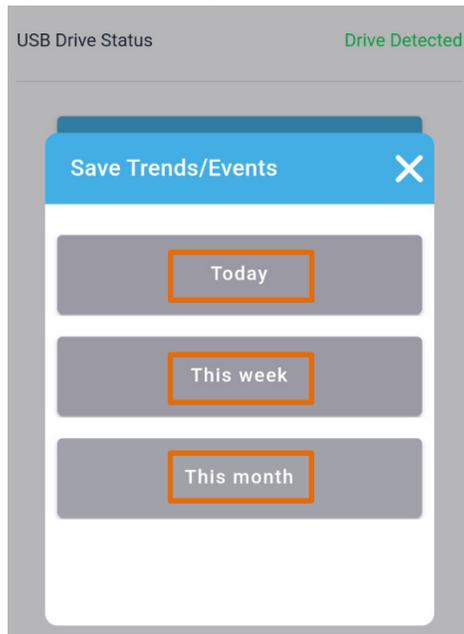


d. To Save Trends and Events from the device

i. Tap **Save Trends / Events**



ii. Tap the time period for which you would like to save trends and events, options are **Today**, **This week**, or **This month**



4. Once you see that the USB Indicator flashlight is no longer blinking, see [Hardware Overview](#). You can safely pull the USB flash drive. It will now contain all the files you downloaded in the previous steps.

### Where in the USB Flash drive will my data be?

Data will be in the USB Drive.

- Setup.ini will be saved as Setup-P3400000.ini where P3400000 is the serial number of the device.
- A folder with the serial number will contain all other data downloaded in previous steps.

## 6.3 Clearing the Device’s Memory

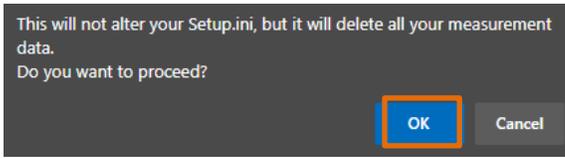
Clearing data stored in the device can be done both via the iOS or Android App or via the webpage.

### 6.3.1 Method 1: Via the webpage

1. Go to the IP address of the device, for instructions on how to do this see [Connect to the PQ Edge via the iOS or Android App](#).

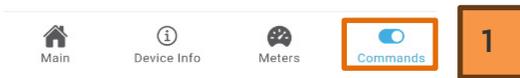
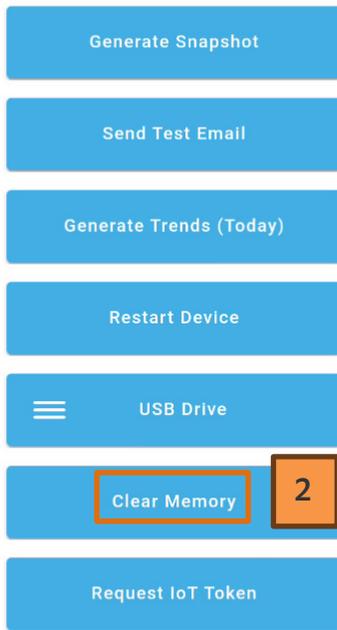
The screenshot displays the PQ Edge web interface. On the left, a navigation menu includes 'Status', 'Meters', 'Phasors', 'Events', 'Trends/Statistics', 'Diagnostics', and 'Commands'. The 'Commands' menu item is highlighted with an orange box and a '1' in a square. The main content area is divided into several sections: 'Actions & Commands' (with 'Generate Daily Trends', 'Generate Weekly Trends', 'Generate Monthly Trends', and 'Generate Snapshot' buttons), 'Diagnostics' (with 'Send Test E-mail' and 'Test Connectivity' buttons), 'Advanced' (with 'Restart device', 'Clear data', 'Reset Energy Accumulation', and 'Reset Peak Measurement' buttons), and 'File Downloads' (with 'Download' buttons for 'Present Setup.ini', 'Log', 'System Audit', and 'Diagnostic Files'). The 'Clear data' button in the 'Advanced' section is highlighted with an orange box and a '2' in a square. On the right side, there are sections for 'Configuration and Logos' (with 'Choose a Setup.ini file:' and 'Web/Graph Logo (location.gif)') and 'Firmware Update' (with 'Choose a .PQ3 file:').

