Avatar HD VTX V2

Walksnail digital HD video transmitter (VTX)
User manual · 32 GB version



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

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1. Safety instructions

The Walksnail Avatar HD VTX V2 is a digital video transmitter (VTX) designed to be installed in an FPV drone or another radio-controlled model. Incorrect installation or handling may damage the transmitter, the drone and other equipment. Follow the instructions below.

- **Install the antenna before every power-on.** Operating without an antenna may damage the components of the transmitter.
- The supply voltage must be within **6–25.2 V**. Observe the correct power polarity – reversed wires may damage the transmitter permanently.
- When using a **6S** battery, the manufacturer recommends soldering a capacitor at the power input.
- Solder only with the battery disconnected. Make sure that solder or wires do not touch neighbouring pads and cause a short circuit.
- The transmitter heats up during operation. Do not touch the heat sink while it is running and make sure air can flow around the transmitter. Keep long operation on the bench without airflow to the necessary minimum.
- Transmitter powered from the drone's Li-Po / LiHV battery: follow the battery manufacturer's instructions. A fully charged cell has 4.20 V (Li-Po) or 4.35 V (LiHV); end the flight at 3.5 V/cell and store the battery at 3.8 V/cell.
- This product is not a toy. Keep it out of the reach of children.
- The transmitter is a radio device. Before use, familiarise yourself with the regulations for radio equipment and drone operation in the country where you use it (chapter 3).

2. Product description

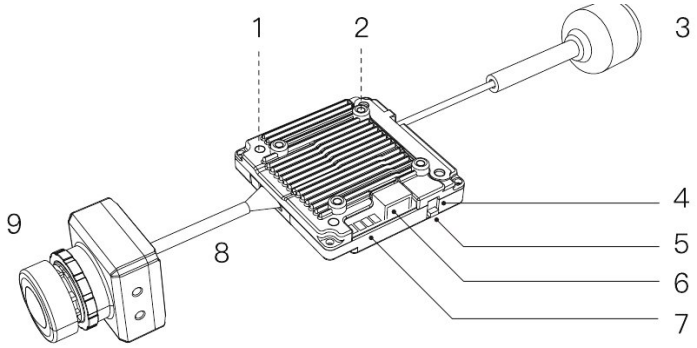
The Avatar HD VTX V2 (type designation **Avatar V2 module**) is the transmitter module of the Walksnail Avatar digital HD video transmission system. Compared with the first version, it has 20×20 mm mounting holes in addition to the original 25×25 mm holes, an updated PCB and shell design, a relocated linking button and solder pads for power. Enhanced TVS protection protects the transmitter against voltage spikes. The 32 GB built-in storage records 1080p or 720p video directly in the transmitter.

2.1 Package contents and what else you need

Package contents	1× Walksnail Avatar HD VTX V2 video transmitter (32 GB)
Not included	Walksnail Avatar camera with coaxial cable, antenna (IPEX connector), USB cable, Walksnail Avatar goggles or receiver

For operation you also need a Walksnail Avatar camera, a 5.8 GHz antenna with an IPEX (u.FL) connector, Walksnail Avatar goggles or a receiver, and a drone flight controller (FC) with a free UART port. A USB cable is needed for the firmware upgrade.

2.2 Parts description



Transmitter with camera and antenna connected (camera and antenna are not included)

1	25×25 mm holes	6	Power port
2	20×20 mm holes	7	Power pad
3	Antenna (not included)	8	Camera coaxial cable
4	LED indicator	9	Camera (not included)
5	Link button		

2.3 Specifications

Parameter	Value
Model	Avatar V2 module
Communication frequency	5.725–5.850 GHz
Transmitter power (EIRP)	CE: < 14 dBm
Channels	8 (4 in CE mode, see chapter 6.2)
I/O interface	JST 1.0 mm 4-pin (power cable), JST 0.8 mm 6-pin (USB)
Mounting holes	25.5×25.5 mm; 20×20 mm
Dimensions	33 × 33 × 10.5 mm
Weight	17.6 g
Storage	32 GB
Recording	1080p / 720p
Wide power input	6–25.2 V
Operating temperature	−20 °C to 40 °C
Supported FC systems	Betaflight, INAV, FETtec, KISS, ArduPilot
OSD	Canvas mode
Latency	average delay 22 ms
Antenna	1× (IPEX connector)

※ Transmitter power values for other regions (FCC, SRRC, MIC) are stated by the manufacturer for markets outside the EU and do not apply in the EU.

