HGLRC M100_MINI GPS

GPS module with M10 chip
Instruction manual



Before wiring and first use, read this entire manual carefully, especially Chapter 5 Attention.

www.rotorama.com

Contents

1. Product description

1.1 Introduction

1.2 Package contents

1.3 Parameters

2. Module description

2.1 Pins and orientation

2.2 Indicator lights

3. Installation and wiring

3.1 Wiring diagram

3.2 Mounting in the drone

4. Betaflight set up

4.1 Serial port set up

4.2 Enabling GPS

4.3 Function check

5. Attention

6. Information for the EU and Czech Market

6.1 Importer and responsible person in the EU

6.2 Product conformity

6.3 Disposal of electrical equipment

7. Warranty and rights arising from defective performance

1. Product description

1.1 Introduction

HGLRC M100_MINI is a small GPS module with a 10th generation chip (M10) and a ceramic antenna. It receives signals from several satellite navigation systems (GPS, GLONASS, BeiDou, Galileo, SBAS and QZSS) and outputs position, speed and altitude to the flight controller (FC) over a serial line using the UBLOX protocol.

The module is intended for FPV drones with a flight controller (FC) running Betaflight firmware – for example to show position and speed in the OSD, to record the flight path or for the return-to-home function (GPS Rescue). The module does not contain a compass (magnetometer).

The module is a receiver of satellite signals only – it does not transmit any radio signal.

1.2 Package contents

- 1× HGLRC M100_MINI GPS module
- 1× SH1.0 4-pin cable
- 1× heat shrink tube Φ12 × 20 mm
- 1× HGLRC sticker

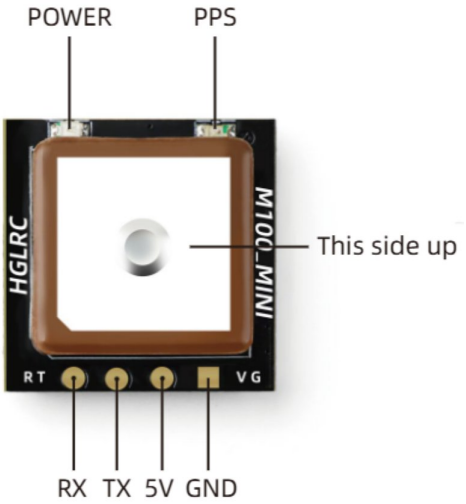
The flight controller (FC), drone and battery are not included.

1.3 Parameters

Parameter	Value
Chip	M10 (10th generation chip)
Frequency	GPS L1, GLONASS L1, BDS B1, Galileo E1, SBAS L1, QZSS L1
Power supply	5 V
Size	15 × 15 × 5.2 mm
Weight	2.7 g
Antenna	ceramic antenna
Compass (magnetometer)	none
Receiving channels	72
Support rate	115200 bps
Output protocol	UBLOX
Output frequency	10 Hz
Speed precision	0.05 m/s
Level positioning precision	2D ACC 2.0 m (outside)
Receiving sensitivity	trace −166 dBm capture −160 dBm
Dynamic characteristics	altitude 50000 m, speed 500 m/s, acceleration 4 g
Working temperature	−40 °C to +85 °C
Storage temperature	−40 °C to +105 °C
Supported FC firmware	Betaflight 4.3.0 or above

2. Module description

2.1 Pins and orientation



Module pins and indicator lights; the antenna side faces up

Pin	Function
RX	module data input – connect to the TX pad of the flight controller
TX	module data output – connect to the RX pad of the flight controller
5V	5 V power supply
GND	ground (−)

There are two indicator lights on the top of the module: **POWER** and **PPS** (time pulse, indicates a position fix). The side with the ceramic antenna must face upwards when mounted.

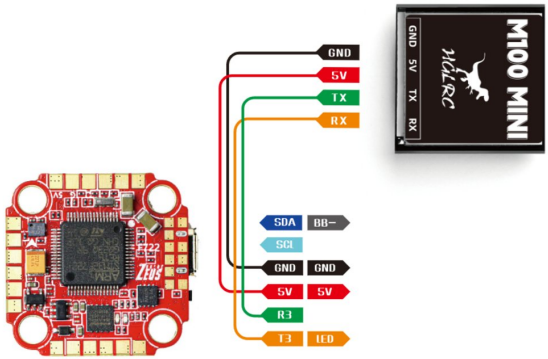
2.2 Indicator lights

Indicator light	PPS (red light)	Power (blue light)
Normal start	normal bright	normal bright
Real position accuracy (fix)	flickering	normal bright

3. Installation and wiring

3.1 Wiring diagram

Connect the GPS to any spare serial port (UART) of the flight controller, or to the port dedicated to GPS by the flight controller manufacturer. The diagram shows UART3 as an example.



