

EchoPlus[®] Wireless Junction Box Installation and Operation Manual



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FCC NOTICE

FCC ID: ZOC-IMI672A01

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INDUSTRY CANADA (IC) NOTICE

IC: 9732A-IMI672A01

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Introduction

The EchoPlus® Wireless Junction Box is a one-way wireless transmitter, located in a junction box, used for the condition monitoring of plant equipment through traditional ICP® accelerometers. The junction box, will “wake up” at determined intervals (8 hours by default) to measure and transmit vibration levels for all activated channels. An Echo® Receiver connected to a computer with the Echo® Data Server software installed is required to receive and collect transmissions. For information on the setup and installation of the Echo® Receiver and Echo® Data Server, please consult the Echo® Receiver System Manual.

Proper Handling

Proper handling of the EchoPlus® Wireless Vibration Junction Box is critical to preventing damage. The following should be avoided:

- Dropping the unit.
- Hitting the unit against hard surfaces.
- Submersing or spraying the units with fluids of any kind.
- Touching the electronic components under cover.
- Using excessive torque when mounting the unit.
- Exposing the unit to temperatures above 170° F.
- Exposing the box to any reactive chemicals.

Programming the EchoPlus® Wireless Junction Box

The Echo® Wireless Vibration Sensor can be programmed with a computer running the Echo® Data Server software through a serial port on the computer.



Tip

If your computer is not equipped with a serial port, a USB to RS232 adaptor can be used. These are readily available from computer electronics vendors.

Attaching the Programming Cable

To begin programming the EchoPlus[®] Wireless Junction Box, open the enclosure and connect a serial cable to the serial port located on the junction box and attach the programming serial port (use the USB to RS232 adaptor if necessary).



Connecting to the Junction Box with the Echo[®] Data Server Software

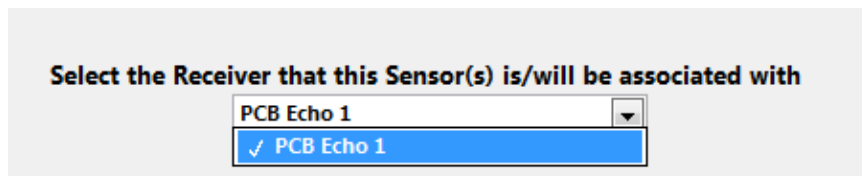
Launch the PCB Echo[®] Data Server and click Echo[®] EchoPlus[®] Sensors under the Configuration drop down menu in the upper left hand corner of the screen.



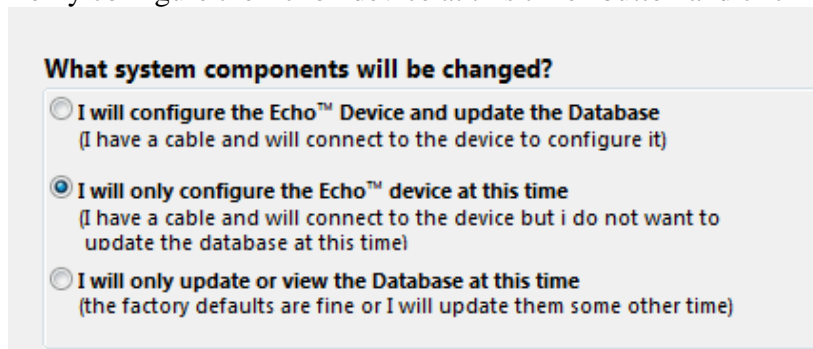
The program will then ask if you wish to set up a Echo[®] Wireless Sensor or an EchoPlus[®] Wireless Junction Box. Select “I want to add, update, or view an EchoPlus[®] unit’s Parameters”.



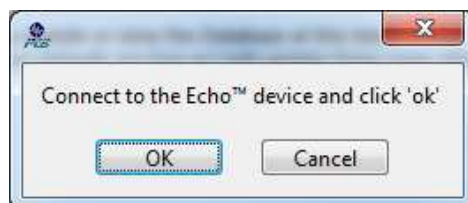
Select the receiver that you would like this specific sensor attuned to. If you are using a single receiver select the default setting.



