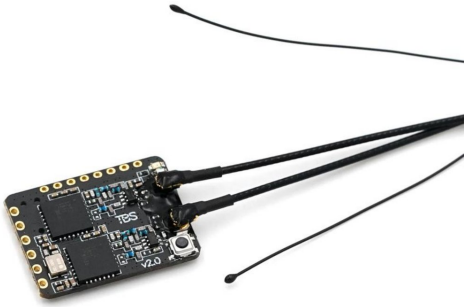
Crossfire Diversity Nano RX

TBS CROSSFIRE diversity R/C receiver
User manual



Read the entire manual before first use, especially the safety instructions. Update your CROSSFIRE transmitter to the latest firmware before binding.

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1. Safety instructions

The receiver is part of the model's control system. Incorrect wiring, configuration or damage may result in loss of control of the model and in injury to persons or damage to property. Observe the following instructions:

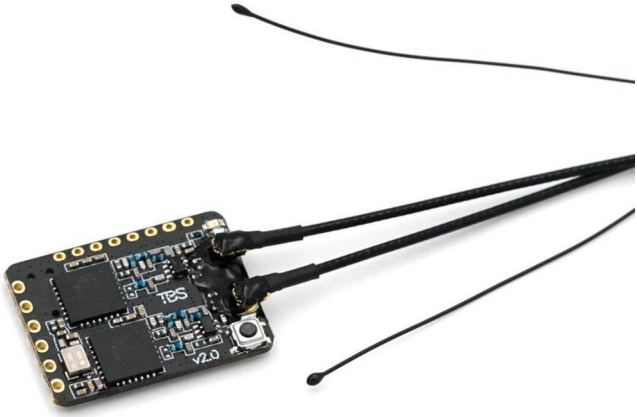
- Wire and solder the receiver only with the model's power disconnected. Before connecting the battery for the first time, check the polarity and all connections.
- Power the receiver only with the voltage given in the specifications. A higher voltage will permanently damage the receiver.
- **Remove the propellers** from the motors during all wiring, configuration and bench tests.
- Never operate the receiver without antennas connected, and make sure the antennas are not cut, broken or shorted against a carbon frame.
- Before every flight, verify the link between transmitter and receiver and the correct response of the model to the controls. Test the failsafe function on the ground (see chapter 6.3).
- Only connect a single-cell (1S) LiPo backup battery **with its own BMS protection** — the receiver's charging circuit has no over-discharge protection.
- Protect the receiver from moisture, dust, undamped vibration and short circuits with conductive parts of the model (heat shrink tubing).
- This product is not a toy. Keep it out of the reach of children — it contains small parts that may be swallowed.
- Operate the model in accordance with the regulations on unmanned aircraft and radio equipment applicable in the country of operation.

2. Product description

2.1 Introduction

The CROSSFIRE Diversity Nano RX is the TBS CROSSFIRE Diversity 8ch RX in a nano package. The small size allows you to save space and weight, while still retaining the key features that make the CROSSFIRE system flexible and reliable.

The receiver has two independent RF input stages (true diversity with two antennas), supports PPM, SBUS and CRSF outputs and is designed for reliable R/C signal transmission even over long distances — typically for long range quadcopters and smaller wings.



TBS Crossfire Diversity Nano RX with antennas connected

2.2 Key features

- Super compact, only 24 × 18 mm (1.8 g).
- Same feature set as the TBS CROSSFIRE DIVERSITY RX receiver: redundant RF stages, 1S backup battery circuitry for RF beacons, SBUS, CRSF, SmartAudio, MAVLink, Serial Bridge.
- Telemetry support.
- Full range receiver.
- 5 V voltage input.
- Integrated backup battery charger — **no over-discharge protection, use a battery with BMS!**
- 2.54 mm pitch front connector and 2 mm pitch side connector.

2.3 Specifications

Parameter	Value
Type designation	TBS Crossfire Diversity Nano Rx (A-CRFR-XNDRX)
Signal format	CRSF
Frequency band	868 MHz / 915 MHz (depending on the transmitter setting, see chapter 7)
Channels	up to 12
Outputs	8 pins (PWM), PPM, SBUS, CRSF
Power supply	5 V (5V IN pin); range according to the manufacturer 3.3–8.4 V
Range	up to 40 km (manufacturer's figure, depends on conditions)
Antenna connectors	2× U.FL
Pins	front pitch 2.54 mm, side pitch 2 mm; no connectors fitted
Dimensions	24 × 18 × 5 mm
Weight	1.8 g (without antennas)
Working temperature	0–40 °C

2.4 Package contents

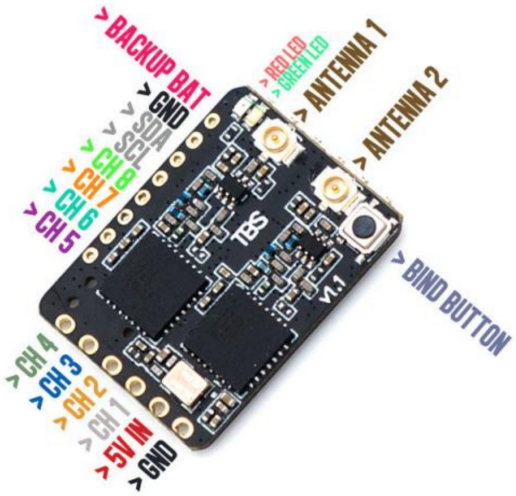
- 1× TBS Crossfire Diversity Nano RX receiver
- 2× TBS Crossfire Micro Receiver Antenna (U.FL)
- 1× spare heat shrink tube
- 14× 30 AWG silicone connection wires

※ The 1S LiPo backup battery, the TBS CROSSFIRE transmitter and the BST cable are not included.

