



CROSSFIRE NANO RX (SE)

TBS Crossfire – 868 MHz receiver for FPV drones
User manual



Read this entire manual before installation. In the EU, operate exclusively in the 868 MHz band.

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1. Safety instructions

The TBS Crossfire Nano RX (SE) receiver is part of the radio control system of a drone or other model. Whether the model responds to your commands depends on its correct installation and function. Read this entire manual before installation.

- When soldering and installing, keep the **flight battery disconnected** and the **propellers removed**. Fit the propellers only after successful binding and verification of the failsafe function.
- Solder the receiver only in a well-ventilated area, using a temperature-controlled fine-tip soldering iron. Prolonged heating may damage the solder pads and components.
- Observe the correct power polarity. Swapping the power input (5V In) and ground (GND) or shorting adjacent pads will destroy the receiver.
- Never power the receiver without the antenna connected, and do not shorten or otherwise modify the antenna.
- After installation, always test that the receiver switches to failsafe mode when the signal is lost and that the model behaves safely (see Chapter 6).
- Protect the receiver from moisture, conductive debris (carbon dust, metal shavings) and mechanical damage – use the supplied heat-shrink tubing.
- The product is intended for persons aged 14 and over. Keep small parts out of the reach of small children.

2. Product description

2.1 Introduction

The CROSSFIRE Nano RX has much of the same feature set as the TBS CROSSFIRE Micro RX but on a smaller form factor and without connectors. 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 **SE (Special Edition)** includes the **TBS Immortal T V2** antenna.



TBS Crossfire Nano RX (SE) with Immortal T V2 antenna

2.2 Key features

- super compact, just 11 × 18 mm,
- same feature set as the regular CROSSFIRE Micro receiver (SBUS, PPM, PWM, CRSF, SmartAudio, MAVLink, Serial Bridge),
- telemetry support,
- full range receiver,
- 5 V voltage input,
- 2.54 mm pitch front connector and 2 mm pitch side connector.

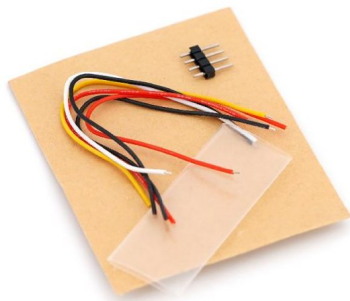
2.3 Specifications

Type designation	TBS Crossfire Nano RX (SE)
Signal format	CRSF
Frequency band	868 MHz (EU version) / 915 MHz – in the EU only the 868 MHz band may be used (Chapter 3)
Channels	12
Output formats	PPM, SBUS, CRSF, PWM
Power supply	5V In input; input voltage range according to the manufacturer 3.3–8.4 V
Antenna connector	U.FL
Dimensions	11 × 18 mm
Weight	0.5 g

Data according to the manufacturer's product page and quick start guide.

2.4 Package contents

- 1× TBS Crossfire Nano receiver,
- 1× TBS Crossfire Immortal T V2 antenna,
- 1× spare heat-shrink tube,
- 6× 30 AWG silicone connection wires (2 black, 2 red, 1 white, 1 yellow),
- 1× pin header 1×4.

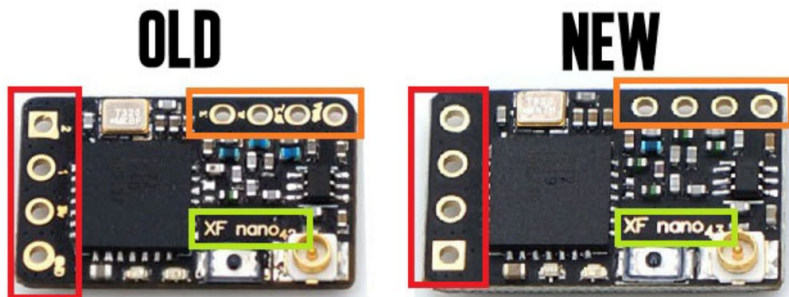


*Connection wires, heat-shrink tube
and pin header*

For operation you also need a radio with a **TBS CROSSFIRE** transmitter module and a flight controller (FC) or other device to which the receiver will be connected.

2.5 Board versions

TBS is now shipping a newer version of the Nano RX. The markings were removed to reduce soldering difficulties, the GND pad is now properly shaped (square), and the version number has also changed. Please see the photo below for a clearer comparison (OLD = older version, NEW = newer version).



