ketsen

# PTP 3Gbps V2

Part Number: PTP-PV2-58

## Ketsen PTP Radio Head

The Ketsen 3Gbps PTP Radio Head is engineered for the ultimate cost to performance ratio. This radio head is a high-performance and cost-effective solution for delivering multi-gigabit connections. It can provide up to 2.5Gbps connections to 5 customers at distances of nearly 1km with high availability. The radio head is compact and sleek for inconspicuous installation in almost any environment.

## Product Overview

### Interface Definition

x5 2.5Gbps Eth with PoE in

### Power

x15W Power Consumption (Max)
48v Passive PoE in (on all 5 Eth ports)

### Mechanical Specs

Dimensions

- 9.1 x 9.1 x 5.4in (231 x 231 x 137mm)
- Weight TBD

Mounting

- Any size pipe mount provided
- +/- 30 deg vertical aiming
- Precision pole mountable bracket assembly with +/- 15º vertical aiming

### Operating Environment

-30°C - 60°C (-22ºF - 149°F)
IP67

### Wireless

- Channels Supported 2 GHz
- Operation Frequency Range: 58.32-69.12 GHz
- Modulation Type: π/2-BPSK, π/2-QPSK, π/2-16QAM
- Maximum Peak Output Power: 42.67dBm
- Radio TX Power: 41.90dBm @BPSK
- 42.67dBm@π/2-QPSK
- 35.65dBm @16QAM
- Antenna Gain: 38 dBi
- Antenna Pattern: 2 deg
- Radio Sensitivity
  -72dBm @ MCS1
  -56dBm @ MCS12

## System Requirements

Microsoft Windows 11, 10, 8, 7, Vista, XP, Linux, Mac OS X
Web Browser: Chrome, Mozilla Firefox, Safari, Microsoft Edge or Internet Explorer 8 (or above)

## What's In the Box

- 1 PTP Radio
- 2 Cable Glands
- 1 Precision Bracket
- 1 Aiming Tool

## Key Features

- Plug and play with Ketsen's CFR
- Dual firmware image with automatic rollback
- Full channel support from 58.32-69.12GHz
- Auto modulation adjustment (hitless)
- AES Encryption supported
- Improved latency and throughput
- Proprietary fast-path support
- Enhanced wireless statistics
- OTA seamless firmware upgrade support
- Automatic troubleshooting file generation support

## Standalone Configuration

The PTP radio without the MBU is unable to operate in a standalone PTP operation. Using a 48v .5A (4,5+:7,8-) POE injector (not included) it is possible to power the radio for testing, configuration and firmware updates.

## Planning

Prior to installation a network wide frequency plan should be coordinated. Consideration for the given topography, climate, interferences and other challenges will need to be considered.

## Colocation

6 Channels at 2160MHz

## Line of Sight

Clear line of sight PTP with no obstructions

## Other Requirements

Typical J-Arm installation or 50mm pole

Mounting hardware is all properly grounded per local building codes.

# Setup and Installation

## Powering Unit over POE Injector

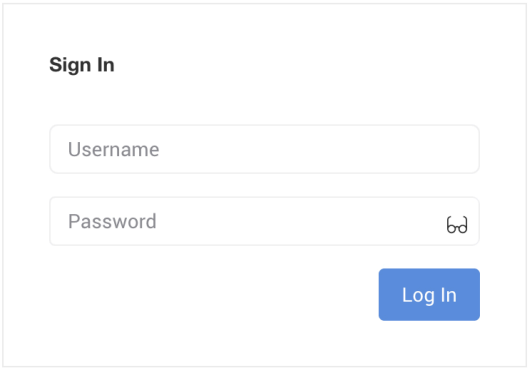
1. Grab a Cat6 Ethernet cable.
2. Plug one end of the cable into the LAN port on the Power over Ethernet (PoE) injector.
3. Plug the other end of the cable into an Ethernet port on your computer.
4. Take another Cat6 cable and connect one end to the POE port on the PoE injector.
5. Plug the other end of the Cat6 cable into the Eth0 on the radio.
6. Finally, plug the power adapter into the PoE injector and connect it to a power outlet.

## Configure your Network Settings

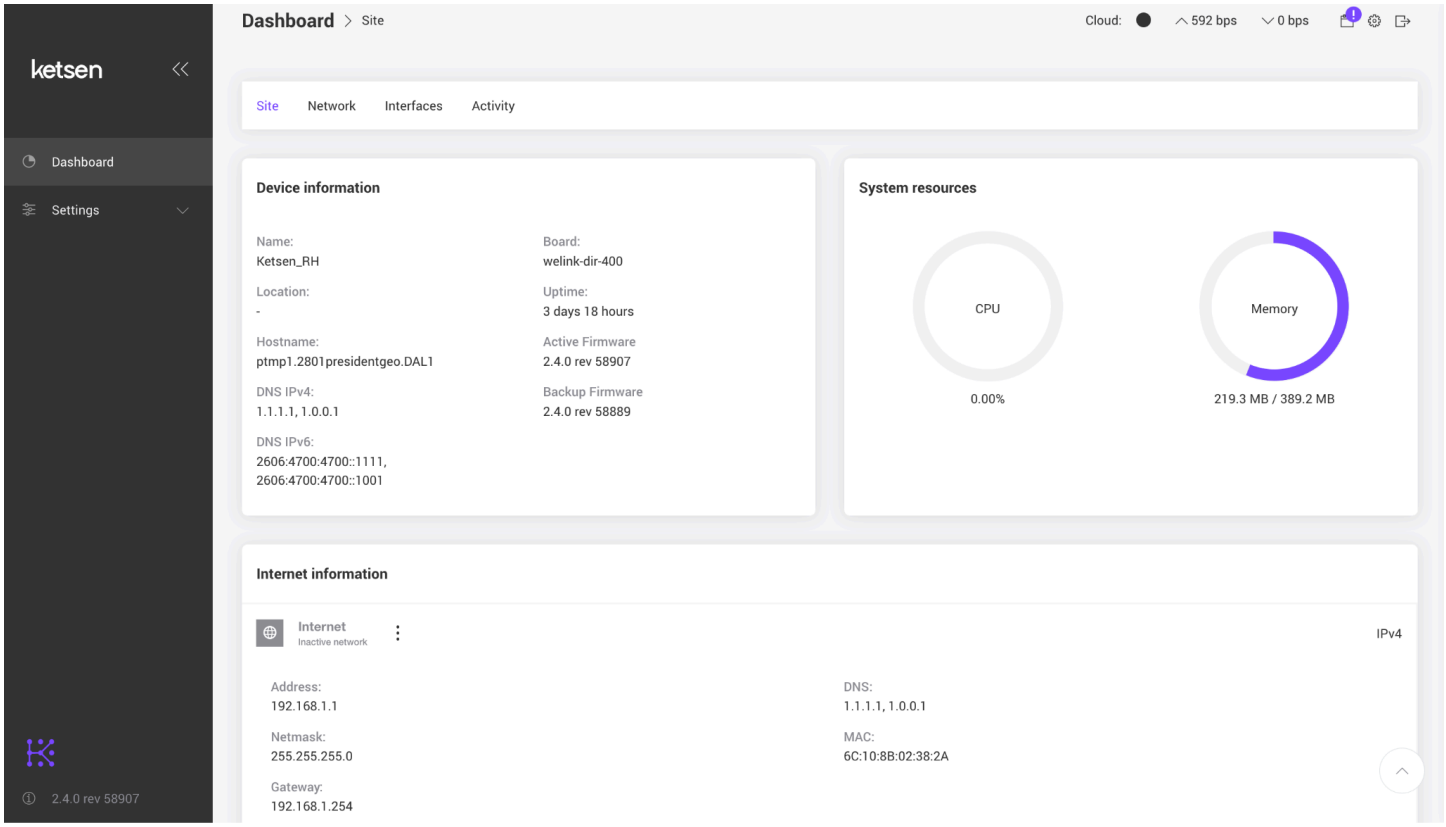
7. Open your computer's Network Settings (location varies depending on your operating system).
8. Find the network adapter connected to the PoE injector (usually labeled "Ethernet" or similar).
9. Click on the adapter and select "Properties" or "Advanced settings".
10. Look for "Internet Protocol Version 4 (TCP/IPv4)" and choose "Properties".
11. Select "Use the following IP address".
12. In the "IP address" field, enter an address within the 192.168.1.x subnet, but different from 192.168.1.1 (e.g., 192.168.1.10).
13. In the "Subnet mask" field, enter 255.255.255.0.
14. Leave the "Default gateway" and "DNS server" fields blank.
15. Click "OK" to save the changes.

