Evaluates: MAXPICO2PMB#

General Description

The MAXPICO2PMB adapter board is a fully assembled and tested PCB that provides an I²C interface to quickly interact with an evaluation kit (EV kit) or a demo board connected through the PmodTM connector.

The adapter board features a rapid development platform - the MAX32625PICO microcontroller, jumpers and a Pmod connector. The user can select on-board pullup resistors on the I²C lines by configuring jumpers. It also features an option to select the pullup voltage for the I²C lines through the power rail jumper. The Pmod connector provides one I²C port and two SPI ports for convenient evaluation.

The MAXPICO2PMB Register Map Tool is a Windows application that interfaces with the MAXPICO2PMB adapter board. The user can import *.regmap files that contain the unique I²C register map information and register field descriptions of an integrated circuit. The application sends commands to the MAX32625PICO microcontroller on the MAXPICO2PMB adapter board over a virtual serial port. The MAX32625PICO microcontroller sends I²C commands to communicate with the EV kit or demo board connected through the Pmod connector.

Features

- USB-Powered Operation
- USB to I²C and SPI Interface
- Pmod Compatible Form Factor
- Flexible Configuration
- MAX32625PICO Rapid Development Platform
- Drag-and-Drop Programming
- Small PCB Area
- Windows[®] 8/10-Compatible GUI Software
- Fully Assembled and Tested

Adapter Board Contents

- MAXPICO2PMB Adapter Board
- USB A to Micro-B Cable

MAXPICO2PMB Adapter Board Files

FILE	DESCRIPTION
PicoRegMapToolSetup.exe	PC GUI Program

Ordering Information appears at end of data sheet.



Windows is a registered trademark and registered service mark of Microsoft Corporation. Pmod is a trademark of Digilent Inc.



MAXPICO2PMB Adapter Board Photo

Quick Start

Required Equipment

Note: In the following sections, software-related items are identified by **bold** text. Text in **bold** refers to items directly from the install of adapter board software. Text which is **bold and underlined** refers to items from the Windows operating system.

- MAXPICO2PMB adapter board with the latest firmware
- USB A to Micro-B cable
- Windows 8/10 PC with USB ports
- EV kit or demo board under evaluation

Procedure

The adapter board is fully assembled and tested. Use the following steps to verify board operation. **Caution: Do not turn on the power supply until all connections are completed**.

 Visit <u>https://www.maximintegrated.com</u> to download the latest version of the adapter board software, PicoRegMapToolVxxx.ZIP located on the MAXPICO2PMB adapter board web page. Download the adapter board software to a temporary folder and unzip the ZIP file.

- Install the adapter board software on your computer by running the PicoRegMapToolSetupVxxx.EXE program inside the temporary folder.
- 3) Verify that all jumpers are in their default positions, as shown in Table 1.
- 4) Connect the Pmod port of the MAXPICO2PMB board to the Pmod connector on the EV kit or demo board under evaluation.
- 5) Connect the USB A to Micro-B cable to the PC and to the MAXPICO2PMB adapter board's USB Micro-B port located at U1. LED D2 on the MAX32625PICO microcontroller flashes blue.
- 6) Run the previously installed GUI program.
- If connection between the PC and the adapter board is successfully established, the status bar at the bottom displays I²C Slave Not Found (see Figure 1).
- 8) The adapter board is now ready for additional evaluations with a specific EV kit or demo board.

Register Map	options 1	icip							
Register	Мар								Read All
Slave Address	Register Address	Register	Value	^	Field	Name	2	Descrip	otion
0x50	0x00	Register 0x00	0xFF		Bit[7:0]	REG_00	NO	description.	
0x50	0x01	Register 0x01	0x00						
0x50	0x02	Register 0x02	0x00						
0x50	0x03	Register 0x03	0x00						
0x50	0x04	Register 0x04	0x00						
0x50	0x05	Register 0x05	0x00						
0x50	0x06	Register 0x06	0x00						
0x50	0x07	Register 0x07	0x00						
0x50	0x08	Register 0x08	0x00						
0x50	0x09	Register 0x09	0x00						
0x50	0x0A	Register 0x0A	0x00						
0x50	0x0B	Register 0x0B	0x00						
0x50	0x0C	Register 0x0C	0x00						
0x50	0x0D	Register 0x0D	0x00	~					
7		6	5		4	3	2	1	0
REG_0	0[7] RI	EG_00[6] RE	G_00[5]	R	EG_00[4]	REG_00[3]	REG_00[2]	REG_00[1]	REG_00[0]
Note: Clic	k toxt to cot	or cloar bit and "M	rite" to con	amit	to device Br	Id text is logic 1	Regular text i	s logic 0 Res	A Write

