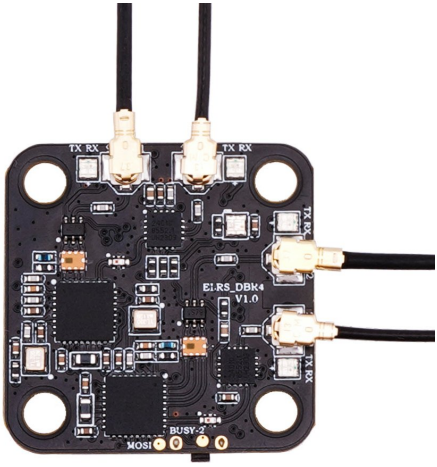
RadioMaster DBR4

Dual Band Xross Gemini ExpressLRS Receiver
2.4 GHz / 868 MHz · User manual



Read the entire manual before installation. In the EU, operate the sub-GHz part only with firmware for the 868 MHz band.

www.rotorama.com

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1. Safety instructions

Read this entire manual before installation and first use and keep it for future reference. The receiver is intended for controlling RC models and FPV drones and may only be installed and operated by a person familiar with the safe operation of RC models.

- Power the receiver only with a DC voltage of **4.5–8.4 V**. A higher voltage will destroy the receiver.
- When wiring, observe the correct polarity (5V / GND) and make sure that wires and solder joints do not touch neighbouring components. A short circuit can damage both the receiver and the flight controller (FC).
- Do not power the receiver without antennas connected. Connect and disconnect antennas only with the power switched off.
- **Always remove the propellers** during installation, binding and setup of the model. The motors may start unexpectedly.
- Before every flight, check the link to the radio, the correct function of all channels and the failsafe setting (behaviour of the model on signal loss).
- Protect the receiver from moisture, dust, mechanical damage and static electricity. Do not hold the board by its components or antenna connectors.
- Operate the receiver only in the frequency bands and at the power levels permitted in the country of use – see chapter 6.
- This product is not a toy. Keep it out of the reach of children – small parts (vibration dampeners) can be swallowed.

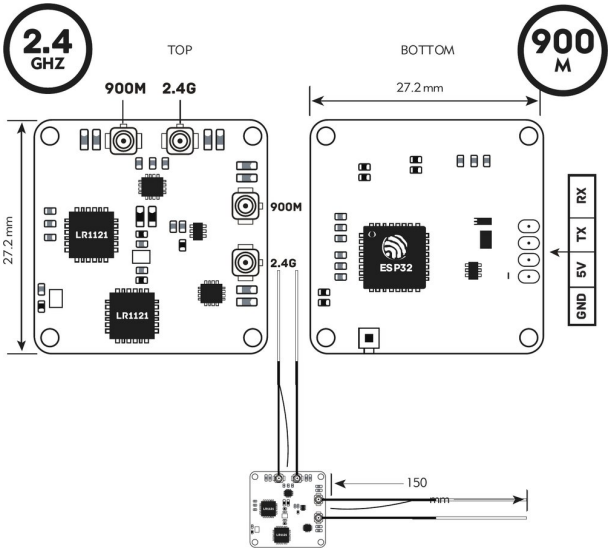
2. Product description

2.1 Introduction

The RadioMaster DBR4 is a dual-band, dual-channel ExpressLRS Gemini receiver with two Semtech LR1121 RF chips. Each of its two receiving sections can work in the 2.4 GHz band as well as in the sub-GHz band, so the receiver can receive two data streams simultaneously (**Gemini** mode), or one in the 2.4 GHz band and the other in the sub-GHz band (**Xrossband** mode, GemX). This provides exceptional interference rejection and minimises lost packets.

The receiver is designed as the companion to the RadioMaster Nomad transmitter module; Gemini and Xrossband modes must also be supported by the transmitter module used.

