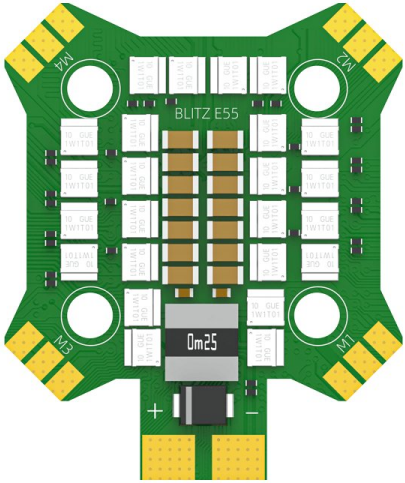
BLITZ Mini E55

iFlight · 4-in-1 electronic speed controller (ESC) 55 A, 2–6S, BLHeli_32

User manual



Read the entire manual and follow the safety instructions before installation and before connecting a battery for the first time. Keep this manual for future reference.

Rotorama, s.r.o. · www.rotorama.com

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1. Safety instructions

1.1 General principles

- The BLITZ Mini E55 electronic speed controller is an electronic component designed to be built into an FPV drone. Installation requires experience with soldering electronics and building drones.
- This product is not a toy. Keep it away from children. Keep small parts out of the reach of children and animals.
- Use the product only for the purpose described in this manual and within the technical data given in Chapter 2.4.
- Do not make any modifications to the ESC that are not described by the manufacturer. Do not continue to use a damaged ESC (burnt components, cracked board, torn-off pads).

1.2 Electrical safety

- Power the ESC only from a **2S to 6S Li-Po** battery; the manufacturer specifies a supply voltage range of **7–26 V**.
- **Never reverse the polarity** of the power supply (+ and −). Reverse polarity destroys the ESC immediately and irreversibly and may also damage other electronics of the drone.
- Do not exceed the maximum continuous current of 55 A or the short-term (burst) current of 65 A. Choose the combination of motor, propeller and battery so that these values are not exceeded.
- Before connecting a battery for the first time, check that there are no solder bridges between the pads, and connect the battery through a short-circuit protection device (smoke stopper) – see Chapter 5.1.
- The battery must be disconnected during any work on the ESC (soldering, replacing a motor, rewiring).

※ A fully charged 6S LiHV battery has a voltage of 26.1 V (6 × 4.35 V), which is higher than the upper limit of 26 V specified by the manufacturer. For 6S operation, therefore, use Li-Po batteries (fully charged 25.2 V).

1.3 Rotating propellers

- As soon as a battery is connected, the motors may start spinning at any time. Always carry out all bench tests and settings **without propellers fitted**.
- Fit the propellers only after you have verified the motor order and direction of rotation and tested Arm (motors on) and Disarm (motors off).

1.4 Heat and operating environment

- The ESC heats up during operation. Ensure airflow around it and do not cover it. Do not touch it after a flight until it has cooled down.

- Protect the ESC from moisture, water, dust and conductive contamination – especially carbon dust from a carbon fibre frame, which can cause a short circuit.
- The board must not come into contact with a carbon frame, screws or other electronics – use rubber damping grommets.

1.5 Li-Po and LiHV batteries

A battery is not included. For safe handling of batteries, observe these values:

State	per cell	4S Li-Po	6S Li-Po
fully charged	4.20 V (LiHV 4.35 V)	16.8 V	25.2 V
end the flight	3.5 V	14.0 V	21.0 V
storage	3.8 V	15.2 V	22.8 V

- Charge batteries only with a suitable balance charger, under supervision and on a non-flammable surface.
- Do not use or charge a damaged, swollen or overheated battery.
- Always connect a **fully charged** battery before a flight. End the flight at the latest when the voltage reaches 3.5 V per cell.

1.6 Regulations for drone operation

The ESC is part of a drone whose operation is governed by Regulations (EU) 2019/947 and 2019/945. These regulations apply in all member states of the European Union, but national implementing rules differ from country to country – operator registration, minimum pilot age, geographical zones, mandatory insurance and permitted frequency bands. **The law of the country in which the product is operated always prevails.** If you operate the drone outside the Czech Republic, follow the regulations of the country in which you fly.

2. Product description

2.1 What the ESC is for

The BLITZ Mini E55 is a 4-in-1 electronic speed controller (ESC) – a single board carries four speed controllers for four brushless motors. It is intended for FPV drones with a 20 × 20 mm mounting pattern and 2S to 6S power. The manufacturer specifies a maximum continuous current of 55 A and a short-term (burst) current of 65 A. The manufacturer uses it in its own ready-to-fly Nazgul F5/F6 series drones and lists it as a companion to the BLITZ series flight controllers.

