

VTX Datasheet

Datasheet version v1.10 2026-04-29

UAB "Elarionas"

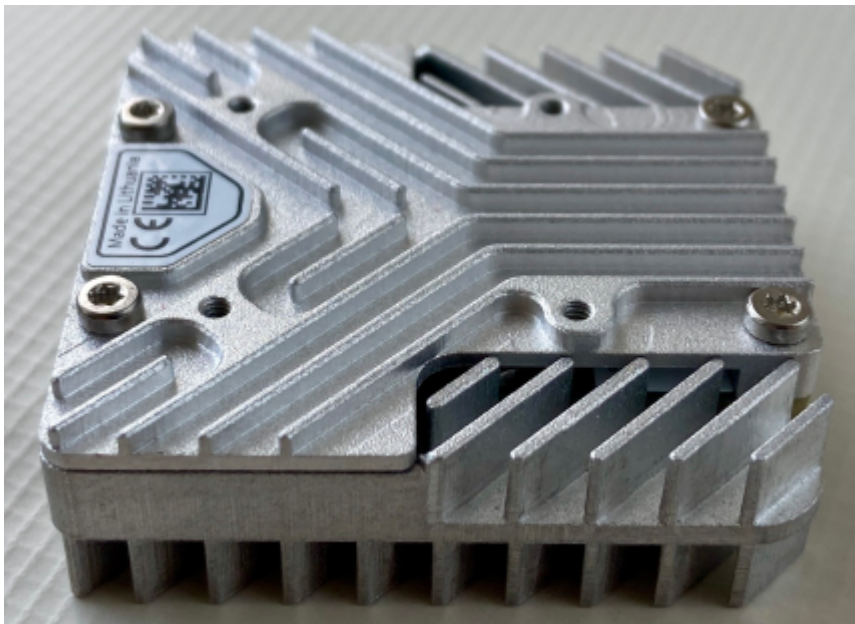
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Made in Lithuania



These analog 5GHz video transmitters are designed and manufactured in Lithuania, using only Western components.



Safety Warnings

This equipment has been evaluated and classified in accordance with the safety requirements of **IEC 62368-1: Audio/Video, Information, and Communication Technology Equipment**.

- **Electrical Energy Source: ES1** The internal operating voltage (22V DC nominal) is classified as ES1. Under normal, abnormal, and single-fault conditions, the voltage levels remain within safe limits and do not pose a risk of electric shock to an **Ordinary Person**.
- **Power Source: PS3** The Li-ion battery system is classified as a high-energy power source (PS3). Due to the potential for high current discharge, the device is to be installed in a fire-protective enclosure to mitigate risks of fire or thermal injury.

Caution

This equipment is intended for installation and use in a Restricted Access Area only. Service and operation are restricted to Skilled Persons as defined by IEC 62368-1.

Warning

All wiring must be secured such that the detachment of a conductor from its terminal cannot result in a reduction of clearances or creepage distances below the minimum requirements of IEC 62368-1. Use supplemental fixing, such as cable ties or heat-shrink tubing, near the terminal point to prevent wire movement in the event of terminal failure.

Warning

This component contains exposed high-energy circuits (PS3). To comply with IEC 62368-1, Annex P.2.2, the end-equipment enclosure must be designed to prevent the entry of foreign objects, such as metal debris, tools, or hardware. During installation, the Skilled Person must ensure that no conductive materials can touch the component or its vicinity, as they may cause a catastrophic short circuit, fire, or explosion.

Warning

This equipment is classified for use in a Pollution Degree 1 environment only. The installation must be designed to strictly prevent the ingress of dust, moisture, or conductive contaminants during its intended use. If the equipment is installed in an environment exceeding PD1, it must be housed in a permanently sealed or filtered enclosure that maintains an internal environment free of pollution throughout the product's life.

