Avatar HD Mini 1S Lite Kit

Walksnail – digital FPV camera and video transmitter (VTX)

User Manual



Read the entire manual before first use, especially the safety instructions in Chapter 1. Never power on the video transmitter without an antenna connected.

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1. Safety Instructions

1.1 General rules

- The product is designed to be installed in an FPV drone or model aircraft. Installation and soldering should be carried out by a person experienced with electronics.
- **Never power on the video transmitter (VTX) without an antenna connected** – the transmitter stage may be damaged.
- Before connecting power, check the polarity and correct wiring of all wires. Reversed wires or overvoltage will permanently damage the device.
- The supply voltage must not exceed the range given in the specification (Chapter 2.2).
- The VTX gets very hot during operation. Do not touch it while it is running, ensure airflow and use a fan when it runs on the ground for a longer time.
- Disconnect the battery when working on the drone. If the drone has to be connected to a battery during setup, remove the propellers.
- Protect the product from moisture, dust, conductive objects and mechanical damage. Do not point the camera directly at the sun.
- The electronics are sensitive to electrostatic discharge. Handle the boards by their edges only.
- This product is not a toy. Keep it out of the reach of children.

1.2 Manufacturer's precautions

① Before powering on, please install all antennas to avoid damage to components.

② When the standby mode is turned on, the power is limited to 10 mW. Before taking off, you need to Arm the flight controller (start the motors) or turn off the standby mode.

③ If you use it with other 5.8 GHz devices at the same time, please choose a different channel.

④ Due to high heat, please take off as soon as possible after power on, and avoid touching the device during operation to avoid being scalded.

⑤ When the VTX is stationary for a long time, please use a fan to assist cooling.

2. Product Description

The Walksnail Avatar HD Mini 1S Lite Kit is a lightweight digital FPV video system designed primarily for small drones (Tinywhoop). The kit contains a video transmitter (VTX) with built-in storage for recording, the Avatar Lite camera and an antenna. The video is received by Walksnail Avatar goggles or a Walksnail Avatar receiver, which are **not included**. The system supports Canvas mode OSD, which displays data from the flight controller directly in the image.

2.1 Package contents

- 1× video transmitter (VTX) with Avatar Lite camera and antenna
- 1× power cable
- 1× USB cable
- 1× set of screws
- 1× set of rubber dampers (soft mount)

2.2 Video transmitter (VTX) specification

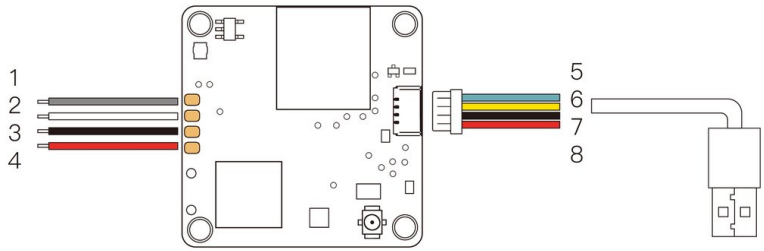
Parameter	Value
Model	Avatar Mini 1S module (V3 board)
Communication frequency	5.725–5.850 GHz
Transmitter power (EIRP)	CE: <14 dBm; FCC: <27 dBm; SRRC: <20 dBm; MIC: <25 dBm
Channels	8
Power input	3.1–13 V (1S–3S LiPo or BEC)
I/O interface	JST1.0 ×4 (power in), HSG0.8 ×4 (USB)
Mounting holes	25.5 × 25.5 mm
Board dimensions	30 × 30 mm
Weight	VTX 5.1 g; complete kit 7.8 g
Storage and recording	8 GB; 1080p / 720p
Bitrate	25 Mbps / 50 Mbps
OSD	Canvas mode
Latency	average delay 22 ms
Supported FC systems	Betaflight, INAV, FETtec, KISS, ArduPilot
Antenna connector	IPEX
Operating temperature	−20 °C to 40 °C

2.3 Camera parameters

Parameter	Value
Model	Avatar Lite camera
Image sensor	1/2.7"
Resolution	1080p/60 fps, 720p/120 fps, 720p/60 fps
Ratio	16:9, 4:3
Lens	2.1 mm
Field of view (FOV)	170°
Aperture	F2.0
Shutter	rolling shutter
Min. illumination	0.001 lx
Weight	1.9 g
Dimensions	14 × 14 × 16 mm

3. Connection

3.1 Wiring diagram



Wires 1–4: power and UART to the flight controller; 5–8: USB cable

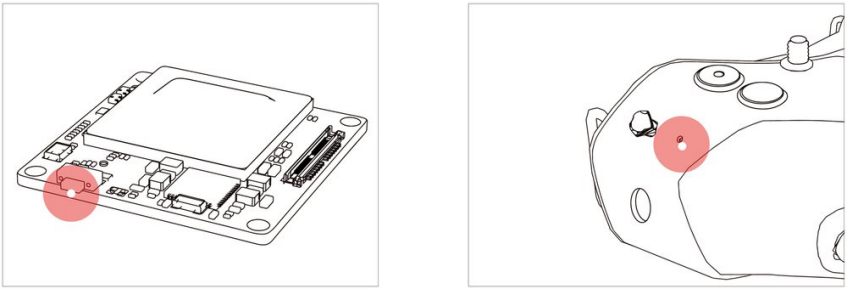
No.	Wire	Function
1	grey – UART TX	connects to flight controller RX
2	white – UART RX	connects to flight controller TX
3	black – GND	power ground
4	red – power	3.1–13 V
5–8	USB-DP, USB-DN, USB-GND, USB-5V	USB cable connector

3.2 Power supply

- The power input range of the VTX (V3 board) is **3.1–13 V**. The manufacturer recommends powering it from a 1S–3S battery.
- When powered from the flight controller's BEC, the BEC must ensure sufficient power supply. Power according to the manufacturer: **5 V at 1.5 A** (80 °C), **12 V at 0.7 A** (80 °C).
- A fully charged 3S LiPo battery has 12.6 V (4.20 V/cell), a 3S LiHV battery 13.05 V (4.35 V/cell) – both are within the permitted range.

