

# SUPROCK TECHNOLOGIES WMR+ MANUAL



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## Table of Contents

FCC Warning.....	3
Introduction .....	4
Connecting your WMR to PC/Acheron Software.....	7
Rescan USB.....	7
Connecting Devices.....	8
Wireless Devices .....	8
Coaxial Devices.....	9
Basic WMR Controls.....	11
Rename device (set user tag).....	12
Update Firmware .....	13
Advanced Actions.....	14
WMR Device Settings.....	14
Auto-connecting (Pairing) a WMR to a WM .....	15
Run Hardware Tests.....	15
Show Packet Stats .....	15
Advanced WM Device Management .....	16

## FCC Warning

### **FCC Part 15.19 Warning Statement-**

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 UNDESIRE OPERATION.

### **FCC Part 15.21 Warning Statement-**

NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

### **FCC Part 15.105(b) Warning Statement-**

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Introduction

The WMR is the gateway that our Asphodel protocol based wireless and coaxial based devices use to connect to a PC or LAN network, including, but not limited to:

- Digital Coaxial Vibration Sensor in wired or wireless mode
- Motes
- Digital Coaxial Strain Gages
- Torque monitoring systems
- Microtelemetry based devices

The WMR+ is designed for smaller systems of up to 4 devices. Each WMR can connect and stream data from one device at a time, or one can be used to cycle between different wireless devices, but not simultaneously.



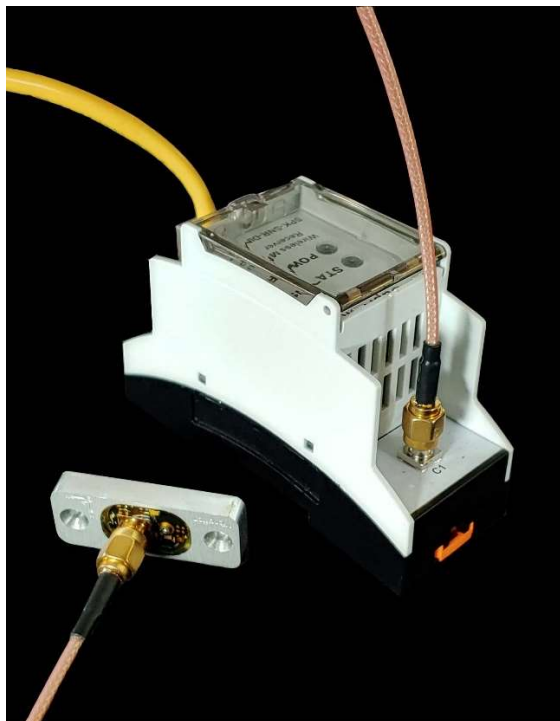
*Figure 1 WMR+ version*

The WMR+ is powered via USB cable, no external power supply is required. In this manual we will explore the installation, function and settings of the WMR for optimal telemetry operation and data acquisition.

The WMR+ is capable of connecting to both wired coax or wireless devices.



The WMRs have been designed with a convenient dual-purpose SMA connection as the sensor interface. It accepts either coaxial cable for wired devices, or a standard SMA 2.4Ghz whip antenna for wireless devices.



*Figure 2 Example coax vibration sensor connected to WMR in wired configuration; both power and data to and from sensor are transmitted via a single SMA coaxial connection.*

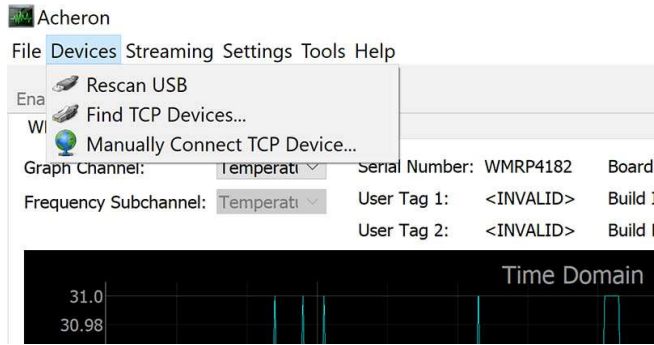


*Figure 3 Example wireless vibration mote with WMR in wireless configuration. For wireless connection simply screw provided SMA antenna to WMR and connect USB to PC. Pictures may not be representative of actual product.*

## Connecting your WMR to PC/Acheron Software

The WMR+ is set up to connect automatically to a PC running the Acheron Software. If the device doesn't connect right away, the Rescan USB option will prompt the Acheron software to rescan the USB ports and find your device.

