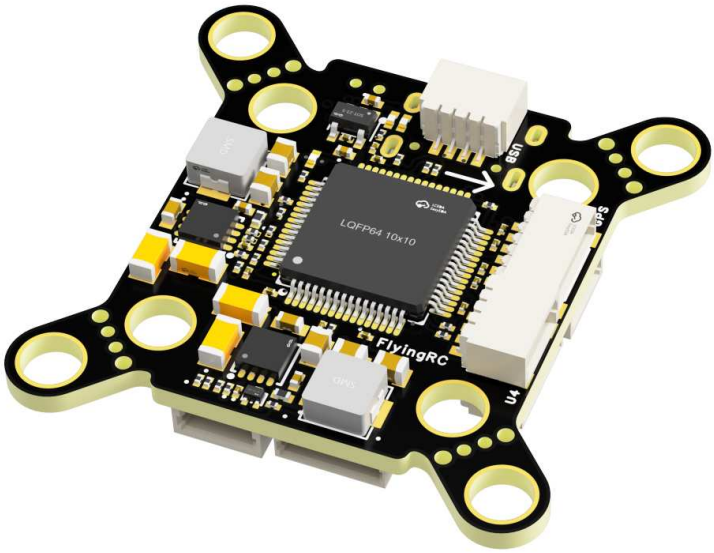
F4D MK1

User manual

FlyingRC F4D MK1 (F405) flight controller for FPV drones



Read the whole manual before assembly. The wrong signal cable wire order will destroy the flight controller.

Version 1.0 · Rotorama, s.r.o.

Contents

1. Safety instructions

1.1 Before you start

This product is an **electronic component of an unmanned aircraft** – a flight controller – not a finished product ready for use. The board becomes usable only after being built into an aircraft, wired to the other parts and configured.

- Read this entire manual before you start building and keep it for future reference.
- The flight controller works with battery voltage. A wiring error can cause a **fire** or destroy the board.
- Building requires experience with soldering and with model building. If you are not confident, ask an experienced modeller for help.
- This product is not a toy. It is not intended for children or for persons not familiar with this manual.
- Do not use a damaged board – after a crash, after overheating, with a cracked board or with a burnt component.

1.2 Handling the board

The board is sensitive to static electricity and to mechanical damage.

- Hold the board by its edges; do not touch the solder pads, connectors or components.
- Discharge static electricity by touching a grounded metal object before handling.
- Do not place the board on metal or conductive surfaces, including the carbon parts of the frame.
- SH1.0 connectors are small. When plugging and unplugging, support the connector body with your fingers, otherwise you will tear it off the board.

1.3 Li-Po and LiHV batteries

The flight controller is designed for **3–6S Li-Po** batteries, that is 11.1–25.2 V. It is powered from the ESC through the VBAT wire of the signal cable. Connecting a 7S battery will destroy the flight controller instantly.

State	Li-Po	6S Li-Po	4S Li-Po
fully charged	4.20 V/cell	25.2 V	16.8 V
end the flight	3.50 V/cell	21.0 V	14.0 V
storage	3.80 V/cell	22.8 V	15.2 V

- Charge only with a charger intended for the given cell type and never leave it unattended.

- Do not use a battery with a swollen pouch, a damaged lead or after a hard crash.
- Never connect the battery with reversed polarity – reverse polarity destroys both the ESC and the flight controller, and such damage is not a product defect.
- Charge and store batteries in a non-flammable container, away from flammable materials.

1.4 Rotating propellers and bench testing

Most of the setup can be done without propellers. Do not fit the propellers until the aircraft is fully configured.

- **Always** remove the propellers before you connect the flight controller to a computer or before you test the motors.
- Secure the aircraft mechanically during motor tests and never reach into the plane of the propellers.
- Never stand, and never let others stand, in line with the propellers.

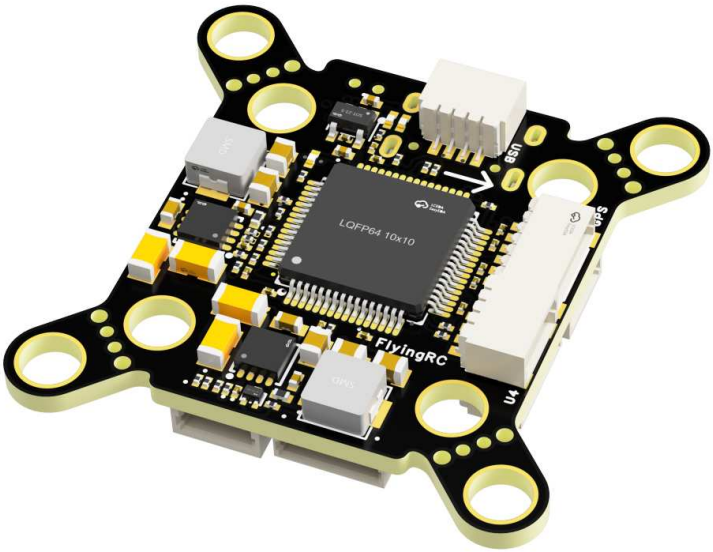
1.5 Temperature and cooling

The flight controller heats up mainly around the BEC converters – especially when the video transmitter is powered from the 9 V output.

