ANALOG DEVICES

EVAL-AD7276SDZ User Guide

UG-450

One Technology Way • P.O. Box 9106 • Norwood, MA 02062-9106, U.S.A. • Tel: 781.329.4700 • Fax: 781.461.3113 • www.analog.com

Evaluating the AD7276, 3 MSPS, 12-Bit ADC

FEATURES

Full featured evaluation board for the AD7276
PC control in conjunction with the system demonstration platform (EVAL-SDP-CB1Z)
PC software for control and data analysis (time and frequency domain)
Standalone capability

EVALUATION KIT CONTENTS

EVAL-AD7276SDZ evaluation board
Evaluation software CD for the AD7276
9 V mains power supply adapter

ADDITIONAL EQUIPMENT NEEDED

EVAL-SDP-CB1Z system demonstration platform, includes a USB cable
Precision analog signal source
SMB cables
PC running Windows XP SP2, Windows Vista, or Windows 7 with USB 2.0 port

ONLINE RESOURCES

Documents
AD7276 data sheet
EVAL-AD7276SDZ user guide
Required Software
EVAL-AD7276SDZ evaluation software

GENERAL DESCRIPTION

The EVAL-AD7276SDZ is a full featured evaluation board that can be used to easily evaluate all features of the AD7276. The AD7276 is a 12-bit, high speed, low power successive approximation ADC. The part operates from a single 2.35 V to 3.6 V power supply and features throughput rates of up to 3 MSPS. The part contains a low noise, wide bandwidth track-and-hold amplifier that can handle input frequencies greater than 55 MHz.

The evaluation board can be controlled via the system demonstration platform (SDP). The EVAL-SDP-CB1Z board allows the evaluation board to be controlled via the USB port of a PC using the AD7276 evaluation software. The EVAL-AD7276SDZ generates all required power supplies on board and supplies power to the EVAL-SDP-CB1Z controller board. On-board components include the following:

AD8022: dual high speed, low noise op amp
ADA4000-1: single, low cost, precision JFET input operational amplifier
AD780: 2.5 V/3.0 V ultrahigh precision band gap voltage reference
ADP1613: step-up PWM dc-to-dc switching converter
ADP1720: 50 mA, high voltage, micropower linear regulator
ADP7104: 20 V, 500 mA, low noise, CMOS LDO
ADM1185: quad voltage monitor and sequencer
ADG3308: low voltage, 1.15 V to 5.5 V, 8-channel bidirectional logic level translator

FUNCTIONAL BLOCK DIAGRAM

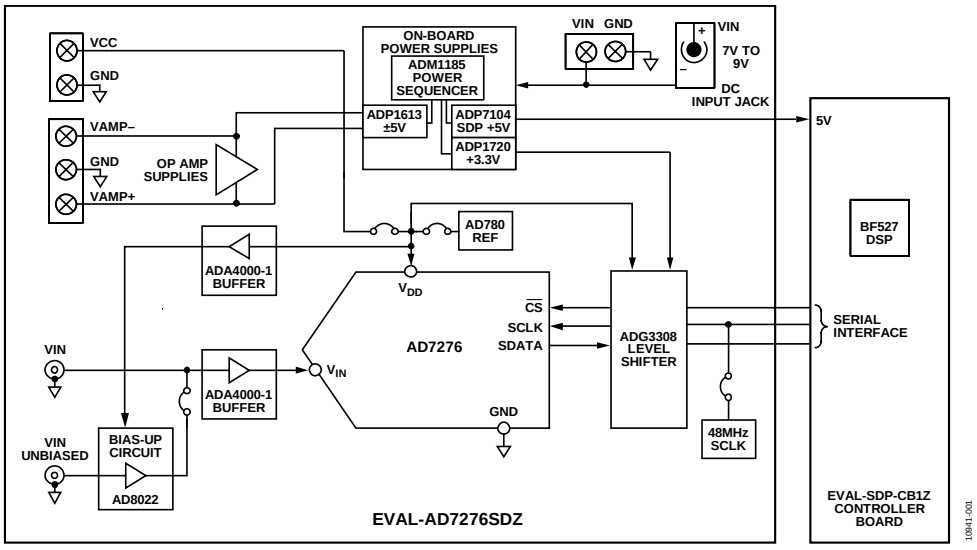


Figure 1.

TABLE OF CONTENTS

REVISION HISTORY

4/13—Revision 0: Initial Version

GETTING STARTED

QUICK START STEPS

To begin using the evaluation board, do the following:

1. With the EVAL-SDP-CB1Z board disconnected from the USB port of the PC, install the AD7276 evaluation board software from the CD included in the evaluation board kit. The PC must be restarted after the software installation is complete. (For complete software installation instructions, see the Software Installation Procedures section.)
2. Connect the EVAL-SDP-CB1Z board to the EVAL-AD7276SDZ board as shown in Figure 2. Screw the two boards together using the nylon screw-nut set included in the evaluation board kit to ensure that the boards are connected firmly together.
3. Connect the 9 V power supply adapter included in the evaluation board kit to Connector J1 on the EVAL-AD7276SDZ board.
4. Connect the EVAL-SDP-CB1Z board to the PC using the supplied USB cable. If you are using Windows® XP, you may need to search for the EVAL-SDP-CB1Z drivers. Choose to automatically search for the drivers for the EVAL-SDP-CB1Z board if prompted by the operating system.
5. Launch the EVAL-AD7276SDZ software from the **Analog Devices** subfolder in the **Programs** menu.

