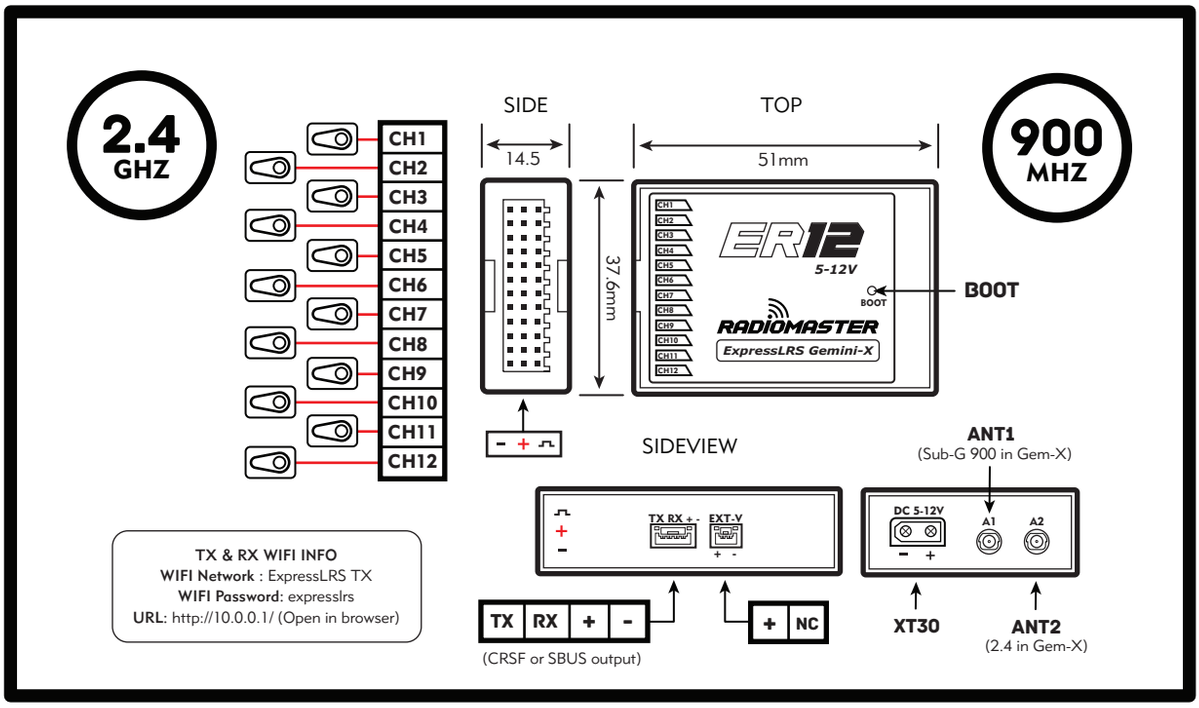
ER12 Receiver User Manual



The Radiomaster ER12 is designed for larger fixed-wing aircraft that require a higher channel count and robust power handling without unnecessary complexity. Its full-size layout and straight-forward integration make it well suited to multi-servo, higher-current installations.

Built on the ExpressLRS platform and equipped with dual Semtech LR1121 transceivers, the ER12 utilizes a dual-band Gemini X RF architecture operating on both 2.4 GHz and Sub-G 900 MHz. The result is a stable, consistent control link across a wide range of operating environments, with an architecture that prioritizes dependable operation.

The ER12 uses amplified PWM outputs to help maintain reliable servo signals over long leads and extension cables commonly used in larger aircraft. The amplified outputs also help ensure clean and consistent signals when operating larger, high-torque servos that place greater demands on the control system. Serial connectivity is available via a dedicated 4-pin JST-GH locking UART/CRSF port for telemetry devices and other serial peripherals.

From installation to operation, the ER12 focuses on practicality, with a clean PCB layout to reduce interference, MMCX antenna connectors for easy serviceability, and a durable injection-molded housing built for long-term use.

