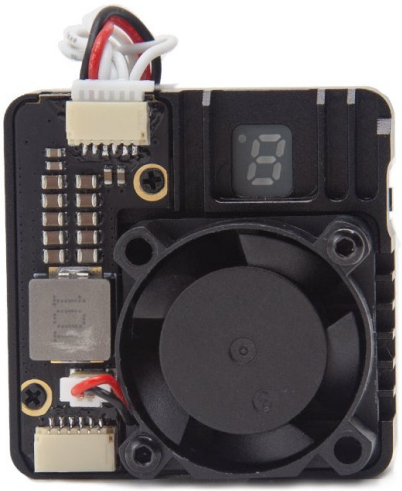
TX2501 CNC

Skyzone · analogue video transmitter (VTX) 5.8 GHz
User Manual



The transmitter can also operate outside permitted bands and with up to 2500 mW. In the Czech Republic, operation without a special authorisation is permitted only in the 5725–5875 MHz band at no more than 25 mW e.i.r.p. Please read Chapter 3.

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1. Safety instructions

1.1 Before you start

Read the entire manual before installation and first power-up. The video transmitter (VTX) is a powerful radio device designed to be installed in a drone, aircraft or other model. Installation requires basic knowledge of electronics and soldering.

- This product is not a toy. Keep it out of the reach of children.
- Use the product only for video transmission from models and similar devices for civilian and recreational purposes. Do not modify it – damage caused by improper intervention is not a product defect.
- Observe the regulations of the country of operation – in particular the permitted bands and the maximum transmit power (Chapter 3).

1.2 Antenna and RF exposure

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

- Always connect the antenna before connecting power, and disconnect it only after power has been disconnected.
- At higher power levels, do not stay permanently in the immediate vicinity of the antenna and do not point it at people close by.

1.3 Heat and cooling

A transmitter with up to 2500 mW of output generates considerable heat. It is therefore fitted with a finned metal CNC case and a fan. The manufacturer explicitly warns that adequate air circulation must be ensured during operation, otherwise the device may be damaged by overheating.

- Do not cover the fan or the fins, and do not install the transmitter in an enclosed space without airflow.
- When testing on the bench without airflow, use the lowest power level and do not leave the transmitter switched on longer than necessary.
- The case may be hot during operation and after switching off. Do not touch it until it has cooled down.

1.4 Power supply and wiring

- Before first power-up, check the wiring and the supply polarity. Reversed wires or a short circuit can destroy the transmitter. Keep the model disconnected from the battery while soldering.
- Do not exceed the permitted supply voltage range (Chapter 2.4).

2. Product description

2.1 Intended use

The Skyzone TX2501 CNC is an analogue video transmitter (VTX) with adjustable output power of 25, 800, 1600 and 2500 mW. In addition to the usual A, B, E, F and R bands, it also supports the L band (Low Band) and the X band (5 GHz) – 56 channels in total in the 4990–5945 MHz range. The CNC case with fan dissipates heat quickly, and the single-digit LED display makes it easy to set and check the band, channel and power.

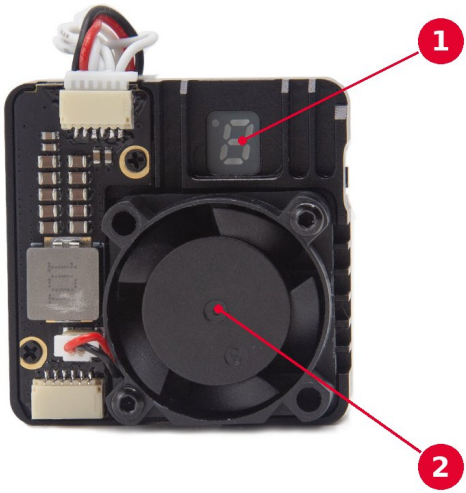
The transmitter is configured with a button or via the flight controller (FC) using the IRC Tramp protocol. Due to its larger size, it is particularly suitable for larger freestyle and long-range drones and for FPV aircraft.

2.2 Package contents

- 1× Skyzone TX2501 CNC video transmitter
- 1× connection cable
- 1× MMCX – SMA cable (pigtail)
- 1× screw set

※ The antenna, camera and flight controller are not included.

2.3 Parts overview



Top view

① LED display – shows band, channel and power (in IRC mode, frequency and power).

② Cooling fan on the CNC case.

2.4 Specifications

Parameter	Value
Model	Skyzone TX2501 CNC (5.8G)
Frequency range	4990–5945 MHz
Bands and channels	A, B, E, F, R, L, X – 7 × 8 = 56 channels
Custom frequency	adjustable in 1 MHz steps within 4990–5945 MHz
Output power	25 / 800 / 1600 / 2500 mW
Supply voltage	7–26 V according to the manufacturer's text; the manufacturer's wiring diagram states 9–26 V
Power output	5 V (5V OUT pin)
Control and indication	SET button or IRC Tramp via the flight controller; single-digit LED display
Antenna connector	MMCX
Mounting pattern	30.5 × 30.5 mm, M3 screws
Dimensions	38.8 × 38.6 × 22.5 mm
Weight	27.5 g

- The manufacturer states that the actual maximum power can reach **3.0–3.5 W**.
- In the X band, the actual power is lower and depends on the frequency (Chapter 5.5).
- The manufacturer gives different supply voltage ranges. We recommend powering the transmitter with **9–26 V**, which satisfies both statements – for example directly from a 3S to 6S Li-Po battery.

