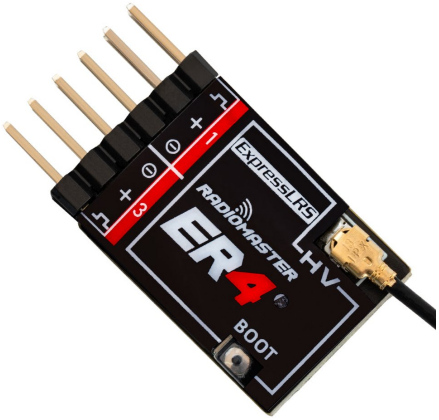
ER4

RadioMaster · ExpressLRS 2.4 GHz receiver
4 PWM channels · user manual



Read this entire manual carefully before installation and first use, and keep it for future reference.

Rotorama, s.r.o. · www.rotorama.com

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1. Safety instructions

1.1 General principles

The RadioMaster ER4 receiver is intended for controlling RC models (aircraft, boats, cars and similar models). Incorrect installation or set-up may lead to loss of control of the model and consequently to property damage or injury.

- This product is not a toy. Keep it away from children unless supervised by an adult.
- Carry out installation, soldering and set-up only with the flight/drive battery disconnected and the propeller removed, or with the model secured against moving on its own.
- Before each use, check that the model responds correctly to all commands from the radio and perform a range check.
- Operate the model only where you do not endanger people, animals or property, and always in accordance with the regulations of the country in which you operate it (see Chapter 3).

1.2 Power supply and wiring

- The receiver supply voltage is **DC 4.5–8.4 V**. A higher voltage will damage the receiver.
- The maximum input voltage of the **EXT-V measuring input is 35 V**. Do not exceed 35 V or the receiver will be damaged.
- If the power supplied is **7.4 V or higher**, place the receiver in an open and ventilated area of the model for better heat dissipation.
- Observe the correct polarity of the connectors (signal, +, −) as shown in the figure in Chapter 4.1. A short circuit or reversed polarity may destroy the receiver and the connected servos.
- A fully charged two-cell Li-Po battery has a voltage of 8.4 V (4.20 V/cell). A fully charged two-cell LiHV battery has 8.7 V (4.35 V/cell) and thus exceeds the permitted receiver supply voltage – do not connect it directly to the receiver.

1.3 Radio operation

- Do not shorten the antenna, do not bend it sharply and protect it from damage. A damaged antenna significantly reduces the range.
- Assign Channel 5 on your radio to a switch (see Chapter 5.6) and always check the behaviour of the model on signal loss (failsafe, see Chapter 5.7) before operation.

2. Product description

2.1 Introduction

Thank you for purchasing the Radiomaster ER4 ExpressLRS receiver. The ER4 receiver is based on the revolutionary ExpressLRS system. It offers high performance, high reliability, flexible configuration, fast response speed and ultra-long range, bringing you a brand new experience with your hobby.

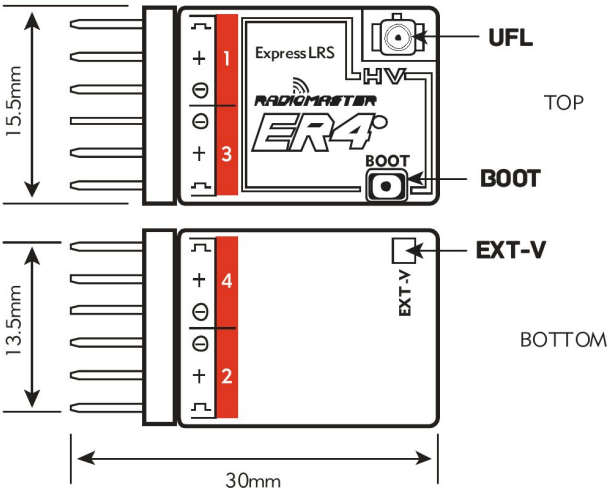
The Radiomaster ER4 receiver can drive 4 servos simultaneously. Designed with a very small volume, it is suitable for small aircraft models, ship models, car models and other models that require a small or lightweight receiver while still providing full range.

