

TLI4971 Current Shield2Go

Quick Start
V1.0.0



Introduction

The TLI4971 is a high precision miniature coreless magnetic current sensor for AC and DC measurements with analog interface and dual fast over-current detection outputs.

Infineon's well-established and robust monolithic Hall technology enables accurate and highly linear measurement of currents with a full scale up to $\pm 120\text{A}$.

The digitally assisted analog concept of TLI4971 offers superior stability over temperature and lifetime. The differential measurement principle allows great stray field suppression for operation in harsh environments.

The high configurability enables customization for a wide variety of applications. All user-programmable parameters such as OCD thresholds, blanking times and output configuration mode can be stored either in an embedded EEPROM memory or in volatile registers.

Programming of the sensor can be performed thru a Serial Inspection and Configuration Interface (SICI).



Link to [Datasheet](#) and [Product Page](#)

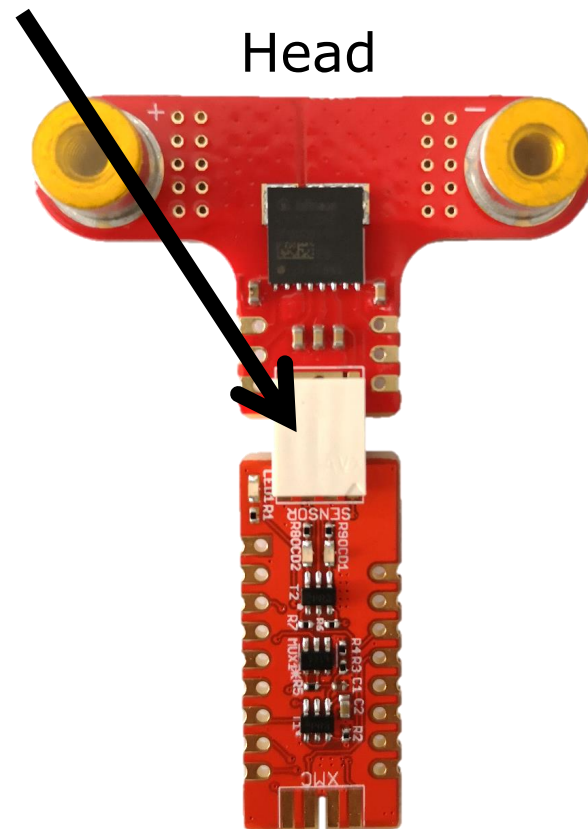
Evaluation Board Notes

Information

- Supply voltage is typ. 3.3 V, please refer to [TLI4971 datasheet](#) for more details about maximum ratings
- Pin out on top (head) is directly connected to the pins of the TLI4971
- If head is detached, only some capacitors are connected to the TLI4971
- Software compatible with Arduino and library fully integrated into the Arduino IDE
- Sales Name S2GO_CUR-SENSE_TLI4971 and TLI4971_MS2GO

Detachable

Head

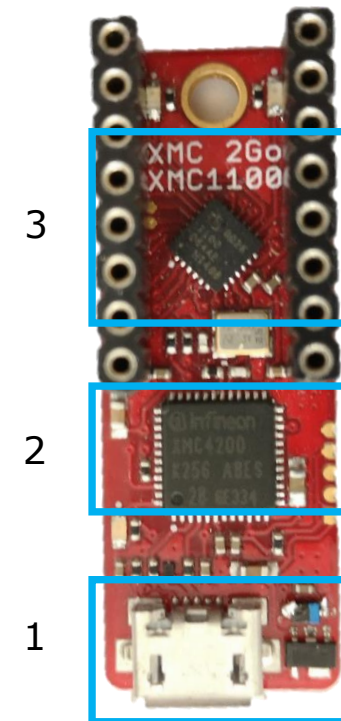


Ensure that no voltage applied to the pins exceeds the absolute maximum rating of 3.6 V

Link to [Board Page](#)

