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› HAPPYMODEL 2-4G ELRS EP1 EP2 EP1DUAL TCXO Receiver Tiny ExpressLRS RX User Manual

HAPPYMODEL EP1 Dual TCXO

HAPPYMODEL 2-4G ELRS EP1 EP2 EP1DUAL TCXO Receiver User Manual

Model: EP1 Dual TCXO, EP1 TCXO, EP2 TCXO

Brand: HAPPYMODEL

1. INTRODUCTION

This manual provides essential information for the setup, operation, and maintenance of your HAPPYMODEL 2-4G ELRS EP1, EP2, and EP1DUAL TCXO Receivers. These receivers are designed for use in racing quadcopters and drones, offering reliable performance with their integrated Temperature Compensated Crystal Oscillators (TCXO) for enhanced frequency accuracy and stability in varying environmental conditions.

2. PRODUCT OVERVIEW

The HAPPYMODEL EP series receivers are compact and lightweight, making them ideal for small drone builds. The TCXO integration ensures consistent performance across a wide range of temperatures.

EP1 Dual TCXO Receiver

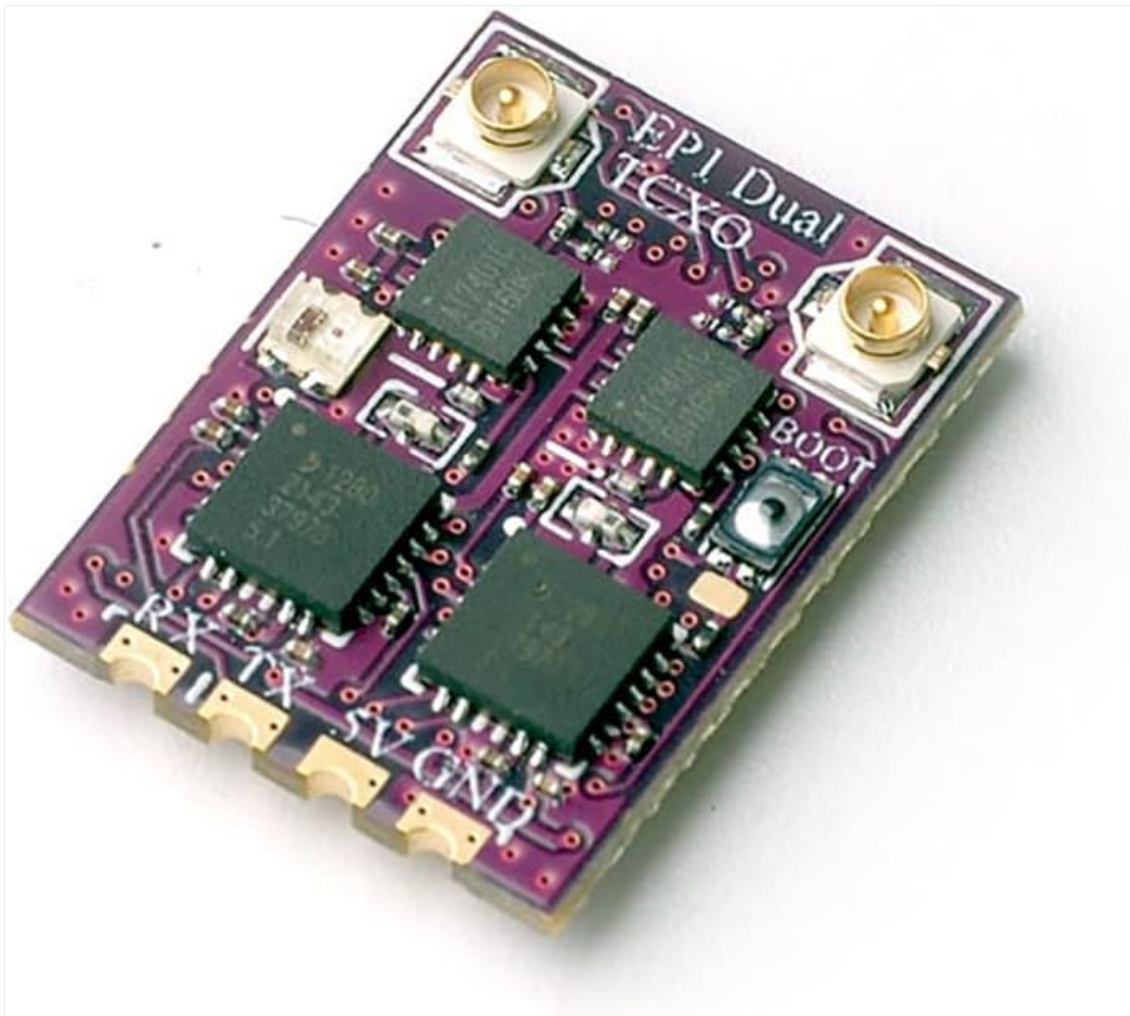


Image: The EP1 Dual TCXO Receiver board, showcasing its compact design and dual antenna connectors.

- **Type:** ISM2-4G
- **MCU:** ESP32 PICO D4, dual SX1280(SX1281)
- **Antenna Connector:** IPEX MHF 1/U.FL
- **RF Frequency:** 2400~2480MHz
- **Telemetry Power:** >19dbm
- **Receiver Protocol:** CRSF
- **Input Voltage:** +5V DC @ "+" pad
- **PCB Size:** 19mm x 14mm
- **Weight:** 1 gram (excluding antenna)
- **Default Firmware:** Unified_ESP32_2400_RX (upgradable to HappyModel EP1 Dual 2400 RX 3.0FW)
