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# Airvine WaveCore

## Configuration Guide



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# Introduction

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## About this Guide

This guide provides information and procedures to configure, manage and monitor the WaveCore devices using a Web Interface.

## Related Documents

For additional information about the WaveCore product line, the following additional documents are available at Airvine Support Web Site <http://www.airvine.com/support>.

- **WaveCore Getting Started Guide (GSG):** A quick reference guide that provides essential information for installing and configuring the devices.
- **WaveCore Hardware Installation Guide:** A guide providing a hardware overview and details about the installation procedures, hardware specifications, and optional accessories.
- **WaveCore Regulatory and Safety Guide:** A guide providing essential information on the country specific safety and regulatory disclosures and norms to be followed while installing the device.
- **WaveCore Configuration Guide:** A guide that gives an overview of the device user interface and explains the step-by-step procedures to configure, manage and monitor the device by using a Graphical User Interface.

## Symbols on Equipment or DocumentationPTP



### **DANGER**

DANGER statements indicate potentially hazardous situations including those that could cause loss of life or physical injury.



### **CAUTION**

CAUTION statements alert a possibility of damage to the system, software, or individual items or parts of equipment withing a system. However, this damage presents no danger to a person.



### **NOTE**

A NOTE provides a tip, guidance, or advice and can emphasize important information.

# System Overview and Introduction

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Airvine WaveCore devices are indoor wireless point-to-point (PTP) devices that provide wireless Layer 2 Ethernet bridge networking solutions for enterprise and business markets. WaveCore devices are sold in pairs, and wirelessly communicate through walls and ceilings (up to 12 inches of concrete<sup>1</sup>), which enables communications without having to drill holes or pull wiring.



A WaveCore pair includes a Controller Node and a Subordinate Node. The Controller Node starts broadcasting on a factory-set frequency band as soon as it is powered up. The Subordinate Node starts searching for the Controller Node broadcast when it powers up, and then locks onto that broadcast so the pair is immediately communicating. Use the Controller Node as the primary device for configuring and monitoring the WaveCore pair.

Both WaveCore devices are configured and monitored via the Controller Node, using the on-board VineManager Web GUI, which can be accessed through a Wi-Fi or wired connection. Any changes made to the Controller Node are automatically applied to the Subordinate Node as well. This ensures that adjustments to Web GUI parameters, including transmission frequency and bandwidth, are synchronized across both WaveCore devices.

WaveCore devices include internal high-gain directional antennas that provide individual transmit and receive links. For optimized transmit and receive rates, the WaveCore antennas must be aligned to within +/-10 degrees of each other. This alignment not only assures maximum transmission rates, but also reduces any interference between the WaveCore pair and any other devices. To ensure optimized transmit and receive rates, the WaveCore devices include on-board signal diagnostics to ensure optimal results.

WaveCore devices are shipped with standard 3-inch mounting brackets. Optional 5-inch mounting brackets can be separately ordered along with other optional accessories listed later in this manual.

The WaveCore devices are powered by 12 VDC, PoE, or both. This allows for power supply redundancy to support failsafe operation.

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<sup>1</sup> Thickness of concrete that can be penetrated by WaveCore depends on such factors as regulatory domain and associated EIRP limits, bandwidth, distance between radios. For estimates, use the VineCalculator™ tool located at [www.airvine.com/support](http://www.airvine.com/support).

# WaveCore Deployment Scenarios

There are many deployment scenarios that WaveCore is designed to handle, many of which involve making wireless connections through walls or ceilings.

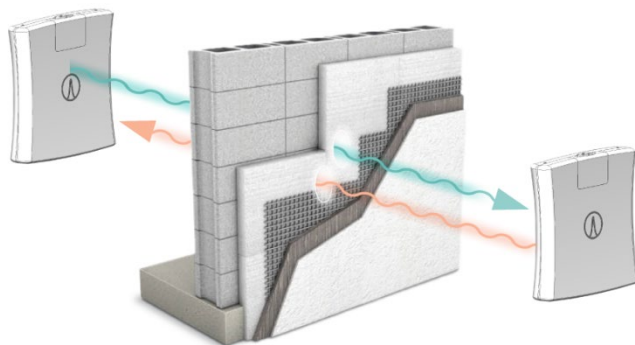
Cement and concrete walls and floors are commonly used in many commercial buildings. Deploying new networks or expanding existing ones in these environments often involves high costs and significant delays due to the need to run network cables through obstacles and across long interior spans.

WaveCore was engineered to enable fast, easy, and cost-effective deployment of high-speed indoor wireless Ethernet connections. eliminating the expense, hassle, and delays associated with having to lay new cable. It can "blast" through obstructions, eliminating the costs and delays typically associated with installing network cables within an enterprise, such as labor expenses, extensive permitting, core and wall drilling, contracting licensed professionals, materials, and x-rays.

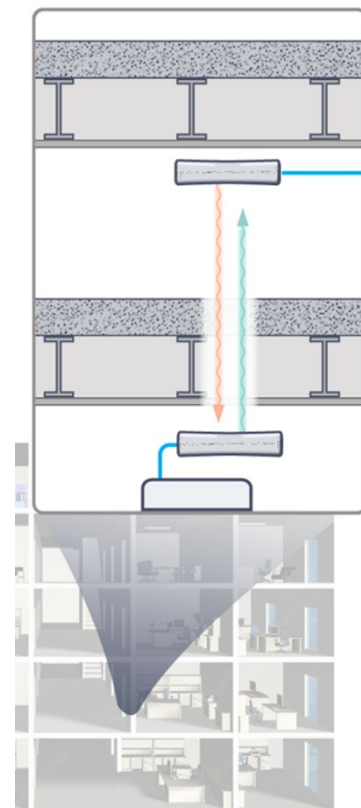
## Connecting Wirelessly Through Walls and Ceilings

Specifically connecting networks into or out of:

- HVAC and fire alarm rooms
- Data closets, IDF/MDF
- Floors/ceilings/hallways



Connecting Through Walls



Connecting Through Ceilings  
Floor-to-Floor



# WaveCore Models

There are currently two versions of the WaveCore product.

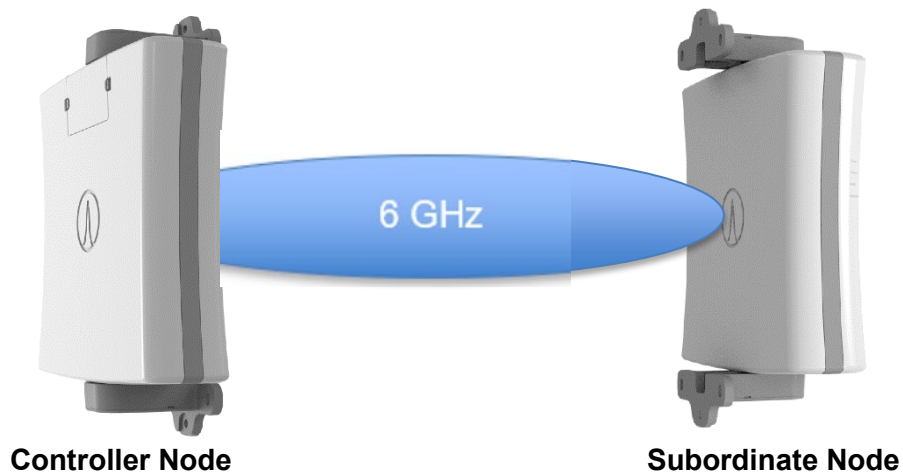
Part Number	Description
WC-1000RH-US	<p>This is a complete point-to-point wireless bridge link that contains two 1000RH-US Wireless Radio Devices, and two SHORT Wall/Ceiling Mounting Brackets.</p> <p>This model is designed to be operated only in the US and Canada. Per FCC/ISED regulations, the country code of the model is fixed to "US". It is not possible for users to change the country code.</p>
WC-1000RH-RW	<p>This is a complete point to point wireless bridge link that contains two 1000RH-RW Wireless Radio Devices and two SHORT Wall/Ceiling Mounting Brackets.</p> <p>This model cannot be operated in the US and Canada. With this model, users can select the country code where the device will be deployed.</p>

\* The country code can only be configured on the RW "world" model.

## Node Types

**Controller Node:** Initiates and maintains the link to the Subordinate Node.  
The Controller Node can only connect to a Subordinate Node

**Subordinate Node:** The Subordinate Node operates under the control of the Controller Node  
The Subordinate Node can only connect wirelessly to a Controller Node



Both Node Types can be individually managed and monitored using the VineManager web-based management utility.

# Factory-Resetting a WaveCore

## Resetting Using the Reset Button

The WaveCore has a recessed reset button next to the RJ45 Ethernet port. Use this button to reset the WaveCore:

Press for less than five seconds to soft reboot the WaveCore.

Press for longer than five seconds to factory-reset the WaveCore.

In either case, wait until the WaveCore **System and Power** LEDs both display a Solid Green Color.

## Resetting Using the VineManager GUI

Alternatively, the VineManager Web GUI can be used to Factory Reset the WaveCore.

# VineManager Graphical User Interface (GUI)

## Factory Default IP Address and User Login

When shipped from the factory, the WaveCore device will be configured with the following default Management IP Addresses and user login and passwords.



### Wired Ethernet Management Parameters:

The following are the factory-default parameters to manage the WaveCore using the HTTP Web GUI or the CLI/SSH **over a wired Ethernet connection** to the WaveCore:

WaveCore Wired Ethernet default IP address:	<b>192.168.0.250</b>
WaveCore Management default user login and password:	<b>admin/admin</b>

### Wi-Fi Management Parameters:

The following are the factory-default parameters to manage the WaveCore using the AirvineMobile App, HTTP Web GUI, or CLI SSH **over a Wi-Fi connection** to the WaveCore:

WaveCore Management Wi-Fi SSID:	<b>avb_[MAC Address]</b>
WaveCore Management Wi-Fi WPA2 passcode: <sup>2</sup>	<b>airvine!</b>
WaveCore Management Wi-Fi IP address:	<b>192.168.3.1</b>
WaveCore Management default user login and password:	<b>admin/admin</b>

## Accessing the VineManager Web GUI

The WaveCore uses an intuitive Web-Based GUI for configuration and monitoring. A standard Internet browser running on a PC, Notebook, or mobile device is all that is needed to manage a WaveCore device. To access the VineManager Web GUI, enter the applicable Management IP Address into the browser address bar.