2. Click **OK**

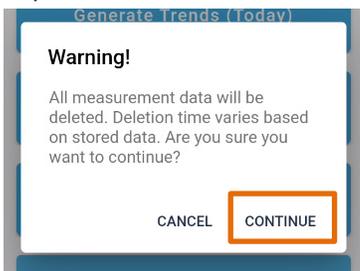


### 6.3.2 Method 2: Via the iOS or Android App

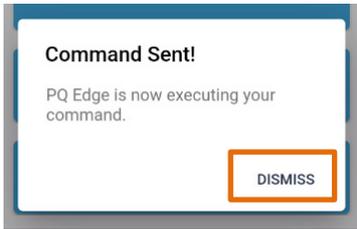
1. Tap **Commands** then **Clear Memory**



2. Tap **Continue**



3. Wait for the device to execute the command, tap **Dismiss**



## 7 Maintenance and Troubleshooting

### 7.1 Updating the Firmware

Updating the firmware allows you to access all the latest features the device has to offer. There are a few different ways to update the firmware.

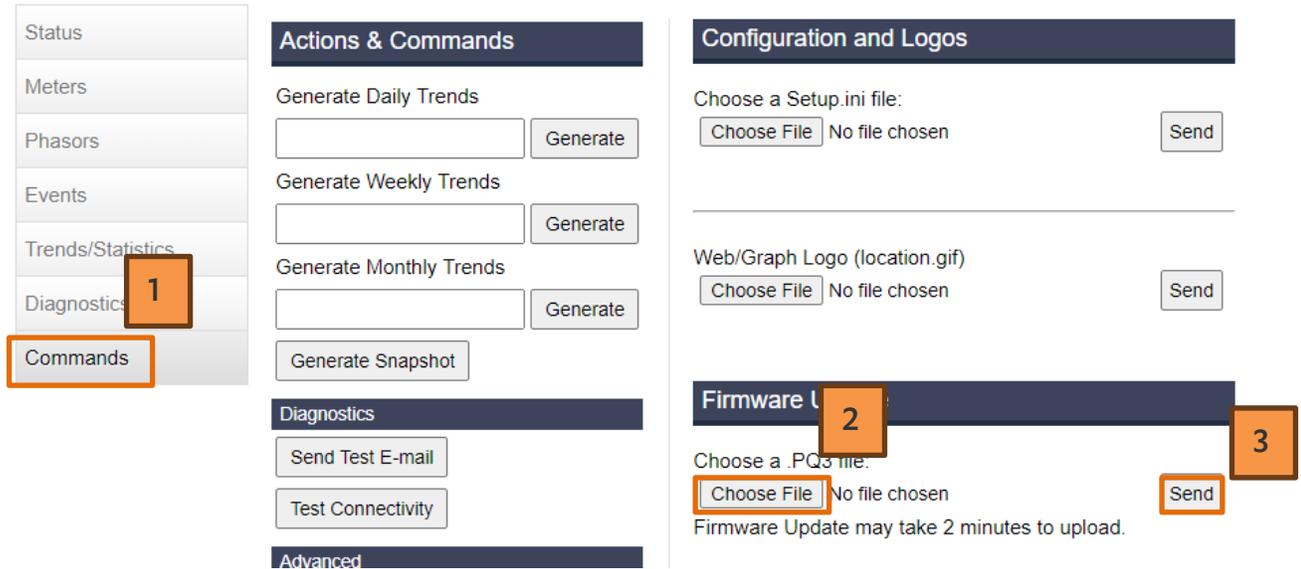
#### 7.1.1 Method 1: Via a computer and USB Flash Drive

1. Via a computer, go to the Powerside help center and download the latest firmware [Powerside Help Center](#). Click on **PQ Edge** and click on **Firmware**.
2. Download or transfer the “.PQ3” extension firmware file to the root directory of a USB Flash Drive.
3. Insert the drive into USB Port of the PQ Edge.
4. Reboot the device using one of the 2 methods below
  - a. Option 1: Reboot the Device via the webpage by navigating to the device’s IP address (see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device) via a computer or mobile device on the same network. Navigate to **Commands** and click **Reboot**.
  - b. Option 2: Pull the instrument power connector and reconnect to reboot the device.
5. Ensure the Status LED flashes white once the device restarts, and then once the device has booted up it will be either Orange if Voltage mains was not detected or Green if voltage mains was detected, see [Status LED Blinking Modes](#).
6. Follow steps to ensure the firmware update was successful, see [Ensuring the firmware update was successful](#).

#### 7.1.2 Method 2: Via the webpage

1. Via a computer, go to the Powerside help center and download the latest firmware [Powerside Help Center](#). Click on **PQ Edge** and click on **Firmware**.
2. Go to the device’s IP address via a computer or mobile device on the same network see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device.