The devices Menu includes options for connecting to USB and TCP device versions.



### Rescan USB

In certain instances when Windows® doesn't immediately recognize a new USB device; clicking Rescan USB rescans the computer's USB ports for devices, automatically connecting to any devices that weren't streaming to Acheron before. Rescan USB can also be found on the top right corner of the window for convenience.



## Connecting Devices

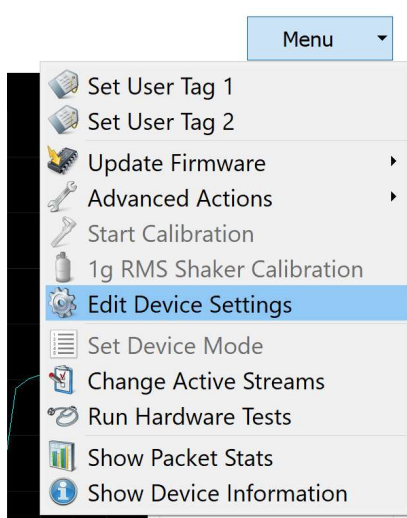
The WMR is used to connect Wireless or Coax devices to the Acheron software, the settings below are for initial setup of wireless and coaxial devices. Once these settings are in effect, it is not necessary to go into the menu to change them as long as the same type of device is being connected to the WMR.

### Wireless Devices

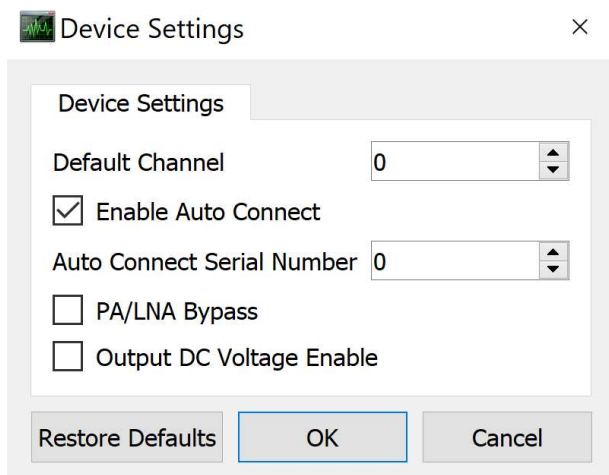
**\*Once the settings in steps 1 and 2 are set and confirmed correct for the type of device connected to the WMR, one may simply connect to the device starting at step 3.**

Once the WMR is connected to the software and streaming:

1. Go to Menu – Edit Device Settings



2. In device settings, ensure PA/LNA bypass and enable DC Power are unchecked.



3. If they are checked, uncheck them. If not, exit and proceed to next step.



Radio

Detail Scan...




4118 ▾

Scan

Connect

Disconnect

Advanced Menu ▾

Channel  0  

- Click Scan, this will provide the user with a list of available devices in the drop menu.

Radio

Detail Scan...

1723 ▾




1723

4118

Connect

Disconnect

Advanced Menu ▾

Channel  0  

- When you have chosen the desired device in the drop menu above the Scan button, press connect.
- The WMR will connect to the device and a new tab will be created in Acheron with that device.

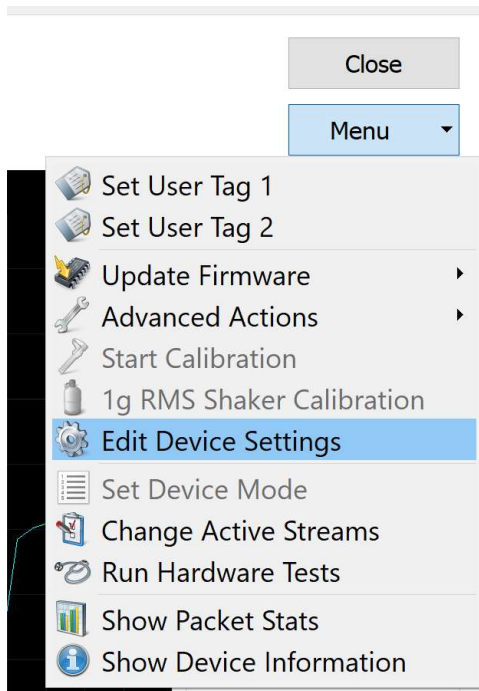
## Coaxial Devices

**\*Once the settings in steps 1 and 2 are set and confirmed correct for the type of device connected to the WMR, one may simply connect to the device starting at step 3.**