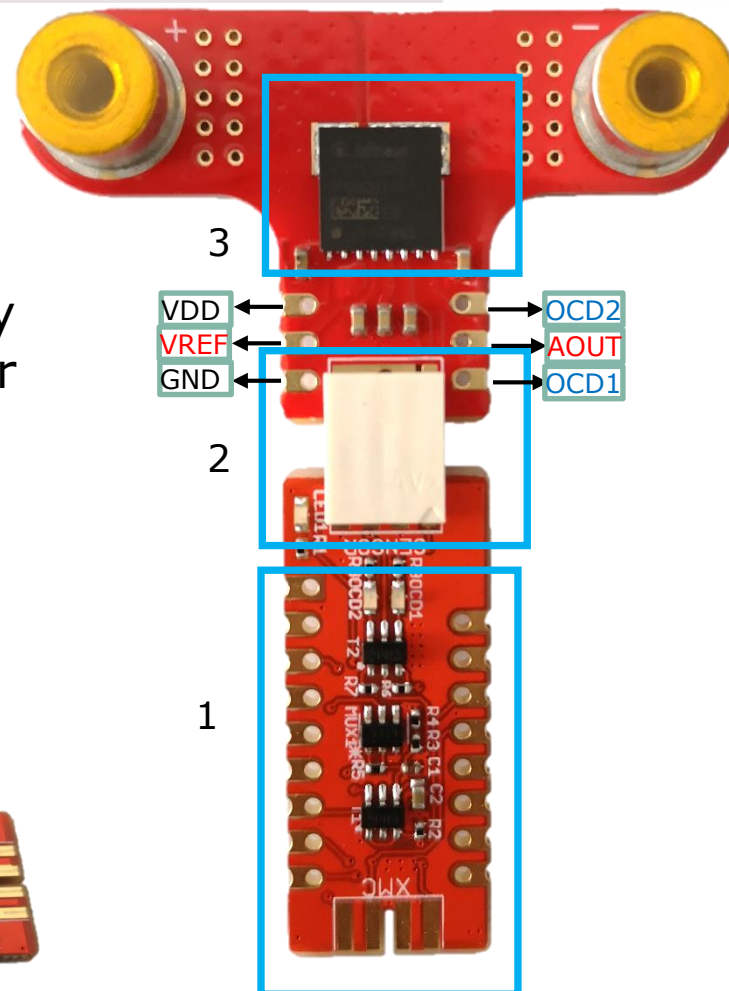
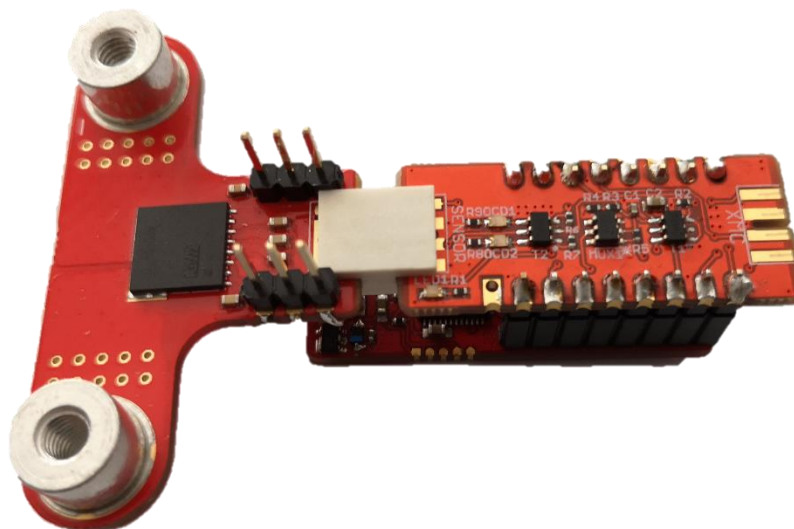
General Description: XMC2go

- › The evaluation kit hardware is built around the XMC1100 Infineon target microcontroller(3), ARM M0 based. In addition, the hardware includes an on-board debugger microcontroller (2) implemented with the Infineon XMC4200 running a SEGGER Jlink debugger.
- › To connect to the PC, a micro-USB (1) to USB cable is required – not provided inside the package.



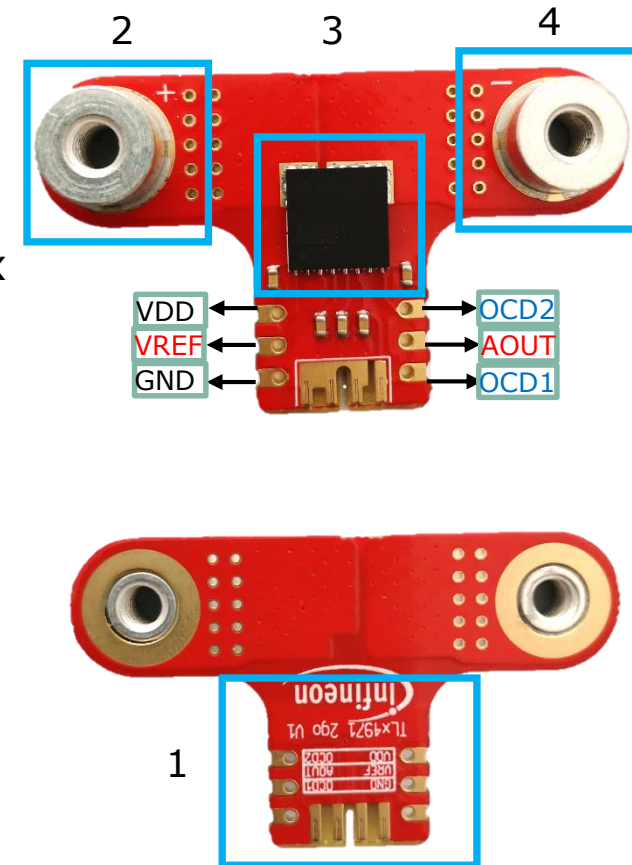
General Description

- › The sensor (3) is placed on a separate PCB so it can be removed and placed in a system when needed.
- › The sensor board inputs/outputs are easily accessible (2) and connected to the sensor shield via a two layer edge connector.
- › The sensor shield (1) can be stacked on top of the XMC 2Go kit or can be connected to the XMC side.



