ROTORAMA

Baby Ratel 2

Analog FPV camera with 1/1.8″ sensor
User manual



Read the entire manual before installation, especially the safety instructions and the power wiring (DC 4.5–26 V).

Manufacturer: CADDXFPV (Caddx) · EU importer: Rotorama, s.r.o. · www.rotorama.com

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1. Safety instructions

1.1 Before you start

The Baby Ratel 2 camera is an electronic component designed to be installed in an FPV drone or another model. Installation requires basic knowledge of electronics and of wiring FPV components. Read this entire manual before installation and keep it for future reference.

- The product is **not a toy**. It contains small parts (screws, cables) that can be swallowed – keep it out of the reach of children.
- Do all wiring work **with the battery disconnected**. Connect power only after checking all connections.
- The supply voltage of the camera is **DC 4.5–26 V**. A higher voltage or reversed polarity will permanently damage the camera.
- When soldering the cables to the flight controller (FC) or the video transmitter (VTX), make sure the wires are assigned correctly and prevent short circuits between adjacent pads.

1.2 Operation

- The operating temperature of the camera is **−20 °C to +60 °C**. Do not expose the camera to higher temperatures or to prolonged direct sunlight in an enclosed space.
- Protect the camera from water, moisture, dust and dirt. If it comes into contact with water, disconnect the power immediately and let it dry thoroughly.
- Do not touch the lens with your fingers – fingerprints and dirt reduce image quality.
- The camera itself does not transmit a radio signal; the image is transmitted by the video transmitter (VTX) to which it is connected. When flying a drone, observe the regulations for unmanned aircraft and radio equipment that apply in the country where you fly – see the manual of the drone and of the video transmitter.

2. Product description

2.1 What the camera is for

The Caddx Baby Ratel 2 is an analog FPV camera in nano format (14 × 14 mm) with a 1/1.8″ Starlight sensor, 1200TVL horizontal resolution and a 165° field of view. It is suitable for small and racing drones where low weight (3 g) and small dimensions matter.

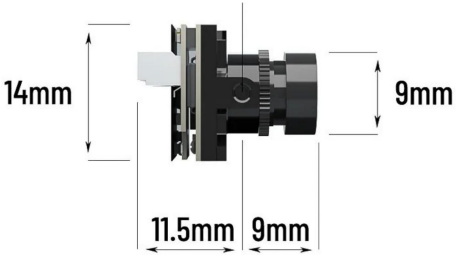
Using the included adapter, the camera can also be mounted in frames for micro-format cameras (19 mm). The camera image is adjusted in the menu (OSD) using a separate menu board with a joystick, which is included in the package.

2.2 Package contents

Item	Qty
Baby Ratel 2 camera	1×
Screw pack	1×
OSD menu board	1×
2-pin silicone cable	1×
3-pin silicone cable	1×
14 mm → 19 mm bracket	1×
1.5 mm Allen wrench	1×
Manufacturer's warranty card	1×

※ The package does **not** include a video transmitter (VTX), flight controller (FC), battery, frame, FPV goggles or monitor.

2.3 Dimensions



Camera dimensions: height and width of the front 14 mm, lens diameter 9 mm, distance from the rear to the axis of the M2 mounting screws 11.5 mm, lens protrusion in front of the screw axis 9 mm.

