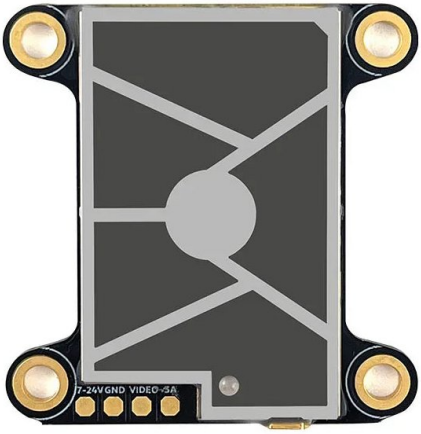
Cement 1000mW VTX

DarwinFPV · 5.8 GHz analogue video transmitter
User Manual



Read this entire manual before installation and first power-up, in particular the safety instructions and Chapter 3 on radio transmission regulations.

Rotorama, s.r.o. · www.rotorama.com

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1. Safety Instructions

1.1 Before You Start

The **DarwinFPV Cement 5.8G 1000mW VTX** video transmitter is intended for installation in FPV drones and models by experienced users who are proficient in soldering and in configuring the flight controller (FC).

- This product is not a toy. Keep it out of the reach of children.
- Always solder and connect wiring with the **battery disconnected**.
- Before the first power-up, check the supply polarity and the correct connection of all wires.
- Do not modify the transmitter in any way and do not remove the protective silicone potting – it would lose its water and dust resistance.

1.2 Radio Transmission and Antenna

- **Always power the transmitter with an antenna connected** for the 5.8 GHz band. The amplifier protection stated by the manufacturer is no reason to operate without an antenna.
- The channel and power used must comply with the regulations of the country in which you operate the transmitter (Chapter 3). **The user is responsible for the channel and power settings.**
- Do not touch the antenna during operation and do not place it close to your body. Do not use the transmitter near medical devices or in places where the operation of radio equipment is prohibited.

1.3 Power Supply and Heat

- The supply voltage must be within **7–24 V** (manufacturer's specification). A higher voltage may destroy the transmitter – see Chapter 4.3.
- The transmitter heats up at higher power – do not leave it powered on for long without airflow.
- The manufacturer states reverse-polarity, overvoltage and overheating protection. These protections do not replace correct wiring – damage caused by incorrect wiring is not a product defect.

1.4 Water and Dust

- According to the manufacturer, the transmitter is rated **IP67**: it withstands immersion in water to a depth of **0.5 m for 30 minutes**.
- The rating applies to the transmitter itself. Solder joints, cables, the MMCX connector, the antenna and the rest of the drone's electronics may not be waterproof – protect them separately.
- After contact with salt or contaminated water, rinse the transmitter with clean water and let it dry thoroughly.

2. Product Description

2.1 Purpose of the Transmitter

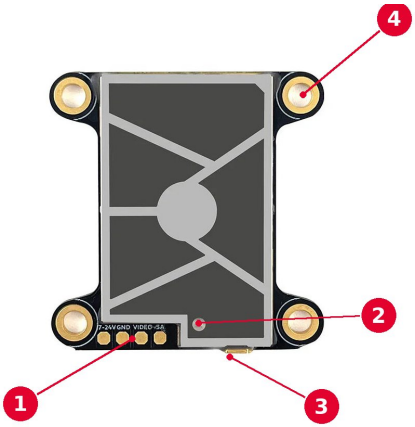
The DarwinFPV Cement is an analogue video transmitter (VTX) for the 5.8 GHz band with selectable output power of 200, 800 and 1000 mW. The electronics are encapsulated in protective silicone, making the transmitter resistant to water and dirt. The 30.5 × 30.5 mm (M3) mounting holes allow installation in a standard stack. Channel and power are set from the flight controller via the **SmartAudio** protocol, typically in the OSD menu.

2.2 Package Contents

Qty	Item
1	DarwinFPV Cement 5.8G 1000mW VTX video transmitter
1	Four-wire connection cable, 90 mm, tinned at both ends (28 AWG, red / black / yellow / white)
1	DarwinFPV sticker

❊ No antenna or pigtail is included. You need a 5.8 GHz antenna with an MMCX connector or a suitable adapter.