- The board must not touch the carbon parts of the frame, the battery connector or other boards – a short circuit may occur.
- Do not wrap the board in heat-shrink tubing and do not pot it. Such modifications block heat dissipation and any damage caused by them cannot be claimed under warranty.
- Do not leave the aircraft standing with the battery connected and without airflow.
- Let the board cool down after a flight before you touch it.

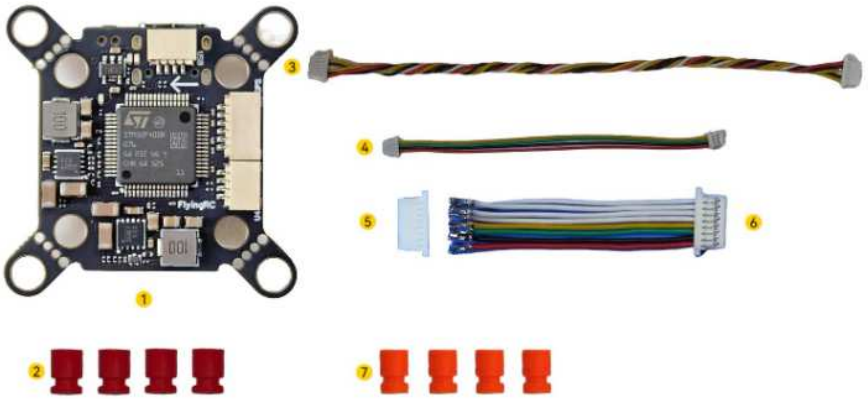
2. Product description

The **FlyingRC F4D MK1** is a flight controller for FPV drones built around the STM32F405 microcontroller with an ICM-42688-P gyroscope and a barometer. All peripherals connect through SH1.0 connectors, so no soldering is needed. The board has 30.5 × 30.5 mm and 20 × 20 mm mounting hole patterns and comes with Betaflight firmware loaded at the factory.



The FlyingRC F4D MK1 flight controller

2.1 Package contents



Package contents

① 1× FlyingRC F4D MK1 (F405) flight controller

② 4× silicone anti-vibration grommet M3

③ 1× cable for the DJI digital video transmitter, 6-pin, 15 cm

④ 1× SH1.0 cable, 4-pin, silicone, 10 cm

⑤ 1× SH1.0 connector, 8-pin, with crimp contacts

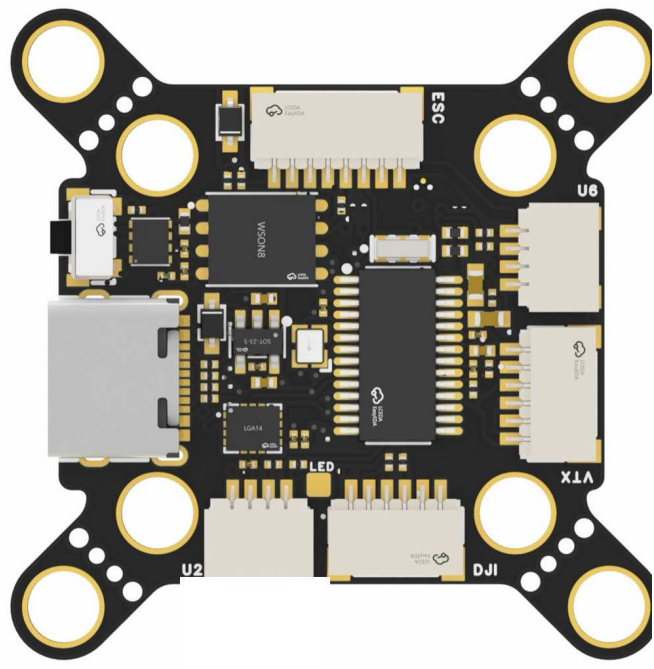
⑥ 1× SH1.0 cable, 8-pin, 30 AWG, silicone, 3.5 cm

⑦ 4× silicone anti-vibration grommet M2

The electronic speed controller, battery, motors, frame, propellers, receiver and video transmitter are not included.