SET-UP

1 The recommended ELRS LUA settings on the remote-control end are:

IMPORTANT

Standard servos:	Performance servos:
Packet Rate: 100Hz Full	Packet Rate: 333Hz Full
Telem Ratio: Std (1:32) (default)	Telem Ratio: Std (1:128)
Switch Mode: 16ch / Full	Switch Mode: 16ch / Full

CRSF / SBUS OUTPUT

The ER12 supports CRSF or SBUS output

To switch protocols:

1. **BIND** the receiver to the transmitter.
2. **OPEN** the ExpressLRS WebUI using a browser.
3. On the **MODEL** page, select the desired serial protocol.
   Alternatively, the protocol can be changed using the ExpressLRS LUA script on the transmitter.

IMPORTANT

XT30 POWER INPUT

XT30 provides direct battery voltage to the receiver and PWM rail. Output matches input voltage.

USE only servos rated for the applied voltage. High-voltage systems (2S LiPo/Li-ion) require HV servos. Standard 5V servos must be powered via a regulated 5V supply or through the standard servo power input pins. When using the XT30 input to power the receiver and servos, the ESC's 5V/BEC wire must be **DISCONNECTED** to avoid back-feeding and possible damage.

SPECIFICATIONS

- Item: ER12 PWM - Dual-Band GEMINI and GEMINI-X Receiver
- Size: 51*37.6*14.5 mm
- Weight: 22.5g (without antenna)
- Power Supply: DC 5.0 – 12.0V (power to the receiver)
- Wireless Protocol: ExpressLRS
- Output Channels: 12-channel PWM
- Serial Output: CRSF / SBUS
- Telemetry Power: Up to 100mW (LUA adjustable)
- Voltage Detection: DC 4.0 – 70V (monitor main flight battery)
- Bus Interface: CRSF
- Antenna Connector: MMCX
- Antenna Type: 2x 2.4GHz & 2x Dual-Band (25cm)
- Version: ExpressLRS 4.1.0 or Higher

FIRMWARE

Device Category: RadioMaster Dual 2.4GHz/900MHz Receiver
Device: ER12 Dual Band True Diversity + 12xPWM RX

PASSPHRASE BINDING

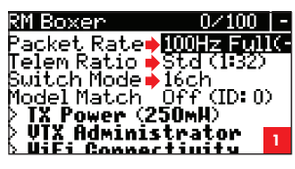
(***Note**: Bind phrases are not secret and can be read.)

1. **OPEN** the ExpressLRS LUA and navigate to the Wifi Connectivity page. Select the **Enable WIFI** option and connect to your radios wifi with a mobile phone, tablet or PC (See TX WIFI info above). **OPEN** the ExpressLRS web page at (http://10.0.0.1/) and choose a unique bind phrase. **Save and Reboot.**
2 Power **ON** the receiver and wait 60 seconds for the LED to blink rapidly to indicate WIFI mode. Connect your phone, tablet or PC to the receivers WIFI (See RX WIFI info above). **OPEN** the ExpressLRS web page at (http://10.0.0.1/) and enter the matching bind phrase previously entered on your radio. **Save and Reboot**. Once both radio and receiver have the same bind phrase set they will automatically bind.

TRADITIONAL BINDING

1. The first time you power on your receiver, the LED is doing a quick **double blink**, which indicates the receiver is in bind mode. If this is not the case, hold down the boot button for 10 seconds to reset the receiver.
2 Power **ON** your transmitter/radio and use the **[BIND]** button on the ExpressLRS Lua script, which sends out a binding pulse.
3. If the receiver has a **solid light**, it's bound!

*Note: To bind receiver a second time or to another radio, power cycle the receiver 3 times. On the third power cycle, the LED will double blink indicating bind mode. If you cannot successfully enter bind mode with the 3 power cycle method, you can hold down the boot button for 10 seconds to reset the receiver to bind mode or use the passphrase method. WARNING: All previous settings in the receiver will be erased and need to be re-entered when using the reset button.

