WaveCatcher User Guide

Manual Version: 2.0 | Software Version 3.5+

Figure 1: *WaveCatcher Carrying Case*

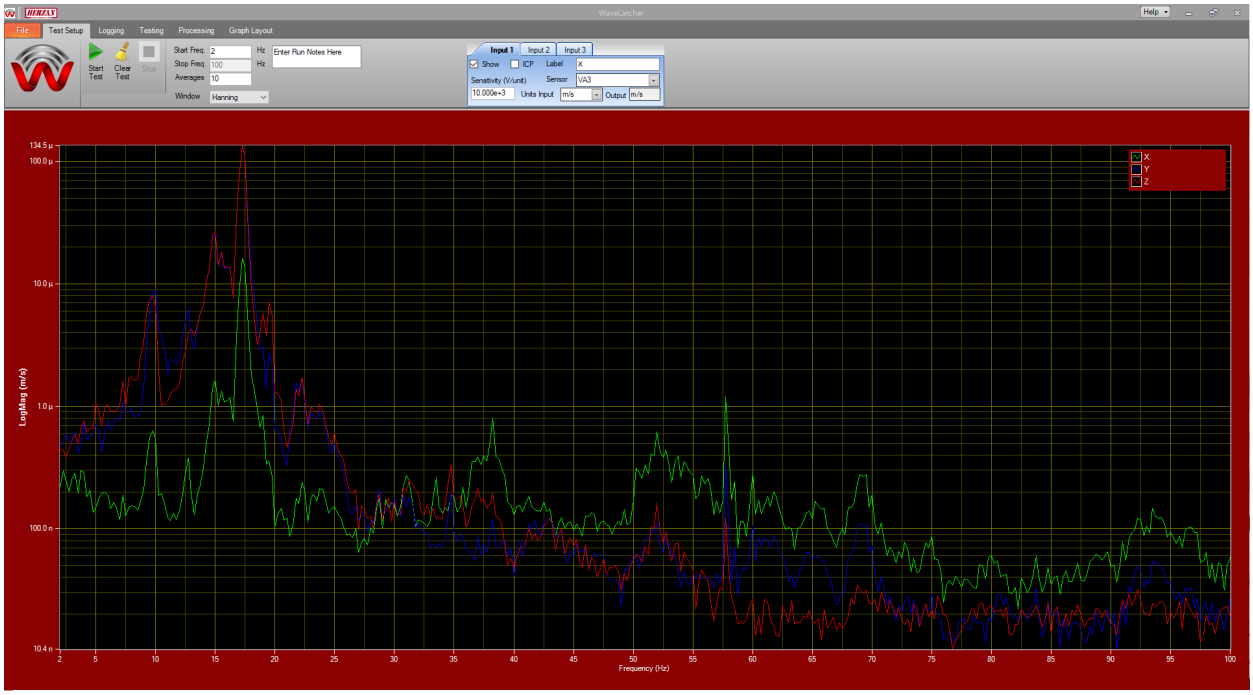

Figure 2: *WaveCatcher Software*

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Overview

The WaveCatcher site survey tool measures comprehensive environmental data (vibration, acoustic, and EMI noise) with the simple push of a button, removing the complexity and time required from most data acquisition systems. The WaveCatcher is designed specifically to be intelligent and intuitive, enabling sales teams, lab managers, and researchers the opportunity to specifically capture environmental data based on their individual research needs.

The following user guide details how to use the WaveCatcher hardware, software, and unique features to the site survey tool.

Pre-Installation Checklist

The *Pre-Installation Checklist* reviews all preliminary items needing to be considered prior to using the WaveCatcher, ensuring an optimal user experience. Please mark YES if an item listed below has been confirmed to be true. Please mark NO or N/A if items listed below are incorrect or have not been confirmed to be true. If there are items listed below marked No or N/A, please contact Herzan directly (949-363-2905 or support@herzan.com) for further instructions.

Item	Description/Notes	Yes	No	N/A
Environmental Noise Needing to Be Measured	The WaveCatcher site survey tool can measure vibration, acoustic, and EMI noise by utilizing a variety of analog sensors. *Are the sensors provided with your WaveCatcher able to measure the desired environmental noise?*			
Frequency Range Needing to Be Measured	**WaveCatcher Hardware:** The current measurement range of the WaveCatcher 3.5+ software is 0-15,000 Hz. **WaveCatcher Sensors:** Each sensor has a unique frequency range in which it can measure (refer to Section: *Complete WaveCatcher Sensor Specification Breakdown*). *Does the frequency range needing to be measured fall within the range of the WaveCatcher Hardware and Sensors provided?*			
Desired Measurement Types	The current measurement types of the WaveCatcher 3.5+ software include: Fast Fourier Transfer (FFT) and Data Logging (*Module Sold Separately*). *Do these measurement types address the type of environmental noise needing to be measured?*			

Item Checklist

The *Item Checklist* ensures all necessary items are included in the WaveCatcher shipment. Please mark YES if an item listed below has been included in your shipment. Please mark NO or N/A if any items listed below have not been included. To visualize the hardware and sensors included with the WaveCatcher, please reference the following sections in the User Guide: *WaveCatcher Hardware Visualized and WaveCatcher Sensors Visualized)*.

If there are items listed below not included in your shipment, please contact Herzan directly (949-363-2905 or support@herzan.com) to receive replacement parts.

Item	Description/Notes	Yes	No	N/A
WaveCatcher Analog-to-Digital Converter	The WaveCatcher analog-to-digital converter (ADC) converts the analog signals generated by the sensors to a digital format, allowing the WaveCatcher 3.5+ software to accurately read what was measured. Also included with the ADC are D Sub Extender Nuts for easing cable installation.			
Sensor(s)	The WaveCatcher is compatible with a variety of analog vibration, acoustic, and EMI sensors. Refer to your purchase order/quotation to confirm the number of sensors provided with your WaveCatcher kit. If you purchased the WaveCatcher-B, no sensors are provided with your kit.			
Notebook	The Notebook computer comes pre-loaded with the WaveCatcher 3.5+ software and all Protocol files for the sensors included (Protocols explained later in the User Guide).			
WaveCatcher Carrying Case	The WaveCatcher carrying case allows for the survey kit to be easily transported between measurement locations.			
Cables	All cables required to operate the WaveCatcher site survey tool will be provided. Standard cables include: • QTY 1: power-supply for the Notebook computer • QTY 1: power-supply for the ADC • QTY 1: ADC Cable > USB Type B to USB Type C cable (connecting ADC to notebook computer) • QTY 1: Custom Sensor Cable > D Sub to BNC-3 cable. • QTY 1: BNC Cable Adapter **NOTE:** some sensors may require additional cables not listed above.			
Installation Manual / Quick Guides	If a printed installation manual and Quick Guides were not provided in the WaveCatcher shipment, please reference the following online resource for further download/print instructions: http://www.herzan.com/resources/manuals-downloads.html or access the documents using the WaveCatcher software in the *Help* dropdown menu.			
Product License Key	A product license key is provided with every WaveCatcher purchase and unlocks measurement capabilities of the WaveCatcher software (ensuring valid users).			

Hardware Guide

How to Setup the WaveCatcher Hardware

Setting up the WaveCatcher hardware is intentionally designed to be intuitive, reinforcing the WaveCatcher's capability as an efficient and effective site survey tool. The following steps highlight how to correctly setup the WaveCatcher hardware and the various sensors available.

Step 1: Connect the Notebook Computer to the WaveCatcher ADC

- Connect the notebook computer to the WaveCatcher ADC by inserting the ADC connection cable into a USB port on the notebook computer. **NOTE:** both the notebook computer and ADC should be fully charged and disconnected from power when performing a measurement.

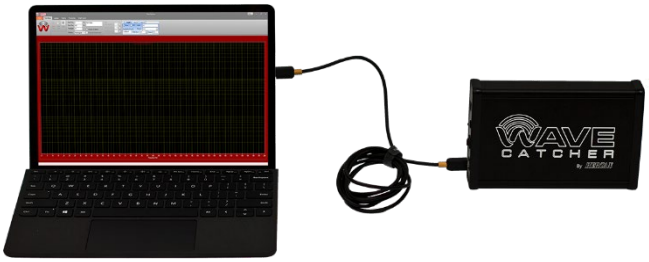


Figure 3: *Notebook Computer Connected to ADC*

Step 2: Connect the Sensor(s) to the WaveCatcher ADC

- Connect the custom sensor cable to the D Sub input on the ADC. Each sensor connects differently to the WaveCatcher ADC, so please reference the following section for further information: *How to Connect WaveCatcher Sensors*.
- Power on the WaveCatcher ADC by using the on/off switch on the front panel.

Figure 4: *Sensor (Acoustic Microphone) Connected to ADC*

Step 3: Turn On The Notebook Computer and Load the WaveCatcher Software

- Once the hardware and measurement sensor(s) are connected, power on the notebook computer by pressing the Power button.
- Once powered on, select the WaveCatcher software icon found on the desktop to load the WaveCatcher software.
- To setup or perform a measurement, refer to the following section: *How to Perform A Measurement*.

Figure 5: *Notebook Computer Power Button Location*

How to Connect the WaveCatcher Sensors

Setup the WaveCatcher hardware prior to connecting the sensors by following the steps outlined in the previous section: *How to Setup the WaveCatcher Hardware*. Each sensor has different steps in connecting to the WaveCatcher ADC, which are outlined below:

VA-3 (Triple Axis Vibration Sensor)

Step 1: Disconnect the ADC's custom sensor cable and connect the VA-3 sensor directly to the ADC's D Sub input.

NOTE: the VA-3 measures all three axes simultaneously and should be placed securely on a flat surface for accuracy.

Figure 6: *VA-3 Triple-Axis Vibration Sensor Connected to ADC*

393B31 (Single Axis Vibration Sensor)

Step 1: Connect the sensor connection cable to the top of the sensor.

Step 2: Connect the BNC adapter to the BNC connector of the sensor connection cable.

Step 3: Connect the sensor connection cable to the ADC by inserting the BNC adapter located on the sensor connection cable to the BNC connector of the ADC.

NOTE: You will want to use Input 1 when performing measurements.

Figure 7: *Single-Axis Vibration Sensor Connected to ADC*

130F20 (Acoustic Microphone)

Step 1: Connect the acoustic microphone directly to the BNC connector of the ADC (Custom Sensor Cable).

NOTE: You will want to use Input 1 when performing measurements.

Figure 8: *Acoustic Microphone Connected to ADC*

MAG-649 (Triple-Axis EMI Sensor)

Step 1: Connect the MAG-649 sensor to its power supply by using the provided sensor connection cable.

Step 2: Power on the MAG-649 power supply to provide power to the MAG-649 sensor.

Step 3: Connect the three BNC cables of the ADC (Custom Sensor Cable) to the BNC connectors of the MAG-649 power supply. Cables labels 1, 2, and 3 correspond with BNC Connectors X, Y, and Z respectively.

Step 4: To perform a DC measurement: have the "Balanced/Unbalanced" button on the MAG-649 power supply pressed inwards and the "DC/AC Coupling" button pressed inwards.

Step 5: To perform an AC measurement: have the "Balanced/Unbalanced" button on the MAG-649 power supply pressed inwards and the "DC/AC Coupling" button pressed outwards.

NOTE: the MAG-649 power supply should be fully charged and disconnected from power when performing a measurement.

Figure 9: *Bartington EMI Sensor Connected to the ADC*

Other Sensors

Consult with Herzan regarding the connection/operation of non-standard sensors.

Software Guide

How to Perform A Measurement

Performing a measurement with the WaveCatcher Site Survey Tool is quick and easy to do, with many automated features like Protocols to get you started. The following steps will highlight how to accurately and efficiently perform a measurement with the WaveCatcher.