Older (OLD) and newer (NEW) board version

3. Radio frequencies and legal conditions of use

3.1 The law of the country of operation applies

The rules for the use of radio frequencies and for drone operation are based on European Union legislation, but national implementing regulations differ from country to country – permitted frequency bands, maximum transmit power, operator registration and flight conditions. The information in this chapter describes the situation in the Czech Republic. If you use the product in another country, you must comply with the regulations of the country in which you use it.

3.2 Frequency band and transmit power

The receiver does not only receive commands from the radio, it also transmits telemetry back to it. It is therefore radio equipment within the meaning of Directive 2014/53/EU (RED).

- In the Czech Republic and in the other EU countries, operate the Crossfire system **exclusively in the 868 MHz band** (EU mode) – in the Czech Republic under the general authorisation of the Czech Telecommunication Office No. VO-R/10 for short range devices in the 863–870 MHz band.
- **The 915 MHz mode** is intended for other markets (e.g. the USA) and uses frequencies that are not permitted for this purpose in the Czech Republic. **Do not use it in the Czech Republic or the EU.**
- The frequency mode and transmit power are set on the TBS Crossfire transmitter module. The user is responsible for a setting that complies with the regulations of the country of operation.
- Use only the supplied antenna or an antenna specified by the manufacturer, without additional amplifiers, and do not modify the receiver in any way.
- Information on the maximum transmit power of the receiver is available from the importer on request, together with the EU declaration of conformity (Chapter 8).

3.3 Simplified EU declaration of conformity

Hereby, Blacksheep Avionics Co. Ltd. declares that the radio equipment type TBS Crossfire Nano RX (SE) is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://www.team-blacksheep.com/doc_ce/id:2028.

3.4 Manufacturer

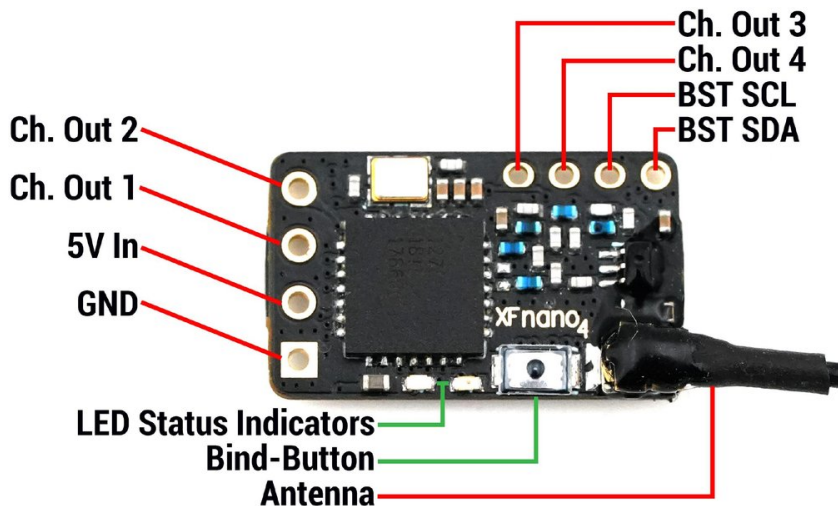
Blacksheep Avionics Co. Ltd., 44-46 Hung To Rd, 12/F, Unit 1204, Century Centre, Kwun Tong, Hong Kong · E-mail: rparker@team-blacksheep.com · www.team-blacksheep.com

4. Installing the receiver

4.1 Wiring the receiver

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. The antenna uses a U.FL connector. Use heat-shrink tubing to protect the receiver.



Receiver connection points

Label in the figure	Meaning
Ch. Out 1 - Ch. Out 4	outputs 1 to 4 (pins 1-4 in the table below)
BST SCL / BST SDA	pins 5 and 6 – BST bus
5V In	receiver power input
GND	ground (square pad)
LED Status Indicators	status LEDs (Chapter 5.2)
Bind-Button	BIND button
Antenna	antenna (U.FL connector)

► Output functions

Pin	Output type	Default
1	PWM CH1 (PWM Ch1 to 12), PPM, RSSI, LQ, RSSI/LQ, SBUS, non-inverted SBUS, CRSF TX, MAVLink TX, SmartAudio, DSMX	CRSF TX
2	PWM CH2 (PWM Ch1 to 12), RSSI, LQ, RSSI/LQ, CRSF RX, MAVLink RX	CRSF RX
3	PWM CH3 (PWM Ch1 to 12), RSSI, LQ, RSSI/LQ, CRSF RX, MAVLink RX	PWM Ch. 3
4	PWM CH4 (PWM Ch1 to 12), RSSI, LQ, RSSI/LQ, SBUS, non-inverted SBUS, CRSF TX, MAVLink TX, SmartAudio, DSMX	SmartAudio
5 (BST)	PWM CH5 (PWM Ch1 to 12), RSSI, LQ, RSSI/LQ, BST SCL	BST SCL
6 (BST)	PWM CH6 (PWM Ch1 to 12), RSSI, LQ, RSSI/LQ, BST SDA	BST SDA

