MCP3421/2 SOT-23-6 Evaluation Board User's Guide

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MCP3421/2 SOT-23-6 EVALUATION BOARD USER'S GUIDE

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Preface

NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our website (www.microchip.com) to obtain the latest documentation available.

Documents are identified with a "DS" number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is "DSXXXXXXXXA", where "XXXXXXXX" is the document number and "A" is the revision level of the document.

For the most up-to-date information on development tools, see the MPLAB® IDE online help. Select the Help menu, and then Topics, to open a list of available online help files.

INTRODUCTION

This chapter contains general information that will be useful to know before using the MCP3421/2 SOT-23-6 Evaluation Board. Items discussed in this chapter include:

- Document Layout
- Conventions Used in this Guide
- Recommended Reading
- The Microchip Website
- Product Change Notification Service
- Customer Support
- Document Revision History

DOCUMENT LAYOUT

This document describes how to use the MCP3421/2 SOT-23-6 Evaluation Board as a development tool to emulate and debug firmware on a target board. The manual layout is as follows:

- **Chapter 1. "Product Overview"** – Short overview of the MCP3421/2 SOT-23-6 Evaluation Board.
- **Chapter 2. "PICkit™ Serial Analyzer"** – Details about the PICkit™ Serial Analyzer and instructions on how to use it to obtain the ADC conversion results.
- **Chapter 3. "MCP2221A Breakout Module"** – Details about the MCP2221A Breakout Module.
- **Appendix A. "Schematic and Layouts"** – Shows the schematic and layout diagrams for the MCP3421/2 SOT-23-6 Evaluation Board.
- **Appendix B. "Bill of Materials (BOM)"** – Lists the parts used to build the MCP3421/2 SOT-23-6 Evaluation Board.

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

Description	Represents	Examples
Arial font:		
Italic characters	Referenced books	*MPLAB® IDE User's Guide*
	Emphasized text	...is the *only* compiler...
Initial caps	A window	the Output window
	A dialog	the Settings dialog
	A menu selection	select Enable Programmer
Quotes	A field name in a window or dialog	"Save project before build"
Underlined, italic text with right angle bracket	A menu path	*File>Save*
Bold characters	A dialog button	Click **OK**
	A tab	Click the **Power** tab
N'Rnnnn	A number in verilog format, where N is the total number of digits, R is the radix and n is a digit.	4'b0010, 2'hF1
Text in angle brackets < >	A key on the keyboard	Press <Enter>, <F1>
Courier New font:		
Plain Courier New	Sample source code	`#define START`
	Filenames	`autoexec.bat`
	File paths	`c:\mcc18\h`
	Keywords	`_asm, _endasm, static`
	Command-line options	`-Opa+, -Opa-`
	Bit values	`0, 1`
	Constants	`0xFF, 'A'`
Italic Courier New	A variable argument	*`file`*`.o`, where *`file`* can be any valid filename
Square brackets [ ]	Optional arguments	`mcc18 [options]` *`file`* `[options]`
Curly brackets and pipe character: { | }	Choice of mutually exclusive arguments; an OR selection	`errorlevel {0|1}`
Ellipses...	Replaces repeated text	`var_name [, var_name...]`
	Represents code supplied by user	`void main (void) { ... }`

RECOMMENDED READING

This user's guide describes how to use the MCP3421/2 SOT-23-6 Evaluation Board. Other useful documents are listed below. The following Microchip documents are available and recommended as a supplemental reference resource:

MCP3421 Data Sheet – *"18-Bit Analog-to-Digital Converter with I^2C Interface and On-Board Reference"* (DS20002003)

MCP3422/3/4 Data Sheet – "*18-Bit, Multi-Channel $\Delta\Sigma$ Analog-to-Digital Converter with I^2C Interface and On-Board Reference*" (DS20002088)

THE MICROCHIP WEBSITE

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- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

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- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the website at: https://www.microchip.com/support.

DOCUMENT REVISION HISTORY

Revision A (January 2023)

- Initial release of this document.

Chapter 1. Product Overview

1.1 INTRODUCTION

The following chapter provides an overview of the MCP3421/2 SOT-23-6 Evaluation Board and demonstrates how to use it with either the PICkit™ Serial Analyzer (DV164122) or the MCP2221A Breakout Module (ADM00559).

1.2 MCP3421/2 SOT-23-6 EVALUATION BOARD OVERVIEW

The MCP3421 and MCP3422 Evaluation Boards have a single-channel and dual-channel 18-bit ΔΣ analog-to-digital converter (ADC), respectively. The MCP3421/2 SOT-23-6 Evaluation Board offers the following headers for simple interfacing:

- Analog CH1± (MCP3421/2), CH2± (MCP3422) and GND header (J4)
- PICkit™ Serial Analyzer header (J3)
- MCP2221A Breakout Module interface header (J3)
- mikroBUS™ interface header (J1 and J2)

Figure 1-1 and Figure 1-2 show the top and the bottom of the MCP3421/2 SOT-23-6 Evaluation Board. The user can connect any sensor input signal and test the ADC conversion results. Both the PICkit™ Serial Analyzer and the MCP2221A Breakout Module can provide a PC Graphic User Interface (GUI) for writing configuration registers and reading ADC conversion values from the MCP3421/2 SOT-23-6 Evaluation Board.

The PICkit™ Serial Analyzer connects the PC GUI to the MCP3421/2 SOT-23-6 Evaluation Board via an I^2C communication bus. The MCP2221A Breakout Module connects the PC GUI to the MCP3421/2 SOT-23-6 Evaluation Board via a USB to I^2C communication bridge.