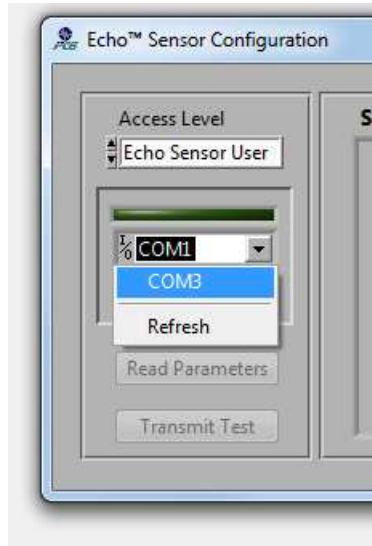
The software will then ask if you would like to set up the junction box, the database, or both. *If this is the first time you are activating this sensor you must do both.* Installing a new junction box and configuration of the database is covered in the Echo[®] System Setup Manual. We will continue by only changing the programming of the Echo[®] Sensor. Select “I will only configure the Echo[®] device at this time” button and click Next.



Make sure the sensor is connected to the computer through the USB to RS232 programming cable and hit OK.

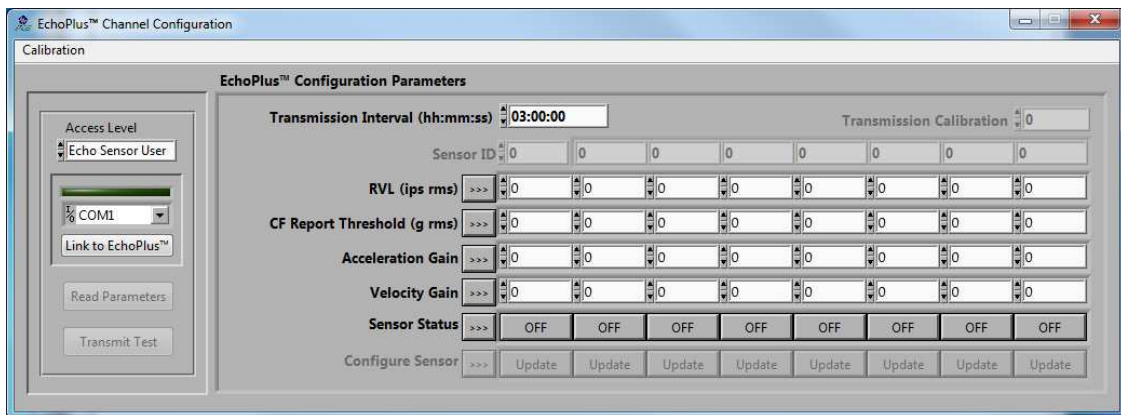


The connection window will appear. Select the appropriate COM port to which the cable is connected.



Reading the Current Programmed Parameters

Click “Link to EchoPlus[®]” and the green light will illuminate indicating the connection has been made. The fields at the right of the window will populate with the current programmed parameters.



The Sensor ID is set at the factory and CANNOT be changed. This ID is unique to each junction box and channel we manufacture. The factory default the Transmission Interval is 8 hours, RVL is 0 (off), and the CF Report Threshold is 0.15.

Explanation of Echo[®] Wireless Sensor Parameters

Sensor ID – The Sensor ID is a unique ID programmed for each channel of the junction box and set at the factory. This number cannot be changed.

Transmission Interval – The Transmission Interval is the time between transmissions. The factory default level is 8 hours. The junction box will “wake up” and make a measurement on each active channel every 8 hours (3 times per day).



Decreasing the Transmission Interval will provide data more often; however, transmitting more often will decrease battery life. Keep in mind “more data is not better data” and may be more than you can process and manage.

RVL (Residual Vibration Level) – This is the minimum Residual Vibration (that is, vibration that is currently present) for the junction box to wake up and make a measurement on that specific channel. If the current vibration is below the RVL, the junction box will assume the equipment is turned off and will not waste power transmitting unusable data. If the value is set to “0” this feature is disabled and will always make a measurement.

CF Report Threshold – Because crest factor is the ratio of true peak divided by RMS vibration, in some instances where the RMS value is extremely low (such as slow speed equipment) the crest factor will appear exceptionally high. This report factor is the minimum RMS level in g for the Crest Factor to be reported.

Sensor Status – The sensor status displays if the specific channel is enabled or disabled. If no sensor is attached to a channel, it is recommended to disable the channel to save power and avoid bulking the database with bad information.

