



WiVibScope User's Manual

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CHAPTER 1 - Overview

1.1 *WiVibScope* Features

WiVibScope is a measurement and analysis package that interfaces directly with the *WiVib* or *WiVib Pro* series of wireless data acquisition devices from Icon Research (for example, the *WiVib-4/4 Pro*).

WiVibScope enables all the functionality of the *WiVib* or *WiVib Pro* unit to be exercised and it produces measurements in both the time and frequency domains. In other words, it acts as a fully-featured oscilloscope and spectrum analyser application. This makes it an ideal tool for setting up and commissioning a condition monitoring installation, as well as enabling detailed analysis of machinery measurements.

In this manual, the *WiVib* or *WiVib Pro* is referred to as a *WiVib*. However, note that certain features (eg. triggers) are not available on the original *WiVib* unit.

The main features of *WiVibScope* are:

- Acquires real-time dynamic and static measurements from multiple *WiVib* channels;
- Allows viewing of both time domain and spectral traces in engineering units;
- Enables all the features of the *WiVib* hardware to be used, including triggering and wakeup modes;
- Caters for various sensor types, including accelerometers and proximity probes;
- Provides comprehensive display options including cursor types, zoom, autoscale and linear/logarithmic graphing;
- Automatically detects *WiVib* devices on a network

This manual explains how to set up and operate *WiVibScope*.

1.2 Main Screen Features

WiVibScope has one main screen that enables all setup and viewing to be carried out. Right-clicking on various parts of the screen brings up additional dialogue boxes adjusting various features.

The main areas of the screen are shown below.

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The screenshot shows the WiVibScope V4.7 software interface. It features a central plot area with a grid, a left-hand control panel, and a bottom control panel. Five yellow callout boxes with arrows point to specific areas:

- WiVib Device Panel:** Located in the top-left corner, it contains fields for IP Address (192.168.101.250), Device (WiVib04ProA), Name (WiVib04ProA:00-C0-1B-0), Active Link (green dot), Battery: Ext Power, and Bat. Timeout: 0 Min. It also has a PowerDown button.
- WakeUp Control Panel:** Located below the device panel, it includes an Interval: 30 Min, a checkbox for Set for Wakeup, and a Next Wakeup field.
- Main Display:** The central plot area, currently empty, with axes ranging from 0 to 2000 Hz on the x-axis and 0.00 to 1.00 on the y-axis.
- Vertical Axis and Cursor Control Panels:** Located at the bottom left, it includes a vertical scale control with up/down arrows and a Peak Detect checkbox. Below it, a cursor control panel shows a cursor at 0 g and a speed of 0.000 ms.
- Cursor Readout Panel:** Located at the bottom center, it includes a Channels list (CH1-CH8) with radio buttons, a Cursor field (0 g), and a Bias field.
- Measurement Setup Panel:** Located at the bottom right, it includes sections for Measure (Acceleration, Velocity, Displacement, Bearing), Bandwidth (2 kHz), Averaging (None, Linear, Peak Hold), Trigger (Disabled, Channel 1), Gating (G1 Off, G2 Off), Display (400), Gain (x1), and Band Filter (High Pass, Low Pass).

WiVib Device Panel: this shows the IP address of the *WiVib* that you have selected, the model of the device, and the name that has been allocated to it.

WakeUp Control Panel: this panel enables you to set the device to turn off and wake up at preset intervals.

Main Display: measurement traces are shown here. By right-clicking anywhere on the display, display options can be altered.

Vertical Axis and Cursor Control Panels: the vertical scaling can be adjusted using the up/down arrows, or autoscale can be selected. Additionally, the cursor can be moved left/right, or it can be set to detect the peak of the displayed trace. The x-axis cursor position is displayed here, along with the speed being detected by the trigger selection.

Cursor Readout Panel: this allows channels to be selected or de-selected for display by clicking on the radio buttons. In addition, the value of the trace at the cursor position on the y-axis is shown. In the case of process measurements (eg.

