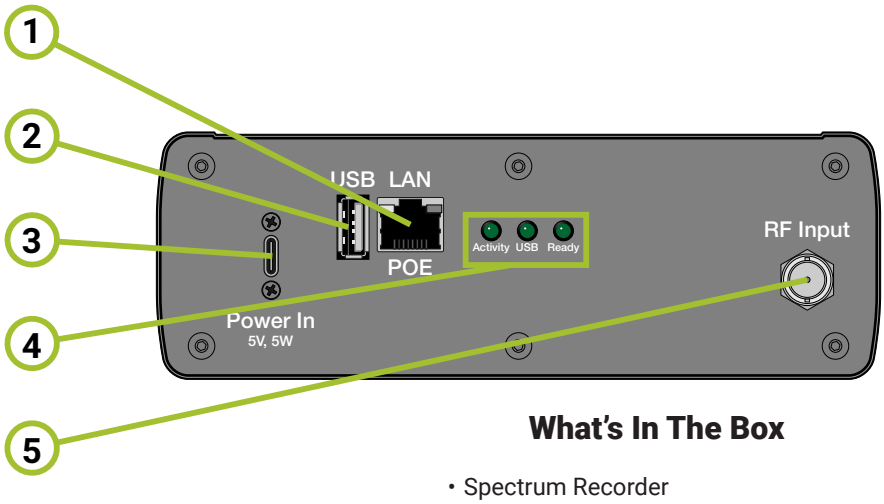
User Guide

Spectrum Recorder

RF Spectrum Data Logger for UHF Band Wireless Audio Devices

Rear panel features



1 Ethernet / PoE RJ45 connection.

2 USB-A connection (for storage drive).

3 USB-C (for 5 V, 1 A supply); use this for power if PoE is not available. A 5-volt DC power supply is included.

4 Indicator LEDs
Activity — Blinks once per second while the Spectrum Recorder is operating.
USB — Indicates that files are being copied to storage drive plugged into the USB port.
Ready — Indicates that one or more new files are available to retrieve.

5 RF input from an antenna or antenna distribution system. Maximum input level is -20 dBm (10 µW). A wideband whip antenna is included for stand-alone operation.

What's In The Box

- Spectrum Recorder
- UHF wideband whip antenna
- 5V USB-C power supply with cable

Getting started

1 For stand-alone operation, such as a pre-build survey of the RF environment, attach the included antenna to the Spectrum Recorder's RF input. To survey the RF environment of an existing system, connect an output from the system distro.

2 Connect power to the Spectrum Recorder, either with the included 5 V supply (or equivalent) through the USB-C port, or with a Power Over Ethernet (PoE) connected to the RJ45 Ethernet port. The Spectrum Recorder will begin scanning and recording immediately. The **Activity** LED will blink once per second to indicate operation. When one or more CSV files are ready for retrieval, the **Ready** LED will come on.

Operation

The Spectrum Recorder starts a new session whenever it is turned on, and then starts another after running continuously for 24 hours, and every 24 hours after. It completes a scan of the 400 to 700 MHz spectrum every 20 seconds. Every 10 minutes it averages the most recent 30 scans and writes a CSV file to its internal storage, for a maximum of 144 files each session. For each current session, the Spectrum Recorder also writes three files based on the accumulated scan data: **Avg.csv**, which is the average of all scans in the session; **MaxHold.csv**, which provides all of the maximum values for each scan point in the session; and **Active.csv**, which depicts the difference between the maximum and average values, to show the frequencies that have dynamic activity. Its internal storage will hold as many as 99 sessions.

If the Spectrum Recorder is connected to a local network with Internet access, the unit will get attempt to get its date and time information from an online server. The 10-minute CSV filenames will be written in the format **nn_xxx_yyyymmdd_hhmmss.csv**. If it is not connected to a network, or cannot otherwise reach a date and time server, the files will be written in the format **nn_xxx.csv**.

In both cases, the session number is **nn** and the file number is **xxx**. The date and time information is depicted as integers as **yyyymmdd** and **hhmmss**.

Retrieving files

Via USB drive

1 Plug a USB drive (FAT32 formatted; 2 GB minimum) into the USB-A port of the Spectrum Recorder. The **USB** indicator will come on as the unit automatically copies all the data files, both the 10-minute scans and the three 24-hour session files, onto the drive. The 10-minute scan files will be in the drive's root directory. The three session files will be in a folder called **24 Hour Spectrum Files**.

2 When the transfer is done, the LED will turn off and you may remove the drive.

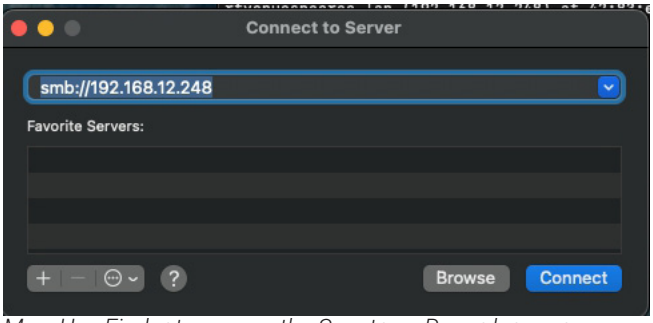
3 The Spectrum Recorder will also have created a folder called **Configuration**. In it will be a log file, **log.txt**, that lists all the files copied to the drive by the Spectrum Recorder. Another file, **version.txt**, will contain the Spectrum Recorder's vital information: firmware version, serial number, session number, number of files in the session, session span time, MAC address, IP address, and the system time when the file dump occurred. The IP address and MAC address may be of use for other functions.