3. Legal conditions of operation

3.1 The law of the country of operation applies

European Union regulations on radio equipment and drones apply in all member states, but national implementing regulations differ from country to country – in particular permitted frequency bands, maximum transmitter power, drone operator registration and operating rules. 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 use it.

3.2 Radio frequencies and transmitter power

The transmitter operates in the **5.725–5.850 GHz** frequency band. The manufacturer states a maximum transmitter power in CE mode of **< 14 dBm EIRP**.

Band in the Czech Republic	Limit	Regulation
5725–5875 MHz	25 mW e.i.r.p.	VO-R/10/05.2025-5, Art. 3, band k

- In the Czech Republic and the EU, use the transmitter only in **CE mode** and only on the channels listed for CE mode in chapter 6.2.
- The FCC mode channels (5660, 5695, 5878 and 5914 MHz) are **outside the band permitted in the Czech Republic** and must not be used there. In some countries outside the EU they require an amateur radio licence.
- The user is responsible for setting the region, channel and transmitter power. Outside the Czech Republic, the limits of the respective country apply.

3.3 Operation in a drone

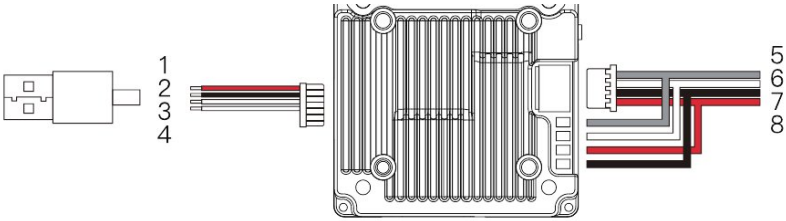
The transmitter is part of the drone in which it is installed. Drone operation is governed by Regulations (EU) 2019/945 and 2019/947 and by the national regulations of the country of operation. A drone with a camera requires operator registration regardless of its weight. When flying with FPV goggles, an observer must stand next to the pilot and keep the drone within direct visual line of sight.

4. Installation and wiring

4.1 Mounting

- Mount the transmitter in the frame using the **25×25 mm** or **20×20 mm** mounting holes, depending on the frame design.
- Position it so that air can flow around the heat sink and it is not exposed to direct impact.
- Route the antenna as far as possible from carbon frame parts and other antennas. Before the first power-on, check that the antenna is firmly connected.
- Do not bend the camera coaxial cable at a sharp angle and secure it against being pulled out.

4.2 Connections



Connection of the USB cable (1–4) and the power cable (5–8)

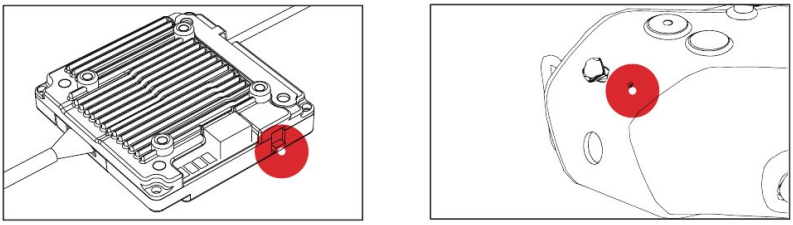
No.	Wire	Function
1	USB-5V	USB 5 V power (red)
2	USB-GND	USB ground (black)
3	USB-DM	USB data D− (white)
4	USB-DP	USB data D+ (white)
5	UART TX	connects to flight controller RX (grey)
6	UART RX	connects to flight controller TX (white)
7	GND	ground (black)
8	Power input	power input 6–25.2 V* (red)

* When using 6S batteries, it is recommended to solder capacitors at the power input.

Instead of using the power connector, power can be soldered directly to the power pads (part 7 in chapter 2.2).

5. Getting started

5.1 Linking with the goggles



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

① Connect the power of the VTX and the goggles.

② Short press the VTX and goggles linking buttons respectively (as shown in the picture). When the VTX enters the pairing state, the indicator light turns red and the goggles beep “di... di... di...”.

③ After the link is successful, the indicator light on the VTX turns solid green, the beeping sound on the goggles stops and the image is displayed.

5.2 UART and OSD setup in Betaflight

The UART function enables the VTX to communicate with the flight controller (FC), allowing the VTX to obtain flight controller information (e.g. for the OSD). Betaflight Configurator is used as an example to introduce the UART setting method.

