FETtec Alpha FC firmware

Manual

Introduction

The FETtec Alpha FC firmware is a completely new drone flight controller firmware by FETtec. The preference is to make a drone firmware that flies as direct as possible without much filtering or high frame and hardware requirements. Keeping the setup clean, robust and simple.

Supported hardware: FETtec AIO 35A (-N), FETtec FC F7, FETtec FC G4 (-N)

Actual functionality

The FETtec Alpha FC firmware includes the following functions and features:

- Flight modes: acro (rate), level (angle) mode and turtle mode
- Analog OSD: there's a changed FETtec Alpha OSD firmware that supports MSP displayport, which makes it display the FETtec FC FWs OSD
    - The onboard OSD is connected to serial 4. a MSP displayport is default set to this serial (FC setup menu)
- Digital OSD support:
    - DJI (very basic MSP that adds voltage, current and consumption to the DJI OSD: PIDs and rates are adjustable in the DJI menu)
    - Shark Byte (the FETtec FC FWs OSD is displayed via MSP displayport)
    - Caddx Walksnail (the FETtec FC FWs OSD is displayed via MSP displayport)
    - Setup a MSP displayport (FC setup menu) where you connected the serial of the DJI air unit or Shark Byte
- supported receiver protocols: Frsky Sbus+S-Port, CRSFv2 and CRSFv3, Ghost
- supported ESC Signals: S2M, FETtec Onewire, DShot300-2400, Oneshot and PWM
- supported VTX control signals: smartaudio (tbs unify's) and tramp

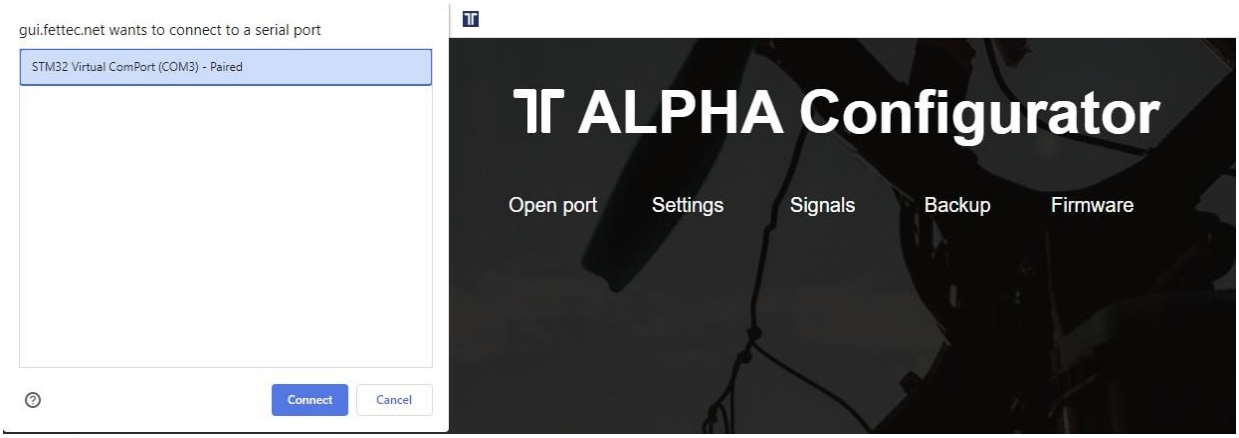
Safety warning

Please always be careful when flashing new firmware:

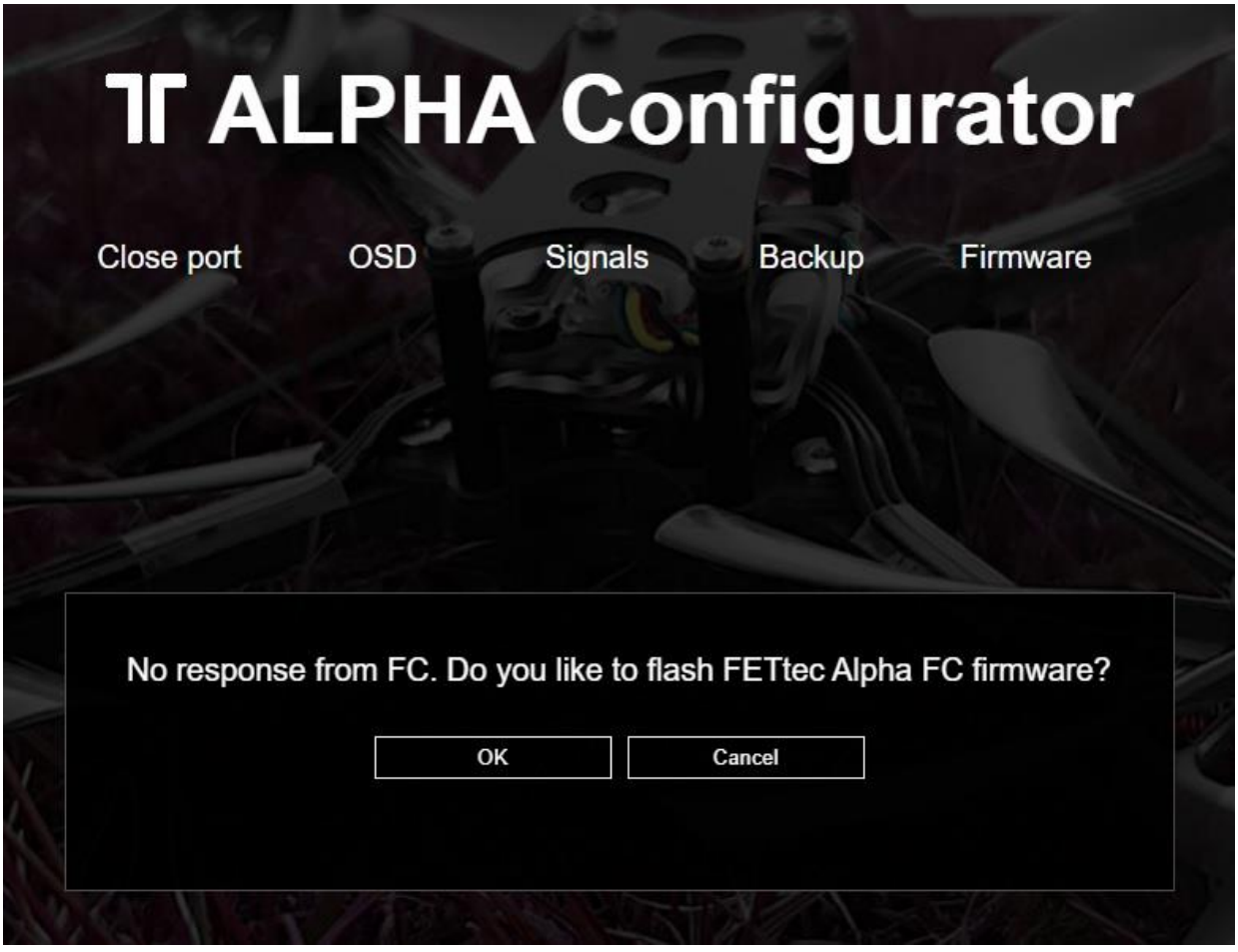
- Remove propeller before flashing and configuration
- Warning! → default prop run direction is "out"!
- always flash latest firmware before operation
- keep distance from your quad when you arm it after you changed something
- don't fly close to people!

