

Evaluating the **ADUX1020** Photometric Sensor for Gesture and Proximity

FEATURES

ADUX1020 full configuration

Register level

Parameter level

Graph views

Time series view

Gesture recognition view

UDP transfer capability

EVALUATION KIT CONTENTS

ADUX1020-EVAL-MCM standard evaluation board

ADUX1020-EVAL-SMALL breakout board

EVAL-SDP-CB1Z controller board

Mini USB cable

ADDITIONAL EQUIPMENT NEEDED

PC running Windows 7 operating system

ADUX1020-EVALZ-LED daughterboard (optional)

ONLINE RESOURCES

ADUX1020 data sheet

Optical Gesture Evaluation Tool

GENERAL DESCRIPTION

The **ADUX1020-EVAL-SDP** evaluation kit provides users with a simple means of interfacing with the **ADUX1020**, collecting data from the **ADUX1020**, and evaluating gesture recognition capabilities.

The **ADUX1020-EVAL-SDP** is a kit that includes the **ADUX1020-EVAL-SMALL** and the **ADUX1020-EVAL-MCM**.

The evaluation kit requires the **Optical Gesture Evaluation Tool**, which can be downloaded from the **ADUX1020-EVAL-SDP** product page, a graphical user interface (GUI) that provides users with low level and high level configurability, real-time data analysis, and user datagram protocol (UDP) transfer capability so the evaluation board can easily interface to a PC.

The USB port of the PC powers the **ADUX1020-EVAL-SDP** kit. On-board voltage regulators provide voltage supplies for the **ADUX1020**.

The evaluation board schematics indicate signal names for easy identification. For additional information on the functionality of the **ADUX1020**, refer to the **ADUX1020** data sheet.

ADUX1020-EVAL-SDP EVALUATION KIT PHOTOGRAPH

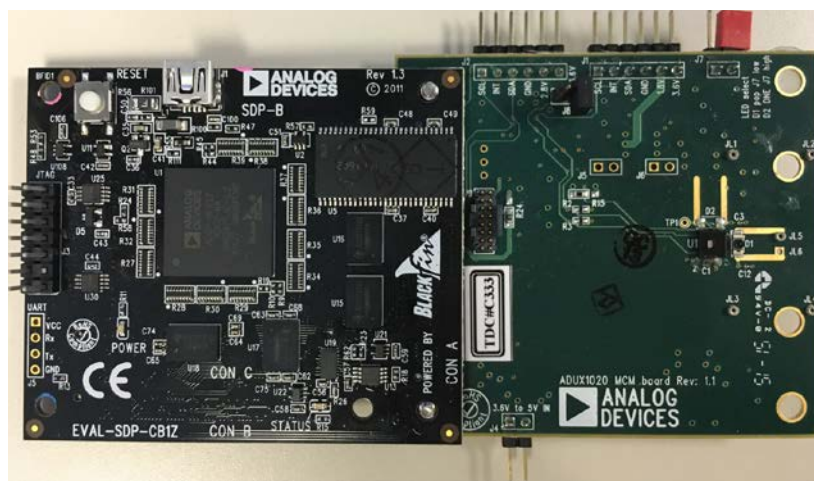


Figure 1.

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REVISION HISTORY

6/2016—Revision 0: Initial Version

EVALUATION BOARD SOFTWARE QUICK START PROCEDURES

INSTALLING THE OPTICAL GESTURE EVALUATION TOOL

Download the [Optical Gesture Evaluation Tool](#) software package from the [ADUX1020-EVAL-SDP](#) product page. Unzip the downloaded software folder, run the enclosed `ADI_OpticalGesture_EvaluationTool.exe` file, and follow the prompts for installing the [Optical Gesture Evaluation Tool](#) software (see Figure 2). For further information, follow the full installation guide included with the [Optical Gesture Evaluation Tool](#) software in the downloaded folder.