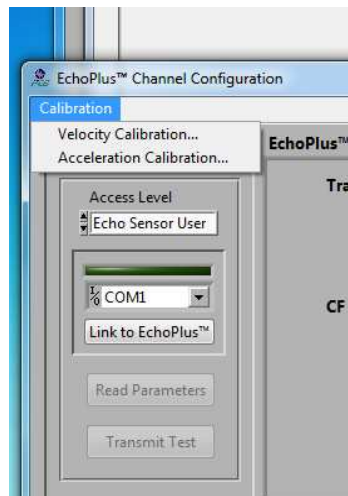
Acceleration Gain – Gain value used to normalize and calibrate acceleration measurements.

Velocity Gain – Gain value used to normalize and calibrate velocity measurements.

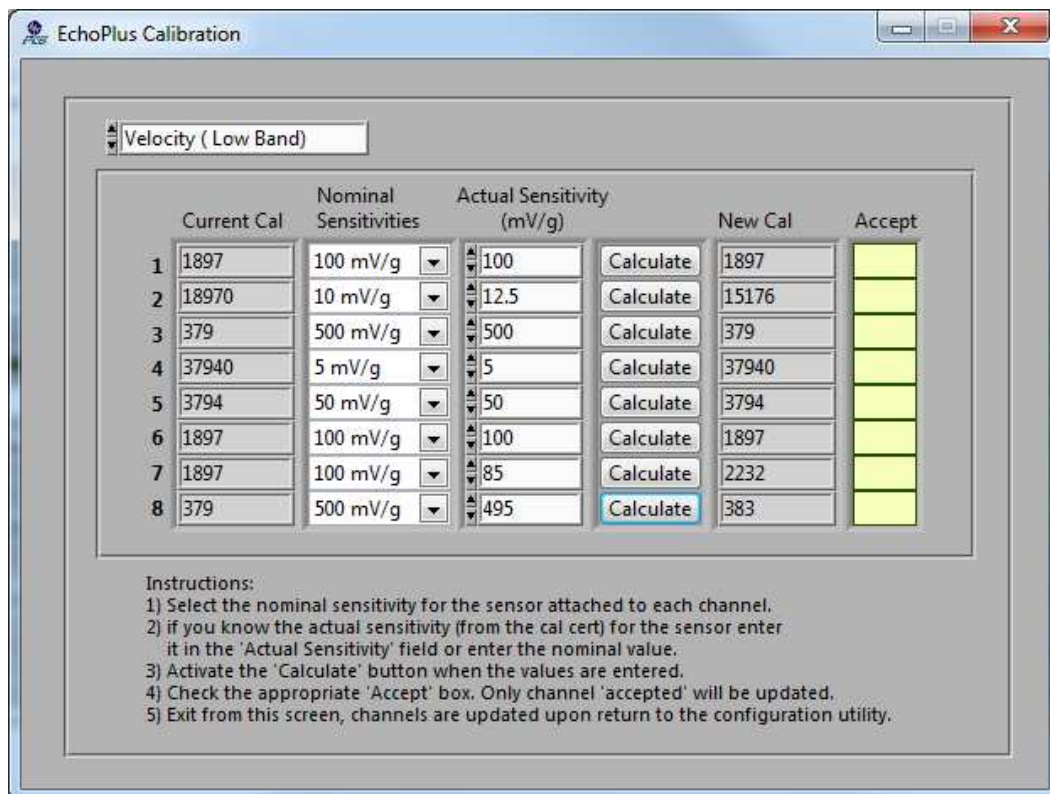
Calibrating the Junction Box to Specific Accelerometer Sensitivities

The EchoPlus[®] Wireless Junction Box can be calibrated to work with an accelerometer of any sensitivity. It can also be used to fine tune and normalize data collected from sensors with slightly different sensitivities. To do this, we need to get the specific Velocity Gain and Acceleration Gain values.

