Jumper AION Nano

ExpressLRS 2.4 GHz transmitter module
User manual



Read the entire manual before first use. Never power on the module without the antenna attached.

www.rotorama.com

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1. Safety instructions

1.1 Before you start

Jumper AION Nano is an ExpressLRS (ELRS) transmitter module for RC radios with a Nano-size module bay. It is used for radio control of FPV drones and RC models. Read the entire manual before first use and keep it for future reference. If you pass the module on to another person, include this manual.

- This product is not a toy. It is not intended for children; children may use the module only under adult supervision.
- The pilot is always responsible for the safe operation of the model controlled by the module. Before every flight, check the link and the receiver failsafe function.
- Do not change module parameters while the model is in the **Arm** state (motors enabled). A parameter change briefly interrupts normal module operation and may cause a link loss and trigger failsafe.
- Never change the Packet Rate in flight – a change always forces the transmitter to disconnect from the receiver.

1.2 Antenna and transmission

- **Never power on the module without the antenna attached.** Transmitting without an antenna can damage the RF section of the module.
- Use only the supplied antenna or an antenna specified for the module by the manufacturer. Do not connect RF amplifiers.
- Tighten the antenna connector by hand only, without tools. Overtightening can damage the connector.
- Keep as clear a line of sight between the antenna and the model as possible, and do not cover the antenna with your hand or body.
- The user is responsible for the transmit power setting. Observe the limits that apply in the country of operation (chapter 3).

1.3 Power, heat and environment

- The module is powered by the radio through the module bay connector. Use it only in a radio whose module bay supplies a voltage within the range stated on the module label (chapter 2.3).
- Insert the module into the radio and remove it **only with the radio switched off**. Before inserting, check that the connector pins are not bent.
- The module heats up at higher transmit power. Do not cover the heatsink fins and do not touch hot parts after prolonged operation.
- Protect the module from moisture, rain, dust, drops and direct sunlight. Do not use it if it is mechanically damaged or wet.
- Do not open or modify the module. Unqualified intervention may damage the product and affect its regulatory compliance.

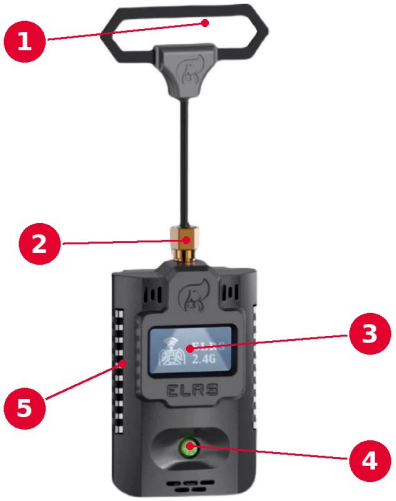
2. Product description

2.1 Package contents

- 1× Jumper AION Nano ELRS 2.4 GHz transmitter module
- 1× Diamond antenna

Not included: RC radio, ExpressLRS receiver or USB-C cable for firmware updates.

2.2 Parts overview



Front of the module

① **Diamond antenna** – antenna for the 2.4 GHz band.

② **Antenna connector** – threaded connector for attaching the antenna.

③ **OLED display** – shows the module status and the settings menu.

④ **Joystick with RGB LED** – five-way menu control; the LED colour indicates the module status (chapter 5.2).

⑤ **Heatsink fins** – passive cooling of the module.



Back of the module



Bottom edge of the module

⑥ **Nano module connector** – connects to the radio's module bay (power, ground and S.Port signal).

⑦ **Type label** – type designation, transmit power, supply voltage and current draw.

⑧ **USB-C port** – firmware update from a computer (chapter 6.2).

2.3 Technical data

Parameter	Value
Product	ELRS 2.4TX Module
Type designation	AION 2.4TX NANO (on the label); AION ELRS2.4TX-NANO (manufacturer's website)
System / firmware	ExpressLRS (ELRS)
MCU	ESP32
Frequency band	2.4 GHz
Transmit power (ELRS)	10–500 mW, adjustable (10 / 25 / 50 / 100 / 250 / 500 mW)
Max. packet rate	500 Hz
Display	OLED 0.96", 128 × 64 px
Controls	five-way joystick with RGB LED
Interface	Nano module bay, S.Port signal
Supply voltage	DC 6–8.4 V (as stated on the label)
Current draw	< 400 mA
Wireless functions	WiFi – firmware update and web interface; Bluetooth – joystick mode for simulators
Firmware update	WiFi or USB-C

※ The manufacturer does not state weight or dimensions. The maximum transmitted power of the WiFi and Bluetooth interfaces is given in the EU declaration of conformity (chapter 8.2).