Warning

This component is designed to be installed into end-equipment powered by PS3 energy source. To comply with IEC 62368-1, Clause 6.4, the end-equipment must provide a fire enclosure that prevents the spread of fire under single fault conditions. The installer must ensure that all materials within the potential fire spread zone meet the required flammability ratings (V-1 or better, or V-0 depending on proximity).>

Warning

All internal and external wiring connected to this component must comply with IEC 62368-1, Clause 6.5. To prevent fire hazards under normal and fault conditions, conductors must be appropriately sized for the maximum available PS3 current and must be secured to prevent contact with hazardous parts or combustible materials in the event of a terminal loosening.

Warning

To prevent the risk of fire under fault conditions, any additional equipment connected to this component must comply with IEC 62368-1. The Skilled Person must verify that the total power draw of all connected external loads does not exceed the rated output of the component. Furthermore, all interconnecting cables must be appropriately sized and rated for the maximum power available from the PS3 source to prevent ignition in the event of a short circuit.

Caution

This component may contain metal edges, heat sinks, or mounting brackets that are sharp. To comply with IEC 62368-1, Clause 8.4, the Skilled Person must handle the component with care during installation and removal. Use appropriate Personal Protective Equipment (PPE) if necessary, and ensure that the component is installed in a manner that does not expose sharp edges to other service areas within the end-equipment.

Warning

This component contains surfaces classified as TS3 (Thermal Energy Source Class 3) under IEC 62368-1. Surface temperatures may exceed safe limits for skin contact. This equipment must be installed in a Restricted Access Area. To prevent thermal burn injury, allow the equipment to cool for at least 5 minutes before touching or servicing. If immediate access is required, the Skilled Person MUST use appropriate heat-resistant Personal Protective Equipment (PPE).

Instructions for installation

This component must be mounted such that it is only accessible within a Restricted Access Area. To maintain compliance with Clause 9, the installer shall provide a physical barrier or distance that prevents an Ordinary Person from touching any surface of the component. A minimum clearance must be maintained from any ventilation openings in the end-equipment to prevent accidental contact (finger probe test). Alternatively an instructional safeguard shall be provided in accordance with Clause F.5 of IEC 62368-1.

Warning

To comply with IEC 62368-1, Annex M.6, the Skilled Person must ensure that the installation prevents accidental short-circuiting of the battery terminals or internal wiring. Failure to maintain proper separation and securing of conductors may lead to fire, explosion, or the release of toxic materials.

Warning

This component must be protected by an appropriately rated overcurrent protective device in the end-equipment. To comply with IEC 62368-1, the Skilled Person must verify that the overcurrent protection is correctly coordinated with the battery's maximum discharge current and the ampacity of the interconnecting wiring. Failure to provide adequate protection may result in fire or explosion under fault conditions.

Warning

RF RADIATION HAZARD. This component generates a high power RF output at 5.8 GHz. The integrator is responsible for ensuring the final installation complies with IEEE C95.1 or local RF exposure limits. A minimum safety separation distance must be calculated based on the gain of the chosen antenna. Do not operate the amplifier without a properly matched load or antenna connected to the RF output.

The integrator must calculate the Minimum Permissible Distance (d) for the end-user using the formula:

$$d = \sqrt{\frac{PG}{4\pi S}}$$

where P is output power of this device, G is the antenna numerical gain, and S=10 W/m² (for Unrestricted) or 50 W/m² (for Restricted/Skilled Persons).

Absolute maximum ratings

Caution

Running a **Video Transmitter (VTX)** without an antenna connected, or with a poor antenna connection, will **permanently damage** the device.

Always double-check your setup:

- **Connect the antenna** *before* plugging in the battery or turning on the VTX.
- Ensure the antenna connector is **tightly screwed on** and the connection is **sound**.

