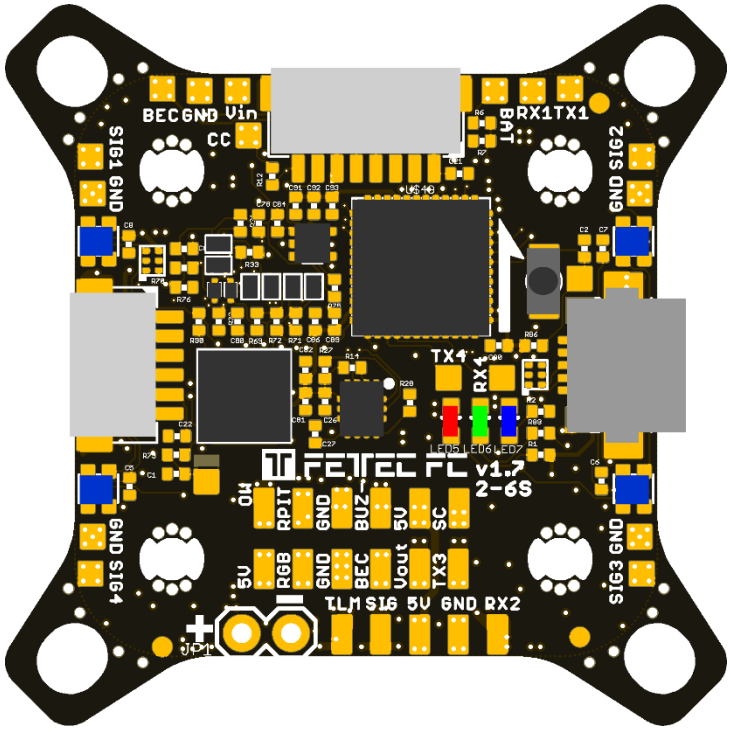
FETtec FC G4 v1.7

Manual



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Introduction

Thank you for purchasing the FETtec FC G4 v1.7.

Features

- Latest STM32G473 Processor
  - 180Mhz + Math accelerator
  - Gyro IIM-42652 SPI
- Supply voltage 6-27V (2S-6S Lipo)
- 2x dedicated onboard BEC (2A each)
  - 5V BEC for RX
  - 5V/16V BEC for VTX (switchable and real Pit*)
- Improved IO protection
  - All IOs of the microcontroller e.g. in connectors or solder pads are protected against voltage or current spikes
- 2x 8 pin connector for solder free ESC connection
  - Connector 1: ESC signal 1-4, telemetry, VCC, GND
  - Connector 2: ESC signal 5-8 (depending on UAV type 1-4), telemetry, VCC, GND
- 1x 8 pin connector for solder free VTX, cam connection and OSD or digital systems
  - real Pit* VCC, GND, Video in, Video out, BEC 5V/16V, VCS/TX3, RX3
- 2x 6 pin connectors for serials
  - RX1, TX1, 3.3V, VCC, 5V, GND
  - RX3, VCS/TX3, RGB LED, VCC, 5V, GND
- 1x 4 pin connector for receiver
  - Signal, TLM, 5V, GND
- 5 UART serials
  - UART 1 free
  - UART 2 used for Receiver
  - UART 3 free
  - UART 4 used for onboard OSD, can be set free
  - UART 5 used for ESCs / TLM / Onewire
- 4 ESC solder pads (Signal/GND) in each corner
- Buzzer pads
- 4 tiny RGB LEDs (selectable color)
- Supported ESC protocols
  - PWM, Oneshot125, Oneshot42, Dshot150/300/600/1200/2400, FETtec Onewire

- FETtec Alpha FC firmware (KISS FC firmware flashable)

- Updated Onboard OSD
  - Graphic OSD (STM32)
  - Full KISS Tuning
  - Filter (PIDs, Rates, Settings)
  - LED control (RGB LED, Racewire)
  - VTX
  - Live data graphs (Voltage, motor rpm, current, motor temp, gyro values, link quality)
  - KISS GPS support + live map
  - Custom graphic pilot logo
  - Stick overlay
  - Custom layout
  - can be deactivated for usage of digital systems

- Maximum outside dimensions: 37,2 x 37,2mm, without outside tips 30 x 30mm
  - Mounting hole arrangement:
    - 20 x 20mm with M2 mounting hole (expandable to M3)
    - 30 x 30mm with M3 mounting hole
    - 30 x 30mm mounting hole tips are removable to reduce overall FC size
- Overall height: 7,9mm
- Weight: 5,37g
- Connector type: JST-SH-1mm

*real Pit-Mode: A power supply pin which is remotely switchable

Safety warning

- Remove propeller before flashing and configuration
- always flash latest firmware before operation
-

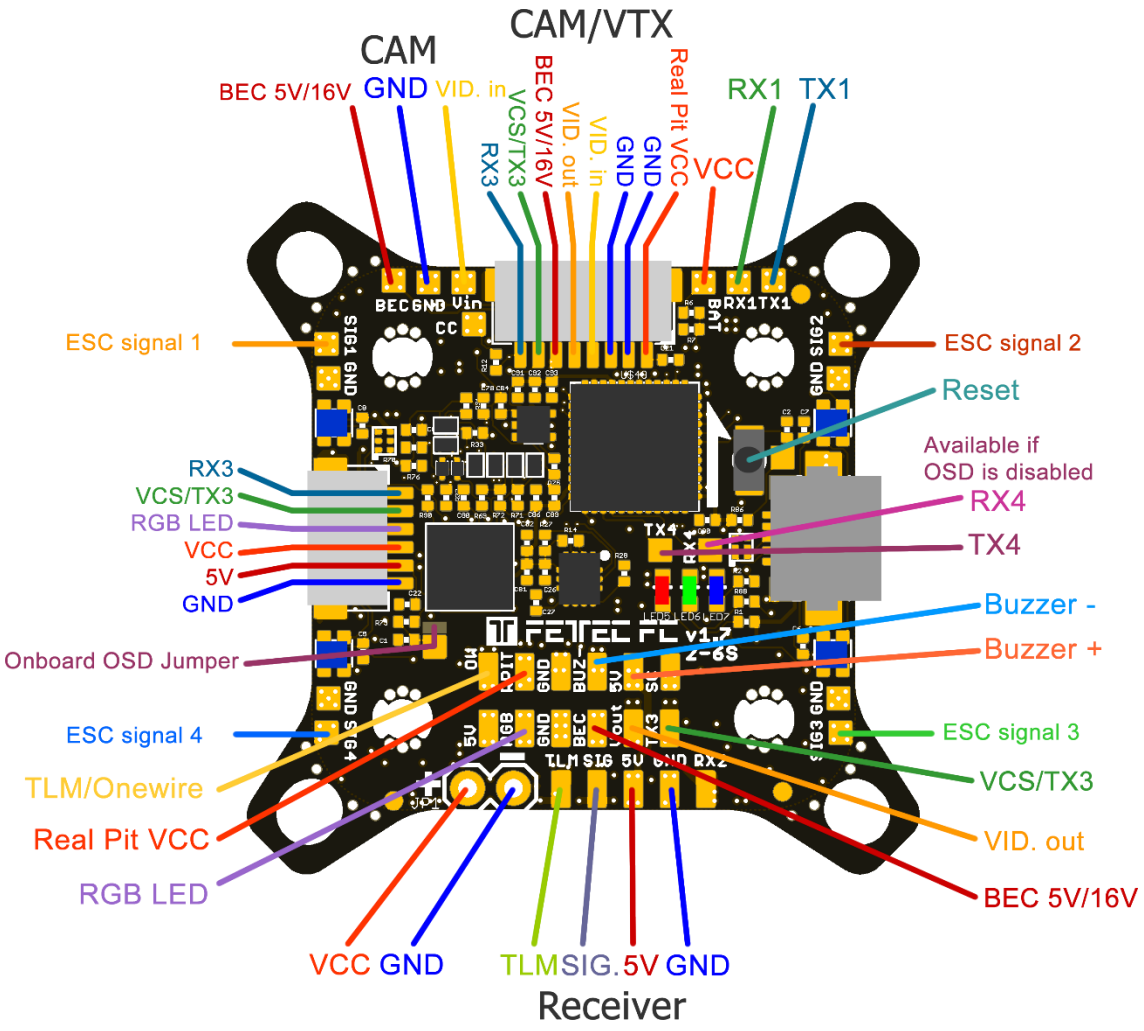
Recommended steps for installation of the FETtec FC G4 v1.7

