

Evaluating the ADBMS6822 Dual isoSPI® Adapter**FEATURES**

- ▶ Full-featured evaluation board for the [ADBMS6822](#)
- ▶ Demonstrates SPI to isoSPI 2-wire datalinks
- ▶ Includes two isoSPI ports for reversible isoSPI support
- ▶ Configurable powering options for LPCM support isoSPI connections through simple DuraClik® connectors
- ▶ Compatible boards EVAL-ADBMS68xx, battery monitor boards [EVAL-SDP-CK1Z](#), controller board
- ▶ PC software for control and data analysis when used with the Analog Devices, Inc., SDP-K1 microcontroller

EVALUATION KIT CONTENTS

- ▶ EVAL-ADBMS6822 dual isoSPI adapter board isoSPI DuraClik™ cable

EQUIPMENT NEEDED

- ▶ EVAL-SDP-CK1Z controller board
- ▶ EVAL-ADBMS68xx isoSPI boards

DOCUMENTS NEEDED

- ▶ [ADBMS6821/ADBMS6822](#) data sheet

SOFTWARE NEEDED

- ▶ Evaluation software for the ADBMS6822:
 - ▶ BMS browser PC-based graphical user interface (GUI) program
 - ▶ Request through [ADI Software Request Form](#)

GENERAL DESCRIPTION

The EVAL-ADBMS6822 evaluation board is a dual SPI to 2-wire isolated serial-port interface (isoSPI) adapter featuring the ADBMS6822. Multiple ADBMS68xx battery monitors can be linked through daisy-chain interconnections. The EVAL-ADBMS6822 evaluation board also features reversible isoSPI, which enables a redundant communication path to the peripheral units. The PCB, components, and DuraClik™ connectors are optimized for low electromagnetic interference (EMI) susceptibility and emissions.

The EVAL-ADBMS6822 evaluation board can communicate to a PC by connecting together with EVAL-SDP-CK1Z. The EVAL-ADBMS6822 evaluation board provides a standard SPI, which can be translated to isoSPI and then onward to a peripheral device or daisy chain as applicable.

The EVAL-ADBMS6822 evaluation board can also be used to evaluate the ADBMS6821. Note that, for the ADBMS6821, there is only one SPI port; therefore, ignore the second SPI port and auxiliary isoSPI port when using the ADBMS6821.

Full specifications on the ADBMS6822 dual isoSPI adapter are available in the ADBMS6821/ADBMS6822 data sheet available from Analog Devices, Inc., and must be consulted with this user guide when using the EVAL-ADBMS6822 evaluation board.

Design files for this circuit board are available at [Design Center](#).

TABLE OF CONTENTS

Features.....	1	Performance Summary.....	4
Evaluation Kit Contents.....	1	Evaluation Board Features.....	5
Equipment Needed.....	1	Hardware Setup.....	5
Documents Needed.....	1	Jumpers.....	5
Software Needed.....	1	EVAL-ADBMS6822 Optional Connections.....	5
General Description.....	1	Evaluation Board Software.....	6
Functional Block Diagram and Evaluation		Where To Get ADBMS68XX_GUI Software?.....	6
Board Layout.....	3		

REVISION HISTORY

1/2024—Revision 0: Initial Version

FUNCTIONAL BLOCK DIAGRAM AND EVALUATION BOARD LAYOUT

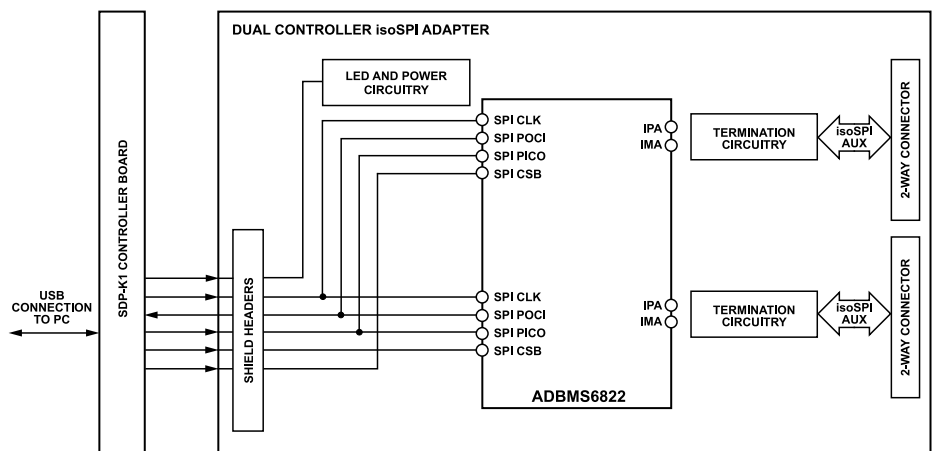


Figure 1. Overview of EVAL-ADBMS6822 Dual isoSPI Controller Adapter and EVAL-SDP-CK1Z Interface Board (Both are Sold Separately)

