ELRS 2.4G 500mW

iFlight ExpressLRS 2.4 GHz receiver
with 70 mm T antenna



Read this entire manual before installation and first use, especially chapters 1 and 3. Keep this manual for future reference.

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Contents

1. Safety instructions

2. Product description

2.1 What the receiver is for

2.2 Package contents

2.3 Technical data

2.4 Parts and pinout

3. Legal requirements for operation in the Czech Republic and the EU

4. Installation

4.1 What else you need

4.2 Connecting to the flight controller (FC)

4.3 Antenna placement

4.4 First power-up and LED check

5. Setup and binding

5.1 Flight controller setup in Betaflight

5.2 Binding with the transmitter

5.3 Connection check and telemetry power

5.4 Firmware update

5.5 Further guides

6. Failsafe and pre-flight check

7. Maintenance and troubleshooting

8. Information for the EU and Czech market

9. Warranty and rights arising from defective performance

1. Safety instructions

The receiver is part of the control chain of a drone or model aircraft. Incorrect installation or setup may lead to loss of control over the aircraft and thus to injury or property damage.

- Always install and configure the receiver **with the propellers removed**. Fit the propellers only after the connection and failsafe have been checked successfully.
- Power the receiver only with **5 V** from the corresponding output of the flight controller. Connecting it to battery voltage will destroy the receiver.
- Before the first power-up, check the wiring and look for shorts between the pins. When soldering, remove any flux residue.
- Do not power the receiver without the antenna connected. Protect the antenna from being cut by the propellers and from sharp edges of the frame.
- The receiver transmits telemetry at up to 500 mW and gets warm. Do not cover the aluminium heatsink with material that prevents heat dissipation, and do not place the receiver next to heat-sensitive parts.
- Set the telemetry power in accordance with the regulations of the country of operation (see chapter 3). The user is responsible for this setting.
- Check the connection and the failsafe function before every flight (chapter 6).
- This product is not a toy. Keep it out of the reach of children – small parts may be swallowed.
- Protect the receiver from moisture, dust, conductive debris and mechanical damage.

2. Product description

2.1 What the receiver is for

The iFlight ELRS 2.4G 500mW is a radio control receiver for the open-source **ExpressLRS (ELRS)** system in the 2.4 GHz band. It receives control commands from a radio with an ExpressLRS module and passes them to the flight controller (FC) using the **CRSF** protocol. In the opposite direction it sends telemetry to the radio – for example battery voltage, link quality or GPS data.

The receiver has a power amplifier with telemetry power of up to **500 mW**, a low-noise amplifier (LNA), a temperature-compensated crystal oscillator (TCXO) and an aluminium heatsink. A pre-soldered SH1.0 connector is provided for connection; solder pads are also available.

2.2 Package contents

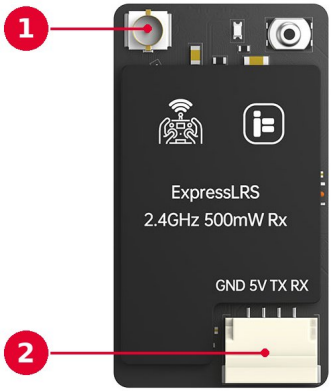
- 1× iFlight ELRS 2.4G 500mW receiver
- 1× 70 mm T (dipole) antenna with IPEX connector

Not included: connection cable to the FC.

2.3 Technical data

Parameter	Value
System / output protocol	ExpressLRS / CRSF
Frequency band	2.4 GHz ISM
Telemetry power	50–500 mW (17–27 dBm)
Low-noise amplifier (LNA)	yes
Oscillator	TCXO (temperature-compensated)
Processor (MCU)	ESP8285
Receiver type	single antenna
Firmware target	iFlight 2.4GHz 500mW RX
Name in Lua script	iF 2G4 500mW RX
Power supply	5 V
Connection	SH1.0 connector (GND, 5V, TX, RX), solder pads on the bottom side
Antenna connector	IPEX
Antenna	T dipole 70 mm
Dimensions	14 × 25 × 4.3 mm
Weight	1.8 g

2.4 Parts and pinout



Top side of the receiver

① **IPEX antenna connector** – connect the supplied antenna here.

② **SH1.0 connector** – pin order **GND, 5V, TX, RX** (printed above the connector).



