ADS1015EVM, ADS1115EVM, ADS1015EVM-PDK, and ADS1115EVM-PDK

This user's guide describes the characteristics, operation, and use of the ADS1015EVM and ADS1115EVM, both by themselves and as part of the ADS1015EVM-PDK or ADS1115EVM-PDK. These evaluation modules (EVMs) are evaluation boards for the ADS1115, a 16-bit multi-channel, delta-sigma analog-to-digital converter (ADC), and the ADS1015, a 12-bit version of the ADS1115. The EVM allows evaluation of all aspects of the ADS1015 or ADS1115 device. Complete circuit descriptions, schematic diagrams, and bills of material are included in this document.

The following related documents are available through the Texas Instruments web site at http://www.ti.com.

<table>
<thead>
<tr>
<th>Device</th>
<th>Literature Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADS1015</td>
<td>SBAS473</td>
</tr>
<tr>
<td>ADS1115</td>
<td>SBAS444</td>
</tr>
<tr>
<td>SN74LVC2G125</td>
<td>SCES204M</td>
</tr>
<tr>
<td>PCA9306</td>
<td>SCPS113I</td>
</tr>
</tbody>
</table>

EVM-Compatible Device Data Sheets

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1 EVM Overview

1.1 Features

ADS1015EVM/ADS1115EVM Features:
• Contains all support circuitry needed for the ADS1015/ADS1115
• Two ADS1015/ADS1115 devices onboard to demonstrate I²C™ bus functionality
• +3.3, +5V, or external power supply options for ADC
• Compatible with the TI Modular EVM System

ADS1015EVM-PDK/ADS1115EVM-PDK Features:
• Easy-to-use evaluation software for Microsoft® Windows® XP
• Data collection to text files
• Built-in analysis tools including scope, FFT, and histogram displays
• Complete control of board settings
• Easily expandable with new analysis plug-in tools from Texas Instruments

For use with a computer, the ADS1015EVM-PDK or ADS1115EVM-PDK is available. This kit combines the ADS1015/ADS1115EVM board with the MSP430-based MMB3 motherboard, and includes ADCPro™ software for evaluation.

The MMB3 motherboard allows the ADS1015/ADS1115EVM to be connected to the computer via an available USB port. This manual shows how to use the MMB3 as part of the ADS1015EVM-PDK/ADS1115EVM-PDK, but does not provide technical details about the MMB3 itself.

ADCPro is a program for collecting, recording, and analyzing data from ADC evaluation boards. It is based on a number of plug-in programs, so it can be expanded easily with new test and data collection plug-ins. The ADS1015EVM-PDK/ADS1115EVM-PDK is controlled by a plug-in running in ADCPro. For more information about ADCPro, see the ADCPro™ Analog-to-Digital Converter Evaluation Software User's Guide (literature number SBAU128), available for download from the TI web site.

This manual covers the operation of both the ADS1015/ADS1115EVM and the ADS1015EVM-PDK/ADS1115EVM-PDK. Throughout this document, the abbreviation EVM and the term evaluation module are synonymous with the ADS1015/ADS1115EVM. For clarity of reading, the rest of this manual will refer only to the ADS1115EVM or ADS1115EVM-PDK, but operation of the EVM and kit for the ADS1015 is identical, unless otherwise noted.

1.2 Introduction

The ADS1115EVM is an evaluation module built to the TI Modular EVM System specification. It can be connected to any modular EVM system interface card.

The ADS1115EVM is available as a stand-alone printed circuit board (PCB) or as part of the ADS1115EVM-PDK, which includes an MMB3 motherboard and software. As a stand-alone PCB, the ADS1115EVM is useful for prototyping designs and firmware.

Note that the ADS1115EVM has no microprocessor and cannot run software. To connect it to a computer, some type of interface is required.