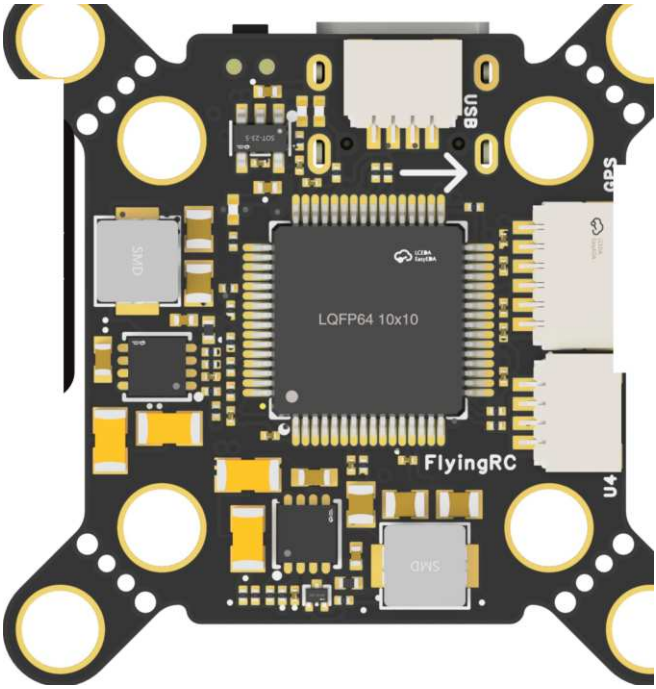
2.2 Flight controller – connectors and pads

All peripherals connect through **SH1.0** connectors; the name of each connector is printed on the board next to it. **T** marks the transmit wire of a serial port, **R** the receive wire. The **U2**, **U4** and **U6** connectors are general-purpose serial ports UART2, UART4 and UART6.



The board side with the ESC, U6, VTX, U2 and DJI connectors, the LED pad and the USB Type-C connector

The other side of the board carries the microcontroller, both BEC converters and the **USB**, **GPS** and **U4** connectors. The white arrow on the board points in the direction of flight.



The board side with the microcontroller and the USB, GPS and U4 connectors

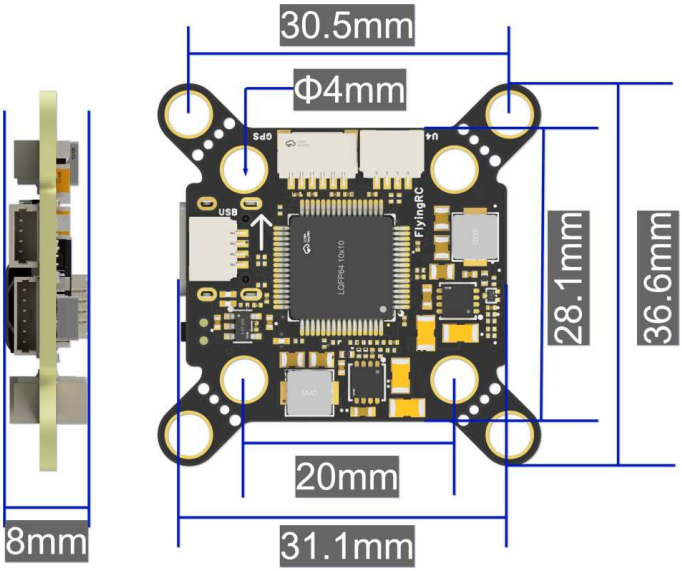
Overview of the connectors and their pins:

Connector	Pins	Pinout
ESC	8	M4 · M3 · M2 · M1 · RX · CURR · G · VBAT
DJI	6	8–26 V · G · TX · RX · G · SBUS
VTX	6	CAM · G · 9V · VTX · G · 9V
GPS	6	SCL · SDA · TX · RX · G · 5V
U2	4	5V · G · RX · TX
U4	4	5V · G · RX · TX
U6	4	5V · G · RX · TX
USB	5	for the USB extension cable
LED	pad	data wire of the WS2812 strip, soldering required

※ The manufacturer gives the pin order of the U2, U4 and U6 connectors in a single common UART connector drawing. Always compare it with the marking on the board itself before you wire anything up.

2.3 Flight controller specifications

Model	FlyingRC F4D MK1
Microcontroller	STM32F405RGT6, 168 MHz
Memory	1 MB Flash, 192 kB RAM
Gyroscope and accelerometer	ICM-42688-P
Barometer	DPS310
Analogue OSD	AT7465E
Serial ports	6× UART, UART3 as a receive wire only
PWM outputs	5 channels – 4 for motors and 1 for an LED strip
I2C bus	1
Current sensing (ADC)	yes
Buzzer	none
LED strip	WS2812, soldering required
USB connector	USB Type-C on the board
Flight data logging	16 MB NOR Flash on the board
SBUS	supported, SBUS pin on the DJI connector
SWD debug interface	none
Power input	3–6S Li-Po, 11.1–25.2 V DC
BEC output for peripherals	5 V / 3 A (MP9943)
BEC output for VTX and camera	9 V / 2 A (MP9943), switchable
Dimensions	36.6 × 36.6 × 8.0 mm; 28.1 × 31.1 × 8.0 mm with the mounting tabs cut off
Mounting holes	30.5 × 30.5 mm and 20 × 20 mm patterns, M4 holes (4 mm diameter)
Weight	6.3 g
Operating temperature	−10 °C to 100 °C
Storage temperature	0 °C to 40 °C
Supported firmware	Betaflight (factory default), INAV, Ardupilot; PX4 is not supported



Flight controller dimensions

2.4 Serial ports (UART)

The flight controller has six serial ports. In Ardupilot firmware the **SERIAL port numbers do not match** the UART numbers printed on the board; the mapping is given in the table below.