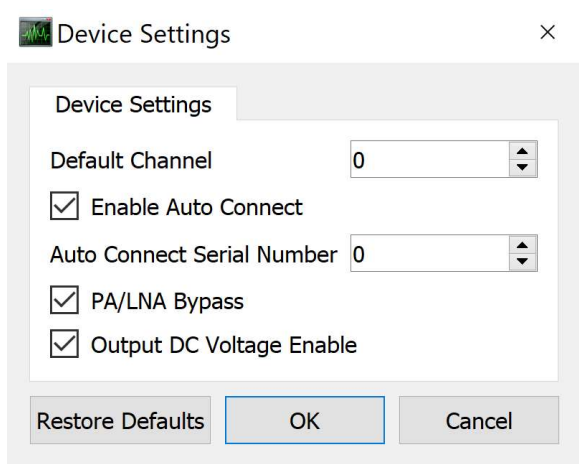
Suprock Technologies Digital Coaxial devices have the ability to send/receive power and data to the WMR through a single coaxial cable. The procedure is similar to connecting wireless devices, except PA/NLA bypass and DC power must be enabled:

Once the WMR is connected to the software and streaming:

- Go to Menu – Edit Device Settings



2. In device settings, ensure PA/LNA bypass and enable DC Power are unchecked.



3. If they are unchecked, check them. If they already are, exit and proceed to next step.

Radio

Detail Scan...


4118 ▾

Scan

Connect

Disconnect

Advanced Menu ▾

Channel  0


4. Click Scan, this will provide the user with a list of available devices in the drop menu.
5. When you have chosen the desired device in the drop menu above the Scan button, press connect.
6. The WMR will connect to the device and a new tab will be created in Acheron with that device.

## Basic WMR Controls

The WMR basic controls are related to identifying and connecting with remote devices. The WMR can scan and connect to remote devices it sees in the environment. For devices using Radio Frequency Power excitation, an RFP must be energized for the remote radio to become powered. The WMR device also allows the user to select the communications channel. This is useful for installers setting up multiple remote devices that coexist in the environment.

The wireless module receiver will display a tab in the Main Plot Window when connected to the software. The WMR has a few graph channels, including its internal temperature sensor, and a few channels with information on RF performance and packet transmission performance. Temperature is displayed in the Graph Window by default.

Enable RF Power (0) Disable RF Power (0)

WMRP4182 

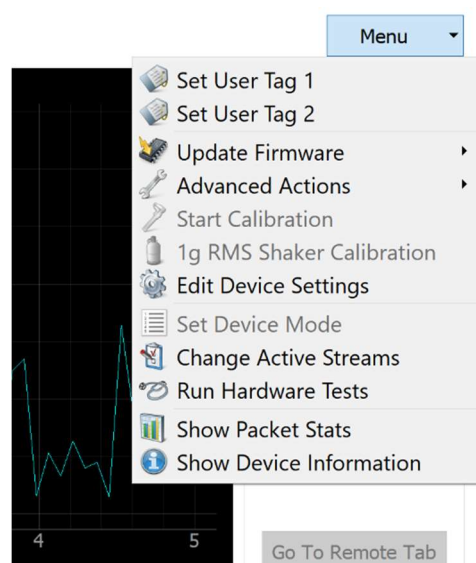
Graph Channel: Temperati ▾ Serial Number: WMRP4182 Board Info: WMR+ rev 4

Frequency Subchannel: Temperati ▾ User Tag 1: <INVALID> Build Info: dev-8b998995c5-bb

User Tag 2: <INVALID> Build Date: 2020-06-01T14:02:52Z

Similar to all other devices, hardware build information, firmware build information, and build date information are displayed at the top of the display tab.

