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Demo/Evaluation Tips for the ADIS1640x



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May 30, 2009

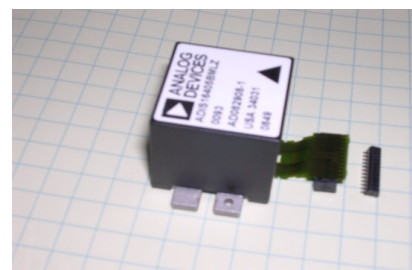




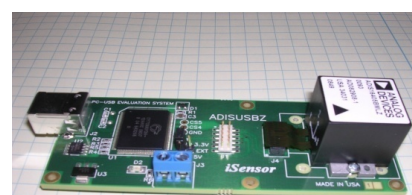
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Evaluation Tool Overview

1. **Interface Connector for those that need to integrate this on a new PCB**
 - ◆ The ADIS1640xAMLZ 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 for simpler connection to an existing processor/system PCB.**
 - ◆ These boards provide a simple connector translation from the 1mm pitch on the ADIS1640xBMLZ 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:
ADIS16405/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 ADIS1640x functions and performance.
 - ◆ Supports approximately 150-200SPS sample rate.
 - ◆ CAUTION: This system DOES NOT provide an appropriate framework for developing a system around the ADIS1640xBMLZ. NO source code or code development support is included with this kit.
 - ◆ Part number for ordering: **ADISUSBZ**



ADIS16405/PCBZ Shown Here

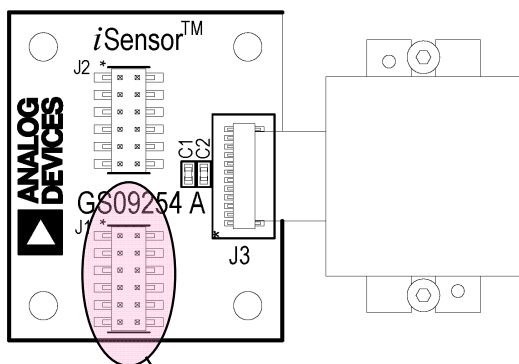


ADISUSBZ & ADIS16405BMLZ Shown Here
(Sold separately)

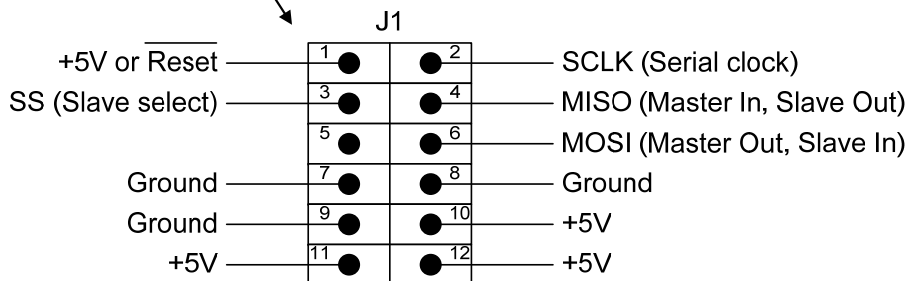


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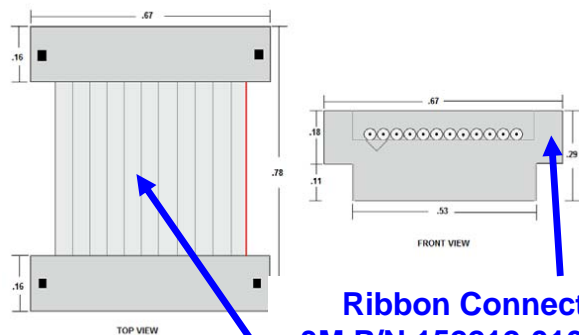
Hooking up to the ADIS1640x/PCBZ



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

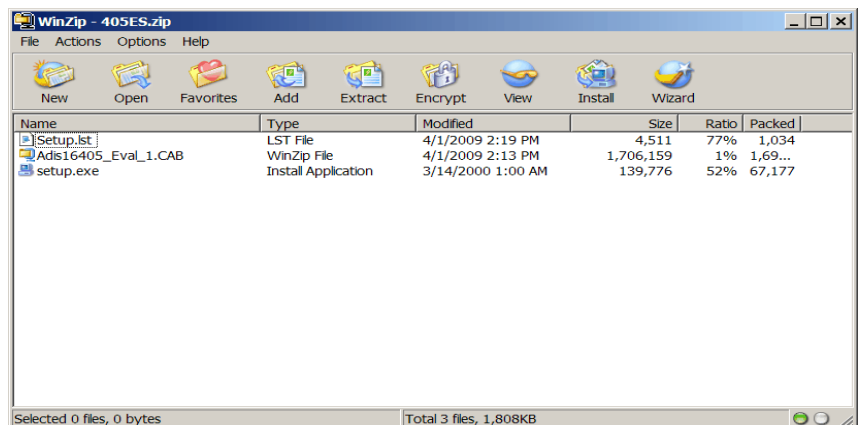
The ADIS16405ES installation package will load the appropriate drivers and prepare a PC to use the ADIS1640x evaluation software.

