



Air75 II Racing

BETAFPV · 1S brushless whoop · ExpressLRS 2.4 GHz
User manual



**Read the entire manual before your first flight, especially Chapter 1.
Battery, radio transmitter and FPV goggles are not included.**

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1. Safety instructions

1.1 Before you start

The Air75 II Racing is a fast FPV racing drone (a so-called whoop) intended for experienced pilots. It is not a toy. Read the entire manual before your first flight, especially Chapter 1, and keep it for future reference.

- The drone is supplied as a **BNF** (Bind-N-Fly) version: to operate it you need your own radio transmitter with the ExpressLRS 2.4 GHz protocol, analog 5.8 GHz FPV goggles, 1S batteries with a BT2.0 connector and a suitable charger. None of these are included.
- If you are new to FPV flying, practise on a simulator first.
- The product is not intended for children without adult supervision. Keep small parts (screws, damping balls) out of the reach of small children.
- Do not make any modifications to the product that are not described in this manual. Modifications and the consequences of crashes are not product defects.

1.2 Rotating propellers and mechanical hazards

- The propellers spin at very high speed and can cause cuts even through the propeller guards (ducts). When the motors are running (**Arm** state), do not touch the drone or hold it in your hand.
- The factory configuration allows Arm (motor start) in any orientation of the drone. Before each motor start, make sure that the drone is lying on the ground and that nobody is nearby.
- Never try to catch a flying drone.
- Always disconnect the battery when working on the drone (setup, replacing parts). Remove the propellers when testing the motors on a computer.
- Always replace damaged or deformed propellers and cracked frames before the next flight.

1.3 Li-Po and LiHV batteries

The drone is powered by a single Li-Po or LiHV cell (1S). Lithium batteries can catch fire if handled improperly.

- Only charge with a charger designed for the given cell type and **never leave charging unattended**. Charge on a non-flammable surface, away from flammable materials.
- Charging voltage: Li-Po **4.20 V/cell** (1S = 4.20 V), LiHV **4.35 V/cell** (1S = 4.35 V). Never charge a Li-Po cell to LiHV voltage.
- End the flight at **3.5 V/cell** (1S = 3.5 V) at the latest. Deeper discharge permanently damages the battery.

- Do not use a swollen, deformed, punctured or crash-damaged battery any further; hand it over for environmentally sound disposal.
- Do not charge or use the battery immediately after a flight until it has cooled down.
- Always disconnect the battery from the drone after the flight.

1.4 Operating environment

- Only fly in good visibility, without rain or strong wind. The drone is not waterproof – protect it from water, moisture, snow and dust.
- Do not fly near people, animals, roads, power lines, airports or in places where drone operation is restricted.
- Fly indoors only with the consent of the building manager and only when there are no uninvolved persons in the room.
- Never power up the drone without the video transmitter antenna connected – the video transmitter may be damaged.
- The video transmitter heats up during operation. After it has been switched on for a longer time on the ground (e.g. during setup), let it cool down.

2. Product description

2.1 Package contents

Qty	Item
1	Air75 II Racing drone (with integrated ExpressLRS 2.4 GHz receiver)
4	Gemfan 1614 three-blade propellers (GF 1614 3-B)
1	Spare Air II Canopy camera canopy
4	Screw M1.4 × 3
2	Self-tapping screw M1.4 × 5
4	Self-tapping screw M1.4 × 4
2	Damping ball H0.8
1	USB-C to SH1.0 adapter
1	SH1.0 4-pin connection cable