Manufacturer

Manufacturer	Jumper
Address	08B, Zhonglou Zhuihui Industrial Park, Lian Dong U Valley, Xinza Street, Zhonglou District, Changzhou, Jiangsu, China
E-mail	support@jumper-rc.com
Web	www.jumper-rc.com

3. Legal conditions for radio operation

3.1 The law of the country of operation applies

Directive 2014/53/EU (RED) applies in all EU member states, but each country sets its own conditions for the use of radio frequencies – permitted bands, maximum transmit power and other restrictions may differ. This chapter describes the situation in the Czech Republic. If you operate the module in another country, you must follow the regulations of the country in which you use it.

3.2 Frequencies and transmit power in the Czech Republic

The module transmits in the 2.4 GHz band. In the Czech Republic, operation in this band is governed by the general authorisations of the Czech Telecommunication Office (ČTÚ):

Band	Limit	Regulation
2400–2483.5 MHz	25 mW e.i.r.p.	VO-R/10 – short range devices, Art. 3(2)(j)
2400–2483.5 MHz	100 mW e.i.r.p.	VO-R/12 – wideband data transmission systems

- The e.i.r.p. limit includes the antenna gain. The power set in the module is therefore not the same as the radiated power.
- The 250 mW and 500 mW transmit power levels **exceed** the limits of the ČTÚ general authorisations. In the Czech Republic, choose a power setting that keeps within the limit applicable to your operation.
- When updating the firmware, select the regulatory domain matching the country of operation; for EU countries, ExpressLRS offers the **EU_CE_2400** domain.
- Operate the module only with the antenna specified by the manufacturer and without additional RF amplifiers.
- The operator is responsible for complying with the permitted frequencies and power levels. The current wording of the authorisations is available at www.ctu.cz.

Rules for operating unmanned aircraft (operator registration, operational categories) are set out in Regulations (EU) 2019/945 and 2019/947 and in the manual for your model.

4. Installation and radio setup

4.1 What else you need

- An RC radio with a Nano (Lite) size module bay, e.g. Jumper T-Pro, T-Lite, Zorro or FrSky X-Lite, running EdgeTX or OpenTX. ExpressLRS recommends EdgeTX.
- An ExpressLRS 2.4 GHz receiver with the same major firmware version as the module.
- The ExpressLRS Lua script (*elrs.lua*) in the *SCRIPTS/TOOLS* folder on the radio's SD card.
- For firmware updates, a computer with ExpressLRS Configurator and a USB-C data cable, or a device with 2.4 GHz WiFi.



Module in the module bay of a Jumper T-Pro radio

4.2 Inserting the module and fitting the antenna

① Switch off the radio.

② Screw the antenna (part ①) onto the antenna connector (part ②) and tighten it by hand.

③ Check that the pins in the module bay and on the module connector (part ⑥) are not bent.

④ Push the module fully into the Nano module bay.

⑤ Switch on the radio. The module display lights up and the joystick LED briefly plays a rainbow effect (startup).

4.3 Model setup in EdgeTX

The setup is done separately for each model. Key names may differ depending on the radio type – follow the manual for your radio.

① Press the **MDL** key and open the *Model Setup* page.

② Set *Internal RF* to **Off** (the internal module must be disabled).

③ Under *External RF*, set *Mode* to **CRSF**.

④ Set *Baudrate* according to the required packet rate (see table below).

⑤ Optionally set a unique *Receiver ID* number (for the Model Match function).

⑥ After changing the Baudrate, switch the radio off and on again.

Baudrate	Use
400K	packet rates up to 250 Hz; works with most radios
921K	packet rates up to 500 Hz
1.87M	highest baudrate supported by the AION Nano module; depends on the radio's capabilities

- For models with a flight controller (FC), e.g. running Betaflight, ExpressLRS recommends turning the *ADC Filter* **off**. For receivers with PWM outputs, leave it on.
- Assign Arm (motor enable) to channel 5 (AUX1), as ExpressLRS expects.

4.4 ExpressLRS Lua script

The Lua script displays and changes the module settings directly on the radio screen. Press the **SYS** key, open *Tools* and run *ExpressLRS*. The module identifies itself in the script as **AION 2G4NANO TX**.

- The packet counter in the header shows bad/good packets between the radio and the module; at a Packet Rate of 500 Hz it should read 0/500.
- The letter **C** in the top right corner indicates a link with the receiver; a dash (-) means there is no link.
- If the script stays on the *Loading...* screen, check the model setup (chapter 4.3) and increase the Baudrate.
- Items not supported by the module are not shown in the script (e.g. fan or backpack settings – the AION Nano has neither).

