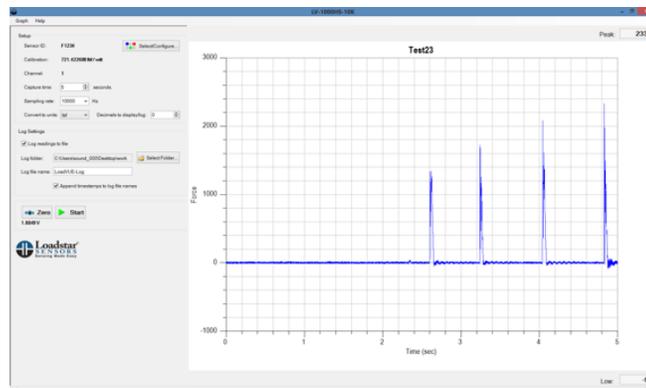




LV-1000HS-10K User Guide

Overview

LV-1000HS-10K software is the compatible software that works with our Impact Force Measurements up to 50 KHz. It must be used with our DI-1000UHS-10K data acquisition system that works with most resistive load cells we offer. The software is compatible with Win 8/10 PCs (note Win XP, Win Vista and Win 7 are no longer supported). We recommend using a Dual or Quad Core PC with at least 8 GB Ram and 1TB disk space to run LV-1000HS-10K.



Note: The DI-1000HS-10K unit is pre-calibrated to your load cell before shipping and is ready to use. Do not try to recalibrate it without first contacting Loadstar Sensors. Once you change the calibration you may need to send the unit back to us to recalibrate the system.

Installation

Insert USB Drive into your PC/s USB port. The installation should start automatically. If not, browse to the folder and run Setup.exe to run the installation. It is best to run the installation by right clicking on the setup.exe file and using "Run As Administrator". By installing as Administrator, the subsequent Driver Installation will go much more smoothly.

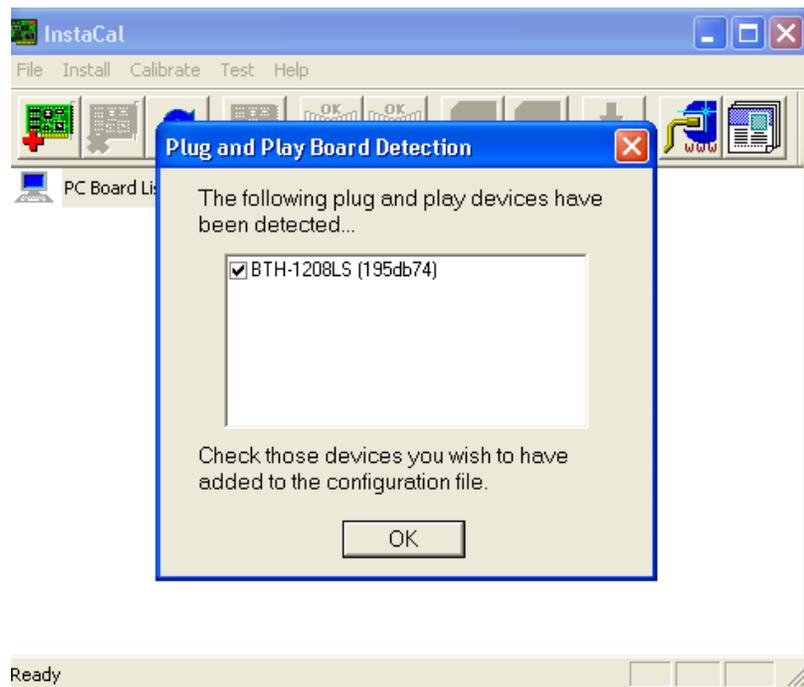
After the main program is installed, the driver installation program (InstaCalSetup.Exe) will be run. This program is provided by Measurement Instruments Computing to work with the BTH-1208LS DAQ Board.

If this program is not found, it may not have been installed due to a known glitch in Windows. If this is the case, please locate the InstaCal setup program by navigating to c:\program files(x86)\loadstar sensors\lv-1000hs-10k\drivers\instacalsetup.exe and Run As Admin (by right clicking on the file name or icon). After the driver installation is completed, you will be asked to reboot the computer.

You **must** reboot in order for the devices to be recognized.