1. Download 405ES.zip into a temporary directory and unpack its contents.
http://www.analog.com/static/imported-files/eval_boards/405ES.zip

OR GO TO:

www.analog.com/isensor-evaluation,
then click on EVALUATION SOFTWARE DOWNLOADS
then click on 405ES.zip option

2. Double-click on “setup.exe”



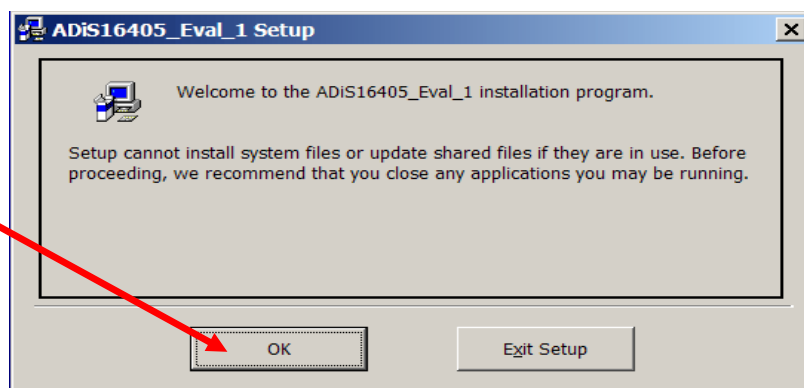
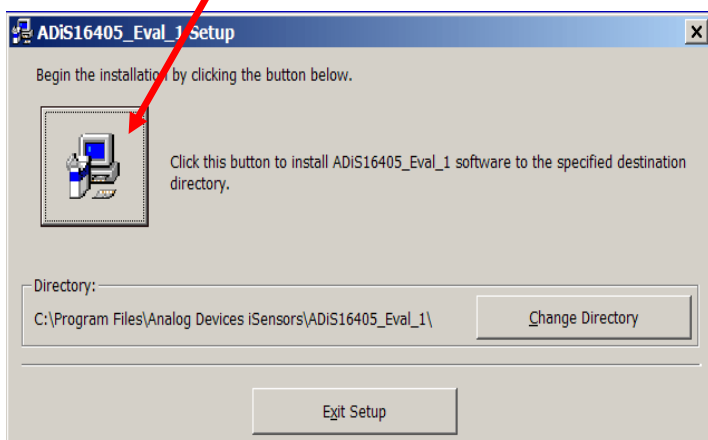


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ADIS1640X Demonstration Software Installation

Installation Steps (continued)

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



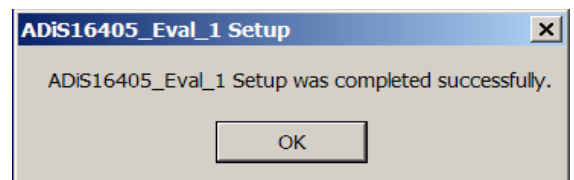
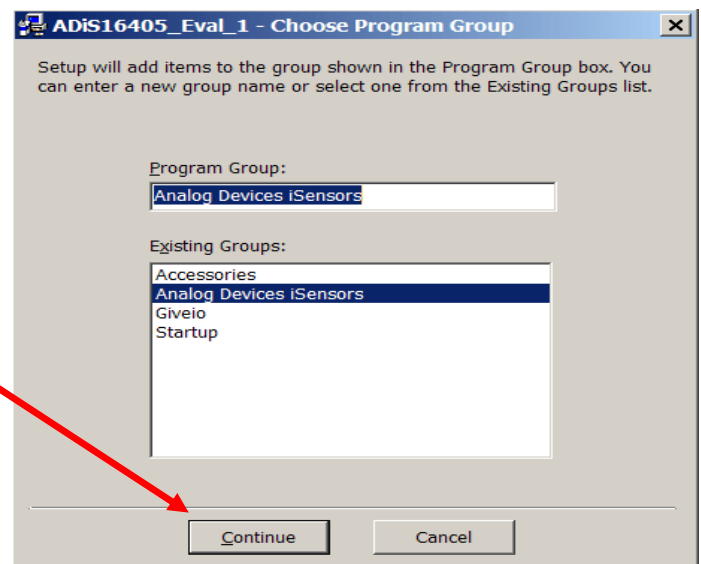
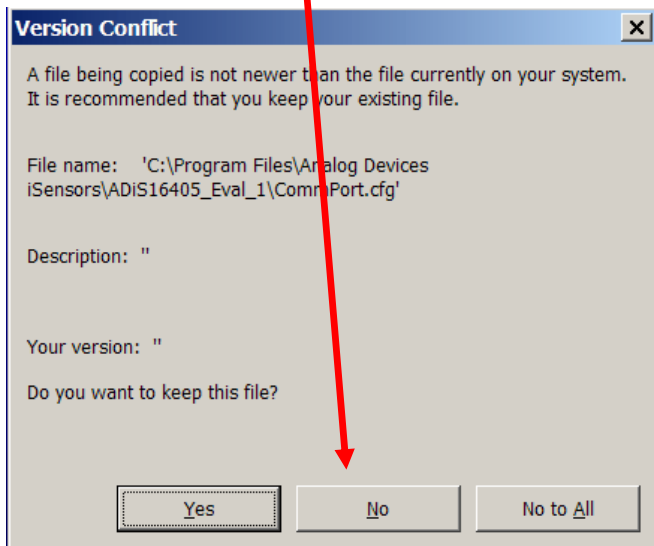
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ADIS1640X Demonstration Software Installation