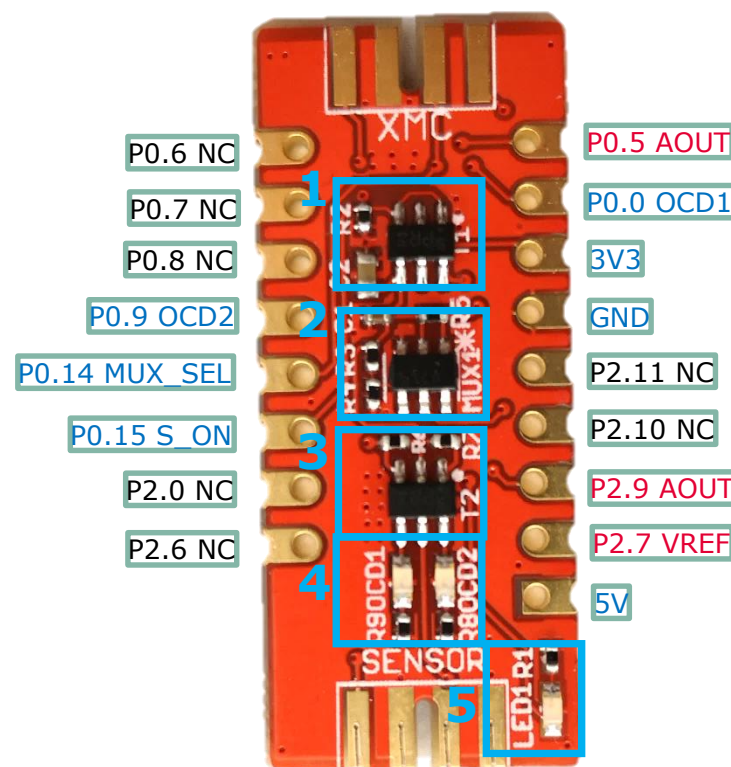
Sensor Board

- › The current sensor (3) is placed on a board with two M4 screw connectors for high current applications (2,4). The PCB is manufactured in 140 μm copper technology and the sensor provides functional galvanic isolation.
- › The sensor inputs/outputs are easily accessible via 2 x 3 pole pin headers (2.54mm pitch) (1).



Sensor Shield

- › The sensor shield will connect the sensor board to the XMC 2Go microcontroller board or later on to a dedicated readout board.
- › The shield contains:
 - Two BSL308PE dual package PMOS transistors (1,3) used for:
 - switching ON/OFF the sensor supply,
 - switching ON/OFF the sensor supply LED (LED1) (5)
 - switching ON/OFF the overcurrent indicator LEDs (4).
 - MAX4624EUT / STG719STR Analog MUX (2) is used to select a external or internal sensor voltage reference.
- › The sensor analog signal output / reference signal can be read by the 12 bit ADC of the XMC 2Go microcontroller



Evaluation Board PCB Details

The

TLI4971 Current Shield2Go

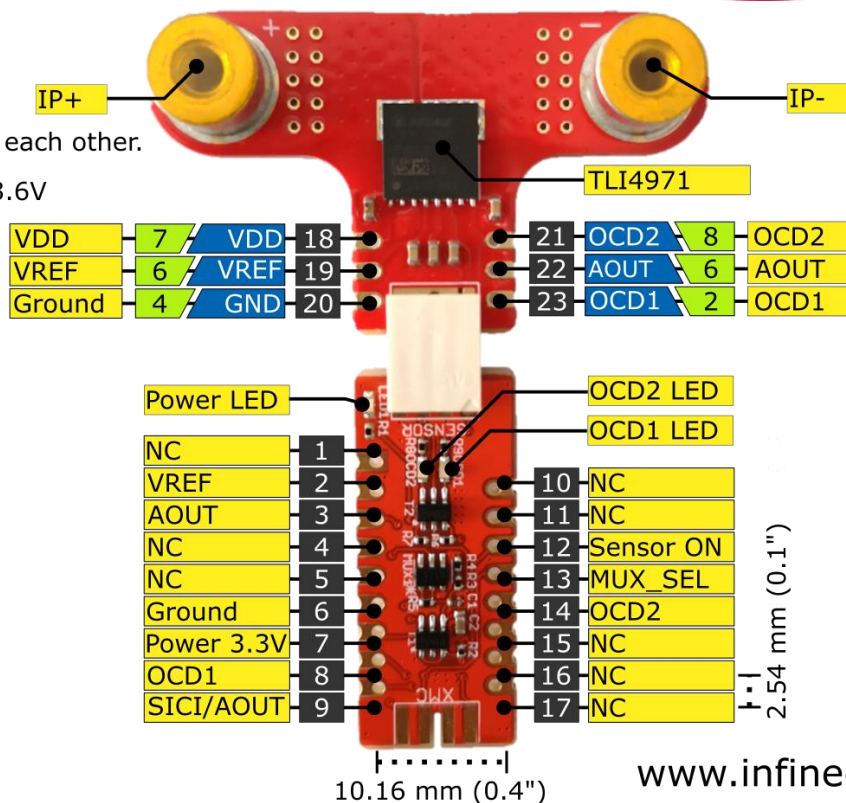


i Ground pins on board connected with each other.