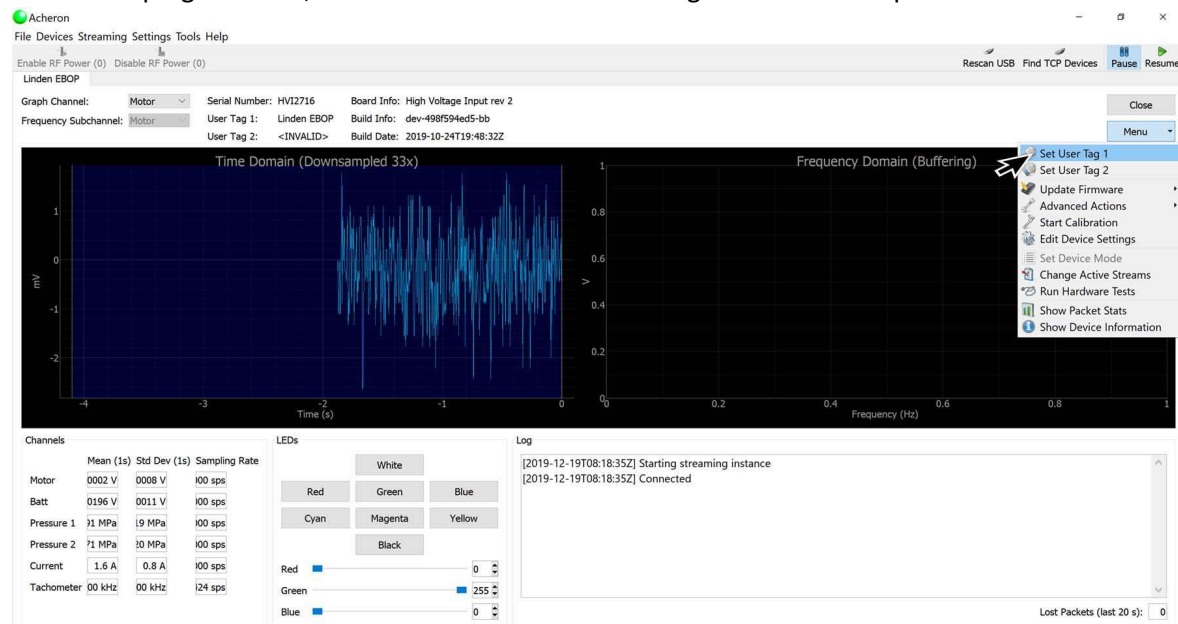
On the right side of the program there is a button named menu, it contains important device and firmware update settings for different devices.



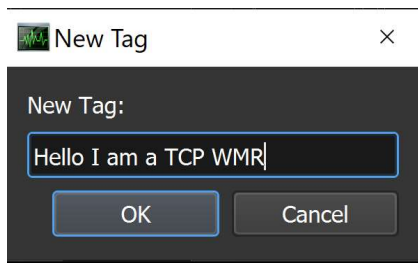
## Rename device (set user tag)

If the PC you are using is monitoring more than one device, it can be helpful to set easily identifiable tags on the devices being used. Procedure involves 3 quick steps:

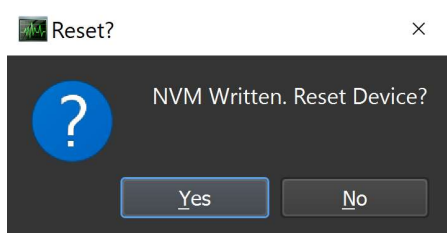
1. In the top right corner, click “Menu” then “Set User Tag 1” from the drop-down.



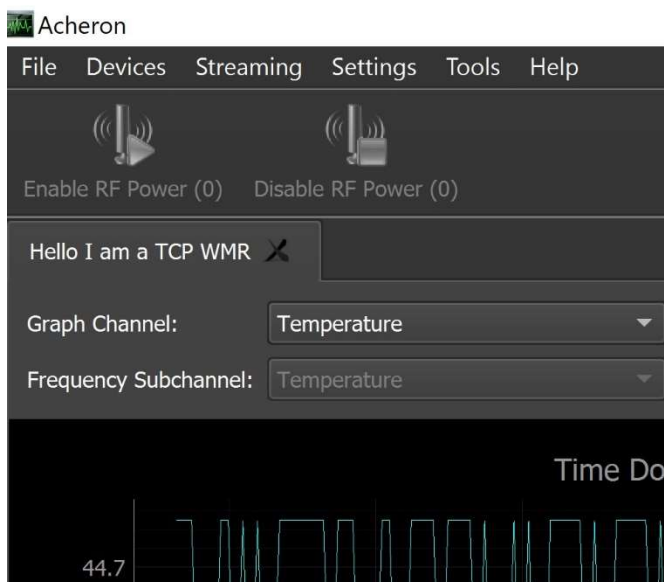
2. In the “New Tag” window, type in desired name. This name should be memorable and make it easy for plant personnel to identify the device. Click “OK” to confirm.



