



ELRS 915MHz

Instruction Manual



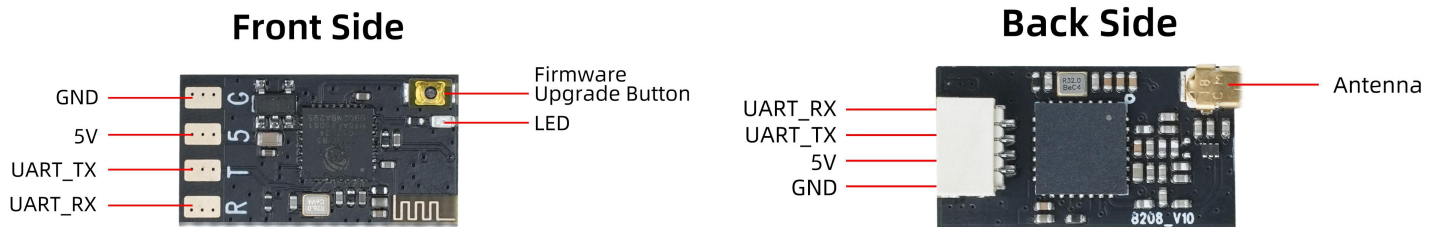
ELRS 915MHz Receiver

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1. Introduction

ELRS 915MHz is a receiver developed based on the open-source project ExpressLRS. It is compatible with ExpressLRS 915MHz modules and transmitters. It employs LoRa modulation technology, and features high receiving sensitivity, strong anti-interference capabilities, and long control range. It operates in the globally free 915MHz frequency band.



2. Specifications

Dimension:	20*11mm(0.79"*0.43")
Weight:	0.9g (0.03oz)
Channel:	16 Channel
Antenna Length:	Approximately 145 mm across the horizontal element, with a 110 mm feed cable
Output Frequency:	915MHz FCC/ 868MHz EU
Protocol:	CRSF
Spread Spectrum:	LoRa(CSS)
Transmission Power:	100mW(20dBm)
Receiver Sensitivity:	-123.5 dBm
Input Voltage:	4-9V DC
Operating Current:	<45mA
Refresh Rate:	500Hz/25Hz
Data Interface:	ELRS Interface
Antenna Connector:	IPEX Socket
Antenna Type:	Dipole T-shaped Antenna
Antenna Impedance:	50Ω
Hardware Interface:	4-pin 1.0 socket / 4-pin 2.54 pad
Control Distance:	Up to 5000 meters (tested in open, interference-free conditions. Actual control distance may vary depending on the flight environment)

Telemetry:	When connected to a flight controller and GPS, it supports the telemetry of voltage, current, latitude, longitude, satellite count, etc.
Model Battery Voltage	Depends on the flight controller configuration
Telemetry Range:	
Response Latency:	Depends on transmitter frequency settings
Operating Temperature:	-20 ~ + 75°C
Default Firmware:	BETA FPV 900 RX
Compatible Transmitter:	All transmitters compatible with 915MHz FCC/ 868MHz EU ExpressLRS high-frequency modules

3. LED Indication

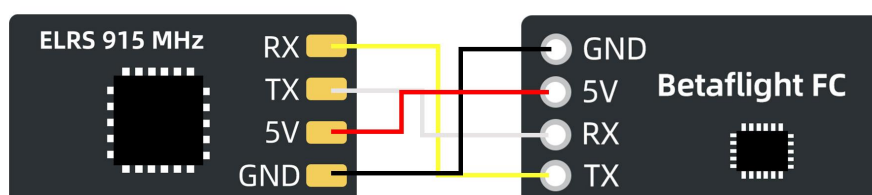
- Solid on: Binding successfully/Transmission signal received
- Flash double quickly: Binding status
- Flash slowly: No transmission signal received
- Flash fast: WiFi upgrade status