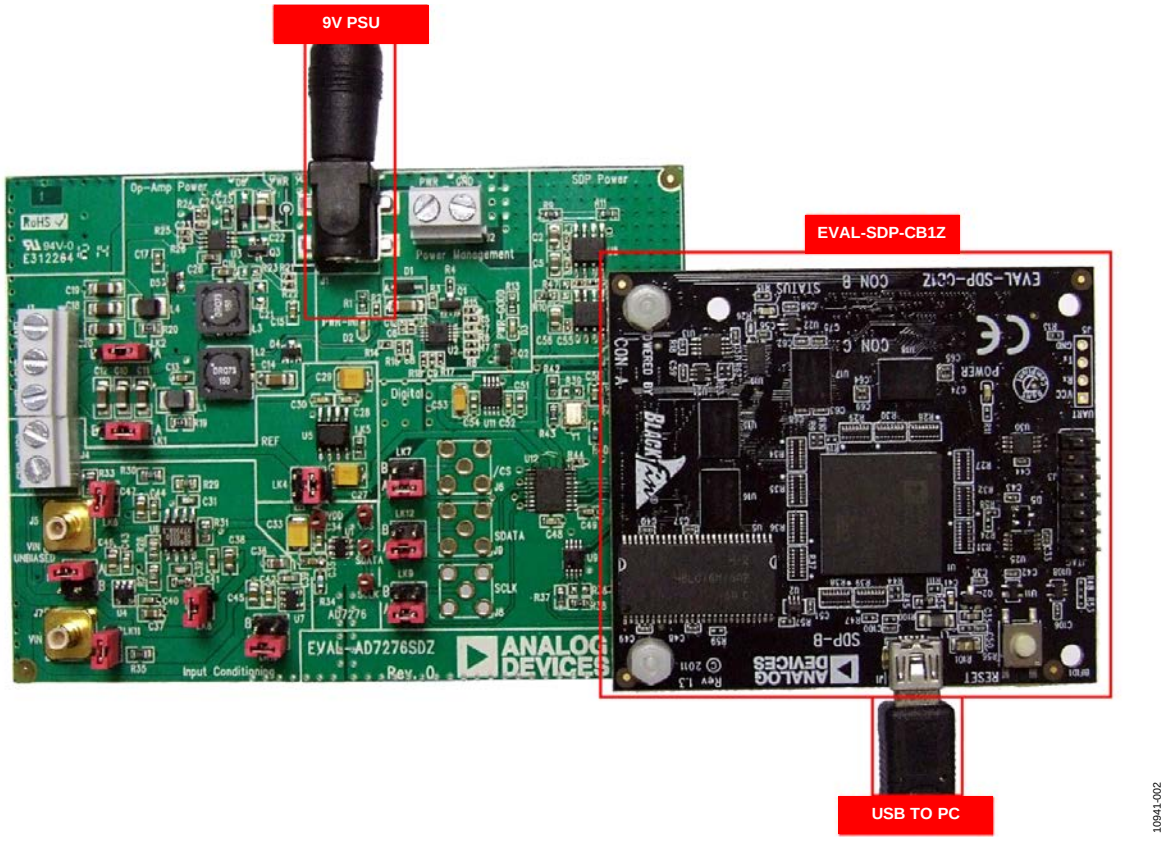


Figure 2. Hardware Configuration—Setting up the EVAL-AD7276SDZ (EVAL-AD7276SDZ on Left and EVAL-SDP-CB1Z on Right)

SOFTWARE INSTALLATION PROCEDURES

The EVAL-AD7276SDZ evaluation kit includes a CD containing software to be installed on your PC before you begin using the evaluation board.

There are two parts to the installation:

- AD7276 evaluation board software installation
- EVAL-SDP-CB1Z system demonstration platform board drivers installation

Warning

The evaluation board software and drivers must be installed before connecting the evaluation board and EVAL-SDP-CB1Z board to the USB port of the PC to ensure that the evaluation system is correctly recognized when it is connected to the PC.

Installing the AD7276 Evaluation Board Software

To install the AD7276 evaluation board software,

1. With the EVAL-SDP-CB1Z board disconnected from the USB port of the PC, insert the installation CD into the CD-ROM drive.
2. Double-click the **setup.exe** file to begin the evaluation board software installation. The software is installed to the following default location: **C:\Program Files\Analog Devices\EVAL-AD7276_77_78SDZ\AD7276**.
3. A dialog box appears asking for permission to allow the program to make changes to your computer. Click **Yes**.

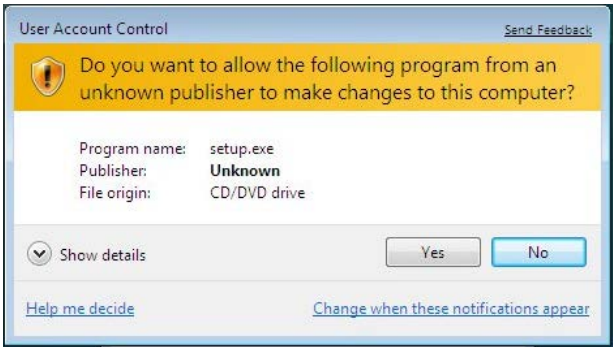


Figure 3. AD7276 Evaluation Board Software Installation: Granting Permission for Program to Make Changes

4. Select the location to install the software, and then click **Next**.

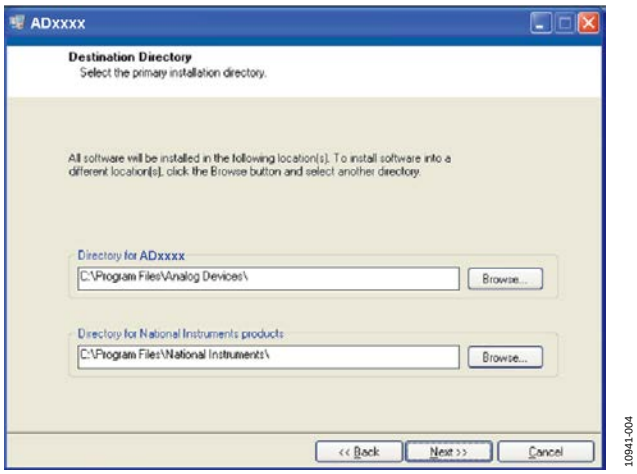


Figure 4. AD7276 Evaluation Board Software Installation: Selecting the Location for Software Installation

5. A license agreement appears. Read the agreement, and then select **I accept the License Agreement** and click **Next**.

Figure 5. AD7276 Evaluation Board Software Installation: Accepting the License Agreement

6. A summary of the installation is displayed. Click **Next** to continue.

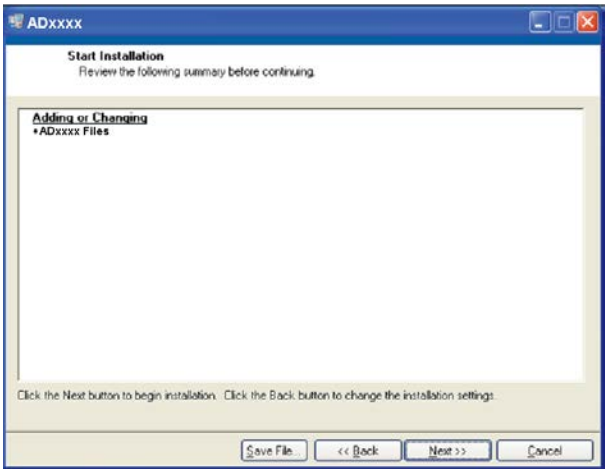


Figure 6. AD7276 Evaluation Board Software Installation: Reviewing a Summary of the Installation

7. A dialog box informs you when the installation is complete. Click **Next**.

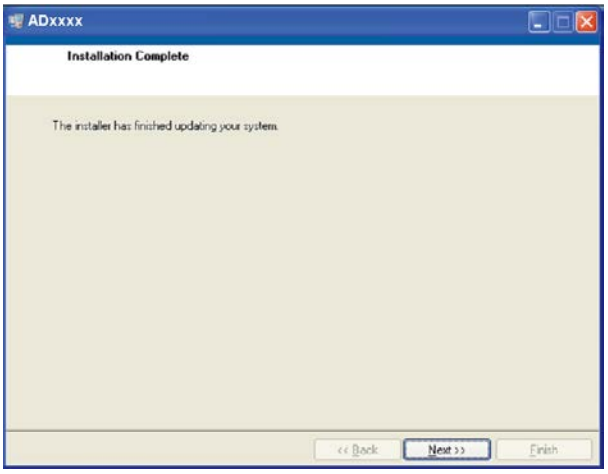


Figure 7. AD7276 Evaluation Board Software Installation: Indicating When the Installation Is Complete

Installing the EVAL-SDP-CB1Z System Demonstration Platform Board Drivers

After the installation of the evaluation board software is complete, a welcome window is displayed for the installation of the EVAL-SDP-CB1Z system demonstration platform board drivers.

1. With the EVAL-SDP-CB1Z board still disconnected from the USB port of the PC, make sure that all other applications are closed, and then click **Next**.

