HiLink HD VTX

User manual
Digital video transmitter (VTX) with camera · 5.8 GHz · OpenIPC



Never switch the transmitter on without the antennas connected. The manufacturer states a power of up to 29 dBm – in the Czech Republic, no more than 25 mW e.i.r.p. is permitted in the 5.8 GHz band (Chapter 3.2).

Manual prepared from the manufacturer's data and video tutorial · Rotorama, s.r.o. · www.rotorama.com

Contents

1. Safety instructions

1.1 Before first use

1.2 Temperature and cooling

1.3 Operating rules

2. Product description

2.1 Package contents

2.2 Parts description

2.3 Specifications

2.4 Firmware and video reception

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

3.1 The law of the country in which you operate the transmitter applies

3.2 Frequency band and transmit power

3.3 The transmitter is a component, not a finished drone

4. Installation and wiring

4.1 Installing in the model

4.2 Connecting to the flight controller

4.3 Flight controller setup

5. Receiving video on a phone

5.1 Installing the PixelPilot app

5.2 Connecting the phone to the transmitter

5.3 Default passwords – change them

6. Settings via the web interface

6.1 Logging in

6.2 Access point and channel

6.3 Transmit power and temperature

6.4 Video, OSD and flight controller
6.5 Link and data rate
6.6 Audio and recording to the card
7. Firmware, maintenance and troubleshooting
7.1 Firmware update
7.2 Maintenance and storage
7.3 Troubleshooting
7.4 Manufacturer
8. Information for the EU and Czech Market
8.1 Importer and responsible person in the EU
8.2 Product conformity
8.3 Disposal of electrical equipment
9. Warranty and rights arising from defective performance

1. Safety instructions

1.1 Before first use

The DarwinFPV HiLink HD VTX is a **digital video transmitter (VTX) with a camera** running OpenIPC firmware, for FPV drones, aircraft, RC cars and boats. The video can be received directly on a phone. Read this manual before installation and keep it.

- **Always connect both antennas before applying power.** Transmitting without antennas may damage the transmitter.
- The supply voltage must be within **7–33 V** DC. A higher voltage will destroy the transmitter.
- Solder and connect only with the battery disconnected, and wire the leads exactly as labelled on the board (Chapter 4.2).
- Hold the board and camera by their edges and discharge static electricity by touching a grounded metal object before handling.
- Do not bend the camera cable or the antenna cables sharply, and route them away from propellers and moving parts.

1.2 Temperature and cooling

The transmitter heats up in operation, the more so at higher power and data rate. It therefore has a double-sided heat sink and a fan connector.

- Ensure airflow around the transmitter. Do not leave it switched on for long periods on the ground without airflow.
- When installed in an enclosed space (aircraft fuselage, car body, boat hull), the manufacturer **recommends connecting a cooling fan**.
- Do not disable the overheating protection (*Temp throttle threshold*, Chapter 6.3) or set it too high – overheating can damage the transmitter irreversibly.
- Do not touch the heat sink during operation – it may be hot.

1.3 Operating rules

- Set the transmit power and channel **only within the limits permitted in the country of operation** – see Chapter 3.2.
- Fly only in permitted airspace and in accordance with local regulations (Chapter 3).
- Check all connectors and antenna mounts before every flight.
- The default Wi-Fi and web interface passwords are publicly known. Change them after the first setup (Chapter 5.3).
- At the edge of the range the video starts to break up and lag – turn back in good time.

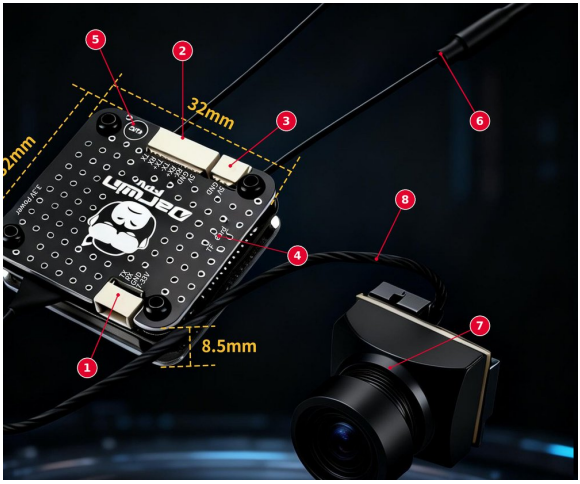
2. Product description

2.1 Package contents

Qty	Item
1	DarwinFPV HiLink HD VTX video transmitter with attached camera and two antennas
1	RJ45 adapter cable (for connection to a computer)
1	4-pin cable (for connection to the flight controller)
1	DarwinFPV sticker

Battery, microSD card, fan and phone are not included.

