Panoramic Power

Bridge Installation and configuration guide

Panoramic Power Bridge

Firmware v476 & v676.12.7/ May 2025

Panoramic Power

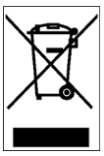
Copyright Notice

Regulatory Compliance

Conforms to UL Std 61010-1, certified to CAN/CSA Std C22.2 No. 61010-1

The Bridge complies with the following certification requirements:

Power supply	⚠ CAUTION Certified AC/DC adapter marked Limited Power Source (LPS), or NEC Class 2, suitably rated for voltage, current and ambient temperature
Electrical rating	5VDC, maximum 1A
Environmental rating	Maximum ambient temperature 60°C Pollution degree 2 Indoor use Relative humidity up to 80%
Cellular radio bands	US: B2(1900) / B4(AWS1700) / B5(850) / B12/13(700) (4G), 850/1900 (3G) EU: B1(2100) / B3(1800) / B7(2600) / B8(900) / B20(800) (4G), 900/1800 (2G)
Wi-Fi radio band	2.4-2.495 GHz
SRD receiver radio frequencies	US: 915 MHz EU: 434 MHz



Product end of use handling (WEEE) – Waste of Electrical and Electronic Equipment

Panoramic Power is committed to protect the global environment and helping our customers with recycle responsibilities. Disposal of electrical and electronic products must be done according with the local and national regulations. You can return your product to a local collection point.

For information about your disposal or collection points, call your distributer or vendor, or contact www.powerradar.energy/support

FCC Supplier's Declaration of Conformity

Product information
Product Name: Sensor Communication Bridge
Model No.: PAN-2-H-3G-US
Brand name: Panoramic Power Gen4+ Bridge
Applicable standards: FCC CFR Title 47 Part 15 Subpart B

This device complies with related rules, operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

The test result has been evaluated by Global United Technology Services Co., Ltd. laboratory and showed in the test report.

Test report number: GTS201906000082F01

It is understood that each unit marketed is identical to the device as tested, and any changes to the device that could adversely affect the emission characteristics will require retest.

The following responsible party designated in FCC §2.909 is responsible for this declaration:

Manufacturer information

Panoramic Power Ltd.
15 Atir Yeda St.,
Kfar Saba 4464312, Israel

Telephone: +972-9-7667600

Email: Zarin.Keydar@centrica.com

Signature:  Date: August 8, 2020

Version Tracker

Date	Version Number	Changes Made to Manual
12-Sept-2023	v676.10.5	- Modbus RTU Baud Rate - Upgrade through Configuration Tool - Include Pulse LED indicator description - Added Wi-Fi signal strength troubleshooting steps
16-Oct-2024	N/A	- Removed PowerRadar term

Contents

About Panoramic Power® and the Bridge

The Panoramic Power System monitors electrical energy consumption at the site level as well as at the individual circuit level. It detects excess usage, allowing organizations to identify and reduce energy, maintenance expenses and monitor site level consumption.

The system consists of wireless, self-powered sensors engineered to allow for rapid, non-invasive installation, with almost no disturbance to operations. Sensors are easily attached to circuit breakers by snapping them onto the outgoing electrical wire. They monitor the flow of electricity through the magnetic field it creates and also use it as a power source. The sensors do not require any maintenance.

Sensors report the power consumption to the Bridge. The Bridge in turn transfers the circuit level information, along with readings originated by the utility meter and read through a pulse input on the Bridge, to the solution's cloud–based analytics platform. A single Bridge can collect data from up to 250 sensors and two utility meters, and multiple Bridges can be used in a single site to increase coverage.

Four generations of Bridges were developed, with the fourth generation now available:

- Basic Entry Level Bridge (PAN-2-E-EWC-US/EU)
- Advanced Cellular Bridge (PAN-2-H-3G-US/EU), featuring a SIM card slot.
- Gen 3 Bridge (PAN-2H-3G-US/EU V3), featuring a SIM card slot.
- Gen 4 Bridge (PAN-2H-3G-US/EU V4), featuring a SIM card slot and two KY pulse inputs.
- Gen 4+ LTE Bridge (PAN-2H-3G-US/EU V4+ (LTE)), featuring LTE SIM card slot, two KY pulse inputs and a Modbus RS-485 connector, or LAN Bridge (PAN-2H-US/EU V4+ (LAN)), which does not include a cellular module.

The table below lists the key features of each Bridge.

Key Features	Basic Entry Level Bridge	Gen2 Bridge	Gen3 Bridge	Gen4 Bridge	Gen4+ Bridge
Plug and Play Installation	✓	✓	✓	✓	✓
Flexible Mounting Options	✓	✓	✓	✓	✓
Wi-Fi / Ethernet connectivity	✓	✓	✓	✓	✓
Cellular connectivity	Via external USB dongle	3G GSM SIM card slot	3G GSM SIM card slot	3G GSM SIM card slot	4G LTE SIM card slot[2]
Store and forward capability in case of network loss	X	✓	✓	✓	✓
Secure TLS connection to the cloud-based server	X	X	✓	✓	✓
Two KY pulse inputs	X	X	X	✓	✓
Field-upgradeable firmware	X	✓	✓	✓	✓
Remote FW upgrade	X	X	✓[1]	✓[1]	✓[1]
Initial configuration	Via the Bridge Configuration Tool	Via built-in web interface	Via built-in web interface	Via built-in web interface	Via built-in web interface

The Advanced 3rd and 4th Gen Bridge provide store-and-forward capability. In case of a network loss that impacts connectivity with the cloud-based server, the Bridge stores measurements until communication is restored.

The Bridge storage capacity is shown in the table below:

# Connected Sensors	# Days Stored
10	10
20	5
100	1
200	0.5

Pulse input data is stored for up to 30 days.

This guide explains how to install and configure the Advanced 4th Gen Bridge. For information on previous generations of Bridges, see the corresponding installation and configuration guides.

[1] Requires Firmware V470 and above

[2] For LTE models only; not available in LAN models

Unpacking and Hardware Configuration

Unpacking the Hardware

We recommend that you follow these unpacking instructions before installing the hardware.

How to Proceed

1. Check the box. If any damage occurred during shipment, contact your sales representative.
2. Open the box. It should include the following items:
    - Bridge
    - Cellular antenna (only in models with cellular option)
    - RF antenna, labeled Rx-1 (EU models) or Rx-2 (US models)
    - Green pluggable adapters for the side connectors
    - 4-piece recloseable fastener with adhesive
3. Keep the box in case you need to repack the Bridge later.

Attaching the Antennas

Before performing any connections, mount the antennas onto the Bridge as follows:

1. Screw the RF antenna (labeled **Rx-1** or **Rx-2**) into its connector, labeled likewise.
2. (Models with cellular option) Screw the cellular antenna (labeled **3G**, **LTE-1** or **LTE-2**) into its connector, labeled likewise.
3. Position the antennas as shown below.

Mounting the Bridge

1. Connect the Bridge to a suitable temperature-rated industrial LPS, +5VDC/1.5A power supply, and install the Bridge on a flat horizontal surface using 3M stickers provided in the box or mount it on a DIN rail**

    ⚠ CAUTION

2. Put attention that the only allowed screws are the DIN rail holder screws (Phillips pan head machine screw M3 x 6mm). Using longer screws will damage the product and will not have warranty.

** DIN rail adapter is not included.

How to Proceed

1. Configure the Bridge as explained in this guide.
2. Position the Bridge at a distance as follows:

   Up to 2 meters from the electrical panel, if the panel is covered with a metallic cover.

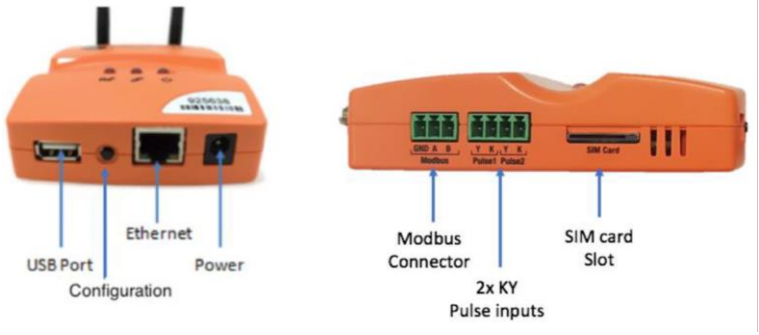
   Up to 5 meters, if the panel is not covered.
3. Choose a clean and even surface, located near a power source.
4. Make sure the Bridge side vents are not blocked.
5. Attaching with screws: Use the template on the back of the Bridge to measure the distance between the two screws.
6. Adhering to the wall: Peel the adhesive backing off two pieces of the re-closeable fastener and attach them to the back of the Bridge.

   In the same way, attach the two remaining pieces of the re-closeable fastener to the wall, making sure they are aligned with the pieces on the Bridge.
7. Attaching to a DIN rail: Attach the DIN rail adapter** to the Bridge using two screws. The adapter clips onto a standard DIN rail.

** Not included.

Connecting the Bridge

Depending on the required network configuration, you can connect the Bridge to the network using Wi-Fi, a cellular network, or wired LAN. In Stand-Alone mode you can connect an RS-485 cable to the Modbus Connector.



Prerequisites

An Ethernet cable for configuring the Bridge.

An Ethernet cable if you connect to the Internet via wired LAN.

A SIM card if you connect to the Internet via a standard GSM/LTE network.

Connecting Pulse Inputs

You can connect the Bridge to a KY or KYZ pulse output of a meter.

Note By default, the system KY vs. KYZ setting is automatically selected according to the meter type defined on the platform:
- Electrical meters use KYZ input settings by default
- Other meters (heat, gas, water, etc.) use KY input settings by default

How to Proceed

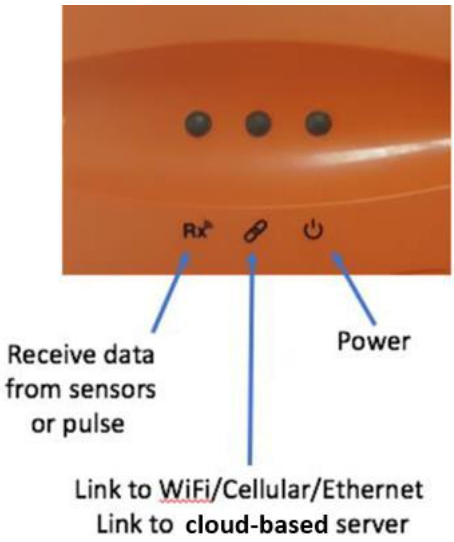
1. Screw the pulse wires into the adapter connected to the pulse input. Make sure to screw the K wire into the K input, and either the Y or Z wire into the Y input.
2. Plug the adapter into one of the pulse inputs on the side of the Bridge.

Pulse Input Electrical Characteristics

- Open terminal voltage: 5 V
- Maximum current: 0.9 mA
- Absolute maximum K-Y voltage input range: 0-26 VD
- Minimum pulse width: 5 mS
- Maximum pulse rate: 100 Hz
- Maximum LOW state voltage: 1.2 V
- Minimum LOW state current: 0.6 mA
- Minimum HIGH state voltage: 2 V
- Maximum HIGH state current (leakage): 0.4 mA

Understanding the Bridge LEDs

Use the following information to familiarize yourself with the Bridge status during normal operation in Wi-Fi, cellular, or ethernet.



Power LED	Bridge Status
Solid green	Connected to the power source
Blinking orange	Firmware upgrade in progress
Solid orange	Firmware upgrade server unreachable (This does not interfere with sensor data delivery or connectivity performance).
Solid red	Firmware upgrade has failed

Link LED	Networking status
Off	X
Blinking orange - slow	Connecting... (L2 layer)
Blinking orange - fast	Connecting... (acquiring IP address)
Blinking green - fast	Connecting... (Resolving server URL)
Blinking green - slow	Connecting... (To cloud-based server)
Solid orange	Connection failed (Authentication error)
Solid green	Connection successful

Rx LED	Bridge Status
Blinking green	Receiving sensor data
Blinking orange	Receiving pulse meter data
Solid red	Configuration mode

Note In some cases, it may take up to several minutes for the Bridge to obtain an IP address; however, if the Link LED is off for more than five minutes, the Bridge may require replacement, please contact support.
It is recommended to wait a few minutes before troubleshooting.

Note for Stand-alone mode Link LED: Solid green when there are server requests. 0.4-sec blink when there is no connection (TCP mode) or no requests for 45 seconds (RTU mode).

Initial Bridge Configuration

Accessing the Bridge Web Interface via 'Config Mode'

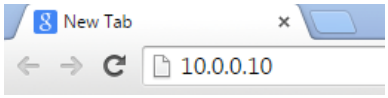
Initial Bridge configuration is done by placing the Bridge into a special configuration mode. This section describes how to access the Bridge web interface for configuring the relevant data communication mode.

Prerequisite

Use Internet Explorer 9.0 (and up), Google Chrome, or Firefox to access the Bridge web interface.