※ When connecting to a flight controller (FC) via CRSF, the wiring is crossed: connect the receiver's **CRSF TX** output to the **RX** pad of the selected serial port (UART) on the flight controller and **CRSF RX** to the **TX** pad. Then, in the flight controller configuration software, enable *Serial RX* on this port and select *CRSF* as the receiver protocol.

4.2 Antenna

Connect the antenna with the U.FL connector to the 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.

- Fit and remove the U.FL connector perpendicular to the board, without levering or pulling on the cable.
- Place the active ends of the antenna as far as possible from carbon frame parts, motors and other antennas, and protect them from the propellers.

4.3 BST connectivity

The TBS CROSSFIRE Nano RX comes with a fully-featured BST port. To connect it to other devices like TBS CORE PRO, FPVision, 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 off one end, cut the unused wires at the other connector, and then solder the required wires accordingly.



BST cable pinout: +5V, +VBATT, GND, SCL, SDA (Nano RX uses only GND, SCL and SDA)

5. Binding and indicators

5.1 Binding with the transmitter

Binding the transmitter and receiver 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 Now power up the receiver (**without pressing the BIND button!**). If your receiver has not been previously bound, it will bind automatically. Otherwise, press and release the BIND button on the receiver to initiate binding. The receiver has a timeout of one minute after power-up to enter bind mode. If the status LED starts blinking slowly, the receiver has successfully switched 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. The receiver has now stored the unique serial number of that particular CROSSFIRE transmitter. If it does not bind, please verify that the firmware on both the receiver and the transmitter is the newest version.

5.2 Receiver status LED

Receiver LED indicator	Description
solid green	the link is up and running OK
solid red	no packets received from the transmitter, the 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
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 flashes)
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, then rebind it

5.3 Firmware and further information

Always use up-to-date CROSSFIRE firmware on both the transmitter and the receiver. This manual is a quick start guide that does not include all functions and information in detail or at all. For further information check the official TBS CROSSFIRE manual:

- English: <https://www.team-blacksheep.com/tbs-crossfire-manual.pdf>
- German: <https://www.team-blacksheep.com/tbs-crossfire-manual-de.pdf>
- product page: www.team-blacksheep.com

6. Pre-flight check

- Before the first flight and after every change to the wiring, verify with the propellers removed that the flight controller (FC) correctly receives all channels and that stick movements match the displayed values.
- **Test the failsafe:** with the propellers removed, Arm the model (motors on), switch off the radio and check that the receiver status LED lights solid red and the model enters the configured failsafe mode (motors stop). Only then fit the propellers.
- Check that the antenna is firmly connected, undamaged and out of reach of the propellers.
- Make sure the system is set to a frequency mode permitted in the country of operation (868 MHz in the EU).
- Perform a range check on the ground before flying and, during flight, monitor the link quality telemetry (LQ / RSSI) if your setup displays it.

7. Maintenance and troubleshooting

- After a crash, check the antenna, the U.FL connector, the solder joints and the protective heat-shrink tubing.
- Replace a damaged antenna – range drops significantly with a damaged antenna.
- Store the receiver in a dry place, out of direct sunlight and out of the reach of children.

Problem	Possible cause and solution
receiver does not bind	the transmitter is not in binding mode, or more than 1 minute has passed since the receiver was powered up – repeat the procedure in Chapter 5.1; check that both transmitter and receiver run the newest firmware
LED solid red	the receiver is not receiving packets from the transmitter – check that the transmitter is switched on and bound, and check the antenna
LED double green blinking	authentication takes longer than a few seconds – rebind the receiver
LED blinking red and green	firmware issue – emergency update of the receiver and rebind
FC does not see the channels	check the crossed wiring CRSF TX → RX and CRSF RX → TX, the selected UART and the CRSF protocol in the FC configuration

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@rotorاما.cz
Phone	+420 252 252 098
Website	www.rotorاما.cz

8.2 Product conformity



- 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@rotorاما.cz.
- **Product identification:** the type designation (TBS Crossfire Nano RX (SE)) is given on the product packaging; the receiver board is marked *XF nano* with the version number.

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.