▶ Procedure for older Betaflight versions

① Solder the white and grey wires of the 4-pin cable to the flight controller (see chapter 4.2).

② Connect the flight controller to Betaflight Configurator, open the *Ports* tab, enable *Configuration/MSP* on the corresponding UART port (UART1 in the figure) and click *Save*.



Ports tab – MSP enabled on UART1

③ Open the *CLI* tab and enter the commands:
set osd_displayport_device = MSP
set displayport_msp_serial = Y (where Y is one less than the number of the serial port, e.g. Y = 2 for UART3)
save



CLI tab

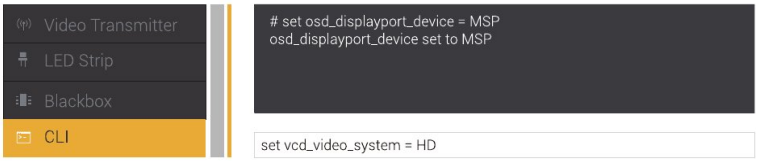
▶ Procedure for Betaflight 4.4

① In the *Ports* tab, enable *Configuration/MSP* on the corresponding UART port (UART1 in the figure), select *VTX (MSP+Displayport)* in the *Peripherals* column and click *Save*.



Ports tab – MSP and VTX (MSP+Displayport)

② Open the *CLI* tab and enter the commands:
set osd_displayport_device = MSP
set vcd_video_system = HD
save



CLI tab

5.3 Firmware upgrade

Download the upgrade firmware from the manufacturer's official website. **Avatar_Sky_X.X.X.img** is the VTX file. Copy it to the VTX USB disk (the VTX needs power supply). Be careful not to change the file name.
Download: www.caddxfpv.com/pages/download-center

① Copy the upgrade file to the root directory of the VTX USB disk, connect the power supply and wait for the device to start up. If there are old firmware files, delete them.

② Press and hold the VTX linking button for 8 seconds and release it after the indicator light goes out. The VTX automatically restarts and enters the upgrade state; the indicator light changes from blinking red to solid red and then turns off. The upgrade takes about 20 seconds. **Do not power off during the upgrade!** If the indicator continues to light up red, the firmware cannot be detected or is wrong – check the firmware file.

③ After the upgrade is successful, the VTX indicator blinks green.

6. Operation

6.1 Status indication

Goggles buzzer – status	Signal
Link state	DI... DI... DI...
Upgrade firmware	DI..... DI..... DI..... DI————
Upgrade failed	DI.. DI.. DI..

VTX indicator – status	Signal
Link state	steady red light
Upgrade firmware	red light rapidly flashes
Wireless connection, image output is normal	steady green light
Wireless not connected	green light rapidly flashes
Wireless connection is normal, but the image is abnormal	green light slowly flashes

6.2 Operating channels

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

In the Czech Republic and the EU, use CE mode only (channels CH1, CH2, CH3 and CH8). Make sure you fully understand and abide by local laws and regulations before use (chapter 3).

6.3 Precautions

- Before powering on, install all antennas to avoid damage to components.
- When standby mode is turned on, the transmitter power is limited to 10 mW. Before taking off, you need to Arm the flight controller (unlock the flight control) or turn off standby mode.
- If you use the VTX with other 5.8 GHz devices at the same time, choose a different channel.

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- After flying, check the transmitter mounting, the condition of the antenna and its connector, and the camera coaxial cable.
- Keep connectors and solder joints clean and dry; moisture and conductive dirt (e.g. carbon dust) may cause a short circuit.
- Store the transmitter in a dry place, away from direct sunlight and out of the reach of children.

7.2 Troubleshooting

Problem	Possible cause and solution
No image in the goggles, indicator rapidly flashes green	No wireless connection. Link the transmitter with the goggles (chapter 5.1).
Indicator slowly flashes green	The connection is normal but the image is abnormal. Check the camera and coaxial cable connection.
No OSD in the goggles	Check the UART wiring (VTX TX to FC RX and vice versa) and the settings in chapter 5.2.
Short range right after take-off	Standby mode is on (10 mW). Arm the drone or turn standby mode off. Check the antenna.
Indicator stays red after the upgrade	The firmware was not found or is wrong. Check the file name and location (chapter 5.3).
Image interference	Other 5.8 GHz devices nearby – choose 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 (Avatar V2 module) 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.