5. Module operation and settings

5.1 Display and joystick

Basic settings can also be changed without the Lua script – using the display (part ③) and joystick (part ④) on the module. The home screen shows the current module settings and firmware version; the link status is indicated by *Connected*, *! Armed !* or *Mismatch!*.

Joystick action	Function
long press centre or right	opens the menu from the home screen
up / down	on the home screen shows link statistics; in the menu moves to the previous / next item; when selecting a value changes the value
press centre or right	enters an item; when selecting a value saves it
left	goes back one level; when selecting a value cancels the change

The menu closes automatically after 20 s of inactivity. Menu items: *PACKET RATE*, *SWITCH MODE*, *TX POWER* (*MAX POWER*, *DYNAMIC POWER*), *TELEM RATIO*, *BLE GAMEPAD*, *BIND MODE*, *WIFI ADMIN* (*TX WIFI*, *RX WIFI*) and *VTX ADMIN*. The menu may differ slightly depending on the firmware version.

※ When the model is in the Arm state, the module joystick is disabled for safety reasons.

5.2 RGB LED indication

LED	Meaning
rainbow colour fade	module starting up
green pulsing	WiFi update mode
blue pulsing	Bluetooth joystick mode
red blinking (fast)	radio chip not detected
one orange flash per second	module not communicating with the radio
solid single colour	linked to the receiver; colour indicates the Packet Rate
single colour fading in and out	no link to the receiver; colour indicates the Packet Rate

Colours by Packet Rate: yellow F500, yellow-green D500, green D250, cyan 333 Full, light blue 500 Hz, blue 250 Hz, blue-violet 150 Hz, violet 100 Full, magenta 50 Hz.

5.3 Binding with a receiver

The module and the receiver will only link if they have the same **major version** of firmware (the first number of the version). The recommended method is a shared **binding phrase**.

▶ Binding phrase (recommended)

When building the firmware in ExpressLRS Configurator or in the module's web interface, enter a unique phrase (at least 8 Latin letters and digits recommended, e.g. your pilot nickname). Set the same phrase in the receiver. Devices with the same phrase link automatically after power-on, with no further binding. The phrase is neither a password nor an encryption key.

▶ Traditional binding

① Switch off the radio.

② Put the receiver into bind mode – power it on and off three times in a row, switching it off within 2 s each time; on the fourth power-on the receiver LED must blink rapidly twice.

③ Switch on the radio and select **[Bind]** in the Lua script, or *BIND MODE* in the module menu, and confirm by pressing the joystick.

④ When the receiver LED is solid, binding is complete. The letter **C** appears in the Lua script.

Other ways to put the receiver into bind mode (a button on the receiver, a command from Betaflight Configurator) are described in the receiver manual and the ExpressLRS documentation.

5.4 Packet Rate, telemetry and Switch Mode

Packet Rate determines how often the module sends data. A higher rate means lower latency but shorter range. The manufacturer specifies a maximum packet rate of 500 Hz.

- **50, 150, 250 and 500 Hz** – LoRa modes; lower rate = higher sensitivity and range.
- **F500** – FLRC mode with the lowest latency and shorter range.
- **D250, D500** – FLRC modes with repeated packet transmission (better link quality, higher latency).
- **100 Full, 333 Full** – LoRa modes with full channel resolution, suitable e.g. for airplanes.
- **Telem Ratio** – share of packets used for telemetry (Off, 1:128 … 1:2). *Std* selects the ratio based on the Packet Rate; *Race* additionally disables telemetry in the Arm state.
- **Switch Mode** – how switch positions are transmitted (*Hybrid* / *Wide*); it can only be changed while not linked to the receiver.

ExpressLRS recommends: 500 Hz with *Race* telemetry for racing, 250 Hz with *Std* telemetry for freestyle, *100 Full* for airplanes.

5.5 Transmit power and Dynamic Power

In the *TX Power* menu, set **Max Power** – the highest power the module will never exceed (10–500 mW). With **Dynamic** = *Off*, the module transmits continuously at this power.

- **Dyn** – the module reduces power based on receiver telemetry when maximum power is not needed. Telemetry must therefore be enabled (Telem Ratio other than *Off* and *Race*).
- **AUX9 – AUX12** – Dynamic Power is enabled with a switch: up position (> 1500 µs) = Dynamic Power, down = Max Power.
- After power-on, the module starts at the lowest power. If link quality (LQ) drops below 50 % or telemetry is lost in the Arm state, the power immediately rises to Max Power.
- Set Max Power with regard to the limits in chapter 3.2.