Rating	Min	Max	Unit
Input voltage on power pins	-0.3	35	V
Input voltage on other pins	-0.3	3.3	V
Operating temperature	-40	85	°C

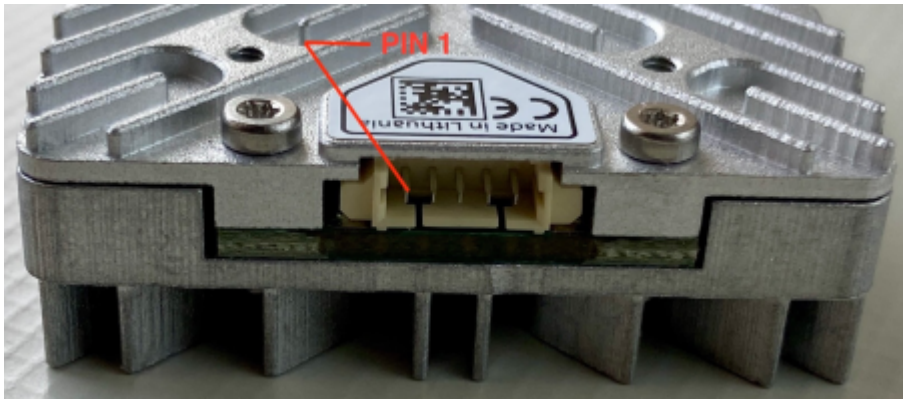
Recommended Operating Conditions

Rating	Value	Unit
Input voltage on power pins	6 - 32	V
Input voltage on video in pin	1.2	V
Input voltage on rx pin	3.3	V

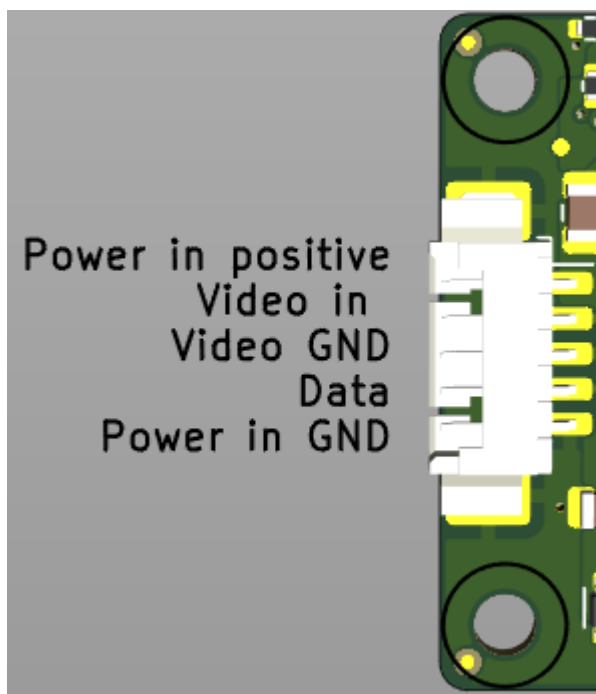
Specifications

Rating	Value
Model	ELRNVTXV3.4
Version	3.4.0
Nominal frequency band	5.8 GHz ISM
Configurable frequency ranges	5.645 - 5.945 GHz 4.9 - 6.15 GHz (extended)
Video Format	NTSC/PAL
Video Input Impedance	75 Ω
Antenna port impedance	50 Ω
Antenna connector	MMCX
Serial protocol	MSP, Smart Audio, TRAMP
TX power levels	25mW, 100mW, 1W, 2.5W
Max output power	34 dBm +- 0.5 dBm
Power consumption	9W max
MCU	STM32F051
Mounting	20x20 mm
Dimensions	42x40 mm
Weight	18 g

Pinout



Pin	Function
1	Power in positive
2	Video in
3	Video GND
4	Data
5	Power in GND



Channel table

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
LowRace	5362	5399	5436	5473	5510	5547	5584	5621
MIL S	6002	6028	6054	6080	6106	6132	6158	6184
MIL T	5931	5960	5990	6015	6041	6067	6093	6119

Usage instructions

Setup with Betaflight Flight Controller and SmartAudio

- Connect VTX Data pin to Flight Controller UART TX pin.
- In *Betaflight configurator* go to "Ports" tab and select *TBS SmartAudio* for port you have connected VTX to and click *Save and Reboot.

