BOXER ELRS

2.4 GHz radio transmitter with ExpressLRS module
User manual



Install the antenna before first power-on and read this manual carefully.
This product is intended for persons aged 14 and over.

www.rotorama.com

Contents

1. Introduction

2. Safety information

3. Important

4. Remote control overview

5. Specifications

5.1 Radio parameters

5.2 Operation in the Czech Republic and in other countries

5.3 EU simple declaration of conformity

6. Batteries and charging

6.1 Suitable batteries

6.2 Inserting the battery

6.3 USB-C ports and charging

7. ExpressLRS RF module

7.1 Output power and update rate

7.2 Bind instructions

7.3 ExpressLRS documentation

8. Information for the EU and Czech Market

8.1 Importer and responsible person in the EU

8.2 Product conformity

8.3 Disposal of electrical equipment

9. Warranty and rights arising from defective performance

9.1 Rights of the buyer under Czech law

9.2 Manufacturer's warranty terms

1. Introduction

Thank you for purchasing the RadioMaster BOXER 2.4 GHz remote control system. The system is versatile and can be used by beginners and professionals. In order to ensure the correct and safe use of this product, please read this manual carefully before use.

Due to constant improvements in software and hardware this manual may change over time. The information contained in this manual is subject to change without notice. Visit the manufacturer's website for the most up to date information.

The BOXER remote control is suitable for all types of fixed-wing aircraft, gliders, helicopters, cars, boats, robotics, multi-rotor aircraft and anything else you might create. The BOXER uses a powerful operating system called **EdgeTX**; links to detailed guides are given in chapter 3.3.

This manual applies to the **RadioMaster Boxer ELRS** radio with a built-in **ExpressLRS 2.4 GHz** RF module. An external module with a different protocol can be fitted into the JR module bay.

This product is intended for persons aged 14 and over. It is not a toy.

2. Safety information

Many remote-control models are equipped with powerful motors and sharp propellers. When using or maintaining models, proceed with caution. When performing assembly or maintenance, make sure to disconnect the power to the model and remove the propellers.

Do not operate the BOXER remote control system under the following conditions:

- in severe weather or strong windy conditions, such as rain, hail, snow, storms or electromagnetic environments,
- in any situation where visibility is limited,
- in areas where people, property, high-voltage power lines, public roads, vehicles or animals may be present,
- if you feel tired or unwell, or under the influence of drugs or alcohol,
- if the remote control or model seems to be damaged or not working properly,
- in areas with high 2.4 GHz interference or where 2.4 GHz radio is prohibited,
- when the radio's battery voltage is too low to be used,
- in areas where local regulations prohibit the use of aviation models.

2.1 Antenna separation distance

When operating your RadioMaster transmitter, please be sure to maintain a separation distance of **at least 20 cm** between your body (excluding fingers, hands, wrists, ankles and feet) and the antenna to meet RF exposure safety requirements.

2.2 Modifications

This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400–2.4835 GHz frequency range. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RadioMaster does not assume any responsibility for any adverse consequences caused by the use or misuse of this product.

3. Important

3.1 Antenna

Install the provided antenna in the top of the radio **BEFORE installing batteries and turning on the radio**.

DO NOT operate the radio without the antenna installed and the internal RF module powered on. Doing so will damage the internal RF module and will not be covered under warranty.

3.2 Firmware

The BOXER is pre-installed with the most stable EdgeTX firmware at the factory at time of release. Please only attempt to update the firmware if you are confident in the process. Incorrect firmware updates may cause the remote control to become inoperable.

3.3 Manual and firmware download

EdgeTX software is very powerful, and has a large number of programming and mixing functions. To download the latest manual, please visit the RadioMaster website www.radiomasterrc.com; for the latest EdgeTX firmware visit www.edgetx.org and for information about ExpressLRS visit www.expresslrs.org.

The official EdgeTX documentation is available by scanning the QR code or clicking the link:

EdgeTX (official website)

Installing and updating EdgeTX, radio operation, model setup, mixes, logical switches and special functions.