- Connect to ALPHA Configurator and update to the latest firmware (see Firmware updates)
- Install the FC in your copter (see Connection diagrams for correct wiring and installation)
- Make sure everything is connected properly and check without propellers

- Connect to FETtec Toolset to proceed with final configuration of the FETtec FC G4

Connection Diagram

Connection Layout top



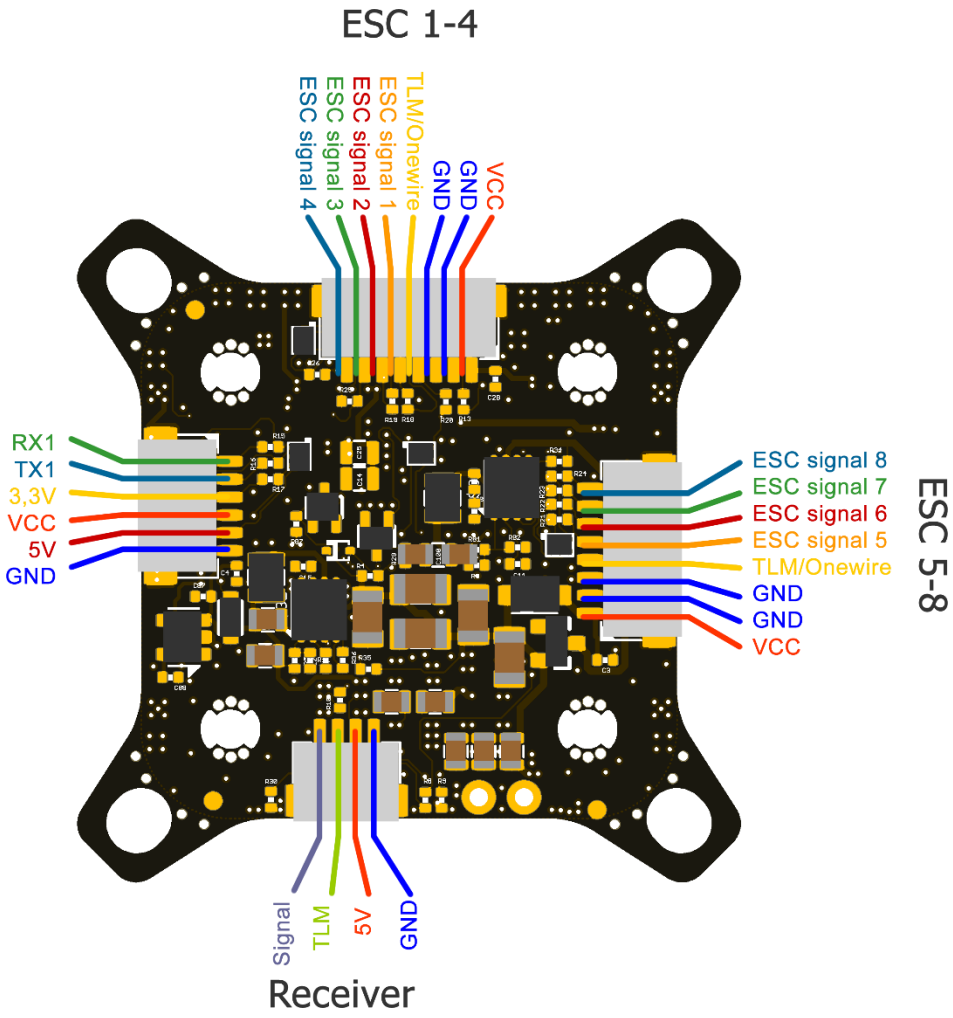
The 8 pin connector combines all necessary connections for analog or digital VTX and camera. It includes:

- Real Pit VCC (Lipo+)
- GND for cam and VTX
- Video in: Analog video signal from cam
- Video out: Analog video to VTX
- BEC 5V/16V: power supply for cam and/or VTX, switchable voltage, real Pit capable
- VCS/TX3: for smart audio / tramp configuration or TX for digital FPV systems
- RX3: for digital FPV systems

6 pin connector (SER3):

- RX3: for digital FPV systems or other functions configurable in GUI (same for VCS/TX3)
- VCS/TX3: for smart audio / tramp configuration or TX for digital FPV systems
- RGB LED: PWM signal pin to control WS2812 LEDs or similar (configurable in GUI)
- VCC: Battery voltage
- 5V
- GND

Connection Layout bottom



8 pin ESC connector 1:

- VCC: Battery voltage out to supply FC power
- GND
- TLM/Onewire: ESC Telemetry signal to FC or Onewire signal pin (depending on configuration)
- ESC signal 1-4: ESC signal output for each ESC

8 pin ESC connector 2:

- VCC: Battery voltage out to supply FC power
- GND
- TLM/Onewire: ESC Telemetry signal to FC or Onewire signal pin (depending on configuration)
- ESC signal 5-8: ESC signal output for each ESC (outputs ESC signal 1-4 if UAV type is configured as BI, TRI, QUAD)

Receiver connector:

- GND
- 5V
- TLM: Telemetry signal to receiver (see page 10 receiver connection diagram for further information)
- Signal: Receiver signal to FC (see page 10 receiver connection diagram for further information)

6 pin connector (SER1):

- RX1: function configurable in GUI
- TX1: function configurable in GUI
- 3,3V
- VCC: Battery voltage
- 5V
- GND

Acronym explanation:

- BEC 5V/16V: switchable voltage (in GUI) and real Pit capable
- GND: Reference Signal Ground
- Onboard OSD Jumper: bridge to deactivate onboard OSD and to activate RX4 and TX4
- Real Pit VCC: real Pit capable VCC pin
- Reset: Reset button to force the FC in bootloader mode, not needed for normal operation
- SIG.: receiver signal (serial)
- TLM: Telemetry signal output for receiver (Serial)
- TLM / Onewire: ESC telemetry input or Onewire signal depending on configuration
- VCC: Battery input voltage (6V-27V)
- VCS: Video control signal (smart audio/tramp)
- VID. in: Analog video signal to OSD
- VID. out: Analog video signal from OSD