2.4 Specifications

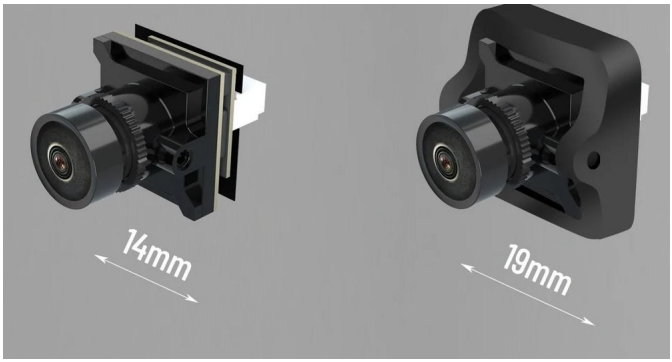
Parameter	Value
Model	Baby Ratel 2
Image sensor	1/1.8″, Starlight
Horizontal resolution	1200TVL
Lens	1.8 mm
Field of view (FOV)	165°
TV system	NTSC / PAL (switchable)
Image aspect ratio	16:9 / 4:3 (switchable)
WDR	Super WDR (HDR)
Noise reduction	3DNR
Min. illumination	0.0001 lx
Electronic shutter	PAL: 1/50–1/100,000 s NTSC: 1/60–1/100,000 s
Video output	CVBS (analog)
Camera OSD	separate OSD menu board
Menu languages	English, Chinese (simplified and traditional), Russian, Spanish, Italian, French, Polish, Portuguese, Japanese
Day / night	Auto / Color / B&W / EXT
Supply voltage	DC 4.5–26 V
Current draw	160 mA at 5 V; 70 mA at 12 V
Operating temperature	−20 °C to +60 °C
Dimensions	14 × 14 × 20.5 mm
Mounting	M2 screws; nano format 14 mm, micro 19 mm with bracket
Weight	3 g (net)

3. Installation

3.1 Mounting in the frame

The camera is fastened with two M2 screws from the included screw pack, which are screwed into the side holes in the camera body. Tighten the screws with the included 1.5 mm Allen wrench.

- Frame for **nano (14 mm)** cameras – insert the camera directly between the side mounts of the frame.
- Frame for **micro (19 mm)** cameras – first insert the camera into the included 14 mm → 19 mm bracket, then fasten the bracket in the frame.
- Set the desired camera tilt before tightening the screws. Tighten the screws gently – excessive force can damage the thread in the camera body or the plastic bracket.
- Route the cables so that they cannot get into the propellers and are not under tension when the camera is tilted.



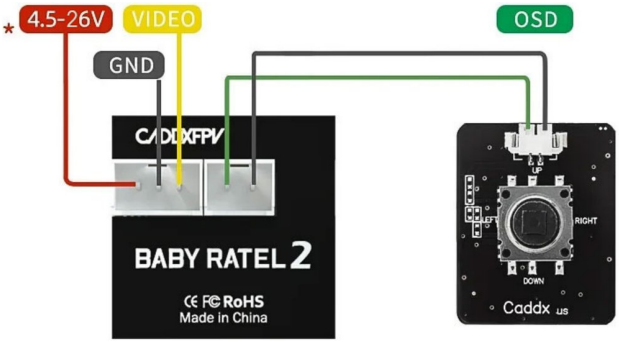
Camera without bracket (width 14 mm) and in the bracket for micro-format frames (19 mm).

4. Connection

4.1 Power and video

The camera has two connectors on the back: a 3-pin connector for power and video signal and a 2-pin connector for the OSD menu board. Connect the included 3-pin silicone cable to the 3-pin connector and solder its wires to the corresponding pads of the flight controller (FC) or video transmitter (VTX):

Wire colour	Signal	Connect to
red	4.5–26 V	power output for the camera
black	GND	ground (GND)
yellow	Video out	video input (CAM) on the FC or VTX
green	OSD	OSD menu board (2-pin connector)



Wiring diagram according to the manufacturer: camera (left) and OSD menu board (right).

4.2 Current draw

According to the manufacturer, the camera draws **160 mA at 5 V** and **70 mA at 12 V** (marked with an asterisk in the diagram). Make sure that the power output of the flight controller or video transmitter you connect the camera to can supply this current and that its voltage is within 4.5–26 V.

❉ Before connecting the battery for the first time, check the wiring and the power polarity. Reversed polarity or a voltage above 26 V will permanently damage the camera.

4.3 OSD menu board

Connect the OSD menu board to the 2-pin connector of the camera (OSD signal and GND) with the included 2-pin cable. The board is used only to set up the camera; after finishing the setup, disconnect it and store it – it does not need to stay on the drone in flight.

5. Camera menu settings (OSD)

5.1 Entering the menu and controls

The camera menu is shown directly in the image, so the camera must be connected and powered and you must watch the image in FPV goggles or on a monitor. The menu board must be connected to the OSD connector.

