Avatar HD Mini VTX V3

Walksnail – digital video transmitter (VTX) 5.8 GHz
User Manual



Read the entire manual before installation and first power-on. Never power on the transmitter without an antenna connected.

www.rotorama.com

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1. Safety instructions

The Walksnail Avatar HD Mini VTX V3 is an electronic component intended for installation in an FPV drone. Installation requires basic knowledge of electronics, soldering and flight controller setup. If you are unsure, ask an experienced pilot or your dealer for help.

- **Never power on the transmitter without an antenna connected.** Operating without an antenna can permanently damage the transmitter.
- The transmitter gets very hot during operation. **Do not touch it** during operation or shortly after switching it off – risk of burns.
- If the transmitter is powered for a longer time without moving (on a bench, during setup), provide **cooling with a fan**. Once powered on the drone, take off as soon as possible.
- Observe the supply voltage range of **3.1–13 V**. Higher voltage or reverse polarity will destroy the transmitter.
- Carry out all wiring work (soldering, plugging in connectors) only with the **battery disconnected**. After soldering, check that there is no short circuit between adjacent pads.
- The product is not a toy and must be kept away from children. Keep small parts and batteries out of the reach of children.
- Protect the transmitter from water, moisture, dust and mechanical damage. Do not operate it outside the operating temperature range of −20 °C to 40 °C.
- Li-Po and LiHV batteries used to power the drone may catch fire if damaged, short-circuited or charged incorrectly. Charge them under supervision on a non-flammable surface and never use a swollen or damaged battery.
- Do not modify the transmitter in any way (electrically or mechanically) and do not use additional amplifiers. Modifications breach the conditions for operating radio equipment and void the warranty.

2. Product description

2.1 What the product is for

The Walksnail Avatar HD Mini VTX V3 is a small digital video transmitter (VTX) of the **Walksnail Avatar** system in the 5.8 GHz band. Together with a Walksnail Avatar camera, it transmits HD video from the drone to Walksnail Avatar goggles or a receiver. It is powered from 3.1–13 V (1–3S), which makes it suitable mainly for smaller 2–4" drones and, thanks to its low weight, also for 5" racing drones.

The transmitter has **8 GB of internal storage** and records video in 1080p or 720p without the need for a memory card or an action camera. It communicates with the flight controller (FC) via a serial port (UART), so the goggles display the OSD in *Canvas mode*. It can be mounted in a 25.5 × 25.5 mm or a 20 × 20 mm stack.



Walksnail Avatar HD Mini VTX V3

2.2 Package contents and what else you need

Package contents	1× Walksnail Avatar HD Mini VTX V3 video transmitter
Not included	USB cable for the VTX (must be purchased separately), camera, goggles or receiver, battery

For operation you also need:

- a Walksnail Avatar camera – the transmitter is compatible with all cameras of this system,
- a 5.8 GHz antenna with a u.FL connector intended for the Walksnail Avatar system,
- Walksnail Avatar goggles or a receiver (VRX),
- a flight controller (FC) with a free serial port (UART) and a power output within 3.1–13 V,
- a USB cable for the VTX – for firmware updates and access to the internal storage.

2.3 Technical data

Parameter	Value
Model	Walksnail Avatar HD Mini VTX V3
Frequency band	5.725–5.850 GHz
Transmit power (e.i.r.p.)	CE: < 14 dBm FCC: < 27 dBm; SRRC: < 20 dBm; MIC: < 25 dBm
Number of channels	8
Supply voltage	3.1–13 V (1–3S)
Connectors	JST 1.0 mm, 4 pins (power) JST 0.8 mm, 4 pins (USB)
Antenna connector	u.FL
Mounting holes	25.5 × 25.5 mm (M2); 20 × 20 mm (M3)
Dimensions	31.5 × 31.5 × 9.4 mm
Weight	13.4 g
Internal storage	8 GB
Video recording	1080p / 720p
Operating temperature	−20 °C to 40 °C
Supported FC systems	Betaflight, INAV, FETtec, KISS, ArduPilot
OSD	Canvas mode
Latency	22 ms on average

※ In the Czech Republic and the EU, operation is only permitted at a power level corresponding to the CE mode (see Chapter 3.2).

2.4 Connection points



Bottom side of the transmitter with solder pads

Pad	Function
VCC	power supply 3.1–13 V
GND	ground (−)
RX	data input – connect to the TX of the flight controller
TX	data output – connect to the RX of the flight controller

Besides the solder pads, the transmitter can also be connected to the flight controller via the JST 1.0 mm power connector (4 pins). The JST 0.8 mm connector (4 pins) is used for the USB cable. The pad labels are printed directly on the transmitter housing – always follow this marking when wiring.