2.2 Receiver layout and dimensions



Top side (TOP) with antenna connectors and bottom side (BOTTOM) with solder pads

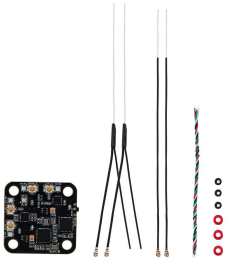
Marking	Meaning
900M / 2.4G	sub-GHz (900M) and 2.4 GHz (2.4G) antenna connectors, one pair per LR1121 chip
RX	receiver input – to the TX pin of the FC UART
TX	receiver output – to the RX pin of the FC UART
5V / GND	receiver power 4.5–8.4 V DC / ground (−)

2.3 Specifications

Parameter	Value
Item	DBR4 Dual Band Xross Gemini ExpressLRS Receiver
MCU	ESP32
RF chip	2× Semtech LR1121
Frequency range	2.404–2.479 GHz (ISM 2.4 GHz) sub-GHz: 903.5–926.9 MHz (FCC 915 MHz version per manufacturer) – in the EU only the 868 MHz band, see chapter 6
Telemetry RF power	max. 100 mW
Antennas	2× 2.4 GHz wire antenna 2× 900 MHz wire antenna
Refresh rate	min. 50 Hz, max. 500 Hz
Working voltage	4.5–8.4 V DC
Weight	2.70 g without antennas / 5.30 g with antennas
Dimensions	27.2 × 27.2 mm
Mounting holes	20 × 20 mm
Bus interface	CRSF
Firmware	ExpressLRS (pre-installed)

※ Manufacturer's data. The firmware is under continuous development – available modes and refresh rates may vary with the firmware version.

2.4 Package contents



- 1× DBR4 Dual Band Xross Gemini ExpressLRS receiver
- 2× 2.4 GHz wire antenna
- 2× 900 MHz wire antenna
- 1× CRSF wire
- 4× 4 mm red vibration dampener
- 4× 3 mm black vibration dampener
- 1× manual card

Not included: radio or transmitter module, flight controller, battery.

3. Installation and wiring

3.1 Connecting to the flight controller (FC)

Connect the receiver to a free hardware UART of the flight controller using the supplied CRSF wire or wires soldered to the RX, TX, 5V and GND pads. The RX/TX lines are crossed. Before connecting a battery for the first time, check the wiring and make sure there is no short between 5V and GND.

DBR4 receiver	Flight controller (FC)
TX	RX of the selected UART (e.g. R2)
RX	TX of the selected UART (e.g. T2)
5V	5 V power output
GND	GND

3.2 Antennas

Connect the 2.4 GHz antennas to the **2.4G** connectors and the 900 MHz antennas to the **900M** connectors – swapping the antennas greatly reduces range.

- Press the connectors on straight and gently until they click. Do not bend the antenna cable sharply at the connector.
- Route the active ends of the antennas as far as possible from carbon parts, cables, motors and the video transmitter (VTX), and out of reach of the propellers.
- Orient antennas of the same band differently from each other (e.g. in a V shape or perpendicular). Replace a damaged antenna.

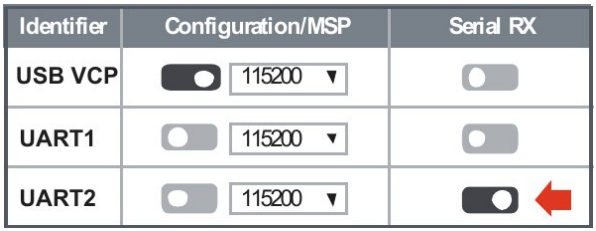
3.3 Mounting in the model

Mount the receiver with screws in a 20 × 20 mm stack; fit the supplied vibration dampeners into the holes (red 4 mm or black 3 mm depending on the hole diameter). If you mount it elsewhere in the frame, secure it against movement and vibration and insulate it from conductive parts.

4. Betaflight setup

4.1 Ports tab

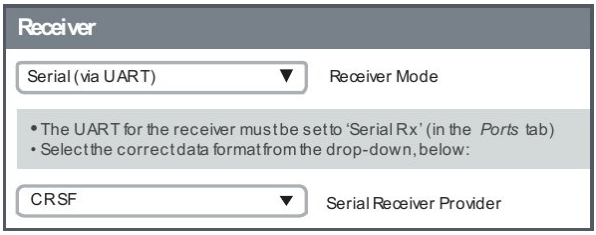
Open Betaflight Configurator, go to the *Ports* tab and enable *Serial RX* on the UART the receiver is connected to (e.g. UART2 as shown below). Then click *Save and Reboot*.



