ROTORAMA

Avatar HD VTX V2

Walksnail · 32GB · Dual antenna
Digital video transmitter (VTX) for FPV drones



Read the entire manual carefully before installation and first power-up.
Never power the transmitter without the antennas connected.

Rotorama, s.r.o. · www.rotorama.com · info@rotorama.cz

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1. Safety instructions

1.1 Before you start

The Walksnail Avatar HD VTX V2 is a digital video transmitter (VTX) designed to be built into an FPV drone. Together with a camera and goggles of the Walksnail Avatar system, it transmits the camera image to the pilot's goggles and at the same time records it to the built-in storage. Installation requires soldering and basic knowledge of FPV drone electronics.

- This product is not a toy. It is not intended for children or persons without experience with electronics and building FPV drones.
- Before installation, also read the manuals for the camera, goggles and flight controller (FC) you use.
- When working on the drone, always disconnect the battery and remove the propellers. Tests on the bench may cause the motors to spin up unexpectedly.

1.2 Power supply and installation

- Power the transmitter only with a voltage in the range of **6–25.2 V** (2S–6S Li-Po battery). A higher voltage will permanently damage the transmitter.
- When powering from a **6S** battery, the manufacturer recommends soldering a capacitor to the power input.
- Observe the polarity and wire assignment according to Chapter 4.2. Swapping the power and data wires may damage both the transmitter and the flight controller (FC).
- Solder only with the battery disconnected. Insulate the joints and route the cables away from the propellers and sharp frame edges.
- After wiring and before connecting the battery for the first time, check for a short circuit between power and ground, ideally with a multimeter or through a fuse (smoke stopper).

1.3 Antennas, heat and operating environment

- **Always connect both antennas before powering on.** Operation without antennas may damage the transmitter circuits.
- The transmitter heats up during operation. Ensure airflow, do not cover the cooling fins and let the housing cool down before touching it.
- Do not run the transmitter on the bench for long without airflow. On the ground, use standby mode (Chapter 5.4).
- Operating temperature according to the manufacturer: **−20 °C to 40 °C**. Protect the transmitter from moisture, water, dust and impacts.
- If you use other 5.8 GHz devices at the same time, select a different channel for the transmitter so that they do not interfere with each other.

2. Product description

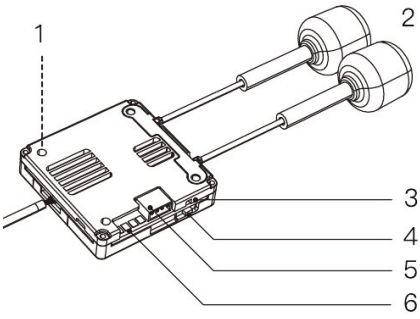
2.1 Package contents and what else you need

Package contents	1× Walksnail Avatar HD VTX V2 32GB (Dual antenna) video transmitter
Manufacturer code	WN01-FP002
Not included	Walksnail Avatar camera, Walksnail Avatar goggles or video receiver, battery, flight controller (FC)

For operation you will also need:

- a **Walksnail Avatar system camera**, which connects to the transmitter with a coaxial cable,
- **Walksnail Avatar goggles or video receiver** to receive the image,
- **two 5.8 GHz antennas with IPEX connectors** – the transmitter has two antenna connectors and both antennas must be connected,
- an FPV drone with a flight controller (FC) and a free UART port (for the OSD in the goggles),
- a 2S–6S Li-Po battery that powers the drone and the transmitter.

2.2 Parts description



Avatar HD VTX V2 (Dual antenna) transmitter; the cable on the left leads to the camera

① Mounting holes with 25.5 × 25.5 mm spacing for M2 screws

② Antennas (2×, IPEX connector)

③ LED indicator

④ Link button

⑤ Power connector (JST1.0, 4 pins)

⑥ Power solder pads – a backup connection option instead of the connector

The transmitter also has mounting holes with 20 × 20 mm spacing for smaller frames. The JST0.8 connector (6 pins) is used to connect the USB cable.

