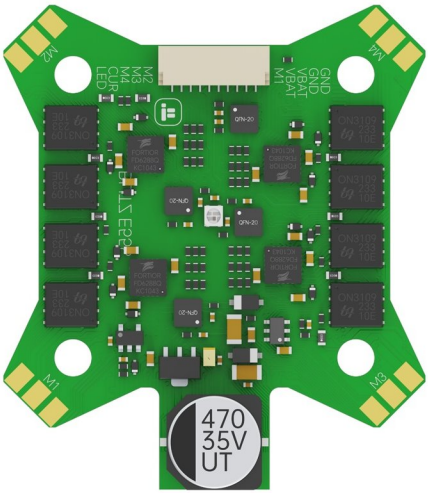
BLITZ E55S

iFlight · 4-in-1 electronic speed controller (ESC)
2–6S LiPo · 55 A · BLHeli_S



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

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1. Safety instructions

1.1 Before you start

The iFlight BLITZ E55S electronic speed controller is an electronic component intended to be built into an FPV drone. Installation requires soldering and basic electronics skills. If you are unsure, have the installation done by an experienced person.

- This product is not a toy. It is not intended for children under 14 years of age.
- Always work with the **battery disconnected**. Connect the battery only after checking all connections.
- **Keep the propellers removed** during initial tests and during all setup on the bench.
- Do not modify the product beyond the procedures described in this manual. Damage caused by incorrect installation or wiring is not a product defect.

1.2 Electrical and thermal hazards

- Reversed polarity or a short circuit between the positive and negative terminals will destroy the ESC instantly and may cause a battery fire.
- Never power the ESC with a higher voltage than 6S LiPo (25.2 V fully charged battery).
- The ESC and motors get hot during operation. Do not touch them after a flight until they have cooled down.
- Make sure the board does not touch the carbon frame or any other conductive parts – carbon fibre is electrically conductive.
- Do not use the ESC in damp conditions, rain or snow unless the board is protected by a suitable conformal coating.

1.3 LiPo batteries

- Charge batteries only with a suitable LiPo charger, under supervision and on a non-flammable surface.
- Do not use a damaged, swollen or punctured battery.
- Do not discharge the battery below 3.5 V per cell and store it long-term at 3.8 V per cell.
- Always disconnect the battery from the drone after a flight.

1.4 Rotating propellers

Once the battery is connected and the drone is armed (Arm – motors enabled), the motors may spin up at any moment. Rotating propellers can cause serious injury. Before arming, make sure there are no people or animals near the drone, and never hold the drone in your hand with propellers fitted.

2. Product description

2.1 Intended use

The iFlight BLITZ E55S is a 4-in-1 electronic speed controller (ESC) – a single board carries four controllers for four brushless motors. It is intended for 5" freestyle and racing FPV drones with a 30.5 × 30.5 mm mounting pattern. It works with 2S to 6S LiPo batteries, handles 55 A continuous (65 A burst) and includes a current sensor. The ESC comes with BLHeli_S firmware.

The ESC has no built-in voltage regulator (BEC). The flight controller (FC) must therefore be powered from the battery voltage (VBAT), which the ESC passes to it through the connecting cable; the supply voltage for other devices is provided by the FC.

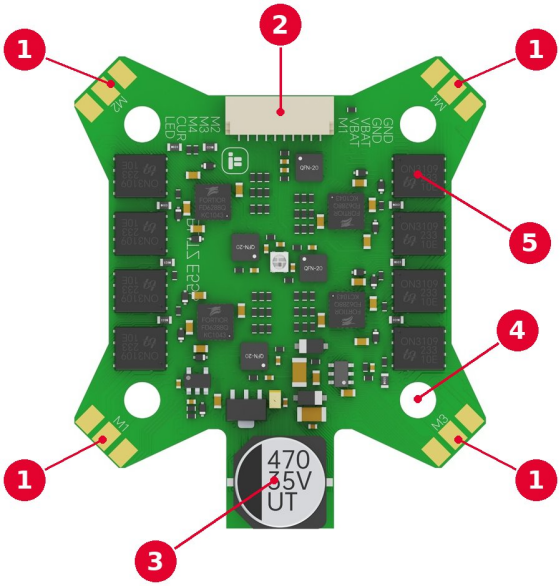
2.2 Package contents

Qty	Item
1×	iFlight BLITZ E55S 4-in-1 ESC (2–6S)
1×	Cable set – power cables and signal cable for connecting to the flight controller (FC)
1×	XT60 connector

The capacitor is already mounted on the ESC board.

Not included: flight controller (FC), motors, propellers, frame, battery or charger.

2.3 Parts overview



Top view of the ESC (illustration)

① **Motor solder pads M1–M4** – three pads for the three wires of each motor.

② **Connector for the flight controller (FC)** – the pins are marked on the board as GND, VBAT, M1, M2, M3, M4, CUR and LED.

③ **Capacitor** – factory-mounted, protects the electronics against voltage spikes. The power cables are connected underneath it.