www.edgetx.org

4. Remote control overview

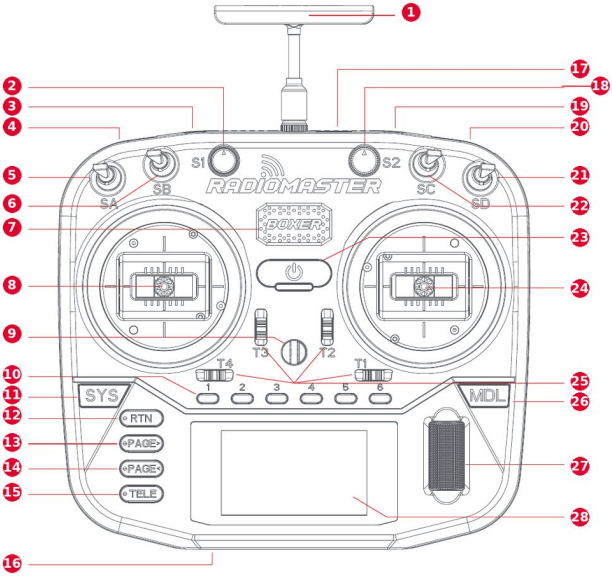


Fig. 4.1 – BOXER controls and ports

No.	Item	No.	Item
1	Antenna	**15**	TELE button
2	S1 dial	**16**	USB-C charger port (bottom)
3	Trainer port	**17**	USB-C data port (PC, simulator)
4	SE latching switch	**18**	S2 dial
5	SA 2-position switch	**19**	Headphone jack
6	SB 3-position switch	**20**	SF momentary switch
7	Speaker	**21**	SD 2-position switch
8	Left gimbal	**22**	SC 3-position switch
9	Lanyard loop	**23**	Power button
10	6-position buttons 1–6	**24**	Right gimbal
11	SYS button	**25**	Trim buttons T1–T4
12	RTN button	**26**	MDL button
13	PAGE> button	**27**	Scroll wheel
14	PAGE< button	**28**	LCD screen

5. Specifications

Parameter	Value
Item	BOXER remote control
Size	235 × 178 × 77 mm
Weight	532.5 g
Frequency	2.400–2.480 GHz
Internal RF module	ExpressLRS 2.4 GHz
ExpressLRS transmitting power	max. 30 dBm (international) / max. 20 dBm (EU LBT)
Cooling fan	built in
Supported protocols	module dependent
Firmware	EdgeTX (transmitter) / ExpressLRS (RF module)
Channels	max. 16 (receiver dependent)
Voltage range	6.6–8.4 V DC
Battery	7.4 V 2S Li-Po or two 3.7 V 18650 Li-Ion cells (batteries not included)
Display	128 × 64 monochrome LCD
Gimbals	high precision 4.0 Hall gimbals (AG01 optional)
External module	JR bay – JR, FrSky and Crossfire compatible
Upgrade method	USB / SD card and EdgeTX Companion PC software

5.1 Radio parameters

The radio transmits in the 2.4 GHz band. Frequency bands and maximum transmitted power according to the EU-type examination certificate SHEA1401-EU (notified body MiCOM Labs, No. 2280):

Radio part	Frequency band	Max. power
ExpressLRS (control link)	2402.4–2479.4 MHz	17.91 dBm e.i.r.p.
Wi-Fi	2412–2472 MHz	16.13 dBm e.i.r.p.
Bluetooth	2402–2480 MHz	2.37 dBm e.i.r.p.

5.2 Operation in the Czech Republic and in other countries

In the Czech Republic, the 2400–2483.5 MHz band may be used without an individual licence under the Czech Telecommunication Office (ČTÚ) general authorisation No. **VO-R/12/11.2021-11**, which sets a maximum radiated power of **100 mW e.i.r.p.** (including antenna gain) for this band.

- The output power of the ExpressLRS module can be set in the radio menu. The user is responsible for ensuring that the set power does not exceed the limit applicable at the place of operation.
- In the Czech Republic and other EU countries, use ExpressLRS firmware with the EU (LBT) regulatory domain. Do not use firmware intended for other regions (e.g. FCC/ISM) or power above the permitted limit there.
- Use only the supplied antenna or an antenna specified by the manufacturer, without additional amplifiers.
- An external module fitted into the JR bay is a separate radio device – follow its manual and the limits applicable at the place of operation.
- The information in this chapter describes the situation in the Czech Republic. **The law of the country in which you operate the radio always prevails** – permitted frequency bands and maximum transmitting power may differ from country to country.

5.3 EU simple declaration of conformity

RadioMaster declares the radio equipment **BOXER** is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: radiomasterrc.com/pages/certificatiion

Manufacturer	ShenZhen RadioMaster Co., Ltd 4th Floor, Yangtian Building, No. 18 Yangtian Road, Xin'an Street, Baoan District, Shenzhen, Guangdong, China
Website	www.radiomasterrc.com

6. Batteries and charging

6.1 Suitable batteries

The BOXER has a built-in USB-C charging function for 3.7 V lithium batteries. The charging circuit is **only** designed to charge 2× 3.7 V Li-Ion 18650 or 2× 3.7 V Li-Poly batteries (2S 7.4 V Li-Po battery pack). The nominal battery voltage is 3.7 V, the charged voltage is 4.2 V/cell (8.4 V in total).