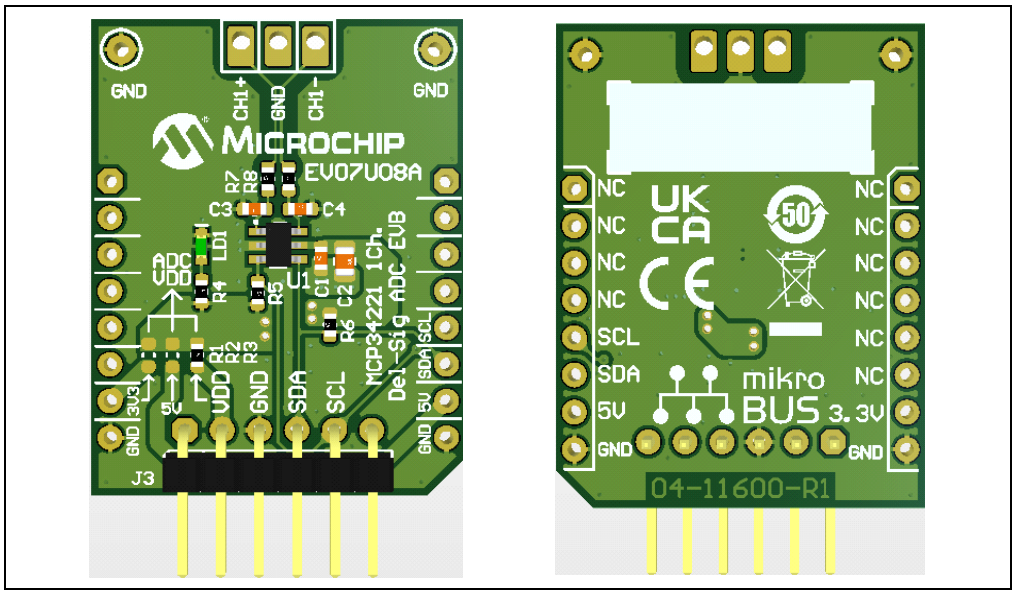


FIGURE 1-1: *Top and Bottom Views of the MCP3421 Evaluation Board (EV07U08A).*

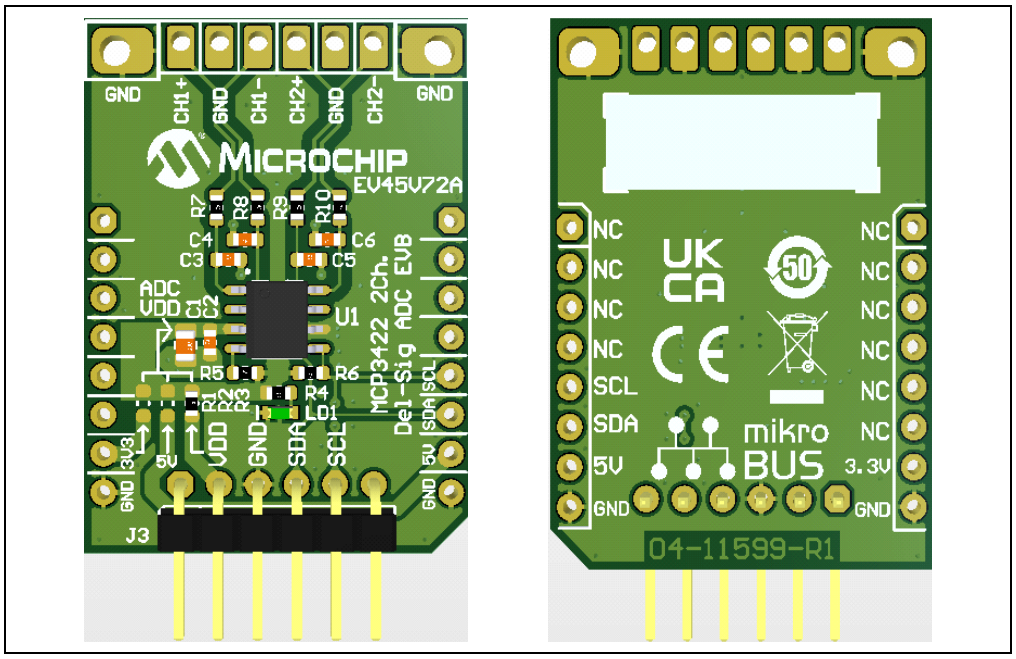


FIGURE 1-2: *Top and Bottom Views of the MCP3422 Evaluation Board (EV45V72A).*

1.2.1 I²C Address Bits

The Device-Code and I²C Bus Address Bits for the MCP342XA0 devices are '1101' and '000', respectively. These bits are programmed at the factory during production.

The Device-Code and I²C Address Bits combine to form an I²C Control-Byte of '0x68' for all Read and Write operations.

Chapter 2. PICkit™ Serial Analyzer

2.1 GETTING STARTED WITH THE PICKIT™ SERIAL ANALYZER

2.1.1 PICkit™ Serial Analyzer and MCP3421/2 SOT-23-6 Evaluation Board Hardware Set-Up

The following steps describe how to connect the PICkit™ Serial Analyzer to the MCP3421/2 SOT-23-6 Evaluation Board:

1. V_{DD} selection: Use the V_{DD} from the PICkit™ Serial Analyzer or use either the 3.3V or 5V supply voltage from the mikroBUS header. Select the V_{DD} path using the R1,R2, or R3 0Ω resistor/jumper:
   a) Connect R3, if using V_{DD} from PICkit™ Serial Analyzer;
   b) Remove R3 and add a 0Ω resistor/jumper to R1 or R2 for 3.3V or 5V, respectively, from the mikroBUS header.
2. Connect the MCP3421/2 SOT-23-6 Evaluation Board's J3 pin header to the PICkit™ Serial Analyzer, as shown in Figure 2-1.
3. LED D1 turns on when V_{DD} is applied.
4. Connecting analog inputs: Connect the unused pin (example, V_{IN}-) to V_{SS} for single-ended measurements.
5. Use the PICkit™ Serial Analyzer PC GUI to send I^2C Write and Read commands. See **Section 2.2 "Creating Script Files"**.
6. Execute the PICkit™ Serial Analyzer script file and obtain the ADC conversion results. The conversion results appear on the PICkit™ Serial Analyzer PC GUI.

CAUTION
The analog input pin has ESD diodes. Certain input conditions can damage the device. Please pay attention to the following conditions: a) Do not apply input greater than the input range specified by the MCP3421 and MCP3422 data sheets; b) Apply input signal after V_{DD} is powered-up.

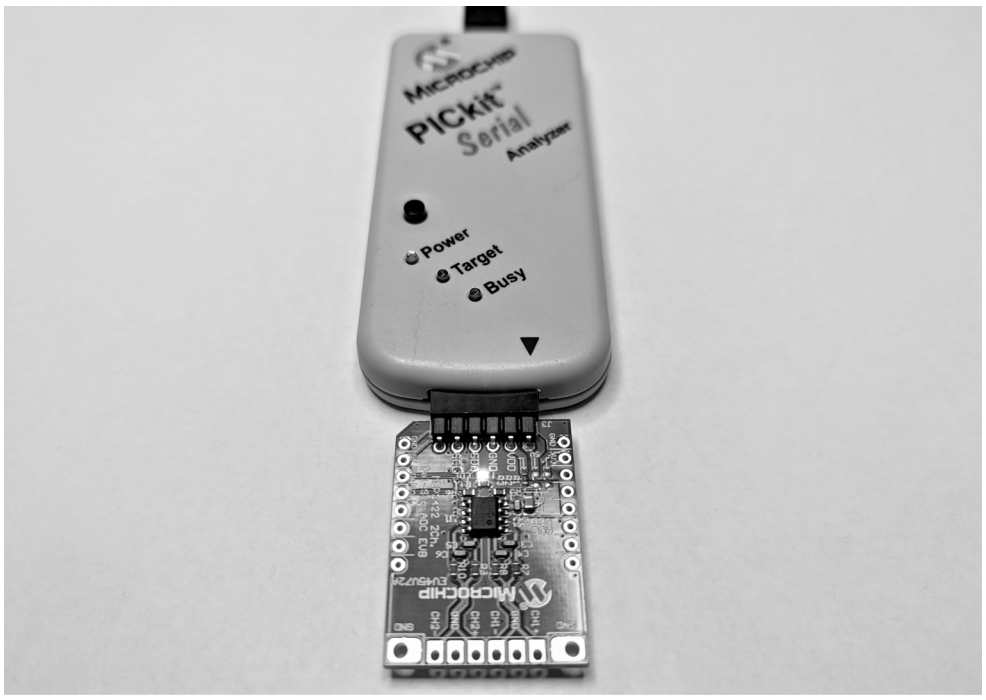


FIGURE 2-1: *MCP3421/2 SOT-23-6 Evaluation Board with the PICkit™ Serial Analyzer.*

2.1.2 PICkit™ Serial Analyzer and MCP3421/2 SOT-23-6 Evaluation Board PC Software Set-up

The following steps describe how to set up the PICkit™ Serial Analyzer PC GUI to write the configuration bits of the MCP3421/2 devices and read the ADC conversion results.

1. Install the PICkit™ Serial Analyzer software on a PC.
2. Connect the USB cable between the PICkit™ Serial Analyzer and the PC.
3. Run the PICkit™ Serial PC Software. Figure 2-2 displays the GUI. Click the **Next** button to configure the PICkit™ Serial Analyzer.

