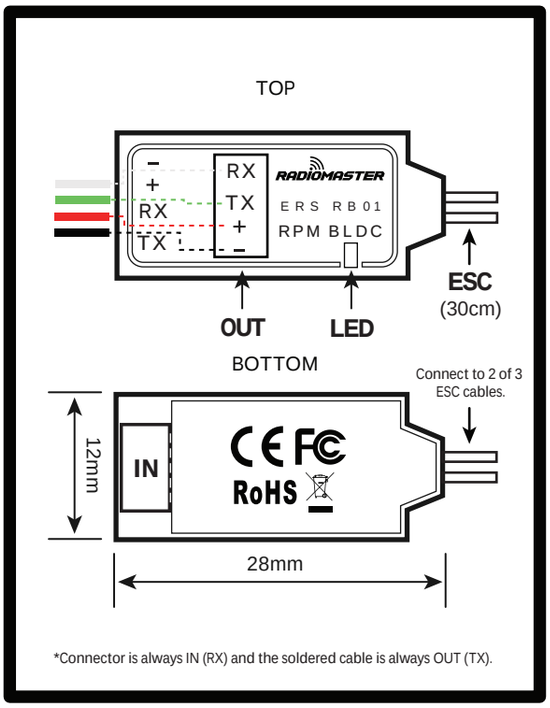
ERS-RB01 User Manual



INTRODUCTION

The ERS-RB01 Brushless Motor Tachometer measures RPM by tapping directly into any two wires of a brushless motor's ESC output. The sensor captures precise speed data, sends it to a compatible ExpressLRS receiver via the CRSF interface, and relays the information back to your radio for real-time monitoring. Ideal for airplanes, helicopters, multirotors, boats, and vehicles where accurate RPM feedback is essential.

FEATURES

- Accurate Engine RPM: Monitors gasoline engine speed in real time with precision.
- ExpressLRS Integration: Sends RPM data directly to compatible ER series receivers via the CRSF interface.
- Multi-Motor Support: Connect multiple ERS-RB01 sensors to monitor several motors simultaneously.
- Versatile Applications: Works with airplanes, helicopters, multirotors, boats, and other RC vehicles.
- Compact & Lightweight: Easy to install without adding significant weight.
- Plug-and-Play: Quick setup with minimal wiring for fast deployment.

SPECIFICATIONS

• Size:	28*12*8mm
• Weight:	4.9g
• Power Supply:	DC 5.0~8.4V
• Current:	10mA
• Measurement method:	Contact type
• Supported:	Brushless
• Range:	200~300 000 RPM
• Accuracy:	±0.1 %

INCLUDES

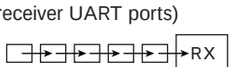
1x ERS SENSOR (ERS-RB01 Brushless RPM Sensor)

3x Heatshrink

DEVICE CONNECTION

All sensors can be connected in series to form a single serial chain. If your receiver has two or more serial ports, do not connect sensors to separate ports - this may cause data anomalies and Lua script interaction errors.

❌ **Problematic connection method:**
(Sensors connected to separate receiver UART ports)

✅ **Correct connection method:** 

(Sensors connected head-to-tail in a single chain)

Once connected, plug the chain into the receiver's UART input. Sensor data will then appear on any remote controller that supports the CRSF protocol. For example, in EdgeTX, navigate to "TELEMETRY," then click "DISCOVER NEW" to search for new sensors. If the display is abnormal, select "DELETE ALL" to clear the list and Discover New.

SCRIPTS WIDGET

The RM Sensor Configurator Lua Script, developed by RadioMaster, allows configuration and monitoring of RadioMaster telemetry sensors. It enables users to view sensor information and adjust supported settings. The RM Sensor Configurator Lua Script file can be downloaded from the official RadioMaster website.
ERS-RB01 Sensor Configuration:
On radios with a full-color display, it appears as "RM Sensor Configurator"; on monochrome displays, it appears as "RM Sensor Config."
Available options:
LED ON/OFF – Enable or disable the sensor status LED
SENSOR POWER ON/OFF – Power the sensor on or off
REBOOT – Restart the sensor remotely
SETRPM_ID – Automatically assign an ID when multiple RB01 sensors are connected
MOTOR POLES – Set the motor pole count for accurate RPM calculation
SET RATE OFFSET – Apply an offset if the measured RPM is not accurate
RESET CONFIG – Restore factory settings
Installation:
- CONNECT the radio to the PC and SELECT USB Storage / U-Disk mode.
- LOCATE the SENSOR_LUA directory.
- COPY all .lua files from this directory to: "SCRIPTS" —> "TOOLS"
- Safely DISCONNECT the radio.

Usage:
- On the radio, OPEN the Tools page (PRESS "SYS" BUTTON to enter the "TOOLS" tab).
- Select RMSensor.
- The interface will automatically detect connected RadioMaster sensors.
- The screen displays sensor information, including:
  - Device type
  - Device name
  - Sensor ID
  - Status and parameters

⚠️ Select a sensor to access its configuration menu.
Available options vary depending on the sensor type. For example:
- RPM (BLD) Sensor – allows Moto_pole adjustment to ensure correct RPM calculation.
- All supported sensors allow remote ReBoot via RM Sensor Configurator for quick resets (e.g., resetting barometer altitude).
- The current sensor needs the capacity to be set in the RM Sensor Configurator.

SET_CAPACITY: Set battery capacity (default: 7000 mAh). Press Enter, scroll the encoder to modify, then Enter to save. This enables real-time telemetry of the remaining percentage.

FIRMWARE UPDATE

⚠️ IMPORTANT POWER WARNING
Always power the sensor only from the RadioMaster UART Tool using the 5V output. DO NOT use a BEC or any external power source - voltage differences can cause immediate damage to the sensor. All sensor updates must be performed via USB-serial using the RadioMaster UART Tool. Connect the sensor through the IN port on the UART Tool before starting the update.

- CONNECT the sensor to an ExpressLRS receiver bound to your radio.
- POWER the sensor and receiver via the UART Tool.
- OPEN RMSensor.lua on the radio and select Firmware Update. This places the ERS sensor into bootloader mode (double-flash LED).

Open the web app and follow:
- SELECT "FIRMWARE UPDATE", connect to the serial device on your PC or Mac, choose the sensor from the dropdown, and click "START."
- SELECT the firmware file and begin the update.

The sensor will auto-restart when the update is complete, and the double-flash will stop.

Required Software Versions:
- EdgeTX 2.11.0 or later
- ExpressLRS 3.6.2 or later