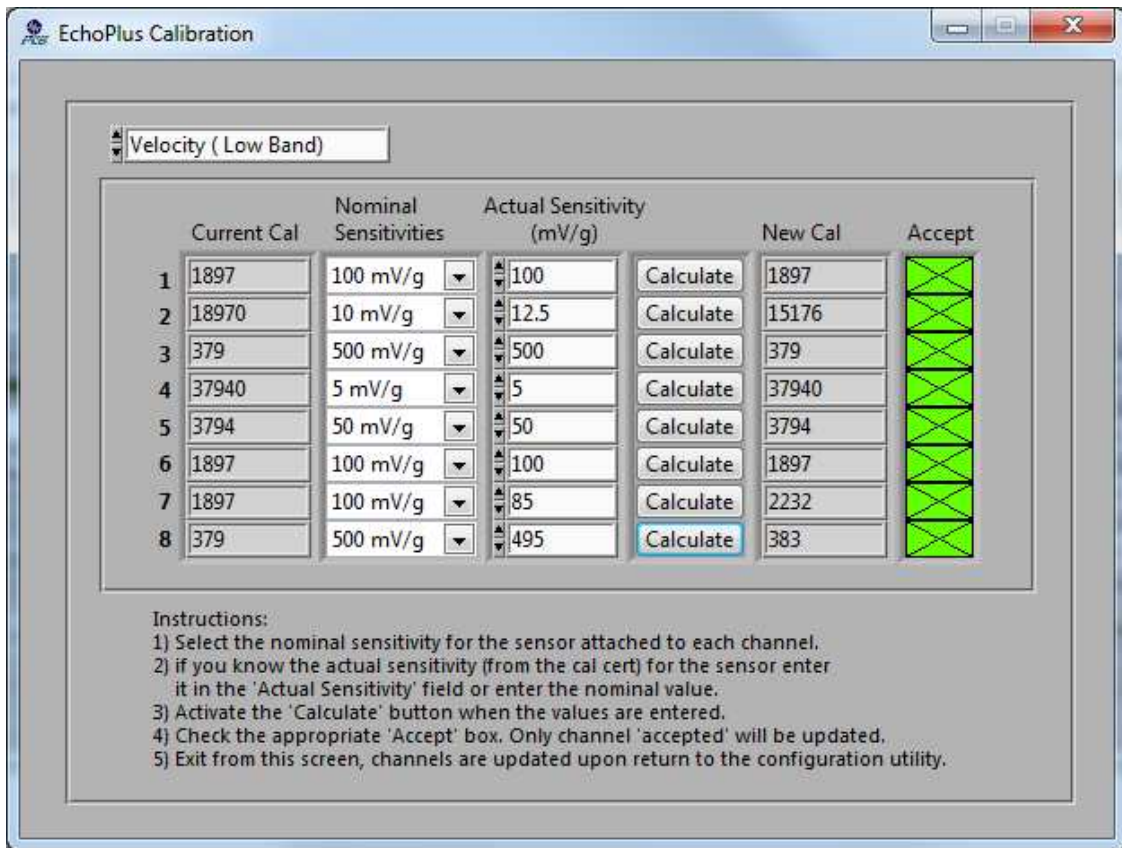
To start, click the Calibration dropdown and select Velocity Calibration.



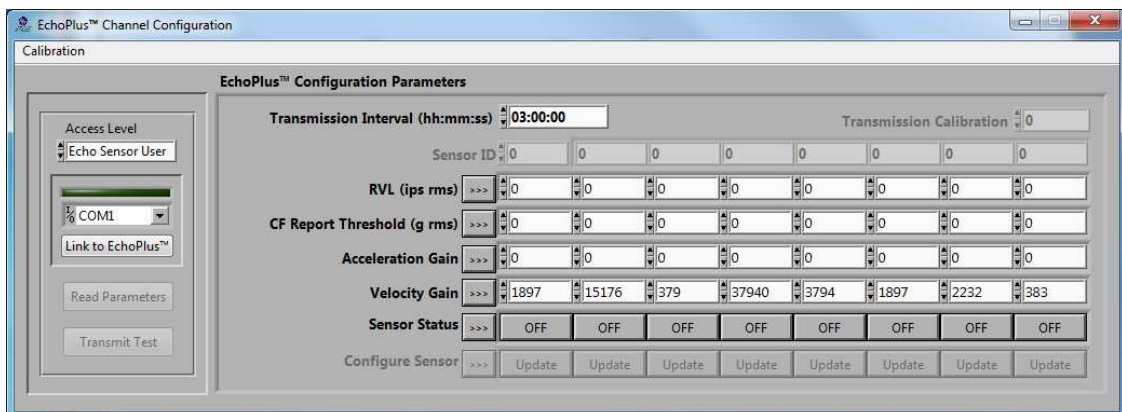
In the calibration menu select the nominal sensitivity of each accelerometer. If you have specific calibration values, input the actual accelerometer sensitivities next to the nominal value. Click the Calculate button to compute the Velocity Gain needed for the sensitivity.



