Bandit BR3

ExpressLRS 868 MHz receiver
User manual



Read the entire manual before installation and use. In the EU, operate the receiver only with the EU868 regulatory domain.

Rotorama, s.r.o. · www.rotorama.com

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1. Safety instructions

Read this entire manual carefully before installation and first use, and keep it for future reference. The receiver is intended for installation in RC models and FPV drones. Installation, setup and operation may only be carried out by a person familiar with the principles of safe RC model operation.

1.1 General principles

- The receiver provides the radio link between the radio transmitter and the model. Incorrect installation or setup may lead to loss of control of the model, a crash, injury to persons or damage to property.
- Before every flight, check the radio link and the failsafe setting (chapter 6.3).
- Always disconnect the battery and remove the propellers when working on the model.
- Protect the receiver from moisture, dust, mechanical damage and direct contact with conductive parts (carbon frame, screws).
- This product is not a toy. Keep it out of the reach of children – it contains small parts that could be swallowed.

1.2 Electrical installation

- Solder only with the power disconnected. Make sure the wires are connected correctly – swapping power and ground may permanently damage the receiver.
- Power the receiver from the **5 V** output of the flight controller (FC) or from a regulated power supply (BEC). Never connect it directly to the flight battery.
- After soldering, check that there is no short circuit between adjacent pads, and insulate the receiver with the included heat-shrink tube.

1.3 Antennas and radio link

- Do not power the receiver without the antennas connected. Use only antennas for the 868/915 MHz band supplied by the manufacturer.
- Do not shorten the antenna cables, do not bend them sharply and do not pinch them. U.FL connectors are fragile – connect and disconnect them perpendicularly, without pulling on the cable.
- Make sure that the radio transmitter and the receiver use the same regulatory domain and that the settings comply with the regulations of the country of operation (chapter 3).

2. Product description

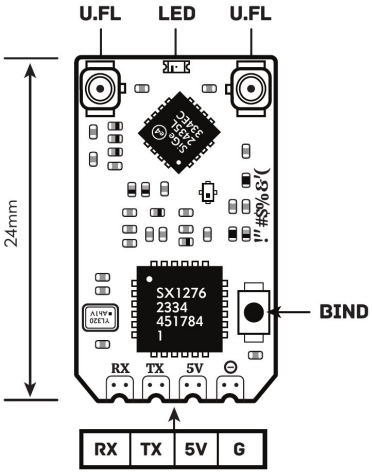
The RadioMaster Bandit BR3 is a miniature **ExpressLRS** receiver for the 868/915 MHz band. It features an ESP8285 MCU and a Semtech SX1276 RF chip, a built-in TCXO (temperature-compensated crystal oscillator) and two U.FL antenna connectors. It communicates with the flight controller (FC) using the CRSF protocol.

2.1 Package contents

- 1× RadioMaster Bandit BR3 receiver
- 2× T antenna (installed on the receiver on delivery)
- 3× receiver heat-shrink tube
- 1× CRSF wire
- 1× manual

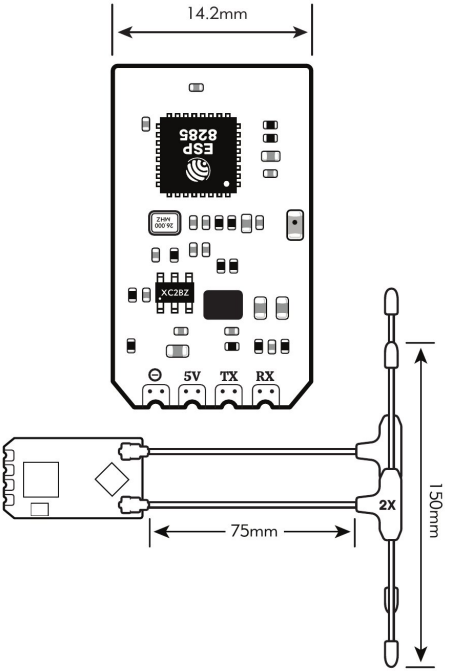
Not included: an ExpressLRS radio transmitter or transmitter module for the 868/915 MHz band, and a flight controller (FC).

2.2 Parts description



Top side of the receiver: U.FL antenna connectors, LED, BIND button and solder pads RX, TX, 5V and G (⊖).