Getting started

1. Open FETtec Toolset https://gui.fettec.net and choose ALPHA Configurator.
2. Connect the FETtec FC via USB.
3. Open the ALPHA Configurator and select open port. Choose the serial port on which the FC shows up and press connect.

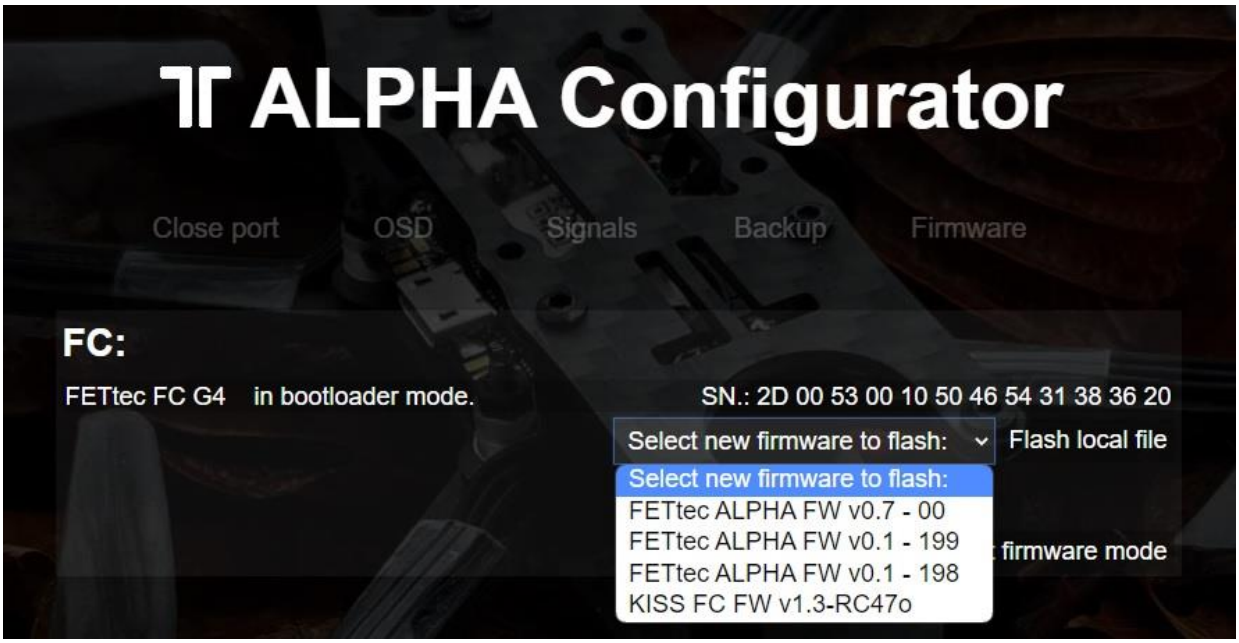


4. If you have KISS FC firmware running on your FC, you will get a warning if you want to flash FETtec Alpha FC firmware. Press “OK”