3. Radio frequencies and legal conditions of use

3.1 The law of the country of operation applies

Regulations (EU) 2019/947 and 2019/945 on unmanned aircraft systems and Directive 2014/53/EU on radio equipment apply in all Member States of the European Union, but national implementing rules differ from country to country – registration portals, minimum pilot age, geographical zones, mandatory insurance, permitted frequency bands and maximum transmit power. The information in this chapter describes the situation in the Czech Republic. If you operate the transmitter in another country, you must follow the regulations of the country in which you fly.

3.2 Frequencies and transmit power in the Czech Republic

The transmitter operates in the **5.725–5.850 GHz** band. In the Czech Republic, operation in the 5725–5875 MHz band without an individual licence is permitted under the general authorisation of the Czech Telecommunication Office (ČTÚ) **VO-R/10** with a maximum transmit power of **25 mW e.i.r.p.**

Manufacturer mode	Max. power (e.i.r.p.)	Use in the CZ
CE	< 14 dBm	permitted
FCC	< 27 dBm	not permitted
SRRC	< 20 dBm	not permitted
MIC	< 25 dBm	not permitted

- In the Czech Republic and the EU, operate the transmitter **in CE mode only**. The user is responsible for the correct region and power setting.
- Under VO-R/10, only the antenna specified by the manufacturer may be used, without additional amplifiers and without electrical or mechanical modifications of the equipment. Operation is not protected against interference.
- Part of the 5.8 GHz band is allocated to the amateur radio service. Higher power may only be used there by a licensed radio amateur within the conditions of that licence.

3.3 Use on a drone

A drone with a camera is subject to Regulation (EU) 2019/947. The operator of a drone equipped with a camera must register (in the Czech Republic with the Civil Aviation Authority) regardless of the weight of the drone. Flying with FPV goggles in the open category is only possible with an observer who stands next to the pilot and keeps the drone in direct visual line of sight. Observe the maximum height of 120 m, the ban on flying over assemblies of people and the restrictions of geographical zones.

4. Installation

4.1 Mounting in the drone

- The transmitter can be mounted in a stack with **25.5 × 25.5 mm** (M2 screws) or **20 × 20 mm** (M3 screws) hole spacing.
- Position it so that air can flow around the housing – the transmitter heats up during operation. Do not cover the cooling fins.
- Place the antenna as far as possible from carbon parts, motors and power cables, ideally vertically outside the frame. Make sure it cannot be hit by a propeller.
- Route the antenna and camera cables without sharp bends and secure them against being pulled out.
- Connect the Walksnail Avatar camera to the camera connector on the transmitter.

Always connect the antenna before powering the transmitter on for the first time.

4.2 Power supply

The supply voltage of the transmitter is **3.1–13 V**. The manufacturer recommends powering from a 1S–3S battery; if you power the transmitter from the flight controller's voltage regulator (BEC), the BEC must supply sufficient current.

Battery	Fully charged	Transmitter supply
1S Li-Po / LiHV	4.20 V / 4.35 V	within range
2S Li-Po / LiHV	8.4 V / 8.7 V	within range
3S Li-Po	12.6 V	within range
3S LiHV	13.05 V	**exceeds 13 V** – use a BEC

Never connect a 4S or higher battery directly – the transmitter would be destroyed. On 4S and larger drones, power the transmitter from a BEC with an output within 3.1–13 V.

4.3 Connecting to the flight controller (FC)

Connect the transmitter to a free serial port (UART) of the flight controller. The data wires are crossed:

Transmitter (VTX)	Flight controller (FC)
TX	RX of the selected UART
RX	TX of the selected UART
GND	GND
VCC	power output 3.1–13 V (1–3S battery or BEC)

5. Getting started

5.1 Linking with the goggles

Before first use, the transmitter must be linked with Walksnail Avatar goggles or a receiver. The procedure on the goggles side is described in their manual.

① Power on the transmitter and the goggles.

② Wait for the transmitter to initialise – the green LED flashes and the status icon appears in the goggles.

③ Press the link button on the transmitter and on the goggles. The transmitter enters the pairing state – the LED lights red and the goggles beep.

④ After a successful link, the transmitter LED lights solid green, the beeping stops and the image appears in the goggles.

