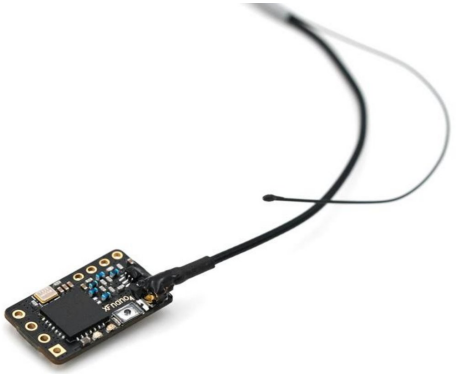
Crossfire Nano RX

TBS Crossfire 868 MHz receiver
User manual



Read this entire manual carefully before installation and first use and keep it for future reference.

www.rotorama.com

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1. Safety instructions

Read this entire manual before installing the receiver. The TBS Crossfire Nano RX receiver is a component intended to be built into a radio-controlled model, typically an FPV drone. Incorrect installation or loss of the radio link may result in loss of control over the model, a crash and injury to persons or damage to property.

- Install and solder the receiver only with the **flight battery disconnected**. Keep the **propellers removed** whenever you work on the model.
- Power the receiver only with **5 V** applied to the *5V In* pad. Reversing power and ground (GND) or connecting the battery voltage directly to the receiver may permanently damage it.
- Never operate the receiver without the antenna connected and do not disconnect the antenna during operation.
- Protect the receiver with heat-shrink tubing against short circuits to conductive parts of the model (carbon frame) and against moisture. Make sure that no wire or solder joint can short an adjacent pad.
- Always verify the **failsafe** function (behaviour of the model on signal loss) before the first flight — see chapter 4.3.
- Solder in a well-ventilated area; the soldering iron tip and molten solder can cause burns.
- Operate the radio equipment only in the frequency band and at the power permitted in the country of use — see chapter 5.
- The product is not a toy. Keep it and its small accessories out of the reach of children.

2. Product description

2.1 Introduction and key features

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.

- super compact, just only 11 × 18 mm,
- same feature set like 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.

2.2 Specifications

Parameter	Value
Signal format	CRSF
Output formats	PPM / SBUS / CRSF / PWM
Channels	12
Frequency	868–915 MHz (in the EU only the 868 MHz band, see chapter 5.2)
Input voltage	5 V (manufacturer's manual); range according to the manufacturer's product page 3.3–8.4 V
Range	up to 40 km (manufacturer's figure; actual range depends on the environment, antennas and set power)
Board dimensions	11 × 18 mm
Weight	0.5 g
Antenna connector	U.FL
Other features	telemetry, SmartAudio, MAVLink, Serial Bridge, BST

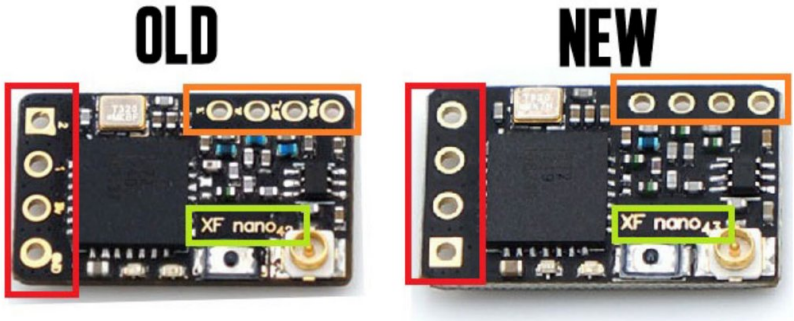
2.3 Package contents

- 1× TBS Crossfire Nano Receiver
- 1× TBS Crossfire Micro Receiver Antenna
- 1× spare shrink tube
- 6× 30 AWG silicone connection wire (2× black, 2× red, 1× white, 1× yellow)
- 1× pin header 1×4

Not included: TBS Crossfire transmitter module or radio, flight controller (FC), BST cable and soldering tools.