❗ **Battery, radio transmitter, FPV goggles and charger are not included.**

2.2 Parts description



Air75 II Racing – main parts

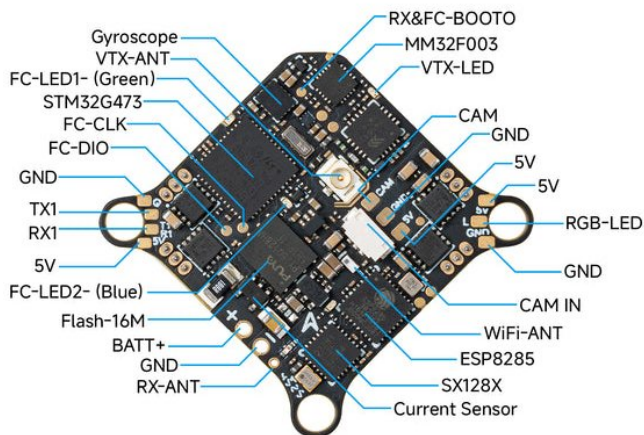
- ① C03 camera in the Air II Canopy
- ② Video transmitter (VTX) antenna
- ③ Flight controller (FC) Matrix 1S 5IN1 II (Chapter 2.4)
- ④ Brushless motor 0802 25000KV (4×)
- ⑤ Gemfan 1614 three-blade propeller (4×)
- ⑥ Air75 II frame with propeller guards (ducts)
- ⑦ BT2.0 battery connector

2.3 Technical data

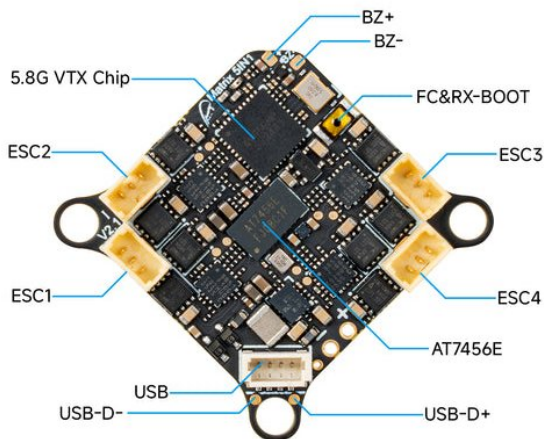
Parameter	Value
Variant	Air75 II Racing (manufacturer code 01010050_2)
Wheelbase (motor diagonal)	75 mm
Frame dimensions (max.)	99.1 × 99.1 × 16.2 mm
Weight without battery	20.9 g
Frame	Air75 II, PP material, 4.00 g
Camera canopy	Air II Canopy, PP material, camera tilt 15°–45°
Flight controller (FC)	Matrix 1S 5IN1 II, STM32G473 processor
Gyroscope	depending on production batch: ICM42688P, ICM42622, BMI270 or an LSM6-series chip
Blackbox memory	16 MB
Electronic speed controllers (ESC)	1S, 12 A continuous / 18 A peak, Bluejay firmware, DShot300/600
Receiver	ExpressLRS 2.4 GHz, serial (CRSF)
Video transmitter (VTX)	5.8 GHz, 48 channels, 25/100/200/400 mW, PIT mode
Camera	C03, 1/3" CMOS sensor, 1200 TVL, NTSC 4:3, 2.1 mm lens, FOV 160°
Motors	4× 0802 25000KV, brass bushings, shaft ø 1.0 mm
Propellers	Gemfan 1614 three-blade, 40 mm diameter
Power supply	1S Li-Po / LiHV
Battery connector	BT2.0
Recommended battery	LAVA II 1S 480 mAh or 580 mAh
Battery slot	16.3 × 6.3 mm
Flight time (manufacturer data)	approx. 7 min with LAVA II 1S 480 mAh battery
Computer connection	SH1.0 4-pin connector (USB-C adapter included)

2.4 Flight controller (FC) and receiver

The Matrix 1S 5IN1 II combines on a single board the flight controller (FC) with Betaflight firmware, four electronic speed controllers (ESC), a serial ExpressLRS 2.4 GHz receiver, an analog 5.8 GHz video transmitter and an OSD chip for on-screen data display. The board is mounted in the frame at three points, which reduces stress on the components in a crash.



Top side of the flight controller (front of the drone at the top). Labels are the manufacturer's original designations.