VineManager can be accessed via the following WaveCore interfaces:

A WaveCore Wired Ethernet port

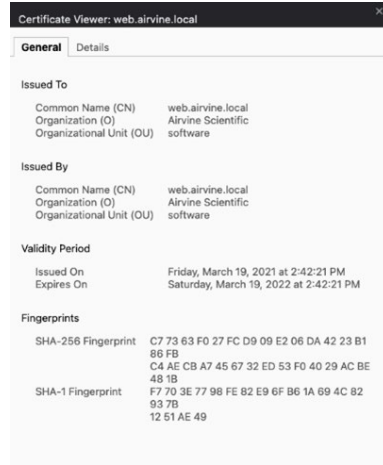
A WaveCore 2.4GHz Local Wi-Fi management interface

<b>Supported Management Interfaces over Wired Ethernet</b>	VineManager, a browser-based Web GUI using HTTP and HTTPS.
<b>Supported Management Interfaces over the WaveCore Wi-Fi Interfaces (Note 1)</b>	VineManager, a browser-based Web GUI using HTTP and HTTPS.
<b>Supported Wi-Fi Browsers</b>	Google Chrome Microsoft Edge

<sup>2</sup> Note: Prior to VineOS SW Release v1.0.1, the default Wi-Fi Management SSID name was "Airvine2"

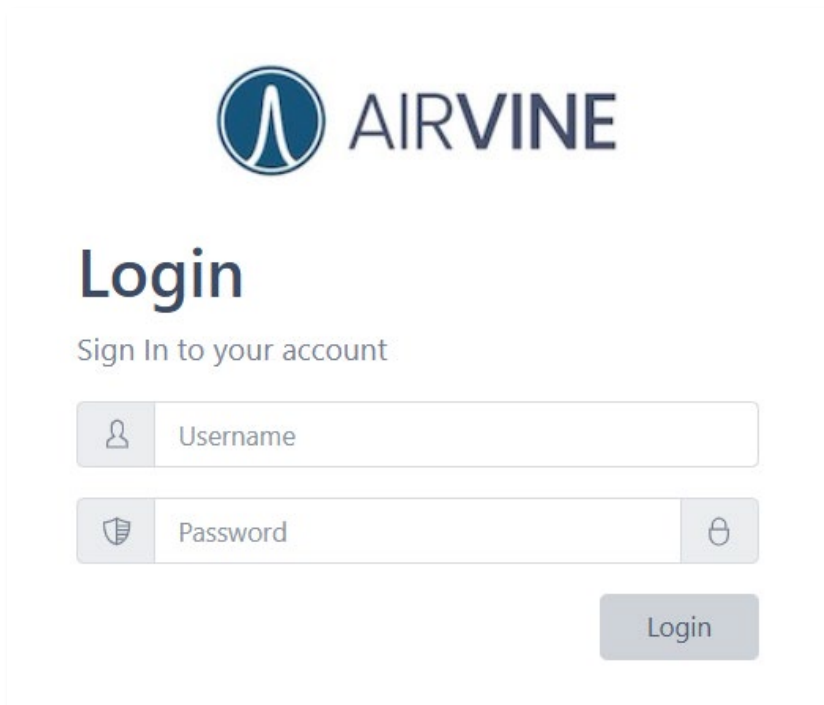
Safari  
Firefox

**Note 1:** The Web GUI supports both http and https connections. For https connections, the web server of the WaveCore device uses a self-signed certificate. Thus, you need to ignore the security warnings on the browser to bypass the validation.



## Logging Into VineManager

When first connecting to the management IP address on your web browser, log onto the VineManager GUI using the default user login and password (admin / admin).



### Note

For security, it is recommended to change the password after the first login. To do this, when logged into VineManager, navigate to Configuration-User-Change Password.

## Setting the Country Code

Upon successful login, you may get presented with a screen that directs you to enter the country of operation (country code) with a drop-down list of countries to select from. If you see this screen, please enter the country of operation (example: Germany) and reboot the system by navigating to *System-Operations-System Operations* pane and click "Reboot". Selecting a country of operation is an important first step as it configures the radio to operate in accordance with radio regulatory requirements for that specific country.

# Graphical User Interface Overview

After logging in, the GUI title bar will display at the top of the browser screen along with a **Navigation Pane** on the left of the browser screen, and a main **Content Pane** in the center right of the browser screen.

The Dashboard provides a high-level summary of the link performance and connection status.

The screenshot shows the WaveCore Network GUI with several callouts:

- MAC and IP of Device:** Points to the header information: MAC: a4:f9:e4:20:00:10, IP: 192.168.0.250.
- Drop Down:** Select which device on the link to manage. Points to the dropdown menu showing "24170001--a4:f9:e4:20:00:10".
- CPU Usage:** Points to the CPU usage indicator showing 48.7%.
- Flash Memory Usage:** Points to the Flash Memory Usage indicator showing 35.3%.
- Change Password & Logout:** Points to the user profile and settings icons.
- Reboot Required Indicator:** Points to a red indicator light.
- Main Memory Usage:** Points to the Main Memory Usage indicator showing 0.2%.
- Alarms and Event Log:** Points to the alarm icon.
- The highlighted Tab indicates current menu / screen:** Points to the "Device" tab in the MONITORING section of the navigation pane.
- Wireless Link Status:** Points to the diagram showing two devices connected via a green dashed line.
- "<" indicates sub-menus:** Points to the chevron icon next to "Operations" in the navigation pane.
- Ethernet Port throughput history:** Points to the Ethernet Traffic graph showing Mbps over time.
- Content Pane for the selected menu on the Navigation Pane:** Points to the Ethernet Traffic graph.
- Wireless throughput history:** Points to the Wireless Traffic graph showing Mbps over time.
- Main Navigation Pane:** Points to the entire left sidebar.

# Using Single Sign On (SSO) to Manage Both Radios

VineManager allows management of both sides of the wireless link with a single sign-on to one of the radios.

Once a wireless connection is made between two WaveCore radios, it is possible to log on to one radio (Near End Radio) and then manage the other Far End Radio over the wireless link without having to manually re-logout to the Far End Radio).

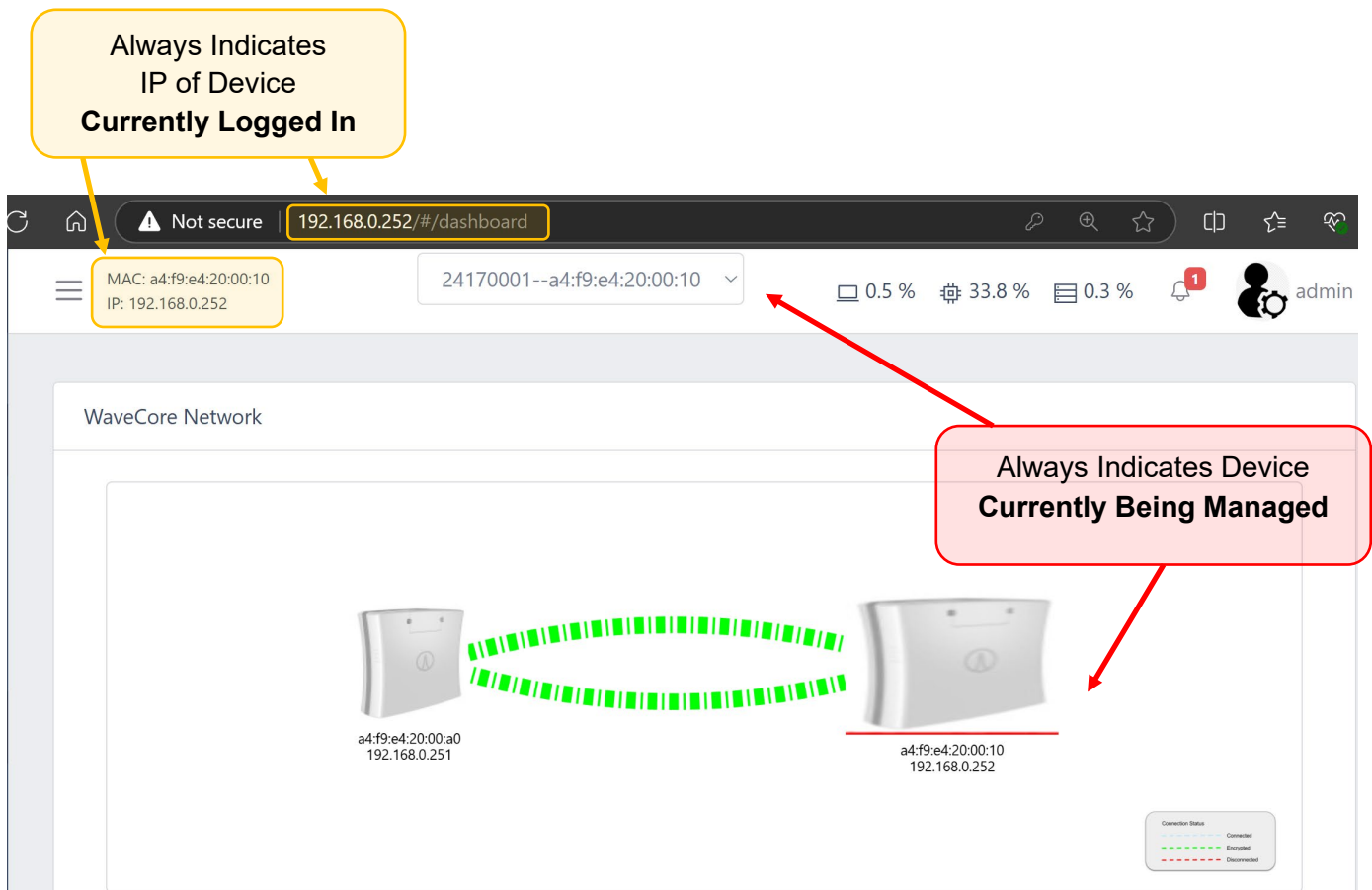
In this example, the user is logged onto Near End Radio (192.168.0.252 / a4:f9:e4:20:00:10).

The upper left side of the window (yellow shaded areas) always indicates IP of the device that is logged into. This IP will always be the same as the IP entered in the browser's address bar.