Via network

You'll need the Spectrum Recorder's IP address to access the data files from a computer on the same local network. To determine the IP address, open a terminal app or command prompt. Type `ping rfvenuespecrec` and press **Enter**. If the Spectrum Recorder is connected to the network and has an IP address assigned, you will see this response on the terminal:

```
Pinging …
        Reply from [IP Address] …
        Reply from [IP Address] …
        Reply from [IP Address] …
        Reply from [IP Address]
```

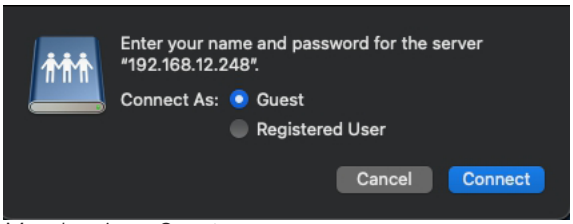
To stop the ping, press **Ctrl+C** (Windows) or **Control-C** (Mac). Copy or write down the IP address.



Mac: Use Finder to access the Spectrum Recorder over a network.

1 Windows: Open **File Explorer** (Windows), and in the address bar, type two *backslashes* (not forward slashes), followed by the Spectrum Recorder's IP address.
Mac: Open **Finder** (Mac) and either type the Spectrum Recorder's IP address or press **Command+K** to find it as a network drive. Press **Enter**. If the Spectrum Recorder requests that you log in, do so as a guest.

2 In the window, open the folder called **share**. Here you will find all the scan data files in CSV format. You may copy them and use them in frequency coordination or analysis tools such as Wireless System Builder (on the RF Venue web site), Wireless Workbench, Soundbase, and more.



Mac: Log in as Guest.

Specifications

Scan Range	**400 – 700 MHz**
Resolution Bandwidth	**25 kHz**
Impedance	**50 Ω**
Dynamic Range	**-130 to +10 dBm**
Average Noise Floor	**-120 dBm**
Data Port Connector	**USB Type A**
LAN and PoE Connector	**RJ45**
Power Connector	**USB Type C**
Power Requirement	**5V DC 1 A (via USB-C) or PoE**
Dimensions	**178 × 61 × 87 mm / 7 × 2.4 × 3.4 In**
Weight	**670 g / 1.48 lb**

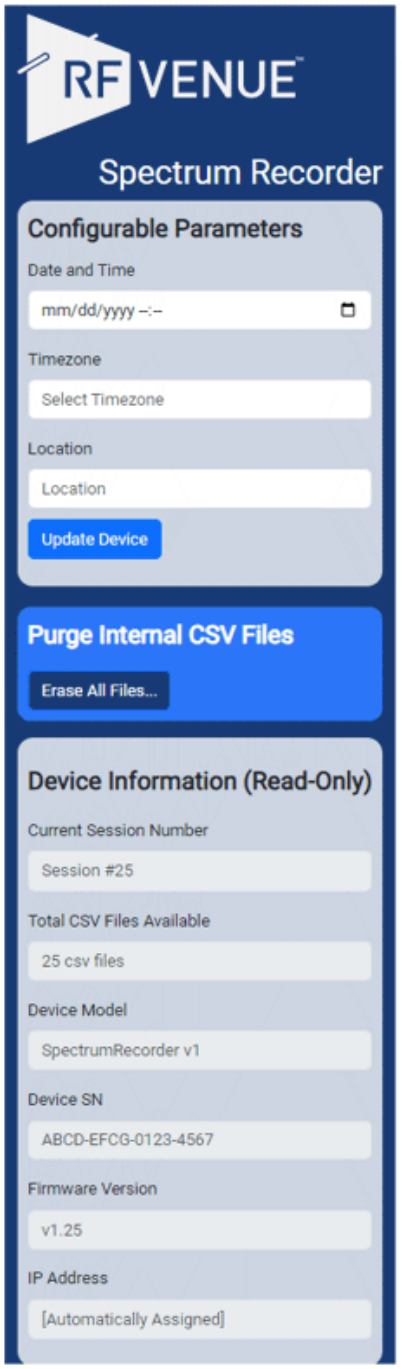
Accessing the Spectrum Recorder GUI

The Spectrum Recorder has a built-in web server that provides a graphic user interface (GUI) when access through a web browser.

1 Open a web browser on a computer on the same network as the Spectrum Recorder.

2 Type the Spectrum Recorder's IP address into the address bar.

3 It may take a few seconds to load, but the GUI (right) will appear in the browser window.



The Spectrum Recorder GUI, as it appears in a browser.

Managing multiple Spectrum Recorder devices on a network

Determining the MAC address of the Spectrum Recorder

If you have multiple Spectrum Recorder devices on the same network, you will need to know their Media Access Control (MAC) addresses. Doing so will allow your network administrator to assign them separate hostnames (the default is **rfvenuespecrec**) in the **Devices** serttings of your network router. In the **Terminal** or **Command Line** app, use the `arp` command to list the devices with their IP addresses and MAC addresses.

You can also insert a USB drive into the Spectrum Recorder and remove it after the **USB** indicator turns off. The device's MAC address will be included in the **version.txt** file written onto the drive.