④ **Mounting holes** – 30.5 × 30.5 mm pattern, 4 mm diameter.

⑤ **Power transistors (MOSFETs)** – two per motor; they get warm during operation.

Pin assignment of connector ②

Pin	Function
GND	Ground (negative)
VBAT	Battery voltage for powering the flight controller (FC)
M1–M4	Motor control signals 1 to 4 from the FC
CUR	Current sensor output to the FC
LED	Pin marked LED on the board; its function is not described by the manufacturer

2.4 Specifications

Parameter	Value
Designation	iFlight BLITZ E55S 4-IN-1 ESC
Type	4-in-1 (four controllers on one board)
Input voltage	2–6S LiPo
Continuous current	55 A
Burst current	65 A
MCU	BB21
Firmware	BLHeli_S
Firmware target	Q-H-25 (BLHeli_S), Q-H-25 (Bluejay)
Supported protocols	DShot150, DShot300, DShot600, MultiShot, OneShot and others
Current sensor	yes
Current sensor scale (Current rate)	200
BEC	no
Mounting pattern	30.5 × 30.5 mm, Ø 4 mm holes
Weight	14.7 g

LiPo battery voltages by cell count

Battery	Fully charged (4.20 V/cell)	End flight (3.5 V/cell)	Storage (3.8 V/cell)
2S	8.4 V	7.0 V	7.6 V
3S	12.6 V	10.5 V	11.4 V
4S	16.8 V	14.0 V	15.2 V
5S	21.0 V	17.5 V	19.0 V
6S	25.2 V	21.0 V	22.8 V

3. Legal conditions of operation

3.1 The law of the country where you fly applies

Regulations (EU) 2019/947 and 2019/945 apply in all member states of the European Union, 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. The information in this chapter describes the situation in the Czech Republic. If you operate a drone in another country, you must follow the regulations of the country in which you are flying.

3.2 A drone built with this ESC

The ESC itself is not an unmanned aircraft. However, a drone that you build from it and other components for your own use is a **privately built unmanned aircraft system** under Regulation (EU) 2019/947, and its operation is governed by the rules of the open category:

- A drone with a maximum take-off mass below 250 g (and a speed below 19 m/s) may fly in subcategory A1; a heavier drone in subcategory A3 – far from people and at a sufficient distance from residential, commercial, industrial and recreational areas.
- If the drone has a camera, the operator must register and display the registration number on the drone (in the Czech Republic with the Civil Aviation Authority).
- When flying with FPV goggles, an observer must stand next to the pilot and keep the drone in direct visual line of sight.
- The maximum flight height is 120 m above the ground; do not fly over assemblies of people.
- The operator and pilot are responsible for compliance with the regulations, including the transmit power settings of the drone's radio equipment.

4. Installation and wiring

4.1 What else you need

- a 5" drone frame with a 30.5 × 30.5 mm mounting pattern,
- a flight controller (FC) with a connector for a 4-in-1 ESC and Betaflight firmware,
- four brushless motors suitable for the battery voltage used,
- a 2S–6S LiPo battery with an XT60 connector,
- a soldering iron with sufficient power, flux-cored solder, screws and silicone grommets for the stack,
- a computer with Betaflight Configurator and a USB cable for the FC.

4.2 Mounting in the frame

① The ESC is mounted in the stack below the flight controller (FC) – usually with the arrow or connector pointing in the direction that matches your FC and the motor layout of the frame.

② Use silicone grommets; they dampen vibrations and also prevent the board from touching the frame.

③ Tighten the screws only lightly. An overtightened stack transmits vibrations and may bend the board.

④ Check that no component or solder pad touches the carbon frame.

4.3 Connecting the motors

① Cut the motor wires to the required length and tin the ends.

② Solder each motor to the three pads marked M1–M4 according to the motor's position in the frame. The order of the three motor wires on the pads does not matter – the direction of rotation is set in software (Chapter 5.4).

③ The joint must be shiny and solid. A cold solder joint will loosen under vibration and may cause a motor to fail in flight.

④ Check that there is no solder bridge between adjacent pads.

4.4 Connecting to the flight controller (FC)

The ESC is connected to the FC with the signal cable from the package. Through this cable the FC receives the battery supply voltage (VBAT), the signals for motors M1–M4 and the current sensor information (CUR).

The wire order in the cable must match both connectors. Before connecting, compare the pin markings on the ESC (GND, VBAT, M1–M4, CUR) with the markings on the FC. If the order does not match, modify the cable by swapping the wires. Incorrect wiring (e.g. VBAT to a signal pin) will destroy the flight controller.

4.5 Power supply and capacitor

① Solder the power cable with the XT60 connector to the power pads of the ESC. Observe the correct polarity: **red wire = positive (+)**, **black wire = negative (−)**.

② Do not remove the factory-mounted capacitor. It suppresses voltage spikes that occur during rapid changes in motor speed and protects both the ESC and the FC.

③ Route the power cable along the shortest path and secure it against being torn out (for example with a cable tie to the frame).