Installation Steps (continued)

5. Click Continue

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

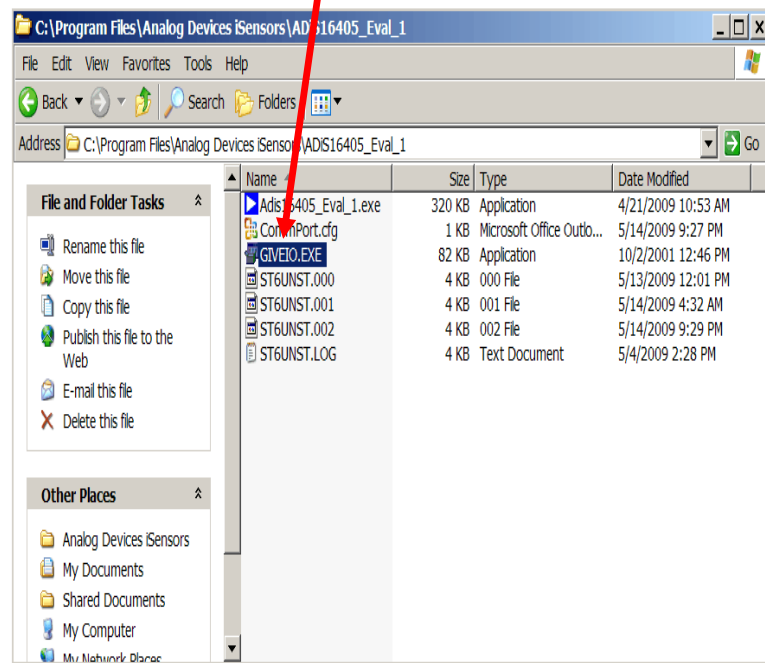
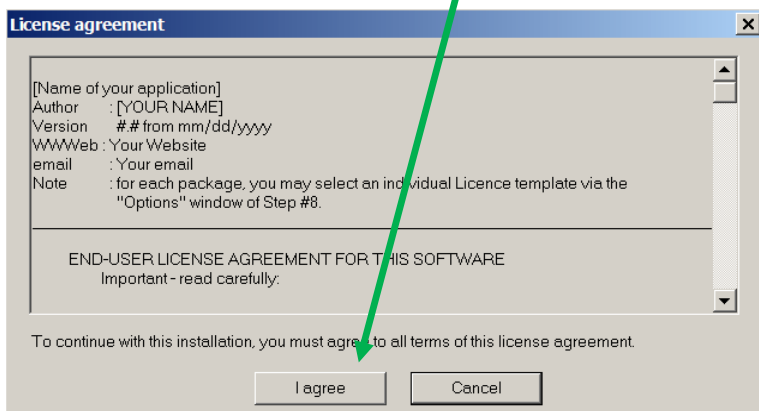
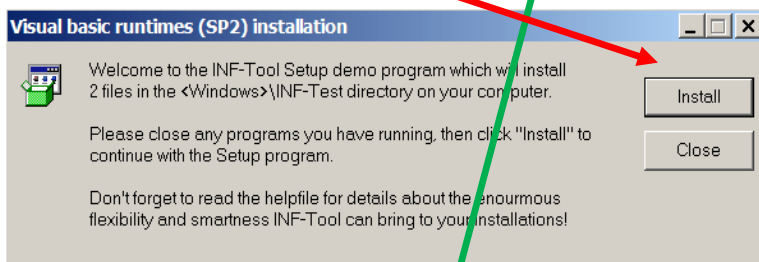


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ADIS1640X Demonstration Software Installation

Installation Steps (continued)

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



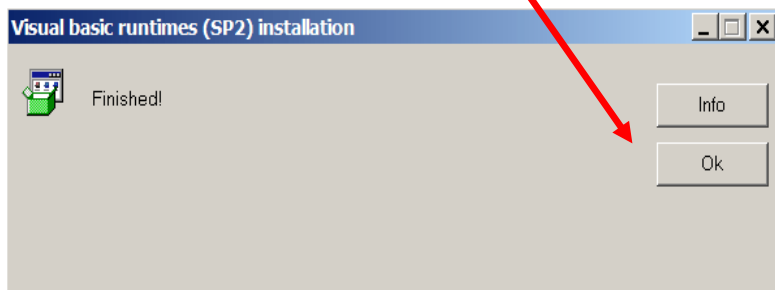
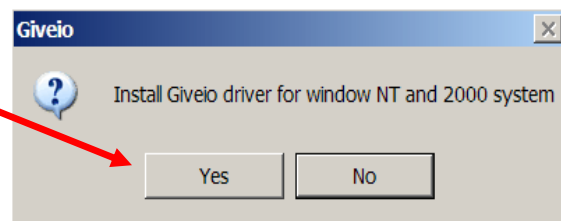
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ADIS1640X Demonstration Software Installation