- **U.FL** – two antenna connectors.
- **LED** – receiver status indication (chapter 5.3).
- **BIND** – receiver button.
- **RX, TX, 5V, G (⊖)** – solder pads for connection to the flight controller (FC): RX and TX data lines, 5 V power and ground.



Bottom side of the receiver (width 14.2 mm) and T antenna – cable length 75 mm, span 150 mm.

2.3 Specifications

Parameter	Value
Type	ExpressLRS receiver 868 MHz / 915 MHz
Size	24 × 14.2 × 3 mm
Weight	1.3 g (without antennas) 5.5 g (with 2 antennas)
MCU	ESP8285
RF chip	Semtech SX1276
Oscillator	TCXO (temperature-compensated)
Refresh rate	25–200 Hz
Telemetry RF power	100–500 mW, adjustable via Lua script
Input voltage	5 V (manufacturer's manual) working voltage DC 4.5–8.4 V (manufacturer's product page)
Antenna connector	2× U.FL (IPEX1)
Antennas	T antenna 868/915 MHz, cable 75 mm, span 150 mm
Receiver protocol (bus)	CRSF
Pre-installed firmware	ExpressLRS, target *RadioMaster BR3 900 RX*

3. Radio frequencies and operating conditions

3.1 The law of the country of operation applies

Radio equipment is subject to Directive 2014/53/EU (RED) throughout the European Union, but the permitted frequency bands, maximum transmit power and other operating conditions are laid down by national regulations and differ from country to country. The information in this chapter describes the situation in the Czech Republic. If you operate the receiver in another country, you must comply with the regulations of the country in which you use it.

3.2 Frequency bands and transmitted power

The receiver also transmits – the telemetry downlink to the radio.

Frequency band for operation in the EU	868 MHz – ExpressLRS regulatory domain **EU868**
915 MHz band	**FCC915** domain – uses frequencies outside the bands permitted in the Czech Republic; do not use it in the Czech Republic
Max. telemetry power (manufacturer's data)	500 mW (adjustable 100–500 mW)

In the Czech Republic, the operation of short-range devices in the 863–870 MHz band is governed by ČTÚ general authorisation No. **VO-R/10**. For frequency-hopping (FHSS) devices across the entire 863–870 MHz band, it sets a limit of **25 mW e.r.p.** when spectrum access techniques according to harmonised standards are used, otherwise with a transmit duty cycle of no more than 0.1 %. A higher power of 500 mW e.r.p. is permitted only in the 869.4–869.65 MHz sub-band with a duty cycle of up to 10 %.

The user is responsible for the telemetry power setting and compliance with the general authorisation. The adjustable telemetry power may exceed these limits. Current conditions: www.ctu.cz; outside the Czech Republic, local limits apply.

3.3 ExpressLRS regulatory domain

- The regulatory domain determines the ExpressLRS operating frequencies. It is selected when flashing with ExpressLRS Configurator; on 900 MHz devices it can also be changed in the receiver's web interface.
- The transmitter module and the receiver must use **the same regulatory domain**, otherwise they will not bind.
- For operation in the EU, set the **EU868** domain. The current domain is shown in the receiver's web interface on the *Information* tab.
- The receiver must not be modified; use only the antennas specified by the manufacturer, without amplifiers.

4. Installation and wiring

4.1 Connecting to the flight controller (FC)

The receiver is connected to a free serial port (UART) of the flight controller. The data lines are crossed:

BR3 receiver	Flight controller (FC)	Function
RX	TX (UARTx)	data from FC to receiver
TX	RX (UARTx)	data from receiver to FC
5V	5 V	power
G (⊖)	GND	ground

- Use the included CRSF wire for the connection. Route the wires along the shortest path and secure them against being pulled out.
- After checking the wiring, insulate the receiver with the included heat-shrink tube.
- Note the number of the UART used – you will need it during setup (chapter 6).

4.2 Antenna placement

- Place the antennas as far as possible from carbon parts, motors, electronic speed controllers (ESC), the video transmitter (VTX) and its antenna.
- Route the active parts of the antennas out of the frame and secure them so that they cannot get into the propellers.
- When using two antennas, orient them in different directions from each other.

