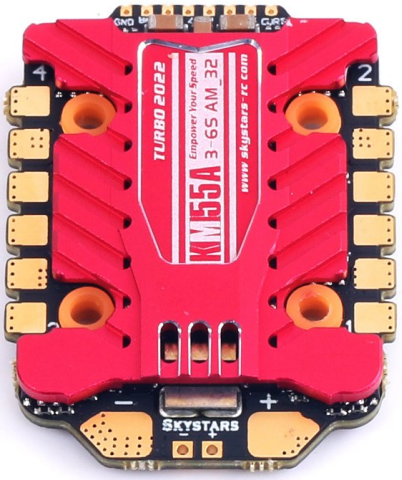
ROTORAMA

KM55A Mini AM32

Skystars – 4-in-1 ESC 55 A, 3–6S
User Manual



Read this entire manual before installation. Connect the battery only after checking the complete wiring, and always with the propellers removed.

www.rotorama.com

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1. Safety instructions

1.1 General rules

- The electronic speed controller (ESC) is a component for building FPV drones. Installation and setup should be carried out by a user with basic knowledge of electronics and soldering. The product is not a toy and must be kept away from children.
- Only connect the ESC to a **3S to 6S** battery. A higher voltage will permanently damage the ESC.
- Before connecting the battery for the first time, check all wiring and the power polarity. Reversing plus and minus will destroy the ESC instantly.
- During all bench tests and while configuring, **keep the propellers removed**. Spinning propellers can cause serious injury.
- The ESC gets hot during operation. After a flight, do not touch the heatsink until it has cooled down.
- Do not exceed the continuous current stated in the technical data. Choose motors and propellers so that the ESC is not continuously overloaded. Never leave a connected battery unattended.

1.2 Li-Po batteries

The manufacturer specifies the ESC for **3S to 6S Li-Po** batteries. Observe the following voltages – per cell and for the whole pack of the given configuration:

Battery	Fully charged	End flight	Storage
1 cell	4.20 V	3.5 V	3.8 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

- Only charge batteries with a charger designed for Li-Po, on a non-flammable surface and under supervision.
- Do not use a damaged, swollen or punctured battery; dispose of it properly.

1.3 Soldering and handling electronics

- Solder only with the battery disconnected, in a well-ventilated area and with a soldering iron powerful enough for thick power wires.
- Make sure that no solder or wire clippings bridge neighbouring pads. A short circuit between motor phases or on the power supply can destroy the ESC.
- Protect the board from moisture, conductive dirt and metal objects. Avoid electrostatic discharge when handling the board.

2. Product description

2.1 What the ESC is for

Skystars KM55A Mini AM32 is a 4-in-1 electronic speed controller (ESC) for FPV drones with a **20×20 mm** mounting pattern. One board contains four speed controllers which, on commands from the flight controller (FC), control the speed of four brushless motors. The ESC runs **AM32** firmware and is fitted with an aluminium heatsink.

The ESC is designed to be powered from 3S to 6S batteries. It has no voltage regulator (BEC) – the flight controller must have its own power supply (see Chapter 3.5).

2.2 Package contents

- 1× Skystars KM55A Mini AM32 electronic speed controller
- 1× accessory kit

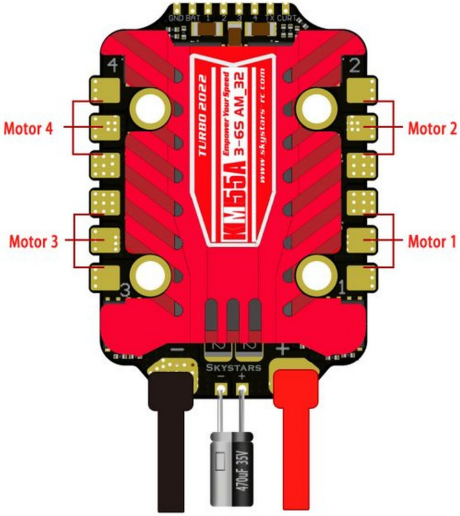
Not included: flight controller (FC), motors, battery, power connector (e.g. XT60) and installation tools.

2.3 Technical data

Parameter	Value
Designation	Skystars KM55A (4-in-1 ESC)
Input voltage	3–6S Li-Po
Continuous current	55 A
Peak current	70 A (manufacturer states “70A ≥ 10S”)
Firmware	AM32
Supported protocol	DShot600 / DShot1200
Voltage regulator (BEC)	no
Mounting holes	20×20 mm, M3
Dimensions	35 × 47 × 6.5 mm
Weight	16.5 g
FC connector	8-pin SH 1.0 mm: GND, BAT, 1, 2, 3, 4, TX, CURR

Data according to the manufacturer Skystars.

