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Demo/Evaluation Tips for the ADIS1636x



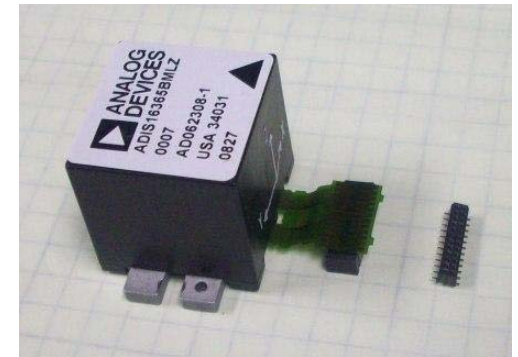
Mark Looney
iSensor Application Engineer
February 19, 2009





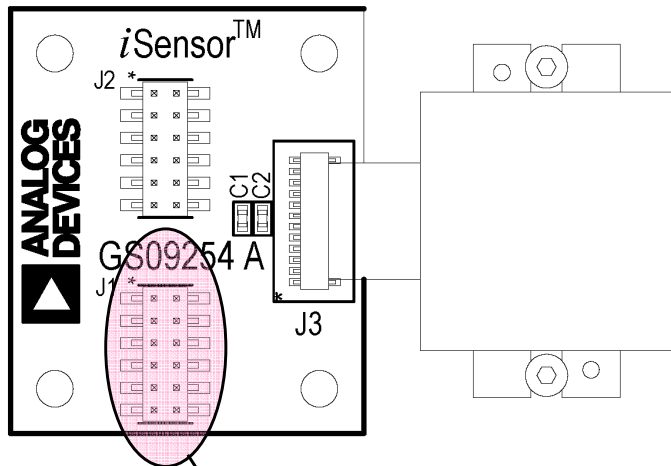
iSensor[®] *The Simple Solution for Sensor Integration* Evaluation Tool Overview

- 1. Interface Connector for those that need to integrate this on a new PCB**
 - ◆ The ADIS1636xBMLZ use the FTMH-112-03 series of connectors from Samtec.
www.samtec.com/FTMH
 - ◆ The evaluation tools use the CLM-112-02-LM-D-A connector from Samtec
 - ◆ Acquire mating connector from Samtec, not ADI. www.samtec.com/samples
 - ◆ Alternate mating connector: www.samtec.com/MLE
- 2. Evaluation/Interface Board (ADIS1636x/PCBZ) for simpler connection to an existing processor/system PCB.**
 - ◆ These boards provide a simple connector translation from the 1mm pitch on the ADIS1636xBMLZ products to a 2mm pitch, which is easier to use in common prototyping environments such as hand-soldering and ribbon cabling.
 - ◆ NOTE: PCB not sold separately.
 - ◆ Part numbers for ordering:
ADIS16360/PCBZ, ADIS16364/PCBZ, ADIS16365/PCBZ
- 3. Evaluation System (ADISUSBZ) for those that prefer a simple PC interface**
 - ◆ This system provides a simple USB interface, along with software for simple data collection and evaluating most of the ADIS1636x functions and performance.
 - ◆ Supports approximately 150-200SPS sample rate.
 - ◆ CAUTION: This system DOES NOT provide an appropriate framework for developing a system around the ADIS1636xBMLZ. NO source code or code development support is included with this kit.
 - ◆ Part number for ordering: **ADISUSBZ**

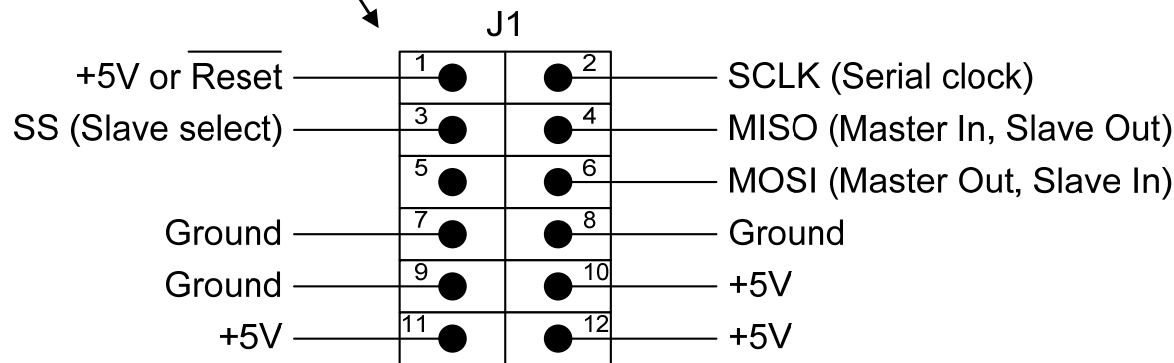


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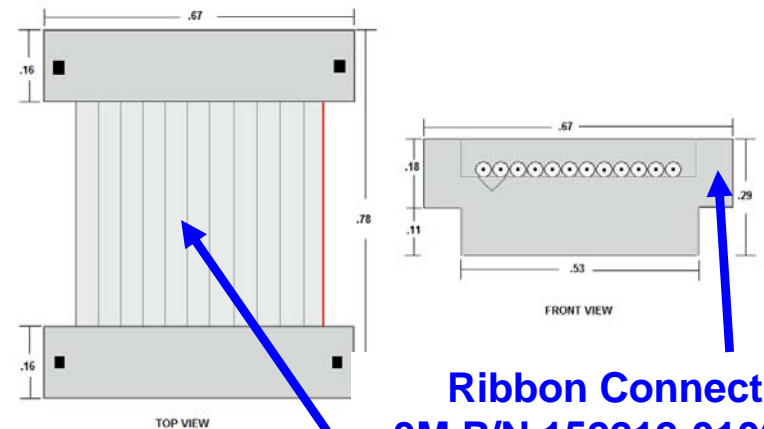
Hooking up to the ADIS1636x/PCBZ



