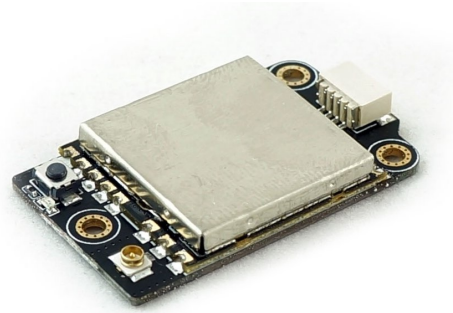
DarwinFPV Ape 25–600 mW

Analogue 5.8 GHz video transmitter
User manual



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

Importer: Rotorama, s.r.o. · www.rotorama.com

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1. Safety instructions

1.1 Before you start

Read this entire manual before installation and first power-up, and keep it for future reference. The video transmitter (VTX) is an electronic component intended for installation in an FPV drone or model aircraft. Installation should be carried out by a user experienced in soldering and wiring FPV electronics.

- This product is not a toy. Keep it out of the reach of children – small parts (screws, cable) can be swallowed.
- Use the product only for its intended purpose, only in accordance with this manual and with the regulations of the country in which you operate it.
- Do not modify the product and do not connect amplifiers or any other accessories that increase the transmitted power.

1.2 Antenna, heat and radio emissions

Never power on the transmitter without an antenna connected. Transmitting without an antenna can permanently damage the transmitter.

- Before every power-up, check that the antenna is firmly snapped into the u.FL connector.
- The transmitter heats up during operation, especially at higher power. Do not touch the shielding cover during operation or immediately afterwards – risk of burns.
- Make sure air can flow around the transmitter. When powered on the ground for a longer time (setup, tuning), select the lowest power of 25 mW.
- Do not hold the powered antenna close to your body and head, and do not point it at other persons at close range.

1.3 Electrical safety

- Power the transmitter only with **5 V** (e.g. from the 5 V output of the flight controller). A higher voltage will destroy the transmitter.
- Carry out all wiring and soldering with the drone battery disconnected.
- Before the first power-up, check the wiring of all leads and look for possible short circuits. We recommend connecting the battery for the first time through a current-limiting protection device (a so-called smoke stopper).
- Protect the product from moisture, water, dust and conductive debris (e.g. metal and carbon shavings).

2. Product description

2.1 Intended use

The DarwinFPV 600mW VTX is a lightweight analogue 5.8 GHz video transmitter for smaller FPV drones. It transmits the picture from the FPV camera to FPV goggles or a monitor. The transmitting power can be switched in four steps: **25 / 200 / 400 / 600 mW**.

The transmitter is powered with 5 V directly from the flight controller (FC) and is connected via a 4-pin connector. Channel, band and power can be set from the flight controller using the **SmartAudio** protocol – in Betaflight Configurator or in the OSD menu.

2.2 Parts

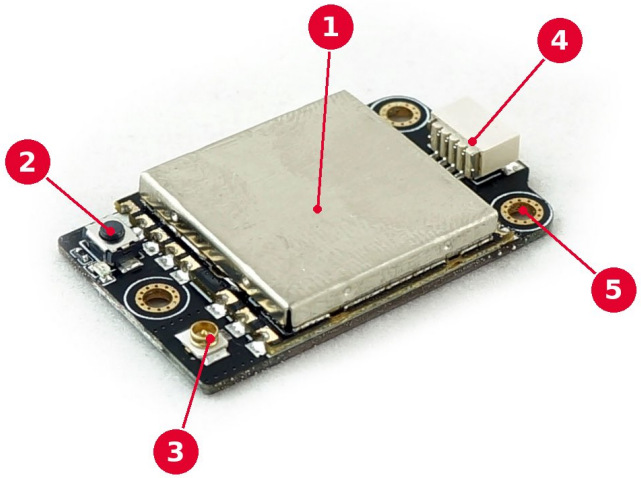


Fig. 1 – Transmitter parts

① Shielding cover of the transmitter module – heats up during operation.