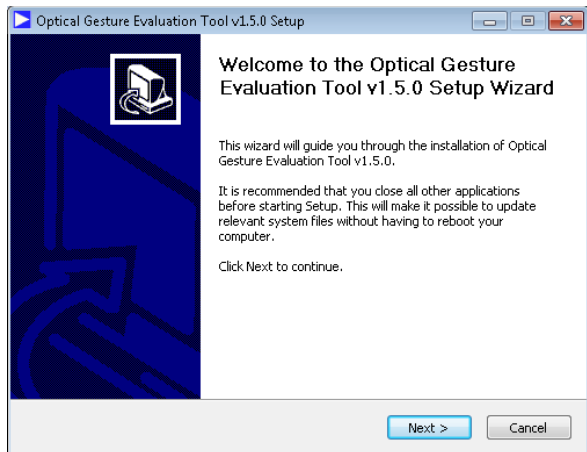


Figure 2. *Optical Gesture Evaluation Tool Setup*

To start the [Optical Gesture Evaluation Tool](#) application, navigate to the `ADI_OpticalGesture_EvaluationTool` from the **Start** menu and click the `ADI_OpticalGesture_EvaluationTool` icon (see Figure 3).

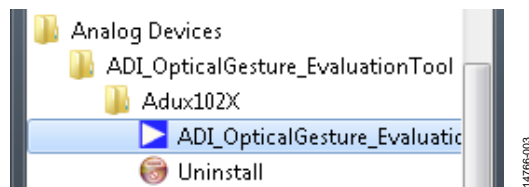


Figure 3. *Navigate to **Optical Gesture Evaluation Tool** from **Start** Menu*

At startup, the [Optical Gesture Evaluation Tool](#) application automatically checks if the installed [Optical Gesture Evaluation Tool](#) software version is up to date. If there is a newer version available, the user is prompted to download the newest version.

EVALUATION BOARD USB CONNECTION

Ensure the provided [EVAL-SDP-CB1Z](#) controller board and [ADUX1020-EVAL-MCM](#) connect together and connect to a PC via the USB cable included with the evaluation kit. After the [Optical Gesture Evaluation Tool](#) application opens, click **File > Connect** (see Figure 4) and select **SDP ASIC Bridge (Debug)**. The [Optical Gesture Evaluation Tool](#) then acknowledges the [ADUX1020-EVAL-SDP](#) kit is connected.

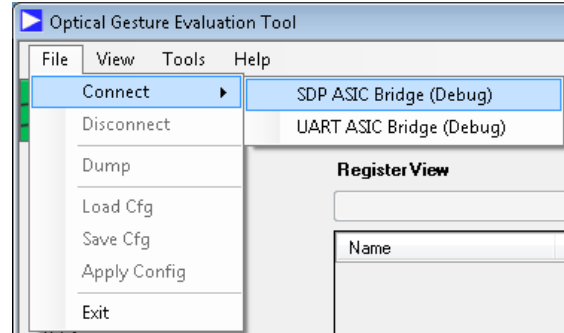


Figure 4. *SDP ASIC Connection*

CONFIGURING THE ADUX1020-EVAL-SDP EVALUATION KIT

Before operating the [ADUX1020-EVAL-SDP](#) kit, connect any jumper across Header J7 on the [ADUX1020-EVAL-MCM](#). If using the [ADUX1020-EVALZ-LED](#) daughterboard, disconnect the jumper from Header J7.

To operate the [ADUX1020](#) in gesture detect mode, click **File > Load Cfg**. Select the `004_ADUX1020_StandardR1.dcfg` file and click **Open** (see Figure 5).

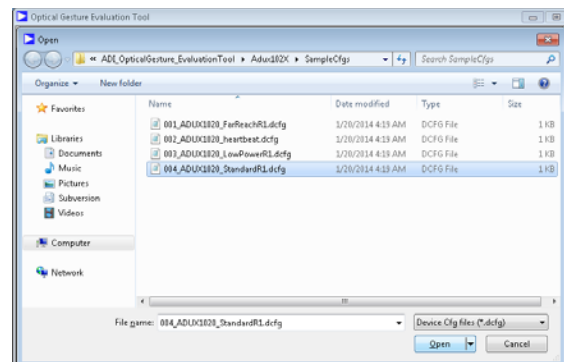


Figure 5. *Loading the Configuration File*

Next, click **View > Off-Chip Analysis and Gesture View** to open the **Graph XYI** tab (see Figure 6). With the evaluation board positioned so there are no objects around it within at least a 20 cm radius, click the **Channel Auto Calibration** button to calibrate the [ADUX1020-EVAL-SDP](#) kit. The [Optical Gesture Evaluation Tool](#) then acknowledges if calibration is successful.

