

PCB Version M952

The E931.08 PIR A2D is used to demonstrate the capability of the E931.08 using a traditional PIR detector. The microcontroller on the module reads PIR voltage and Temperature information on every interrupt and passes it on to the USB port. The module can be used get familiar with the E931.08 or to characterise traditional PIR detectors from various suppliers.



Notes:

1. The module is not protected against ESD, avoid potential difference between yourself and the module before use.



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Module Description and Connection

1. Power Supply

The SiLab USB to UART Bridge internal regulator generates a stable 3.3V for the circuitry on the module.

2. Detector Readout

The Microchip PIC reads the data from the digital detector, through the DOCI interface.

3. LED Indicators

A power LED D2 indicates that the module is connected to the USB port. LED D1 is controlled by the processor; it is used to indicate it the E931.08 is powered.

4. Programming connector

J2 is a programming connector can be used to reprogram the MCU. The pins on the programming on the connector are compatible to the MPLAB ICD2 LE, PICKit 2 and PICKit 3 programmers. Pins 4 and 5 are used for mode setting inputs upon start-up of the module.



5. USB interface with a Personal Computer (PC) A CP2102-GM USB to UART Bridge interfaces between a PC and the UART on the MCU. It may be necessary to install an appropriate driver on the PC if it is not handled automatically by the operating system. The driver can be found here:

<u>http://www.silabs.com/products/mcu/</u> Pages/USBtoUARTBridgeVCPDrivers.aspx

After the driver is installed correctly and the module is plugged in to a USB port on the PC, an additional entry in the Ports category of the Device Manager will show up.

Make a note of the new Com Port number that is assigned to the module, since it will have to be specified when using the PC Scope software or the terminal software.

Port used by module



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Software version on Module

This document is valid for software version Compiled on 17-May-12 11:12:48 and later.

PC Interface

The module interfaces to a PC via a serial to USB converter IC. The Silabs driver software installed on the PC takes creates a virtual serial port again. There is software needed on the PC to make sense of the data from the module. The options available are the use of a terminal program or the MOS Scope Software.

A serial terminal program such as Hyper Terminal or Putty can be used to see and possibly log the actual register values in plain text.

If a direct graphical display of the data is preferred, the MOS Scope software can be used. The MOS Scope software needs a configuration file for the particular module used, ensure that the file name and the module number match.

The MOS Scope SW outputs data to the PC in a binary format and the terminal programs uses standard ASCII data. The ASCII output format is selected with a jumper on the programming connector; the binary format does not need any jumpers.

In terminal mode the jumper is inserted between VSS and Pin 13 on the PIC. Sensing of this mode is only done on a reset of the module, power up or MCU reset.







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Terminal interface

Insert the module in the USB port; Give it a couple of moments for the driver to load and the port to be initialized. COM3 Properties 8 3

nect To		y X	Bits per second:	115200	•
dfv			<u>D</u> ata bits:	8	•
iter details for	the phone number that you	want to dial:	Parity:	None	•
untry/region:	South Africa (27)	*	Stop bits:	1	•
<u>a</u> a code:	012		<u>H</u> ow control:	None	•
one number:			·		

The port settings on the terminal program must be as follows:

115200b/s, 8 data bits, 1 start bit, 1 stop bit, no parity, no flow control

In Terminal Mode the information from the MCU are transferred as ASCII characters and end with a <LF><CR combination.

🕵 PuTTY Configuration 8 X Category Session Options controlling local serial lines Select a serial line Temina Keyboard Bell Features Serial line to connect to COM3 Configure the serial line Speed (baud) 115200 Window Appearanc Data bits 8 Behaviou Translation Selection Colours Stop bits Parity None Connection Flow control None Data Prox Telr About Help Open www<u>O</u>moseco.za

Jalegory.						
 ⇒ Session Logging ⇒ Terminal → Keyboard → Features ⇒ Window → Appearance → Behaviour → Translation → Selection 	Basic options for your F	PuTTY session				
	Specify the destination you want Serial line	to connect to Speed				
	COM3	115200				
	Connection type: ◯ Raw ◯ Ielnet ◯ Rlogin ◯ SSH ④ Senial					
	Load, save or delete a stored session Savgd Sessions					
	115k_USB					
Colours	Default Settings	Load				
Data Proxy Telnet Riogin @ SSH Serial	460.5k_USB_Port3 460.5k_USB_Port5	Sa <u>v</u> e				
	Mos_server	Delete				
	Close window on exit: Always Never I ()	Only on clean exit				

In Putty the setup screens would like as follows:

Terminal software should be running now.

Ensure that a 3 pin Digital PIR is inserted in the module.

The terminal window should be open and a couple of coulombs of data should be scrolling form the bottom of the window at this stage, Press 'R' to restart the SW on the module.

The specific Digital PIR that is inserted will be identified automatically upon restart of the program running on the MCU. The correct registers will now be read continuously from the detector.

The terminal window will show a couple of coulombs of data depending on the type of detector used.



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Data is always shown in the sequence PIR register, Temperature register, Time between readings.