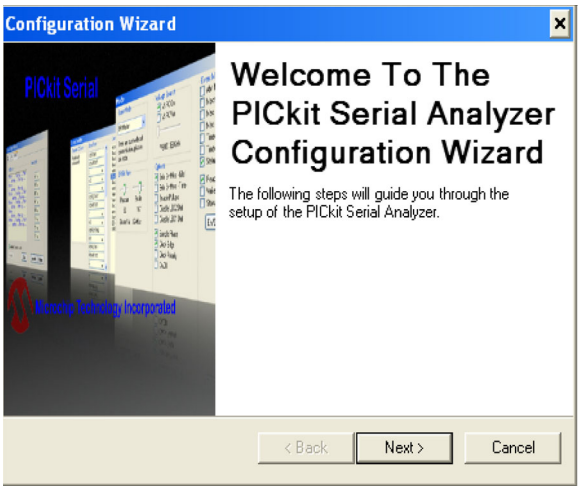


FIGURE 2-2: *PICkit™ Serial Analyzer Configuration Wizard Welcome Window.*

4. Select the **I²C Master** option as communication mode, then click the **Next** button.

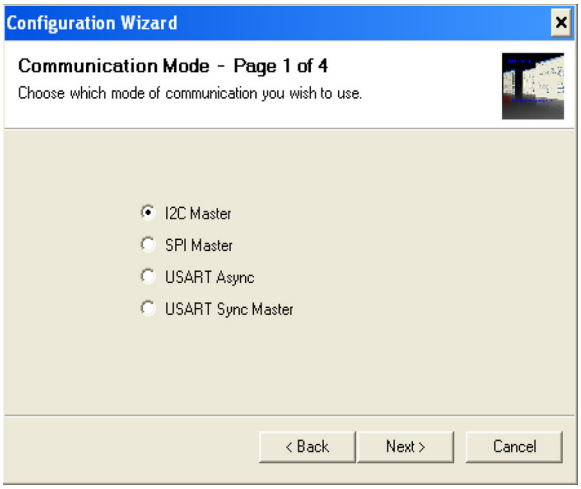


FIGURE 2-3: *Communication Mode Selection.*

5. Select either **100 kHz** or **400 kHz**. Click the **Next** button.

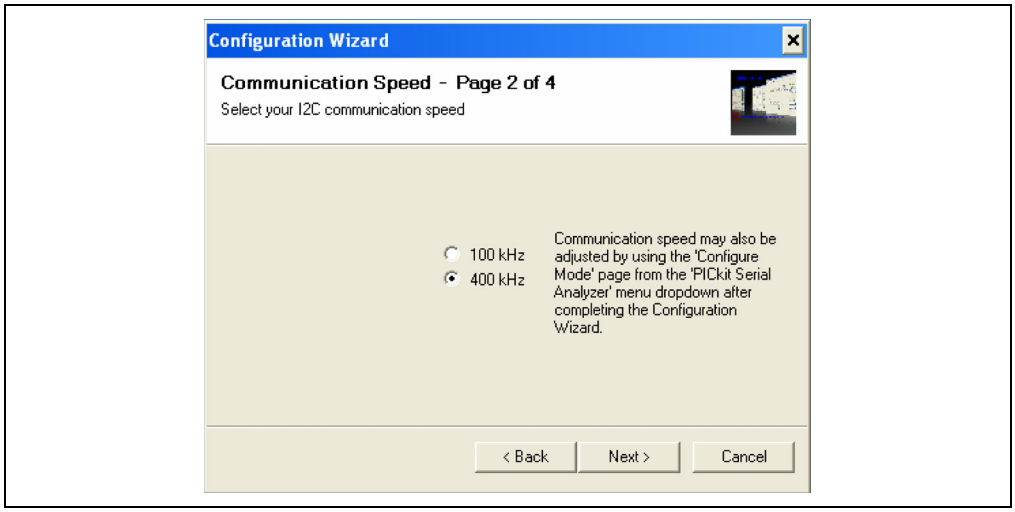


FIGURE 2-4: *I^2C Communication Speed Window.*

Note: The MCP3421/2 devices support the I^2C bus data rate up to 3.4 MHz, but the current version of the PICkit™ Serial Analyzer supports an I^2C bus data rate up to 400 kHz only.

6. Select **No**, as shown in Figure 2-5, then click the **Next** button.

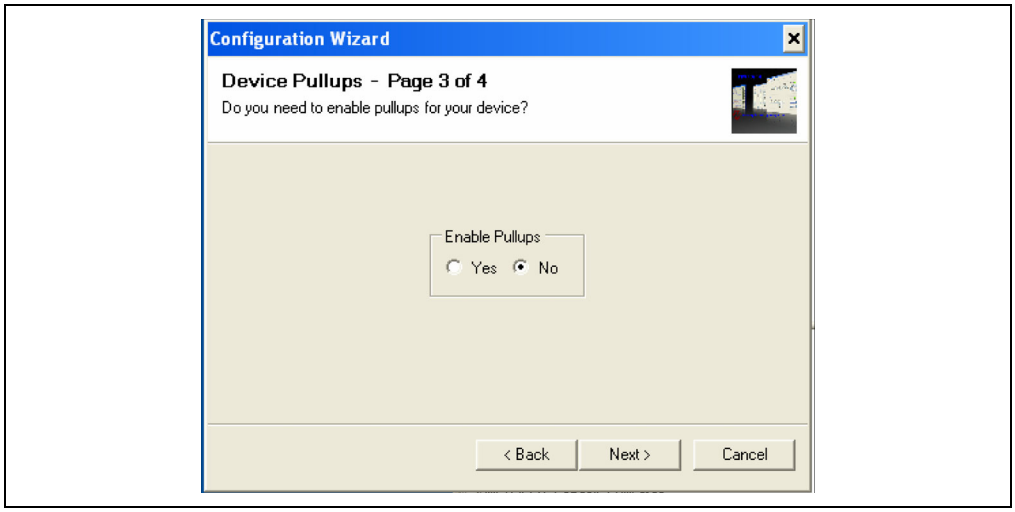


FIGURE 2-5: *Device Pull-ups Window.*

Note: The MCP3421/2 SOT-23-6 Evaluation Board has its own pull-up resistors. Therefore, additional pull-up resistors from the PICkit™ Serial Analyzer are not needed.

7. Select the V_{DD} voltage of the MCP3421/2 SOT-23-6 Evaluation Board and click the **Next** button.

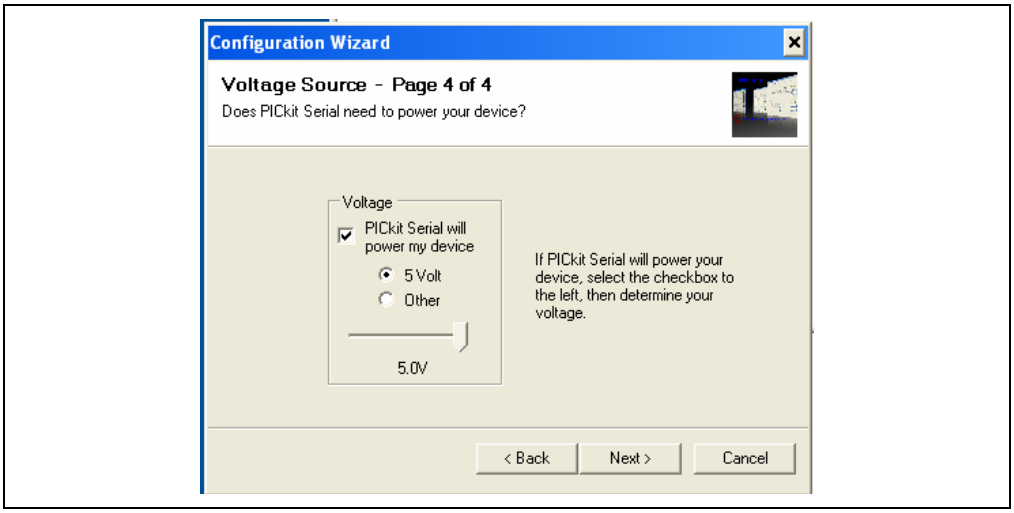


FIGURE 2-6: *Voltage Source Selection Window.*

Case 1 – PICkit™ Serial Analyzer V_{DD} power supply:

a) By choosing the "PICkit™ Serial will power my device" option and selecting the **5 Volt** radio button, as shown in Figure 2-6, the MCP3421/2 SOT-23-6 Evaluation Board will be powered by the 5V DC output of the PICkit™ Serial Analyzer through the R3 0Ω resistor/jumper.

Case 2 – External V_{DD} power supply:

a) Option 1 - mikroBUS header *with* an 8/16/32-Bit Microchip Evaluation Board:
In this case, either R1 or R2 can be populated with a 0Ω resistor/jumper.

b) Option 2 - mikroBUS header *without* an 8/16/32-Bit Microchip Evaluation Board:
In this case, either R1 or R2 can be populated with a 0Ω resistor/jumper with an external power supply applied to the 3.3V pad at J1 or the 5V pad at J2 of the mikroBUS header.