! The maximum voltage on the pins is 3.6V

Legend

 	Information
 	Labelling of Pins in Datasheet
 	Pin Number in Datasheet
 	Physical Pin Number
!	Warning
i	Additional Information
NC	Not Connected

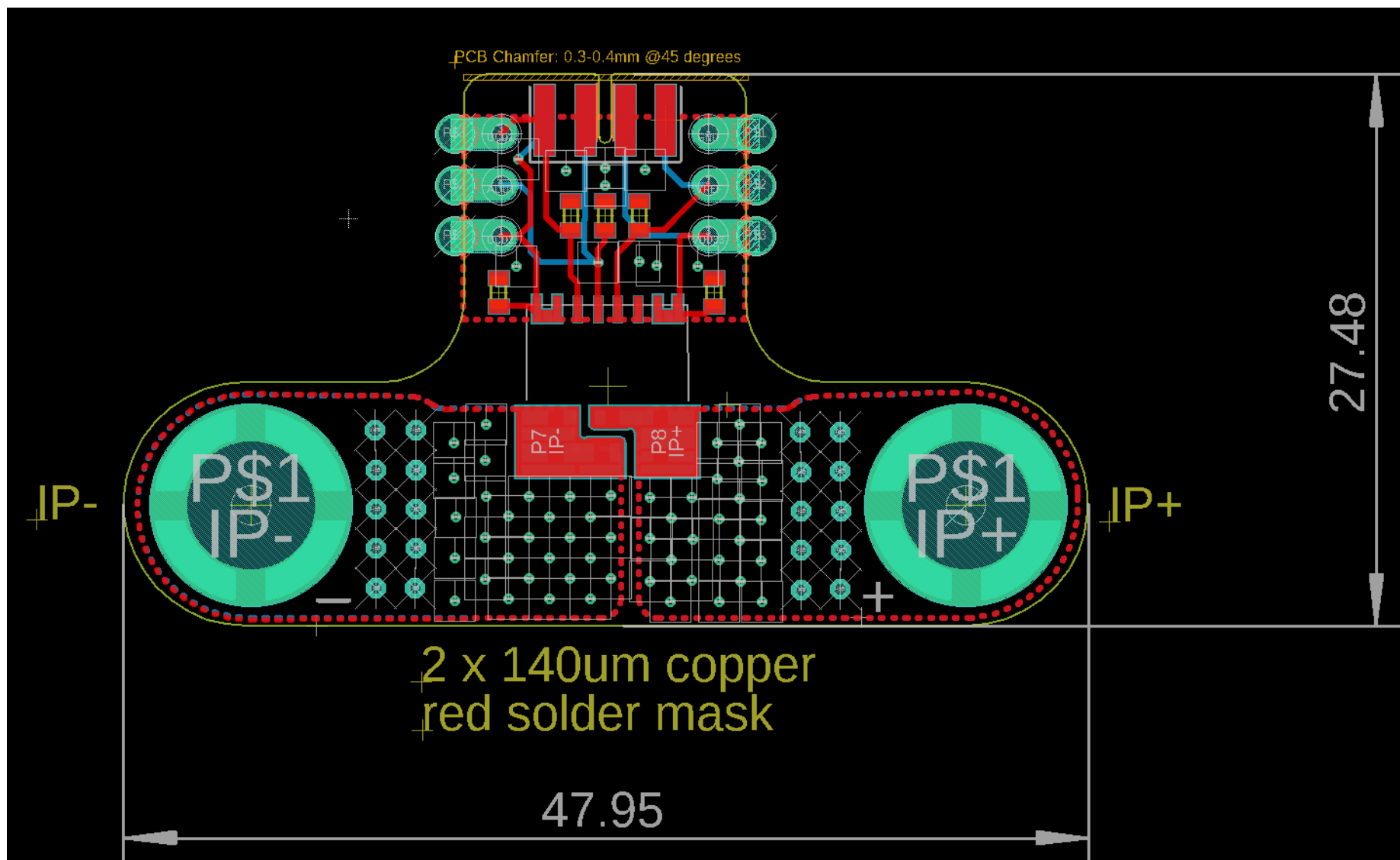


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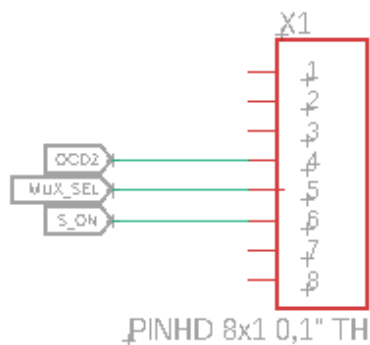