- **Feature:** Built-in TCXO (temperature compensated crystal oscillator)



Image: The EP1 Dual TCXO Receiver shown alongside its two T-style antennas, ready for connection.

EP1 TCXO Receiver



Image: A detailed close-up view of the EP1 TCXO Receiver, highlighting its compact components.

- **Type:** ISM2-4G
- **MCU:** ESP8285
- **RF Module:** SX1280(SX1281)IMLTRT
- **Antenna:** Omni directional
- **Frequency Range:** 2400 M to 2500 M
- **Receive Refresh Rate:** 25~500Hz
- **Working Voltage:** 5V
- **Weight:** 0.41 gram (without antenna)
- **Dimension:** 10mm*10mm*6mm
- **Peak Gain:** 2.23dB

- **Default Firmware:** HappyModel_EP_2400_RX V2.2 version
- **Feature:** Built-in TCXO (temperature compensated crystal oscillator)

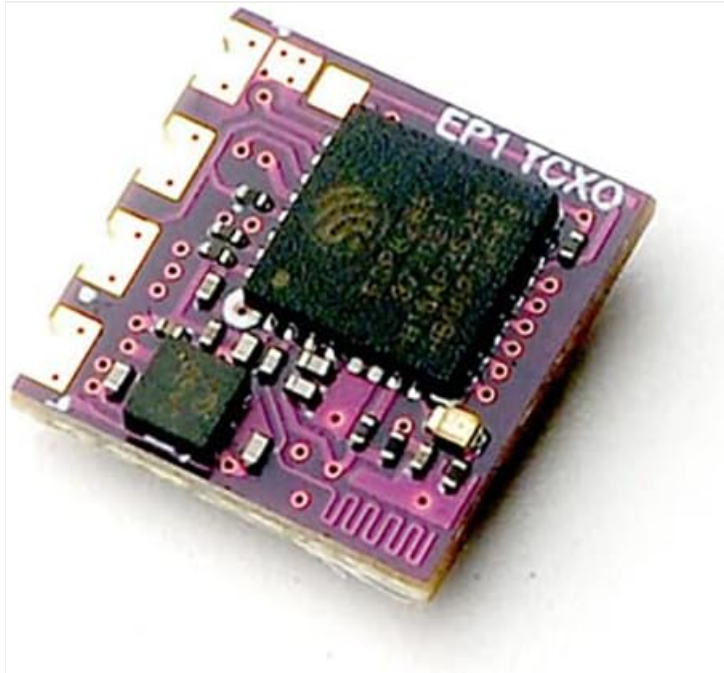


Image: The EP1 TCXO Receiver displayed with two T-style antennas, illustrating its small footprint.

EP2 TCXO Receiver

- **Type:** ISM2-4G
- **MCU:** ESP8285
- **RF Module:** SX1280(SX1281)IMLTRT
- **Antenna:** SMD Ceramic antenna
- **Frequency Range:** 2400 M to 2500 M
- **Receive Refresh Rate:** 25~500Hz
- **Working Voltage:** 5V
- **Weight:** 0.44 gram
- **Dimension:** 10mm*10mm*6mm
- **Peak Gain:** 3.7dB
- **Default Firmware:** HappyModel_EP_2400_RX V2.2 version
- **Feature:** Built-in TCXO (temperature compensated crystal oscillator)

3. SETUP

Proper installation and wiring are crucial for optimal performance. Ensure all connections are secure before powering on your drone.

