



Micro TX Module

User Manual



Welcome to ExpressLRS!

BETA FPV Micro RF TX module is based on ExpressLRS project, open source RC link for RC applications. ExpressLRS aims to achieve the best possible link performance in both speed, latency and range. This makes ExpressLRS become one of the fastest RC links available while still offering long-range performance.

Github Project Link: <https://github.com/ExpressLRS>

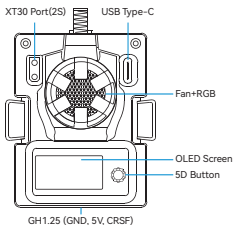
Facebook Group: <https://www.facebook.com/groups/636441730280366>

The ExpressLRS official project does NOT support the OLED function for the moment. BETA FPV team has made a pull request on Github and wait for the official to finish this merge. Please get the firmware from BETA FPV Github nowadays until ExpressLRS official support.

<https://github.com/BETA FPV/ExpressLRS>

Specifications

- Frequency bands (2.4GHz version): 2.4GHz ISM
- Frequency bands (915MHz/868MHz version): 915MHz FCC/868MHz EU
- RF output power: 25mW/50mW/100mW/250mW/500mW (2.4GHz)
100mW/250mW/500mW (915MHz/868MHz)
- Packet refresh rate: 50Hz/150Hz/250Hz/500Hz (2.4GHz)
25Hz/50Hz/100Hz/200Hz (915MHz/868MHz)
- Input voltage: 5-12V (2S)
- USB port: Type-C

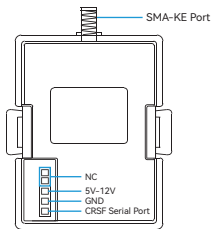


Note: Please DO NOT use 3S or above battery to power up the TX module. Otherwise, the power supply chip in the TX module will be damaged permanently.

BETA FPV Micro RF TX module is compatible with radio transmitter which has the micro module bay (AKA JR/SLIM module bay, e.g. Frsky Taranis X9D, TBS Mambo).

Basic Configuration

ExpressLRS uses the Crossfire serial protocol (AKA CRSF protocol) to communicate between the radio transmitter and the RF TX module. So make sure your radio transmitter support the CRSF serial protocol. Next, we use the radio transmitter with OpenTX system to show how to setup the CRSF protocol and LUA script.



Note: Please assemble the antenna before power on. Otherwise, the PA chip in the RF TX module will be damaged permanently.

CRSF Protocol

ExpressLRS uses the CRSF serial protocol to communicate between the radio transmitter and the RF TX module. To set this up, in OpenTX system, enter into model settings, and on the "MODEL SETUP" tab, turn off the "Internal RF". Next enable "External RF" and select "CRSF" as the protocol.

MODEL SETUP		2/14
Use global funcs	<input checked="" type="checkbox"/>	
Internal RF		
Mode	OFF	
External RF		
Mode	CRSF	
Channel Range	CH1-16	
Receiver	00	

LUA Script

ExpressLRS use the OpenTX LUA script to control the RF TX module, like bind or setup.

- Save the ELRS.lua script files onto the radio transmitter's SD Card in the Scripts/Tools folder;
- Long press the "SYS" button (for RadioMaster T16 or similar radios) or the "Menu" button (for Frsky Taranis X9D or similar radios) to access the Tools Menu where you can find ELRS script ready to run with only one click;
- Below image show the LUA script run successfully;

```

ExpressLRS 0bf0d9 0: 250
Pkt Rate      250Hz(-108dbm)
TLM Ratio     1:64 (78bps)
Power         500 mW
RF Freq       2.4G ISM

[Bind]           [Wifi Update]
  
```

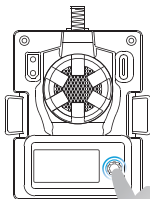
- With the LUA script, pilot could check and setup some configurations of the RF TX module.

0:250	On the top right. Indicator which tells how many bad UART packets and how many packets it's getting from the radio per second. It can be used to confirm the communication between the radio transmitter and the RF TX module is working properly. e.g. 0:200 means 0 bad packets and 200 good packets per second.
Pkt. Rate	RF transmitter packet rate.
TLM Ratio	Receiver telemetry ratio.
Power	RF TX module output power.
RF Freq	Frequency bands.
Bind	Set the RF TX module into binding status.
Wifi Update	Open the WIFI function for firmware update.

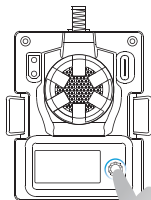
Note: The newest ELRS.lua script file is available in BETAFPV Support website (Link in More Information Chapter).

Button and OLED

There is a 5D button on the micro RF TX module. Pay attention only the virtual dimension works and the other four dimensions are invalid. Below is the basic operation of the button and OLED.



Long Press:
Enter menu page or
change the value of this row.



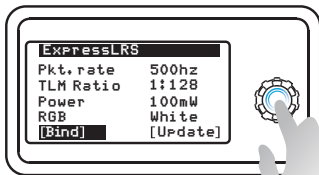
Short Press:
Move to the next row.

Note: When the RF TX module is entering menu page, the binding between RF TX module and receiver will be lost, the binding will recover after exiting menu page automatically; you must re-power the receiver if you have changed the Pkt Rate.

Note: When the RF TX module enters WIFI Upgrade status, the button will be invalid. Please re-power the RF TX module after firmware update via WIFI.

Bind

The Micro RF TX module comes with officially major release V1.1.0 protocol and no Binding Phrase included. So please make sure the receiver works on officially major release V1.0.0~V1.1.0 protocol. And no Binding Phrase setted. Micro RF TX module could enter binding status via ELRS.lua script, as description in "LUA Script" chapter. Besides, using the button and OLED, move to the BIND position and long press the button. Then the RF module will enter binding status.



long press the button.

Then the RF TX module will enter binding status.

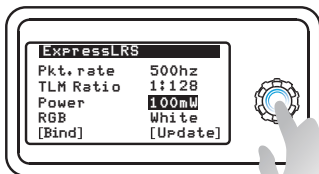
Note: The LED will NOT flash when enter binding status. The module will exit from binding status 5 seconds later auto.

Note: If you reflash firmware of the RF TX module with your own Binding Phrase, please make sure the receiver has the same Binding Phrase. The RF TX module and the receiver will bind automatically in this situation.

Output Power Switch

Micro RF TX module could switch the output power via ELRS.lua script, as description in "LUA Script" chapter.

Besides, using the button and OLED, move to the Output position. Long press the button could switch the output power.



Long press the button could switch the output power.

Note: The RGB LED will NOT change according to the output power. When the output power is 250mW or above, the fan will spin automatically. The Micro RF TX module does NOT support 1W or 2W output. When switch to this value, the system will move to 500mW automatically.

More Information

As ExpressLRS project is still in frequently update, please check BETA FPV Support (Technical Support -> ExpressLRS Radio Link) for more details and newest manual.

<https://support.betafpv.com/hc/en-us>

- Newest user manual;
- How to upgrade the firmware;
- FAQ and troubleshooting.