Step 1: Load A Protocol or Select A Sensor

Load a measurement *Protocol* (i.e. pre-saved sensor and measurement settings) for the sensor being used to perform a measurement. There may be multiple protocols saved on the notebook computer if multiple sensors were supplied with your WaveCatcher, so please **ensure the correct protocol is selected** to prevent the data from being rendered unusable and the sensor from being damaged.

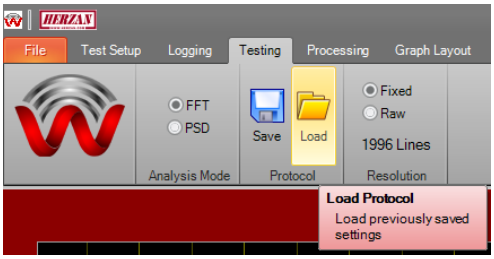


Figure 10: *Loading A Protocol*

You may also select a sensor from the *Sensor* drop down menu to load the required measurement settings for the sensor connected to the WaveCatcher ADC. When selecting a sensor for the sensor drop down menu, ensure the same sensor is selected for Inputs 1, 2, and 3 if the sensor selected is a 3-axis sensor. **NOTE:** there are multiple sensors listed in the drop-down menu that are not included with your WaveCatcher site survey kit, so please ensure the correct sensor is selected when performing a measurement.

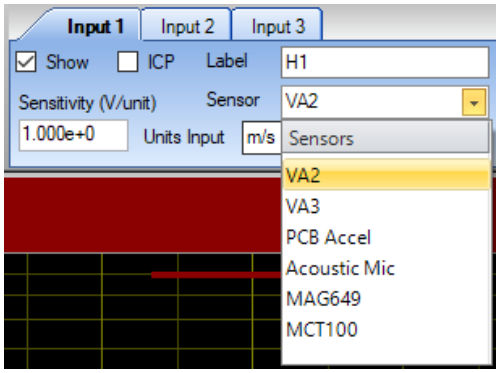


Figure 11: *Selecting The Correct Measurement Sensor from the Sensor Drop Down Menu*

Step 2: Customize Measurement Parameters/Protocol

A protocol loads all settings needed to perform a measurement for the sensor selected, however, there are several settings found on the *Test Setup*, *Testing*, and *Graph Layout* tabs that can be modified to accommodate specific measurement needs. Modify these settings as needed (Refer to section: *How to Customize Measurement Settings*), considering the technical specifications of the sensor being measured.

Settings that should never be modified include:

- Sensitivity (V/unit)
- ICP Selection Box (checked or unchecked)

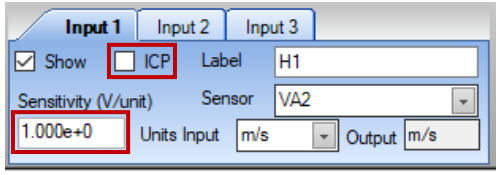


Figure 12: *Settings Not to Modify*

You may also save the modified measurement parameters to the Protocol file if you would like to perform the same measurements in the future. **NOTE:** if you are making changes to the settings found on the Input tabs, make sure to edit all three Input tabs if the settings are needing to be consistent as they do not automatically update.

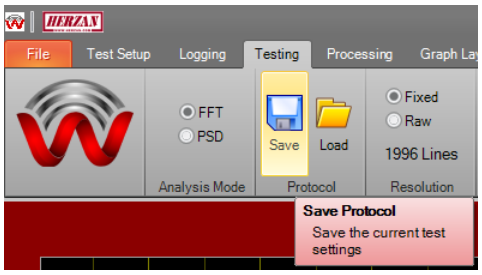


Figure 13: *Saving A Protocol*

Step 3: Enter Run Notes

Enter notes describing the measurement being taken into the Run Notes dialog box, considering the sensor being used, frequency range measured, conditions of measurement, etc.

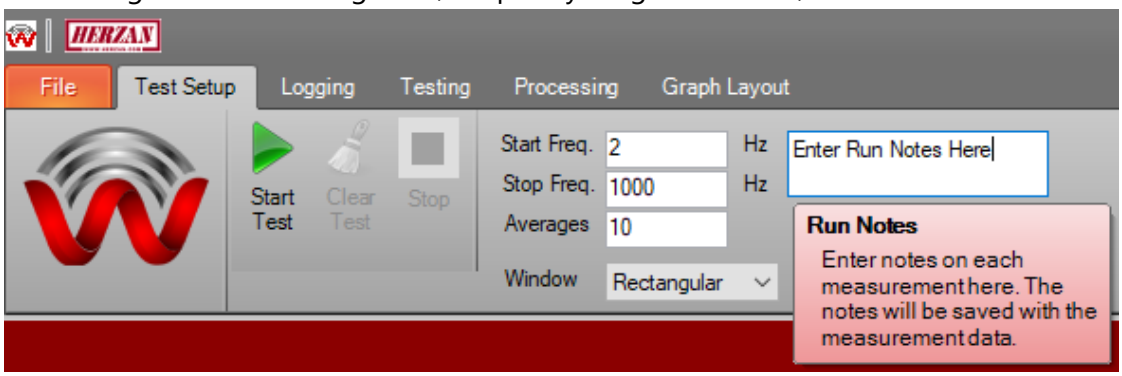


Figure 15: *Section to Enter Run Notes for A Measurement*

Step 4: Run the Measurement

Once all desired measurement parameters have been entered in the WaveCatcher software, run the measurement by selecting the *Start Test* Button at the top left section of the *Test Setup* tab.

Figure 14: *Start Button*

Step 5: Save the Measurement

The measurement will stop once the specified number of averages have been completed. The measurement data will save to a .XLSX file and a dialog box will appear to label the file name. Enter the desired name into the dialog box and press *OK* to continue.

TIP: If you do not want to manually input a file name into the *Save As* dialog box, you can unselect the checkbox found on the top left section of the *Graph Layout* tab. This selection will default the file name to the date and time the measurement was taken.

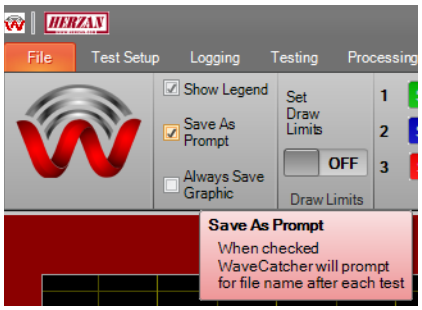


Figure 16: *Unselecting Save As Checkbox*

Once a measurement has been saved, you are finished performing your first measurement. Repeat *Steps 3 – 5* to continue performing measurements with the same parameters or *Steps 1 – 5* to perform measurements with different parameters or measurements with a new sensor.

How to Customize Measurement Settings

Frequency Range

The frequency range measured can be modified to represent individual measurement needs. The *Start Freq.* represents the frequency where environmental noise will start being measured. The *Stop Freq.* represents the frequency where environmental noise will stop being measured. **NOTE:** sensors have a minimum and maximum frequency range in which they can measure. Refer to the following section for more information: *WaveCatcher Sensor Specifications*.

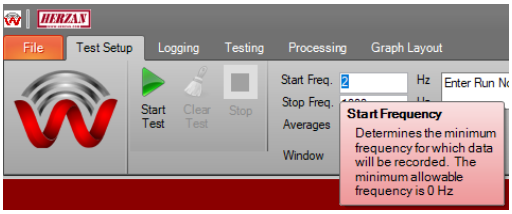


Figure 17: *Setting the Start and Stop Frequency Ranges for A Measurement*

Averages

The WaveCatcher averages multiple samples during a measurement to remove outliers in data and provide a more consistent data set. The number of averages can be modified based on the preference of the user, however, using too few averages may result in data not representative of the environment due to unique events being captured. It is recommended to use 10 averages per measurement, which is the default amount for the WaveCatcher.

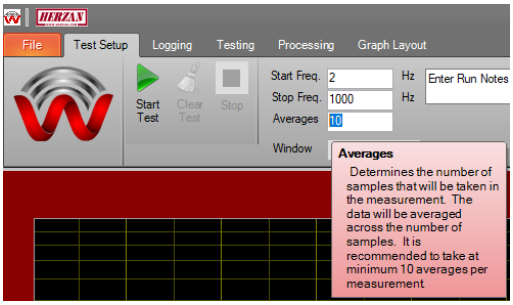


Figure 18: *Setting the Number of Averages Taken Per Measurement*

Window

The *Window* setting applies an FFT filter to the measurement data, with two options to choose from using the drop-down menu: Hanning and Rectangular (default). The Hanning Window setting is common for performing site survey measurements, while the Rectangular window setting is common when analyzing transient signals in modal analysis (i.e. a shock response), where the energy versus time distribution is extremely uneven. Either can be selected depending on the type of measurement being taken.

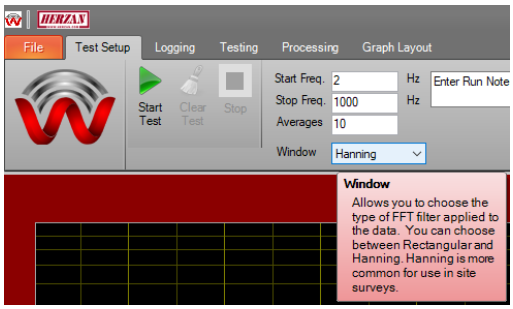


Figure 19: *Setting the Window Mode or FFT Filter for the Measurement*

Run Notes

Run notes provide a descriptive context for the measurement being taken, however, the information needs to be manually entered in order to be referenced later.

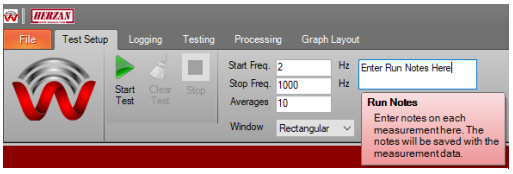


Figure 20: *Entering the Run Notes to Provide Context for the Measurement*

TIP: Helpful information such as the frequencies measured, location of measurement, sensor being used, and number of averages help thoroughly characterize the measurement being taken.

Units Input/Output

Prior to performing a measurement, users can preemptively convert the data represented on screen from the native input units to a desired output units. The drop-down menu provides the unit conversion options available for the sensor being used.

Example: the VA-3 natively measures in velocity (m/s), however, a user may want to characterize their environment with respect to acceleration (m/s^2). Selecting the Option Input: m/s > Output: m/s^2, allows the desired data to be captured and easily analyzed on screen.

NOTE: make sure the correct input units are used for the sensor being measured. Refer to the following section for more information: *WaveCatcher Sensor Specifications*.

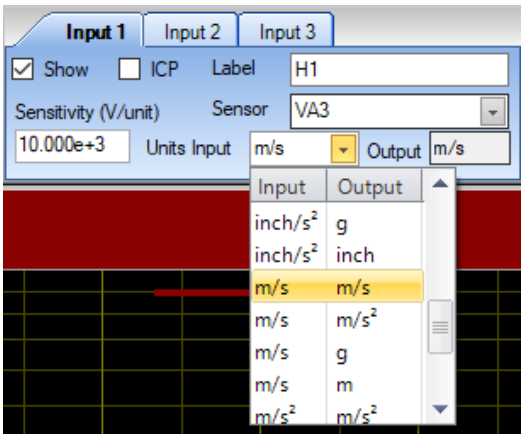


Figure 21: *Customizing the Input and Output Units for the Measurement*

Show/Label

Within the input section of the Test Setup tab, *Show* and *Label* are two settings that can be modified based on the type of measurement being taken. The Show settings allows a user to not display on screen an input or axis being measured. This is most common when a multiple axis sensor is being used or multiple sensors are being used. The Label section allows you to define the label for the input/axis being measured. The best practice is to label them according to their measurement direction (i.e. H1, H2, and V or X, Y, and Z), but custom labels can also be used and displayed on screen as needed.

