

SUPROCK TECHNOLOGIES Mote MANUAL



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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

Our wireless mote system is a complete solution for continuous asset vibration and wear monitoring. An unlimited number of wireless motes are managed by a rugged central base station to acquire data for intelligent trending. All machine data is collected one place reducing the need for route collection

- Long term measurements of asset health.
- Capable of high speed tri-axis real-time data.
- In depth frequency analysis capabilities and trending.
- Cloud based or direct local measurement solution.
- Suprock telemetry powers the B&D Predictive 24/7 measurement suite.

Applications

- CNC
- Electric motors
- Bearing health monitoring
- Belt drives
- Fans
- Pumps
- Gear wear
- Machine qualification, validation, and vibration monitoring
- Predictive Maintenance

Technical Specification

- Frequency Response: 6000Hz +/- 3 dB 12000Hz +/- 5 dB
- Radio Frequency: 2.4GHz Proprietary
- Sensitivity: 1mg Resolution 3200Hz to 12800Hz F-max axis-selectable
- Spectral lines: Unlimited
- Samples per acquisition: Infinite
- Sample rate: 3200sps - 25600sps configurable
- Ingress Protection IP68
- Range: Up to 800' line of sight (antenna dependent)
- Power Source: 2 x AA lithium (ANSI C18 size 15)
- Battery life: Up to 10 years
- Range: +/- 30g nominal Velocity, acceleration, displacement & demodulation



Height (a): 97.5mm
Base Diameter (b): 51.5mm
Body Diameter (c): 38.5mm

Figure 1 Mote

The Mote requires a WMR (Wireless Module Receiver) to connect to the monitoring software.

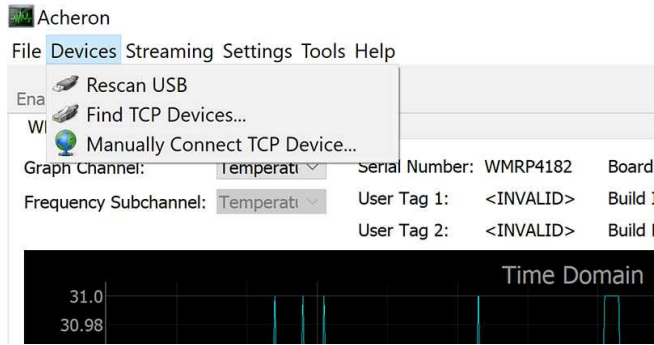


Figure 2 Mote connection

Connecting your WMR to PC/Acheron Software

In order to use the Mote the WMR must be set-up first. 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 to the Mote

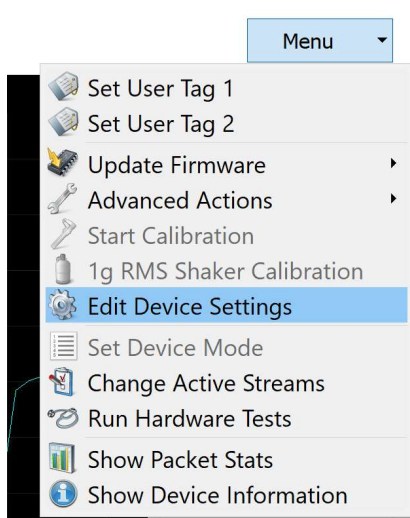
The WMR is used to connect the Mote to the Acheron software, the settings below are for initial setup of wireless and coaxial devices. Once these settings are in effect, it is not necessary to go into the menu to change them as long as the same type of device is being connected to the WMR.

Wireless Devices

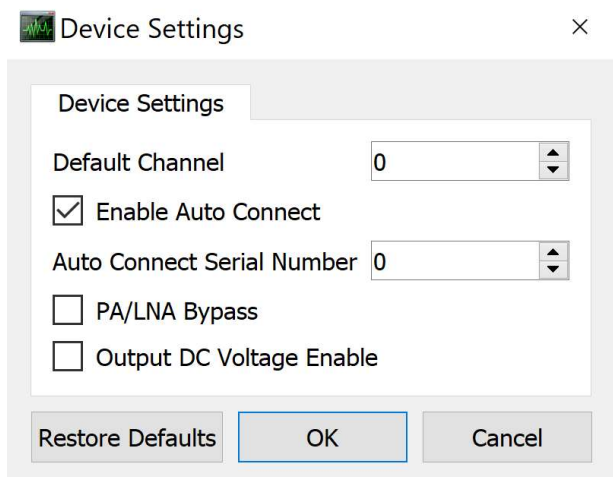
***Once the settings in steps 1 and 2 are set and confirmed correct for the type of device connected to the WMR, one may simply connect to the device starting at step 3.**