Example: GPS module wired to UART3 of the flight controller

GPS module		Flight controller (FC)
GND	→	GND
5V	→	5V
TX	→	R3 (RX of UART3)
RX	→	T3 (TX of UART3)

※ TX and RX are crossed: module TX goes to FC RX and module RX goes to FC TX.

3.2 Mounting in the drone

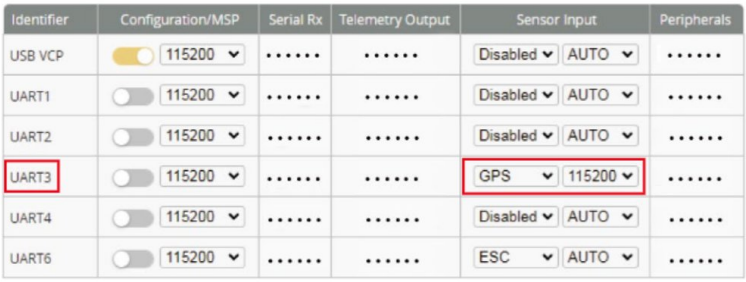
- Solder carefully according to the wiring diagram, always with the battery and the USB cable disconnected. A short circuit or swapped wires can burn the GPS module.
- Mount the module with the **antenna facing upward** (towards the sky) and as far as possible from the motors, power wires and other parts with interference – typically the video transmitter (VTX) and the radio receiver.
- There must be no metal or carbon parts above the antenna that would shield the satellite signals. You can use the included heat shrink tube to protect the module.

4. Betaflight set up

Connect the flight controller to a computer and start the Betaflight Configurator. The following procedure uses UART3 as an example – if you connected the module to a different port, set that port instead.

4.1 Serial port set up

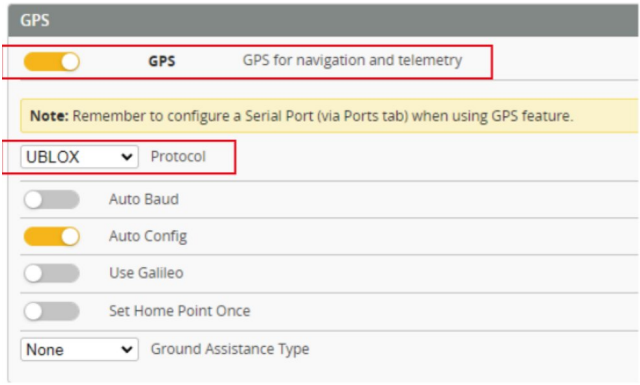
Open the *Ports* tab. Find **UART3**, select **GPS** in the *Sensor Input* column and baud rate **115200**. Save the settings with *Save and Reboot*.



Ports tab – UART3 set to GPS, 115200

4.2 Enabling GPS

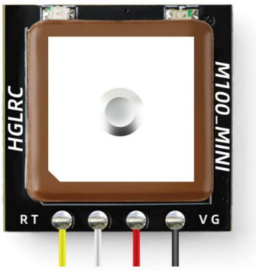
Open the *Configuration* tab, turn on the **GPS** switch in the *GPS* section and select the **UBLOX** protocol (*Protocol*). Save the settings.



Configuration tab – GPS enabled, UBLOX protocol

4.3 Function check

Power on the quadcopter. When the GPS is working normally, its indicator lights will light up and the **GPS** icon on the top bar of the Betaflight Configurator will light up.



Indicator lights on a connected module



GPS icon lit on the top bar of the Betaflight Configurator

A position fix (flickering PPS light) is only possible outdoors under open sky. Inside buildings or close to tall buildings and trees the module usually will not get a fix, or only with a long delay.

5. Attention

① Supply power to the GPS only with the specified voltage of 5 V.

② Solder carefully according to the wiring diagram to avoid burning the GPS by a short circuit.

③ Use Betaflight firmware 4.3.0 or above. Older versions do not recognize the 10th generation chip (M10).

④ The GPS must be installed with the antenna facing upward and away from the motors, power wires and other parts with interference.

▶ General rules

- Protect the module from moisture, water, dust and mechanical damage; do not expose the ceramic antenna to impacts.
- Do not use the module if the board, antenna or cable is visibly damaged.
- Always test functions that use GPS (e.g. GPS Rescue) in a safe area before relying on them, and keep the drone under control at all times. These functions cannot be relied on if GPS reception is lost.
- This product is not a toy. Keep it out of the reach of children – small parts can be swallowed.

6. Information for the EU and Czech Market

6.1 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

6.2 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_MINI) is printed on the module's circuit board.

6.3 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.

7. 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 6.1.
- 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.