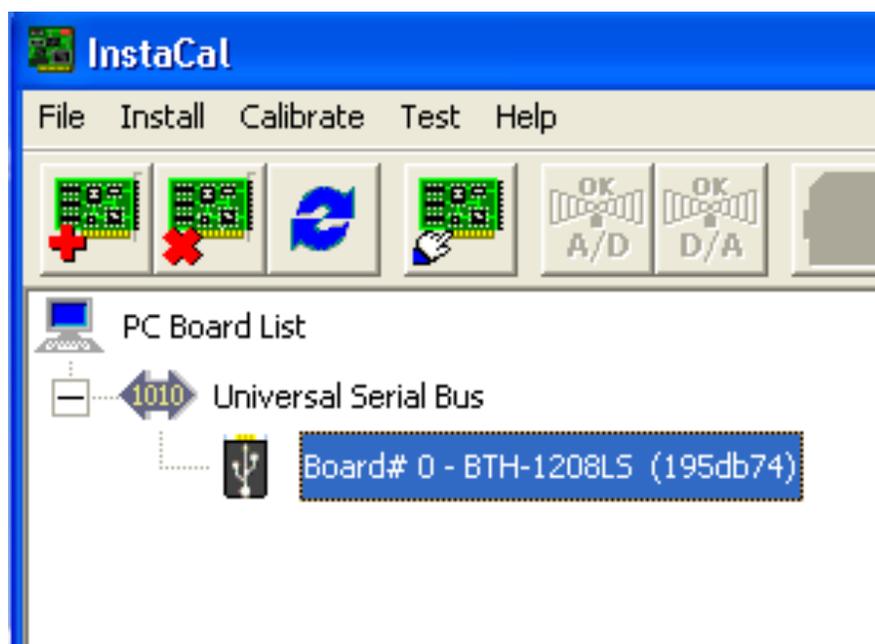
After Rebooting:

1. Connect the DI-1000HS-10K to the computer's USB port. Make sure to Power the DI-1000UHS-10K device with the provided 9V or 12V DC adapter. The USB cable connection will show a green LED light BUT is NOT enough.
2. Windows will prompt you for the drivers. Choose "Install drivers automatically".
3. THEN run the InstaCal configuration utility (This can be done by navigating to the Programs...Measurement Computing...InstaCal) This utility will detect the DAQ automatically and show the following dialog.
4. If this program is not found, please refer to the beginning of this document on manually installing it.



Click OK to continue. The DI-1000HS-10K device will now be added to the Windows registry so Windows can recognize the device from now on. **The InstaCal configuration utility needs to be run only once on the PC on which the application is being run.** When freshly installed on another PC you must install and run InstaCal once again on that PC.

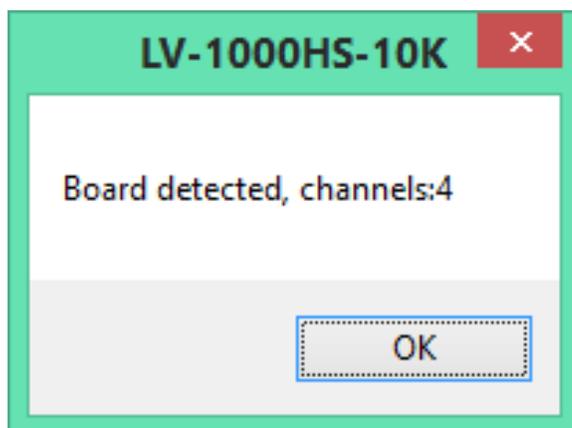
This is what is shown after successful installation of the drivers for the DI-1000UHS-10K.



Just quit the InstaCal program once you see this screen and you can move to the next step to launch LV-1000HS-10K

Startup and Sensor Selection

Click on the LV-1000HS-10K icon on your desktop () to start the program. The software will search for the DAQ and indicate that the board has been found. Click Continue to proceed to the main screen of LV-1000HS-10K.