5.2 OSD setup in Betaflight

The UART connection allows the transmitter to obtain information from the flight controller and display the OSD in the goggles. The procedure is described for Betaflight Configurator; for other FC systems (INAV, KISS, ArduPilot...) follow their documentation.

① Connect the flight controller to Betaflight Configurator.

② On the *Ports* tab, enable the *Configuration/MSP* switch for the UART to which the transmitter is connected. In newer Betaflight versions, also select *VTX (MSP + DisplayPort)* in the *Peripherals* column. Click *Save*.

③ On the *CLI* tab, enter the commands for your Betaflight version (see below) and store them with the *save* command.

▶ Newer Betaflight versions (with the VTX (MSP + DisplayPort) option on the Ports tab)

set osd_displayport_device = MSP
set vcd_video_system = HD
save

▶ Older Betaflight versions

set osd_displayport_device = MSP
set displayport_msp_serial = Y
save

The value *Y* is one less than the number of the UART used (e.g. Y = 2 for UART3).

5.3 Video recording and internal storage

The transmitter records video to its 8 GB internal storage in 1080p or 720p. When connected via the USB cable, the internal storage behaves as a USB drive – the transmitter must be powered at the same time. This way you can download recordings and copy firmware files.

5.4 Firmware update

Download firmware only from the manufacturer's official website (www.caddxfpv.com). The file for the transmitter is named *Avatar_Sky_X.X.X.img*, the file for the goggles *Avatar_Gnd_X.X.X.img*. Do not rename the file.

① Connect the powered transmitter to a computer with the USB cable. Delete any old firmware file from the root directory of the internal storage and copy the new *Avatar_Sky_X.X.X.img* file there.

② Connect the power supply and wait for the transmitter to initialise.

③ Press and hold the link button on the transmitter for about 8 seconds. The LED starts flashing red – the update is in progress. **Do not switch the transmitter off during the update.**

④ After a successful update, the transmitter LED flashes green.

The goggles are updated in a similar way – follow the goggles manual. Provide fan cooling for the transmitter during the update.

6. Operation and LED indication

▶ Operating rules

- Always check that the antenna is connected before powering on.
- When standby mode is enabled, the transmitter transmits at reduced power. Before take-off, Arm the drone (switch the motors on) or disable standby mode.
- The transmitter heats up quickly – after powering on at ground level, take off as soon as possible. Use a fan for longer bench work.
- When overheating, the transmitter signals this by alternately flashing red and green LEDs – switch it off and let it cool down.
- Before flight, check the mounting of the transmitter, antenna and camera and make sure the image in the goggles is stable.
- Before flight, insert a **fully charged** battery into the drone. End the flight at 3.5 V per cell at the latest (e.g. 10.5 V for 3S).

▶ LED indication

Transmitter status	LED
Pairing state or no firmware detected	solid red
Firmware update	rapidly flashing red
Wireless link established, image normal	solid green
Wireless link not established	rapidly flashing green
Camera not detected	slowly flashing green
Transmitter overheating	alternately flashing red and green

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- After a crash, check the housing, the antenna, the antenna connector and the camera cable. Replace a damaged antenna – operating with a damaged antenna reduces range and may damage the transmitter.
- Remove dirt from the cooling fins with a dry brush or compressed air. Do not use water or solvents.
- The u.FL connector is fragile – do not connect and disconnect the antenna repeatedly without need and do not pull on the cable.
- Store in a dry place at room temperature. Store drone batteries at 3.8 V per cell (11.4 V for 3S).

7.2 Troubleshooting

Problem	Possible cause and solution
Transmitter does not light up	Check the power supply (3.1–13 V), the polarity and the wiring of the connector or the VCC/GND pads.
LED lights solid red	The transmitter is in the pairing state or has not found firmware. Link it with the goggles (Ch. 5.1) or reload the firmware (Ch. 5.4).
LED flashes green rapidly, no image in the goggles	No link established. Check the antenna, that the goggles are on, and the linking.
LED flashes green slowly	Camera not detected. Check the camera cable and its connection.
LED alternately flashes red and green	Overheating. Switch the transmitter off, let it cool down and ensure airflow.
No OSD in the goggles	Check the crossed TX/RX wiring, the UART setting on the *Ports* tab and the CLI commands (Ch. 5.2).
Short range, video dropouts	Check the antenna and its position, CE mode/standby mode and interference from other 5.8 GHz devices – select a different channel.

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 (Walksnail Avatar HD Mini VTX V3) is given on the product or on 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.

- 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.