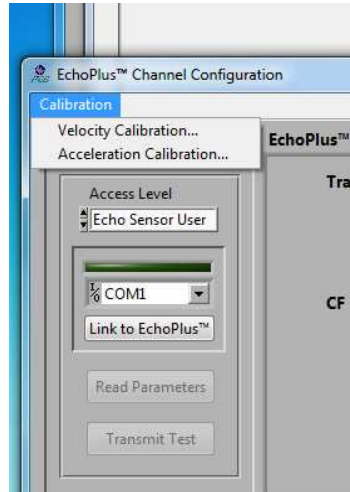
Click Accept to accept the new gain values.



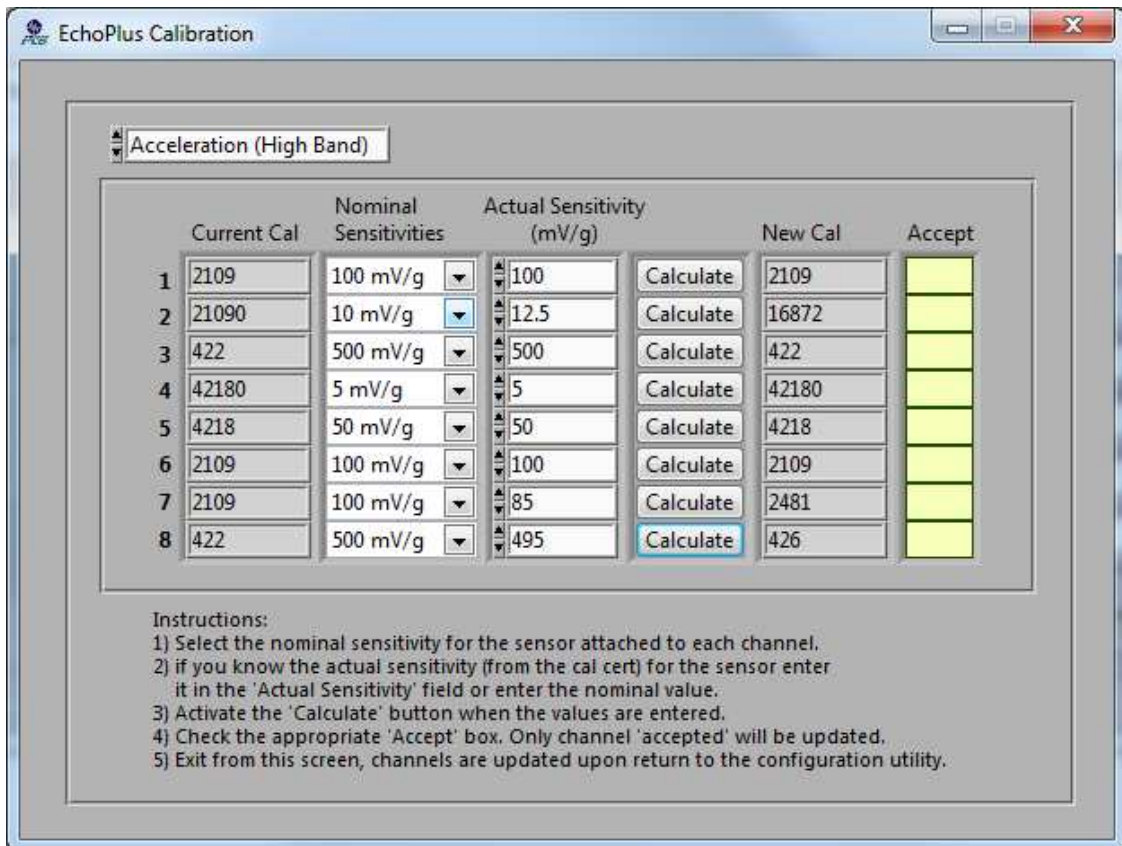
Close the window and the software will automatically import the new values to the configuration window.