Figure 1. The Status of the GUI Shows I²C Slave Not Found Ready for Further Evaluations

Detailed Description of Software

Software Startup

Upon starting the program, the **MAXPICO2PMB Register Map Tool** automatically searches for the virtual serial port of the MAX32625PICO microcontroller. Ensure that **I²C Slave Not Found** or **Connected**, with an EV kit or demo board connected at the Pmod connector, is shown in the status strip of the GUI. If any other message is displayed, check all connections, and verify that the steps in the <u>Quick Start</u> section were followed in the correct order.

When the application is opened for the first time, a default register map is loaded with a default 7-bit slave address of 0b0101000 (shown as 0x50, the 8-bit write address). Follow the steps in the next section to open the register map for the EV kit or demo board under evaluation.

The **Read All** button reads all the registers visible on the current tab page. All statuses are polled continuously. The polling feature can be disabled in the **Options** section of the menu bar by selecting **Disable Polling**.

Opening a Register Map

To open a register map file, simply drag and drop the .regmap file anywhere into the application, or manually open the file by following these steps:

- 1) Open the **File** menu in the top left corner of the application and select **Open Register Map**.
- 2) Click the **Browse**... button and open the targeted *.regmap file.
- 3) Click the **OK** button to load the register map.

MAXPICO2PN	AB Register	Map Tool	
File Device	Options	Help	
Open Regis	ter File		
Exit			_

Figure 2. Open Register File

Open Register File	
Current Register File: Default	
Device Name: I ² C Slave	
Slave Address: 0b0101000 (0x50	Write / 0x51 Read)
Select Register File	Browse
Note: Slave addresses are shown	n as the 8-bit write address.
	OK Canad

Figure 3. Browse and Open the *.regmap File

ToolStrip Menu Bar

The **Toolstrip** menu bar (Figure 4) is located at the top of the GUI window. This bar comprises **File**, **Device**, **Options**, and **Help** menus whose functions are detailed in the following sections.

File Menu

The **File** menu contains the option to open a register map and exit out of the GUI program.

Device Menu

The **Device** menu provides the ability to connect or disconnect the adapter board to the GUI. If the board is disconnected while the GUI is open, the GUI displays **Not Connected** in the lower right corner. If the adapter board is then plugged back in, the bottom right corner of the GUI displays I²C Slave Not Found or Connected.

Options Menu

The **Options** menu provides additional setting to access more features offered by the GUI. The **Disable polling** option lets the user read the registers manually instead of getting automatically frequent register updates from the IC.

Help Menu

The **Help** menu contains the **About** option, which displays the GUI splash screen indicative of which GUI version is being used.

Register Map

The **Register Map** tab (Figure 5) displays all register fields and their corresponding descriptions and allows the user to read or write all I²C registers. The user can click **Read All** on the top right corner to perform a burst read of all registers.

