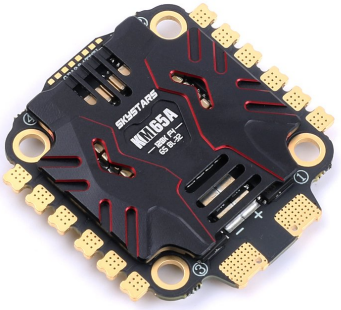
Skystars KM65 AM32

4in1 electronic speed controller (ESC) 65 A, 3–6S
User manual



Read the entire manual carefully before installation. Always keep the propellers removed when working with the ESC.

www.rotorama.com

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1. Safety instructions

1.1 Before you start

The Skystars KM65 AM32 is an electronic speed controller (ESC) designed to be built into an FPV drone. Installation requires soldering, basic electronics knowledge and the use of configuration software. Read this entire manual before installation and keep it for future reference.

- This product is not a toy. It is not intended for children or for persons who are not familiar with the operation of FPV equipment.
- Use the ESC only within the technical data given in Chapter 2.3 – in particular the supply voltage and current.
- Do not make any modifications to the ESC that are not described in this manual.
- Drone operation is subject to aviation regulations. The law of the country in which you operate the product always applies – in the EU, Regulation (EU) 2019/947 applies, but national implementing rules differ from state to state.

1.2 Electrical safety and soldering

- Always disconnect the battery and unplug the flight controller (FC) from USB before soldering.
- Observe the supply polarity. Reverse battery polarity will destroy the ESC; such damage is not a product defect.
- Make clean, well-heated solder joints. Cold joints and solder bridges between adjacent pads can destroy the ESC under load.
- Solder the capacitor supplied in the package as close to the power pads as possible. Without it, voltage spikes can damage the ESC and other electronics.
- For the first battery connection we recommend using a short-circuit protection fuse (smoke stopper).
- Solder in a well-ventilated area and wear eye protection.

1.3 Rotating propellers and operation

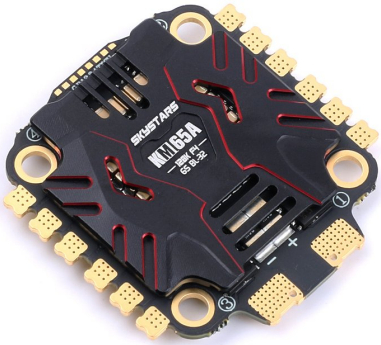
- Whenever you work on the drone on the bench – configuration, motor test, firmware update – **keep the propellers removed**.
- The ESC heats up during operation. Do not touch the heatsink immediately after a flight and do not cover it.
- Never leave a connected battery unattended.

2. Product description

2.1 Purpose

The Skystars KM65 AM32 is a four-in-one electronic speed controller (4in1 ESC) for 5–8" freestyle and long-range drones. It supports 3–6S battery power and current up to 65 A, which is enough for motors of size 2207–2808.

The ESC has an aluminium heatsink that dissipates heat better and at the same time protects the components from mechanical damage. It connects to the flight controller (FC) with a connector; solder pads are also available. It uses a 32-bit F4 processor and AM32 firmware – it supports telemetry, bidirectional DShot and a high PWM frequency. It is protected against voltage spikes by a TVS diode.



Skystars KM65 – top view

2.2 Package contents

Qty	Item
1×	Skystars KM65 AM32 ESC (4in1 ESC)
1×	Capacitor
1×	XT60 connector with cable
1×	Screw set

※ The flight controller (FC), the cable to the FC, motors, propellers and battery are **not** included.

2.3 Technical data

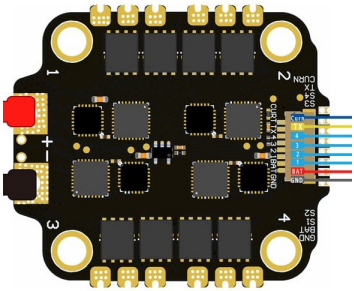
Parameter	Value
Type	4in1 electronic speed controller (ESC)
Power supply	3–6S LiPo
Current rating	65 A
Processor	F4, 32-bit
Firmware	AM32
Control signal	DShot, bidirectional DShot
PWM frequency	up to 128 kHz
Telemetry	yes (TX pin)
Current sensor	yes (CURR pin)
Protection	TVS diode against voltage spikes
BEC output	none
Mounting pattern	30.5 × 30.5 mm, M3 (with soft mounts)
Dimensions	45.6 × 45 × 7.6 mm
Weight	19 g
Recommended motors	2207–2808
Intended use	5–8" freestyle and long-range drones

2.4 Connections

On the top side (with the heatsink) there are solder pads for motors 1–4 along the sides, the battery power pads (−/+) on the bottom edge and the connector for the flight controller (FC) on the top edge. The numbers ①–④ next to the mounting holes correspond to the motor numbers.