2 Analog Interface

For maximum flexibility, the ADS1115EVM is designed for easy interfacing to multiple analog sources. Samtec part numbers SSW-110-22-F-D-VS-K and TSM-110-01-T-DV-P provide a convenient 10-pin, dual-row, header/socket combination at J1. This header/socket provides access to the analog input pins of the ADS1115. Consult Samtec at http://www.samtec.com or call 1-800-SAMTEC-9 for a variety of mating connector options.
All of the pins on J1 are connected directly to the ADS1115 device input pins, with no protection. Use appropriate caution when handling these pins. Table 1 summarizes the pinouts for the analog interface J1.

Table 1. J1: Analog Interface Pinout

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Signal</th>
<th>Description, ADS1015/ADS1115</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1.2</td>
<td>A0(+)</td>
<td>AIN0, Device 1 (U1)</td>
</tr>
<tr>
<td>J1.4</td>
<td>A1(+)</td>
<td>AIN1, Device 1 (U1)</td>
</tr>
<tr>
<td>J1.6</td>
<td>A2(+)</td>
<td>AIN2, Device 1 (U1)</td>
</tr>
<tr>
<td>J1.8</td>
<td>A3(+)</td>
<td>AIN3, Device 1 (U1)</td>
</tr>
<tr>
<td>J1.10</td>
<td>A0(+)</td>
<td>AIN0, Device 2 (U2)</td>
</tr>
<tr>
<td>J1.12</td>
<td>A1(+)</td>
<td>AIN1, Device 2 (U2)</td>
</tr>
<tr>
<td>J1.14</td>
<td>A2(+)</td>
<td>AIN2, Device 2 (U2)</td>
</tr>
<tr>
<td>J1.16</td>
<td>A3(+)</td>
<td>AIN3, Device 2 (U2)</td>
</tr>
<tr>
<td>J1.1-7 (odd)</td>
<td>Unused</td>
<td></td>
</tr>
<tr>
<td>J1.15</td>
<td>Unused</td>
<td></td>
</tr>
<tr>
<td>J1.9-19 (odd)</td>
<td>AGND</td>
<td>Analog ground connections (except J1.15)</td>
</tr>
<tr>
<td>J1.18, J1.20</td>
<td>Unused</td>
<td></td>
</tr>
</tbody>
</table>

3 Digital Interface

3.1 Serial Data Interface

The ADS1115EVM is designed to easily interface with multiple control platforms. Samtec part numbers SSW-110-22-F-D-VS-K and TSM-110-01-T-DV-P provide a convenient 10-pin, dual-row, header/socket combination at J3. This header/socket provides access to the digital control and serial data pins of the ADC. Consult Samtec at http://www.samtec.com or call 1-800-SAMTEC-9 for a variety of mating connector options.

All logic levels on J3 are 3.3V CMOS, except for the I2C pins. These pins conform to 3.3V I2C rules. Table 2 describes the J3 serial interface pins.

Table 2. J3: Serial Interface Pins

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Name</th>
<th>Signal Name</th>
<th>I/O Type</th>
<th>Pullup</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>J3.1-19 (odd)</td>
<td>—</td>
<td>Unused</td>
<td>—</td>
<td>None</td>
<td>Digital comparator output or conversion ready for Device 1 (U1)</td>
</tr>
<tr>
<td>J3.2</td>
<td>GPIO0</td>
<td>ALERT/RDY (U1)</td>
<td>Out</td>
<td>None</td>
<td>Digital comparator output or conversion ready for Device 1 (U1)</td>
</tr>
<tr>
<td>J3.4</td>
<td>DGND</td>
<td>DGND</td>
<td>In/Out</td>
<td>None</td>
<td>Digital ground</td>
</tr>
<tr>
<td>J3.6</td>
<td>GPIO1</td>
<td>ALERT/RDY (U2)</td>
<td>Out</td>
<td>None</td>
<td>Digital comparator output or conversion ready for Device 2 (U2)</td>
</tr>
<tr>
<td>J3.8</td>
<td>GPIO2</td>
<td>Unused</td>
<td>—</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>J3.10</td>
<td>DGND</td>
<td>DGND</td>
<td>In/Out</td>
<td>None</td>
<td>Digital ground</td>
</tr>
<tr>
<td>J3.12</td>
<td>GPIO3</td>
<td>Unused</td>
<td>—</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>J3.14</td>
<td>GPIO4</td>
<td>Unused</td>
<td>—</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>J3.16</td>
<td>SCL</td>
<td>SCL</td>
<td>I2C</td>
<td>High</td>
<td>I2C clock</td>
</tr>
<tr>
<td>J3.18</td>
<td>DGND</td>
<td>DGND</td>
<td>In/Out</td>
<td>None</td>
<td>Digital ground</td>
</tr>
<tr>
<td>J3.20</td>
<td>SDA</td>
<td>SDA</td>
<td>I2C</td>
<td>High</td>
<td>I2C data</td>
</tr>
</tbody>
</table>
4 Power Supplies