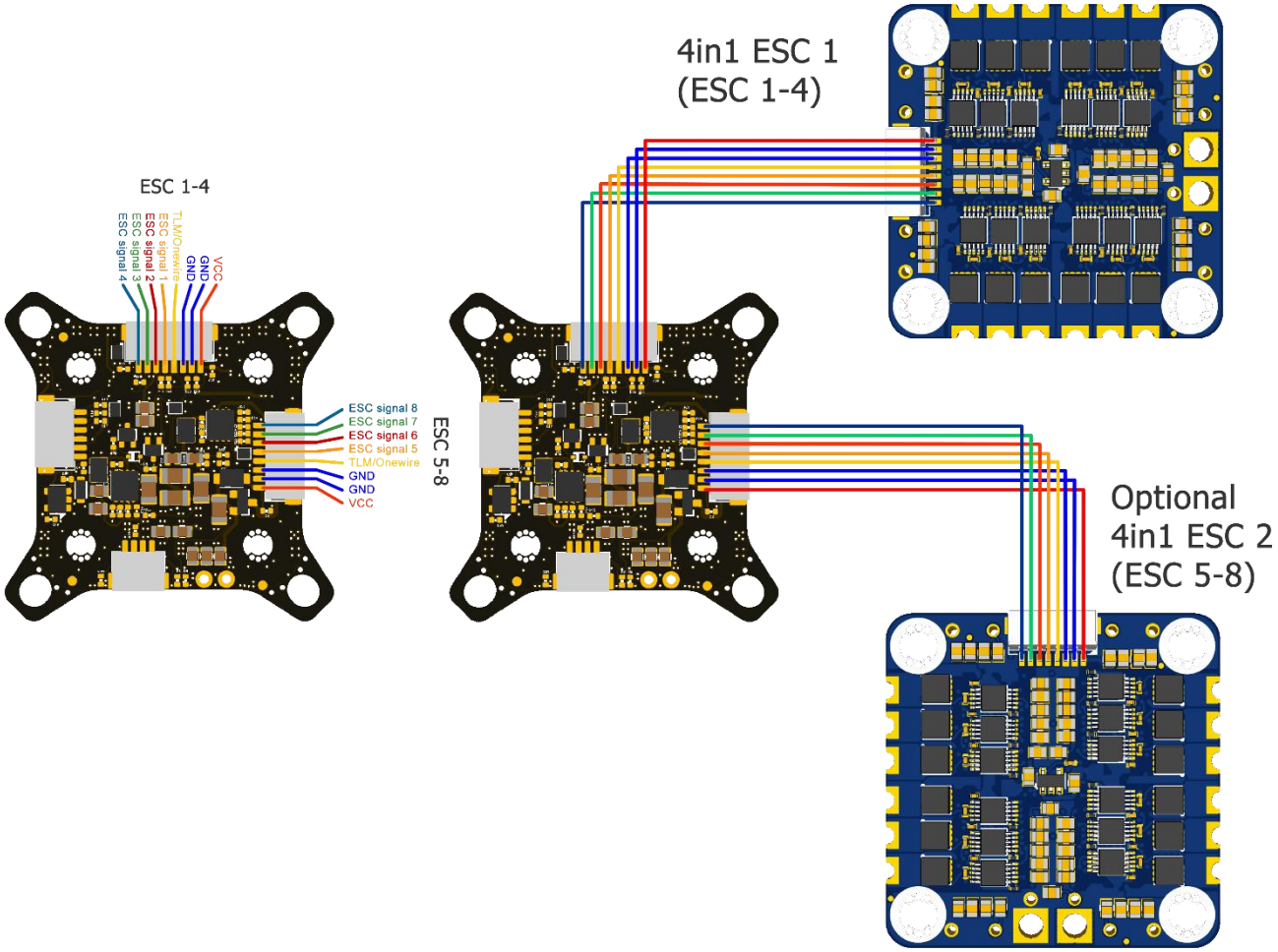
ESC connection diagram

ESC connection via 8 pin connector

For easy ESC connection via 8 pin cable

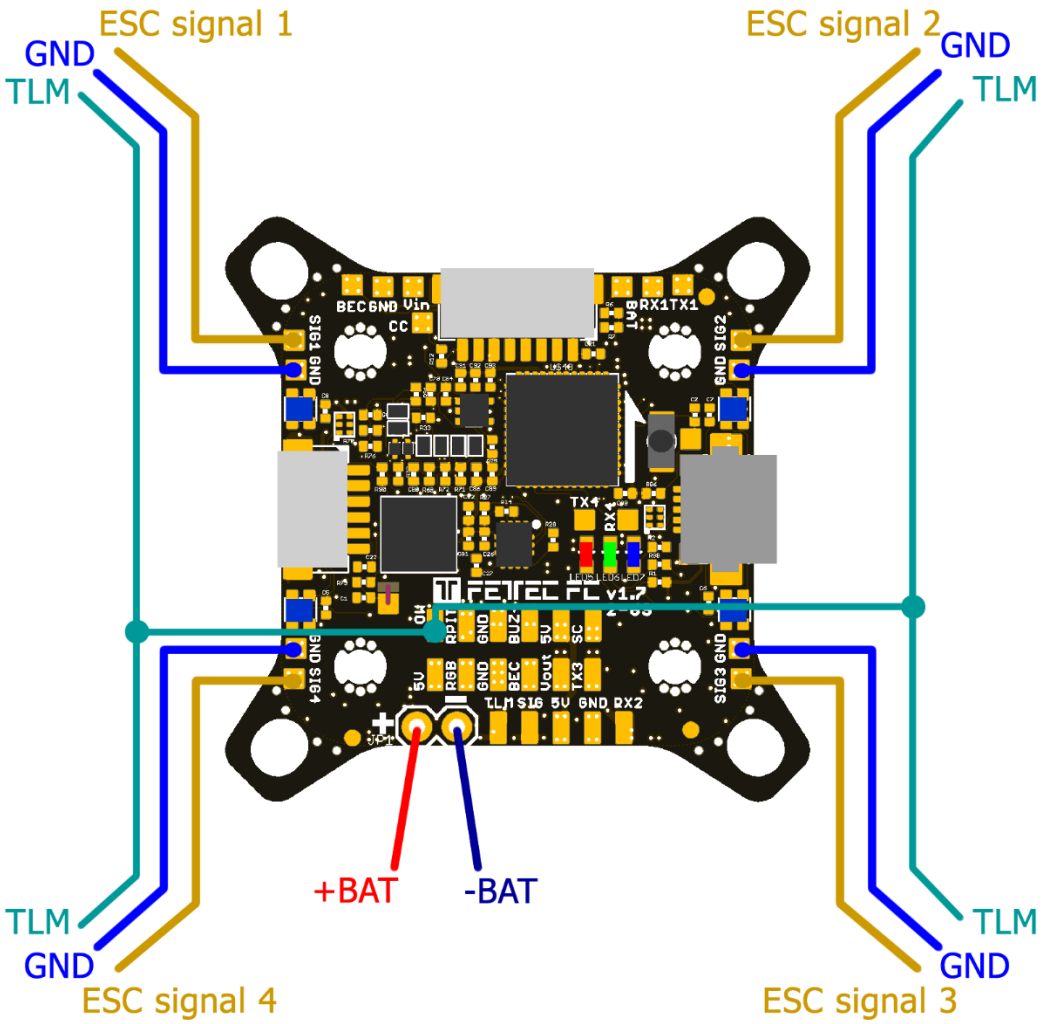
FETtec FC G4 v1.7 to FETtec 4in1 ESC 45A (same for FETtec 4in1 ESC 35A), cable included with FETtec ESCs.

