

The World Leader in High Performance Signal Processing Solutions



*iSensor*TM Evaluation Tool Overview



August 12, 2008



iSensor™ Evaluation Tool Overview

Purpose – Why these tools?

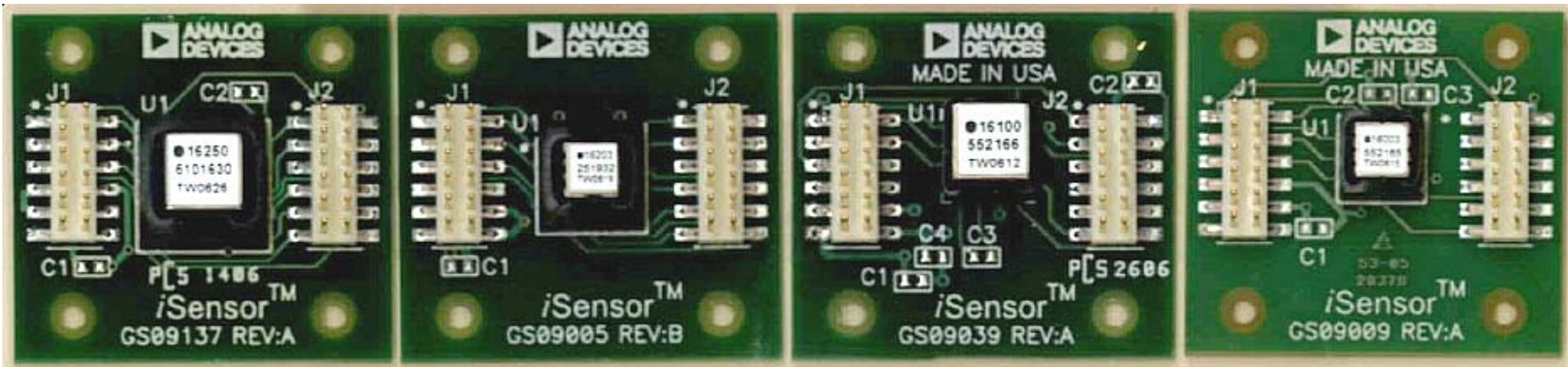
- 1. Simplify iSensor integration into existing digital processor platforms such as uC, DSP, FPGA, CPLD, etc. Which would approach would get you writing code and making measurements quicker?**
 - ◆ Designing a custom PCB, having it fabricated, and managing the solder reflow process for a new package style or.....
 - ◆ Bolting a small iSensor PCB to your platform, connecting its SPI to you processor's SPI or other digital I/O.
 - ◆ **Provide simple demonstration tools that enable quick verification of basic iSensor functions and in some cases, characterization of critical performance criteria.**

iSensor™ Evaluation Tools

Evaluation Boards

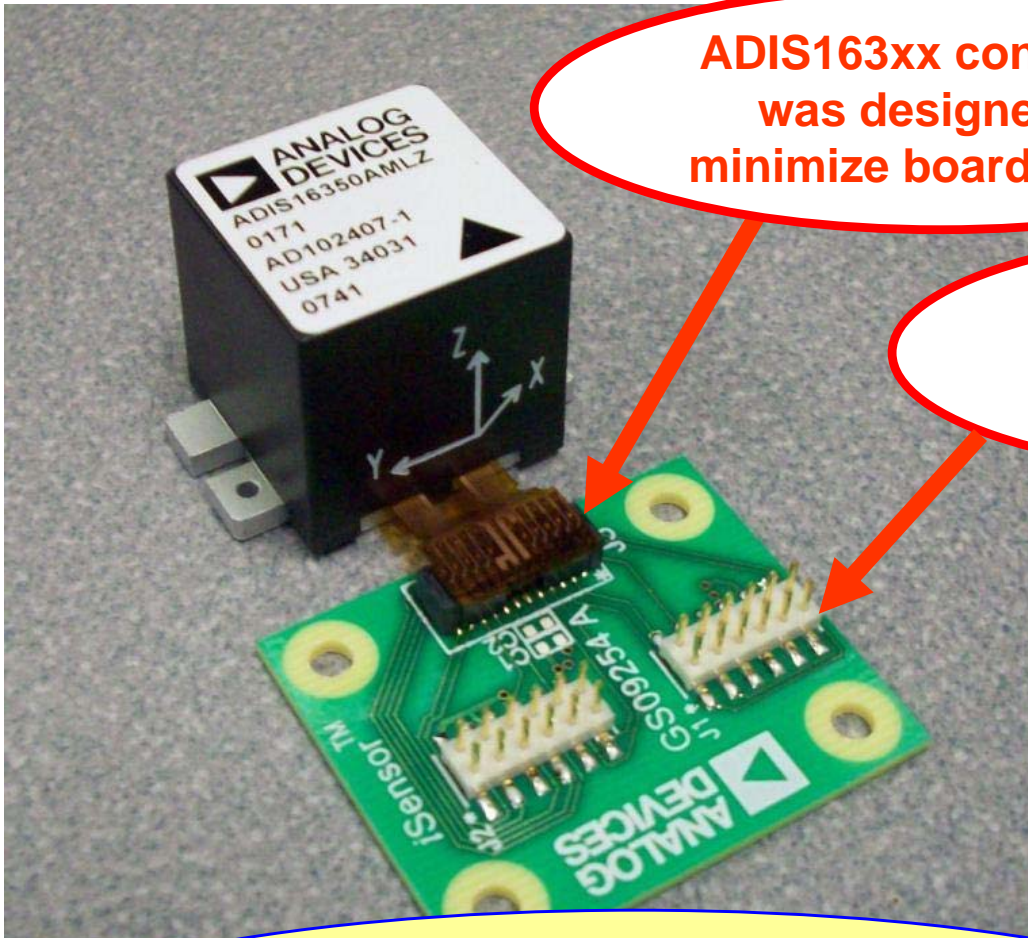
Evaluation board – ADIS16XXX/PCB:

- Designed for integrating into existing digital platforms
- Eliminates the need for “prototype” soldering
- Small size: 1.2” x 1.3”
- Access SPI port using standard ribbon cable (2mm pitch)
- 2mm mounting holes for secure attachment
- Drops into ADISEVAL & ADISEVAL/USB Evaluation Systems
 - ◆ Simplifies interface design for evaluating multiple devices



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Evaluation Boards - Triple Axis Interface



ADIS163xx connector was designed to minimize board space.

ADIS163xx connector geometries are too small for ribbon cable interfaces!

The ADIS163xx/PCBZ provides a simple connector translation.

For prototype needs, this provides ribbon cable-friendly interface.

Just bolt the device and PCB to your platform, cable over to you processor, and start developing your interface and taking data.

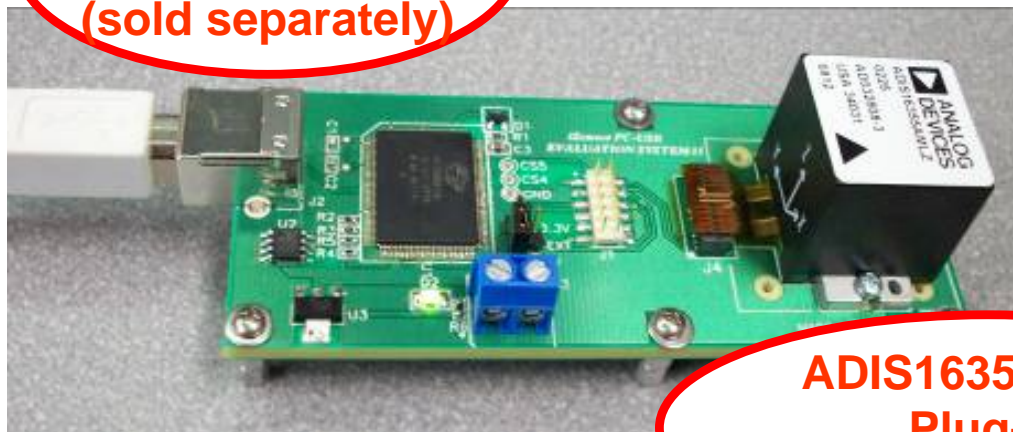
ADIS163xx/PCBZ orders include ADIS163xxAMLZ part & interface PCB.

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ADISUSB, PC-Based Evaluation System



**ADIS16XXX/PCB
Plug-in
(sold separately)**



**ADIS1635xAMLZ
Plug-in
(sold separately)**

Products supported:

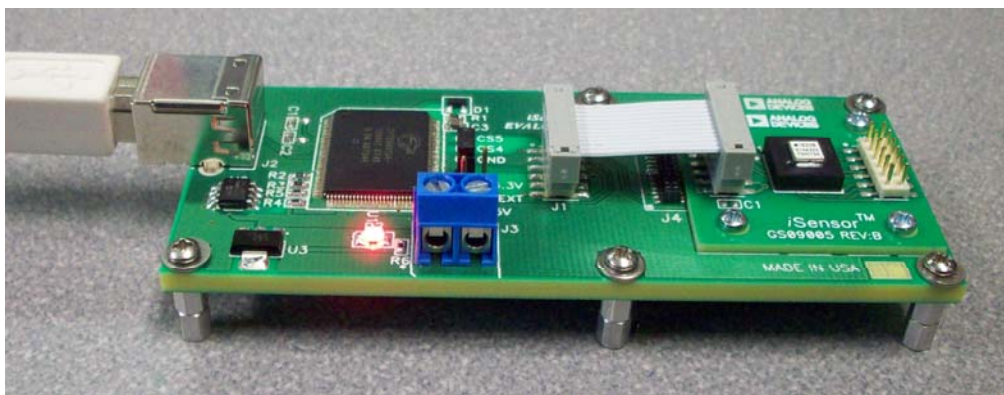
ADIS16003, ADIS16006, ADIS16080, ADIS16100,
 ADIS16201, ADIS16203, ADIS16204, ADIS16209,
 ADIS16250, ADIS16251, ADIS16255, ADIS16350,
 ADIS16354, ADIS16355

- ◆ **Complete evaluation system**
- **SPI-to-USB Port Interface PCB**
- **USB A-to-B Interface Cable**
- **iSensor™ Evaluation Software**
 - ◆ Device control
 - ◆ Data plots, data logging