4. Binding

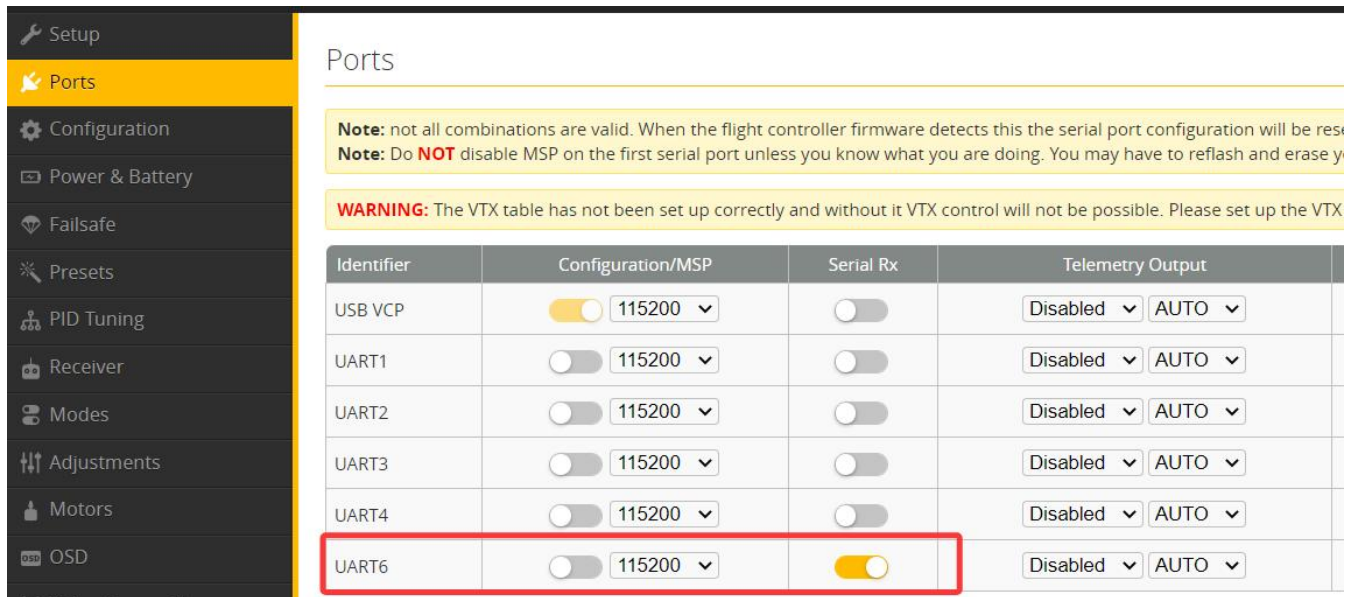
- (1) Power on ELRS 915MHz receiver three times consecutively, with a power-up interval of less than 1.5 seconds.
- (2) The indicator light of the receiver will flash twice, indicating it has entered the binding status.
- (3) Press the BIND button on the ExpressLRS remote control (transmitter or module).
- (4) The indicator light of the receiver will turn solid, indicating successful binding.
- (5) After successful binding, the program will record the paired remote control device. The next power-on will restore the last binding record. No need to bind them every time the receiver is powered on.

5. Configure Betaflight Flight Controller

- (1) Connect ELRS 915MHz to any serial port of the Betaflight flight controller. (Take UART6 as an example to show the settings):



- (2) Connect the flight controller to the computer. Open Betaflight Configurator and connect. Click Ports menu and enable Serial RX of UART6.



The screenshot shows the Betaflight Configurator interface with the 'Ports' tab selected. The left sidebar contains various configuration options. The main area displays a table of serial ports. UART6 is highlighted with a red box, showing its configuration.

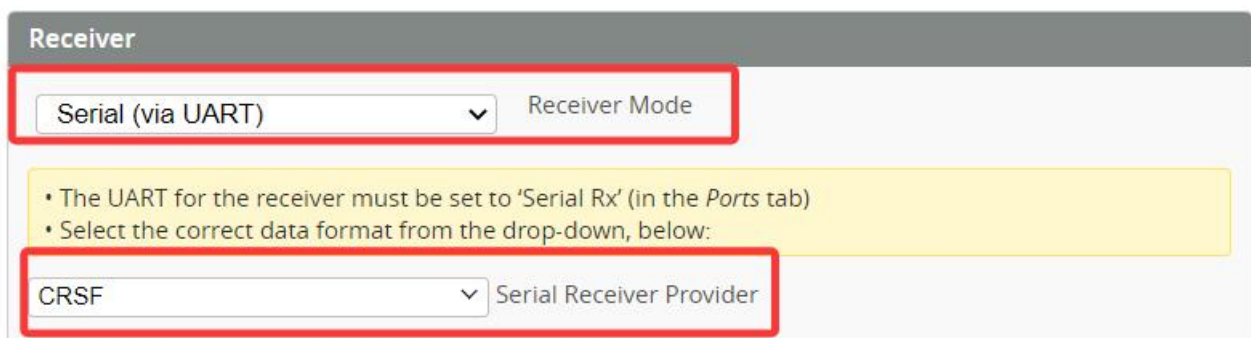
Ports

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.
Note: Do **NOT** disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your firmware.