Any other ESC is usable (please make sure the signal pinout is correct, otherwise change accordingly



Single ESC connection diagram

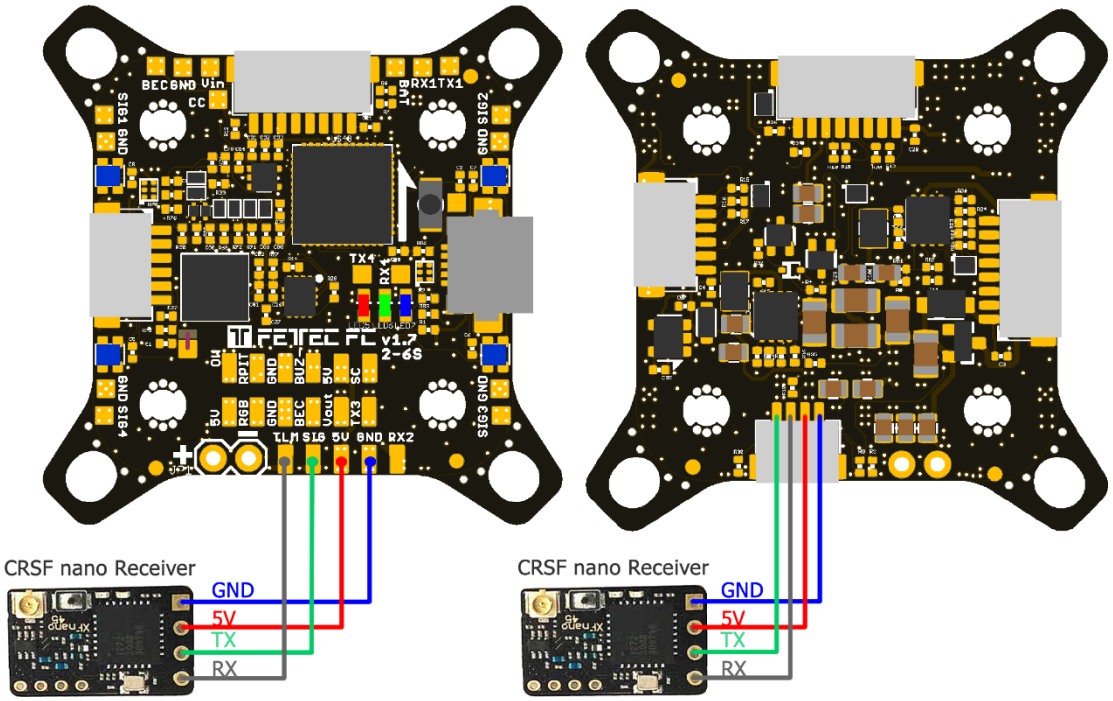
The FETtec FC G4 v1.7 provides 4 ESC signal pads for solder connection of single ESCs



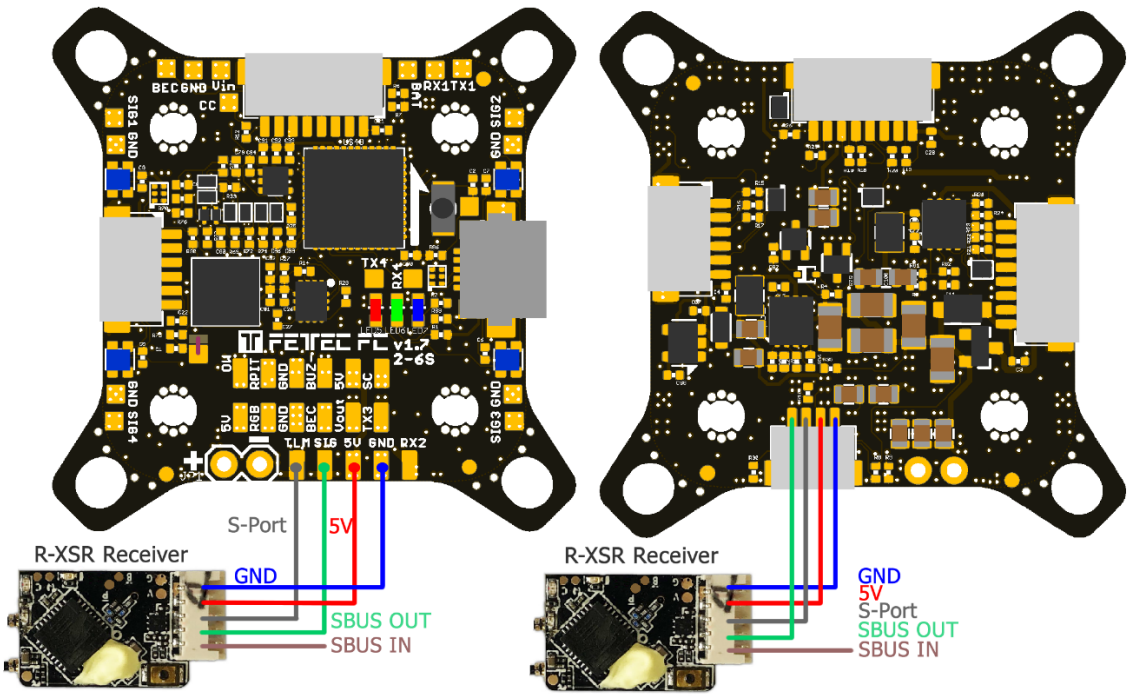
Receiver connection diagram

Receivers can be connected via receiver connector (on bottom side of FC) or receiver solder pads (on top side of FC)