Bottom side of the flight controller – motor connectors ESC1-ESC4, USB connector (SH1.0) and FC&RX-BOOT button.

Pad / element	Function
ESC1-ESC4	JST1.25 3-pin motor connectors
USB	SH1.0 4-pin connector for computer connection
FC&RX-BOOT	boot mode button for flashing firmware
RX-ANT	ExpressLRS receiver antenna
VTX-ANT	video transmitter antenna connector
BZ+ / BZ–	pads for connecting a buzzer (buzzer not fitted)
TX1 / RX1	UART1 serial port
FC-LED1 / FC-LED2	flight controller status LEDs (green / blue)

Serial ports: in the factory state UART2 is connected to the video transmitter and UART3 to the onboard receiver. UART1 is available on pads for further devices.

*** UART3 is not freely available - it is only released by desoldering a resistor, which disconnects the onboard receiver. Modifying the board is not a product defect.**

2.5 Video transmitter and camera

The C03 camera transmits an analog NTSC 4:3 picture to the video transmitter (VTX), which sends it in the 5.8 GHz band to your FPV goggles. The video is not recorded in the drone. The channel and power of the video transmitter are set via the SmartAudio protocol from Betaflight (*Video Transmitter* tab) or from the OSD menu.

Factory default	Value
Band / channel	Raceband R3 (5732 MHz)
Power	25 mW
Selectable power levels	25 / 100 / 200 / 400 mW, PIT (reduced power)
Video standard	NTSC

► Raceband channels

Channel	R1	R2	R3	R4	R5	R6	R7	R8
MHz	5658	5695	5732	5769	5806	5843	5880	5917
CZ	X	X	✓	✓	✓	✓	X	X

❖ **In the Czech Republic you may only use channels in the range 5725-5875 MHz with a maximum power of 25 mW e.i.r.p. Do not use band L (5362-5621 MHz) in the Czech Republic at all. Outside the Czech Republic, the frequencies and limits of the country of operation apply.**

Higher video transmitter power increases consumption and heating and shortens the flight time.

3. Preparing for the first flight

3.1 What else you need

- A radio transmitter with the **ExpressLRS 2.4 GHz** protocol (built-in or external ELRS module).
- Analog FPV goggles or a monitor with a **5.8 GHz** receiver.
- 1S Li-Po or LiHV batteries with a **BT2.0** connector – the manufacturer recommends LAVA II 1S 480 mAh or 580 mAh.
- A charger for 1S cells with a BT2.0 connector and a computer for setup in Betaflight.

3.2 Choosing and connecting the battery

Slide the battery into the slot under the frame (16.3×6.3 mm), secure it and plug it into the BT2.0 connector. Always insert a **fully charged** battery before flying: Li-Po 4.20 V, LiHV 4.35 V (1S). After connecting, put the drone down and do not move it until the gyroscope has initialised.



Bottom view

3.3 Propellers

- The drone is fitted with Gemfan 1614 three-blade propellers (40 mm); a spare set is included.
- The manufacturer sets a reversed motor rotation direction (in Betaflight *Motor direction is reversed*). Fit a new propeller with the same direction of rotation as the original one.
- Push the propeller onto the shaft all the way; it must not wobble or touch the guard.

3.4 Camera tilt

The Air II Canopy allows the camera tilt to be set from 15° to 45° in 10° steps. A smaller tilt suits slower indoor flying, a larger tilt suits fast flying. After changing the tilt, tighten the camera firmly again.

4. Setup

4.1 Connecting to a computer

- Connect the drone to the computer using the SH1.0 4-pin cable and the USB-C adapter from the package. Do not connect the battery.
- The flight controller uses a customised Betaflight development firmware. The manufacturer therefore recommends the development version of the configurator: master.app.betaflight.com.
- Betaflight firmware: target **BETA FPVG473_V2**. Do not flash the official Betaflight firmware to the drone (Chapter 4.8).