J2 is the power-supply input connector. Table 3 lists the configuration details for J2.

Table 3. J2 Configuration: Power-Supply Input

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Name</th>
<th>Function</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>J2.1</td>
<td>+VA</td>
<td>External analog supply</td>
<td>If 3.3 or 5V supplies not used</td>
</tr>
<tr>
<td>J2.2</td>
<td>–VA</td>
<td>Unused</td>
<td>No</td>
</tr>
<tr>
<td>J2.3</td>
<td>+5VA</td>
<td>Unused</td>
<td>No</td>
</tr>
<tr>
<td>J2.4</td>
<td>–5VA</td>
<td>Unused</td>
<td>No</td>
</tr>
<tr>
<td>J2.5</td>
<td>DGND</td>
<td>Digital ground input</td>
<td>Yes</td>
</tr>
<tr>
<td>J2.6</td>
<td>AGND</td>
<td>Analog ground input</td>
<td>Yes</td>
</tr>
<tr>
<td>J2.7</td>
<td>+1.8VD</td>
<td>Unused</td>
<td>No</td>
</tr>
<tr>
<td>J2.8</td>
<td>VD1</td>
<td>Unused</td>
<td>No</td>
</tr>
<tr>
<td>J2.9</td>
<td>+3.3VD</td>
<td>3.3V digital supply</td>
<td>If 5V or external supplies not used</td>
</tr>
<tr>
<td>J2.10</td>
<td>+5VD</td>
<td>+5V digital supply</td>
<td>If 3.3V or external supplies not used</td>
</tr>
</tbody>
</table>

4.1 Power Options

JMP1 is arranged as four rows, each of which can be shorted. Table 4 lists the power option details for JMP1. For normal operation, all jumpers should be installed.

Table 4. JMP1 Configuration: Power Options

<table>
<thead>
<tr>
<th>Row</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>VDD1</td>
<td>Supply current measurement point for Device 1. Must be connected for operation.</td>
</tr>
<tr>
<td>3-4</td>
<td>VDD2</td>
<td>Supply current measurement point for Device 2. Must be connected for operation.</td>
</tr>
<tr>
<td>5-6</td>
<td>VDD</td>
<td>Supply current measurement point for the other digital devices. Must be connected for operation.</td>
</tr>
<tr>
<td>7-8</td>
<td>GND</td>
<td>Connects DGND to AGND.</td>
</tr>
</tbody>
</table>

Switch S1 selects the supply voltage used to feed JMP1 and the respective VDDs shown in Table 4. S1 may be switched to +VA, +5VD, or +3.3VD from power connector J2.

5 EVM Operation

This section provides information on the analog input, digital control, and general operating conditions of the ADS1115EVM.

5.1 Analog Input

Each of the analog input sources can be applied directly to J1 (top or bottom side) or through signal-conditioning modules available for the modular EVM system.

5.2 Digital Control

The digital control signals can be applied directly to J3 (top or bottom side). The modular ADS1115EVM can also be connected directly to a DSP or microcontroller interface board, such as the 5-6K Interface or HPA-MCU Interface boards available from Texas Instruments, or the MMB3 if purchased as part of the ADS1115EVM-PDK. For a list of compatible interface and/or accessory boards for the EVM or the ADS1115, see the relevant product folder on the TI web site.
5.3 Default Jumper Settings and Switch Positions

Figure 1 shows the jumpers found on the EVM and the respective factory default conditions for each.