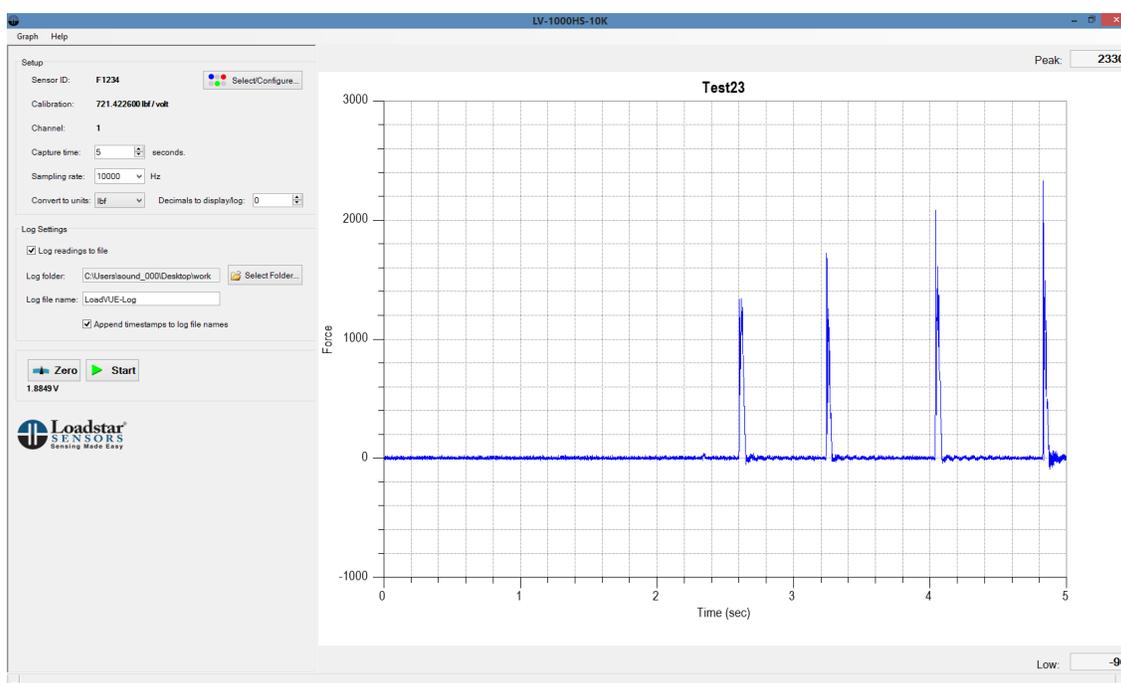


If the board is not detected the software will still continue and show the main screen, where you can add/remove sensors, view previously saved files (using the menu option Graph...Overlay Graphs...). If the board is NOT detected, you have to go back to InstaCal and make sure the board is properly installed.

Operation

The main window consists of the following areas:

- The sensor selection and data capture settings area.
- Log settings area
- Graph area
- Zero and Start buttons



Sensor Setup and Selection

The sensor is pre-calibrated at our facilities or you can calibrate then sensor yourself using the software's calibration window. You must first Click on the Select/Configure button shown in the main window to enter the sensor configuration.



Setup

Sensor ID: **F1234** Select/Configure...

Calibration: **721.422600 lbf / volt**

Channel: **1**

Capture time: seconds.

Sampling rate: Hz

Convert to units: Decimals to display/log:

You will then be presented with a screen to setup a new sensor.

Select / Configure Sensor

Select	Sensor ID	Sensor Type	Channel
<input checked="" type="checkbox"/>	F1234	force	1
<input type="checkbox"/>	T1234	torque	0

Details

ID:

Type:

DAQ Channel:

Calibration: /Volt

Only one channel can be selected for data capture.



Add a sensor, by entering the following data:

ID

The sensor's unique identification. You can choose your own name for the sensor (for example, Impact Tester etc, or use the serial number of the DAQ)

Type

Force by default

Channel

Select where this is sensor is connected to channel 0, 1, 2 or 3. By default it is set to 0 (when only one sensor is connected)

Calibration

Refer to the calibration certificate provided by Loadstar Sensors. Enter the calibration value (for example, lbf/volt, N/volt etc). You do NOT need to calibrate the sensor. It will come pre-calibrated. IF and ONLY IF you need to or would like to calibrate the sensor yourself, click on the Calibrate... to show the calibrate window.

After entering all the required data, click on Save to save your changes. Select this sensor ID in the selection pane and then click Close to return to the main window.



Operating the Sensor to Measure Impact Forces

Before you can run your test you need to set the following parameters for your test:

Capture Time (seconds)

Depending on your expected test duration, select a data capture duration. This value is entered in seconds. We recommend using 10 KHz as the one with the best signal to noise ratio for most commonly performed tests. The lower the capture rate, the lower the noise and higher the resolution. The noise is usually “white noise”. So you can capture the data in a log file and open it for post processing to “get” better resolution and accuracy than what you see displayed on screen from the raw data.

Sampling Rate (Hz)

Choose the data sampling frequency. The following options are available: 1000 Hz, 2000 Hz, 5000 Hz and 10000 Hz.

Output Units (Convert to units...)

If the sensor is calibrated in lbf and you want our output (logs, graphs etc) to be Newtons, you can make your selection here.

Decimals to Display

The log file outputs and the peak and low values displayed will use this setting to determine how many decimals places to format the numbers. Usually, it is not useful to display more digits than +/- 0.1% of full scale because it is not meaningful. For e.g., if you have a 10K lb sensor, just go with zero digits after the decimal.



Logging Test Data to a Comma Separated File

Check the Log readings to file checkbox to enable logging of sensor data to an Excel compatible CSV file. By default, the files will be saved to My Documents folder. Click on Select Folder to choose a different folder to save the files. Also enter a file name for the log file. Check Append timestamps to append the date and time of the test to the file name itself.