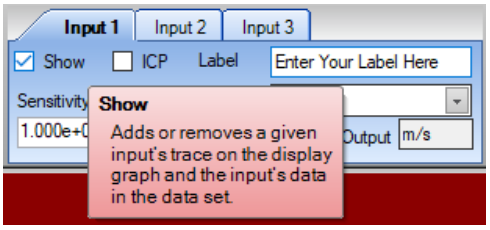


Figure 22: *Setting Whether A Measurement Input Will Be Shown On the Graph*

Settings to Never Customize

There are two settings that should never be customized when a protocol is loaded or a sensor is selected form the *Sensor* drop down menu: the *Sensitivity (V/unit)* and *ICP* selection. Doing so may damage the sensor or render the measurement data unusable.

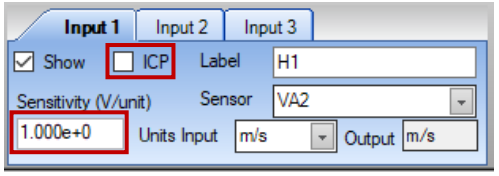


Figure 23: *Settings Not to Modify*

How to Customize Graphical Layouts

Adding Draw Limits

Draw limits provide a visual overlay to reference in real time whether measurement data exceeds environmental specifications.

To set draw limits:

Step 1: Select the *Set Draw Limits* option under the *Graph Layout* tab, which prompts a dialog box with data fields to complete.

Step 2: Enter the frequency where the draw limit line should begin in the *Start Freq.* field.

Step 3: Enter the specific amplitude limit in the *Limit* field.

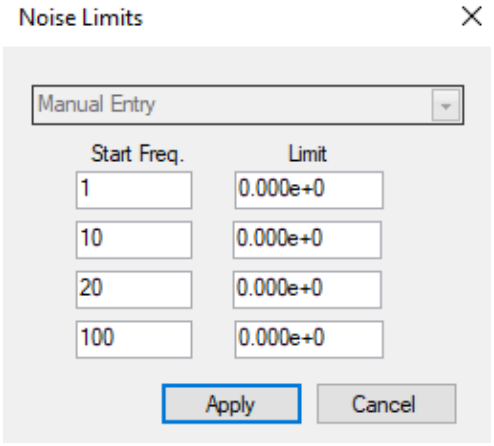


Figure 24: *Setting the Draw Limit Overlay Specifications*

Step 4: Repeat Steps 2-3 to create additional draw limit entries. **NOTE:** Additional draw limit entries will end the previous draw limit at the subsequent draw limit's start frequency.

TIP: Draw Limits can be saved within the measurement settings of a Protocol for future use. Draw Limits can be turned On and Off using the Draw Limit toggle switch.

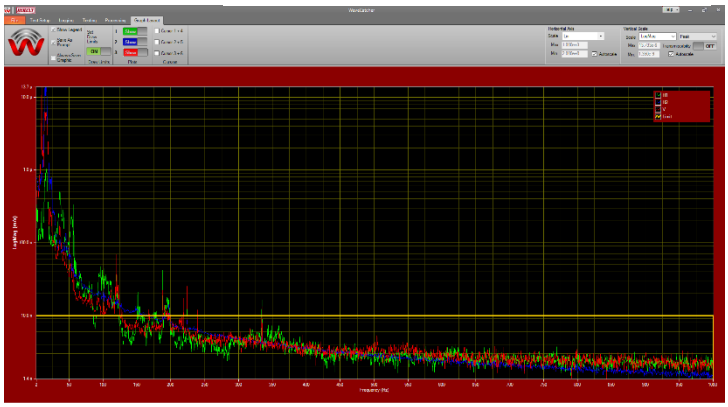


Figure 25: *Visualization of the Draw Limit Overlay (Solid Yellow Line)*

Using Cursors/Markers

Adding Cursors

Cursors are used to pinpoint individual data points on an input's trace. To add a cursor to an input's trace:

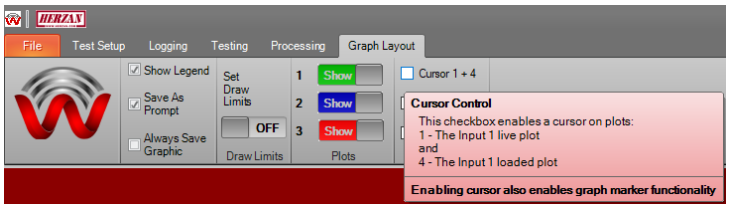


Figure 26: *Selecting Cursors to Display for Discrete Data Review*

Step 1: After a live measurement has been performed or measurement data has been loaded (See Section: *Analyzing Measurements Using the WaveCatcher*), select the cursor(s) you would like to display on the measurement graph. Doing so will allow the cursor function to be used along with the live and loaded measurement data.

Cursors can be raised on the first 3 Live plots and Loaded measurement plots. On the selection checkboxes, the Live plots are referred to as 1, 2, and 3 for Inputs 1, 2, and 3. The Loaded plots are referred to as 4, 5, and 6 for the first 3 Loaded plots. **NOTE:** The Cursors are raised on both the selected live plot and the corresponding Loaded plot when a box is checked.

TIP: A Cursor can be moved by clicking and holding on the cursor's dashed line with the mouse and moving it to a new position or by selecting the graph with the mouse and using the left and right arrow keys.

NOTE: when using the left and right arrow keys to move along a cursor trace, the lowest input will be selected (i.e. Input 1 versus Input 2).

Adding/Removing Markers

The *Marker* function integrates with the cursor function and allows the user to label and display specific point values on the graph. Markers can be used for Live or Loaded measurement cursors by selecting the appropriate Cursor option in the *Cursors* section.

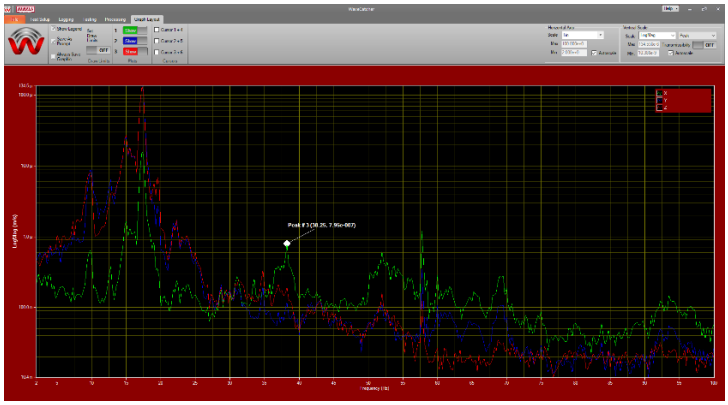


Figure 27: *Visualization of a Marker Placed On Screen*

To Add A Marker:

Step 1: Add the desired cursors to the graph, following the steps outlined in the *Adding Cursors* section.

Step 2: Drag the cursor to the desired point on the graph where a marker needs to be made.

Step 3: Right Click on the Graph Display and click *Add Marker*.

Step 4: A dialogue window will appear, requiring you to select the Plot to add the Marker (via *Add to Plot*), the *Marker Text* (i.e. name of the Marker), and appending the coordinates of the Marker (via *Append Coordinates).*

TIP: using the Append Coordinates function will display the Marker Text and Point Value in parentheses with a line leading back to the Marker. This display box can be moved freely around the graph.

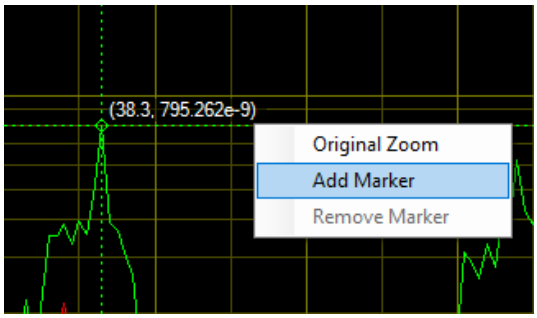


Figure 28: *Selecting A Point On the Graph to Set As A Marker*

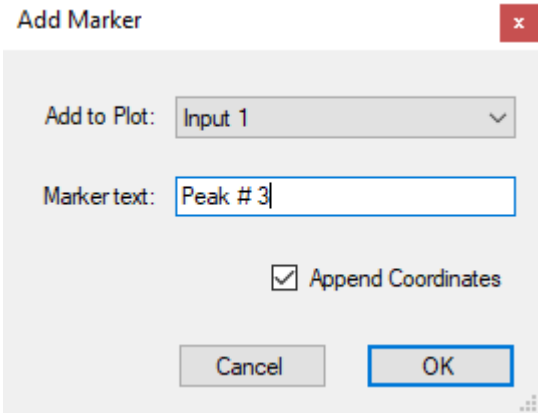


Figure 29: *Configuring Settings for A Marker*

To Remove A Marker

Step 1: Right Click on the Graph and highlight *Remove Marker* to bring up a list of active Markers.

Step 2: Select the Marker to be removed, which will be labeled by the Marker Text label and point value.

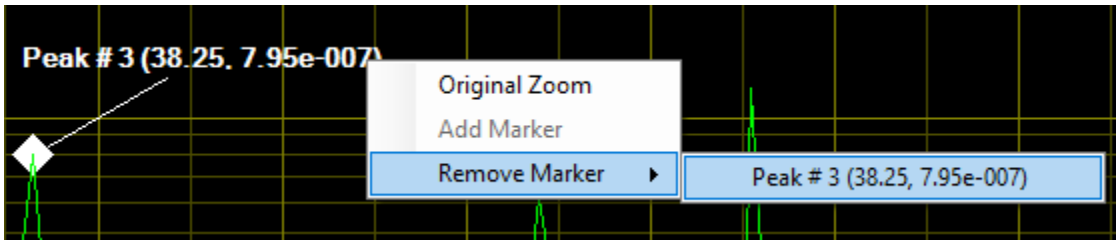


Figure 30: *Visualization of Removing A Marker*

Modifying the Horizontal Axis Graphical Layout

Scale

The Horizontal Axis Scale can be modified to be Linear, Logarithmic (Log), or 1/3 Octave, depending on the requirements of the measurement being performed. Select a scaling option within the drop-down menu prior to performing a measurement to customize this setting. **NOTE:** the default horizontal axis scale is Linear.

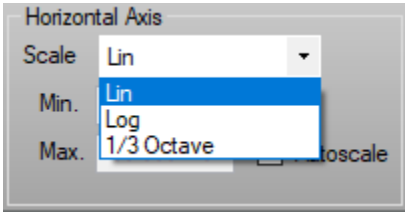


Figure 31: *Selecting Desired Horizontal Axis Scaling Setting*

Minimum/Maximum Frequency Range

The minimum and maximum frequency range can be modified once the auto-scale checkbox is unchecked. Doing so allows the graphical display to represent the customized frequency range, regardless of the frequency range measured in the *Testing Setup* tab.

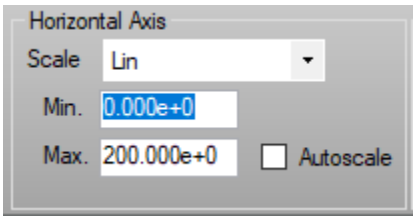


Figure 32: *Customizing Min. and Max. Frequency Range Scales*

Modifying the Vertical Axis Graphical Layout

Scale

The Vertical Axis Scale can be modified to be Linear, Logarithmic, or dB Mag, depending on the requirements of the measurement being performed. Select a scaling option within the drop-down menu prior to performing a measurement to customize this setting. **NOTE:** the default vertical axis scale is Logarithmic.