How to Proceed

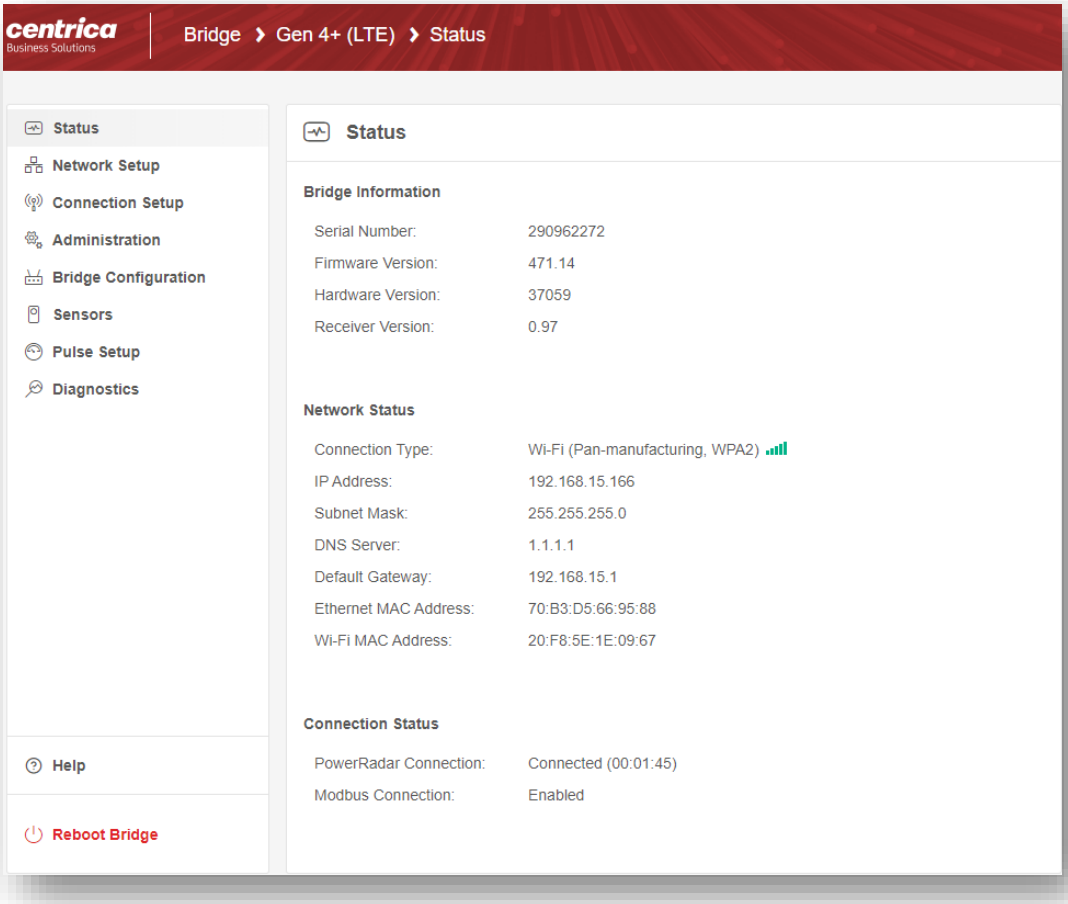
1. On your PC, disable your Wi-Fi and disconnect the LAN cable.
2. Connect the Bridge to the power source.
3. Once the Bridge powers up, it performs a self-test, after which all LEDs light up in sequence. For more information on LED status, see Understanding the Bridge LEDs on the previous page.
4. Make sure no USB device is connected to the USB port of the Bridge.
5. Press the Configuration button for approximately 5 seconds, until the Rx LED lights solid red. The Bridge is now in configuration (Config) mode.
6. Connect the Bridge to the PC using the LAN cable, only after the Rx LED lights solid red (indicating that the Bridge is in configuration mode).
7. Activate your web browser. In the address bar, enter IP address *10.0.0.10*.



The Status page appears and displays the current configuration.

Notes

- Please ensure that your laptop is not connected to any networks (Wi-Fi, LAN etc.) when configuring the Bridge. If your laptop supports "airplane mode", consider placing the laptop in this mode to disable all such networks easily.
- It may take a few minutes for the computer to connect to the Bridge's DHCP server; you can release and renew your IP address on your computer to speed up the process.
- In some cases, first-time loading can take several minutes. If the Status page does not appear, wait a few more seconds and refresh the page in the browser. If the page does not load, use Ctrl+F5 to browser's cache refresh.



Entering Credentials

Accessing any of the tabs (except Status), asks for the Bridge Admin credentials.

How to Proceed

1. Select the required tab from the side menu.
2. Enter the Username and Password in the Sign in screen.

By default, both are *panpwr*. We recommend changing them once you access the tool. See '*Bridge Administration*' on page 24.

Note 1 Modifying the default user and password is strongly recommended to enhance the Bridge security and avoid unauthorized access to the configuration screens.

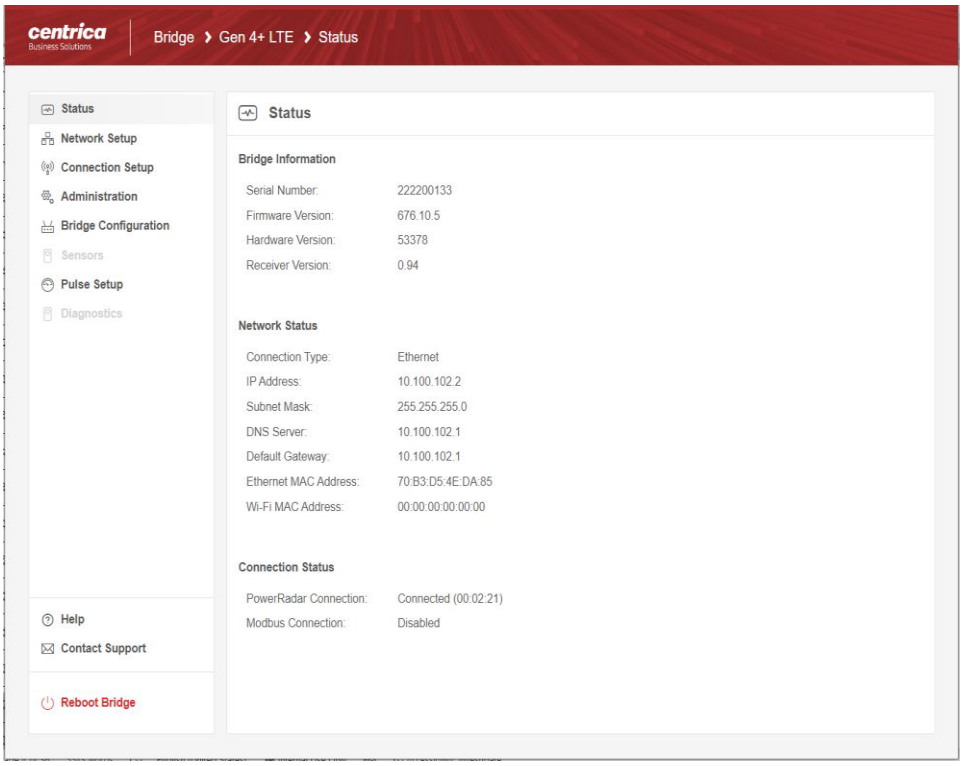
Note 2 When changing credentials, it is important to keep them in a safe place. The only way to restore Bridge credentials is to restore the Bridge to factory settings, which will erase all configurations and revert to default credentials.

3. Select Sign In.

The Status Tab

The Status Tab is the first to open when opening the Bridge UI. This page displays the Bridge important settings, network interfaces and status and connection status.

- **Bridge Information** – Displays the Bridge serial number, firmware and hardware versions (may be needed by the support team for troubleshooting).
- **Network Status** – Displays the connection type (Ethernet, Wi-Fi, Cellular) and related networking parameters including signal strength, where applicable.
- **Connection Status** –
    - Shows if the Bridge is connected to the cloud-based server and the duration of the connection.
    - Shows if the Bridge is enabled to accept Modbus requests from a Modbus master to retrieve local sensor data.



Network & Connection Setup

Configuring the Bridge for Wi-Fi Networking

If the Bridge connects to the network over Wi-Fi, you will need to configure which Wi-Fi network and settings to use.

Prerequisites

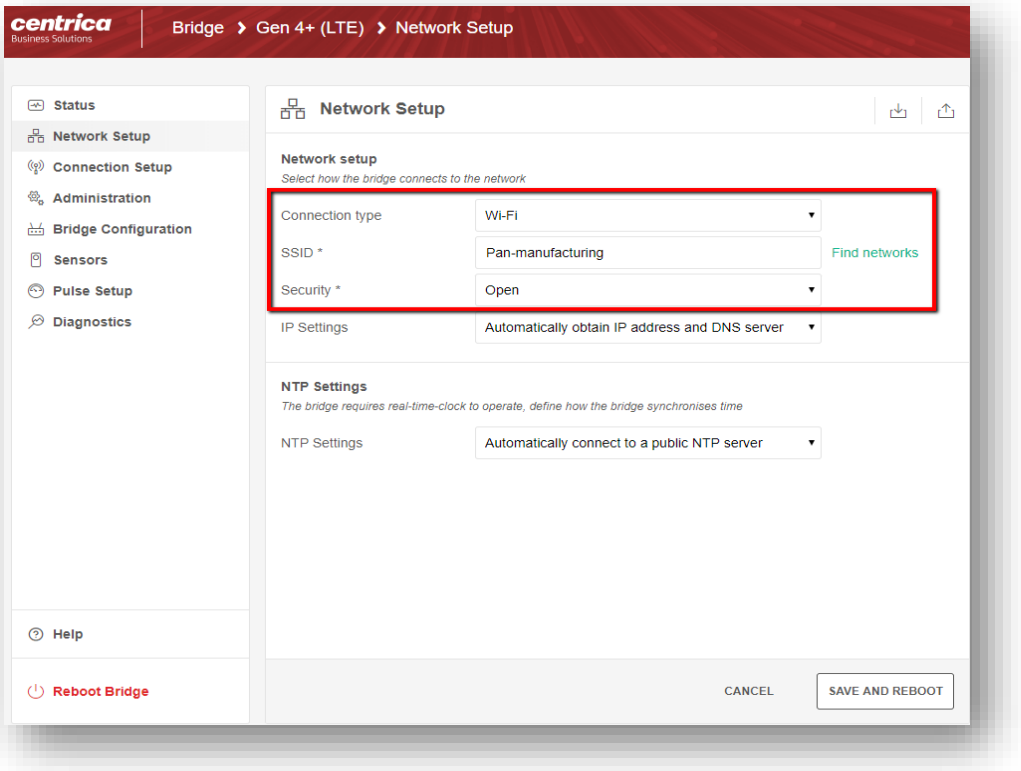
Ask your network administrator for the following information:

- SSID and password to access the network.
- Username, and password for enterprise networks requiring credentials.
- When connecting to the cloud-based platform, with Wi-Fi and Ethernet connections, verify that the system administrator has opened the following ports for outbound communications:
    - Port 443 for outbound TCP/TLS traffic
    - Port 123 for outbound NTP
    - Verify that DHCP & DNS ports are open (67/68, 53) and configured.

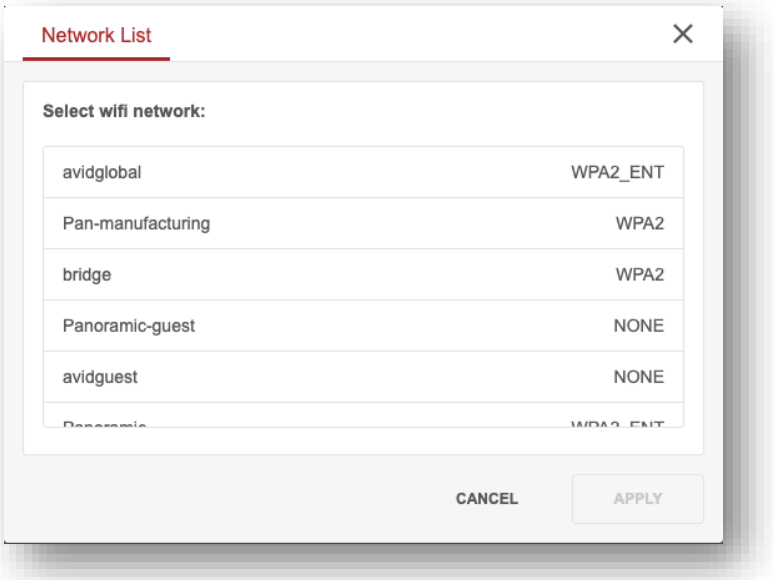
How to Proceed

1. In the Network Setup tab - Connection Type, select Wi-Fi.
2. To enable the system to find the SSID (network name) and Security (encryption method used), click Find networks.