② Button on the transmitter board. The manufacturer describes setup via the flight controller (SmartAudio) – we recommend this method (Chapter 5).

③ Antenna connector **u.FL (IPEX)**.

④ 4-pin connector for connection to the flight controller.

⑤ Mounting holes.

2.3 Specifications

Designation	DarwinFPV 600mW VTX
Type	analogue video transmitter (VTX)
Frequency band	5.8 GHz, 40 channels
Transmitting power	25 / 200 / 400 / 600 mW (adjustable)
Supply voltage	5 V
Current draw (manufacturer's data)	600 mA
Control protocol	SmartAudio
Antenna connector	u.FL (IPEX)
Dimensions (L × W)	28 × 15 mm
Weight	3.5 g

※ The manufacturer does not publish a list of frequencies for the individual channels. The frequency of the selected channel is shown by Betaflight Configurator or by your FPV goggles.

2.4 Package contents

The manufacturer lists the following package contents:

- 1× DarwinFPV 600mW VTX video transmitter
- 1× set of spare screws
- 1× 4-pin connecting cable (3 cm)
- 1× sticker

A 5.8 GHz antenna with u.FL connector may be included depending on the current e-shop offer; if it is not in the package, it must be purchased separately. The product does not include a camera, flight controller or battery.

2.5 Power indicator

The red indicator on the transmitter board shows the currently set power by the number of flashes:

25 mW	200 mW	400 mW	600 mW
1 flash	2 flashes	3 flashes	4 flashes

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

3.1 The law of the country of operation applies

Radio equipment and drone operation are governed by European Union regulations, but national regulations differ from country to country – permitted frequency bands, maximum transmitting power, conditions for amateur radio operation, registration portals 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 comply with the regulations of the country in which you use it.

3.2 Frequencies and transmitting power in the Czech Republic

Band	Max. power	Conditions
5725–5875 MHz	25 mW e.i.r.p.	licence-free, under the ČTÚ general authorisation No. VO-R/10
5650–5850 MHz	as per licence	radio amateurs only, with a certificate of competence and a ČTÚ licence (Decree No. 156/2005 Coll.)

- Without an amateur radio licence, you may operate the transmitter in the Czech Republic **only at 25 mW** and only on channels whose frequency lies within the **5725–5875 MHz** band.
- The 200, 400 and 600 mW power levels are not covered by the general authorisation; in the Czech Republic they may only be used within the amateur radio service.
- The user is responsible for the channel and power settings. Channels outside the permitted band may interfere with other radio services.
- The e.i.r.p. value also includes the antenna gain – with a higher-gain antenna, the actual radiated power is higher than the set power.

3.3 Use on a drone

A drone with a camera and a video transmitter is subject to Regulations (EU) 2019/945 and 2019/947. A drone equipped with a camera requires operator registration (in the Czech Republic with the Civil Aviation Authority) 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. Observe the operational limits of the open category, in particular the maximum height of 120 m and the ban on flying over assemblies of people.

4. Installation and connection

4.1 What else you need

- a flight controller (FC) with a 5 V output and a free UART port (TX pin) or a SOFTSERIAL pin,
- an analogue FPV camera,
- a 5.8 GHz antenna with a u.FL (IPEX) connector,
- a computer with Betaflight Configurator and a USB cable for connecting the flight controller,
- FPV goggles or a monitor for receiving 5.8 GHz analogue video.

4.2 Mounting

- Fasten the transmitter using the mounting holes ⑤ and the supplied screws. Do not overtighten the screws to avoid damaging the board.
- Position it so that air can flow around the shielding cover ① and so that the board does not touch the carbon frame or other conductive parts.
- Route the antenna as far as possible from carbon parts and wires, and secure it so that it cannot be caught by the propellers.