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temperature) the process value is displayed. By right-clicking anywhere on the panel, channel sensitivities and engineering units can be altered.

Measurement Setup Panel: settings for measurements are altered and displayed here. Time and frequency display options are selected here, and values are selected from drop-down menus.

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CHAPTER 2 – Getting Started

2.1 Installation

Installation is from either CD or USB memory stick.

Installation from CD

If AutoRun is enabled on your computer drive, the installation menu will be displayed. Click on **Install Software** and select *WiVibScope*. If installation does not run automatically, then use Windows Explorer to select the drive with the label *WiVib Suite*, and run the application called *WiVibSuite.exe* which will be in the root folder.

Installation from USB Stick

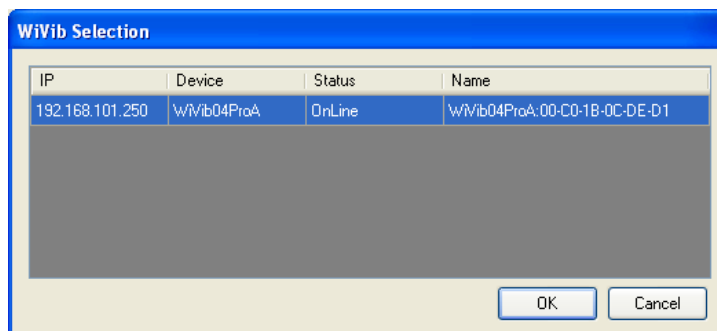
When a USB drive is inserted, the Windows Autoplay dialogue box will appear. Select *WiVib Suite Installation* and click **OK**. Click on **Install Software** and select *WiVibScope*. If the Autoplay box does not appear, then use Windows Explorer to select the drive with the label *WiVib Suite*, and run the application called *WiVibSuite.exe* which will be in the root folder.

Note that, if you wish to copy the files from the CD or USB stick to your computer and install from your computer, then ensure that all the files are kept in their original folders, otherwise installation may fail.

In either case, a shortcut will be placed on your desktop. Click on the shortcut to launch *WiVibScope*. If you wish to print a copy of this manual, it is available on the CD/USB stick.

2.2 Connecting to a WiVib

When *WiVibScope* is launched, the first thing it does is look for available *WiVibs* on the network. The screen below will appear and one or more *WiVibs* will appear on the *WiVib Selection* dialogue box. For a *WiVib* to connect, it must be on the same network as the PC, have the correct IP address of the host, and be switched on. If a *WiVib* does not appear, check with the *WiVibConfig* utility that your settings are correct. If you are having difficulty, refer to the section called *Setting Up Your Network* at the end of this chapter.



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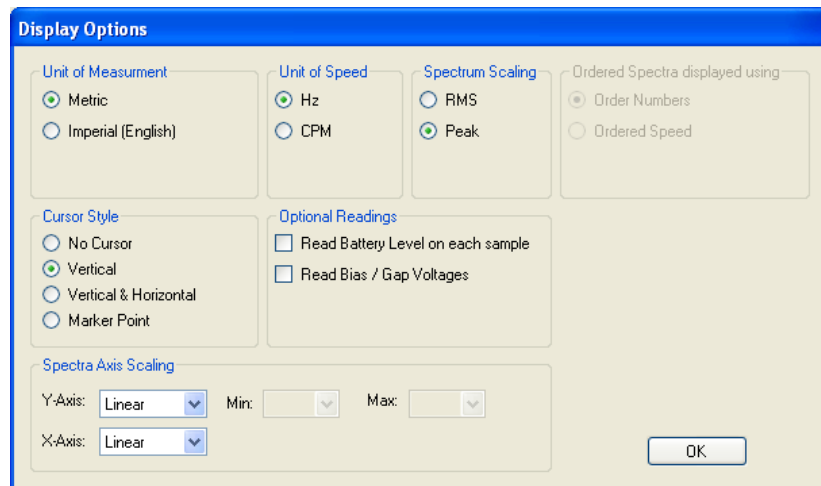
Click on the *WiVib* that you want to connect to (in the example, there is only one) and click **OK**. Traces will now start to appear on the display.