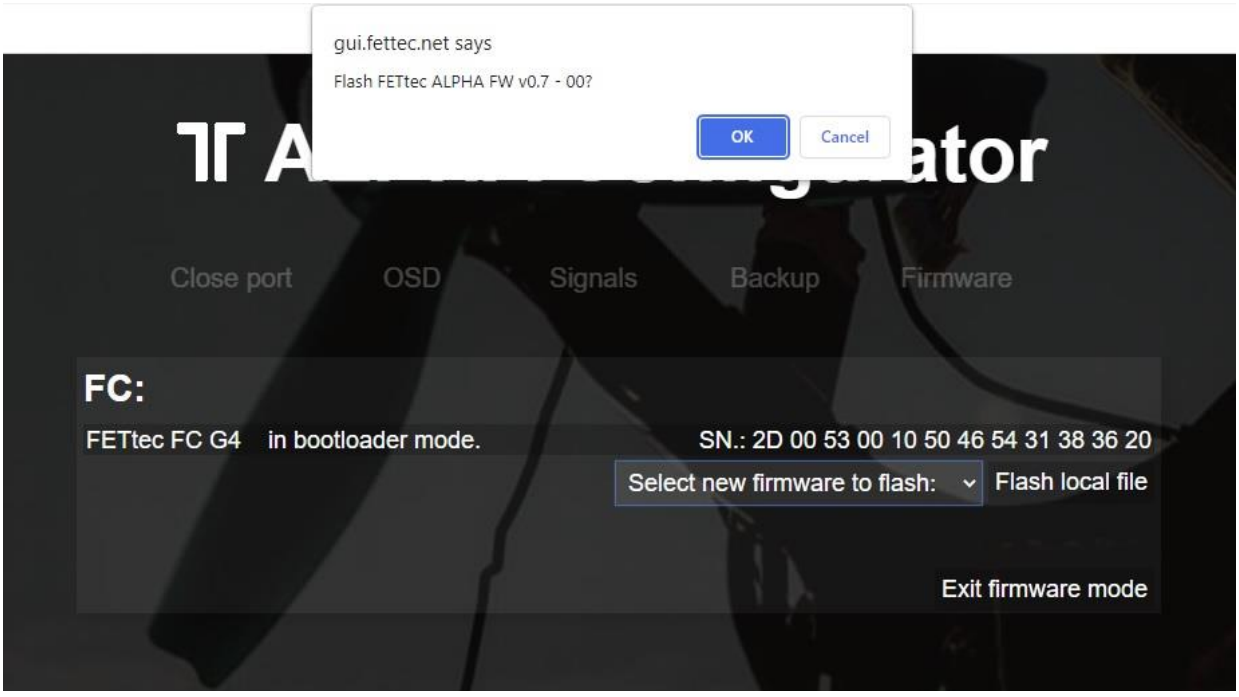


Select serial port again

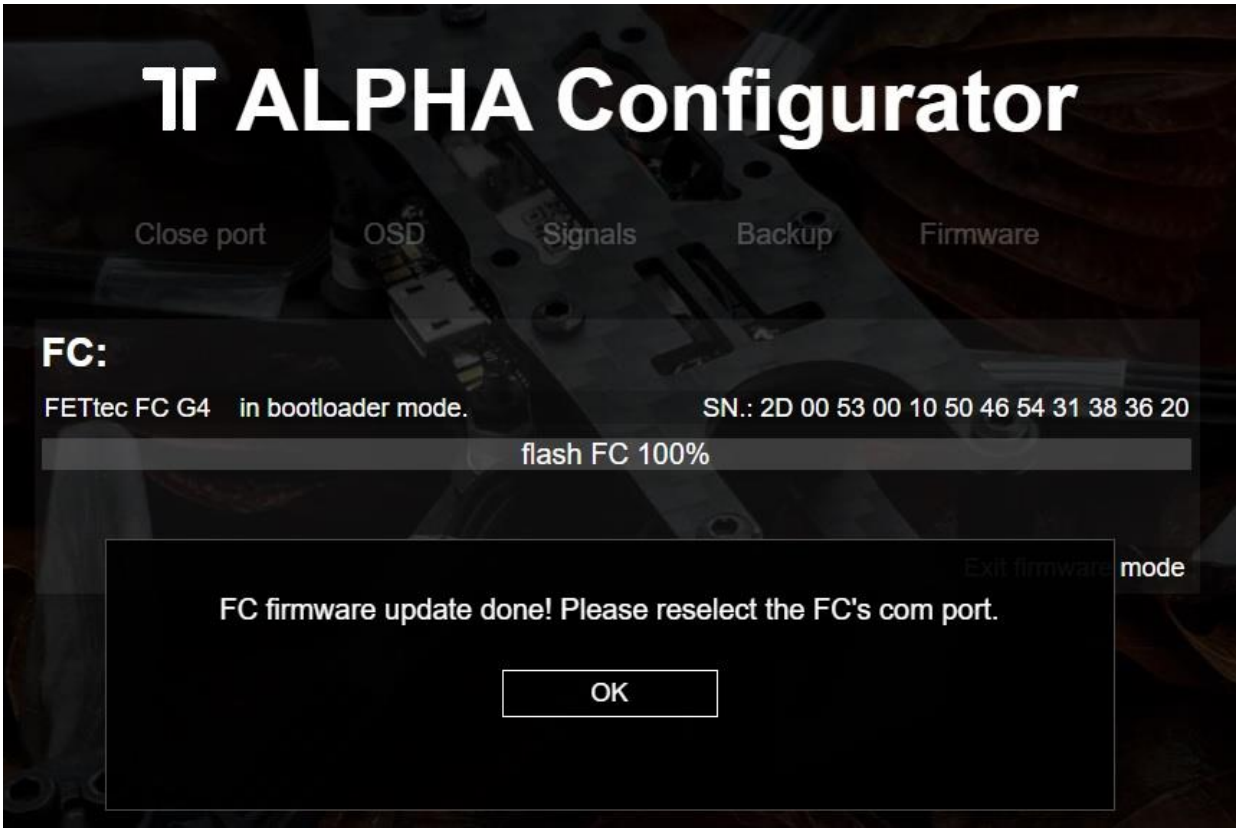
5. “Select new firmware to flash”.
   We always recommend flashing the latest available firmware.



6. Confirm to flash FETtec ALPHA firmware by pressing “OK”



7. FC firmware update is done!



The FC needs a restart after that, therefore the com port is requested to be selected and connected again

Now you can customize everything in the GUI according to your wishes.

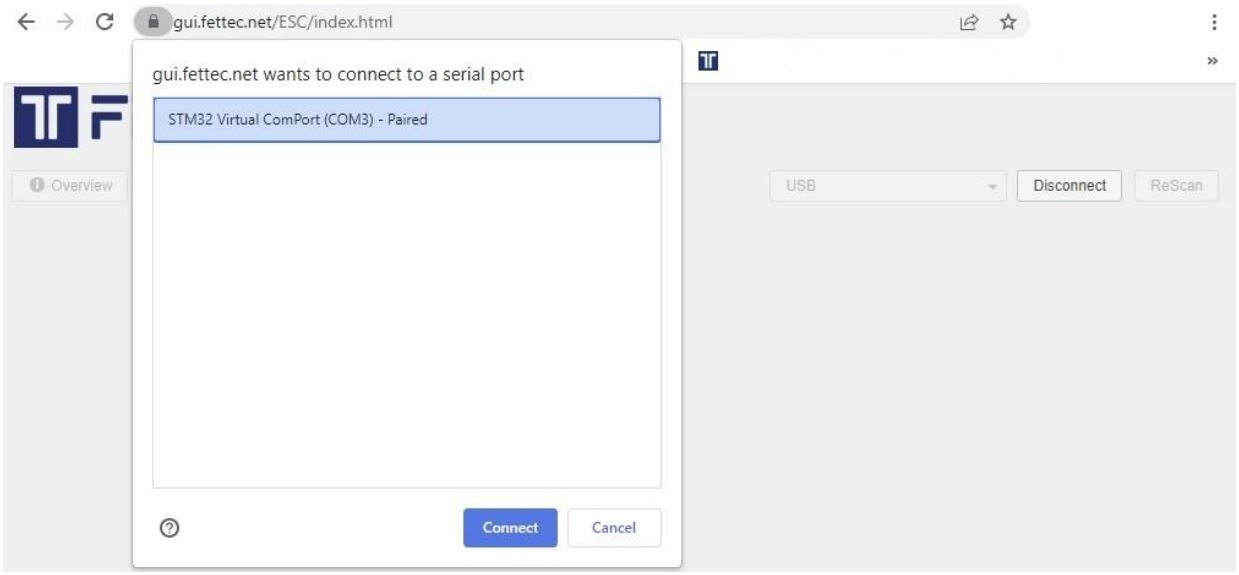
Please connect everything like described in the manual of the FC or AIO.

The receiver signal will get auto detected (supported systems are Frsky Sbus+S-Port, CRSFv2 and CRSFv3 and Ghost).

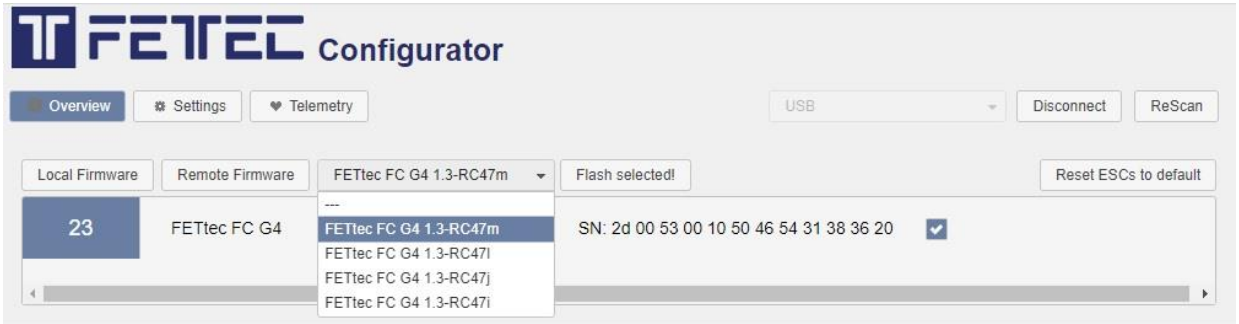
Get back to KISS

If the FETtec Alpha FC firmware is flashed on your FC and you want to get back to KISS firmware, follow these steps:

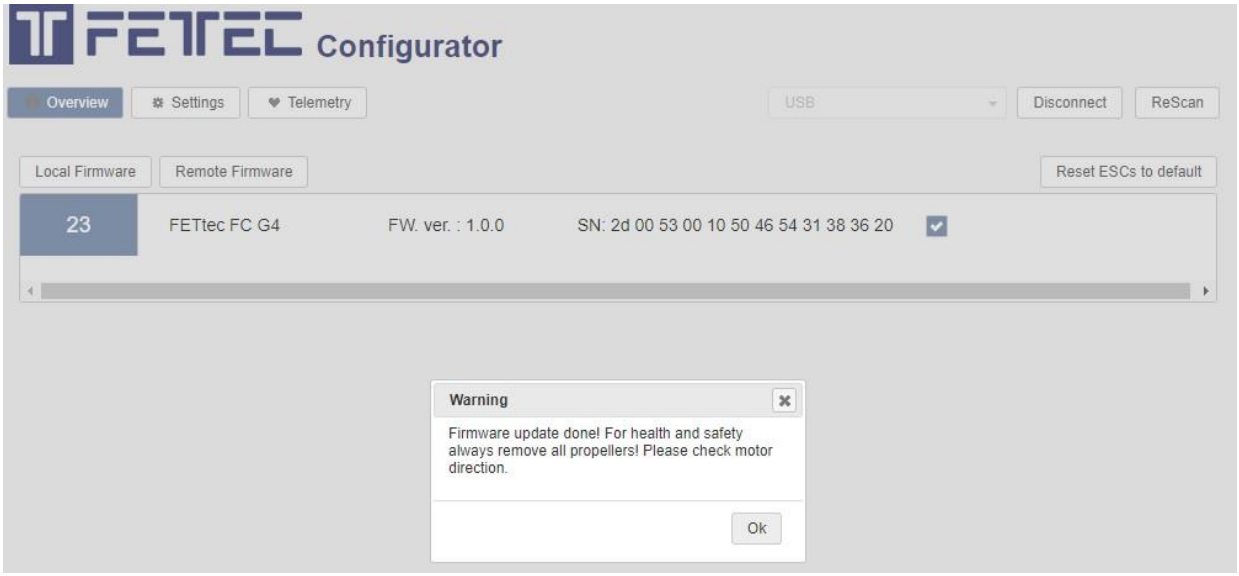
1. Open FETtec Toolset https://gui.fettec.net/
2. Connect the FETtec FC via USB.
3. Press the reset button once
4. Open the FETtec **ESC** Configurator and select “USB” and connect.
5. Choose the serial port on which the FC shows up and press connect.



6. Now the FC shows up and you can select KISS Firmware (FETtec FC G4 1.3-RC47m) in “Remote Firmware” and press “Flash selected!”



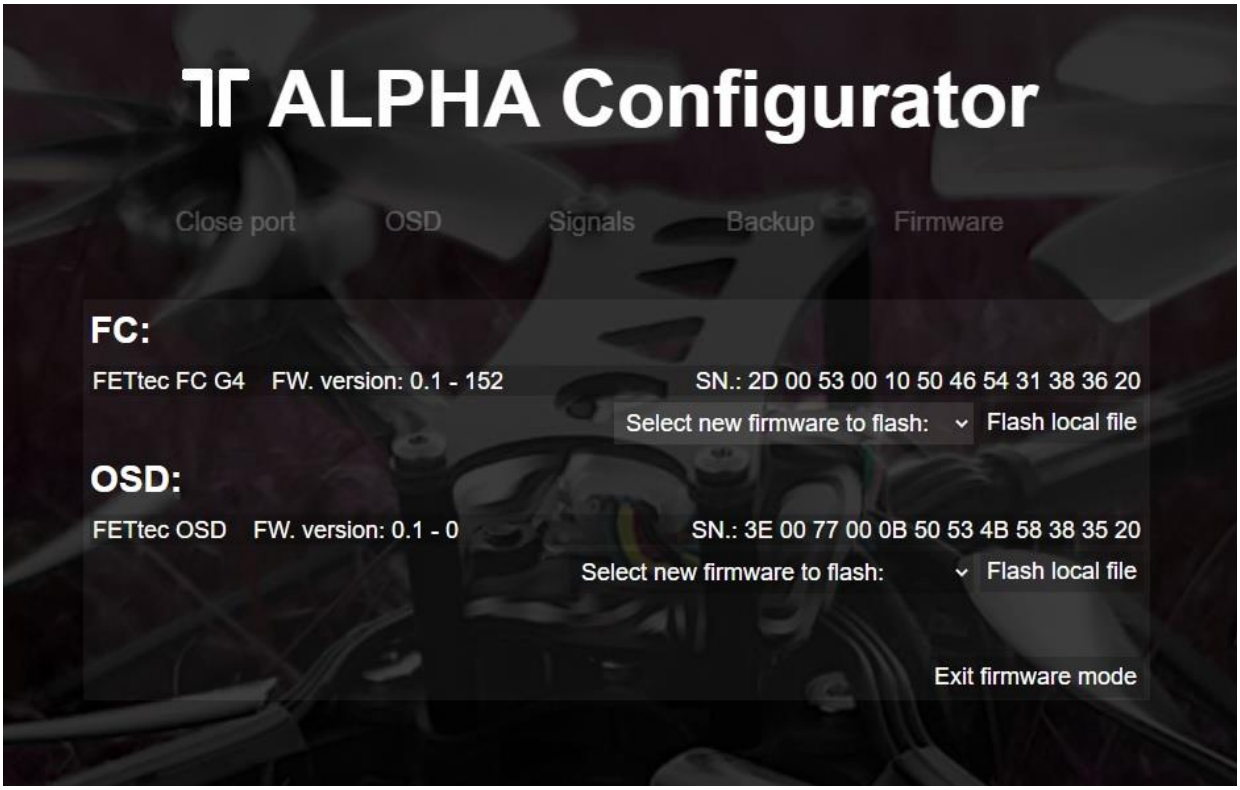
7. Flashing to KISS FC firmware done.



Firmware updates

For firmware updates it is the same procedure as flashing the FETtec Alpha FC firmware.

Connect FC via open port and choose “Firmware”.



Now you can flash the latest firmware update via “Select new firmware to flash” or choose “Flash local file”.

We always recommend to use the latest available firmware to get the best user experience.

If you like to try new features and firmware developments you can join our Discord channel to be always up to date (https://discord.gg/pfHAbahzRp).

Settings

You can set up the FC according to your wishes in the ALPHA Configurator.