2.3 Technical data

Data given by the manufacturer on the product page of the transmitter.

Parameter	Value
Model	Avatar V2 module (Dual Antenna)
Manufacturer code	WN01-FP002
Frequency band	5.725–5.850 GHz
Transmit power (e.i.r.p.)	CE: <14 dBm (EU mode) FCC: <30 dBm; SRRC: <20 dBm; MIC: <25 dBm (outside the EU only)
Number of channels	8
Supply voltage	6–25.2 V (2S–6S), with TVS protection
Connectors	JST1.0, 4 pins (power and UART) JST0.8, 6 pins (USB)
Antenna connectors	2× IPEX
Mounting holes	25.5 × 25.5 mm; 20 × 20 mm
Dimensions	33 × 33 × 10.5 mm
Weight	15.4 g
Built-in storage	32 GB
Video recording	1080p / 720p
Latency	22 ms on average
OSD	Canvas mode
Supported FC firmware	Betaflight, INAV, FETtec, ArduPilot, KISS
Operating temperature	−20 °C to 40 °C

3. Legal conditions of operation in the Czech Republic and the EU

3.1 The law of the country of operation applies

Regulations (EU) 2019/947 and 2019/945 on unmanned aircraft and Directive 2014/53/EU on radio equipment apply in all member states of the European Union, but national implementing rules differ from state to state – in particular the permitted frequency bands and maximum transmit powers, operator registration, geographical zones and compulsory insurance. 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 operate it.

3.2 Radio frequencies and transmit power

The transmitter operates in the **5.725–5.850 GHz** band. For the EU market (CE mode), the manufacturer states a maximum transmit power of **<14 dBm e.i.r.p.** In the Czech Republic, the 5725–5875 MHz band may be used under the general authorisation of the Czech Telecommunication Office (ČTÚ) No. VO-R/10/05.2025-5, Art. 3(2)(k), with a limit of **25 mW e.i.r.p.**, without entitlement to protection against interference.

- In the EU, operate the transmitter **in CE mode only** and only on the channels listed for CE in Chapter 5.3.
- The FCC, SRRC and MIC power modes and the FCC mode unlock procedure (so-called FCC unlock), which the manufacturer offers for download, are intended for other regions. **Do not use them** in the EU.
- Use antennas designed for the 5.8 GHz band. Do not add amplifiers or other modifications that would increase the transmitted power.
- The operator is responsible for the transmitter settings and compliance with the limits. Outside the Czech Republic, the frequencies and limits of the respective country apply.

3.3 Flying a drone with FPV goggles

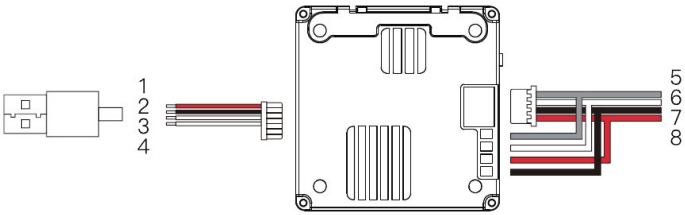
The transmitter itself is not an unmanned aircraft, but the drone you build it into is subject to Regulation (EU) 2019/947. In the open category, the drone must be kept within visual line of sight. If you fly with FPV goggles, an **unmanned aircraft observer** who watches the drone directly with their own eyes must stand next to you. A drone with a camera is subject to operator registration regardless of its weight. Current rules in the Czech Republic are published by the Civil Aviation Authority (www.caa.gov.cz).

4. Installation and wiring

4.1 Mounting in the frame

- Mount the transmitter in the frame using the mounting holes with **25.5 × 25.5 mm** or **20 × 20 mm** spacing, depending on the frame.
- Position it so that air flows around it and the LED indicator and the link button remain accessible.
- Route the antennas as far as possible from carbon parts of the frame and from the propellers, ideally vertically or angled backwards. The two antennas should point in different directions.
- Do not bend the camera cable at sharp angles and secure it against being pulled out.