UART3	☐	MSP	115200 ▼	Disabled ▼	AUTO ▼	☐	Serial RX	Disabled ▼	115200 ▼	TBS SmartAudio ▼	115200 ▼
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- After Flight controller reboots disconnect USB cable, power down the flight controller and power it up together with VTX using battery power.
- Connect USB cable and set up VTX table in *Video transmitter* tab

Use this VTX table:

```
{
  "description": "Betaflight VTX Config file",
  "version": "1.0",
  "vtx_table": {
    "bands_list": [
      {
        "name": "BAND A  ",
        "letter": "A",
        "is_factory_band": true,
        "frequencies": [
          5865,
          5845,
          5825,
          5805,
          5785,
          5765,
          5745,
          5725
        ]
      },
      {
        "name": "BAND B  ",
        "letter": "B",
        "is_factory_band": true,
        "frequencies": [
          5733,
          5752,
          5771,
          5790,
          5809,
          5828,
          5847,
          5866
        ]
      }
    ]
  }
}
```

```
    "name": "BAND E ",
    "letter": "E",
    "is_factory_band": true,
    "frequencies": [
        5705,
        5685,
        5665,
        5645,
        5885,
        5905,
        5925,
        5945
    ]
},
{
    "name": "FATSHARK",
    "letter": "F",
    "is_factory_band": true,
    "frequencies": [
        5740,
        5760,
        5780,
        5800,
        5820,
        5840,
        5860,
        5880
    ]
},
{
    "name": "RACE",
    "letter": "R",
    "is_factory_band": true,
    "frequencies": [
        5658,
        5695,
        5732,
        5769,
        5806,
        5843,
        5880,
        5917
    ]
},
{
    "name": "RACE_LOW",
    "letter": "L",
    "is_factory_band": true,
    "frequencies": [
        5362,
        5399,
        5436,
        5473,
```

```

        5510,
        5547,
        5584,
        5621
    ]
},
{
    "name": "MIL_S",
    "letter": "S",
    "is_factory_band": false,
    "frequencies": [
        6002,
        6028,
        6054,
        6080,
        6106,
        6132,
        6158,
        6184
    ]
},
{
    "name": "MIL_t",
    "letter": "T",
    "is_factory_band": false,
    "frequencies": [
        5931,
        5960,
        5990,
        6015,
        6041,
        6067,
        6093,
        6119
    ]
}
],
"powerlevels_list": [
    {
        "value": 129,
        "label": "1 "
    },
    {
        "value": 132,
        "label": "25 "
    },
    {
        "value": 148,
        "label": "100"
    },
    {
        "value": 158,
        "label": "1.0"
    }
]

```

```
    },  
    {  
      "value": 163,  
      "label": "2.5"  
    }  
  ]  
}
```

Setup with Betaflight Flight Controller and IRC Tramp

- Connect VTX Data pin to Flight Controller UART TX pin.
- In *Betaflight configurator* go to "Ports" tab and select *IRC Tramp* for port you have connected VTX to and click *Save and Reboot.

UART1	☐	115200 ▾	☐	Disabled ▾	AUTO ▾	Disabled ▾	AUTO ▾	VTX (IRC Tran ▾	AUTO ▾
-------	--------------------------	----------	--------------------------	------------	--------	------------	--------	-----------------	--------

- After Flight controller reboots disconnect USB cable, power down the flight controller and power it up together with VTX using battery power.
- Connect USB cable and set up VTX table in *Video transmitter* tab