A fully charged 6S LiHV battery (4.35 V/cell = 26.1 V) exceeds the upper limit of 26 V. Do not power the transmitter directly from it.

3. Legal conditions of operation

3.1 The law of the country of operation applies

Frequency bands and maximum transmit powers for short-range devices are only partly harmonised in the European Union, and national regulations 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 follow the regulations of the country in which you transmit. The user is always responsible for the selected band, channel and power.

3.2 Frequencies and transmit power in the Czech Republic

Without an individual authorisation, the transmitter may be operated in the Czech Republic only under the general authorisation of the Czech Telecommunication Office (ČTÚ) No. VO-R/10 (short-range devices):

Band	Max. power	Regulation
5725–5875 MHz	25 mW e.i.r.p.	VO-R/10, Art. 3(2)(k)

- The power levels **800, 1600 and 2500 mW** exceed the 25 mW e.i.r.p. limit. You must not use them in the Czech Republic without a special authorisation.
- The **L** band (5362–5621 MHz), the **X** band (4990–5200 MHz) and channels below 5725 MHz and above 5875 MHz are not covered by any general authorisation in the Czech Republic for this type of device.
- Under the general authorisation, the channels whose frequency lies within 5725–5875 MHz may be used in the Czech Republic: **A1–A8, B1–B8, F1–F7 and R3–R6** (table in Chapter 5.4). For channels at the very edge of the band (e.g. A8 – 5725 MHz), part of the transmitted signal extends outside the band.
- A licensed radio amateur may transmit with higher power in the 5650–5850 MHz band under the conditions of the amateur service (Decree No. 156/2005 Coll.).

3.3 Frequency bands and power of the product

Information pursuant to Article 10(8) of Directive 2014/53/EU (RED), as stated by the manufacturer:

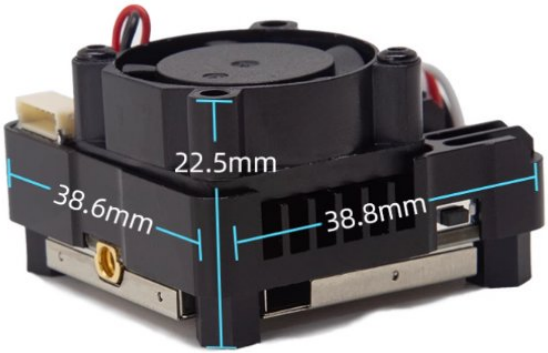
Frequency band	Maximum output power
4990–5945 MHz	2500 mW (according to the manufacturer, the actual power can reach 3.0–3.5 W)

Restrictions on putting into service (CZ): without a special authorisation, only the 5725–5875 MHz band with up to 25 mW e.i.r.p. In other EU countries, a harmonised limit of 25 mW e.i.r.p. applies to this band (Decision 2006/771/EC); check the local regulations.

4. Installation

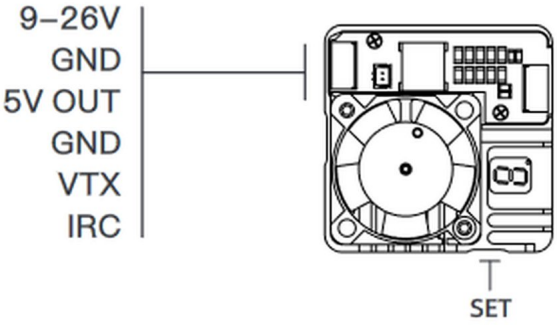
4.1 Mounting

- The transmitter has a 30.5 × 30.5 mm mounting pattern for M3 screws. Fasten it with the supplied screws to the frame or to the flight controller stack.
- Choose a location with good airflow – the fan and the fins must not be covered.
- The MMCX antenna connector and the pigtail cable must not be subjected to pulling or bending. Secure the pigtail to the frame.
- The SET button should remain accessible if you want to configure the transmitter manually.



Dimensions and MMCX antenna connector on the side of the case

4.2 Wiring



Wiring diagram according to the manufacturer (SET = button)

Wire	Function and connection
9–26V	Positive supply – e.g. directly from the battery (range see Chapter 2.4)
GND	Supply ground
5V OUT	5 V power output
GND	Ground
VTX	Video signal input – from the video output of the camera or of a flight controller with OSD
IRC	IRC Tramp control line – to the TX pin of a free UART on the flight controller

※ If you will not control the transmitter via the flight controller, do not connect the IRC wire.