2.4 Wiring overview



Top view: motor pads 1–4, power leads (− / +), capacitor and 8-pin connector to the FC (source: Skystars)

Pin	Function
Motor 1–4	Three pads for the phase wires of each motor; numbers 1–4 are marked on the board near the corners.
− / +	Battery power (black − / red +) and pads for the capacitor.
GND	Ground – connection to the FC
BAT	Battery voltage for powering the FC and voltage measurement
1, 2, 3, 4	Motor 1–4 signal from the flight controller
TX	ESC telemetry output
CURR	Current sensor output

3. Installation

3.1 What else you need

- a frame with 20×20 mm mounting and M3 screws of suitable length,
- a flight controller (FC) with 20×20 mm mounting and an 8-pin connector for a 4-in-1 ESC (or solder pads),
- four brushless motors suitable for the voltage of the battery you will use,
- a power connector matching your batteries (e.g. XT60) and a 3S–6S battery,
- a soldering iron, solder, flux and a multimeter; we also recommend a smoke stopper for the first power-up,
- a computer with Betaflight Configurator (or another configurator for your FC) and a web browser for the AM32 configurator.

3.2 Mounting on the frame

- The ESC is mounted in a frame with a 20×20 mm pattern underneath the flight controller (stack). The mounting holes are fitted with rubber grommets for vibration damping.
- Orient the ESC so that the power leads run towards the rear of the frame and the motor pads are as close to the arms as possible.
- Do not overtighten the stack screws – the rubber grommets must not be fully compressed.
- Make sure that neither the board nor the heatsink touches the carbon frame. Carbon fibre is electrically conductive.

3.3 Connecting the motors

- Each motor has three phase wires; solder them to the three pads next to the corresponding motor number (1–4).
- The order of the three motor wires does not affect operation, only the direction of rotation. It can be changed later in software (Chapters 4.2 and 5.1); there is no need to resolder the wires.
- Cut the wires to the required length and strip only as much insulation as the pad requires.
- After soldering, check that there is no solder bridge between neighbouring pads.

3.4 Power supply and capacitor

- Connect the power leads with the battery connector to the **−** and **+** pads. Observe the correct polarity: **black wire = minus, red wire = plus**.
- Solder a **low-ESR capacitor** to the capacitor pads (marked − and + between the power leads). The manufacturer's diagram shows a 470 µF / 35 V capacitor and asks for the supplied low-ESR capacitor to be used. The capacitor suppresses voltage spikes that can damage the ESC and other electronics.
- The capacitor is polarised – the lead marked with a stripe (−) must go to minus. Secure the capacitor so that its leads cannot break due to vibration.

※ Operating without the capacitor, or with the capacitor fitted with reversed polarity, can permanently damage the ESC.

3.5 Connecting to the flight controller (FC)

The ESC is connected to the FC with an 8-pin cable with SH 1.0 mm connectors. The pin order on the ESC is **GND, BAT, 1, 2, 3, 4, TX, CURR**.

- **Before connecting, compare the pin order on the ESC with the connector on your FC.** If they differ, the cable must be re-pinned. An incorrectly connected BAT wire can destroy the flight controller.
- The ESC has **no BEC**. The BAT pin supplies the full battery voltage to the FC – the FC must have a voltage regulator to power itself and its peripherals.
- Pins 1–4 are the signals for motors 1–4, pin TX is ESC telemetry and pin CURR is the current sensor output.
- Route the cable so that it is not under tension and cannot touch the propellers.



Underside: label with ratings and the connector pin order (GND, BAT, ESC1–ESC4, TX, CURR)

4. Flight controller setup

The following procedure describes the setup in Betaflight Configurator; tab names may differ slightly between versions. With other FC firmware (e.g. INAV), proceed similarly according to its documentation.

4.1 Motor protocol

- On the *Motors* tab (*Configuration* in older versions), select the **DShot600** protocol. The manufacturer states support for DShot600 and DShot1200; your choice must match the performance of your FC.
- AM32 firmware supports **bidirectional DShot** (*Bidirectional DShot*). When enabled, the FC receives motor RPM from the ESC and can use the RPM filter. Save the settings with the *Save* button.

4.2 Motor order and direction

- **Remove the propellers.** Connect the battery and, after confirming the warning on the *Motors* tab, spin up the motors one by one.
- Check that the motor that spins is the one shown in the program's diagram. If the order does not match, change the output mapping in the flight controller (in Betaflight using the motor remapping function).
- Check the direction of rotation of each motor against the diagram. Correct a wrong direction in the AM32 configurator (Chapter 5.1) or with the reverse direction function in Betaflight – there is no need to resolder the wires.