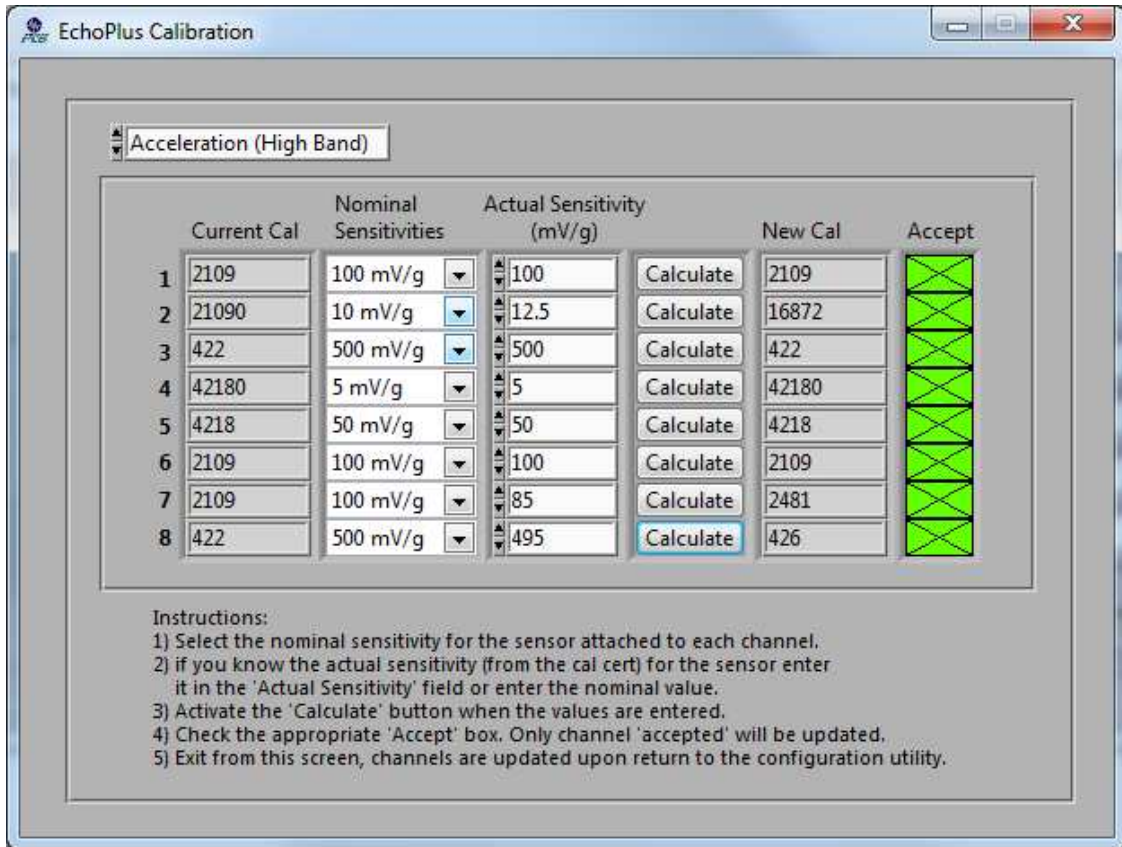
To change velocity gain, again click the calibration menu and this time select Acceleration Calibration.



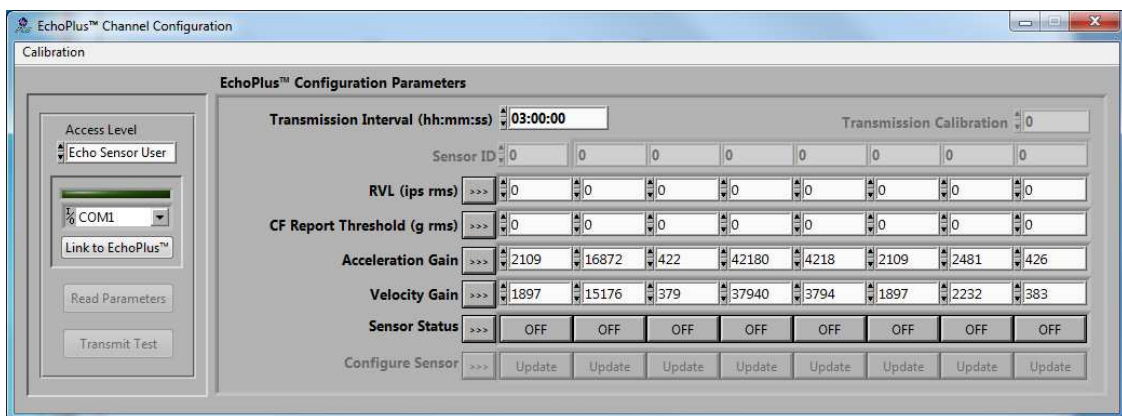
In the calibration window enter the nominal sensitivities, and if available, the actual sensitivities for each accelerometer. Click calculate to calculate the Acceleration Gain values.