Board marking	Port	Ardupilot	Default function
USB	USB	SERIAL0	console
DJI	UART1	SERIAL1	telemetry 1
U2	UART2	SERIAL6	receiver input (CRSF)
ESC (R3)	UART3	SERIAL2	ESC telemetry
U4	UART4	SERIAL4	free
GPS	UART5	SERIAL3	GPS
U6	UART6	SERIAL5	free

- **UART3** is broken out as the **RX** receive wire on the ESC connector only – it carries ESC telemetry.
- Direct memory access (DMA) is available on **UART1** and on the transmit wire of **UART6**. UART3, UART4 and UART5 work without DMA.
- Once wired up, each port must be assigned its function. If you connect a GPS module to the GPS connector, for example, set *SERIAL3_PROTOCOL* to GPS in

Ardupilot and make sure no other port is set to GPS.

❊ For receivers using a protocol other than SBUS or PPM – ExpressLRS, for example – the manufacturer gives the setting *BRD_ALT_CONFIG* = 1, while its text mentions SERIAL7 even though the mapping table puts the receiver input on SERIAL6. If the receiver does not communicate, try setting this parameter and restarting the flight controller.

2.5 PWM outputs and motors

The flight controller has five PWM outputs. Outputs **S1 to S4** are broken out on the ESC connector, the fifth output drives an addressable LED strip. The motor outputs are split into two groups according to the microcontroller timers:

Group	Outputs	Timer	Channels
1	S1, S2	TIM8	CH4, CH3
2	S3, S4	TIM1	CH3N, CH1

- All four outputs support the **DShot** 150, 300 and 600 protocols.
- Outputs in the same group **cannot** be used at the same time for DShot ESCs and for 50 Hz servos.

2.6 I2C bus and voltage and current sensing

The I2C bus is broken out on the GPS connector as **SCL** (clock wire) and **SDA** (data wire). It is used to connect an external magnetometer; in Ardupilot it is enabled with *COMPASS_AUTODEC* = 1.

Battery voltage is sensed on the **VBAT** pin through a divider built into the board, current on the **CURR** pin from the current sensor of the ESC.

Firmware	Parameter	Value
Betaflight	current sensor scale	100 (1/10 mV/A)
Ardupilot	BATT_VOLT_PIN	10
Ardupilot	BATT_VOLT_MULT	11.0
Ardupilot	BATT_CURR_PIN	11
Ardupilot	current sensor scale	100 (A/V)
INAV	voltmeter divider ratio	1100

❊ The manufacturer's documentation gives two different sets of values for the analogue inputs – *BATT_VOLT_PIN* 14, *BATT_VOLT_MULT* 21 and *BATT_CURR_PIN* 15 in the ADC input table, and the values listed in the table above in the recommended settings overview. After the first power-up, always compare the voltage shown in the configurator with the voltage measured directly on the battery and recalibrate the divider ratio if they differ.

3. Legal conditions of operation in the Czech Republic and the EU

3.1 The law of the country you fly in applies

Regulations (EU) 2019/947 and 2019/945 apply in all Member States of the European Union, but the national implementing rules differ from state to state – registration portals, pilot age, geographical zones, insurance, frequency bands and transmit powers. The information in this chapter describes the situation in the Czech Republic. If you fly in another country, you must follow the rules of that state.

3.2 The flight controller is a component, not a finished drone

The flight controller is not an unmanned aircraft. Regulation (EU) 2019/945, which defines classes C0 to C6, applies to finished unmanned aircraft systems bearing a class identification label, not to individual parts. The board therefore cannot bear a class marking, and it contains no radio equipment – the receiver and the video transmitter are bought separately and follow their own documentation.

Once the board is built into an aircraft, Regulation (EU) 2019/947 and the related Czech rules apply to the **operation** of that aircraft. Responsibility for compliance rests with the operator.

3.3 Operator registration and operational categories

These obligations apply to the finished aircraft you build the board into.

- The operator must **register** if the aircraft carries a sensor capable of capturing personal data, i.e. a camera – regardless of weight. In the Czech Republic registration runs at dron.caa.gov.cz and the number issued must be displayed on the aircraft.
- An aircraft without a class marking built after 1 January 2024 may be operated as a **privately built unmanned aircraft system** – in subcategory A1 below 250 g and 19 m/s, otherwise in subcategory A3; subcategory A2 is not available. A drone based on this set usually weighs well over 250 g, so expect **subcategory A3**.
- The usual open-category limits apply: **up to 120 m** above ground, continuous visual contact and no flying over assemblies of people. Subcategory A3 also requires 150 m from residential, commercial, industrial and recreational areas.
- With FPV goggles, an **unmanned aircraft observer** must stand next to you and keep visual contact with the aircraft without optical aids.
- Before flying, check the geographical zones at dronemap.rlp.cz and weigh the actual take-off mass including the battery.
- Liability insurance is not compulsory for small aircraft in the open category, but we recommend it.