3. Otherwise, enter these values manually.

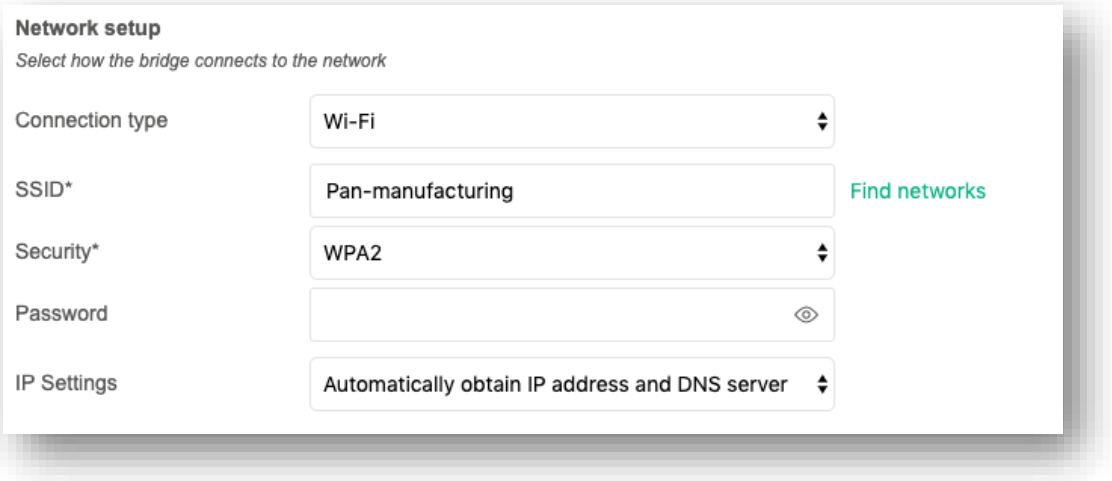


Clicking 'Find networks', shows a list of networks in your vicinity:



Note If the expected Wi-Fi network was not found, or if no network was found at all, click the **Find Networks** button again to re-attempt to search for networks.

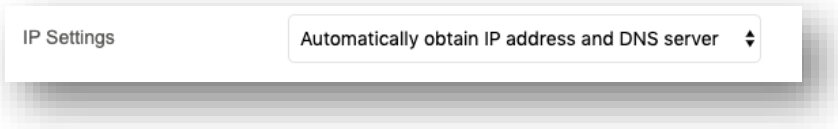
4. Select the network you want to use and click Apply.



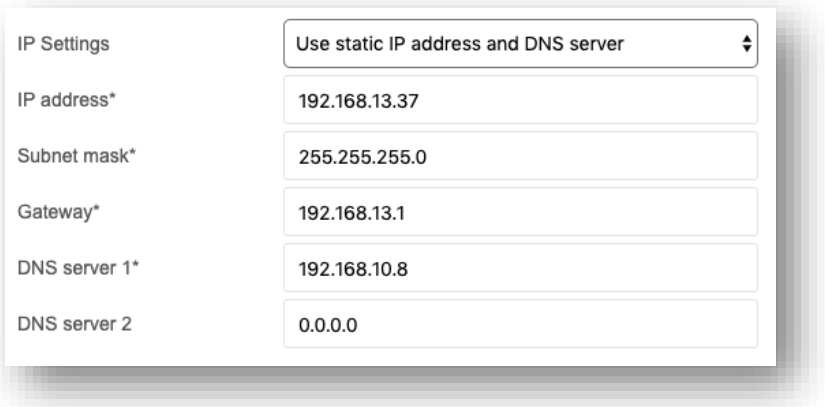
5. For Open, WEP, and WPA and WPA2 security, enter the Wi-Fi password in the screen above.
6. For enterprise WPA and enterprise WPA2 security, enter the username/password to be used for RADIUS server authentication.

Note WPA Enterprise / WPA2 Enterprise support the username/password mode only. Client-certificate authentication is not supported.

7. In IP Settings, select how the Bridge receives its IP address and DNS settings. By default, both are provided by the DHCP server:



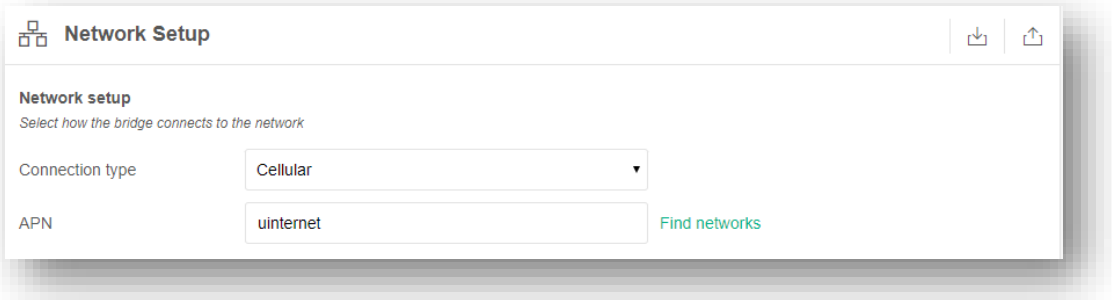
8. Other options provide the ability to specify a static IP address or static DNS server address:



9. To save the configuration to the Bridge, click Save and Reboot.
10. To discard changes made to an unsaved configuration and return to the saved settings, click Cancel.
11. To exit configuration mode, disconnect the Bridge from the power source.
12. Install the Bridge as explained in Mounting the Bridge.
13. Reconnect the Bridge to the power source.

Configuring the Bridge for Cellular Networking

Use a SIM card if you connect to the Internet via a standard GSM/LTE network.



Prerequisites

For some SIM cards, the system fills in details automatically in the Network Setup tab. For others, you need to get the information from the SIM card supplier or the service provider.

How to Proceed

1. Insert the SIM card into the slot with the truncated end, as shown below.

2. In the Network Setup tab, Connection Type, select Cellular.
3. Enter the APN you received from the cellular network operator.
4. To save the configuration to the Bridge, click Save and Reboot.

Note: After reboot, the Bridge will be in normal mode, to continue to manage the Bridge via the UI, please place the Bridge back in config mode as explained in *Accessing the Bridge Web Interface via 'Config Mode'* on page 12.

5. Install the Bridge as explained in Mounting the Bridge.

Configuring the Bridge for Ethernet Networking

If you use Ethernet to connect to the network, follow the steps below.

Prerequisites

If you need a static IP address for the Bridge, make sure to have the network setting information ready before starting the procedure.

When connecting to the cloud-based server, with Wi-Fi and Ethernet connections, verify that the system administrator has opened the following ports for outbound communications:

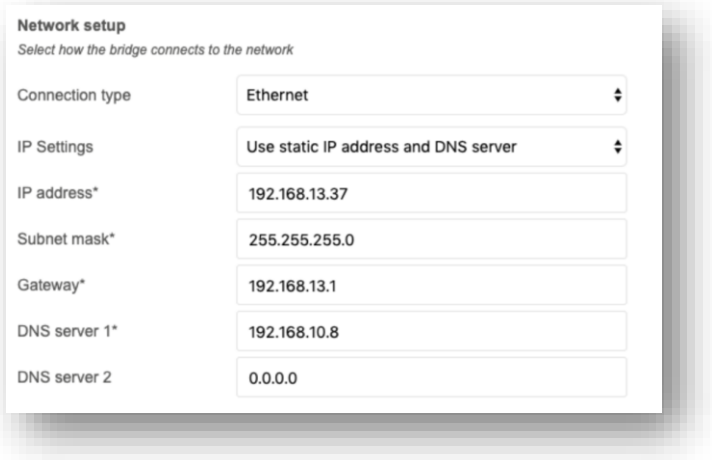
- Port 443 for outbound TCP/TLS traffic
- Port 123 for outbound NTP
- Verify that DHCP & DNS ports are open (67/68, 53) and configured.

How to Proceed

1. In the Network Setup tab, Connection Type, select Ethernet.
2. In IP Settings, select whether you want the Bridge to:
   - Automatically obtain an IP address and DNS server (using DHCP)
   - Use a static IP address and DNS server.
   - Automatically obtain an IP address and use static DNS.
   - Use a static IP address and obtain a DNS server.
3. Based on the selection in the previous step, several fields may become active (IP Address, Subnet Mask, etc.). Fill them in according to your required network settings.

4. To discard changes made to an unsaved configuration and return to the saved settings, select Cancel. Otherwise, to save the configuration to the Bridge, click Save and Reboot.

Note: After reboot, the Bridge will be in normal mode, to continue to manage the Bridge via the UI, please place the Bridge back in config mode explained in *Accessing the Bridge Web Interface via 'Config Mode'* on page 12.



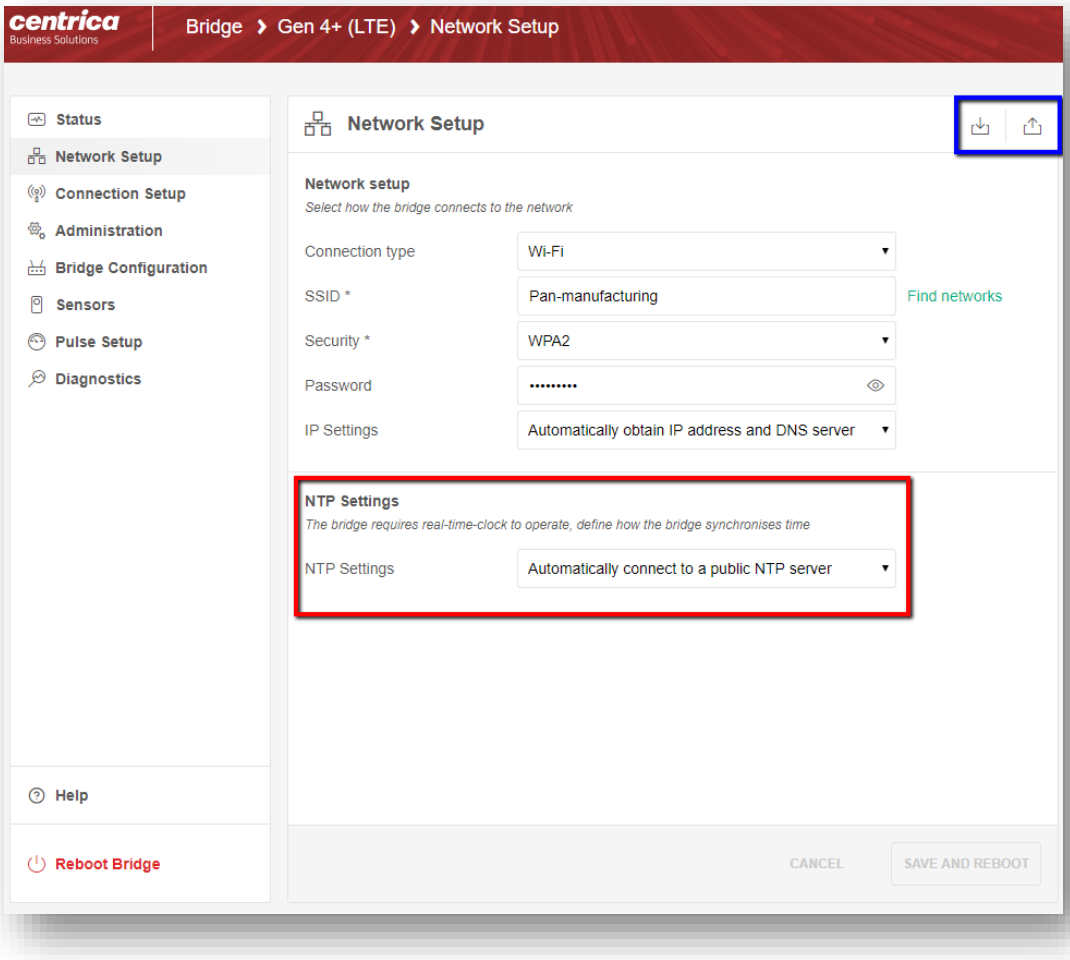
Install the Bridge as explained in Mounting the Bridge.

Network Time Protocol (NTP) configuration

To operate properly, the Bridge requires accurate time-of-day information. After reset, the Bridge gets this information using the standard NTP protocol. This protocol is also used to periodically verify the accuracy of the internal clock.

By default, the Bridge uses a set of predefined publicly accessible NTP servers. In this mode, when using a corporate (Ethernet or Wi-Fi) network, a firewall rule allowing outbound NTP access is required.

Alternatively, a dedicated NTP server address can be specified. This mode is useful for deployments within corporate networks, when the NTP Bridge is internal. In this case, there is no need to open the NTP firewall port.



Import / Export Network Configuration

The '*Network Setup*' tab contains two buttons for exporting and importing the network configuration (see highlighted in blue in the image above). This can be used by installers of multiple Bridges with similar network configurations in the following way:

- Configure one Bridge with network parameters
- Export the configuration
- Edit the configurations where necessary (e.g. to add the Wi-Fi password which is not saved during export)
- Import the configuration to other Bridges.

Export:

Export network configuration will allow you to save each of the network settings to a text file in INI format.

Note: Wi-Fi passwords will not be saved to the file. The format of the configuration file is covered in '*Network export file structure*' on page 44.

Import:

Import network configuration will allow you to upload each of the network settings from a text file in INI format.

Note: Wi-Fi passwords are not saved in the file and should be added manually before importing.