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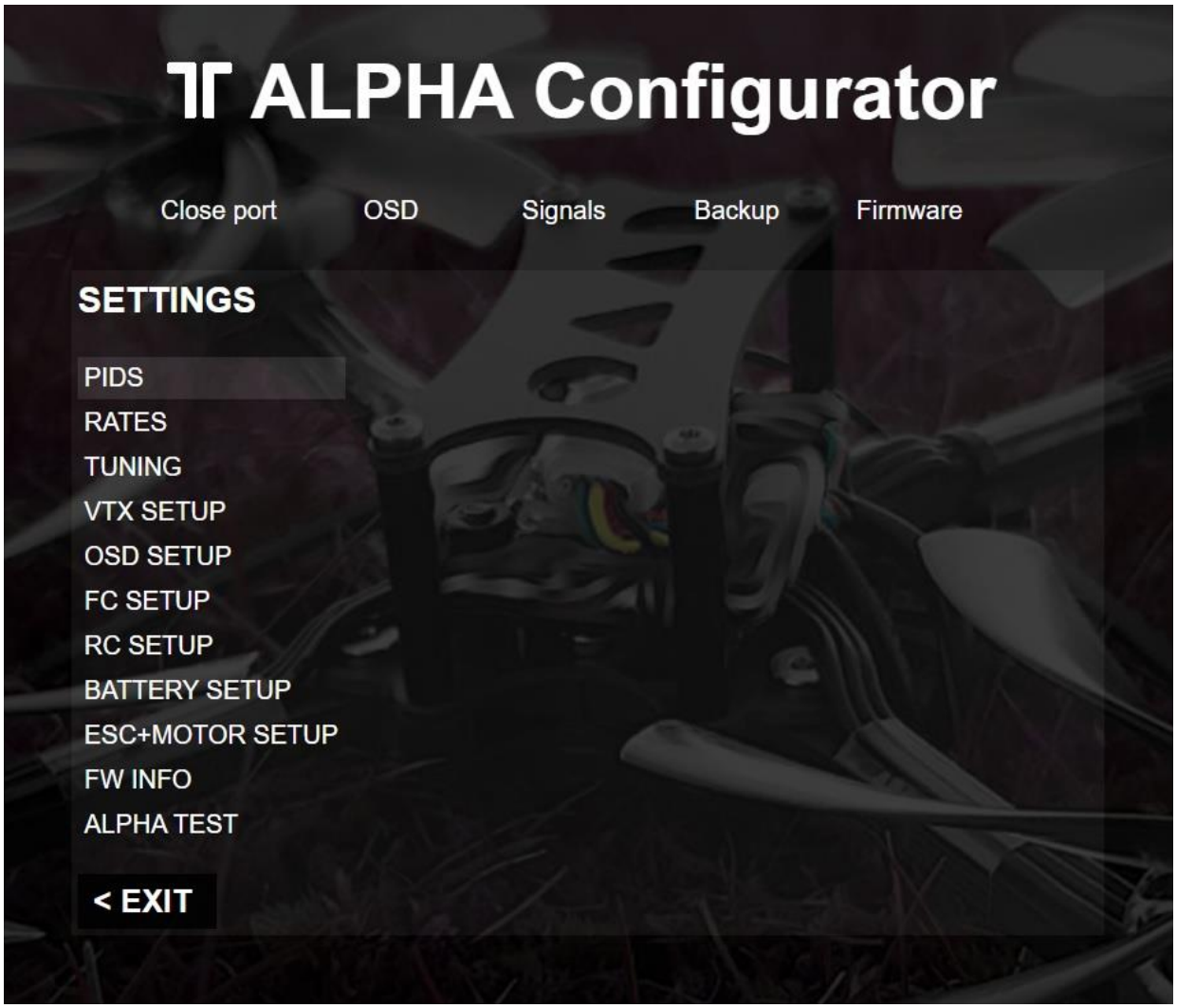
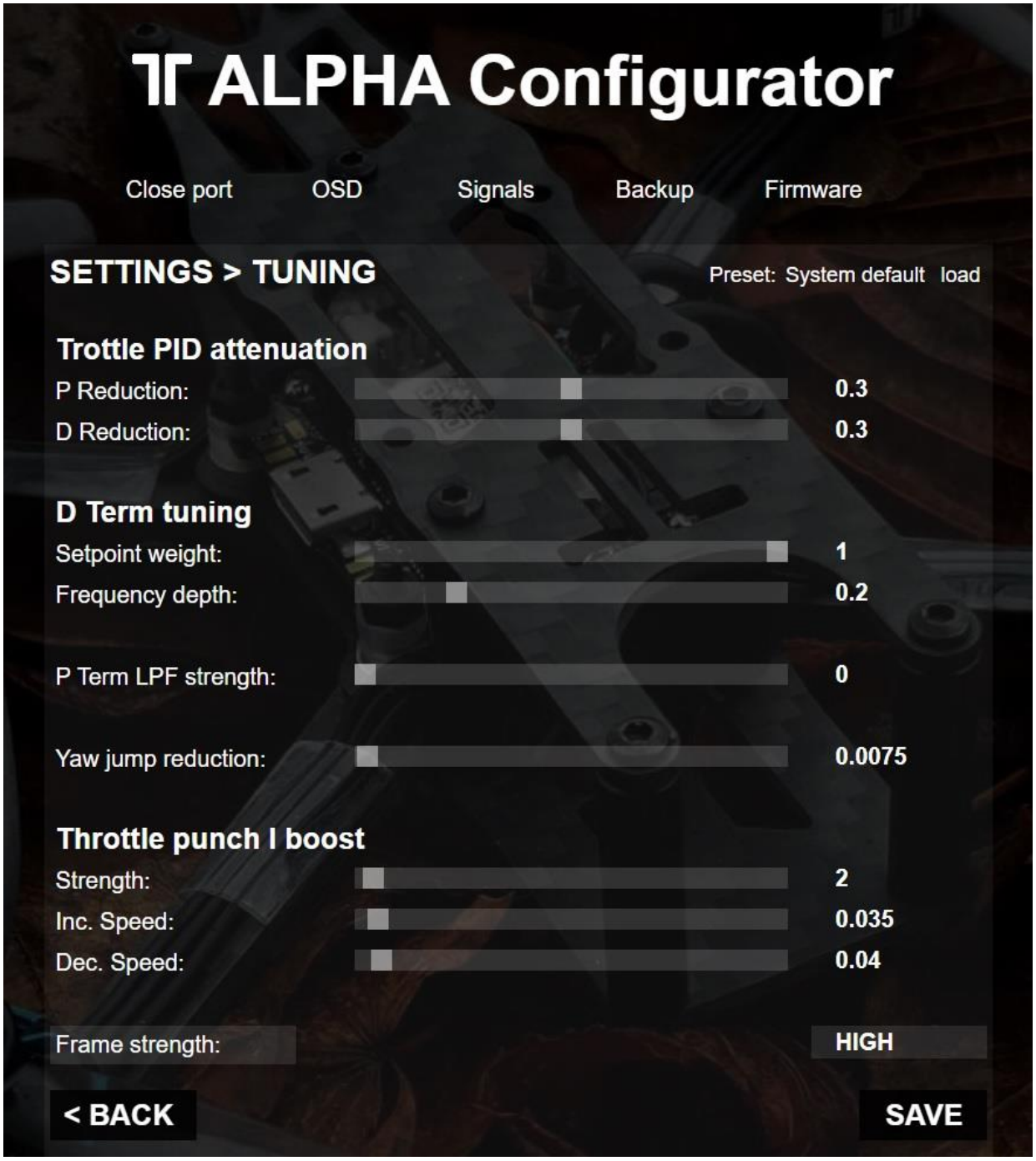


All functions are explained in the respective category.