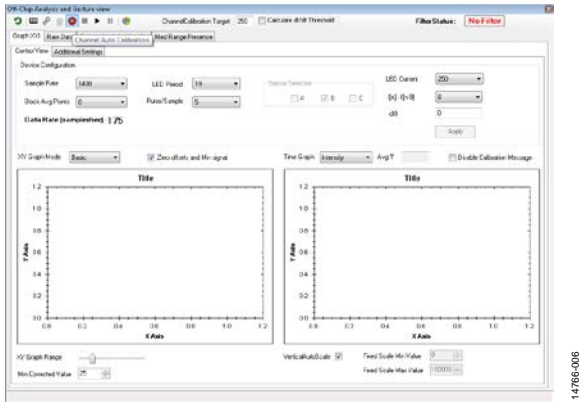


Figure 6. Running the Channel Auto Calibration

STREAMING DATA

Press the **Play** button to begin streaming data from the evaluation board. Move an object or hand within 15 cm above the **ADUX1020** to see the corresponding output of the device on the graphs. The **Y Ratio vs X Ratio** graph shows the calculated x, y position of the object above the device (see Figure 7). The **Intensity** graph shows the average intensity of reflected light seen by the device, represented in ADC codes.

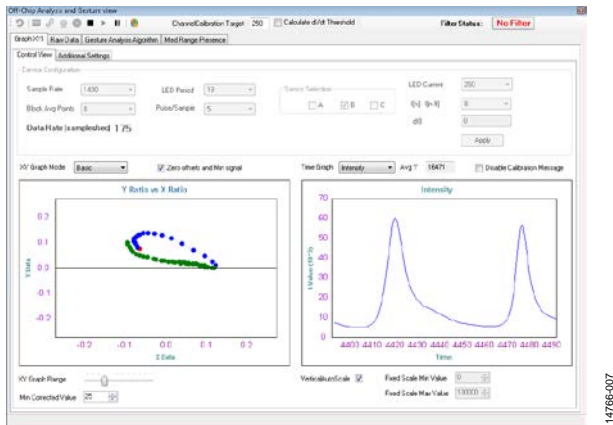


Figure 7. Graph of Streaming Data

GESTURE RECOGNITION

To view the gesture recognition capability, navigate to the **Gesture Analysis Algorithm** tab and select **LSLF Swipe determination** from the drop-down menu. Click the **Play** button if the device is not already streaming data.

Move a hand within 15 cm above the device and swipe in any of the four indicated directions. Alternatively, the center indicator can be activated by quickly lowering a hand towards the sensor (see Figure 8).

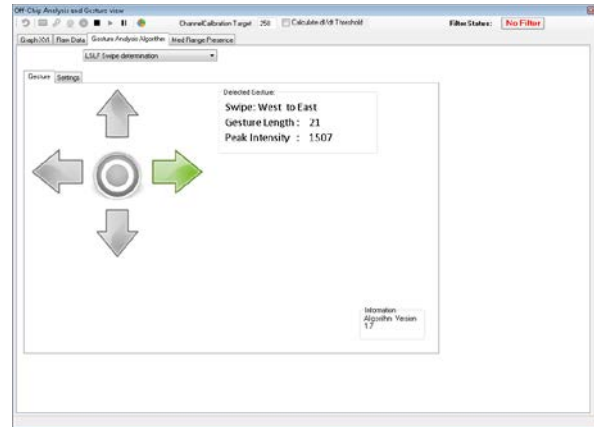


Figure 8. Gesture Recognition Algorithm Tab

For more detailed information [Optical Gesture Evaluation Tool](#) and additional features of the software, see the **Optical Gesture Evaluation Tool User Manual**, which can be found in the **Help > Help Topics** menu.

ADDITIONAL EVALUATION BOARDS

HIGH POWER LED DAUGHTERBOARD

The [ADUX1020-EVALZ-LED](#) is an optional daughterboard for the standard [ADUX1020-EVAL-MCM](#) evaluation board. It functions as a high-power LED driver intended for gesture recognition at distances greater than 15 cm.