## Access the Radio WebUI

16. Open a web browser on your computer.
17. In the address bar, type http://192.168.1.1.
18. The CUB web interface login screen should appear.
19. Enter the username and password. Default Credentials (case sensitive): Username: root / Password: admin

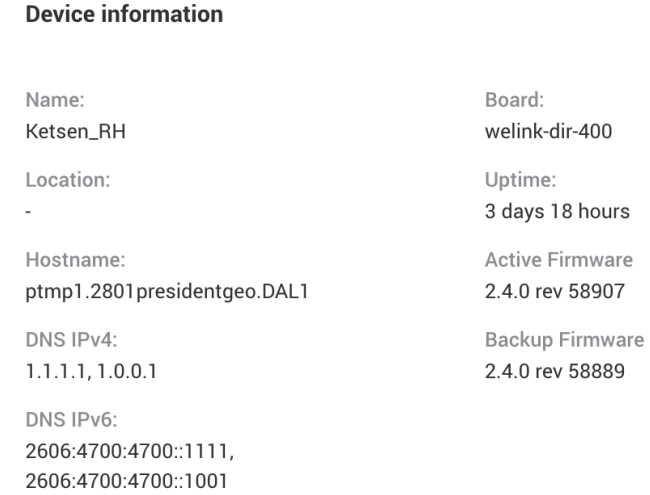


## Navigating the Radio WebUI




## Dashboard Overview

**Device Information** - This section gives basic information regarding the device.

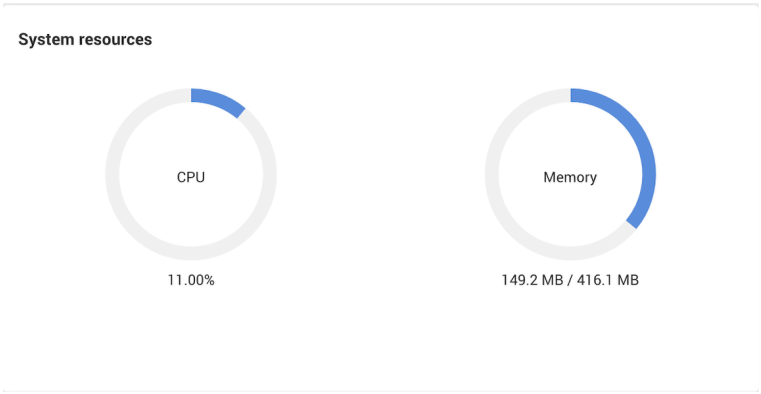



- **Name**: Displays the customizable name or identification of the device.
- **Location**: Displays the user defined location of the device.
- **Hostname**: Displays the user defined hostname.
- **Active Firmware**: Displays the current active bank firmware information.
- **Backup Firmware**: Displays the current backup bank firmware information.

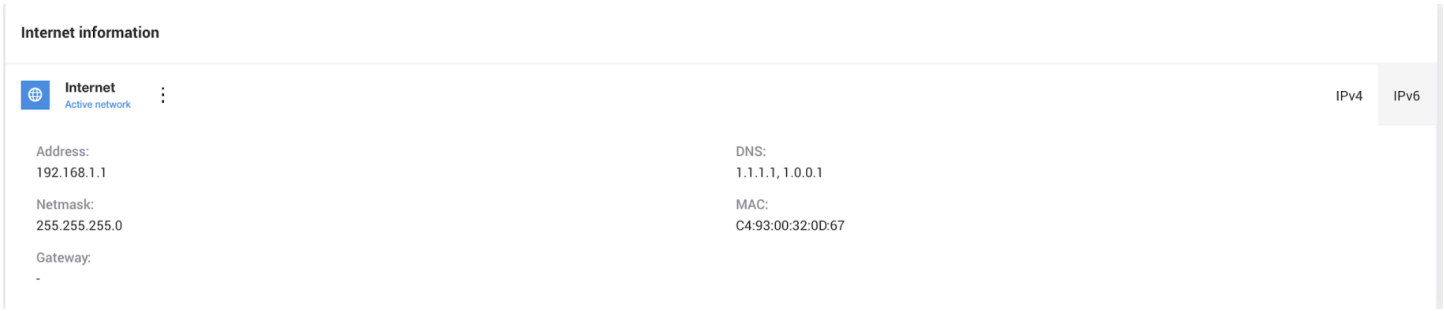
- **DNS IPv4:**
- **DNS IPv6:**
- **Board**: Displays the processor information of the radio head.
- **Uptime**: Displays the total time the device has been running since a reboot or system was powered on. Days:Hours:Min:Sec

**System Resources** - Displays current CUP and memory resources.

- **CPU** – Displays the current CPU capacity in percentage being utilized
- **Memory** – Displays the current system memory being consumed in MB.



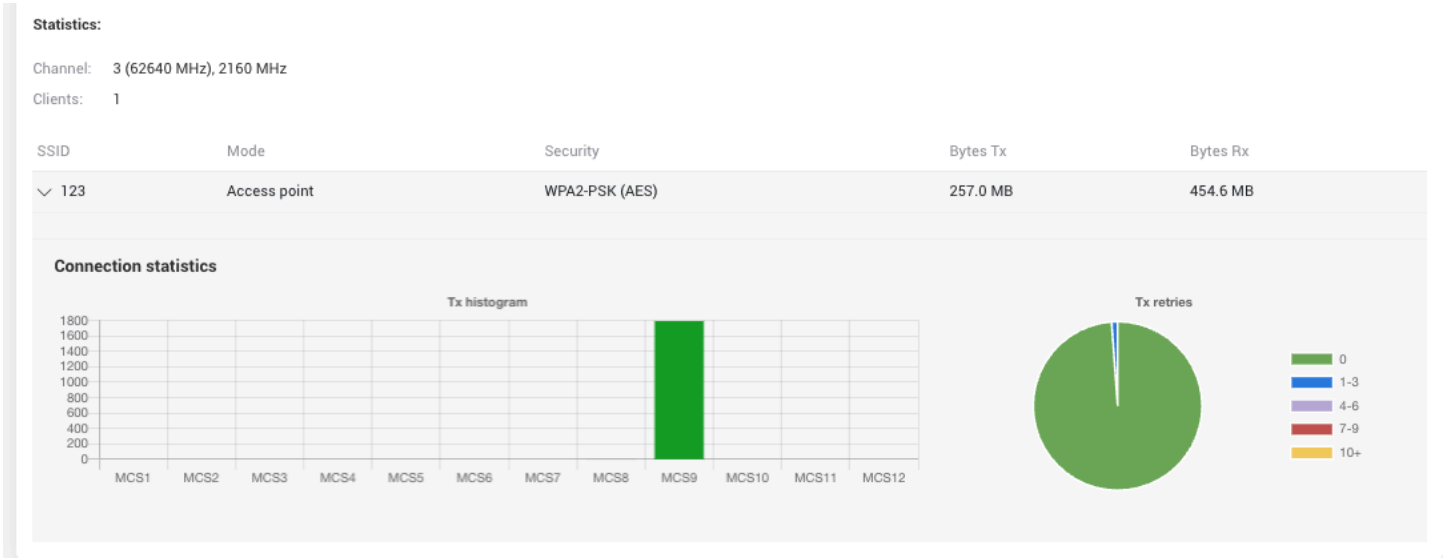

**Internet information** – This section gives basic internet connectivity information for IPv4 and IPv6 connections.




**60GHz Radio** – This section gives information about internal radio and the remote connected station.

- **Channel** – Displays the current operating channel / frequency and spectral width of the channel being used.
- **Clients** – Displays the number of connected clients when in AP mode
- **Radio SSIDs** – Displays the remote connected radio head link information.

- **SSID** – Displays the SSID of the link.
- **Mode** – Displays the current mode of the local radio head Access Point or Station

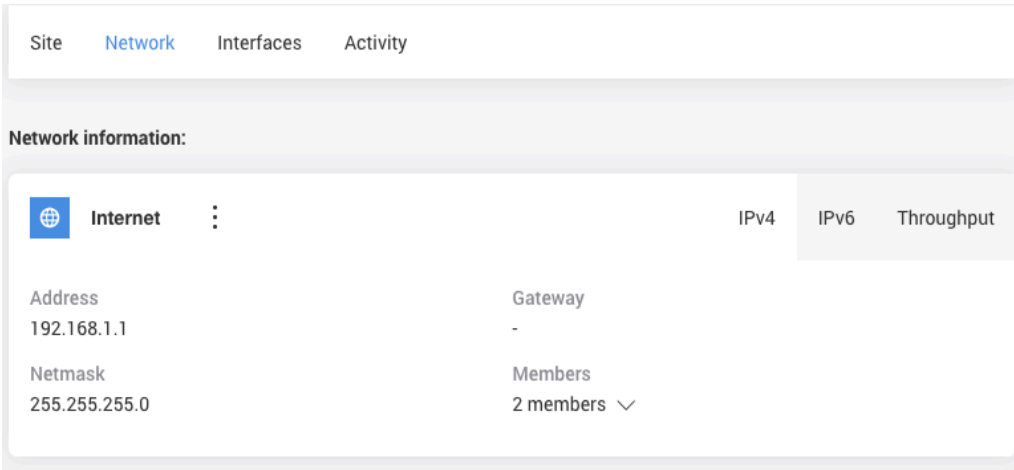



- **Clients** – Displays the number of clients in AP mode.
- **SSID** - Displays the current SSID
- **Mode** - Displays the current mode radio is set to
- **Security** – Displays the current security being used over the link.
- **Connected AP MAC** – Displays the remote connected radio head MAC address.
- **Bytes Tx** – Displays the number of bytes transited since reboot.
- **Bytes Rx** – Displays the number of received bytes since reboot.

