

Evaluating the LTC2420 20-Bit, μ Power, No Latency, $\Delta\Sigma$ ADC

FEATURES

- ▶ Fully featured evaluation board for the LTC2420
- ▶ QuikEval evaluation software compatible

EVALUATION KIT CONTENTS

- ▶ EVAL-LTC2420-EBZ evaluation board
- ▶ Ribbon cable to connect to the Linduino [DC2026C](#)

EQUIPMENT NEEDED

- ▶ DC2026C controller board (must be purchased separately)
- ▶ PC running Windows® 7 or Windows 10
- ▶ Analog signal source

SOFTWARE NEEDED

- ▶ [QuikEval](#) evaluation software

DOCUMENTS NEEDED

- ▶ LTC2420 data sheet
- ▶ EVAL-LTC2420-EBZ design files (see the [EVAL-LTC2420-EBZ](#) product page)

GENERAL DESCRIPTION

The EVAL-LTC2420-EBZ is a fully featured evaluation board that evaluates the LTC2420, a 20-bit, μ Power, no latency, $\Delta\Sigma$ analog-to-digital converter (ADC).

The EVAL-LTC2420-EBZ uses QuikEval evaluation software to provide an intuitive graphical user interface (GUI) that configures and controls the LTC2420 using the serial peripheral interface (SPI).

The LTC2420 is used for various data acquisition applications such as weigh scales or gas analyzers. The LTC2420 accepts any external reference voltage from 0.1 V to V_{CC} and can be configured to reject 50 Hz or 60 Hz interference.

For full specifications on the LTC2420, see the [LTC2420](#) data sheet, which must be consulted with this user guide when using the EVAL-LTC2420-EBZ.

EVALUATION BOARD PHOTOGRAPH

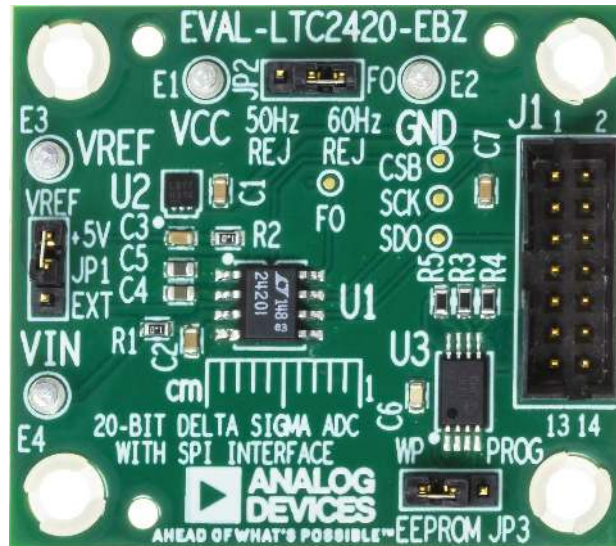


Figure 1. EVAL-LTC2420-EBZ Evaluation Board

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REVISION HISTORY**1/2023—Revision 0: Initial Version**

EVALUATION BOARD HARDWARE

EVALUATION BOARD OVERVIEW

The EVAL-LTC2420-EBZ requires the EEPROM power and [DC2026C](#) controller board connections described in the [DC2026C Connections](#) section. The ribbon cable provided in the evaluation kit connects the EVAL-LTC2420-EBZ and the DC2026C via the J1 connector. Turrets are provided to connect the EVAL-LTC2420-EBZ to the power supplies.

The EVAL-LTC2420-EBZ has other features to allow the user to select an external reference and to select 50 Hz or 60 Hz noise rejection, and offers a fast mode at 100 SPS with 16-bit noise and 12-bit total unadjusted error.

POWER SUPPLIES

The EVAL-LTC2420-EBZ is powered from the DC2026C. No external power supply is required.

DIGITAL INTERFACE

DC2026C Connections

The EVAL-LTC2420-EBZ uses the DC2026C to integrate with the QuikEval evaluation software through the SPI. Use the provided ribbon cable to connect J1 of the EVAL-LTC2420-EBZ to J1 of the DC2026C. When this connection is made, the DC2026C powers the electrically erasable programmable read-only memory (EEPROM) on the EVAL-LTC2420-EBZ. The QuikEval evaluation software uses the EEPROM to identify the EVAL-LTC2420-EBZ and load the proper module.