Installation Steps (continued)

9. Click “yes”

10. Giveio Driver complete





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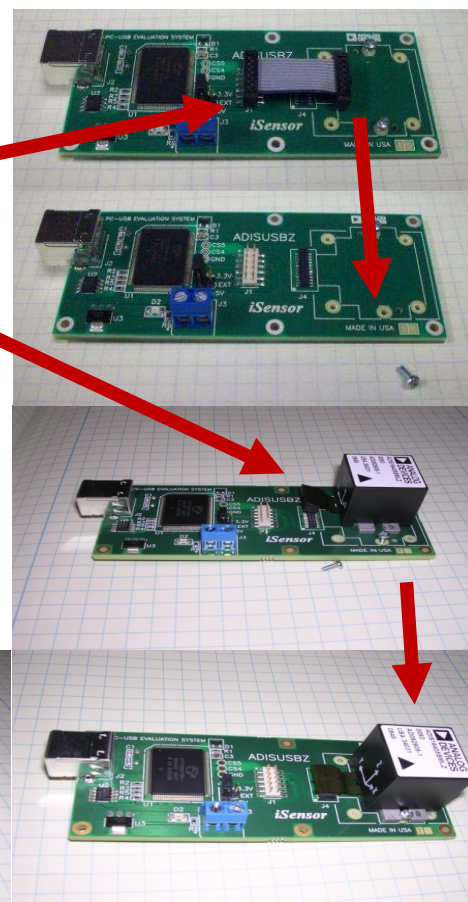
ADIS1640x Installation on ADISUSBZ

Installation Steps (continued)

11. Install ADIS1640xBMLZ on ADISUSBZ

1. Remove ribbon cable & 2mm screws
2. Place ADIS1640xBMLZ using silk on ADISUSBZ
3. Secure ADIS1640xBMLZ using 2 M2mmx0.4mm pan head screws (provided) between two tabs
4. Align ADIS1640xBMLZ connector over J4 on ADISUSBZ and press it down to make connection
5. Change JP1 from “+3.3V” option to “+5V” option

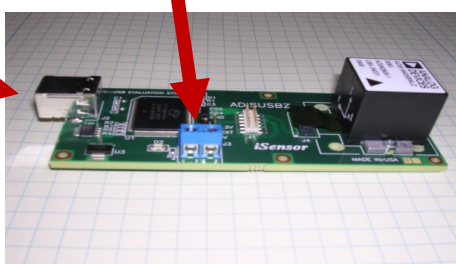
12. Plug in USB cable



CAUTION

DO NOT PULL ON THE ADIS1640x 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.





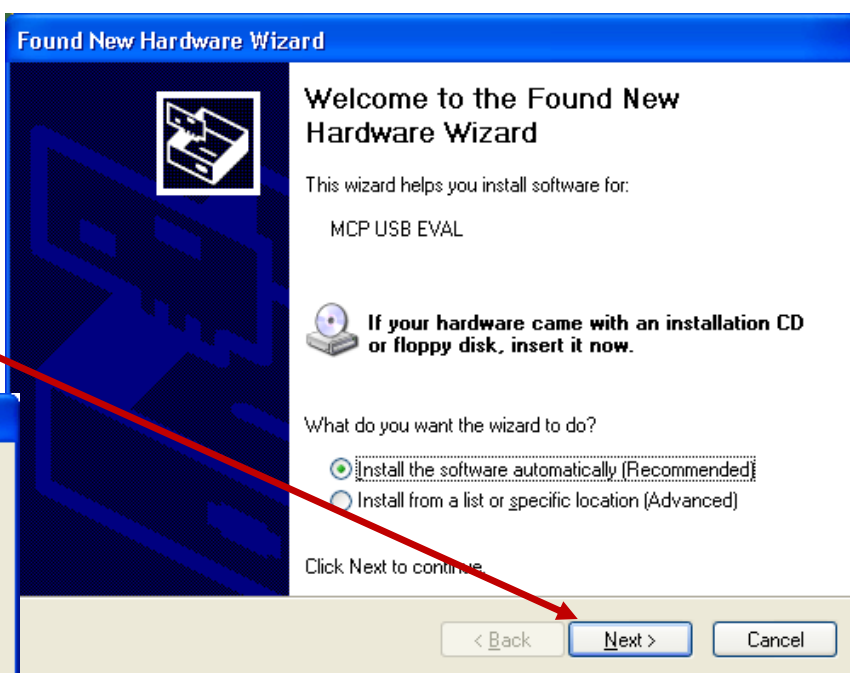
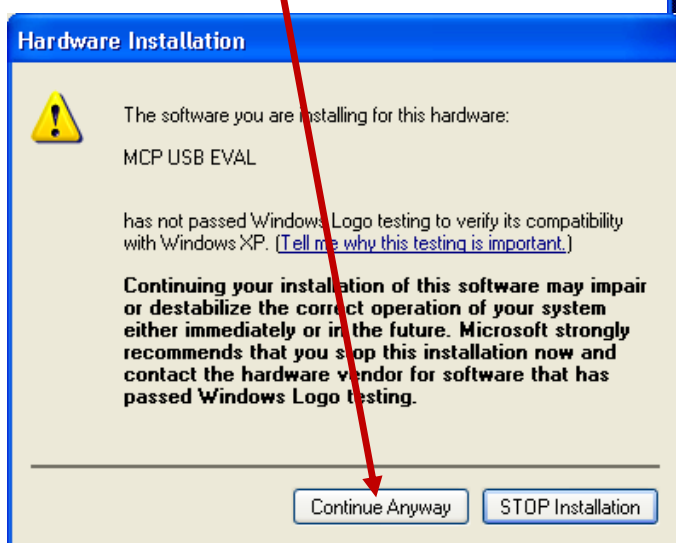
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MCP USB Driver Installation

