Moxon antenna

Moxon directional antenna with SMA / RP-SMA connector
Mounting, aiming and maintenance manual



Never switch on the radio without an antenna connected. This product is not a toy – it is intended for persons aged 14 and over.

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1. Safety instructions

- This product is **not a toy** and is intended for persons aged 14 and over. It contains small parts – keep it out of the reach of small children.
- **Never switch on the radio or the transmitter module without an antenna connected.** Without an antenna the transmitting stage can be permanently damaged. This also applies to switching on briefly and to configuring settings in the menu.
- Always screw the antenna on and off with the **radio switched off** or the module switched off.
- Do not disassemble or shorten the antenna and do not solder anything to it. It is tuned to the operating band and any modification will detune it.
- A directional antenna radiates the signal mainly in one direction. If it is not pointing at the model, the range of the RC link drops considerably. This can result in loss of signal (failsafe) and a crash of the model.

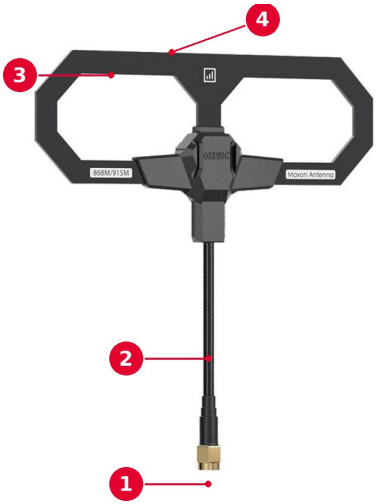
2. Product description

2.1 About the product

The Moxon is a directional antenna for RC radios and transmitter modules, for example ExpressLRS. Compared with an omnidirectional antenna, it concentrates the signal in one direction and thereby extends the range of the RC link in that direction. It connects to the radio or module with a screw-on **SMA** or **RP-SMA** connector – the connector type is stated in the antenna designation.

The active part of the antenna is a flat board with conductive arms. The antenna is a passive part without electronics – it needs no power supply and no setup.

2.2 Parts description



Illustrative photo – the shape and size of the board, the cable length and the design vary depending on the antenna type.

① **SMA or RP-SMA connector** – with a coupling nut used to screw the antenna onto the radio or module.

② **Cable or support part** – connects the antenna board to the connector.

③ **Antenna board** – the radiating part.

④ **Long edge** – used to aim the antenna at the model (Chapter 4).

2.3 Compatibility

- The band of the antenna must match the band of the transmitter. Depending on the version, the antenna is designed for the **2.4 GHz** band, for the **868/915 MHz** band, or for both bands – the band is stated in the antenna designation.
- The antenna connector must match the connector on the radio or module. **SMA and RP-SMA are not compatible with each other**, even though they have the same thread. The difference is in the centre contact – see the figure.
- If the connectors do not match, use a suitable SMA ↔ RP-SMA adapter. Never force connectors together.
- The antenna is not intended for video transmitters (VTX).



Male – connector with coupling nut, female – connector with external thread. An SMA male has a centre pin, an RP-SMA male a centre socket.

3. Mounting

3.1 Screwing on the antenna

① Switch off the radio or module.

② Check that the antenna connector type matches the connector on the radio (Chapter 2.3).

③ Fit the antenna straight in line with the connector, not at an angle.

④ Turn the coupling nut **clockwise** and tighten it **by hand** until the antenna is held firmly. Do not use pliers or a wrench.

⑤ Switch on the radio only with the antenna screwed on.

Do not tighten the nut with force. Overtightening damages the centre contact or loosens the connector in the radio or module.

3.2 Unscrewing the antenna

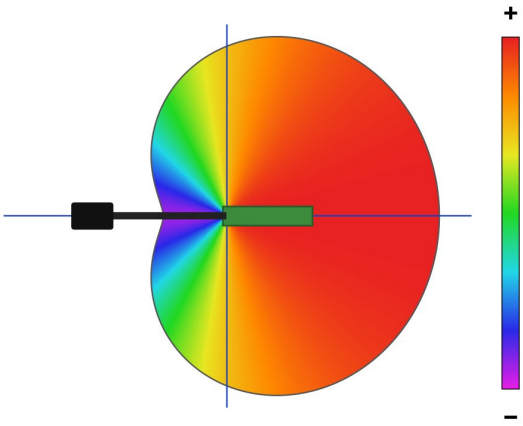
Switch off the radio and turn the coupling nut **anticlockwise**. Do not bend the antenna sideways or pull on it while doing so.