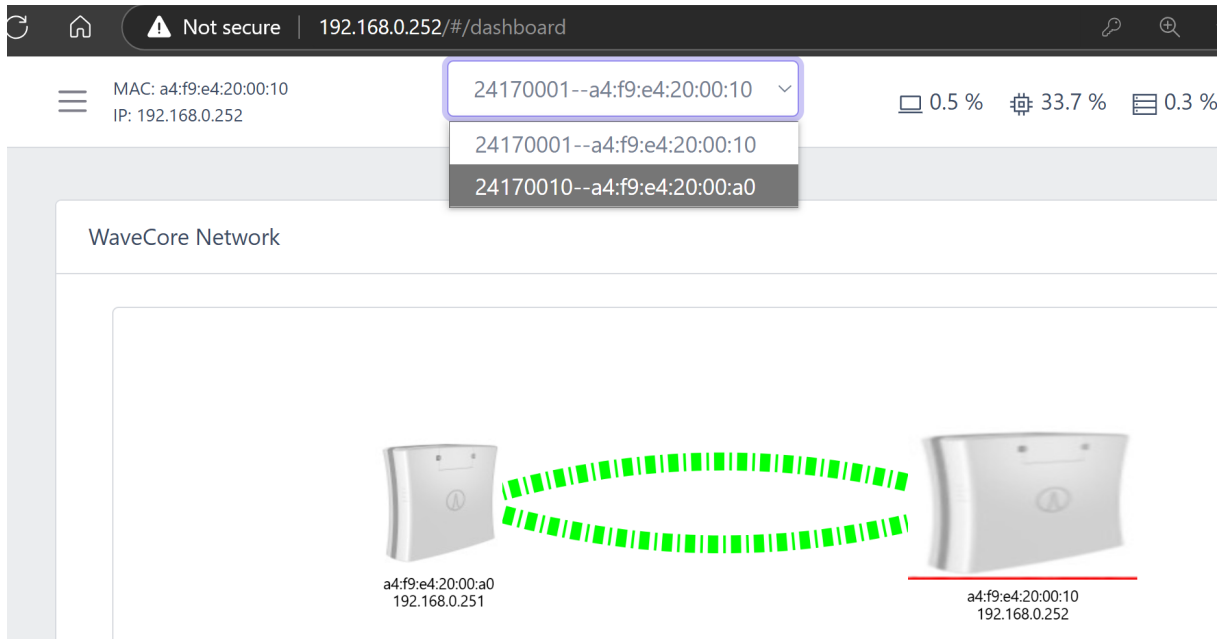
The device currently being managed is indicated by 1) the device listed in the top center device selection drop down box and 2) RED underlined ICON on the WaveCore Network connection dashboard.

In the example below (196.168.0.252 / a4:f9:e4:20:00:10) both the device that is logged into (yellow) as well as the device being managed (red).

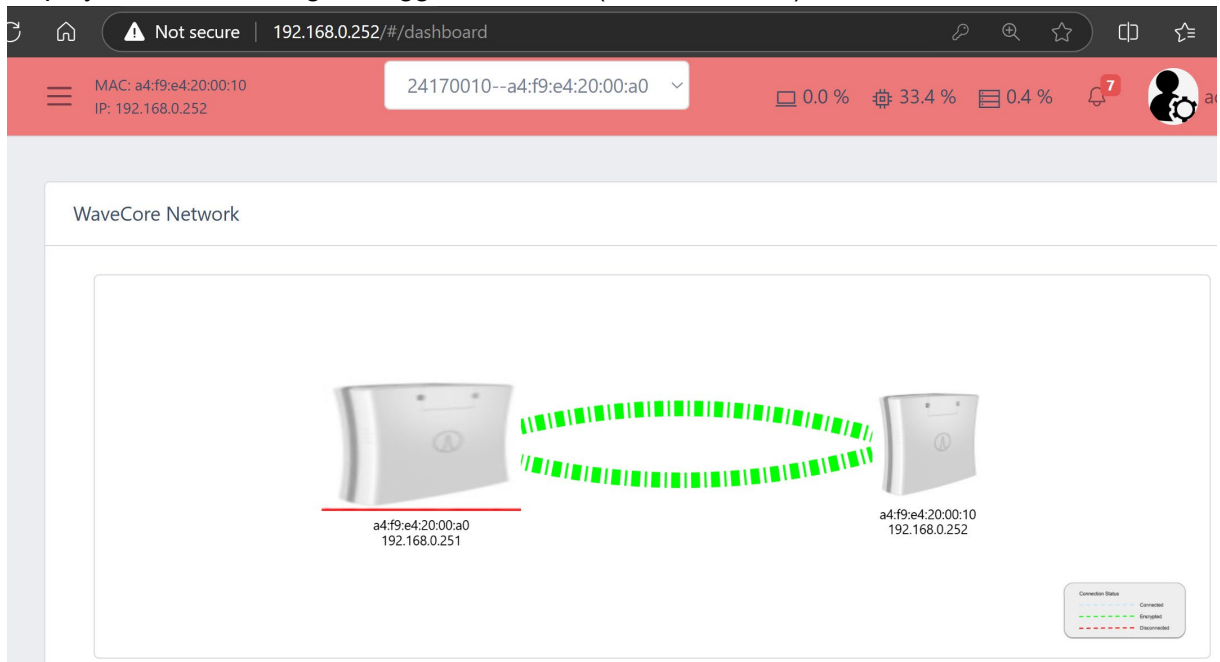
With this SSO mechanism, it is easy and quick to switch back and forth to manage both radios



To select the other device to manage from main dashboard screen, either select the other device's MAC address from the top center drop down menu (a4:f9:e4:20:00:a0) or mouse click on the other device ICON on the WaveCore Network Connection Dashboard.



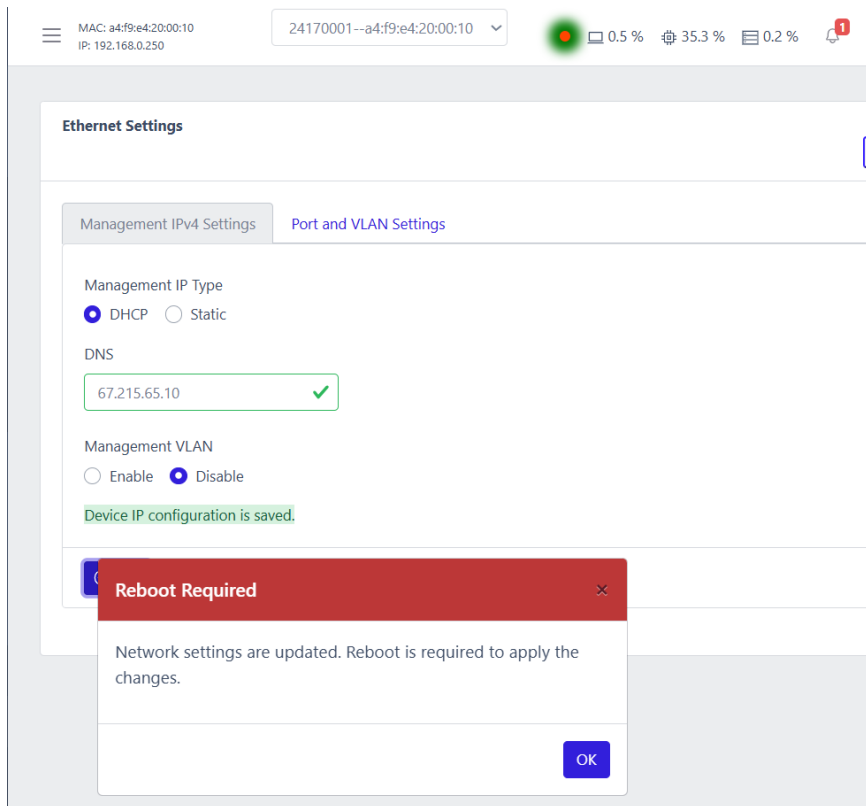
Once the other node is selected, you are now managing the other device (a4:f9:e4:20:00:a0 / 192.168.0.251) and that device's ICON will now be underlined RED indicating that it is now being managed. Also, the top center device selection drop down menu will also indicate the other device MAC address (a4:f9:e4:20:00:a0). The top part of the screen will now shade "RED" indicating that you are managing a device, via a proxy mechanism, through the original device you are still logged into (192.168.0.252). Note the browser URL address bar and the Left top of the screen both continue to display the IP of the original logged in device (192.168.0.252).





# Reboot Required Indicator

Configuration changes made to Ethernet or Wireless settings will require a “Reboot” to apply the changes to the system. Multiple changes can be made and queued up together before rebooting the system either by clicking “Reboot” in the System/Operations/System Operations screen or by quickly depressing the physical “Reset” button located under the interface bay cover of the system.



As an added reminder, a Reboot Required Indicator<sup>3</sup> red button will display and flash green at the top of the screen whenever there are pending saved changes that require a reboot. Once a reboot happens, the Reboot Required Indicator will disappear until the next time a configuration change is made and “saved” to an Ethernet or Wireless setting.



<sup>3</sup> Requires release 1.0.1 or later

# DEVICE MONITORING

The Monitoring Tabs allow you to view (but not change) the WaveCore system parameters and to view WaveCore performance metrics.

## Monitoring/Viewing General Device Status

Navigate to **MONITORING/General** to view general device configurations and status.

The screenshot displays the WaveCore monitoring interface. On the left is a dark sidebar with navigation tabs: Dashboard, MONITORING (Device, General, Ethernet, Wireless, Wi-Fi), Event, Statistics, CONFIGURATION (General, Network, User), and SYSTEM (Operations, Troubleshooting, Firmware Update, System Operations). The main content area shows device information for MAC: a4:f9:e4:20:00:10 and IP: 192.168.0.252, with a device ID of 24170001-.

**Device General**

Device Name	WaveCore
Description	Airvine WaveCore device
Location	Building 150
MAC Address	a4:f9:e4:20:00:10
Serial Number	24170001
Model Name	VB1000
Country Code	US
Firmware Version	0.2.0.112
Management IP Address	192.168.0.252
Up Time	0:31:00

**Hardware Status**

CPU Usage	1.5 %
Memory Usage	33.9 %
Flash Usage	0.3 %

**Device Logging**

Status	Disable
Server Protocol	tcp
Port	0

**NTP Settings**

Status	Enable
Primary Server	time.nist.gov
Backup Server	time.google.com
TimeZone	America/Los_Angeles

<b>General Device Parameters</b>	
<b>Device General</b>	
<b>Device Name</b>	Customer-assigned name
<b>Description</b>	Customer-assigned description
<b>Location</b>	Customer-assigned location
<b>MAC Address</b>	Factory-assigned MAC address
<b>Serial Number</b>	Factory-assigned serial number
<b>Model Name</b>	Factory-assigned model name
<b>Country Code</b>	Customer-assigned country code
<b>Firmware Version</b>	Latest installed firmware version
<b>Management IP Address</b>	Customer-assigned Management IP address
<b>Up Time</b>	Elapsed time since last reset
<b>Hardware Status</b>	
<b>CPU Usage</b>	Real-time CPU loading percentage
<b>Memory Usage</b>	Real-time memory use percentage
<b>Flash Usage</b>	Real-time disk use percentage
<b>Device Logging</b>	
<b>Status</b>	Device logging status—enabled or disabled
<b>Server</b>	Target device logging server IP address
<b>Protocol</b>	Device logging protocol—TCP or UDP
<b>Port</b>	Target device logging server port
<b>NTP Settings</b>	
<b>Status</b>	Network Time Protocol—enabled or disabled
<b>Primary Server</b>	Selected NTP primary server name
<b>Backup Server</b>	Selected NTP backup server name
<b>Time Zone</b>	Customer-selected uniform standard time zone

## Monitoring/Viewing Ethernet Port Status

Navigate to **MONITORING/Ethernet** to view Wired Ethernet Port and VLAN Settings.