2.4 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.



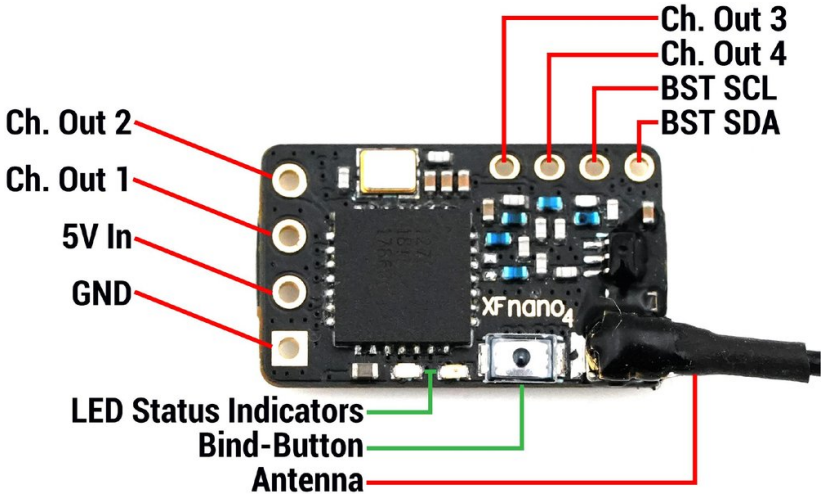
Old (left) and new (right) board version; red: front pads, orange: side pads, green: version number

3. Wiring the receiver

3.1 Pin description

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 pin description

Label in the picture	Meaning
Ch. Out 1 – Ch. Out 4	outputs 1–4 (pins 1–4, see chapter 3.2)
BST SCL / BST SDA	BST bus (pins 5 and 6), can also be used as outputs 5 and 6
5V In	+5 V power input
GND	ground (square pad)
LED Status Indicators	status LEDs (see chapter 4.2)
Bind-Button	BIND button
Antenna	antenna (U.FL connector)

3.2 Output mapping

The function of each pin can be changed in the receiver settings. The default assignment is shown in the *Default* column.

Pin	Output type	Default
1	PWM CH1 (PWM Ch1 to 12), PPM, RSSI, LQ, RSSI/LQ, SBUS, n.i. 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, n.i. 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

※ Abbreviations: *n.i. SBUS* = non-inverted SBUS, *RSSI* = signal strength, *LQ* = Link Quality. The asterisk next to SmartAudio is taken over from the manufacturer's original manual, which gives no explanation for it.

The CRSF protocol is normally used to connect the receiver to the flight controller (FC): connect pin 1 (CRSF TX) to the RX input of the selected FC UART and pin 2 (CRSF RX) to the TX output of the same UART.

3.3 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.



TBS Crossfire Micro Receiver Antenna with U.FL connector

3.4 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 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 (+5V, +VBATT, GND, SCL, SDA); on the Nano RX only GND, SCL and SDA are connected

4. Binding and operation

4.1 Binding

Binding the transmitter and receiver is super simple:

① Just 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 automatically bind. 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 doesn’t bind, please verify that your firmware is the newest version on both the receiver and the transmitter.

4.2 Receiver LED indicators

LED status	Description
solid green	the link is up and running OK
solid red	no packages received from the transmitter and 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
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

4.3 Failsafe and pre-flight check

Failsafe is the behaviour of the model when the radio signal is lost. On signal loss the receiver enters failsafe mode (solid red LED) — what the model does in this situation is determined by the settings of the receiver and the flight controller (FC).

- After installation and before every first flight with new settings, verify the failsafe: **with the propellers removed**, Arm the model (motors on), switch off the transmitter and check that the motors stop or that the model reacts according to your settings.
- Before every flight check that the receiver LED is solid green, the antenna is firmly connected and undamaged, and that the channel movements in the flight controller configurator match the stick movements of the radio.
- Place the antenna as far as possible from conductive parts (carbon, battery leads) and from the video transmitter (VTX); its active part must not be bent or covered by metal or carbon.