2.2 Package contents

Qty	Item
1×	ER4 2.4GHz ELRS PWM Receiver
2×	Heat-shrink tube
1×	Voltage telemetry wire (Type-A)
1×	User card

※ The package does **not** include an ExpressLRS 2.4 GHz radio (RF module), servos, an electronic speed controller (ESC) or a battery.

2.3 Parts description



Top (TOP) and bottom (BOTTOM) view, dimensions in mm

Marking	Meaning
UFL	Antenna connector (u.FL)
BOOT	BOOT button – holding it down for 10 s resets the receiver to bind mode (see Chapter 5.2)
EXT-V	Solder pad of the external voltage measuring input (see Chapter 4.2)
1, 2, 3, 4	Servo outputs CH1–CH4; 1 and 3 on the top side, 2 and 4 on the bottom side

2.4 Specifications

Parameter	Value
Size	30 × 15 × 5 mm
Weight	3 g
Power supply	DC 4.5–8.4 V
Antenna type	15 cm, high sensitivity antenna
Wireless protocol	ExpressLRS (pre-installed)
Frequency band	2.4 GHz
Output channels	4CH PWM
Telemetry power	10 mW
Battery voltage detection range	DC 4.0–35 V
Connectors	2.54 mm pins

3. Radio frequencies and legal conditions

3.1 The law of the country of use applies

Radio equipment and the operation of models are governed by European Union legislation that applies in all Member States, but national implementing regulations differ from country to country – permitted frequency bands, maximum transmitter power, conditions for operating models and unmanned aircraft, registration and compulsory 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 Frequency band and transmitted power

The receiver operates in the 2.4 GHz band and, in addition to receiving commands, also transmits telemetry back to the radio. The manufacturer states a telemetry power of **10 mW**.

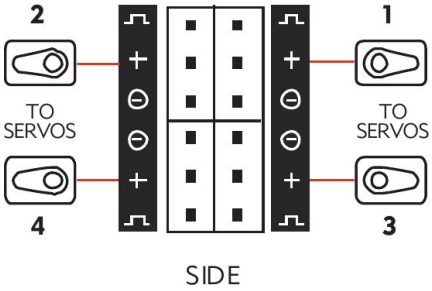
Band	Limit in the Czech Republic	Regulation
2400–2483.5 MHz	25 mW e.i.r.p.	ČTÚ, VO-R/10, Art. 3(j)

- The transmitting power of the system is set in the radio (ExpressLRS RF module). The user is responsible for setting the power in accordance with the regulations.
- Outside the Czech Republic, the frequency bands and power limits of the respective country apply.
- If you use the receiver in an unmanned aircraft (drone, model aircraft), Regulations (EU) 2019/945 and 2019/947 and national civil aviation regulations also apply to its operation.

4. Installation and wiring

4.1 Connecting servos and power

Connect the servos and the electronic speed controller (ESC) to outputs CH1–CH4. Each output has three pins: signal, plus (+) and minus (−). The signal pins are on the outer edges of the pin header, the minus (−) pins in the middle, see the figure.



Side view: outputs 1 and 3 on top, 2 and 4 at the bottom (TO SERVOS)

- The receiver is powered via the + and − pins of the output connectors, for example from the BEC of the speed controller. The supply voltage must be within **DC 4.5–8.4 V**.
- The servo signal wire (usually yellow, orange or white) goes to the signal pin.

4.2 Voltage measurement – EXT-V input

The receiver automatically sends voltage telemetry to the radio – either of the external battery connected to the EXT-V input or of the receiver's own supply voltage.

