M100-5883

HGLRC – GPS module with compass
User manual



Read this manual carefully before installation and first use, and keep it for future reference.

www.rotorama.com

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1. Safety instructions

The GPS module is an electronic component intended to be built into a model (drone, aircraft). Observe the following instructions during installation and operation:

- Supply power to the GPS only within the voltage range given in Chapter 3. A higher voltage will permanently damage the module.
- Solder carefully according to the wiring diagram to avoid short-circuiting and burning the GPS or the flight controller (FC).
- Always disconnect the flight battery before soldering or handling the wiring.
- After turning on the compass (magnetometer), calibrate it before the first flight.
- Install the GPS with the antenna facing up and away from motors, power wires and other interfering parts.
- Use Betaflight 4.3 or newer firmware – older versions do not recognise the M10 (10th generation) chip.
- Protect the module from moisture, dust, mechanical damage and static electricity.
- GPS-dependent functions (e.g. return to home / GPS Rescue) do not replace the pilot's attention. Always check that the module has a valid position fix before flight.

2. Product description

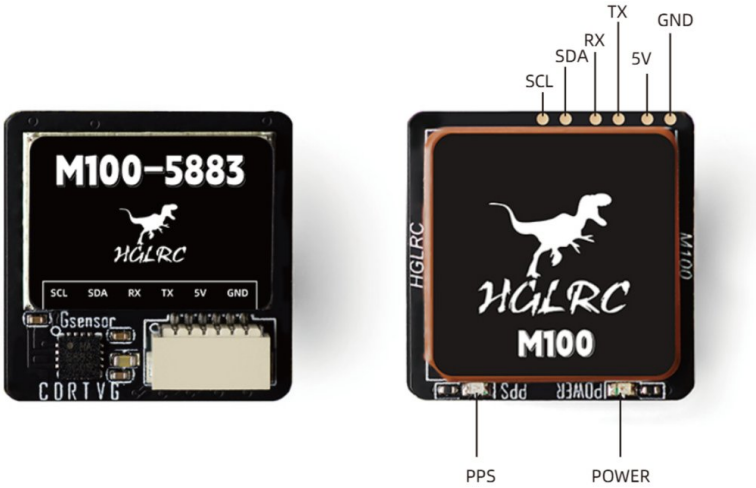
2.1 Introduction

The HGLRC M100-5883 is a GPS module with an M10 (10th generation) chip and a ceramic antenna, complemented by a **QMC5883** compass (magnetometer). The module provides the flight controller with position, speed and heading and is intended for FPV drones and aircraft running Betaflight or INAV firmware.

2.2 Package contents

- 1× GPS module M100-5883
- 1× connection cable
- 1× heat-shrink tube

2.3 Pinout and LED indicators



Module bottom view (left) and top view (right) – pins SCL, SDA, RX, TX, 5V, GND and LEDs PPS and POWER

State	PPS (blue LED)	POWER (red LED)
Normal start	steady on	steady on
Valid position fix	flashing	steady on

3. Specifications

Parameter	Value
Chip	M10 (10th generation)
Compass (magnetometer)	QMC5883
Antenna	ceramic
Receiver type	GPS/QZSS L1C/A, SBAS (EGNOS, GAGAN, MSAS, WAAS), GLONASS L1OF, BDS B1I, Galileo E1B/C
Receive channels	72
Sensitivity	tracking and navigation −166 dBm, reacquisition −160 dBm, cold start −148 dBm
Time to first fix (TTFF)[1]	cold start 29 s, hot start 1 s
Horizontal position accuracy[2]	2.0 m CEP
Time pulse signal accuracy	RMS 30 ns, 99 % 60 ns
Speed accuracy[3]	0.05 m/s
Operating limits[4]	acceleration ≤ 4 g, altitude 80,000 m, speed 500 m/s
Time pulse signal frequency (PPS)	1 Hz
Baud rate	9600–460800 bps (default 115200 bps)
Protocol	UBLOX
Max. navigation update rate	10 Hz (default 10 Hz)
Supply voltage	3.3–5 V
Dimensions	21 × 21 × 8.02 mm
Weight	7.73 g

※ Default configuration of received systems: GPS + Galileo + QZSS + SBAS.

[1] All satellites at ≥ −130 dBm.

[2] CEP 50 %, 24 hours static, ≥ −130 dBm, more than 6 SVs.