Wiring Diagram

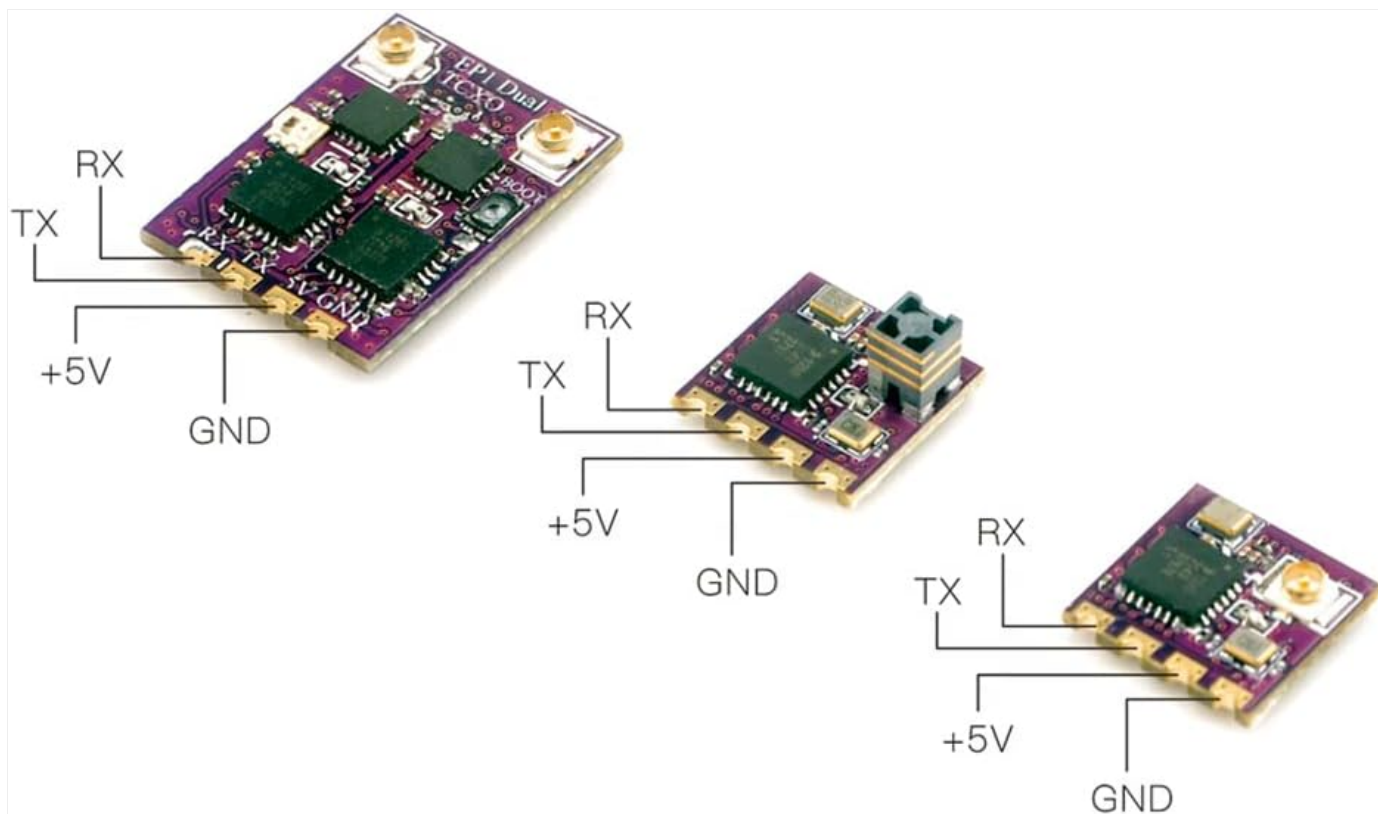


Image: A visual guide showing the RX, TX, +5V, and GND pinouts for the EP1 Dual, EP1, and EP2 TCXO receivers, essential for correct wiring.