Bridge Connection setup

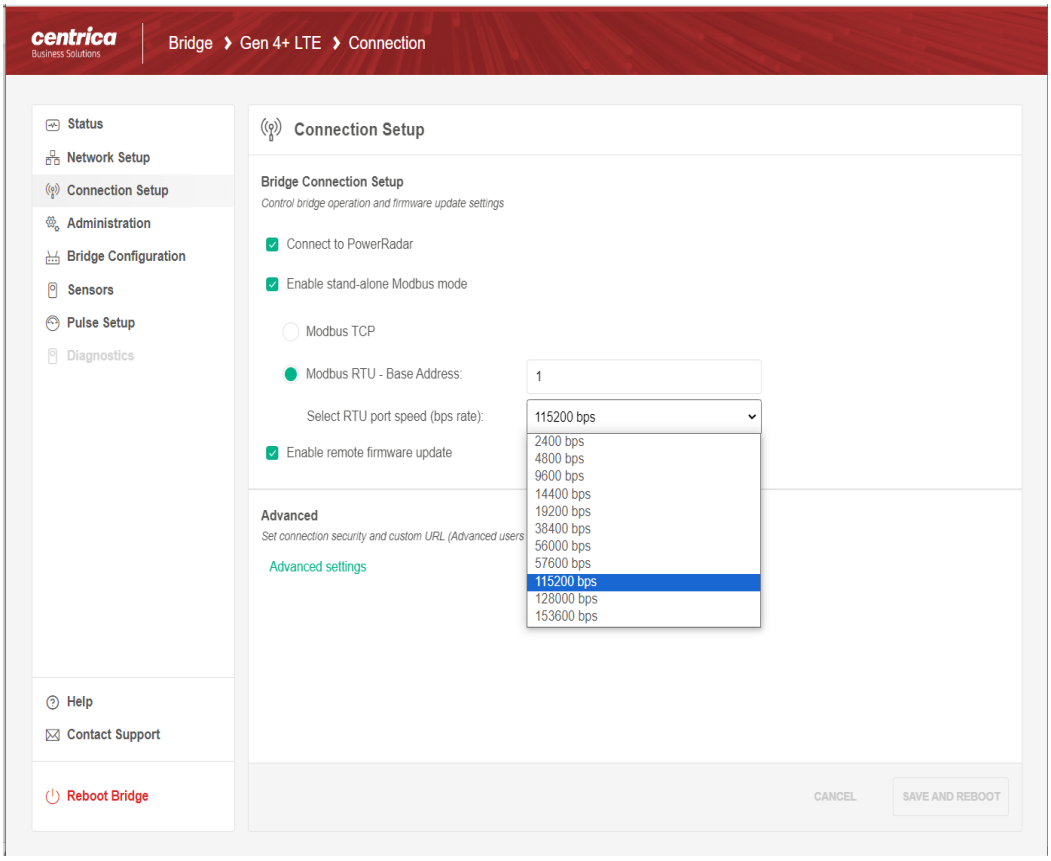
The '**Connection Setup**' tab, configures the main Bridge operating mode. Panoramic Power Bridges can have three operating modes:

- **Connect to PowerRadar** – This is the default mode in which all sensor data received is sent to the cloud for processing and display. This mode is used by customers who use the cloud-based server for data analytics and processing or those who use the platform's cloud base export.
- **Stand Alone Mode (Modbus)** – In this mode the Bridge processes and displays sensor readings locally. It makes these readings available in the Bridge UI and via Modbus TCP or RTU interface to be read by a Modbus master server. This mode does not require cloud access and is used to integrate sensor data to local 3rd party systems.
- **Dual mode** - Both options above can be activated simultaneously allowing sensor data to be sent to the platform and processed locally at the same time.

How to Proceed

1. In the Connection Setup tab, apply the right checkbox based on the desired mode:
    - Check Connect to PowerRadar to establish connection and send sensor data to the cloud.
    - Check Enable stand-alone Modbus mode to enable processing of sensor data locally and to enable a local Modbus interface to be used to retrieve sensor data. Select either Modbus TCP or select Modbus RTU and provide the Base Address in the field (1 to 247).
    - Check Enable remote firmware update to allow the server to periodically upgrade the Bridge firmware when a new version is available. This option is only supported when Connect to PowerRadar is checked.
2. By default, the connection to the cloud-based server (if enabled) will be using TLS. To change the default connection URL or protocol, click Advanced Settings.

3. To discard changes made to an unsaved configuration and return to the saved settings, select Cancel. Otherwise, to save the configuration to the Bridge, click Save and Reboot.



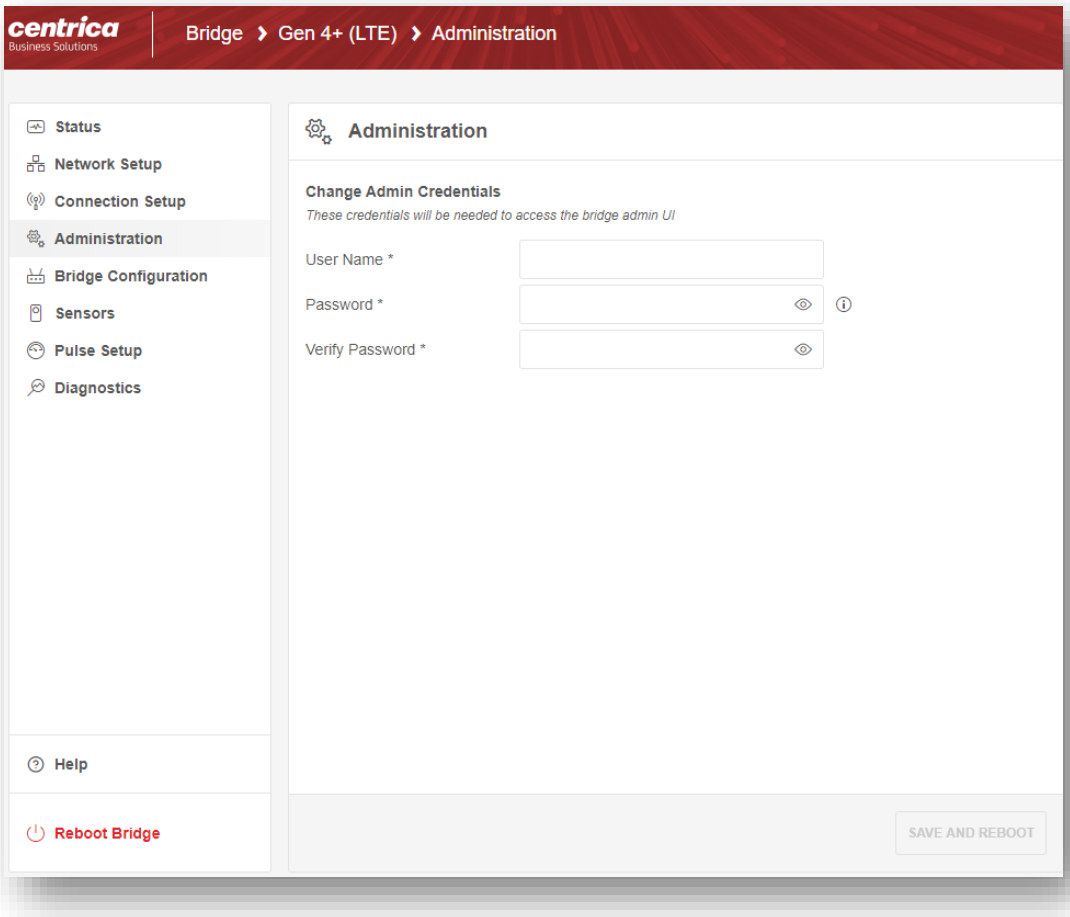
Bridge Administration and Configuration

Bridge Administration

In the Bridge administration tab, you can change the default username and password required to access the Bridge.

How to Proceed

1. Access the Bridge web interface.
2. Select the Administration tab
3. Enter the new User Name and Password.
4. In the Verify password field, enter the new password again.
5. Select.



Bridge Configuration

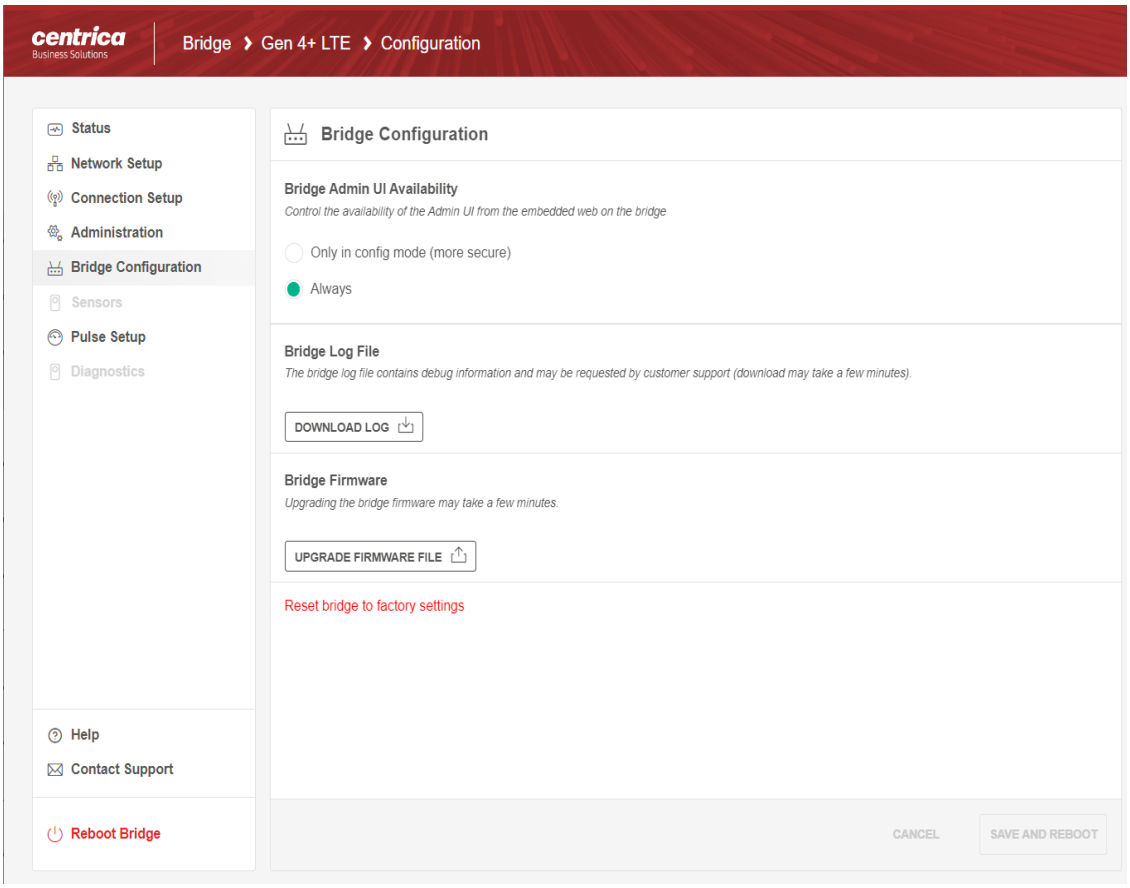
The Bridge configuration tab controls from where the Bridge administrative UI will be accessible.

By default, and for enhanced security, the Bridge admin UI is only accessible while in config mode. This is explained in Accessing the Bridge Web Interface via 'Config Mode' on page 12.

It is possible to make the Bridge admin UI accessible always even during normal Bridge operations. This mode will only work in Ethernet or Wi-Fi networking and would require that the accessing device knows the Bridge IP address and has route to the Bridge.

How to Proceed

1. Access the Bridge web interface.
2. Select the Bridge Configurations tab
3. Choose the availability of the Bridge admin UI
4. Select Save and Reboot.



Note: Setting *Bridge Admin UI availability* to *Only in config mode* is the most secure option since it mandates physical access to the Bridge for configuration. When placing the Bridge in 'Always' mode it is strongly advised to change the Bridge admin password to prevent unauthorized access.

Downloading the Bridge Log File

The Bridge log file contains debug information and may be requested by customer support. Once the "Download Log" option is clicked on, the size of the file will display and increase until the download is complete. The log will be a ".txt" file type and will be found in your Downloads folder.

Upgrading the Bridge

The user can upgrade the Firmware from the Bridge Configuration screen.

Pressing the "Upgrade Firmware File" button will open a file selection window to select a file from the local disk. Select the Firmware file (pan_gen_.....fw) and press the "Open" button.
The Bridge will start uploading the file from the disk. The Bridge power LED will blink Red (the same as in USB or remote upgrade). At the end of the process, there will be a note on the screen and the Bridge will restart.

Resetting the Bridge Configuration to Factory Defaults

Important Restoring to factory defaults will erase all your Bridge data and settings and revert to Ethernet networking.

How to Proceed

1. Access the Bridge web interface.
2. Select Bridge Configuration.
3. Click Reset to factory default at the bottom of the page.
4. At the prompt, click OK.
5. The Bridge will reboot with factory setting.
6. Follow the steps described in *'Initial Bridge Configuration'* on page 12 to reconfigure the Bridge using config mode.