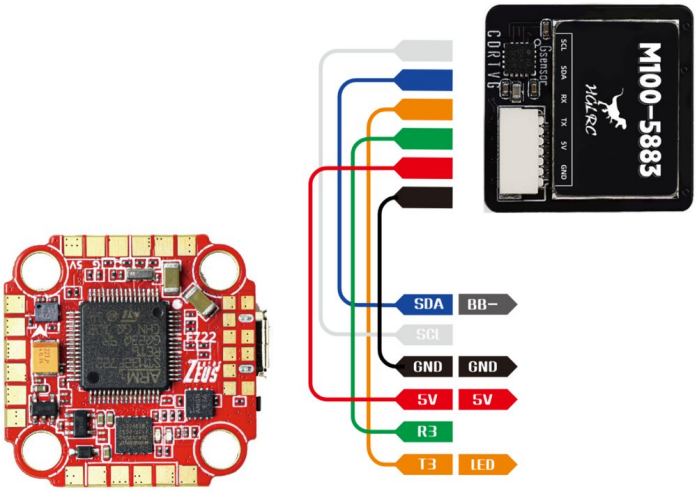
[3] 50 %, 30 m/s, dynamic operation.

[4] Assuming an airborne platform with acceleration below 4 g.

4. Wiring and mounting

4.1 Connecting to the flight controller

Connect the GPS to any free serial port (UART) of the flight controller or to a dedicated GPS serial port. **UART3** is used as an example in this manual. The compass communicates with the flight controller over the I²C bus (pins SCL and SDA).



Wiring diagram – example connection to UART3 of the flight controller

GPS module	Flight controller (FC)
SCL	SCL (I²C)
SDA	SDA (I²C)
TX	RX of the selected UART (R3 in the example)
RX	TX of the selected UART (T3 in the example)
5V	5V
GND	GND

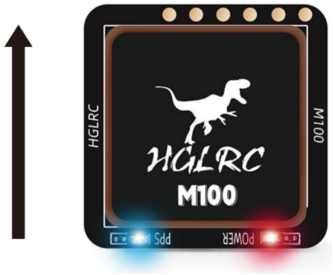
TX and RX are cross-connected (TX → RX, RX → TX). Always connect the GPS to a free serial port or to a dedicated GPS serial port.

4.2 Module placement and orientation

- Mount the module with the antenna (ceramic surface) facing **up**, with a clear view of the sky.
- Place it as far as possible from motors, power wires, electronic speed controllers (ESC) and other sources of interference – the compass is sensitive to magnetic

fields.

- Choose the module orientation according to the figure below. The compass orientation setting given in Chapters 5 and 6 (*CW 180° flip*) is taken from the manufacturer's manual; after mounting, always check that the compass shows the correct heading.

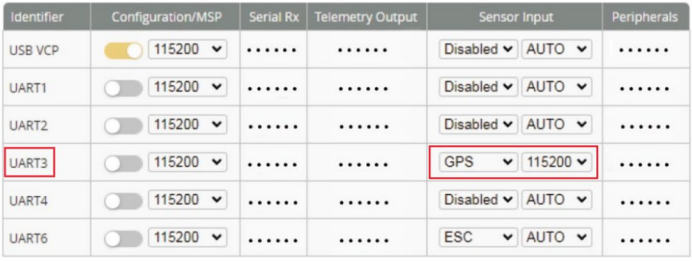


Compass direction according to the manufacturer (arrow)

5. Betaflight settings

▶ Step 1 – port

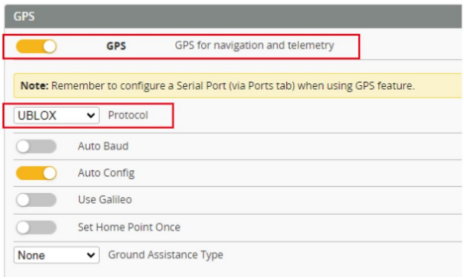
Open the *Ports* tab. For the port the GPS is connected to (**UART3** in the example), set **GPS** in the *Sensor Input* column and select baud rate **115200**. Save the settings.



Ports tab – UART3, Sensor Input: GPS, 115200

▶ Step 2 – GPS feature

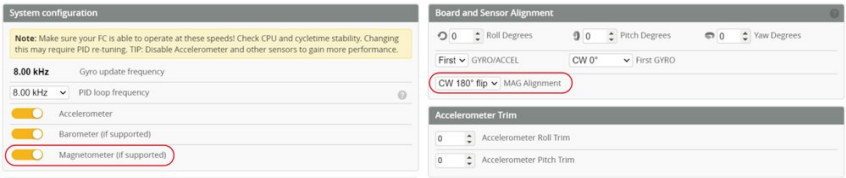
On the *GPS* tab (or *Configuration*), turn on the **GPS** feature and select **UBLOX** as the *Protocol*. Save the settings.



Turning on GPS and selecting the UBLOX protocol

▶ Step 3 – compass

On the *Configuration* tab, turn on **Magnetometer** in the *System configuration* section and set *MAG Alignment* to **CW 180° flip** in the *Board and Sensor Alignment* section. Save the settings and calibrate the compass.



Turning on the magnetometer and setting MAG Alignment: CW 180° flip

▶ Step 4 – function check

Power on the aircraft. When the GPS is working normally, the LEDs on the module are on (see Chapter 2.3) and the **GPS** icon (with the compass also the **Mag** icon) lights up in the top bar of Betaflight Configurator.