Accept the values by clicking the accept button next to each accelerometer you wish to update.

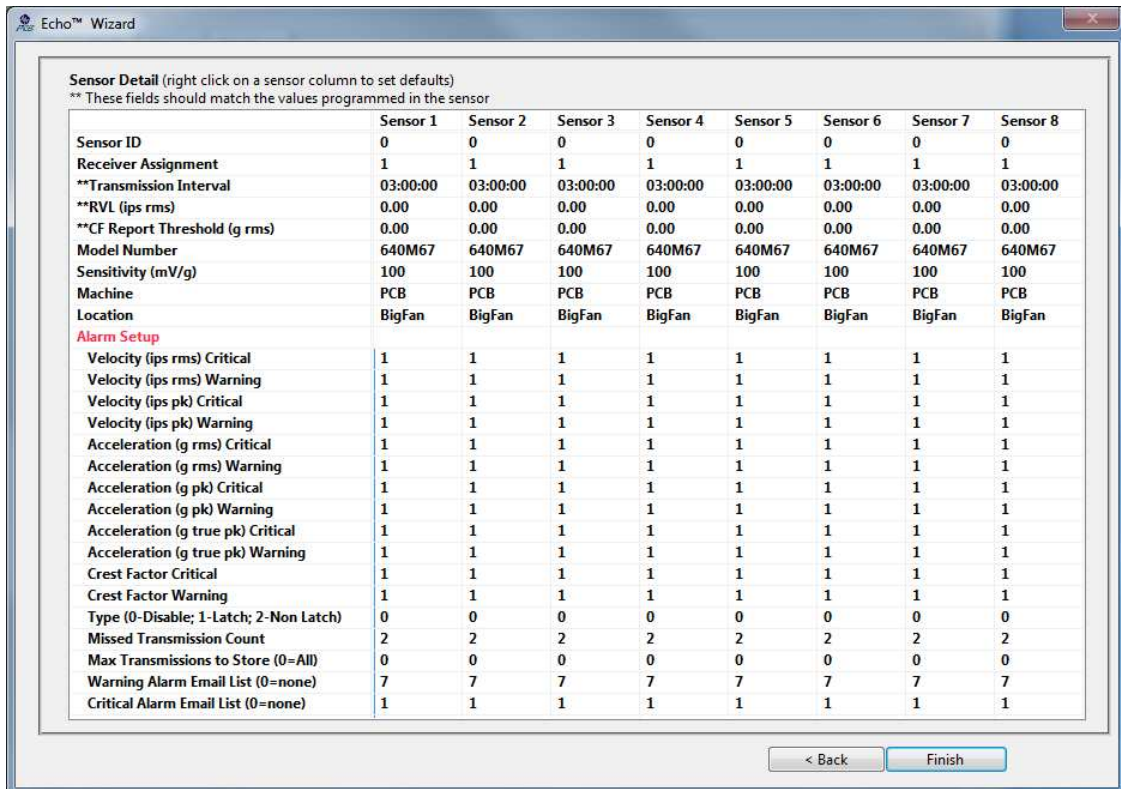


Close the window and the software will import those new values to the programming screen.



Click update to save the settings for each accelerometer you wish to make changes to. After all settings are adjusted, close the window.

The database configuration window will open allowing the configuration of each channel in the junction box. In this window each channel can be set for alarm and alert levels, name and location. The setup of the database will be covered in the “Echo® Wireless System Manual”.



After all database settings are acceptable, click finish to update the database.

Mounting

The Echo® Wireless Junction Box should be mounted in a clean and convenient location where it can be accessed.