3. Click **Commands** then click **Choose File** under Firmware Update, browse for the .PQ3 file downloaded in step 1 and click **Send**

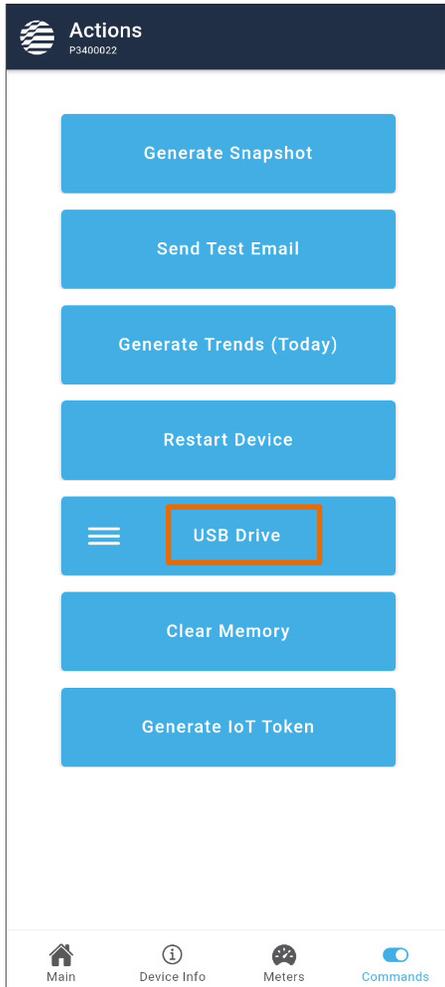


4. Ensure the Status LED flashes white once the device restarts, and then once the device has booted up it will be either Orange if Voltage mains was not detected or Green if voltage mains was detected, see [Status LED Blinking Modes](#).
5. Follow steps to ensure the firmware update was successful, see [Ensuring the firmware update was successful](#).

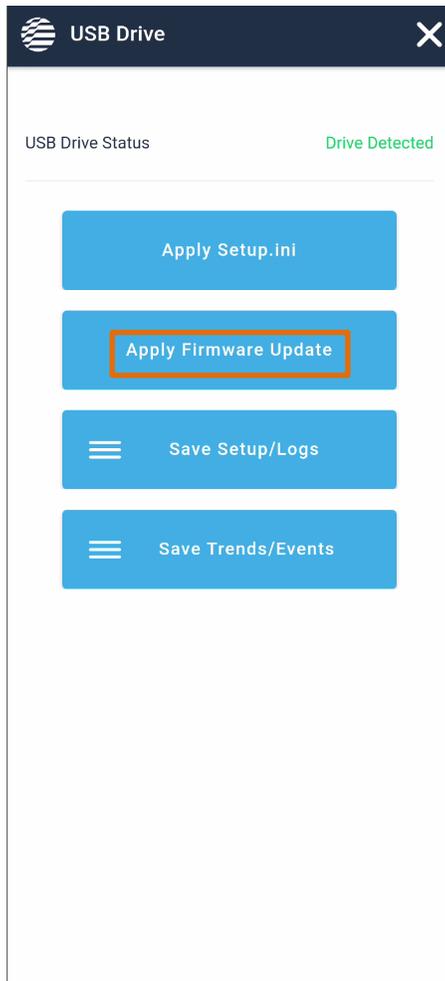
### 7.1.3 Method 3: using the iOS or Android App (and a USB flash drive)

1. Via a computer, go to the Powerside help center and download the latest firmware [Powerside Help Center](#). Click on **PQ Edge** and click on **Firmware**.
2. Download or transfer the ".PQ3" extension firmware file to the root directory of a USB Flash Drive.
3. Insert the drive into USB Port of the PQ Edge.

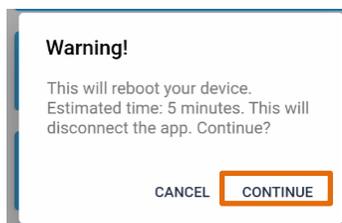
4. In the iOS or Android app tap **USB Drive**



## 5. Tap **Apply Firmware Update**



## 6. Click **CONTINUE**



7. Ensure the Status LED flashes white once the device restarts, and then once the device has booted up it will be either Orange if Voltage mains was not detected or Green if voltage mains was detected, see [Status LED Blinking Modes](#).
8. Follow steps to ensure the firmware update was successful, see [Ensuring the firmware update was successful](#).

