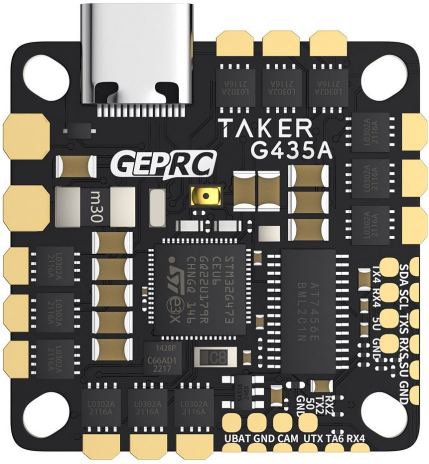
TAKER G4 35A AIO

Flight controller (FC) and 4-in-1 speed controller (ESC) on a single board

User manual



Before installation and before connecting a battery for the first time, read this entire manual carefully, especially the safety instructions in Chapter 1.

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1. Safety instructions

1.1 General

The TAKER G4 35A AIO is an electronic component designed to be built into a multicopter (FPV drone). Installation requires experience with soldering and with building and setting up FPV drones. If you are not sure, have the installation done by an experienced modeller.

- This product is not a toy. It is not intended for children or persons unfamiliar with FPV equipment.
- Operate the board only within the specifications given in Chapter 2.4 — in particular, do not exceed the input voltage of **2–4S Li-Po** or the current rating of the speed controllers.
- Protect the board from moisture, dust, metal shavings and carbon dust. Conductive dirt can cause a short circuit.
- Never operate a damaged board (cracked board, burnt components, lifted pads).

1.2 Soldering and installation

- Solder only with the battery and the USB cable disconnected.
- Use a soldering iron with a suitable tip and good flux. Do not overheat the pads — prolonged heating can lift a pad.
- After soldering, remove flux residue and check that no solder bridge has formed between adjacent pads.
- Mount the board so that no component or joint touches the frame (carbon is conductive).

1.3 Li-Po batteries

- Use only Li-Po batteries with 2 to 4 cells (2S–4S) in good condition. Do not use a swollen, damaged or overheated battery.
- Charge batteries only with a Li-Po charger, under supervision, on a non-flammable surface. Disconnect the battery when the drone is not in use.
- Never short-circuit the battery and always observe the correct polarity. Reverse polarity destroys the board immediately and irreversibly.

1.4 Tests with motors and propellers

Always remove the propellers for configuration, motor tests and firmware updates.

- Spinning propellers can cause serious injury. Fit them only after the complete setup and a check of the motor direction.

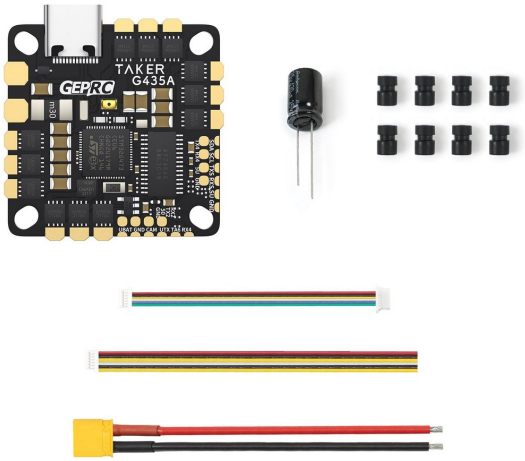
2. Product description

2.1 What the board is for

The GEP-TAKER G4 35A AIO made by GEPRC is an AIO (all-in-one) board that combines a **flight controller (FC)** and a four-channel **electronic speed controller (ESC)** on a single printed circuit board. It is based on the STM32G473 processor with an operating frequency of 170 MHz and the ICM42688-P gyroscope. It connects to a computer via a USB-C connector.

The board is powered by a 2S–4S Li-Po battery and the speed controllers handle a continuous current of 35 A. The mounting holes are compatible with a hole spacing of 25.5 to 26.5 mm, so the board can be used in any frame with this mounting pattern.

