Whip antennas 2.4 GHz

Receiver antennas with IPEX4 (MHF4) connector
Connection, positioning and maintenance manual



Read the entire manual before installation and keep it for future reference. 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.
- Always connect and disconnect the antenna with the **model switched off**, when the receiver is not powered.
- **Do not switch on the receiver without an antenna connected.** Many current receivers also transmit (for example telemetry), and operating them without an antenna can damage their transmitting stage.
- Do not shorten or extend the antenna and do not solder anything to it. The length of the active part is tuned to the operating band and any modification will detune the antenna.
- A damaged, disconnected or poorly positioned antenna reduces the range of the RC link. This can result in loss of signal (failsafe) and a crash of the model. Therefore check the condition of the antenna before every flight.

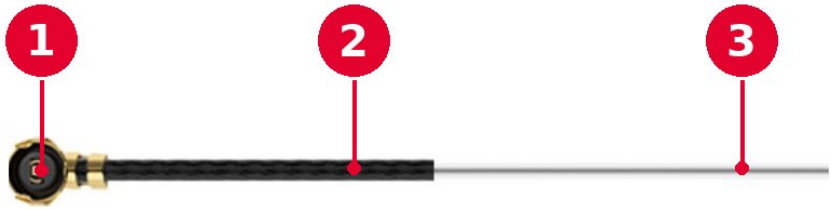
2. Product description

2.1 About the product

The whip antenna is a replacement antenna for RC receivers operating in the **2.4 GHz** band, for example FrSky or ExpressLRS 2.4 GHz. It connects to the receiver with a small **IPEX4** connector, also referred to as **MHF4**.

The antenna consists of a thin coaxial cable. Its unshielded end is the active part of the antenna that receives the signal. The antenna is a passive part without electronics – it needs no power supply and no setup. Thanks to its low weight and small connector, it is particularly suitable for small receivers and boards with an integrated receiver.

2.2 Parts description



Illustrative photo – cable length and design vary depending on the antenna type.

① **IPEX4 (MHF4) connector** – snaps into the socket on the receiver.

② **Coaxial cable** – shielded lead that carries the signal from the active part to the receiver.

③ **Active part** – the thin unshielded end of the antenna. This part receives the signal and must therefore be positioned freely, away from carbon and metal parts of the model.

2.3 Compatibility

- The band of the antenna must match the band of the receiver. The antenna is designed for **2.4 GHz**. It is not suitable for 868/915 MHz receivers or for video transmitters (VTX).
- The receiver must have an **IPEX4 (MHF4)** socket. It is smaller and lower than the more common **IPEX1** (u.FL). The two types are not compatible and cannot be connected to each other – check the socket type in the receiver documentation.
- If the receiver has two antenna sockets (diversity), connect an antenna to both.
- A receiver with an antenna integrated directly on the board (ceramic or PCB) that has no IPEX4 socket cannot use this antenna.

3. Connecting to the receiver

3.1 Connecting the antenna

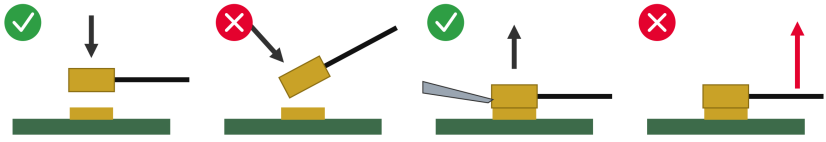
① Switch off the model so that the receiver is not powered.

② Locate the IPEX4 socket on the receiver. If the receiver is sealed in heat-shrink tubing, open it at the socket so that you can reach it.

③ Place the antenna connector exactly above the socket, parallel to the receiver board.

④ Press the connector **straight down** – with a fingernail or the flat end of a plastic tool – until it clicks in noticeably.

⑤ Check that the connector sits straight in the socket and does not come off. A correctly fitted connector can rotate in the socket, but it must not sit at an angle.



From left: fitting straight ✓, fitting at an angle ✗, removing straight up with a flat tool ✓, pulling on the cable ✗.

Do not press on the connector at an angle and do not use metal tools with sharp edges. You would damage the socket and its connection to the receiver board.

3.2 Disconnecting the antenna

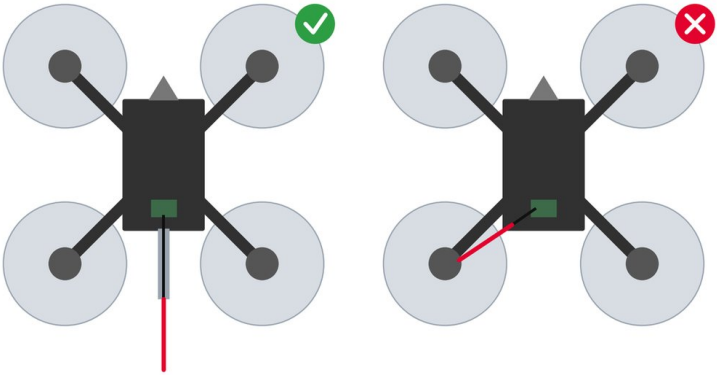
Lever the connector up with a flat plastic tool or use an IPEX4 (MHF4) connector puller and lift it **straight away from the board**. Never pull on the cable – the cable will tear out of the connector or the socket will be torn off the receiver.