2.2 Parts description



HiLink HD VTX with camera

① 4-pin connector for the flight controller – pins **TX, RX, GND, 7-33V**

② 8-pin connector for the RJ45 adapter – pins **TX, RX, TX+, TX−, RX+, RX−, GND, 5V**

③ 2-pin **5V / GND** connector for a fan

④ microSD card slot (TF Card) on the side of the board

⑤ microphone (MIC)

⑥ two antennas with IPEX1 connector

⑦ camera with M12 lens

⑧ camera cable (MIPI)

The pin labels are printed directly on the transmitter board. Always follow the board printing when wiring.

2.3 Specifications

Parameter	Value
Model	DarwinFPV HiLink HD VTX
Processor	SigmaStar SSC338Q
Camera sensor	Sony IMX415, 1/1.8″
Lens	M12, 160° field of view
Camera size	19 × 19 mm
Camera cable length (MIPI)	130 mm
Resolution and frame rate	1080p / 60 fps, 1080p / 90 fps, 720p / 120 fps
Frequency band	5.8 GHz (5150–5850 MHz)
Output power	29 dBm (manufacturer's data, see Ch. 3.2)
Antennas	2×, 2 dBi gain, IPEX1 connector
Range (manufacturer's data)	200–500 m with APFPV firmware and a phone; up to 15 km with other firmware and a ground station, over open sea without interference
Supply voltage	7–33 V DC
Power outputs (manufacturer's data)	5 V / 1 A and 10 V / 510 mA
Flight controller communication	MSP OSD / MAVLink (UART)
Flight controllers	F4 / F7 / H7 with Betaflight, INAV or ArduPilot firmware
Indicator LED	red / green / blue
Microphone	yes
Recording	to a microSD card, up to 256 GB
Mounting pattern	25.5 × 25.5 mm (M2 screws)
Dimensions	32 × 32 × 8.5 mm
Weight (without antennas)	28 ± 2 g
Operating temperature	−10 °C to 40 °C
Default firmware	APFPV (OpenIPC)

※ Range figures are the manufacturer's data under ideal conditions. At the power permitted in the Czech Republic the range is considerably shorter.

2.4 Firmware and video reception

The transmitter works as a Wi-Fi access point. It comes with the **APFPV** firmware from the OpenIPC project: the phone connects to the transmitter via Wi-Fi and the **PixelPilot** app displays the video. No additional receiver is needed.

The manufacturer states that the transmitter also supports **OpenIPC** and **RubyFPV** firmware. With these, the video is received by a ground station with its own Wi-Fi adapter; switching to them and their setup follow the documentation of the respective project and are not covered by this manual.

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

3.1 The law of the country in which you operate the transmitter applies

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 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 Frequency band and transmit power

The manufacturer states a frequency band of **5150–5850 MHz** and an output power of **up to 29 dBm** (approx. 800 mW) with an antenna gain of 2 dBi. Such a high power **is not permitted for transmission from a model in the Czech Republic or in other EU member states**. The following limits apply in the Czech Republic (e.i.r.p. = including antenna gain):

Band	e.i.r.p. limit	Conditions in the Czech Republic
5150–5170 MHz	–	unmanned aircraft systems (UAS) **must not** transmit here (VO-R/12)
5170–5250 MHz	200 mW	VO-R/12; the only RLAN band the EU permits for UAS (Decision (EU) 2022/179)
5250–5350 MHz	200 mW	indoor use only (VO-R/12) – not usable for flying
5470–5725 MHz	1 W	only with DFS/TPC (VO-R/12); not permitted for UAS under Decision (EU) 2022/179
5725–5875 MHz	25 mW	VO-R/10 (short-range devices); higher power under VO-R/12 only for fixed installations

- For video transmission from a flying model in the Czech Republic, the usable options are therefore **5725–5875 MHz at no more than 25 mW e.i.r.p.** (this includes channel 165, 5825 MHz), or 5170–5250 MHz at no more than 200 mW e.i.r.p.
- The *VTX Power Output* slider (Chapter 6.3) does not show the power in mW. Keep it at the lower end of the range; you are responsible for complying with the limit.
- The user is responsible for the choice of channel, channel width and power – also after installing other firmware (OpenIPC, RubyFPV).
- Use only the antennas supplied by the manufacturer. Additional radio-frequency amplifiers are not permitted.

