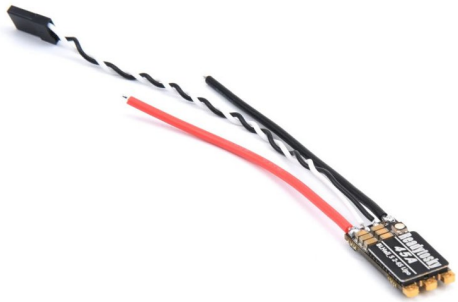
Readytosky 45A

Electronic speed controller (ESC) 2–6S, BLHeli_S
User manual



The ESC has no BEC. Power the flight controller, receiver and other electronics from a separate source.

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1. Safety instructions

1.1 Before you start

The electronic speed controller (ESC) is an electronic component that must be properly installed in the model by soldering. Read the entire manual before installation and keep it for future reference. The product is not a toy and is not intended for children.

- Use the ESC only within the specifications given in Chapter 2.4 – in particular, do not exceed the permitted number of battery cells and the continuous current.
- When operating a model fitted with this ESC, follow the regulations of the country in which you operate the model. Rules for unmanned aircraft (e.g. Regulation (EU) 2019/947) and for model aircraft differ between countries; **the law of the country of operation always prevails**.

1.2 Electrical and fire hazards

- **Disconnect the battery** before any soldering and before any change to the wiring.
- Observe the correct power polarity: red wire = plus (+), black wire = minus (−). **Reverse polarity destroys the ESC instantly and irreversibly**; such damage is not covered by the warranty.
- Insulate the soldered joints and check that they do not touch neighbouring pads, bare wires or a carbon frame anywhere (carbon is electrically conductive).
- Charge and store Li-Po batteries according to their manufacturer's instructions, on a non-flammable surface and under supervision. Do not use a swollen or mechanically damaged battery.

1.3 Rotating propellers

- When wiring, configuring and bench testing, **always keep the propellers removed**.
- The motor may start spinning immediately after the battery is connected as soon as the ESC receives a valid throttle signal. Connect the battery only after switching on the transmitter, with the throttle at minimum and Disarm (motors off) engaged.
- Never lean over the model with the battery connected, and keep a safe distance from people and animals.

2. Product description

2.1 What the ESC is for

The Readytosky 45A is a standalone (single-channel) speed controller for brushless motors. It is suitable for fixed-wing models as well as multicopters where each motor uses its own ESC (e.g. mounted on the frame arm). It is powered from a 2S to 6S Li-Po battery and handles a continuous current of 45 A.

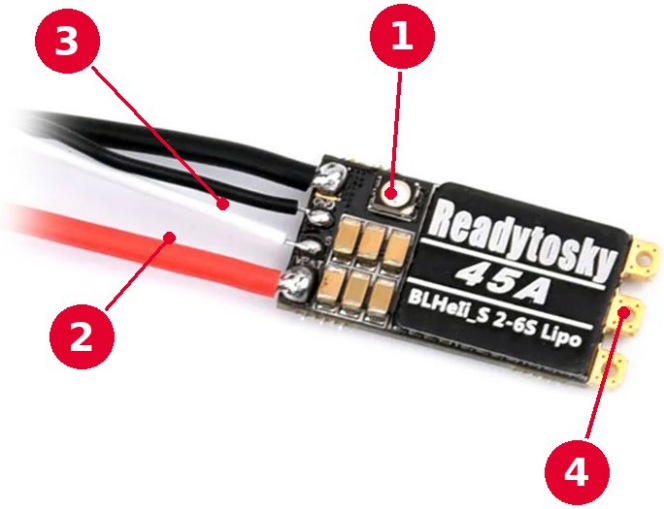
The ESC runs **BLHeli_S** firmware and supports the digital DShot protocol as well as analogue protocols. It features an integrated programmable RGB LED which, according to the manufacturer, improves the visibility of the model at dusk. The ESC **has no BEC** – it does not supply power to the flight controller (FC), receiver or servos.

2.2 Package contents

Qty	Item
1×	Readytosky 45A BLHeli_S speed controller with soldered power and signal cables

※ The package does **not** include a battery connector (e.g. XT60), motor connectors, heat-shrink tubing, a capacitor or a motor. The power wires have bare ends.

2.3 Parts description



Readytosky 45A ESC – top view

① **RGB LED** – integrated programmable LED.

② **Power cable** 18AWG – red wire plus (+), black wire minus (−); connects to the battery or to the power distribution board.

③ **Signal cable** – twisted pair (white signal, black ground GND) terminated with a servo connector; connects to the motor output of the flight controller or to the receiver.

④ **Motor solder pads** – three pads for the three motor phase wires.

2.4 Specifications

Parameter	Value
Power supply	Li-Po 2S–6S
Continuous current	45 A
Peak current	55 A (short-term)
BEC	no
Firmware	BLHeli_S
Control MCU	EFM8BB21F16G
Supported protocols	DShot150 / DShot300 / DShot600, Oneshot125
PCB	6 layers, 3 oz copper, gold-plated surface
LED	integrated programmable RGB LED
Power cable	18AWG, length 90 mm
Signal cable	length 150 mm
Dimensions	13 × 28.5 mm
Weight	6.6 g

※ Data provided by the manufacturer Readytosky. The fully charged voltage of a 6S Li-Po battery is 25.2 V (4.20 V/cell). The manufacturer does not state the use of LiHV batteries.

