# Functional description for evaluation module TermoCouple\_USB\_M956



The TermoCouple\_USB\_M956 module contains everything needed to evaluate a E931.08 Single Channel Analog to Digital Converter. The microcontroller on the module interfaces with the E931.08 and reads periodically data from the E931.08. It is recommended that the module be connected to a PC capture and evaluate the information generated Analog to Digital Converter.



Notes:

1. The module is ESD Sensitive, and is not protected, so be careful!

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### **Module Description**

#### 1. Power Supply

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

#### 2. Sensor Readout and Signal Processing

The Microchip PIC reads the data from the E931.08 every 15ms through the DOCI interface.

#### 3. LED drivers

A power LED indicates that the module is connected to the USB port.

LED L2 is controlled by the MCU, upon start-up it will blink for a couple of seconds before readings is sent back to the USB port.

#### 4. Programming connector

The programming connector can be used to reprogram the MCU. The pins on the programming on the connector are compatible to the MPLAB ICD2 LE and PICKit 2 and PICKit 3 programmers.

	5. USB interface with a Personal Computer		
🚔 Device Manager	(PC)		
Device Manager         File       Action       View       Help         Helgard-PC-WIN7         Disk drives         Disk drives         Disk drives         Disk drives         Display adapters         Disk drives         Disk drives         Display adapters         Disk drives         Disk drives         Display adapters         Display adaptics         Microchip Tools         Display adapters         Monitors         Network adapters         Display adapters </th <th colspan="3"><ul> <li>(PC)</li> <li>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.</li> <li>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.</li> <li>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.</li> </ul></th>	<ul> <li>(PC)</li> <li>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.</li> <li>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.</li> <li>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.</li> </ul>		
<ul> <li>PCI Simple Communications Controller</li> <li>Ports (COM &amp; LPT)</li> <li>Communications Port (COM1)</li> <li>Silicon Labs CP210x USB to UART Bridge (COM3)</li> <li>Processors</li> <li>Sound, video and game controllers</li> <li>System devices</li> <li>Universal Serial Bus controllers</li> <li>USB Virtualization</li> </ul>	Port used by module		

It may be necessary to manually download and install the driver on older operating systems; the link to the driver download page is shown below:

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

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The software on the module is able to interface to a terminal with the following port settings.

COM1 Properties	? X			
Port Settings				
Bits per second: 115200	•			
Data bits: 8	<b>_</b>			
Parity: None	<b>_</b>			
Stop bits: 1	•			
Flow control: None	<b>•</b>			
Resto	re Defaults			

The data format is as follows: 115kb/s

8 data bits, 1 start bit, 1 stop bit, no parity, no flow control

Values from the MCU are transferred as ASCII characters and end with a <LF><CR combination.

## Software Description

The software running on the processor reads all the registers of the device with every interrupt generated by the IC (15ms) The first value displayed is the ADC value and the second value displayed is the on chip temperature value.

COM3_Term - HyperTerminal	×
<u>File Edit View Call Iransfer H</u> elp	
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64382 8241	
64383 8241	
64383 8240	
64383 8240	
64385 8240	
64385 8240	
64386 8240	
64386 8238	
66383 8239	
04000 0207	E
Connected 00:00:04 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo	.41

It is possible to capture the data and store it in a text file that can be opened with a spread sheet program like Excel afterwards.

Click >Transfer > Capture Text, save the file. To stop the data logging click on Transfer> Capture Text > Stop.



## **Contact Information**

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