- Outside the Czech Republic, the bands and power limits of that country apply.

3.3 The transmitter is a component, not a finished drone

The transmitter is not an unmanned aircraft and does not bear a class label under Regulation (EU) 2019/945. Once you install it in an aircraft, the **operation** of the aircraft is subject to Regulation (EU) 2019/947 and the related Czech regulations. The operator is responsible for complying with them.

- The transmitter contains a camera, so the aircraft operator must **register** regardless of the aircraft's weight. In the Czech Republic, registration is handled by the Civil Aviation Authority at dron.caa.gov.cz; the assigned number must be displayed on the aircraft.
- The usual limits of the open category apply: height **up to 120 m** above ground, constant visual line of sight and no flying over assemblies of people.
- If you fly using the video on a phone or goggles, an **unmanned aircraft observer** must stand next to you and keep visual contact with the aircraft without optical aids.
- Before flying, check the geographical zones on the map at dronemap.rlp.cz.
- The camera and built-in microphone record video and sound. Do not record people or their private property without their consent.

4. Installation and wiring

4.1 Installing in the model

- The transmitter has mounting holes with a **25.5 × 25.5 mm** pattern for **M2** screws.
- Fix the camera in a mount at the front of the model. If the image is upside down after installation, rotate it in the web interface (*Flip Image*, Chapter 6.4).
- Route both antennas **pointing upwards as far as possible** with their ends **as far apart as possible** so that they do not cross. This reduces mutual interference. The antennas must not reach into the propellers and should not be covered by carbon or metal.
- Do not place the transmitter right next to the RC receiver or a GPS module.
- Add a fan in enclosed spaces (Chapter 1.2).

4.2 Connecting to the flight controller

The transmitter is connected to the flight controller (FC) with the supplied **4-pin cable** plugged into connector ① (figure in Chapter 2.2). Solder the cable to a free serial port (UART) of the flight controller:

VTX pin	Connect on the flight controller to
TX	**RX** of the selected UART
RX	**TX** of the same UART
GND	GND
7-33V	7–33 V supply (e.g. VBAT/BAT pad)

Always connect the transmitter's TX to the flight controller's RX and the transmitter's RX to the flight controller's TX. Before connecting the battery, check that no more than 33 V is applied to the 7-33V pin.

4.3 Flight controller setup

The transmitter communicates with the flight controller using the **MSP** (Betaflight, INAV) or **MAVLink** (ArduPilot) protocol – this lets it display an OSD with flight data. In the flight controller configurator, enable MSP or MAVLink respectively on the UART the transmitter is connected to. For details, refer to the documentation of the flight controller firmware.

Then select the transmitter's serial port in the *Flight Controller* field of the transmitter's web interface (Chapter 6.4).

5. Receiving video on a phone

5.1 Installing the PixelPilot app

The video from the transmitter is displayed by the **PixelPilot** app from the OpenIPC project. It is intended for phones and tablets running **Android**; there is no iOS version.

- The manufacturer offers the installation file on the transmitter's product page in the *Support* tab (darwinfpv.com).
- Alternatively, download it from the project's official page github.com/OpenIPC/PixelPilot: under *Releases*, select the latest version and download the file **PixelPilot.apk**.
- Open the downloaded file and install the app. Installing apps from sources other than Google Play must be allowed on the phone.

※ Video smoothness depends on the phone's performance. Only one receiving device can be connected to the transmitter at a time.

5.2 Connecting the phone to the transmitter

① Start the PixelPilot app.

② Connect the battery to the model and wait about **15 seconds** for the transmitter to boot.

③ In the phone's Wi-Fi settings, find the **OpenIPC** network and connect to it using the password **12345678**.