8. Click the **OK** button to complete the configuration. The MCP3421/2 SOT-23-6 Evaluation Board can now be configured using the PICkit™ Serial Analyzer.

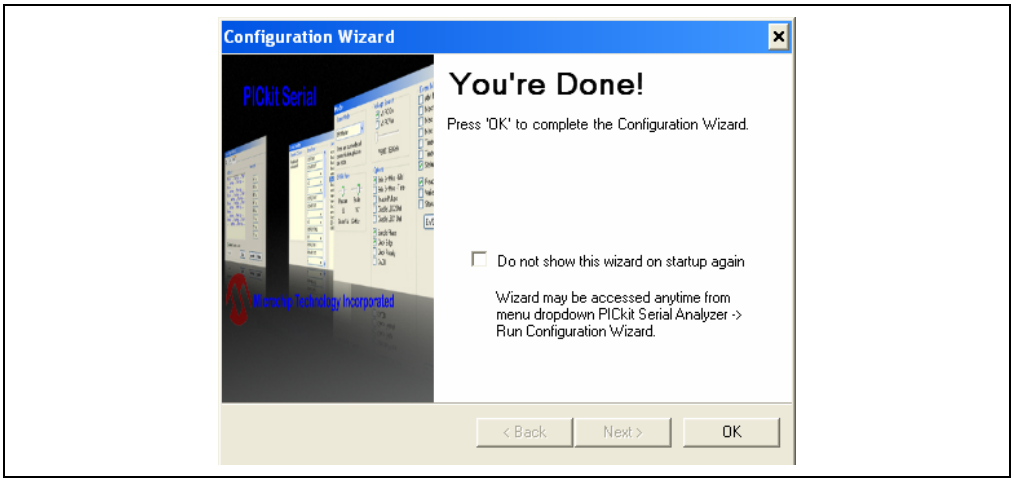


FIGURE 2-7: *Configuration Wizard – Final Step.*

2.2 CREATING SCRIPT FILES

To establish communication between the PICkit™ Serial Analyzer and the MCP3421/2 SOT-23-6 Evaluation Board, a Script File is needed. The following sections explain I^2C Script Files for the MCP3421/MCP3422 Read/Write operations.

2.2.1 Creating a Script File

To create an I^2C Command Script for Read and Write operations of the MCP3421/2 devices, click the **Communication** tab from the Top Bar menu, then select Script, then click the Script Builder option, as shown in Figure 2-8.

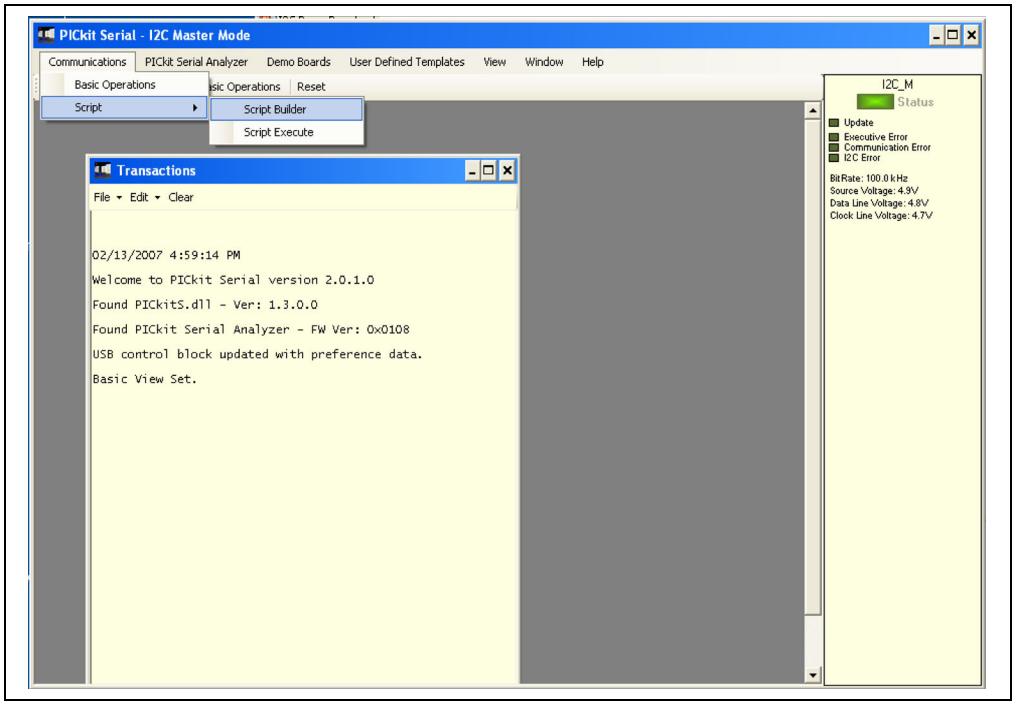


FIGURE 2-8: *Creating a Script File with Script Builder.*

2.2.2 Writing the Configuration Register

1. Click the **WriteBlockAddrA8** in the “Example I^{2}C Scripts” column to fill in the parameters of the “Script Detail” column. Right-click the “Script Detail” column to change the parameters.
2. Under the Script Detail box, select an item in the parameter box.
3. Right-click the parameter box for the option menu to appear to the right of the selection.
4. Select the desired options (delete or insert the parameter box).
5. To add a new I^{2}C command, select I2CM and then select the desired command from the list.
6. Keep the I2CSTART, I2CWRTBYT and I2CSTOP parameters in the same order as shown below. Address bits A2, A1, and A0 are `0`, `0` and `0`, respectively, for the MCP3421/MCP3422 devices populated on the MCP3421/2 SOT-23-6 Evaluation Board. See the MCP3421/MCP3422 data sheets for more information regarding address bit selection.
7. Change the fourth and fifth parameter values in the “Script Detail” column per the desired device operation (see Figure 2-9).

Note: Note that the *0C* in the configuration byte selects the following options:

- Channel Selection: Channel 1
- Conversion Mode: One-Shot Conversion
- Sample Rate(Resolution): 3.75 SPS (18-bit)
- Gain Selection: 1x

2.2.3 Saving and Executing the Script File

1. Type in any script name (e.g. MCP3421_WR) in the space under the “Script Name” field.
2. Click the **Save Script** button.
3. Click the **Execute Script** button.

- At this point, the PICkit™ Serial Analyzer transmits the I^{2}C command to the MCP3421/2 SOT-23-6 Evaluation Board. The **Busy** LED on the PICkit™ Serial Analyzer will momentarily turn on and then turn off. If the LED remains on, a communications problem has occurred. Remove the PICkit™ Serial Analyzer from the computer and re-check the parameter values, including the order of parameters under the “Script Detail” column. Try again until the **Busy** LED goes off immediately after executing the I^{2}C command.
- The saved file name appears in “Users I^{2}C Scripts” column and can be reused any time by selecting the file name.