Figure 8. EVAL-SDP-CB1Z Drivers Setup: Beginning the Drivers Installation

2. Select the location to install the drivers, and then click **Next**.

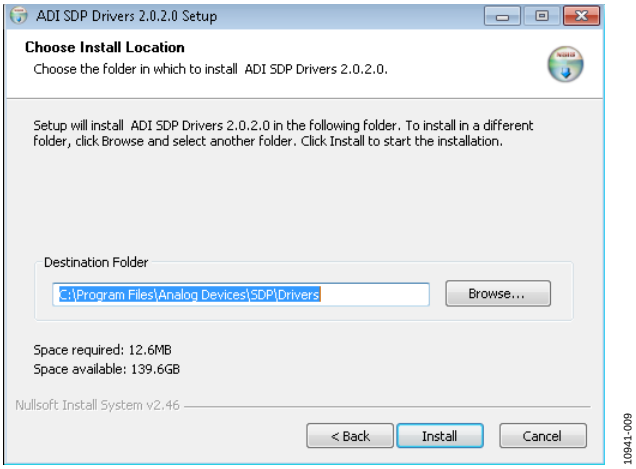


Figure 9. EVAL-SDP-CB1Z Drivers Setup: Selecting the Location for Drivers Installation

3. Click **Install** to confirm that you would like to install the drivers.

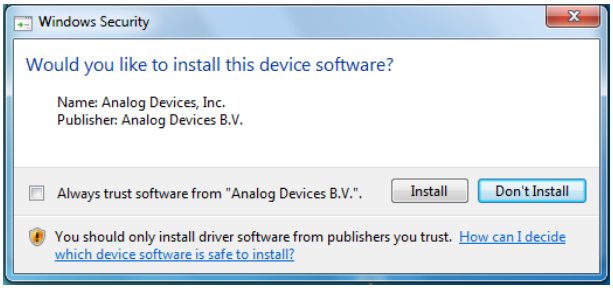


Figure 10. EVAL-SDP-CB1Z Drivers Setup: Granting Permission to Install Drivers

4. To complete the drivers installation, click **Finish**, which closes the installation wizard.

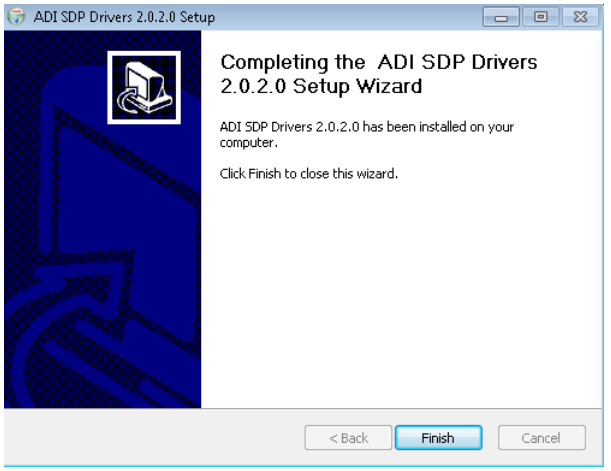


Figure 11. EVAL-SDP-CB1Z Drivers Setup: Completing the Drivers Setup Wizard

5. Before using the evaluation board, you must restart your computer. A dialog box opens, giving you the following options: **Restart**, **Shut Down**, **Restart Later**. Click the appropriate button.

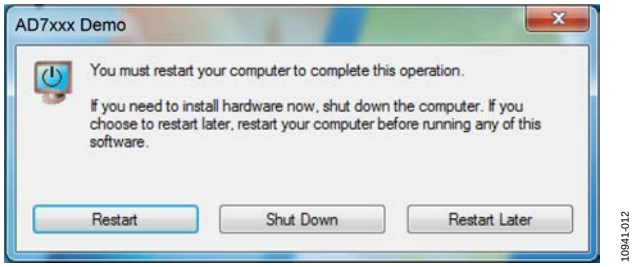


Figure 12. EVAL-SDP-CB1Z Drivers Setup: Restarting the Computer

EVALUATION BOARD SETUP PROCEDURES

The AD7276 evaluation board connects to the EVAL-SDP-CB1Z system demonstration board. The EVAL-SDP-CB1Z board is the controller board, which is the communication link between the PC and the main evaluation board. Figure 2 shows a photograph of the connections made between the AD7276 daughter board and the EVAL-SDP-CB1Z board.

After following the instructions in the Software Installation Procedures section, set up the evaluation and SDP boards as detailed in this section.

Warning

The evaluation software and drivers must be installed before connecting the evaluation board and EVAL-SDP-CB1Z board to the USB port of the PC to ensure that the evaluation system is correctly recognized when it is connected to the PC.

Configuring the Evaluation and SDP Boards

1. Connect the EVAL-AD7276SDZ board to Connector A or Connector B of the EVAL-SDP-CB1Z board (see Figure 2).
   a. Screw the two boards together using the nylon screw-nut set included in the evaluation board kit to ensure that the boards are connected firmly together.
2. Connect the 9 V power supply adapter included in the evaluation board kit to Connector J1 of the EVAL-AD7276SDZ board. (Alternatively, a bench power supply can be used to power the EVAL-AD7276SDZ via Connector J2. See Table 1 for more information about the connections and options for the required power supplies.)
3. Connect the EVAL-SDP-CB1Z board to the PC using the supplied USB cable.

EVALUATION BOARD HARDWARE

AD7276 DEVICE DESCRIPTION

The AD7276 can interface to microprocessors or DSPs.

The input signal is sampled on the falling edge of $\overline{CS}$, and the conversion is also initiated at this point. There are no pipeline delays associated with the part.

The AD7276 uses advanced design techniques to achieve very low power dissipation at high throughput rates.

The reference for the part is taken internally from V_{DD}. This allows the widest dynamic input range to the ADC; therefore, the analog input range for the part is 0 V to V_{DD}. The conversion rate is determined by the SCLK.

For more information about the AD7276, refer to the AD7276 data sheet, which should be used in conjunction with this user guide.

POWER SUPPLIES

The EVAL-AD7276SDZ can be used in two modes: SDP controlled mode and standalone mode (see the Modes of Operation section for more information).

When the EVAL-AD7276SDZ board is used in conjunction with the EVAL-SDP-CB1Z board (SDP controlled mode), connect the ac transformer to Connector J1 on the EVAL-AD7276SDZ board. The V_{DD}, +AMP, and −AMP supplies are generated on board. When the EVAL-AD7276SDZ board is used in standalone mode, the V_{DD} and amplifier supplies must be sourced from external sources (see Table 1).

Alternatively, a bench power supply can be connected to J2 to supply 7 V to 9 V.

Table 1. External Power Supplies Required

Power Supply	Connector	Voltage Range	Purpose
V_{IN}[1]	J1 or J2	7 V to 9 V	Supplies all on-board power supplies, generating all required voltages to run the evaluation board
+AMP	J3-3	+5 V	Supplies the positive rail of the amplifier
−AMP	J3-1	−5 V	Supplies the negative rail of the amplifier
V_{DD}	J4	2.35 V to 3.6 V	Supplies the V_{DD} digital supply

[1] When V_{IN} is supplied, all other power supplies are available on board. If the V_{IN} supply is not used, all other power supplies must be sourced from an external source.

LINK CONFIGURATION OPTIONS

There are multiple jumper (LKx) options that must be set correctly to select the appropriate operating setup before you begin using the evaluation board. The functions of these options are outlined in Table 2.

SETUP CONDITIONS

Care should be taken before applying power and signals to the evaluation board to ensure that all link positions are as required by the operating mode. There are two modes in which to operate the evaluation board. The evaluation board can be operated in SDP controlled mode to be used with the SDP board, or the evaluation board can be used in standalone mode.

Table 3 shows the default positions in which the links are set when the evaluation board is packaged. When the board is shipped, it is assumed that you are going to operate the evaluation board with the SDP board (SDP controlled mode).