To ensure proper serial transfers and compatibility, set JP3 of the DC2026C to the 5 V position.

DC2026C Connector Pin Descriptions

[Figure 2](#) shows the pins for the DC2026C J1 connector. For descriptions of each pin, see [Table 1](#).

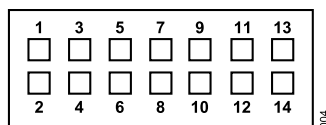


Figure 2. DC2026C J1 Connector Pins

Table 1. DC2026C Connector J1 Pin Descriptions

Pin No.	Mnemonic	Description
1	V+	Unregulated voltage from the DC2026C, nominally 7 V
2	VCCIO	I/O voltage set by JP3 on the DC2026C
3	GND	Ground
4	SCL/SCK	Serial clock from the DC2026C
5	MISO	Serial data from the LTC2420
6	CS	Chip select from the DC2026C
7	SDA/MOSI	Serial data from the DC2026C
8	GND	Ground
9	EEDA	Serial data for EEPROM
10	EEV _{CC}	V _{CC} for EEPROM
11	EESCL	Serial clock for EEPROM
12	EEGND	Ground for EEPROM
13	GND	Ground
14	NC	No connection

REFERENCE

By default, the EVAL-LTC2420-EBZ uses the 5 V [LT6660-5](#) reference. To use an external reference, place the EVAL-LTC2420-EBZ JP1 jumper into the EXT position and apply an external reference to E3 (VREF).

ON-BOARD CONNECTORS

[Table 2](#) describes the seven on-board connectors on the EVAL-LTC2420-EBZ.

Table 2. On-Board Connectors

Connector	Function
J1	SPI/I ² C interface pin header connector
JP1	VREF select
JP2	50Hz REJ/ 60Hz REJ select
E1	VCC
E2	GND
E3	VREF
E4	VIN

GETTING STARTED

The QuikEval evaluation software controls and configures the on-board [LTC2420](#) through the [DC2026C](#).

SOFTWARE INSTALLATION PROCEDURES

Before connecting the DC2026C to the EVAL-LTC2420-EBZ, take the following steps to set up the EVAL-LTC2420-EBZ for initial use in the QuikEval evaluation software:

1. Download the [QuikEval](#) evaluation software package to start the software installation.
2. Open the `ltcgev.exe` file and follow the instructions in the folder to complete the software installation process.

EVALUATION HARDWARE SETUP

When the QuikEval evaluation software installation is complete, take the following steps to set up the DC2026C and the EVAL-LTC2420-EBZ together:

1. Connect the DC2026C to the EVAL-LTC2420-EBZ via the J1 connectors with the ribbon cable provided.
2. Connect the input voltage between VIN (E4) and GND (E2) on the EVAL-LTC2420-EBZ.
3. Start the QuikEval evaluation software (see the [Software Operation](#) section).

SOFTWARE OPERATION

To start the QuikEval evaluation software, from the **Start** menu, click **Analog Devices > QuikEval**. The software window opens (see [Figure 3](#)) until the software recognizes the EVAL-LTC2420-EBZ. When the software recognizes the EVAL-LTC2420-EBZ, the main software window in [Figure 4](#) opens.