3. Installation

3.1 What else you need

- a brushless motor suitable for the chosen voltage and a current of up to 45 A,
- a flight controller (FC) or receiver with an output for the ESC; for fixed-wing models also a separate power supply for the receiver and servos (BEC), as the ESC has no BEC,
- a battery connector (e.g. XT60) or a power distribution board,
- a 2S–6S Li-Po battery,
- a soldering iron with sufficient power, solder, heat-shrink tubing or other insulation,
- to change settings, a computer with configuration software (see Chapter 4.2).

3.2 Connecting the motor

Solder the three motor phase wires to the three solder pads ④. The order of the wires is not prescribed – it only determines the direction of rotation. If the motor spins the wrong way after the first start, swap any two phase wires or change the direction in the settings (Chapter 4.4).

- Cut the motor wires to the required length and tin them before soldering.
- Solder quickly with a sufficiently hot tip so that the board does not overheat unnecessarily.
- Check that no solder bridge has formed between neighbouring pads.

3.3 Connecting the power supply

Solder the power cable ② to the battery connector or to the power distribution board. **The red wire is plus (+), the black wire minus (−).** Check the polarity again before connecting the battery for the first time – ideally with a multimeter.

- Do not extend the power wires unnecessarily. Longer power leads increase voltage spikes at the ESC.
- In practice, a low-ESR electrolytic capacitor with a voltage rating above the fully charged voltage of the battery used is recommended at the power input of the model. The capacitor is not included.
- When connecting the battery for the first time, it is advisable to use a short-circuit protector (a so-called smoke stopper).

3.4 Connecting the control signal

Connect the signal cable ③ to the motor output of the flight controller (FC) or – in a fixed-wing model – to the throttle channel of the receiver. The **white wire** is the signal, the **black wire** is ground (GND). Always connect the ground wire; it ensures reliable signal transmission.

You can use the connector directly, or cut it off and solder the wires to the flight controller pads. The ESC automatically detects the signal type (DShot, Oneshot125, etc.) at power-up; the protocol is selected in the flight controller – in Betaflight on the *Configuration* tab under *ESC/Motor protocol*.

3.5 Mounting in the model

- The ESC needs cooling. Place it where air flows around it – on a multicopter typically on the arm under the propeller, in an aircraft in the airflow.
- Secure the ESC with cable ties or double-sided tape; if it sits on a carbon frame, insulate it from the frame.
- Route the cables so that they cannot get into the propeller and do not pull on the soldered joints.
- Choose heat-shrink tubing that does not hinder heat dissipation, and do not cover the LED if you want to use it.

4. BLHeli_S firmware and settings

4.1 Supported control signals

The manufacturer states support for the **DShot150, DShot300, DShot600** and **Oneshot125** protocols. According to its documentation, the BLHeli_S firmware also works with the standard 1–2 ms pulse signal (PWM), Oneshot42 and Multishot. The signal type is detected automatically when power is applied.

- For multicopters with a flight controller we recommend the digital **DShot** protocol – it does not require throttle range calibration.
- In a fixed-wing model where the ESC is controlled directly by the receiver, a 1–2 ms pulse signal (PWM) is used. Perform the throttle range calibration before first use (Chapter 4.5).

4.2 Configuration software

ESC parameters are changed on a computer. You can use the web tool esc-configurator.com (Chrome or Edge browser) or the BLHeliSuite program. Documentation and source code of the BLHeli_S firmware are available at github.com/bitdump/BLHeli.

① Remove the propellers.

② On a multicopter, connect the flight controller to the computer with a USB cable and **connect the battery as well** – the ESC is not powered from USB. The configurator communicates with the ESC through the flight controller (so-called passthrough). A fixed-wing model without a flight controller requires a BLHeli_S programming adapter (USB linker).

③ In the configurator, connect to the serial port and read the ESC settings (*Read Settings*).

④ Change the required parameters and save them to the ESC (*Write Settings*).

⑤ Disconnect the battery first and only then the USB cable.

Flashing different firmware is done at your own risk. Damage to the ESC caused by incorrect or interrupted flashing is not a product defect.

4.3 Programmable parameters

The most important BLHeli_S firmware parameters (exact names vary slightly between configurators):

Parameter	Meaning
Startup Power	power during motor start-up
Motor Timing	commutation timing; options 0° / 7.5° / 15° / 22.5° / 30°
Demag Compensation	protection against motor desynchronisation (off / low / high)
Motor Direction	rotation direction: normal / reversed / bidirectional

Parameter	Meaning
Beep / Beacon Strength	volume of tones and of the beacon signal
Beacon Delay	idle time after which the ESC starts beeping
Programming by TX	programming with the throttle stick; also enables throttle calibration
Min / Max Throttle	pulse signal range (PWM, Oneshot, Multishot only)
Temperature Protection	temperature protection; threshold adjustable 80–140 °C in BLHeli_S
Low RPM Power Protect	power limitation at low RPM
Brake on Stop	motor brake at zero throttle

※ Factory values are set by the ESC manufacturer. Note down the current settings before changing them. BLHeli_S firmware always runs in Damped Light mode (regenerative braking and active freewheeling), which ensures fast motor response.