2.3 Defining Your Preferences

One of the first things you will probably wish to do is to set up your transducer and display preferences, together with your transducer sensitivities. So let's get started.

First, right-click on the display area, and the menu screen below will appear. Use the radio buttons to select whether you wish to see:

- metric or imperial units;
- speed in Hz or RPM;
- spectra in RMS or Peak values;
- ordered spectra as numbers of orders or ordered speed.



You can select your cursor style, and whether you wish to see the display in logarithmic or linear units (this option applies to spectral displays only).

You can also decide whether you want the *WiVib* to take additional measurements on each display update. The options are to measure the battery voltage, and also to read the bias voltage (when using an accelerometer), or the gap voltage (when using a proximity probe). If you turn these off, the trace update rate to the display will be faster.

Click **OK** to exit and your settings are automatically saved. Don't worry if you are not sure of your settings at this point – you can change them any time by right clicking on the display again.

Now we want to set up our transducers and sensitivities. Right-click on the *Cursor Readout Panel* to bring up the screen below.

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The screenshot shows the 'WiVib Sensor Settings' dialog box. It is divided into two main sections: 'AC Channels' and 'DC Channels'.
In the 'AC Channels' section, the 'Sensor Type' is set to 'Accelerometer'. Below this, there are four channels (Channel 1 to Channel 4). Each channel has a sensitivity input field set to '100.00' and a unit dropdown menu set to 'mv / g'.
In the 'DC Channels' section, the 'Process' radio button is selected. Below this, there are four channels (Channel 5 to Channel 8). Each channel has three input fields: 'Sensitivity' (set to '10.0'), 'Units' (set to 'mV / degC'), and 'Offset (mV)' (set to '0.0').
An 'OK' button is located at the bottom of the dialog.

The first item to define here is the type of sensor you are using from the *Sensor Type* drop-down menu. The sensor type automatically selects the appropriate units for that sensor based on your metric/imperial selection. For example, the default sensor type is *Accelerometer*, and the units are *mv/g*. You can use the default value or adjust the sensitivity to match your sensor. Note that the sensor type on the AC channels (channels 1 to 4) is the same for all channels – you can't mix sensor types.

The DC channels enable any unit to be defined. The default is temperature, using a sensor calibrated as 10mV/°C. To change units, enter the sensitivity in mV/unit, the name of the unit you want to display (eg. degC, degF, psi etc) and any offset that the sensor may have. The offset is used, for example, when a 4-20mA sensor has its 4mA level equal to zero and you wish to remove this offset.

The DC channels (channels 5-8) can be set to provide a single process value only, selected by clicking the **Process** radio button. Alternatively, a dynamic signal (such as a timewave or spectrum) can be displayed by clicking the **Dynamic** radio button. In reality, all of the measurements on DC channels are dynamic, but what the process selection does is take 256 samples at 2560Hz (ie. 100mS sample period), average the samples, and display the result on the Cursor Readout Panel. No trace is displayed for a process measurement. Note that channels 1 to 4 are disabled if you are taking dynamic measurements on channels 5 to 8.

2.4 Setting Up Your Network

If you are finding that a *WiVib* that is on your network is not connecting, check the following:

- The *WiVib*, access point/router and PC are all on the same subnet or have access to each other via an appropriate gateway;
- The SSID and encryption settings are the same on the *WiVib* as on the access point/router;
- The host PC IP address on the *WiVib* (ie. the PC that the *WiVib* expects to connect to) is the same as your PC.

If in any doubt, use the recommended default settings. Refer to the *WiVib* Operating Manual for full instructions.