- The EXT-V (external voltage input) of the ER4 is accessed via the **EXT-V** solder pad on the PCB (on the bottom side of the receiver). A single wire (the voltage telemetry wire from the package) must be soldered to this pad and connected to the positive wire of the battery or ESC.
- The maximum input voltage for the EXT-V telemetry reading is **35 V**. Do not exceed 35 V or the receiver will be damaged.
- If no EXT-V power source is found, the ER4 will default to reading the voltage on the receiver pins. Only one voltage input can be used at any given time.
- After connection, the telemetry voltage must be calibrated on your radio (see Chapter 5.5).

4.3 Placement in the model and antenna

- If the power supplied is 7.4 V or higher, please ensure that the receiver is in an open and ventilated area of the model for better heat dissipation.

- Route the end of the antenna as far as possible from carbon and metal parts, high-current wires and the speed controller.
- Mount the receiver so that it is not exposed to vibration and impacts, and insulate it against short circuits – the heat-shrink tube from the package can be used for this.

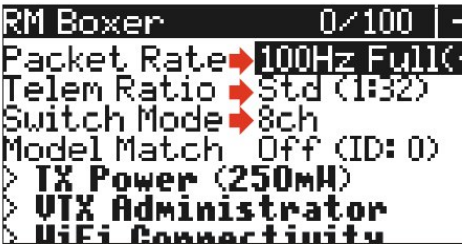
5. Binding and set-up

5.1 Recommended ExpressLRS Lua settings

The recommended ELRS Lua settings on the remote-control end are:

Item	Standard servos	Performance servos
Packet Rate	100Hz Full	333Hz Full
Telem Ratio	Std (1:32)	Std (1:128)
Switch Mode	8ch	8ch

※ If unsure, use the settings for standard servos – *Telem Ratio* Std (1:32) is the default.



Recommended settings in the ELRS Lua (illustrative screenshot of the radio)

5.2 Traditional binding

① The first time you power on your receiver, the LED is doing a quick double blink, which indicates the receiver is in bind mode. If this is not the case, hold down the BOOT button for 10 seconds to reset the receiver.

② Power on your transmitter/radio and use the **[BIND]** button in the ExpressLRS Lua script, which sends out a binding pulse.

③ If the receiver has a solid light, it is bound.

※ To bind the receiver a second time or to another radio, power cycle the receiver 3 times. On the third power cycle, the LED will double blink indicating bind mode. If you cannot successfully enter bind mode with the 3 power cycle method, you can hold down the BOOT button for 10 seconds to reset the receiver to bind mode or use the passphrase method (Chapter 5.3).

WARNING: All previous settings in the receiver will be erased and need to be re-entered when using the BOOT button for a reset.

5.3 Passphrase binding

① Open the ExpressLRS Lua and navigate to the *WiFi Connectivity* page. Select the *Enable WiFi* option and connect to your radio's Wi-Fi with a mobile phone, tablet or PC (see Chapter 5.4). Open the ExpressLRS web page at http://10.0.0.1/ and choose a unique bind phrase. Save and Reboot (*Save and Reboot*).

② Power on the receiver and wait 60 seconds for the LED to blink rapidly to indicate Wi-Fi mode. Connect your phone, tablet or PC to the receiver's Wi-Fi (see Chapter 5.4), open the web page at http://10.0.0.1/ and enter the matching bind phrase previously entered on your radio. Save and Reboot.

③ Once both radio and receiver have the same bind phrase set, they will automatically bind.

※ Bind phrases are not secret and can be read.

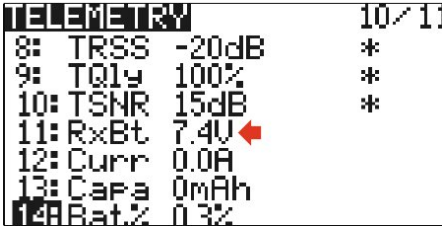
5.4 Wi-Fi connection details

Item	Radio (TX)	Receiver (RX)
Network name	ExpressLRS TX	ExpressLRS RX
Password	expresslrs	expresslrs
URL (open in browser)	http://10.0.0.1/	http://10.0.0.1/