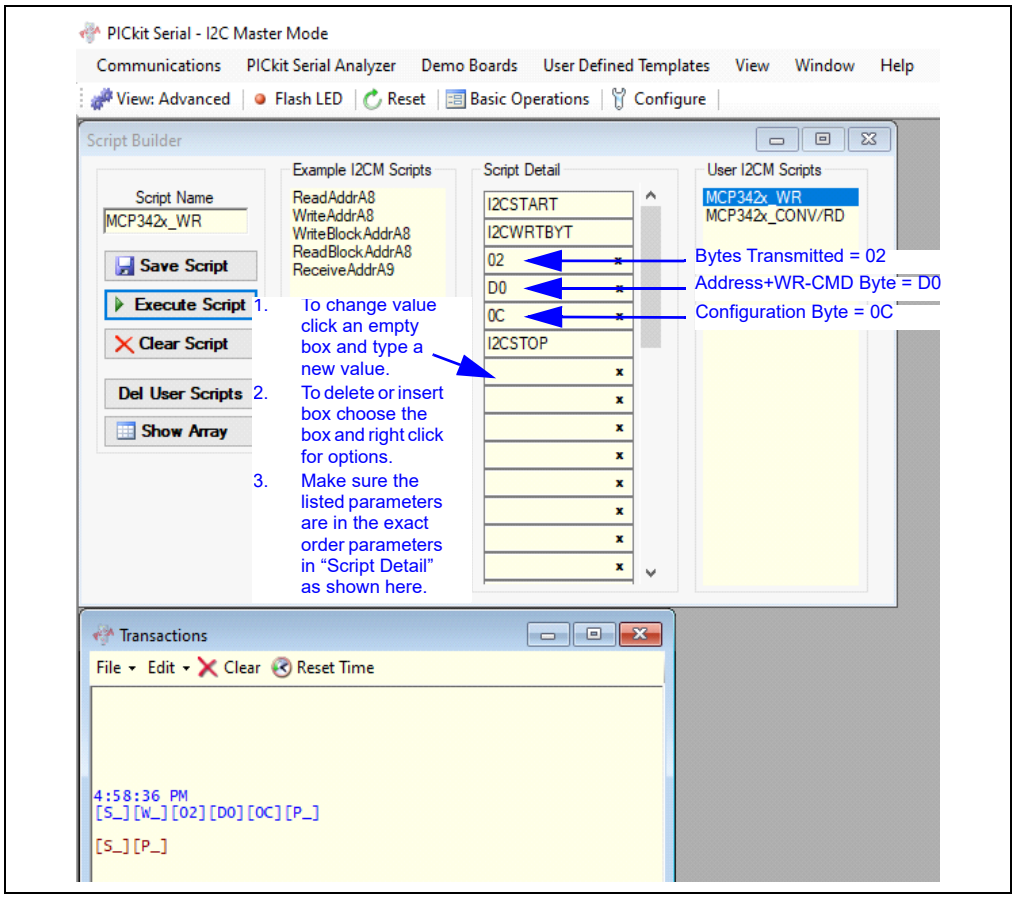


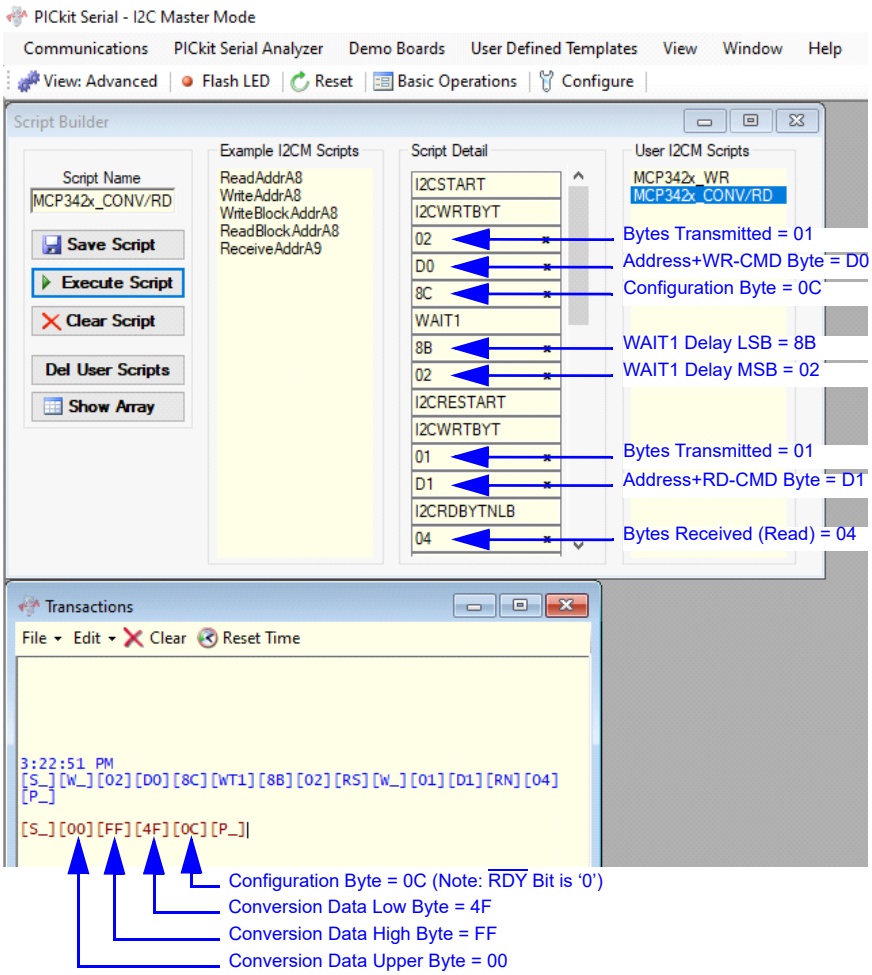
FIGURE 2-9: *PICkit™ Serial I²C Write Command.*

2.2.4 Reading Conversion Data

1. Click on **ReadAddrA8** in the "Example I²C Scripts" column to fill in the parameters of the "Script Detail" column. Right-click the "Script Detail" column to change the parameters.
2. Under the "Script Detail" box, select an item in the parameter box.
3. Right-click the parameter box for the option menu to appear to the right of the selection.
4. Select the desired options (delete or insert the parameter box).
5. To add a new I²C command select I2CM and then select the desired command from the list.
6. Keep the I2CSTART, I2CWRTBYT, WAIT1, I2CRESTART, I2CRDBYTNLB and I2CSTOP (after 4 Bytes Received) parameters in the same order as shown below. Address bits A2, A1, and A0 are `0`, `0` and `0`, respectively, for the MCP3421/2 devices populated on the MCP3421/2 SOT-23-6 Evaluation Board. See the MCP3421/2 data sheets for more information regarding address bit selection.
7. Change the 4th, 5th, 7th, 8th, 12th and 14th parameter values in the "Script Detail' column per the desired device operation (see Figure 2-10).

Once all parameters have been entered the script can be saved by clicking the **Save Script** button and then executed by clicking on the **Execute Script** button.

Note:	For a comprehensive explanation of the PICkit™ Serial Analyzer PC Software see DS51647C.



Results:

Input Voltage = 1.023578V

Output Code: 0x00FF4F (= 65359 in Decimal)

Output Code: (65359 x 15.625 µV (LSB))/PGA = 1.021242 V with PGA = 1

Note: 1 LSB with 18-bit Resolution option: 15.625 µV

FIGURE 2-10: *PICkit™ Serial I²C Conversion and Read Command.*

NOTES:

Chapter 3. MCP2221A Breakout Module

3.1 GETTING STARTED WITH THE MCP2221A BREAKOUT MODULE

3.1.1 MCP2221A Breakout Module and MCP3421/2 SOT-23-6 Evaluation Board Hardware Set-Up

The following steps describe how to connect the MCP2221A Breakout Module to the MCP3421/2 SOT-23-6 Evaluation Board.

1. V_{DD} selection: When using the MCP2221A Breakout Module the 0Ω R3 resistor/jumper is recommended, i.e. not R1 or R2, to avoid contention between the power supplied by the MCP2221A Breakout Module and the power available from the mikroBUS header.
2. Configure the MCP2221A Breakout Module output supply voltage for either 3.3V or 5V via the J4 jumper.
3. Configure the I^2C Bus SCL and SDA pull-ups via the JP2 and JP3 jumpers.
4. Connect the MCP3421/2 SOT-23-6 Evaluation Boards J3 pin header to the MCP2221A Breakout Module.
5. LED LD1 turns on when V_{DD} is applied.
6. Connecting analog inputs: Connect unused pins (example, V_{IN-}) to V_{SS} for single-ended measurements.
7. Use the MCP2221A Breakout Module PC GUI to send I^2C Write and Read Commands. See **Section 3.2 "Creating Command List Files"**.
8. Execute the MCP2221A Breakout Module Command List File and obtain the ADC conversion results. The conversion results appear in the MCP2221A I^2C/SMBus Terminal GUI.