**No Power Supply
Required!**

iSensor[®] The Simple Solution for Sensor Integration

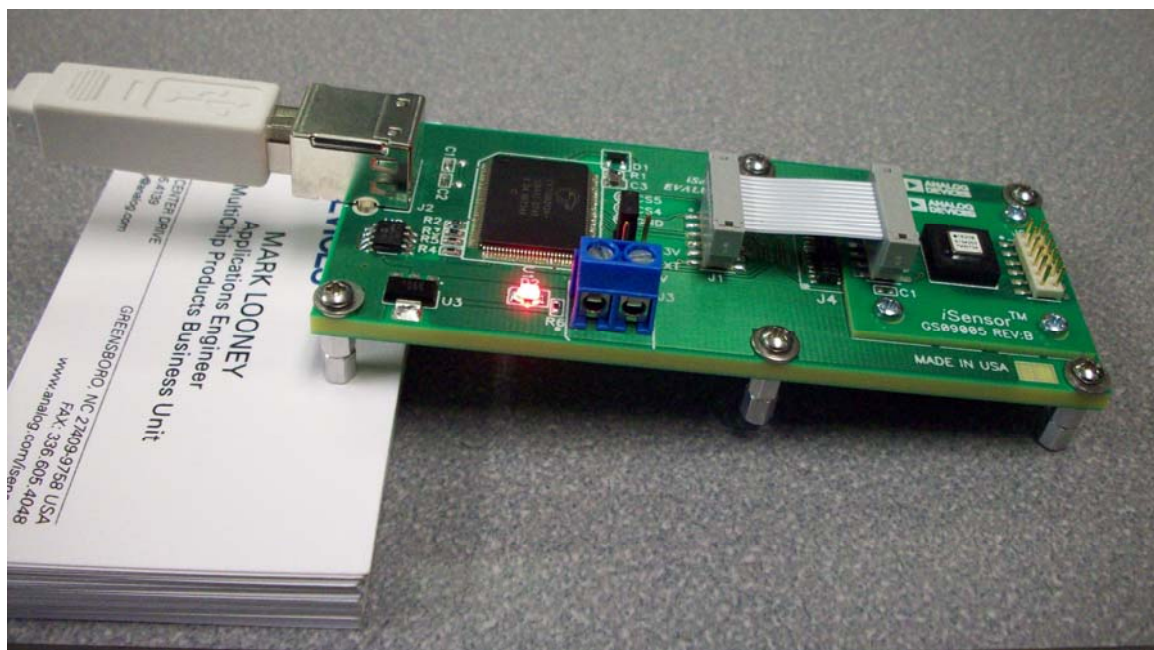
ADIS16209 Demonstration Tips – Horizontal Calibration



1. Use a set of business cards to prop up one side of the evaluation system and simulate a system-level offset bias.
2. Click on Read to observe the incline angle measurement.

KEY POINTS

- Many users will experience offset due to system-level influences, such as PCB thickness variation and solder volume tolerances, etc.
- The ADIS16209's auto-null provides a simple means to overcome these offset factors.





iSensor[®] The Simple Solution for Sensor Integration

ADIS16209 Demonstration Tips – Horizontal Calibration

1 Click on Calibration to open Calibration Register Window

2 Click on auto-null, and the part calculates the appropriate adjustment factors

3 Click Write, then Close, then Read to observe the improved behavior

Register	Value
SUPPLY_OUT (V)	3.297
XACCL_OUT (G)	0.005
YACCL_OUT (G)	0.065
AUX_ADC (V)	1.468
TEMP_OUT (dgrC)	25.000
XINCL_OUT (dgr)	0.300
YINCL_OUT (dgr)	3.700
ROTATION (dgr)	26.075

Register	Value
XACCL_NULL	0
YACCL_NULL	0
XINCL_NULL	0
YINCL_NULL	0
ROT_NULL	0

Register	Value
XACCL_NULL	139
YACCL_NULL	62
XINCL_NULL	19
YINCL_NULL	9
ROT_NULL	-4359



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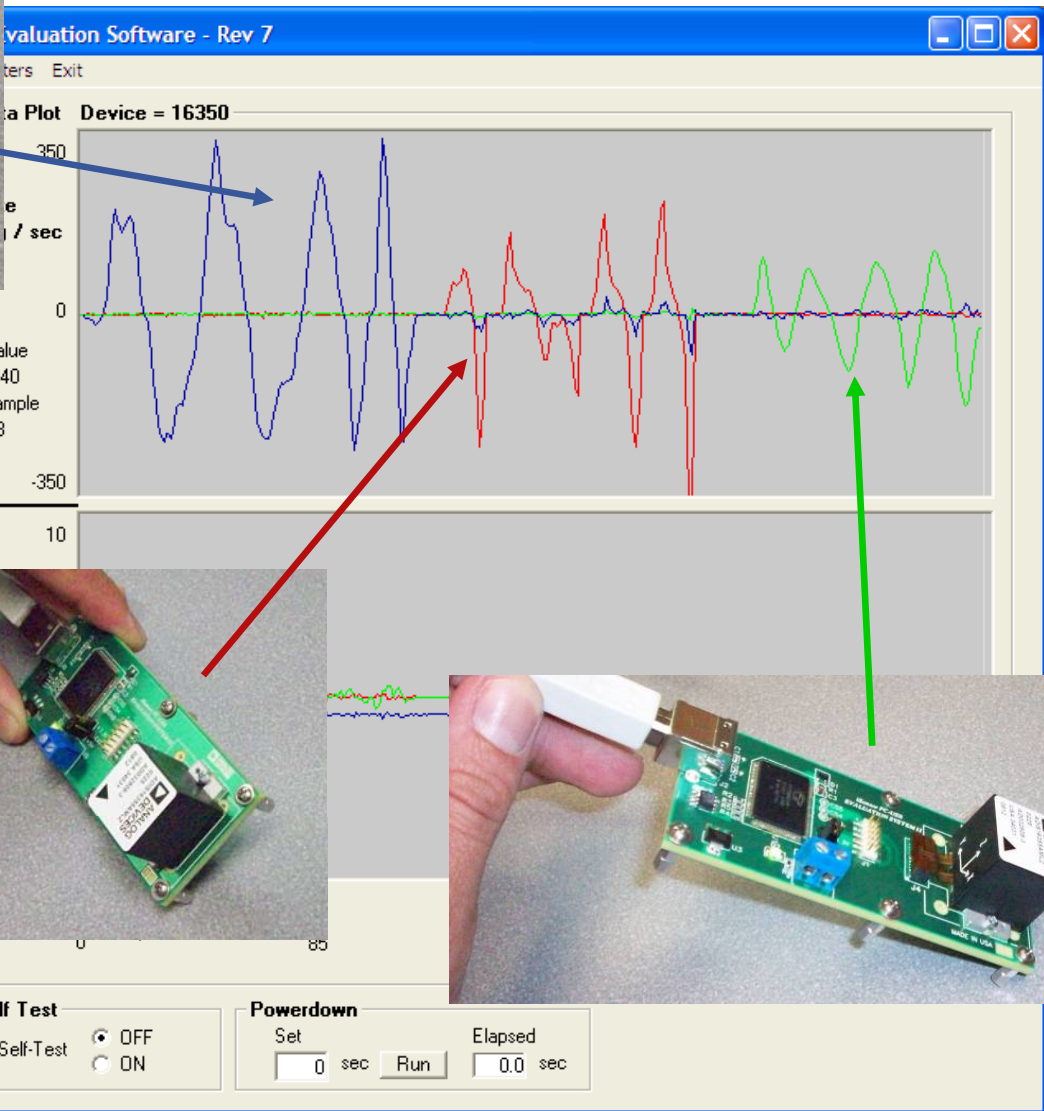
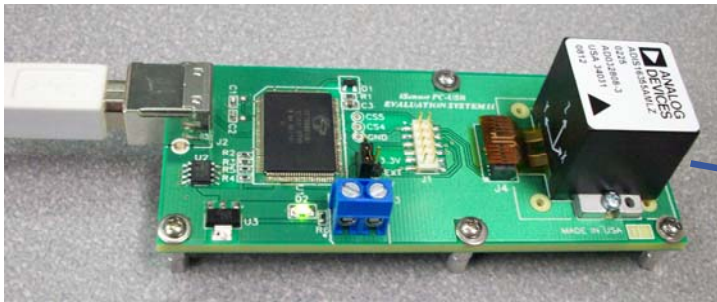
ADIS16209 Demonstration Tips – Horizontal Calibration

