RunCam Thumb 2

4K action camera for FPV drones
User manual



Power supply DC 5 V only! Read the entire manual, especially the safety instructions, before first use.

www.rotorama.com

Contents

1. Safety instructions

2. Product description

2.1 Overview

2.2 Package contents

2.3 Specifications

3. Preparation and installation

3.1 Lens cover and ND filters

3.2 Camera mounting

3.3 Micro SD card

3.4 Power supply

4. Operation

4.1 Basic operations and indicator light

4.2 Configuration via QR code

4.3 PC connection

4.4 RunCam app and product support

5. Remote control via the flight controller

5.1 Type-C control cable

5.2 Remote control via UART

5.3 PWM remote control

6. Firmware update

7. Maintenance and troubleshooting

8. Information for the EU and Czech Market

9. Warranty and rights arising from defective performance

1. Safety instructions

Read this entire manual before first use and keep it for future reference.

1.1 Power supply and electrical connection

- The camera must be powered **exclusively with 5 V DC**. Never connect it directly to the flight battery voltage (VBAT) or to any other higher-voltage source – the camera will be destroyed immediately.
- Before switching on for the first time, check the wiring (5V, GND, signal) and its polarity.
- Always solder and connect with the power disconnected. Leave soldering to the flight controller (FC) to an experienced person – a short circuit may damage both the camera and the flight controller.

1.2 Temperature and operating environment

- The camera heats up during operation. After prolonged recording, do not touch its surface and let it cool down.
- Do not cover the ventilation holes. During long recording without airflow, the camera shuts down for protection (see Chapter 7.1).
- Protect the camera from water, moisture, dust, debris and drops. Do not use it in the rain.
- Do not open or modify the camera.

1.3 Mounting on the drone and operation

- Mount the camera firmly on the drone and route the cables away from the propellers. Check the mount and cables before every flight.
- This product is not a toy. Keep the camera, ND filters, lens cover and small parts out of the reach of children.
- Do not remove the microSD card during recording or during a firmware update.

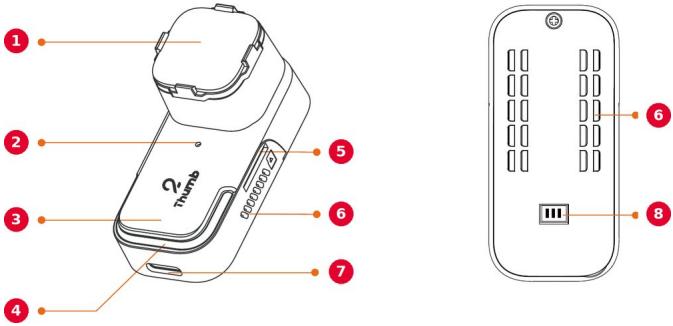
1.4 Privacy

- The camera records video and sound (built-in microphone). Capturing a person's likeness or recording their private life requires their consent (Sections 84 and 86 of the Czech Civil Code). Outside purely personal and household activities, Regulation (EU) 2016/679 (GDPR) also applies.
- Under Regulation (EU) 2019/947, a drone with a camera carries a sensor able to capture personal data – the operator must register even if the drone weighs less than 250 g.
- The information in this section describes the situation in the Czech Republic. If you use the camera in another country, follow the regulations of the country in which you operate it.

2. Product description

RunCam Thumb 2 is a small and light action camera (27 g) for recording footage from an FPV drone at up to 4K and 60 frames per second. It has no battery of its own – it is powered by the drone with 5 V via the 3-pin JST 1.25 connector or via USB-C. The built-in gyro records the camera's motion, so the footage can be stabilised afterwards in Gyroflow. The camera is configured with a QR code from the RunCam app and can also be controlled from the radio via the flight controller (UART or PWM).

2.1 Overview



Front view (left) and rear view (right)

① Lens cover (replaceable with an ND filter)	⑤ Micro SD card slot
② MIC	⑥ Ventilation holes
③ Button (power/shutter button)	⑦ Type-C
④ Indicator light (red/green)	⑧ 1.25mm 3P (5V/GND/PWM)

2.2 Package contents

- 1× RunCam Thumb 2 camera
- 1× 3D printed mount
- 1× JST 1.25 3-pin cable
- 1× Type-C control cable
- 1× ND8 filter, 1× ND16 filter, 1× ND24 filter

Not included: microSD card and USB-A to USB-C cable for powering from a power bank or connecting to a computer.

