Bandit BR1

ExpressLRS 868/915 MHz receiver
User manual



In the Czech Republic and the EU, operate the receiver only in the EU868 regulatory domain (Chapter 3).

www.rotorama.com

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1. Safety instructions

1.1 Before you start

- Read this entire manual before installation and first use and keep it for future reference.
- The receiver is intended to be installed in RC models (drones, aircraft, vehicles) by an experienced user. It is not a toy – keep it away from children.
- Always solder and connect the receiver **with the model battery disconnected**.
- Power the receiver with **5 V** only. A higher voltage or reverse polarity will permanently damage the receiver.
- Never power the receiver without an antenna connected, and never transmit from the transmitter (radio) without an antenna connected.

1.2 Safe operation of the model

- **Remove the propellers** during setup and binding on the bench.
- Before every flight, check that the model responds correctly to the radio and test the failsafe function (the behaviour of the model on signal loss).
- Monitor the link quality (LQ / RSSI telemetry) and do not fly beyond the range of a reliable link.
- The operator is responsible for complying with local regulations for radio equipment and unmanned aircraft – see Chapter 3.

2. Product description

2.1 Introduction

The RadioMaster Bandit BR1 is a small **ExpressLRS** (ELRS) receiver for the 868/915 MHz band. It uses an ESP8285 MCU and a SEMTECH SX1276 RF chip, connects to the flight controller (FC) via the CRSF serial bus and sends telemetry back to the radio.

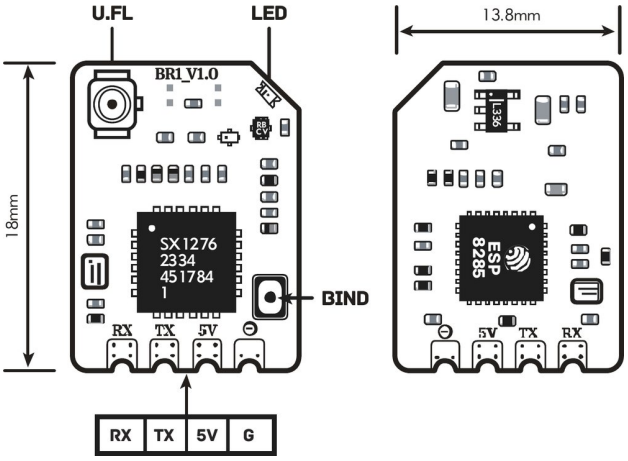
The receiver features a built-in TCXO (temperature-compensated crystal oscillator), which ensures reliable, stable and accurate signal reception even with larger temperature changes. Utilizing 0402 components, it offers superior resistance to vibration.

2.2 Package contents

Qty	Item
1	Bandit BR1 receiver
1	T antenna (U.FL / IPEX1 connector)
1	CRSF wire
3	Receiver shrink tube sleeve
1	Manufacturer's manual

※ The package contents correspond to the manufacturer's product page. An older manufacturer's manual card lists 4 silicone wires instead of one wire.

2.3 Parts description



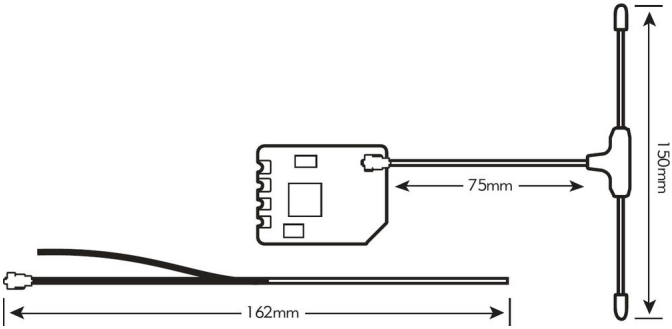
Top view (left) and bottom view (right), dimensions 18 × 13.8 mm