The screenshot shows the 'Analog Devices - ADIS16209 Evaluation Software - Rev 1' window. The 'Output Registers' section on the left lists various sensor outputs, with 'ROTATION (dgr)' at -137.175. A blue arrow points from a 'Success!' callout to the rotation value. The central part of the interface features a circular calibration diagram with concentric circles and a diamond shape, and a horizontal scale from -90 to +90 degrees. Below the scale are 'X_INCL' and 'Y_INCL' bars. The 'Status Register' section at the bottom shows several 'OK' indicators for power supply, control, and alarm flags. Other sections include 'Loop Setup', 'SMPL_PRD' (Sample Rate: 5.005), 'AVG_CNT' (Avg Count: 8), 'Auxiliary DAC', 'Sleep Count', and 'Self Test'.

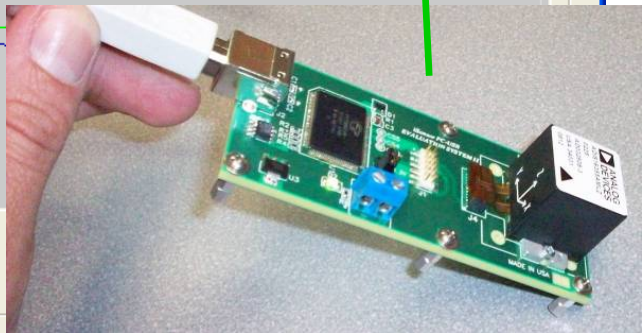
Success!