2.3 Specifications

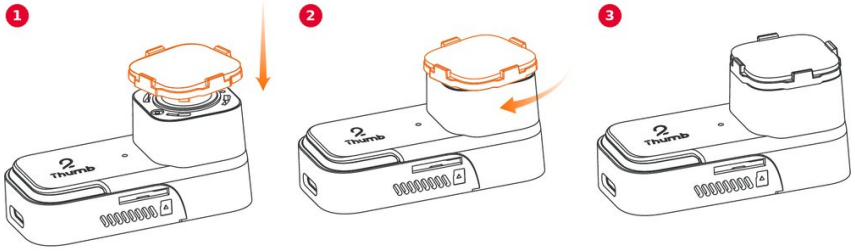
Parameter	Value
Model	RunCam Thumb 2
Sensor	Sony IMX586 (48 MP)
Resolution	4K: 3840 × 2160 @ 30 / 30 (4:3) / 60 (xv) / 60 fps 2.7K: 2688 × 1512 @ 60 (4:3) / 60 fps 1440p: 1920 × 1440 @ 60 fps 1080p: 1920 × 1080 @ 60 / 60 (xv) / 120 fps
Max frame rate	120 fps
Video format	MP4
Gyro	built-in (data for stabilisation in post-processing; not the same as in-camera EIS)
Micro SD card	max 512 GB; U3, A2 recommended
Operating voltage	**DC 5 V (only)**
Power consumption	max 700 mA @ 5 V
Power interface	JST 1.25 3-pin / USB-C
Communication interface	Type-C
Remote control	PWM / UART
Wi-Fi	not supported; configuration via QR code from the app
Dimensions	26 × 27.5 × 55 mm
Net weight	27 g

※ Data are taken from the manufacturer's manual and product page.

3. Preparation and installation

3.1 Lens cover and ND filters

The lens is protected by a clear lens cover. One of the supplied ND filters can be fitted in its place. The cover and the filters are fitted the same way:



Fitting the lens cover

① Align the lens cover to the mounting holes.

② Rotate the lens cover to the left to lock it.

③ Finished. To replace it, rotate the cover in the opposite direction and remove it.

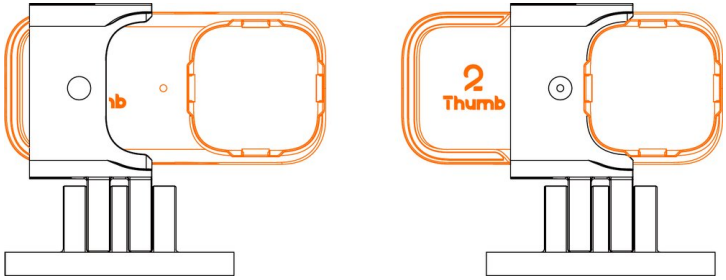
▶ Using the ND filters

An ND (neutral density) filter evenly reduces the light reaching the sensor without changing colours. In bright conditions the camera then uses a longer exposure time and motion in the footage looks smoother. The filter number indicates the strength – ND8 is the weakest and ND24 the strongest of the supplied filters. Use a stronger filter in bright sunshine and a weaker one under an overcast sky. Do not use a filter at dusk or indoors.

Clean the filters and the cover with a dry soft lens cloth; do not touch the glass with your fingers.

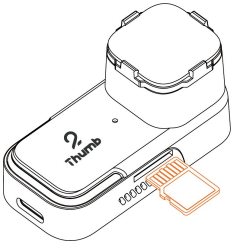
3.2 Camera mounting

Insert the camera into the supplied mount. The camera can be mounted in two orientations, as shown in the figure.



Camera in the mount – two possible orientations

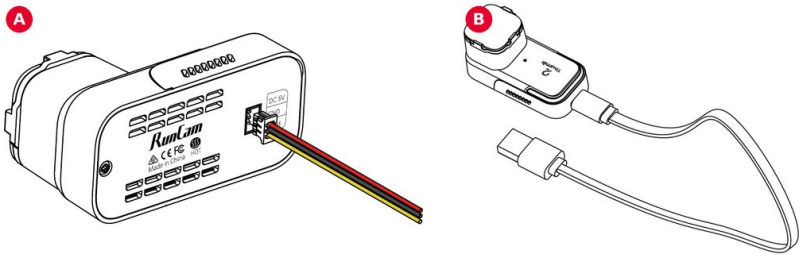
3.3 Micro SD card



- A **U3** microSD card is recommended (4K@60FPS / 4K@30FPS / 2.7K@60FPS / 1080P@120FPS requires U3 or above).
- Supported card capacity is up to 512 GB.
- As a precaution, please power off the camera before inserting or removing the card.
- Use care when handling memory cards. Avoid liquids, dust and debris. Check the card manufacturer's guidelines regarding use in acceptable temperature ranges.