Suggested connections with a Master Processor



J1 Ribbon Cable Interface Parts



Ribbon Connector
3M P/N 152212-0100-GB

Ribbon Cable
3M P/N 3625/12 (100m)

ADISUSBZ uses the following cable assembly from Samtec:

ASP-140062-01

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ADISUSBZ-based Evaluation

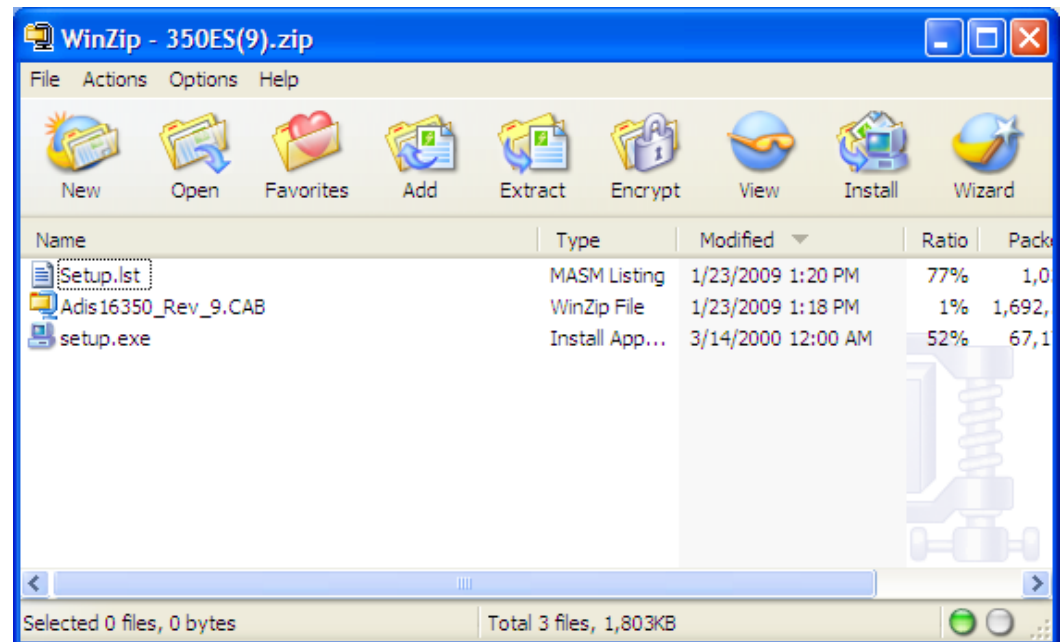
All ADIS1636x parts use the ADIS16350 evaluation software package.

1. Download 350ES.zip into a temporary directory and unpack its contents.
http://www.analog.com/static/imported-files/eval_boards/350ES.zip

OR GO TO:

www.analog.com/isensor-evaluation,
then click on EVALUATION SOFTWARE DOWNLOADS
then click on 350ES.zip option

2. Double-click on “setup.exe”

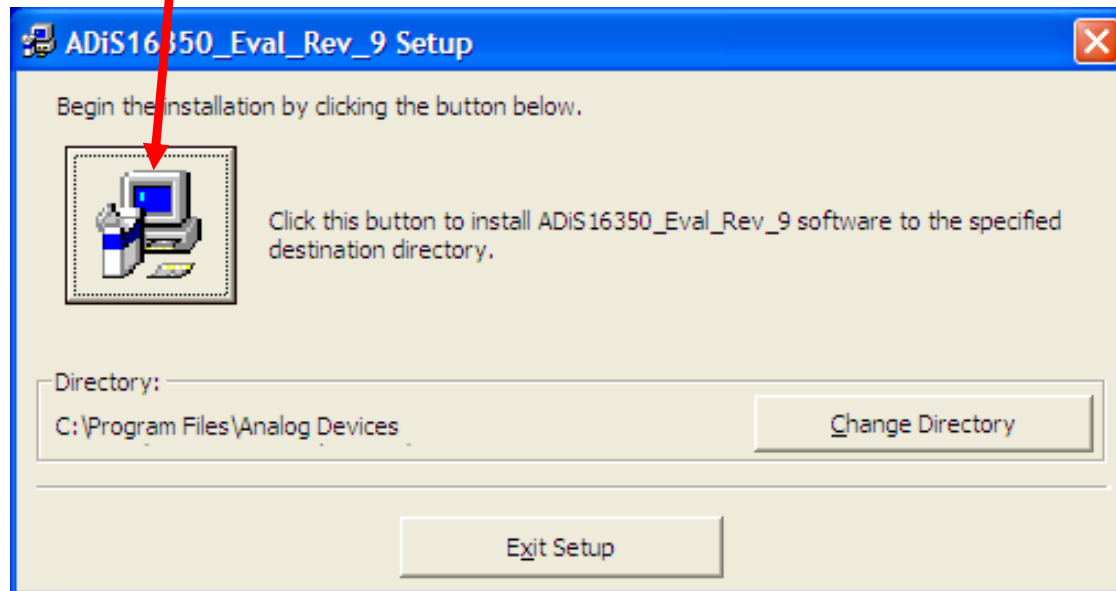
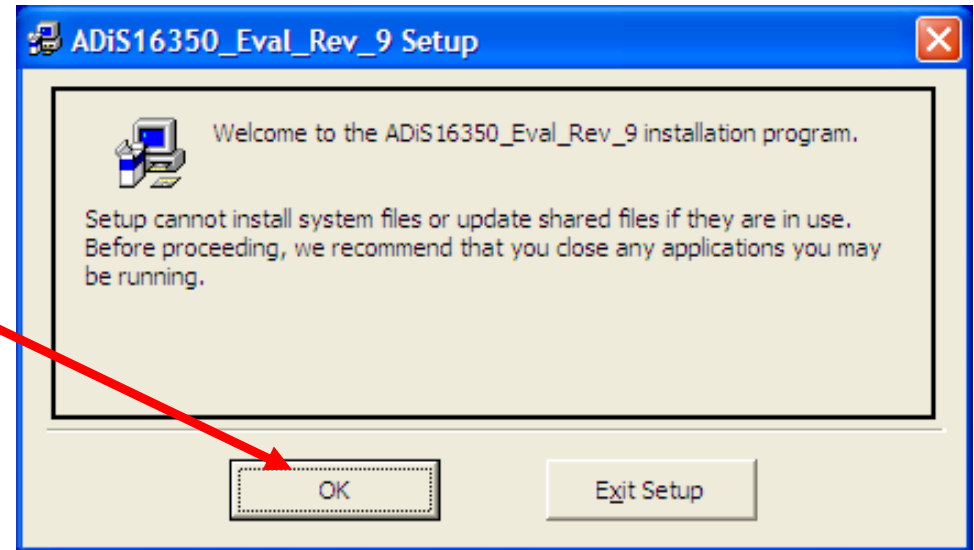