4. Installation and wiring

4.1 What else you need

In addition to the package contents you will need:

- a frame with a 30.5 × 30.5 mm or 20 × 20 mm mounting pattern,
- a 4-in-1 electronic speed controller and four motors matching the chosen size,
- a 3–6S Li-Po battery and a matching charger,
- a receiver and a radio transmitter,
- a video transmitter – digital or analog – together with a camera or goggles,
- a temperature-controlled soldering iron, solder, wires and heat-shrink,
- a computer with the Betaflight, INAV or Ardupilot configurator and a USB-C cable.

4.2 Mounting in the frame

The flight controller mounts on the **30.5 × 30.5 mm** or **20 × 20 mm** pattern. The mounting holes are **M4** with a 4 mm diameter; together with the supplied anti-vibration grommets they take **M3 screws** on the 30.5 mm pattern and **M2 screws** on the 20 mm pattern. The flight controller is usually mounted above the ESC.

① Fit the supplied anti-vibration grommets matching the chosen pattern into the holes of the board.

② Place the flight controller in the frame so that the white arrow on the board points **forward** in the direction of flight.

③ Tighten the screws only lightly – overtightening compresses the grommets and stops them damping vibration.

④ Check that the board touches neither the frame nor another board with any component or solder pad.

- The mounting tabs can be cut off; the board then measures 28.1 × 31.1 mm and mounts on the 20 × 20 mm pattern only.

If the flight controller faces any other direction, set the orientation in the configurator. Mechanically correct installation is always more reliable.

4.3 Power supply

The flight controller has no power pads and no battery connector of its own. It is powered from the **ESC** through the **VBAT** wire of the eight-pin signal cable; the **CURR** wire at the same time carries the reading from the current sensor of the ESC.

- There are two converters on the board: **5 V / 3 A** for peripherals – the receiver, the GPS module, the LED strip – and **9 V / 2 A** for the video transmitter and the camera.

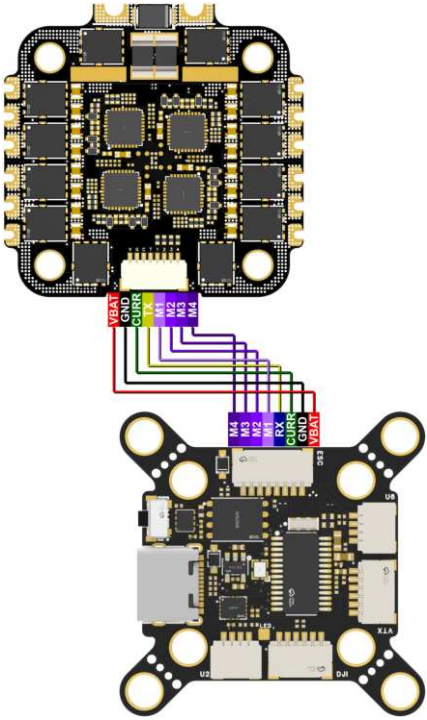
- The 9 V output can be switched on and off from the radio – see chapter 5.7.
- The **DJI** connector carries the battery voltage (8–26 V), not the 9 V from the converter.
- The capacitor that suppresses voltage spikes from the motors belongs on the power pads of the ESC. Without it you risk gyro noise, video transmitter dropouts and destruction of the electronics.

4.4 Connecting the ESC

‼ The signal cable must have the wire order matching the ESC you use. The wrong order will destroy the flight controller. Always check the order before you connect the battery for the first time.

The flight controller is connected to a 4-in-1 ESC with an eight-pin **SH1.0** cable. The cable carries the power supply, the current sensing, the ESC telemetry and the four motor signals. The **ESC** connector on the flight controller follows the Betaflight connector standard; with an ESC of the same standard the wires face each other in the same order.

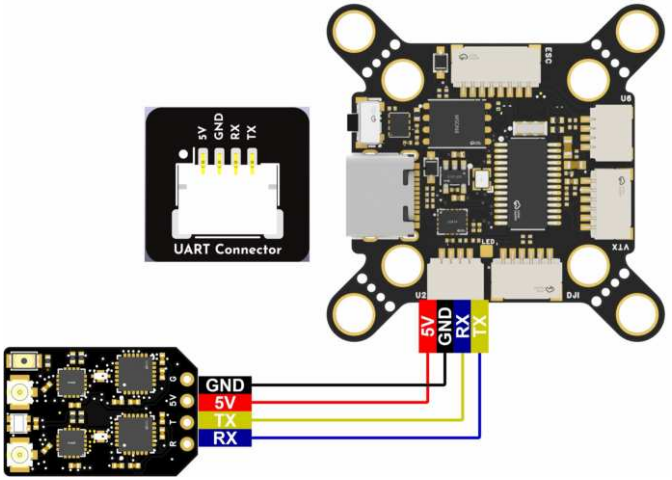
ESC	Flight controller	Function
VBAT	VBAT	battery voltage
G	G	ground
CURR	CURR	current sensor
TX	RX	ESC telemetry
M1	M1	motor 1 signal
M2	M2	motor 2 signal
M3	M3	motor 3 signal
M4	M4	motor 4 signal