2.2 Package contents



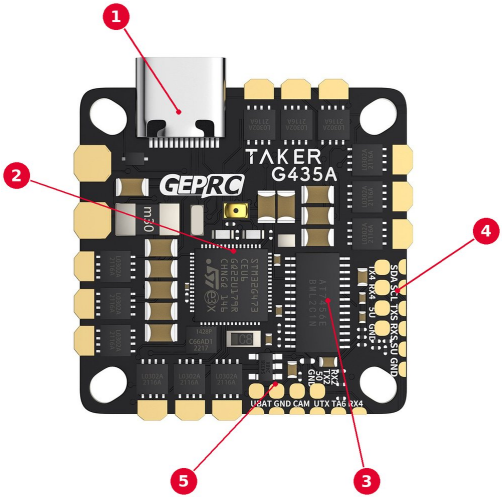
Package contents (illustrative manufacturer photo)

- 1× GEP-TAKER G4 35A AIO board
- 1× power lead with XT30 connector
- 1× electrolytic capacitor
- 1× set of rubber damping grommets (soft mount)
- set of connection cables with connectors

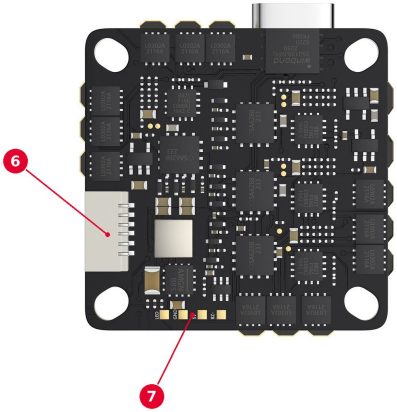
Not included: motors, propellers, frame, receiver, camera, video transmitter, battery, charger or mounting screws.

Drone operation: a drone with this board is operated under Regulation (EU) 2019/947 and national rules. The law of the country in which the product is operated is always decisive — before flying, familiarise yourself with the rules of the country where you fly.

2.3 Description of parts



Top side of the board



Bottom side of the board

① USB-C connector — connection to a computer (configuration, firmware update)
② Flight controller processor STM32G473
③ OSD chip AT7456E (displays data in the analogue video image)
④ Solder pads for UART4, UART5, I2C (SDA, SCL), 5V supply and GND
⑤ Solder pads for the camera, peripheral power and other interfaces (incl. UART2)
⑥ Connector for the connection cable from the package
⑦ Solder pads LED, GND, 5V and BZ− (buzzer)

The large solder pads around the edge of the board are used to connect the motors and the power lead. The exact labels of all pads are printed directly on the board — always check them on the board you have in hand before soldering.

2.4 Specifications

Parameter	Value
Designation	GEP-TAKER G4 35A AIO (on the board: TAKER G435A)
Processor (MCU)	STM32G473CEU6, 170 MHz
Gyroscope (IMU)	ICM42688-P
Betaflight firmware target	TAKERG4AIO
OSD	Betaflight OSD, AT7456E chip
UART	4× (UART1, UART2, UART4, UART5)
Buzzer / LED	yes / yes (outputs on pads)
USB	USB-C
BEC output	5 V / 3 A
Current sensor	yes
ESC processor	BB21F16G
ESC firmware	BLHeli_S, target J-H-15
ESC protocols	DShot600, Oneshot, Multishot
Continuous current	35 A
Burst current	45 A
Input voltage	2–4S Li-Po
Board dimensions	33.4 × 34.4 mm
Mounting holes	spacing 25.5–26.5 mm, diameter 3.05 mm
Weight	7.7 g

3. Installation

3.1 What else you need

- a frame with 25.5–26.5 mm electronics mounting and mounting screws,
- 4 brushless motors and propellers suitable for 2S–4S voltage and for a current of up to 35 A per speed controller,
- an RC receiver and a radio transmitter,
- an FPV camera and a video transmitter (VTX), or a digital video system,
- a 2S–4S Li-Po battery with an XT30 connector and a suitable charger,
- a soldering iron, solder, flux, a multimeter and a computer with Betaflight Configurator.

3.2 Mounting in the frame

- Insert the rubber damping grommets from the package into the mounting holes. They reduce the transfer of vibration from the frame to the gyroscope.
- Orient the board according to the frame design so that the USB-C connector is accessible after installation. You will then set the actual board orientation in Betaflight (5.3).
- Do not overtighten the screws — compressed grommets lose their damping effect and the board may bend.
- Make sure that neither the bottom side of the board nor connector ⑥ touches the frame or other electronics.

3.3 Connecting the motors

- Shorten the wires of each motor to the required length, strip and tin them.
- Solder the three motor wires to the three pads of the respective speed controller. The order of the three wires does not matter — the direction of rotation is set in software (5.3).
- Check the assignment of motors to positions in the frame (M1–M4) in Betaflight on the *Motors* tab.
- Route the wires so that they cannot get into the propellers and cannot be pinched by the frame.

