

RadioMaster MT12

RadioMaster MT12 Surface Radio Controller User Manual

Models: ExpressLRS TX + ER3C-I Receiver | 4in1 TX + R85C Receiver

1. INTRODUCTION

The RadioMaster MT12 is an advanced open-source surface radio controller designed for remote control cars, trucks, and boats. It is the first surface radio officially supported by EdgeTX, ExpressLRS, and the Multi-module project. This manual provides essential information for the setup, operation, and maintenance of your MT12 controller.

The MT12 offers extensive customizability and a versatile operating system, making it suitable for a wide range of surface models. It is available in two main versions: one with built-in ExpressLRS and an ER3C-I receiver, and another with a 4-in-1 multi-protocol module and an R85C receiver.

2. SAFETY INFORMATION

Warning:

- This product is not intended for use by children.
- Always operate your RC model in a safe environment, away from people, animals, and obstacles.
- Ensure all batteries are correctly installed and charged before operation.
- Regularly inspect your equipment for any damage or wear.
- Improper use can lead to serious injury or property damage.

3. PRODUCT OVERVIEW

The RadioMaster MT12 features a compact design with excellent ergonomics, 10 physical inputs, and a 128*64 Monochrome LCD display. It includes a standard Nano module compartment and a rotatable antenna.



Figure 3.1: Overall view of the RadioMaster MT12 controller with included accessories, including the receiver and module bay covers.



Figure 3.2: Close-up of the MT12's 128*64 Monochrome LCD display and primary control buttons (SYS, PAGE<, RTN, power, PAGE>, MDL, TELE).



Figure 3.3: Side view of the RadioMaster MT12, showcasing the steering wheel and ergonomic grip.



Figure 3.4: Close-up of the MT12's adjustable trigger mechanism, providing precise control.



Figure 3.5: Front view of the RadioMaster MT12, showing the grip and the USB-C port located at the base for charging and data transfer.



Figure 3.6: Rear view of the RadioMaster MT12, highlighting the oversized battery compartment and the Nano module bay.

4. SETUP

4.1 Battery Installation

The MT12 requires 2 x 18650 cells or a 2S 7.4V 5000mAh battery pack (batteries not included). Open the battery compartment cover located at the rear of the transmitter and insert the batteries, ensuring correct polarity. Close the cover securely.

4.2 Charging

The MT12 features built-in USB-C charging with QC3.0 fast charging support, up to 2.0A MAX. Connect a USB-C cable to the port at the base of the transmitter and to a compatible USB power source. The charging status will be indicated on the display.

4.3 Firmware

The MT12 comes with EdgeTX firmware pre-installed. Firmware upgrades can be performed via the USB-

C port or by using an SD card. Refer to the official EdgeTX documentation for detailed upgrade procedures.

4.4 Receiver Binding

The binding process connects your MT12 transmitter to its receiver. The specific steps depend on the version of your MT12 (ExpressLRS or 4-in-1) and the receiver type.

- **ExpressLRS Version (with ER3C-I Receiver):** Follow the standard ExpressLRS binding procedure. Typically, this involves powering on the receiver while holding its bind button, then initiating the bind function on the MT12 via the EdgeTX menu. The ER3C-i receiver comes with ExpressLRS 3.3.0 pre-installed.
- **4-in-1 Version (with R85C Receiver):** The 4-in-1 multi-protocol module supports various protocols (D8/D16/SFHSS). Select the appropriate protocol in the EdgeTX menu for your R85C receiver and initiate the binding process. Consult the receiver's manual for its specific binding mode.

5. OPERATION

5.1 Basic Controls

- **Steering Wheel:** Controls the steering of your model.
- **Trigger:** Controls throttle (forward/reverse).
- **SYS Button:** Accesses system settings.
- **MDL Button:** Accesses model settings.
- **PAGE < / PAGE > Buttons:** Navigate through menus and pages.
- **RTN Button:** Returns to the previous screen or cancels an action.
- **TELE Button:** Accesses telemetry data.
- **Power Button:** Turns the transmitter on/off.