## Network

**IPv4**

- **Address** – Displays the local IPv4 address.
- **Netmask** – Displays the local subnet mask.
- **Gateway** – Displays the local gateway
- **DNS** – Displays the local DNS servers
- **MAC** – Displays the local MAC address




**IPv6**

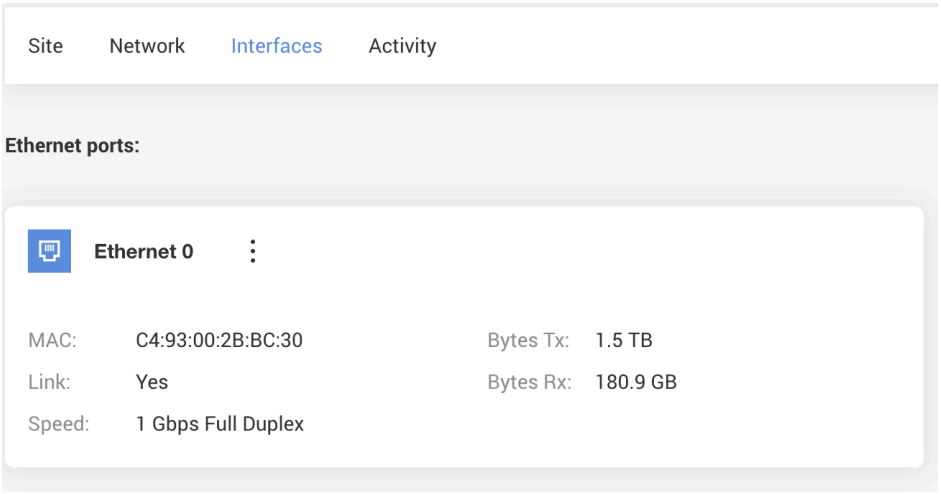
- **Address** – Displays the local IPv6 address.
- **Prefix** – Displays the local subnet prefix.
- **Gateway** – Displays the local gateway
- **DNS** – Displays the local DNS servers

- **MAC** – Displays the local MAC address

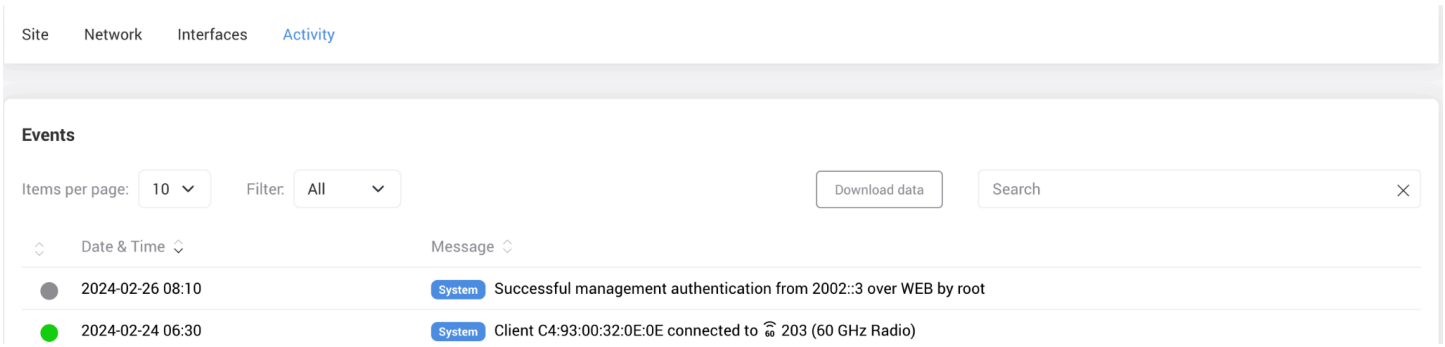
## Interfaces

### Info

- **MAC** – Displays the local IPv4 address.
- **Link** – Displays the local subnet mask.
- **Speed** – Displays the local gateway.
- **Bytes TX** – Shows interface total transmit Bytes
- **Bytes RX** – Shows interface total receive Bytes




## Activity

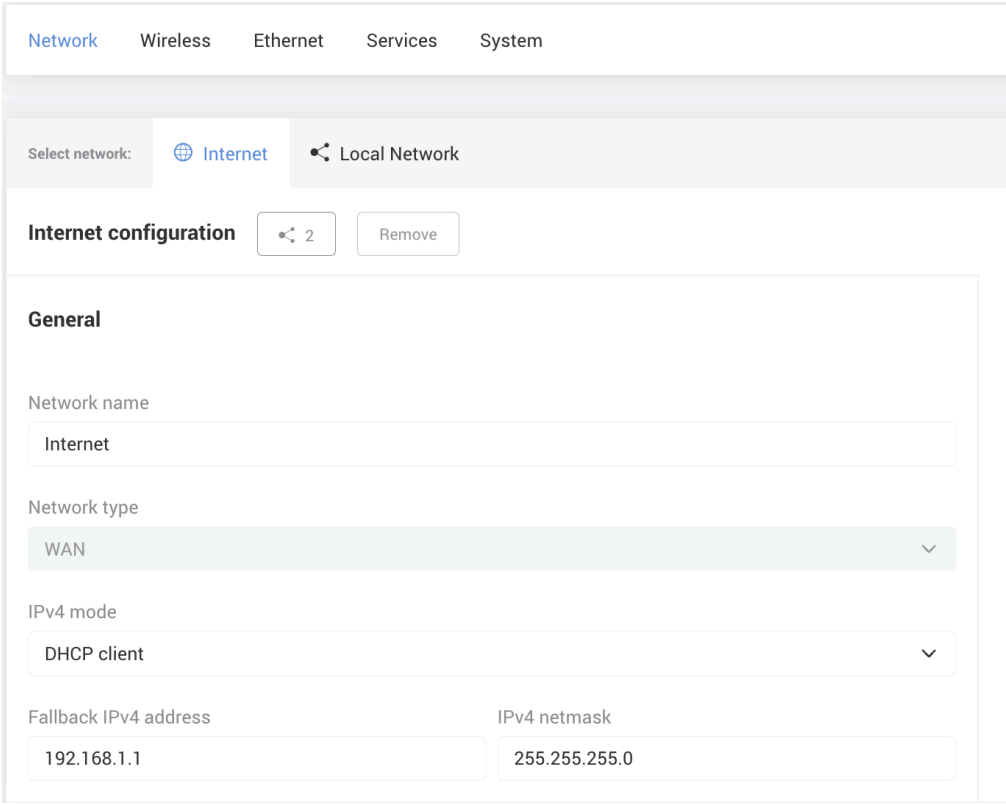



- **Events** – This section provides history of the radio head Events are listed in chronological order and timestamped.
- **Items per page** – Change from 10, 25, 50, and All entries listed per page.
- **Download Data** – Downloads the event log in a .txt format to the local computer
- **Search** – Use the search bar to look for specific entries that match your criteria.
- **Entries**


- **Date & Time** – Displays the date and time of each entry
  Year-Month-Day Hour:Min
- **Message** – Displays the event message.

# Configuration

## Network



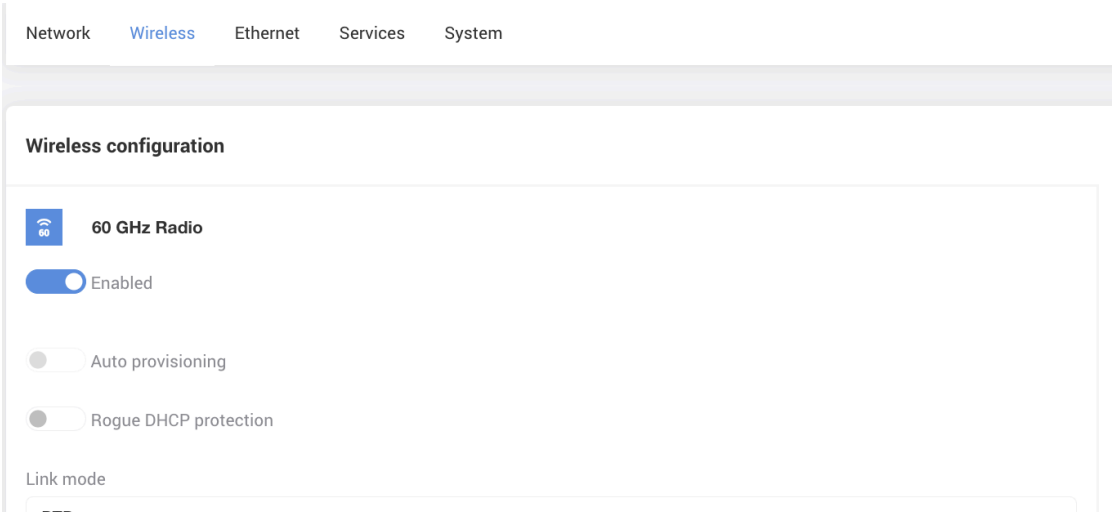

**Internet Configuration** – This section allows configuration of the radio head should an internet connection be needed. From here you may add or configure an existing network.

- **Network name** – User configurable network identification
- **Network type** – Select from LAN or WAN networks
- **IPv4 mode** – Select from using a Static IP or using a DHCP client.
- **Static** – Static IP address, Netmask, Gateway, DNS servers will need to be assigned.
- **DHCP client** – A Fallback IPv4 address and Netmask will be needed.
- **Fallback IPv4 address** – This is a user defined address that the radio head will default to if no DHCP server assigns a dynamic address.

**Local Network**

- **Disable** – Disable the Management VLAN. If selected a static IP will need to be assigned for Management
- **Allow device access from this zone** – Allows device access from this zone.