Sensor Board – Hardware Layout

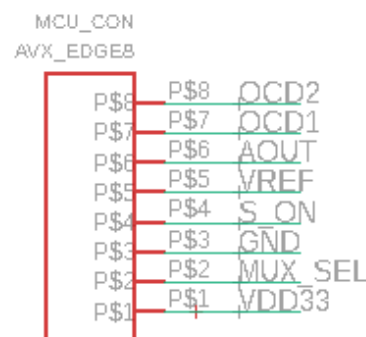
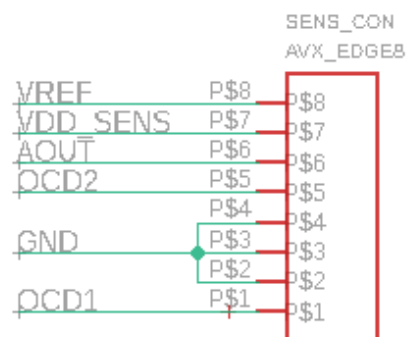
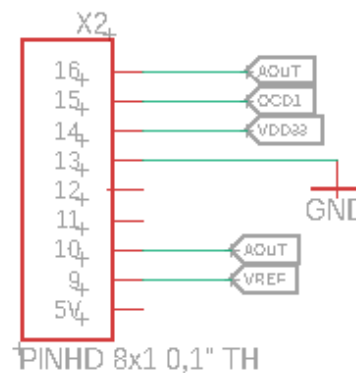


Sensor Shield – Hardware Schematic

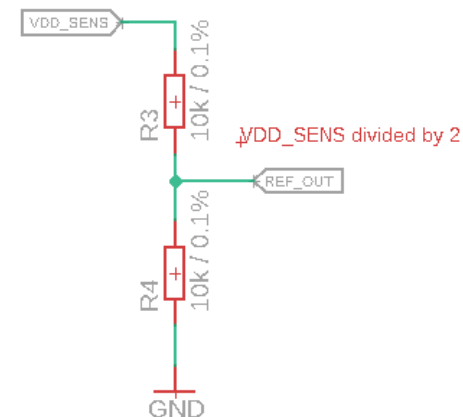
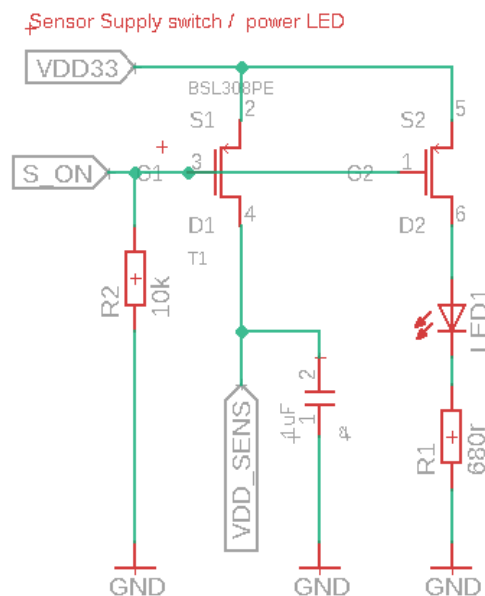
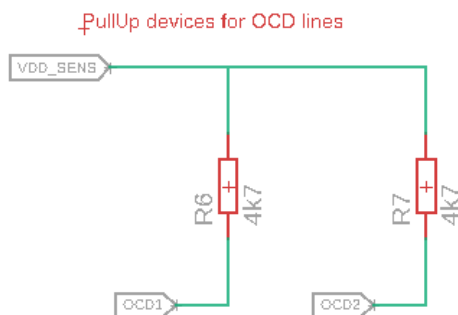
PinHeader XMC1100



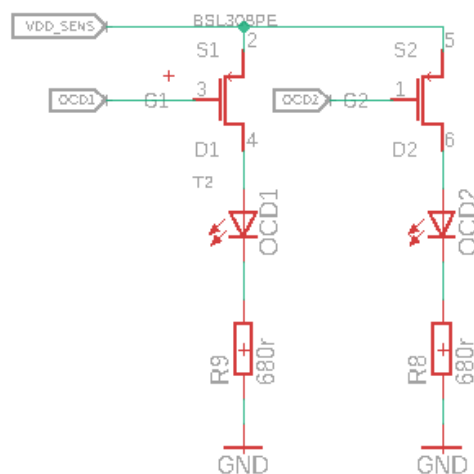
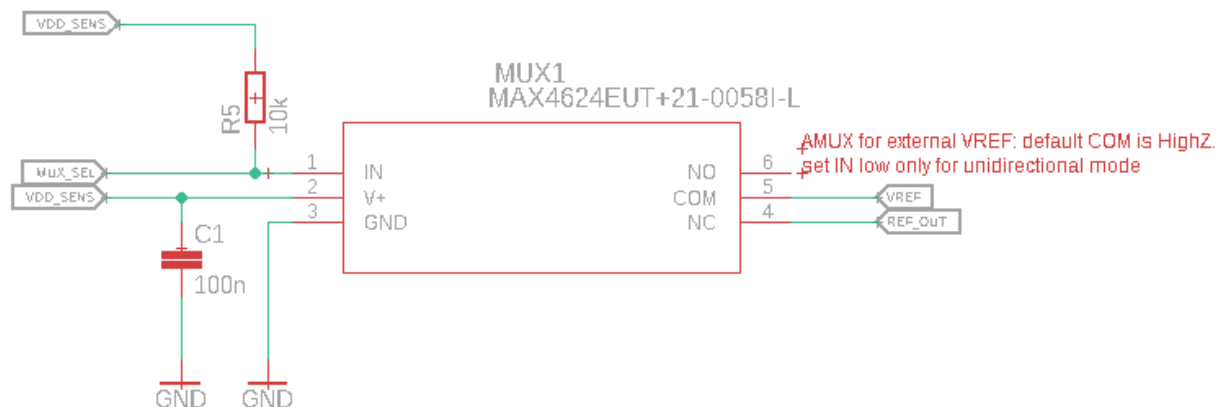
JSSOP-16 Pinout