Tuning, rates and hints

Tuning

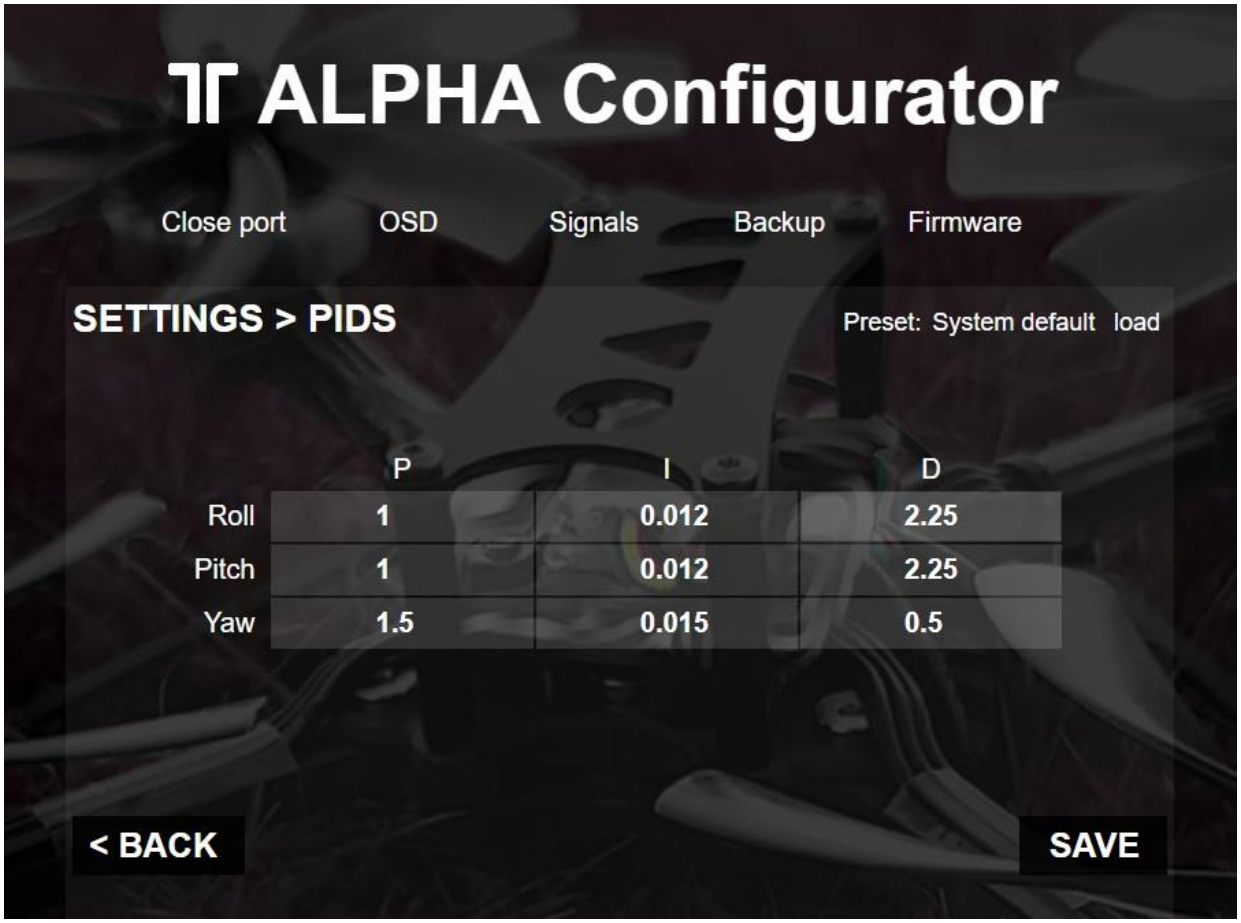
ALPHA Configurator → Settings → Tuning



If you have a very loose frame, you can adjust the frame strength in the FC setup. The lower it is, the more loose it will fly. But it makes it work even on frames that are printed from TPU.

PID

ALPHA Configurator → Settings →PIDs



The default PIDs are:
Roll and Pitch: P = 1.0, I = 0.012, D = 2.25
Yaw = P = 1.5, I = 0.015, D = 0.5

To get the best performance try first to rise I and D in steps of maximum 20% until it starts to oscillate. On FETtec Alpha FC firmware P is the least important value.

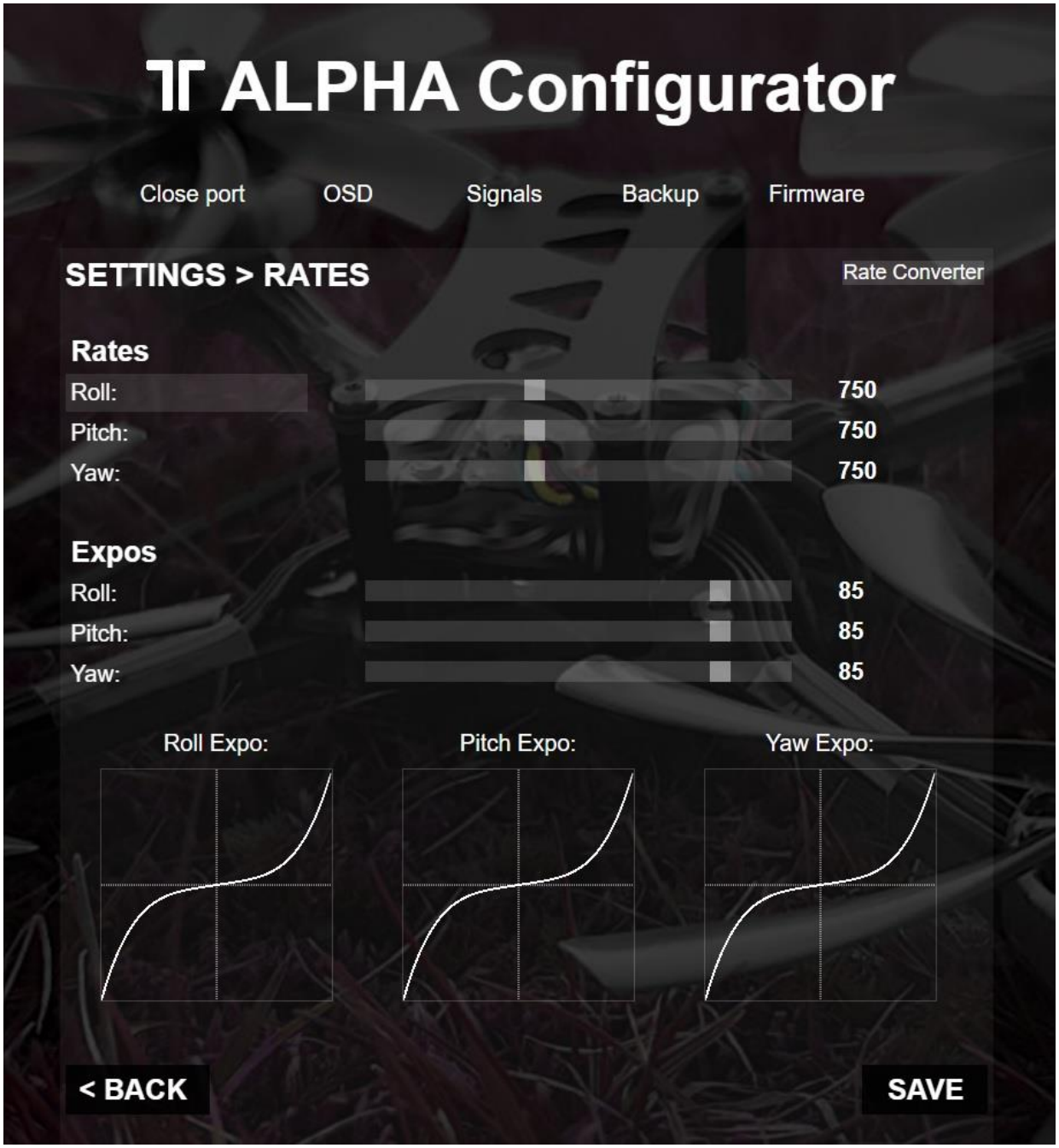
For duct copters Yaw, I and D can be raised by 100% - 200% of the default values.