Table 5 lists the switches found on the EVM and the respective factory default conditions for each.

<table>
<thead>
<tr>
<th>Switch</th>
<th>Position</th>
<th>Switch Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Right (default)</td>
<td>VDD = +3.3VD</td>
</tr>
<tr>
<td></td>
<td>Center</td>
<td>VDD = +5VD</td>
</tr>
<tr>
<td></td>
<td>Left</td>
<td>VDD = +VA</td>
</tr>
</tbody>
</table>

6 ADS1115EVM-PDK Kit Operation

This section provides information on using the ADS1115EVM-PDK, including setup, program installation, and program usage.

To prepare to evaluate the ADS1115 with the ADS1115EVM-PDK, complete the following steps:

Step 1. Install the ADCPro software (if not already installed) on a PC.
Step 2. Install the ADS1115EVM-PDK EVM plug-in software.
Step 3. Complete the USB driver installation process.
Step 4. Set up the ADS1115EVM-PDK.
Step 5. Connect the ADS1115EVM-PDK to the computer with a USB cable.
Step 6. Run the ADCPro software.

Each task is described in the subsequent sections of this document.
6.1 Installing the ADCPro Software

CAUTION
Do not connect the ADS1115EVM-PDK before installing the software on a suitable PC. Failure to observe this caution may cause Microsoft Windows to not recognize the ADS1115EVM-PDK as a connected device.


To install the ADS1115EVM-PDK plug-in, run the file: **ads1115evm-pdk-plug-in-1.0.0.exe** (1.0.0 is the version number, and increments with software version releases). Double-click the file to run it; then follow the instructions shown. You can also use the ADCPro Update Check feature to check for newer versions of the ADS1115EVM-PDK plug-in, once you have installed a version of it.

Follow the on-screen prompts. Once the ADCPro plug-in installs, you will be prompted to install the Virtual COM port driver as shown in Figure 2.

![Figure 2. Virtual COM Port Installer](image1.png)

Press OK, and the screen shown in Figure 3 displays.

![Figure 3. Virtual COM Port Setup](image2.png)

If you already have a TUSB3410 Virtual COM port driver installed on your system, select Cancel; otherwise, press Setup and follow the on-screen prompts. You may be notified that the driver is not digitally signed. If this occurs, select Continue Anyway and proceed.
6.2 Setting Up the ADS1115EVM-PDK

The ADS1115EVM-PDK contains both the ADS1115EVM and the MMB3 motherboard; however, the devices are shipped unconnected. Follow these steps to set up the ADS1115EVM-PDK.

Step 1. Unpack the ADS1115EVM-PDK kit.

Step 2. Set the switches on the MMB3 as described below, as Figure 4 illustrates.

- Set switch SW4 to the right.
- Set the DAC switch (SW5) to the OUT position (to the right).

![Figure 4. MMB3 Switch Locations](image-url)
Step 3. Plug the ADS1115EVM into the MMB3 as Figure 5 illustrates.

![Figure 5. Connecting ADS1115EVM to MMB3](image)

Step 4. Set the jumpers and switches on the ADS1115EVM as shown in Figure 1 (note that these settings are the factory-configured settings for the EVM).
6.2.1 About the MMB3

The MMB3 is a Modular EVM System motherboard. It is designed around the MSP430F449, a low-power microcontroller from Texas Instruments. Figure 6 shows a block diagram of the MMB3.

Figure 6. MMB3 Block Diagram

The MMB3 was designed to be used as a stand-alone demonstration platform for low-speed data converters. It features an onboard, 20-bit digital-to-analog converter (DAC) that can be used as a signal source for an ADC under test, and has a joystick for control of functions on the board when it is not controlled by a PC. **These features are experimental and not supported in the ADS1115EVM-PDK at this time.**

The MMB3 derives power from the USB interface, and generates +5VD, 3.3V, and 1.8V, as well as +5VA and –5VA and ±10V. The ±10V is supplied to the daughtercard power connector as +VA and –VA.

**CAUTION**

When using the ADS1115EVM connected to the MMB3, do not move switch S1 to the +VA position. This switch position will apply +10V to the devices on the EVM and damage the EVM.