Connect the receiver to your flight controller according to the pinout diagram above. Typically, this involves connecting:

- **RX** (Receiver) to the flight controller's **TX** (Transmit) pad for serial communication.
- **TX** (Transmit) to the flight controller's **RX** (Receiver) pad for telemetry (if supported and desired).
- **+5V** to a stable 5V power source from the flight controller or PDB.
- **GND** to a common ground point.

Binding Process (ExpressLRS)

To bind your receiver to your ExpressLRS transmitter module, follow these general steps:

1. Ensure your ExpressLRS transmitter module is powered on and configured for binding.
2. Power on your receiver. For most ExpressLRS receivers, you need to power cycle the receiver three times rapidly.
3. After the third power cycle, the receiver's LED should flash rapidly, indicating it is in binding mode.
4. Initiate the binding process from your transmitter. Refer to your specific ExpressLRS transmitter module's manual for detailed instructions on how to do this.
5. Once bound, the receiver's LED should turn solid, indicating a successful connection.

4. OPERATING

Once bound, your receiver will communicate with your transmitter. The receive refresh rate can range from 25Hz to 500Hz, depending on your ExpressLRS configuration.

Firmware

The receivers come with default firmware as specified in the product overview. For optimal performance and access to new features, it is recommended to keep your ExpressLRS firmware updated on both your transmitter and receiver. Firmware updates can typically be performed via Wi-Fi or passthrough methods using the ExpressLRS Configurator.

5. MAINTENANCE

These receivers are designed for durability, but proper care can extend their lifespan:

- Avoid exposing the receiver to excessive moisture or extreme temperatures beyond its operating range.
- Ensure proper ventilation when installed in a drone to prevent overheating.
- Regularly check antenna connections for security and damage. Replace damaged antennas immediately.
- Keep the receiver clean and free from dust or debris.

6. TROUBLESHOOTING

If you encounter issues with your receiver, consider the following common troubleshooting steps:

- **No Link/Binding Failure:**
 - Ensure your transmitter and receiver are running the exact same ExpressLRS firmware version.
 - Verify the binding phrase on your transmitter matches the one compiled into your receiver's firmware.
 - Check all wiring connections for correctness and security.
 - Confirm the receiver is receiving stable 5V power.
- **Intermittent Signal/Range Issues:**
 - Inspect antennas for damage or kinks. Ensure they are properly oriented and not obstructed by carbon fiber or other conductive materials.
 - Check for sources of electrical noise near the receiver (e.g., ESCs, motors).
 - Verify the transmit power settings on your transmitter.
- **Receiver Not Responding:**
 - Re-flash the receiver firmware.
 - Check for short circuits or physical damage to the board.

7. SPECIFICATIONS

Detailed specifications for each receiver model:

Feature	EP1 TCXO	EP2 TCXO	EP1 Dual TCXO
Type	ISM2-4G	ISM2-4G	ISM2-4G
MCU	ESP8285	ESP8285	ESP32 PICO D4
RF Module	SX1280(SX1281)IMLTRT	SX1280(SX1281)IMLTRT	Dual SX1280(SX1281)
Antenna	Omni directional	SMD Ceramic	IPEX MHF 1/U.FL Connector
Frequency Range	2400 M to 2500 M	2400 M to 2500 M	2400 M to 2480 M
Receive Refresh Rate	25~500Hz	25~500Hz	25~500Hz
Working Voltage	5V	5V	+5V DC
Weight	0.41 gram (without antenna)	0.44 gram	1 gram (exclude antenna)
Dimension	10mm*10mm*6mm	10mm*10mm*6mm	19mm x 14mm

Feature	EP1 TCXO	EP2 TCXO	EP1 Dual TCXO
Peak Gain	2.23dB	3.7dB	N/A
Telemetry Power	N/A	N/A	>19dbm
Receiver Protocol	N/A	N/A	CRSF
Default Firmware	HappyModel_EP_2400_RX V2.2	HappyModel_EP_2400_RX V2.2	Unified_ESP32_2400_RX



Image: The EP1 Dual TCXO Receiver placed on a digital scale, demonstrating its extremely low weight, crucial for lightweight drone builds.

8. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official HAPPYMODEL website or contact your retailer. Keep your proof of purchase for any warranty claims.

Manufacturer: HAPPYMODEL

Recommended Age: 16 years and up

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question