iSensor[®] The Simple Solution for Sensor Integration

ADIS16350 Demonstration Tips – Look at each axis

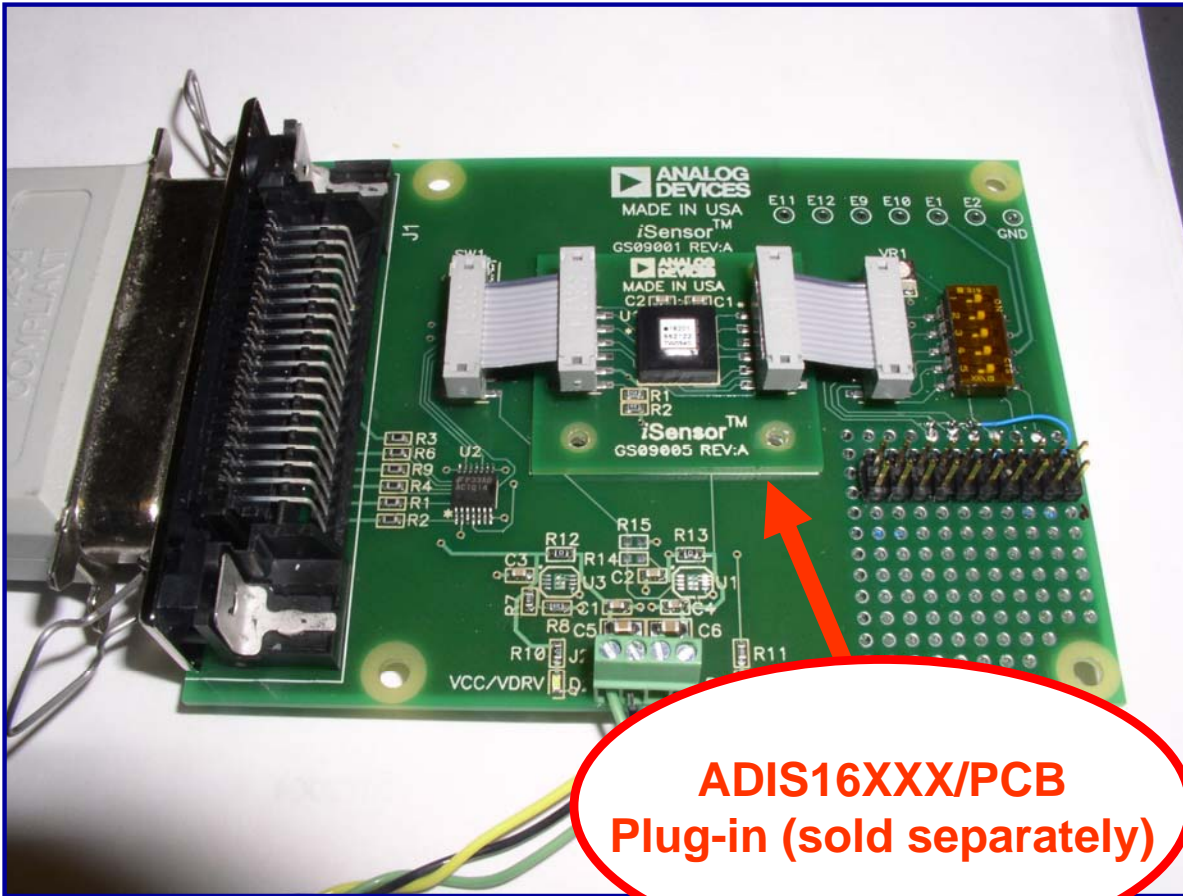


Tip
Use standoffs to isolate each axis



iSensor™ Evaluation Tools

ADISEVAL, PC-Based Evaluation System



Products supported:

ADIS16003, ADIS16006, ADIS16060, ADIS16080,
 ADIS16100, ADIS16201, ADIS16203, ADIS16204,
 ADIS16209, ADIS16250, ADIS16251, ADIS16255

- ◆ **Complete evaluation system**
- **SPI-to-Parallel Port Interface PCB**
- **IEEE Parallel Interface cable**
- **Ribbon cables**
- **iSensor™ Evaluation Software**
 - ◆ Device control
 - ◆ Data plots, data logging

iSensor™ Evaluation Tools

ADIS16350/4/5 Evaluation Software

Output Registers

Power Supply (V)	4.946	Graph
X_Gyro (d/s)	1.172	<input checked="" type="checkbox"/>
Y_Gyro (d/s)	-0.147	<input checked="" type="checkbox"/>
Z_Gyro (d/s)	2.124	<input checked="" type="checkbox"/>
X_Accel (g)	0.005	<input checked="" type="checkbox"/>
Y_Accel (g)	-0.058	<input checked="" type="checkbox"/>
Z_Accel (g)	-1.035	<input checked="" type="checkbox"/>
X_Temp (degC)	25.872	
Y_Temp (degC)	26.890	
Z_Temp (degC)	26.163	
AUX_ADC	2.496	

Loop
Loop Delay msec: 5

Data Plot

Rate deg / sec

value: 350
sample: 156

Accel. g

value: 9.6
sample: 53

Sample Number: 0, 85, 175, 260, 350

Status Register

Power Supply Low	OK
Power Supply High	OK
Control Write Flag	OK
SPI Write Flag	OK
Alarm1 Set	OK
Alarm2 Set	OK

Self Test

Self-Test: OFF ON

Powerdown

Set: 0 sec Elapsed: 0.0 sec

1. Read output registers
2. Device Configuration: Drop-down menu that provides controls for: calibration, dynamic range, sample rate, filtering, alarms, and digital I/O controls
3. Data-logging controls

iSensor™ Evaluation Tools

ADIS16209 Evaluation Software

The screenshot shows the 'Analog Devices - ADIS16209 Evaluation Software - Rev 1' window. The interface includes a menu bar (Interface, Alarms, Calibration, GPIO/MSC, Registers, Exit) and several panels:

- Output Registers (1):** A list of sensor outputs with a 'Read' button. Values include: SUPPLY_OUT (V) 3.293, XACCL_OUT (G) -0.001, YACCL_OUT (G) -0.043, AUX_ADC (V) 1.484, TEMP_OUT (dgrC) 33.460, XINCL_OUT (dgr) -0.100, YINCL_OUT (dgr) -2.500, and ROTATION (dgr) -87.950. A 'Data Read' indicator shows 'New' and 'Status' shows 'OK' (2).
- Orientation Graphic (3):** A circular diagram with concentric circles and a central square, representing the sensor's orientation. Below it are X_INCL and Y_INCL bar graphs.
- Loop Setup (4):** Includes 'Start' and 'Stopped' buttons, a 'Loop Delay (mS)' field set to 100 (5), a 'Log Data to File' checkbox, a 'File' dropdown set to 'Datalog', and a 'Record cnt' field.
- Status Register:** Includes 'Read Status' and 'Clear' buttons, and a list of status indicators: Power Supply High (OK), Power Supply Low (OK), Control Write Flag (OK), SPI Write Flag (OK), Alarm1 Set (OK), Alarm2 Set (OK), and Self Test Fail (OK).
- Control Panels (6):** Includes 'Read DUT Settings' and 'Reset to Factory Defaults' buttons, 'SMPL_PRD' (Sample Rate (ms) 0.366), 'AVG_CNT' (Roll Avg Count 256), 'Auxiliary DAC AUX_DAC' (Output (Volts) 0.0000), 'Sleep Count SLP_CNT' (Time (Sec) 0.0), and 'Self Test' (Self-Test Disabled).