3.4 Power supply

Thumb 2 supports terminal power supply (JST 1.25 3-pin) and Type-C power supply. The power supply voltage **only supports DC 5 V**.

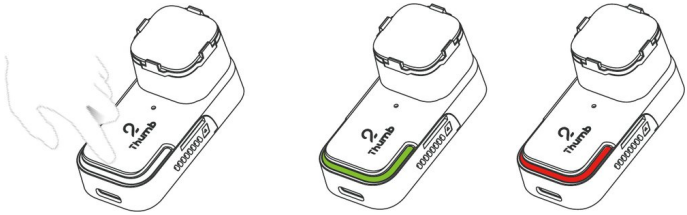


A – power supply from the drone's BEC (5 V), B – power supply from a power bank

Never connect the camera to the flight battery voltage (VBAT). Use the 5 V (BEC) output of the flight controller.

4. Operation

4.1 Basic operations and indicator light



Button, green light and red light

Function	Operation and indication
Power on / power off	Long press the Power/Shutter button: light blinks green for 3 seconds and turns solid red – camera powers on. Long press the Power/Shutter button: light goes off – camera powers off.
Start / stop recording	Short press: camera starts recording, light blinks red slowly. Short press: camera stops recording, light turns solid red.
Switch modes	Double press: camera changes to QR configuration mode, light turns solid green. Double press: camera quits QR mode, light turns solid red.
QR code configuration mode	Scan the QR code via the RunCam app. Applying succeeds: light turns solid red. Applying fails: light stays solid green.
Remote control mode	Connect Thumb 2 to a PWM pad of the FC to configure (Chapter 5).
Micro SD card error	Red light flashes quickly.
Sensor module error	Green light flashes quickly.

4.2 Configuration via QR code



① Go to the RunCam app and select **Thumb 2**.

② Configure the settings and generate a QR code.

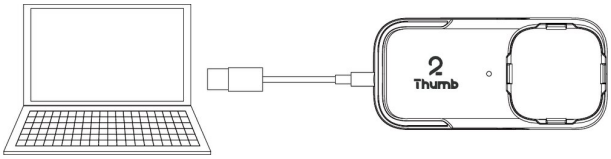
③ Power on the camera and double press the button to switch to scanning mode – the light turns solid green.

④ Use the camera to scan the QR code generated in the RunCam app. The light turns solid red when the camera scans successfully.

※ Optimum distance between the camera and the screen: **25 mm**.

4.3 PC connection

When connected to a computer via Type-C, the camera is identified as a USB disk upon startup (access to the files on the microSD card). Press the button to switch to UVC mode (webcam).



Connecting to a PC via USB-C

※ If the PC cannot recognise the camera, check that the microSD card is inserted properly. If accessing the files on the microSD card fails, try another USB cable or USB port.

4.4 RunCam app and product support

Search for “RunCam” in Google Play or the App Store to download the app, or download it from the manufacturer's official website www.runcam.com.

Manufacturer support: support.runcam.com/hc/en-us

5. Remote control via the flight controller

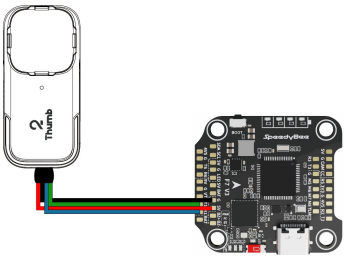
The camera can be connected to the drone's flight controller (FC) and recording can be started with a switch on the radio. The procedures below use the SpeedyBee F7 V3 flight controller, Betaflight Configurator and the Radiomaster TX12 radio as an example. With other equipment, the names of pads, UARTs and channels may differ.

5.1 Type-C control cable

Colour	Wire	Function
red	Power	supports external power input of DC 5 V
black	Ground	power ground wire / remote control signal ground wire
yellow	Video	can be soldered to the VI pad of the flight controller or to the Video In pad of the video transmitter (VTX) to transmit the video signal to the VTX
blue	TX	to the R3 pad or another spare UART of the flight controller – remote control of the camera
green	RX	to the T3 pad or another spare UART of the flight controller – remote control of the camera

5.2 Remote control via UART (recommended)

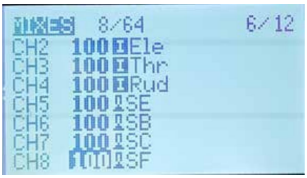
① Solder the wires of the Type-C control cable to the pads on the SpeedyBee F7 V3: Power wire to the 5V pad, GND wire to the GND pad, TX wire to the R3 pad and RX wire to the T3 pad.