Flight controller to ESC wiring based on the manufacturer's documentation

4.5 Receiver

The receiver connects to the **U2** connector, which is routed to UART2 – SERIAL6 in Ardupilot firmware.

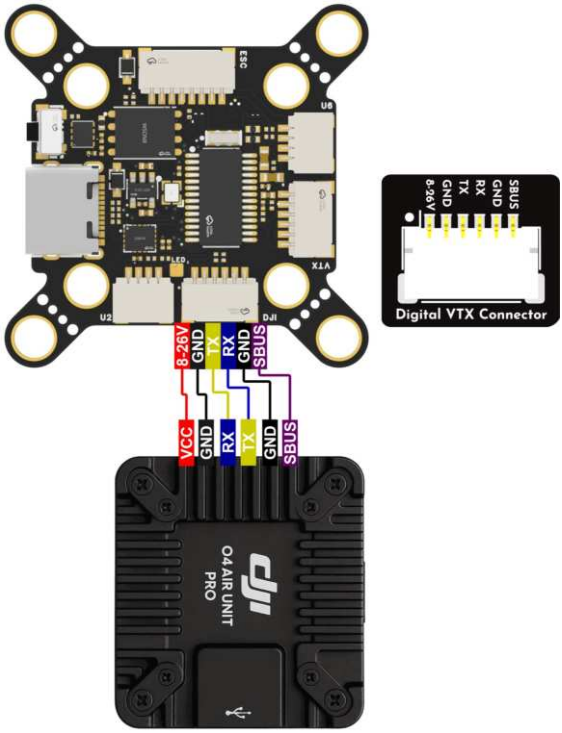


Receiver wiring based on the manufacturer's documentation

- The **TX** and **RX** wires cross over: connect the receiver TX pin to **RX** on the flight controller and the receiver RX pin to **TX**.
- Power the receiver from the **5V** and **G** pins of the same connector.
- A receiver using the **SBUS** protocol connects to the SBUS pin of the DJI connector.

4.6 Digital video transmitter

The six-pin **DJI** connector is intended for a digital video transmitter. A 15 cm cable is included in the package – no soldering is needed.

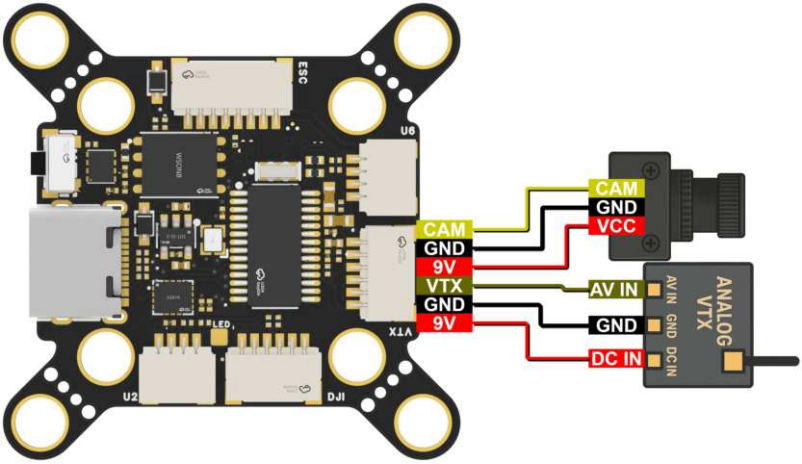


Digital video transmitter wiring based on the manufacturer's documentation

- The connector carries **8–26 V** power, the **UART1** serial port for data and the on-screen display (OSD), and the **SBUS** input.
- The **TX** and **RX** wires cross over here as well: flight controller TX to video transmitter RX and vice versa.
- Power on this connector follows the battery voltage and is therefore not switchable. Only the 9 V output on the VTX connector can be switched – see chapter 5.7.

4.7 Analogue camera and video transmitter

The six-pin **VTX** connector carries the **CAM**, **G**, **9V**, **VTX**, **G** and **9V** pins. It serves both the analogue camera and the analogue video transmitter.