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

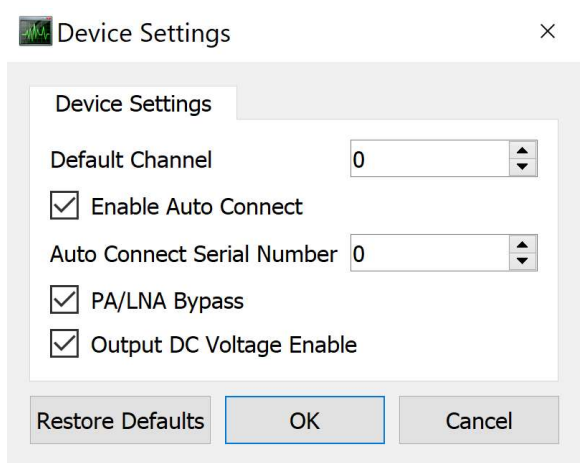
Advanced Menu ▾

Channel  0

- When you have chosen the desired device by serial number 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.

WMR Device Settings

In the WMR, the device settings relate to what Mote 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 Mote device. The auto-connect 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 Mote devices in the same location.



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

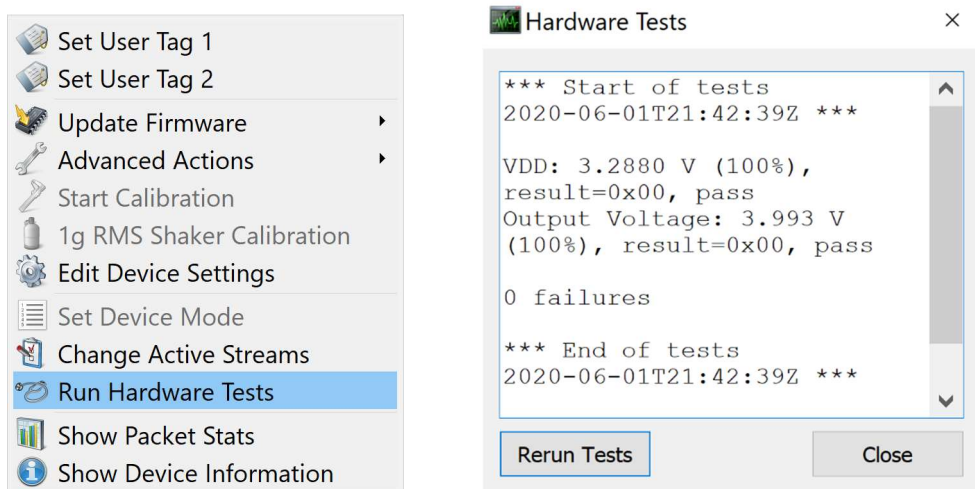
Auto-connecting (Pairing) a WMR to a Mote

The WMR has the ability to “pair” with a Mote 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 Mote target is serial number 955, you would enter 955 in the auto connect serial number and check the box for “Enable Auto Connect”

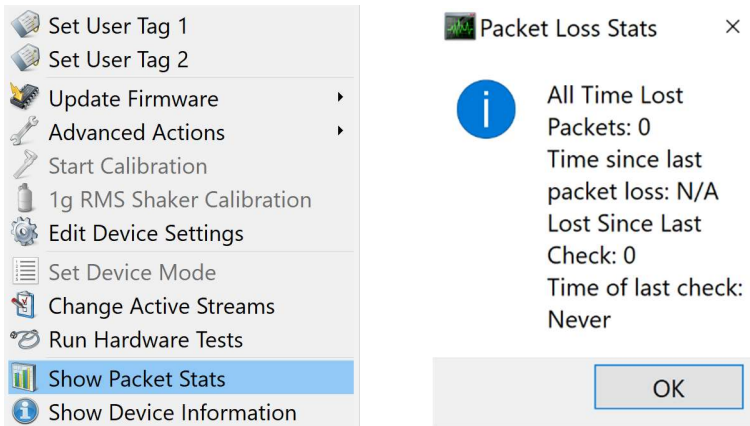
Run Hardware Tests

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

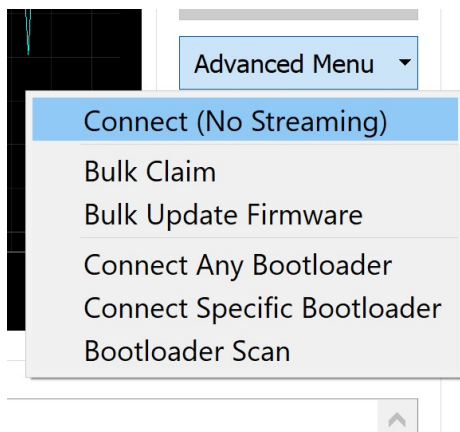
Show Packet stats prompts a report of successful and lost packets, useful for determining the fidelity of a wireless connection or when optimizing connection in a high obstruction area.



