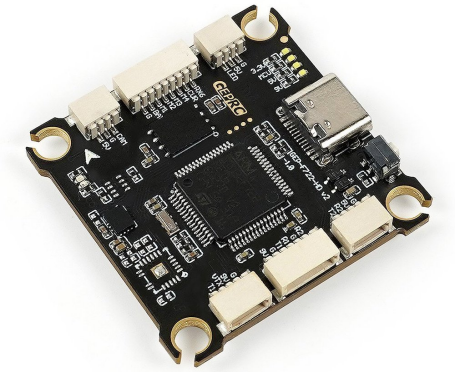
GEP-F722-HD V2

GEPRC

Flight controller (FC) for FPV drones



Read this manual carefully before installation and before connecting a battery for the first time.

www.rotorama.com

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1. Safety instructions

1.1 Before you start

The GEPRC GEP-F722-HD V2 flight controller (FC) is an electronic component designed to be built into an FPV drone. Installation requires experience with soldering and with configuring Betaflight. Read this entire manual before connecting a battery for the first time and keep it for future reference.

- The product is not a toy and is not intended for children.
- Carry out all soldering and wiring **with the battery and the USB cable disconnected**.
- When working on the flight controller and when configuring it in Betaflight, **always remove the propellers**.
- Protect the electronics against electrostatic discharge — work on an antistatic mat and do not touch the components on the board.

1.2 Power supply and wiring

- The input voltage of the flight controller is **3–6S LiPo**. Never connect it to a higher voltage.
- Observe the **polarity** of the power supply (BAT / GND). Reverse polarity or a short circuit will destroy the flight controller immediately and is not covered by the warranty.
- Do not load the 5 V and 9 V BEC outputs beyond the values given in the specifications (Chapter 2.2).
- Before connecting a battery for the first time, use a multimeter to check that there is no short circuit between the positive and negative power terminals.
- Make sure that the supply voltage of each connected device (camera, video transmitter, receiver, GPS) matches the output you connect it to.

1.3 LiPo batteries

- The battery is not included. Use only undamaged LiPo batteries with the appropriate cell count (3S to 6S).
- A LiPo cell is fully charged at 4.20 V/cell; end the flight at 3.5 V/cell at the latest and keep the battery at 3.8 V/cell for storage.
- Charge batteries under supervision, on a non-flammable surface and with a charger designed for LiPo. Do not use a swollen or mechanically damaged battery.

2. Product description

2.1 Intended use

The GEP-F722-HD V2 is a flight controller (FC) for FPV drones with a 30.5 × 30.5 mm mounting hole pattern. It is based on an STM32F722 processor and an ICM42688-P gyroscope and has 16 MB of blackbox memory, a built-in barometer, analog OSD, an integrated LC power filter and a USB-C port. The DJI Air Unit connector allows a DJI digital system (O3 Air Unit, Caddx Vista) to be plugged in directly with the supplied cable.

Two independent 5 V and 9 V power supplies (BEC) power the receiver, camera, video transmitter and other accessories. Silicone damping grommets in the mounting holes reduce the transfer of vibrations to the gyroscope.

