BLITZ Mini M10 GPS V2

iFlight
GPS module with QMC5883L compass



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

Rotorama, s.r.o. · www.rotorama.com

Contents

1. Product description

1.1 Intended use

1.2 Technical data and package contents

2. Use

2.1 Safety during installation

2.2 Connecting to the flight controller

2.3 Mounting on the drone

2.4 Setup in Betaflight Configurator

2.5 First satellite fix and operation

3. Troubleshooting

4. Information for the EU and Czech Market

4.1 Importer and responsible person in the EU

4.2 Product conformity

4.3 Disposal of electrical equipment

5. Warranty and rights arising from defective performance

1. Product description

1.1 Intended use

iFlight BLITZ Mini M10 GPS V2 is a satellite navigation receiver with an integrated **QMC5883L** compass (magnetometer) for FPV drones. The module is based on the **u-blox M10** chip and features a low-noise amplifier (LNA), an RF filter and a temperature-compensated crystal oscillator (TCXO). It passes the position to the flight controller (FC) at a refresh rate of 10 Hz.

Using the GPS data, the flight controller shows position, speed and distance from the take-off point in the OSD and enables functions such as *GPS Rescue* (automatic return on signal loss) or finding the drone after a crash from its last known position. The compass provides the heading required by the navigation modes of some firmwares. The built-in farad capacitor retains data for a fast *hot start* after a short power interruption. The module only receives satellite signals and does not transmit anything.



BLITZ Mini M10 GPS V2 (illustration by the manufacturer)

1.2 Technical data and package contents

Package contents

- 1× BLITZ Mini M10 GPS V2 GPS module
- 1× cable set (according to the manufacturer's packing list)

Not included

- GPS frame mount (offered separately by the manufacturer),
- flight controller (FC), drone and battery.

Product designation: BLITZ Mini M10 GPS V2, manufacturer iFlight.

GPS chip	u-blox M10
Compass (magnetometer)	QMC5883L
Satellite systems (GNSS)	GPS, SBAS, Galileo, QZSS, GLONASS
Refresh rate	10 Hz
GPS / compass interface	UART (TX/RX), UBLOX protocol / I²C (SCL/SDA)
Baud rate	9600–460800 bps, default 115200 bps
Sensitivity (tracking)	−167 dBm
Cold / hot start	27 s / 1 s
Max. altitude	80,000 m
Max. speed	500 m/s
Speed accuracy	0.05 m/s
Max. acceleration	≤ 4 G
Antenna size	18.2 × 18.2 × 4 mm
Module dimensions	20 × 21 × 8 mm
Weight	8 g
Supply voltage	3.3–5.5 V
Connector	JST-SH, 6-pin

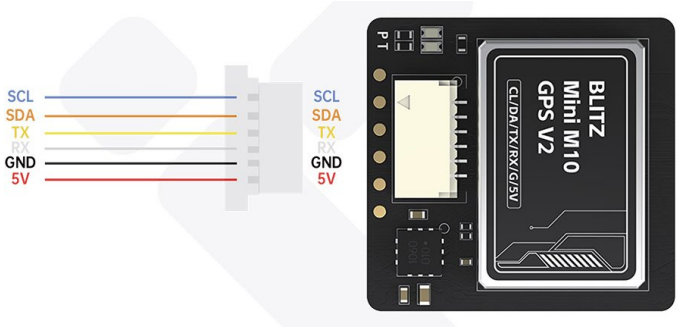
2. Use

2.1 Safety during installation

- **Always disconnect the drone battery** before soldering and wiring.
- Power the module only from a flight controller output in the range of **3.3–5.5 V**. Connecting it to battery voltage will destroy the module.
- Check all wiring before connecting the battery for the first time. Swapping power and ground (5V/GND) will damage the module.
- Protect the module from moisture, impacts and static electricity. Do not touch the components on the board with your fingers.
- Mechanical damage, modifications to the board and incorrect wiring are not product defects.

2.2 Connecting to the flight controller

The module is connected with a six-pin cable with a JST-SH connector. The pin assignment given by the manufacturer is shown in the figure below (it is also printed on the antenna cover: CL/DA/TX/RX/G/5V).