The ESC runs BLHeli_32 firmware and supports the DShot150/300/600, MultiShot and OneShot protocols. It has a current sensor and supports telemetry. **It has no BEC** – it does not supply the flight controller (FC) with a regulated voltage; through the signal cable it only passes on the battery voltage (VBAT). The flight controller must therefore be able to handle battery power with its own circuits.

2.2 Package contents

1 ×	BLITZ Mini E55 4-in-1 ESC (2–6S)
1 ×	set of power cables and ESC signal cable

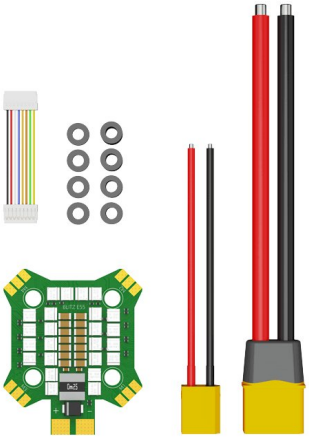
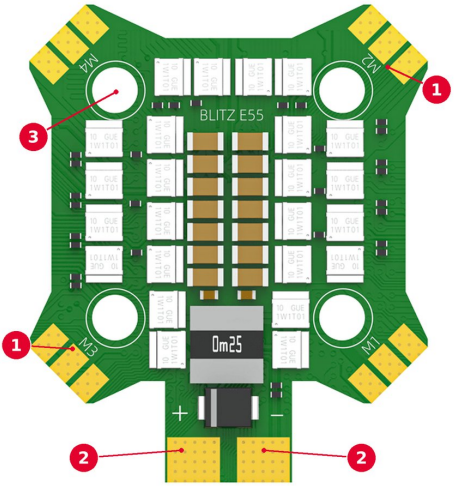


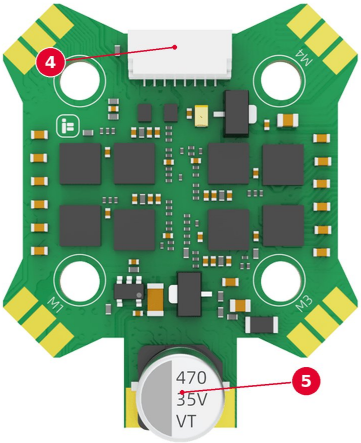
Illustration of the package contents (source: iFlight). The actual package contents are decisive.

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

2.3 Parts description



Top side of the ESC



Bottom side of the ESC

① Motor solder pads M1–M4 (three pads per motor)
② Power solder pads: + (positive) and − (negative)
③ Mounting holes, 20 × 20 mm pattern, 4 mm diameter
④ Signal cable connector to the flight controller (8 wires)
⑤ Electrolytic capacitor (470 µF / 35 V according to its marking) at the power pads

2.4 Technical data

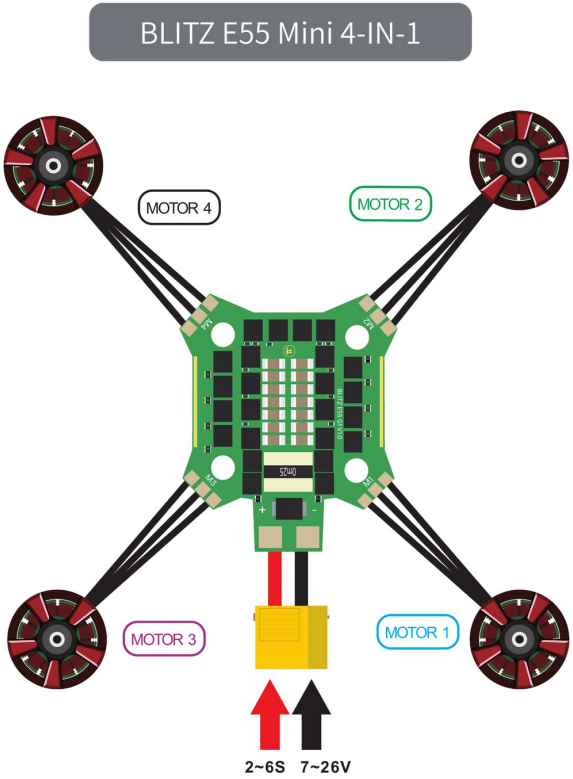
Parameter	Value
Designation	BLITZ Mini E55 4-IN-1 ESC
Manufacturer	iFlight
Power supply	2S–6S Li-Po (7–26 V)
Continuous current	55 A
Short-term (burst) current	65 A
Processor (MCU)	G071
BEC	no
Firmware	BLHeli_32
Firmware target	IFLIGHT_BLITZ_G071_01
Protocols	DShot150/300/600, MultiShot, OneShot
Current sensor	yes (Betaflight: Scale 200, Offset 0)
Telemetry	supported
Mounting pattern	20 × 20 mm, holes Φ 4 mm
Dimensions	35 × 42 mm
Weight	11.3 g