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ADIS16350 Demonstration Software Installation

Installation Steps (continued)

3. Click OK on next screen
4. Click here to start installation



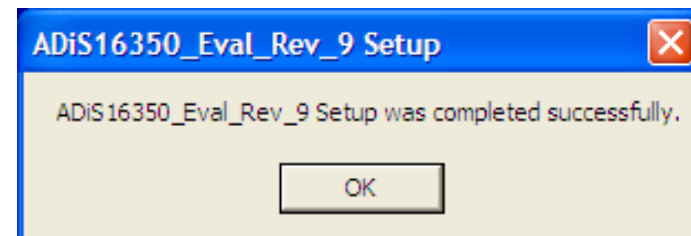
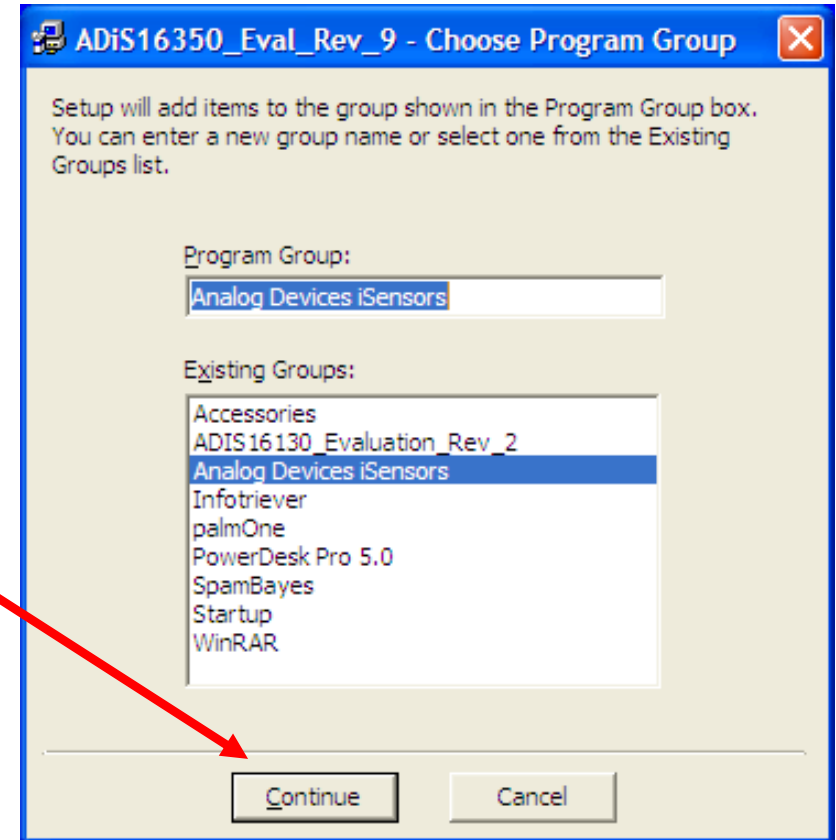
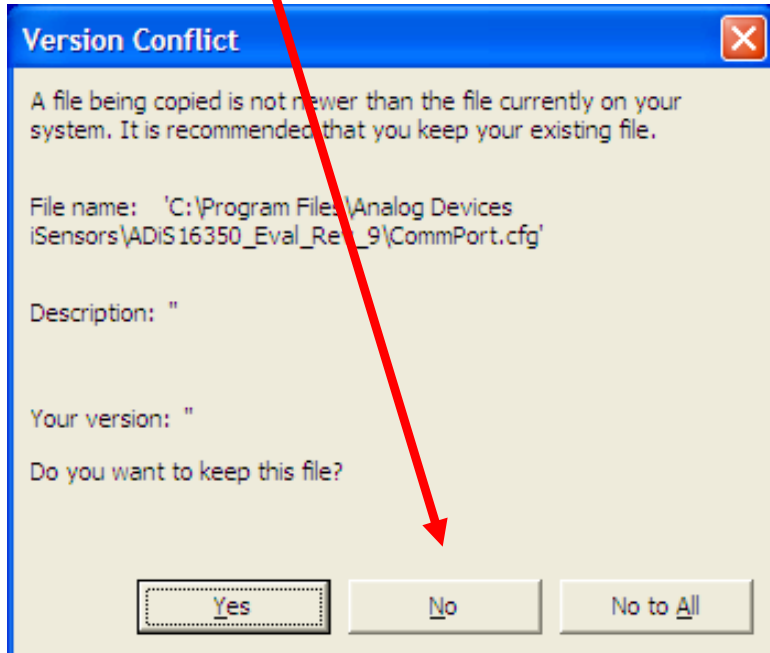
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ADIS16350 Demonstration Software Installation

Installation Steps (continued)