To use the [ADUX1020-EVALZ-LED](#), attach it to the [ADUX1020-EVAL-MCM](#) evaluation board as shown in Figure 9. The daughterboard connects to the [ADUX1020-EVAL-MCM](#) via five pins, labeled on the daughterboard as GND, GND1, LEDX, 3.3V, and VLED. These pins on the daughterboard plug into five similarly spaced test points on the [ADUX1020-EVAL-MCM](#) labeled JL1, JL2, JL3, JL4, and JL5. When connecting the [ADUX1020-EVALZ-LED](#), ensure Header J7 on the [ADUX1020-EVAL-MCM](#) is not connected, as shown in Figure 9.

Operation and configuration of the [ADUX1020-EVAL-SDP](#) with the [ADUX1020-EVALZ-LED](#) daughterboard follows the instructions listed in the Evaluation Board Software Quick Start Procedures section.



Figure 9. Connecting the [ADUX1020-EVALZ-LED](#) Daughterboard

SMALL FORM-FACTOR BREAKOUT BOARD

The [ADUX1020-EVAL-SMALL](#) is a small form-factor breakout board (see Figure 10) for the [ADUX1020](#) that allows easy access to the [ADUX1020](#) pinout via a standard connector cable.

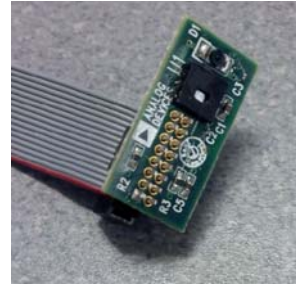


Figure 10. [ADUX1020-EVAL-SMALL](#) Breakout Board

The top view of the connector pinout for the [ADUX1020-EVAL-SMALL](#) is shown in Figure 11.