3. Installation and wiring

3.1 What you will need

- a flight controller (FC) with a 20 × 20 mm mounting pattern and a connector for a 4-in-1 ESC,
- four brushless motors suitable for the chosen battery voltage,
- a soldering iron powerful enough for thick power wires, solder and flux,
- a multimeter and a short-circuit protection device (smoke stopper),
- screws and rubber damping grommets matching your frame,
- a computer with Betaflight Configurator.

3.2 Wiring diagram



Wiring diagram according to the manufacturer: motors M1–M4 and 2–6S power supply (7–26 V). The board shown may differ in appearance from the version supplied.

3.3 Mounting in the frame

- The ESC is mounted in a stack below the flight controller. Orient the power pads ② towards the rear of the drone, where the power lead exits – the layout of motors M1–M4 then matches the diagram in Chapter 3.2.
- Place rubber damping grommets between the frame, the ESC and the flight controller. Do not overtighten the screws – the board must not bend.
- Check that the ESC components do not touch the flight controller, the frame or the screws.

3.4 Connecting the motors

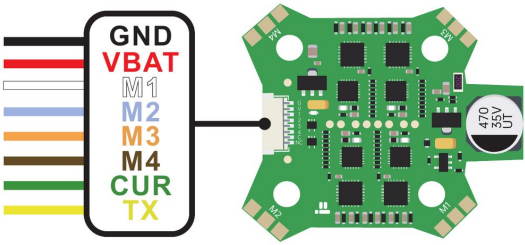
- Solder the three wires of each motor to the three pads ① of the corresponding output M1–M4 according to the diagram: M1 rear right, M2 front right, M3 rear left, M4 front left (top view, front of the drone at the top).
- The order of the three wires of a motor determines only its direction of rotation. The direction is then set in software (Chapter 4.4) or by swapping two wires.
- Shorten the wires to the required length so that they are not under tension and cannot get into a propeller. Solder quickly with well-heated joints and without solder bridges between pads.

3.5 Power lead and capacitor

- Solder the power lead from the package to pads ②: **red wire to +**, **black wire to −**. Check the polarity with a multimeter before connecting a battery for the first time.
- Capacitor ⑤ suppresses voltage spikes in the power supply. Keep it connected, keep its leads as short as possible and observe the correct polarity.
- The manufacturer notes: if you install the ESC in the **iH3 O3** frame kit, remove the capacitor after receiving the ESC and only then install the ESC.

3.6 Signal cable to the flight controller

The ESC is connected to the flight controller with the supplied 8-wire cable, which plugs into connector ④. Wire assignment according to the manufacturer:



Signal connector pinout according to the manufacturer

Wire	Function
GND	ground (negative)
VBAT	battery voltage for powering the flight controller
M1–M4	control signals of motors 1 to 4
CUR	current sensor output (to the FC current input)
TX	ESC telemetry (to the RX input of an FC serial port)

※ The wire order in the flight controller connector differs between manufacturers. Before connecting, compare the FC connector description with the table above. A VBAT wire routed to the wrong pin can destroy the flight controller. If the order does not match, re-pin the cable or use the cable supplied by the FC manufacturer.

4. Configuration in Betaflight

Configure the ESC in Betaflight Configurator with the flight controller connected. Tab and option names are given as displayed by the program; see the FC manual for FC-specific steps.

4.1 ESC protocol

On the *Configuration* tab (or *Motors*), select one of the DShot protocols (DShot150, DShot300 or DShot600) under *ESC/Motor protocol* and save the setting. The ESC also supports MultiShot and OneShot.

4.2 Current sensor

If the CUR wire is connected to the current measurement input of the flight controller, set the current meter source to *Onboard ADC* on the *Power & Battery* tab and enter the values recommended by the manufacturer in the *Amperage Meter* section:



Current meter setting recommended by the manufacturer: Scale 200, Offset 0

To check accuracy, compare the OSD consumption after a flight with the capacity recharged by the charger, and adjust *Scale* if necessary.