3. Wiring the receiver

3.1 Pin layout

The receiver does not come with any connectors on-board. This is intended to allow for flexible and more varied setups, i.e. it is easier to add a connector than to remove a pre-soldered one. Use normal servo wires to either connect directly to the soldering pads/vias or use a 2.54 mm pin header to mount it to a motherboard.



Pin layout: 5V IN and GND (power), CH1–CH8, SCL/SDA (BST), BACKUP BAT and GND (backup battery), ANTENNA 1 and 2, BIND BUTTON, red and green LED

3.2 Output functions CH1–CH8

Outputs CH1 to CH8 are multi-purpose and support the functionality listed below. The output function is set in the receiver menu (CROSSFIRE transmitter, LUA script or TBS Agent).

Pin	Output type	Default
1	PWM CH1 (PWM ch. 1–12), PPM, RSSI, LQ, RSSI/LQ, CRSF TX	PWM ch. 1
2	PWM CH2 (PWM ch. 1–12), RSSI, LQ, RSSI/LQ, CRSF RX	PWM ch. 2
3	PWM CH3 (PWM ch. 1–12), RSSI, LQ, RSSI/LQ, SBUS, n.i.SBUS, Serial TX, MAVLink TX, CRSF TX, DSMX, SmartAudio	PWM ch. 3
4	PWM CH4 (PWM ch. 1–12), RSSI, LQ, RSSI/LQ, Serial RX, MAVLink RX, CRSF RX	PWM ch. 4

Pin	Output type	Default
5	PWM CH5 (PWM ch. 1–12), RSSI, LQ, RSSI/LQ, Serial RTS	PWM ch. 5
6	PWM CH6 (PWM ch. 1–12), RSSI, LQ, RSSI/LQ, Serial RTS	PWM ch. 6
7	PWM CH7 (PWM ch. 1–12), RSSI, LQ, RSSI/LQ, Serial RX, MAVLink RX, CRSF RX	PWM ch. 7
8	PWM CH8 (PWM ch. 1–12), RSSI, LQ, RSSI/LQ, SBUS, n.i.SBUS, Serial TX, MAVLink TX, CRSF TX, DSMX, SmartAudio	PWM ch. 8

※ The connection to the flight controller (FC) usually uses the CRSF protocol (the receiver's TX and RX are crossed with RX and TX of the selected FC UART) or SBUS.

3.3 Antennas

The antennas use a U.FL connector. Connect the antenna with the U.FL connector to the ANTENNA 1 or ANTENNA 2 socket on the receiver. To ensure that it does not disconnect or unseat, run the coax cable across the receiver board over to the servo channel end and secure it with the heat shrink tubing.

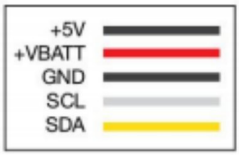
3.4 Backup battery and Find mode (beacon)

The receiver has solder pads (BACKUP BAT and GND) for an optional single-cell (1S) LiPo backup battery **with BMS**. The battery is charged by the receiver as soon as power is applied to the model. If the model loses power after a crash, the receiver keeps running on it and helps you locate the model — it sends RF beacon signals and, with a GPS connected, the last known coordinates, which the transmitter displays in the *Find mode* menu.

The integrated charging circuit has no over-discharge protection. Use only a 1S LiPo battery with its own BMS protection. Do NOT enable Find mode during the flight.

3.5 BST connectivity

The TBS CROSSFIRE Diversity Nano RX comes with a fully-featured BST (Blacksheep telemetry) port. To connect it to other devices like TBS CORE PRO, FPVision layer, GPS, or other TBS peripherals, a custom cable needs to be made. The BST connector usually has 5 pins, but on the CROSSFIRE Nano RX only **SDA, SCL and GND** have to be connected. The best practice is to use a BST cable, cut the connector on one end, and cut the unused wires on the other connector. Then solder the required wires accordingly.



BST cable pinout

※ The BST bus needs clean 5 V to power up the connected devices. Even if the pins carry the same labels (SCL, SDA), non-TBS GPS units or compasses do not work on the BST bus.

4. Binding

Make sure you have updated the firmware of both the CROSSFIRE transmitter and receiver to the latest version. The binding is super simple:

① Power up the TBS CROSSFIRE transmitter.

② On the standard transmitter, enter the configuration menu by pressing and holding the joystick for 3 seconds, select *General* and *Binding* — a message “Binding” will start blinking, waiting for the receiver. On the Micro transmitter, a short press on the button will initiate binding mode.

