BETAFPV

Nano TX Module
User Manual

Welcome to ExpressLRS!

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

Github Project Link: https://github.com/ExpressLRS
Facebook Group: https://www.facebook.com/groups/636441730280366

Specifications

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

SMA-KE Port

Heat Sink

LED

Bind/Power Button

USB Type-C
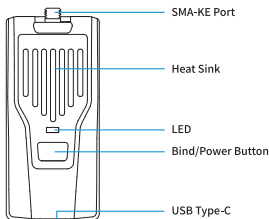
BETAFPV Nano RF module is compatible with radio transmitter which has the nano module bay (AKA lite module bay, e.g. Frsky Taranis X-Lite、Frsky Taranis X9D Lite、TBS Tango 2).

Basic Configuration

ExpressLRS uses the Crossfire serial protocol (AKA CRSF protocol) to communicate between the radio transmitter and the Nano RF 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.

NC
5V-12V
GND
CRSF Serial Port
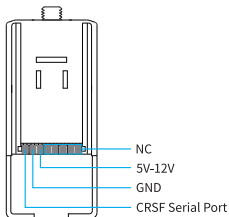
Note：Please assemble the antenna before power on. Otherwise, the PA chip in the Nano TX module will be damaged permanently.

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.

LUA Script

ExpressLRS use the OpenTX LUA script to control the 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 Nano 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 tansmitter and the RF TX module is working properly. e.g. 0:200 means 0 bad packets and 200 good packets per second.
Rkt. 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).

Bind

Nano RF TX module could enter binding status via ELRS.lua script, as description in "LUA Script" chapter.
Besides, short press the button on the module could also enter binding status.

Short press the button
Enter binding status
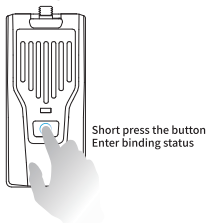
Note: The LED will NOT flash when enter binding status. The module will exit from binding status 5 seconds later auto.

Output Power Switch

Nano RF TX module could switch the output power via ELRS.lua script, as description in "LUA Script" chapter.
Besides, long press the button on the module could switch the output power.

Long press the button
Switch output power
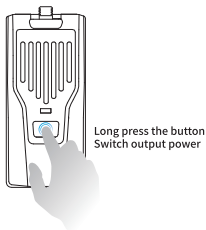
The RF TX module output power and LED indication as show below.

LED Color	RF output power
Blue	100mW
Purple	250mW
Red	500mW

More Information

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

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

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