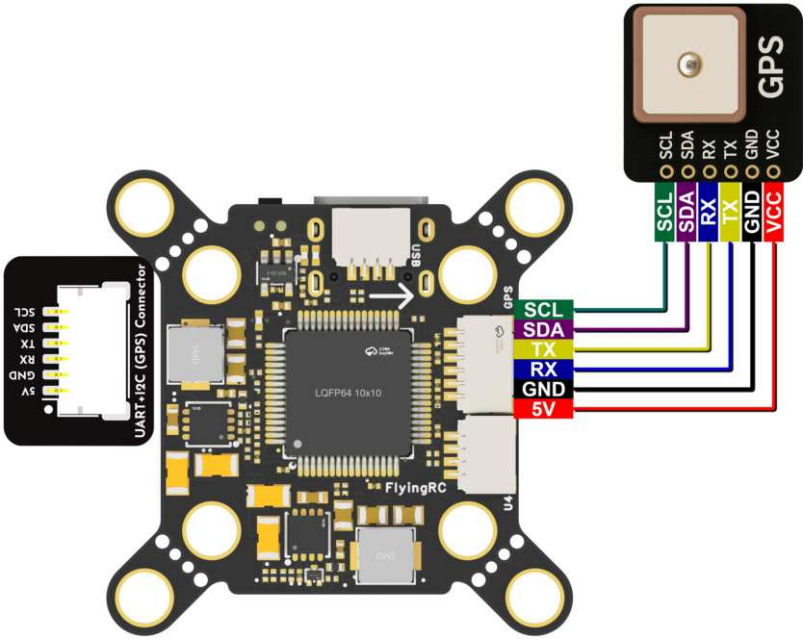


Analogue camera and video transmitter wiring based on the manufacturer's documentation

- Connect the camera video signal to the **CAM** pin and the camera power to **9V** and **G**.
- Connect the video input of the transmitter to the **VTX** pin and its power to the second **9V** and **G** pair.
- The 9 V supply comes from a converter on the board and can be switched off from the radio – see chapter 5.7.
- The analogue on-screen display (OSD) is drawn by the AT7465E chip; with digital video the display is drawn in the video transmitter.

4.8 GPS module and compass

The GPS module connects to the **GPS** connector, that is to UART5 – SERIAL3 in Ardupilot firmware.



GPS module with compass wiring based on the manufacturer's documentation

- Connect the **TX** pin of the module to **RX** and the **RX** pin of the module to **TX**.
- A module with a compass also uses the I2C bus – the **SCL** and **SDA** pins of the same connector.
- Place the module as far as possible from the power wires and from the motors, otherwise the compass will be disturbed.
- In Ardupilot set *SERIAL3_PROTOCOL* to GPS and make sure no other port is set to GPS.

4.9 LED strip

The data wire of an addressable **WS2812** strip is soldered to the pad marked **LED** next to the U2 connector. Take the 5 V power and ground for the strip from the 5V and G pins of any free UART connector.

- The LED pad is the only place on the board where soldering is required; all other peripherals connect through connectors.
- The LED output is the fifth PWM channel.

5. Setting up

5.1 Connecting to a computer

The flight controller is connected to a computer with a **USB Type-C** cable.

① Remove the propellers.

② Connect the flight controller to the computer with a USB-C cable. Do **not** connect the battery.

③ Start the configurator and press *Connect*.

④ If the board does not appear, try a different cable – many USB-C cables are charge-only and have no data lines.

USB does not power the video transmitter or the motors. The ESC and the motors are tested only with the battery connected and always without propellers.

5.2 Flight controller firmware

The flight controller ships with **Betaflight** firmware loaded at the factory. Betaflight, INAV and Ardupilot are all supported.

Betaflight	MATEKF405TE
INAV	MATEKF405TE
Ardupilot	MatekF405-TE

- The manufacturer does not release a dedicated target for this board; for all three firmwares it refers to the **Matek F405-TE** target.
- Flashing a different target will not damage the board, but it will not work correctly – in particular the port and output assignment.
- Save your configuration with the *diff all* command on the *CLI* tab before you reflash the firmware.

The manufacturer provides limited technical support for Betaflight and Ardupilot firmware. No technical support is provided for INAV firmware.

5.3 Basic flight controller settings

Firmware	Parameter	Value
Betaflight	gyroscope orientation	CW 90° Flip
Ardupilot	COMPASS_AUTODEC	1 – external magnetometer
Ardupilot	SERIAL3_PROTOCOL	GPS – module on the GPS connector

The values for voltage and current sensing are given in chapter 2.6.

5.4 Accelerometer calibration

Calibrate after installation in the frame, when the aircraft is complete.

① Place the aircraft on a level horizontal surface.

② Choose *Setup → Calibrate Accelerometer* in the configurator.

③ Do not move the aircraft during calibration.

5.5 Checking the motor order and direction

Always carry out this test without propellers and with the aircraft mechanically secured.

① Remove the propellers and connect the battery.

② Open the *Motors* tab in the configurator and enable motor testing.

③ Spin up motors 1 to 4 one by one and check that the intended motor runs.

④ Check the direction of rotation; if it is wrong, change it in the configuration program of the ESC.