3.4 Power lead and capacitor

- Solder the power lead with the XT30 connector to the power pads of the board. **Red wire = plus (+), black wire = minus (−).** Check the polarity of the pads according to the marking on the board.
- Solder the capacitor from the package in parallel to the power pads, as close to the board as possible: the longer lead (+) to plus, the lead marked with a stripe (−) to minus. The capacitor absorbs voltage spikes generated during motor

control and protects the electronics.

- Secure the capacitor (e.g. with a cable tie or heat-shrink tubing) so that its leads do not break due to vibration.

Reverse polarity of the power supply or omitting the capacitor can destroy the board. Such damage is not a product defect.

3.5 First power-up

① Use a multimeter to check that there is no short circuit between plus and minus of the power supply.

② Do not have the propellers fitted.

③ Connect the battery via short-circuit protection (smoke stopper).

④ If anything heats up, smokes or smells, disconnect the battery immediately and check the wiring.

4. Connecting peripherals

4.1 UART and I2C interfaces

The board has four UARTs (UART1, UART2, UART4, UART5) and an I2C bus (SDA and SCL pads). Each UART has a TX (transmit) and an RX (receive) pin. General rule: **peripheral TX to board RX, peripheral RX to board TX**; connect power and GND as the peripheral requires.

- Connect one peripheral per UART and assign its function in Betaflight on the *Ports* tab (5.2).
- The 5V pads are powered by the built-in 5 V / 3 A BEC. The total draw of all peripherals on 5 V must not exceed 3 A.

4.2 Receiver

Connect a serial receiver (e.g. ExpressLRS or another system with serial output) to a free UART: receiver TX to board RX, receiver RX to board TX, power to 5V and GND. In Betaflight, enable *Serial Rx* for this UART on the *Ports* tab and select the receiver protocol on the *Receiver* tab. For binding, see the receiver and radio transmitter manuals.

4.3 Camera, video transmitter and OSD

- **Analogue system:** connect the camera video signal to the CAM pad and the video transmitter input to the board's video output. The AT7456E chip overlays OSD data (voltage, flight time, warnings…) on the image. Set the OSD layout on the *OSD* tab in Betaflight.
- **Digital system:** connect the video transmitter data line to a free UART and assign its function in Betaflight as documented by the system manufacturer (typically *VTX (MSP + DisplayPort)*).
- Power the camera and VTX as specified by their manufacturers. Never power a video transmitter without an antenna.

4.4 Buzzer and LED

- Connect a buzzer to the 5V (+) and BZ− (−) pads on the bottom side ⑦. It helps to find the drone and warns about the battery state.
- Connect addressable LEDs to the LED (data), 5V and GND pads ⑦. Set the LED functions in Betaflight on the *LED Strip* tab.

4.5 Connector on the bottom side

Connector ⑥ on the bottom side takes the connection cable from the package, so a peripheral can be connected without soldering. The manufacturer does not specify the wire assignment — **check it before connecting a device** using the board labels, the device documentation or a multimeter.

5. Setup in Betaflight

Carry out all settings and tests in this chapter with the propellers removed.

5.1 Connecting to a computer

① Install **Betaflight Configurator** (betaflight.com) or use its web version.

② Connect the board to the computer with a USB-C cable. USB power is sufficient for setting up the basic functions; motors, the video transmitter and other peripherals powered from the battery do not work without a battery.

③ In the program, select the appropriate port and click *Connect*.

④ If the computer does not recognise the board, try a different USB-C cable (some cables are for charging only) and install the drivers offered by Betaflight Configurator.

Before changing any settings, save a backup of the default configuration on the *CLI* tab using the command *diff all*.

5.2 Ports and receiver

- On the *Ports* tab, assign its function to each UART in use (receiver, video transmitter, GPS…). Do not disable the UART used for the USB connection to the computer.
- On the *Receiver* tab, check that the stick movements of the radio transmitter correspond to the channels and that the values are around 1500 with the sticks centred.
- On the *Modes* tab, assign the *ARM* mode, and other modes if required, to a switch on the radio transmitter.