4.3 Connecting to the flight controller

The transmitter is connected to the flight controller with the supplied 4-pin cable plugged into connector ④. The cable carries the 5 V power supply and the SmartAudio control signal. Connect the **white RX wire** of the transmitter to the **TX** pin of a free UART port on the flight controller, or to the **SOFTSERIAL1** pin.

Before connecting, compare the wire order in the cable with the pin description of your flight controller. Swapping power and signal can destroy both the transmitter and the flight controller.

4.4 Connecting the antenna

Place the antenna connector perpendicularly onto the u.FL connector ③ and press until it clicks. When disconnecting, pull by the connector, not by the cable. The u.FL connector is delicate and not designed for frequent disconnection – secure the antenna cable against pulling (e.g. with a cable tie).

5. Setting the channel and power

5.1 Port setup in Betaflight

① Connect the flight controller to the computer and start Betaflight Configurator.

② On the *Ports* tab, find the port to which the white wire of the transmitter is connected (UART, or SOFTSERIAL1).

③ In the *Peripherals* column, select *VTX (TBS SmartAudio)* for this port and save the setting with *Save and Reboot*.

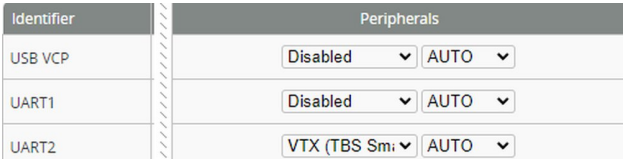


Fig. 2 – Ports tab (shortened): VTX (TBS SmartAudio) on UART2 – example

5.2 Selecting band, channel and power

After the reboot, open the *Video Transmitter* tab. In the *Selected Mode* section, select the band (*Band*), channel (*Channel*) and power (*Power*) and save the setting. The same parameters can also be changed in the OSD menu using your radio.

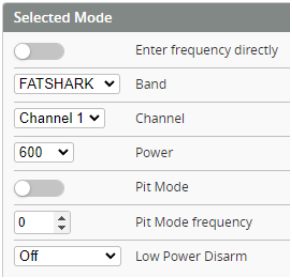


Fig. 3 – Video Transmitter tab, Selected Mode section

Without an amateur radio licence, select 25 mW and a channel in the 5725–5875 MHz band in the Czech Republic (see Chapter 3.2).

5.3 Checking the settings

- After connecting power, check by the number of indicator flashes that the required power is set (see Chapter 2.5).
- Tune your FPV goggles to the same channel and check the video reception.

6. Operation, maintenance and troubleshooting

6.1 Before every flight

- Check that the antenna is connected and undamaged.
- Verify the set channel and power and that they comply with the regulations of the country of operation.
- Make sure your settings do not interfere with other pilots – when flying together, agree on channel allocation.

6.2 Maintenance and storage

- After a crash, check the antenna, the u.FL connector and the cable, and replace them if necessary.
- Clean the product with a dry soft brush; do not use water or solvents.
- Store in a dry place, away from direct sunlight and heat sources.

6.3 Troubleshooting

Problem	Possible cause and solution
Transmitter does not light up, no video	Check the 5 V supply and the cable wiring. Make sure the flight controller is powered from the battery (the 5 V output may not be active when powered from USB only).
Noisy picture or short range	Check the antenna and the u.FL connector. Make sure the goggles are tuned to the same channel. Route the antenna away from carbon parts.
Settings from Betaflight are not applied	Check that the white wire is on the TX pin and that *VTX (TBS SmartAudio)* is enabled on the correct port. If the *Video Transmitter* tab offers no bands and channels, load a VTX table for SmartAudio into Betaflight.
Video drops out after a few minutes	The transmitter is overheating – provide airflow and use 25 mW on the ground.

7. Information for the EU and Czech Market

7.1 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

7.2 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 (DarwinFPV 600mW VTX) corresponds to the product name on the packaging; the manufacturer DarwinFPV is printed on the underside of the transmitter board.

7.3 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.

8. 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 7.1.
- 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.