TBS Crossfire

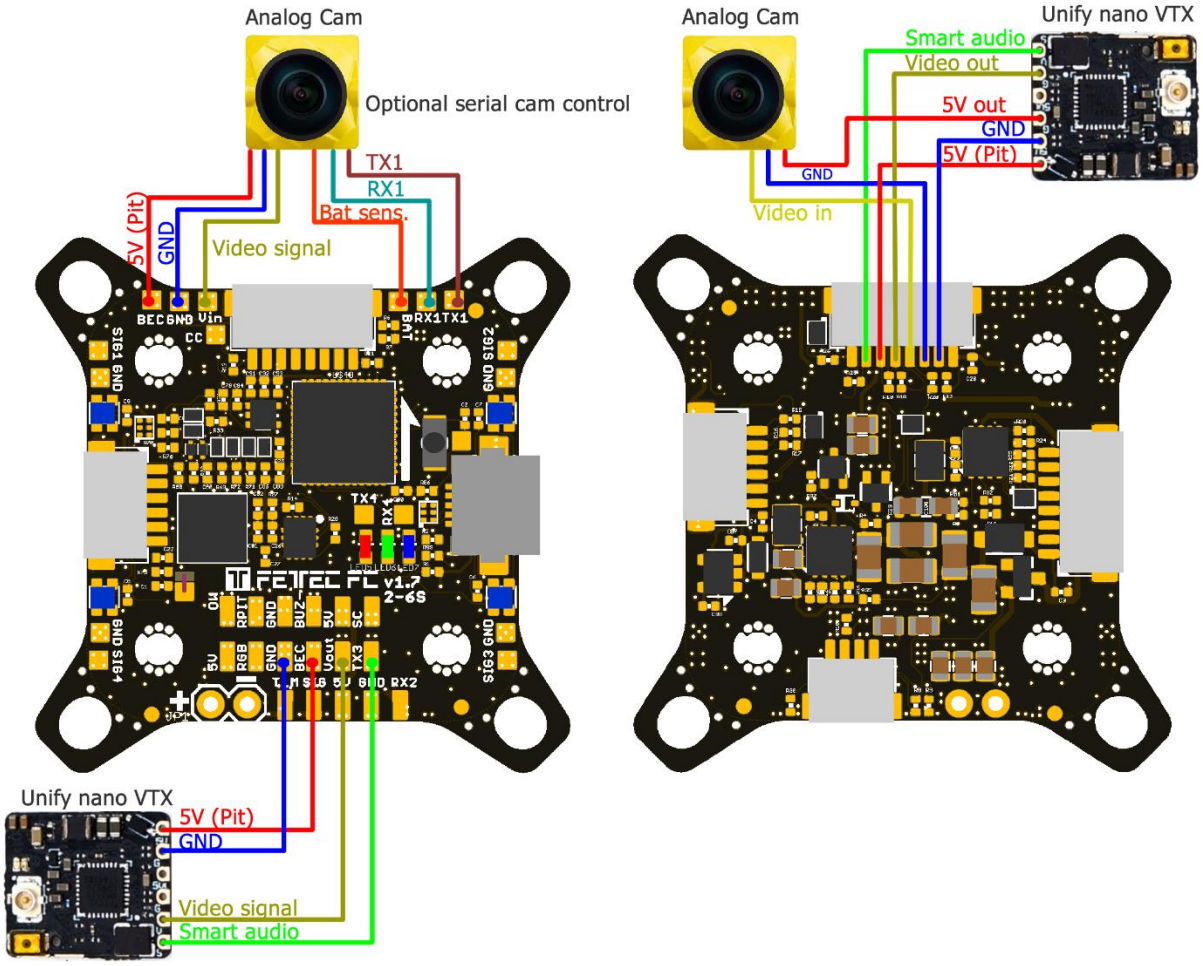


SBUS receiver / FrSky R-XSR



Analog FPV connection diagram

VTX and cam can be connected via FPV connector (on top side of FC) or FPV solder pads (on top side of FC)

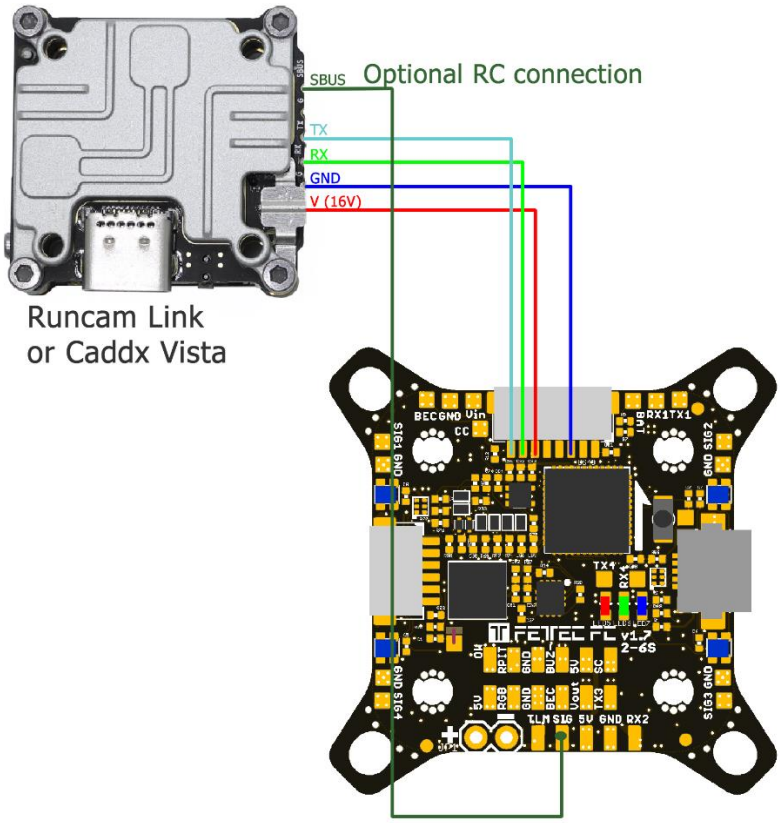


Note: RX and TX connection is only used for cameras which support serial connection

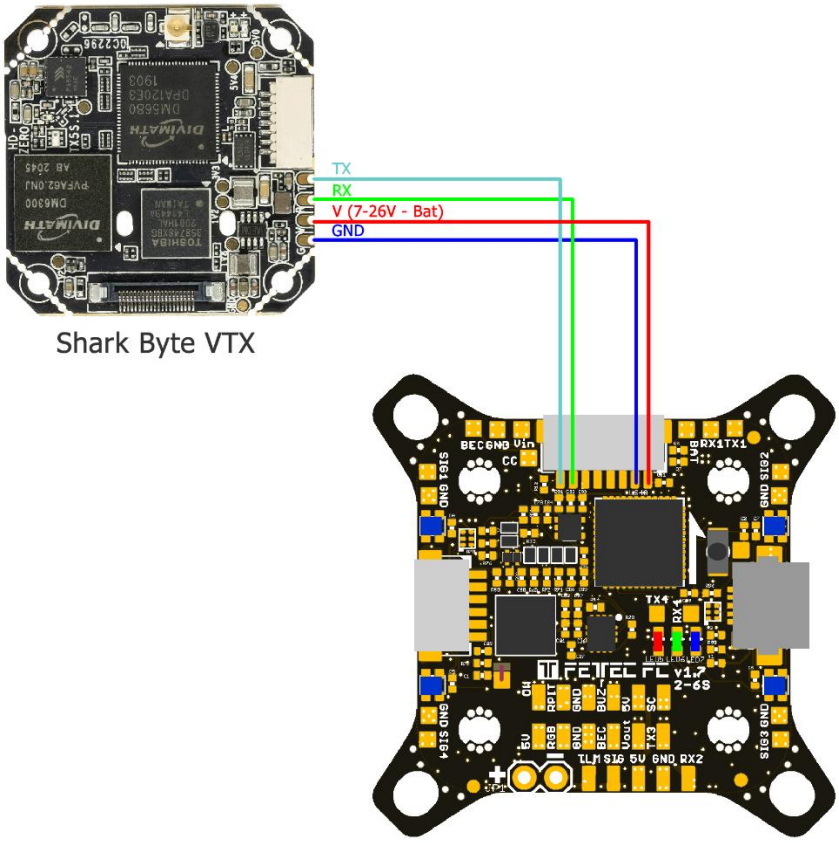
Digital FPV connection diagram

Choose MSP Port on serial 3 in the FETtec ALPHA Configurator → Settings → FC setup → Serial or KISS GUI