Table 2. Link Option Functions

Link No.	Function
LK1	−AMP. Amplifier negative voltage supply selection. Position A: the amplifier negative voltage is supplied from the on-board supply. Position B: the amplifier negative voltage is supplied from an external source via J3 Terminal 1.
LK2	+AMP. Amplifier positive voltage supply selection. Position A: the amplifier positive voltage is supplied from the on-board supply. Position B: the amplifier positive voltage is supplied from an external source via J3 Terminal 3.
LK3	Bias-up voltage selection. Selects the voltage level that is supplied to U4. Position A: the bias-up voltage level that is supplied to U4 is V_{DD}. Position B: the bias-up voltage level that is supplied to U4 is 0 V.
LK4	V_{DD} source selection. Position A: V_{DD} is sourced from U5. Position B: V_{DD} is sourced externally via J4.
LK5	U5 output voltage selection. Inserted: the U5 output voltage is 3.0 V. Removed: the U5 output voltage is 2.5 V.
LK6	V_{IN} unbiased input impedance selection. Inserted: the V_{IN} unbiased input impedance is 51 Ω.
LK7	$\overline{CS}$ signal. Position A: the $\overline{CS}$ signal is connected to EVAL-SDP-CB1Z. Position B: the $\overline{CS}$ signal is connected externally via J6.
LK8	Biased-up input signal. Inserted: the biased-up input signal is connected to the U7 input buffer.
LK9	SCLK signal. Position A: the SCLK signal is connected to EVAL-SDP-CB1Z. Position B: the SCLK signal is connected externally via J8.
LK10	Buffer input source. Position A: the input signal is connected to the U7 input buffer. Position B: the input signal connected to the U7 input buffer is set to 0 V.
LK11	V_{IN} input impedance selection. Inserted: the V_{IN} input impedance is 51 Ω.
LK12	SDATA signal. Position A: the SDATA signal is connected to EVAL-SDP-CB1Z. Position B: the SDATA signal is connected externally via J9.

Table 3. Default Link Positions for Packaged EVAL-AD7276SDZ

Link No.	Position	Function
LK1	A	The amplifier negative voltage is supplied from the on-board supply.
LK2	A	The amplifier positive voltage is supplied from the on-board supply.
LK3	A	The selected voltage level that is supplied to U4 is V_{DD}.
LK4	A	V_{DD} is sourced from U5.

Link No.	Position	Function
LK5	Inserted	The U5 output voltage is 3.0 V.
LK6	Inserted	The V_{IN} unbiased input impedance is 51 Ω.
LK7	A	The $\overline{CS}$ signal is connected to EVAL-SDP-CB1Z.
LK8	Inserted	The biased-up input signal is connected to the U7 input buffer.
LK9	A	The SCLK signal is connected to EVAL-SDP-CB1Z.
LK10	A	The input signal is connected to the U7 input buffer.
LK11	Inserted	The V_{IN} input impedance is 51 Ω.
LK12	A	The SDATA signal is connected to EVAL-SDP-CB1Z.

EVALUATION BOARD CIRCUITRY

ANALOG INPUTS

Two analog input options are available for the EVAL-AD7276SDZ:

- VIN (J7)—for use with a unipolar signal source
- VIN UNBIASED (J5)—for use with a bipolar signal source

VIN (J7)

Use the VIN (J7) input when a unipolar signal source is available (see Table 4 for jumper settings). The input is buffered by U7 and fed to the AD7276 via an R-C filter.

Table 4. Unipolar Input Jumper Settings

Link	Jumper Settings
LK8	Removed
All Other Links	Set as described in Table 3.

VIN UNBIASED (J5)

Use the VIN UNBIASED (J5) input when a bipolar signal source is available (see Table 5 for jumper settings). The input is biased up by U6 and buffered by U7 and then is fed to the AD7276 via an R-C filter.

Table 5. Bipolar Input Jumper Settings

Link	Jumper Settings
LK11	Removed
All Other Links	Set as described in Table 3.

REFERENCE OPTIONS

The following on-board reference supply is available:

- AD780: 2.5 V/3.0 V ultrahigh precision band gap voltage reference. The reference is taken from the V_{DD} pin of the AD7276.

Alternatively, an external reference voltage can be applied to J4.

SOCKETS/CONNECTORS

Table 6. Socket/Connector Functions

Socket	Function
J1	PWR. A 7 V to 9 V dc transformer power connector.
J2	A 7 V to 9 V bench supply screw terminal connector.
J3	V_{SS} and V_{DD}. Screw terminal connectors for external amplifier power supplies.
J4	External power supply for V_{DD} of the AD7276.
J5	VIN UNBIASED. Analog input for use with bipolar signal sources.
J6	$\overline{CS}$. External connection to $\overline{CS}$.
J7	VIN. Analog input for use with unipolar signal sources.
J8	SCLK. External connection to SCLK.
J9	SDATA. External connection to SDATA.
J10	EVAL-SDP-CB1Z evaluation board controller socket.

MODES OF OPERATION

SDP CONTROLLED MODE

The AD7276 uses a high speed serial interface that allows sampling rates of up to 3 MSPS. For more information about the operation of the serial bus, refer to the AD7276 data sheet.

The EVAL-AD7276SDZ communicates with the EVAL-SDP-CB1Z board using level shifters. The EVAL-SDP-CB1Z operates at a 3.3 V logic level, which allows logic voltages that exceed 3.3 V to be used without damaging the SDP interface.

STANDALONE MODE

The EVAL-AD7276SDZ can also be used without the EVAL-SDP-CB1Z controller board. In this case, the EVAL-AD7276SDZ is connected to the digital interface using the SMB connectors as described in Table 7.

Table 7. Standalone Jumper Settings

Pin	SMB	Jumper Setting
$\overline{CS}$	J6	Shorting link in Position B
SCLK	J8	Shorting link in Position B
SDATA	J9	Shorting link in Position B

HOW TO USE THE SOFTWARE FOR EVALUATING THE AD7276

SETTING UP THE SYSTEM FOR DATA CAPTURE

After completing the steps in the Software Installation Procedures and Evaluation Board Setup Procedures sections, set up the system for data capture as follows:

1. Allow the **Found New Hardware Wizard** to run after the EVAL-SDP-CB1Z board is plugged into your PC. (If you are using Windows XP, you may need to search for the EVAL-SDP-CB1Z drivers. Choose to automatically search for the drivers for the EVAL-SDP-CB1Z board if prompted by the operating system.)
2. Check that the board is connected to the PC correctly using the **Device Manager** of the PC.
   a. Access the **Device Manager** as follows:
      i. Right-click **My Computer** and then click **Manage**.
      ii. A dialog box appears asking for permission to allow the program to make changes to your computer. Click **Yes**.
      iii. The **Computer Management** box appears. Click **Device Manager** from the list of **System Tools** (see Figure 13).
   b. **Analog Devices System Development Platform (32MB)** should appear under **ADI Development Tools**, indicating that the EVAL-SDP-CB1Z driver software is installed and that the board is connected to the PC correctly.

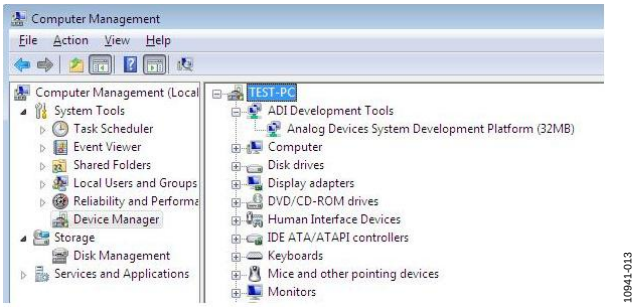


Figure 13. Device Manager: Checking that the Board Is Connected to the PC Correctly

Launching the Software

After completing the steps in the Setting Up the System for Data Capture section, launch the AD7276 software as follows:

1. From the **Start** menu, select **Programs** > **Analog Devices** > **EVAL-AD7276_77_78SDZ** > **AD7276**. The main window of the software then displays.
2. If the EVAL-AD7276SDZ evaluation system is not connected to the USB port via the EVAL-SDP-CB1Z when the software is launched, a connectivity error displays (see Figure 14). Connect the evaluation system to the USB port of the PC, wait a few seconds, click **Rescan**, and follow the on-screen instructions.