## Wireless




**Wireless Configuration** - This section allows configuration of the 60 GHz radio head.

- **Enable** – Enable or disable the 60GHz wireless signal.
- **Wireless Mode** – Select from Station

(default) or Access point

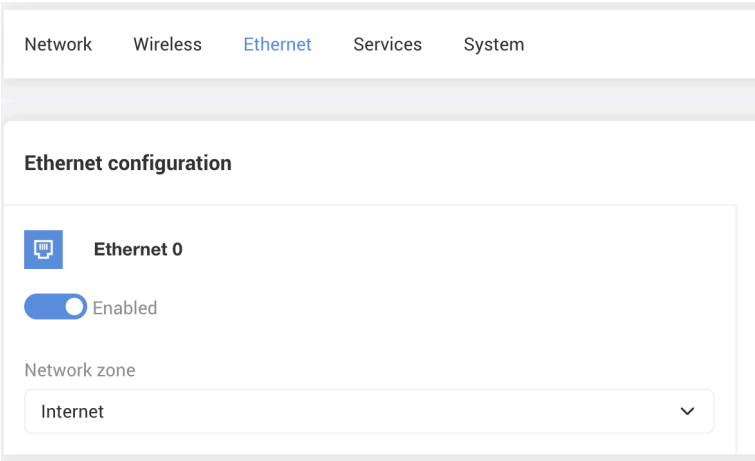
- **Channel** – Select channels 1-4. When wireless mode Station is used Auto may be used or a static channel may be selected.
- **SSID** – Enter the unique SSID
- **Scan** – Scan function will be available if the wireless mode selected is station.
- **Lock AP MAC** – Enter the MAC address of pairing AP
- **Security mode** – Select from Open or WPA2 personal

**Connection Settings** - This section allows L2TP profile configuration of the 60 GHz radio head.

## Ethernet

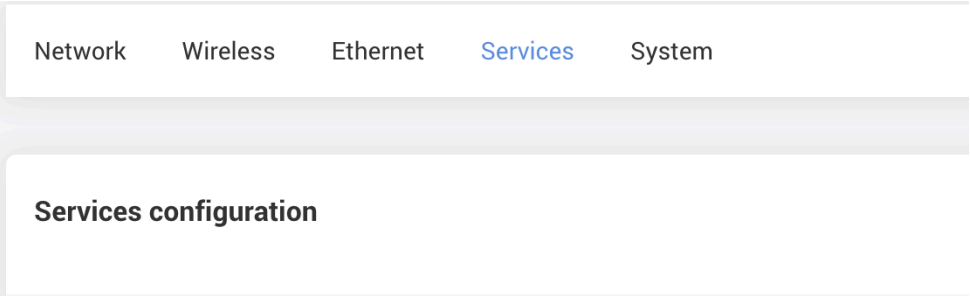
**Ethernet Configuration** – This section allows for configuration of Ethernet 0

- **Enabled** – Enable or disable Ethernet 0 port

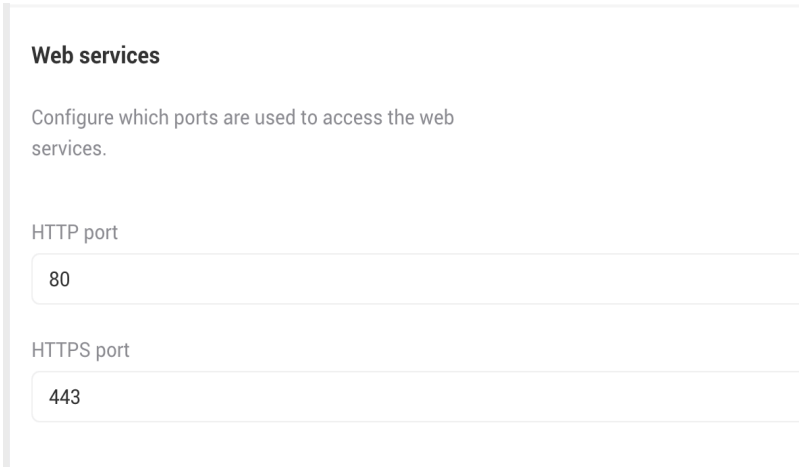



## Services

**Services Configuration** – This section allows configuration of additional radio head services

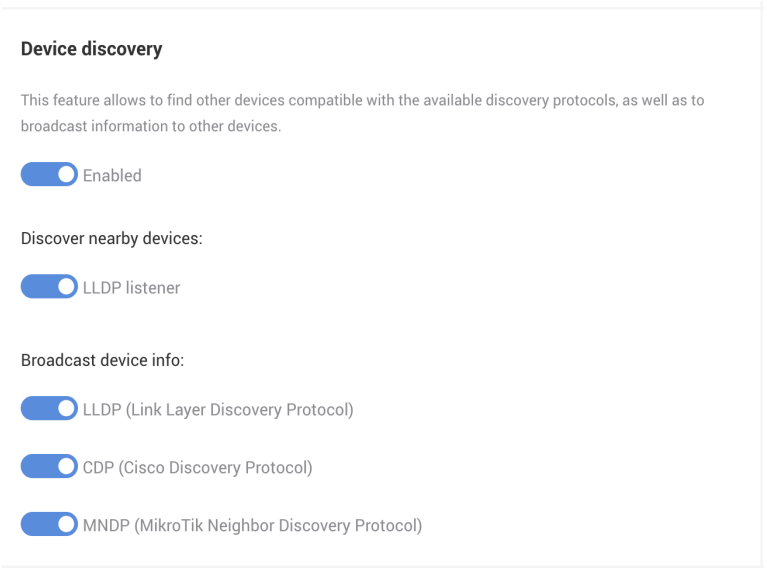



**Web Services** – Configure non typical HTTP and HTTPS ports



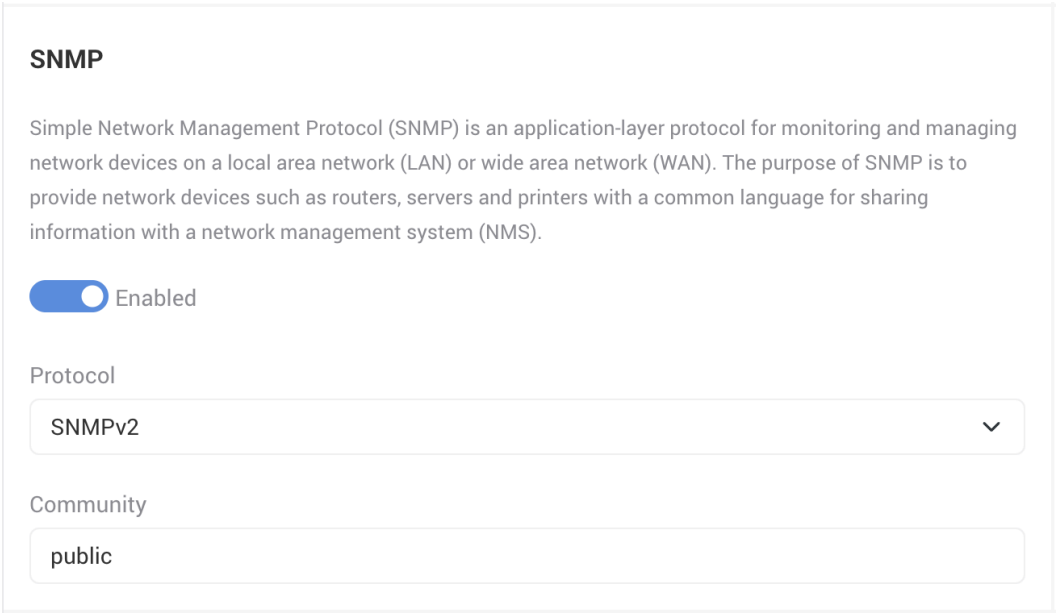
**Device Discovery** - This feature allows to find other devices compatible with the available discovery protocols, as well as to broadcast information to other devices.

- **Enable** – Enable or Disable Device discovery
- **LLDP listener** – Enable LLDP listener
- **LLDP** – Enable (Link Layer Discovery Protocol)
- **CDP** – Enable (Cisco Discovery Protocol)
- **MNDP** – Enable (MikroTik Neighbor Discovery Protocol)




**SNMP** - The purpose of SNMP is to provide network devices such as routers, servers and printers with a common language for sharing information with a network management system (NMS).

- **Enable** – Enable or disable SNMP Traps
- **Protocol** – Select from SNMPv2, SNMPv3
- **Community** – Enter the community string SNMPv2
- **Password** – Enter the password SNMPv3



**Cloud Agent** - This function enables functionality to control the device from the cloud.

**Cloud Agent**

Enables functionality to control the device from the cloud.

Enabled

Server

nats.welink-nms.com

Port

5222

**Remote Syslog** - Syslog is a protocol used by network devices to send event messages to a logging server or file.

**Remote syslog**

Syslog is a way for this network device to send event messages to a logging server or file.