4.3 ESC telemetry and bidirectional DShot

- **ESC telemetry:** connect the TX wire to the RX input of a free serial port (UART) of the flight controller. On the *Ports* tab, select *ESC* as the sensor input for this port, and enable the *ESC Sensor* feature on the *Configuration* tab. Telemetry transmits ESC data (e.g. temperature and RPM) to the flight controller.
- **Bidirectional DShot:** BLHeli_32 firmware can send motor RPM back over the signal wire. Enable the feature on the *Motors* / *Configuration* tab; it is used, for example, by the RPM filter in Betaflight.

4.4 Motor order and direction of rotation

- The M1–M4 layout according to Chapter 3.4 matches the default Quad X layout in Betaflight.
- On the *Motors* tab (without propellers!), spin the motors one by one and check that the correct motor spins in the direction shown in the program's illustration.
- Reverse a motor spinning the wrong way in software – with the motor direction tool in Betaflight Configurator or in the ESC configuration program (Chapter 6.2) – or by swapping two motor wires.

5. First start-up

5.1 Checks before connecting a battery for the first time

① Under good lighting, inspect all solder joints – no solder bridges, broken wires or solder residue on the board.

② Using a multimeter in resistance or continuity mode, verify that there is no short circuit between pads + and −.

③ Check that the propellers are **not** fitted.

④ Connect the battery for the first time through a short-circuit protection device (smoke stopper). If the protection trips, disconnect immediately and find the fault.

⑤ After connection, the motors beep briefly – the ESC has initialised.

5.2 Motor test without propellers

Following Chapter 4.4, verify the order and direction of rotation of all four motors. Spin the motors only briefly and at low speed. If a motor does not run smoothly, stutters, or the ESC heats up excessively, disconnect the battery and check the wiring (Chapter 7.3).

5.3 Before the first flight

- Verify Arm (motors on) and Disarm (motors off) and the failsafe settings according to the flight controller and radio manuals.
- Only then fit the propellers in the correct direction and tighten them firmly.
- Carry out the first flight carefully in an open area and check the temperature of the ESC and motors after a short flight.

6. BLHeli_32 firmware

6.1 Firmware and target

The ESC is factory-flashed with **BLHeli_32** firmware with the target **IFLIGHT_BLITZ_G071_01**. The ESC is ready for use; changing the firmware or settings is not necessary for normal operation.

※ Never flash firmware with a target other than the one intended for this ESC. Incorrect firmware can destroy the ESC and the motors.

6.2 Changing the ESC settings

ESC parameters (e.g. motor direction of rotation) are changed in a BLHeli_32 configuration program that connects to the ESC through the flight controller (passthrough) – the battery must be connected and the propellers removed.

The manufacturer states that the original BLHeli_32 configuration program has been closed for regulatory reasons. To change the parameters of this ESC, it recommends downloading the *BLHeliSuite32Test* program from the *Download* section of the manufacturer's product page (shop.iflight.com).

7. Maintenance and troubleshooting

7.1 Maintenance

- After every flight, and especially after a crash, check the solder joints, motor wires, power lead and capacitor.
- Keep the board clean and dry. Remove dust and dirt with a dry soft brush; do not use water or solvents.
- If the ESC gets wet, disconnect the battery immediately and let it dry thoroughly. Inspect it before further use.
- Regularly check the tightness of the stack screws and the condition of the damping grommets.

7.2 Storage

Store the ESC in a dry place at room temperature, protected from dust and mechanical damage. Before storing the drone, disconnect the battery and store the battery at a storage voltage of 3.8 V per cell.

7.3 Troubleshooting

Problem	Possible cause and solution
No beeps after connecting the battery	Check the polarity and soldering of the power lead, the battery charge and the motor connections. If you suspect a short circuit, disconnect the battery immediately.
Short-circuit protection trips	Short circuit on the board or in the wiring – look for solder bridges, damaged insulation, contact between the board and the frame.
Motor does not spin or stutters	Cold or broken motor wire joint, damaged motor, wrong ESC protocol (Chapter 4.1).
A different motor spins than expected	Motor order does not match the diagram – re-solder the motors or change the output mapping in Betaflight.
Motor spins in reverse	Reverse the direction in software or swap two motor wires (Chapter 4.4).
Incorrect current reading in the OSD	Check the CUR wire connection and the Scale/Offset settings (Chapter 4.2).
No ESC telemetry	Check that the TX wire is connected to RX of the selected UART and the settings on the Ports and Configuration tabs (Chapter 4.3).
ESC overheats	Insufficient cooling or overload – check the motor and propeller combination, free running of the motors and airflow.

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 Mini E55) is given on the product packaging; the circuit board is printed with “BLITZ E55”.

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.