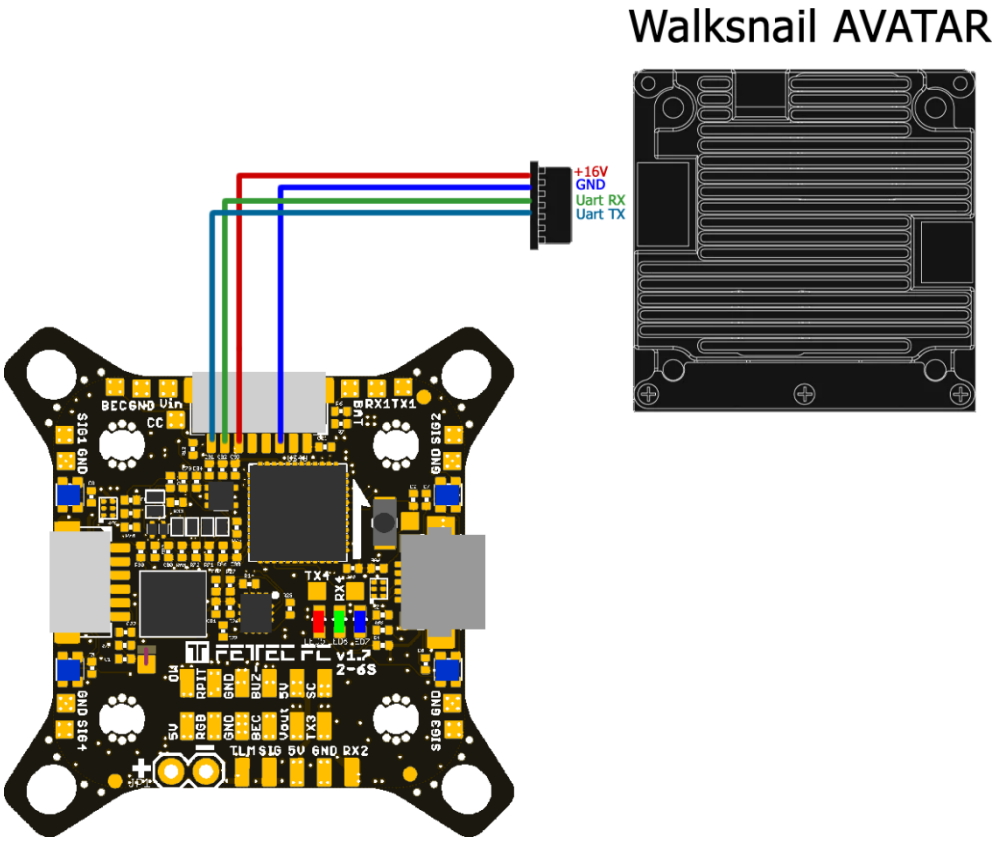
DJI/Caddx/Runcam Vista FPV system



Fatshark Shark Byte system



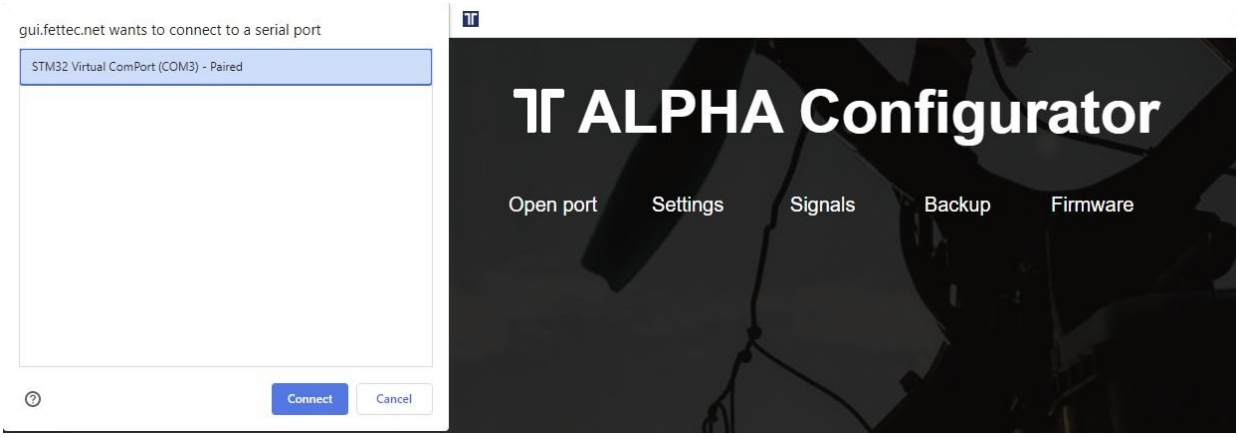
Caddx Walksnail



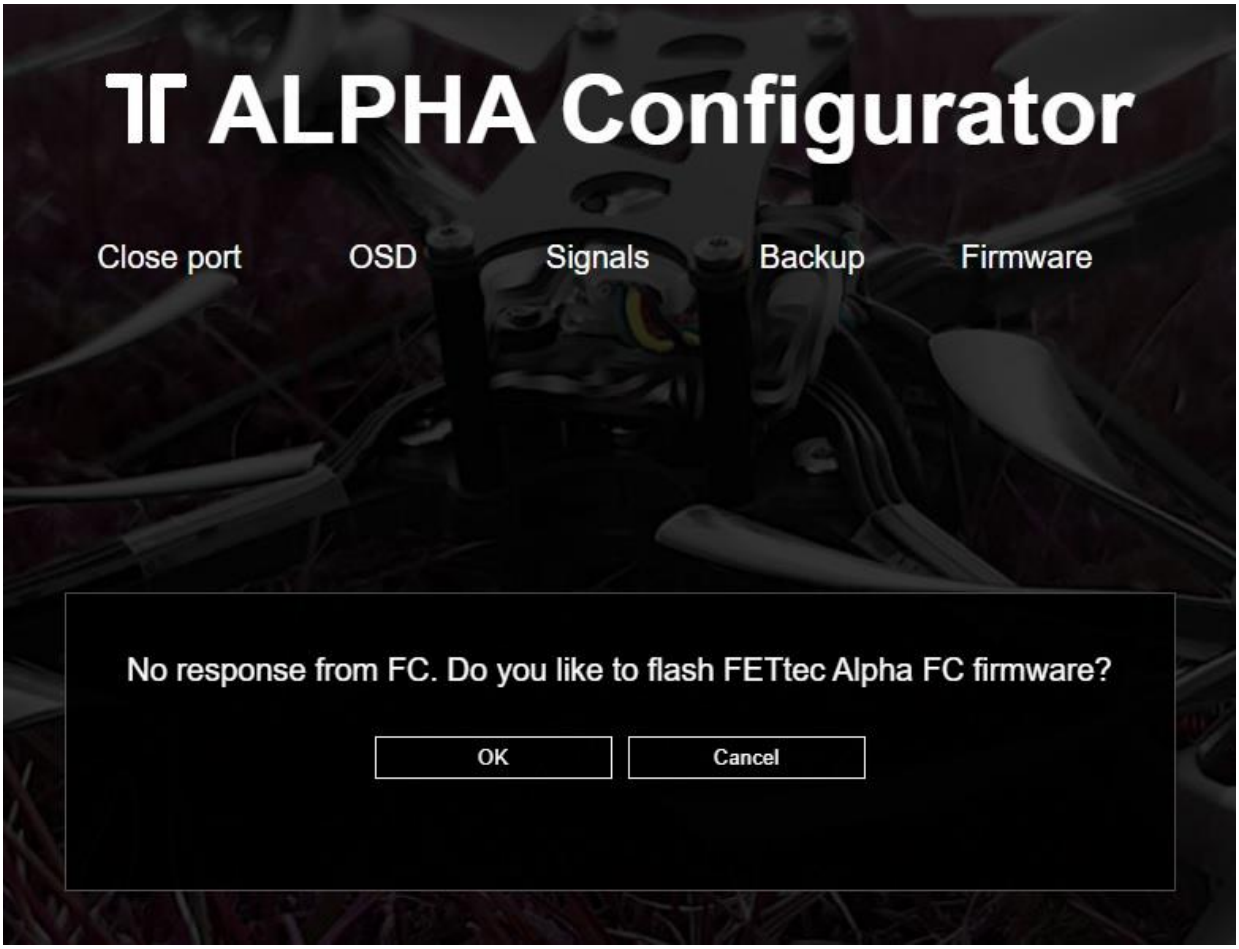
FC configuration

The FETtec FC G4 v1.7 is preflashed with FETtec Alpha FC firmware.

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.