Top view: position of motors 1–4 and power pads (source: Skystars)



Bottom side of the board (rotated): FC connector and signal solder pads (source: Skystars)

▶ Connector and signal pad pinout

Pin	Function
GND	ground
BAT	battery voltage (for voltage measurement and FC power)
S1–S4	motor 1–4 control signals from the FC
TX	ESC telemetry (connects to the RX pin of the selected UART on the FC)
CURR	current sensor output (connects to the current input on the FC)

※ The ESC has no BEC output. The BAT pin carries the full battery voltage – never connect it to 5 V or 3.3 V inputs.

3. Installation and wiring

3.1 What else you need

- a frame with a 30.5 × 30.5 mm mounting pattern for M3 screws,
- a flight controller (FC) with Betaflight firmware and a matching connection cable or wires,
- four brushless motors, recommended size 2207–2808,
- a 3–6S LiPo battery with an XT60 connector,
- a soldering iron powerful enough for the power cables, solder and flux.

3.2 Mounting in the frame

- Place the ESC in the frame so that the power pads face the route of the battery cable and the motor wires can be routed as short as possible.
- Use M3 screws and soft mounts. Do not overtighten the screws – the soft mounts are meant to dampen vibration.
- The ESC must not touch the carbon frame or screws anywhere other than at the mounting holes. Carbon is electrically conductive.
- Leave space between the heatsink and other parts for airflow.

3.3 Connecting the motors

Solder the wires of each motor to the three pads next to the corresponding motor number (figure in Chapter 2.4). The order of the three motor wires only determines the direction of rotation – it can be changed later in software (Chapters 4.4 and 5.1).

- Cut the wires to the required length, strip and tin them.
- After soldering, check that there is no solder bridge between adjacent pads.
- Route the motor wires so that they cannot get into the propellers or chafe on the edges of the frame.

3.4 Power cable and capacitor

- Solder the cable with the XT60 connector to the power pads: **red wire to +**, **black wire to −**. Check the polarity against the marking on the board.
- Solder the capacitor from the package to the same pads – observe its polarity (the negative lead is marked with a stripe on the case). Keep the capacitor leads as short as possible.
- The manufacturer explicitly recommends using the supplied low ESR capacitor.
- Secure the capacitor against vibration (e.g. with heat-shrink tubing or a cable tie) and protect it from the propellers.

3.5 Connecting to the flight controller (FC)

Connect the ESC to the flight controller with a connector cable or with wires soldered to the signal pads. Before connecting, **always compare the pin order** on the ESC and on the FC – flight controllers from other manufacturers may use a different order, in which case the cable must be re-pinned.

- GND and BAT – power and battery voltage measurement on the FC,
- S1–S4 – motor signals; the order must match the motor numbering in Betaflight,
- TX – to the RX pin of a free UART on the FC (for ESC telemetry),
- CURR – to the current sensor input on the FC.

4. Betaflight setup

Setup is done in Betaflight Configurator. Tab and item names are given as shown in the program. **Keep the propellers removed at all times.**

4.1 Protocol and bidirectional DShot

- On the *Motors* tab (*Configuration* in some versions), select one of the DShot variants as the *ESC/Motor protocol*.
- Enable *Bidirectional DShot*. The ESC then reports the motor RPM back to the flight controller, which uses it for the RPM filter.
- Set *Motor poles* according to the number of magnets of the motors used (stated by the motor manufacturer).
- Save the settings with *Save and Reboot*.

4.2 ESC telemetry

If the TX pin of the ESC is connected to the RX of a UART on the FC, serial ESC telemetry (voltage, current, temperature) can be received.

- On the *Ports* tab, select *ESC* in the *Sensor Input* column for the respective UART.
- On the *Configuration* tab, enable the *ESC_SENSOR* feature (depending on the program version it may be located elsewhere).
- If you only use bidirectional DShot, connecting TX is not necessary.

