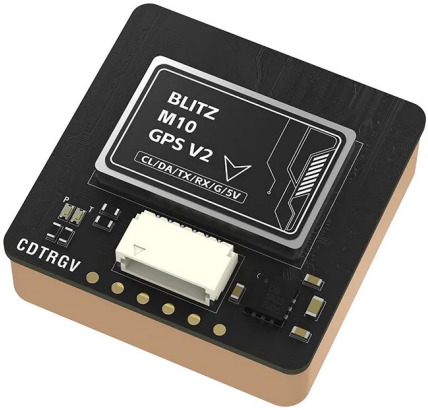
BLITZ M10 GPS V2

iFlight · GPS module with QMC5883L compass
User manual



Read the entire manual before installation and first flight, especially the safety instructions in Chapter 1.

www.rotorama.com

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1. Safety instructions

- Always install and wire the module **with the flight battery disconnected and the propellers removed**. Soldering and modifying wiring while powered may damage both the module and the flight controller.
- Before powering up for the first time, check the wiring of all leads according to Chapter 3.2. Reversing power and ground, or connecting a voltage higher than stated in the technical data, will destroy the module.
- The module is an electronic component sensitive to static electricity. Avoid touching the pads and components unnecessarily; work on a grounded mat or wear a grounding wrist strap.
- Protect the module from moisture, dust, metal debris and mechanical damage. Do not use a damaged module.
- GPS-based functions (e.g. GPS Rescue) **do not guarantee the return of the drone**. Their behaviour is affected by signal strength, number of satellites, settings, wind, interference and the condition of the drone. The pilot is always responsible for flight safety.
- Always test any new GPS function first in an open area far from people, buildings and obstacles.
- When operating a drone, follow the regulations of the country in which you fly. EU regulations apply in all member states, but national implementing rules (registration, zones, insurance, frequencies) differ – the law of the country of operation always prevails.
- This product is not a toy. Keep it out of the reach of children – small parts may be swallowed.

2. Product description

2.1 What the module is for

The iFlight BLITZ M10 GPS V2 is a satellite navigation (GNSS) receiver with a u-blox M10 chip and an integrated QMC5883L compass (magnetometer). It connects to the flight controller (FC) of an FPV drone and provides it with position, altitude and speed. These are used, for example, by GPS Rescue, by the distance and direction to home shown in the OSD, or for position logging.

The module has a 25 × 25 mm patch antenna, a low-noise amplifier (LNA), an RF filter, a temperature-compensated crystal oscillator (TCXO) and flash memory. A built-in supercapacitor (farad capacitor) retains data after a short power-off for a faster hot start. According to the manufacturer, the V2 version offers faster and more stable satellite acquisition than the previous version.



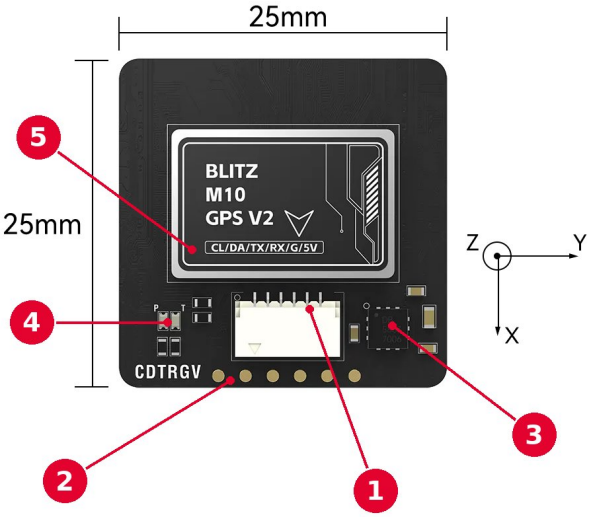
Antenna side – must face the sky when installed

2.2 Package contents

- 1× BLITZ M10 GPS V2 GPS module (25 × 25 mm)
- 1× cable set

※ The flight controller, a module mount and mounting hardware are not included.

2.3 Parts description



Electronics side; compass axes marked on the right

① **JST-SH connector, 6-pin** – for connection with the supplied cable.

② **CDTRGV solder pads** – from the left C = SCL, D = SDA, T = TX, R = RX, G = GND (ground), V = 5V (power).

③ **QMC5883L compass** – magnetometer connected to the I2C bus (SDA, SCL).

④ **LED indicators marked P and T**.

⑤ **Print with the model designation and pin order** CL/DA/TX/RX/G/5V.

▶ Compass orientation

The compass axes are shown in the figure above (view of the electronics side): the X axis points down towards the edge with the solder pads, the Y axis points to the right and the Z axis points perpendicularly out of the board towards the viewer. Set the magnetometer alignment in Betaflight according to how the module is actually oriented on the drone (Chapter 4.2). Recalibrate the compass after every change of the module's position or orientation.

2.4 Technical data

Parameter	Value
GNSS chip	u-blox M10
Compass	QMC5883L
Satellite systems	GPS + SBAS + Galileo + QZSS + GLONASS
Refresh rate	10 Hz
Default baud rate	115200 bps
Sensitivity (tracking)	−167 dBm
Cold start	27 s
Hot start	1 s
Max. altitude	80,000 m
Max. speed	500 m/s
Speed accuracy	0.05 m/s
Max. acceleration	≤ 4 G
Antenna size	25 × 25 × 6 mm
Overall dimensions	25 × 25 × 11 mm
Weight	16 g
Input voltage	3.3–5.5 V
GPS interface	UART (RX, TX)
Compass interface	I2C (SDA, SCL)
Connector	JST-SH, 6-pin

※ According to the manufacturer, the module does not support BeiDou.