WARNING: The VTX table has not been set up correctly and without it VTX control will not be possible. Please set up the VTX table.

Identifier	Configuration/MSP	Serial Rx	Telemetry Output
USB VCP	☒ 115200	☐	Disabled v AUTO v
UART1	☐ 115200	☐	Disabled v AUTO v
UART2	☐ 115200	☐	Disabled v AUTO v
UART3	☐ 115200	☐	Disabled v AUTO v
UART4	☐ 115200	☐	Disabled v AUTO v
UART6	☐ 115200	☒	Disabled v AUTO v

- (3) Click Receiver menu. Select Serial (via UART) for receiver mode, and set CRSF for serial receiver provider.



The screenshot shows the Betaflight Configurator 'Receiver' tab. The 'Serial (via UART)' option is selected for the Receiver Mode, and 'CRSF' is selected for the Serial Receiver Provider. Both are highlighted with red boxes.

Receiver

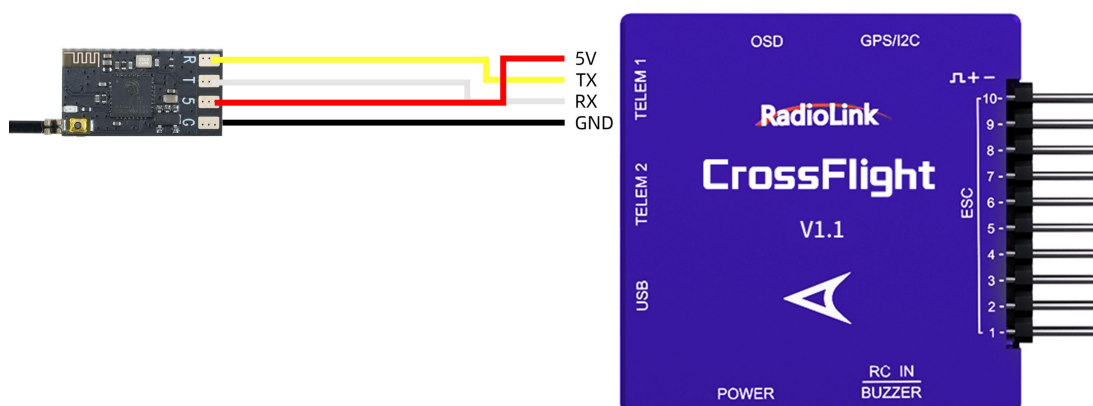
Serial (via UART) Receiver Mode

• The UART for the receiver must be set to 'Serial Rx' (in the Ports tab)
 • Select the correct data format from the drop-down, below:

CRSF Serial Receiver Provider

6. Configure APM Flight Controller

- (1) Connect ELRS 915MHz to the TELEM1 port of the APM flight controller. The following example uses the TELEM1 port of the Radiolink CrossFlight flight controller:



(2) Connect CrossFlight flight controller to the computer and set the following 3 parameters in Mission Planner:

Set SERIAL1_BAUD to 115

Set SERIAL1_OPTIONS to 0

Set SERIAL1_PROTOCOL to 23

7. Upgrade Firmware

This example uses the method of downloading the officially released firmware and then using ELRS to compile the firmware.

(1) Download the official ELRS firmware. You can use the latest version or choose an older one. It is best to keep the version of the transmitter and the receiver the same. Inconsistencies may cause malfunctions. Here is the link to download the firmware:

<https://github.com/ExpressLRS/ExpressLRS/releases>

The screenshot shows the GitHub release page for ExpressLRS V3.5.2. On the left, a 'Release list' sidebar shows versions from V3.6.2 down to V3.5.0-RC2, with V3.5.2 selected. The main content area for V3.5.2 includes the release date (Nov 8, 2024), commit hash (7ac5f4d), and a 'Compare' button. Below this, 'Changes since 3.5.1:' lists bugfixes and other fixes with links to their respective issues. A 'Compatibility' section states it's a bugfix/patch release compatible with earlier 3.x versions. A 'Who should update from V3.5.x?' section lists 'Airport users updating from 3.4'.