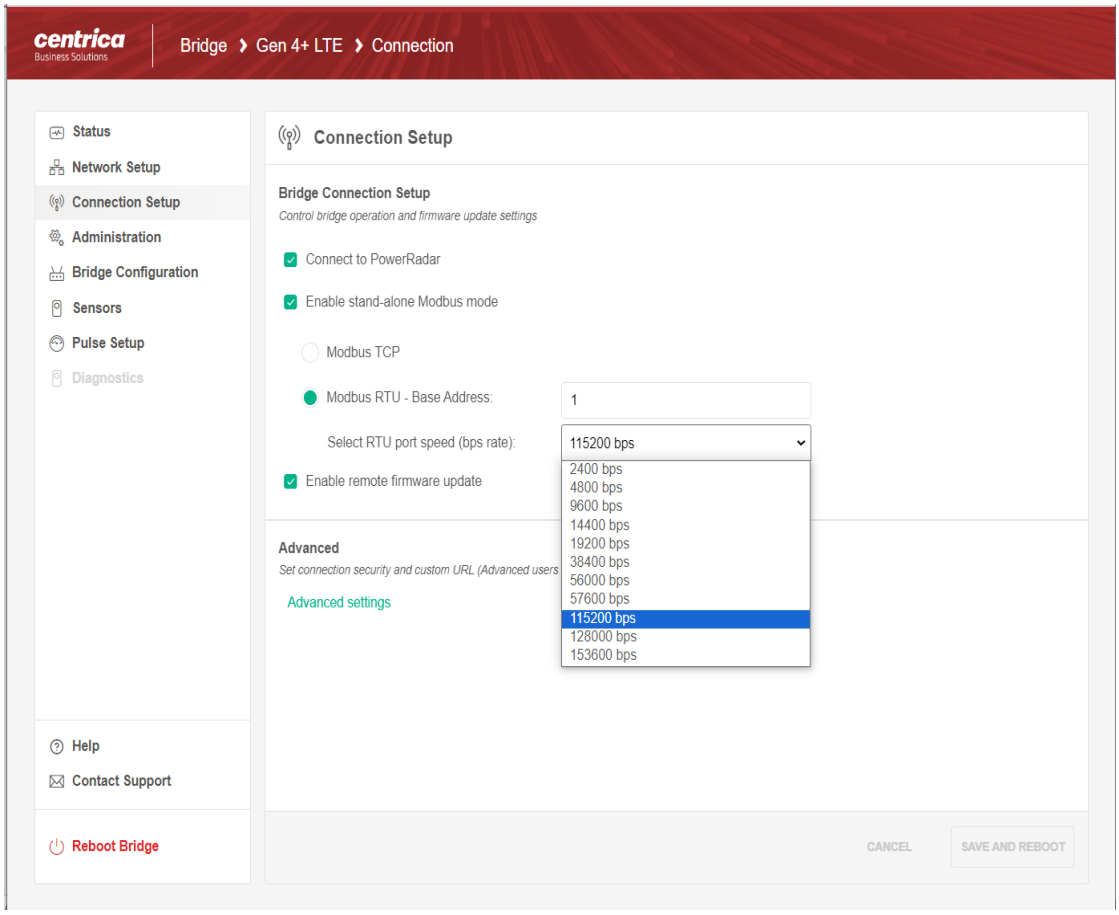
Starting with firmware V470, the Bridge can operate in stand-alone mode. In this mode, sensor data is stored and displayed on the Bridge itself and can be made available to an external Modbus server.

Enabling stand-alone mode

By default, the stand-alone mode is disabled, and the Sensors tab is also disabled. To enable the stand-alone mode:

1. In the Connection setup tab, select the checkbox next to Enable stand-alone Modbus mode.
2. This mode can work in conjunction to Connect to PowerRadar mode.
3. Select the Modbus connection type: Modbus TCP or Modbus RTU.
4. When selecting the Modbus RTU, enter the Base Address (1 to 247).
5. Set the RTU connection rate by selecting a port rate (bps) from the dropdown menu

6. Click Save and Reboot to make this change in the Bridge
7. When the Bridge reboots, the Sensors tab will become enabled and allow the configuration of sensors to process.



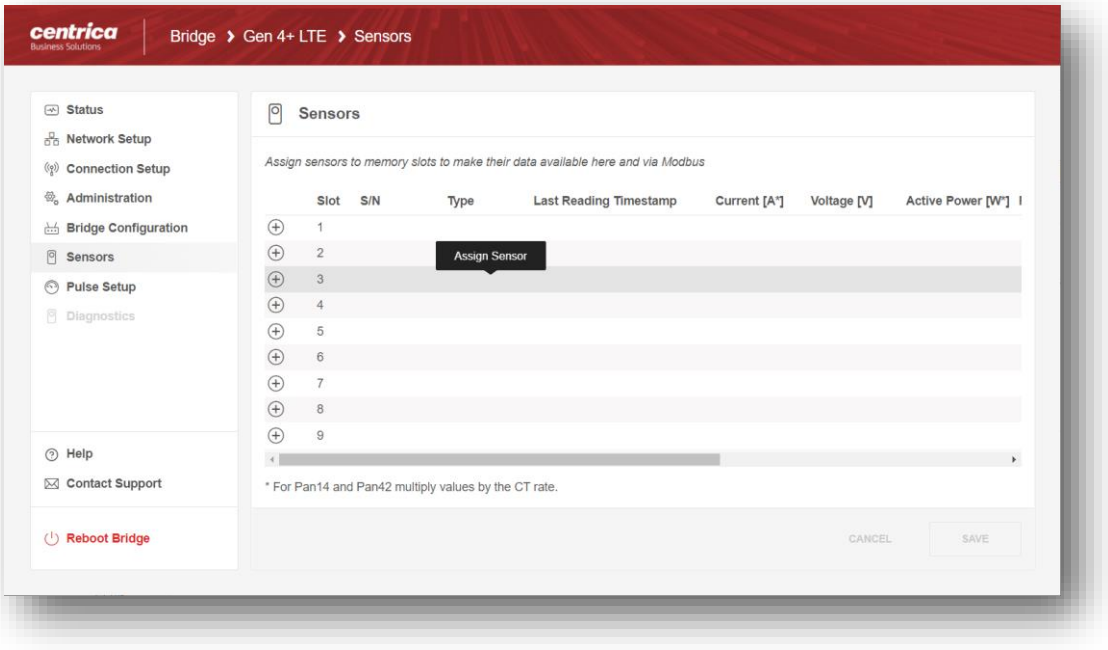
The Sensors tab

When working in stand-alone mode, the Bridge can store readings of up to 32 data points (A single phase sensor or a phase in a 3-phase sensor), display them in the Sensors tab and make them available via Modbus.

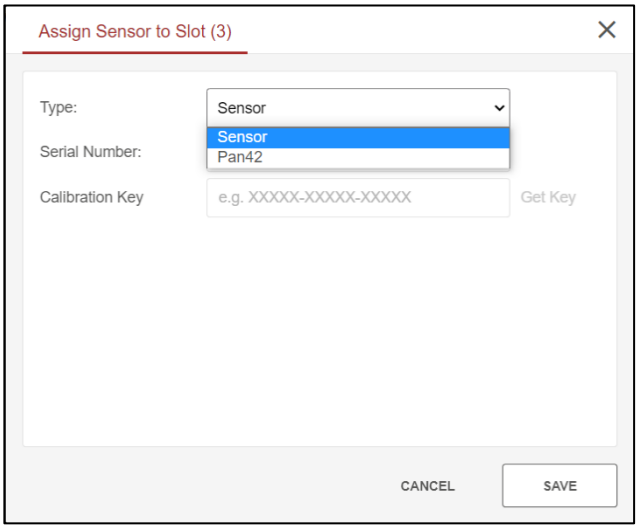
In stand-alone mode, each sensor (identified by its serial number) is assigned to a slot (a 3-phase sensor is assigned to 3 consecutive slots). Whenever the Bridge receives a reading from this sensor, it updates the slot readings and makes it available to be retrieved by Modbus. This way each sensor is always located in a specific location.

Assigning a sensor to a slot

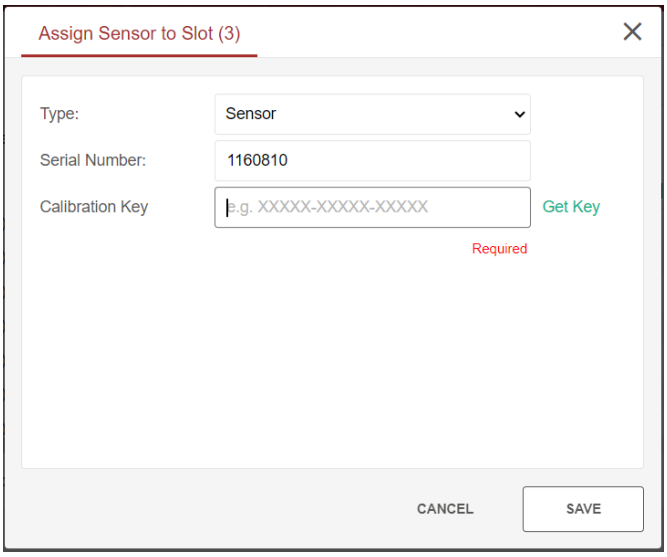
1. In the Sensors tab, select the slot to which you want to assign the sensor.
2. Hover with the mouse over the relevant row (slot) and click Assign Sensor or on the + sign.



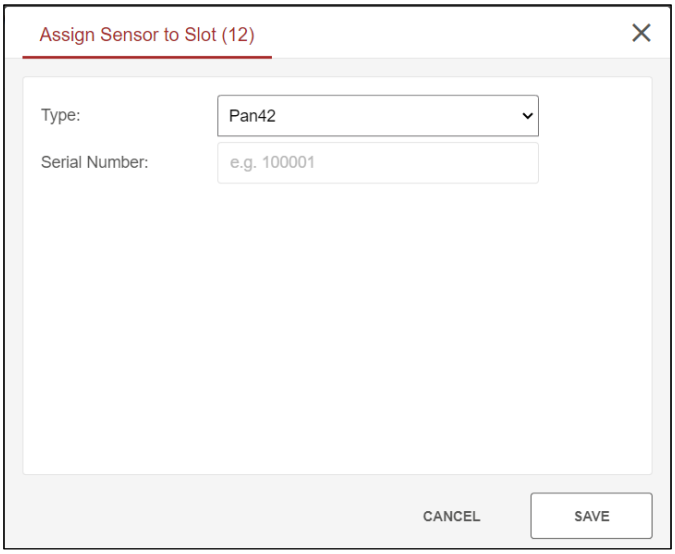
3. In the popup dialog choose the Type of sensor:



4. For other than PAN-42, Provide the serial number of the sensor to use and move to the Calibration Key field



5. Type the calibration key if you have it or click 'Get Key' to have it automatically retrieved and inserted (The web site must be reachable from the configuration laptop).
6. Click Save to populate the slot and close the pop-up window.
7. To add a PAN-42 sensor, select the Pan42 from the Type menu:



8. Type the sensor's serial number. The sensor is registered in 3 slots (for 3 phases).
9. Press the Save button.

Note 1: Stand-alone mode supports the following sensor types: PAN-10, PAN-12, PAN-14 and up to 3 PAN-42 sensors.

Note 2: The calibration key is a unique, per-sensor, value used by the Bridge to calibrate each reading for accuracy. It is a mandatory, sensor specific, value.

Note 3: When clicking 'Get Key, your browser communicates with the software to get the calibration key. It is, therefore, essential that the laptop has Internet connectivity.

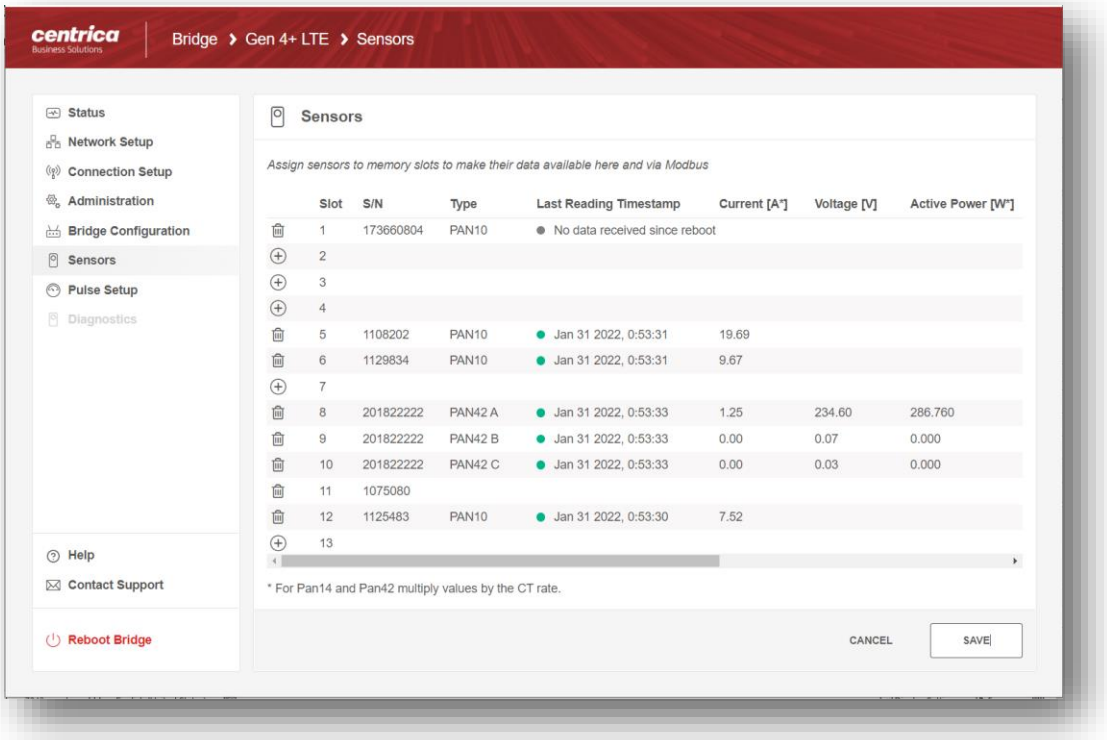
Note 4: If having issues retrieving the calibration key, please contact support who can provide an offline list of calibration keys to be entered manually.