## 7.2 Ensuring the firmware update is successful.

### 7.2.1 Method 1: Via the webpage

1. Go to the device's IP address via a computer or mobile device on the same network see [Connect to the PQ Edge via the iOS or Android App](#) to find the IP address of your device.
2. Click on **Diagnostics** then scroll down to **Firmware Update History**. You will see a log of all the firmware's that have ever been installed on the device including time, date, and firmware version.

The screenshot shows the PQ Edge web interface. On the left is a navigation menu with items: Status, Meters, Phasors, Events, Trends/Statistics, Diagnostics, and Commands. The 'Events' item is highlighted with an orange box and a '1' in a box next to it. To the right is a 'PQ Edge' information panel with the following details:

|                         |                                   |
|-------------------------|-----------------------------------|
| Serial Number:          | P3400023                          |
| Model Number:           | PQNGXX-PQ-004N-0000-0000          |
| Firmware Version:       | 3.10.3.23.07.14                   |
| Build Date:             | 05/22/23                          |
| Calibration Date:       | 05/24/23                          |
| Calibration Version:    | 4.7.1                             |
| Temperature (internal): | 45.7°C                            |
| Uptime:                 | 18d 10h 25m                       |
| IOT:                    | IOT provisioned<br>IOT registered |

Below this is the 'Firmware Update History' section. A single entry is shown: '2023/07/16 08:51 PDT: 3.10.3.23.07.14'. This entry is highlighted with an orange box and a '2' in a box next to it.

### 7.2.2 Method 2: Checking on the USB Drive

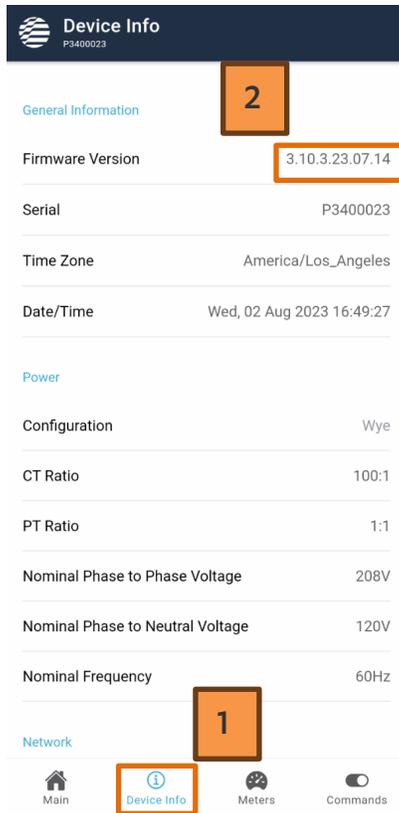
If a USB drive was used to update the firmware.

1. Check the USB drive on your computer to ensure the file extension has been appended with the date and time the firmware was updated.

PSL\_FIRMWARE\_3.10.3.23.07.14.PQ3.202307201341

### 7.2.3 Method 3: Check the current firmware version on the iOS or Android App

1. Click **Device Info**, check under **Firmware Version** ensure the firmware version you applied is the version you see on the app.



## 7.3 Decommissioning the Device

Decommissioning the device to store it for future use, replace it with another like device may be necessary. Follow the following recommended steps to do this:

1. First backup the Setup.INI, Logs, and device data following the steps in [Using a USB flash drive via the iOS or Android App to download historic data, configuration, trends, and events.](#)
2. Follow steps to clear the device's memory, see [Clearing the Device's Memory.](#)
3. Once data has been backed up simply power off the device by removing instrument power, if using USB, make sure the device's USB activity light is not flashing indicative that the device is still writing to the USB drive.

## 7.4 Reinstalling a Previously Decommissioned Device

1. Edit the Setup.INI file backed up in [Decommissioning the Device](#) steps in the configurator program if parameters or circumstance have changed since the device was last in commission. See [Configuring the PQ Edge.](#)
2. Follow steps in [Applying the configuration to the device](#) to apply the Setup.INI file to the device.
3. Ensure readings are correct and as expected. See [Verifying configuration.](#)
4. In the iOS or Android app, first [Connect to the PQ Edge via the iOS or Android App](#)
5. Clear the device's memory, see [Clearing the Device's Memory](#) if device was previously used in a different site.

## 7.5 Voltage Readings are Incorrect or not as Expected

### 7.5.1 Voltage readings are zero

In the chance that voltage readings are zero, check the following:

1. Check if there is a breaker that is in the off state that is supplying the voltage main terminals.
2. Check the voltage at the voltage main terminals using a meter.
3. Contact Powerside for support. See [Contacting Powerside for Help](#).