CAUTION

The analog input pin has ESD diodes. Certain input conditions can damage the device. Please pay attention to the following conditions:

a) Do not apply input greater than the input range specified by the MCP3421 and MCP3422 data sheets.

b) Apply input signal after V_{DD} is powered-up.

3.1.2 MCP2221A Breakout Module and MCP3421/2 SOT-23-6 Evaluation Board PC Software Set-Up

The following steps describe how to set up the MCP2221A I^2C/SMBus Terminal software to write the configuration bits of the MCP3421/2 devices and read the ADC conversion results.

1. Install the MCP2221A I^2C/SMBus Terminal software onto a personal computer (PC).
2. Connect the USB cable between the MCP2221A Breakout Module and the PC.
3. Run the MCP2221A I^2C/SMBus Terminal PC Software. The GUI will appear as shown in Figure 3-1.

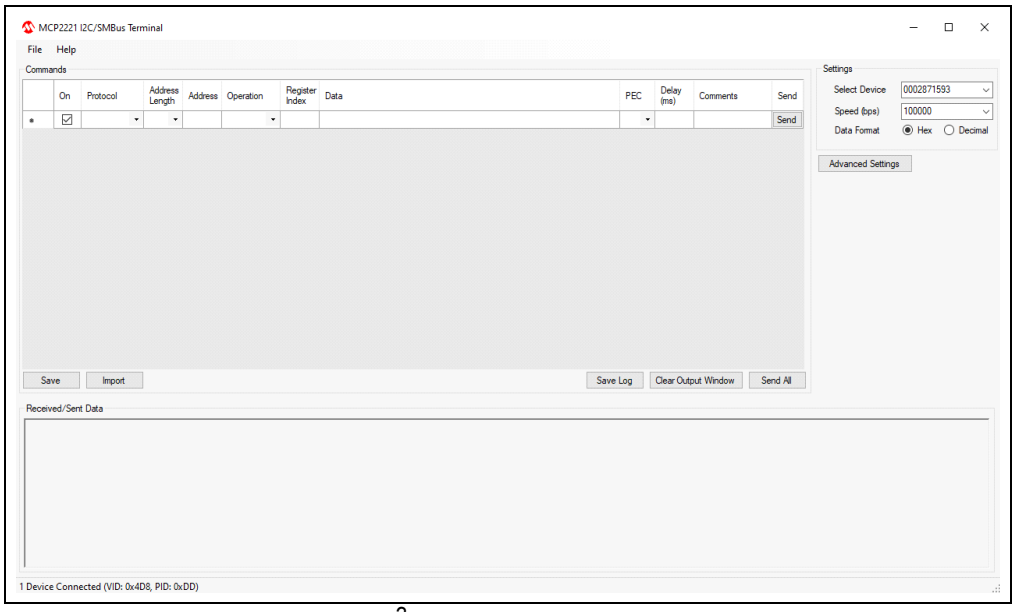


FIGURE 3-1: *MCP2221A I²C/SMBus Terminal Window.*

3.2 CREATING COMMAND LIST FILES

To establish communication between the MCP2221A I²C/SMBus Terminal and a MCP3421/2 SOT-23-6 Evaluation Board, a command list is needed. The following sections explain I²C Commands Lists for the MCP3421/2 Read/Write operations.

3.2.1 Creating a Command List

To create an I²C Command List for Read and Write operations of the MCP3421/2 devices, select I²C under the Protocol column. At this point, a new command row will automatically be added to the command list below the current command row. The following steps will be used to create a set of executable commands to Write the Configuration register.

3.2.2 Writing the Configuration Register

1. Select 7-bit for the "Address Length".
2. Enter the Device Code (`1101`) and Address Bits (`000`) as a 7-bit value of '`1101000`' (0x68) for the "Address".
3. Select Write for the "Operation".
4. The "Register Index" is for SMBus operation *only* and should be left blank.
5. The "Data" value (hex format) will specify the value to be written to the Configuration Register.
6. The "PEC" (Packet Error Check) is for SMBus operation *only* and should be left blank.
7. A "Delay" (in milliseconds) can be inserted following execution of the current command; i.e. between the current command the next command, if required.
8. "Comments" can be added to describe the operation executed by the command.

Note: Note that the 0x*0C* in the Data column selects the following options:

- Channel Selection: Channel 1
- Conversion Mode: One-Shot Conversion
- Sample Rate(Resolution): 3.75 SPS (18-bit)
- Gain Selection: 1x

3.2.3 Saving and Executing the Command List

There are two ways to save the current Command List.

1. Simply select File from the menu bar and select Save Command List.
2. Click on the **Save** button located at the bottom-left of the “Commands” dialog.

There are also two ways to execute a command:

1. Click on the **Send** button located to the right of the “Comments” column.
2. Click on the **Send All** button located at the bottom-right of the “Commands” dialog to execute all commands in the “Commands” dialog list.
   - At this point, the MCP32221A Breakout Module transmits the I^2C Write command to the MCP3421/2 SOT-23-6 Evaluation Board. The “Received/Sent Data” dialog will display a summary of the command(s) executed, e.g. “> I^2C Write, Address = 0x68, Data: 0C Delay = 0”.
   - The “Received/Sent Data” dialog will also display an *OK* acknowledgment indicating the command was properly executed, or an *Address NACK received* non-acknowledgment indicating an error has occurred when sending the command (see Figure 3-2).
   - It should be noted the **Send All** button is the only way to execute a Delay.