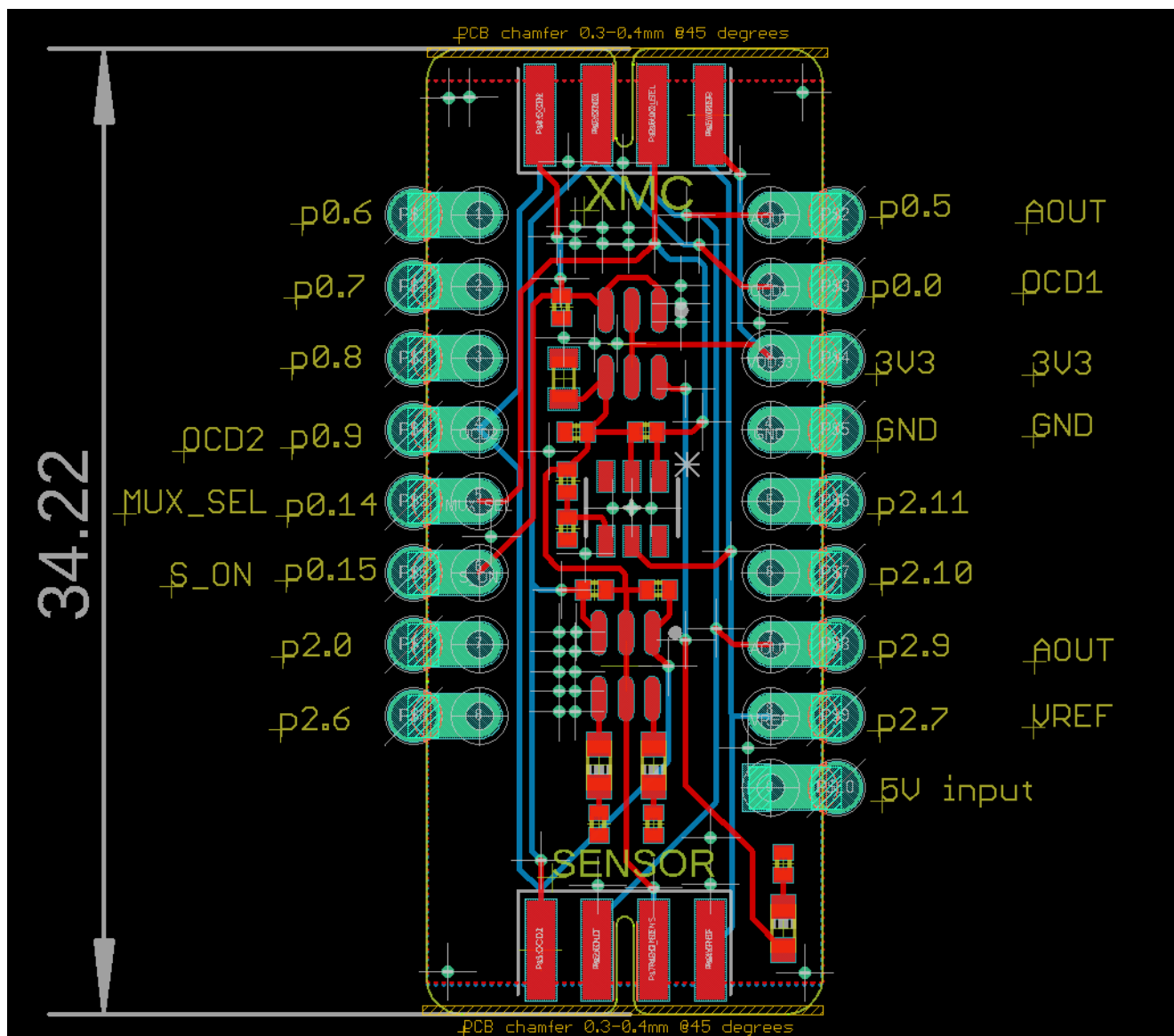
Sensor Shield – Hardware Schematic



Sensor Shield – Hardware Schematic



Sensor Shield – Hardware Layout



Arduino: The Arduino IDE

Arduino IDE



Arduino is a hardware-software prototyping environment IDE developed by arduino.cc:

- Installation Details for Windows:
Click [here](#)
- Installation Details for Linux:
Click [here](#)
- Installation Details for Mac OS:
Click [here](#)
- Installation Details for Portable IDE:
Click [here](#)