4.2 Connector wiring



Left: USB cable (JST0.8 connector); right: power cable (JST1.0 connector, 4 pins)

No.	USB cable	No.	Power cable (4 pins)
1	USB 5V (red)	5	UART TX (grey) → RX on the FC
2	USB GND (black)	6	UART RX (white) → TX on the FC
3	USB DM (white)	7	GND (black)
4	USB DP (white)	8	Power input 6–25.2 V (red)

When powering from a 6S battery, the manufacturer recommends soldering a capacitor to the power input. Instead of the connector, power can also be soldered to the solder pads ⑥.

4.3 Connecting to the flight controller (FC)

The UART connection allows the transmitter to obtain data from the flight controller (FC) and display it in the goggles as an OSD.

① Connect the red wire (8) to power. The transmitter can be powered directly from the battery if the flight controller (FC) provides the battery voltage, or from an output that supplies a voltage in the range of 6–25.2 V.

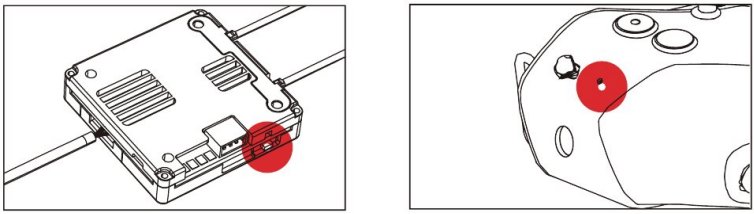
② Connect the black wire (7) to GND.

③ Connect the grey UART TX wire (5) to RX of the selected UART on the flight controller (FC).

④ Connect the white UART RX wire (6) to TX of the same UART.

5. Setup

5.1 Linking with the goggles



Link button on the transmitter (left) and on the goggles (right)

① Connect power to the transmitter and switch on the goggles.

② Briefly press the link button on both the transmitter and the goggles. The transmitter enters linking mode – the indicator lights red and the goggles beep repeatedly.

③ After successful linking, the transmitter indicator lights solid green, the goggles stop beeping and display the image.

5.2 Flight controller setup in Betaflight

The procedure is shown using Betaflight Configurator and port UART1 as an example. Use the UART to which you have actually connected the transmitter.

▶ Newer Betaflight versions (the Ports tab offers VTX (MSP+Displayport))

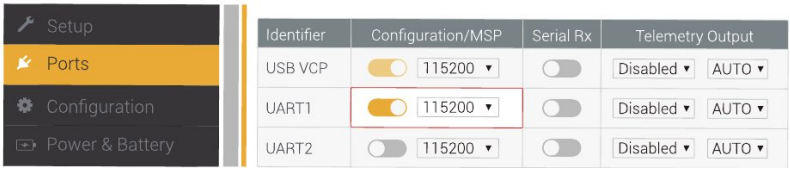


Ports tab – MSP enabled and VTX (MSP+Displayport) peripheral on UART1

① On the *Ports* tab, enable *Configuration/MSP* for the selected UART, select *VTX (MSP+Displayport)* in the *Peripherals* column and click *Save*.

② On the *CLI* tab, enter the commands:
set osd_displayport_device = MSP
set vcd_video_system = HD
save

▶ Older Betaflight versions (VTX (MSP+Displayport) option missing)



Ports tab – MSP enabled on UART1

① On the *Ports* tab, enable *Configuration/MSP* for the selected UART and click *Save*.

② On the *CLI* tab, enter the commands:
set osd_displayport_device = MSP
set displayport_msp_serial = Y (Y is the UART number minus one, e.g. Y = 2 for UART3)
save

The transmitter also supports INAV, FETtec, ArduPilot and KISS firmware. For the setup procedure, see the documentation of the respective firmware.

5.3 Operating channels

Centre frequencies of the channels in MHz according to the manufacturer. A dash means that the channel is not available in the given mode.