③ Power up the receiver (without pressing the BIND button!). If your receiver has not been previously bound, it will automatically bind. Otherwise, press and release the BIND button on the receiver to initiate binding. You need to push the button within one minute to avoid the timeout. If the status LED starts flashing slowly, the receiver has switched successfully to bind mode.

④ Within a few seconds, the process will finish with a “Binding complete” message on the standard transmitter, or a solid green LED on the Micro transmitter.

If it doesn't bind, please verify that your firmware is the newest version on both the receiver and the transmitter. You may want to bind through the LUA script on the Micro TX to walk through the wizard on the firmware update.

5. LED indicators

5.1 Receiver status LED

Indication	Description
Solid green	The link is up and running OK.
Solid red	No packages received from the transmitter and receiver is in failsafe mode.
Slow red blinking	The receiver needs an update, confirmation on the TX is required.
Slow green blinking	The receiver is in binding mode / Find mode active.
Fast green blinking	Receiver bootloader active or firmware upgrade running.
Green is flashing	Diversity RX is in Find mode (up to 1 min. delay between flashing).
Double green blinking	Authentication running / error. Rebind your receiver if it remains longer than a few seconds.
Red/green blinking (any pattern)	Firmware issue — run the emergency update for the receiver (chapter 6.2), then rebind it.

5.2 Backup battery LED

Indication	Status
Red blinking	Backup battery is charging.
Solid red	Backup battery is fully charged.

6. Firmware and settings

6.1 Firmware update

In order to update and configure your CROSSFIRE, you need **TBS AGENT DESKTOP** or **TBS AGENT WEB**. Connect the CROSSFIRE transmitter to the computer via USB and run the update with TBS Agent.

The receiver is updated over the air (OTA) from the transmitter. With the transmitter and the receiver both in bind mode, you will get a message on the radio / TBS Agent telling you that the receiver needs to be updated — follow the instructions shown there. When the transmission is finished, the receiver flashes itself; after this, they are bound and ready to be used. When you update your transmitter firmware, you need to rebind the receiver; if it was bound before, you don't need to press the BIND button again.

6.2 Emergency update

When the update of the receiver fails, it will no longer work. The receiver stores a specific “golden” firmware, which can be restored by the following steps:

① Hold the BIND button and power up the receiver — the LED starts to flash rapidly.

② Release the button, then push and hold it again — the LED will start to blink in a double pattern.

③ As soon as the LED switches to rapid flashing again, release the button.

④ When the pattern changes back to slow, single blinking, the emergency update is finished.

Now the receiver is working again and has automatically turned on binding mode. Power up your transmitter, start the binding and run the OTA update again.

6.3 Failsafe setup

The TBS CROSSFIRE supports two failsafe behaviors: **Cut** and **Failsafe position**. Setting them up correctly is crucial for the safety of your model. The setting is located in the receiver menu (transmitter, LUA script or TBS Agent) under *General → FS. Mode*.

- **Cut** — if the link breaks up, the receiver will output no signal, which will be detected by the flight controller (FC), which then runs its own failsafe routine. Use this setting on models with a flight controller.
- **Failsafe position** — the receiver will output a previously taught position for all channels. Used on models without an FC or with an FC that requires a special stick position. If you do not teach a position, the receiver will output the last position before the link broke up.

Teaching a position: power up your bound receiver and your radio, open the transmitter menu, hold the sticks and switches in the desired position and select

Set fs. Mode; wait for the confirmation.

▶ **Failsafe test**

After every change of the failsafe setting, test the correct function on the ground: remove the propellers, power up the radio and the model, Arm the model (with FC) or move the sticks into a certain position (no FC), shut down your radio and check that the model behaves as set.

6.4 Further information

This manual covers the basic functions of the receiver and does not include all functions of the CROSSFIRE system in detail. For further information check the official TBS CROSSFIRE manual: www.team-blacksheep.com/tbs-crossfire-manual.pdf.

7. Frequency bands and operation in the EU

The TBS CROSSFIRE system operates in two frequency bands — **868 MHz** (Europe / Africa / Middle East) and **915 MHz** (America, Asia / Oceania). The band is selected on the CROSSFIRE transmitter in the *General* → *Frequency* menu according to your location; the receiver operates in the band selected by the transmitter. The receiver transmits a telemetry downlink signal.

In the Czech Republic and other EU countries, set the transmitter only to the 868 MHz band permitted in the respective country. The CROSSFIRE 915 MHz modes (902–928 MHz) must not be used in the EU. The user is responsible for the band and transmit power settings.

Frequency allocations and permitted transmit power differ from country to country. The information in this manual describes the situation in the Czech Republic; if you operate the product in another country, you must follow the regulations of the country in which you operate it. In the Czech Republic, the operation of short range devices is governed by the CTU general authorisation VO-R/10.

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 (TBS Crossfire Diversity Nano Rx, A-CRFR-XNDRX) is given in this manual and in the EU declaration of conformity; the board revision is printed on the receiver 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.