### Wired Management Interface

<b>Management IP Type</b>	dhcp
<b>Management IP Address</b>	192.168.0.250
<b>Subnet Mask</b>	255.255.255.0
<b>Default Gateway</b>	
<b>Preferred DNS</b>	127.0.0.1
<b>Management VLAN ID</b>	None

### Port Settings

Port Name	Port Enable	Tagged VLAN ID	Untagged VLAN ID
Ethernet SFP+	Yes	Default	Default
Ethernet RJ45	Yes	Default	Default

### Port Statistics

Port Name	Bytes Sent	Bytes Received	Packets Sent	Packets Received	Error In	Error Out	Drop In	Drop Out
Ethernet SFP+	0.0B	0.0B	0	0	0	0	0	0
Ethernet RJ45	3.4M	1.9M	6,267	6,172	0	0	0	0

<b>WaveCore Ethernet Parameters</b>	
<b>Management IPv4 Settings</b>	
<b>Management IP Type</b>	IP address assignment type - Static or DHCP
<b>Management IP Address</b>	Management IP address (required)
<b>Subnet Mask</b>	Management IP subnet mask (optional)
<b>Default Gateway</b>	Default gateway (optional)
<b>DNS</b>	Domain name server (optional)
<b>Management VLAN ID</b>	Management VLAN ID (default 4090) (optional)
<b>Port Settings Table</b>	
<b>Port Name</b>	Ethernet SFP+ or Ethernet RJ45
<b>Port Enable</b>	Customer-selected value, Yes (default) or No
<b>Tagged VLAN ID</b>	<p>Indicates if a port is configured as at Trunk port and if so, lists all tagged VLAN ID associated with that TRUNK port.</p> <p>None: Port is not configured as a VLAN TRUNKING port.</p> <p>VLAN ID List: Indicates that port is configured as a VLAN TRUNK port and lists all VLAN ID's associated with that trunk port. VLAN packets whose VLAN ID don't match what is configured on the TRUNK port will be dropped.</p>
<b>Untagged VLAN ID</b>	<p>Indicates if the port is configured as an untagged VLAN port (aka VLAN Access Port). That is, the port will support VLAN tagging and un-tagging.</p> <p>None: Port is not configured as an untagged VLAN port.</p> <p>VLAN ID: A SINGLE VLAN ID number (example: 5) indicates the port is SINGLE configured as an untagged VLAN port.</p> <p>Untagged ingress packets received on the Ethernet port will be tagged with the specified VLAN ID (EX 5) and forwarded to the Wavecore switch.</p> <p>Egress tagged VLAN packets with the specified VLAN ID (ex: 5) received on the port's Ethernet interface from the WaveCore switch, will be untagged before egressing out of the Ethernet port.</p>
<b>Port Statistics</b>	
<b>Port Name</b>	Ethernet SFP+ or Ethernet RJ45
<b>Bytes Sent</b>	Number of traffic bytes sent out of the Ethernet Port
<b>Bytes Received</b>	Number of traffic bytes received on the Ethernet Port
<b>Packets Sent</b>	Number of packets sent out of the Ethernet Port
<b>Packets Received</b>	Number of packets bytes received on the Ethernet Port
<b>Error In</b>	Number of errored packets received
<b>Error Out</b>	Number of errored packets sent
<b>Drop In</b>	Number of ingress packets dropped
<b>Drop Out</b>	Number of egress packets sent

## Monitoring/Viewing WaveCore Wireless Radio Status

Navigate to **Monitoring/Device/Wireless** to view important WaveCore Wireless Link settings and real-time statistics.

A blue **Antenna Alignment Mode** button is located on this screen. When pressed, the system will go into antenna alignment mode allowing the installer to point the radio.

**WaveCore Radio Settings**

<b>MAC address of Far End Node</b>	a4:f9:e4:20:00:a0
<b>SSID</b>	avb_a4f9e4200010_a4f9e42000a0
<b>Channel Selection</b>	33 (6115 MHz)
<b>Channel Center</b>	6105 MHz
<b>Bandwidth</b>	320 MHz
<b>RX Signal</b>	-46
<b>Device Type</b>	Controller Node
<b>Connection Status</b>	Connected
<b>Connected Time</b>	5029 seconds

☰ Antenna Alignment Mode

WaveCore Radio Settings	
<b>MAC address of the Far End Node</b>	MAC Address of the Far End WaveCore Device currently configured.
<b>SSID</b>	Connection ID of the Radio Link - avb_[ Network ID]_[far-end WT MAC address]
<b>Channel Selection</b>	Indicates the 20 MHz beacon channel number and frequency used by the controller node to inform the subordinate node of available services and link conditions.
<b>Channel Center</b>	Center Channel Frequency of the main 80, 160, or 230 MHz channel currently in use.
<b>Bandwidth</b>	Channel Bandwidth in MHz
<b>RX Signal</b>	RX Received Signal Power. Higher (less negative) numbers indicate a stronger signal and higher over-the-air data rates
<b>Device Type</b>	Indicates Device Type of the unit: <b>Controller Node</b> (CN) or <b>Subordinate Node</b> (SN)
<b>Connected Status</b>	Indicates whether the wireless link is " <b>Connected</b> " or " <b>Not Connected</b> ".
<b>Connected Time</b>	Total duration of time that the wireless connection has been made in seconds.

## Monitoring/Viewing Management Wi-Fi Status

Navigate to **Monitoring/Device/Wi-Fi** to view WaveCore Management Wi-Fi settings and real-time statistics.

**Management WiFi (2.4GHZ)**

<b>Status</b>	Enable
<b>SSID</b>	avb_a4:f9:e4:20:00:10
<b>Passphrase</b>	*****
<b>Management URL</b>	<a href="http://192.168.3.1">http://192.168.3.1</a>

Connected WiFi Clients

Wi Fi Address	Signal	Connected Time
8E:B2:D1:13:25:5C	-39 dbm	19 seconds ago

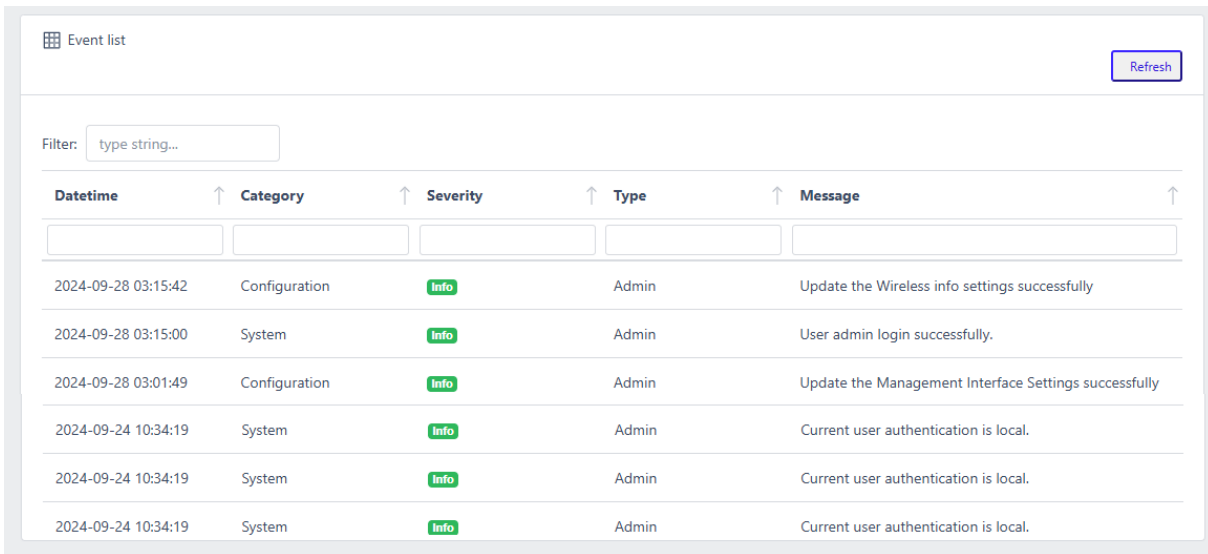
WaveTunnel Management Wi-Fi Parameters	
Management Wi-Fi (2.4GHz)	
<b>Status</b>	Customer-selected WLAN status. Default = Enable
<b>SSID</b>	User configured Wi-Fi WLAN SSID. Default = "avb_[MAC Address of WaveCore]"
<b>Passphrase</b>	User configured password to establish a secure, encrypted connection to the WaveCore management Wi-Fi.
<b>Management URL</b>	IP Address used to access VineManager Web GUI when connected to the WaveCore management Wi-Fi radio. Once connected to the WaveCore management Wi-Fi radio, enter this URL into your web browser navigation bar and you will be presented with the VineManager log on screen.
Connected Wi-Fi Clients	
<b>Wi-Fi Address</b>	MAC Address of the connected client device
<b>Signal</b>	Signal strength in dBm
<b>Connected Time</b>	Time that the Wi-Fi client has been connected

# Monitoring/Event

Navigate to **Monitoring/Device/Event** page to view WaveCore event/alarm log and sort by date, category, severity, type, and message.