4.3 Current measurement

On the *Power & Battery* tab, select *Onboard ADC* as the current meter source (CURR input) and enter the current sensor values. The manufacturer's wiring diagram states:



Current sensor settings according to the manufacturer: Scale 290, Offset 0

- **Scale:** 290, **Offset:** 0
- For accuracy, compare the consumption shown in the OSD with the mAh recharged by the charger and adjust Scale proportionally.

4.4 ESC telemetry

- Connect the ESC **TX** pin to the RX input of a free UART on the flight controller; on most FCs it is already part of the ESC connector.
- In Betaflight, on the *Ports* tab, select *ESC* in the *Sensor Input* column for this UART.

5. AM32 firmware

The ESC is factory-flashed with **AM32** firmware. It is open-source firmware for speed controllers; its documentation and source code are at github.com/am32-firmware/AM32.

5.1 Configuring the ESC

- The ESC is configured through the flight controller (*passthrough*) – nothing needs to be connected to it separately.
- Use the **AM32 Configurator** at am32.ca (runs in a browser with Web Serial support, e.g. Chrome), or esc-configurator.com.
- Close Betaflight Configurator, connect the FC to the computer with a USB cable, **remove the propellers** and connect the battery – the ESC does not communicate without it.
- In the configurator, connect to the FC and read the ESC settings. You can change, for example, the direction of rotation of individual motors.
- Write the changes to all four ESCs and disconnect the configurator before disconnecting the battery.

5.2 Firmware update

- Updates are performed in the same configurator. Flash **only firmware intended for this ESC** – the configurator offers the target according to the ESC hardware. Never force flashing of a different target.
- Do not disconnect the battery or the USB cable while writing. An interrupted write can leave the ESC unresponsive.
- An update is not necessary for normal operation. Only perform it when you need a new feature or a fix.

※ Flashing unsuitable firmware or interrupting the write process is not a product defect.

6. Commissioning

6.1 Before connecting the battery for the first time

① Visually check all solder joints – no solder bridges, wire clippings or dirt.

② Use a multimeter to measure the resistance between the − and + power pads. It must not show a short circuit.

③ Check the polarity of the power connector and the capacitor.

④ Check the pin order of the 8-pin cable (Chapter 3.5).

⑤ **Remove the propellers.** We recommend using a smoke stopper for the first power-up.

⑥ Connect the battery. The motors play the start-up tones – the ESC is ready.

6.2 Motor test without propellers

- Still without propellers, check the motor order and direction in the FC configurator (Chapter 4.2).
- Check the **Arm** (motors on) and **Disarm** (motors off) function with your radio transmitter and the failsafe settings of the flight controller.
- The motors should spin up smoothly, without stuttering or unusual noise.

6.3 Pre-flight check

- Insert a **fully charged** battery (4.20 V per cell, e.g. 25.2 V for 6S) and check its condition.
- Check the mounting of the ESC, capacitor and wires and the condition of the propellers.
- After the first short flights, check the temperature of the ESC and motors. An excessively hot ESC indicates overload – use smaller propellers or different motors.
- End the flight at the latest at 3.5 V per cell (e.g. 21.0 V for 6S).

7. Maintenance and troubleshooting

7.1 Maintenance

- After every flight, and especially after a crash, check the solder joints, capacitor, FC cable and stack mounting.
- Keep the ESC dry and clean. Remove dust and dirt with a dry brush or compressed air.
- If water gets into the ESC, disconnect the battery immediately and let it dry thoroughly. Do not power it up until it is completely dry.
- Replace the rubber grommets in the mounting holes if they are cracked.

7.2 Troubleshooting

Problem	Possible cause and solution
No tones after connecting the battery	Check the power connector and the − / + solder joints. Make sure the FC sends the motor signal (DShot protocol set according to Chapter 4.1).
A motor does not spin or stutters	Cold solder joint or broken motor phase wire; faulty motor. Check the joints and test the motor on another output.
Motor spins in the wrong direction	Change the direction in the AM32 configurator or in the FC (Chapter 4.2).
A different motor spins than expected	Adjust the motor mapping in the flight controller (Chapter 4.2).
AM32 configurator does not find the ESC	Connect the battery; close Betaflight Configurator; use a browser with Web Serial support.
Inaccurate consumption in the OSD	Adjust the Scale value of the current sensor (Chapter 4.3).
ESC telemetry does not work	Check the connection of the TX pin to the FC UART and the settings on the *Ports* tab (Chapter 4.4).
ESC overheats	Excessive load – smaller propellers, different motors; check that the motors spin freely.

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 (KM55A) is shown on the heatsink of the ESC and the basic ratings on the label on the underside of the board; the firmware version is displayed by the AM32 configurator (Chapter 5).

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.