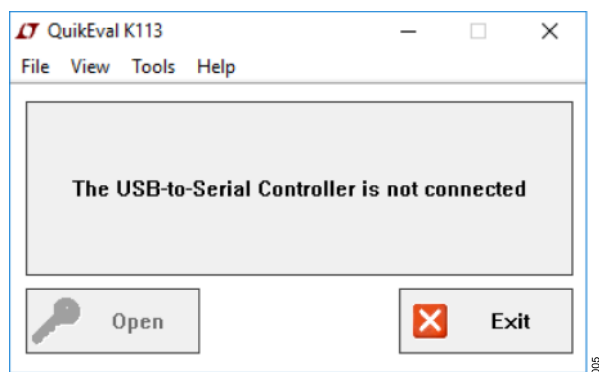


Figure 3. Select Interface Window

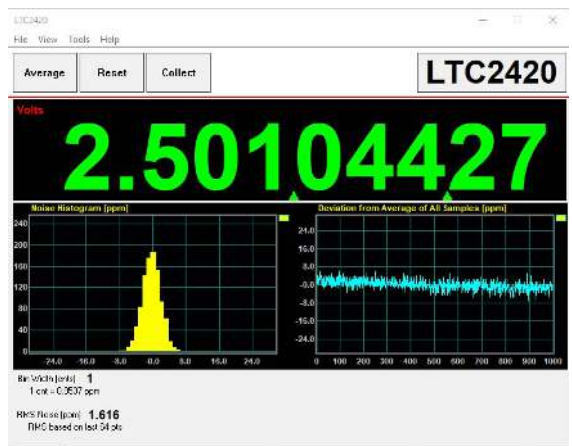


Figure 4. QuikEval Evaluation Software Main Window

MAIN WINDOW

In the main QuikEval evaluation software window (see the [Software Operation](#)), the output voltage, a histogram, and a time domain output are displayed. Various settings for the EVAL-LTC2420-EBZ can be configured in the tools menu, including the calibration, data logging, and display units.

Refer to the LTC2420 data sheet for more information on the device features associated with the different tab functions that are described in the following sections.

ADC Calibration

A single-point or two-point calibration can be set up to increase display accuracy. User defined-units can also be displayed.

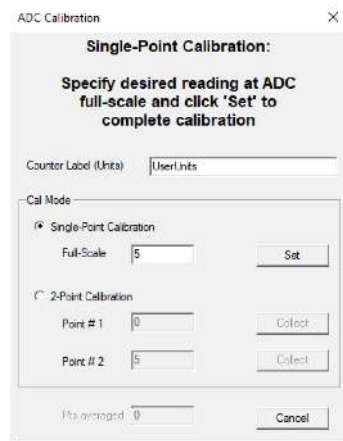


Figure 5. ADC Calibration Example

QuikEval Options

Options include setting the number of points in the average, the number of samples displayed, and the data timeout.

The user can also specify the output display in part per million (PPM), volts, ADC counts, or user-defined units.

GETTING STARTED

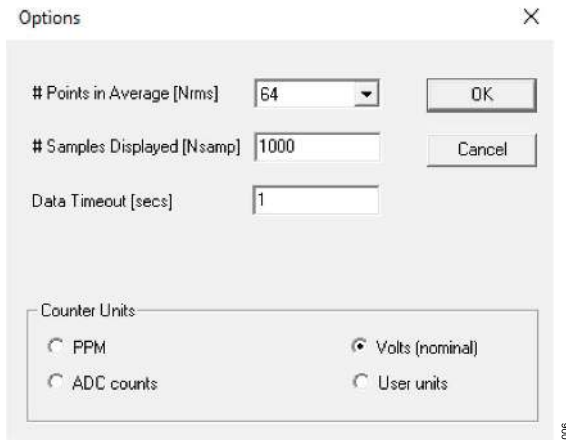


Figure 6. Options

Data Logging

The EVAL-LTC2420-EBZ can be set up for data logging as shown in the example configuration (see [Figure 7](#)).

Options include sample period, number of points to log, and how long to log data.

Click on the **Begin** button to start the data logging.

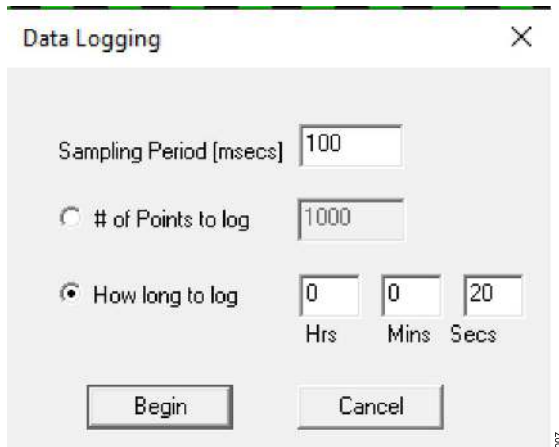


Figure 7. Example Configuration

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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