- **Short press the joystick** on the menu board to enter the OSD settings.
- Moving the joystick up and down (UP / DOWN) selects menu items; moving it left and right (LEFT / RIGHT) changes the value of the selected item.
- Items marked with the ↵ symbol contain a submenu – enter it by pressing the joystick. The *RETURN* item takes you one level up.
- Save the changes with the *SAVE EXIT* item in the main menu.

5.2 Main menu (MAIN MENU)

Item	Function
AE ↵	exposure – chapter 5.3
WB ↵	white balance – chapter 5.4
DAY&NIGHT ↵	day / night mode – chapter 5.5
IMAGE ENHANCE ↵	image enhancement – chapter 5.6
VIDEO SETTING ↵	video settings – chapter 5.7
LANGUAGE	menu language (e.g. ENGLISH)
RESET	restore default settings
SAVE EXIT	save changes and exit the menu
EXIT	exit the menu

5.3 Exposure (AE)

Item	Function	Range / options
BRIGHTNESS	image brightness	0–30
EXPOSURE MODE	exposure mode	GLOBE / BLC
BLC	backlight compensation level	1–8
ADVANCED	advanced exposure settings	—
RETURN	back to the main menu	—

GLOBE – exposure based on the whole image; *BLC* (Back Light Compensation) – brightens dark objects in front of a bright background.

5.4 White balance (WB)

Item	Function	Range / options
MODE	white balance mode	ATW / MWB
RGAIN	red gain	0–32
BGAIN	blue gain	0–32
RETURN	back to the main menu	—

ATW – automatic tracking white balance; *MWB* – manual white balance, in which the colour rendering is set with the *RGAIN* and *BGAIN* values.

5.5 Day / night mode (DAY&NIGHT)

Item	Function	Range / options
MODE	day / night mode	BW / AUTO / COLOR / EXT
RETURN	back to the main menu	—

COLOR – always colour image; *BW* – always black-and-white image; *AUTO* – automatic switching; *EXT* – switching by an external signal. If the camera unexpectedly shows a black-and-white image, check this setting.

5.6 Image enhancement (IMAGE ENHANCE)

Item	Function	Options
CONTRAST	contrast	MANUAL / AUTO
SHARPNESS	sharpness	MANUAL / AUTO
COLOR GAIN	colour saturation	MANUAL / AUTO
3DNR	noise reduction	MANUAL / AUTO
RETURN	back to the main menu	—

5.7 Video settings (VIDEO SETTING)

Item	Function	Options
VIDEO STANDARD	TV system	PAL / NTSC
HD FORMAT	video output format	CVBS
IMAGE RATIO	image aspect ratio	4:3 / 16:9
D-WDR	wide dynamic range	OPEN / CLOSE
RETURN	back to the main menu	—

- Set the TV system (PAL / NTSC) to match your FPV goggles or monitor; a wrong system shows as a rolling or black-and-white image.
- Choose the aspect ratio according to the goggles display – if they do not match, the image will be stretched or squeezed.

6. Maintenance and storage

- Clean the lens with a dry microfibre cloth. Do not use solvents or aggressive cleaning agents.
- After a crash, check the lens, camera body, bracket, cables and connectors. Replace damaged cables.
- Regularly check that the M2 mounting screws are tight.
- Store the camera in a dry place, away from direct sunlight and within the operating temperature range.

7. Troubleshooting

Problem	Possible cause and solution
No image	Check the power supply (4.5–26 V), polarity, ground (GND) and the connection of the yellow video wire. Make sure the VTX is transmitting and the goggles are on the same channel.
Black-and-white image	Check *DAY&NIGHT* → *MODE* and the TV system (PAL / NTSC) according to the goggles.
Stretched or squeezed image	Set *VIDEO SETTING* → *IMAGE RATIO* (4:3 / 16:9) according to the goggles display.
Interference or lines in the image	Power supply noise – check the ground wire and route the cables away from the power cables of the speed controllers (ESC).
Wrong colours	Check *WB*; in *MWB* mode adjust *RGAIN* and *BGAIN*, or use *RESET*.
Image too dark or too bright	Adjust *AE* → *BRIGHTNESS* and the exposure mode.
Menu does not appear	Check the connection of the menu board to the OSD connector and press the joystick briefly.
Blurred image	Clean the lens.

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 (Baby Ratel 2) is given on the back of the camera.

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.