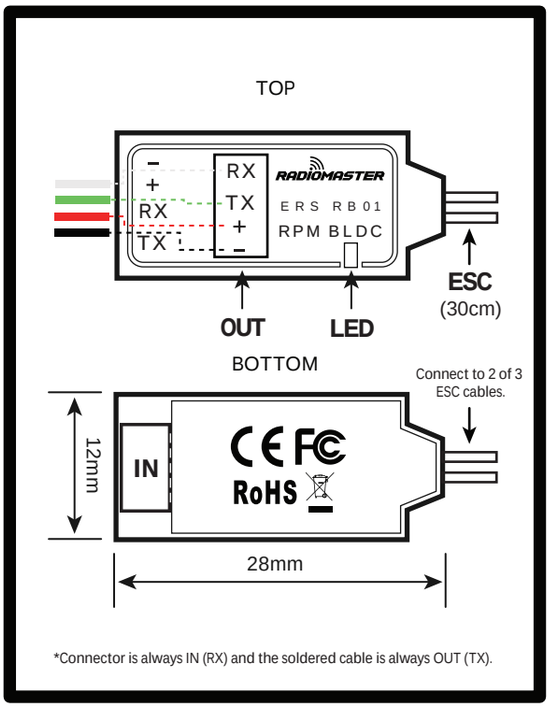
ERS-RB01 User Manual



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

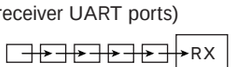
1x ERS SENSOR (ERS-RB01 Brushless RPM Sensor)

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.

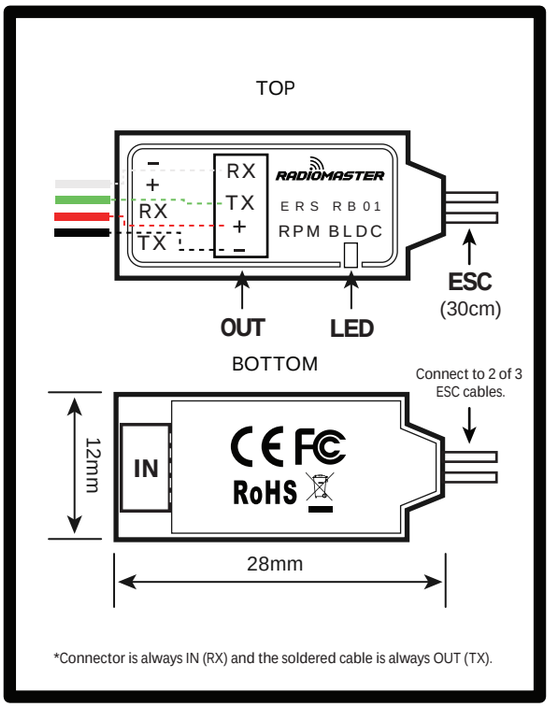
- CONNECT the sensor to an ExpressLRS receiver bound to your radio.
- POWER the sensor and receiver via the UART Tool.
- OPEN RMSensor.lua on the radio and select Firmware Update. This places the ERS sensor into bootloader mode (double-flash LED).

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

ERS-RB01 用户手册



简介

ERS-RB01 无刷电机转速计通过直接接入无刷电机的任意两相线来测量转速。传感器捕捉精确的速度数据，通过CRSF接口发送到兼容的ExpressLRS接收机，然后将信息转发到您的遥控器进行实时监控。它非常适用于飞机、直升机、多旋翼飞行器、船只和其他遥控载具，在这些应用中，精确的转速反馈至关重要。

功能特性

- 精确的引擎转速：以高精度实时监控汽油引擎转速。
- ExpressLRS集成：通过CRSF接口将转速数据直接发送到兼容的ER系列接收机。
- 多电机支持：可同时连接多个ERS-RB01 传感器以监控多个电机。
- 应用广泛：适用于飞机、直升机、多旋翼飞行器、船只和其他遥控载具。
- 紧凑轻巧：易于安装，不会增加不必要的重量。
- 即插即用：设置简单，接线最少，可快速部署。

规格参数

• 尺寸:	28*12*8毫米
• 重量:	4.9克
• 供电:	直流 5.0~8.4V
• 电流:	10mA
• 测量方法:	接触式
• 支持:	无刷
• 范围:	200~300 000 RPM
• 精度:	±0.1 %