5.3 Motors and ESC protocol

- On the *Configuration* tab, select the ESC protocol — **DShot600** is recommended. The board also supports Oneshot and Multishot.
- On the same tab, set the board orientation (*Board alignment*) if the board is not mounted in the default direction in the frame (check the rotation with a tilt test on the *Setup* tab).
- On the *Setup* tab, check that the model on the screen follows the tilting of the drone. Calibrate the accelerometer on a level surface (*Calibrate Accelerometer*).
- On the *Motors* tab (with the battery connected), spin up the individual motors one by one and check their position and direction of rotation. Reverse the direction of rotation in the ESC configuration program (6.2) or by swapping two motor wires.

5.4 Voltage and current measurement

The board measures the battery voltage and has a built-in current sensor. On the *Power & Battery* tab, check that the displayed voltage matches the battery voltage measured with a multimeter. If necessary, refine the current reading by adjusting the calibration constant (*Scale*) based on a comparison with the capacity recharged after the flight.

Li-Po battery state	per cell	2S / 3S	4S
fully charged	4.20 V	8.4 V / 12.6 V	16.8 V
end the flight	3.5 V	7.0 V / 10.5 V	14.0 V
storage	3.8 V	7.6 V / 11.4 V	15.2 V

Set the low-voltage warning (*Power & Battery* tab and OSD) so that the flight is ended at a voltage of 3.5 V per cell at the latest. Always insert a fully charged battery before flight.

5.5 Arm, Disarm and failsafe

- Control **Arm** (motors on) and **Disarm** (motors off) with the radio transmitter switch to which you assigned the *ARM* mode on the *Modes* tab.
- If the drone refuses to arm, the *Setup* tab or the OSD shows the reason (e.g. throttle not at minimum, drone tilted, no receiver signal).
- On the *Failsafe* tab, check that the motors stop when the signal is lost (radio transmitter switched off). Carry out this test **without propellers**.

6. Firmware

6.1 Flight controller firmware

The flight controller uses **Betaflight** firmware, target **TAKERG4AIO**. To update, use the *Firmware Flasher* tab in Betaflight Configurator: select the TAKERG4AIO target, choose the version and click *Flash Firmware*.

- Save a configuration backup before updating (*CLI → diff all*).
- Never flash firmware intended for a different target.
- Do not disconnect the board while flashing. If the board does not respond after a failed update, put it into bootloader mode (DFU) and repeat the flashing; in Betaflight Configurator, the *No reboot sequence* option is used for this.

6.2 Speed controller firmware

The speed controllers use **BLHeli_S** firmware (target J-H-15, BB21F16G processor). Change the speed controller settings (e.g. motor direction) through the flight controller in passthrough mode, for example with the web application esc-configurator.com. When working with the speed controllers, the battery must be connected and the propellers must be removed.

Unsuitable firmware or incorrect speed controller settings can damage the motors or speed controllers. Do not flash firmware for any target other than J-H-15 to the speed controllers.

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- After every crash, check the board, solder joints, motor wires and power lead. Replace damaged wires.
- Keep the board clean and dry. Remove dust with a soft brush and soldering residue with isopropyl alcohol.
- If moisture gets into the board, disconnect the battery immediately and let the board dry thoroughly before further use.
- Store the drone in a dry place, at room temperature and with the battery disconnected. Store batteries at a voltage of 3.8 V per cell.

7.2 Troubleshooting

Problem	Possible cause and solution
Computer does not recognise the board	Charging-only cable without data wires — use a different cable. Missing driver — install it from Betaflight Configurator.
Motors do not spin	Battery not connected; wrong ESC protocol (select DShot600); faulty solder joint on the motor pads.
Motor spins in the wrong direction	Change the direction in the ESC configuration program (6.2) or swap two motor wires.
Cannot arm	The reason is shown on the *Setup* tab or in the OSD. Check the throttle position, receiver signal and drone tilt.
Receiver does not respond	TX and RX wires swapped; *Serial Rx* not enabled on the *Ports* tab; wrong protocol on the *Receiver* tab.
No OSD in the image	Check the wiring of the camera to the CAM pad and of the video transmitter to the video output, and the settings on the *OSD* tab.
Voltage or current reading incorrect	Adjust the calibration on the *Power & Battery* tab (5.4).
Drone oscillates or goes out of control after take-off	Wrong board orientation or motor order, loose propellers, excessive vibration — check Chapter 5.3 and the board mounting.

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 (TAKER G435A, sales name GEP-TAKER G4 35A AIO) is printed directly on the board; the firmware version is shown by Betaflight Configurator after the board is connected to a computer.

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

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 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.