(2) Download ExpressLRS Configurator tool. Download the appropriate tool based on your computer system. Here is the download link:

<https://github.com/ExpressLRS/ExpressLRS-Configurator/releases>

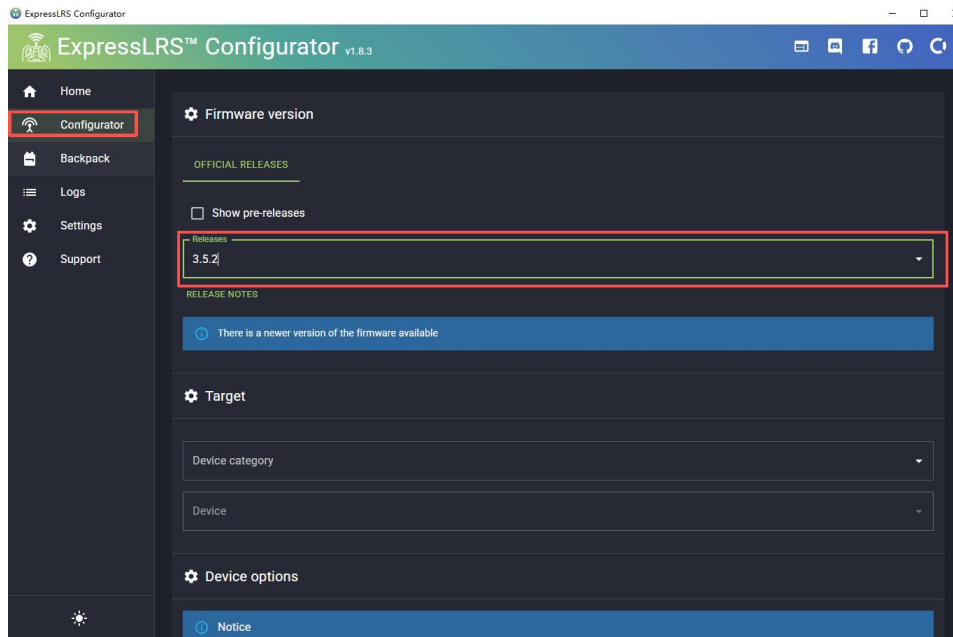
The screenshot shows the GitHub release page for ExpressLRS Configurator 1.8.3. The 'Release list' sidebar on the left shows multiple entries for 'ExpressLRS Configurator...'. The main content area for version 1.8.3 (marked as 'Latest') includes the release date (2 weeks ago), commit hash (421d656), and a 'Compare' button. A 'Changelog' section lists updates like adding native macOS arm64 build and updating Python. A 'Which file do I need?' section provides installation instructions and file names for Windows, Mac OS X, and Linux.

(3) Install ExpressLRS Configurator.

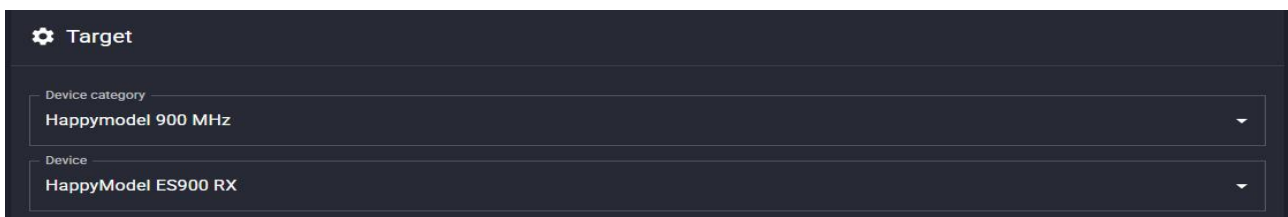
(4) Prepare a USB to UART TTL adapter cable (as shown on the right). Please note that the adapter cable needs to be cross-connected to the T and R pin of the receiver.



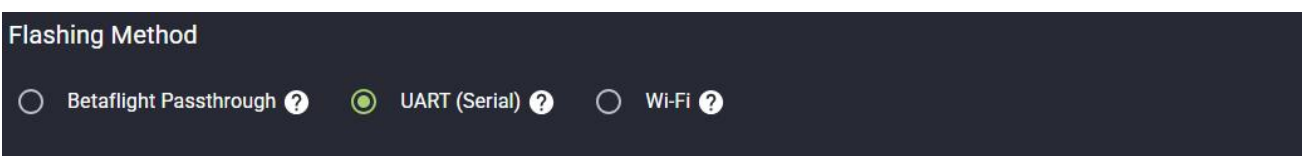
(5) Open ExpressLRS Configurator. Select Configurator -- Releases, and choose the desired version. ExpressLRS-3.5.2 is used as an example.