🙆 MAXPICO2PMB Register Map Tool	· -	×
File Device Options Help		

Figure 4. The ToolStrip Menu Items

The Device		icip						
Register Map								
Register N	lap							Read All
Slave Address	Register Address	Register	Value	^ Field	Name		Descript	tion
0x50	0x00	Register 0x00	0x01	Bit[7:0]	REG_00	No de	scription.	
0x50	0x01	Register 0x01	0x29					
0x50	0x02	Register 0x02	0x0C					
0x50	0x03	Register 0x03	0x00					
0x50	0x04	Register 0x04	0x00					
0x50	0x05	Register 0x05	0x00					
0x50	0x06	Register 0x06	0xEC					
0x50	0x07	Register 0x07	0x00					
0x50	0x08	Register 0x08	0x20					
0x50	0x09	Register 0x09	0x80					
0x50	0x0A	Register 0x0A	0x00					
0x50	0x0B	Register 0x0B	0x00					
0x50	0x0C	Register 0x0C	0x00					
0x50	0x0D	Register 0x0D	0x00	~				
7		6	5	4	3	2	1	0
REG_00	(7) RE	EG_00[6] RE	G_00[5]	REG_00[4]	REG_00[3]	REG_00[2]	REG_00[1]	REG_00[0]
Nata: Clial		n alaan hit and MA		mait to device D	Id tout in Innin 4	Desuder text is la	nia O Dara	d Muita

Figure 5. Register Map Tab

Evaluates: MAXPICO2PMB#

The left table shows the register to be read from or written to. The right table contains descriptions for each register field of the selected 8-bit register. All bits, along with their field names, are displayed at the bottom of the page.

To set a bit, click the bit label. **Bold** text represents logic 1 and regular text represents logic 0. To configure the changes to the device, click the **Write** button at the bottom right.

Detailed Description of Hardware

The MAXPICO2PMB adapter board provides a convenient way to evaluate the EV kit or demo board connected at the Pmod connector. The adapter board features the MAX32625PICO microcontroller and various jumpers for flexible configurations. The user can select on-board pullup resistors on the I²C lines by configuring jumpers J1 and J2. It also features an option to select the pullup voltage for the I²C lines through the power rail jumper J3. The Pmod connector provides one I²C port and two SPI ports for convenient evaluation. The MAXPICO2PMB adapter board operates from the USB +5V DC and therefore does not require an external power supply. <u>Figure 6</u> shows the pin configuration for the I²C/SPI compatible connector at the MAXPICO2PMB2# board.

Firmware Update

This section covers the procedure to update the MAXPICO2PMB adapter board with the latest firmware by programming a firmware image file (.bin) onto the onboard MAX32625PICO microcontroller.



Figure 6. X2 Pmod I²C/SPI Connector Pin Configuration

- Put the board in maintenance mode by holding the button while the board is being connected to the computer. It can be easier to hold the button while inserting the USB cable at the computer end rather than the micro USB connector end (see Figure 7).
- If the board enters bootloader mode successfully, the LED on the board turns red and the board appears to the computer as a USB drive named MAINTENANCE.
- Drag and drop the firmware image file (.bin) into the MAINTENANCE drive and the board installs the new firmware.



Figure 7. Enter Maintenance Mode on the MAX32625PICO

Using the Register Map Tool with MAX20342EVKIT

This section covers an example of opening the MAX20342 regmap file in the MAXPICO2PMB **Register Map** tool to interface with the MAX20342EVKIT (read and write register).

Hardware setting

- 1) Follow the default jumper settings from <u>Table 1</u> and the setup *Procedure*.
- 2) Follow the default jumper settings on the MAX20342EVKIT.
- Connect the MAXPICO2PMB adapter board to the MAX20342EVKIT through the Pmod connector (see Figure 8).
- Connect a Micro-B cable to the USB1 port of the MAX20342EVKIT to power the EV kit. LED D4 of the MAX20342EVKIT lights up green.



Figure 8. Using the MAXPICO2PMB Adapter Board with MAX20342EVKIT

Table 1. Jumper Table (J1-J3)

JUMPER	SHUNT POSITION	DESCRIPTION
J1	1-2*	Connect 4.7k Ω pullup resistor to the SDA line
J2	1-2*	Connect 4.7k Ω pullup resistor to the SCL line
12	1-2	Connect VIO to 3.3V of the MAX32625PICO microcontroller
J3	2-3*	Connect VIO to 1.8V of the MAX32625PICO microcontroller

*Default position

Evaluates: MAXPICO2PMB#

MAXPICO2PMB Register Map Tool GUI

Follow these steps to use the MAX20342 regmap file:

 Follow the <u>Procedure</u> and the status of the GUI shows I²C Slave Not Found.