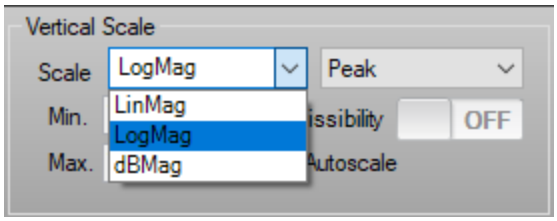


Figure 33: *Selecting Desired Vertical Axis Scaling Setting*

Minimum/Maximum Amplitude Range

The minimum and maximum amplitude range can be modified once the *Autoscale* checkbox is unchecked. Doing so allows the graphical display to represent the customized amplitude range, regardless of the native amplitudes measured by the sensor.

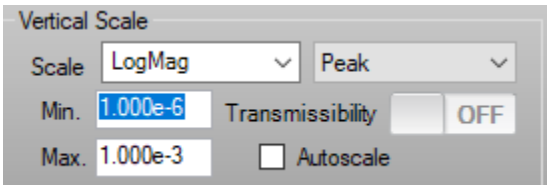


Figure 34*: Customizing Min. and Max. Amplitude Range Scales*

Sample Mode

The *Sample Mode* can be modified to sample measurement data in Peak-to-Peak, Peak, Peak-to-Peak RMS (Root Mean Square), and Peak RMS modes. Changing the sample mode allows the measurement data to represent whatever format is required by the site survey being performed or instrument being characterized.

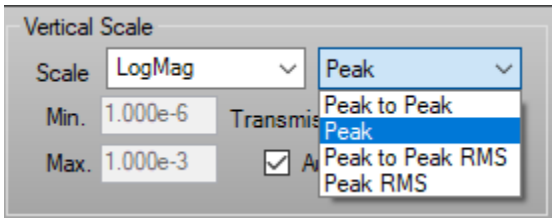


Figure 35: *Selecting Desired Sample Mode for Measurement*

Multi-Y Scale Functionality

Users can perform measurements with individual inputs (i.e. Input 1, 2, and 3) displaying unique Y-Scales based on the selected output units. When output units under Input 2 or Input 3 are different than the output units of Input 1, secondary Y scales form to the right of the graph in their respective trace color. Performing measurements in this format is common when customers want to utilize different single axis sensors for individual inputs or display multiple measurement modes (i.e. Displacement, Velocity, or Acceleration).

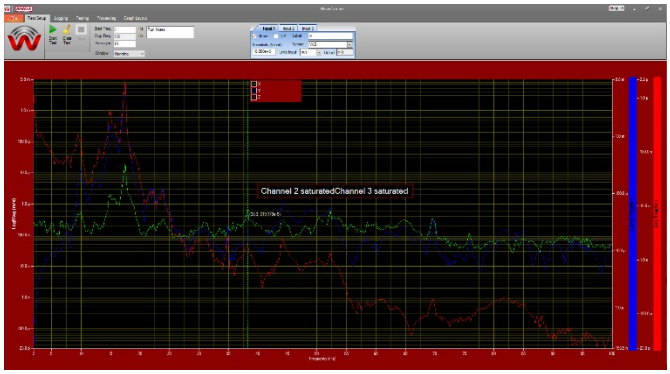


Figure 36: *Visualization of Multiple Y-Scaling Functionality*

Transmissibility

When the Transmissibility option is enabled, the ability to display a transmissibility graph is available. The data used for this graph is sourced from Input 1 and Input 2, calculated as Input 2/Input 1. The Transmissibility option can be enabled when the following conditions are met:

- Valid live data on both Input 1 and Input 2
- Inputs are not disabled and the measurement is not in a Data Logging session.

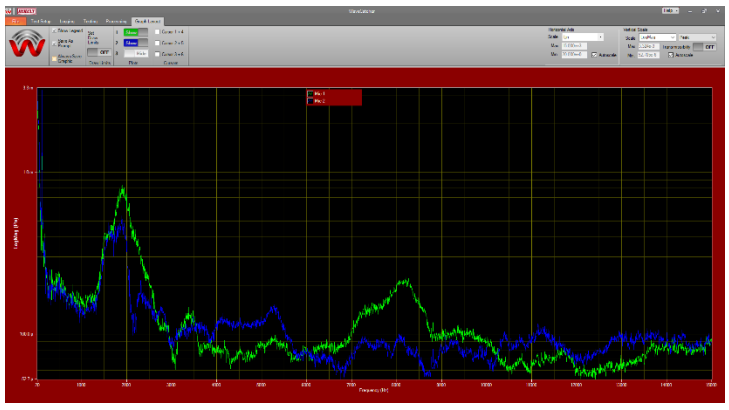


Figure 37: *Transmissibility Raw Input Data (Two Sensors)*

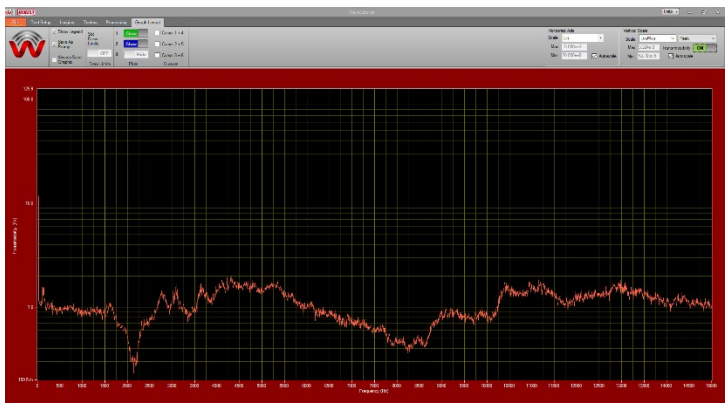


Figure 38: *Transmissibility Data (Input2/Input1)*

Modifying Data Resolution

The WaveCatcher has two options for data resolution: *Fixed* and *Raw*. Fixed is the default setting for sensors, allowing the data represented on screen to be more readable due to the even spacing of tick marks. Raw is the native data captured by the sensor and ADC.

The Fixed resolution will calculate the number of lines and frequency bins depending on the frequency range selected. **NOTE:** When entering the *Start* and *Stop* frequencies in the *Test Setup* tab, the Stop Frequency entered may adjust slightly to maintain an equally divisible frequency bin.

The measurements rates are calculated per the following table:

Start Frequency (Hz)	Stop Frequency (Hz)	Frequency Bins (Hz)
0	99	0.25
100	3,000	0.5
3,001	5,000	1.0
5,001	15,000	5.0

To change the resolution from Fixed to Raw:

Step 1: Access the *Resolution* panel under the *Testing* tab.

Step 2: Select the *Raw* resolution option to revert the data displayed to be the Raw data produced by the WaveCatcher ADC.

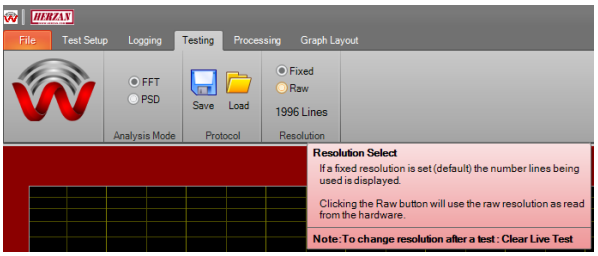


Figure 39: *Selecting Desired Resolution Option*

NOTE: The raw frequency bins are variable and subject to the following:

- Sample rate
- Number of samples
- Frequency range

NOTE: To change resolution after a measurement: clear the live test by selecting *Clear Live Test*.

NOTE: Raw resolution is primarily used when performing data logging measurements or if analysis is to be performed using 1/3 Octave graphing. The Data Logging module automatically sets the resolution to Raw.

How to Perform A Data Logging Measurement

Data logging is available in the standard WaveCatcher software for a 5-minute measurement at a 3 Hz sample rate. Extending a data logging measurement beyond 5 minutes and a 3 Hz sample rate requires a purchase of the full Data Logging module upgrade, allowing up to a 24-hour measurement to be taken at a 1,000 Hz sample rate.

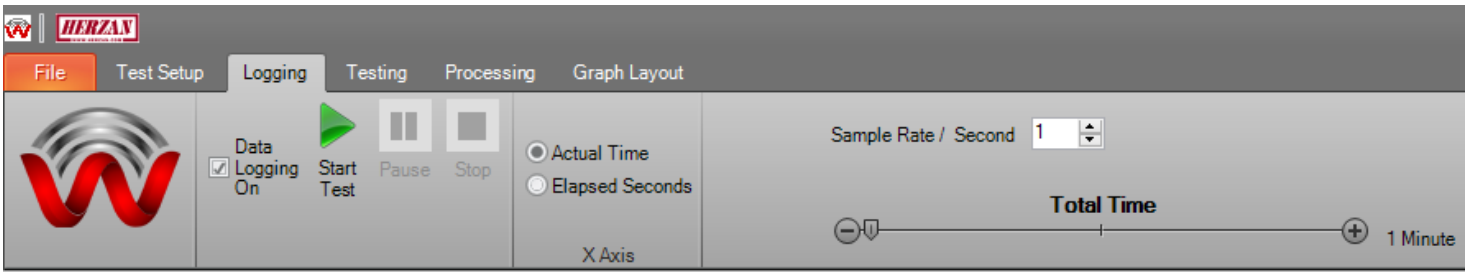


Figure 40: *Data Logging Configuration Window*

Use the following steps to setup and run a data logging measurement:

Step 1: Select the *Logging* tab and check the *Data Logging On* checkbox, which will enable the data logging controls.

Step 2: Select *Actual Time* or *Elapsed Seconds*.

a. Actual Time will set the X scale to timestamps in hours, minutes, seconds and hundredths of seconds starting when Run button is pressed.
b. Elapsed Seconds will set the X scale to seconds starting at zero.

Step 3: Set the sample rate per second (up to 3 samples per second).
NOTE: when the Data Logging upgrade module is purchased, the available sample rate increases to 1,000 samples per second.

Step 4: Set the Total Time slider (up to 5 minutes) to the desired length of time for the data logging measurement. You can adjust the length of the data logging measurement by dragging the slider icon or by using the + and - buttons. The time selected displays to the right of the slider.

a. For 1 to 5 minutes the step is 1 minute.

NOTE: when the data logging upgrade module is purchased, the available total measurement time increases to 24 hours.

Step 5: Press *Start Test* to begin the data logging measurement.

Step 6: The completion Data and Time for the data logging measurement will display above the graph.

Step 7: When the data logging measurement is complete, enter the desired file name for the data logging measurement in the prompted Save As dialogue window.

Cancelling a Data Logging Measurement

Due to the continuous stream of measurement data, cancelling a Data Logging measurement happens after the five minute cycle is completed. Pressing the *Stop* button during a Data Logging measurement will display *CANCEL PENDING* above the graph, which will end the session at the end of the Total Time collection cycle.

NOTE: If the Total Time collection cycle is less than 5 minutes, the measurement will end once the measurement is complete.

How to Perform Data Post Processing

Converting Measurement Units

Users can quickly translate measurement data into a different unit set or measurement type (i.e. displacement > acceleration), through the software's internal conversion program.

Units are now selected as a set of inputs and outputs, with the input units being the native units measured by the sensor, and the output units being the desired units to be displayed after a conversion is performed (i.e. inch/s2 > g). The input and output units are listed once the sensor is selected in the above drop-down menu.