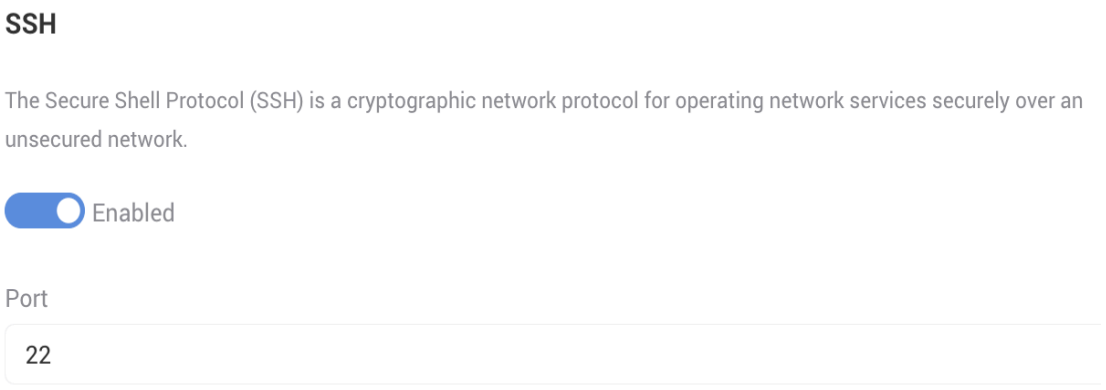
Enabled

Mode

Instant logging to file

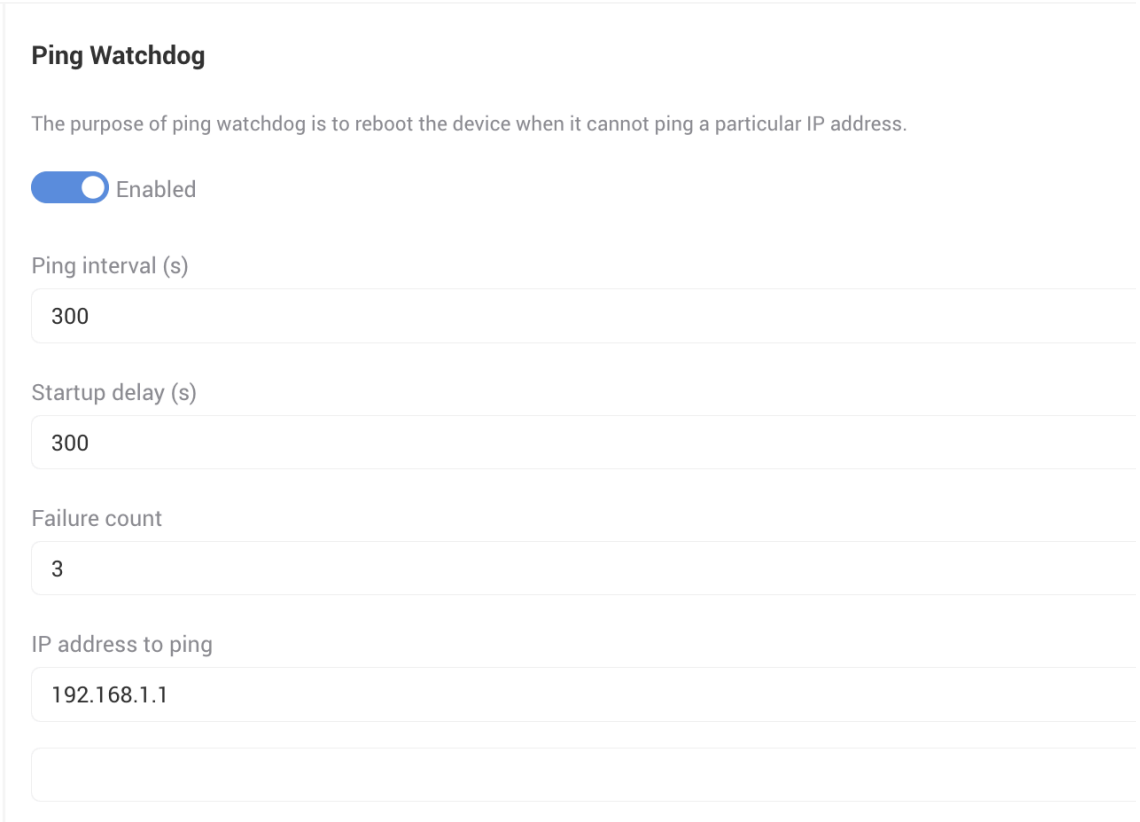
Each syslog line is instantly written to /etc/logread.out file in the device flash memory. WARNING: the device has limited amount of flash memory, also, because of frequent writing, this logging method can decrease the lifetime of the flash memory

**SSH** - The Secure Shell Protocol (SSH) is a cryptographic network protocol for operating network services securely over an unsecured network.

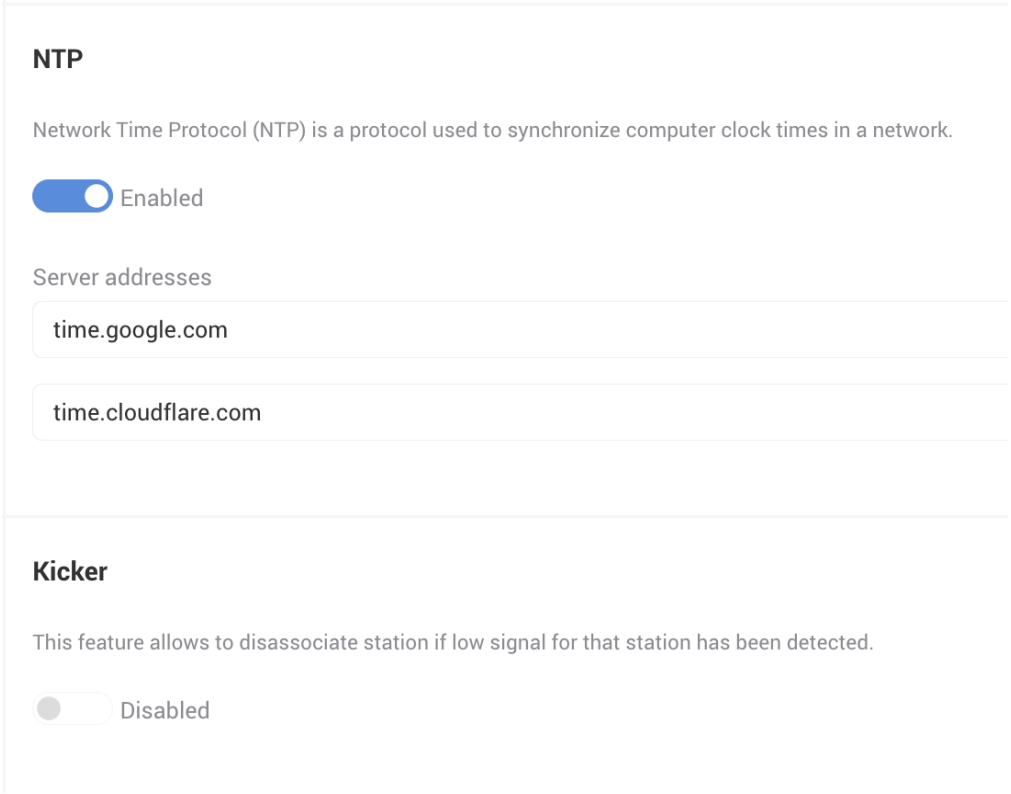



**Ping Watchdog** - The purpose of ping watchdog is to reboot the device when it cannot ping a particular IP address.

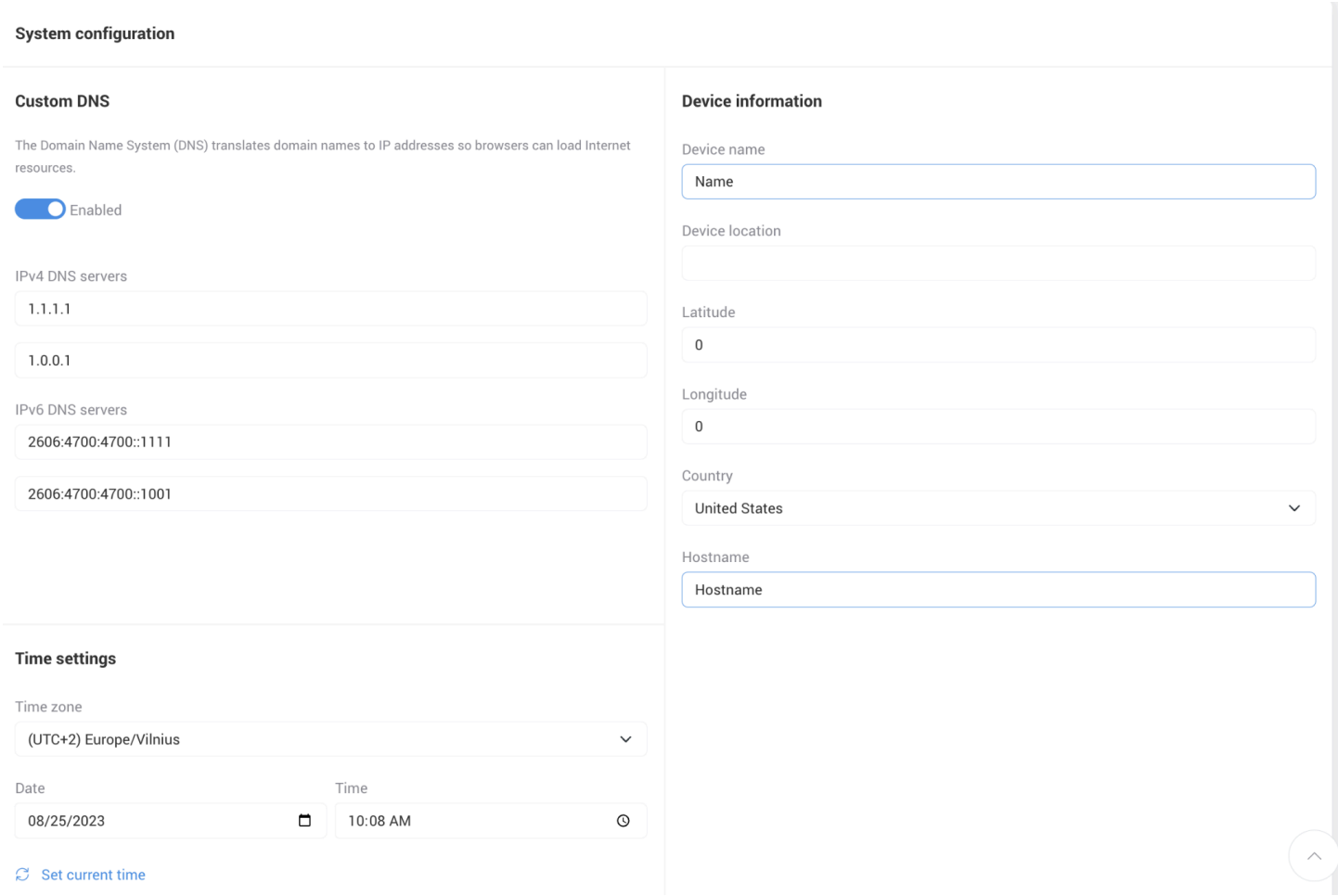
- **Enable** – Enable or Disable Ping watchdog
- **Ping interval** – Select ping interval from 5s to 300s
- **Startup delay** – Select startup delay from 60s to 300s
- **Failure count**– How many times failure must occur to enable watchdog
- **IP address to ping** – Pingable remote IP address