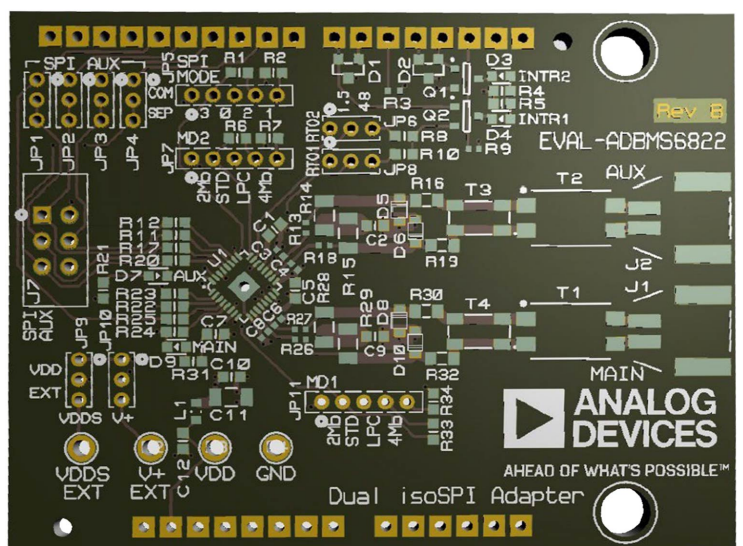


Figure 2. Overview of the EVAL-ADBMS6822 Evaluation Board Layout

PERFORMANCE SUMMARY**Table 1. Specifications are at $T_A = 25^\circ\text{C}$**

Parameter	Min	Typ	Max	Unit
V_{DD} Supply Voltage	3.0		5.5	V
V_{DDS} Supply Voltage	1.7		5.5	V
V_+ Supply Voltage	3		30	V
V_+ Supply Voltage (LPCM)	6		30	V
V_{IH} Input Range	$0.7 \times V_{DDS}$			V
V_{IL} Input Range			$0.3 \times V_{DDS}$	V

EVALUATION BOARD FEATURES

HARDWARE SETUP

Shield-Mount Board Connection

The primary EVAL-ADBMS6822 evaluation board connection is accomplished by plugging the board directly onto an [EVAL-SDP-CK1Z](#) controller board (SDP-K1) as shown in [Figure 3](#). The pins on the backside of the EVAL-ADBMS6822 evaluation board connect directly with sockets on the SDP-K1 board. The shield connections provide all the default data and power connections. Note that the SDP-K1 interface voltage must be set at P14 to 3.3 V.

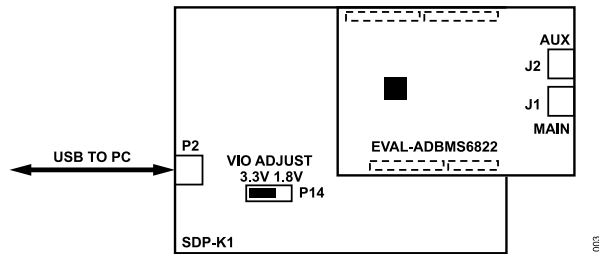


Figure 3. Direct Installation of the EVAL-ADBMS6822

EVAL-ADBMS6822 isoSPI Connections

J1 is the MAIN isoSPI port. The applications that only use one port use this connection to make daisy-chain connections to peripheral isoSPI devices. **J2** is an auxiliary port that is used as a redundant controller in a reversible isoSPI daisy-chain network, and as another independent isoSPI interface.

JUMPERS

Several features or optional connections are configured with jumpers on the latest version of the EVAL-ADBMS6822 evaluation board.

EVAL-ADBMS6822 OPTIONAL CONNECTIONS

SPI AUX Optional Header J7

This double row of through-holes (hole field) can be used to connect a fully independent AUX SPI channel. A connector or discrete wires can be soldered to this array.

JP1-JP4: These are set as a group to either configure the AUX port SPI traffic as being common (COM) with the MAIN SPI, or completely separate (SEP). The common connection (COM) shares the POCI, PICO, SCK from the SDP-K1 controller, along with dedicated CS lines to provide multiplexing. The separate setting (SEP) connects the AUX SPI signals to J7 exclusively.

JP5: Sets the SPI mode for both channels of the [ADBMS6822](#). Mode 0 is used in most applications.

JP6: Two settings are provided for setting the low-power cell monitoring (LPCM) response interval of the AUX channel: either 1.5 seconds or 48 seconds. Other intervals can be achieved with resistor value changes to the board.

JP7, JP11: Configures the operating modes of the AUX and MAIN channels, respectively. Positions of the jumper correspond to the following options:

- ▶ **2 MB:** 2 MB peripheral with 1-bit latency
- ▶ **STD:** Standard bidirectional isoSPI
- ▶ **LPC:** Standard bidirectional isoSPI with LPCM timeout monitor support
- ▶ **4 MB:** 4 Mbps unidirectional

JP8: Two options are provided for setting the LPCM response interval of the MAIN channel: either 1.5 seconds or 48 seconds. Other intervals can be achieved with resistor value changes to the board.

JP9: Configures the VDDS supply pins to either the VDD potential or an externally furnished voltage at turret VDDS EXT.

JP10: Configures the V+ supply pins to either the VDD potential or an externally furnished voltage at turret V+ EXT.

Table 2. Pin Designations for the J7 SPI AUX Connector

Number	Pin	Description
1	POCI2	SPI Controller Inputs (Controller Mode) or Peripheral Outputs (Peripheral Mode).
2	VDDS	SPI Power-Supply Inputs (1.7 V to 5.5 V).
3	SCK2	SPI Clock Inputs (Controller) or Outputs (Peripheral).
4	PICO2	SPI Controller Outputs (Controller Mode) or Peripheral Inputs (Peripheral Mode).
5	CS2	Chip-Select
6	GND	Ground

EVALUATION BOARD SOFTWARE

WHERE TO GET ADBMS68XX_GUI SOFTWARE?

Request the GUI software with the **ADI Software Request Form** from the following link:

- ▶ https://form.analog.com/form_pages/softwaremodules/SRF.aspx.
- ▶ Or search for **Software Request Form** at www.analog.com.

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.

Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time. LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed.



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Analog Devices Inc.:](#)

[EVAL-ADBMS6822](#)