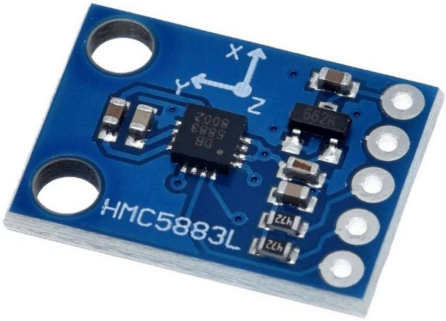
QMC5883L

External compass (magnetometer) for DIY projects
User manual



Read the entire manual before first use. The module is not intended for drone flight controllers (FC) running Ardupilot, Betaflight or iNav firmware.

www.rotorama.com

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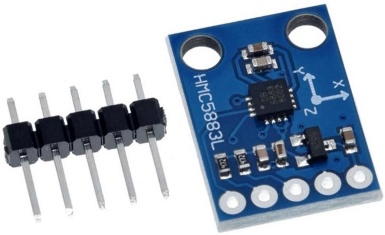
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1. Product description

1.1 Intended use

QMC5883L is a magnetometer that serves as an electronic compass. It measures the magnetic field in three axes (X, Y, Z), and your own program can use the measured values to determine the heading relative to magnetic north. The module communicates via the **I2C** bus and can be powered from either the 5V or the 3.3V rail of the microcontroller.

The module is intended for **DIY projects with Arduino and other microcontrollers (MCU)** – for example robots, stations or experimental circuits. **This model is not supported by Ardupilot, Betaflight or iNav firmware** and is therefore not suitable as a compass for a drone with a flight controller (FC).



Magnetometer module (the pin header in the photo is for illustration only)

1.2 Specifications and package contents

Product designation	QMC5883L – external compass for DIY
Type	3-axis magnetometer (electronic compass)
Power supply	3–5 V
Communication interface	I2C
Pins	VCC, GND, SCL, SDA, DRDY
Dimensions	18 × 17 × 2 mm
Weight	1 g
Package contents	1× external magnetometer

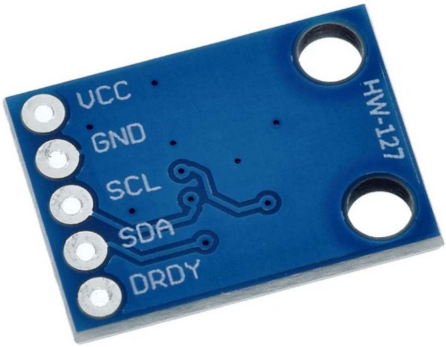
Not included: microcontroller (Arduino etc.), connecting wires, power supply or USB cable.

The printed circuit board is marked **HMC5883L** (component side) and **HW-127** (bottom side). These are board markings and do not indicate a different product.

2. Use

2.1 Module pins

The five pins are brought out to solder holes along one edge of the board. Their labels are printed on the bottom side of the module:



Bottom side of the module with pin labels

Pin	Function
VCC	module power supply (3–5 V)
GND	ground (common with the microcontroller ground)
SCL	I2C bus clock signal
SDA	I2C bus data signal
DRDY	Data Ready signal; not connected for basic use with the example code

2.2 Connecting to Arduino

Solder the module to wires or a pin header and connect it to the microcontroller. Always make connections **with the power disconnected**.

Module	Arduino
VCC	5V (or 3.3V)
GND	GND
SCL	SCL (pin A5 on Arduino Uno and Nano)
SDA	SDA (pin A4 on Arduino Uno and Nano)
DRDY	not connected

For other boards and microcontrollers, refer to the documentation of the board for the location of the I2C bus pins.

2.3 Example code

Example code for the Arduino IDE is available on the product page. Download it via the QR code or the link below:

Example code for Arduino (.ino)

① Open the file in the Arduino IDE, select your board and port, and upload the program.

② Open the *Serial Monitor* and set the speed to **9600 Bd**.