Mode	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CE / SRRC	5735	5770	5805	–	–	–	–	5839
FCC	5660	5695	5735	5770	5805	5878	5914	5839
MIC	5660	5700	–	–	–	–	–	5745

In the EU, use only the CE mode channels (CH1, CH2, CH3 and CH8). Some FCC and MIC mode channels lie outside the band permitted in the EU.

5.4 Standby mode

When standby mode is enabled, the transmit power is limited to **10 mW**. Before take-off, therefore, Arm (start the motors) the flight controller or switch standby mode off – otherwise the video link will only have a limited range.

5.5 Firmware upgrade

Download the firmware from the manufacturer's website (www.caddxfpv.com, Download Center section). The file for the transmitter is named **Avatar_Sky_X.X.X.img** – do not change the file name.

① Connect the transmitter to power and to a computer with the USB cable. The transmitter appears as a storage device (USB disk).

② Copy the firmware file to the root directory of the transmitter's disk. Delete older firmware files from the disk. Wait until the transmitter has fully started.

③ Hold the link button on the transmitter for about 8 seconds and release it when the indicator goes out. The transmitter restarts and the upgrade begins: the indicator flashes red, then lights solid red and finally goes out. The upgrade takes about 20 seconds.

④ After a successful upgrade, the indicator flashes green.

Do not disconnect the transmitter from power during the upgrade. If the indicator stays red, the transmitter did not find the firmware file or the file is invalid – check it and repeat the procedure.

Walksnail Avatar goggles are upgraded separately according to their manual. For correct operation, keep the firmware of the transmitter and the goggles at mutually compatible versions as instructed by the manufacturer.

6. Status indication

6.1 Transmitter indicator

Status	Transmitter indicator
Linking	solid red
Firmware upgrade	red, flashing rapidly
Wireless connection established, image normal	solid green
Wireless connection not established	green, flashing rapidly
Wireless connection normal, image abnormal	green, flashing slowly

6.2 Goggles buzzer indication

Status	Goggles sound
Linking	Beep... beep... beep...
Firmware upgrade	Beep..... beep..... beep..... beeeep
Upgrade failed	Beep.. beep.. beep..

7. Maintenance and troubleshooting

7.1 Before every flight

- Check that both antennas are firmly connected and undamaged.
- Check the camera cable and the power cable – they must not be pinched or chafed.
- Verify that you have the image and OSD in the goggles and that the transmitter uses a channel permitted in the country of operation.
- Always insert a **fully charged** battery into the drone (Li-Po 4.20 V/cell).

7.2 Maintenance and storage

- Keep the transmitter clean and dry. Remove dust from the cooling fins with a dry brush.
- After a crash, check the housing, the IPEX antenna connectors and the cables. Replace a damaged antenna before powering on again.
- IPEX connectors are fragile – disconnect the antennas carefully, straight upwards, ideally with a suitable tool.
- Store in a dry place, out of the reach of children, at a temperature within the operating temperature range.

7.3 Troubleshooting

Problem	Possible cause and solution
The goggles show no image, the indicator flashes green rapidly	The transmitter is not linked with the goggles. Link them according to Chapter 5.1 and check that the transmitter and goggles use the same channel.
The indicator flashes green slowly	The connection works, but the camera image is missing. Check the connection and condition of the camera's coaxial cable.
No OSD in the goggles	Check the UART wiring (TX to RX and RX to TX) and the settings according to Chapter 5.2.
Short video range	Standby mode (10 mW) is enabled – Arm or switch the mode off. Check the antennas and their placement.
The indicator stays red after an upgrade	The firmware was not found or is invalid. Check the file name and location and repeat the upgrade.
The transmitter does not power on	Check the supply voltage (6–25.2 V), the polarity and the joints of the power cable.

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 product is identified by the type designation Avatar V2 module (Dual Antenna) and the manufacturer code WN01-FP002.

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.