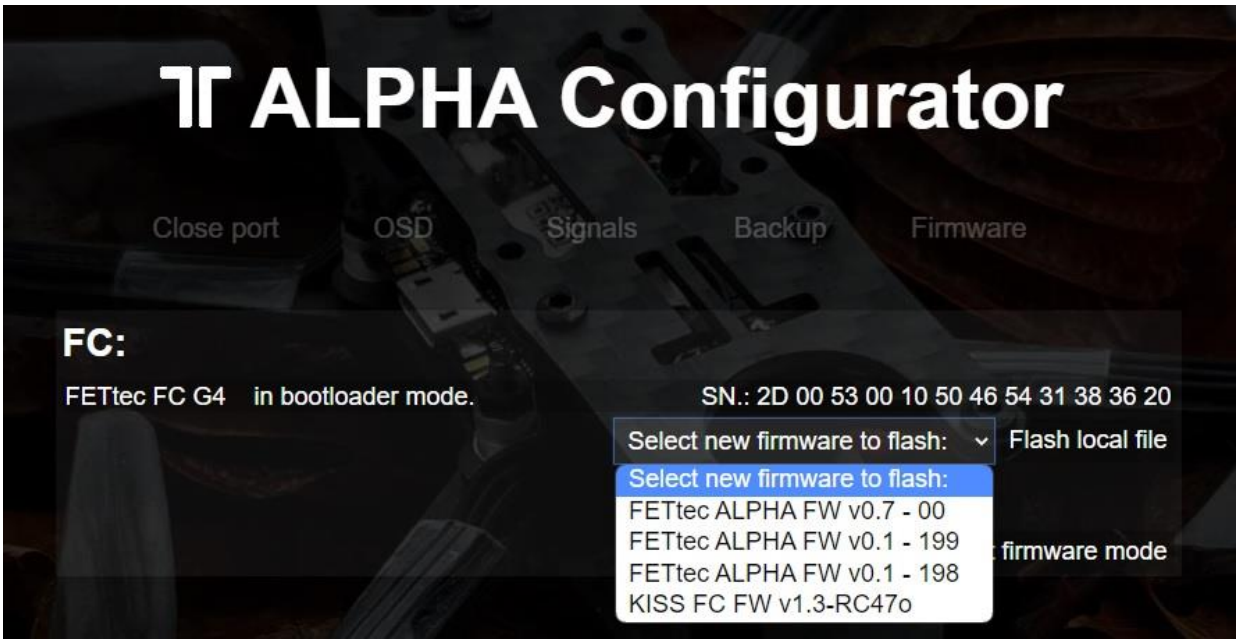


4. If you have KISS FC firmware running on your FC, you will get a warning if you want to flash FETtec Alpha FC firmware. Press “OK”

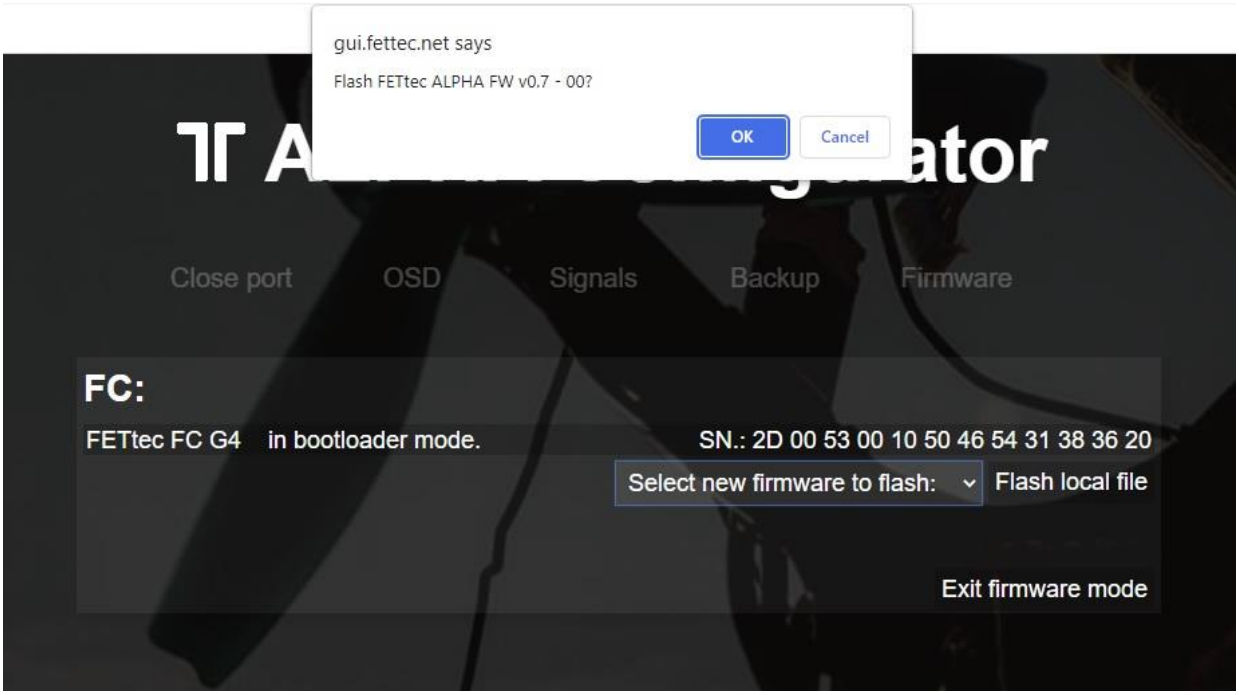


Select serial port again

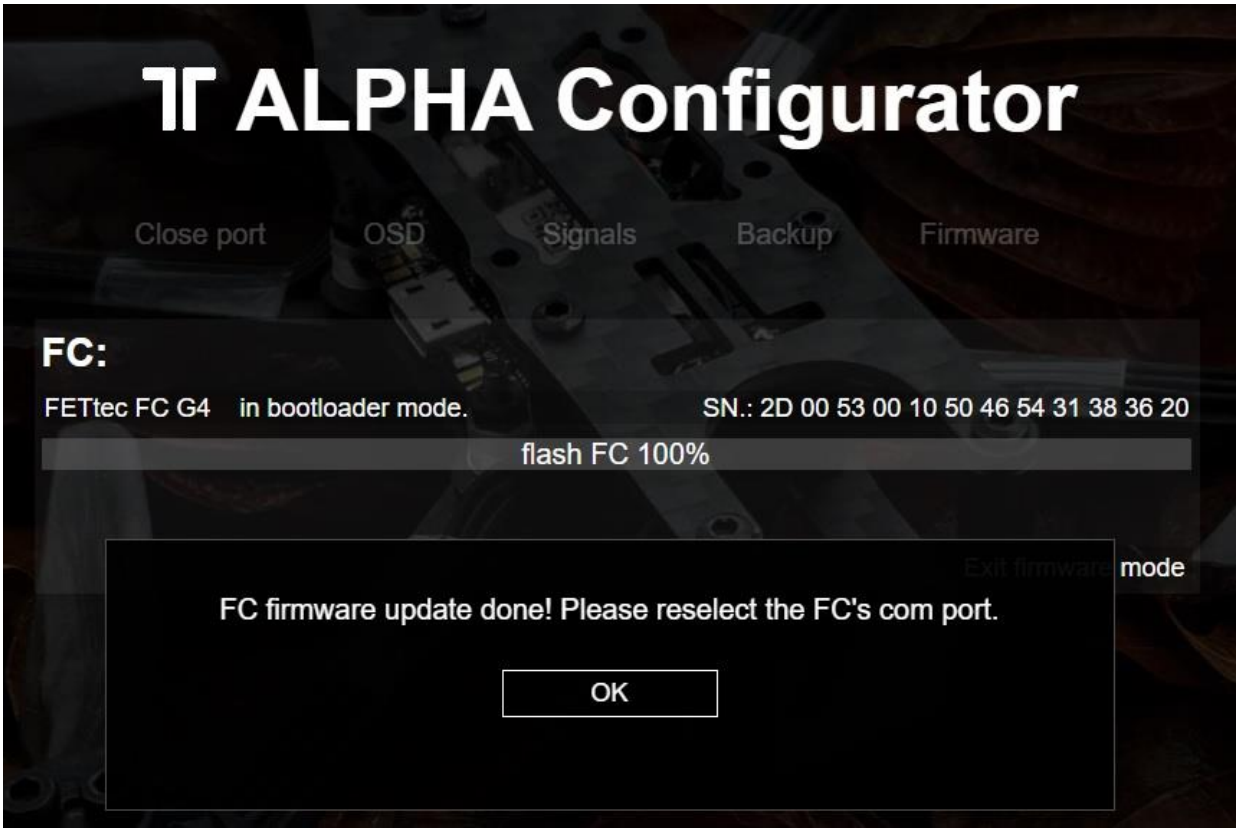
5. “Select new firmware to flash”.
   We always recommend flashing the latest available firmware.