**NTP** - Network Time Protocol (NTP) is a protocol used to synchronize computer clock times in a network.
**Kicker** - This feature allows the radio to disassociate a station if low signal for that station has been detected (Only available for Access Point mode).



## System




### System Configuration

**Custom DNS** - The Domain Name System (DNS) translates domain names to IP addresses so browsers can load Internet resources.

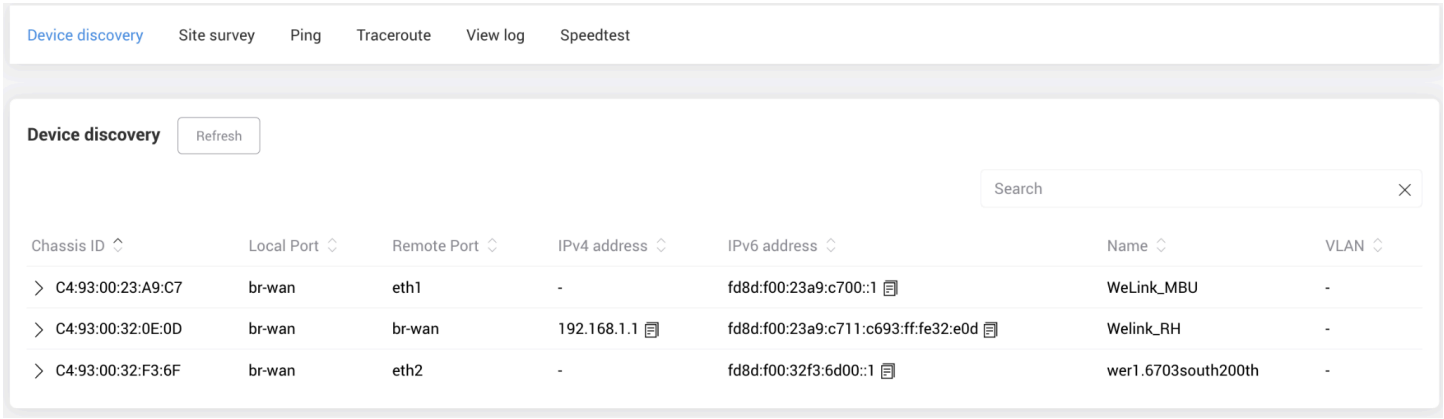
**Time Settings** - Time zone information

### Device Information

- **Device Name** – Set the device name
- **Device location** – Set the device location
- **Longitude & Latitude** - Set device latitude and longitude
- **Country** – Set the country
- **Hostname** – Set the Hostname

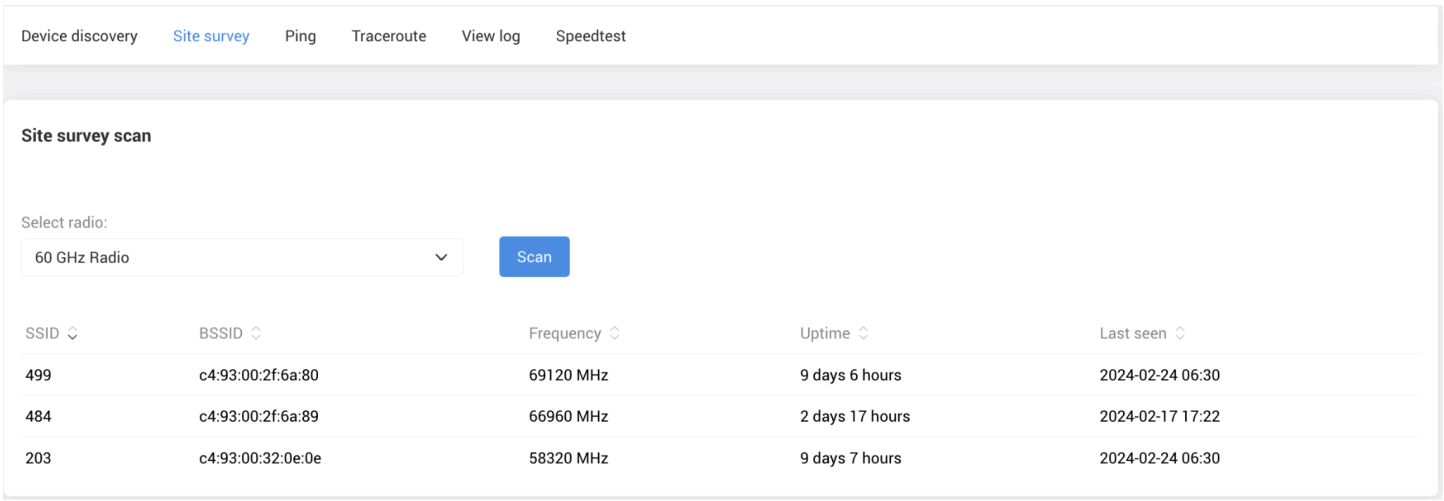
# Tools

## Device Discovery



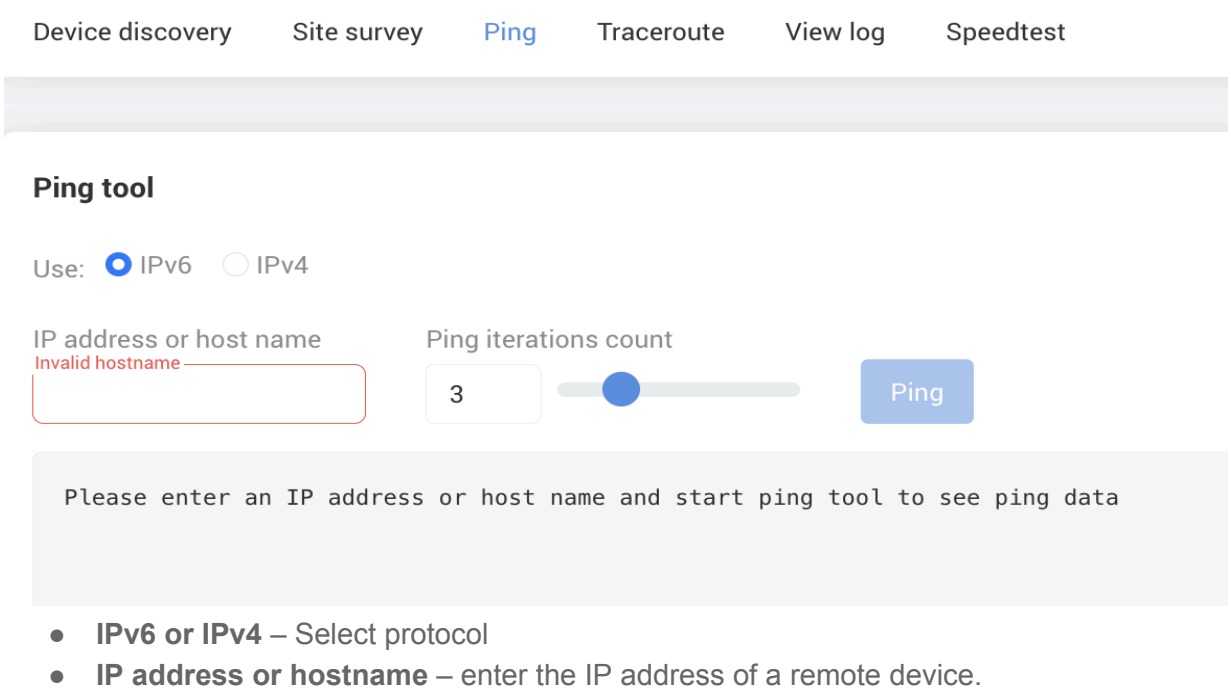

- **Chassis ID**– MAC address of discoverable device
- **Local Port ID** – Local port of discoverable device
- **Remote Port ID** – Remote port of discoverable device
- **Management IPv4 address** – Management IPv4 address if used
- **Management IPv6 address** – Management IPv6 address if used
- **System Name**– Name of remote device
- **System description** – Description of remote device
- **VLAN ID** – VLAN ID (if used)