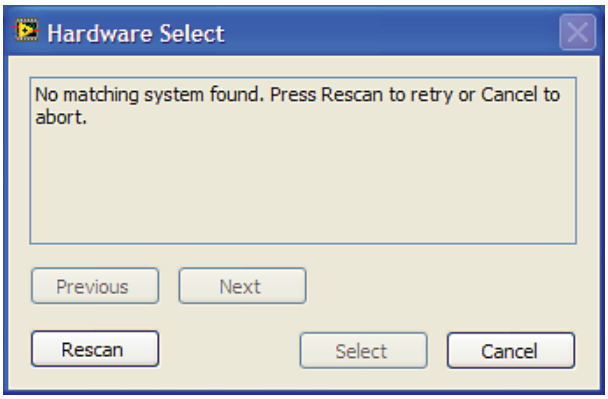
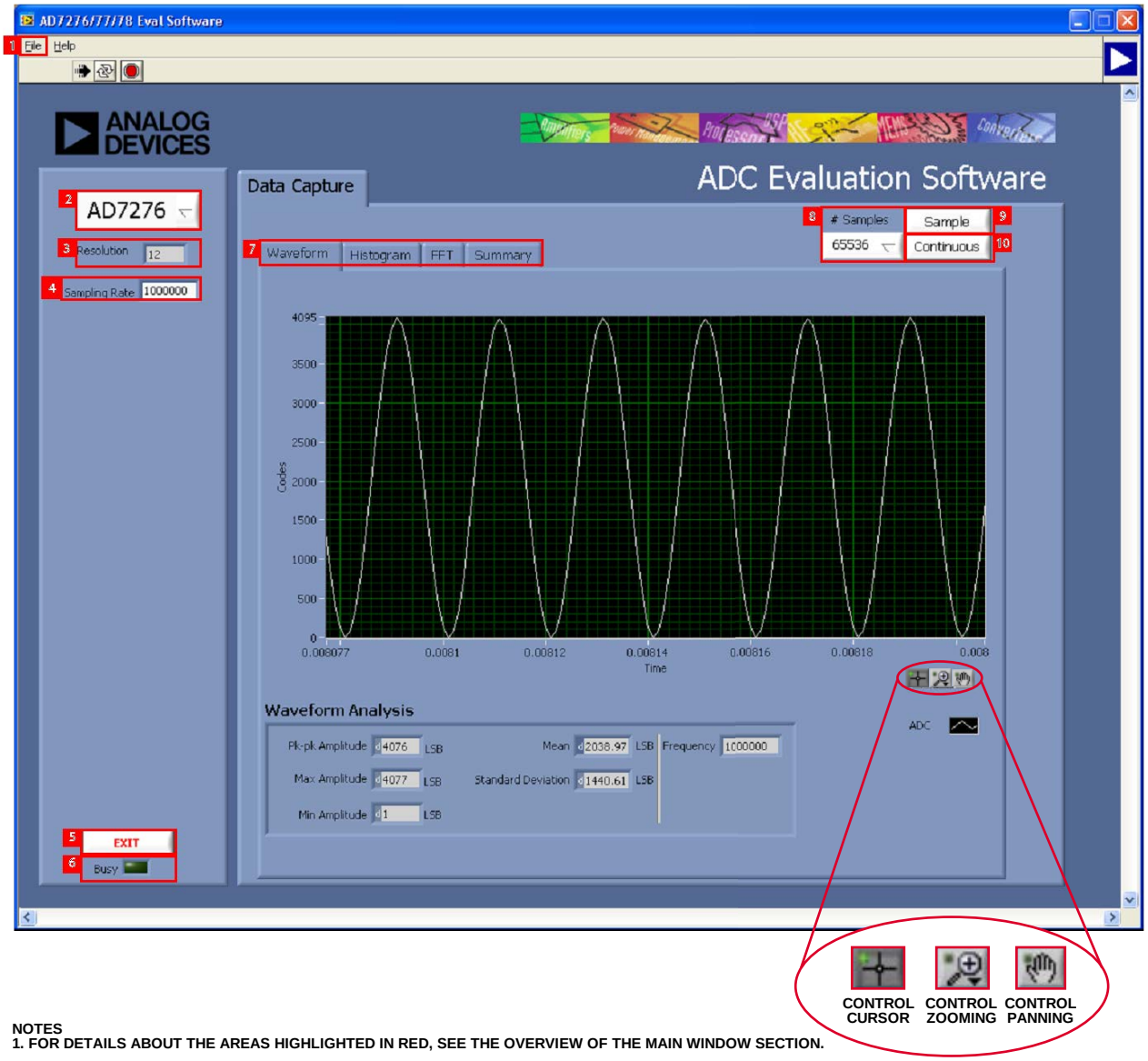


Figure 14. Connectivity Error Alert

When the software starts running, it searches for hardware connected to the PC. A dialog box indicates when the evaluation board attached to the PC is detected, and then the main window appears (see Figure 15).



NOTES
1. FOR DETAILS ABOUT THE AREAS HIGHLIGHTED IN RED, SEE THE OVERVIEW OF THE MAIN WINDOW SECTION.

Figure 15. Evaluation Software Main Window

OVERVIEW OF THE MAIN WINDOW

The main window of the software is shown in Figure 15 and has the features described in this section.

File Menu (Section 1)

The **File** menu (labeled 1 in Figure 15) offers the choice to

- **Load data**: load previously captured data or example files in .tsv (tab separated values) format for analysis (see Figure 16). (The default location for example files is **C:\Program Files\Analog Devices\EVAL-AD7276_77_78SDZ**.)
- **Save Data as .tsv**: save captured data in .tsv format for future analysis (see Figure 17).
- **Print Front Panel Picture**: print the main window to the default printer.
- **Save Picture**: save the current screen capture.
- **Exit**: quit the application.

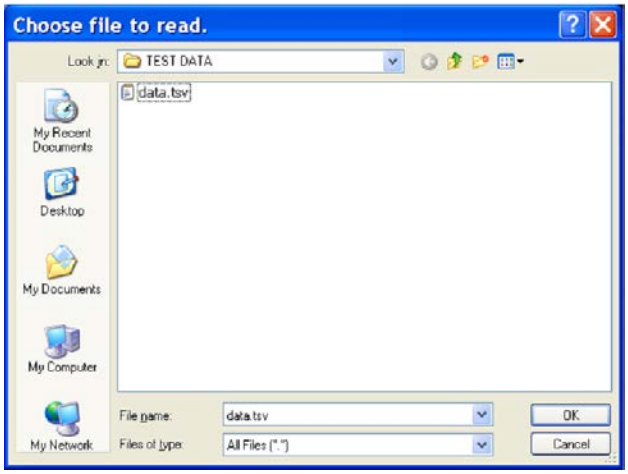


Figure 16. Load File Dialog Box:
Loading Previously Captured Data or Example Files in .tsv Format

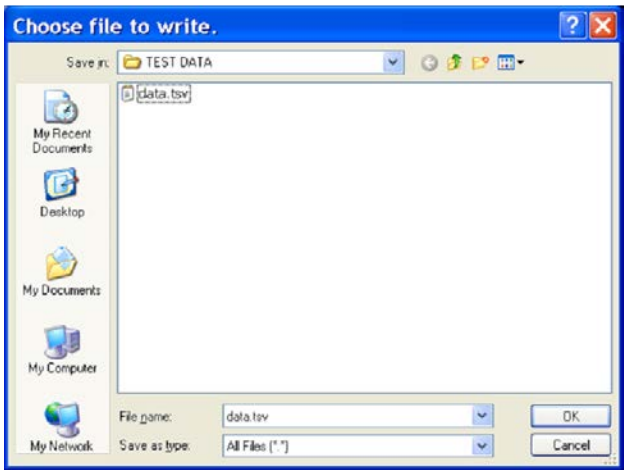


Figure 17. Save File Dialog Box:
Saving Data as .tsv

Part Information Box (Section 2)

The **Part Information** box (labeled 2 in Figure 15) displays the generic being evaluated and is for informational purposes only.