Installation Steps (continued)

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

14. Then click on
“Continue Anyway”

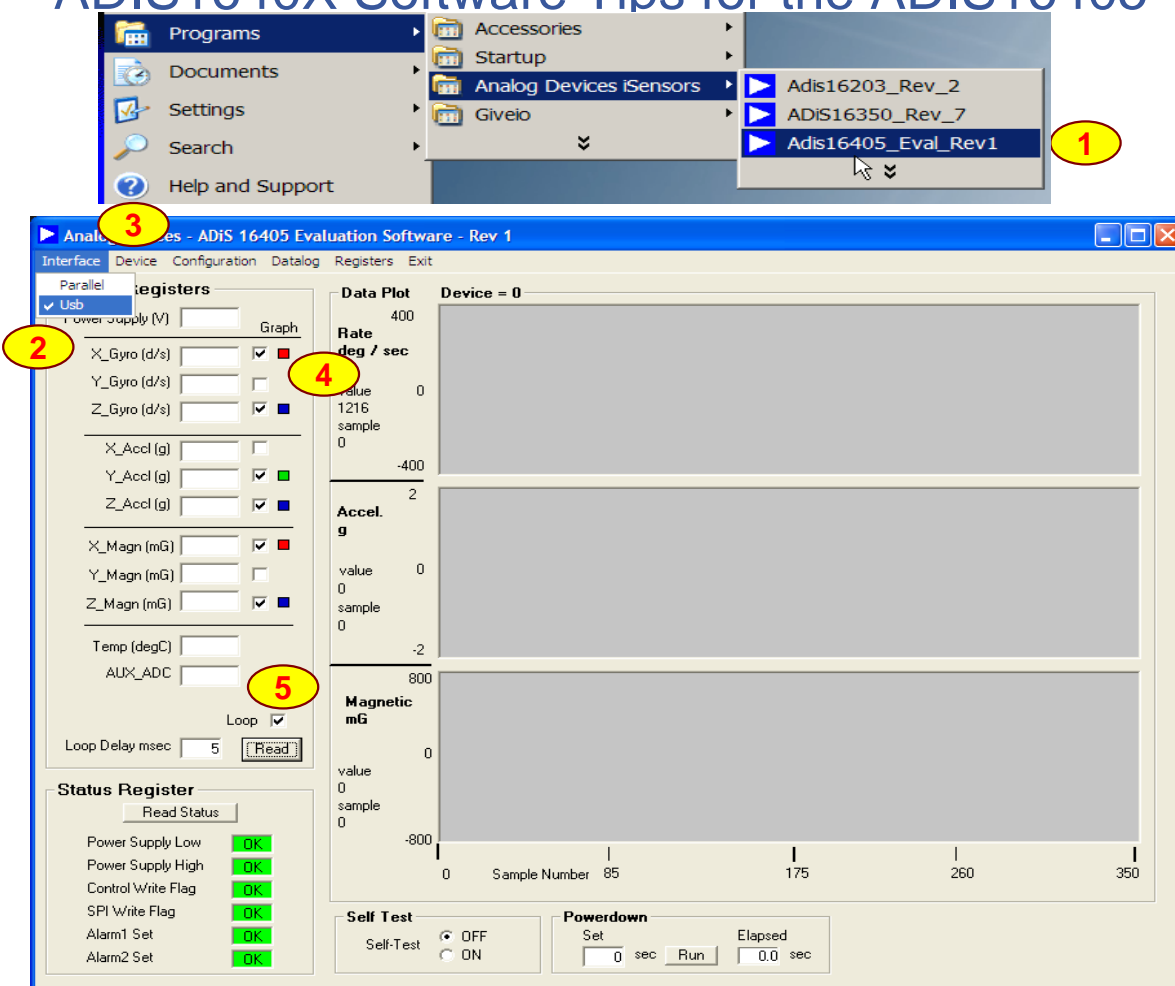


This process may repeat. Just follow the instructions and allow it to go through one more time. After completing this, then the devices is ready for test.