4.3 Current sensor

On the *Power & Battery* tab, select *Onboard ADC* as the *Current Meter Source*. The manufacturer gives the following values in its wiring diagram:

Item	Value per manufacturer
Scale [1/10th mV/A]	80
Offset [mA]	0



Current sensor settings in Betaflight (source: Skystars)

※ We recommend verifying the measurement accuracy: after several flights, compare the mAh consumption shown in the OSD with the capacity the charger puts back during charging, and adjust the *Scale* value if necessary.

4.4 Checking the motors and direction of rotation

- Connect the battery and on the *Motors* tab enable the switch for motor control.
- Spin up each motor individually and check that **the correct** motor spins (according to the motor position diagram in Betaflight) and in **the correct direction**.
- If the motor order does not match, change the output assignment in Betaflight (motor remapping function) or the wiring of signals S1–S4.
- If a motor spins the wrong way, change its direction in AM32 Configurator (Chapter 5.1) or swap any two motor wires.

5. AM32 firmware

5.1 Configuration in AM32 Configurator

The ESC uses the open-source AM32 firmware. Its parameters (motor direction, beeps, protections and more) are set in **AM32 Configurator**, which is available on the AM32 project website – am32.ca. Communication runs through the flight controller (passthrough) – the FC must have Betaflight firmware installed.

① Remove the propellers.

② Close Betaflight Configurator so that it does not block the serial port.

③ Connect the FC to the computer via USB and **connect the battery** – the ESC is powered only from the battery.

④ In AM32 Configurator select the port, connect and read the ESC settings.

⑤ Change the required parameters, write them to the ESCs and disconnect the battery when finished.

5.2 Firmware update

Firmware updates are also done in AM32 Configurator. Always use firmware intended exactly for this ESC, which the program offers based on the identification it reads. Incorrect firmware can render the ESC inoperable.

- Do not disconnect the battery or USB during the update.
- Before updating, note down the current settings (especially the motor directions).
- After the update, check the direction and function of all motors again (Chapter 4.4).

6. Operation

6.1 Checks before connecting the battery for the first time

- Visually check all joints – no solder bridges, no stray wire strands.
- Use a multimeter to verify that there is no short circuit between the + and − pads.
- Check the polarity of the power cable and the capacitor.
- Keep the propellers removed and make the first connection through a short-circuit protection fuse (smoke stopper).

6.2 Batteries

The ESC is intended for 3–6S LiPo batteries. Always insert a **fully charged** battery before flight. For LiPo batteries, observe these values:

State	per cell	3S	4S	5S	6S
fully charged	4.20 V	12.6 V	16.8 V	21.0 V	25.2 V
end flight	3.5 V	10.5 V	14.0 V	17.5 V	21.0 V
storage	3.8 V	11.4 V	15.2 V	19.0 V	22.8 V

6.3 During operation

- Connect the battery only after switching on the radio transmitter and disconnect it before switching the transmitter off.
- Arm (motors on) only at the take-off site, away from people. Disarm (motors off) immediately after landing.
- After a demanding flight, check the temperature of the ESC and motors. An excessively hot ESC indicates overload – use smaller propellers or fly less aggressively.
- After a crash, check the ESC, motor wires and capacitor before the next flight.

7. Maintenance and troubleshooting

7.1 Maintenance

- Regularly check the motor and power solder joints, especially after a crash.
- Keep the heatsink and the area around the ESC clean; dirt, grass and moisture can cause a short circuit.
- The ESC must not get wet. If water gets into it, disconnect the battery immediately and let it dry thoroughly.
- Replace a damaged or swollen capacitor immediately.

7.2 Troubleshooting

Problem	Possible cause and solution
Motors do not beep after connecting the battery	Check the power joints, polarity and signal connection to the FC. Verify that the FC has valid firmware and DShot protocol set.
A different motor spins than expected	Signals S1–S4 do not match the order in Betaflight – remap the motors or change the wiring.
Motor spins the wrong way	Change the direction in AM32 Configurator or swap two motor wires.
Motor stutters or does not start	Cold joint or broken motor wire; check the soldering. Test the motor on another output.
Betaflight reports RPM telemetry errors	Check that *Bidirectional DShot* is enabled, the *Motor poles* setting and the selected DShot protocol.
Measured current does not match	Adjust the *Scale* value on the *Power & Battery* tab (Chapter 4.3).
AM32 Configurator does not connect	Connect the battery, close Betaflight Configurator, check the USB cable and the Betaflight firmware on the FC.
ESC overheats	Overload – smaller propellers, weaker motors or less aggressive flying; ensure airflow around the heatsink.

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 (KM65A) is marked on the aluminium heatsink of the ESC.

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.