The MMB3 is not sold as a microcontroller development board, and it is not available separately. TI cannot offer support for the MMB3 except as part of an EVM kit. For schematics or other information about the MMB3, contact Texas Instruments.
6.3 **EVM Power Supply**

The ADS1115EVM-PDK is powered completely from the USB connection on the MMB3. The MMB3 provides 3.3V and 5V to the ADS1115EVM.

6.4 **Running the Software and Download of Firmware to MMB3**

**NOTE:** The software is continually under development. These instructions and screen images are current at the time of this writing, but may not exactly match future releases.

The program for evaluating the ADS1115EVM-PDK is called *ADCPro*. This program uses plug-ins to communicate with the EVM. The ADS1115EVM-PDK plug-in is included in the ADS1115EVM-PDK package.

The program currently runs only on Microsoft Windows platforms of Windows XP; Windows Vista is **NOT** supported.

If this is the first time installing ADCPro and plug-ins, follow these procedures to run ADCPro and perform any necessary firmware installations. Make sure the ADCPro software and device plug-in software are installed as described in Section 6.1.

**Step 1.** Start the software by selecting *ADCPro* from the Windows Start menu. The screen in Figure 7 appears.

![Figure 7. ADCPro Software Start-up Display Window](https://www.ti.com/images/adcpro/startup.png)
Step 2. Select ADS1115EVM from the EVM drop-down menu. The ADS1115EVM-PDK plug-in appears in the left pane, as Figure 8 shows.

![Figure 8. ADS1115EVM-PDK Plug-In Display Window](image)

Step 3. The ADS1115EVM-PDK plug-in window has a status area at the top of the screen. When the plug-in is first loaded, the plug-in searches for the board. You will see a series of messages in the status area indicating this action.
Step 4. If the plug-in cannot connect to the EVM, you will see a window as shown in Figure 9. This message may indicate that the firmware is not loaded on the MMB3. You may select Retry Auto Connect; if that action fails, select Retry Manual Connect and specify the COM port to be used.

![Connection Timeout Warning](image)

Figure 9. Connection Timeout

Step 5. The plug-in will detect whether or not the board has the correct firmware loaded. The first time you use the ADS1115EVM-PDK, the firmware for the MMB3 may need to be downloaded to the MMB3. If the firmware needs to be loaded, you will see a screen as shown in Figure 10.

![Firmware Download Message Box](image)

Figure 10. Firmware Download Message Box
Switch the BSL switch (SW4) on the MMB3 to the BSL position (to the left) as instructed, then press OK. The plug-in will download the firmware to the MMB3. This operation may take a couple of minutes, so the progress is updated in the message at the top of the ADS1115 plug-in window (as Figure 11 shows). The firmware is saved in flash memory on the MMB3, so this operation should only need to be performed once.

![Firmware Download Progress Indicator](image.png)

Figure 11. Firmware Download Progress Indicator
When the firmware download completes, the message box shown in Figure 12 appears. Follow the on-screen instructions and the plug-in should now connect to the EVM.

![Figure 12. Firmware Download Complete Message Box](image)

7 Evaluating Performance with the ADCPro Software

The evaluation software is based on ADCPro, a program that operates using a variety of plug-ins. To use ADCPro, load an EVM plug-in and a test plug-in. To load an EVM plug-in, select it from the EVM menu. To load a test plug-in, select it from the Test menu. To unload a plug-in, select the Unload option from the corresponding menu.

Only one of each kind of plug-in can be loaded at a time. If you select a different plug-in, the previous plug-in is unloaded.

7.1 Using the ADS1115EVM-PDK Plug-in

The ADS1115EVM-PDK plug-in for ADCPro provides complete control over all settings of the ADS1115. It consists of a tabbed interface (see Figure 13), with different functions available on different tabs. These controls are described in this section.

You can adjust the ADS1115EVM settings when you are not acquiring data. During acquisition, all controls are disabled and settings may not be changed. The ADS1115EVM plug-in always collects data from both ADS1115 devices on the EVM, so you must be sure to have both devices configured as desired in order to collect meaningful data.