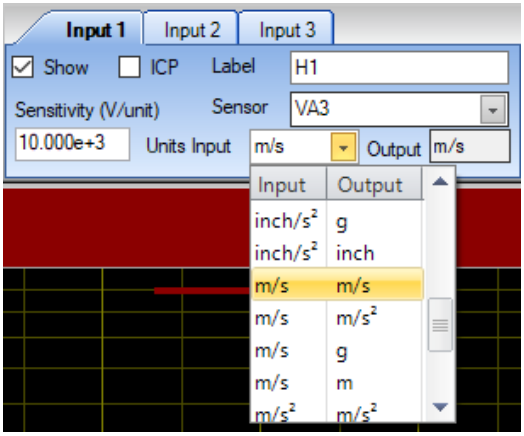


Figure 41: *Converting Measurement Units Using Custom Input and Output Settings*

Dynamic Sampling

Making changes to the sampling mode can dynamically change the plot and re-scale the graph to allow the user to review previously collected data in the new sampling mode. Available sampling modes include: Peak-to-Peak, Peak, Peak-to-Peak RMS, and Peak RMS.

NOTE: Peak is the default sampling mode used when performing a measurement.

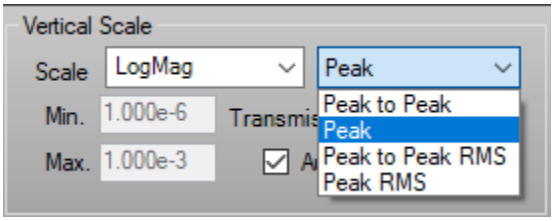


Figure 42*: Configuring Dynamic Sampling by Selecting Custom Sample Modes*

Comparing Multiple Measurements

Analyzing Measurements Outside of the WaveCatcher

The spreadsheet files (.XLSX or .CSV) can be opened and modified using any spreadsheet program. OpenOffice.org Base is installed on the computer as the default spreadsheet program, but programs like Excel or Google Sheets can also be used to review the collected data. **NOTE:** Measurements saved to the database location can also be loaded into the WaveCatcher interface.

Step 1: To access previously collected measurement data, open the WaveCatcher folder and select the desired measurement file. Location of the WaveCatcher folder can vary depending on installation location of the WaveCatcher software, however, it is commonly located here: C:\Users\User Name\Documents\WaveCatcher)

The measurement graph or window image files (.BMP files) can be viewed using any image viewer program.

Analyzing Measurements Using the WaveCatcher

Measurement files (saved locally or within the database) can be analyzed using the WaveCatcher software.

Step 1: To reload collected measurement data (saved locally or within the database) within the WaveCatcher software, access the *Processing* tab and select *Load/Unload Data*

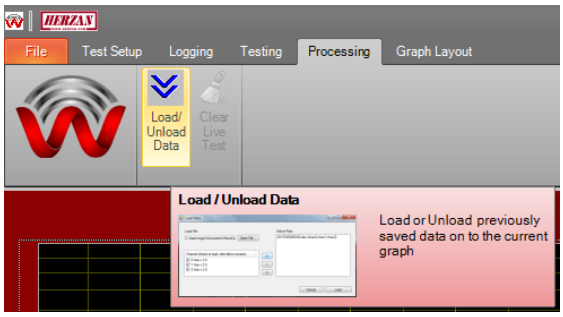


Figure 43: *Loading/Unloading of Measurement Data*

Step 2: Click the *Open File* button and choose the desired measurement file name.

Step 3: Check the individual Input plots needing to be viewed and analyzed. The inputs will show the file version, which will dictate what additional information will be required to accurately review the measurement. Measurements Version 3.5+save settings like the Sensor used and Sample Mode as well.

a. *Measurements (< Version 3.0):* All settings must be set by the user.

b. *Measurements (>= Version 3.0):*

b.i. Loading a file without an existing measurement on the graph: the Sample Mode, Sensor, Sensitivity and Units will be set to the saved values.

b.ii. Loading a file with an existing measurement on the graph: a check is run to confirm the Sensors and Units are the same between the existing and loaded measurements. If there is a warning displayed, the file will not load until fixed.

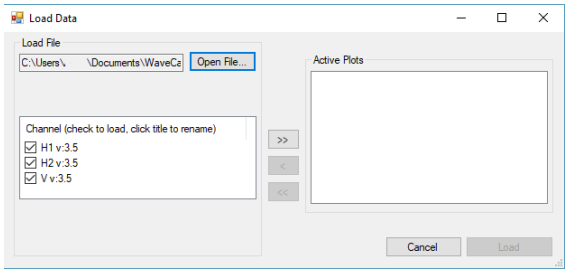


Figure 44: *Loading and Unloading Data Configuration Window*

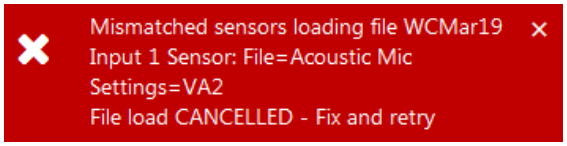


Figure 45: *Error Message When Mismatched Sensors Are Being Used*

Step 4: To make input(s) from the loaded measurement active plots on the graph, press the "**>>**" button, which will transfer the plots to the *Active Plots* section of the screen. If the input(s) do not transfer to the Active Plots section of the screen, repeat steps 1 and 2. To make input(s) from the loaded measurement inactive plots on the graph, press the "**<<**" button, which will transfer the plots from the Active Plots section of the screen.

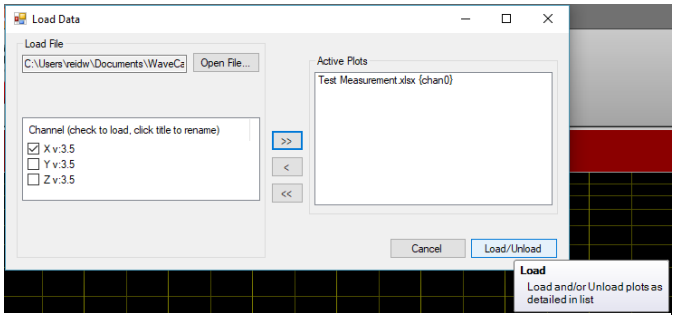


Figure 46: *Enabling Loaded Measurements to Be Displayed*

Step 5: Once the desired measurement file and input(s) are listed under Active Plots, finish the data loading process by clicking the Load button.

TIP: You may clear all live measurement plots on the graph by selecting *Clear Live Tests.* Doing so can help you focus on the previously loaded measurement data.

NOTE: The Database Groups and Tests option will only appear if the Data Logging Option is purchased with your WaveCatcher. Refer to the supplemental guide provided with the Data Logging Option for further instructions on Data Post Processing for Data Logging measurements.

Re-Saving Loaded Measurements

Saving loaded data allows previous measurements to save data into a different file format.

Step 1: Load a locally saved file (.XLSX) or database file

Step 2: Save the file to a different file format (i.e. .CSV or .XLSX).

TIP: This function is particularly helpful when wanting to convert data from a database file to a .XLSX or .CSV file for further analysis in a spreadsheet format.

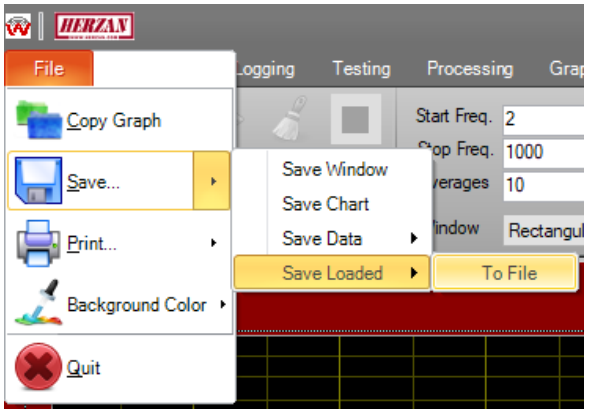


Figure 47: *Re-Saving Loaded Measurements Into A Different File Format*

Resources

WaveCatcher Hardware Visualized

The WaveCatcher hardware is intentionally designed to be intuitive, reinforcing the WaveCatcher's capability as an efficient and effective site survey tool. The following represents the standard hardware included in a WaveCatcher site survey tool.

1. **QTY 1:** Notebook Computer and Power Supply
2. **QTY 1:** WaveCatcher Analog-to-Digital (A/D) Converter, D Sub Extender Nuts, Power Supply, and WaveCatcher A/D Cable (USB Type B to USB Type C Cable)
3. **QTY 1:** Custom Sensor Cable (D Sub to 3 BNC Cable) and BNC Cable Adapter
4. **QTY 1:** Carrying Case

1

Notebook Computer and Power Supply

2

WaveCatcher ADC and Related Cables

3

Custom Sensor Cable and BNC Adapter

4

WaveCatcher Carrying Case

WaveCatcher Sensors Visualized

Herzan offers four standard sensors with the opportunity to also include custom sensors should they provide an analog signal and interface with the WaveCatcher ADC. The following sensors are the standard analog sensors available to the WaveCatcher.

Vibration Sensor(s)

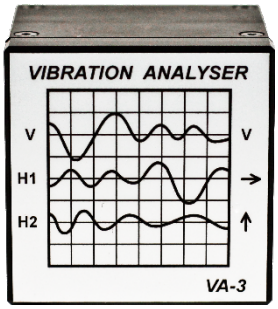
- *Triple-Axis:* Model #: VA-3; Manufacturer: Table Stable
- *Single-Axis:* Model #: 393B31; Manufacturer: PCB Inc.
    - This sensor comes with a sensor connection cable.

Acoustic Microphone

- Model #: 130F20; Manufacturer: PCB Inc.

EMI Sensor

- Model #: MAG-649; Manufacturer: Bartington
    - This sensor comes with a sensor connection cable, power supply, and three BNC cables.



VA-3 Vibration Sensor

PCB Vibration Sensor

PCB Acoustic Microphone

Bartington EMI Sensor

NOTE: Not all sensors will be included in your WaveCatcher kit. Please refer to your quotation to determine which sensor(s) are included.

WaveCatcher Sensor Specifications

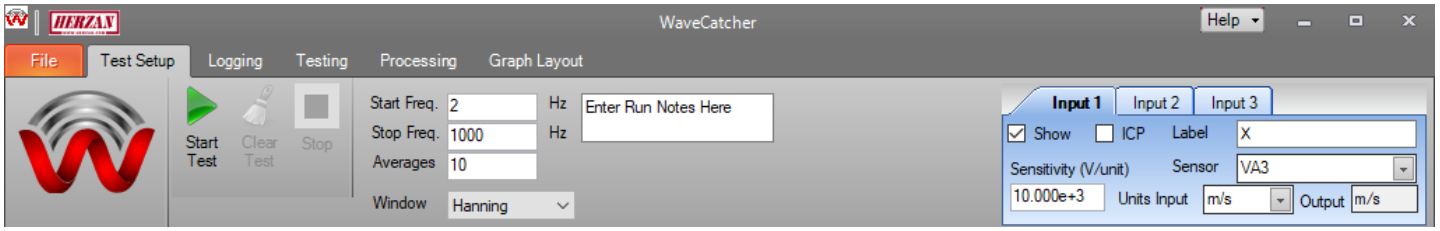
Noise Measured	Sensor Model Number	Sensor Manufacturer	Sensitivity (Volts/EU)	Frequency Range	# of Axes	Measurement Type (measured units)	Measurement Range	ICP Sensor (Yes/No)
Vibration Noise	VA-3	Table Stable Ltd.	10,000	2 – 1,000 Hz	3	Velocity (m/s)	10^{-7} – 10^{-3} m/s	No
	393B31	PCB Inc.	10 = MFG target, but varies (each sensor is unique)	0 – 300 Hz	1	Acceleration (g's)	0.5g pk	**Yes**
Acoustic Noise	130E20	PCB Inc.	40 = MFG target, but varies (each mic is unique)	20 – 20,000 Hz	N/A	Omni-directional (pascal)	N/A	**Yes**
EMI Noise	MAG649	Bartington	3	0 – 1,000 Hz	3	AC **OR** DC Fields (G: Gauss)	+- 100 µT	No

Legend

Noise Measured	Type of environmental noise being measured by the sensor.	**Number of Axes**	Number of axes measured by the sensor (X, Y, and/or Z)
Sensor Model Number	Unique identifier for the sensor set by the manufacturer.	**Measurement Type**	Type of measurement performed by sensor and measurement units.
Sensor Manufacturer	Manufacturer of the sensor.	**Measurement Range**	Range of amplitudes measured by sensor.
Sensitivity (volts/EU)	Sensitivity value used when measuring with the WaveCatcher. Volts/Engineering Unit (EU) is often used to identify sensitivity.	**ICP Sensor**	Internally Controlled Power Sensor draws power directly from the WaveCatcher's ADC. Having this setting correctly entered in the WaveCatcher software is **critical**.
Frequency Range	Range of frequencies (Hz) measured by the sensor.		