10. Repeat this for as many slots as needed.
11. Once complete, click Save Settings at the bottom of the tab to flush the updated table to the Bridge memory.

Viewing sensor data

Once a sensor has been assigned to a slot, every sensor reading received by the Bridge will be displayed in the table.

The table will always show the latest reading received. A new reading will override the previous one.

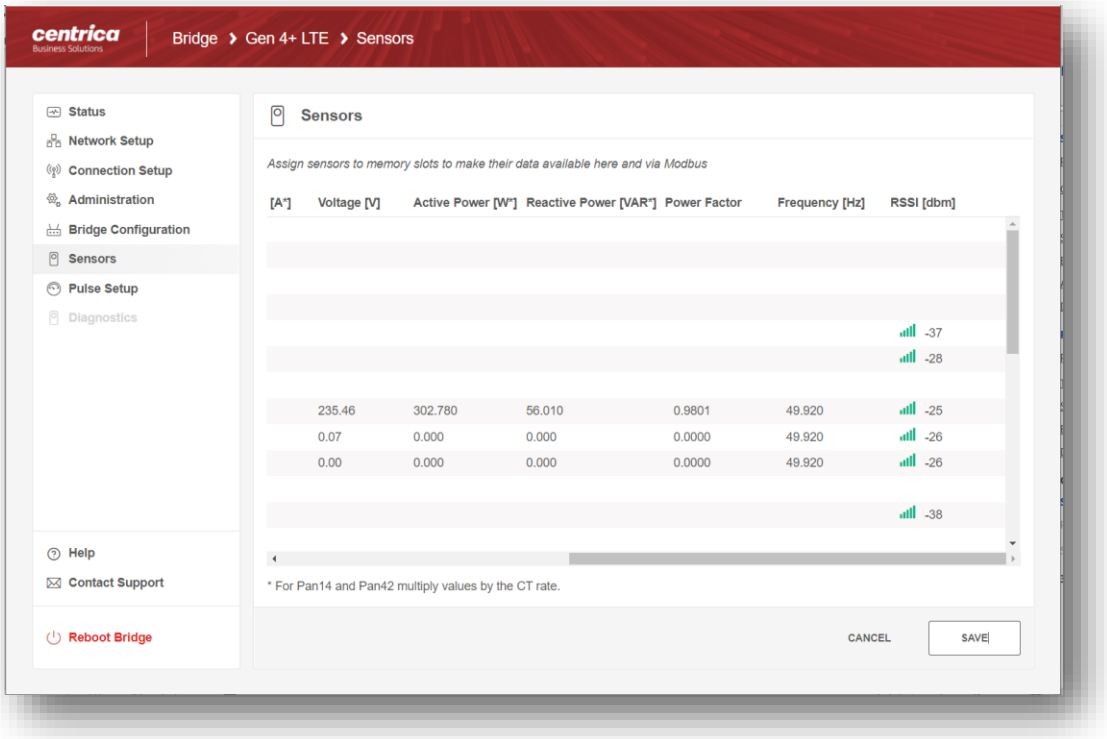


Information displayed includes:

- Slot number
- Serial Number of the sensor assigned to this slot

- Sensor type
- Last reading timestamp as measured by the Bridge RTC clock
- Last **Current** reading in Ampere
- The reception level[2] of the recent message (**RSSI**)

Scroll Right for additional readings:



Note 1: The information provided here is also available via the Modbus TCP/RTU interface. Please refer to the *Bridge Programmers Guide* for more information.

Note 2: The current readings shown here have already been individually calibrated by the Bridge for accuracy, using the calibration key.

Note 3: PAN-10 and PAN-12 current readings can be used as-is. For PAN-14, these values should be multiplied by the CT Rate of the CT used.

For PAN-42, the table will show the following additional values:

- **Voltage [V]**: The last measurement in Volts RMS
- **Active Power [W]**: The last measurement in Watts

[2] This indicates how well the sensor message is received by the Bridge.

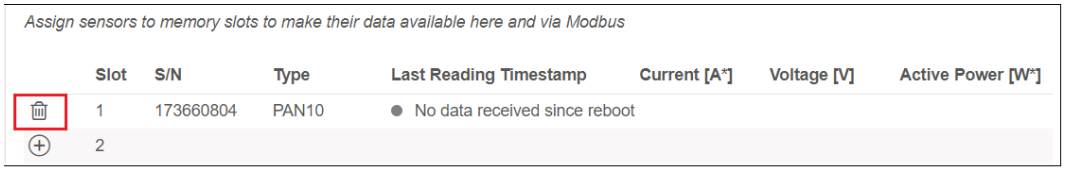
- **Reactive Power [VAR]:** The last measurement in VARs
- **Power Factor**: The last measurement power factor
- **Frequency [Hz]**: The last measurement in Hertz

Note 4: For PAN-42 the current, active power and reactive power reading values should be multiplied by the CT-Rate of the CT used.

Removing a sensor from a slot

It is possible to remove a sensor from a slot.

1. In the Sensors tab, select the slot you want to edit or clear.
2. Click the trash icon to empty this slot (remove the assigned sensor). Confirm the delete



3. You can delete a PAN-42 sensor by pressing the Trash-Can at any of the 3 sensor lines, all 3 lines will be deleted.

Once complete, click Save at the bottom of the tab to flush the updated table to the Bridge memory.

Configuring the Pulse Inputs

If you connect the Bridge to a meter's pulse output, you will need to enable the pulse inputs in the Bridge configuration.

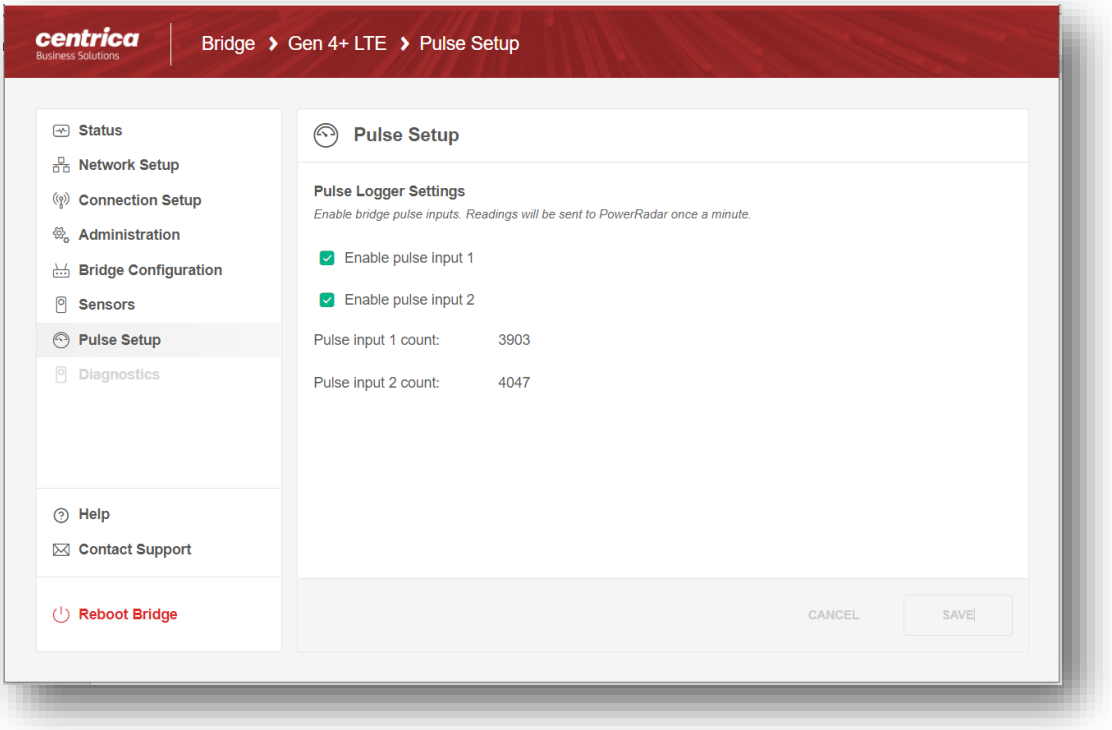
Prerequisites

Have the pulse outputs connected to the pulse input connectors on the side of the Bridge.

How to Proceed

1. In the Pulse Setup tab, select the checkbox next to the pulse input you want to enable
2. The Bridge counts the pulses automatically. The counters update every 10 seconds.
3. When connected to the platform, the pulse count is sent to the platform automatically.
4. When Stand-alone (Modbus TCP/RTU) mode is enabled, the pulse reading is available via Modbus TCP/RTU.

5. Pulse inputs are of type KY (2 terminals) but the counter counts both the Rising and Falling edges of the pulses. If the connected device is of type KY, you need to divide the reported counter value by 2. If the connected device is of type KYZ, connect either the K and Y terminals or the K and Z terminals. You do not need to divide the reported counter value by 2.



Upgrading the Bridge Firmware

This section explains how to upgrade the Bridge to the latest firmware version.

Upgrading using a USB stick

Prerequisites

Make sure you have a USB flash drive with the upgraded firmware, or a FAT-32 formatted USB flash drive if you need to download the firmware from your email account.

How to Proceed

1. Download the firmware to the root directory of the USB flash drive, if necessary.
2. Make sure the firmware file name is **pan_gen.fw** in the root directory of the USB flash drive. If the name is different, change it to pan_gen.fw.
3. Connect the USB flash drive to the USB port on the Bridge. The power LED will turn off for a short blink. This tells you that the Bridge recognized the USB flash drive.

4. If you boot the Bridge, wait for the LED self-test sequence to end. Note that this is relevant only if the Bridge is not yet operational.

Note If you proceed to the next Step before the self-test sequence ends, the Bridge enters configuration mode rather than upgrade mode.

5. If the Bridge is connected to the LAN network, disconnect it from the LAN network.
6. Press the Configuration button for approximately 20 seconds. After 5 seconds the Rx LED Red turns on to show that you can enter to configuration mode (by releasing the button). Keep pressing the button and the Rx Red LED will turn off. After approximately 20 seconds the ⏻ LED will turn Orange (Red and Green). You can release the button.
7. The ⏻ LED lights Orange. All other LEDs are off. The Bridge is in firmware upgrade mode.
8. Wait several minutes for the upgrade process to complete (up to 5 minutes). When the Bridge loads the file into the internal flash, the ⏻ LED blinks fast in Orange. Then, the Bridge reboots, the blinks stop shortly and starts blinking Orange again while the firmware is installed into the controller.

After a successful upgrade the Bridge will reboot. The ⏻ LED lights green, and the Bridge returns to normal operation. A LED self-test sequence occurs, and the Bridge returns to normal operation.