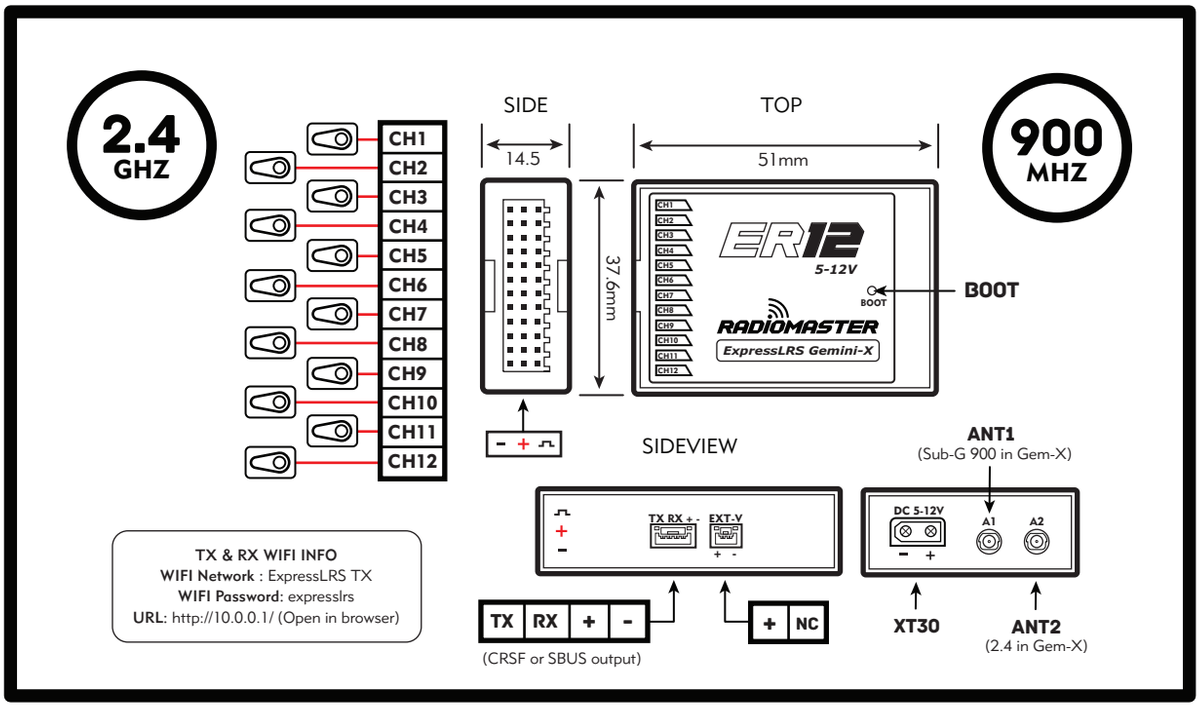




EXT-V POWER INPUT

The **EXT-V** input on the **ER12** is accessed through the 2-pin JST-GH connector. Solder the red wire to the positive (+) terminal of the battery or ESC. The ER12 features multiple independent ADC channels and can monitor voltage from V-EXT, and V-XT30, allowing it to accurately detect and report the appropriate input voltage for your installation.

ER12 接收机用户手册



RadioMaster ER12 面向需要更多通道数和更强供电能力、但又不希望过于复杂的大型固定翼飞机设计。其全尺寸的布局和简洁的集成方式，非常适合多舵机、大电流的安装场景。

基于 ExpressLRS 平台，搭载两颗 Semtech LR1121 收发器，ER12 采用双频段 Gemini X 射频架构，同时工作于 2.4 GHz 和 Sub-G 900 MHz。

结果是在广泛的工作环境下都能提供稳定、一致的控制链路，架构上以可靠运行为优先。

ER12 使用放大的 PWM 输出，有助于在大型飞机常见的长线缆和延长线上保持可靠的舵机信号。放大输出也有助于在使用大型、高扭矩舵机时保证信号的干净一致——这些舵机对控制系统有更高的要求。串行通信通过专用的 4-pin JST-GH 锁定式 UART/CRSF 接口提供，可用于遥测设备和其他串行外设。

从安装到使用，ER12 始终聚焦于实用性：清晰的 PCB 布局可降低干扰，MMCX 天线连接器便于维护，耐用的一体注塑外壳可长期使用。

注意事项

1 1. 推荐的遥控器端 ELRS LUA 设置如下：

IMPORTANT

标准舵机：	高性能舵机：
Packet Rate: 100Hz Full	Packet Rate: 333Hz Full
Telem Ratio: Std (1:32) (default)	Telem Ratio: Std (1:128)
Switch Mode: 16ch / Full	Switch Mode: 16ch / Full