Marking	Meaning
U.FL	Antenna connector (U.FL / IPEX1)
LED	Status LED – see Chapter 5.3
BIND	Bind button
RX	Receiver data input – connect to the TX pin of the FC UART
TX	Receiver data output – connect to the RX pin of the FC UART
5V	5 V power supply
G (⊖)	Ground (GND)

2.4 Specifications

Parameter	Value
Model	RadioMaster Bandit BR1
System	ExpressLRS
Frequency band	868 MHz / 915 MHz (operation in the EU – see Chapter 3)
MCU	ESP8285
RF chip	SEMTECH SX1276
Oscillator	TCXO
Refresh rate	25–200 Hz
Telemetry power	max. 50 mW (17 dBm)
Bus / protocol	CRSF
Input voltage	5 V DC
Antenna connector	U.FL (IPEX1)
Size	18 × 13.8 × 3 mm
Weight	0.9 g without antenna; 2.9 g with T antenna
Default firmware (target)	RadioMaster BR1 900 RX

2.5 Antenna



Antenna dimensions according to the manufacturer: T antenna – lead 75 mm, span 150 mm; wire antenna – length 162 mm

- The U.FL connector is fragile. Attach and remove the antenna straight, without levering, and do not let the cable pull on the connector – secure it, e.g. with a cable tie.
- Place the active part of the antenna as far as possible from carbon parts, metal, motors, electronic speed controllers (ESC) and the video transmitter (VTX); carbon blocks the signal.
- Use only the antenna supplied by the manufacturer or an antenna specified by the manufacturer for this receiver. Replace a damaged antenna.

3. Radio frequencies and operation in the EU

3.1 The law of the country of operation applies

Short-range radio devices are subject to national regulations in every EU member state – permitted frequency bands, maximum transmit power and duty cycles may differ. 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 band and transmitted power

The receiver operates in the 868 MHz or 915 MHz band depending on the installed firmware (regulatory domain). In addition to receiving commands, it transmits telemetry back; the manufacturer specifies the maximum telemetry power as **50 mW (17 dBm)**.

Band	Conditions in the CZ	ELRS domain
863–870 MHz	max. 25 mW e.r.p., general authorisation ČTÚ VO-R/10	EU868 – use in the EU
902–928 MHz	not permitted for this use in the CZ and the EU	FCC915 – do not use in the EU

In the Czech Republic and the EU, operate the receiver only with firmware in the EU868 regulatory domain. The user is responsible for the power settings and compliance with the limits set by local regulations.

3.3 Regulatory domain and matching transmitter and receiver

- The regulatory domain is selected when building and flashing the firmware (ExpressLRS Configurator, *Regulatory Domain* option). Choose the domain appropriate for the country you are flying in – in the EU **EU868**.
- The manufacturer's product page lists FCC915 as the regulatory domain. Before first use, check the domain of the installed firmware and, if necessary, flash firmware with the EU868 domain (Chapter 6).
- The configuration of the receiver must match the configuration of the transmitter module, otherwise the devices will not connect. The first number of the firmware version must be the same on the transmitter module and the receiver.

4. Installation and wiring

4.1 Connecting to the flight controller (FC)

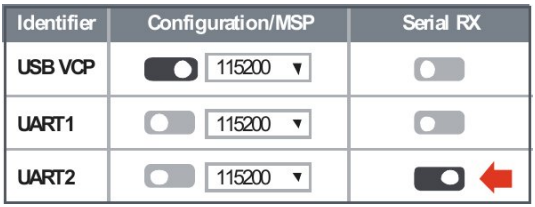
Connect the receiver to a free UART of the flight controller (FC) with four wires. The data wires are connected crosswise:

BR1 receiver	Flight controller (FC)
TX	RX pin of the selected UART (e.g. RX2)
RX	TX pin of the same UART (e.g. TX2)
5V	5 V output
G	GND

- After soldering, check that there are no solder bridges between the pads, and only then connect power.
- Slide the receiver into the supplied shrink tube sleeve and mount it so that the wires do not pull on the solder pads.