Filter the event log by one of the following:

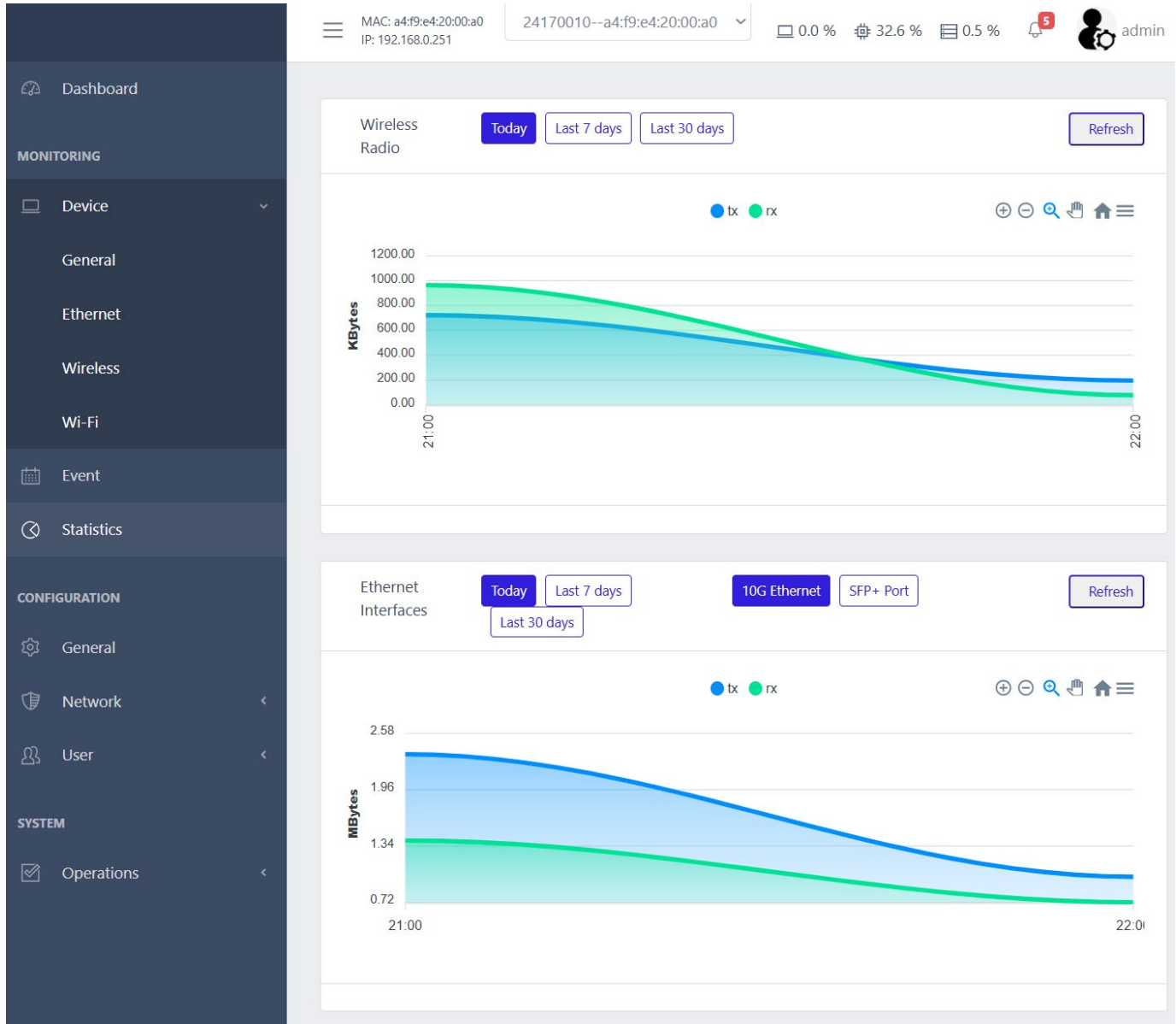
- 1) Enter a string into the "Filter:" box (applies to all text fields in log).
- 2) Enter a string into the Box located below each category
- 3) Select ↑ for ascending order or select ↓ for descending order for each category





# Monitoring/Statistics

Navigate to **MONITORING/Statistics** to view historical transmit and receive data throughput on each of three data interfaces: Main Wireless Link, Ethernet Port RJ45, and Ethernet Port SFP+.



# DEVICE CONFIGURATION

---

The configuration menus are where you a user can make changes to the device settings.

## **Process to Save and Execute Configuration Changes:**

In each configuration screen, clicking "save" will be needed to register the configuration change. Multiple configuration changes, made on different screens can be "saved" and batched together.

**Rebooting the system will be required before the saved changes are committed and executed by the system. Unless the system is rebooted, the configuration changes will not be implemented and used by the system.**

The system can be rebooted by either navigating to **SYSTEM/System Operations** screen and pressing the "Reboot" button or by pressing the WaveCore physical reset button located under the removeable interface bay cover for less than 5 seconds.

# Configuration/General

## Configuration/General/General Tab

The screenshot shows the 'Device Settings' page with the 'General' tab selected. The 'Refresh' button is in the top right. The 'General' tab is active, with other tabs being 'Device Logging', 'NTP Server', and 'API Authenticaiton'. The form contains the following fields:

- Device Name:** Text input with 'WaveCore' and a green checkmark.
- Device Description:** Text input with 'Airvine WaveCore dev' and a green checkmark. Below it is the text 'Input the device description here.'
- Device Location:** Text input with a green checkmark. Below it is the text 'Input the device location here.'
- Country Code:** Drop-down menu with 'United States of Amer' selected. Below it is the text 'Set the country code for this device.'

At the bottom of the form are two buttons: a blue 'Save' button with a checkmark icon and a red 'Cancel' button with a close icon.

Navigate to **CONFIGURATION/General/General** tab to configure general device settings. In the General tab, enter or select the following:

Parameter	Select or Enter	Then
<b>Device Name</b>	Enter a name for the device (required)	Click "Save".
<b>Device Description</b>	Enter a WaveCore Device Name (optional)	
<b>Device Location</b>	Enter a WaveCore location (optional)	
<b>Country Code</b>	Select the country code from the drop-down list (required)  Note: Certain WaveCore models like 1000RH-US will not allow changes to the country code.	

### Note

The country code must be set identically on both radios (CN and SN).



## Configuration/General/Device Logging

Navigate to **General/Device Settings/Device Logging** tab to configure a remote SYSLOG server to send the event log to. In the Syslog Settings page, enter or select the following:

Parameter	Select or Enter	Then
Status	Select Enable or Disable (default) SYSLOG server logging	Click "Save".
Server	Enter the IP address for the syslog server	
Protocol	Select UDP or TCP for the syslog server connection	
Port	Enter the port number for the syslog server connection (optional)	

### Device Settings

Refresh

General **Device Logging** NTP Server API Authenticaiton

Status  
 Enable  Disable

Server  
192.168.31.252 ✓

Protocol  
 TCP  UDP

Port  
514

# Configuration/General/NTP Server

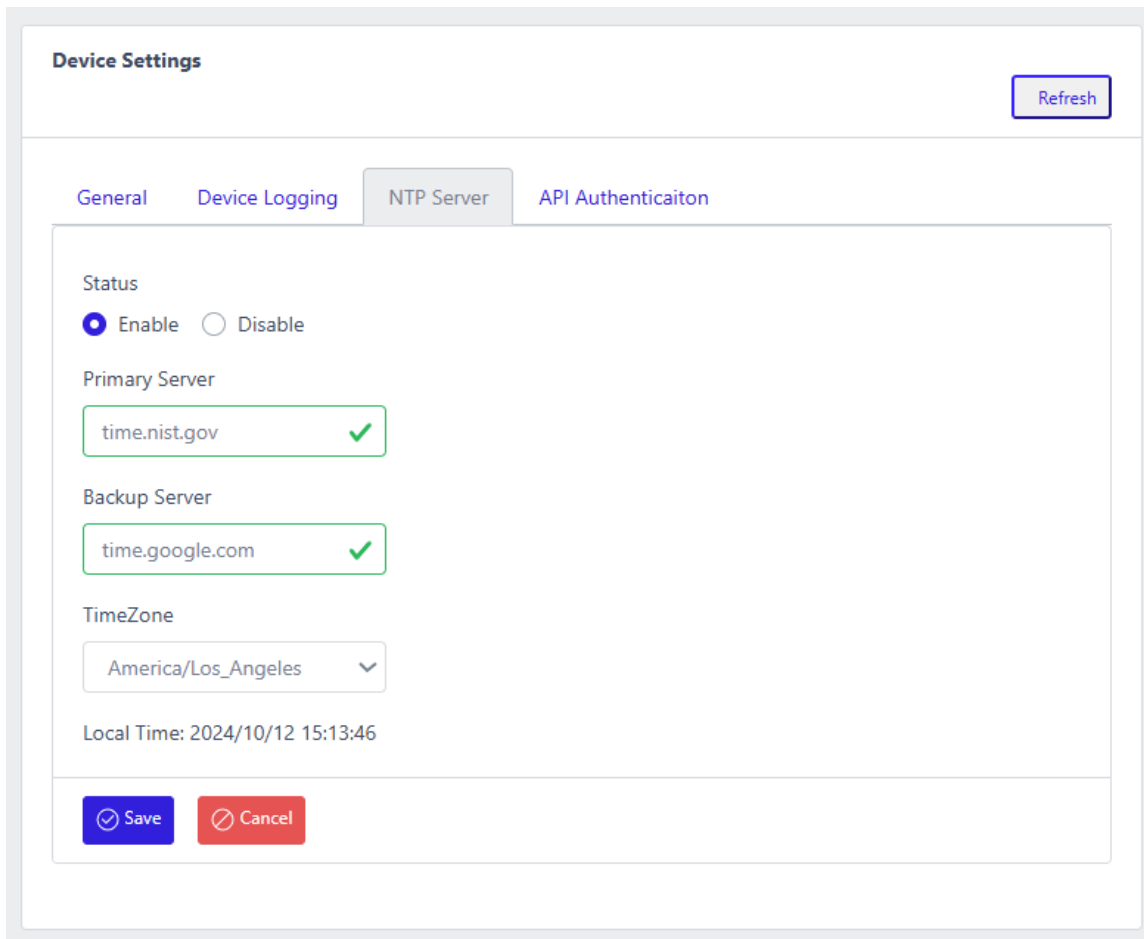
Navigate to **Settings/Device Settings/NTP Server** tab configure a remote NTP server to set/maintain the system time.