CRSF / SBUS 输出

ER12支持 CRSF 或 SBUS输出

切换协议的方法：

1. 将接收机与发射机 BIND（绑定）。
2. 使用浏览器打开 ExpressLRS WebUI。
3. 在 MODEL 页面选择需要的串行协议。

也可以通过发射机上的 ExpressLRS LUA 脚本切换协议。

IMPORTANT

XT30 电源输入

XT30 直接将电池电压供给接收机和 PWM 母线。输出与输入电压相同。

只能使用与所加电压匹配的舵机。高压系统（2S LiPo/Li-ion）需要使用高压舵机。标准 5V 舵机必须通过稳压的 5V 电源，或通过标准舵机电源输入引脚供电。当使用 XT30 输入为接收机和舵机供电时，必须 断开 ESC 的 5V/BEC 线，以避免反向馈电和可能的损坏。

规格参数

- 产品名称: ER12 PWM - Dual-Band GEMINI and GEMINI-X Receiver
- 尺寸: 51*37.6*14.5 mm
- 重量: 22.5g (不含天线)
- 输入电压: DC 5.0 – 12.0V (接收机供电电压)
- 无线协议: ExpressLRS
- 输出通道: 12-channel PWM
- 串口输出: CRSF / SBUS
- 功率: Up to 100mW (LUA 可调)
- 电压检测范围: DC 4.0 – 70V (监测主电池)
- 总线类型: CRSF
- 天线接口: MMCX
- 天线类型: 2x 2.4GHz & 2x Dual-Band (25cm)
- 固件版本: ExpressLRS 4.1.0 or Higher

固件下载

Device Category: RadioMaster Dual 2.4GHz/900MHz Receiver
Device: ER12 Dual Band True Diversity + 12xPWM RX

密码绑定

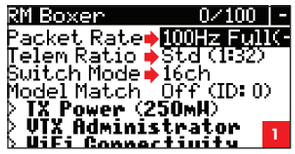
(*注：**Bind phrase** 并不保密，可以被读取。)

1. 打开 ExpressLRS LUA 脚本，进入 Wifi Connectivity 页面。选择 Enable WIFI，用手机、平板或电脑连接你遥控器的 WIFI（参见上方的 TX WIFI 信息）。在浏览器中打开 ExpressLRS 网页（http://10.0.0.1/），设置一个唯一的 bind phrase，Save and Reboot。
2 2. 打开接收机电源，等待 60 秒，LED 快速闪烁表示已进入 WIFI 模式。将手机、平板或电脑连接至接收机的 WIFI（参见上方的 RX WIFI 信息）。在浏览器中打开 ExpressLRS 网页（http://10.0.0.1/），输入与遥控器一致的 bind phrase，Save and Reboot。当遥控器和接收机设置的 bind phrase 一致时，将自动完成绑定。

传统绑定

1. 首次给接收机上电时，LED 会快速 双闪，表示接收机处于绑定模式。如果不是此状态，请长按 boot 按键 10 秒以复位接收机。
2 2. 打开你的遥控器/发射机电源，使用 ExpressLRS Lua 脚本中的［BIND］按钮，发送绑定脉冲。
3. 如果接收机 LED 变为常亮，即表示绑定成功！

*注：要对接收机进行二次绑定，或绑定到另一台遥控器，请对接收机进行 3 次断电上电循环。第三次上电时，LED 双闪表示进入绑定模式。如果 3 次断电上电的方式无法成功进入绑定模式，也可以长按 boot 按键 10 秒将接收机复位到绑定模式，或使用 passphrase 方式。警告：使用复位按键时，接收机内所有先前的设置都会被擦除，需要重新设置。





EXT-V 电源输入

ER12 上的 EXT-V 输入通过 2-pin JST-GH 连接器接入。将红线焊到电池或 ESC 的正极（+）端。ER12 具有多路相互独立的 ADC 通道，可以监测 V-EXT 和 V-XT30 上的电压，从而在你的安装中准确地检测并上报合适的输入电压。