⑤ Fit the propellers according to the firmware diagram only after a successful test.

5.6 Arm, Disarm and failsafe

Assign **Arm** (motors on) and **Disarm** (motors off) to a switch on the radio. Do not use a lever or a button for Arm that can return by itself.

- The Arm switch must be in the off position before you connect the battery.
- Set the behaviour on signal loss on the *Failsafe* tab; the recommended setting is to cut the motors immediately.
- Test the failsafe function without propellers – switch off the radio and verify that the motors stop.

5.7 Switched 9 V supply

The 9 V supply for the video transmitter can be switched from the radio through the **PINIO1** output, controlled in Betaflight by the *USER1* mode.

- On the *Modes* tab of the configurator, assign the *USER1* mode to the chosen switch on your radio.
- Switching it off protects the video transmitter from overheating during bench tests and between flights.
- Remember to switch the supply back on before the flight.

5.8 Flight data logging

The flight controller logs flight data to the **16 MB NOR Flash memory** on the board. The memory holds several flight logs.

- Logging is enabled and the recorded data downloaded in the configurator on the *Blackbox* tab.
- Erase the memory after downloading, otherwise no further log will be written.
- The flight controller **has no memory card slot**.

※ In the general Ardupilot settings the manufacturer gives the parameter *LOG_BACKEND_TYPE* = 4 for logging to a TF card. The F4D MK1 flight controller has no memory card slot, however, and stores the data in the memory on the board.

6. Operation

6.1 Pre-flight check

Go through this checklist before every flight:

- The propellers are undamaged, correctly oriented and tightened.
- The flight controller is firmly secured and no wire is loose or chafed.
- All SH1.0 connectors are fully seated.
- The receiver antenna is connected and not kinked.
- The radio is switched on, its battery is charged and the Arm switch is in the off position.
- A **fully charged** battery is fitted in the aircraft – 4.20 V per cell for Li-Po.
- The battery connector is secured and the battery is strapped down.
- You have verified the range and the failsafe function.

6.2 Monitoring the battery voltage

The flight controller measures voltage and current and passes the data to the on-screen display and telemetry.

- End the flight at **3.50 V per cell** at the latest – 21.0 V for a 6S pack and 14.0 V for a 4S pack.
- Deep discharge damages the battery permanently and reduces its capacity.
- The voltage reading fluctuates under load; what matters is the voltage at rest after landing.
- Let the battery cool down after the flight before charging it.

6.3 Temperature

The ESC becomes hotter than any other part of the aircraft. On the flight controller it is the 9 V converter that heats up, when the video transmitter is powered from it.

- Disconnect the battery between flights, or at least switch off the 9 V supply.
- Do not leave the aircraft standing in the sun with the battery connected.
- Make sure there is airflow around the board, especially during longer bench tests.

7. Maintenance and troubleshooting

7.1 After every flight

- Disconnect the battery and let the board cool down.
- Check the solder joints, the connectors and the antenna mounting.
- Remove dirt with a soft brush; do not use solvents.
- After a crash, always inspect the board against the light – look for cracked joints and loose components.

7.2 Soldering and repairs

- Use a temperature-controlled soldering iron with a fine tip; the pads of the flight controller are small.
- Do not overheat the pads – a lifted pad cannot be repaired.
- Always disconnect the battery and USB before soldering.
- Desoldering a component or modifying the board is not a product defect and cannot be claimed under warranty.

7.3 Storage

- Store the board in an antistatic bag, in a dry place and out of the reach of children.
- Store batteries charged to **3.80 V per cell**, i.e. 22.8 V for a 6S pack.
- Check the batteries regularly during longer storage.

7.4 Troubleshooting

Problem	Possible cause	Solution
The board does not appear in the configurator	USB cable without data wires, missing driver	try a different cable; if problems persist, flash the firmware in DFU mode
Nothing lights up after the battery is connected	wrong signal cable wire order, reversed polarity	disconnect the battery immediately and check the cable against the table in chapter 4.4
A motor does not spin or spins the wrong way	swapped wires, reversed direction in the ESC firmware	check the order on the *Motors* tab, change the direction in the ESC configuration program
The analogue video transmitter does not start	9 V power switched off, connector not seated	check the USER1 mode and that the connector is fully seated
The receiver does not communicate	swapped TX and RX, wrong port assignment	cross the TX and RX wires; in Ardupilot try BRD_ALT_CONFIG = 1
GPS does not get a fix	wrong port assignment, interference from the power wiring	set SERIAL3_PROTOCOL to GPS and move the module away from the wires
The voltage fluctuates, the gyroscope is noisy	missing or badly soldered capacitor	solder a capacitor to the power pads of the ESC
The displayed voltage does not match reality	uncalibrated voltage divider	compare it with the voltage on the battery and adjust the divider ratio as described in chapter 2.6

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.cz

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 is printed directly on the board.

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 manufacturer does not issue its own warranty terms for this product.

- 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.