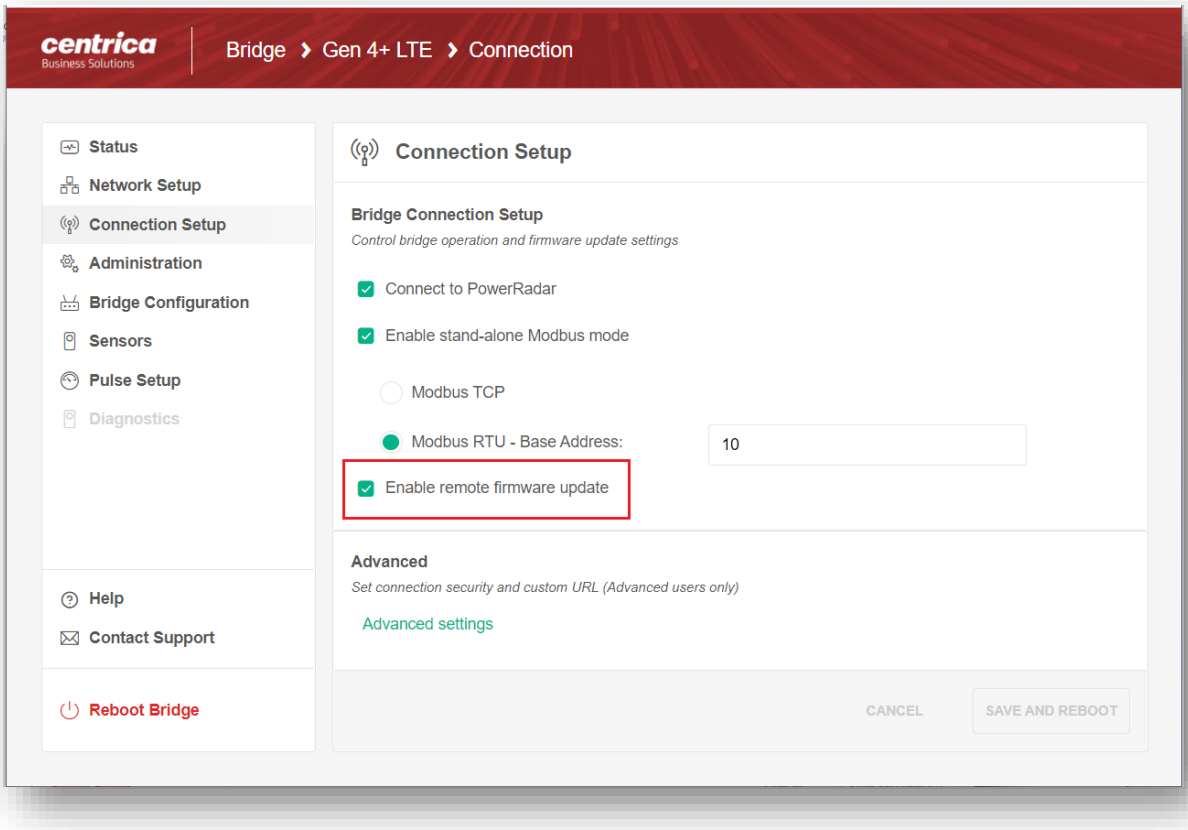
9. Disconnect the USB flash drive.

Note 1: If the firmware file is missing, the Bridge will blink the ⏻ LED and the Rx LED in Red, three times, and stop the upgrade process.

Note 2: If the firmware version on the USB drive is identical to the one installed, the Bridge will blink the ⏻ LED and the 🔗 LED in Green, three times, and stop the upgrade process. The Bridge will not be updated, and the power LED will turn red. A lower version will result in downgrading the Bridge's firmware and a reset of the Bridge configuration.

'Over the air' firmware upgrades

When connected to the cloud-based server, the Bridge can automatically receive firmware upgrades from the cloud. To enable this feature, go to the Connection Setup tab and check Enable remote firmware updates.



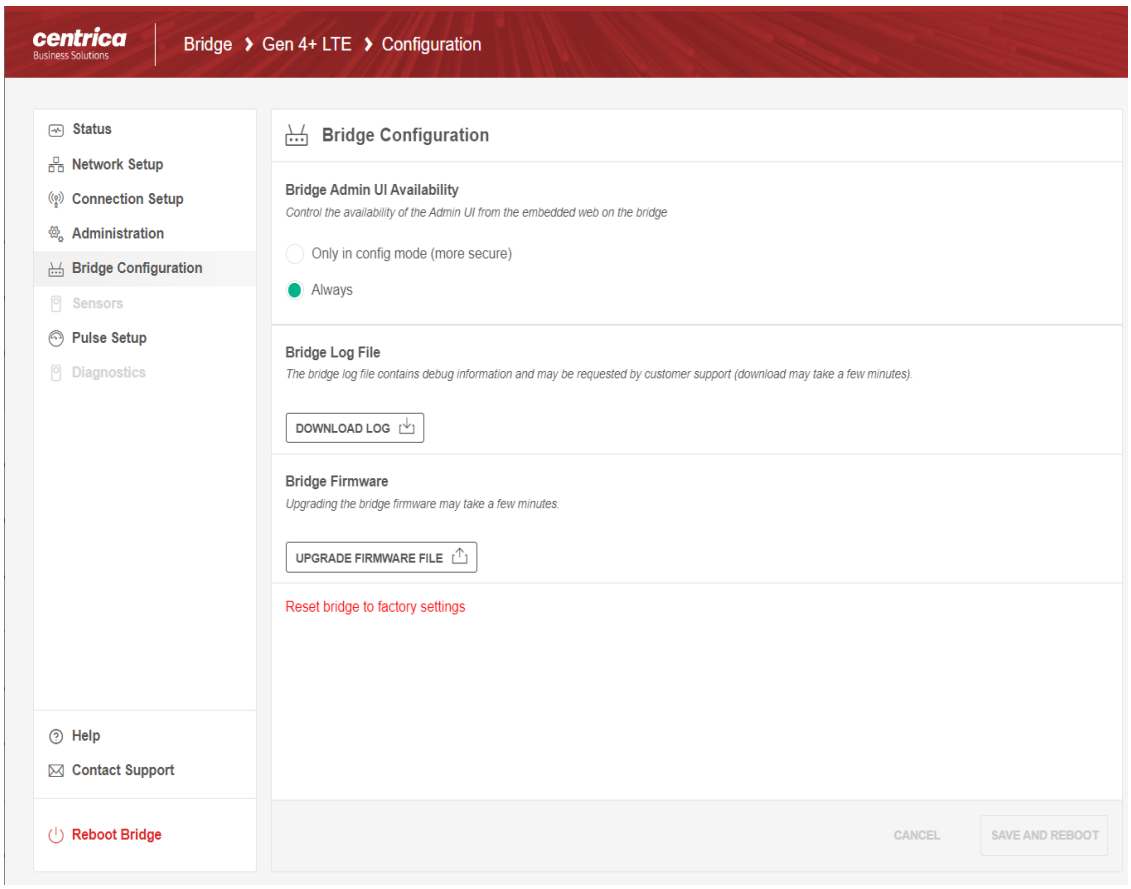
Note 1 To complete the setup, please also enable firmware updates on the platform's Bridge settings. Please refer to the software documentation for more information.

Note 2 Over the air firmware updates only work when the connection to the server is secure (over TLS port 443). It will not work is If the Bridge is set to TCP connectivity.

Upgrade through the Configuration Tool UI

The user can upgrade the Firmware from the Bridge Configuration screen.

Pressing the "Upgrade Firmware File" button will open a file selection window to select a file from the local disk. Select the Firmware file (pan_gen_.....fw) and press the "Open" button.
The Bridge will start uploading the file from the disk. The Bridge power LED will blink Red (the same as in USB or remote upgrade). At the end of the process, there will be a note on the screen and the Bridge will restart.


centrica
Business Solutions
Bridge › Gen 4+ LTE › Configuration
Status
Network Setup
Connection Setup
Administration
Bridge Configuration
Sensors
Pulse Setup
Diagnostics
Help
Contact Support
Reboot Bridge
Bridge Configuration
Bridge Admin UI Availability
Control the availability of the Admin UI from the embedded web on the bridge
Only in config mode (more secure)
Always
Bridge Log File
The bridge log file contains debug information and may be requested by customer support (download may take a few minutes).
DOWNLOAD LOG
Bridge Firmware
Upgrading the bridge firmware may take a few minutes.
UPGRADE FIRMWARE FILE
Reset bridge to factory settings
CANCEL
SAVE AND REBOOT

Troubleshooting & Diagnostics

Hardware based 'Revert to factory settings'

When reverting the Bridge to factory settings, all Bridge configuration is erased and returned to its factory default (including the Bridge admin credentials). This procedure can be done from the admin UI or using a special hardware interface sequence.

The admin UI method is covered in *The user can upgrade the Firmware from* the Bridge Configuration screen.

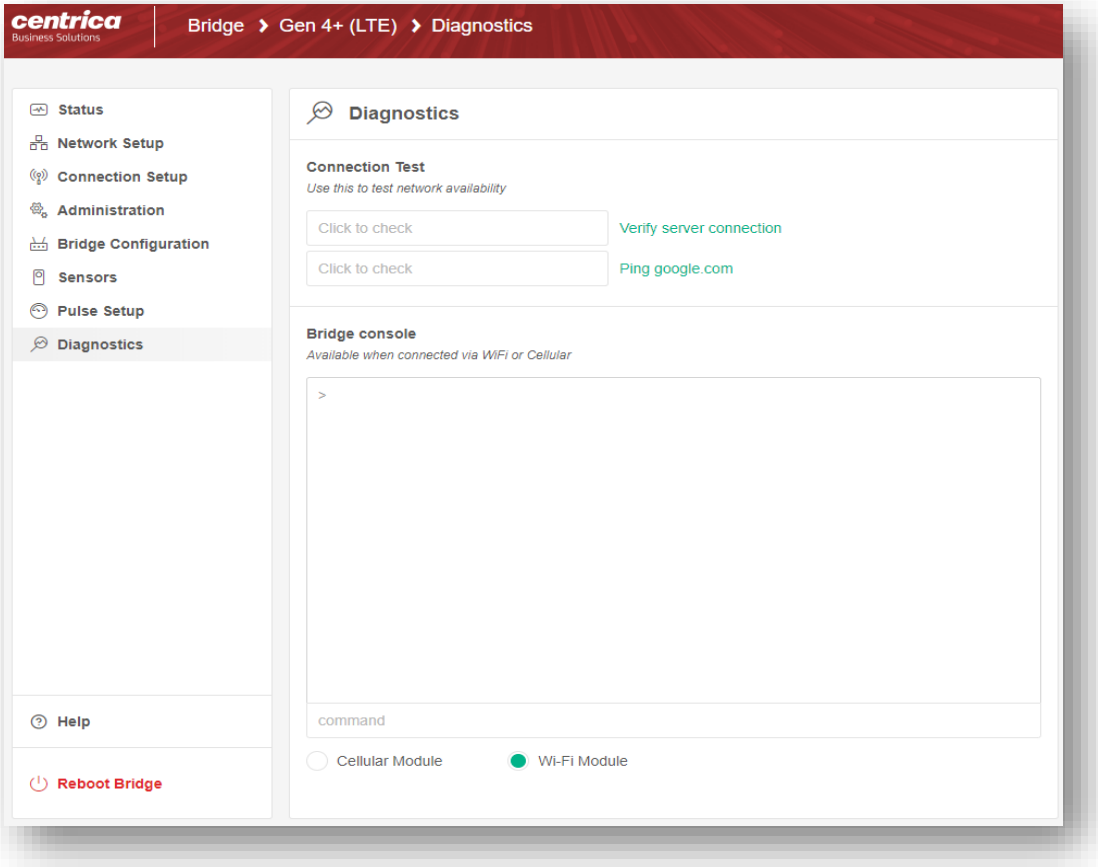
Pressing the "Upgrade Firmware File" button will open a file selection window to select a file from the local disk. Select the Firmware file (pan_gen_.....fw) and press the "Open" button.
The Bridge will start uploading the file from the disk. The Bridge power LED will blink Red (the same as in USB or remote upgrade). At the end of the process, there will be a note on the screen and the Bridge will restart.

Resetting the Bridge Configuration to Factory Defaults on page 26. However, this method requires knowledge of the Bridge credentials to access the UI.

When the Bridge admin interface cannot be accessed (due to unknown credentials or other reasons), it is possible to perform a hardware factory as described below:

How to Proceed

1. Remove all connections or cables from the Bridge.
2. Connect the Bridge to the power source.
3. Press the Configuration button for approximately 5 seconds, until the Rx LED lights solid red. The Bridge is now in configuration (Config) mode.
4. Press the Configuration button five (5) times at a rate of one press per second.
5. The Bridge should now reboot with default factory settings
6. If the Bridge does not reboot, you may need to re-try steps 1 through 4 again a few times, until the Bridge reboots.

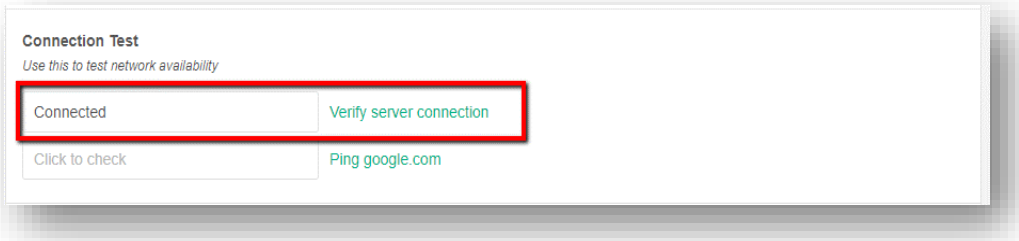


The Diagnostics tab

The Diagnostics tab is where you can test the Wi-Fi or cellular connection while in config mode. This Tab is only available when connected in Config mode

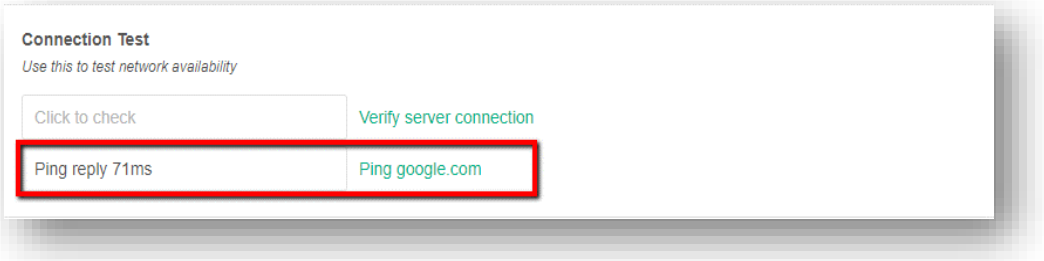
How to Proceed

1. Access the Bridge web interface as explained in *Accessing the Bridge Web Interface via 'Config Mode'* on page 10.
2. Select the Diagnostics Tab.
3. Click Verify server connection to make sure the Bridge communicates with the cloud-based server.