5.6 Bluetooth joystick for simulators

Select **[BLE Joystick]** in the Lua script, or *BLE GAMEPAD* in the module menu. The LED starts pulsing blue and the radio can be connected to a simulator via the computer's Bluetooth as a game controller. To exit the mode, restart the radio or change the model.

6. Firmware update and further guides

Firmware is built with **ExpressLRS Configurator**: *Official Releases* tab, category **Jumper 2.4 GHz**, device **Jumper AION Nano 2.4GHz TX**. In the firmware options, always select the regulatory domain for the country of operation; entering a binding phrase is recommended, and you can optionally enter your home WiFi network credentials.

※ The first WiFi update from factory or older firmware to a newer major version may require an intermediate step (Repartitioner file). Follow the module page at expresslrs.org. Updating via USB-C does not require this step.

6.1 Updating via WiFi

① In the Configurator, select the **WiFi** method, click *Build* and take the *firmware.bin* file from the folder that opens.

② In the Lua script, open *WiFi Connectivity* → *Enable WiFi*, or *WIFI ADMIN* → *TX WIFI* in the module menu. The LED pulses green.

③ Connect your phone or computer to the **ExpressLRS TX** WiFi network, password **expresslrs**.

④ Open **http://10.0.0.1** in a browser. If the module is connected to your home WiFi, use **http://elrs_tx.local**.

⑤ On the *Update* tab, upload the *firmware.bin* file and click *Update*.

⑥ Wait for the success message. **Do not disconnect or switch off** the module while flashing; the update is complete when the Lua script returns to the main screen.

If the module receives no valid data from the radio after power-on (e.g. when powered via USB-C outside the radio), it enters WiFi mode on its own after a set interval (at least 60 s according to the ExpressLRS documentation). On a computer connected to a router by cable, the address 10.0.0.1 may open the router page – use a phone or tablet instead.

6.2 Updating via USB-C

① Remove the module from the radio and connect it to a computer with a USB-C data cable.

② Check that the computer recognises it as a serial port. If not, install the **CP210x** (Silicon Labs) or **CH9102** driver – depending on the converter used in your unit.

③ In the Configurator, select the **UART** method, set the firmware options and click *Flash*.

④ After the green success message, disconnect the module, insert it back into the radio and check the firmware version in the Lua script.

6.3 Further guides

Official documentation for EdgeTX and ExpressLRS is available at edgetx.org and expresslrs.org. Scan the QR codes to open it.

EdgeTX – official documentation (edgetx.org): installing and updating EdgeTX, radio setup, models, mixes and switches.

ExpressLRS – official documentation (expresslrs.org): firmware, binding, setting up transmitter modules and receivers.

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- Clean the module with a soft dry cloth. Do not use solvents or water.
- Regularly check the antenna, its cable and the antenna connector. Replace a damaged antenna.
- Keep the module connector and the module bay contacts clean.
- Store the module in a dry place, away from direct sunlight and heat sources. Before transport, remove it from the radio or unscrew the antenna so that it does not break.

7.2 Troubleshooting

Problem	Cause and solution
Display off, module not responding	The module is not inserted correctly or the bay does not supply power. Switch off the radio, remove the module, check the contacts and insert it again.
LED flashes orange once per second	The module is not communicating with the radio. Check that External RF is set to CRSF and Internal RF to Off (chapter 4.3).
Lua script stays on "Loading..."	Incorrect model setup or low Baudrate. Check chapter 4.3 and increase the Baudrate.
Higher Packet Rate cannot be set	The Baudrate is too low (400K is only sufficient up to 250 Hz). Increase the Baudrate and restart the radio.
Module does not link with the receiver	Different binding phrase, incompatible major firmware version or a different regulatory domain. Match the settings of both devices.
Link drops at short range	Loose or damaged antenna, covered antenna, Packet Rate too high. Check the antenna and select a lower Packet Rate.
ExpressLRS TX network does not appear	The module is connected to your home WiFi – use http://elrs_tx.local. The device must support 2.4 GHz WiFi.
Computer does not recognise the module via USB	The CP210x / CH9102 driver is missing or a charge-only cable is used. Install the driver and use a data cable.

If the problem persists, contact the seller (chapter 8.1).

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 (AION 2.4TX NANO) is given on the rating label on the back of the module; the firmware version number is shown on the start screen of the module display and in the ExpressLRS Lua script.

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.