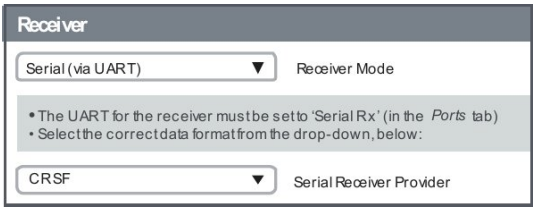
4.2 Betaflight setup

① Open Betaflight Configurator, go to the *Ports* tab and enable the corresponding UART as a *Serial RX* (e.g. UART2 as shown below). *Save and Reboot*.



Ports tab – Serial RX enabled on UART2

② On the *Configuration* tab (in newer versions of the program on the *Receiver* tab), click on *Serial-based receiver / Serial (via UART)* on the *Receiver* panel and select **CRSF** as the *Serial Receiver Provider*. Save the settings.



Receiver panel – Serial (via UART) mode, CRSF protocol

5. Binding to the radio

5.1 Binding phrase

ExpressLRS allows you to skip the binding step by using a **binding phrase**. A transmitter module and a receiver with the same phrase connect automatically. Enter the phrase when flashing the firmware in ExpressLRS Configurator or in the receiver's web interface (WiFi). Use a unique phrase of at least 8 alphanumeric characters of the Latin alphabet.

※ Traditional binding according to Chapter 5.2 works only if no binding phrase is set on the receiver.

5.2 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 status

LED	Meaning
solid on	connected to the transmitter (or bootloader mode)
double blink, then pause	bind mode
slow blink (500 ms)	waiting for connection to the transmitter
triple blink, then pause	connected, but Model Match mismatch
medium speed blink (100 ms)	RF chip not detected
fast blinking (25 ms)	WiFi mode

LED status according to the ExpressLRS documentation

6. Firmware and further guides

6.1 Firmware update via WiFi

- Firmware target in ExpressLRS Configurator: **RadioMaster BR1 900 RX**. Select the **EU868** regulatory domain (Chapter 3.3).
- Power on the receiver and leave it without connection to the transmitter; after the set interval has elapsed, it switches to WiFi mode (the LED blinks fast).
- Connect to the WiFi network named e.g. **ExpressLRS RX** (password **expresslrs**) and open **http://10.0.0.1/** in your browser.
- Upload the firmware file built in ExpressLRS Configurator in the web interface. Do not disconnect the receiver from power during the upload.

For compatibility, the transmitter module and the receiver must have the same first number of the ExpressLRS firmware version.

6.2 Detailed guides

Detailed information on the ExpressLRS system – setup, binding, the Lua script and firmware updates – can be found in the official documentation on the www.expresslrs.org website.

expresslrs.org

Official ExpressLRS website expresslrs.org

ExpressLRS documentation: www.expresslrs.org

7. Maintenance and troubleshooting

7.1 Maintenance

- After a crash, check the antenna, the U.FL connector and the solder joints.
- Protect the receiver from moisture, dust and conductive contamination (carbon dust, metal chips).
- Store in a dry place at room temperature.

7.2 Troubleshooting

Problem	Cause and solution
LED is off	The receiver has no power – check 5 V and GND; on some FCs, 5 V is only available with the battery connected.
LED blinks slowly, no connection	Different binding phrase, regulatory domain or major firmware version on the transmitter and receiver. Make them match or bind.
Triple blink, then pause	Model Match mismatch – adjust the model settings in the radio or disable Model Match.
Connected, but Betaflight shows no channels	Swapped TX/RX wires, Serial RX on a different UART or CRSF protocol not selected (Chapter 4).
Short range, dropouts	Damaged or shielded antenna, loose U.FL connector, antenna close to carbon or the VTX.

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 (BR1) is printed on the receiver board (BR1_V1.0).

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.