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ADIS1640X Software Tips for the ADIS16405

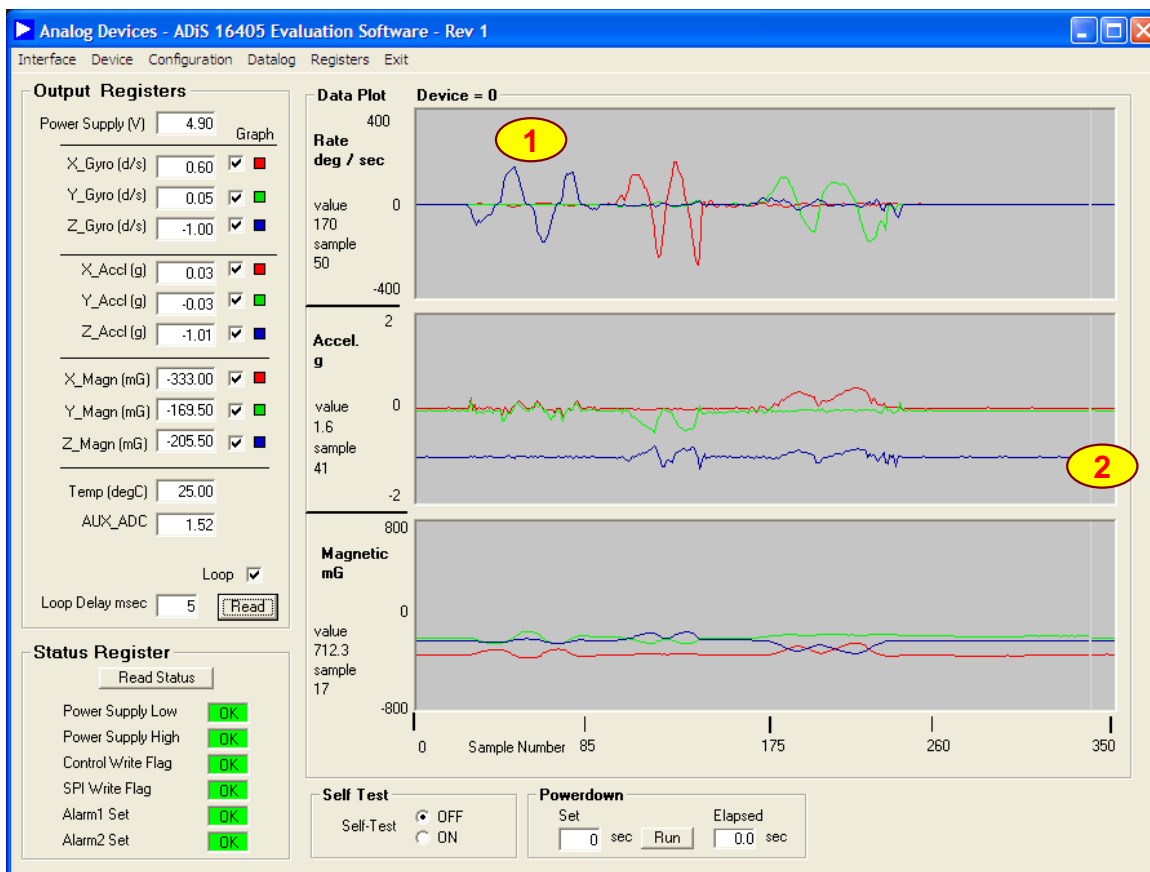


1. Locate ADIS16405_Rev1 Program from the computer start menu.
2. Click on "Interface" and select USB, then OK when the pop-up window shows the USB device is connected.
3. Click on device to select part number for device under test
4. Select which sensor outputs to monitor on the graph.
5. Start on-screen graphing by selecting loop and then Read button.



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ADIS1640X Software Tips for the ADIS16405