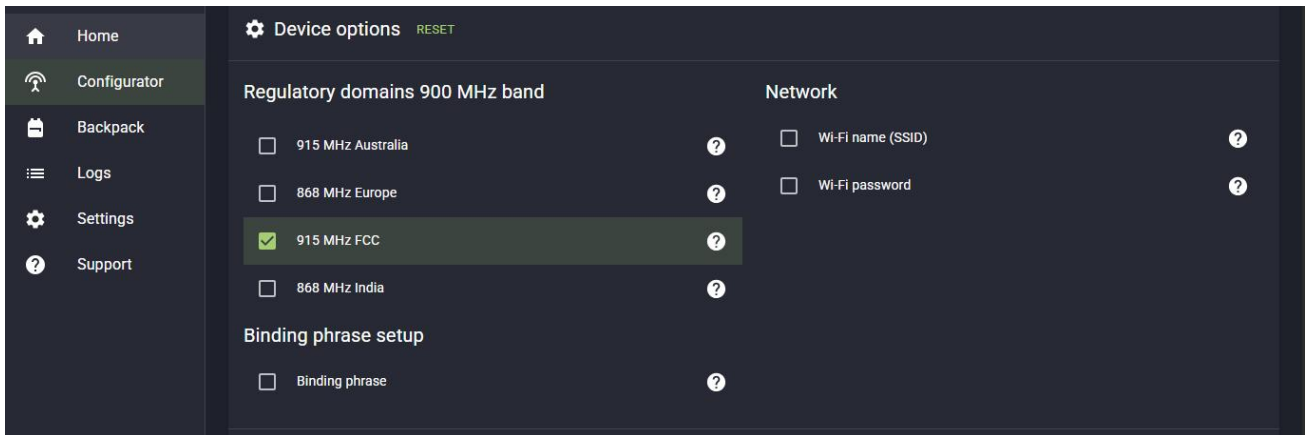
(6) Select the hardware information. Select "Happymodel 900MHz" from the "Device category" dropdown menu; and select "Happymodel ES900 RX" from the "Device" dropdown menu.



(7) Select serial port (UART) for flashing method. You can also try other download methods on your own.

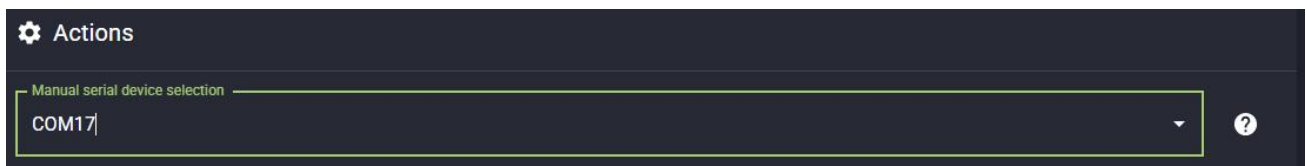


(8) Set the device options. Select the appropriate region for use, and you can customize the binding phrase here. For this demonstration, 915MHz FCC is selected.



(9) Press and hold the firmware upgrade button on the receiver while powering it on. A solid light on the receiver indicates that it has entered firmware upgrade mode. If it is in another mode, please try again until the light stays on.

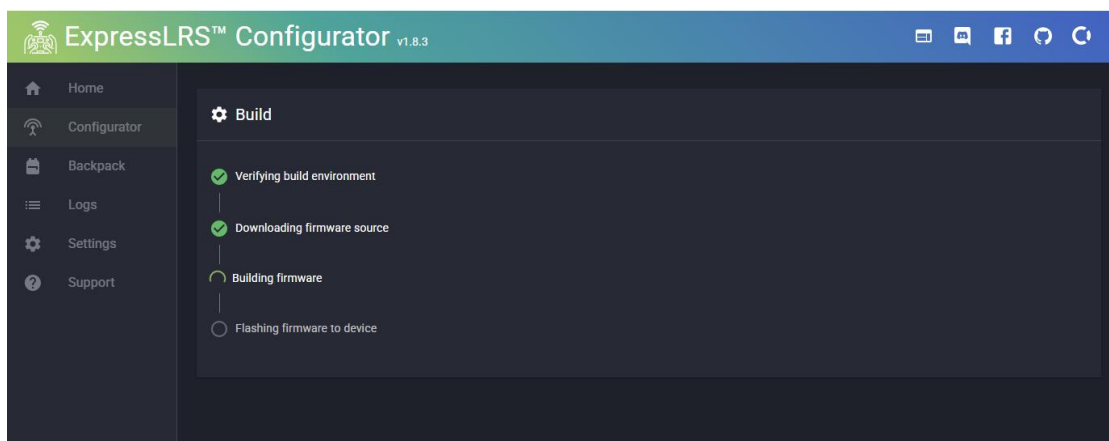
(10) The compiler will recognize the serial port. Select the recognized serial port COMxx in the Manual serial device selection. Alternatively, you can leave it blank; the tool will automatically detect it during subsequent downloads.