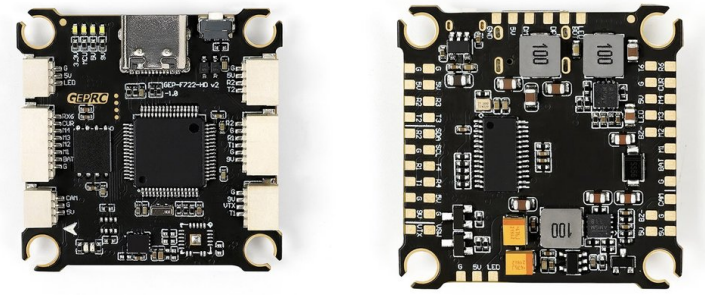
2.2 Specifications

Parameter	Value
MCU	STM32F722
IMU	ICM42688-P (SPI)
Blackbox	16 MB onboard
Barometer	built-in
OSD	Betaflight OSD w/ AT7456E chip
BEC	5 V / 3 A and 9 V / 2.5 A (dual BEC)
Input voltage	3–6S LiPo
UART	5
Power filter	integrated LC filter
USB interface	USB-C
Air Unit connection	direct plugging into the DJI Air Unit
Firmware target	Betaflight, target **GEPRCF722**
Size	36.85 × 36.85 mm
Mounting holes	30.5 × 30.5 mm; ⌀ 4 mm hole becomes ⌀ 3 mm (M3) with the silicone grommet
Weight	8.1 g

2.3 Package contents

- 1× GEP-F722-HD V2 flight controller
- 1× DJI Air Unit adapter cable
- 1× flight controller adapter cable (for the ESC)
- 4× nylon nut
- 4× silicone grommet
- 2× SH1.0 4-pin silicone cable
- 1× camera connection cable

The package does **not** include an ESC, receiver, camera, video transmitter, GPS module, buzzer, LED or battery.



Top side with the USB-C port (left) and bottom side with solder pads (right)

3. Installation

3.1 Mechanical installation

① Insert the supplied silicone damping grommets into the four mounting holes. This reduces the ⌀ 4 mm hole to ⌀ 3 mm for M3 screws.

② Place the flight controller on the frame screws with a 30.5 × 30.5 mm pattern. The arrow on the board indicates the direction of flight; if the board is mounted in a different orientation, set the orientation in Betaflight (*Configuration* tab, *Board and Sensor Alignment*).

③ Secure the flight controller with the supplied nylon nuts. Do not overtighten the nuts — the grommets must remain flexible, otherwise they lose their damping effect.

④ Check that neither the board nor its cables touch the carbon frame, the propellers or any sharp edges.

3.2 Connecting the ESC

The ESC is connected to the 8-pin connector with the supplied cable. The connector carries the signals **TLM** (ESC telemetry, port R6), **CUR** (current sensor), **M1–M4** (motor signals), **BAT** (battery voltage) and **GND**. The same signals are also available on the solder pads on the bottom side of the board.

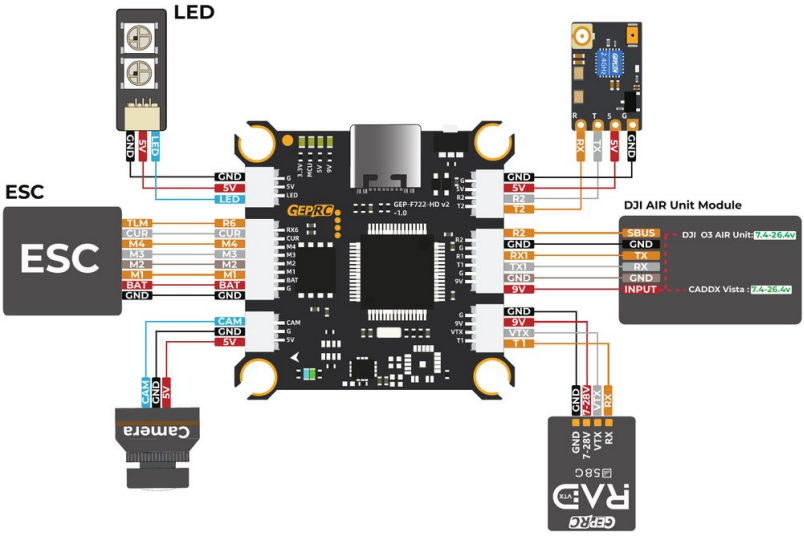
❉ The wire order of ESC connectors differs between manufacturers. Before connecting, compare the pin labels on the flight controller and on the ESC and modify the cable if necessary. Incorrect wiring of BAT can destroy both boards.

3.3 Indicator LEDs on the board

The top side of the board has indicator LEDs labelled **3.3V**, **MCU**, **5V** and **9V**. They indicate the 3.3 V, 5 V and 9 V power rails and the processor (MCU). If the indicator of a power rail does not light up, disconnect the power and check the wiring.