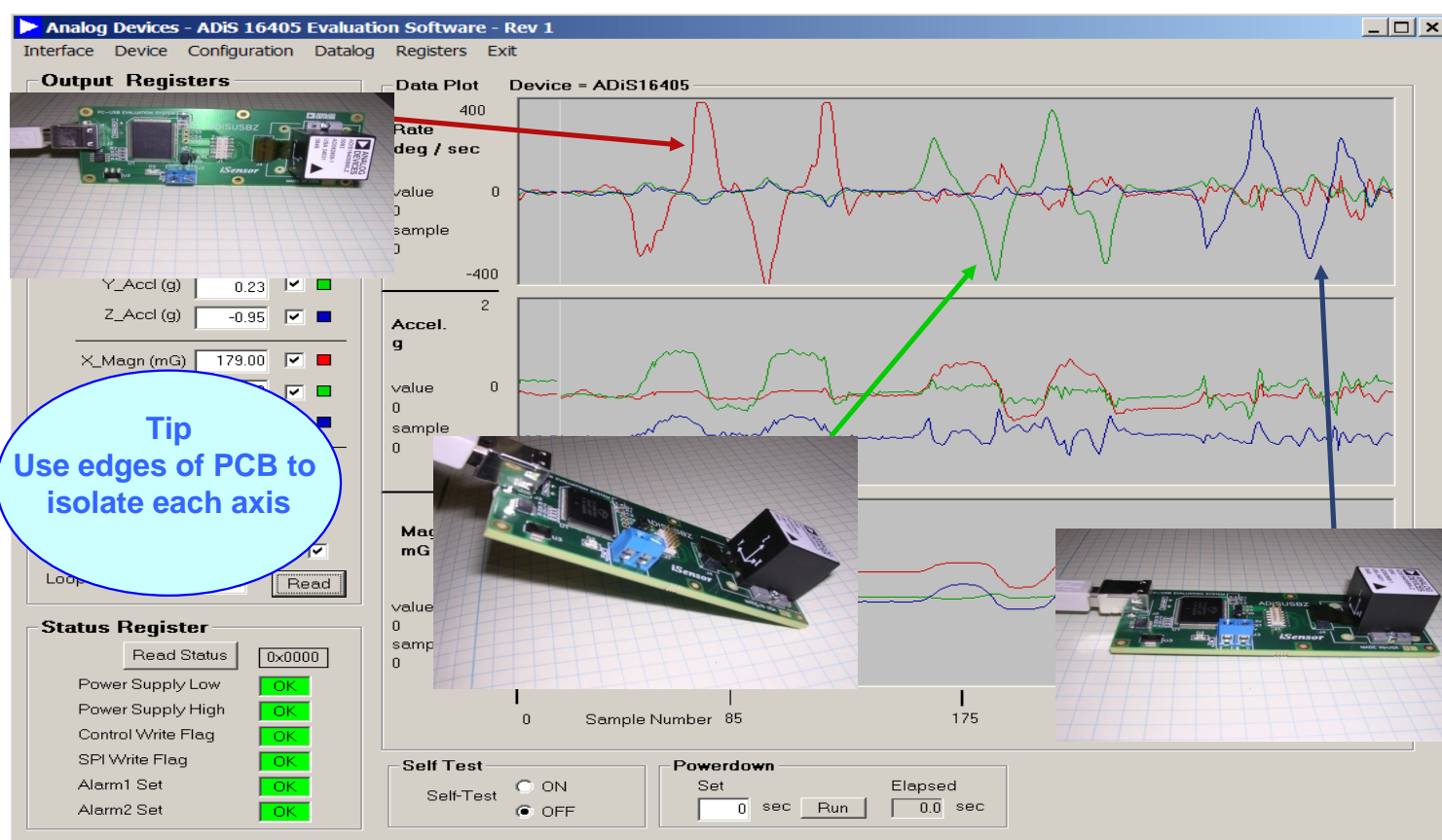


1. Use the axis markings on the device to determine rotation response with respect to the response on screen.
2. Notice the accelerometer response to gravity.



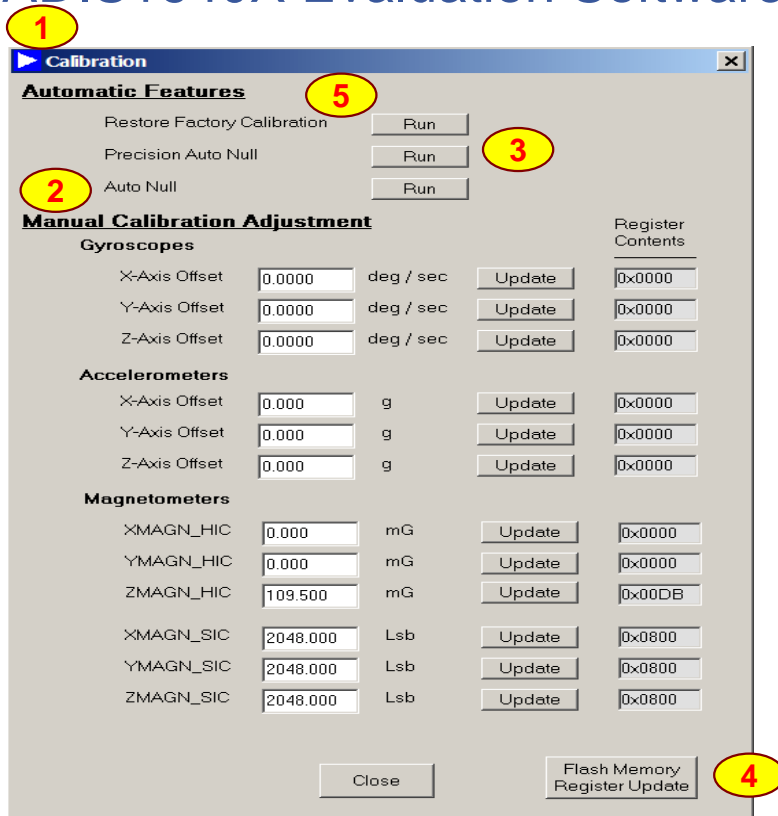
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ADIS16405 Demonstration Tips – Gyro response



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ADIS1640X 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 ADIS16405, 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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ADIS1640X Evaluation Software, Operation Menu Features