5. Click Continue

6. If this message comes up, click on "No"

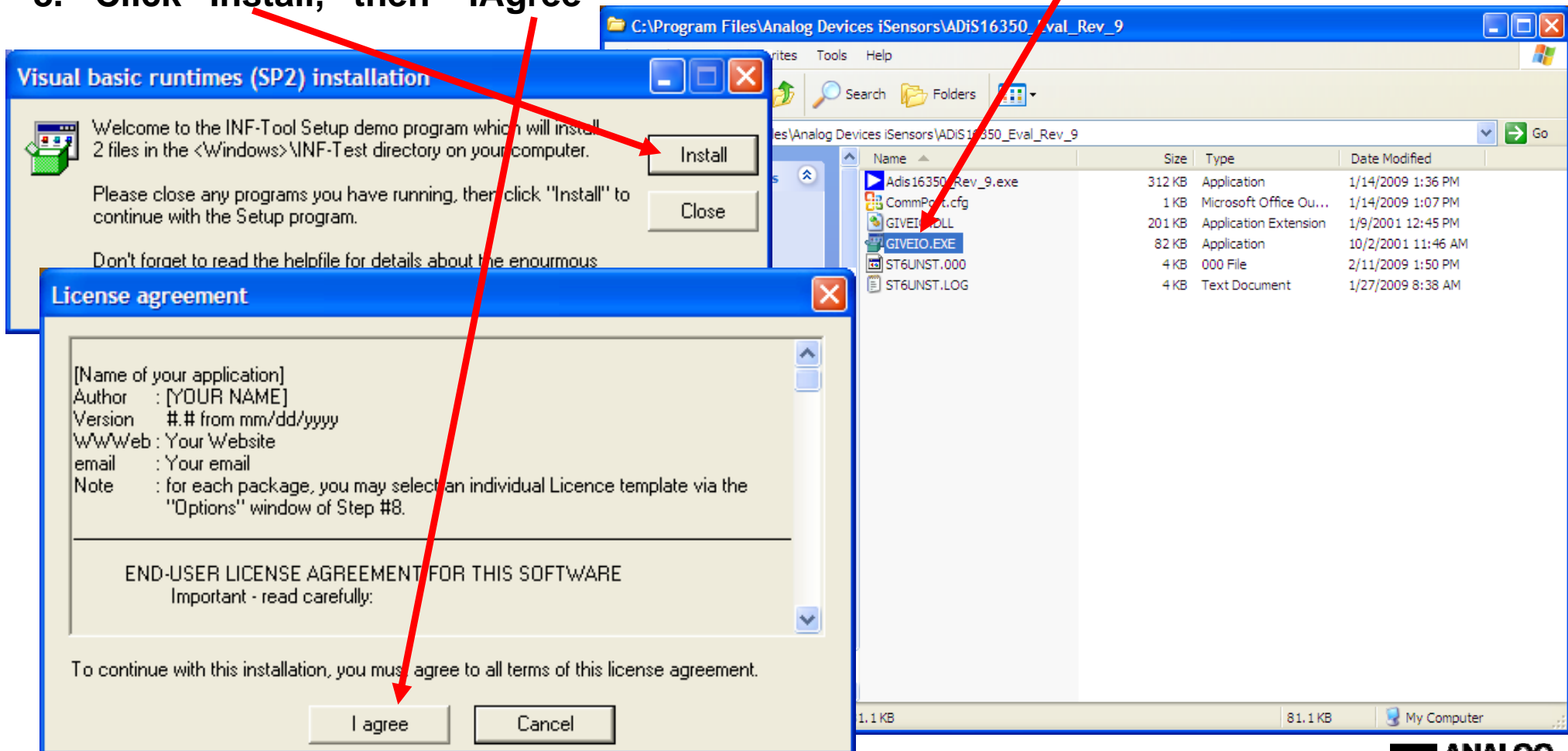


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ADIS16350 Demonstration Software Installation

Installation Steps (continued)

7. Open the newly created directory and double-click onto “giveio.exe”
8. Click “Install,” then “I Agree”

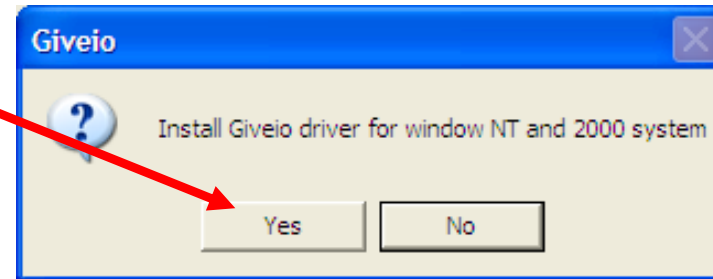


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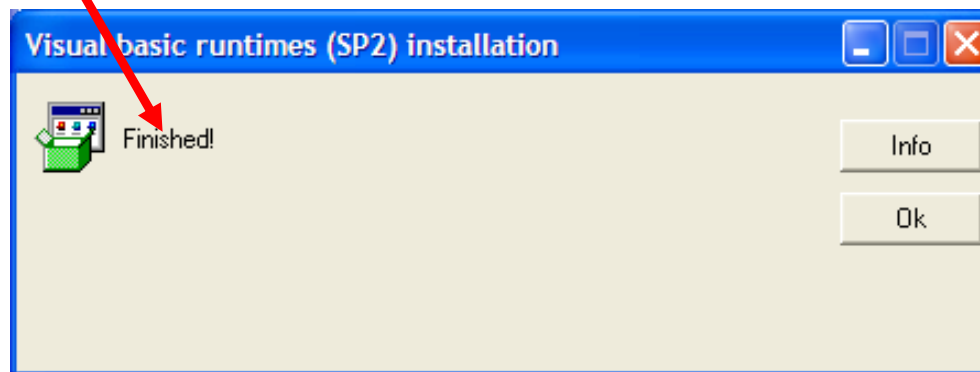
ADIS16350 Demonstration Software Installation

Installation Steps (continued)