Connection via UART3 (SpeedyBee F7 V3 example)

② In Betaflight Configurator, set UART3 as *RunCam Device*.

③ On the *Modes* tab, find *CAMERA CONTROL*, assign an AUX channel of your choice and set the range to **1900–2100**.

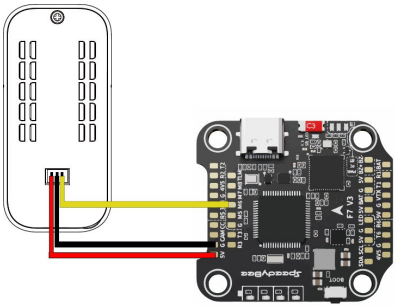


④ Choose your model on the radio, open the *MIXER* page and assign the channel to a switch. In the Radiomaster TX12 example, channel CH5 is assigned to the SE switch.

⑤ Test: power on Thumb 2 and the flight controller. Setting SE to the bottom starts / stops recording.

5.3 PWM remote control

① Solder the JST 1.25 3-pin wires to the pads on the SpeedyBee F7 V3: Power wire to the 5V pad, GND wire to the GND pad and PWM wire to the M6 pad.



PWM connection to the M6 pad
(SpeedyBee F7 V3 example)

② Connect the flight controller to Betaflight Configurator and open the *CLI* tab.

③ Type **resource** to proceed, then type the commands below:

```
resource motor 6 none
resource pinio 2 B05
set pinio_config = 129,129,1,1
set pinio_box = 0,41,255,255
save
```

※ Pin B05 corresponds to the M6 pad of the example flight controller. On a different flight controller, find the correct pin in the output of the **resource** command.

▶ Test method one (recommended) – button

① Choose your model on the radio, open the *INPUTS* and *MIXER* pages and assign the channel to a button. In the Radiomaster TX12 example, channel CH10 is assigned to the SA button.



Radiomaster TX12 – INPUTS and MIXES, channel CH10 on the SA button

② In Betaflight Configurator, on the *Modes* tab, configure mode *USER2*. The example uses AUX6 with a range of 1775–2100.

③ Control: with the camera on, a short press of SA starts recording; another short press stops recording. A double press of SA takes a photo.

▶ Test method two – switch

① Choose your model on the radio, open the *MIXER* page and assign the channel to a switch. In the Radiomaster TX12 example, CH7 is assigned to the SF switch.

② On the *Modes* tab, configure mode *USER2*. The example uses AUX3 with a range of 1775–2100.

③ Control: the SF switch is in the middle position by default. Toggling it once to the bottom starts / stops recording.

※ One-time toggling means the SF switch moves quickly from the middle to the bottom and back to the middle, generating an effective command.

6. Firmware update

For the camera's best performance, please use the latest firmware. Firmware and the updating method: www.runcam.com/download/Thumb2.

① Download the firmware, extract the archive and find the file **Thumb2.bin**.

② Copy Thumb2.bin directly to the root of the microSD card (not into a folder) and do not rename it.

③ Insert the card and power on the camera. The camera detects the update automatically – the red and green lights flash alternately.

④ After about 2–3 minutes the update is finished and the camera shuts off automatically.

Do not power off the camera or remove the microSD card during the update.

7. Maintenance and troubleshooting

7.1 Overheat protection

The camera shuts down when its temperature reaches **96 °C**. At 4K@60fps or in a still status (without airflow), recording lasts about 10 minutes before the camera shuts down for protection. For long-time recording, cool the device or reduce the resolution. In-flight recording is not subject to this limitation.

7.2 Maintenance and storage

- Clean the lens cover and ND filters with a dry soft lens cloth. Do not use solvents.
- Keep the ventilation holes and the card slot clean.
- Store the camera in a dry place away from direct sunlight, ideally with the lens cover fitted.
- After a crash, check the camera, mount, cables and connectors.

7.3 Troubleshooting

Symptom	Possible cause and solution
Camera does not power on	Check the 5 V supply, the wiring and polarity, or try powering via USB-C.
Red light flashes quickly	Micro SD card error – check that the card is inserted properly, or try another U3 card.
Green light flashes quickly	Sensor module error – contact your retailer.
Light stays solid green after scanning the QR code	Applying failed – repeat the scan from a distance of about 25 mm.
PC does not recognise the camera	Check the microSD card, try another USB cable or port.
Camera shuts down during long recording	Overheat protection – let the camera cool down, provide airflow or reduce the resolution.
Recording cannot be started from the radio	Check the wiring, the UART setting or CLI commands, the channel assignment and the mode range on the *Modes* tab.

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 (RunCam Thumb 2) is given on the camera and on the product packaging.

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.