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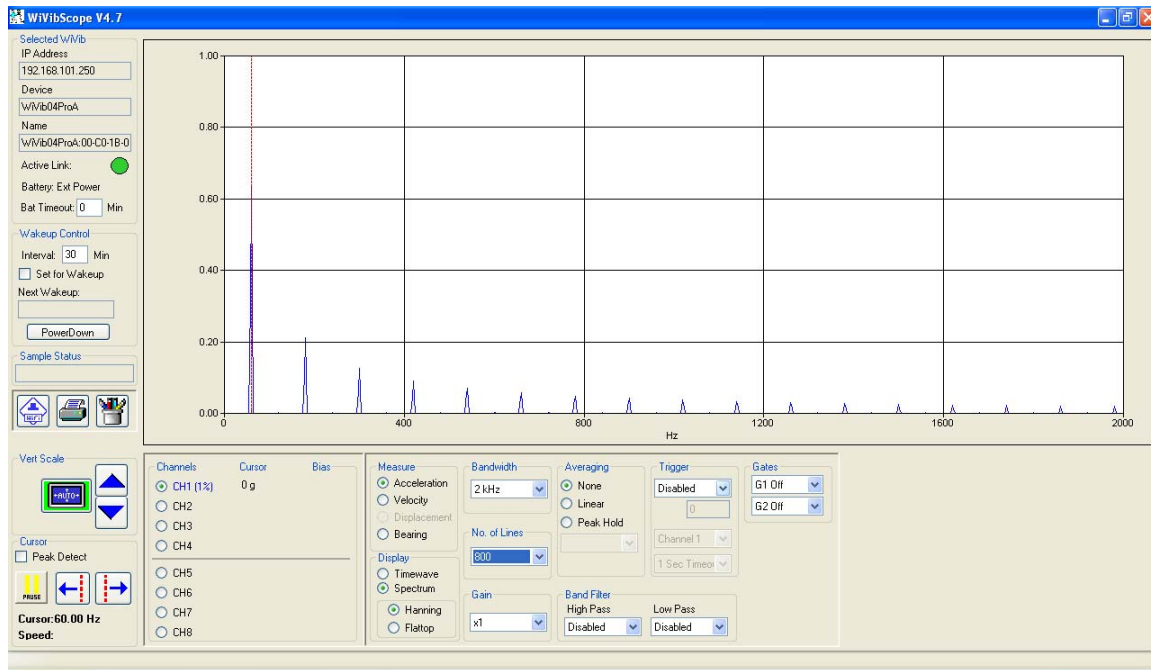
3.1 Using the Main Screen

By now, you should be able to connect to a *WiVib* and you have set up the preferences for the measurements you want to take. You have probably noticed that data is already appearing in the display screen.

There are a number of controls on the main display screen, as well as fields whereby measurement parameters can be adjusted. The controls will be examined first.

3.2 Display Controls

The main display screen is shown below. The controls will be looked at in turn. It has already been explained how right-clicking on the display area and the Cursor Readout Panel enables display options and sensor scaling to be defined. Once a *WiVib* connects, data is automatically displayed and refreshed on the display.



Selected WiVib: Details of the *WiVib* from which data is being received is shown on the panel marked *Selected WiVib*. These are the IP Address of the *WiVib* on the network, the model type and the name that has been given to that particular *WiVib*.

The *Active Link* indicator shows the connectivity status of the selected *WiVib*. If it is red, it means that the *WiVib* is not communicating with the host PC. If it is solid dark green, a connection has been established. The indicator flashes light green when new data has arrived.

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If the selection was made to read the battery level in the *Display Options* menu box, the battery level will be shown. If the *WiVib* is on external power, the word *Ext Power* will appear.

The *Bat Timeout* (battery timeout) setting is the length of time in minutes that the *WiVib* will remain powered without receiving any commands from the host PC. If this time is exceeded, then the *WiVib* will power down. This is to save battery power in the event of a network interruption or the PC being turned off. If you wish to disable the battery timeout, this can be done by setting the battery timeout to zero. If the *WiVib* is externally powered, then the battery timeout function is ignored.