4.2 Binding the receiver

Bind the onboard ExpressLRS receiver to the radio transmitter as follows:

- ① Connect and disconnect the battery three times in a row (power the flight controller on and off).
- ② The receiver LED blinks rapidly twice – the receiver is in bind mode.
- ③ Start binding on the radio transmitter or ELRS module (*Bind*).
- ④ When the receiver LED is solid, binding is complete.

✱ **The radio transmitter and receiver must have a compatible major version of the ExpressLRS firmware. If you use a binding phrase, set the same one in both devices.**

4.3 Radio transmitter switches

The manufacturer assigns the flight functions to the following radio channels. Check the assignment and adjust it if necessary in Betaflight on the *Modes* tab.

Channel	Function	Range
AUX1 (channel 5)	Arm – motor start	1700–2100
AUX2 (channel 6)	Angle (self-levelling)	900–1300
	Horizon	1300–1700
	Acro (no self-levelling)	1700–2100
AUX3 (channel 7)	Flip over after crash (turtle)	1700–2100
AUX4 (channel 8)	Beeper (motor beeping)	1700–2100

With AUX2 above 1700, neither Angle nor Horizon mode is active, so the drone flies in Acro mode.

4.4 Video transmitter setup

- Set your FPV goggles to band Raceband, channel R3 (5732 MHz), or set the video transmitter to the channel of your goggles (Chapter 2.5).

- When flying in a group, agree on channels with the other pilots. Observe the restrictions in Chapter 2.5.

4.5 Accelerometer calibration

If the drone drifts sideways in Angle mode, calibrate the accelerometer: place the drone on a level surface and in Betaflight on the *Setup* tab select *Calibrate Accelerometer*. Do not move the drone during calibration.

4.6 Motor check

- **Remove the propellers.** Connect the drone to the computer and connect the battery.
- On the *Motors* tab, accept the warning and spin motors 1–4 individually at low speed.
- Check that the correct motor spins and that it rotates in the correct direction according to the diagram in Betaflight.

4.7 Arm, Disarm and failsafe

- **Arm** (motor start): throttle at minimum, AUX1 switch to the Arm position. The motors start spinning at idle.
- **Disarm** (motor stop): AUX1 switch back. If you lose control or crash, Disarm immediately.
- If Arm is not possible, Betaflight shows the reason in the OSD or on the *Setup* tab (e.g. throttle not at minimum, no receiver signal).
- **Failsafe:** if the radio signal is lost, the flight controller stops the motors and the drone falls; the motors then start beeping (DShot beacon). Test the failsafe on the ground without propellers: after Arm, switch off the radio transmitter – the motors must stop.

4.8 Firmware update

- The drone is supplied with configured firmware; only update it if you have problems.
- The flight controller firmware differs depending on the fitted gyroscope (identify the type from the chip marking on the board or in Betaflight). Download the firmware for the **Racing** variant and your gyroscope from the manufacturer's support (article *CLI and Firmware for Air75 II* at support.betafpv.com). Do not flash the official Betaflight firmware.
- The ExpressLRS receiver can be updated via Wi-Fi or in passthrough mode in ExpressLRS Configurator (target *BETAFPV 2.4GHz AIO RX*, method *BetaflightPassthrough*).
- ESC firmware: **Bluejay**. Do not flash it repeatedly at short intervals – the flight controller may lock up and be damaged.

5. Flying

5.1 Pre-flight check

- The battery is **fully charged** (Li-Po 4.20 V, LiHV 4.35 V), undamaged and firmly secured.
- The propellers are intact, correctly fitted and spin freely.
- The frame, propeller guards and camera canopy are not cracked, the video transmitter antenna is connected.
- The radio transmitter is on and bound, the Arm switch is in the Disarm position, throttle at minimum.
- The goggles are on the correct channel and the picture is clear.
- The flying site is safe and there are no uninvolved persons nearby.