④ Return to the PixelPilot app – the camera image is displayed.

⑤ Before the first flight, check the smoothness and latency of the video on the ground.

5.3 Default passwords – change them

Item	Default value
Wi-Fi network name (SSID)	OpenIPC
Wi-Fi password	12345678
Web interface	http://192.168.0.1
User / password (web, SSH)	root / 12345

The default passwords are the same on all units and publicly known. Anyone within range could connect to the transmitter and change its settings. After the first setup, therefore, set your own Wi-Fi network name and password (Chapter 6.2).

6. Settings via the web interface

6.1 Logging in

① Connect the battery, wait about 15 seconds and connect your phone or computer to the transmitter's Wi-Fi (Chapter 5.2).

② In a web browser, open **192.168.0.1** and log in as **root** with the password **12345**.

③ The home page shows the transmitter status. The transmission settings are on the *AalinkFPV Control* page.

※ The interface may change with the firmware version. The items below are described as shown by the manufacturer in its video tutorial.

6.2 Access point and channel

Item	Meaning
SSID, Password	Name and password of the transmitter's Wi-Fi network. After a change, click *Apply & Restart*. Then connect the phone to the new network.
20 / 40 / 80 MHz	Channel width. A narrower channel penetrates better but has a lower transfer rate; a wider one the opposite.
Channel	Wi-Fi channel. Choose according to interference in the area; according to the manufacturer, channel 165 is usually cleaner than lower channels. Use only a channel permitted in the country of operation (Chapter 3.2). Confirm with *Apply*.
Force & Restart (8812au)	Forced restart of the network card driver. Do not use under normal circumstances.
Restore & Restart	Restores all transmitter settings to their defaults and restarts it.

6.3 Transmit power and temperature

Item	Meaning
VTX Power Output	Transmit power. Moving the slider left (*Pit mode*) lowers the power, moving it right (*Extra*) raises it. Lower power = shorter range and less penetration, but less heat – suitable for tuning and short-range flights. Higher power = longer range, but the transmitter heats up more. **Set only the power permitted in the country of operation (Chapter 3.2).**
Temp throttle threshold	Temperature at which the transmitter reduces its power and CPU clock by itself to avoid overheating. Too low a value causes frequent power reductions in flight; too high a value risks irreversible damage.
CPU overclock	Processor overclocking. Keep it disabled; use it only for frame drops caused by insufficient CPU performance, with good cooling and gradually.

6.4 Video, OSD and flight controller

Item	Meaning
Video Mode	Video format, e.g. *16:9 1080p 60 50HzAC* = aspect ratio, resolution, frame rate and suppression of light flicker. Confirm with *Apply*.
OSD Size	Size of OSD text and icons.
Flip Image	Rotates the image by 180° if the camera is mounted upside down.
Overshoot Fix	Prevents the image from washing out when moving from a dark scene to a very bright one.
HQ i-frames	High-quality key frames; reduce long-lasting image break-up after violent manoeuvres. The manufacturer recommends keeping the default value.
Focus Mode (HQ center)	Allocates more data to the centre of the image at the expense of the edges. The manufacturer recommends enabling it.
Flight Controller	Serial port of the transmitter to which the flight controller is connected (*None, ttyS0–ttyS3*).

6.5 Link and data rate

Item	Meaning
Max MCS	Upper limit of Wi-Fi modulation and coding (separately for 20, 40 and 80 MHz). Higher = sharper image, but worse penetration and more dropouts. Lower = less detail, but a more stable image.
Link resilience	Left is more aggressive (higher MCS, sharper, more sensitive to interference), right is more conservative (lower MCS, smoother).
Maximum Throughput	Upper limit of the data rate. A higher value = better image, but more stuttering under interference and higher temperature.
LQ Consideration	What the quality adapts to: *Lowest* = the worse of the uplink and downlink, *Downlink only* = only the direction from the transmitter to the receiver.

6.6 Audio and recording to the card

- Audio: in the top menu *Majestic* → *Settings* → *Audio*, enable the microphone and speaker. Adjust the microphone volume as needed; keep the sampling rate and codec at their defaults.
- Recording: in the top menu *Record*, enable *Enable recording*. The transmitter then records to the microSD card in the transmitter. Keep the default file path; set the maximum length of a single file and the share of card space used as needed.
- For smooth recording without dropped frames, use a **fast microSD card**. Maximum card capacity 256 GB.