9. Click “yes”



10. Giveio Driver complete



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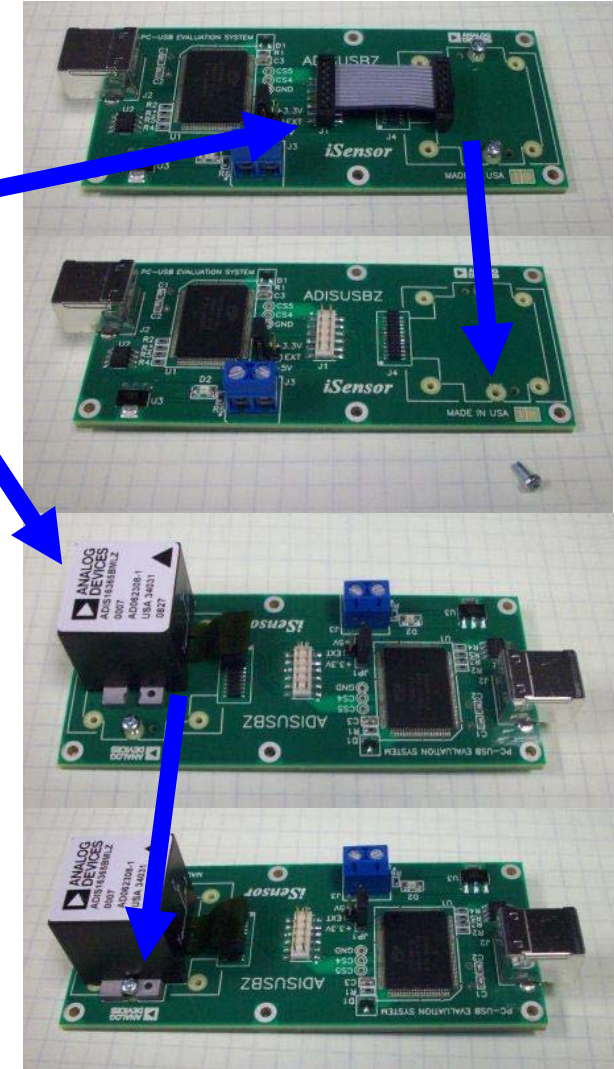
ADIS1636x Installation on ADISUSBZ

Installation Steps (continued)

11. Install ADIS1636xBMLZ on ADISUSBZ

1. Remove ribbon cable & (1) 2mm screw
2. Place ADIS1636xBMLZ using silk on ADISUSBZ
3. Slide ADIS1636xBMLZ onto screw head. Screw may need loosening
4. Secure ADIS1636xBMLZ using 2 M6x2mm pan head screws (provided) between two tabs
5. Align ADIS1636xBMLZ connector over J4 on ADISUSBZ and press it down to make connection
6. Change JP1 from “+3.3V” option to “+5V” option

12. Plug in USB cable



CAUTION

DO NOT PULL ON THE ADIS1636x BODY TO BREAK THE CONNECTION WITH THE MATING CONNECTOR. WHEN DISCONNECTING, BREAK THE CONNECTION BY USING A SMALL SLOTTED SCREWDRIVER TO PRY THE CONNECTOR UP BEFORE REMOVING SCREWS

The flex circuit can break when mishandled and in most cases, repair is impossible. ADI does not offer repair or replacement service for broken flex and encourages appropriate care when handling the flex.

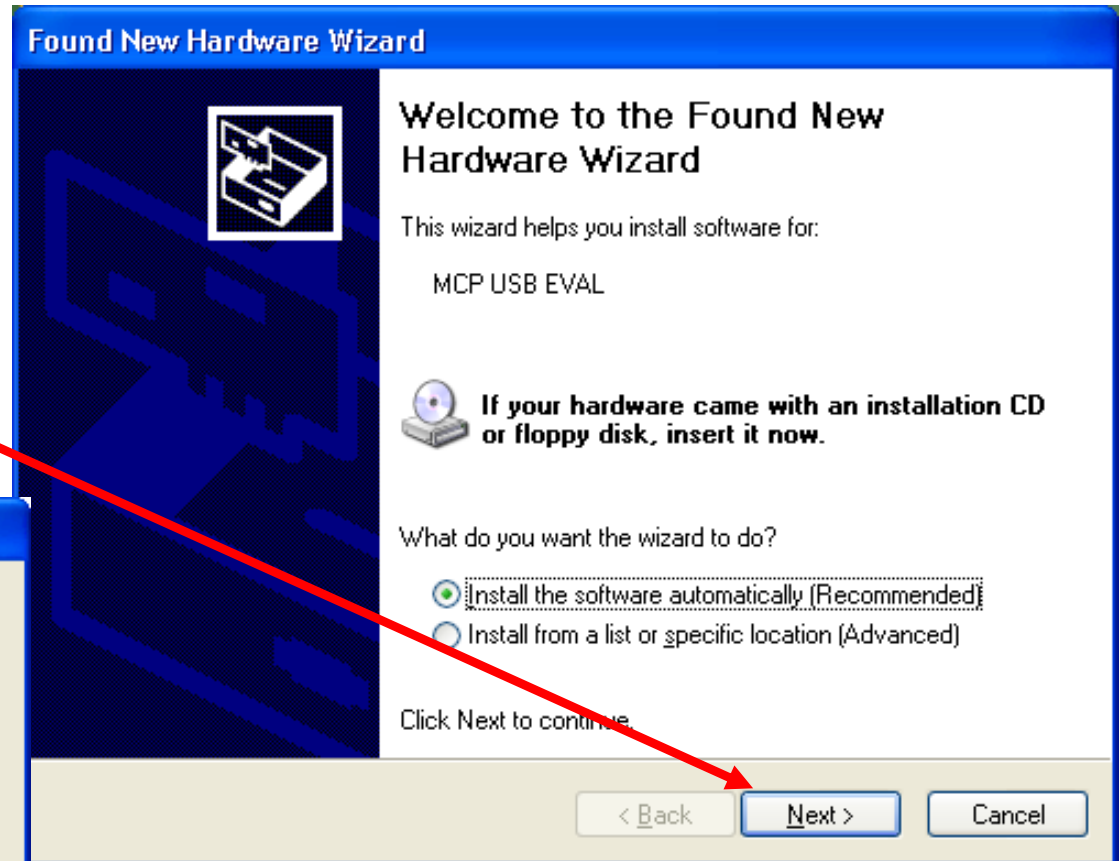
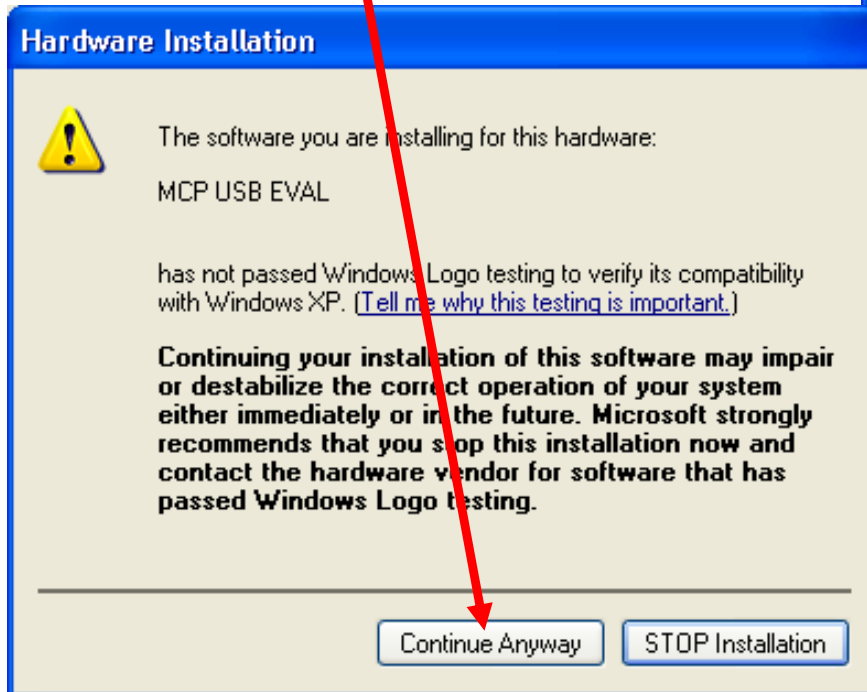
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MCP USB Driver Installation