Cursor Panel: The cursor can be moved by clicking on the left and right buttons in the *Cursor* panel. It can also be moved by left-clicking anywhere on the screen, and it can be dragged to a desired position by holding down the left mouse button. The cursor can also be set to move to the highest peak on each incoming trace by ticking the *Peak Detect* box. Note that the peak detect function will be disabled if cursors are moved manually.

The x-axis cursor position and machine speed (if trigger is enabled) are shown in this panel. Display update can be paused by clicking the **Pause** button (note that data is still read – it is simply not displayed).

Vertical Scaling: Above the *Cursor* panel is the vertical axis control panel, *Vert Scale*. Traces can be boosted and unboosted using the up and down arrows. *Autoscale* is turned on by clicking on this button, and a green border indicates that it is enabled. It is automatically disabled if a boost/unboost button is pressed.

Channels (Channel Selection): Channels can be selected or de-selected for display by clicking on the appropriate radio buttons. The value of the trace at the cursor position on the y-axis is shown. In the case of process measurements (eg. temperature) the process value is displayed.

The right-hand column shows additional information. For Accelerometer and Velocity Probe sensor selections, the bias voltage of each sensor is shown in the *Bias* column. For Proximity Probe and Volts selections, the column is labelled *Gap* to indicate this type of measurement. These measurements must be enabled in the *Display Options* dialogue box for these readings to be taken. For information, both bias and gap readings are taken over a period of one second to eliminate AC signal effects.

By right-clicking anywhere on the panel, channel sensitivities and engineering units can be altered.

Changing a WiVib: If you wish to change the *WiVib* that you are communicating with to another on the same network, you can click the **WiFi** button at any time and select a different *WiVib*.

WakeUp Control: To conserve battery power, the *WiVib* can be programmed to turn on (or “wake up”) at preset intervals. This is called *WakeUp Mode*. The frequency at which the unit wakes up is defined in the *WakeUp Control* panel. To turn Wakeup Mode on, tick the **Set for Wakeup** box. Now choose the **Interval** (in minutes) that you wish between wakeups. Click the **PowerDown** button. The *WiVib* will turn off the Active Link indicator will go red. The time at which the *WiVib* will wake up is shown in the *Next Wakeup* box. When that time is reached, the *WiVib* will turn on

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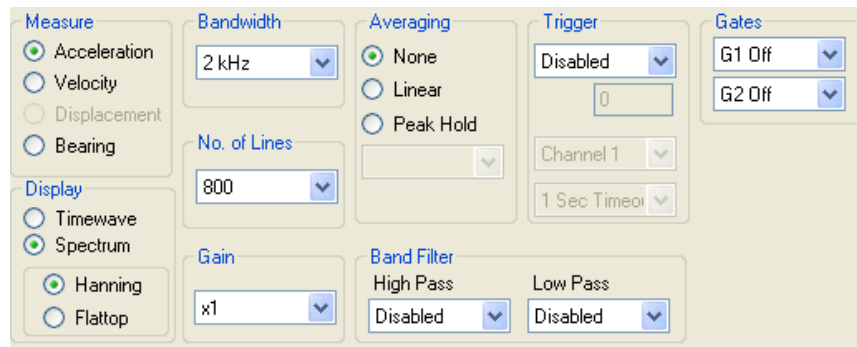
and a set of measurements on the selected channels will be taken. The unit will turn off again. To leave WakeUp Mode, untick the *Set for Wakeup* box. The unit will stay on at the next wakeup time, or you can press the ON/OFF button on the *WiVib* to turn it on right away.

Note that the actual time used is the time of the host PC that the *WiVib* is communicating with.

Printing and Saving: The screen can be printed or saved using the **Print** and **File** buttons. Various file types are available from the dropdown list.

3.3 Defining Measurement Parameters

The panel below shows the parameters that can be modified to suit the type of measurement you wish to take.