The default rates are:
Roll, Pitch and Yaw: 750 degree per second.
This value represents the maximum rotation in degree per second at full stick input.

Default Expo:
Roll, Pitch and Yaw: 85.

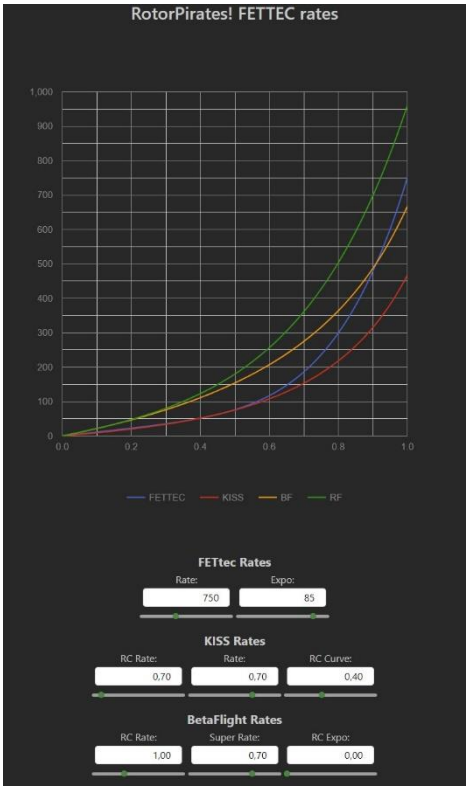
Rates

ALPHA Configurator → Settings → Rates



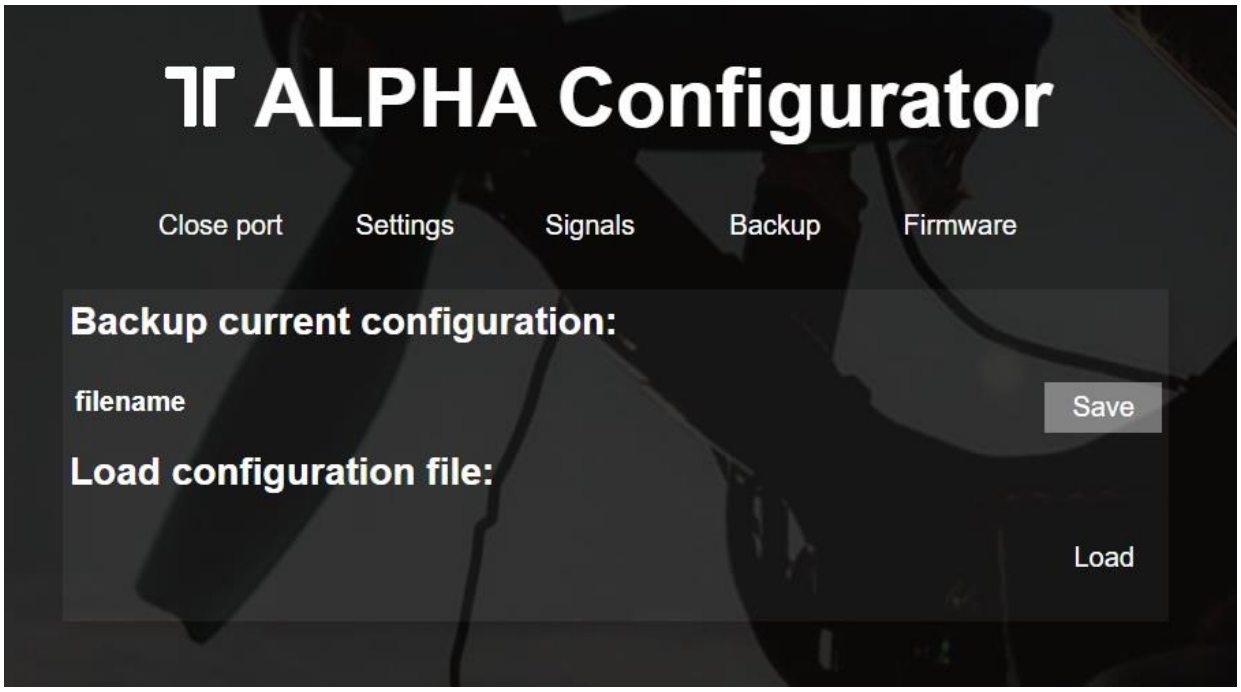
Rate converter

To compare rate and expo with other firmwares, this tool can be used:
https://gui.fettec.net/rateconvert/



Backup

To ensure that your settings are not getting lost, use the backup function by pressing the button “backup” and saving the configuration local as a text file.



OSD

Only for the FETtec AIO 35A/FETtec FC G4.