The IPEX4 connector is very small and is not designed for frequent connecting and disconnecting. Repeated disconnection loosens the joint.

4. Positioning and routing the antenna

4.1 Positioning the active part

- Route the active part ③ **out of the frame**. Carbon parts, metal parts, the battery and the electronics all shield the signal.
- The active part must not reach into the **path of the propellers**, even when it bends in flight or in a crash.
- A proven solution is to thread the cable through a plastic tube or an antenna mount at the rear of the frame so that the active part sticks out. The active part may be inside a plastic tube or sleeve, but never put it in a metal or carbon tube.
- Keep as much distance as possible from the video transmitter (VTX) antenna and do not run the two antennas parallel next to each other.
- A whip antenna receives worst in the direction of its axis. The antenna of the radio is usually vertical while flying, so point the active part vertically or at an angle rather than horizontally along the frame.



Top view: active part (red) routed in a tube behind the frame between the rear propellers ✓, active part lying on the arm and in the propeller path ✗.

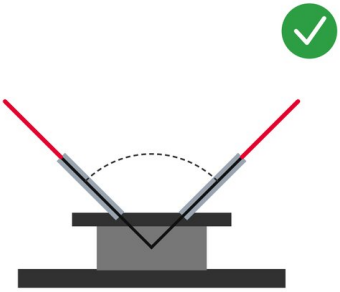
4.2 Cable routing

- Route the cable without sharp bends or kinks. Do not pinch it between frame parts, under a screw or under an overtightened cable tie.

- Do not route it over sharp edges of the carbon frame, which can cut through the insulation.
- Secure the cable so that it does not flutter in flight and cannot get into the propellers. Store any excess length loosely in a gentle curve.

4.3 Two antennas (diversity)

If the receiver has two antennas, place their active parts as far apart as possible and turn them approximately 90° to each other, for example in a V shape. When one antenna is in an unfavourable position relative to the radio, the other one keeps receiving the signal.



Two antennas turned approximately 90° to each other (rear view).

4.4 Securing the connector

To prevent the connector from coming loose on impact, the best solution after the function check is to seal the whole receiver, including the connected connector, in **heat-shrink tubing**. The tubing holds the connector in the socket and protects the receiver at the same time. Do not overheat the receiver or the cable while shrinking the tubing. The connector can also be secured with a piece of tape.

5. Function check

- Carry out the check with the propellers removed.
- Switch on the radio, 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). The values should correspond to the state before the antenna was replaced or to a similar model.
- With a receiver that has two antennas, watch the values of both antennas. A noticeably weaker signal on one of them indicates a fault in its connection or position.
- 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 Inspection after a crash and before flight

- Check that the cable insulation is not cut or worn and the cable is not kinked.
- Check that the active part is not broken, torn off or shortened.
- Check that the connector is held firmly in the receiver socket.

Replace an antenna with a damaged cable or a damaged active part. We do not recommend repairs such as shortening or soldering – they impair reception.

Antennas on a model are exposed to impacts and propeller strikes. Damage to the antenna caused by a crash, collision or propeller strike is not a product defect.

6.2 Cleaning and storage

- Clean the antenna with a dry soft cloth. Do not use solvents.
- Store it in a dry place, loosely and without sharp bends. Do not place other objects on it.

7. Troubleshooting

Problem	Possible cause and solution
Weak signal, short range or failsafe	The connector is not seated, the cable or active part is damaged, the active part is covered by carbon parts or lies next to the VTX antenna, or the antenna does not match the band of the receiver. Check the connection (Chapter 3.1), positioning (Chapter 4) and condition of the antenna (Chapter 6.1).
The connector cannot be fitted	The receiver has a different type of socket (for example IPEX1), or you are fitting the connector at an angle. Check the socket type (Chapter 2.3) and fit the connector straight.
The connector comes off by itself	The connector or the socket is worn from repeated disconnection. Replace the antenna and secure the connector (Chapter 4.4). If the socket is damaged, the receiver must be repaired or replaced.
One of two antennas has a noticeably weaker signal	This antenna is disconnected, damaged or shielded by the frame. Check its connection and position, and replace it if necessary.
The cable is torn out of the connector	The antenna was disconnected by pulling on the cable, or the cable was caught by a propeller. Replace the antenna.

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.