In the NTP Settings page, enter or select the following:

Parameter	Select or Enter	Then
Status	Select Enable (default) or Disable for the NTP Server function	Click "Update".
Primary Server	Enter the primary NTP Server URL	
Backup Server	Enter the backup NTP Server URL	
TimeZone	Select the time zone from the drop-down menu	

**Note:** The WaveCore node displays the current local date and time at the bottom of the NTP Settings screen.

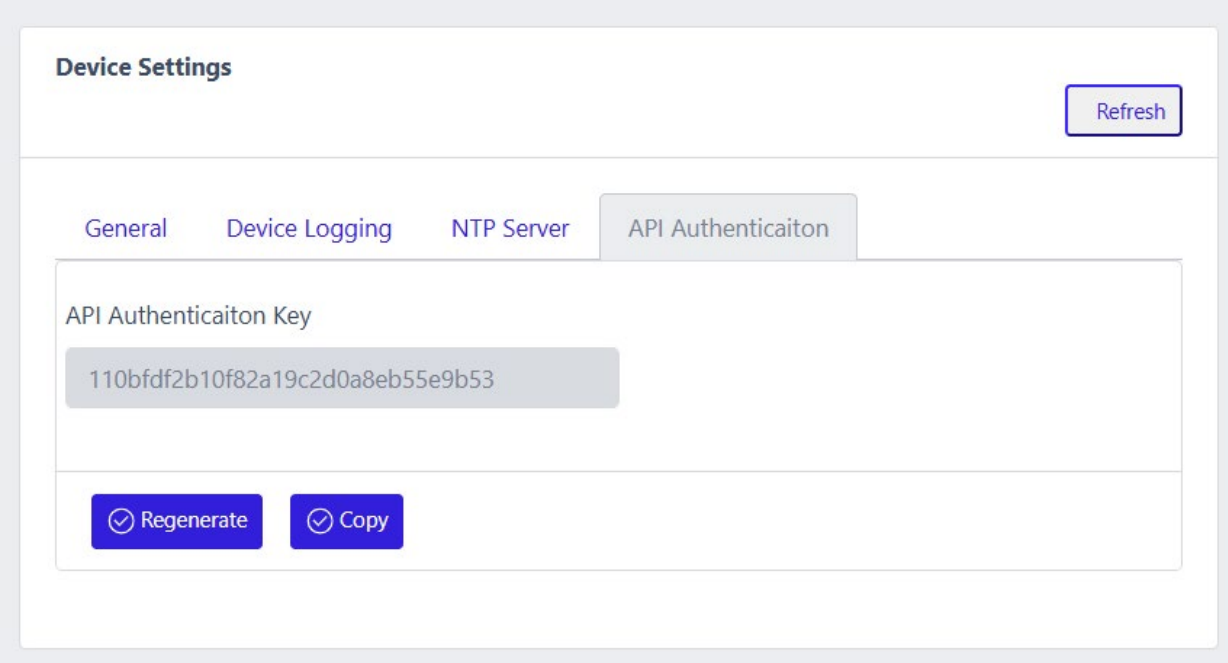
Note: If a NTP server is not configured, the system will adopt the time of your local client device that is accessing the system.



# Configuration/General/API Authentication

Navigate to **Settings/Device Settings/API Authentication** tab view or regenerate the RESTAPI Authentication Key for this device.

The API Authentication Key is required to authenticate and establish an external RESTAPI management connection to the WaveCore unit for remote management.



# Configuration/Network/Ethernet

In the Network sections, you can configure and change the management IP of the WaveCore device, define a management VLAN, and change Ethernet Port and VLAN settings.

## Configuration/Network/Ethernet/Management IPv4 Settings

Navigate to **CONFIGURATION/Network/Ethernet/Management IPv4 Settings Tab** to update the WaveCore management IP settings. Select or enter the required parameter values.

Parameter	Select or Enter	Then
<b>Management IP Type</b>	Select DHCP (Default) or Static. Note: If a DHCP server cannot be reached upon bootup, the system will configure the default "static" IP Address which is 192.168.0.250.	Click "Update".
<b>IP Address, Subnet Mask, Default Gateway</b>	If you selected Static, enter a user-defined Wired management network IP address, subnet mask, and optional gateway, and optional DNS server as required. The default Static IP address is 192.168.0.250 and default subnet mask is 255.255.255.0	
<b>Preferred DNS, Alternate DNS</b>	If you selected DHCP, also enter the Preferred DNS.	
<b>Management VLAN</b>	If you selected Static, also select Management VLAN Enable or Disable; default = Disable If you selected Management VLAN Enable, then also enter the Management VLAN ID; default = 4090	



# Configuration/Network/Ethernet/Port and VLAN Settings

Navigate to **CONFIGURATION/Network/Ethernet/Port and VLAN Settings Tab** to update the WaveCore wired Ethernet Port and VLAN setting.

To update these settings, select or enter the required parameter values.

The main Port and VLAN Settings tab indicates the current settings status of each wired Ethernet port.

**Ethernet Settings** Refresh

Management IPv4 Settings | **Port and VLAN Settings**

Port Settings

Port Name	Port Enable	Tagged VLAN ID	Untagged VLAN ID	
Ethernet SFP+	Yes	Default	Default	<a href="#">Edit</a>
Ethernet RJ45	Yes	Default	Default	<a href="#">Edit</a>

Click “Edit” to change a port’s VLAN setting.

**Ethernet Settings** Refresh

Management IPv4 Settings | **Port and VLAN Settings**

Port Settings

Port Name	Port Enable	Tagged VLAN ID	Untagged VLAN ID	
Ethernet SFP+	Yes	Default	Default	<a href="#">Hide</a>

**Ethernet SFP+ Configurations**

Port  
 Enable  Disable

Tagged VLAN ID Exmple: 100 or 3, 4-5, 10-20, blank, 'all' or 'none'

Untagged VLAN ID Example: 2 to 4090, blank or 'none'

[Save](#) [Cancel](#)

Ethernet RJ45	Yes	Default	Default	<a href="#">Edit</a>
---------------	-----	---------	---------	----------------------

<b>Setting WaveCore Ethernet Parameters</b>	
<b>Management IPv4 Settings</b>	
<b>Management IP Type</b>	IP address assignment type - Static or DHCP
<b>Management IP Address</b>	Management IP address (required)
<b>Subnet Mask</b>	Management IP subnet mask (optional)
<b>Default Gateway</b>	Default gateway (optional)
<b>DNS</b>	Primary domain name server (optional)
<b>Management VLAN ID</b>	Management VLAN ID (default 4090) (optional)
<b>Port Settings Table</b>	
<b>Port Name</b>	<b>Ethernet SFP+</b> or <b>Ethernet RJ45</b>
<b>Port Enable</b>	Customer-selected value, Yes (default) or No
<b>Tagged VLAN ID</b>	<p>Indicates if a port is configured as a Trunk port and if so, lists all tagged VLAN ID associated with that TRUNK port.</p> <p>To configure a TRUNK port with a list of VLAN IDs, enter, for example, 100, 3, 6-8, 10-20 or leave blank (default) to allow all tagged and untagged traffic.</p> <p>When a list of VLAN IDs is configured, VLAN packets received on that port whose VLAN IDs don't match the list configured on the TRUNK port will be dropped while VLAN packets received on the port that matches the VLAN ID in the list will be forwarded.</p>
<b>Untagged VLAN ID</b>	<p>Indicates if the port is configured as an untagged VLAN port (aka VLAN Access Port). That is, the port will support VLAN tagging and un-tagging.</p> <p>Enter (2-4090) to configure an Access Port with a Untagged VLAN ID A or leave blank (default).</p> <p>When a VLAN Access Port is configured with a VLAN ID (example VLAN 5), untagged packets received on the Ethernet port will be tagged with the specified VLAN ID 5 and then forwarded while tagged VLAN packets (with VLAN ID 5) received on the port will be untagged then forwarded as a standard, non-VLAN packet.</p>

# Configuration/Network/Wireless: 6 GHz transport radio

Navigate to **CONFIGURATION/Network/Wireless** to update the settings for the WaveCore 6 GHz wireless transport radio.

Setting WaveCore Wireless Radio Parameters	
<b>Management IPV4 Settings</b>	
<b>MAC address of the other node</b>	<p>Configure the MAC address of the far end node that this device will establish a communication link with.</p> <p>WaveCore devices are sold as a complete link. Each radio is configured in the factory to communicate with the other radio so this parameter should always be configured.</p> <p>In the case one of the radios becomes defective and needs to be replaced, the replacement radio will not be pre-configured and as such, each radio in the link will need to be configured with the MAC address of the other node in order to re-establish the link.</p>
<b>Channel / Frequency</b>	<p>Configure the frequency of the radio link (default: auto)</p> <p>It is recommended to leave at "auto" as the controller node will scan the frequency band and will determine the optimal frequency channel to use.</p>
<b>Bandwidth</b>	<p>Configure the bandwidth of the radio link: 80 MHz, 160 MHz, and 320 MHz (default)</p>

### WaveCore Radio Settings

Auto Setting  Advanced Setting

MAC address of the other node

✓

Channel / Frequency

▼

Set the channel

Bandwidth

▼

Choose the bandwidth



#### Note:

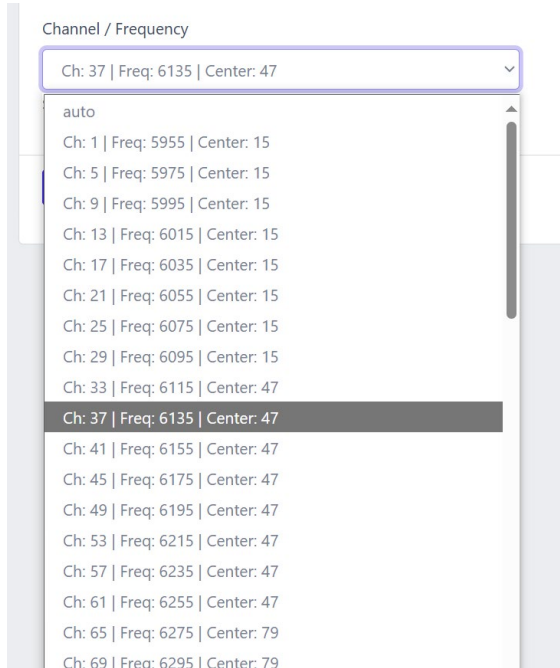
Bandwidth should be configured the same on both WaveCore nodes.

If the radio on one side is configured at a lower bandwidth (say 160 MHz) than the radio on the other side (say 320 MHz), then the resulting bandwidth of the link will be the lower of the two bandwidths; in this case the link bandwidth would be 160 MHz.

# Manual Configuration of Channel Frequency

While it is recommended to leave the **Channel / Frequency** as “auto”, users have the option to manually configure a specific frequency channel for ratio transmission. The drop-down list displays all available channels and this list will vary based on the bandwidth and country code configured for the radio.

To manually configure a channel, select the channel number from the drop-down list based on the right side of the list “| **Center: Chan Number**”. In the example below, the 160 MHz Center: 47 channel is selected (with a center frequency of 6145 6145 MHz per the frequency table below). When the device is rebooted, the radio link will tune to channel 47 (6145 MHz).



The following table maps the unique channel numbers to their corresponding frequencies grouped by bandwidth.

80 MHz Channels			
Channel #	Lower Frequency (in MHz)	Center Frequency (in MHz)	Upper Frequency (in MHz)
7	5945	5985	6025
23	6025	6065	6105
39	6105	6145	6185
55	6185	6225	6265
71	6265	6305	6345
87	6345	6385	6425
103	6425	6465	6505
119	6505	6545	6585
135	6585	6625	6665
151	6665	6705	6745
167	6745	6785	6825
183	6825	6865	6905
199	6905	6945	6985
215	6985	7025	7065

160 MHz Channels			
Channel #	Lower Frequency (in MHz)	Center Frequency (in MHz)	Upper Frequency (in MHz)
15	5945	6025	6105
47	6105	6145	6265
79	6265	6305	6425
111	6425	6465	6585
143	6585	6625	6745
175	6745	6785	6905
207	6905	6945	7065

320 MHz Channels							
Channel #	Lower Frequency (in MHz)	Center Frequency (in MHz)	Upper Frequency (in MHz)	Channel #	Lower Frequency (in MHz)	Center Frequency (in MHz)	Upper Frequency (in MHz)
31	5945	6105	6265	63	6105	6265	6425
95	6265	6425	6585				
159	6585	6745	6905				
191	6745	6905	7065				

# Configuration/Network/Wi-Fi (2.4 GHz Local Management Radio)

Navigate to **CONFIGURATION/Network/Wi-Fi** to update the settings for the local management Wi-Fi radio.