## Site Survey



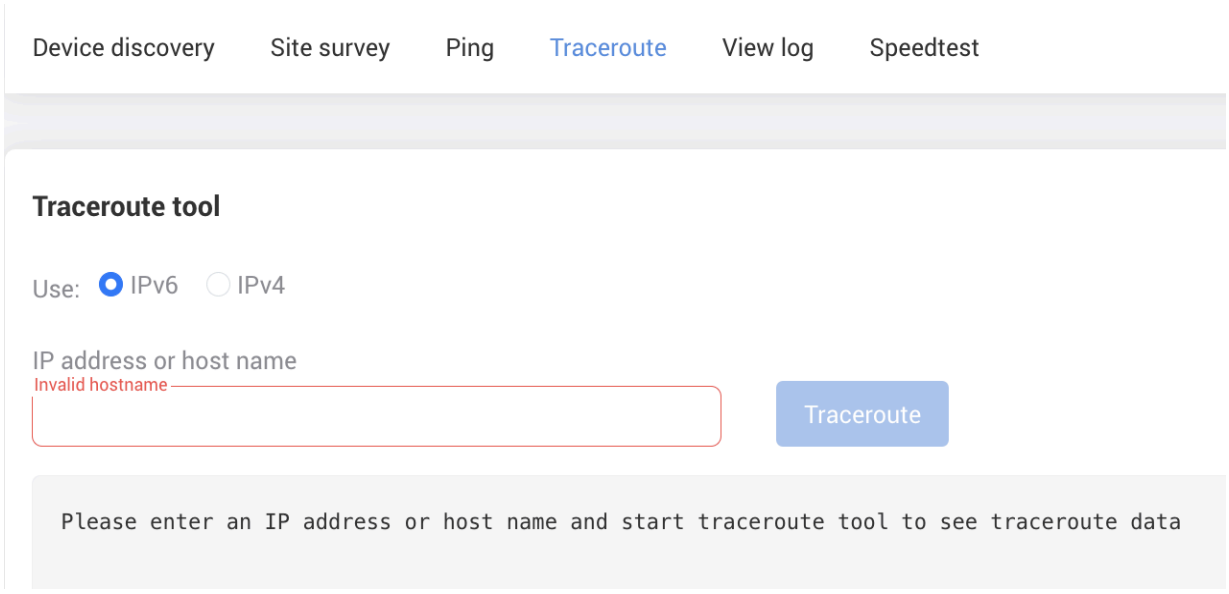

- **SSID** – SSID of scanned site
- **BSSID** – BSSID of scanned site
- **Uptime** – Scan device uptime
- **Last Seen** – Time device was last seen

## Ping



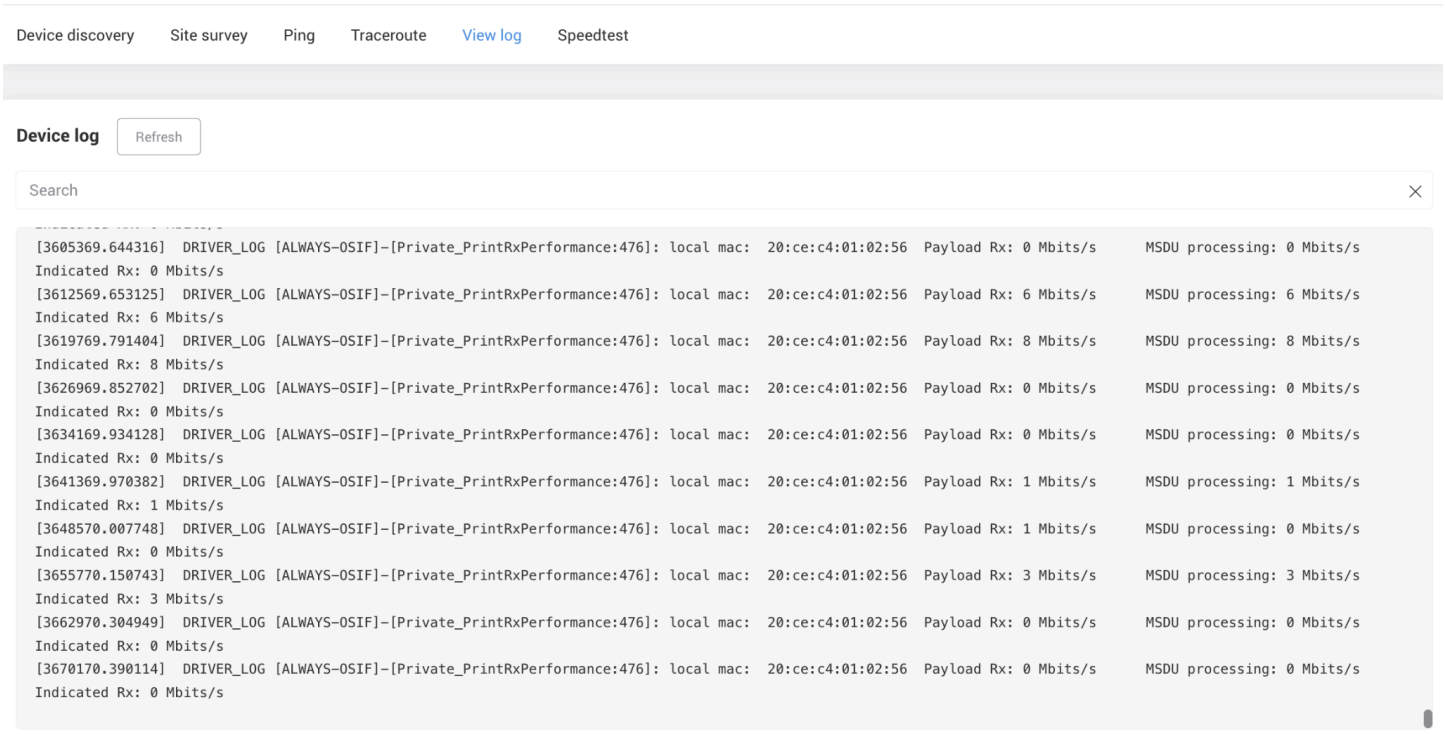

- **IPv6 or IPv4** – Select protocol
- **IP address or hostname** – enter the IP address of a remote device.
- **Ping iterations count** – How many times to ping the device.

## Traceroute



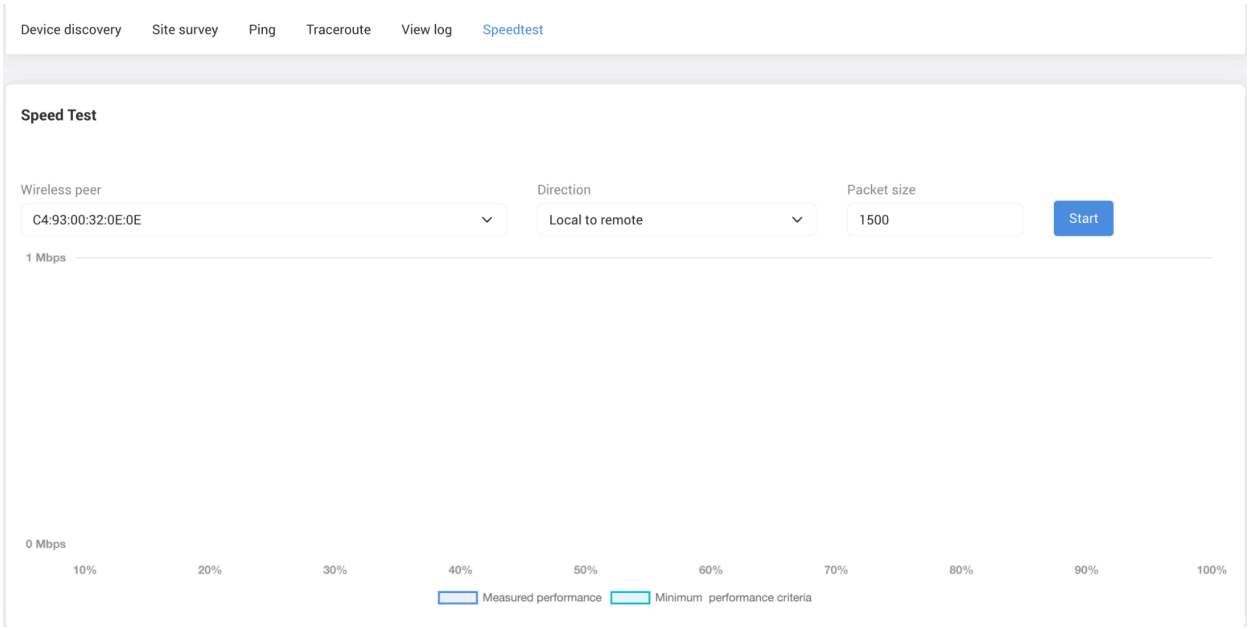

- **IPv6 or IPv4** – Select protocol.
- **IP address or hostname** – enter the IP address of a remote device.