3. Installation and wiring

3.1 Placement on the drone

- Place the module so that **the antenna has a clear view of the sky** – antenna side up. Do not cover it with carbon plates or metal parts; carbon fibre blocks the GNSS signal.
- Place the module **as far as possible from the video transmitter (VTX)** and its antenna, and from sources of electrical interference in general. The typical location is the rear of the drone.
- If you use the compass, keep the module as far as possible from power leads, electronic speed controllers (ESC), motors, magnets and ferromagnetic screws – they disturb the magnetic field measurement.
- Mount the module firmly and without play, ideally in a mount designed for the 25 × 25 mm size. The compass must keep a fixed orientation relative to the frame.
- Route the cable so that it cannot get into the propellers and is neither stretched nor pinched.

3.2 Connecting to the flight controller (FC)

The GPS connects to a free serial port (UART) of the flight controller. The compass connects separately to the I2C bus – **compass data is not transmitted over the UART**; to use the compass, you must also connect the SDA and SCL leads.

Module pin	Flight controller	Note
TX (T)	RX	TX and RX are crossed
RX (R)	TX	TX and RX are crossed
5V (V)	5V	power 3.3–5.5 V
G (GND)	GND	ground
DA (SDA)	SDA	compass only
CL (SCL)	SCL	compass only

- The lead order in the supplied cable may not match the connector of your flight controller. Before powering up, check each lead against the print on the module and the wiring diagram of your FC.
- Do not use the UART that hosts the RC receiver (Serial RX) for the GPS.
- If the flight controller has no SDA and SCL pads, the compass cannot be connected; the GPS will work without it.

Swapped TX and RX leads are the most common reason why the flight controller does not “see” the GPS.

4. Betaflight setup

The procedure describes the setup in Betaflight Configurator. Tab and option names may differ slightly depending on the version. The module uses the UBLOX protocol; the procedure is similar in other flight controller firmware.

4.1 UART port and enabling GPS

① On the *Ports* tab, find the UART to which the GPS is connected and select *GPS* for it. *Serial RX* must not be enabled on the same UART.

② Click *Save and Reboot*.

③ On the *Configuration* tab, enable *GPS* and select *UBLOX* as the protocol.

④ Click *Save and Reboot*.

※ The default baud rate of the module is 115200 bps.

4.2 Compass (magnetometer)

A compass is not required for most FPV builds – GPS Rescue in Betaflight works without it. If you want to use it:

① Make sure the SDA and SCL leads are connected and that the flight controller firmware includes magnetometer support.

② On the *Configuration* tab, enable *Magnetometer* and, under *Board and Sensor Alignment*, set the magnetometer alignment according to the actual orientation of the module (Chapter 2.3).

③ Click *Save and Reboot*.

④ On the *Setup* tab, start *Calibrate Magnetometer* and rotate the drone around all axes in turn during calibration. Calibrate away from metal objects and electronics.

⑤ Check that the heading of the drone in the Configurator matches the actual orientation of the drone.

4.3 Checking satellite reception

Place the drone outdoors with a clear view of the sky, connect the battery and wait for a position fix. The first fix after moving to a new location may take longer than usual. Check the number of satellites, the coordinates, the recording of the home point and the GPS indicators in the OSD.

- The manufacturer recommends **at least 6 satellites, preferably 8 or more**.
- Do not take off with weak GPS reception if you want to rely on GPS Rescue.

4.4 GPS Rescue

GPS Rescue is a Betaflight safety feature that, when the RC link is lost, attempts to bring the drone back to the home point: it climbs to a safe altitude, returns towards the home point and starts descending. It is not a fully autonomous function and does not guarantee the return of the drone.

① On the *Failsafe* tab, select *GPS Rescue* as the *Stage 2* procedure and save (*Save and Reboot*).

② Set the minimum number of satellites, the return altitude (high enough above trees, buildings and power lines), the return speed and the descent. Choose moderate values – excessive speed and steep descent both worsen the behaviour.

③ On the *Modes* tab, assign an AUX switch to the *GPS Rescue* mode so that you can test the function safely.

④ Test the function in a large open area, with a strong GPS signal and at a safe altitude. If the drone behaves unexpectedly, turn the switch off and take back control.

Never use GPS Rescue for the first time during a long-range flight.

5. Operation, maintenance and troubleshooting

5.1 Before every flight

- Check the module mounting and the integrity of the cable.
- Wait for a sufficient number of satellites and for the home point to be recorded.
- Verify a stable GPS indicator in the OSD and a stable link with the RC transmitter.
- Use a fully charged battery and check the antennas.

5.2 Maintenance and storage

- Keep the module clean and dry; remove dirt with a dry soft brush.
- After a crash, check the antenna, the connector and the solder joints. Replace a cracked or otherwise damaged module.
- Store in a dry place, out of direct sunlight and away from strong magnets.

5.3 Troubleshooting

Problem	Possible cause and solution
FC does not detect the GPS	Swapped TX/RX, wrong UART selected, Serial RX enabled on the UART, UBLOX protocol not selected, incorrect power supply. Check the wiring and Chapter 4.1.
No or weak satellite reception	Antenna covered (carbon, metal), module close to the VTX, reception indoors. Move the drone to an open area and the module further from sources of interference.
Compass does not work	SDA/SCL not connected, firmware without magnetometer support, magnetometer not enabled on the Configuration tab.
Wrong compass heading	Incorrect magnetometer alignment or missing calibration; interference from power leads and magnets. See Chapters 2.3 and 4.2.
GPS Rescue does not activate	Too few satellites, home point not recorded, failsafe or switch set incorrectly.
Drone does not return correctly with GPS Rescue	Too few satellites, strong wind, magnetic interference, incorrect flight controller orientation or unstable flight already in manual mode.

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 (BLITZ M10 GPS V2) is printed on the module 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

Rights of the buyer under Czech law

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.