3. If you are satisfied with the name entered, click yes to save to NVM and reset device.



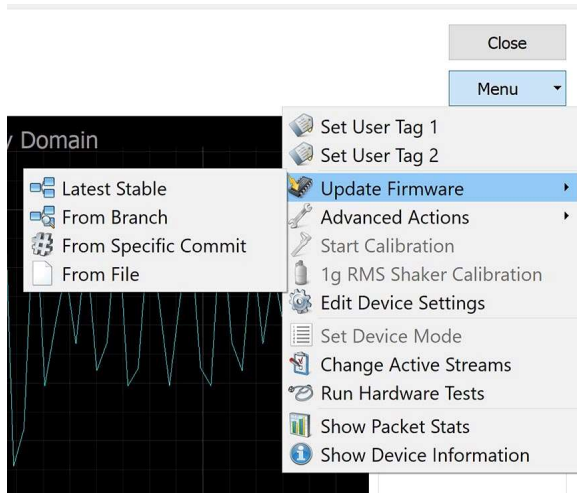
Confirm that the device name you entered appears in the device tab. If not, please repeat steps 1-3.



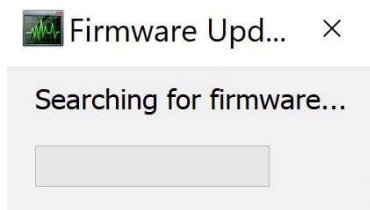
Your new user tag will be displayed as the device tab for easier reference.

## Update Firmware

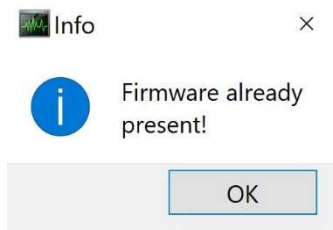
Suprock tech sensor firmware gets updated from time to time to improve functionality or adding new features. Updating firmware is a simple affair and can be done directly from the program. It is recommended to only use “latest stable” unless directed by Suprock Tech personnel.



1. Click update firmware – Latest Stable



2. The program will check for new firmware
3. If new firmware is found, the program will download the firmware and install
4. Once installed, your device will reboot with new firmware. This is normal.
5. If device has latest firmware, Acheron will inform the user that latest firmware is already present

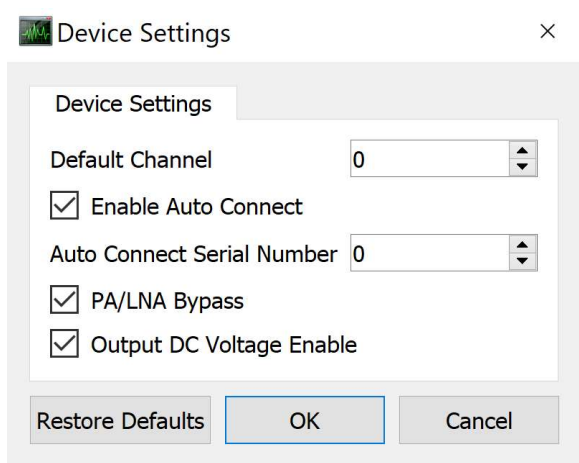


## Advanced Actions

The Advanced Actions section is for recovery/diagnostics and should only be used under the direction of Suprock Tech personnel.

## WMR Device Settings

In the WMR, the device settings relate to what WM the WMR is going to talk with. By default, the WMR is set to a Channel (radio frequency) of 0 in the 2.4GHz band. Also by default, the WMR is set to connect to any WM device. The autoconnect and serial number can be changed by a qualified hardware installer, as these relate to the physical installation. Likewise, the channels will be changed by the installer to reflect coexistence with other WMR and WM devices in the same location.



PA/LNA bypass and Output DC voltage are enabled for Coax devices and disabled for wireless devices, respectively.