Log Settings

Log readings to file

Log folder: 

Log file name:

Append timestamps to log file names

The timestamp will consist of year, month, date, hour, minute and seconds. For example, if you enter "Test" as the file name, the files will be saved as Test-20150428133627, Test-20150428141009 etc. If you do not change the filename between tests, but do not check Append timestamps, timestamps will be appended anyway since it is not possible to have two files with the same name in the same folder.

The total number of points captured will be: Capture Frequency (samples/sec) × Capture Time (sec). The more the number of points that are captured, more the memory that will be needed to plot, log the data etc. If you find the software performance slowing down, try to reduce the capture time and/or capture frequency to the minimum required.



Graph

The data is not plotted “live” as it is in LoadVUE Pro, SensorVUE or ControlVUE where the maximum data rate supported is 1 khz.

In this application, the acquired data will be plotted in the graph area **after** the data acquisition is complete. Right-click on the graph to show the Graph Options window.

Graph Options

Graph Title:

Y-Axis Options (Load, Displacement)

Auto

Fixed

Minimum:

Maximum:

Y-Axis Title:

The following options are available:

Graph Title

The graph title will be displayed on top of the graph.

Y-Axis Options, Auto or Fixed

Select Auto to autoscale the Y-Axis values.

Select Manual to specify upper and lower bounds for the Y-Axis and enter the appropriate values.

Y-Axis Title

Enter a title for the Y-Axis.

Data Capture

If you have an initial load on the sensor, click Zero to remove this initial value from force calculations. The voltage at this initial value will be displayed. This voltage should typically be around 0.5V DC. That is because the solution tries to map the sensor into a 0.5 to 4.5 VDC range for most cases. If the initial voltage



is not close to 0.5V then something is wrong. You need to check your power supply and make sure all the wires are properly connected to the terminal block and the terminal block is firmly inserted into the DI-1000UHS-10K female connector snugly. If all looks good then you can continue to your test.

Click on tare to zero out the sensor and then click on Start to run your test.

At this point, you will lose control for the duration of the capture time while the software reads the data from the sensor, converts the voltages to force values, calculates Peak and Low values, and logs and plots the readings. The LED indicator on the DAQ will blink every second for the duration of the capture time.

After the data capture is completed, the data will be plotted and also saved as a file (if the Log File option has been selected). By right clicking on the graph, the graph can be copied to the clipboard or printed. Peak and Low values are also shown (the maximum +ve and -ve values).

Zooming in and out of the Plot to view areas of interest

Press F9 and use mouse cursor to zoom in on specific areas of the graph. Right-click to zoom out. Press F9 again to exit the zoom feature.



Calibrating a Sensor

Note: The system is shipped PRE-CALIBRATED and ready to use. You DO NOT need to calibrate the sensor prior to use. You just need to enter the force/volt information only from the provided calibration certificate in order to work with a sensor. The information provided is ONLY for recalibration purposes in case the sensor exhibits wrong values in response to applied forces. Please consult Loadstar Sensors before performing ANY calibration procedure on your impact force measurement solution.

The calibration screen shown below allows you to calibrate your sensor using known applied loads, torques or displacements.

The screenshot shows a software window titled "Calibrate" with a close button (X) in the top right corner. The window contains three sections for calibration steps:

- A. Remove load (Load=0) and click 'Read'**
This section has two input fields: "Load" with the value "0" and "kgf", and "Volts" with the value "1.8853". A "Read" button is to the right of the "Volts" field.
- B. Place a known load (preferably full load) and click 'Read'**
This section has two input fields: "Load" with the value "2000" and "kgf", and "Volts" with the value "4.6608". A "Read" button is to the right of the "Volts" field.
- C. Click 'Calibrate'**
This section features a "Calibrate" button with a calculator icon, which is highlighted with a dashed blue border. To its right is a text field containing the value "720.5909" followed by "kgf/ volts".

At the bottom of the window are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.



The procedure to calibrate a sensor is as follows:

Step 1

Remove any applied load (or torque or displacement) from the sensor, enter 0 in the appropriate area, and click on the Read button. Volts at zero load will be displayed. Note: The load does not actually have to be zero. You can apply a dead load (for example, mounting fixtures etc.) and choose to zero out this load.

Step 2

Now apply a known load, preferably full load, enter the load value and click on the Read button. Volts at this load will be displayed.

Step 3

Click Calibrate to compute the slope of the calibration curve, for example kgf/volts.

Step 4

Click OK to accept the calibration. This will return you to the Select/Configure Sensor window. Then click on Save to save this calibration.

Select Close to return to the main window. If this is the sensor you want to use for your test, then make sure you have selected this sensor (by checking the first column on the sensor list) to be read.