WaveCatcher Software Visualized

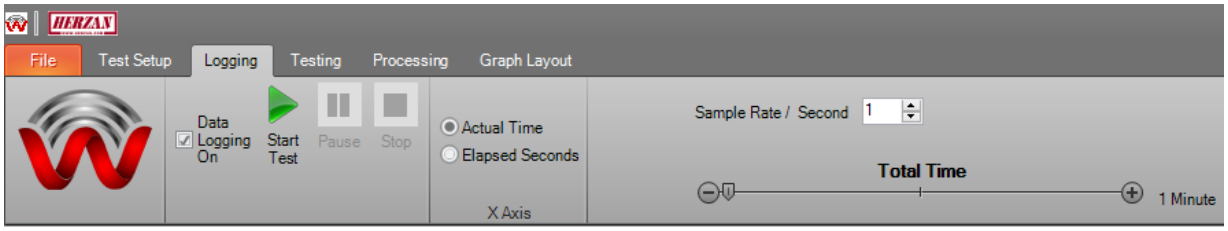
Test Setup



Item	Description/Notes
Start Test	Starts the measurement. Click on this button to begin collecting data.
Pause Test	Pauses the measurement.
Clear Test	When a live test is displayed, the *Clear Test* button is enabled. Pressing Clear Test clears all live data. Doing so de-clutters the graph if several plots are loaded to be analyzed.
Stop	Stops the measurement currently running. If the measurement is stopped, data will not be automatically recorded for that measurement, but you may save the data manually.
Start Freq.	Determines the minimum frequency for which data will be recorded (minimum: 0 Hz).
Stop Freq.	Determines the maximum frequency for which data will be recorded (maximum: 15,000 Hz).
Averages	Determines the number of samples taken during a measurement. The data will be averaged across the number of samples. *Recommended:* 10 averaged samples per measurement.
Window	Selects the type of FFT filter applied to the data (e.g. Hanning or Rectangular).
Run Notes	Enter notes on each measurement here. The notes will be saved with the measurement data. Important information regarding the measurement should be recorded here.
Input 1, 2, 3	Each input represents a unique measurement direction from a sensor. They can record individual display or recording settings, which can be edited by toggling between the three input tabs. **NOTE:** Changing a setting for one Input does not change the setting for all.
Show	Adds/removes an input's trace on the display graph and data in the data set. **Note:** Running a test with these unchecked will disable the Graph Layout Show/Hide functionality.
ICP	A sensor labeled Internally Controlled Power or ICP requires power to be supplied directly by the WaveCatcher ADC. Check this box **ONLY** if data is being taken using an ICP sensor.
Label	A Label for the Input's trace on the Display Graph, describing the axis label or type.
Sensor	Default WaveCatcher sensor settings, pre-populating sensitivity, input, and output units.
Sensitivity (V/unit)	Sensitivity settings allow the ADC to accurate convert measurement data for the WaveCatcher. Refer to section *WaveCatcher Sensor Specifications* section for further details.
Units Input/Output	Determines the units the data will be input from sensor and the desired output display. Changing the units with data displayed will re-calculate and re-plot the graph.

Unit	Description	Unit	Description
G	G's: acceleration divided by Earth's gravitational pull	**Inch**	Inches (unit of displacement)
m/s2	Meters per second squared (acceleration)	**Pa**	Pascals (unit of sound measurement)
m/s	Meters per second (velocity)	**G**	Gauss (unit of measuring magnetic fields)
M	Meters (displacement)	**mG**	Milligauss (unit of measuring magnetic fields)
Inch/s2	Inches per second squared (unit of acceleration)	**T**	Tesla (unit of measuring magnetic fields)
Inch/s	Inches per second (velocity)	**nT**	Nano Tesla (unit of measuring magnetic fields)

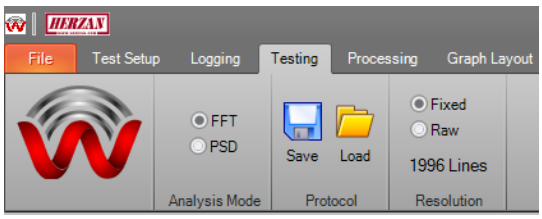
Logging



Item	Description
Data Logging On	Enables data logging functionality.
Start Test	Starts the data logging measurement.
Pause	Pauses the measurement after the current sample is complete, creating a note above the graph labeled *PAUSED PRESSED*. The test will remain paused until the Resume button is pressed (Resume button replaces pause button when measurement is paused).
Stop	Stops the data logging measurement.
X Axis: Actual Time	Displays actual time when performing a data logging measurement.
X Axis: Elapsed Seconds	Displays elapsed seconds when performing a data logging measurement.
Sample Rate / Second	Specifies the number of samples to take per second (1 to 1000).
Total Time	Specifies the total time for the measurement (1 minute to 24 hours).
NOTE: Vertical Scale sample mode is locked to Peak and Resolution is locked to Raw.	

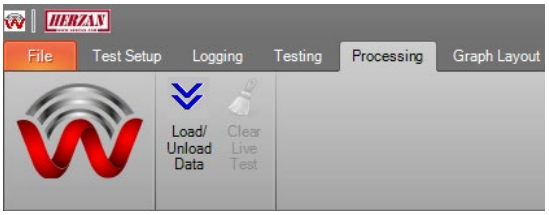
Testing

Item	Description
Analysis Mode: FFT	Sets the analysis mode to Fast Fourier Transform (FFT).
Analysis Mode: PSD	Sets the analysis mode to Power Spectral Density (PSD).
Protocol: Save	Saves measurement settings (via a Save As Prompt) to be reused for future measurements.
Protocol: Load	Loads measurement settings previously saved from past measurements. **NOTE:** Once a protocol is loaded, you will be notified when making changes to loaded settings.
Resolution: Fixed	Calculates the number of lines and fixed bins depending on the frequency span selected.
Resolution: Raw	Displays data based on the Raw data produced by the sensor and ADC. The raw data bins are variable and calculated using the Sample Rate, number of samples, and frequency span.

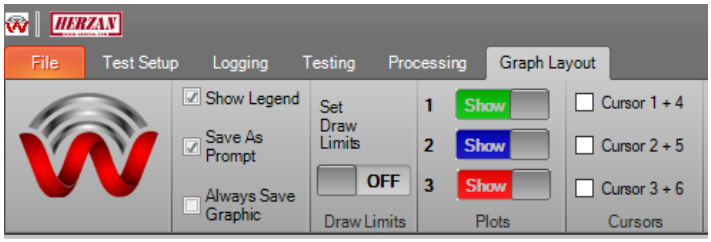


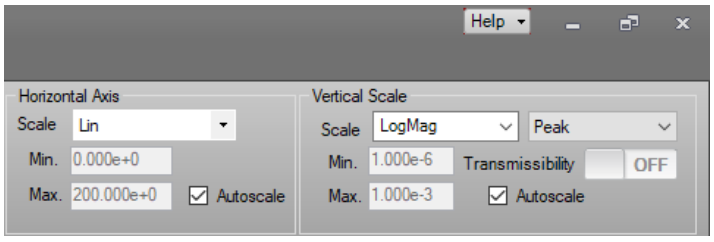
Processing

Item	Description/Notes
Load/Unload Data	Loads a previously performed measurement.
Clear Live Test	Clears live test to only display loaded measurement data.



Graph Layout





Item	Description/Notes
Show Legend	Toggles the legend on or off.
Save As Prompt	When checked, the WaveCatcher will prompt to save as a custom file name after each test. When unchecked a file will be saved automatically after each test.
Always Save Graphic	Automatically saves a bitmap of the measurement graph alongside the data set to the local machine.
Set Draw Limits (On/Off)	Toggles on or off the option to add lines to the graph at specific amplitudes and frequencies (i.e. instrument specifications). Selecting this option prompts a dialog box to enter the frequency where the line should start in the Start Freq field and the specific amplitude in the Limit field. Additional draw limit entries will end the previous Draw Limit at the subsequent draw limit's start frequency.
Plots 1, 2, and 3 (Show/Hide)	Toggles the display of live measurements (1-3) on or off, with the switch's color indicating the measurement plot being toggled.
Cursors (1 – 6)	Toggles a cursor on or off from the input's trace in the display graph. The cursor can be moved to pinpoint specific data points on an input's trace. Cursors are available for Live measurements (Inputs 1, 2, and 3) or Loaded measurements (Inputs 4, 5, and 6).
Horizontal Axis: Scale	Allows the user to select different horizontal scaling modes: linear, Log, and 1/3 Octave.
Horizontal Axis: Min.	Sets the minimum value displayed for the horizontal axis.
Horizontal Axis: Max.	Sets the maximum value displayed for the horizontal axis.
Horizontal Axis: Autoscale	When selected, automatically sizes the axis to fit the data taken (selected by default). When unselected, the minimum and maximum frequencies can be set manually.
Vertical Scale: Scale	Allows the user to select different vertical scaling modes: linear magnitude (LinMag), logarithmic magnitude (LogMag), or decibel magnitude (dBMag).
Vertical Scale: Min.	Sets the minimum value displayed for the vertical axis.
Vertical Scale: Max.	Sets the maximum value displayed for the vertical axis.

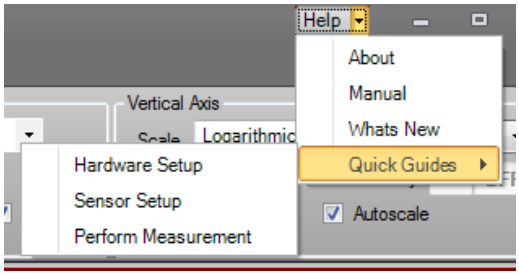
Vertical Scale: Autoscale	When selected, automatically sizes the axis to fit the data taken (selected by default). When unselected, the minimum and maximum frequencies can be set manually.
Vertical Scale: Transmissibility	When checked, the ability to display a transmissibility graph is available. The data used for this graph is sourced from Input 1 and Input 2; calculated as Input2/Input1. ***NOTE:*** The switch is enabled when the following conditions are met: valid live data on both Input 1 and Input 2, inputs are not disabled, and measurements are not in Data Logging mode.
Sample Mode (Peak)	Allows the user to switch between various sample modes, including: *Peak*, *Peak-to-Peak*, *Peak RMS (Root Mean Square)*, or *Peak-to-Peak RMS*.

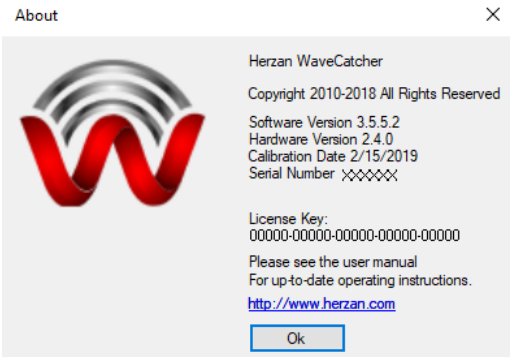
Sample Mode	Description
Peak	Measures the change between peak (highest amplitude value) and zero value. Peak is the default sample mode.
Peak-to-Peak	Measures the change between peak (highest amplitude value) and trough (lowest amplitude value).
Peak to Peak RMS	The square root of the mean squared peak-to-peak value.
Peak RMS	The square root of the mean squared peak value.