Г

 Under File, choose Open Register File, Browse for the MAX20342 regmap file, then click OK. The status shows Connected. The Slave Address column reflects the 8-bit I²C slave address of the MAX20342 0x6A. All MAX20342 specific details are filled in the **Register Map** tab, and default register values are loaded (see Figure 9).

 Go to Register Address 0x16 COMM_CTRL2 and locate bit 3 (Enable Force DB Output). Click on the DBFrc bit so it becomes bold and click Write to set this bit. Locate bit 4 (DB Output) and set this bit. LED D6 of the MAX20342EVKIT turns red (see Figure 10).

gister Map									
Register N	lap				1				Read All
Slave Address	Register Address	Register	Value	^	Field	Name		Desc	ription
0x6A	0x00	REVISION ID	0x01		Bit[7:0]	Revision_id	Inte	ormation about the	e hardware
0x6A	0x01	COMMON_INT	0x00				10	131011.	
0x6A	0x02	CC_INT	0x20						
0x6A	0x03	BC_INT	0x00						
0x6A	0x04	OVP_INT	0x00						
0x6A	0x05	RES_INT1	0x00						
0x6A	0x06	RES_INT2	0x00						
0x6A	0x07	COMMON_STA	0x00						
0x6A	0x08	CC_STATUS1	0x01						
0x6A	0x09	CC_STATUS2	0x00						
0x6A	0x0A	BC_STATUS	0x00						
0x6A	0x0B	OVP_STATUS	0x80						
0x6A	0x0C	COMMON_MASK	0x04						
0x6A	0x0D	CC_MASK	0x00	~					
7		6	5		4	3	2	1	0
Revision_	id[7] Rev	vision_id[6] Revision	on_id[5]	Re	evision_id[4]	Revision_id[3]	Revision_id[2] Revision_id[1] Revision_id[0]
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							

Figure 9. Open the MAX20342 Regmap File in MAXPICO2PMB Register Map Tool

le Device	Options H	Help									
egister Map									D 141	_	
Register M	Лар								Read All		
Slave Address	Register Address	Register	Value	^	Field	Name	116	Descripti	on	^	
0x6A	0x0C	COMMON_MASK	0x04				05	058 SWICh Control 0600: All switches open			
0x6A	0x0D	CC_MASK	0x00		Bit[7:6]	USBSWC	Ob	0b01: USB SW to UT/UR position 0b10: USB SW to TDP/TDN position 0b11: Follow the automatic hardware			
0x6A	0x0E	BC_MASK	0x00		Diq7.0j		Ob				
0x6A	0x0F	OVP_MASK	0x00				setting				
0x6A	0x10	RES_MASK1	0x00			NotUSBCmpl	No	Not USB Compliant in Case of SDP			
0x6A	0x11	RES_MASK2	0x00				De	etection. CEb is set	low in case of		
0x6A	0x15	COMM_CTRL1	0xC0	Bit[5]	Bit[5]		SE	SDP if NotUSBCompl = 1.			
0x6A	0x16	COMM_CTRL2	0xD8				Ob	0b0: Compliant 0b1: Not compliant			
0x6A	0x17	RFU_RW	0x00								
0x6A	0x18	RFU_RO	0x00			DR	registers are set by the result of				
0x6A	0x19	COMM_CTRL3	0x00		Detai Di		ch	charger FSM. With DBFrc = 1,			
0x6A	0x1A	OVP_CTRL	0x01		Diq4j	00	registers are set by I2C com		C command	nand	
0x6A	0x20	CC_CTRL0	0x00				on	tout: DB is the control	of open drain		
0x6A	0x21	CC_CTRL1	0x8D	~	Bit[3]	DBErc	Fr	able Force DB Out	oute	~	
7		6 5	;		4	3	2	1	0		
USBSWO	C[1] US	SBSWC[0] NotUSF	3Cmpl		DB	DBFrc	-	CE	CEFrc		
Note: Click	text to set	or clear bit and "Writ	e" to com	nmit t	o device. Bo	ld text is logic 1. Reg	ular text	is logic 0. Rea	d Write		

Figure 10. An Example of Setting Bits with the MAX20342 Regmap

Ordering Information

PART	ТҮРЕ
MAXPICO2PMB#	Adapter Board

#Denotes RoHS compliance.

