

USB 3D-Gauss Meter

Key Features

- 3D magnetic field measuring.
- Magnetic field measurement range up to ± 300 mT / ± 3000 G.
- Direct logging to host computer at up to 2500 samples per second in 3D mode.
- USB Type-C Connector.

This product is a 3D-Gauss Meter based on the Texas Instruments TMAG5170 Hall effect sensor. The 3D-Gauss Meter is connected to a host computer via USB, and the measurements are displayed or logged through our Python GUI client. The USB 3D-Gauss Meter enables high quality magnetic field measurements at low cost.

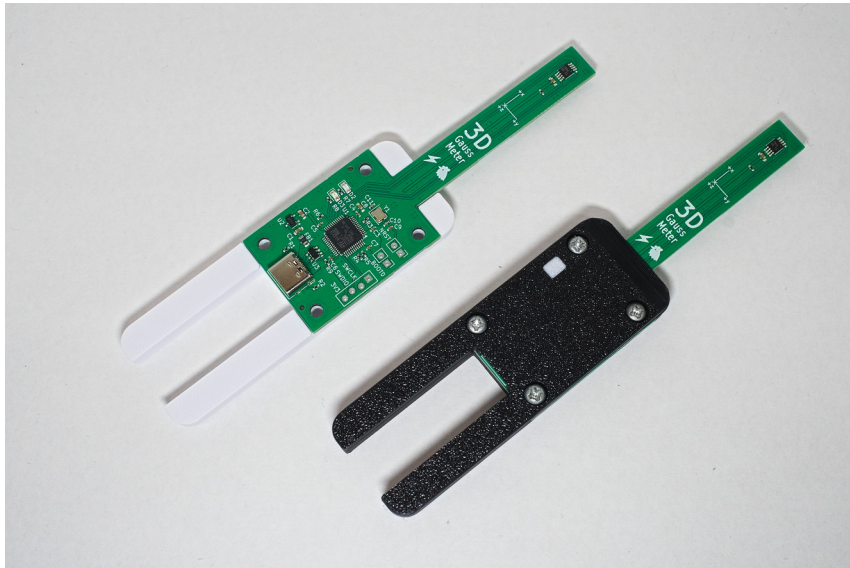


Figure 1: The PCB (left) and the assembled (right) USB 3D-Gauss Meter.

[Demo and setup video.](#)

Functional Description

On the USB 3D-Gauss Meter, the TMAG5170 Hall effect sensor is controlled by an STM32 microcontroller. The STM32 is in turn controlled by the Python GUI client running on the host computer via USB. The Python GUI client, hardware design files and firmware source code can be downloaded from our [Github repository](#). The firmware is flashed before shipping and the USB 3D-Gauss Meter is ready to measure out of the box.

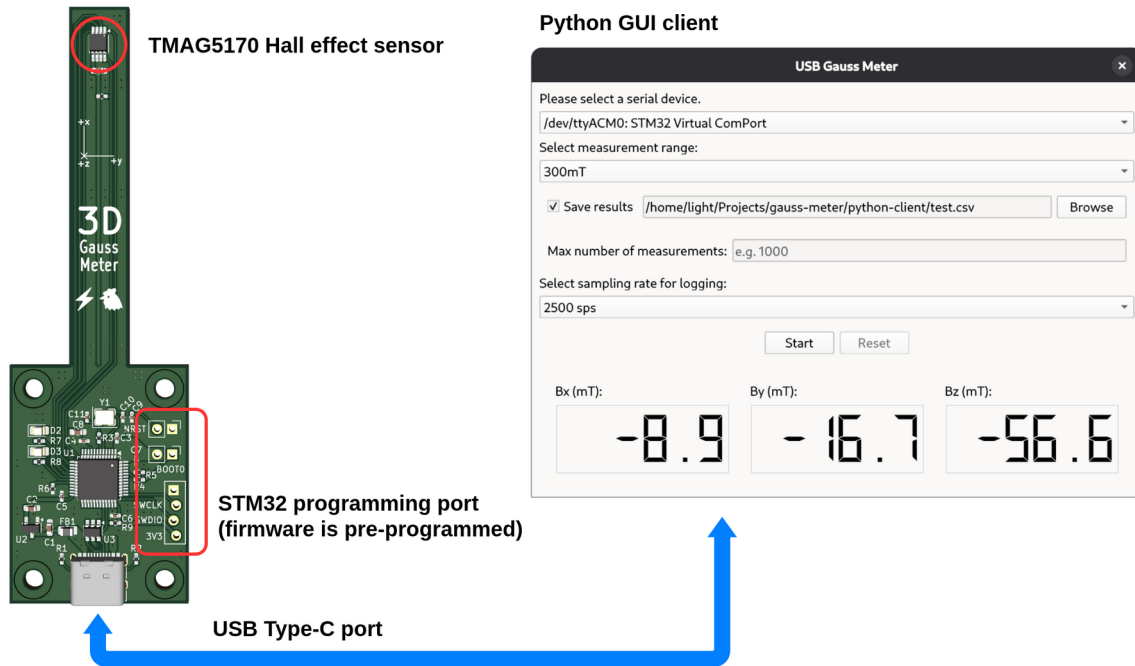


Figure 2: The system diagram of the USB 3D-Gauss Meter.

There are two modes of operation: live display mode and logging mode. There are three measurement range settings: ± 75 , ± 150 and ± 300 mT.

- Live-display mode:
The measured magnetic field is displayed on the computer screen in real time.
- Logging mode:
The measured magnetic field is logged in a CSV file. The maximum logging sample rate is 2500 samples per second on all 3 axes.

Setup

1. Connect the USB 3D-Gauss Meter to a host computer with an USB Type-C cable.
2. Setup the Python GUI Client. Please follow the instruction on our [website](#) to setup the Python GUI client.
3. Select measurement range (± 75 , ± 150 , or ± 300 mT) and start measuring!

Specification

Parameter	Minimum	Typical	Maximum
Least count (± 75 mT range)		36.6 μ T / 0.366 G	
Least count (± 150 mT range)		73.2 μ T / 0.732 G	
Least count (± 300 mT range)		14.65 μ T / 1.465 G	
Magnetic field sensitivity error (± 75 , ± 150 mT range)		$\pm 0.5\%$	$\pm 3.5\%$
Magnetic field sensitivity error (± 300 mT range)		$\pm 0.5\%$	$\pm 6.0\%$
Magnetic field zero offset (± 75 , ± 150 mT range)		$\pm 50 \mu$ T / 0.5 G	$\pm 300 \mu$ T / 3 G

The specification listed above are excerpted from the [TMAG5170 datasheet](#). Please visit the datasheet for more detailed information.

Revision History

PCB Revision	Datasheet Revision	Firmware Revision	Description
1.0	1.0.0	2.0.0	Initial version.