When you change a setting on the ADS1115EVM plug-in, the setting immediately updates on the board. Settings on the ADS1115EVM correspond to settings described in the ADS1115 product data sheet (available for download at www.ti.com) for details.
7.1.1 Data Rate and Sampling Information

The **Data Rate** control on the main plug-in window sets the data rate for both ADS1115 converters on the EVM. It is a requirement of the ADCPro software that both devices operate at the same data rate. The ADS1115EVM-PDK always operates the device in continuous conversion mode; one-shot power-down mode is not supported.

The ADS1115EVM-PDK allows the **Data Rate** control to set the data rate to 8, 16, 32, 64, 128, 250, 475, or 860 samples per second (SPS). Note that the data rate can go quite low; therefore, if the block size is large, the time it takes to collect a block of data can be quite long. It is advisable to first test collection at the higher data rates. Once a test is known to work properly, drop down to the lower data rate and allow sufficient time to collect the data.

The ADS1015EVM-PDK allows the **Data Rate** control to set the data rate to 128, 256, 500, 920, 1600, 2500, or 3300 SPS. The MMB3 does not have the capability to send every sample at data rates above 920 SPS; when a data rate higher than this is selected, the data points collected will not be continuous. The ADS1015 will operate at the higher data rate, but data will be collected at 920 SPS, skipping some data points.

Note that both the ADS1115 and ADS1015 have internal clocks with a ±10% accuracy. If performing FFT tests, frequencies may appear to be incorrect as a result of this tolerance range. At data rates above 920 SPS, the sample rate reported to test plug-ins will be 920 SPS so that FFT tests should run properly.

The ADS1115EVM-PDK plug-in has a tabbed interface, with two different tabs to control the other functions of the two ADS1115s on the EVM. These tabs are described below.
7.1.2 Device 1 Tab

This tab, shown in Figure 13, is the primary tab that controls all features of the ADS1115. Device 1 refers to U1 on the ADS1115EVM.

Figure 13. Device 1 Tab
Evaluating Performance with the ADCPro Software

The I2C Address groupbox contains controls related to the setting of the I2C address of Device 1. The JMP2 Settings control is set up to mimic the layout of JMP2 on the EVM. When, for example, a jumper is installed in the rightmost position, connecting the ADS1115 ADDR pin to GND, the GND radio button should be selected here.

Whenever the JMP2 settings are changed, the I2C address of the device is changed, and the corresponding address value is shown in the 7 bit and 8 bit indicators. The 7 bit indicator shows the address considering only the seven bits that set the address of the device; the 8 bit indicator reflects how a byte would actually be viewed if the eighth bit (the R/W bit) is set to zero.

The ACK light will reflect whether or not the address selected returns an I2C acknowledgement. If this light is red, then no device was found at that address. This result may indicate that the jumper settings on the EVM do not match the selection in the JMP2 Settings. A red light may also indicate that the two devices on the board have been set to the same I2C address, and this state will be indicated by a message at the top of the plug-in that says I2C Address Conflict. The two devices on the ADS1115EVM must be set for different I2C addresses in order for the plug-in to operate. When a valid I2C address is selected, the ACK light will turn green, indicating that a valid address has been found on the bus.

The Mux Setting control determines which set of inputs is used, displayed as AINP:AINN, where AINP is the input connected to the positive input of the ADC, and AINN is the input connected to the negative input of the ADC. Selections available are AIN0:AIN1, AIN0:AIN3, AIN1:AIN3, AIN2:AIN3, AIN0:GND, AIN1:GND, AIN2:GND, or AIN3:GND.

The PGA Gain control sets the PGA gain. Selections available are 0.66666, 1, 2, 4, 8, or 16.

The Comparator groupbox contains controls related to the comparator functions of the ADS1115. The Queue control selects whether to Disable Comparator, or to enable the comparator and have it Assert after one conversion, Assert after two conversions, or Assert after four conversions. The comparator output status is reflected by the D1 LED on the EVM.