4.4 Motor rotation direction

You can change the direction of rotation by swapping two motor phase wires or with the *Motor Direction* parameter in the configurator. In *bidirectional* mode (so-called 3D), zero throttle is at the centre of the range; above it the motor spins forward, below it in reverse; programming by TX is disabled in this mode. 3D mode also requires matching flight controller settings.

4.5 Throttle range calibration

Calibration is only needed with pulse control (PWM 1–2 ms, Oneshot, Multishot). **With DShot, calibration is disabled** and stored values are ignored. Calibration only works with the *Programming by TX* parameter enabled.

① Remove the propeller. Switch on the transmitter and move the throttle stick to **maximum**.

② Connect the battery. The ESC beeps three times, plays a low tone after detecting the signal and starts measuring the maximum.

③ Keep the throttle up. After 3 seconds the ESC confirms that the maximum has been stored.

④ Move the throttle to **minimum**. After 3 seconds the ESC confirms that the minimum has been stored.

⑤ The calibration is stored. You can disconnect the battery or continue using the ESC.

※ The calibration range is 1000–2000 µs; the difference between minimum and maximum must be more than 140 µs (70 µs in bidirectional mode). On a multicopter with a flight controller, calibration is performed in the flight controller configuration software – e.g. in Betaflight on the *Motors* tab.

5. Operation

5.1 Start-up tones

The ESC produces tones through the connected motor. Without a motor connected you will not hear any tones.

Signal	Meaning
3 tones after power-up	the ESC has switched on
1 low tone	the ESC has detected the control signal; the Arm (motors on) sequence starts
1 high tone	throttle is at zero – the Arm sequence is complete, the ESC is ready
a beep about every 3 s	beacon – the ESC has been idle at zero throttle for a long time (Chapter 5.3)

If only three tones sound after power-up and nothing else, the ESC is not receiving a valid signal – check the signal cable wiring and the protocol setting in the flight controller. If the throttle is at maximum at power-up, the ESC starts throttle calibration (Chapter 4.5).

5.2 Protection functions

- **Temperature protection** – once the set threshold is exceeded, the firmware gradually limits motor power (75 %, 50 %, 25 %, 0 % in steps of 5 °C).
- **Stalled motor protection** – if the motor fails to start for a few seconds, the ESC stops trying and waits until the throttle returns to zero.
- **Low RPM Power Protect** – power limitation at low RPM protects the ESC and the motor. Disable it only when justified.

Protection functions do not replace a correct choice of motor and propeller. A combination that draws more than 45 A continuously will destroy the ESC.

5.3 Beacon – locating the model

If the ESC is armed and the throttle stays at zero for the set time (*Beacon Delay*), it starts beeping through the motor roughly once every three seconds. This helps you find the model after a crash while the battery is still connected. Set the volume with the *Beacon Strength* parameter.

※ Disconnect the battery after the flight – with the beacon active the ESC keeps drawing current. End the flight at a voltage of 3.5 V/cell (21.0 V for 6S) at the latest.

6. Maintenance and storage

- After each flight, check the soldered joints, cable insulation and ESC mounting. Repair a loose or cracked joint immediately.
- Protect the ESC from moisture, water, dust and conductive debris (metal and carbon dust). Do not power up a wet ESC; let it dry thoroughly.
- After a crash, check that the board is not cracked or burnt and that no components are missing. Do not use a damaged ESC.
- Store in a dry place at room temperature, away from direct sunlight. Store batteries separately at 3.8 V/cell (22.8 V for 6S).
- Always remove the propellers when changing settings or updating firmware.

7. Troubleshooting

Problem	Possible cause and solution
No tones after connecting the battery	The battery or power connection is faulty, the motor is not connected, or the ESC is damaged (e.g. by reverse polarity). Check the voltage and the joints.
Only 3 tones, the motor does not start	The ESC is not receiving a signal. Check the signal and ground wires and the protocol in the flight controller.
The motor spins the wrong way	Swap two motor phase wires or change *Motor Direction* (Chapter 4.4).
The motor stutters or misses at start-up	Check the phase wire joints. Try a higher *Startup Power*, a different *Motor Timing* or a higher *Demag Compensation*.
Throttle range does not match with PWM	Perform the throttle range calibration (Chapter 4.5).
The configurator does not find the ESC	Connect the battery (the ESC is not powered from USB), check the signal wire and close other programs using the serial port.
Power drops in flight, the ESC is hot	Temperature protection has kicked in. Improve cooling, use a smaller propeller or reduce the load.

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 (Readytosky 45A BLHeli_S 2-6S Lipo) is printed on the top side of the speed controller.

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.