7. Firmware, maintenance and troubleshooting

7.1 Firmware update

The firmware is uploaded from a computer via cable. The procedure follows the manufacturer's video tutorial and requires basic command-line skills. Download the APFPV firmware package from the *Support* tab on the manufacturer's product page and unpack it; keep both files (kernel *uImage.ssc338q* and system *rootfs.squashfs.ssc338q*) in one folder. Do not disconnect power during the upload.

① Plug the supplied RJ45 adapter into the transmitter's 8-pin connector ② and into the computer's network card. Connect the battery.

② In Windows, open *Control Panel → Network and Internet → Network and Sharing Center → Change adapter settings*. A new network connection must appear (without a red cross – otherwise check the wiring).

③ In the connection properties, open *Internet Protocol Version 4*, select *Use the following IP address* and enter the IP address **192.168.1.3** and the subnet mask **255.255.255.0**.

④ Open a command prompt in the firmware folder (type **cmd** in the File Explorer address bar).

⑤ Transfer both files (adjust the file name to the downloaded firmware). Confirm the authenticity prompt with **yes**; the password is **12345**.

```
scp -O uImage.ssc338q root@192.168.1.10:/tmp/
scp -O rootfs.squashfs.ssc338q root@192.168.1.10:/tmp/
```

⑥ Connect to the transmitter with **ssh root@192.168.1.10** (password 12345) and check that both files are in the /tmp folder.

⑦ Start the firmware upload and wait for it to finish:

```
sysupgrade -z -n --kernel=/tmp/uImage.ssc338q
--rootfs=/tmp/rootfs.squashfs.ssc338q
```

※ Password characters are not displayed when typed in the command prompt. After a firmware update, settings may be reset to their defaults, including the default passwords.

7.2 Maintenance and storage

- After every flight, check the antennas, their IPEX1 connectors and the camera cable. Replace a damaged antenna – a faulty antenna shortens the range and may damage the transmitter.
- Clean the lens with a soft lens cloth.
- Protect the transmitter from moisture, dust and dirt. After a crash, inspect it before switching it on again.

- Store in a dry place, away from direct sunlight, with the battery disconnected. The operating temperature is −10 °C to 40 °C.

7.3 Troubleshooting

Problem	Cause and solution
The phone cannot see the OpenIPC network	The transmitter has not booted yet – wait about 15 s after connecting the battery. Check the 7–33 V supply. If you changed the SSID, look for the new network.
Wi-Fi is connected but PixelPilot shows nothing	Check that the app is running and that the phone has not switched to another network or mobile data. Restart the app.
The video stutters, breaks up or freezes	Check the antenna position (Ch. 4.1), change the channel, lower *Max MCS*, move *Link resilience* to the right or lower *Maximum Throughput*.
The video weakens after a while	The transmitter is overheating and limiting its power. Improve cooling, add a fan, lower the power or data rate.
No OSD is displayed	Check the TX/RX wiring (Ch. 4.2), the MSP/MAVLink protocol on the flight controller port and the *Flight Controller* setting (Ch. 6.4).
Recording does not start or drops frames	Enable *Enable recording*, use a fast microSD card of up to 256 GB and check the space usage limit.
Forgotten password or wrong settings	Use *Restore & Restart* in the web interface. If the interface is not accessible, contact the seller.
The computer does not see the network connection (Ch. 7.1)	Check the RJ45 adapter wiring and the transmitter's power supply, the IP address setting 192.168.1.3 and the mask 255.255.255.0.

7.4 Manufacturer

Manufacturer	DarwinFPV
Address	Room 104, Jiangxia Industrial Park, Taiwan Industrial Zone, Shiyan Street, Baoan District, Shenzhen, China
E-mail	info@darwinfpv.com
Web	www.darwinfpv.com
Manufacturer's video tutorial	youtube.com/watch?v=QAJ_raCAqPE

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:** type designation **DarwinFPV HiLink HD VTX**; the manufacturer's name is printed on the transmitter board.

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 manufacturer does not issue its own warranty terms for this product.

- 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.