Advanced Mote Device Management

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

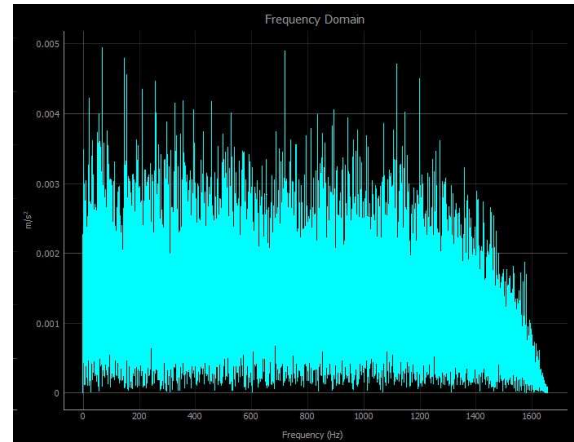
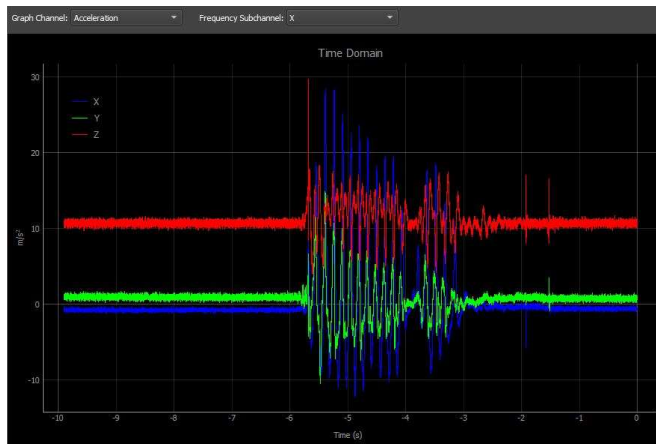
- **Connect (No Streaming)** There is the option to connect to a Mote device without streaming. This option is a development option, but also can be used in scenarios of connecting to a Mote when power supply is not ideal, to save the power consumption of the module while internal settings are modified.
- **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 Motes in range of the WMR.
- **Connect Specific Bootloader** gives the user the option of entering a Mote 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 Mote tab with no data streams.

Basic Mote functionality

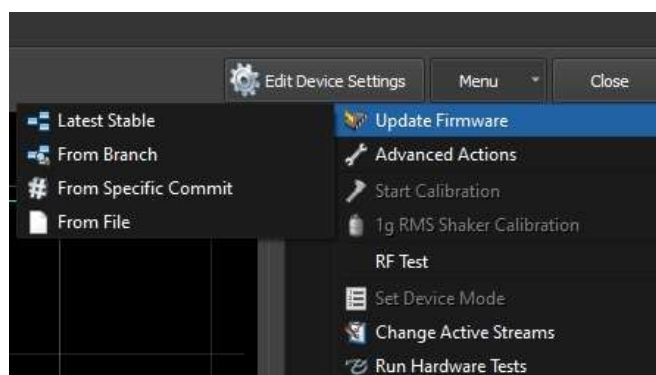
Now that the Mote is connected it will respond to movement or vibration and can be read on the graphs on the screen. Examples below.



The chart in the bottom left of the screen, like the WMR, presents the data collected by the Mote such as temperature and signal strength. See below.

Channels				Device Info	
	Mean (1s)	Std Dev (1s)	Sampling Rate		
X	-0.704 m/s^2	0.130 m/s^2	3200 sps	Serial Number: WM7768 Board Info: GTI Mote rev 5 User Tag 1: <EMPTY> User Tag 2: <EMPTY> Build Info: 1.2.2-b3b5da223b-bb Build Date: 2020-05-11T18:01:51Z Battery: 3.158 V	
Y	0.891 m/s^2	0.221 m/s^2	3200 sps		
Z	10.683 m/s^2	0.267 m/s^2	3200 sps		
Sample Interval	1.20760 ms	0.00041 ms	800 sps		
Temperature	23.8 °C	0.1 °C	10 sps		
Receive Strength	-27 dBm	0 dBm	10 sps		
Valid Packets	84	1	10 sps		
Duplicate Packets	1	1	10 sps		

Like the WMR, the Mote has options in the top right; Edit Device Settings and Menu. You can update the firmware from latest stable or specific branch, as well as edit the device settings. See below.



In the device settings, you can turn on and off Axis readings. There are also user options for data rate. See below.

