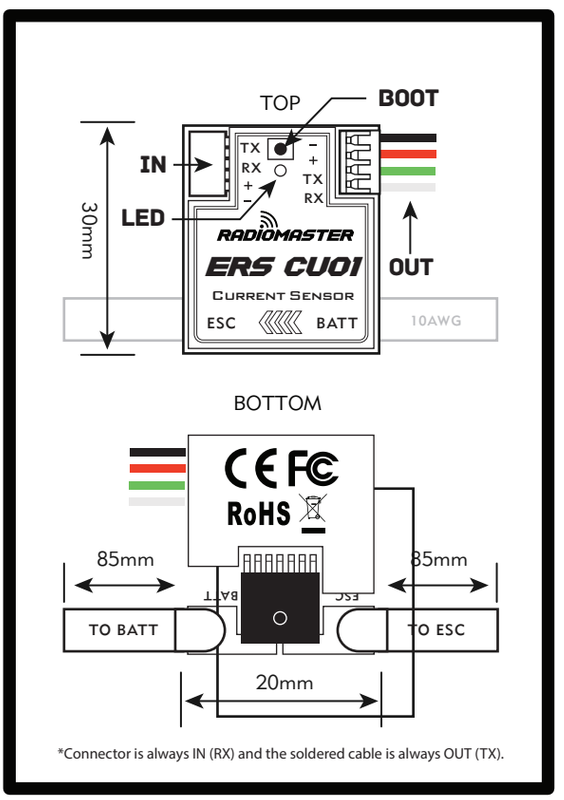
ERS-CU01 User Manual



*Connector is always IN (RX) and the soldered cable is always OUT (TX).

INTRODUCTION

The **ERS-CU01** Current Sensor is a compact telemetry module for use with compatible ExpressLRS PWM receivers. Installed inline between the battery and ESC, it measures real-time operating current and sends the data through the ELRS receiver for display on your radio. This provides instant insight into system load, efficiency, and power consumption across your entire powertrain.
As part of the ERS sensor family, the ERS-CU01 also supports pass-through expansion, allowing easy daisy-chaining with additional telemetry modules.

FEATURES

- Real-Time Current & Voltage Monitoring: View live current draw and voltage directly on your radio to better understand system performance.
- Inline Installation: Soldered between the battery and ESC for accurate, full-system current measurement.
- Future-Ready Pass-Through: Includes in-and-out ports for daisy-chaining additional ERS sensors as your telemetry needs grow.
- Seamless ExpressLRS Integration: Designed to work smoothly with compatible ER series ExpressLRS PWM receivers.

SPECIFICATIONS

• Size:	30*25*10.5mm
• Weight:	21.8g
• Power Supply:	DC 5.0~8.4V
• Operating current:	22 mA
• Current range:	1~150 A
• Max voltage:	70 V
• Current accuracy:	±0.5 A
• Voltage accuracy:	±0.1 V
• Continuous current:	100 A

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, allowsconfiguration 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-CU01 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
SET CAPACITY – Set the battery capacity (default 7000 mAh) to enable remaining capacity percentage telemetry
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 exam-ple:
- 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-timetelemetry 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.
- **HOLD** the BOOT button while powering on the sensor via the UART Tool to enter 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

INCLUDES

1x ERS SENSOR (ERS-CU01 Current Sensor)
3x Heatshrink