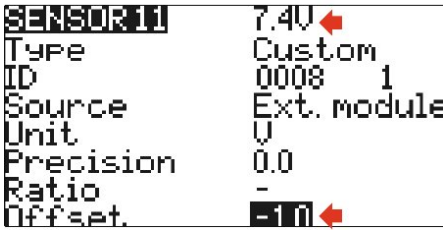
5.5 Telemetry voltage calibration

Calibration of the telemetry voltage will be required on your radio. Navigate to the *TELEMETRY* page on your radio and locate the **RxBt** sensor. Edit the sensor settings (*SENSOR*) and adjust the *Offset* until the displayed reading matches the actual voltage of the battery in the model. If there is a large difference, adjustment of the *Ratio* may also be required.

※ For best results, calibrate the voltage of your radio using a fully charged battery of the correct cell count intended for use in the model.



TELEMETRY page – RxBt sensor (illustrative screenshot)



Sensor settings – Offset item (illustrative screenshot)

5.6 Channel 5 and arming

ExpressLRS uses Channel 5 for the Arm / Disarm state of the RF module. The ER4 receiver has 4 channels and does not require any channel outputs to be re-mapped; however, it is still recommended to assign Channel 5 on your radio to a switch such as your throttle cut switch, so the RF module in your radio can be armed and disarmed, which provides benefits such as dynamic power.

Please visit www.expresslrs.org to learn more about the importance of setting up arming.

5.7 Failsafe check

Before first use, check how the model behaves on signal loss (failsafe): with the model secured against movement and the propeller removed, switch off the radio and watch the response of the servos and the speed controller. The model must not increase throttle on its own. The ExpressLRS documentation describes how to set the behaviour on signal loss (Chapter 6.2).

6. Firmware and further documentation

6.1 Receiver firmware

The receiver comes with ExpressLRS firmware pre-installed and supports Wi-Fi updates and configuration in the web interface (WebUI). When updating the firmware (for example in the ExpressLRS Configurator), select this target:

Device Category	Radiomaster 2.4Ghz
Device	RadioMaster ER4 2400 PWM RX

※ The firmware versions of the receiver and the RF module must be compatible with each other. Flashing firmware intended for another device may render the receiver inoperable.

6.2 ExpressLRS and EdgeTX documentation

Detailed set-up procedures for the ExpressLRS system and for radios running EdgeTX can be found in the official documentation:

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

7. Maintenance and troubleshooting

7.1 Maintenance and storage

- Regularly check the antenna, connectors and solder joints, especially after an impact or crash of the model.
- Protect the receiver from moisture, dust, direct sunlight and extreme temperatures. Do not use a wet or dirty receiver.
- Store it in a dry place out of the reach of children.

7.2 Troubleshooting

Symptom	Cause and solution
LED double blinks	The receiver is in bind mode. Bind it as described in Chapter 5.2 or 5.3.
LED blinks rapidly	The receiver is in Wi-Fi mode (activated 60 s after power-on without a link). Connect to the ExpressLRS RX network, or switch on the bound radio and restart the receiver.
LED is solid	The receiver is bound and has a link to the radio.
The receiver does not bind	Check that the bind phrase in the radio and in the receiver match. Alternatively, hold down the BOOT button for 10 s and bind the receiver using the traditional method (Chapter 5.2).
RxBt voltage does not match reality	Calibrate the RxBt sensor (*Offset*, or *Ratio*) as described in Chapter 5.5. Check the wiring of the EXT-V wire.
Servos do not respond correctly	Check the connector polarity (Chapter 4.1) and the *Packet Rate* setting according to the servo type (Chapter 5.1).
The receiver overheats	With a supply of 7.4 V or higher, provide a ventilated location (Chapter 4.3). Do not exceed the supply voltage of 8.4 V.

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 (RadioMaster ER4) is printed on the top side of the receiver; the CE marking is on its bottom side.

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.