4. Wiring diagrams

4.1 Top side — connectors

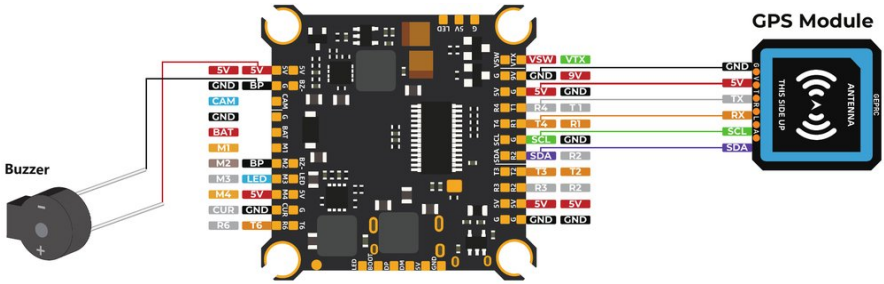


Wiring of the ESC, LED, camera, receiver, DJI Air Unit and analog video transmitter (manufacturer's diagram)

Connector	FC pins	Connected device
LED	GND, 5V, LED	LED strip
ESC	R6 (TLM), CUR, M4, M3, M2, M1, BAT, GND	ESC
Camera	CAM, GND, 5V	analog camera
Receiver	GND, 5V, R2, T2	receiver (TX, RX, 5V, GND)
DJI	R2 (SBUS), GND, RX1, TX1, GND, 9V	DJI Air Unit
Analog VTX	GND, 9V, VTX, T1	video transmitter

- Receiver: the receiver TX pin goes to **R2**, the receiver RX pin to **T2**.
- DJI Air Unit: **RX1** → unit TX, **TX1** → unit RX, **R2** → SBUS, **9V** → INPUT. The manufacturer specifies a supply range of **7.4–26.4 V** for both the DJI O3 Air Unit and the Caddx Vista.
- Analog video transmitter: **9V** → power, **VTX** → video input, **T1** → RX (VTX control). Make sure that your video transmitter accepts a 9 V supply.
- The receiver connector and the DJI connector share the **R2** pin (UART2). Always use only one receiver signal source.

4.2 Bottom side — solder pads



Wiring of the buzzer and GPS module to the solder pads on the bottom side (manufacturer's diagram)

Device	FC pads	Device pin
Buzzer	5V	+
	BZ−	−
	GND / 5V	GND / V
GPS module	R4	TX
	T4	RX
	SCL / SDA	SCL / SDA (compass)

The bottom side also provides pads for power (BAT, GND, 5V, 9V), the motor signals M1–M4, current sensor (CUR), camera (CAM), LED, video (VTX) and the serial ports (T1/R1, R2/T2, T3/R3, T4/R4, R6/T6). Solder the pads quickly, with enough flux and without bridging neighbouring pads.

5. Betaflight configuration

5.1 Connecting to a computer and firmware

- Connect the flight controller to the computer with a USB-C cable and start Betaflight Configurator.
- When updating the firmware, select the target **GEPRCF722**. Do not flash any other target.
- After flashing the firmware, calibrate the accelerometer (*Setup → Calibrate Accelerometer*) on a level surface.
- A battery does not need to be connected for configuration via USB. Always keep the propellers removed.

5.2 Receiver

In the manufacturer's diagram the receiver is connected to UART2. Settings according to the manufacturer:

Port	Configuration/MSP	Serial Rx
USB VCP	enabled, 115200	disabled
UART1	disabled, 115200	disabled
UART2	disabled, 115200	**enabled**

- *Receiver* tab: *Receiver Mode* = **Serial-based receiver**, *Serial Receiver Provider* = **CRSF** (for CRSF and ExpressLRS receivers; for another protocol select the corresponding item).
- Remember to configure a serial port (via the *Ports* tab) and choose a serial receiver provider when using the RX_SERIAL feature.