Installation Steps (continued)

13. USB Driver screen will pop-up
Click “Next” to start this process

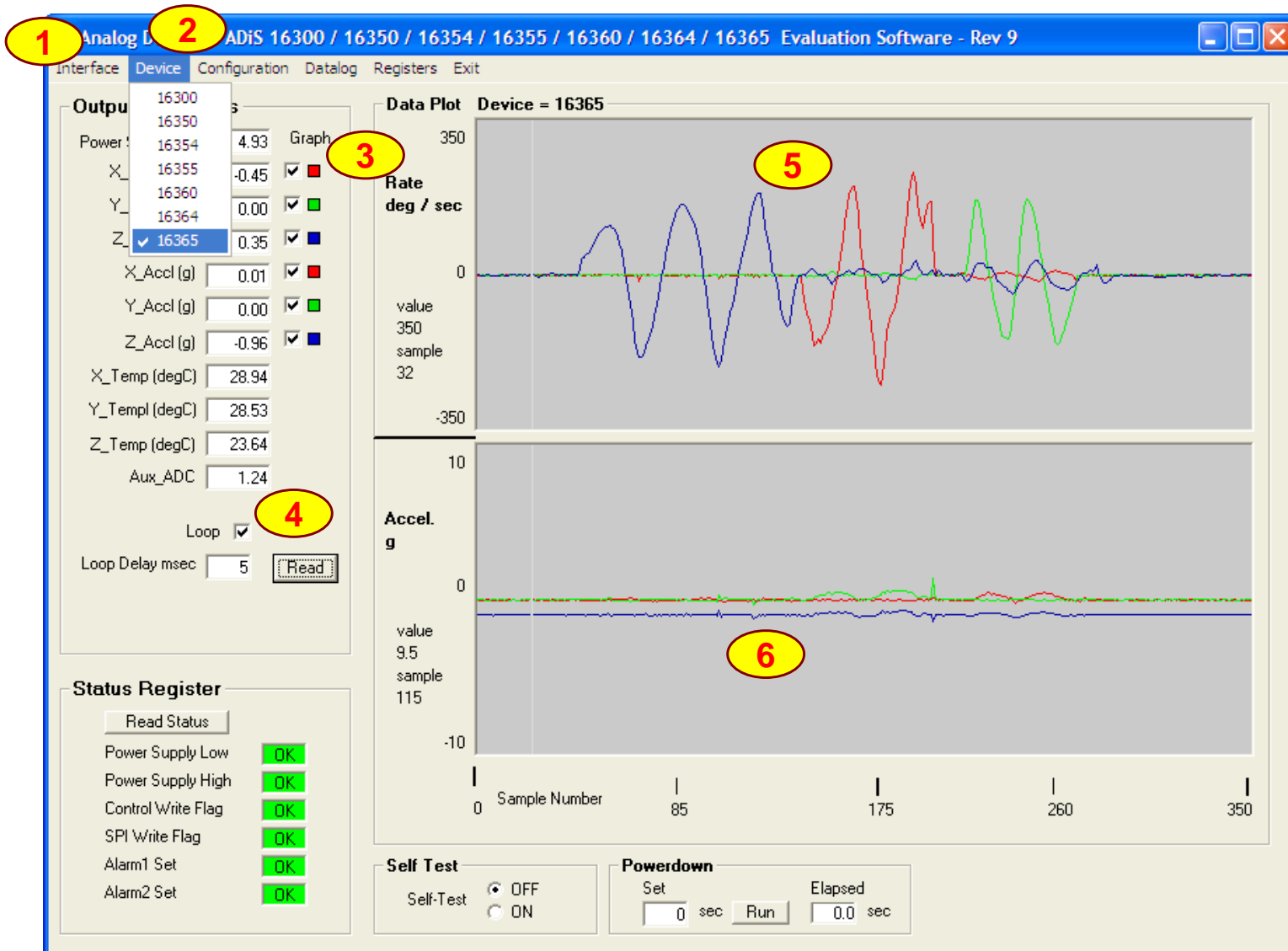
14. Then click on
“Continue Anyway”



This process may repeat. Just follow the instructions and allow it to go through one more time. After completing this, then the devices is ready for test.