Use this VTX table:

```
{
  "description": "Betaflight VTX Config file",
  "version": "1.0",
  "vtx_table": {
    "bands_list": [
      {
        "name": "BAND A  ",
        "letter": "A",
        "is_factory_band": true,
        "frequencies": [
          5865,
          5845,
          5825,
          5805,
          5785,
          5765,
          5745,
          5725
        ]
      },
      {
        "name": "BAND B  ",
        "letter": "B",
        "is_factory_band": true,
        "frequencies": [
          5733,
          5752,
          5771,
          5790,
          5809,
          5828,
          5847,
          5866
        ]
      },
      {
        "name": "BAND E  ",
```

```
    "letter": "E",
    "is_factory_band": true,
    "frequencies": [
        5705,
        5685,
        5665,
        5645,
        5885,
        5905,
        5925,
        5945
    ]
},
{
    "name": "FATSHARK",
    "letter": "F",
    "is_factory_band": true,
    "frequencies": [
        5740,
        5760,
        5780,
        5800,
        5820,
        5840,
        5860,
        5880
    ]
},
{
    "name": "RACE",
    "letter": "R",
    "is_factory_band": true,
    "frequencies": [
        5658,
        5695,
        5732,
        5769,
        5806,
        5843,
        5880,
        5917
    ]
},
{
    "name": "RACE_LOW",
    "letter": "L",
    "is_factory_band": true,
    "frequencies": [
        5362,
        5399,
        5436,
        5473,
        5510,
```

```

        5547,
        5584,
        5621
    ]
},
{
    "name": "MIL_S",
    "letter": "S",
    "is_factory_band": false,
    "frequencies": [
        6002,
        6028,
        6054,
        6080,
        6106,
        6132,
        6158,
        6184
    ]
},
{
    "name": "MIL_t",
    "letter": "T",
    "is_factory_band": false,
    "frequencies": [
        5931,
        5960,
        5990,
        6015,
        6041,
        6067,
        6093,
        6119
    ]
}
],
"powerlevels_list": [
    {
        "value": 1,
        "label": "1 "
    },
    {
        "value": 25,
        "label": "25 "
    },
    {
        "value": 100,
        "label": "100"
    },
    {
        "value": 1000,
        "label": "1.0"
    },
    {

```

```
{
  {
    {
      "value": 2500,
      "label": "2.5"
    }
  }
}
```

Setup with Betaflight Flight Controller and MSP

Elarion VTX features "Automagic" set up via MSP protocol where VTX table is automatically downloaded by flight controller from VTX.

Note

This setup works only if Betaflight is compiled with no digital video support

- Before set up, make sure any VTX table from previous setup is removed. Go to "Video transmitter" tab in *Betaflight configurator* and remove all bands, channels and power levels by setting their count to "0".
- Connect VTX Data pin to Flight Controller UART TX pin.
- Also connect power, video-in and ground pins.
- In *Betaflight configurator* go to "Ports" tab and make sure there is no configuration assigned to your chosen UART port.
- In *Betaflight configurator* go to "Presets" and enter "OpenVTx" in the search field
- Click on OpenVTx preset
- In Options drop down choose UART port to which you have soldered Data signal

OpenVTx



Community

VTX

Author: Jye Smith

Firmware: 4.2; 4.3; 4.4; 4.5

Keywords: vtx; vtx table; OpenVTx; TRAMP; SA 2.1; MSP

Options

[MSP (Betaflight 4.4+): UART 3]

- ☐ TRAMP (Betaflight 4.2+)
- ☐ SmartAudio 2.1 (Betaflight 4.2+)

MSP (Betaflight 4.4+)

- ☐ UART 1
- ☐ UART 2
- ☒ UART 3
- ☐ UART 4
- ☐ UART 5
- ☐ UART 6
- ☐ UART 7

VTx tables for Op
MSP control is su
Update using the
Source code can

The information
Betaflight makes
provided herein.
complying with a

Tx/

entertainment purposes only.
the use of any information
or ensuring they are

Using the VTX tables as provided may be in breach of your local RF laws. It is up to the end user to research and comply with local regulations and in using these presets the user assumes all

Discussion...

