Herzan WaveCatcher Manual

Single-Axis

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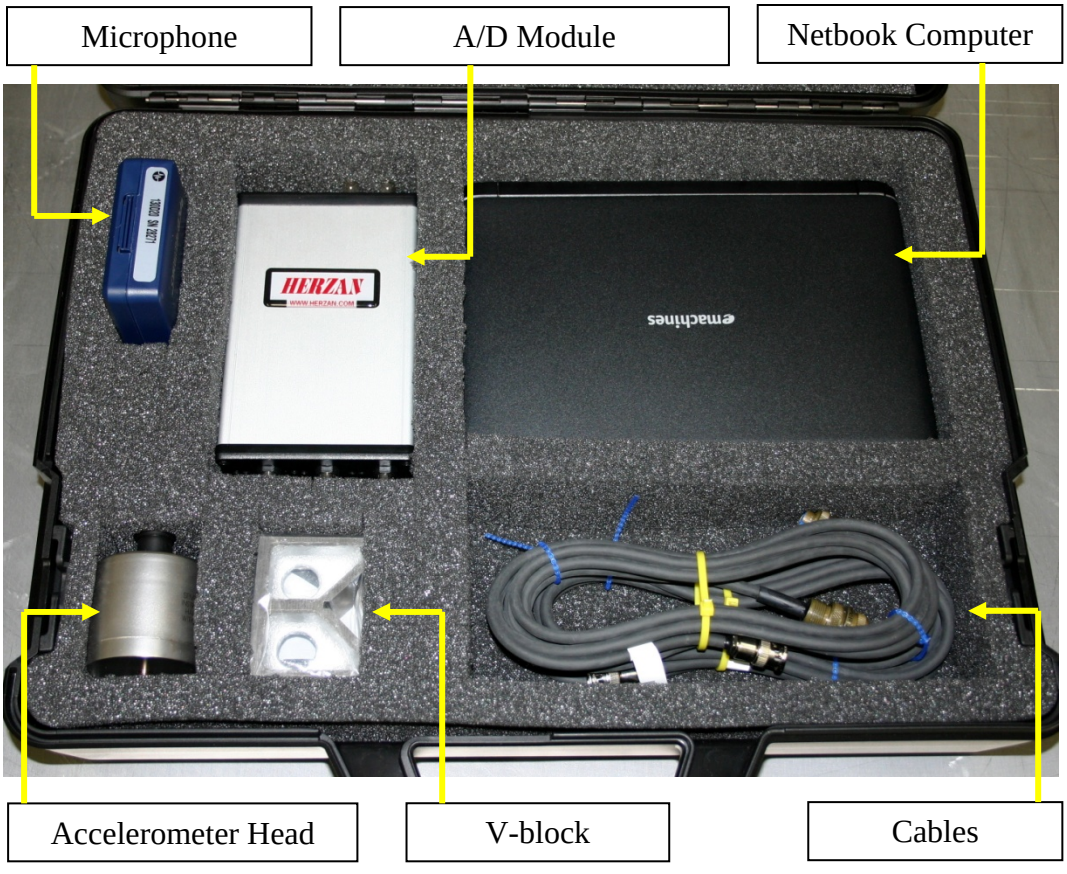
Single-Axis WaveCatcher Components

- Carrying Case
- Analog-to-digital conversion module (A/D module)
- Netbook Computer
- Single-axis Accelerometer Head
- V-block
- PCB Piezotronics Testing Microphone
- USB Type B-to-USB Type A cable
- BNC-to-two pin cable
- Computer power cable
- BNC-to-BNC cable
- Manuals and Certifications



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Setting Up

1. Connect power cable to netbook computer. Plug in to wall outlet. Open computer and turn on by pressing Power button.
2. Connect the A/D module's USB Type B output to the computer's USB Type A input using the USB cable.
3. Launch the WaveCatcher software using the icon on the desktop or via the icon on the start menu.

QUICK START: Running a Vibration Test

1. Remove accelerometer head from WaveCatcher case. Connect the accelerometer head to Input 1 of the A/D module using the BNC-to-two pin cable. Place the accelerometer head in the desired testing location with the flat side resting on a flat surface.