Resolution Box (Section 3)

The **Resolution** box (labeled 3 in Figure 15) displays the resolution of the AD7276 in bits.

Sampling Rate Box (Section 4)

The default sampling frequency in the **Sampling Rate** box (labeled 4 in Figure 15) matches the maximum sample rate of the ADC being evaluated. Although you can adjust the sampling frequency, there are limitations in terms of the sample frequencies that can be entered. If an unusable sample frequency is input, the software automatically adjusts the sample frequency accordingly. Units can be entered as, for example, 10k for 10,000 Hz. The software automatically adjusts the sample frequency according to the ability of the ADC being evaluated. For example, if you enter a value that is beyond the ability of the device, the software indicates this and reverts to the maximum sample frequency.

Exit Button (Section 5)

Clicking **Exit** (labeled 5 in Figure 15) closes the software. Alternatively, you can select **Exit** from the **File** menu.

Busy LED (Section 6)

The **Busy** LED (labeled 6 in Figure 15) indicates when a read from the EVAL-SDP-CB1Z board is in progress.

Tabs Area (Section 7)

There are four tabs available in the tabs area (labeled 7 in Figure 15) of the main window: **Waveform**, **Histogram**, **FFT**, and **Summary**. These tabs display the data in different formats. Navigation tools are provided within each tab to allow you to control the cursor, zooming, and panning (see Figure 15) within the graphs displayed.

Each tab is described in more detail in the Generating a Waveform Analysis Report; Generating a Histogram of the ADC Code Distribution; Generating a Fast Fourier Transform of AC Characteristics; and Generating a Summary of the Waveform, Histogram, and Fast Fourier Transform sections.

Samples Box (Section 8)

The **# Samples** box (labeled 8 in Figure 15) allows you to select the number of samples to analyze. When **Sample** or **Continuous** is clicked, the software requests this number of samples to be taken. This is the total number of samples taken on all channels.

Sample Button (Section 9)

Clicking **Sample** (labeled 9 in Figure 15) performs a single capture, acquiring a set number of samples at the selected sampling rate.

Continuous Button (Section 10)

Clicking **Continuous** (labeled 10 in Figure 15) performs a continuous capture from the ADC. Clicking **Continuous** a second time stops sampling.

GENERATING A WAVEFORM ANALYSIS REPORT

Figure 18 illustrates the waveform capture tab for a 50 kHz sine wave input signal.

The **Waveform Analysis** area (labeled 1 in Figure 18) reports the amplitudes recorded from the captured signal and the frequency of the signal tone.

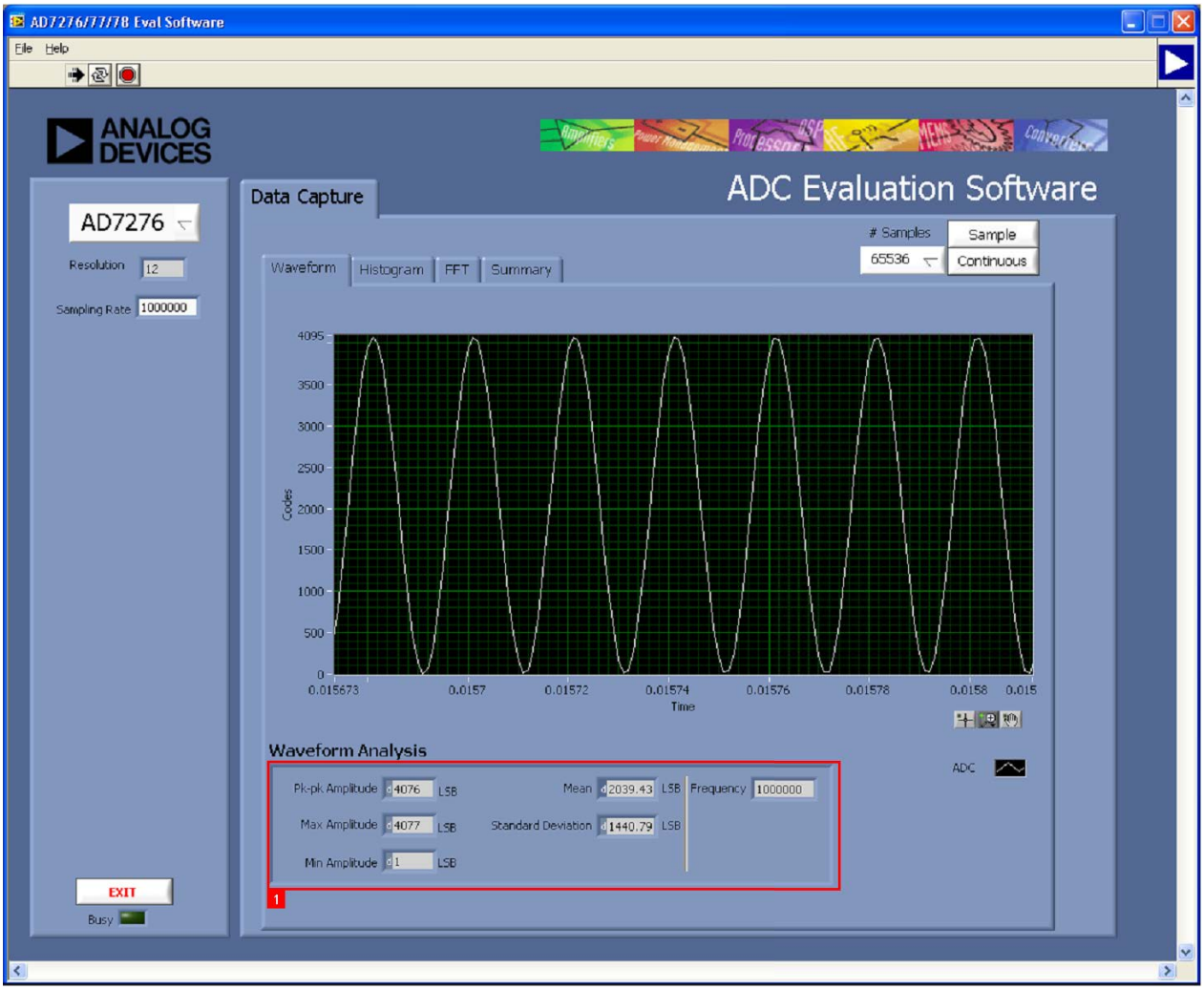


Figure 18. Waveform Tab

GENERATING A HISTOGRAM OF THE ADC CODE DISTRIBUTION

The **Histogram** tab can be used to perform ac testing or, more commonly, dc testing. This tab shows the ADC code distribution of the input and computes the mean and standard deviation, which are displayed as **Mean** and **Transition Noise**, respectively, in the **Histogram Analysis** area (labeled 1 in Figure 19).

Figure 19 shows the histogram with ac input for a 50 kHz sine wave applied to the ADC input and the resulting calculations.