If the antenna has a cable or a swivel connector, it can be turned to the required position after screwing it on. Do not bend the cable sharply and do not bend it repeatedly at the same point.

4. Aiming the antenna

4.1 Radiation pattern

The Moxon concentrates the signal in one direction. It radiates most strongly forwards and over a wide angle to the sides as well as above and below the board. The signal is weakest behind the antenna, on the side of the connector and cable.



Illustrative radiation pattern (section, side view): strongest signal in red, weakest in blue and purple. The connector with the cable is on the left.

4.2 Aiming at the model

- The Moxon **is not a patch antenna**. Do not point the flat side of the board at the model, but its **long edge** – the one facing away from the connector.
- Turn the antenna so that the long edge of the board points into the area in which you are flying.
- Because of polarisation, turn the board so that its **long edges are vertical** – the antenna then radiates with vertical polarisation. The receiver antennas on the model should be oriented the same way.
- During the flight, keep the antenna turned towards the model. When flying around or above yourself, an omnidirectional antenna is more suitable.
- There should be no obstacles between the antenna and the model. Do not cover the antenna with your hand or body.
- Fly within line of sight. Buildings, trees and terrain between the radio and the model attenuate the signal considerably.

4.3 Frequency bands and power

- In Europe, RC systems use the **2.4 GHz** band and the **868 MHz** band. The 915 MHz band is intended for other regions – the regulations of the country in which you operate the model apply.
- An antenna with higher gain increases the radiated power. The operator is responsible for complying with the permitted radiated power – if necessary, reduce the output power in the transmitter settings.

5. Function check

- Carry out the check with the propellers removed.
- Switch on the radio with the antenna screwed on, then the model, and check that the link is established.
- In the telemetry of the radio, check the signal strength (RSSI) and link quality (LQ).
- After replacing the antenna, start flying close by and keep watching the telemetry. Only fly further away once the link is reliable.

6. Maintenance and storage

6.1 Pre-flight inspection

- Check that the antenna is firmly tightened and has no play.
- Check that the antenna board is not cracked or bent and the cable is not damaged.
- When replacing the antenna, check that the thread and the centre contact are not damaged, bent or dirty.

Replace an antenna with a damaged board, cable or connector.

6.2 Cleaning, transport and storage

- Clean the antenna with a dry soft cloth. Do not use solvents.
- When transporting the radio in a bag or case, protect the antenna from bending or unscrew it. The leverage of the antenna can easily damage the connector in the radio.
- Store it in a dry place and do not place other objects on it.

7. Troubleshooting

Problem	Possible cause and solution
Weak signal, short range or failsafe	The antenna is not tightened, is damaged, does not match the band of the transmitter, is not pointing at the model, or its flat side is pointing at the model. Check the mounting (Chapter 3.1), aiming (Chapter 4) and condition of the antenna (Chapter 6.1).
The link drops out when the model is behind you or above you	The model is outside the beamwidth of the directional antenna. Turn the antenna towards the model or use an omnidirectional antenna.
The antenna cannot be screwed on	The antenna connector does not match the connector on the radio (SMA × RP-SMA), or you are fitting the antenna at an angle. Check the connector type (Chapter 2.3) or use an adapter.
The antenna screws on but there is no link	Both the antenna and the radio have a socket, or both have a pin (SMA × RP-SMA). The centre contact then does not connect. Use an antenna with the correct connector or an adapter.

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.cz

8.2 Product safety and identification

- The product is a passive antenna without electronics. It is not subject to the Radio Equipment Directive (RED) or the Electromagnetic Compatibility Directive (EMC). It is placed on the market in accordance with Regulation (EU) 2023/988 on general product safety (GPSR).
- **Product identification:** the manufacturer and type designation can be found on the product page in the e-shop and, for some versions, also on the packaging.
- This product is **not a toy** and is intended for persons aged 14 and over.

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.