4.3 Antenna

- Connect the antenna via the supplied MMCX – SMA pigtail, or use an antenna with an MMCX connector.
- Choose an antenna for the frequencies on which you will transmit. The manufacturer offers separate antennas for 5.8 GHz and for 5 GHz (X band).
- The polarisation of the transmitter antenna and the receiver (goggles) antenna must be the same.
- Place the antenna as far as possible from carbon parts and power wires.

5. Settings

5.1 Button mode and IRC mode

Band, channel and power can be set in two ways: with the SET button directly on the transmitter, or from the flight controller using the IRC Tramp protocol (e.g. in Betaflight or via the OSD menu operated with the radio transmitter).

Only one of the modes can be used at a time. If you want to configure the transmitter with the button, you must disable the IRC Tramp protocol in Betaflight.

- **Button mode:** the display shows band, channel and power in sequence.
- **IRC mode:** the display shows frequency and power.

The manufacturer has not published a detailed button operation procedure for the TX2501 CNC version. We therefore recommend configuring the transmitter via the flight controller (Chapter 5.3).

5.2 Display and power indication

The selected power level is shown on the LED display as follows:



Power indication: 0 = 25 mW, one bar = 800 mW, two bars = 1600 mW, three bars = 2500 mW

5.3 Setup via the flight controller (FC)

① Connect the IRC wire to the TX pin of a free UART on the flight controller (Chapter 4.2).

② In Betaflight Configurator, open the *Ports* tab and select *VTX (IRC Tramp)* in the *Peripherals* column for the respective UART. Save the settings.

③ On the *Video Transmitter* tab, set up the VTX table according to the channel table in Chapter 5.4 and the power levels 25, 800, 1600 and 2500 mW. Enter the power level values according to the Betaflight documentation for the IRC Tramp protocol.

④ Select band, channel and power and save the settings. Check them on the transmitter display and in the goggles.

※ Always choose band, channel and power in accordance with the regulations of the country of operation (Chapter 3). Before flying, make sure the flight controller does not switch the transmitter to a non-permitted power level (e.g. via a function that increases power after Arm).

5.4 Channel table

Channel frequencies in MHz according to the manufacturer:

Band	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
A	5865	5845	5825	5805	5785	5765	5745	5725
B	5733	5752	5771	5790	5809	5828	5847	5866
E	5705	5685	5665	5645	5885	5905	5925	5945
F	5740	5760	5780	5800	5820	5840	5860	5880
R	5658	5695	5732	5769	5806	5843	5880	5917
L	5362	5399	5436	5473	5510	5547	5584	5621
X	4990	5020	5050	5080	5110	5140	5170	5200

The manufacturer also states that a custom frequency can be set in 1 MHz steps within 4990–5945 MHz.

5.5 Power in the X band

In the X band, the actual output power is lower and depends on the frequency:

MHz	4990	5020	5050	5080	5110	5140	5170	5200
Power	1 W	1.2 W	1.4 W	1.5 W	2 W	2.2 W	2.4 W	2.5 W

6. Operation

6.1 Before the flight

- Check that the antenna is securely connected and undamaged.
- Check the mounting of the transmitter and the condition of the wiring.
- Insert a fully charged battery into the model. A fully charged Li-Po cell has 4.20 V, a LiHV cell 4.35 V.
- After switching on, check the band, channel and power shown on the display and make sure they comply with the regulations of the country of operation.
- Check that the fan is running and nothing prevents it from turning.
- Agree on channels with other pilots so that you do not interfere with each other's video.
- When flying, observe aviation rules – Regulation (EU) 2019/947 and the national regulations of the country of operation.

6.2 During and after the flight

- Monitor the battery voltage. End the flight at 3.5 V per cell at the latest (e.g. 10.5 V for 3S, 21.0 V for 6S).
- After landing, disconnect the battery first and only then handle the model.
- The transmitter case may be hot after the flight.
- Do not leave the transmitter switched on on the ground longer than necessary – without airflow it heats up faster.

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- Keep the fan and the fins clean. Remove dust and dirt with a dry brush or compressed air.
- After a crash, check the case, fan, MMCX connector, pigtail and wiring.
- Protect the transmitter from moisture, water and condensation.
- Store it in a dry place at room temperature, with the antenna disconnected, in a protective cover.

7.2 Troubleshooting

Problem	Possible cause and solution
Display does not light up	Check the power supply, polarity and voltage (Chapter 2.4) and the cable connection.
No image in the goggles	Check that the goggles and the transmitter are on the same channel, that the antenna is connected and that the VTX wire is correctly connected to the video output.
Transmitter cannot be set from the flight controller	Check the connection of the IRC wire to the UART TX pin, the *VTX (IRC Tramp)* setting on the *Ports* tab and the VTX table.
Button settings get overwritten	IRC mode is active. Disable the IRC Tramp protocol in Betaflight, or configure only via the flight controller.
Short range, video interference	Check the antenna and its position, matching polarisation and the channel. Change channel if another pilot is using it.
Transmitter overheats	Check that the fan is running and not covered. Ensure airflow and reduce the power.

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 (TX2501 CNC) is shown 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

Rights of the buyer under Czech law

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.