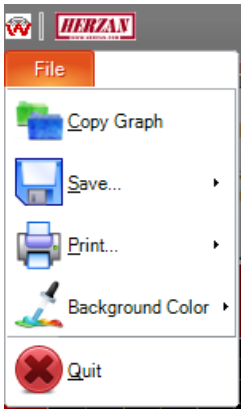
File / Help

Item	Description/Notes
Help: About	Provides information on the WaveCatcher's Software Version, Hardware Version, Last Calibration Date, Serial Number, and License Key.
Help: Manual	Direct link to the WaveCatcher User Manual.
Help: Whats New	Direct link to a document listing what's new with the WaveCatcher software and hardware.
Help: Quick Guides	Direct link to the WaveCatcher Quick Guides.
File: Copy Graph	Copies the graph displayed on screen except the measurement settings displayed up top.
File: Save	Provides options to save measurement data, graphs, and more:
File: Print	Provides options to print the chart on screen or the entire window.
File: Background Color	Provides options to change the background color of the WaveCatcher software (default is Herzan Red).
File: Quit	Closes the WaveCatcher software.

Save Type	Description
Save Window	Saves the entire window on screen, including the measurement settings displayed up top.
Save Chart	Saves the chart displayed on screen, except the measurement settings displayed up top.
Save Data (To File or Database)	Saves the recently measured data either to a local file (.XLSX or .CSV) or a data base file (Herzan database)
Save Loaded (To File or Database)	Saves the recently loaded data either to a local file (.XLSX or .CSV) or a data base file (Herzan database)







Best Practices

How to Perform A Site Survey

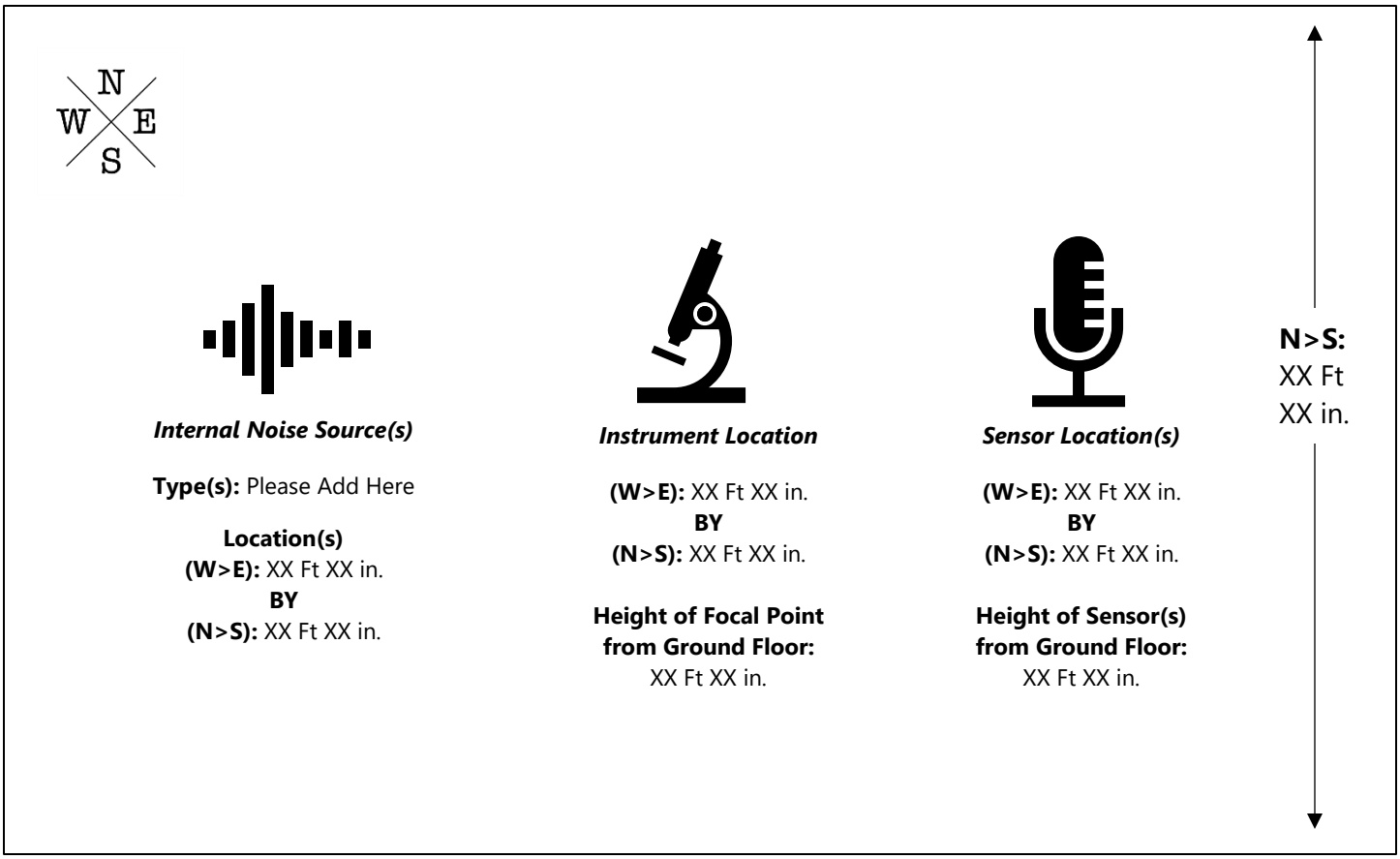
This guide helps ensure all necessary information is collected to deliver a complete and comprehensive site survey report. This guide is broken down into three sections: **Customer Details**, **Measurement Details**, and **Room Details**.

CUSTOMER DETAILS			
Company Contact	*Name:*	*Phone:*	*Email:*
Company	*Name:*	*Address:*	
Instrument Details	*Manufacturer:*	*Make:*	*Model:*
Microscope Environmental Specifications	*Vibration:*	*Acoustic:*	*EMI:*

MEASUREMENT DETAILS			
Site Survey Details	*Performed By:*	*Date:*	
Site Survey Tool Used			
Sensor(s) Used	*Vibration:*	*Acoustic:*	*EMI:*
Frequency Range(s) Measured	*Vibration:*	*Acoustic:*	*EMI:*
Number of Locations Measured	*Vibration:*	*Acoustic:*	*EMI:*

Room Details

W>E: XX Ft XX in.



Room Ceiling Height:

Room Location in Building (i.e. ground floor, 1st floor, etc.):

External Noise Source(s):

Disconnecting the WaveCatcher Hardware

Follow the steps below to disconnect the WaveCatcher ADC successfully from the notebook computer:

Step 1: Click on the small upward facing arrow located at the bottom right-hand side of the Windows taskbar.

Step 2: Right click on the USB icon.

Step 3: Click the *Eject WC* option and wait for the computer's confirmation to safely remove the WaveCatcher ADC USB cable.

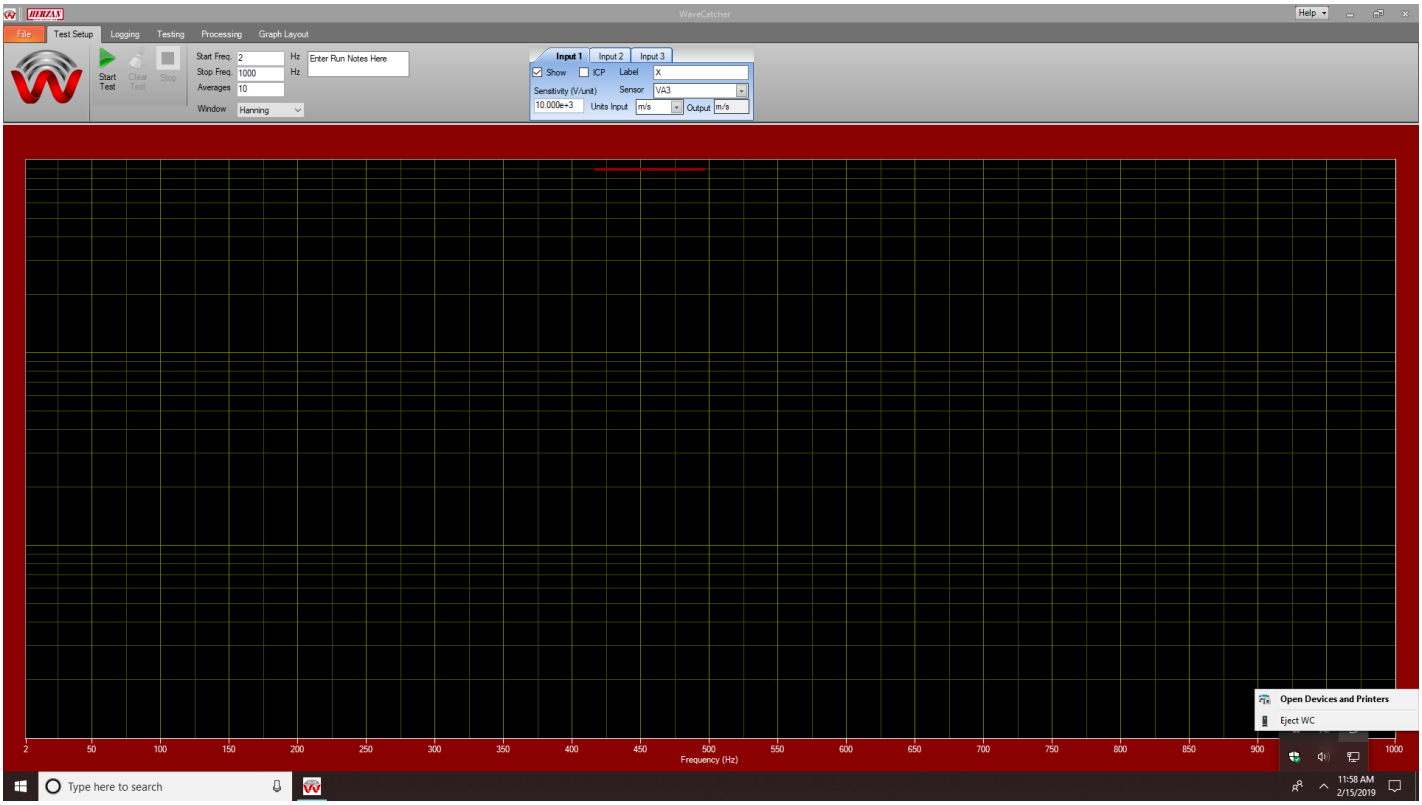


Figure 48: *Pop Up Window Showing How to Safely Disconnect the WaveCatcher ADC from the Notebook Computer*

Install/Uninstall the WaveCatcher Software

If the WaveCatcher software is not previously installed on the provided notebook computer or you need to re-install the software, please follow the steps below:

Step 1: Contact Herzan for a link to download the WaveCatcher 3.5+ software. The file downloaded should be a Zip File that will need to be extracted to receive the contents of the software.

Step 2: Right Click on the downloaded Zip File Folder and select *Extract All*. Select the destination for the extracted folder to be on the main hard drive (Typically C: Drive).

Step 3: Open the Extracted Folder and double click the file labeled *Setup.bat*. Selecting this file will begin the installation process. If the installation process does not immediately prompt, right click the file labeled *Setup.bat* and select *Run As Administrator*.

NOTE: if a previous version of the WaveCatcher software was downloaded on the notebook computer, uninstall the software before installing the new version of the software.

Step 4: Install the WaveCatcher 3.5+ software completely following the guided prompts and accepting the EULA agreements. Note any errors listed during the installation of the WaveCatcher software and contact Herzan directly for further instructions (Refer to the Contact Us Section).