View online...

Show CLI

Close

Pick

- Click "Pick", then click "Save and Reboot"

- After Flight controller reboots disconnect USB cable, power down the flight controller and power it up together with VTX using battery power.
- Connect to Flight controller and check if changes are correctly applied in "Ports" tab:

UART3	☒ 9600	☐	Disabled	AUTO	Disabled	AUTO	VTX (MSP + D)	AUTO
-------	--	--------------------------	----------	------	----------	------	---------------	------

- Also check if *Betaflight* was able to successfully download VTX table from VTX. Go to "Video transmitter" tab and check VTX table is available:

VTX Table

6

Number of bands

8

Number of channels by band

Name	Letter	1	2	3	4	5	6	7	8	
BAND_A	A	5865	5845	5825	5805	5785	5765	5745	5725	Band 1
BAND_B	B	5733	5752	5771	5790	5809	5828	5847	5866	Band 2
BAND_E	E	5705	5685	5665	5645	5885	5905	5925	5945	Band 3
FATSHARK	F	5740	5760	5780	5800	5820	5840	5860	5880	Band 4
RACE	R	5658	5695	5732	5769	5806	5843	5880	5917	Band 5
RACE_LOW	L	5362	5399	5436	5473	5510	5547	5584	5621	Band 6

5

Number of power levels

1	2	3	4	5	
1	14	20	30	34	Value
1	25	100	1.0	2.5	Label

Choose your Band, channel and power level:

Selected Mode

☐

Enter frequency directly

RACE

Band

None

Channel

100

Power

☐

Pit Mode

0

Pit Mode frequency

Off

Low Power Disarm

Warning

Don't leave VTX switched full power on the with no air flow. Use Betaflight feature Low Power Disarm - ON.

ON

Low Power Disarm

Setup with iNav Flight Controller

- Connect VTX Data pin to Flight Controller UART TX pin.
- In *iNav configurator* go to "Ports" tab and select *TBS SmartAudio* for port you have connected VTX to and click *Save and Reboot.

UART3	☐	MSP	115200	Disabled	AUTO	☐	Serial RX	Disabled	115200	TBS SmartAudio	115200
-------	--------------------------	-----	--------	----------	------	--------------------------	-----------	----------	--------	----------------	--------

- After Flight controller reboots disconnect USB cable, power down the flight controller and power it up together with VTX using battery power.
- Connect to Flight controller and check if changes are correctly applied in "Configuration" tab:

VTX

Use only bands, channels and power levels that are legal in a place you fly!
Always refer to VTX user manual and local regulations!

Fatshark	Band
4	Channel
1	Power Level
Disabled	Use low power while the craft is disarmed

Warning

Don't leave VTX switched full power on the with no air flow. Use iNav feature *Use low power while craft is disarmed* - Always.

Always	Use low power while the craft is disarmed
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LED indication

- Both LEDs will light up on boot
- Leds blinking interchangeably indicates bootloader mode

In normal operation blue LED indicates parameter and green led indicates value:

- 1 blue blink - band
 - 2 blue blinks - channel
 - 3 blue blinks - power
- Green LED blinks represent value, for example:
- for band:
 - 1 blink - band A,
 - 8 blinks - band MIL_T
 - for power:
 - 3 blinks - 25 mW,
 - 6 blinks - 2.5W

Firmware programming

- Firmware programming is available in "Betaflight passthrough" serial mode using MSP and SmartAudio protocols.
- Connect your VTX to flight controller and set it up with Betaflight or iNav according to instructions above before attempting to update firmware.
- Make sure you have disconnected and closed Betaflight or iNav configurator software and FC serial port is free before programming.
- Firmware programming is provided via web-based flashing tool <https://vtxflasher.elarion.io/>. Use Chrome browser to open the web page.

Mechanical

Use 4 M2 screws to fix VTX to drone frame. VTX features 20x20 mm screw pattern.