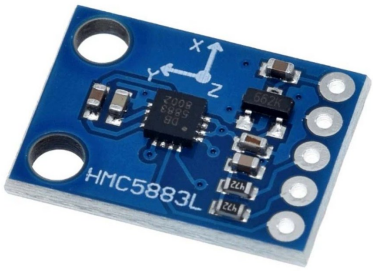
③ Approximately every 100 ms the program prints the raw magnetic field values in the X, Y and Z axes.

The example code sets the module to continuous measurement mode (200 Hz, ±8 G range) and communicates with the module at I2C address **0x2C**. If the module does not respond at this address, find its actual address with an *I2C scanner* program (example in the Arduino IDE) and modify the code.

※ The code prints raw data, not a finished heading. Add the heading calculation and calibration in your own program.

2.4 Mounting and axis orientation

The direction of the X, Y and Z axes is marked on the top side of the board. Orient the module in your device accordingly.



X, Y and Z axis marking on the top side of the module

- To determine the heading, mount the module horizontally or compensate for tilt in your program.
- Fix the module through the two mounting holes using non-magnetic screws (plastic, brass, aluminium) or with double-sided tape.
- Place it as far as possible from motors, magnets, loudspeakers, steel parts and high-current wires – they disturb the magnetic field and distort the measurement.
- After mounting in the final device, perform a calibration (e.g. by slowly rotating the device in all axes and recording the minimum and maximum values).

3. Safety and troubleshooting

3.1 Safety instructions

- The supply voltage must not exceed 5 V. Never swap VCC and GND.
- Change the wiring only with the power disconnected.
- The module is sensitive to static electricity. Discharge yourself by touching a grounded object before handling and do not touch the components with your fingers.
- When soldering, follow safe practice for working with a soldering iron, solder briefly and in a well-ventilated room.
- Protect the module from moisture, dust, conductive objects and mechanical damage. Do not place the bare board on a metal surface.
- The product is not a toy. Keep it out of the reach of small children – small parts present a choking hazard.
- Do not use the product as the sole source of navigation where an incorrect reading could endanger health or property.

3.2 Troubleshooting

Problem	Cause and solution
Serial Monitor shows nothing or garbage	Check the 9600 Bd speed and that the correct program is uploaded.
Values are always 0 or do not change	Check the SDA/SCL wiring (are they swapped?), the power supply and the common ground. Use an I2C scanner program to verify the module address and adjust it in the code if necessary.
Module is not visible on the I2C bus	Check the quality of the solder joints and the power supply. Disconnect other devices on the bus and try again.
Heading drifts or is inaccurate	There is a source of interference nearby (motor, magnet, steel, current-carrying wire). Move the module and calibrate it again.

3.3 Regulations of the country of use

The product is sold throughout Europe. The information in this manual is based on the regulations of the European Union and the Czech Republic. If you use the product in another country, **follow the regulations of the country in which you operate it**.

4. Information for the EU and Czech Market

4.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorama.cz
Phone	+420 252 252 098
Website	www.rotorama.com

4.2 Disposal of electrical equipment



- The crossed-out wheeled bin symbol on the product, its packaging or in the documentation means that at the end of its service life the product **must not be disposed of together with mixed municipal waste**.
- Hand it over at a take-back point for electrical equipment – at a collection yard, at a take-back point of a collective system, or at the retailer when purchasing a new equivalent product. Take-back is free of charge for the end user.
- The obligations under Act No. 542/2020 Coll., on end-of-life products, are fulfilled by the importer through a collective take-back system.
- Proper disposal helps prevent negative impacts on the environment and human health and contributes to the reuse of secondary raw materials.

Through its contractual partner **ASEKOL a.s.**, the company ensures the take-back of waste electrical equipment from households and the separate collection of waste electrical equipment, batteries and accumulators in accordance with the applicable legislation. The customer is entitled to hand over old electrical equipment or a battery or accumulator at any collection point of the above contractual partner. The addresses of these take-back points are listed at www.asekol.cz, www.ecobat.cz and also https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu.

5. Warranty and rights arising from defective performance

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 4.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.