

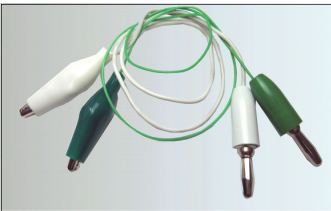
# Calibrating Your Accelerometer

Silicon Designs, Inc.

## Equipment You Will Need



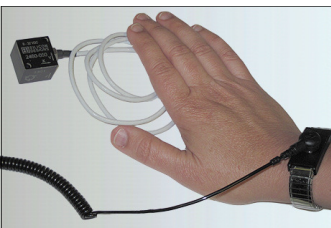
Voltmeter or Other Signal Measuring Device



Signal Connectors



Power Supply & Connectors



Accelerometer module and ESD precautions

All Silicon Designs accelerometer modules respond to the Earth's gravity and should show approximately 1g of input when stationary and laid flat. It's possible to use this capability to do a static calibration of the device.

In addition to the equipment listed to the left, you will also need the accelerometer's data sheet (available on [www.silicondesigns.com](http://www.silicondesigns.com)) and a calculator.

For this example we will be using a Silicon Designs 2260-025, however these instructions will work for all Silicon Designs modules.

Connect your accelerometer according to the instructions in the Quick Start Guide.

In this example we are using a 9 Volt DC battery, which falls within the +8 to +32 Volt DC range supported by the 2260.

Place the module in the +1G position (lid up) and check the output voltage (Figure A).

Place the module in the -1G position (lid down) and check the output voltage (Figure B).

### Calculate the 0G Bias

$\frac{1}{2} \times (+1G \text{ reading} + -1G \text{ reading})$

This 2260 measures  $\frac{1}{2} \times (.199 + -.124) = .0375$

### Calculate the Scale Factor

$\frac{1}{2} \times ( [+1G \text{ reading}] - [-1G \text{ reading}] )$

This 2260 measures  $\frac{1}{2} \times (.199 - -.124) = .1615$

### Calculate the Sensitivity

The data sheet will provide the sensitivity, but the math for figuring out sensitivity is simple. Take the accelerometer's output range value, for example  $\pm 4V$ , and convert to mV, in this case 4000 mV. Divide that mV number by your sensor's g range, in this case 25g, so  $4000/25 = 160mV$ . This means that 1 g of acceleration equals 160 mV of output and +/- 1g would be 320 mV.

In this example, the readings were .199 and -.124. Add them together and  $|.199| + |-.124| = .323$  Volts DC or 323mV for the entire +/- 1g range.



Figure A

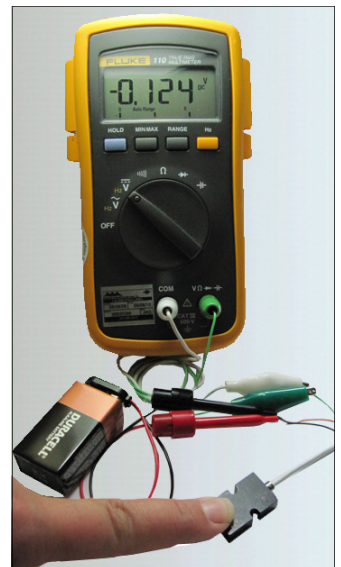


Figure B