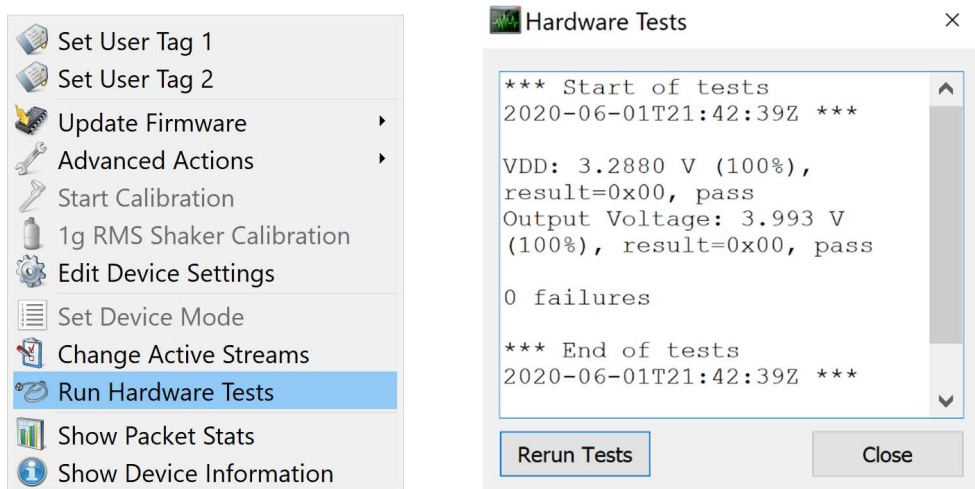
### Auto-connecting (Pairing) a WMR to a WM

The WMR has the ability to “pair” with a WM to automatically connect to the device. This option can be exercised from the WMR menu under “Device Settings”. Refer to the previous section for WMR setting information. Typically, the Auto Connect option is used after a hardware setup has been established by the installer.

For example, if your WM target is serial number 955, you would enter 955 in the auto connect serial number and check the box for “Enable Auto Connect”

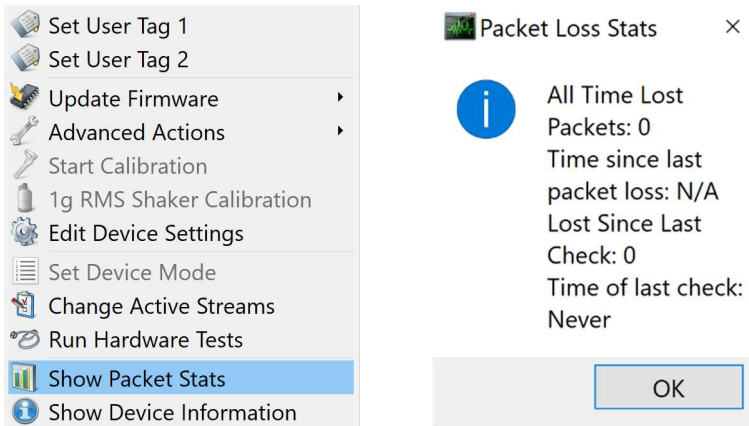
### Run Hardware Tests

Suprock telemetry has built in hardware diagnostics. If the user is having an issue or wishes to check the operating state of the hardware, Run Hardware Tests provides a full report of the functioning of the telemetry and sensors.



### Show Packet Stats

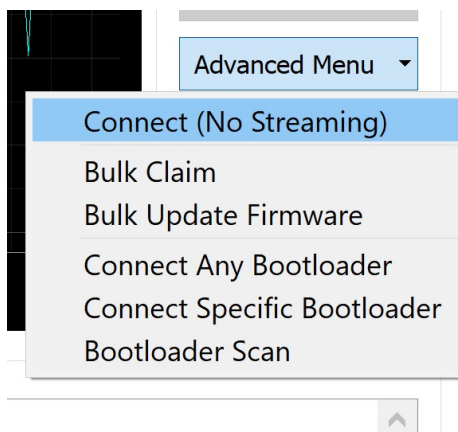
Show Packet stats prompts a report of successful and lost packets, useful for determining the fidelity of a wireless connection or when optimizing connection in a high obstruction area.



## Advanced WM Device Management

The WMR also contains options for the user to manage the WM device.

- **Connect (No Streaming)** There is the option to connect to a WM device without streaming. This option is a development option, but also can be used in scenarios of connecting to a WM when power supply is not ideal, to save the power consumption of the module while internal settings are modified.
- **Bulk Claim** Scans and claims any wireless Asphodel devices in the area
- **Bulk Firmware Update** Automatically checks and updates the firmware of wireless Asphodel devices that have been claimed by the WMR in question
- **Connect Any Bootloader** scans for the presence of bootloaders on WMs in range of the WMR.
- **Connect Specific Bootloader** gives the user the option of entering a WM serial number.
- **Bootloader Scan** is a development control and can be used to identify devices that are not booted in application, or if the application firmware is corrupted.



Connect, no streaming will open a WM tab with no data streams.