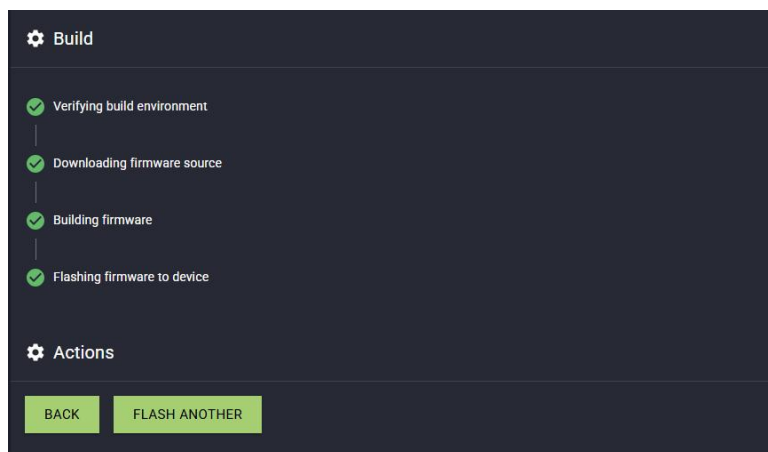
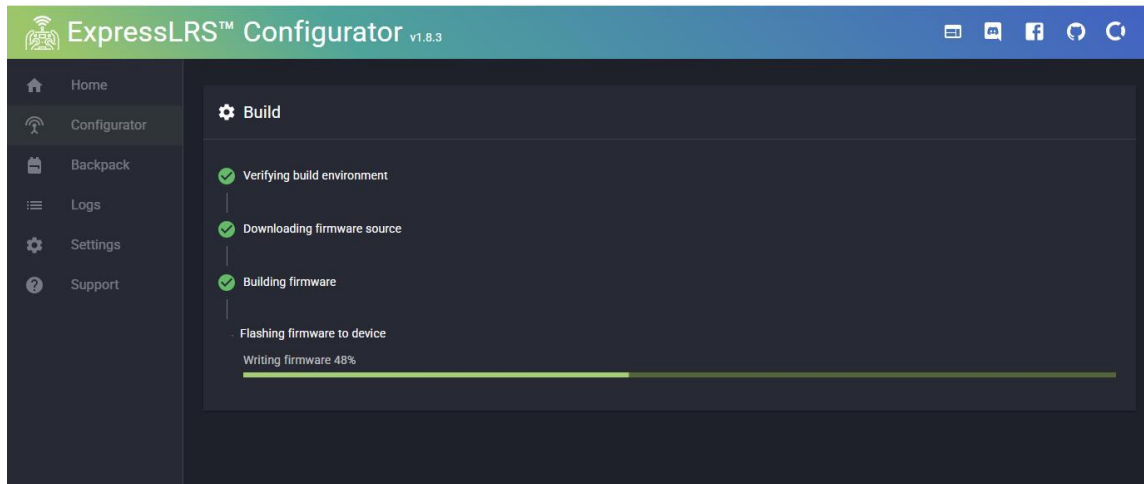
(11) Click FLASH. The software will begin downloading the source code for the corresponding device and compiling it.



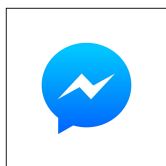
(12) The system will enter the Build interface, and it will take some time. Please be patient and follow the prompts if any errors occur.



- (13) After entering the Build interface, you can view the entire compilation process. Once all four stages are successfully completed, the following screen appears, indicating that the firmware has been flashed to the receiver.



Technical Support Here



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via Facebook Messenger



User Manual



FAQ



Tutorials

If the above code cannot solve your problem, you can also send emails to our technical support: after_service@radiolink.com.cn This content is subject to change. Please download the latest version from https://www.radiolink.com/elrs_915mhz_manual