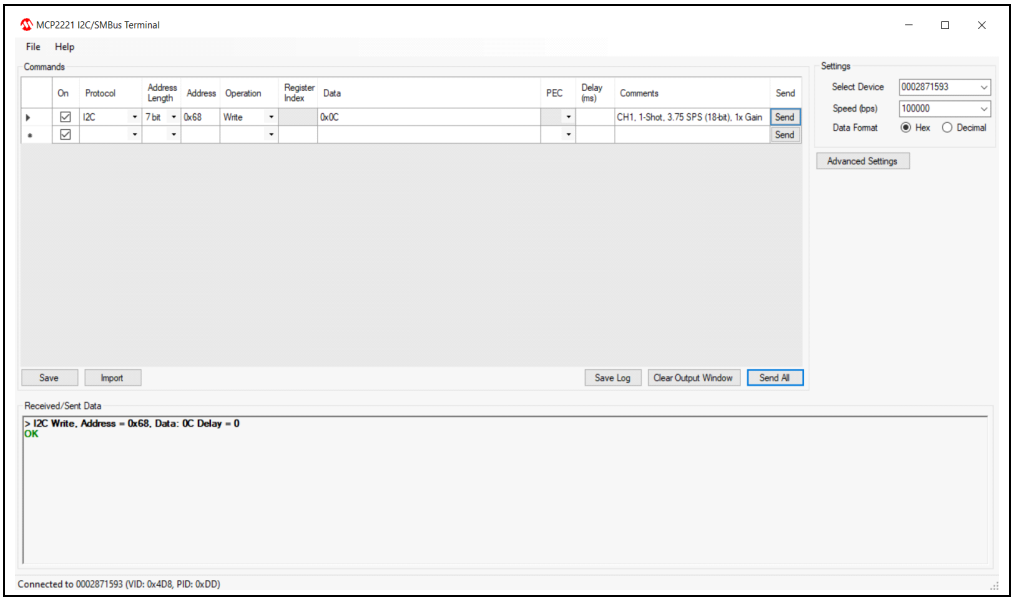


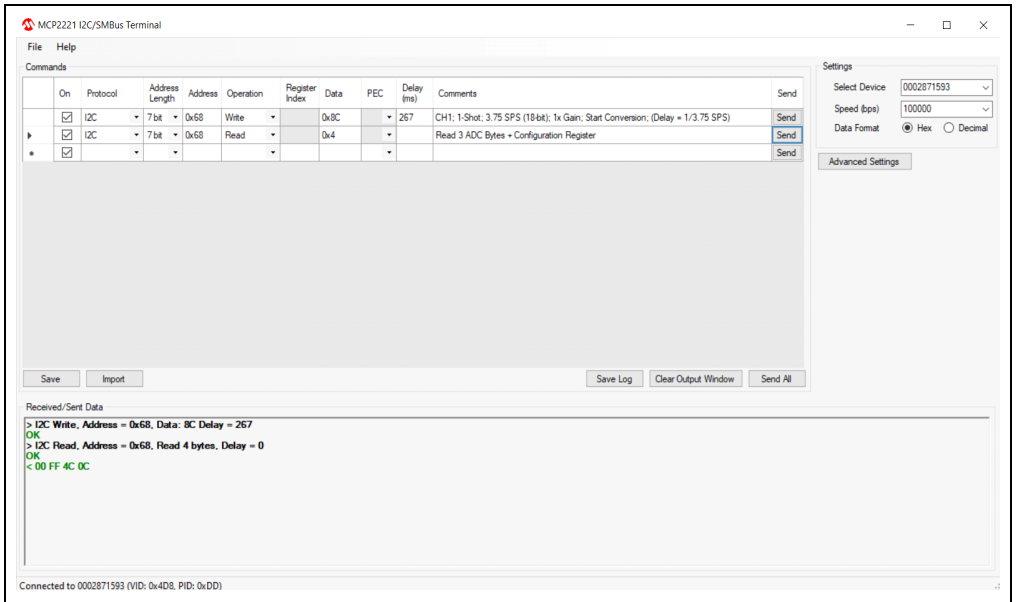
FIGURE 3-2: *MCP2221A Breakout Module I^2C Write Command.*

3.2.4 Reading Conversion Data

1. Select 7-bit for the "Address Length".
2. Enter the Device Code (1101) and Address Bits (000) as a 7-bit value of '1101000' (0x68) for the "Address".
3. Select Read for the "Operation".
4. The "Register Index" is for SMBus operation *only* and should be left blank.
5. The "Data" value (hex format) will specify the number of bytes to be read from the device. The number of bytes will depend on the Sample Rate/Resolution set in the Configuration Register. After the conversion data has been read, any additional bytes requested will read the contents of the Configuration Register.
6. The "PEC" (Packet Error Check) is for SMBus operation *only* and should be left blank.
7. A "Delay" (in milliseconds) can be inserted between the previous command and the current command, if required.
8. "Comments" can be added to describe the operation executed by the command.

Once all commands have been entered in the Command dialog the Command List can be saved by clicking the **Save** button (or *File>Save Command List*) and then executed by clicking on the **Send All** button (see Figure 3-3).

Note: For a comprehensive explanation of the MCP2221A Breakout Module I²C/SMBus Terminal PC Software see DS50002282.



Results:

Input Voltage = 1.022778V

Output Code: 0x00FF4C (= 65356 in Decimal)

Output Code: (65356 x 15.625 µV (LSB)) / PGA = 1.021195V with PGA = 1

Note: 1 LSB with 18-bit Resolution option: 15.625 µV

FIGURE 3-3: *MCP2221A Breakout Module I²C Conversion and Read Command (Input Voltage 1.022778V).*