## View log

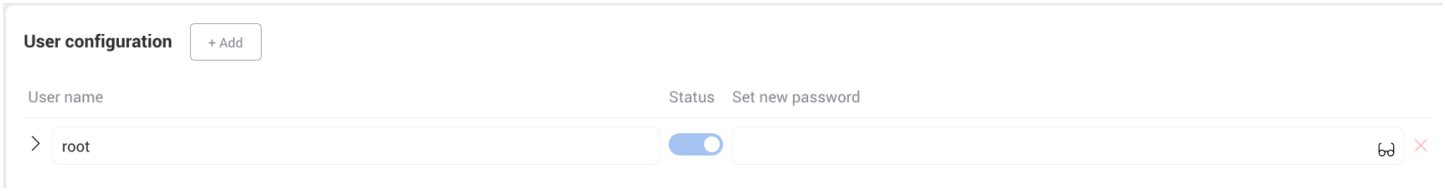



**Device Log** – View logged messages of radio head.

## Speedtest

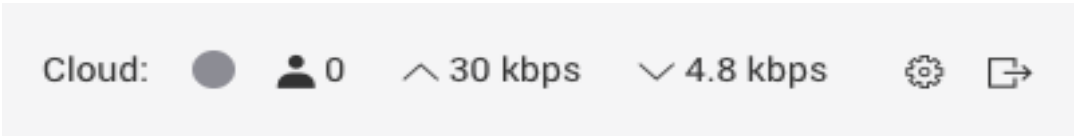


## User Configuration




**User Configuration** - Add user profiles and unique credentials as needed.

## Toolbar




The toolbar shows client connections, WAN interface Tx and RX throughput, Device/Firmware actions

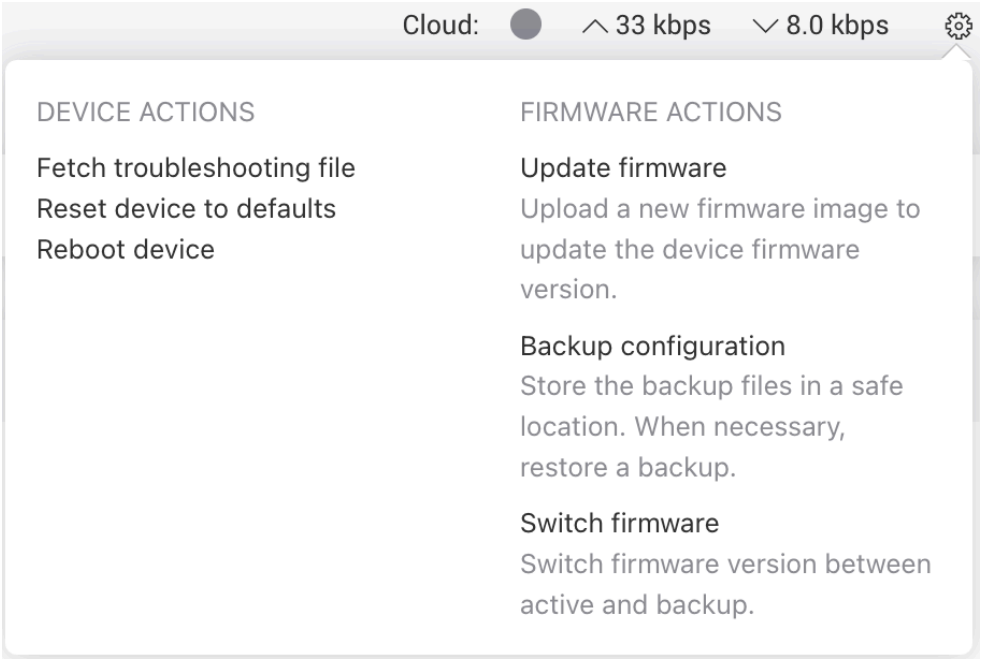
## Cog Wheel (Settings)

### Device Actions

**Fetch Troubleshooting file** – Downloads diagnostic file to the local computer containing additional debug information.

**Reset Device to defaults** - Will reset radio back to default settings.

**Reboot Device** - Will reboot device.




### Firmware Actions

**Update firmware**

Upload a new firmware image to update the device firmware version.

**Backup configuration**

Store the backup files in a safe location. When necessary, restore a backup.

**Switch firmware**

Switch firmware version between active and backup.

# Updating Radio Firmware

## Steps

1. Log into the web user Interface and Login to the device: Open the web browser and type 192.168.1.1 in the address bar.
   *Note: Network settings must be set to 192.168.1.5/24 in order to successfully log into the GUI. If issues connecting ensure networking settings are properly set on the network settings.*
2. Login using factory credentials: Username: root / Password: admin
   Credentials can be updated or skipped for a later time.
3. Proceed to update device firmware: Click the gear icon in the top right corner and select “Update firmware”. Toggle “Reset config after device update” and then “Upload file”. Select the downloaded firmware file from your computer’s library then click “Update file”.
4. Wait for the update to complete. Refresh the browser and log back into the device.
5. Repeat the update process one more time to update both the Active and Backup firmwares.

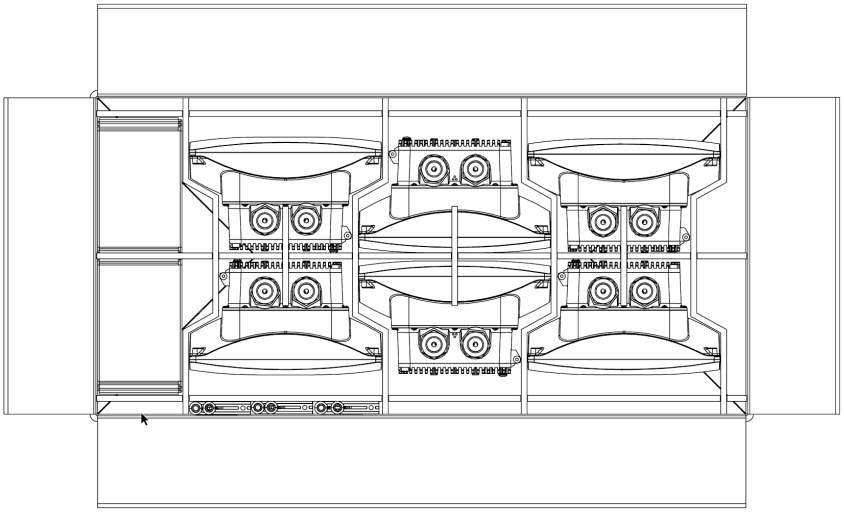
# Installation

1. PTP systems employing Radio PTP-PV2-58 must utilize Vertical polarization.
2. Identify the desired orientation of the Mounting-bracket (Left or Right). The bracket and radio can be oriented in 2 positions to help optimize space and aiming on the mast.
3. Align the Mounting bracket onto the 4 designated mounting holes on the radio.
4. Insert the 2 carriage bolts onto the 2 square holes on the precision bracket before mounting the bracket to the radio.
5. Using a 4mm allen wrench fasten the bracket to the radio with the 4 provided screws.
6. Once the bracket is attached to the radio, use the C-clamp and both carriage bolts to fasten the radio back to the desired mast.
7. Ensure the radio is level and plumb. Perform a rough alignment using the provided scope.
8. After securing the radio to the desired mast, connect the unit using an outdoor-rated Cat6 patch cable.
    a. For Point-to-Point (PTP) configuration, plug the cable into the assigned port on the Core Fabric Router. Please refer to the CFR documentation for detailed PTP configuration instructions.

# Radio Alignment Instructions

1. Refer to Linkview for the calculated link’s target RSSI.
2. Verify Linkview configuration and radio application has been successfully transferred to the radio(s). *Note: Radios will not connect if not properly configured.*

3. Ensure radio firmware is matching and operating the latest firmware version. The radios will arrive in bulk packaging with the glands facing upwards for easy access.



*Note: Use Bulk updater tool for quick firmware upgrades*

4. Assemble the precision alignment bracket for mounting to the radio.
5. Using the provided 4mm Allen wrench, loosen both azimuth and elevation screws to adjust the antenna's angle. Once both radios have a rough alignment, a connection should be established.
6. Fine-tune radio signal using Techview Aiming map to optimize alignment. Slowly adjust the antenna's angles in small increments, observing the changes in RSSI. Aim for the highest signal strength while maintaining a stable connection
    a. To optimize PTP links, have one person at each end slowly modify the antenna's azimuth and elevation angles while the other person tracks signal strength. After achieving the optimal antenna orientation, tighten the azimuth and elevation lock bolts on the first radio then repeat step 4 and 5 for the adjacent PTP radio.

## Safety and Regulatory Guidelines

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 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 technician for help

**FCC Caution**: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
This device complies with Part 15 of the FCC 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.

**IMPORTANT NOTE:**
**FCC Radiation Exposure Statement:**
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 40 cm between the radiator and your body.

**Industry Canada**
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.

**ISED Radiation Exposure Statement:**

This equipment complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 40 cm between the radiator and your body.
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 40 cm de distance entre la source de rayonnement et votre corps.

**CE Statement**
This equipment complies with EU radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 40 cm between the radiator and your body.

All operational modes:
60 GHz: 802.ad

The frequency and maximum transmitted power limit in EU are listed as below:
57-71 GHz

**Europe - EU Declaration of Conformity**

Hereby, **Ketsen Networks, Inc**. declares that the radio equipment type: PTP-PV2-58 is in compliance with Directive 2014/53/EU and Directive 2014/35/EU.

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|---|---|---|---|---|---|
| AT | BE | BG | CH | CY | CZ |
| DE | DK | EE | EL | ES | FI |
| FR | HR | HU | IE | IS | IT |
| LI | LT | LJ | LV | MT | NL |
| NO | PL | PT | RO | SE | SI |
| SK | TR | | | | |

The abbreviations of the countries, as prescribed in table to the left, where any restrictions on putting into service or any requirements for authorization of use exist.