



Ratel Ultra

Analog FPV camera
User manual



Read this manual carefully before installation, especially the safety instructions, and keep it for future reference.

Importer: Rotorama, s.r.o. · www.rotorama.cz

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1. Safety Instructions

Read this entire manual carefully before installation and first use, and keep it for future reference. If you pass the product on to another person, include this manual.

1.1 Electrical safety

- Always connect and disconnect the camera **with the power disconnected** – unplug the drone's flight battery.
- The supply voltage must be within **4.5-26 V DC**. A higher voltage will permanently damage the camera.
- Observe the polarity: red wire = positive voltage, black wire = GND (ground). Reversed polarity may destroy the camera.
- Insulate soldered joints properly (with heat-shrink tubing) and make sure the wires do not touch conductive parts of the frame or other joints.
- Protect the camera from water, moisture and dust. The manufacturer does not specify any ingress protection (IP) rating.

1.2 General warnings

- This product is not a toy. Keep it out of the reach of children – it contains small parts that could be swallowed.
- Do not disassemble or modify the camera. Improper intervention may damage the product.
- Do not touch the lens with your fingers. Do not point the lens directly at the sun for extended periods.
- The electronics are sensitive to electrostatic discharge – discharge yourself by touching a grounded object before handling.

2. Product Description

Ratel Ultra is a micro-size analog FPV camera with a 1/1.8 inch sensor and 1500TVL resolution, designed for FPV drones. With a minimum illumination of 0.00001 Lux it is also suitable for flying at dusk and at night. The camera has its own OSD menu, which is operated with the included menu board.



Ratel Ultra camera

2.1 Package contents

- 1× Ratel Ultra camera
- 1× OSD menu board
- 1× accessory kit
- 1× user manual

2.2 Manufacturer

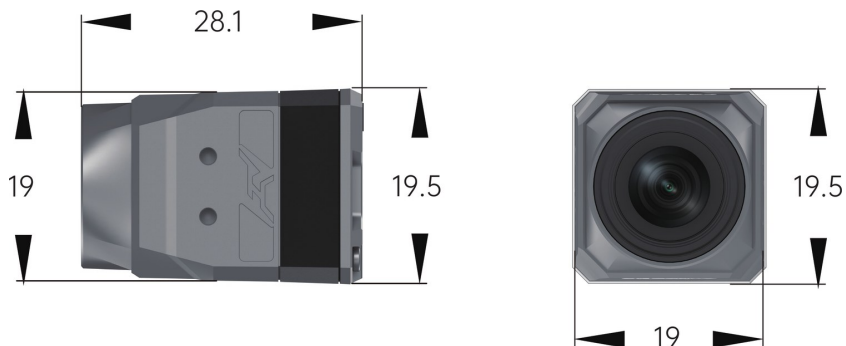
Manufacturer	CaddxFPV – Caddx Technology (Shenzhen) Co., Ltd.
Address	13F Minrray Building, Ganli Industrial Park, Bulan Road, Longgang District, Shenzhen, Guangdong, China
E-mail	support@caddxfpv.com
Web	www.caddxfpv.com

The importer and responsible person in the EU is Rotorama, s.r.o. – see Chapter 8.1.

3. Specifications

Parameter	Value
Product	Ratel Ultra
Image sensor	1/1.8 inch sensor
Horizontal resolution	1500TVL
TV system	NTSC & PAL (switchable)
Image	16:9 & 4:3 (switchable)
WDR	Super WDR (HDR)
Min. illumination	0.00001 Lux
FOV	125°
Electronic shutter	PAL: 1/50–1/100,000 s NTSC: 1/60–1/100,000 s
OSD menu	supported
OSD languages	English, Simplified Chinese, Traditional Chinese, Russian, Spanish, Italian, French, Polish, Portuguese, Japanese
Day/Night	Auto / Color / B&W / EXT
Dimensions	19.5 × 19.5 × 28.1 mm
Wide power input	DC 4.5–26 V

3.1 Dimensions

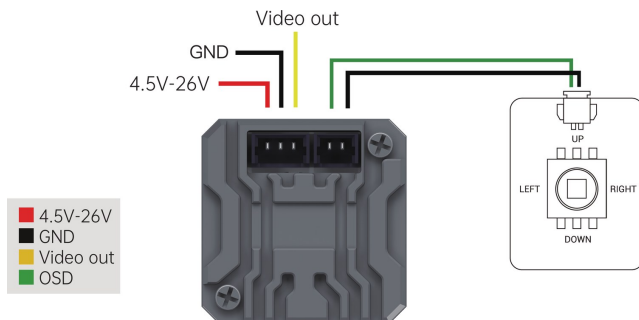


Camera dimensions in mm (side and front view)

4. Connection and Installation

4.1 Connection

The camera has two connectors on the back: a 3-pin connector for power and video output, and a 2-pin connector for the OSD menu board.



Connecting the camera and the OSD menu board (right)

Wire	Signal	Connection
red	4.5V-26V	power supply +4.5–26 V DC (e.g. BEC output of the flight controller or VTX)
black	GND	ground (common with the power supply and the video transmitter)
yellow	Video out	analog video output (CVBS) – to the video input of the flight controller (FC) with OSD or directly to the video transmitter (VTX) input
green	OSD	control wire for the OSD menu board

*** The maximum permissible supply voltage is 26 V. Check the polarity and the wiring of all wires before switching on for the first time.**

4.2 Installing in a drone

- ① Disconnect the drone's flight battery.
- ② Fasten the camera in the frame mount using screws in the holes on the sides of the camera. Do not overtighten the screws.
- ③ Connect the 3-pin cable: power, GND and Video out according to the table in Chapter 4.1.
- ④ Route the cables so that they cannot reach the propellers and are not under tension or rubbing against the edges of the frame.
- ⑤ Connect the battery and check the image in your goggles or on the monitor. Adjust the camera tilt to suit your flying style.