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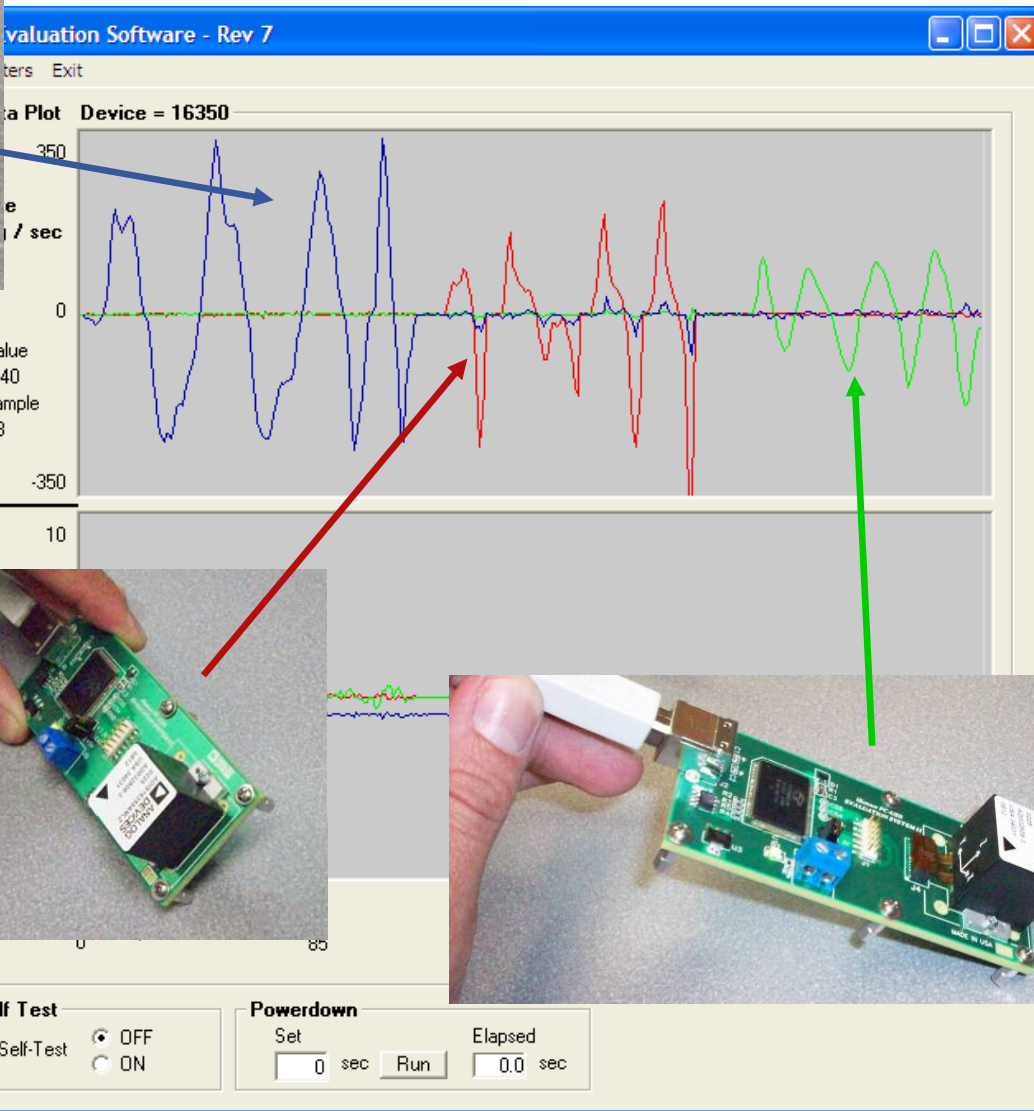
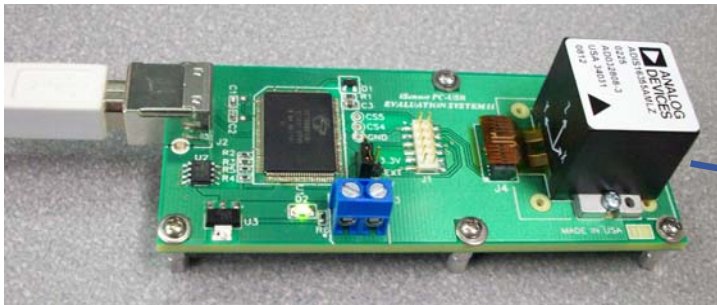
ADIS16350 Software Tips



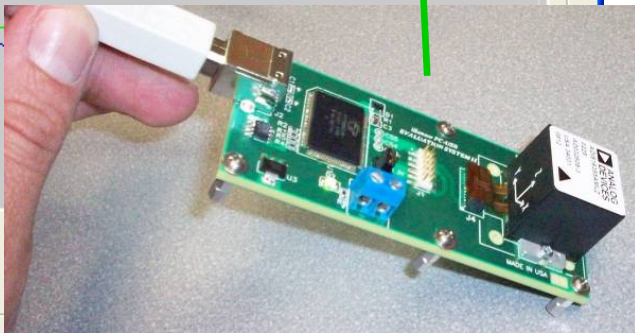
1. Click on "Interface" and select USB, then OK when the pop-up window shows the USB device is connected.
2. Click on device to select part number for device under test
3. Select which sensor outputs to monitor on the graph.
4. Start on-screen log
5. Use the ADISUSBZ edges to confine rotation to one axis and compare it with the axis labels on the part (see white lines near flex exit from body)
6. Lay sensor flat on table, then turn it upside down to see change in z-axis accelerometer output (upside down response not shown in graph here)

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ADIS16350 Demonstration Tips – Look at each axis