Batteries are not included. Always install the antenna first, before inserting the batteries (chapter 3.1).

Do not use LiFe battery packs or 18650 Li-Ion batteries with a nominal voltage of 3.6 V and a fully charged voltage of 4.10 V. Charging the incorrect type of battery may damage the charger or cause a fire.

If using Li-Ion 18650 cells, ensure the cells are **not protected** and are **button-top** cells.

6.2 Inserting the battery

The battery compartment is on the back of the radio under a hinged cover.



Fig. 6.1 – Back of the radio (left) and battery compartment with the cover removed (right)

No.	Description
1	JR external module bay
2	Cover latch (PUSH)
3	Battery compartment cover
4	Battery connector
5	microSD card slot (the card with EdgeTX data is pre-installed)

Procedure:

① Turn off the radio and check that the antenna is installed.

② Press the **PUSH** latch (fig. 6.1, item 2) and remove the battery compartment cover.

③ Insert the battery – a 2S Li-Po pack or a holder with two 18650 cells – and connect it to the connector (fig. 6.1, item 4). Observe the correct polarity.

④ Route the cable so that it is not pinched when refitting the cover, and snap the cover back on.

6.3 USB-C ports and charging

The radio has two USB-C ports with different functions:

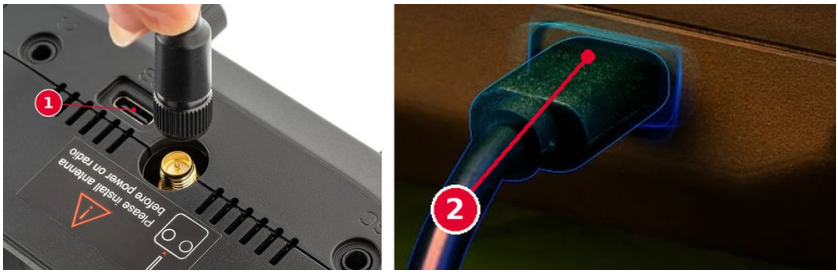


Fig. 6.2 – Top USB-C data port (left) and bottom USB-C charger port (right)

No.	Description
1	**Top USB-C data port** (next to the antenna) – connection to a computer: simulator (the radio acts as a joystick), EdgeTX Companion software, firmware updates and access to the SD card.
2	**Bottom USB-C charger port** – charging the inserted batteries. Supports QC3.0 fast charging, charging current max. 2.0 A.

Charge the batteries via the bottom charger port (2). The top port (1) is for connecting to a computer.

When charging:

- Check the voltage and condition of the batteries regularly.
- Never charge unattended.
- Always charge in a safe area away from combustible materials.
- Refrain from charging if the remote control gets wet or damaged in any way.
- Do not charge with the polarity reversed.
- Do not dispose of used batteries with household waste or in fire – hand them over at a battery collection point (chapter 8.3).

7. ExpressLRS RF module

7.1 Output power and update rate

The BOXER ELRS is equipped with an internal ExpressLRS module, capable of providing 25–1000 mW RF output. In non-extreme circumstances, **100 mW** output at **500 Hz** update rate is recommended, as higher RF output and update rates may significantly reduce battery life and generate excessive heat.

The radiated power must not exceed the limit applicable at the place of operation – for the Czech Republic see chapter 5.2.

7.2 Bind instructions

① Turn off the transmitter.

② Cycle power to the receiver 3 times; the receiver LED will flash twice, indicating bind mode.

③ Turn on the transmitter, long press the **SYS** button and choose the *ExpressLRS* LUA script under the *TOOLS* menu. Scroll down to *[Bind]* and press enter (press the scroll wheel).

④ The LED on the receiver should now be solid, indicating successful bind.



Fig. 7.1 – TOOLS menu (left) and the ExpressLRS script with the [Bind] item (right)

7.3 ExpressLRS documentation

The official ExpressLRS documentation is available by scanning the QR code or clicking the link:

ExpressLRS (official website)

Firmware options and regulatory domains, radio preparation, ExpressLRS LUA script, binding and firmware updates.

www.expresslrs.org

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 (BOXER ELRS) and the serial number are given on the product rating label; the firmware version number can be found by pressing the *SYS* button on the *VERSION* page.

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

9.1 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 manufacturer's warranty terms set out below (Chapter 9.2) **do not in any way limit** the buyer's rights arising from these regulations.

- 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.

9.2 Manufacturer's warranty terms

❊ The following text is the manufacturer's original warranty statement.

If there is any problem with your remote control hardware, please keep the proof of purchase and contact the retailer where you purchased the BOXER. You may also visit the manufacturer's warranty support page www.radiomasterrc.com/contact.