Ports tab – Serial RX enabled on UART2

4.2 Configuration tab – receiver

On the *Configuration* tab, in the *Receiver* panel, set *Receiver Mode* to *Serial (via UART)* and select **CRSF** as the *Serial Receiver Provider*. Save the settings.



Receiver panel – Serial (via UART), CRSF protocol

After binding, check on the *Receiver* tab that all channels respond to stick and switch movements in the correct direction.

5. Binding with the radio

The receiver can be bound to an ExpressLRS transmitter module in two ways: with an identical Binding Phrase set in both the transmitter and the receiver, or by traditional binding described below. The first number of the ExpressLRS firmware version must match between the transmitter module and the receiver.

5.1 Traditional binding

Traditional binding only works if no Binding Phrase is set in the receiver (the *Binding Phrase* field in the receiver settings must be left empty).

① Power OFF your transmitter/radio.

② Plug in and unplug your receiver 3 times (according to ExpressLRS, switch it off within 2 seconds each time).

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 in the ExpressLRS Lua script, which sends out a binding pulse.

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

LED status	Meaning
quick double blink	bind mode
solid light	bound, link established

5.2 Checks before the first flight

- With the propellers removed, check the function and direction of all channels on the *Receiver* tab in Betaflight.
- Set up and test failsafe: after switching off the radio, the model must enter the configured failsafe state and the motors must not spin up.
- Test Arm (motors on) and Disarm (motors off) with the switch on the radio.
- Check range and link quality (RSSI / LQ telemetry) at a short distance first.

6. Frequency bands and firmware

6.1 Operation in the EU and in the Czech Republic

Frequency bands and maximum transmit power levels differ from country to country. The information in this chapter describes the situation in the Czech Republic and in the EU. If you operate the receiver in another country, you must follow the regulations of the country in which you operate it.

The 915 MHz sub-GHz band (903.5–926.9 MHz, FCC version) must not be used in full in the EU or in the Czech Republic. In the EU, operate the sub-GHz part of the receiver only with ExpressLRS firmware for the EU regulatory domain (868 MHz band) and with a transmitter module set up identically.

- In the Czech Republic, the conditions for operating short-range devices are set by the Czech Telecommunication Office in its general authorisations (VO-R/10 for the 863–870 MHz band, VO-R/12 for the 2.4 GHz band).
- Set the receiver's telemetry transmit power so that it does not exceed the limit applicable to the given band in the country of use.
- If you are unsure about the setup of the sub-GHz part, use the receiver in the 2.4 GHz band only.

6.2 ExpressLRS firmware

The receiver is supplied with ExpressLRS firmware installed. Firmware updates, selection of the regulatory domain, setting the Binding Phrase and other parameters are done with the ExpressLRS tools (ExpressLRS Configurator, the receiver's web interface). Detailed procedures can be found on the official ExpressLRS website.

ExpressLRS binding guide
www.expresslrs.org/quick-start/binding

Official ExpressLRS website
www.expresslrs.org

7. Troubleshooting

Problem	Possible cause and solution
LED does not light	The receiver has no power – check the 5V / GND wiring and the voltage at the flight controller output.
Receiver will not bind	A Binding Phrase is set in the receiver, or the major firmware version or regulatory domain of transmitter and receiver differ. Repeat the procedure in chapter 5.1.
Bound, but no response in Betaflight	RX/TX wires swapped, Serial RX enabled on a different UART or CRSF not selected – see chapters 3.1 and 4.
Short range, dropouts	Antennas on the wrong connectors, damaged or shielded antennas, unsuitable mode or band – see chapter 3.2.
Channels respond reversed	Adjust the channel settings in the radio, not in the receiver.

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 (DBR4) is printed on the receiver's circuit board.

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.