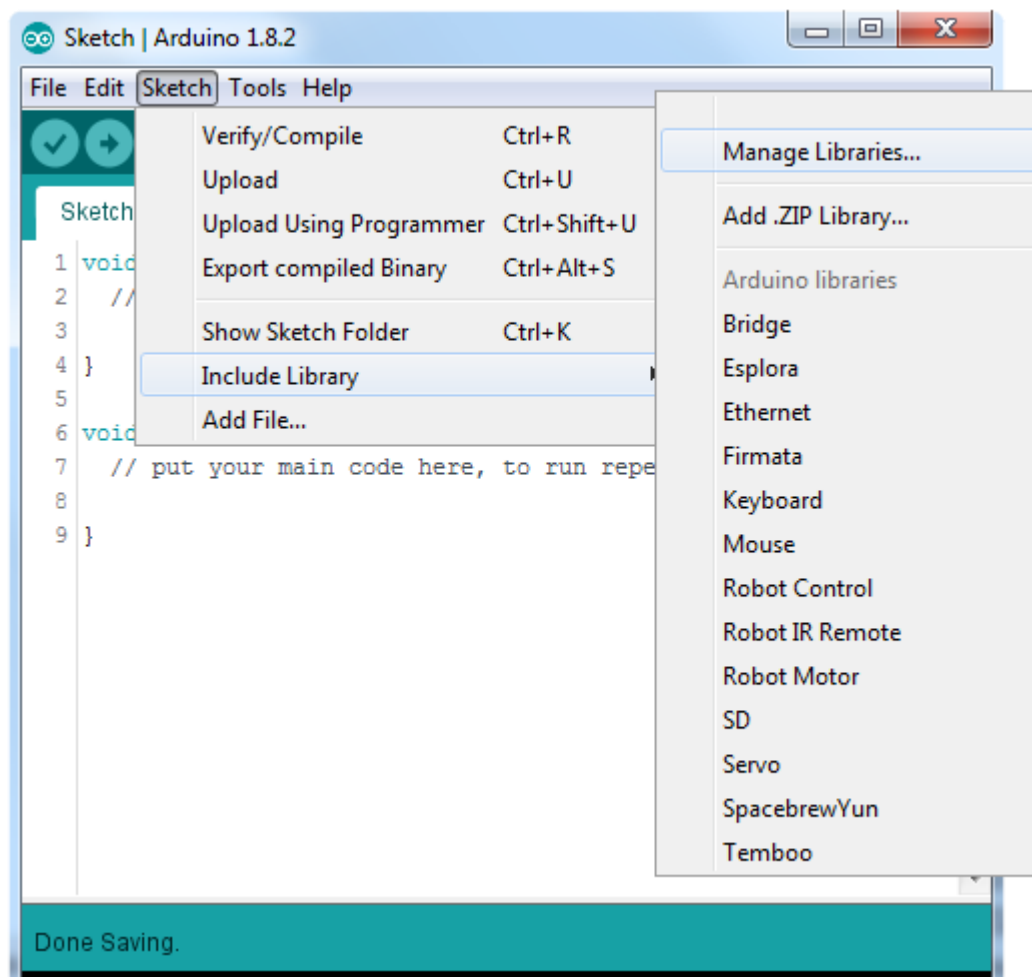
Arduino Quick Start

- What is Arduino? Click [here](#)
- Extended information about the Arduino environment. Click [here](#)
- How to import libraries? Click [here](#)
- How to install additional boards? Click [here](#)
- Problems related to Arduino? Click [here](#) for troubleshooting

How to download the library for Arduino - 1

Notes

- Open the Arduino IDE
- Navigate to *Sketch – Include Library – Manage Libraries*
- The Arduino library manager will be opened (see next slide for further instructions)
- Additional notes for installation can be found in the GitHub repository, e.g. if the library manager is not used



<https://github.com/Infineon/TLI4971-Current-Sensor>

How to download the library for Arduino - 2



Notes

- The Arduino library manager is a comprehensive tool to install external libraries for Arduino
- Search for *TLI4971* in the *Filter your search...* field
- Select as *Type: All* and *Topic: All* when searching for *TLI4971*
- As shown in the picture, please choose the respective library and install it
- Regularly check your installed libraries for updates
- In case of problems, please visit also our [GitHub repository](https://github.com/Infineon/TLI4971-Current-Sensor) and open an issue to get further help