The Mode switch allows selection of the comparator mode, either Traditional or Window. The Action switch selects between Non-latching or Latching operation, and the Polarity switch determines if the ALERT output of the device is Active Low or Active High. More details on these settings can be found in the product data sheet.

The LO_THRESH and HI_THRESH controls set the numbers that are placed in corresponding low and high threshold registers of the ADS1115. These numbers are displayed and entered in decimal format.

7.1.3 Device 2 Tab

This tab is identical to the Device 1 tab, but controls the settings for Device 2, which is U2 on the ADS1115EVM.
7.1.4 About Tab

The About tab displays information about the EVM and software, as shown in Figure 14.

![Figure 14. About Tab](image)

The Plugin Version and Firmware Version indicators show the version numbers of the plug-in and firmware code, respectively.

The Notes indicator will show manufacturing information about the EVM that is stored in the EVM EEPROM, and may show relevant notes about the plug-in or firmware code, if there are any.
7.1.5 Collecting Data

Once you have configured the ADS1115 for your test scenario, press the ADCPro Acquire button to start the collection of the number of datapoints specified in the Test plug-in Block Size control. The ADS1115EVM-PDK plug-in disables all the front panel controls while acquiring, and displays a progress bar as shown in Figure 15.

Figure 15. Progress Bar While Collecting Data

For more information on testing analog-to-digital converters in general and using ADCPro and Test plug-ins, refer to the ADCPro User Guide.
7.2 Troubleshooting

- If the ADS1115EVM plug-in cannot find the ADS1115EVM-PDK, press the USB RESET button on the MMB3 (refer to Figure 4) and try again.
- If the MMB3 board is unable to be detected, there may be conflicting settings for the COM port assignments on your PC that requires manual configuration.
  1. Open the Device Manager application under Windows. You should observe an item entitled USB-Serial Port under the Ports (COM&LPT) menu.
  2. If the USB - Serial Port is configured to use a COM port already in use, you can either disable the current use for the port OR configure the USB-Serial Port as a COM port that is not used. To do this:
     (a) Select the COM port item and right-click to access the Properties menu.
     (b) In the properties, select the Port Settings tab.
     (c) Select the Advanced button.
     (d) Select the desired COM port setting from the COM Port Number control. This control will note if the COM port is in use or open.
  3. Press the USB RESET button on the MMB3 to reconnect.
- If ADCPro stops responding while the ADS1115EVM-PDK is connected, try unplugging the USB cable from the PDK. Unload and reload the plug-in before reapplying power to the PDK.

8 Schematics and Layout

Schematics for the ADS1015EVM and ADS1115EVM are appended to this user’s guide. The bill of materials is provided in Table 6.
NOTE: All components should be compliant with the European Union Restriction on Use of Hazardous Substances (RoHS) Directive. Some part numbers may be either leaded or RoHS. Verify that purchased components are RoHS-compliant. (For more information about TI's position on RoHS compliance, see the TI web site.)

### Table 6. ADS1015EVM/ADS1115EVM Bill of Materials

<table>
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<th>Item No.</th>
<th>Qty</th>
<th>Value</th>
<th>Ref Des</th>
<th>Description</th>
<th>Vendor</th>
<th>Part Number</th>
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<td>Texas Instruments</td>
<td>6511174</td>
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<td>6</td>
<td>0.1μF</td>
<td>C1, C2, C3, C4, C5, C6</td>
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<td>Panasonic</td>
<td>ECJ-1V81C104K</td>
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<td></td>
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<td>Samtec</td>
<td>TSM-110-01-L-DV-P</td>
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<tr>
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<td></td>
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<td>Samtec</td>
<td>SSW-110-22-F-D-VS-K</td>
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<td></td>
<td>J2A</td>
<td>10-pin SMT Plug</td>
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<td>E-Switch</td>
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<td>Texas Instruments</td>
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<td>Samtec</td>
<td>SNT-100-BK-G-H</td>
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EVM Warnings and Restrictions

It is important to operate this EVM within the input voltage range of 2V to +5.5V and the output voltage range of 2V to +5.5V. Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than +40°C. The EVM is designed to operate properly with certain components above +40°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.
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