MAXPICO2PMB Adapter Board Bill of Materials

ITEM	REF_DES	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1	1	CL21A106KOQNNN; GRM21BR61C106KE15;	SAMSUNG ELECTRONICS;MURATA;	10115	CAP; SMT (0805); 10UF; 10%;
1	CI	T	EMK212ABJ106KD	TAIYO YUDEN	1006	16V; X5R; CERAMIC
			C0603C104K5RAC;C1608X7R1H104K;			
			ECJ-1VB1H104K;GRM188R71H104KA93;			
2	62	1	CGJ3E2X7R1H104K080AA;	KEMET;TDK;PANASONIC;MURATA;	0.1115	CAP; SMT (0603); 0.1UF; 10%;
2	C2	T	C1608X7R1H104K080AA;	TDK;TDK;SAMSUNG;SAMSUNG;AVX	0.10F	50V; X7R; CERAMIC;
			CL10B104KB8NNN;CL10B104KB8NFN;			
			06035C104KAT2A			
						TEST POINT; PIN DIA=0.125IN;
						TOTAL LENGTH=0.445IN;
3	GND	1	1 5011	KEYSTONE	N/A	BOARD HOLE=0.063IN; BLACK;
						PHOSPHOR BRONZE WIRE SILVER
						PLATE FINISH;
4	11 12	h	DRCOCCAAN		DRCOOSAAN	CONNECTOR; MALE; THROUGH HOLE;
4	JI, JZ	Z	PBCUZSAAN	SOLLINS ELECTRONICS CORP.	PBCUZSAAN	BREAKAWAY; STRAIGHT; 2PINS
						CONNECTOR; MALE; THROUGH HOLE;
5	J3	1	PCC03SAAN	SULLINS	PCC03SAAN	BREAKAWAY; STRAIGHT THROUGH;
						3PINS; -65 DEGC TO +125 DEGC
6	D1 D2	r	CRCW04024K70FK;	VISHAY DALE;	A 7K	RES; SMT (0402); 4.7K; 1%;
0	ΝΙ, ΝΖ	2	MCR01MZPF4701	ROHM SEMICONDUCTOR	4.7K	+/-100PPM/DEGC; 0.0630W
						MODULE; BOARD; MAX32625PICO
7	111	1	MAX2262ERICO	ΝΑΧΙΝΑ	MAY2262EDICO	BOARD DESIGN FOR MAX32625 ARM
	01	T	MAX32023FICO		WIAA52025FICO	CORTEX-M4F; BOARD; LAMINATED
						PLASTIC WITH COPPER CLAD;
						CONNECTOR; FEMALE;
8	X2	1	PPPC062LJBN-RC	SULLINS ELECTRONICS CORP.	PPPC062LJBN-RC	THROUGH HOLE; 0.1IN CC; HEADER;
						2 ROW; RIGHT ANGLE; 12PINS
9	PCB	1	MAXPICO2PMB_APPS_A	MAXIM	PCB	PCB:MAXPICO2PMB_APPS_A
TOTAL		11				



MAXPICO2PMB Adapter Board Schematic

Evaluates: MAXPICO2PMB#



MAXPICO2PMB Adapter Board PCB Layouts





MAXPICO2PMB Adapter Board PCB Layout—Top



MAXPICO2PMB Adapter Board PCB Layout—Bottom



MAXPICO2PMB Adapter Board PCB Layout—Bottom Silkscreen

Evaluates: MAXPICO2PMB#

Revision History

REVISION	REVISION	DESCRIPTION	PAGES
NUMBER	DATE		CHANGED
0	1/21	Initial release	—

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at https://www.maximintegrated.com/en/storefront.html.

Maxim Integrated cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim Integrated product. No circuit patent licenses are implied. Maxim Integrated reserves the right to change the circuitry and specifications without notice at any time.