   CAUTION: The accelerometer head is very sensitive. Avoid rough handling or dropping the head.
2. Using WaveCatcher software, load a testing QuickSet (see Using QuickSet section, Page 7) or configure custom testing parameters. A QuickSet for testing acceleration has already been configured and can be accessed through the Load Settings option on the QuickSet menu.
3. Make notes regarding test in Run Notes section.
4. Press Start to run a test.
5. The duration of the test will depend on the number of averages selected. It is recommneded to do at least ten averages per test. You will see the averages counting up in the Averages box. You can stop the test before it completes the specified number of averages by pressing Cancel. The test data will not be automatically saved if you press Cancel, but you can save the data manually using the instructions below.
6. The test will automatically stop upon taking the specified number of averages. The data will automatically be saved to a .CSV file. A dialog box will appear displaying the file name that the data was saved to. Press OK to continue. (See Saving the Data section, Page 5, for other Save options.)
7. Repeat steps 4 through 7 to conduct additional tests.
8. Place accelerometer head sideways in V-block to conduct testing of horizontal axes. Make note of acceleromter orientation in Run Notes.

QUICK START: Running an Acoustic Test

1. Remove microphone from blue case. CAUTION: The microphone head is very sensitive. Avoid touching the tip of the microphone.
2. Connect the acoustic microphone to the Input 1 BNC connector on the A/D module using BNC-to-BNC cable.
3. Using WaveCatcher software, load a testing QuickSet (see Using QuickSet section, Page 7) or configure custom testing parameters. A QuickSet for testing sound pressure in Pascals has already been configured and can be accessed through the Load Settings option on the QuickSet menu.
4. Adjust the settings and display functions as desired in the Run Control pane (see below for additional details). Add relevant testing details in the text field. Set the desired number of averages to take in your test. We recommend taking at least ten averages for a site survey.
5. Place the acoustic microphone in the desired testing location. Make notes regarding test in Run Notes section. Make note of orientation of the microphone.
6. Press Start to run a test.
7. The duration of the test will depend on the number of averages selected. You will see the averages counting up in the Averages box. You can stop the test before it completes the specified number of Averages by pressing Cancel. The test data will not be automatically saved if you press Cancel, but you can save the data manually using the instructions below.
8. The test will automatically stop upon taking the specified number of averages. The data will automatically be saved to a .CSV file. A dialog box will appear showing the file name that the data was saved to. Press OK to continue. (See Saving the Data section, Page 5, for other Save options.)
9. Repeat steps 5 through 8 to conduct additional tests.

Saving the Data

There are three methods to save test data:

Auto Save: Upon completing a test, a .CSV file with the data will automatically be saved to the WaveCatcher folder in My Documents.

Save Bitmap: This will save a bitmap (.BMP) image of the graph as it is currently configured, including input labels. Access the File menu and select Save Bitmap. Choose the destination folder and the file name you would like to save to.

Save Data: This will save a comma-seperated values (.CSV) file of the data which you have taken in the current test. Access the File menu and select Save Data. Choose the destination folder and the file name you would like to save to.

Copy: This will copy a bitmap image of the current test to your computer's clipboard. Access the Edit menu and select Copy. Access the document (for example, a Word file) into which you would like to insert the image, access the Edit menu, and select Paste.

Using the Data

The .CSV files can be opened and manipulated using any spreadsheet program. OpenOffice.org Base is already installed on the computer as the default spreadsheet program. Use File Explorer to access the .CSV file. The data files can also be accessed throught the Open function in any spreadsheet program.

The .BMP files can be viewed using any image viewer program.

Run Control

Start Button: Starts the test. Click on this button to start taking data.

Cancel Button: Cancels the test currently running. If the test is cancelled, data will not be automatically recorded for that test. You may save the data set manually or simply move on to the next test.

Units: Determines in what units the data will be displayed and recorded.
V – volts
g – g's represent acceleration divided by Earth's gravitational pull
m/s^2 – meters per second squared
m/s – meters per second
m – meters – measure of displacement
inch/s^2 – inches per second squared
inch/s – inches per second
inch – inches – measure of displacement

Start Frequency: Determines the minimum frequency for which data will be recorded. The minimum allowable frequency is 1 Hz.

Stop Frequency: Determines the maximum frequency which data will be recorded. The maximum allowable frequency is 5000 Hz.

Averages: Determines the number of samples that will be taken in the test. The data will be averaged across the number of samples. It is recommended to take AT LEAST 10 averages per test.

Window: Allows you to choose the type of FFT filter applied to the data. You can choose between Rectangular and Hanning. Hanning is more common for use in site surveys.

Run Notes: Enter notes on each test here. The notes will be saved with the test data. Important information regarding the test should be recorded here. Common examples of run notes include date and time, location, and units.

Input Settings

You can manipulate several display and recording settings for each Input. Toggle between the three inputs by clicking the tabs at the top of the Input settings pane. NOTE: Changing a setting for one Input will not automatically change the setting for the other inputs.

Show: Adds or removes a given input's trace on the display graph and the input's data in the data set. Unchecking the box will remove the input's trace from the display graph and will remove the input's data from the data set.