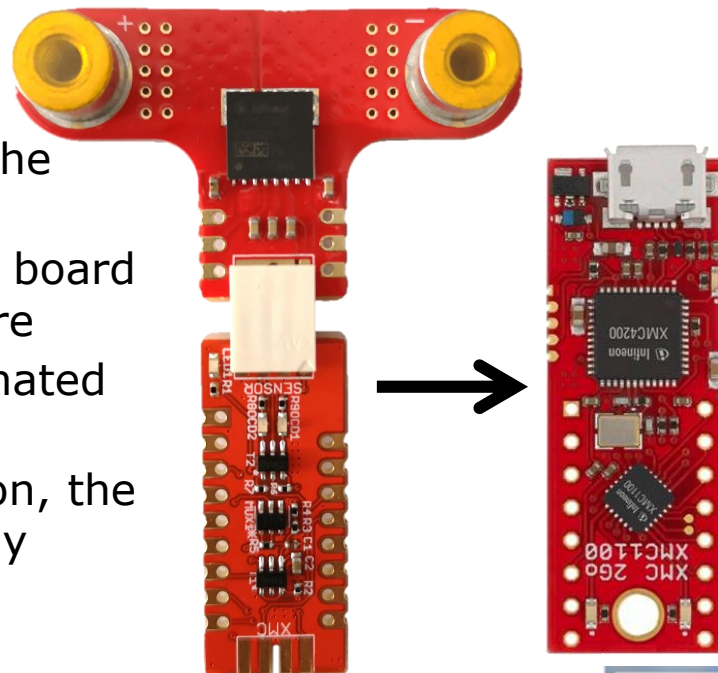


<https://github.com/Infineon/TLI4971-Current-Sensor>

Example with XMC 2Go

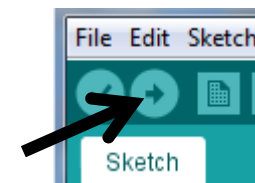
Notes

- The Shield2Go form factor of the Shield2Go evaluation board is directly compatible with the [XMC 2Go](#) board
- Stack the TLI4971 Current Sensor Shield2Go board on top of the XMC 2Go as shown in the picture
- The additional pin on the left-top side (designated with NC) is left floating
- Using the [XMC-for-Arduino](#) Arduino integration, the [Arduino library](#) for the TLI4971 can be directly used



Steps

- Open one of the examples for the TLI4971 from *File – Examples* and select as board *XMC1100 XMC2Go*
- Connect the stacked boards to the PC and press the *Upload* button
- Select the related COM port from *Tools – Port* and open the serial monitor with the set baud rate (see sketch/code with `Serial.begin(<BAUDRATE>);`)



<https://github.com/Infineon/XMC-for-Arduino>
<https://github.com/Infineon/TLI4971-Current-Sensor>

- The TLI4971 has a maximum rating of 3.6 V
- Third party boards with 5 V logic, e.g. the Arduino Uno, cannot be connected to the TLI4971 Current Sensor Shield2Go board directly, even if the power is connected to the 3.3 V pin as the interface lines, e.g. SICI, will still be driven by 5 V
- Please use appropriate level shifting for these boards, e.g. by using the Infineon [My-IOT-Adapter](#)



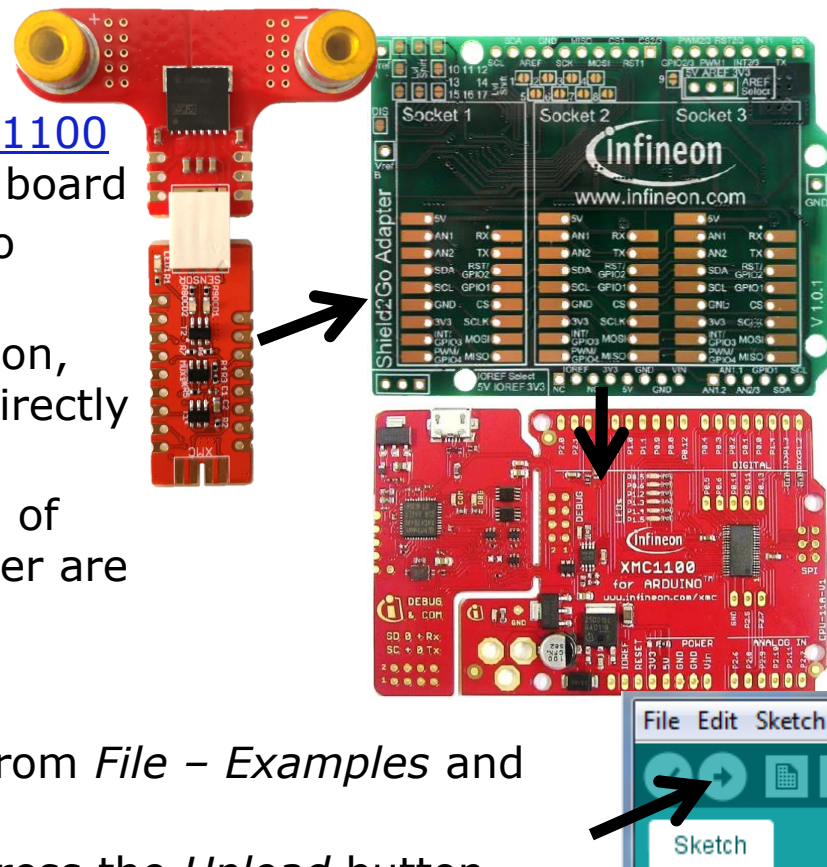
Example with XMC1100 Boot Kit + My IoT Adapter

Notes

- Stack the My IoT Adapter on top of the [XMC1100 Boot Kit](#) or another Arduino Uno compatible board
- Stack the TLI4971 Current Sensor Shield2Go board in socket 1 of the [My IoT Adapter](#)
- Using the [XMC-for-Arduino](#) Arduino integration, the [Arduino library](#) for the TLI4971 can be directly used
- NOTE:** The TLI4971 needs to be in Socket 1 of the Adapter as the analog pins on the Adapter are shorted for Socket 2/3

Steps

- Open one of the examples for the TLI4971 from *File – Examples* and select as board *XMC1100 Boot Kit*
- Connect the stacked boards to the PC and press the *Upload* button
- Select the related COM port from *Tools – Port* and open the serial monitor with the set baud rate (see sketch/code with `Serial.begin(<BAUDRATE>);`);



<https://github.com/Infineon/XMC-for-Arduino>
<https://github.com/Infineon/TLI4971-Current-Sensor>



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