🛃 сомз	- PuTTY	101 Mar.	
64549	7962	3909	^
64545	7961	3910	
64552	7961	3909	
64553	7961	3909	
64550	7962	3910	
64548	7961	3909	
64548	7962	3910	
64544	7963	3909	
64541	7963	3909	
64550	7962	3909	
64559	7962	3910	
64564	7963	3909	
64565	7963	3909	
64567	7961	3910	
64568	7961	3909	
64571	7962	3908	
64574	7962	3909	
64577	7962	3910	
64571	7962	3909	
64561	7961	3910	
64562	7961	3910	
64557	7961	3910	
64557	7962	3909	
			www.mos.co.za

The following options are supported on this software version and are selected by pressing a single character on the keyboard.

Key controls options that are available as follows:

Key	Action	E931.08
Т	Display Temperature On/Off	Yes
t	Display time between measurements	Yes
space	Detector power On/Off	Yes
С	Transfer/Stop transfer data to PC	Yes
f	[#] Enable/Disable HP Filter on PIR data	Yes
R	Reset the MCU	Yes
Α	[#] Enable/Disable AC PIR data	No
V	[#] Enable/Disable Voltage or Counts graph	Yes
	display (scope mode)	
V	SW Version	Yes
q	Display the menu message	Yes



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The 'q' was pressed and the register data is not displayed any more, the options menu is displayed, to see the register reads press the "c".

🛃 сомз	- PuTTY	
64580	7987	•
64575	7986	
64572	7986	
64572	7987	
64574	7986	
64573	7987	
64575	7984	
64576	7986	
64578	7985	
64579	7985	
64575	7985	
64570	7986	
64567	7986	
[9]	Option Menu	
[]	Power on/off	
[A]	AC coupling	
[f]	filter output	
[t]	Time Meas	
[T]	Temp Meas	
[V]	Scope mode Voltage enable	
[v]	Software Version	
[R]	Reset MCU	=
[<]	Continue / Show register reads	www.mos.co.za

The 'f' was pressed to show the filtered ADC values. Software filters are implemented on the module for all devices except the E931.08.

CON	3 - PuTTY	
-8	7988	*
-3	7989	
-1	7990	
-6	7989	
-9	7989	
-7	7989	
-10	7988	
-8	7989	
-7	7989	
2	7990	
6	7990	
0	7989	
-8	7989	
-3	7989	
1	7990	
9	7990	
10	7990	
9	7989	
12	7989	
14	7989	
12	7989	
11	7989	-
12	7989	www.mos.co.za



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MOS Scope Software

The operation of the MOS Scope SW is described in a different document that is supplied with the software. Key issues regarding the use of this module only are highlighted below.

In Scope mode (selected by removing all jumpers upon start-up) the information from the MCU are transferred as a binary packet to the PC. For the MOS Scope SW to function correctly the correct module configuration file must be loaded and the correct baud rate and port must be selected in the configuration settings.

The module number is usually the last 4 characters of the "Data Config Mxxx.csv" file in this case the config file will be called "Data Config M952.csv"

Connect the module to a USB port on the PC. Start the Scope software (usually a icon on the desktop) Click on the Data Config Tab, now click on File, select Open Config file. Load the correct file for the module.

Scope		str.										6			l	×
<u>F</u> ile		_														
Scope Dat	ta Configuration															
Device Data	Received															
A5-0A-6	62-01-00-	00-FD-3	BD-8B-4F		\mathcal{I}											Save/Refresh
System Config	uration															
Company 1	litle			Chart T	itle			Po	rt Number				Baud Rate			
I M952 Mode	ule 8001 Lens			Traditio	nal PIR Eval		(CC	омз			(115200			
Data Configura	tion(To add new	entry double	dick in white sp	ace below orid	.)		· · · · ·									
Device	▲ Default In	Product N	Name Of	Unit Of M	Factor	Offset	From Byte	To Byte N	Data Rate Rea	ad Skip	Graph Pan	Contains N	Min Scale	Max Scale	Show YAxis	Stop Watch
▶ 62	1	E931.08	PIR ADC	Counts	1	. 0	5		8 15	0	1		0	0		
62	1	E931.08	Temperature	Counts	1	. 0	9	1	.0 15	0	2	2	C	C		
62	2	E931.08	PIR ADC	Volt	8.13E-07	0	5		8 15	0	1		C	C		
62	2	E931.08	Temprerat	Degrees	0.001111111	-52.0778	9	1	.0 15	0	2	2	C	C		
62	3	E931.08	Filter ADC	Counts	1	. 0	5		8 15	0	1		C	C		
62	3	E931.08	Temperature	Counts	1	. 0	9	1	0 15	0	2	2	0	0		
62	4	E931.08	Filter ADC	Volt	8.13E-07	0	5	i i	8 15	0	1		-0.0001	0.0001		
62	4	E931.08	Temperature	Degrees	0.001111111	-52.0778	9	1	0 15	0	2	2	0	40		
62	4	E931.08	Temperature	Degrees	0.001111111	-52.0778	9	1	0 15	0	2	2		40 •	ww.mo	S.

Ensure that the correct Port and baud rate is also set for the module.

Click Save/Refresh

Wait a couple of seconds

Each time the Save/Refresh button is clicked the Device Data Received should change, this shows that the data from the module is received correctly.

Click on the Scope Tab to see the graphical data.

Press Start

The data from the module is now supposed to be displayed on the graph.



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Hardware



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