Cursor: Adds or removes a cursor from the input's trace in the display graph. The cursor can be moved to pinpoint certain data points on the input's trace. The Cursor can be moved by clicking and holding on the cursor's dashed line with the mouse and moving it to a new position.

ICP: Check this box if you are taking data using an ICP sensor. Leave this box unchecked if the sensor is non-ICP (ie. the sensor has its own power source).

Sensitivity (V/EU): Enter the sensitivity of your sensor here to record accurate data. A sensor's sensitivity can be found in the sensor's documentation. Be sure to use V/EU units. Check that you have the accurate units and, if not, perform conversion prior to entering the value. The sensitivity value will be recorded with the data.

Label: Enter a Label for the Input's trace on the Display Graph. This label will be recorded with the data. It is recommended to use the label to indicate the sensor being used, the axis being measured (if applicable), and the units selected.

Using QuickSet

A QuickSet function is included to allow you to save your Run Control and Input settings and load these settings later. This will preserve your preferred testing configuration from day to day and will save the time and trouble of repeatedly entering your settings.

To Save a QuickSet: Once you have entered your preferred settings in the Run Control and Input sections, access the Quick Set menu and select Save Settings. Select the preferred save location (the default location is the WaveCatcher folder) and enter the name of the QuickSet settings. Choose a name which is relevant to the type of test that the settings will be used for in the future, for example "Vibration Test – Lab Floor - Acceleration".

To Load a QuickSet: Access the Quick Set menu and select Load Settings. Locate the desired QuickSet file, select it, and click Open. This will automatically configure your settings and you will be prepared to start taking a test.

Acquisition

You can manipulate the display graph using the controls above the graph. The same controls are provided for both the Horizontal and Vertical Axes.

Sample Mode -
Peak to Peak: measures the change between peak (highest amplitude value) and trough (lowest amplitude value).
Peak: measures the change between peak (highest amplitude value) and zero value.
RMS: root mean square – the square root of the mean squared peak value.

Analysis Mode -
FFT: fast Fourier transform
PSD: power spectral density

Draw Limit: allows user to add lines to graph at specific amplitudes and frequencies. This function is useful for adding allowable noise levels (based on instrument specifications) to graphs for comparison to actual noise levels. Enter the frequency where the line should start in the Start Freq field. Enter the noise level limit in the Limit field. Adding additional entries will stop the previous Draw Limit and add a new one.

Time Average: changes the testing duration from number of averages to number of minutes. Enter the number of minutes you would like the test to run for. Click the Time Average Enable check box to enable time averaging.

Legend: toggles the graph legend on and off. Legend displays the trace labels in the upper right corner of the graph.

Display Settings

You can manipulate the display graph using the controls above the graph. The same controls are provided for both the Horizontal and Vertical Axes.

SCALE-
Horizontal Axis: Allows you to toggle between Linear and Log Scale.
Vertical Scale: Allows you to select linear magnitude (LinMag), logarithmic magnitude (LogMag), or decibel magnitude (dBMag).

Autoscale: Checking this box automatically sizes the axis to fit the data that is taken.

Min: Allows you to manually set the minimum value displayed for that axis. **NOTE:** You will need to uncheck the Autoscale box to manipulate Min setting.

Max: Allows you to manually set the maximum value displayed for that axis. **NOTE:** You will need to uncheck the Autoscale box to manipulate Max setting.

Feedback

Herzan welcomes your feedback! Please let us know what we can do to improve our products. You can reach us at feedback@herzan.com or (949) 363-2905.

We look forward to hearing from you!

Appendix A:
Best Practices – Conducting a Site Survey

- Ensure that you are not changing parameters between tests which you plan to compare.
- The more averages that are taken, the more noise will be filtered out. Taking more averages will ensure more accurate data.
- For vibration testing, make sure the sensor is firmly coupled to the surface you would like to measure. For light accelerometer heads, adhesive or wax may be required to ensure a firm coupling.
- Beware of 60 Hz spikes in the data. These are often related to electro-magnetic interference and can be an artifact of line noise. If you notice significant 60 Hz spikes in your data, make sure your testing set-up is grounded properly and run the test again.
- Narrow the frequency span of your test to achieve better frequency resolution. If you are unsure of the frequency area of interest, start with a broad frequency range and narrow your focus based on results.
- Significant resonances in one axis can often feed into other axes and appear in the data for other directions. Measure multiple points in different locations to diagnose the phenomenon.
- Noise levels change throughout the day, due to foot and street traffic, equipment running, and other causes. It is recommended to run tests at different times of day to filter out the periodic noise.
- When doing comparative measurements, eliminate as many variables as possible. If possible, take the data simultaneously using identical sensors, with the sensors aligned.

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