The local management Wi-Fi radio is used to locally access and manage the WaveCore device. The maximum range of the Wi-Fi radio is about 20 meters.

When your client device (Laptop or Mobile Device) is connected and authenticated to the Management Wi-Fi, you can access the VineManager WEB GUI by entering 192.168.3.1 into the web browser's address (URL) bar.

Parameter	Select or Enter	Then
<b>Management Wi-Fi Name</b>	This is the SSID of the Management Wi-Fi radio. Enter a Wi-Fi SSID; default = AirVine2	Click "Save".
<b>Passphrase</b>	Enter a new Wi-Fi passphrase; default = airvine!	

### Wi-Fi

[Refresh](#)

Management Wi-Fi Name

 ✓

Passphrase

 ✓

# Configuration/User: User account settings

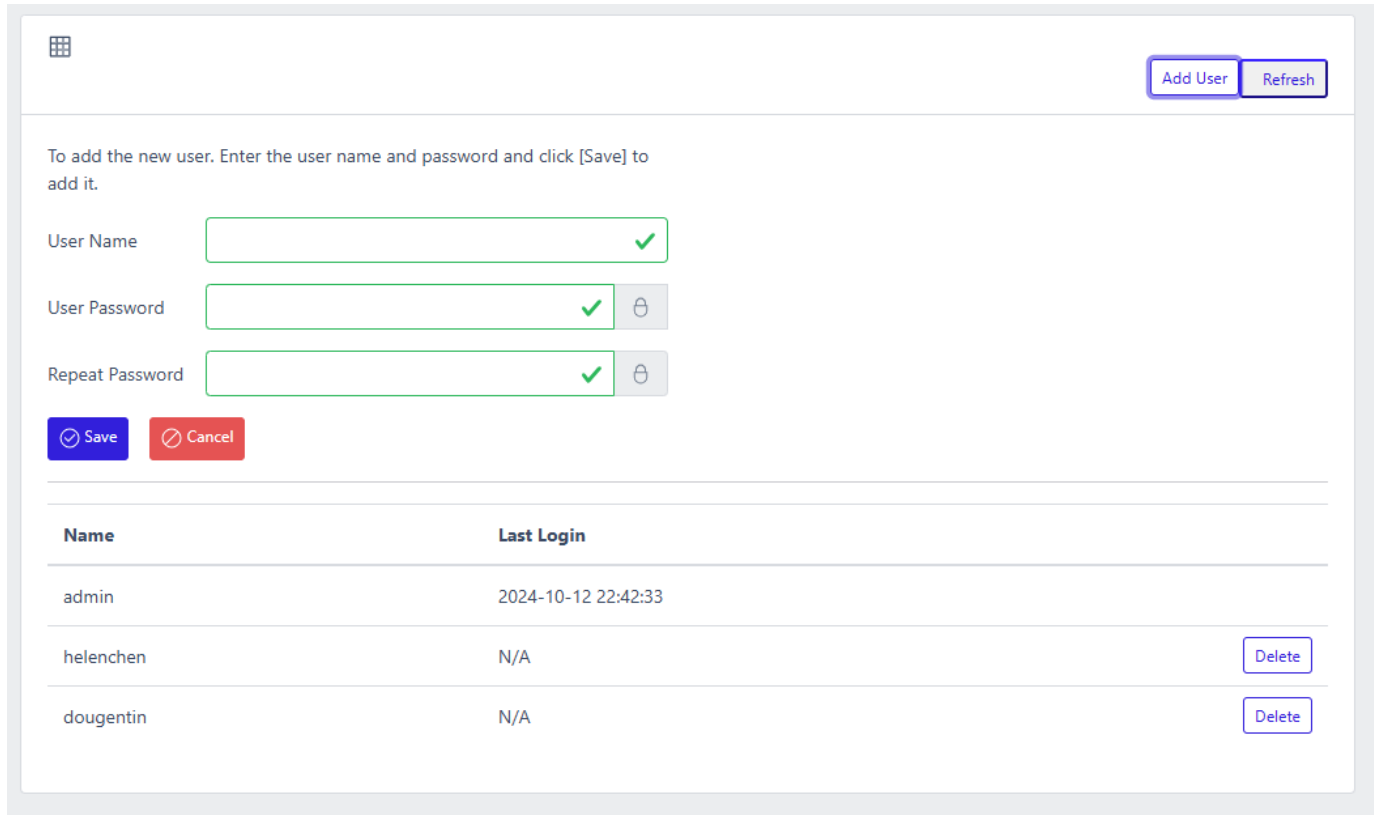
## Configuration/User/User Management (add/change user accounts)

Navigate to **CONFIGURATION/User/User Management** to add, delete, or change user accounts.

Click “Add User” to add a new user account and then set the User Name and User Password. Then click “Save” to save the changes to the system.

Click “Delete” to delete a specified user account.

To change the password of a different account (from the one you are currently logged in as), you must first log out, then log on to that account and navigate to CONFIGURATION/User/Change Password to change the password.



The screenshot displays the 'User Management' interface. At the top right, there are 'Add User' and 'Refresh' buttons. Below this, a form is provided for adding a new user. The form includes three input fields: 'User Name', 'User Password', and 'Repeat Password'. Each field has a green checkmark indicating it is valid. To the right of the password fields are eye icons for toggling visibility. Below the form are 'Save' and 'Cancel' buttons. At the bottom, a table lists existing users with columns for 'Name' and 'Last Login'. The 'admin' user has a last login of '2024-10-12 22:42:33', while 'helenchen' and 'dougentin' have 'N/A'. Each user entry has a 'Delete' button to its right.

Name	Last Login	
admin	2024-10-12 22:42:33	
helenchen	N/A	Delete
dougentin	N/A	Delete

# Configuration/User/Change Password

Navigate to **CONFIGURATION/User/Change Password** to change the current account password.

**Change Password**

Current Password	<input type="password"/>	✓	🔒
New Password	<input type="password"/>	✓	🔒
Repeat Password	<input type="password"/>	✓	🔒

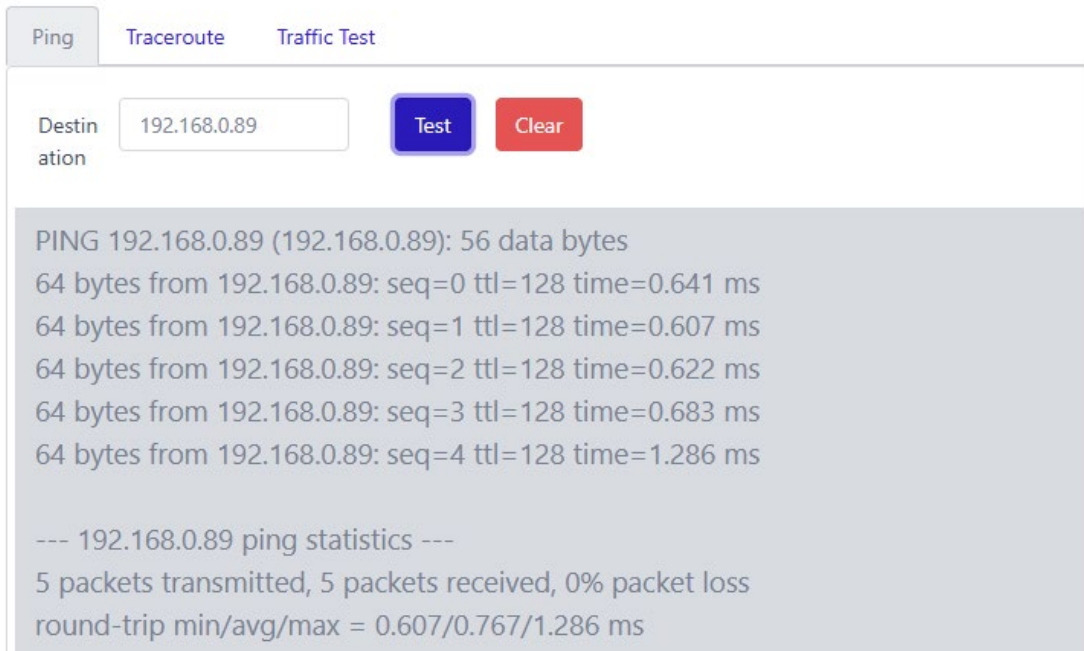
# SYSTEM CONFIGURATION

## System/Operations/Troubleshooting/Ping Tab

Navigate to **SYSTEM/Operations/Troubleshooting/Ping Tab** to run the internal ping utility to test connections to a remote device's IP.

To run, enter remote device's IP, and click "Test".

Device Troubleshooting Tools



Ping Traceroute Traffic Test

Destination: 192.168.0.89 [Test] [Clear]

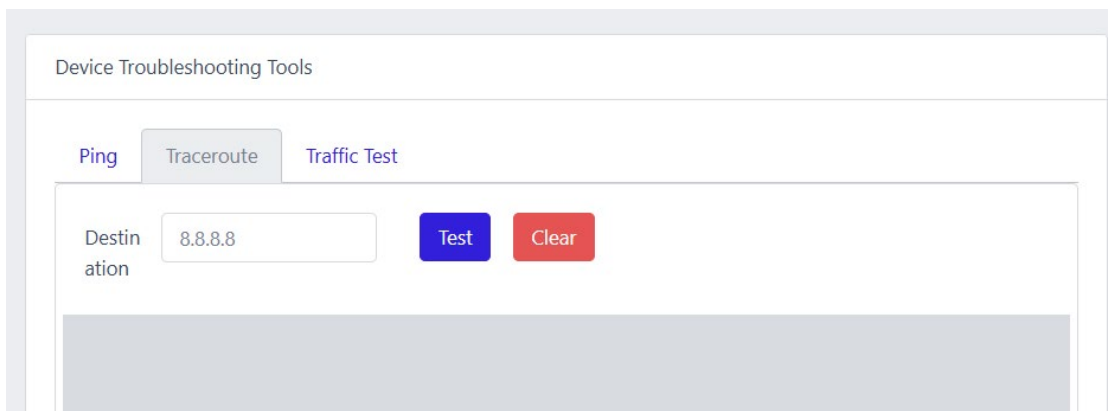
```
PING 192.168.0.89 (192.168.0.89): 56 data bytes
64 bytes from 192.168.0.89: seq=0 ttl=128 time=0.641 ms
64 bytes from 192.168.0.89: seq=1 ttl=128 time=0.607 ms
64 bytes from 192.168.0.89: seq=2 ttl=128 time=0.622 ms
64 bytes from 192.168.0.89: seq=3 ttl=128 time=0.683 ms
64 bytes from 192.168.0.89: seq=4 ttl=128 time=1.286 ms

--- 192.168.0.89 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.607/0.767/1.286 ms
```

## System/Operations/Troubleshooting/Traceroute Tab

Navigate to **SYSTEM/Operations/Troubleshooting/Traceroute Tab** to run the internal traceroute utility to test connections to a remote device's IP.