5.2 Take-off and basic control

- Place the drone on a flat surface, switch on the radio transmitter and goggles and connect the battery.
- For the first flights choose Angle mode (AUX2 down) – the drone levels itself.
- Arm and smoothly add throttle. The Air75 II Racing has a high thrust-to-weight ratio and reacts to throttle very quickly – handle the throttle gently.
- Only use Acro mode (no self-levelling) once you can control the drone safely in Angle mode.

5.3 Voltage monitoring and ending the flight

- Monitor the battery voltage in the OSD. End the flight at **3.5 V/cell** (1S = 3.5 V) measured at rest at the latest.
- Under load the voltage briefly drops lower. Set the OSD warning in Betaflight on the *Power & Battery* tab.
- After landing, Disarm and disconnect the battery.

5.4 Finding the drone and flipping it back

- **Flip over after crash (turtle):** if the drone lies upside down after a crash, Disarm, switch AUX3 on, Arm and flip it over with a short stick movement. Then Disarm, switch AUX3 back and Arm again.
- **Beeper:** switch AUX4 to make the motors beep, which helps you find the drone in grass or between obstacles.
- If the signal is lost, the motors beep by themselves (Chapter 4.7). Disconnect the battery of the found drone as soon as possible.

6. Maintenance and troubleshooting

6.1 After every flight

- Disconnect the battery and let it cool down.
- Check the propellers, propeller guards, camera canopy and antenna.
- Remove hair, grass and dirt from the motors. The motor must turn freely and without rubbing.
- Do not clean the drone with water or solvents.

6.2 Replacing propellers and camera canopy

- Pull the damaged propeller off the shaft and fit a new one with the same direction of rotation (Chapter 3.3).
- The Air II Canopy is fixed with screws. When replacing it, take care of the camera and antenna wires and after assembly check that the antenna is still connected.

6.3 Replacing a motor

- The motor is connected with a JST1.25 3-pin connector to the ESC1-ESC4 connector on the bottom of the flight controller and fixed to the frame with three M1.4 screws.
- As a replacement, use a BETAFPV 0802 (2026) motor in the **Racing 25000KV** version.
- After replacement, check on the *Motors* tab (without propellers) that the motor rotates in the correct direction.

6.4 Storage

- Store batteries at **3.8 V/cell** ($1S = 3.8\text{ V}$) in a fireproof bag, in a dry and cool place.
- Store the drone without the battery, in a dry place away from direct sunlight.

6.5 Troubleshooting

Problem	Possible cause and solution
Receiver does not bind	The radio transmitter is not in ELRS 2.4 GHz mode, different ELRS major version or binding phrase. Repeat the procedure from Chapter 4.2.
Arm not possible	Throttle not at minimum, no receiver signal or the drone is connected to a computer. The reason is shown in the OSD or on the <i>Setup</i> tab.
No picture in the goggles	Goggles and video transmitter are not on the same channel, the transmitter is in PIT mode or the antenna is damaged.
Picture OK, but no OSD	Enter in the Betaflight CLI: <code>set osd_displayport_device = MAX7456</code> , <code>set vcd_video_system = NTSC</code> , <code>save</code> .
Drone flips over on take-off	Propellers fitted on the wrong motor or with the wrong direction, motor connected incorrectly. Check Chapters 3.3 and 4.6.
Drone drifts in Angle	Calibrate the accelerometer (Chapter 4.5).
Vibrations, shaky picture	Damaged propeller, bent motor shaft or dirt in the motor. Replace the faulty part.
Short flight time	Worn or not fully charged battery, high video transmitter power, damaged propellers.
Motor does not spin or rums	Loose JST1.25 connector, dirt in the motor or damaged motor.

7. Information for the EU and Czech Market

7.1 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@rotorاما.cz
Phone	+420 252 252 098
Website	www.rotorاما.cz

7.2 Product conformity



- 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@rotorاما.cz.
- **Product identification:** the type designation (Air75 II Racing) and the product code (01010050_2) are given on the product packaging.

7.3 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>.

8. 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. Any manufacturer's warranty terms **do not in any way limit** the buyer's rights arising from these regulations.

- 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 7.1.
- 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.