2.3 Parts Overview



Top view

① Solder pads for the connection cable, from left: **7-24V** (power), **GND** (ground), **VIDEO** (video input), **SA** (SmartAudio)

② LED indicator

③ MMCX antenna connector

④ 30.5 × 30.5 mm mounting hole for an M3 screw (four in total)



Underside of the transmitter with label

2.4 Specifications

Model	DarwinFPV Cement 5.8G 1000mW VTX
Frequency range	5645–5945 MHz
Channels	40 (bands A, B, E, F, R)
Output power	200 / 800 / 1000 mW
Control	SmartAudio (configuration via OSD)
Supply voltage	7–24 V DC (manufacturer states 2–6S)
Current draw at max. power	600 mA at 10 V and 1000 mW (30 dBm) output
Camera power output	none
Video input impedance	75 Ω
Video standard	NTSC / PAL
Microphone	none
Antenna connector	MMCX
Indication	LED, power indicator lights red
Protection	reverse polarity, overvoltage and overheating
Ingress protection	IP67 (0.5 m, 30 min)
Operating temperature	−10 °C to 50 °C
Mounting holes	30.5 × 30.5 mm (M3)
Dimensions	38 × 37 × 4.5 mm
Weight	9.2 g (without antenna and cable)
Range (manufacturer's data)	3 km – measured without interference on a sea coast with the manufacturer's original antenna

2.5 Channels and Power Levels

The following frequency table in MHz corresponds to the Betaflight VTX table provided by Rotorama for this transmitter (Chapter 5.2). Fields marked “—” are not defined in the table.

Band	1	2	3	4	5	6	7	8
A	5865	5845	5825	5805	5785	5765	5745	5725
B	5733	5752	5771	5790	5809	5828	5847	5866
E	5705	5685	5665	—	5885	5905	—	—
F	5740	5760	5780	5800	5820	5840	5860	5880
R	5658	5695	5732	5769	5806	5843	5880	5917

VTX table value	Power
0	200 mW
1	800 mW
2	1000 mW (1 W)

※ Not all channels and power levels may be used legally – see Chapter 3.

3. Legal Conditions of Operation

3.1 The Law of the Country Where You Transmit Is Decisive

Each member state of the European Union regulates the use of radio frequencies through its own legislation. Permitted frequency bands, maximum transmit power and the conditions for amateur radio operation differ from country to country. 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 transmit**.

3.2 Frequencies and Transmit Power in the Czech Republic

Without a special authorisation, transmitting in the 5.8 GHz band in the Czech Republic is only permitted under General Authorisation No. VO-R/10 of the Czech Telecommunication Office (ČTÚ) (short-range devices):

Band	Limit	Conditions
5725–5875 MHz	25 mW e.i.r.p.	VO-R/10, Art. 3(k); the limit includes antenna gain

The lowest selectable power of this transmitter (200 mW) exceeds the 25 mW e.i.r.p. limit. It therefore cannot be operated in the Czech Republic under the general authorisation.

- Operation at higher power is possible in the Czech Republic only on the basis of an **individual authorisation** to use radio frequencies (Section 17 of Czech Act No. 127/2005 Coll., on Electronic Communications), typically within the **amateur radio service** – with a certificate of competence, an individual authorisation and an assigned call sign. Details are provided by the Czech Telecommunication Office at www.ctu.gov.cz.
- The amateur radio band in this range is 5650–5850 MHz. Channels **A1, B8, E5, E6, F7, F8, R7 and R8** (above 5850 MHz) do not fall within it; channels above 5875 MHz also lie outside the band of General Authorisation VO-R/10.
- Operation on shared frequencies must not cause harmful interference to other services.

3.3 Use on a Drone

If you use the transmitter on an unmanned aircraft, Regulation (EU) 2019/947 and national aviation regulations also apply: operator registration (required for a drone with a camera regardless of its weight), the operational limits of the open category, and flying with FPV goggles only with an observer. Up-to-date information for the Czech Republic is provided by the Civil Aviation Authority of the Czech Republic (www.caa.gov.cz).

4. Installation and Wiring

4.1 What Else You Need

- a 5.8 GHz antenna with an MMCX connector (or a pigtail / adapter for your connector type),
- an analogue FPV camera with its own power supply (the transmitter has no camera power output),
- a flight controller (FC) with OSD and a free UART for SmartAudio,
- a soldering iron, solder and insulating material; M3 screws and standoffs for stack mounting,
- FPV goggles or a monitor with a 5.8 GHz analogue receiver.

4.2 Mounting

- Fasten the transmitter in the stack or frame with four M3 screws through the 30.5 × 30.5 mm mounting holes.
- Make sure the transmitter does not touch the carbon frame or other parts with sharp edges and that air can flow around it.
- Position the antenna as far as possible from carbon, propellers and the receiving antenna of the RC system.