To run, enter remote device's IP in the "Destination" box, and click "Test".



Device Troubleshooting Tools

Ping Traceroute Traffic Test

Destination: 8.8.8.8 [Test] [Clear]

[Empty output area]

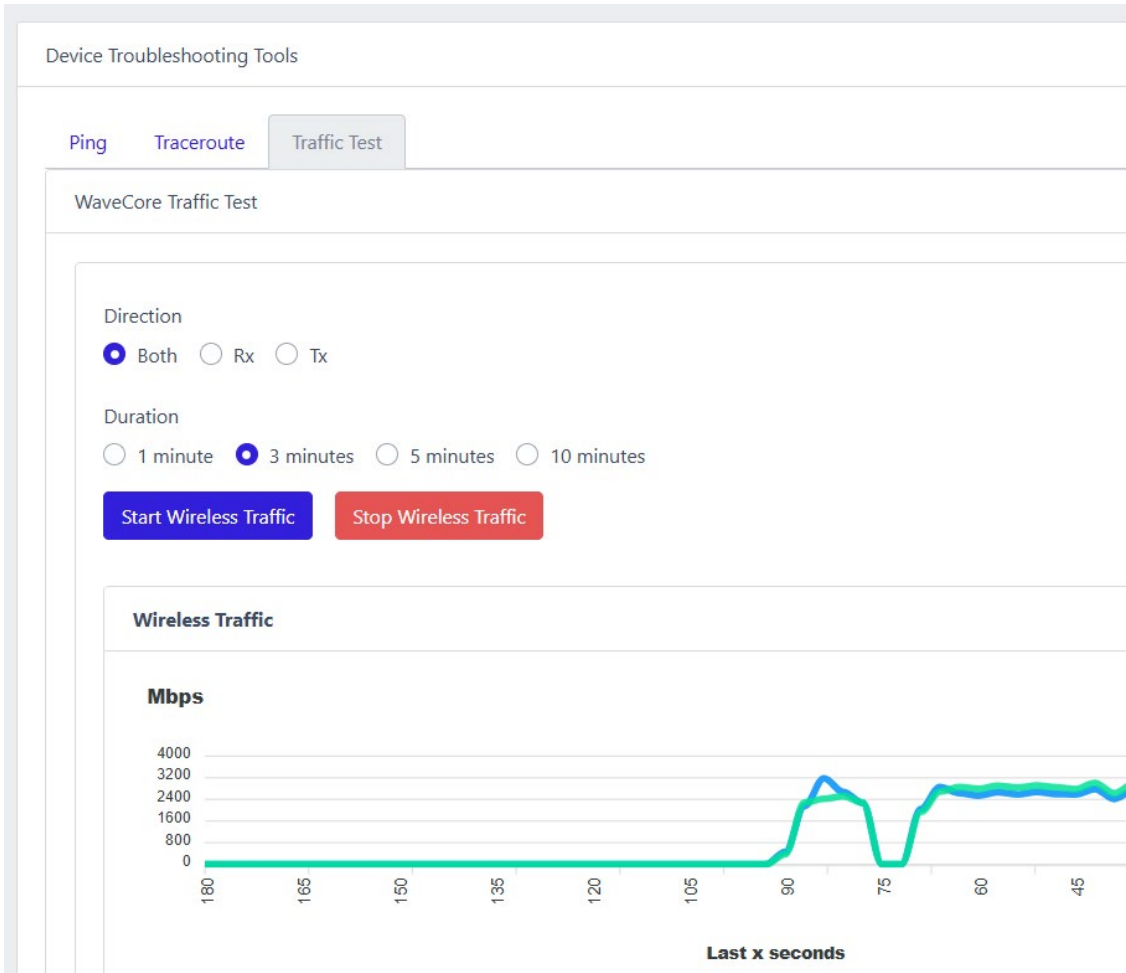


# System/Operations/Troubleshooting/Traffic Test

Navigate to **SYSTEM/Operations/Troubleshooting/Traffic Test tab** to run the internal traffic test across the wireless link to gauge the links performance. Test traffic utilizes the TCP protocol. Running the traffic test can be a useful diagnostic before and after installing the WaveCore units.

To run, enter the Direction of the traffic test and Duration of the test then click "Start Wireless Traffic".

Parameter	Select or Enter
<b>Direction</b>	Both – Send Traffic in both directions across the link RX – Send and report traffic from far end device to current device TX – Send and report traffic from current device to far end device.



## System/Operations/Firmware Update

Navigate to **SYSTEM/System/Operations/Firmware Update** to upgrade and manage the firmware.

Up to two images of VineOS firmware can be locally stored in the WaveCore device (a Primary Image and a Backup Image).

The **Current Firmware Information** screen shows which VineOS images are stored in the device; each image is identified by its Version Number, Size, and the images Checksum.

The **Active** column indicate which image is currently running on the device:

- Active Indicates the image that is currently running on the device.
- Inactive Indicates the image that is in storage, but not running on the device.

The **Primary** column indicate which image is currently running on the device:

- Primary Indicates the image that will be used on the next reboot of the system.
- Backup Indicates the image that will NOT be used on the next reboot of the system.

### Current Firmware Information

[Refresh](#)

Image Number	Active	Primary	Version	Size	Checksum
1	Active	Primary	0.2.0.112	63.9M	025323e6c63d3f42e896d5bf3cebf990
2	Inactive	Backup	0.2.0.107	63.9M	4e9bd8e2a85dcf8dc63da598992a9a06

[Set As Primary](#)

### Step1: Download/Upload The Firmware File

From:  HTTP  FTP  TFTP  Local File

To upload the firmware file, click[Choose a file] to select the file and then click [Upload] to confirm.

[Choose a file](#)

[Upload](#)

To make a "Backup" image the "Primary", simply select the Row that is the Backup image (the row will then shade grey) and click "Set as Primary".

The screenshot shows the 'Current Firmware Information' section with a table of firmware images. A confirmation dialog box is overlaid on the interface, asking for confirmation to set image #2 as primary. The dialog text reads: "Confirmation: Are you sure? Firmware image#2 will be set as primary. You need to reboot device to boot up from the primary." Below the dialog are two buttons: "No" and "Yes".

Image Number	Active	Primary	Version	Size	Checksum
1	Active	Primary	0.2.0.112	63.9M	025323e6c63d3f42e896d5bf3cebf990
2	Inactive	Backup	0.2.0.107	63.9M	4e9bd8e2a85dcf8dc63da598992a9a06

The table will now show the "Inactive" image as "Primary".

The screenshot shows the 'Current Firmware Information' section after the confirmation. The table now shows image #2 as 'Active' and 'Primary', and image #1 as 'Backup'. The 'Set As Primary' button is still visible at the bottom.

Image Number	Active	Primary	Version	Size	Checksum
1	Active	Backup	0.2.0.112	63.9M	025323e6c63d3f42e896d5bf3cebf990
2	Inactive	Primary	0.2.0.107	63.9M	4e9bd8e2a85dcf8dc63da598992a9a06

When you reboot, that Inactive image will now show as "Active" and "Primary" in the table.

To upload a new VineOS firmware image to the device, WaveCore allows two methods:

1. Upload an image from a remote site/server using: HTTP/HTTPS, TFP, or TFTP.
2. Upload an image as a Local File directly from your connected device (typically a PC or Laptop).

**Step 1: Select the method and file to upload to the WaveCore device.**

After the image has been identified (server logged in or local file selected), click the “Upload” button to upload the image to the WaveCore device.

The screenshot shows a web interface titled "Step 1: Download/Upload The Firmware File". It features a "From:" section with four radio buttons: "HTTP" (selected), "FTP", "TFTP", and "Local File". Below this are five input fields: "Server Address" (192.168.31.252), "Server Port" (8080), "File Path" (/avs\_nor0.bin), "User Name", and "User Password". Each of the first three fields has a green checkmark to its right. At the bottom, there are two buttons: a blue "Download" button with a checkmark icon and a red "Clear" button with a delete icon.

**Step 2: Write the Firmware Image to the Device**

Click if you want to “Set as primary” the image as primary (or if unclicked it will overwrite the backup slot).

Click “Reboot after update” if you wish to automatically reboot the system which is needed to write the image.

The screenshot shows a web interface titled "Step 2: Write The Firmware Image To Device". It displays the "File Name:" as "avBlaster64.0.2.0.102.bin" with a size of "(65.8M)". Below the file name are two checked checkboxes: "Set as primary" and "Reboot after update". At the bottom, there are two buttons: a blue "Write Image" button with a checkmark icon and a red "Delete Image" button with a delete icon.

# System/Operations/System Operations

Navigate to **SYSTEM/Operations/System Operation** to:

- Backup the system configuration into either local memory or into a downloadable file that you can use to load into other WaveCore devices which can save configuration time.
- Reboot the system which must be done whenever configuration changes are to be permanently saved or to write VineOS firmware images into permanent system memory.
- Factory reset the system which resets the WaveCore to factory default configuration settings. While factory resetting the system will result in losing all of your configuration settings but will boot back up and run the current Primary firmware image.
- Download System Support Logs to your local PC or Laptop. The Airvine support team occasionally may request support logs to help troubleshoot technical issues.

### Backup and Restore

[Refresh](#)

To backup all settings, including system and network configurations etc.click[backup] and select to save the backup file.

[Backup](#)

---

To upload the backup configuration file, click[Choose a file] to select a previously saved backup file and click [Upload] to confirm.

[Choose a file](#)

[Upload](#)

---

To "Download", "Restore" or "Delete" the backup configuration file, click the button in the selected row.

Number	Name	Size	Datetime			
1	20241013_00_06_03.tar.gz	20.7K	2024-10-13 00:06:03	<a href="#">Download</a>	<a href="#">Restore</a>	<a href="#">Delete</a>

### Reboot

Reboot the device.

[Reboot](#)

### Reset

Factory reset the device.

[Reset](#)

### Download System Support Logs

Click to download the support logs from this device

[Download](#)