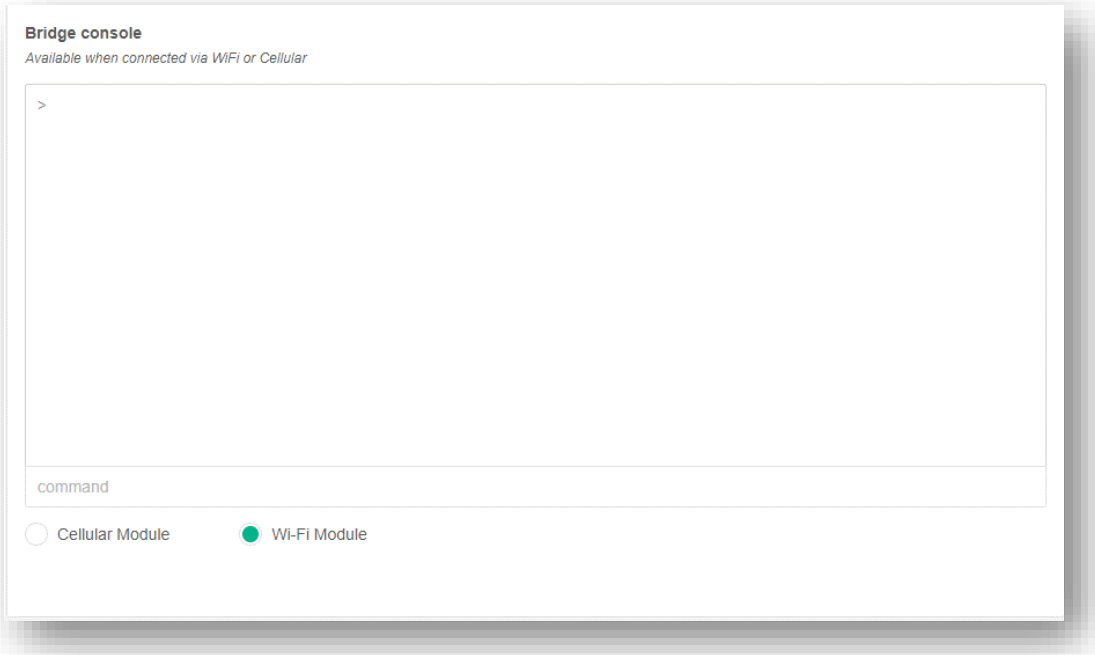
Note: This method will work only for Wi-Fi and Cellular networking modes. It will not work in Ethernet mode, since in Config Mode the Bridge's Ethernet cable is connected to the Configuration laptop.

4. Click Ping to google.com to make sure the Internet connection is working.



Bridge Console

The Bridge console is for Panoramic Power technician use only and should not be used by end customers unless directed by customer support.



Troubleshooting

If you encounter a problem, try the solutions listed in this section.

Otherwise, contact Customer Support for help by submitting a support ticket at https://www.powerradar.energy/support .

Problem

The Bridge is not receiving sensor data (the Rx LED is off).

Solutions

Try moving the Bridge closer to the electrical panel.

Verify the position of the sensors in the electrical panel: make sure they are visible or try moving them to the front of the panel.

Make sure the RF antenna is tightly screwed into the antenna connector of the Bridge.

Make sure the Bridge is not in configuration mode (the Rx LED lights red).

Problem

The Bridge does not connect to the cloud-based server (the LED does not turn solid green).

Solutions

If you are using Ethernet:

Look at the LAN port (RJ-45 connector) on the Bridge. It contains two small built-in LEDs. One of them should light solid green and the other should be blinking orange. If this does not happen, tighten both ends of the LAN cable or replace it.

If the LED blinks green but does not turn solid, it means that local network connectivity is established but the Bridge cannot access the cloud-based server. This is often caused by local firewalls blocking TCP port 8051. Please verify this with your system administrator.

If you are using Wi-Fi:

Verify the wireless network reception strength in the status page. The level should be at least two, preferably three (out of five).

If no reception level is showing and “Connecting...” is shown instead, it means that the Bridge cannot establish Wi-Fi network connectivity. In this case, please verify your Wi-Fi credentials (SSID, Security Type or password).

If the LED blinks green but does not turn solid, it means that local network connectivity is established but the Bridge cannot access the cloud-based server. This is often caused by local firewalls blocking TCP port 8051. You can verify this using the Diagnostics tool or with your system administrator.

If you are using cellular:

Verify the cellular network reception strength in the status page. The level should be at least three (out of five).

If no reception level is showing and “Connecting...” is shown instead, it means that the Bridge cannot establish cellular network connectivity. In this case, please verify your cellular credentials (APN, PPP credentials where needed), and make sure the SIM card has a valid and enabled data plan.

You can test the cloud connectivity using the Diagnostics tool.

Problem

The Bridge does not connect to the cellular network when using the SIM card (LED is off).

Solutions

Make sure the SIM card is in place before connecting the Bridge to the power source.

After verifying that the SIM card is tightly secured in its slot, disconnect the Bridge from the power source and reconnect it.

Verify with your service provider that a data plan is enabled for your SIM card. The Bridge connects to the cellular data network only if the SIM card has a data plan.

In low reception areas it may take a while for the Bridge to connect. Enter configuration mode and check the reception bar in the **Status** page.

Problem

The Bridge does not return to normal operation after a firmware upgrade (LED lights red).

Solution

The upgrade was unsuccessful, and the Bridge rolled back to the previous firmware version.

How to Proceed

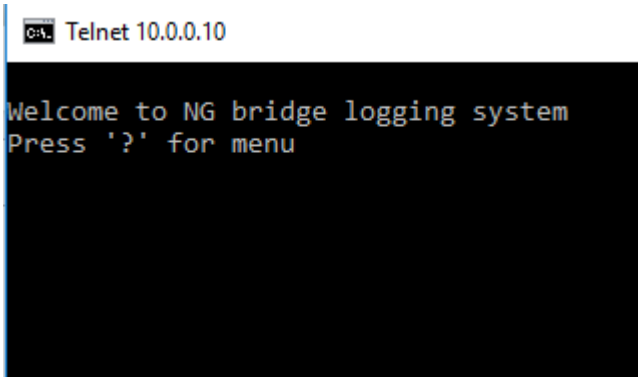
1. Disconnect the USB flash drive from the Bridge.
2. Disconnect and reconnect the power cable to the Bridge.
3. The Bridge performs a self-test and the LED lights green. The Bridge is ready for normal operation with the rolled-back version.
4. Enter configuration mode and check the running firmware version in the Status page.
5. Contact Customer Support if you need additional assistance.

Bridge Log Extraction

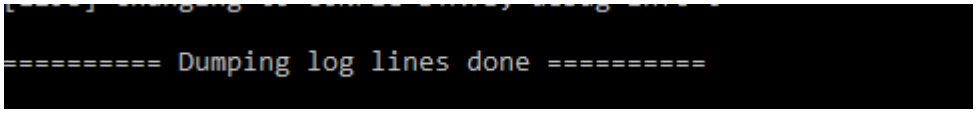
In cases where we want to investigate issues in the Bridge, there is a debug log in the Bridge.

To extract the log, follow these steps:

1. Disconnect the PC from all communication (Bluetooth, Wi-Fi, etc.).
2. Connect the PC to the Bridge and enter configuration mode as explained in Accessing the Bridge Web Interface via ‘Config Mode’ on page 10.
3. Open the command line in the console.
4. Type: ipconfig.
5. If the default gateway is 10.0.0.13, you can connect the computer to the Bridge. If not, type ipconfig /release.
6. After the operation is done, type: ipconfig/renew. Then type: telnet 10.0.0.10.
7. You will see the following screen:



8. Click ‘d’ (lowercase only as this is case-sensitive).
9. The log history will be printed on the terminal until this row appears:



10. Copy the log by right-clicking on the CMD, and then Edit Select All Ctrl C, and copy the information to a Notepad or Word file and send the file to Support via submitting a support ticket.

Check if your network blocks connection to the cloud-based server

1. Take a laptop and connect it to the same network as the Bridge.
2. Open the cmd terminal and type:

```
telnet bridges.powerradar.energy 443
```

3. If you enter a black empty screen, this means you can reach this URL from this network.
4. If you do not enter a black empty screen and instead you see the message below, it means there is likely a problem in the firewall.

```
Connecting To bridges.powerradar.energy...
```

5. If step 4 occurs, connect the Bridge via a hotspot from your cellular device and see if the Bridge can connect.
6. If step 5 was unsuccessful, the unit may have a hardware issue, please contact support.
7. If step 5 was successful – talk to the local IT – the TLS connection is probably blocked or there could be a mismatch on the port: the Bridge is working on full duplex (configure as auto on both sides) of 100baseT.
8. If auto and auto still don't work configure the switch's port to be 100 full.
9. Without a DNS server the Bridge will not be able to connect, so make sure there is an active DNS service on the network.
10. If public NTP port (123) is blocked by IT, you can supply an alternative local NTP server for the Bridge to use.

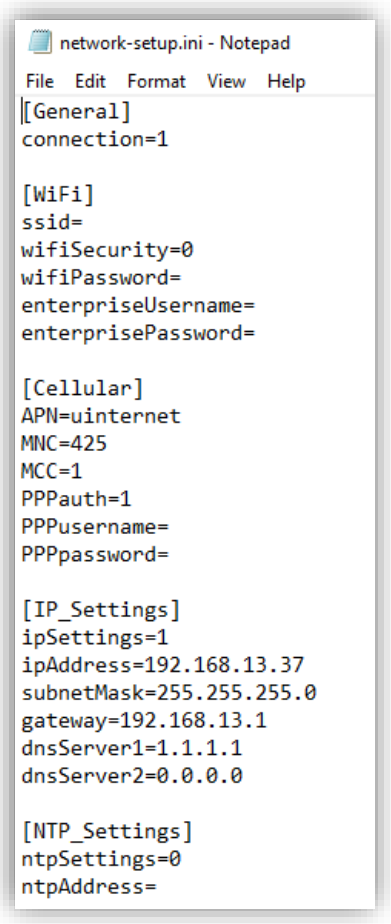
Handling failed Firmware upgrades

When upgrade was unsuccessful, the Bridge rolls back to the previous firmware version and stays in this mode. In this case the power LED ⏻ lights red

1. Disconnect the USB flash drive from the Bridge.
2. Disconnect and reconnect the power cable to the Bridge.
3. The Bridge performs a self-test and the ⏻ LED lights green. The Bridge is ready for normal operation with the rolled-back version.
4. Enter configuration mode and check the running firmware version in the Status page.
5. Contact Customer Support for further help.

Network export file structure

The following image is an example of the INI file created when exporting the Bridge network configuration. The file contains five sections with key value pairs.



Most values are self-explanatory strings, below are some values that are enumerations of possible options:

Connection:
1-Ethernet
2-Cellular
3-WIFI

wifiSecurity:
0-no Security
1-WEP 64
2-WEP 128
3-WPA
4-WPA2
5-WPA Ent,
6-WPA Ent2

ipSettings:
0-Automatically obtain IP address and DNS server
2-Use static IP address and DNS server
3-Automatically obtain IP address and use static DNS
4-Use static IP and obtain DNS server

ntpSettings:
0-Automatically connect to a public NTP server
1-Use specific NTP server

Problem

The Bridge is experiencing multiple reconnections when set to Wi-Fi connection type.

Solution

Run a Diagnostics command to determine the Wi-Fi signal strength of the Bridge.

How to Proceed

Connect laptop to the bridge and put it in Configuration Mode.

Once the Bridge is configured for Wi-Fi, check the Status page to ensure the Bridge's Wi-Fi network has at least 4 bars

If it is 3 bars or less, in the Diagnostics tab, run the following AT command in the Console field to check the RSSI signal strength:

- **AT+WRSSI=?**
- **On screen it will be:**
  AT+WRSSI=?
  -63
  OK

  RSSI (WIFI) **>=-60dBm**.

NOTE: If during installation customer have 3 bars, it is good indication that in the future he might have WIFI disconnections.

Maintenance and Servicing

Maintenance is not required. For any issues, please reach out to your Support Provider who can submit a support ticket on your behalf at:
https://www.powerradar.energy/support