包装明细

1x ERS传感器（ERS-RB01 无刷转速传感器）

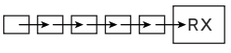
3x 热缩管

设备连接

所有传感器都可以串联连接，形成一个单一的串行链。如果您的接收机有两个或更多的串行
端口，请勿将传感器连接到不同的端口——这可能会导致数据异常和Lua脚本交互错误。

❌ 错误的连接方法：（传感器连接到不同的接收机UART端口）

✅ 正确的连接方法：（传感器头尾相连，形成单一链条）



连接后，将链条插入接收机的UART输入端口。传感器数据将出现在任何支持CRSF协议的遥控器上。例如，在EdgeTX中，导航至“遥测（TELEMETRY）”页面，然后点击“发现新传感器(DISCOVER NEW SENSORS)”。如果显示异常，选择“删除所有（DELETE ALL）”以清除列表，然后重新发现。

脚本工具（SCRIPTS WIDGET）

由RadioMaster开发的RMSensor Lua工具，允许对RadioMaster遥测传感器进行配置和监控。它使用户能够查看传感器信息并调整支持的设置。RMSensor Lua文件可以从官方RadioMaster网站下载。

ERS-RB01 传感器配置：

在全彩显示的遥控器上，它显示为 “RM Sensor Configurator”；
在单色显示的遥控器上，它显示为 “RM Sensor Config.”

可用选项：

- LED ON/OFF – 启用或禁用传感器状态LED。
- SENSOR POWER ON/OFF – 打开或关闭传感器电源。
- SETRPM_ID – 当连接多个RB01 传感器时自动分配ID。
- MOTOR_POLES – 设置电机极数以进行精确的RPM计算。
- SET_RATE_OFFSET – 当测量的RPM不准确时应用偏移量。
- RESET_CONFIG – 恢复出厂设置。

安装：

1. 将遥控器连接到PC并选择 USB存储 / U盘模式。
2. 找到SENSOR_LUA目录。
3. 将此目录中的所有 .lua 文件复制到： SCRIPTS -> TOOLS
4. 安全断开遥控器连接。

使用方法：

1. 在遥控器上，打开“工具”页面（按“SYS”按钮进入“TOOLS”选项卡）。
2. 选择RMSensor。
3. 界面将自动检测连接的RadioMaster传感器。
4. 屏幕显示传感器信息，包括：
   - 设备类型
   - 设备名称
   - 传感器ID
   - 状态和参数
5. 选择一个传感器以访问其配置菜单。
6. 可用选项因传感器类型而异。例如：

RPM (BLD) Sensor – 允许调整电机极数以确保正确的RPM计算。

7. 所有支持的传感器都允许通过Lua进行远程重启，以实现快速重置（例如，重置气压计海拔）。
8. 当前传感器需要在RMSensor Lua中设置容量。
9. SET_CAPACITY：设置电池容量（默认为7000 mAh）。按Enter，滚动编码器进行修改，然后按Enter保存。这将启用剩余电量百分比的实时遥测。

固件更新

⚠️ 重要电源警告

始终仅使用RadioMaster UART工具通过5V输出为传感器供电。请勿使用BEC或任何外部电源 - 电压差异可能导致永久性损坏。所有传感器更新必须通过USB-串口设备使用RadioMaster UART工具进行。在开始更新之前，通过UART工具上的IN端口连接传感器。

1. 将传感器连接到已绑定的ExpressLRS接收机。
2. 使用UART工具为传感器和接收机供电。
3. 在遥控器上打开RMSensor Lua并选择固件更新。这将使ERS传感器进入引导加载程序
模式（LED将双闪）。
4. 打开网页应用并按照以下步骤操作：
选择“FIRMWARE UPDATE”，将串口设备连接到您的PC或Mac，从下拉菜单中
选择传感器，然后点击“START”。
选择固件文件并开始更新。
5. 更新完成后，传感器将自动重启，双闪将停止。

所需软件版本：

EdgeTX 2 .1 1 .0 或更高版本。

ExpressLRS 3 .6 .2 或更高版本。