5.2 Channel Configuration

The MT12 supports 16 control channels as standard. The 4-in-1 version has the ability for expansion up to 32 channels when used with an additional 4-in-1 RF module and compatible receivers.

5.3 External Modules

The MT12 features a Nano size module bay, compatible with modules such as the RadioMaster Ranger Nano Module, RadioMaster RM 4in1 module, or TBS Crossfire Nano module. This allows for expanded protocol support and functionality.

6. MAINTENANCE

- **Cleaning:** Use a soft, dry cloth to clean the transmitter. Avoid using solvents or abrasive cleaners.
- **Storage:** Store the MT12 in a cool, dry place, away from direct sunlight and extreme temperatures. Remove batteries if storing for extended periods.
- **Firmware Updates:** Regularly check for and install the latest EdgeTX firmware updates to ensure optimal performance and access to new features.

7. TROUBLESHOOTING

- **Transmitter Not Powering On:** Check battery installation and charge level. Ensure batteries are fully

charged.

- **Loss of Control/Random Shutdowns:** Verify the integrity of the SD card. A corrupted or faulty SD card can impact system stability. Ensure the SD card is properly inserted and functioning correctly. Consider backing up and reformatting the SD card or replacing it if issues persist.
- **Binding Issues:** Confirm the correct protocol is selected in the EdgeTX menu for your receiver. Ensure both transmitter and receiver are in bind mode. Check for interference.
- **No Response from Model:** Check receiver power and connection to the model's ESC/servos. Ensure the receiver is correctly bound to the transmitter.
- **Display Not Working:** Check for physical damage. If the issue persists after a power cycle, contact support.

8. SPECIFICATIONS

8.1 RadioMaster MT12 Surface Radio

Feature	Specification
Physical Dimensions	177.8 x 118.4 x 207.8 mm
Weight	480 grams
Operating Frequency	2.400GHz - 2.480GHz
Internal RF Options	4-in-1 multi-protocol / ELRS 2.4GHz
Supported Protocols	Module dependent
Operational Current	160mA (4in1) / 320mA (ELRS)
Operational Voltage	DC 6.6 - 8.4V
Operating System	EdgeTX
Control Channels	16 standard, expansion to 32 channels (4in1 only)
Display	128*64 Monochrome LCD
Battery Compatibility	2 x 18650 cells or 2S 7.4V 5000mAh battery pack (not included)
Charging	Built-in USB-C Charging, QC3.0 fast charging (2.0A MAX)
Firmware Upgrade	Via USB or SD card
Wheel and Trigger Sensor	Hall-effect
Module Bay	Nano size

8.2 R85C Receiver (Included with 4in1 version)

Feature	Specification
Power Supply	DC 4.5 - 8.4V
Frequency Range	2400-2483.5Mhz

Supported Protocol	D8/D16/SFHSS
Output Channel	5CH PWM
Antenna Type	High-sensitivity 2.4G antenna
Telemetry Power	100mW / 20dBm
Weight	5.7 grams
Dimensions	31.0 x 18.5 x 13.0 mm

8.3 ER3C-i Receiver (Included with ExpressLRS version)

Feature	Specification
Power Supply	DC 4.5 - 8.4V
Antenna Type	Built-in high-sensitivity ceramic antenna
Wireless Protocol	ExpressLRS 3.3.0 pre-installed
Output Channel	3CH PWM
Telemetry Power	10mW
Battery Voltage Detection Range	DC 4.0 - 35V
Weight	4.2 grams
Dimensions	26.1 x 18.5 x 13.0 mm
Firmware Device Category	Radiomaster 2.4Ghz
Firmware Device	RadioMaster ER3C-i

9. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official RadioMaster website or contact your authorized dealer. Keep your proof of purchase for warranty claims.