Module pin assignment (source: iFlight)

GPS wire	Function	Connect to FC
SCL	I²C clock (compass)	SCL
SDA	I²C data (compass)	SDA
TX	GPS data from module	RX of the selected UART
RX	GPS data to module	TX of the same UART
GND	ground	GND
5V	power supply	5 V output

❇ TX and RX are crossed: the module's TX goes to the flight controller's RX and vice versa.

- Use a free hardware UART of the flight controller for the GPS. Check your FC documentation to find out which UART is free.
- The compass only works if the **SCL and SDA** wires are connected to the I²C pads of the flight controller. Compass data is not transmitted over the UART.
- If the flight controller has no I²C bus available, connect only TX, RX, GND and 5V – the GPS will work without the compass.

2.3 Mounting on the drone

- Mount the module **with the antenna facing up** so that it has the clearest possible view of the sky and is not covered by carbon or metal.
- Place it as far as possible from the video transmitter (VTX) antenna, the receiver and the camera – their interference increases the time needed to find satellites.
- The compass is sensitive to magnetic fields. Keep the module away from motors, power cables, electronic speed controllers (ESC) and the battery.
- Fix the module firmly in a mount or with double-sided tape so that it cannot rotate in flight – any rotation changes the compass reading.
- Route the cable so that it cannot get into the propellers.

2.4 Setup in Betaflight Configurator

The flight controller firmware must include GPS support (and magnetometer support for the compass). When building the firmware via *Cloud Build*, include these options. Tab names may differ slightly between configurator versions.

① On the *Ports* tab, for the UART the GPS is connected to, select **GPS** in the *Sensor Input* column and save.

② On the *GPS* tab (in older versions on the *Configuration* tab), enable GPS, select the **UBLOX** protocol and leave automatic configuration (*Auto Config*) enabled. The flight controller will then set the baud rate itself.

③ Enable reception of additional systems (e.g. Galileo) as required and save.

④ For the compass, enable the magnetometer in the hardware settings and, after a restart, check that the sensor is detected.

⑤ Turn the drone and check that the heading of the model in the configurator matches reality. If not, adjust the magnetometer alignment (*Mag Alignment*) and calibrate the magnetometer if the firmware offers it.

In other firmwares (INAV, ArduPilot) the procedure is similar: assign the GPS function to the UART, select the UBLOX protocol and enable the magnetometer on the I²C bus. Follow the documentation of the firmware concerned.

2.5 First satellite fix and operation

- Perform the first position fix (cold start) **outdoors under open sky**, with the drone stationary. The manufacturer states a cold start of 27 s; in practice the time depends on the view of the sky and on interference. Indoors the module will usually not get a fix.
- After a short power interruption the module reacquires faster thanks to the built-in capacitor (hot start).
- Enable the *GPS Rescue* function only after verifying that the module holds its position reliably, and always test it first in a safe area.
- Before take-off, wait until the flight controller has stored the take-off point (home). Without it, return functions do not work correctly.
- GPS does not make the drone autonomous. The pilot is responsible for the flight.

※ You are responsible for operating the drone in which the module is installed. The regulations of the country in which you fly always prevail – Regulation (EU) 2019/947 applies throughout the EU, but national implementing rules differ.

3. Troubleshooting

Problem	Possible cause and solution
Configurator does not see the GPS	Check the TX/RX crossover, the UART assignment on the *Ports* tab and the selected UBLOX protocol. Check the module power supply.
Module does not find satellites	Go outdoors under open sky and wait. Move the module away from the VTX and camera, do not cover the antenna with carbon.
Few satellites, position drifts	Interference from the drone electronics or poor view of the sky. Try another module position or enable additional systems (e.g. Galileo).
Compass not detected	Check the SCL/SDA wiring to the I²C bus, that the magnetometer is enabled and that the firmware supports it.
Compass shows wrong heading	Adjust the magnetometer alignment (*Mag Alignment*), calibrate it and move the module away from motors and power cables.

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 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 (BLITZ Mini M10 GPS V2) is printed on the antenna cover of the module.

4.3 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.

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.