### 7.5.2 Voltage readings appear incorrect

In the chance that the voltage readings are incorrect, check the following:

1. Check the configuration to verify that the **Potential transformer ratio** is set correctly, see [Configuration: AC Voltage](#)
2. Check the voltage at the voltage main terminals using a multimeter to see if readings match.
3. Contact Powerside for support. See [Contacting Powerside for Help](#).

## 8 More Information

### 8.1 Summary Specifications

| TECHNICAL SPECIFICATIONS       |   |
|--------------------------------|---|
| <b>Dimensions (L x W x H)</b>  | 5.52 in X 3.78 in X 2.38 in (14.02 cm X 9.60 cm X 6.04 cm), 1.8 in (3.5 cm) DIN rail mountable                        |
| <b>Weight</b>                  | 8.4 oz (238g)   |
| <b>Operating Environment</b>   | Temperature: -40 to +158° F (-40 to +70° C)<br>Humidity: 5 - 95% RH (inside use)<br>Altitude: <2000 m above sea level |
| <b>Power Supply</b>            | AC: 24 Vac $\pm$ 10% at 50/60 Hz, 1.5A max<br>DC: $\pm$ 24 to 48 Vdc $\pm$ 10% (polarity independent), 1A max.        |
| <b>Internal Memory</b>         | 32 GB   |
| <b>Data Backup</b>             | USB 2.0 thumb drive   |
| <b>Clock Synchronization</b>   | SNTP, NTP   |
| <b>Output File Types</b>       | Text, GIF, CSV, and IEEE 1159-3 PQDIF   |
| <b>Communication Ports</b>     | Ethernet RJ45 10/100 (optional external wireless or cell modem)   |
| <b>Communication Protocols</b> | Modbus/TCP, DNP 3.0, SNMP with traps, BACnet, FTP or HTTP (secure FTPS and HTTPS), and email                          |

| VOLTAGE              |  |
|----------------------|--|
| <b>Sampling Rate</b> | 512 samples per cycle at 50 Hz / 60 Hz (applies to voltage and current channels) |
| <b>Voltage Range</b> | 0 to 750 Vac (L-N), 0 to 1300 Vac (L-L), impedance: 4.8M $\Omega$                |
| <b>Frequency*</b>    | 50 Hz, 60 Hz, 400 Hz   |

| CURRENT       |  |
|---------------|--|
| <b>Inputs</b> | 4 inputs (I1 to I4), differential<br>Input : 0.333 Vrms at rated current<br>Impedance: 33.3 k $\Omega$ |

| POWER AND ENERGY |   |
|------------------|---|
| <b>Channels</b>  | Calculated channels from I1 to I3 currents, and L1-N, L2-N, L3-N voltages |

| POWER QUALITY   |                                      |
|-----------------|--------------------------------------|
| <b>Channels</b> | According to IEC 61000-4-30 Class A. |

## 8.2 Conductor characteristics

| Connection                                    | Minimum wire size              | Maximum wire size            | Limitations and remarks. Comply with all local safety and installation requirements and regulations.  |
|---|--------------------------------|------------------------------|---|
| Voltage Main Terminals<br>L1, L2, L3, N       | 20 AWG (0.52 mm <sup>2</sup> ) | 14 AWG (2.1mm <sup>2</sup> ) | Minimum 600V UL-recognized insulation system required. These terminals require less than 0.01 amps. Connection to N (15) is optional dependent on your wiring configuration see <a href="#">Wiring Diagrams</a> . For single phase monitoring, connect either L1-N or L1-L2 as appropriate for the mains configuration. |
| Earth terminal                                | 20 AWG (0.52 mm <sup>2</sup> ) | 14 AWG (2.1mm <sup>2</sup> ) | Connect this terminal to a suitable earth connection. For proper device operation you must connect this terminal to earth. It is used as a measurement reference.   |
| Instrument Power and Current Sensor terminals | 20 AWG (0.52 mm <sup>2</sup> ) | 14 AWG (2.1mm <sup>2</sup> ) | Minimum 600V UL-recognized insulation system required.  |

## 8.3 Warranty

We offer a 2-year warranty for the device. The warranty period begins on the date the device was shipped to you.

### 8.3.1 How to check warranty status

Contact us with your device serial number for Powerside to confirm warranty status of your device.

## 8.4 Contacting Powerside for Help

To contact Powerside please call +1 (510) 522-4400 or +1 (888) 736-4347 via phone or email [support@powerside.com](mailto:support@powerside.com).