Bottom side – solder pads RX, TX, 5V, GND

Pin	Function
GND	ground – connect to any GND pad on the flight controller
5V	5 V power supply from the flight controller
TX	control output to the FC – connect to the **RX** pad of the selected UART
RX	telemetry input from the FC – connect to the **TX** pad of the same UART

3. Legal requirements for operation in the Czech Republic and the EU

3.1 The law of the country of operation applies

European Union legislation (Directive 2014/53/EU on radio equipment, Regulations (EU) 2019/945 and 2019/947 on unmanned aircraft systems) applies in all member states, but national implementing rules differ from country to country – permitted frequency bands, maximum transmit power, operator registration, geographical zones and mandatory insurance. The information in this chapter describes the situation in the Czech Republic. **If you operate the product in another country, you must comply with the regulations of the country in which you operate it.**

3.2 Frequencies and transmit power

The receiver transmits a telemetry return channel in the 2.4 GHz band. In the Czech Republic, operation in this band is governed by General Authorisation No. VO-R/10 issued by the Czech Telecommunication Office (ČTÚ):

Band	Limit in the Czech Republic	Source
2400–2483.5 MHz	25 mW e.i.r.p.	VO-R/10, Art. 3(j)

- The maximum telemetry power of the receiver (500 mW) **exceeds** the limit applicable in the Czech Republic. Set the power so that the radiated power including antenna gain does not exceed the limit.
- When flashing the firmware, select the regulatory domain corresponding to the country of operation – for the EU this is *Regulatory_Domain_EU_CE_2400*.
- The user is responsible for the power setting and compliance with regulations. Outside the Czech Republic, the limits of the respective country apply.

3.3 Operating a drone or model aircraft

The receiver is a component. The drone or model aircraft into which you install it is subject to Regulation (EU) 2019/947 – in particular operator registration, pilot competency, a maximum flight height of 120 m and visual line of sight. Current rules for the Czech Republic are published by the Civil Aviation Authority at www.caa.gov.cz.

4. Installation

4.1 What else you need

- a radio with an **ExpressLRS 2.4 GHz** transmitter module – the major firmware version number (the first number) must be the same in the transmitter and the receiver,
- a flight controller (FC) with a free full UART and a 5 V output,
- a connection cable with an SH1.0 plug (4 pins), or soldering equipment,
- a computer with Betaflight Configurator (or the configurator of another FC firmware) and ExpressLRS Configurator.

4.2 Connecting to the flight controller (FC)

Connect the receiver to any free UART of the flight controller – with a cable to the SH1.0 connector, or by soldering wires to the pads on the bottom side. Follow the wiring diagram of your flight controller.

① Receiver **GND** → any GND pad on the FC.

② Receiver **5V** → 5 V pad on the FC.

③ Receiver **TX** → **RX** pad of the selected UART (e.g. R2).

④ Receiver **RX** → **TX** pad of the same UART (e.g. T2).

※ TX and RX are cross-connected. If the FC connector has a different wire order than the receiver (GND, 5V, TX, RX), modify the cable before connecting – swapping 5V and GND will destroy the receiver.

4.3 Antenna placement

- Snap the IPEX connector on straight and without force; secure the antenna cable so that the connector is not under tension.
- Place the active part of the antenna (T) as far as possible from carbon, metal parts and motors, out of reach of the propellers; do not bend it at a sharp angle.

4.4 First power-up and LED check

Before fixing the receiver in place, check the wiring for shorts, remove the propellers and power up the drone (preferably from the flight battery). Watch the status LED:

- **slow blinking** (500 ms) – the receiver is waiting for a connection with the transmitter; wiring is OK,
- **solid light without a bound transmitter** – bootloader mode; use a different UART,
- **LED off** – disconnect power immediately and check the wiring.

5. Setup and binding

5.1 Flight controller setup in Betaflight

① On the *Ports* tab, enable *Serial Rx* for the UART to which the receiver is connected. Save.

② On the *Receiver* tab, select *Serial (via UART)* mode and the *CRSF* protocol. Save.

③ After binding (chapter 5.2), check on the *Receiver* tab that the channels respond to stick and switch movement and that the channel order matches your radio.

With other flight controller firmware (INAV, ArduPilot), set up a serial receiver with the CRSF protocol according to its documentation.

5.2 Binding with the transmitter

Before binding, make sure that the transmitter module and the receiver have the same major ExpressLRS firmware version number.

▶ Binding with a binding phrase – recommended

Choose your own phrase (at least 8 characters, letters and numbers only) and set it identically in the transmitter module and the receiver – when flashing the firmware in ExpressLRS Configurator or in the receiver's web interface (chapter 5.4). Devices with the same phrase connect automatically.

▶ Binding without a phrase

① Switch off the radio.