5. Binding with the radio transmitter

5.1 Binding with a binding phrase

If the transmitter module and the receiver are flashed with firmware containing **the same binding phrase** and the same options, including the regulatory domain, they connect automatically without any further procedure.

5.2 Traditional binding

According to the manufacturer, the *Binding Phrase* field must be uncommented in *Device options* on the RX for traditional binding.

① Power OFF your transmitter/radio.

② Plug in and unplug your receiver 3 times.

③ Make sure the LED is doing a quick double blink, which indicates the receiver is in bind mode.

④ Power ON your transmitter/radio and use the **[BIND]** button on the ExpressLRS Lua script, which sends out a binding pulse.

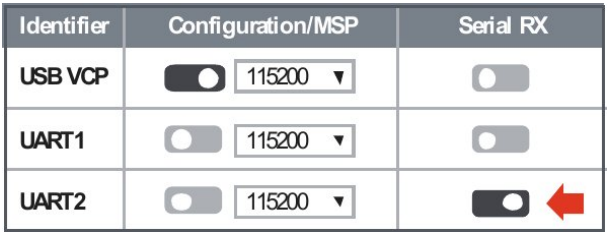
⑤ If the receiver has a solid light, it's bound!

5.3 LED indication

LED	Status
quick double blink	bind mode
solid light	receiver is bound and connected

6. Setup in Betaflight

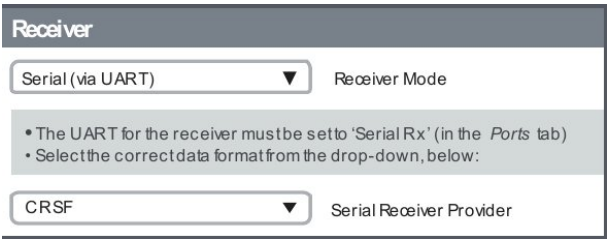
6.1 Ports tab



Ports tab – enabling Serial RX on the UART the receiver is connected to (example: UART2).

Open Betaflight Configurator, go to the *Ports* tab and enable **Serial RX** on the UART the receiver is connected to (UART2 in the picture). Click *Save and Reboot*.

6.2 Receiver settings



Receiver panel – Receiver Mode: Serial (via UART), Serial Receiver Provider: CRSF.

On the *Configuration* tab, in the *Receiver* panel, select *Serial-based receiver* (mode *Serial (via UART)*) and select **CRSF** as the protocol. Save the settings.

6.3 Failsafe and pre-flight check

- On the *Receiver* tab, check that the stick movements correspond to the channels and their direction.
- On the *Failsafe* tab, set the behaviour of the model on signal loss and verify it by switching off the radio transmitter – with the **propellers removed**.
- Perform a range test on the ground before the first flight.
- Make sure the model can be safely armed (Arm – motors enabled) and disarmed (Disarm – motors disabled) with a switch on the radio transmitter.

7. Firmware and troubleshooting

7.1 Firmware and further guides

The receiver is supplied with ExpressLRS firmware installed (target *RadioMaster BR3 900 RX*). Update it with ExpressLRS Configurator, selecting the correct target and the **EU868** domain (chapter 3.3). Receiver and transmitter module firmware versions must be compatible.

ExpressLRS documentation
Setup, binding, firmware updates and the web interface.
www.expresslrs.org

EdgeTX documentation
Operating an EdgeTX radio, including running the ExpressLRS Lua script.
edgetx.org

Official documentation: www.expresslrs.org and edgetx.org.

7.2 Maintenance

- After a crash, check the antennas, U.FL connectors and solder joints.
- Replace a damaged antenna with an antenna intended for the 868/915 MHz band.

7.3 Troubleshooting

Problem	Possible cause and solution
LED does not light	Check the 5 V power supply, ground and the solder joints.
Receiver does not bind	Check the same regulatory domain (EU868) and compatible firmware on the TX module and receiver; repeat chapter 5.
Bound, but Betaflight does not respond to the sticks	Check the crossed RX/TX wiring, Serial RX enabled on the correct UART and the CRSF protocol (chapter 6).
Short range, signal dropouts	Check the antennas, U.FL connectors and antenna placement (chapter 4.2).

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 Bandit BR3) is given on the product packaging and in the accompanying documentation. Information on the installed firmware and the regulatory domain is shown in the receiver's web interface (*Information* tab).

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.