5.3 DJI digital system

Port	Configuration/MSP	Serial Rx
USB VCP	enabled, 115200	disabled
UART1	**enabled**, 115200	disabled
UART2	disabled, 115200	**enabled**

- UART1 (MSP) is used for communication with the DJI Air Unit, UART2 receives the SBUS signal from the DJI unit.
- *Receiver* tab: *Receiver Mode* = **Serial (via UART)**, *Serial Receiver Provider* = **SBUS**.
- The UART for the receiver must be set to *Serial Rx* (in the *Ports* tab), and the correct data format must be selected from the drop-down list.

5.4 Analog video transmitter

Port	Configuration/MSP	Peripherals
USB VCP	enabled, 115200	Disabled, AUTO
UART1	disabled, 115200	**VTX (IRC Tramp)**, AUTO
UART2	disabled, 115200	Disabled, AUTO

The video transmitter (channel, power) is controlled via UART1 (pin T1). Because UART1 is also used by the DJI Air Unit, only one of the two devices can be used on it at a time.

5.5 Other features

The manufacturer's diagram shows the following settings in the *Configuration* tab (*Other Features*):

Feature	Description	State
AIRMODE	permanently enable Airmode	enabled
OSD	On Screen Display	enabled
DYNAMIC_FILTER	dynamic gyro notch filtering	disabled

5.6 GPS module

- In the manufacturer's diagram the GPS module is connected to UART4 (pads R4/T4). In the *Ports* tab, set **GPS** under *Sensor Input* for UART4.
- In the *Configuration* tab, enable the **GPS** feature and select the protocol according to the module used.
- The compass of the GPS module is connected to the I2C bus (SCL and SDA pads).

6. Before the first flight

- In the *Motors* tab (without propellers!), check the motor order and direction of rotation.
- In the *Receiver* tab, check that all channels respond correctly to the stick movements of the radio.
- In the *Setup* tab, check that the model on the screen follows the tilting of the drone in the correct direction.
- Assign a switch for **Arm** (motors on) and **Disarm** (motors off), and set up and test the **failsafe**.
- Before flying, insert a **fully charged** battery (4.20 V/cell) and check that the propellers are secure.

6.1 Maintenance

- Regularly check the solder joints, cables and connectors, especially after a crash.
- Replace the silicone damping grommets if they are damaged or hardened.
- Protect the flight controller against moisture, dust and metal debris. Do not fly in wet conditions.

6.2 Troubleshooting

Problem	Possible solution
The computer does not recognise the flight controller	Use a different USB-C cable (with data wires) and a different port, and install the drivers from Betaflight Configurator.
The receiver does not respond	Check the wiring TX → R2 and RX → T2, the Serial Rx setting on UART2 and the receiver protocol.
No video from the DJI unit	Check the DJI cable, the 9V supply and that MSP is enabled on UART1.
The drone cannot be armed	Check the cause in the *Setup* tab (Arming disable flags), the accelerometer calibration and the switch setting.
The 5V or 9V indicator does not light up	Disconnect the power immediately and look for a short circuit or overload on the respective rail.

7. Further information

- Betaflight — firmware and documentation: betaflight.com
- GEPRC — manufacturer, product page: geprc.com
- Rotorama — retailer and importer: www.rotorama.com

7.1 Operating the assembled drone

Operate a drone built with this flight controller in accordance with Regulations (EU) 2019/947 and 2019/945. These regulations apply in all EU Member States, but national implementing rules differ from country to country — registration portals, minimum pilot age, geographical zones, mandatory insurance, permitted frequency bands and maximum transmit power. If you operate the drone in another country, you must follow the regulations of the country in which you fly.

7.2 Manufacturer

Manufacturer	GEPRC
E-mail	support@geprc.com
Web	geprc.com

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 (GEP-F722-HD v2) is printed directly on the printed circuit board of the flight controller.

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.