② Power the receiver on and off within 2 seconds three times in a row; leave it on the third time. Alternatively, use the *Bind Receiver* button on the *Receiver* tab in newer versions of Betaflight Configurator.

③ The receiver LED blinks twice and pauses – the receiver is in bind mode.

④ Switch on the radio and select *[Bind]* in the ExpressLRS Lua script.

⑤ As soon as the receiver LED is solid, binding is complete.

Bind mode is cancelled by restarting the receiver; the previous binding information remains valid.

5.3 Connection check and telemetry power

On the radio, open the system menu (*SYS* key) → *Tools* → *ExpressLRS*. The letter **C** in the upper right corner of the script means that the transmitter and the receiver are communicating. If *Model Mismatch* is displayed instead, the Model Match setting does not match (see 7.3).

Set the receiver's telemetry power in the receiver settings in the ExpressLRS Lua script or in its web interface so that it complies with the regulations of the country of operation (chapter 3.2).

5.4 Firmware update

Firmware is flashed with **ExpressLRS Configurator**. Select the target **iFlight 2.4GHz 500mW RX**, the regulatory domain for the country of operation and, optionally, a binding phrase. Choose the firmware version to match the version in the transmitter module.

▶ Via Wi-Fi

① Switch off the radio and power up the receiver. Without a connection to the transmitter, Wi-Fi mode starts after 60 s – the LED blinks rapidly.

② Connect your phone or computer to the **ExpressLRS RX** network (password **expresslrs**) and open the address **10.0.0.1** in a browser.

③ In the web interface, on the *Update* tab, upload the firmware file created in ExpressLRS Configurator with the *Build* button.

▶ Via the flight controller (Betaflight passthrough)

Close Betaflight Configurator and connect the FC with a USB cable (if necessary, also connect a battery – remove the propellers and ensure cooling of the video transmitter). In ExpressLRS Configurator, select the *BetaflightPassthrough* method and press *Flash*. When finished, the receiver LED blinks slowly again.

5.5 Further guides

Detailed information on the ExpressLRS system and the EdgeTX radio firmware can be found in the official documentation:

- ExpressLRS: www.expresslrs.org
- EdgeTX: www.edgetx.org

6. Failsafe and pre-flight check

Failsafe is the flight controller's response to loss of the signal from the radio. It is configured in the flight controller (in Betaflight on the *Failsafe* tab); for a drone, immediately stopping the motors is common.

▶ Failsafe test (always without propellers)

① Remove the propellers, switch on the radio and the drone, and Arm (start the motors).

② Switch off the radio.

③ The motors must stop according to the failsafe setting. If they do not, do not fly and correct the setting.

▶ Before every flight

- the antenna is connected, undamaged and out of reach of the propellers,
- the receiver is firmly mounted, cables are neither tensioned nor chafed,
- the Lua script shows a connection (C) and the channels in the flight controller respond correctly,
- the telemetry power complies with the regulations of the country of operation,
- Arm and Disarm (stopping the motors) work on the selected switch.

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- After a crash, check the antenna, the IPEX connector and the connection cable; replace a damaged antenna.
- Clean the receiver with a dry brush; do not use solvents or water.
- Store in a dry place at room temperature, protected from moisture and mechanical damage.

7.2 Status LED meaning

LED	Receiver status
solid	connected to the transmitter, or bootloader mode
double blink, then pause	bind mode
slow blinking (500 ms)	waiting for connection with the transmitter
triple blink, then pause	connected, but Model Match setting does not match
medium blinking (100 ms)	radio chip not detected
fast blinking (25 ms)	Wi-Fi mode

Meaning of the signals according to the ExpressLRS documentation.

7.3 Troubleshooting

Problem	Cause and solution
LED off	incorrect power wiring – disconnect immediately and check GND and 5V
LED solid, no connection established	the receiver is in bootloader mode – connect it to a different UART (see 4.2)
LED blinks slowly, transmitter is on	major firmware version, binding phrase or regulatory domain do not match; bind the receiver again (5.2)
LED blinks rapidly	the receiver has entered Wi-Fi mode (60 s without transmitter) – switch on the radio and restart the receiver
triple blink, *Model Mismatch* in Lua	in the Lua script, briefly switch *Model Match* to the opposite value and back (both devices powered and connected)
connected, but channels in the FC do not respond	TX and RX swapped, *Serial Rx* on a different UART, or protocol is not CRSF (5.1)
short range, telemetry dropouts	antenna near carbon, metal or motors, damaged antenna or connector, low telemetry 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 (ExpressLRS 2.4GHz 500mW Rx) is printed on the top side of the receiver.

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.