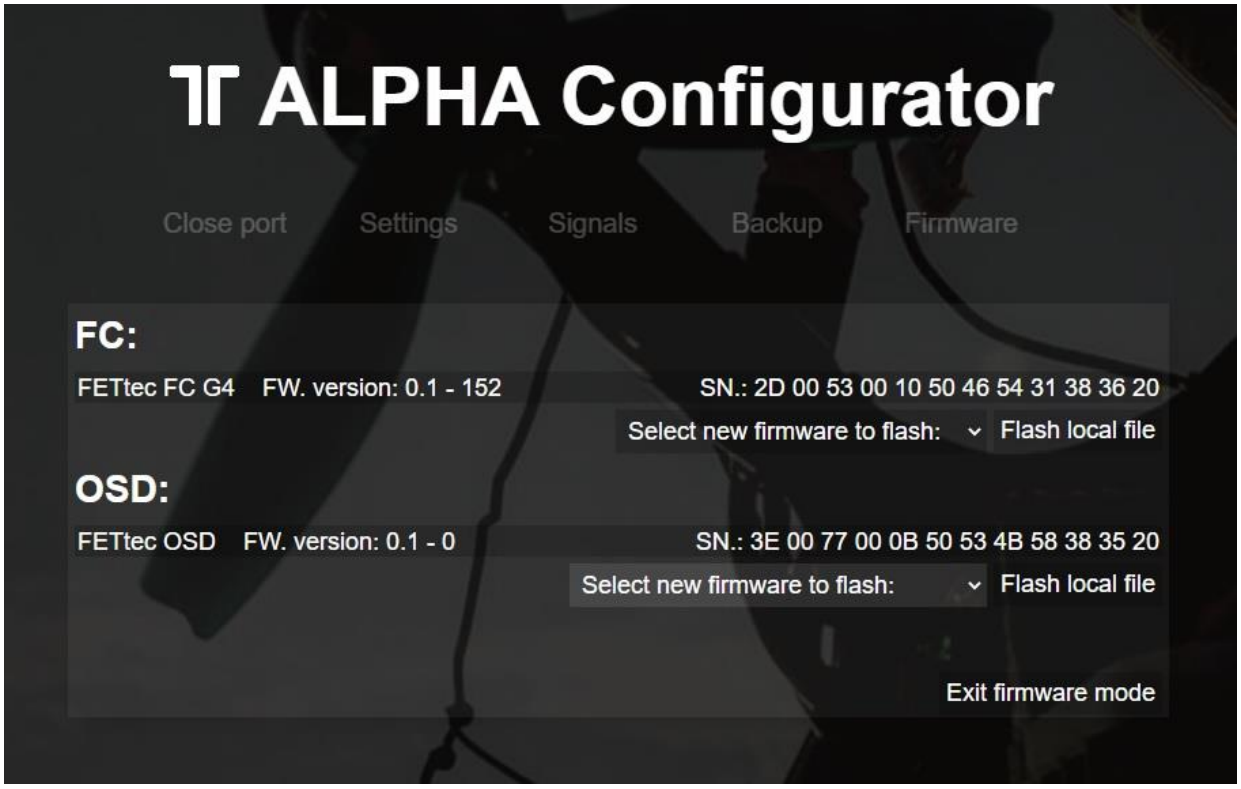
The N-versions don’t have an analog onboard OSD but you can use the FETtec OSD Board in combination with the FETtec AIO 35A-N and FETtec FC G4-N to get the same functionality.

All functional OSD telemetry items are configurable in the settings. In addition, the position of the telemetry can be changed by drag and drop in the GUI's OSD screen.

The GUI's OSD and settings screen is a direct live clone of the FPV OSD. This means every move you do in the GUI or via Transmitter in the FPV screen is synchronous.

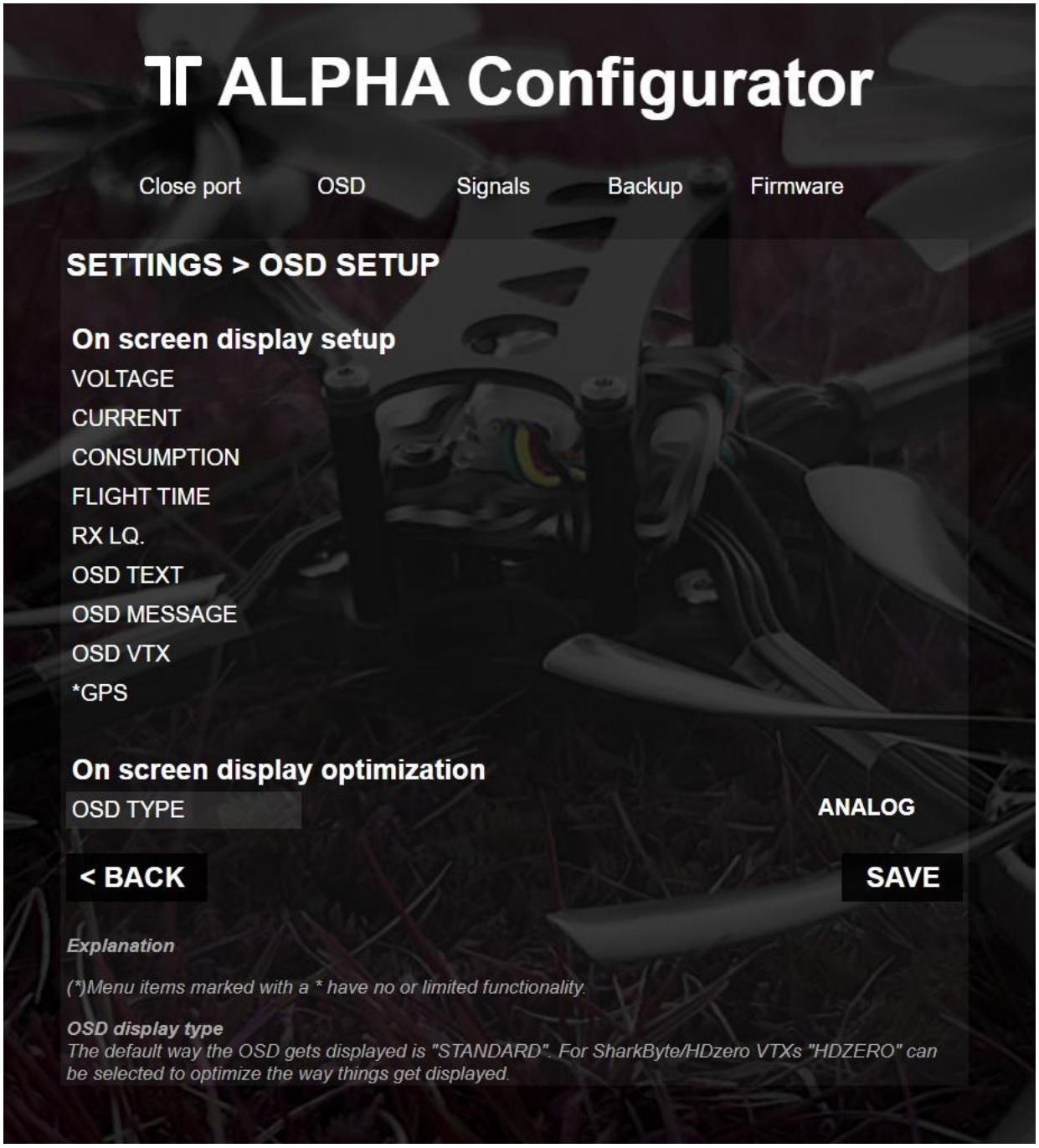
Update

To update the FETtec OSD connect FETtec AIO 35A/FETtec FC G4 to FETtec FC Configurator and flash via “Firmware” the latest update.



Settings

In the settings of the ALPHA Configurator you can choose “OSD Setup”



All parts of the OSD can be enabled/disabled and selected in their position.

Please read the explanations in the area below to be sure what the changes do.

All setting can easily be set and checked in the overview “OSD”

Here you can get an overview of how the selected settings look in the OSD