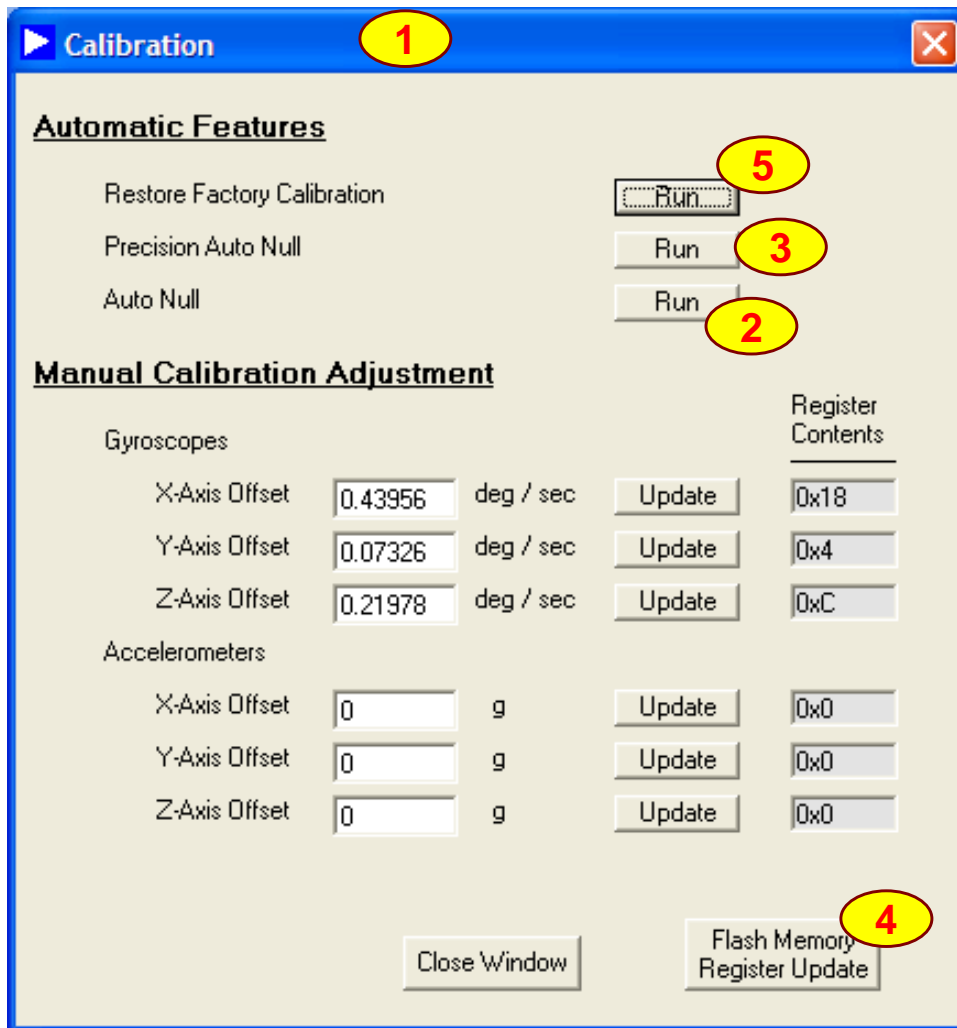


Tip
Use standoffs to isolate each axis



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ADIS16350 Evaluation Software, Calibration Menu Features



1. From the main menu, click on Configuration, then on Calibration to reach this menu.
2. Use Auto Null Run button to do a quick offset calibration.
3. Use Precision Auto Null to execute this option inside the ADIS1636x, which takes a 30-second average to produce these numbers. Keep the device still and away from vibration and thermal variation during this 30 second period.
4. Use the Flash Memory Register Update to store settings in non-volatile flash.
5. Use the Restore Factory Calibration to return all of these factors to zero.

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ADIS16350 Evaluation Software, Operation Menu Features

Operational Control

Sample Rate

819.202 SPS SMPL_PRD Contents 0x1 Update

Measurement Range and Digital Filtering

Select Gyro Range 320 deg/sec 160 deg/sec 80 deg/sec

32 Taps SENS/AVG Contents x405 Update

Auxilliary Digital I/O Configuration

Configure as a general purpose I/O line

Digital I/O Line 0: Input Output Set Line 0 Level: High Low

Digital I/O Line 1: Input Output Read Line 1 Level: High Low

Configure as a data ready line

Select I/O line DI/O0 DI/O1 Output Polarity High Low

Enable ON OFF

Auxilliary D/A Converter Output

0.0 Volts AUX_DAC Contents 0x0 Update

Flash Memory Register Update

Close Window

1. From the main menu, click on Configuration, then on Calibration to reach this menu.
2. Bias stability performance is typically best when using the maximum sample rate.
3. Use the on-board Bartlett Window Filter to reduce noise. Enter number of taps (power of 2 steps sizes), then click on update. Since the ADISUSBZ supports sample rates of 150-200SPS, start with at least 8 taps.
4. Digital and analog I/O channel configuration options.
5. Use the Flash Memory Register Update to store settings in non-volatile flash.

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ADIS16350 Evaluation Software, Data log Menu

Datalog Control

FILE SETUP

Samples per File: 4096 **1**

Sample Delay msec: 0

Files per Session: 1

FILE INFORMATION

Directory: C:\Program Files\Analog Devic

File Name: DATALOG

File Number: 1 .CSV

DATA SELECTION

Power Supply

X Gyro **2**

Y Gyro

Z Gyro

X Accel

Y Accel

Z Accel

X Temperature

Y Temperature

Z Temperature

Aux Adc

3

Start Datalog

1. Set the total number of samples.
2. Set the inertial sensor channels to monitor.
3. When the data log is in process, a message will appear in this location until the data collection process has completed.



◆ CONTACTS:

- APPLICATIONS ENGINEER:

Mark Looney
mark.looney@analog.com
1-336-605-4139

- MARKETING:

Bob Scannell
bob.scannell@analog.com
1-336-605-4031

MORE INFORMATION ON iSENSOR EVALUATION TOOLS:

- www.analog.com/isensor-evaluation