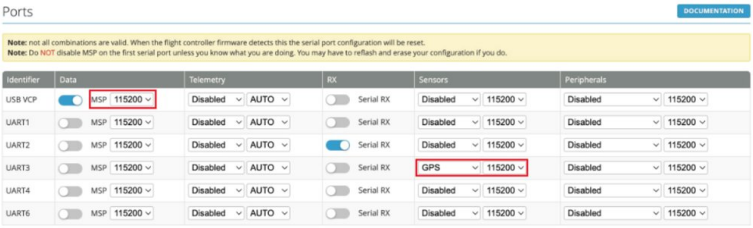


Betaflight top bar – active Mag and GPS icons

6. INAV settings

▶ Step 1 – port

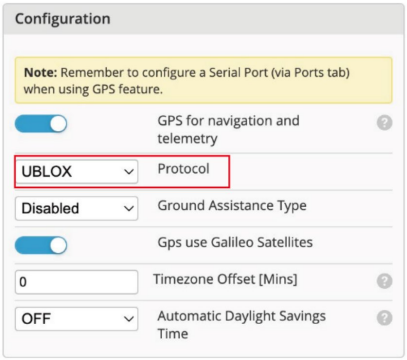
Open the *Ports* tab. For the port the GPS is connected to (**UART3** in the example), set **GPS** in the *Sensors* column and select baud rate **115200**. Save the settings.



Ports tab – UART3, Sensors: GPS, 115200

▶ Step 2 – GPS feature

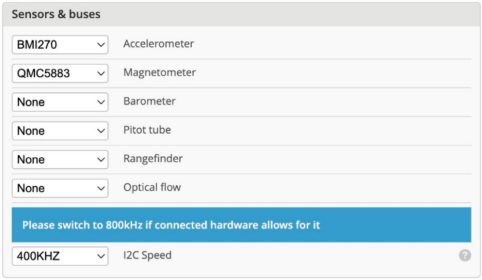
On the *Configuration* tab, turn on *GPS for navigation and telemetry* and select **UBLOX** as the *Protocol*.



Turning on GPS and selecting the UBLOX protocol

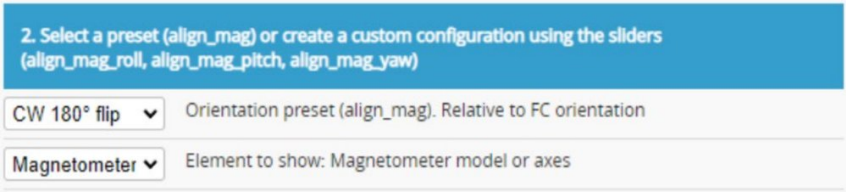
▶ Step 3 – compass

In the *Sensors & buses* section, select **QMC5883** as the *Magnetometer*.



Selecting the QMC5883 magnetometer

When setting the compass orientation (magnetometer calibration / alignment), select the *align_mag* preset **CW 180° flip**. Save the settings and calibrate the compass.



Magnetometer orientation preset align_mag: CW 180° flip

▶ Step 4 – function check

Power on the aircraft. When the GPS is working normally, the LEDs on the module are on (see Chapter 2.3) and the **GPS** and **Mag** icons light up in the top bar of INAV Configurator.



INAV top bar – active Mag and GPS icons

7. Maintenance and troubleshooting

7.1 Maintenance

- Keep the module dry and clean; remove dirt from the antenna with a dry soft brush.
- Regularly check the solder joints, the cable and the module mounting, especially after a crash.
- Do not store the model with the module near strong magnets – they can affect the compass.

7.2 Troubleshooting

Problem	Possible cause and solution
No LED is on	Check the power supply (5V, GND) and the solder joints.
GPS icon in the configurator is not lit	Check the TX/RX cross-connection, the selected port and baud rate 115200 on the *Ports* tab, and the UBLOX protocol. Make sure the port is not used by another function.
The module does not get a position fix	A cold start takes longer; wait outdoors with a clear view of the sky. Remove sources of interference near the antenna (VTX, camera, cables).
Compass (Mag) is not detected	Check the SCL and SDA wiring and that the magnetometer is enabled in the configurator; in INAV select QMC5883.
Compass shows a wrong heading	Check the compass orientation (CW 180° flip) against the actual mounting of the module and recalibrate the compass.

8. Information for the EU and Czech Market

8.1 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

8.2 Product conformity

CE

- The product bears the **CE** marking and complies with the requirements of the applicable European Union harmonisation legislation.
- A copy of the **EU Declaration of Conformity** is available from the importer at the address stated above or at the e-mail address info@rotorama.cz.
- **Product identification:** the type designation (M100-5883) is printed on the top side of the module.

8.3 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.

9. 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 8.1.
- 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.