1. Read registers
2. Horizontal incline outputs
3. Vertical rotation orientation graphic
4. Start/stop for continuous data observation.
5. Added loop delay to slow sampling down.
6. Internal sample rate and filtering controls.

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ADIS16250/1/5 Evaluation Software

The screenshot shows the ADIS16250 Evaluation Software interface. The title bar reads "Analog Devices - ADIS16250 Evaluation Software - Rev 1.0". The menu bar includes "Interface", "Alarms", "User Cal", "GPIO/MSC", "Register", "Aux DAC", "Powerdown", "About", "Help", and "Exit".

At the top, there is a "Scale (S2-S0)" control with a value of 320 and buttons for "Read Setup" and "Reset to Factory Defaults".

The main display area features a graph for "GYRO Output dgr/s" with a y-axis ranging from -320 to 320 and a top x-axis for "Angle Output" with values from 0 to 360. The graph area is currently empty, with red dashed horizontal grid lines.

At the bottom, there are four panels:

- Output Registers (1):** Contains a "Read" button and several data fields: SUPPLY_OUT (V) 4.985, GYRO (Dgr/S) 0.88, AUX_ADC (V) 2.499, Temp Out (dgr) 36.04, Angle Out (dgr) 0.33, Data Read New, and Status OK.
- Status Register:** Contains a "Read Status" button and a list of status indicators: Power Supply Low OK, Power Supply High OK, Control Write Flag OK, SPI Write Flag OK, Gyro Overrange OK, Diag Error OK, Alarm1 Set OK, and Alarm2 Set OK.
- Loop Setup (2):** Contains "Start" and "Stop" buttons, a "Loop Delay (mS)" field set to 25.0, a checkbox for "Stop after 1 sweep", a checkbox for "Log Data to File", a "File" field set to "Adis16250" and "1", and a "Loop Count" field.
- Sample Rate Settings (4):** Contains "SMPL_PRD" controls with a value of 1 and "Sample Rate (mS)" set to 3.91. Below it is an "AVG_CNT" section with a value of 6, "Roll Avg Count" set to 64, and "Avg Rate (Sec)" set to 0.50.

Callout 3 points to the "Stop after 1 sweep" checkbox in the Loop Setup panel.

Callout 5 points to the "Scale (S2-S0)" control at the top right.

Callout 6 points to the "ADIS16250 Evaluation Software - Rev 1.0" text in the title bar.

1. Read output registers
2. External sample rate adjustment
3. Data logging
4. Internal sample rate setting
5. Dynamic range setting
6. Calibration, Alarms, and other features

iSensor™ Evaluation Tools

ADIS16201 Evaluation Software

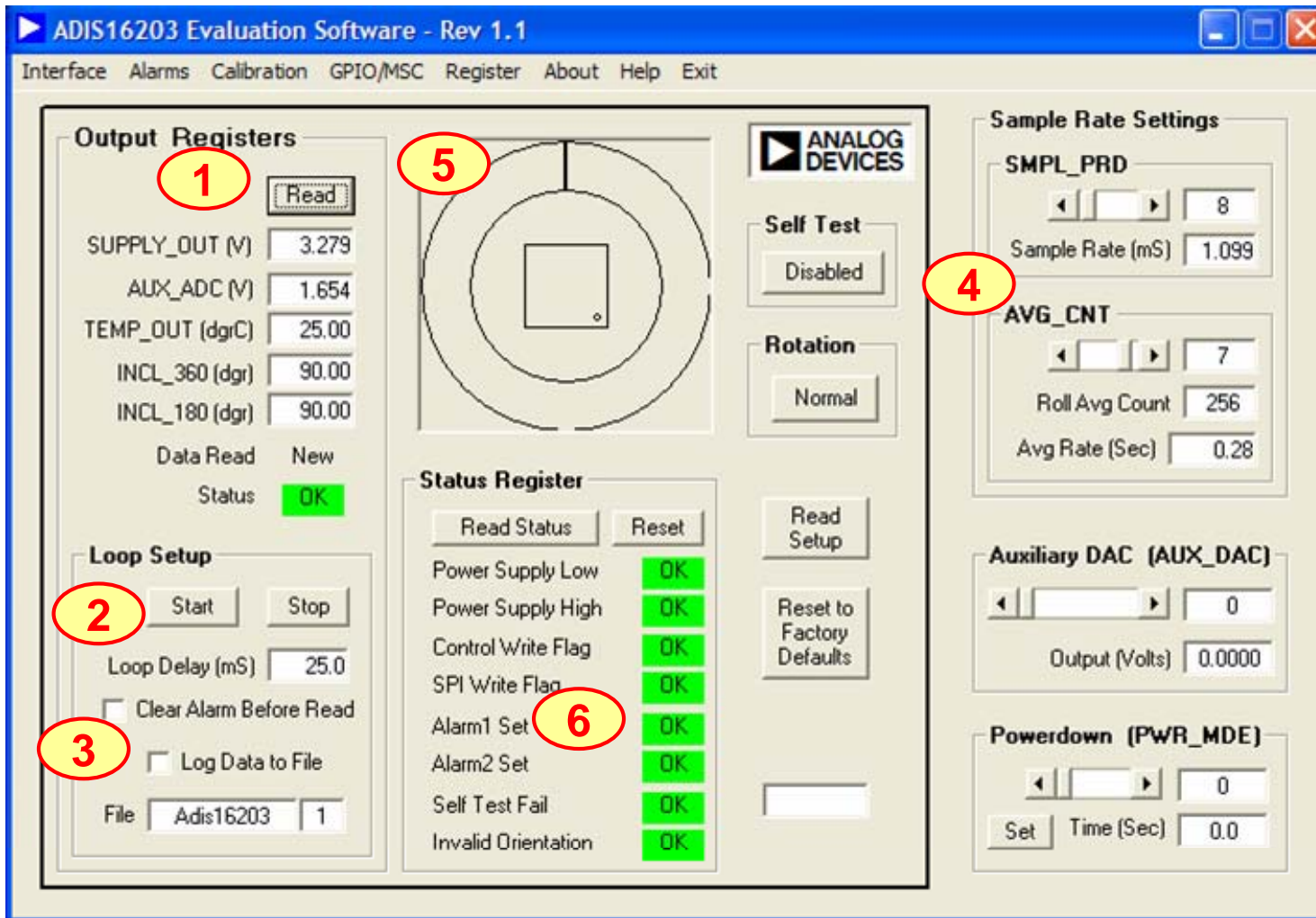
The screenshot displays the 'Analog Devices - ADIS16201 Evaluation Software - Rev 2.1' interface. The main window is divided into several sections:

- Output Registers:** A list of sensor outputs with a 'Read' button. A red circle '1' highlights the 'Read' button.
- Loop Setup:** Includes 'Start' and 'Stop' buttons, 'Loop Delay (mS)' set to 25.0, a 'Log Data to File' checkbox, and a 'File' field containing 'Adis16201' and '1'. A red circle '2' highlights the 'Start' button, and a red circle '3' highlights the 'Log Data to File' checkbox.
- Status Register:** Shows various status indicators (Power Supply Low, Power Supply High, Control Write Flag, SPI Write Flag, Alarm1 Set, Alarm2 Set) all marked as 'OK'. It includes 'Read Status', 'Read Setup', and 'Reset to Factory Defaults' buttons.
- Sample Rate Settings:** Includes 'SMPL_PRD' (set to 10), 'Sample Rate (mS)' (1.331), 'AVG_CNT' (set to 7), 'Roll Avg Count' (128), and 'Avg Rate (Sec)' (0.17). A red circle '4' highlights the 'AVG_CNT' value.
- Auxiliary DAC (AUX_DAC):** Shows 'Output (Volts)' set to 0.0000.
- Powerdown (PWR_MDE):** Shows 'Set Time (Sec)' set to 0.0.
- Self Test:** Shows 'Self-Test' set to 'Disabled'.

1. Read output registers
2. External Sample rate adjustment
3. Data logging
4. Internal sample rate setting and filter settings