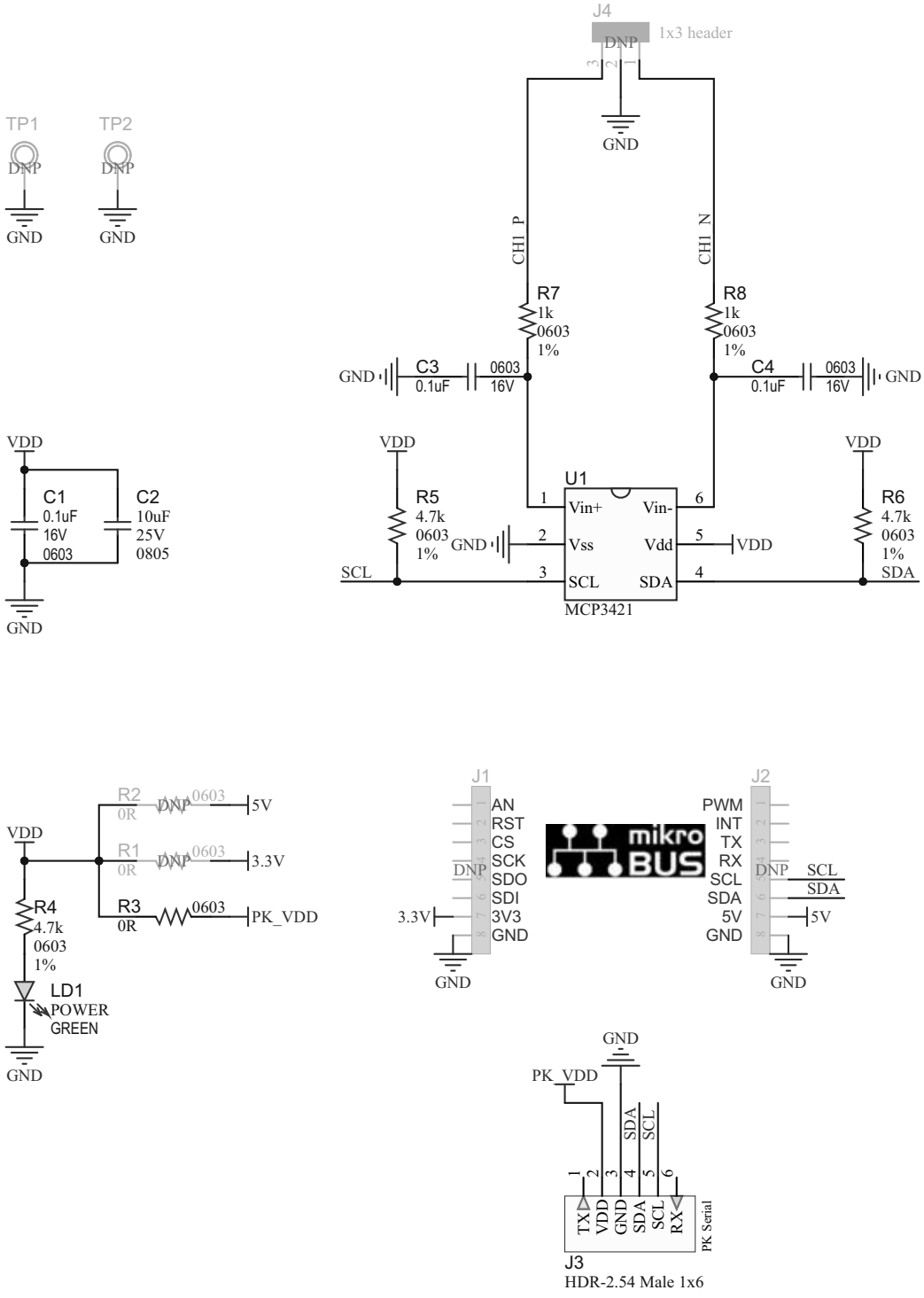
Appendix A. Schematic and Layouts

A.1 INTRODUCTION

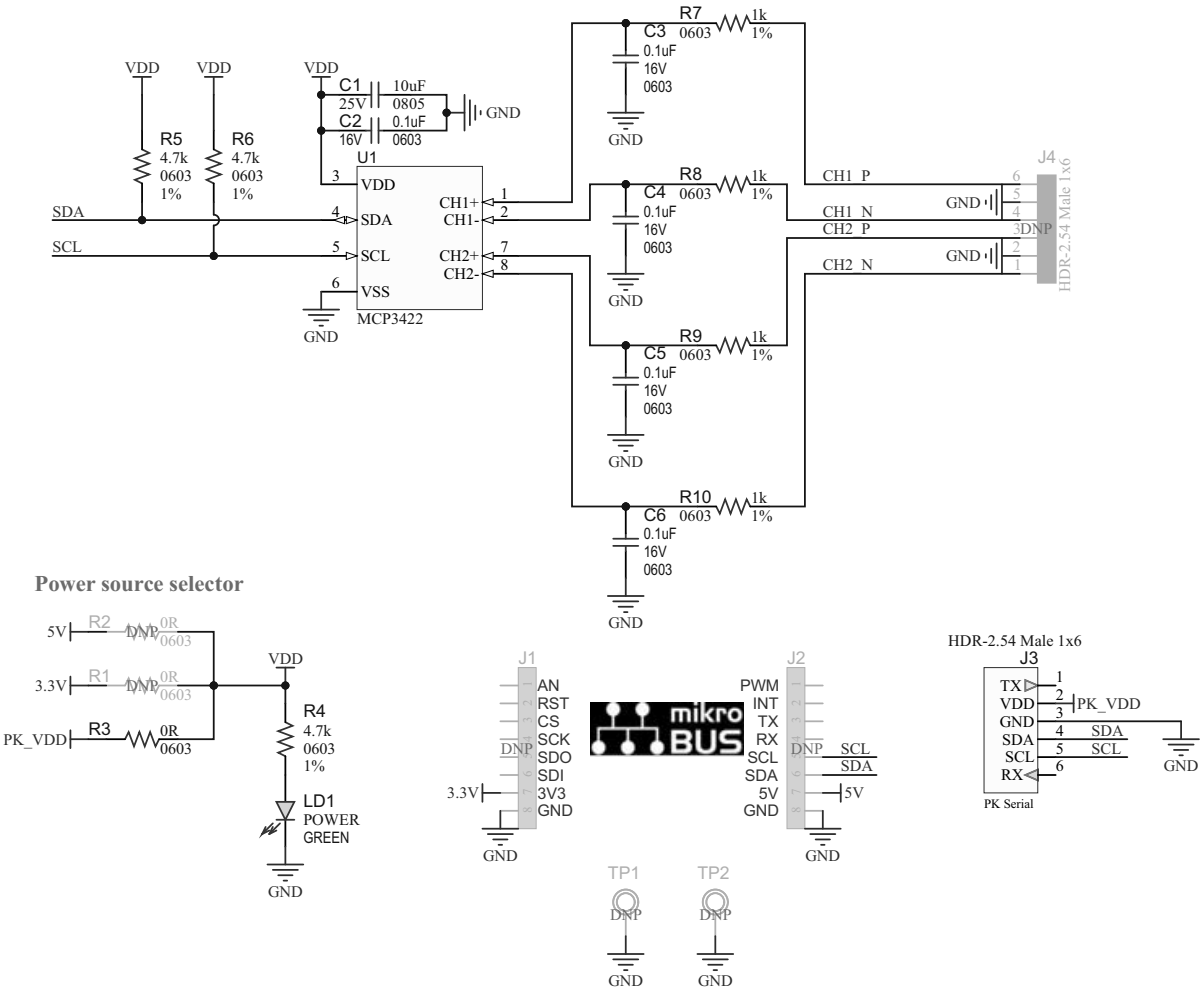
This appendix contains the following schematics and layouts for the MCP3421/2 SOT-23-6 Evaluation Board.

- MCP3421 Schematic
- MCP3422 Schematic

A.2 MCP3421 SCHEMATIC



A.3 MCP3422 SCHEMATIC



NOTES:

Appendix B. Bill of Materials (BOM)

TABLE B-1: MCP3421 BILL OF MATERIALS (BOM)

Qty.	Reference	Description	Manufacturer	Part Number
3	C1, C3, C4	Capacitor, ceramic, 0.1 µF, 16V, 10%, X7R, surface mount, 0603	Taiyo Yuden Co., Ltd.	EMK107B7104KA-T
1	C2	Capacitor, ceramic, 10 µF, 25V, 10%, X5R, surface mount, 0805	Murata Electronics®	GRM21BR61E106KA73L
0	J1, J2	Connector, Header 2.54, male, 1x8, gold, 5.84MH, TH	FCI	68001-108HLF
1	J3	Connector, Header-2.54, male, 1x6, gold, 5.84MH, TH, R/A	FCI	68016-106HLF
0	J4	Connector, Header-2.54, male, 1x3, gold, 6.10MH, TH, vertical	METZ CONNECT GmbH	PR20203VBNN
1	LABEL1	Label, PCBA, 18x6 mm, Datamatrix, Assy#/Rev/Serial/Date	ACT Logimark AS	505462
1	LD1	Diode, LED, green, 3.2V, 20 mA, 430 mcd, clear, SMD 0603	Würth Elektronik	150060GS75000
0	R1	Resistor, TKF, 0R, 1/10W, surface mount, 0603, AEC-Q200	Panasonic® – ECG	ERJ-3GEY0R00V
0	R2	Resistor, TKF, 0R, 1/10W, surface mount, 0603, AEC-Q200	Panasonic – ECG	ERJ-3GEY0R00V
1	R3	Resistor, TKF 0R 1/10W surface mount, 0603, AEC-Q200	Panasonic – ECG	ERJ-3GEY0R00V
3	R4, R5, R6	Resistor, TKF, 4.7 kΩ, 1%, 1/10W, surface mount, 0603	Digi-Key® Electronics	311-4.70KHRTR-ND
2	R7, R8	Resistor, TKF, 1 kΩ, 1%, 1/10W, surface mount, 0603	Vishay/Dale	CRCW06031K00FKEA
0	TP1, TP2	Misc., Test point, multi purpose, mini, black	Keystone® Electronics Corp.	5001
1	U1	Microchip, Analog, ADC-Delta Sigma 18-bit MCP3421A0T-E/CH, SOT-23-6	Microchip Technology Inc.	**MCP3421A0T-E/CH**

TABLE B-2: MCP3422 BILL OF MATERIALS (BOM)

Qty.	Reference	Description	Manufacturer	Part Number
1	C1	Capacitor, ceramic, 10 µF, 25V, 10%, X5R, surface mount, 0805	Murata Electronics	GRM21BR61E106KA73L
5	C2, C3, C4, C5, C6	Capacitor, ceramic, 0.1 µF 16V 10% X7R, surface mount, 0603	Taiyo Yuden Co., Ltd.	EMK107B7104KA-T
2	J1, J2	Connector, Header-2.54, male, 1x8, gold, 5.84MH, TH – **DO NOT POPULATE**	FCI	68001-108HLF
1	J3	Connector, Header-2.54, male, 1x6, gold, 5.84MH, TH, R/A	FCI	68016-106HLF
1	J4	Connector, Header-2.54, male, 1x6, gold, 5.84MH, TH, vertical – **DO NOT POPULATE**	FCI	68000-106HLF

TABLE B-2: MCP3422 BILL OF MATERIALS (BOM) (CONTINUED)

Qty.	Reference	Description	Manufacturer	Part Number
1	LABEL1	Label, PCBA, 18x6mm, Datamatrix, Assy#/Rev/Serial/Date	ACT Logimark AS	505462
1	LD1	Diode, LED, green, 3.2V, 20 mA, 430 mcd, clear, surface mount, 0603	Würth Elektronik	150060GS75000
2	R1, R2	Resistor, TKF, 0R, 1/10W, surface mount, 0603, AEC-Q200 – **DO NOT POPULATE**	Panasonic – ECG	ERJ-3GEY0R00V
1	R3	Resistor, TKF, 0R, 1/10W, surface mount, 0603, AEC-Q200	Panasonic – ECG	ERJ-3GEY0R00V
3	R4, R5, R6	Resistor, TKF, 4.7 kΩ, 1%, 1/10W, surface mount, 0603	Digi-Key Electronics	311-4.70KHRTR-ND
4	R7, R8, R9, R10	Resistor, TKF, 1 kΩ, 1%, 1/10W, surface mount, 0603	Vishay/Dale	CRCW06031K00FKEA
2	TP1, TP2	Misc., test point, multi purpose, mini, black, – **DO NOT POPULATE**	Keystone Electronics Corp.	5001
1	U1	Microchip, Analog, ADC-Delta Sigma18-bit MCP3422A0T-E/SN, SOIC-8	Microchip Technology Inc.	**MCP3422A0T-E/SN**

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