❊ The manufacturer's original guide also describes the older V2 board with a range of only 3.1–5 V. Rotorama supplies this kit with the V3 board. If you are not sure about the board version, power the VTX from a 5 V BEC.

4. Linking with the Goggles



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

① Connect the power of the VTX and the goggles.

② Wait for the VTX to initialize: the green light flashes and the status icon appears in the goggles.

③ Press the link button of the VTX and of the goggles respectively (as shown in the picture). When the VTX enters the pairing state, the indicator light turns red and the goggles beep repeatedly (DI… DI… DI…).

④ After the link is successful, the indicator light on the VTX turns solid green, the beeping of the goggles stops and the image is displayed.

5. Flight Controller Setup (UART)

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

First solder the white and grey wires of the power cable to the flight controller (see Chapter 3.1): grey (VTX TX) to RX and white (VTX RX) to TX of the selected UART.

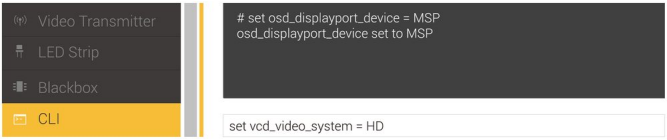
5.1 Newer Betaflight versions

Applies to Betaflight versions that offer the *VTX (MSP+Displayport)* option in the *Peripherals* column of the *Ports* tab.



Ports tab – example setting for UART1

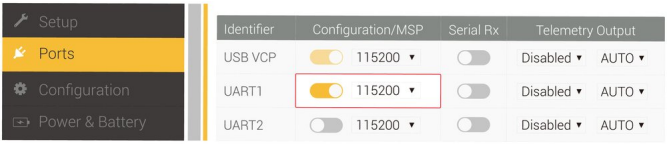
① In the *Ports* tab, open the corresponding UART port (UART1 in the figure as an example): check the *Configuration/MSP* switch, select *VTX (MSP+Displayport)* in the *Peripherals* column and click *Save*.



CLI tab

② Open the *CLI* command line and enter:
set osd_displayport_device = MSP
set vcd_video_system = HD
save

5.2 Older Betaflight versions



Ports tab – example setting for UART1

① Connect the flight controller to Betaflight Configurator, open the corresponding UART port in the *Ports* tab (UART1 in the figure as an example), check the *Configuration/MSP* switch and click *Save*.



CLI tab

② Open the *CLI* command line and enter:
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

6. Firmware Upgrade

Please go to the official website of the manufacturer (www.caddxfpv.com) to download the upgrade firmware. **Avatar_Sky_X.X.X.img** is the VTX file, **Avatar_Gnd_X.X.X.img** is the goggles file. Copy it to the VTX or to the SD card of the goggles and **be careful not to change the file name**. The power must be on to use the USB disk function of the VTX.

① Copy the upgrade file to the root directory of the VTX and the goggles (delete the old firmware file first if there is one), connect the power supply and wait for the devices to initialize.

② Press and hold the link button on the VTX and on the goggles for 8 seconds. The indicator light flashes red when the VTX enters the upgrade state; the goggles automatically restart and beep.

③ After the upgrade is successful, the indicator light of the VTX flashes green and the goggles stop beeping after 5 seconds.

Do not power off during the upgrade process. The upgrade of the goggles takes about 6 minutes.

7. Status Indication and Channels

7.1 Status indication

Status	Goggles buzzer
Boot failure	DI.. DI..... DI.. DI.....
Link state	DI.... DI.... DI.... DI....
Upgrade firmware	DI..... DI..... DI..... DI——
Upgrade failed	DI.. DI.. DI.. DI..

Status	VTX indicator
Link state or no firmware detected	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
Camera not detected	green light slowly flashes
VTX overheating	alternately flashing red and green lights

7.2 Operating channels

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

Central frequencies of channels CH1–CH8 in MHz according to the regional setting

Make sure you fully understand and abide by local laws and regulations before using this product. An amateur radio license may be needed in FCC regions when using channels 1, 2, 6 or 7, as they are amateur frequency bands. Users who use the amateur frequency bands with a modified or cracked version or without a license may be punished for breaking local laws or regulations.

7.3 Operation in the Czech Republic

Regulations (EU) 2019/947 and 2019/945 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, compulsory insurance, permitted frequency bands and maximum transmitting power. The information in this chapter describes the situation in the Czech Republic. If you operate the product in another country, you must follow the regulations of the country in which you use it.

Band	Limit	Regulation
5725–5875 MHz	25 mW e.i.r.p.	VO-R/10, Art. 3(k)

- In the Czech Republic, use only the **CE** regional setting (channels CH1, CH2, CH3 and CH8). The FCC and MIC settings use channels outside this band or higher power and must not be used in the Czech Republic.
- The user is responsible for the setting of region, channel and power.
- A drone with a camera is subject to Regulation (EU) 2019/947: the operator must register regardless of the drone's weight and display the registration number on the drone.
- FPV flying with goggles is possible in the open category only with an unmanned aircraft observer who keeps the drone in direct visual line of sight.

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 1S Lite Kit) 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.

- 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.