TLI4970-D050T4 CurrentSense Shield2Go

Quick Start V1.0.0





Introduction

The TLI4970-D050T4 is a highly accurate coreless magnetic current sensor. Thus, the output signal is highly linear and without hysteresis. However, a differential measurement principle allows effective stray field suppression.

Due to the integrated primary conductor (current rail), there is no need for external calibration. Additionally, a separate interface pin (OCD) provides a fast output signal in case a current exceeds a pre-set threshold.

A small leadless package (QFN-like) allows for standard SMD assembly.

Key features are a AC & DC measurement range up to ±50 A, highly accurate over temperature range and lifetime of max. 1.0 % (0 h), 1.6 % (over lifetime) of indicated value, low offset error (max. 25 mA at room temperature) and a high magnetic stray field suppression. Additionally, the sensor has fast over current detection with configurable threshold and a galvanic isolation up to 2.5 kV max. rated isolation voltage.

The sensor has a 16 bit digital SPI output (13 bit current value).

Link to <u>Datasheet</u> and <u>Product Page</u>





Evaluation Board Notes

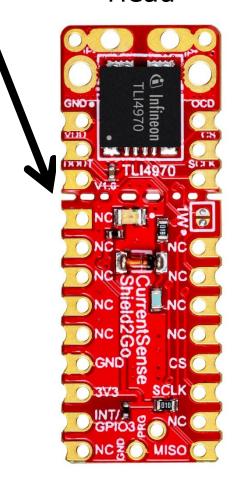
Breakable

Head

Information

- Supply voltage is max. 3.6 V, please refer to the <u>TLI4970-D050T4 datasheet</u> for more details about maximum ratings
- Pin out on top (head) is directly connected to the pins of the TLI4970-D050T4 sensor
- If head is broken off, only one capacitor is connected to the TLI4970-D050T4 sensor
- Software compatible with Arduino and library fully integrated into the Arduino IDE
- Sales Name S2GO_CUR-SENSE_TLI4970 and OPN S2GOCURSENSETLI4970TOBO1

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



Link to **Board Page**



Evaluation Board PCB Details

The

Infineon **TLI4970-D050T4 CurrentSense Shield2Go** 10.16 mm (0.4") / IP-20 Ground pins on board are connected with each other. TLI4970-D050T4 **GND ∦** VDD Legend DOUT Red Power LED One Wire Solder Bridge NC Information If one wire solder bridge NC 10 NC NC Labelling of Pins in Datasheet is soldered, pin 11 is connected NC 11 One Wire to one wire interface. NC By default, pin 11 is not Pin Number in Datasheet connected. Physical Pin Number шш Ground SCLK 15 -SPI: SCLK Warning INT/GPIO3 200 - 16 NC Additional Information NCEO MISO 17 **EEPROM Program** Not Connected



To make the board compatible with the one wire interface of the Current Sensor 2GO kit, solder the one wire solder bridge.

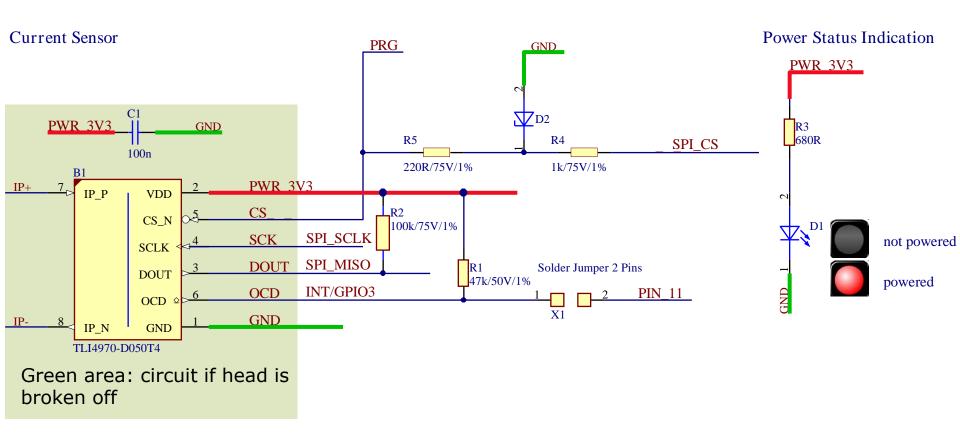
To program the internal EEPROM of the TLI4970, apply the respective programming voltage to the PRG pin. Refer to the programming guide for additional information.