AC Input

To perform a histogram test of ac input,

1. Apply a signal source to the selected analog input on the board.
2. Click the **Histogram** tab from the main window.
3. Click **Sample**.

Raw data is then captured and passed to the PC for statistical computations, and various measured values are displayed in the **Histogram Analysis** area.

DC Input

A histogram test of dc input can be performed with or without an external source because the evaluation board has a buffered $V_{REF}/2$ source at the ADC input.

To perform a histogram test of dc input,

1. If an external source is being used, apply a signal source to the selected analog input. It may be required to filter the signal to ensure that the dc source is noise-compatible with the ADC.
2. Click the **Histogram** tab from the main window.
3. Click **Sample**.

Raw data is then captured and passed to the PC for statistical computations, and various measured values are displayed in the **Histogram Analysis** area.

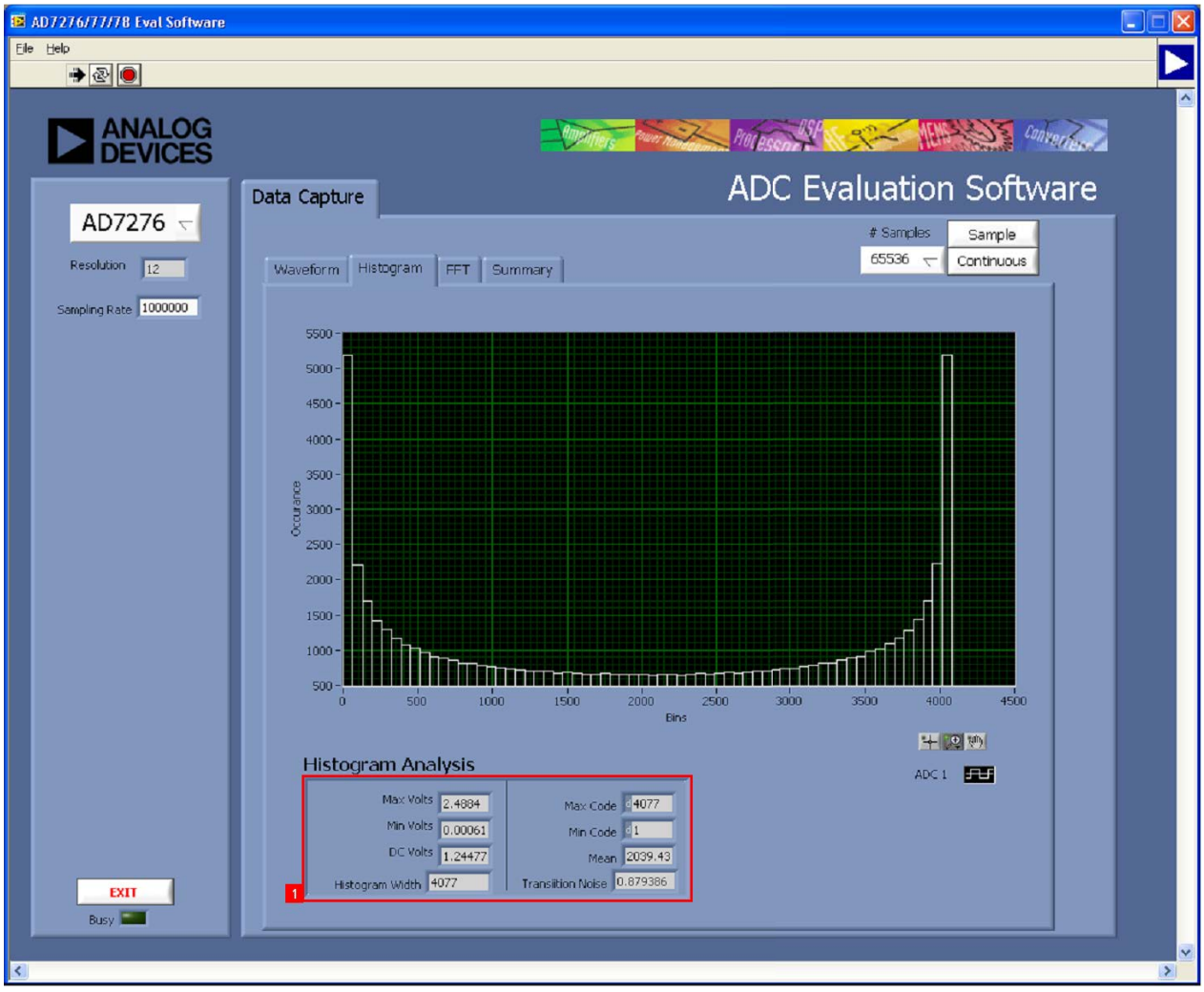


Figure 19. Histogram Tab

GENERATING A FAST FOURIER TRANSFORM OF AC CHARACTERISTICS

Figure 20 shows the **FFT** tab. This feature tests the traditional ac characteristics of the converter and displays a fast Fourier transform (FFT) of the results.

To perform an ac FFT test,

1. Apply a sinusoidal signal with low distortion (better than 115 dB) to the evaluation board at the selected analog input. To attain the requisite low distortion, which is necessary to allow true evaluation of the part, one option is to
   a. Filter the input signal from the ac source. Choose an appropriate band-pass filter based on the sinusoidal signal applied.
   b. If a low frequency band-pass filter is used when the full-scale input range is more than a few volts peak-to-peak, use the on-board amplifiers to amplify the signal, thus preventing the filter from distorting the input signal.
2. Click the **FFT** tab from the main window.
3. Click **Sample**.

As in the histogram test, raw data is then captured and passed to the PC, which performs the FFT and displays the resulting SNR, THD, and SINAD.

The **Spectrum Analysis** box displays the results of the captured data.

- The area labeled 1 in Figure 20 shows the input signal information.
- The area labeled 2 in Figure 20 displays the fundamental frequency and amplitude in addition to the second to fifth harmonics.
- The area labeled 3 in Figure 20 displays the performance data, including the SNR, THD, and SINAD.