4.4 Firmware update

Keep both the transmitter module and the receiver on the newest TBS Crossfire firmware. If the receiver needs an update, its LED blinks slowly red and the update must be confirmed on the transmitter module. The update procedure is shown in the manufacturer's video guides: Update TX and Update RX.

※ This manual deliberately does not state specific firmware version numbers — the product may be supplied with different versions.

5. Radio frequencies and conditions of use

5.1 The law of the country of use applies

European Union legislation (Radio Equipment Directive 2014/53/EU, Regulations (EU) 2019/945 and 2019/947 on unmanned aircraft systems) applies in all Member States, but national implementing rules differ from country to country — permitted frequency bands, maximum transmit power, registration portals and drone operating conditions. The information in this chapter describes the situation in the Czech Republic. If you use the product in another country, you must follow the regulations of the country in which you use it.

5.2 Frequency bands and transmit power

According to the manufacturer, the receiver operates in the 868–915 MHz band and, thanks to telemetry, also transmits itself. The frequency band and transmit power of the whole link are controlled by the TBS Crossfire transmitter module to which the receiver is bound. **The user is responsible for the band and power settings.**

Band (Czech Republic)	Max. power	Conditions
863–870 MHz	25 mW e.r.p.	duty cycle or spectrum access techniques according to VO-R/10
869.40–869.65 MHz	500 mW e.r.p.	duty cycle max. 10 % or spectrum access techniques according to VO-R/10
902–928 MHz (915 MHz)	—	**not permitted in the Czech Republic and the EU** (band for markets outside the EU)

Source: CTU general authorisation No. VO-R/10/05.2025-5, effective from 15 June 2025.

- In the Czech Republic and other EU Member States use **only the 868 MHz band** and observe the power limits of the respective country. The 915 MHz band is intended for markets outside the EU.
- The maximum transmit power of the receiver (telemetry) is not stated in the manufacturer's publicly available documentation; the importer will provide this information on request (chapter 8.1).
- CTU (Czech Telecommunication Office) regulations may change; see www.ctu.gov.cz.

5.3 Operating a drone with this receiver

The receiver itself is a component; the classes C0–C6 apply to complete unmanned aircraft systems, not to individual parts. Operation of the drone in which you install it is governed by Regulation (EU) 2019/947 and the regulations of the country of use — in particular operator registration, pilot competence, operational limits (height, visual line of sight, distance from people) and insurance. In the Czech Republic, information is provided by the Civil Aviation Authority (www.caa.gov.cz).

6. Troubleshooting

Problem	Possible cause and solution
LED does not light up	The receiver is not powered — check the solder joints on the 5V In and GND pads and the presence of 5 V.
The receiver does not bind	Binding can only be started within one minute of powering up the receiver. Check that the transmitter module is in binding mode and update the firmware of both the transmitter module and the receiver.
LED blinks slowly red	The receiver needs an update — confirm it on the transmitter module.
LED double-blinks green for more than a few seconds	Authentication error — rebind the receiver.
LED blinks red and green in any pattern	Firmware issue — run the emergency update of the receiver, then rebind it.
The flight controller does not see the channels	Check the wiring CRSF TX → RX and CRSF RX → TX, the selected UART and the receiver protocol (CRSF) in the flight controller configuration.
Short range, signal dropouts	Check the U.FL connection, antenna damage and its placement away from carbon, cables and the VTX.

7. Further information

This manual is based on the manufacturer's quick start guide, which does not include all functions and information in detail or at all. For further information check the official TBS CROSSFIRE manual: English version / German version.

Manufacturer: Team BlackSheep (TBS), www.team-blacksheep.com.

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 Nano RX) and the board version number (XF nano) are given on the printed circuit board of the receiver.

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.