Measure: The type of measurement is defined here. The options are context sensitive depending on the type of sensor selected. For example, you cannot measure acceleration when using a proximity probe. The table below shows the types of measurement that can be taken with each type of sensor.

Measure	Sensor Type			
	Accelerometer	Velocity Probe	Proximity Probe	Volts
Acceleration	Y	N	N	Volts
Velocity	Y	Y	N	Volts
Displacement	N	Y	Y	Volts
Bearing	Y	N	N	Volts

The bearing measurement enables the on-board demodulator (enveloping) function in the *WiVib* to measure bearing condition.

Display: The selection of a time or spectral display is made here. Additionally, a Hanning or Flattop window can be selected for the spectrum.

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Sample Rate / Bandwidth: This field enables the Sample Rate (if a timewave display is selected) or the Bandwidth (if spectrum display is selected) to be defined from a drop-down menu.

No. of Samples / No. of Lines: This field enables the number of time samples (if a timewave display is selected) or the number of spectral lines (if spectrum display is selected) to be defined from a drop-down menu.

Gain: The channel gain in a range 1 to 50 in 1, 2, 5 steps is selected here. The same gain applies to all channels.

Averaging: The type of averaging can be selected between None, Linear and Peak Hold. The number of averages is selected from the drop-down menu which is enabled if a type of averaging is selected. Note that averaging can only be performed in the time domain if a trigger is enabled.

Band Filter: The band filter acts as a bandpass filter where the high-pass and low-pass edges are selected from the two drop-down menus. The filter is usually used to define the passband frequency range when using the bearing demodulator. You will notice that bandpass default values are automatically set when the *Bearing* selection is first made, and these should be set to suit the bearing being measured. A bandpass filter can be defined without using the bearing measurement function if desired. Note that bandpass filter settings are remembered for each of the measurement options.

Trigger: the trigger options are selected from the Trigger drop-down menu. The table below shows the options available.

Selection	<i>Function</i>	<i>Comments</i>
<i>Disabled</i>	Trigger is disabled	The <i>WiVib</i> will “free-run” ie. it will not wait for a trigger
<i>Enabled</i>	Trigger is enabled	The <i>WiVib</i> will wait for a trigger pulse to acquire a data record
<i>Pre Trigger</i>	Pre-Trigger is enabled	The <i>WiVib</i> will wait for a trigger pulse and the display will include the number of samples before the trigger point as specified in the <i>Delay</i> field.
<i>Post Trigger</i>	Post-Trigger is enabled	The <i>WiVib</i> will wait for a trigger pulse and then delay for the number of samples specified in the <i>Delay</i> field before acquiring the specified number of samples.
<i>Trigger + Tacho</i>	Trigger and tacho measurements are both enabled	Trigger is enabled and a speed measurement is also taken which is displayed in the <i>Cursor</i> panel.

The trigger source (**Channel 1** or **Channel 2**) is selected in the drop-down menu below the trigger type. Note that channel 1 can be an analog or digital trigger depending on the jumper setting in the *WiVib*. See the *WiVib* operating manual for details.

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The final drop-down menu specifies the trigger timeout which is the length of time that the *WiVib* will wait for a trigger before abandoning the measurement. If a trigger is not detected within the timeout period (ie. the timeout expires), a message *Trigger Timeout* will appear in the *Sample Status* box and no data will be read. This will continue until a trigger is detected or triggers are disabled.

Gates: Trigger inputs can also be used as gates. A set of measurements will not be taken if the gate signal inputs do not match the criteria specified in the drop-down menus. Both gates must match. Each gate can either be off, or require a high or low signal at its input to enable measurement. If the signals on the gate(s) do not match the gate configuration, then a message *Incorrect Gates* will appear in the *Sample Status* box and no data will be read. This will continue until the gate inputs match the gate settings or the gates are turned off.

Note that a gate has to be in a matched state for the whole of data acquisition period for a gate configuration to be valid and data to be read.

If no input is connected to a gate, then that gate input is read as logic low.

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