Operational Control

Sample Rate

819.202 SPS SMPL_PRD Contents 0x0001 Update

Measurement Range and Digital Filtering

Select Gyro Range ☒ 300 deg/sec ☐ 150 deg/sec ☐ 75 deg/sec

1 Taps SENS_AVG Contents 0x0400 Update

Auxiliary Digital I/O Configuration

Configure as a general purpose I/O line GPIO_CTRL Contents 0x0F00

Digital I/O Line 0:	<input checked="" type="radio"/> Input <input type="radio"/> Output	Line 0 Level	<input checked="" type="radio"/> High <input type="radio"/> Low
Digital I/O Line 1:	<input checked="" type="radio"/> Input <input type="radio"/> Output	Line 1 Level	<input checked="" type="radio"/> High <input type="radio"/> Low
Digital I/O Line 2:	<input checked="" type="radio"/> Input <input type="radio"/> Output	Line 2 Level	<input checked="" type="radio"/> High <input type="radio"/> Low
Digital I/O Line 3:	<input checked="" type="radio"/> Input <input type="radio"/> Output	Line 3 Level	<input checked="" type="radio"/> High <input type="radio"/> Low

Configure as a data ready line MSC_CTRL Contents 0x0000

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

Enable ☐ ON ☒ OFF

Auxiliary D/A Converter Output

0.0 Volts AUX_DAC Contents 0x0000 Update

Close Window Flash Memory Register Update

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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ADIS1640X Evaluation Software, Data log Menu

Datalog Control

FILE SETUP

1 Samples per File 1000

Sample Delay msec 0

Files per Session 1

FILE INFORMATION

Directory C:\Program Files\Analog Device

File Name DATALOG

File 1 .csv

Data Format

☒ Scaled Units ☐ LSB's

DATA SELECTION

2

☐ Power Supply

☒ X Gyro

☒ Y Gyro

☒ Z Gyro

☒ X Accel

☒ Y Accel

☒ Z Accel

☐ X Magn

☐ Y Magn

☐ Z Magn

☐ Temperature

☐ AUX_ADC

3

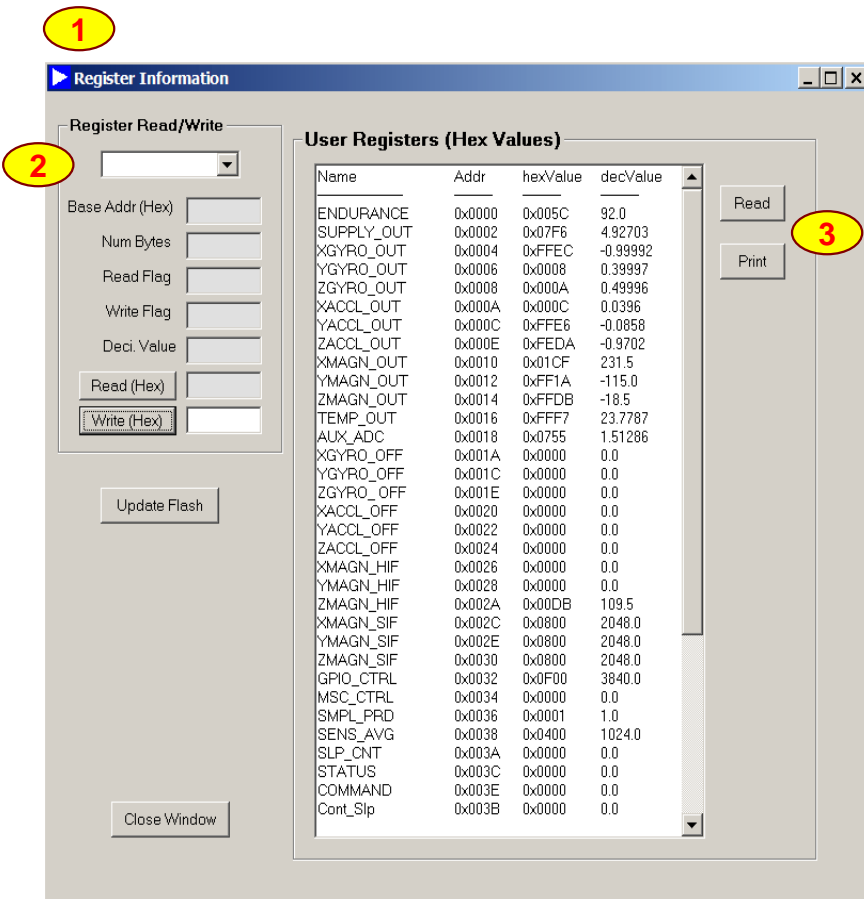
Start Datalog

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 (below) will appear in this location until the data collection process has completed.

DATALOG IN PROGRESS

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ADIS1640X Evaluation Software, Data log Menu



1. Access Register Menu information.
2. Pick a register for Read/Write.
3. Read or print user Registers.



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MORE INFORMATION ON iSENSOR EVALUATION TOOLS:

- www.analog.com/isensor-evaluation