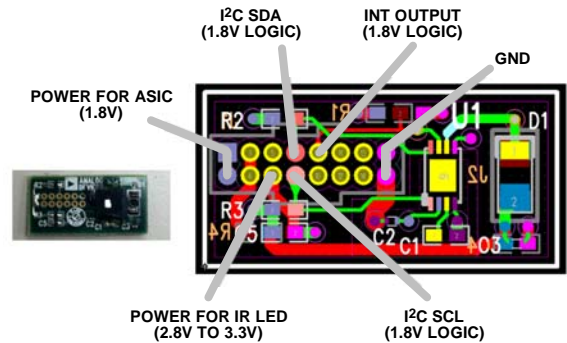


Figure 11. [ADUX1020-EVAL-SMALL](#) Breakout Board

EVALUATION BOARD SCHEMATICS AND ARTWORK

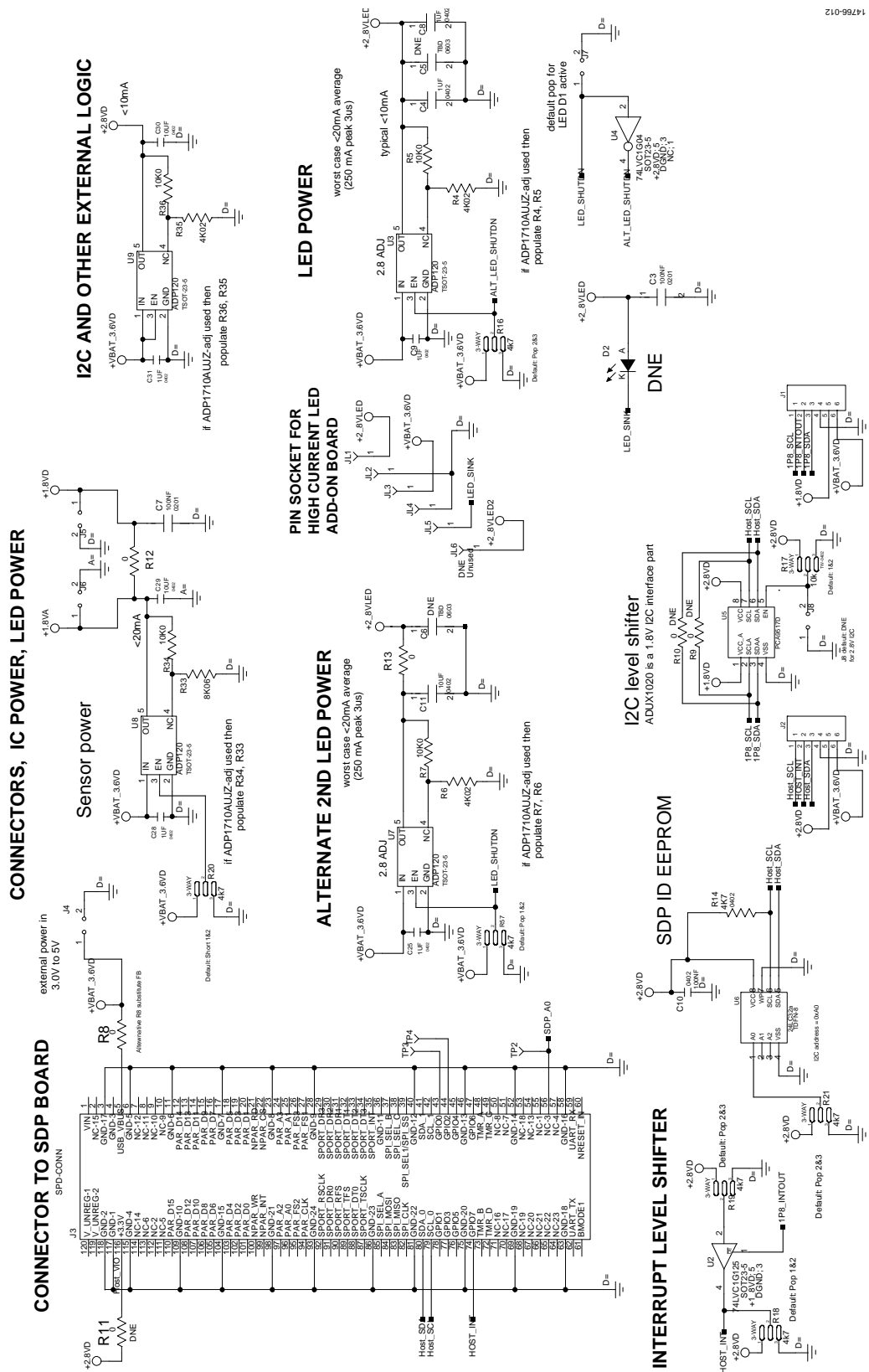
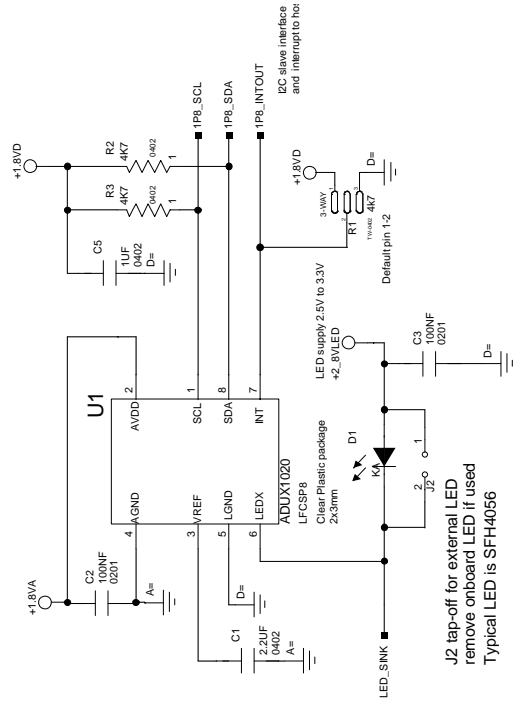


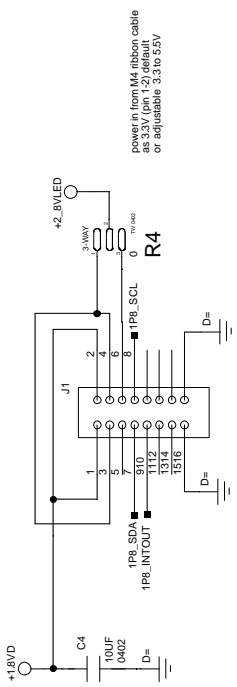
Figure 12. ADUX1020-EVAL-MCM Evaluation Board Schematic



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NOTES
 1. IN THE ADUX1020, LGND MEANS DGND AND AVDD MEANS VDD.

2x8 pin header
 0.05" pitch



These resistors below are not in the BOM
 indicates a trace connection between planes

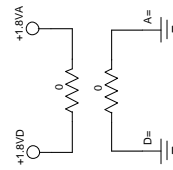


Figure 13. ADUX1020-EVAL-SMALL Small Form-Factor Breakout Board Schematic

NOTES



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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