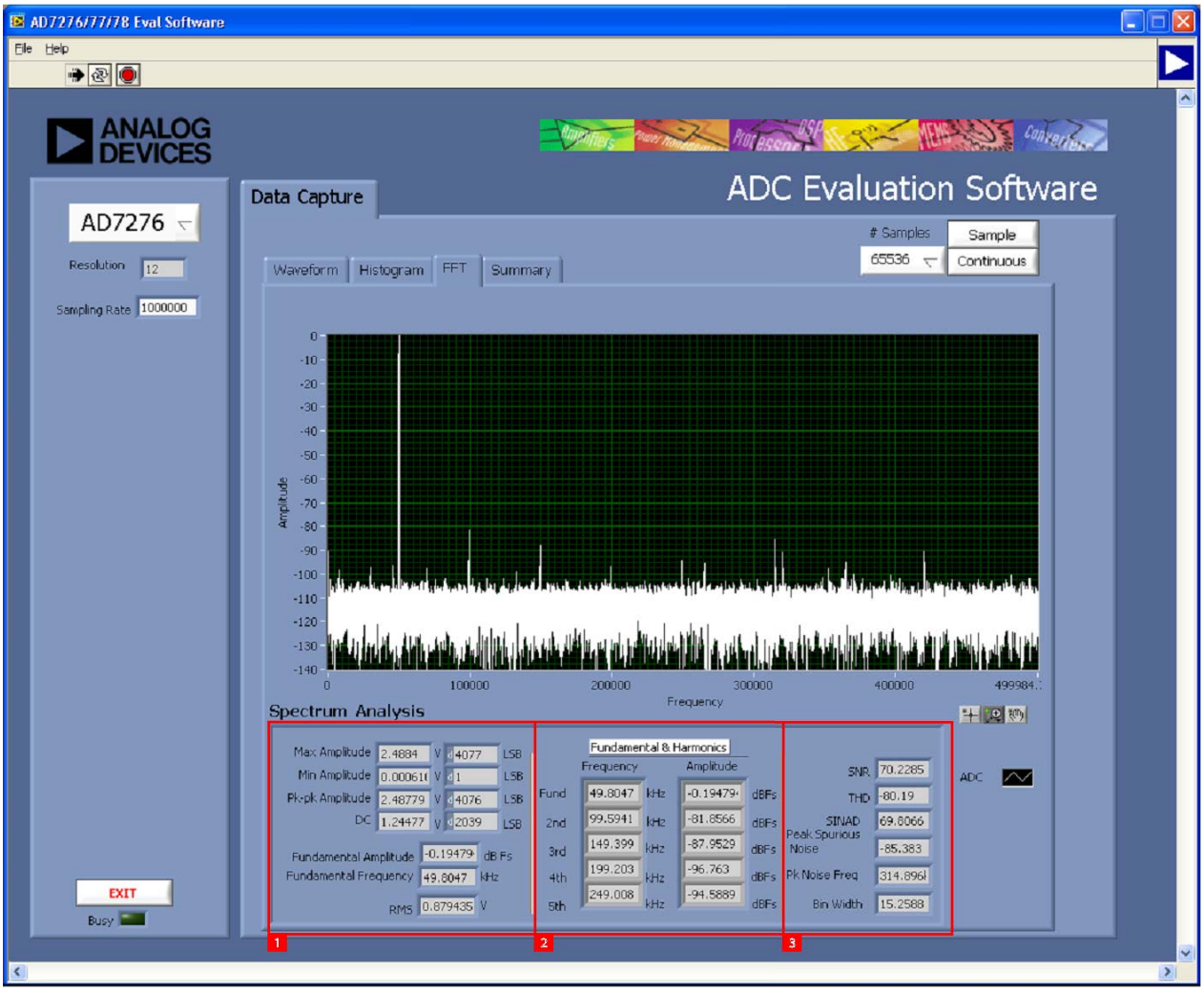


Figure 20. FFT Tab

GENERATING A SUMMARY OF THE WAVEFORM, HISTOGRAM, AND FAST FOURIER TRANSFORM

Figure 21 shows the **Summary** tab. The **Summary** tab captures all the display information and provides it in one panel with a synopsis of the information, including key performance parameters such as SNR and THD.

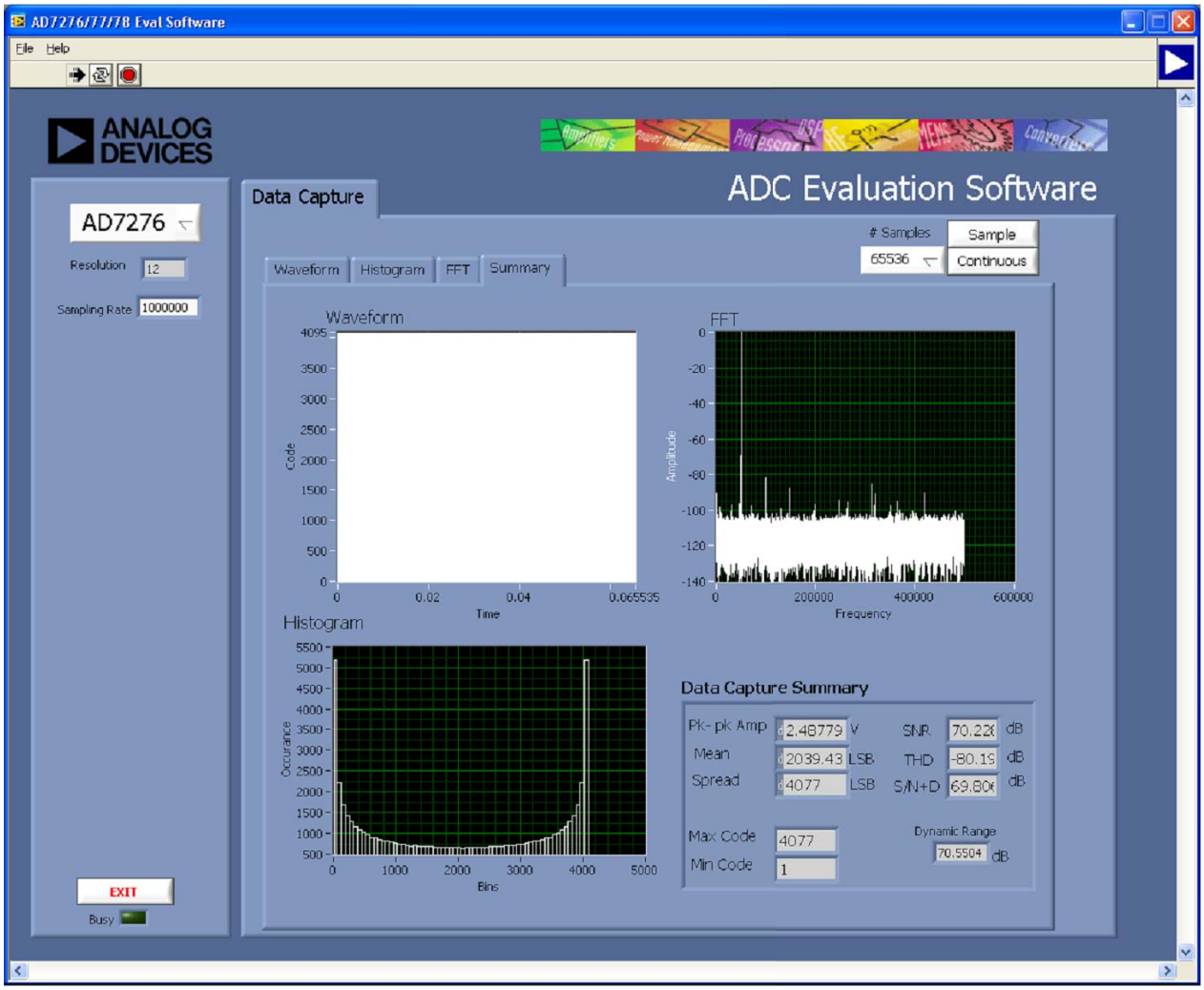


Figure 21. Summary Tab

RELATED LINKS

Resource	Description
AD7276	Product Page: 3 MSPS, 12-Bit ADC in 8-Lead MSOP
AD8022	Product Page: Dual High Speed, Low Noise Op Amp
ADA4000-1	Product Page: Single, Low Cost, Precision JFET Input Operational Amplifier
AD780	Product Page: 2.5 V/3.0 V Ultrahigh Precision Band Gap Voltage Reference
ADP1613	Product Page: 650 kHz/1.3 MHz Step-Up PWM DC-to-DC Switching Converter with 2.0 A Current Limit
ADP1720	Product Page: 50 mA, High Voltage, Micropower Linear Regulator
ADP7104	Product Page: 20 V, 500 mA, Low Noise, CMOS LDO
ADM1185	Product Page: Quad Voltage Monitor and Sequencer
ADG3308	Product Page: Low Voltage, 1.15 V to 5.5 V, 8-Channel Bidirectional Logic Level Translator
EngineerZone	Online Community: Analog Devices Online Technical Support Community
Circuits from the Lab	Reference Circuits: Circuit Designs that Have Been Built and Tested to Ensure Function and Performance and that Address Common Analog, RF/IF, and Mixed-Signal Design Challenges by Applying Analog Devices' Vast Applications Expertise

ANALOG DEVICES

www.analog.com