4.3 Cable Wiring

Solder the cable to the transmitter pads (see the labels printed on the board) and to the corresponding flight controller pads:

VTX pad	Function	Connect to FC
7-24V	power	VTX power pad (VBAT or BEC output within 7–24 V)
GND	ground	GND
VIDEO	video input	OSD video output (VTX / VO)
SA	SmartAudio	TX of a free UART

- Always verify the cable wire colours (red / black / yellow / white) against the pad labels on both the transmitter and the FC.
- Connect the camera to the camera input on the FC, not directly to the transmitter – otherwise the OSD will not appear in the image and configuration via OSD will not be possible.

The manufacturer states both a 7–24 V range and 2–6S. A fully charged 6S LiPo battery has 25.2 V (4.20 V/cell), 6S LiHV 26.1 V (4.35 V/cell) – this is above the 24 V upper limit. With 6S, therefore, power the transmitter from a regulated FC output with a voltage of 7–24 V. With 2S, the voltage drops to 7.0 V (3.5 V/cell) at the end of a flight, i.e. to the lower limit.

4.4 Connecting the Antenna

- Connect the antenna or pigtail to the MMCX connector **before connecting the battery for the first time**.
- Fit the MMCX connector straight on, without levering, and secure the antenna cable against being torn out (cable tie, antenna mount).
- Use an antenna designed for the 5.8 GHz band with the same polarisation as your receiver's antenna.

5. Betaflight Configuration

5.1 SmartAudio Setup

Connect the flight controller to your computer and open Betaflight Configurator.

① On the *Ports* tab, locate the UART whose TX is connected to the SA wire.

② In the *Peripherals* column, select *VTX (TBS SmartAudio)* and save with the *Save and Reboot* button.

③ Make sure you have not enabled another function for this UART (e.g. Serial RX).

5.2 Loading the VTX Table

For the flight controller to know the transmitter's channels and power levels, load the VTX table into it:

① Download the VTX table file from the product page at www.rotorama.com or directly from this link: 1000mw.json.

② On the *Video Transmitter* tab, select *Load from file*, choose the downloaded file and save with the *Save* button.

③ After the restart, the tab should show the SmartAudio transmitter type and the power levels 200, 800 and 1W.

※ Do not use VTX tables of other transmitters (e.g. Cement 2.5 W) – they contain different power levels and bands.

5.3 Selecting Channel and Power

- You can set the channel and power on the *Video Transmitter* tab, in the flight controller's OSD menu (using the radio transmitter sticks) or with a script on the radio transmitter.
- Set the same channel on the transmitter and in the goggles. For bench tests, select the lowest power.
- Always select the channel and power in accordance with the regulations of the country of operation (Chapter 3).

5.4 LED Indicator

The transmitter has an LED indicator; the power indicator lights red. If it does not light up after power is connected, disconnect the battery and check the wiring.

6. Operation

6.1 Before Every Flight

- The antenna is firmly connected and undamaged.
- The transmitter and goggles are on the same channel; channel and power comply with regulations.
- Cables are secured and cannot get into the propellers.
- No other pilot is transmitting on the channel.

6.2 Temperature and Operation on the Ground

- The operating temperature is −10 °C to 50 °C.
- On the ground, without airflow, keep the transmitter powered for as short a time as possible and at the lowest power.
- According to the manufacturer, the overheating protection protects the transmitter but may limit video transmission.

7. Maintenance and Troubleshooting

7.1 Maintenance and Storage

- After flying, check the condition of the solder joints, the cable and the MMCX connector.
- After contact with water, rinse the transmitter and the drone with clean water (if necessary) and let everything dry before reconnecting the battery.
- Store in a dry place, away from direct sunlight and out of the reach of children.

7.2 Troubleshooting

Problem	Possible cause and solution
Indicator does not light	No power: check the 7-24V and GND pads, the voltage on the FC and the solder joints.
No image in the goggles	Transmitter and goggles on different channels; faulty or disconnected VIDEO wire; camera not powered.
Image without OSD	Camera is connected directly to the transmitter instead of via the FC; OSD is not enabled in Betaflight.
Channel and power cannot be changed	SA wire is not on the UART TX pin, VTX (TBS SmartAudio) is not selected on the Ports tab, or the VTX table is missing (Chapter 5.2).
Weak or noisy image	Damaged or poorly connected antenna, antenna shielded by carbon, mismatched antenna polarisation, interference from another pilot.
Video dropouts on the ground	The transmitter is overheating – reduce power and ensure airflow.

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 (DarwinFPV Cement 5.8G 1000mW VTX) is given in this manual and on the proof of purchase; an identification label with a barcode is located on the underside of the transmitter.

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.