Ground

www.infineon.com



Evaluation Board Schematic





Arduino: The Arduino IDE

Arduino IDE



Arduino is a hardware-software prototyping environment IDE developed by <u>arduino.cc</u>:

- 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

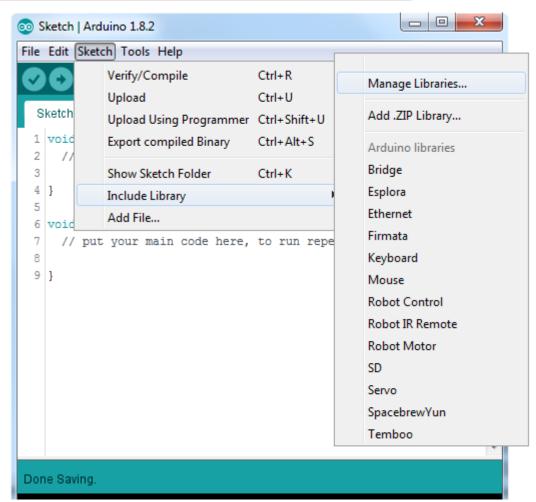
- What is Arduino? Click <u>here</u>
- Extended information about the Arduino environment. Click <u>here</u>
- How to import libraries? Click <u>here</u>
- How to install additional boards? Click <u>here</u>
- Problems related to Arduino? Click <u>here</u> for troubleshooting



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, e.g. if the library manager is not used





https://github.com/Infineon/TLI4970-D050T4-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 TLI4970-D050T4 in the Filter your seach... field
- Select as Type: All and Topic: All when searching for TLI4970-D050T4
- 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 <u>GitHub repository</u> and open an issue to get further help



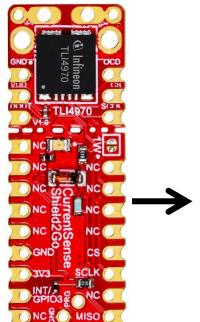
https://github.com/Infineon/TLI4970-D050T4-Current-Sensor



Example with XMC 2Go

Notes

- The Shield2Go form factor of the Shield2Go evaluation board is directly compatible with the XMC 2Go board
- Stack the TLI4970-D050T4 CurrentSense 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 <u>XMC-for-Arduino</u> Arduino integration, the <u>Arduino library</u> for the TLI4970-D050T4 can be directly used





Steps

- Open one of the examples for the TLI4970-D050T4 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/TLI4970-D050T4-Current-Sensor

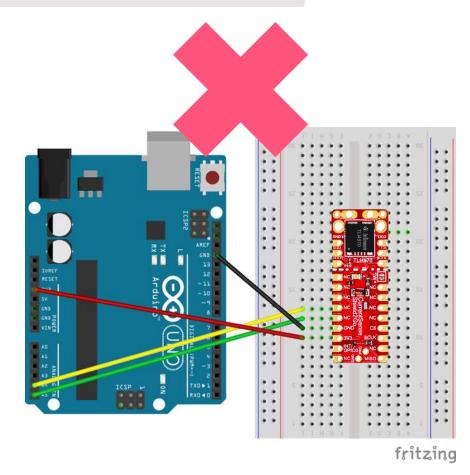
File Edit Sketch



Important Warning

Important Warning

- The TLI4970-D050T4 has a maximum rating of 3.6 V on any pin
- Third party boards with 5 V logic, e.g. the Arduino Uno, cannot be connected to the TLI4970 CurrentSense Shield2Go board directly.
- Even if the power is connected to the 3.3 V pin, the interface lines, e.g. MISO, will still be driven by 5 V
- Please use appropriate level shifting for these boards



Not

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