iSensor™ Evaluation Tools

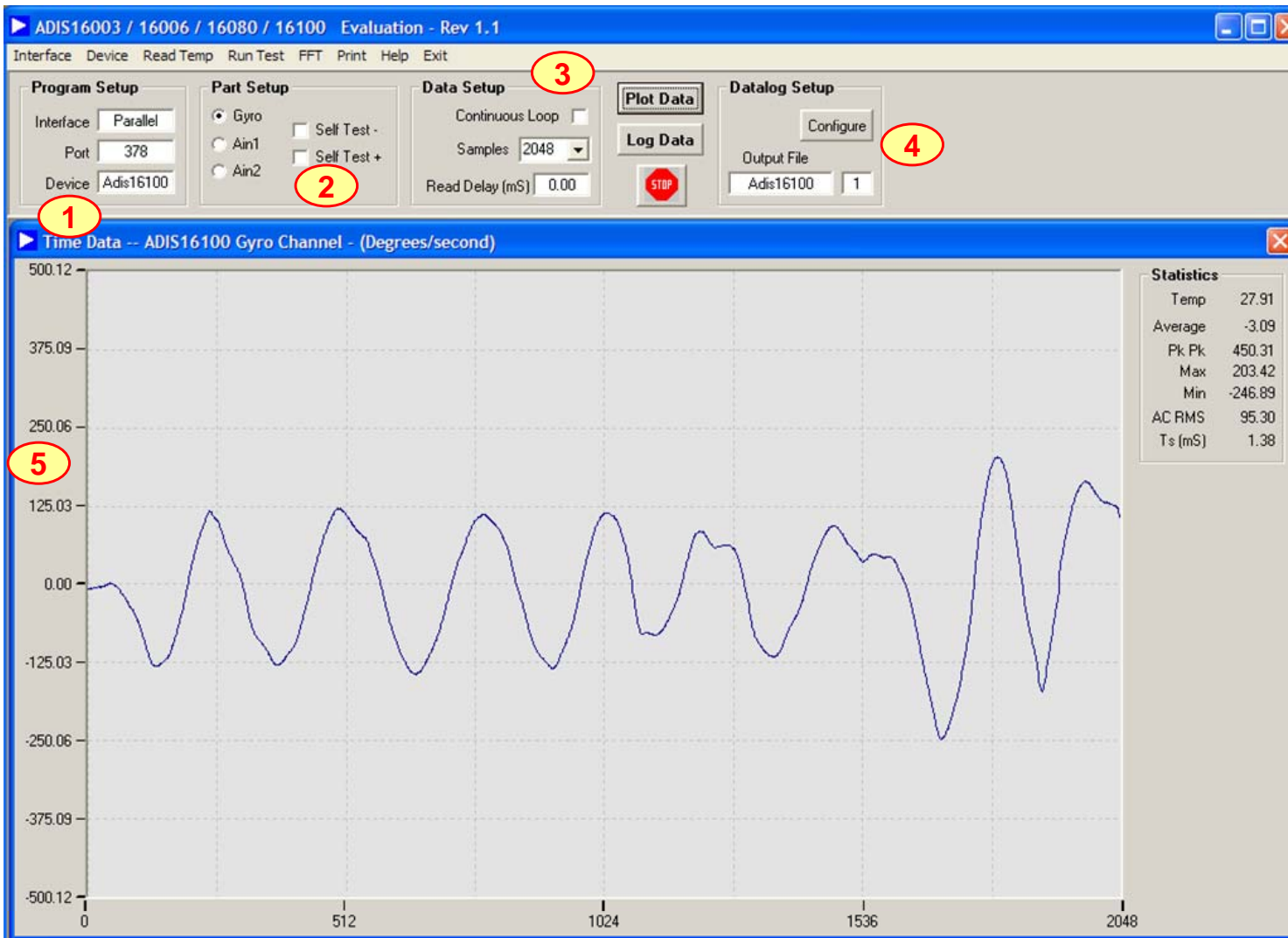
ADIS16203 Evaluation Software



1. Read output registers
2. External Sample rate adjustment
3. Data logging
4. Internal sample rate setting and filter settings
5. Visual incline angle indication
6. Programmable alarms

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ADIS16100 Evaluation Software

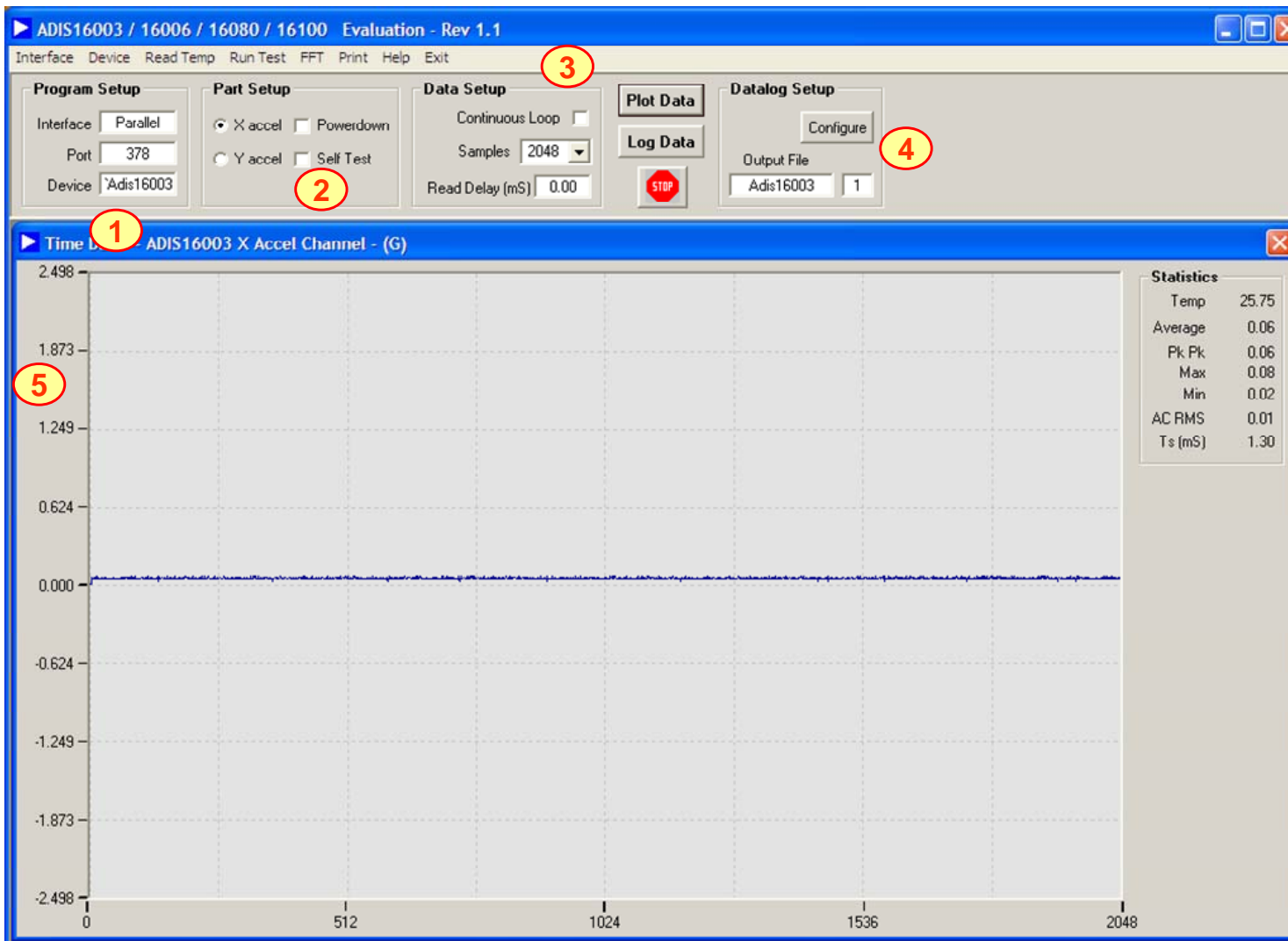


1. Device settings: which product?
2. Select data to plot: Rate, Temp, ADC inputs
3. Plotting setup
4. Data logging setup
5. Scale: Hint – Try right clicking here!

NOTE: ADIS16060 and ADIS16080 covered by this same package

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ADIS16003 Evaluation Software



1. Device settings: which product?
2. Select data to plot: Rate, Temp, ADC inputs
3. Plotting setup
4. Data logging setup
5. Scale: Hint – Try right clicking here!

NOTE: ADIS16006 covered by this same package

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