④ Keep the motor and power cables as short as possible and away from the antennas of the receiver and video transmitter – this reduces electromagnetic interference.

5. Setup

5.1 First power-up

Before connecting a battery for the first time, perform a check without power, and then power up with short-circuit protection:

① **Keep the propellers removed.**

② Use a multimeter to verify that there is no short circuit between the positive and negative power wires.

③ Make the first connection through a short-circuit protector (smoke stopper) or from a current-limited bench power supply.

④ After connection the motors will beep briefly. If smoke, a burning smell or excessive heating appears, disconnect the battery immediately.

5.2 ESC protocol in Betaflight

In Betaflight Configurator open the *Motors* tab (*Configuration* in older versions) and select one of the DShot protocols as the ESC protocol – for example **DShot300** or **DShot600**. DShot is a digital protocol and does not require throttle range calibration.

5.3 Current sensor

For the flight controller to display the current draw and consumed capacity (mAh) in the OSD, go to the *Power & Battery* tab in Betaflight, set *Current Meter Source* to **Onboard ADC** and enter the value given by the manufacturer as Current rate in the *Scale* field: **200**.

※ For accurate readings, compare the capacity shown in the OSD after several flights with the capacity your charger put back into the battery, and fine-tune the Scale value if necessary.

5.4 Motor order and direction of rotation

In the *Motors* tab in Betaflight, check (**without propellers**, after confirming the safety notice) that each slider spins the motor shown in the diagram on screen and that it spins in the correct direction.

- If the motor order does not match, use the motor remapping function in Betaflight (*Motor Reordering*) – no re-soldering is needed.
- If a motor spins in the wrong direction, change the direction of rotation in software, for example with the *Motor direction* function in Betaflight or in the ESC configurator (Chapter 5.5).
- If the direction of rotation corresponds to reversed propellers (props out), enable the *Motor direction is reversed* option in Betaflight.

5.5 ESC firmware

The ESC comes with **BLHeli_S** firmware. The manufacturer specifies the target **Q-H-25** for it; for the alternative **Bluejay** firmware the specified target is also **Q-H-25**.

- ESC settings (direction of rotation, beep volume, motor startup, etc.) are changed through the flight controller (passthrough mode) in an ESC configurator, for example the ESC Configurator web application or BLHeliSuite. Remove the propellers and connect the battery before connecting to the computer.
- When flashing firmware, always select the target specified by the manufacturer. Flashing firmware with a different target may permanently damage the ESC.
- Switching to different firmware (e.g. Bluejay) is at the user's own risk. Errors occurring during firmware flashing are not a product defect.

6. Operation

6.1 Pre-flight check

- Insert a **fully charged** battery with the appropriate cell count (2S–6S) into the drone.
- Check that all solder joints are solid and that no wire is pinched or chafed.
- Make sure the ESC does not touch the frame and is firmly mounted.
- Check that the propellers are fitted correctly and tightened securely.
- After connecting the battery, wait for the initial motor beeps before arming.

6.2 During and after the flight

- Monitor the battery voltage in the OSD and end the flight at 3.5 V per cell at the latest (e.g. 21.0 V for 6S).
- The manufacturer specifies a continuous current of 55 A and a burst current of 65 A, which is intended only for short-term loads. Choose motors and propellers so that the ESC is not continuously overloaded.
- After the flight, check the temperature of the ESC and motors. If the ESC is very hot to the touch after a normal flight, the motor and propeller combination is too demanding for it or cooling is restricted.
- After a crash, check the board, solder joints and cables before the next flight.

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- Keep the ESC dry and clean. Remove dirt with a dry brush; let any moisture dry out completely before the next power-up.
- Regularly check the motor and power solder joints, the capacitor and the cable to the FC.
- Store in a dry place, out of direct sunlight, with no battery connected.

7.2 Troubleshooting

Problem	Possible cause and solution
Nothing happens after connecting the battery	Check the polarity and soldering of the power cable and the XT60 connector. Make sure the battery is charged.
The FC does not power on, the motors beep	Check the connecting cable to the FC and the wire order (VBAT, GND) – Chapter 4.4.
One motor does not spin or stutters	Check the soldering of all three motor wires and the signal wire of that motor in the FC cable. Test the motor on another output.
Motors spin in the wrong order	Remap the motors in Betaflight (*Motor Reordering*) – Chapter 5.4.
A motor spins in the wrong direction	Change the direction of rotation in software – Chapters 5.4 and 5.5.
The OSD shows no current or nonsensical values	Set *Current Meter Source* to Onboard ADC and *Scale* to 200; check the CUR wire – Chapter 5.3.
The ESC overheats	Motor and propeller combination too powerful, insufficient cooling or a damaged motor. Reduce the load and check the motors.
Cannot connect with the ESC configurator	Connect the battery (the ESC has no BEC), use passthrough mode via the FC and check the DShot protocol.

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 (BLITZ E55S) is printed on the ESC circuit 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 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.