5. Camera OSD Menu

5.1 Operating the menu

The OSD menu is operated with the included menu board, which has a five-way switch *UP / DOWN / LEFT / RIGHT* and a centre button.

- ① Connect the menu board to the camera's 2-pin connector (OSD and GND wires) and power up the camera.
- ② **Short press** the centre button of the menu board to enter the OSD settings. The menu appears in the camera image (in your goggles or on the monitor).
- ③ Use *UP / DOWN* to move between items and *LEFT / RIGHT* to change a value. Items marked with ↵ open a submenu when the centre button is pressed. The *RETURN* item goes back one level.
- ④ Save the settings with *SAVE EXIT* in the main menu.
- ⑤ Disconnect the menu board from the camera once the settings are complete.

5.2 Main menu (MAIN MENU)

AE	↵
WB	↵
DAY&NIGHT	↵
IMAGE ENHANCE	↵
VIDEO SETTING	↵
LANGUAGE	↵
<ENGLISH>	
RESET	
SAVE EXIT	
EXIT	

Item	Function
AE ↵	exposure (Ch. 5.3)
WB ↵	white balance (Ch. 5.4)
DAY&NIGHT ↵	day/night mode (Ch. 5.5)
IMAGE ENHANCE ↵	image enhancement (Ch. 5.6)
VIDEO SETTING ↵	video output (Ch. 5.7)
LANGUAGE	OSD menu language
RESET	restore factory settings
SAVE EXIT	save settings and exit
EXIT	exit the menu

Main menu in the camera image

5.3 AE – exposure

Item	Values	Meaning
BRIGHTNESS	0–30	image brightness
EXPOSURE MODE	GLOBE / BLC	GLOBE – exposure metered from the whole image; BLC – backlight compensation
BLC	1–8	backlight compensation level
ADVANCED	–	advanced exposure settings
RETURN	–	back to the main menu

5.4 WB – white balance

Item	Values	Meaning
MODE	ATW / MWB	ATW – auto tracking white balance; MWB – manual white balance
RGAIN	0–32	red gain
BGAIN	0–32	blue gain
RETURN	–	back to the main menu

5.5 DAY&NIGHT – day/night mode

Item	Values	Meaning
MODE	BW / AUTO / COLOR / EXT	BW – black-and-white image; AUTO – automatic switching; COLOR – colour image; EXT – external mode
RETURN	–	back to the main menu

5.6 IMAGE ENHANCE – image enhancement

Item	Values	Meaning
CONTRAST	MANUAL / AUTO	contrast
SHARPNESS	MANUAL / AUTO	sharpness
COLOR GAIN	MANUAL / AUTO	colour saturation
3DNR	MANUAL / AUTO	3D noise reduction
RETURN	–	back to the main menu

5.7 VIDEO SETTING - video output

Item	Values	Meaning
VIDEO STANDARD	PAL / NTSC	TV system of the video output
HD FORMAT	CVBS	video output format (analog CVBS)
IMAGE RATIO	4:3 / 16:9	image aspect ratio
D-WDR	OPEN / CLOSE	digital WDR on / off
RETURN	-	back to the main menu

❖ **Set the TV system (PAL/NTSC) and the aspect ratio to match your goggles or monitor, otherwise the image may be unstable, black-and-white or distorted.**

6. Maintenance

- Clean the lens only with a dry, soft microfibre cloth or optical lens tissue. Do not use solvents.
- After a crash, check the lens, cables and connectors. Replace damaged cables.
- Regularly check that the camera mounting screws are tight.
- If the camera has been exposed to moisture, do not switch it on until it is completely dry.
- Store the camera in a dry place, away from direct sunlight and heat sources.

7. Troubleshooting

Problem	Possible cause and solution
No image	Check the power supply (4.5–26 V DC), polarity and the Video out wiring. Make sure the video transmitter and goggles are on the same channel.
Image is unstable, rolling or black-and-white	The camera's TV system does not match the receiver. Set <i>VIDEO STANDARD</i> to match your goggles or monitor.
Image is stretched or cropped	The aspect ratio does not match the display. Adjust <i>IMAGE RATIO</i> (4:3 / 16:9).
Image is black-and-white even in good light	Check <i>DAY&NIGHT</i> → <i>MODE</i> ; select <i>COLOR</i> for a permanently colour image.
Interference, lines or noise in the image	Power the camera from a filtered output (BEC), shorten the cables and route them away from power wires and electronic speed controllers (ESC), check the common ground.
Menu does not appear	Check the connection of the menu board to the 2-pin connector and short press the centre button.
Settings are lost after power-off	Exit the menu with <i>SAVE EXIT</i> .
Image is unsatisfactory after adjustments	Restore the factory settings with <i>RESET</i> and save them.

8. Information for the EU and Czech Market

The information in this chapter and in Chapter 9 describes the situation under the law of the European Union and the Czech Republic. If you use the product in another country, **the law of the country in which the product is used shall prevail.**

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@rotorاما.cz
Phone	+420 252 252 098
Website	www.rotorاما.cz

8.2 Product conformity



- 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@rotorاما.cz.
- **Product identification:** the type designation (**Ratel Ultra**, manufacturer code MN01-9000B) is given on the product or its 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. Any voluntary warranty terms of the manufacturer **do not in any way limit** the buyer's rights arising from these regulations.

- 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.