Step 5: Once the software has finished downloading, you will be prompted to connect the WaveCatcher hardware. Connect the WaveCatcher hardware and sensors to the notebook computer by referencing the following sections: *How to Connect the WaveCatcher Hardware* and *How to Connect the WaveCatcher Sensors*.

NOTE: Before running the software for the first time, verify the drivers were installed successfully.

Step 6: To verify the drivers were installed successfully, plug in the ADC (if not plugged in already), access the *Control Panel* folder on the notebook computer and open the *Device Manager* program. Expand the *Universal Serial Bus Controllers* item and verify *WaveCatcher DAQ* appears. If the WaveCatcher DAQ appears, the WaveCatcher is ready to be used successfully. If the WaveCatcher DAQ does not appear, wait five minutes for the computer to recognize the drivers. If problems persist, restart the notebook computer and repeat the initial steps in Step 6. If after restarting the notebook computer WaveCatcher DAQ does not appear, refer to the Troubleshooting section (Pg. 30), or contact Herzan customer support (Pg. 31).

Step 7: When running the WaveCatcher software for the first time, a prompt will appear to enter the license key. Enter the license key provided with your WaveCatcher site survey tool to grant the software a permanent license of the WaveCatcher software.

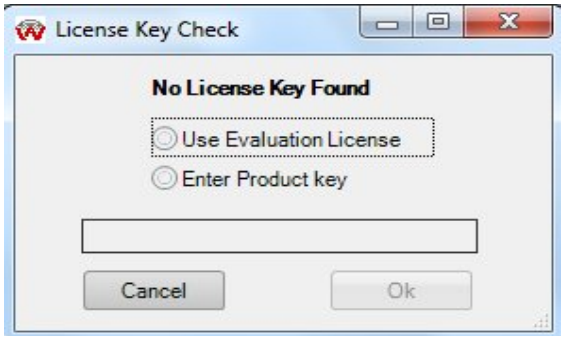


Figure 49: *License Key Check*

NOTE: Selecting *Use Evaluation License* will generate a one-time license key, which will allow use of the WaveCatcher's measurement features for 14 days. Each time the WaveCatcher is launched with an evaluation license key, a countdown will be displayed with the remaining days available during the evaluation period. When the evaluation expires, the WaveCatcher will force the entry of a Product License Key, which will be supplied with the WaveCatcher tool if purchased. Once the license key has been entered into the dialogue box, you may find it stored in the *About* tab in the WaveCatcher software under *License Key*.

Figure 51: *Dialogue Box Requiring Product Key be Entered*

Figure 52*: Prompts for An Expiring and Expired WC License*

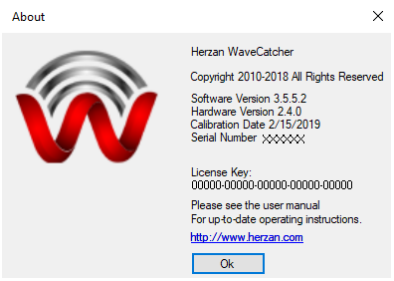


Figure 50: *About Page with Relevant Hardware and Software Information*

NOTE: contact us if you encounter any issues during the installation process.

Recommended Hardware Specifications

If you are installing the WaveCatcher software onto a new computer (not provided by Herzan), please consider the following recommended hardware specifications when selecting a computer.

- Operating System: Windows 7 or 10 Pro Version
- Processor (CPU): Intel Version, 3.5 GHz Clock speed or higher
- Memory Capacity: 8GB or higher
- Hard Drive: 200 GB disk total, 2 GB disk available or more
- USB Port: Version 2.0 or greater
- Monitor/Screen Resolution: 1024x625 or higher

Troubleshooting

The following messages or issues are known within the Herzan software and require a specific action towards a resolution.

Message/Issue	Type	Action
Evaluation will expire in XX Days	Info	No action required; the trial version of the WaveCatcher software is active during the listed duration (XX Days).
Evaluation has expired	Info	Obtain a valid product key from Herzan and enter the key into the dialogue window as detailed in the following section: *Install/Uninstall the WaveCatcher Software*.
Mismatched sensors loading file: (filename)	Error	*Description:* This issue prompts when the sensors in a loaded measurement do not match the sensors listed in the live WaveCatcher software. ***Action:*** Change the sensor in the live WaveCatcher software to match the sensor in the loaded measurement data; OR clear the current test using the *Clear Test* button.
Mismatched units loading file: (filename)	Error	*Description:* The issue prompts when the measurement units in a loaded measurement do not match the measurement units in the live WaveCatcher software. ***Action:*** Change the measurement units in the live WaveCatcher software to match the measurement units in the loaded measurement data; OR clear the current test using the *Clear Test* button.
Started Using local files for Data	Info	No action required; indicates the WaveCatcher is not connecting to a database. **NOTE:** If you have the Data Logging / Database option and see this message then try rebooting the computer. If the message persists then contact Herzan.
This software is licensed to WaveCatcher Hardware Serial #: XXXXXX. Please contact Herzan LLC to change it. No operations are allowed	Error	*Description:* The issue prompts when the WaveCatcher ADC is different from the previous ADC used with this WaveCatcher installation. ***Action:*** Change the ADC for the one last used. **NOTE:** If the correct ADC is connected, contact Herzan for further instructions.
Load A Sensor Protocol?	Action	*Description:* This message allows you to load a protocol during the WaveCatcher start up. ***Action:*** Answer Yes to open a File Open Dialog to selection a Protocol; OR Answer No to start WaveCatcher with default settings. **NOTE:** A Protocol can be loaded from the *Testing* tab after start up.
Error Detecting firmware version	Error	*Description:* This issue prompts for 3 reasons: 1. Incompatible ADC connected; ***Action:*** Connect compatible ADC 2. ADC not connected; ***Action:*** Connect ADC 3. Windows ADC USB Driver corrupt; ***Action***: Remove USB cable and replace. **NOTE:** to verify Issue #3: go to device manager, open the USB device tree, and look for *WaveCatcher DAQ*.

Graph does not appear after a Data Logging session	Issue	Force a redraw of the graph by toggling the X Axis scale in the *Logging* tab.
Graph does not appear after loading a previously saved test	Issue	*Description:* Issue prompts due to current scale settings. ***Action:*** Force a redraw by toggling Linear/Logarithmic in the Y Axis and/or Auto-scale in the *Graph Layout* tab.
Scaling appears incorrect after a graph operation.	Issue	Force a redraw by toggling Linear/Logarithmic in the Y Axis and/or Auto-scale in the *Graph Layout* tab.
No Calibration File Found Please perform a Calibration	Error	WaveCatcher ADC must be returned to Herzan for Calibration.
Must have a live plot to save one	Info	*Description:* The user has selected File->Save->Save Data and no live data exists. There must be a current test displayed to use this function. ***Action:*** Perform a measurement to save the measurement plot.
Must have a loaded plot to save one	Info	*Description:* The user has selected File->Save->Save Data and no loaded data exists. There must be a loaded measurement displayed to use this function. ***Action:*** Load a measurement to save the measurement plot.
Problem with the Sensors database No Operations allowed.	Error	*Description:* The WaveCatcher Software is missing some Data. ***Action:*** Reboot the notebook computer and reload the WaveCatcher software. If the issue persists, uninstall the WaveCatcher software, then reinstall.
File not Found message when loading Manual, What's New, Quick Guides or Videos.	Error	***Action:*** Uninstall the WaveCatcher software, then reinstall. If the issue persists, contact Herzan for next steps.
Must have a Test Group set. Cannot continue.	Error	*Description:* This issue prompts if the Data Logging/Database module is installed. ***Action:*** Confirm there is a value in the combo box under the *Start* button in the *Test Setup* tab. Select a value from the list (default is 'default') or add a new Name. Additional help can be found in the Database module *Tooltip*.
Setting ICP On (Off)	Info	No action required; this message prompts when a Sensor is changed and the ICP status has been changed to match the Sensor.
Warning Overriding Loaded Protocol	Info	*Description:* This issue is prompted when Protocol measurement settings are changed. ***Action:*** If a change was made in error then reload the Protocol OR no action is required if the change was not made in error. NOTE: you can save over the existing protocol following the steps outlined in section: *How to Perform A Measurement*.
Cannot select dB with SPL units	Info	Select either Linear or Logarithmic in the Y Scale when output units are set to SPL for acoustic measurements

NOTE: If you receive messages or issues within the WaveCatcher not outlined above, please contact Herzan directly using the information provided in the *Contact Us* section.

Glossary

Term	Description/Notes
1/3 Octave	Horizontal axis scaling technique and logarithmic unit of frequency. Frequency band: $f2=f1*(\sqrt{2})^3$. f2 = upper band-edge frequency; f1 = lower band frequency.
AC Measurement	Measuring AC Fields (alternating current) within the environment. AC fields are generally caused by electrical power sources (2.5 Hz+), with most trouble frequencies at 50/60 Hz.
Amplitude	A measure of a periodic variable (i.e. noise source) over a single period (i.e. frequency). Amplitudes vary depending on the sampling mode being used.
Analog-to-Digital Converter (ADC)	Hardware designed by Herzan to read the analog signals generated by sensors and create a digitally compatible version for the WaveCatcher software to read and interpret.
Database	Database used when saving large data sets or clusters of data sets. Database is included with the Data Logging upgrade module.
dBMag	A vertical axis scaling technique used to represent the data in terms of decibels (dB). Relates to the ratio of one value to another logarithmically, often used when measuring acoustic noise.
DC Measurement	Measuring DC Fields (direct current) within the environment. DC fields are caused by the Earth's magnetic field and DC power sources (e.g. battery power, solar power and wind power).
Fast Fourier Transform (FFT)	An algorithm computing discrete Fourier transform (DFT) of a sequence, whereby converting a signal to be represented within the frequency domain.
Frequency Bin	A segment [fl,fh] of the frequency range that aggregates the amplitude from a subset of the frequency range, resulting from an FFT.
Hanning Window	An FFT window where data segments are represented in a sinusoidal shape. Common for performing site survey measurements as they work well with random data due its minimal impact of on the frequency resolution and amplitude accuracy.
Plots	Plots are the individually displayed measurement inputs in a WaveCatcher measurement.
Power Spectral Density (PSD)	A measure of a sensor's measured amplitude versus frequency. Common when needing to characterize random signals over a broad frequency range.
Protocol	A programmable measurement setting allowing WaveCatcher users the ability to save measurement settings for future use, saving time configuring the WaveCatcher.
Rectangular Window	An FFT window where data segments are not modified at all. Often used to measure shock responses or unique events, not long-term vibration monitoring.
Resolution	Determines how the data is being represented in the graph. Two options are available for resolution: *Fixed*, which creates a fixed number of frequency bins based on the frequency range measured; and *Raw*, which is the native resolution captured by the WaveCatcher's ADC and is influenced by the sample rate, number of samples, and frequency range.
Transmissibility	The ratio of the vibrational force being measured in a system to the vibrational force entering a system. Often used when determining effectiveness of a vibration control platform.

Contact Us

If you have questions about your WaveCatcher site survey tool or would like to speak to a Herzan representative about future applications, please don't hesitate to contact us at any time.

Sales:

- Email: sales@herzan.com
- Phone: (949) 363-2905 Extn. 300

Support:

- Email: support@herzan.com
- Phone: (949) 363-2905 Extn. 305

Connect with Us

There are many ways in which you can connect with us and stay current on the latest developments at Herzan.

➢ Herzan.com/about/herzan-happenings.html

➢ Facebook.com/Herzanllc

➢ Twitter.com/Herzanllc

➢ Linkedin.com/company/Herzan

➢ Plus.google.com/+Herzan

➢ Youtube.com/Herzanvideopage