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.

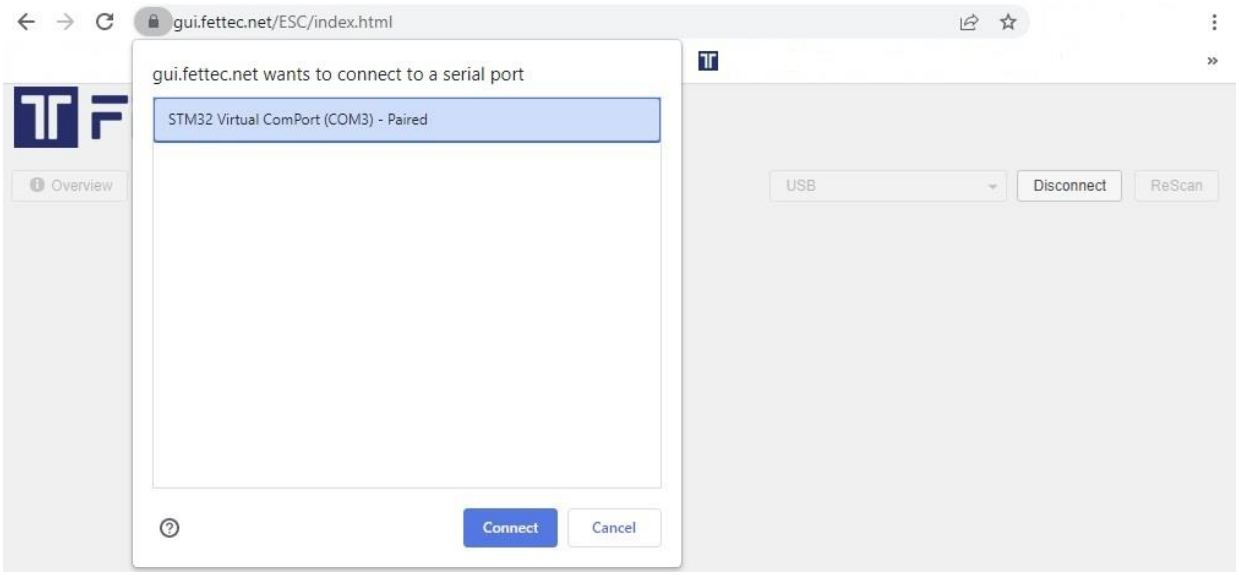
Please connect everything like described in the manual of the FC.

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

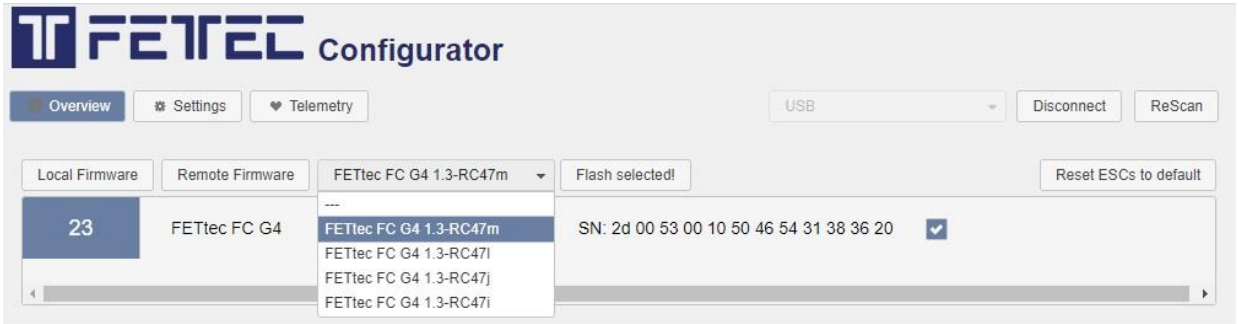
Get back to KISS

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

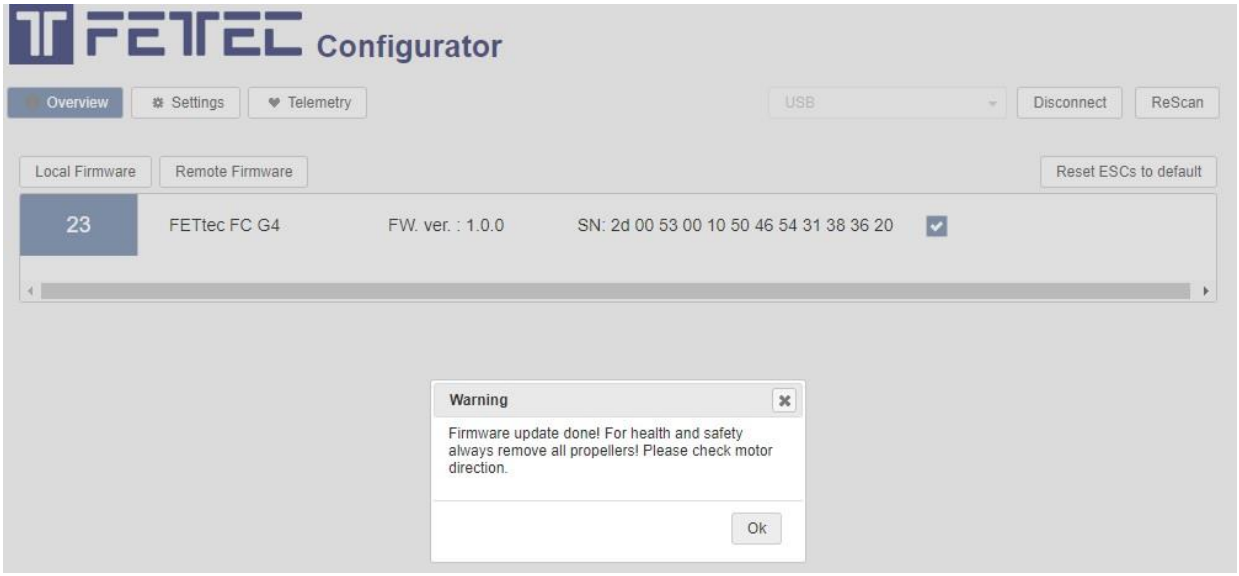
1. Open FETtec Toolset https://gui.fettec.net/
2. Connect the FETtec FC via USB.
3. Press the reset button once
4. Open the FETtec **ESC** Configurator and select “USB” and connect.
5. Choose the serial port on which the FC shows up and press connect.



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!”



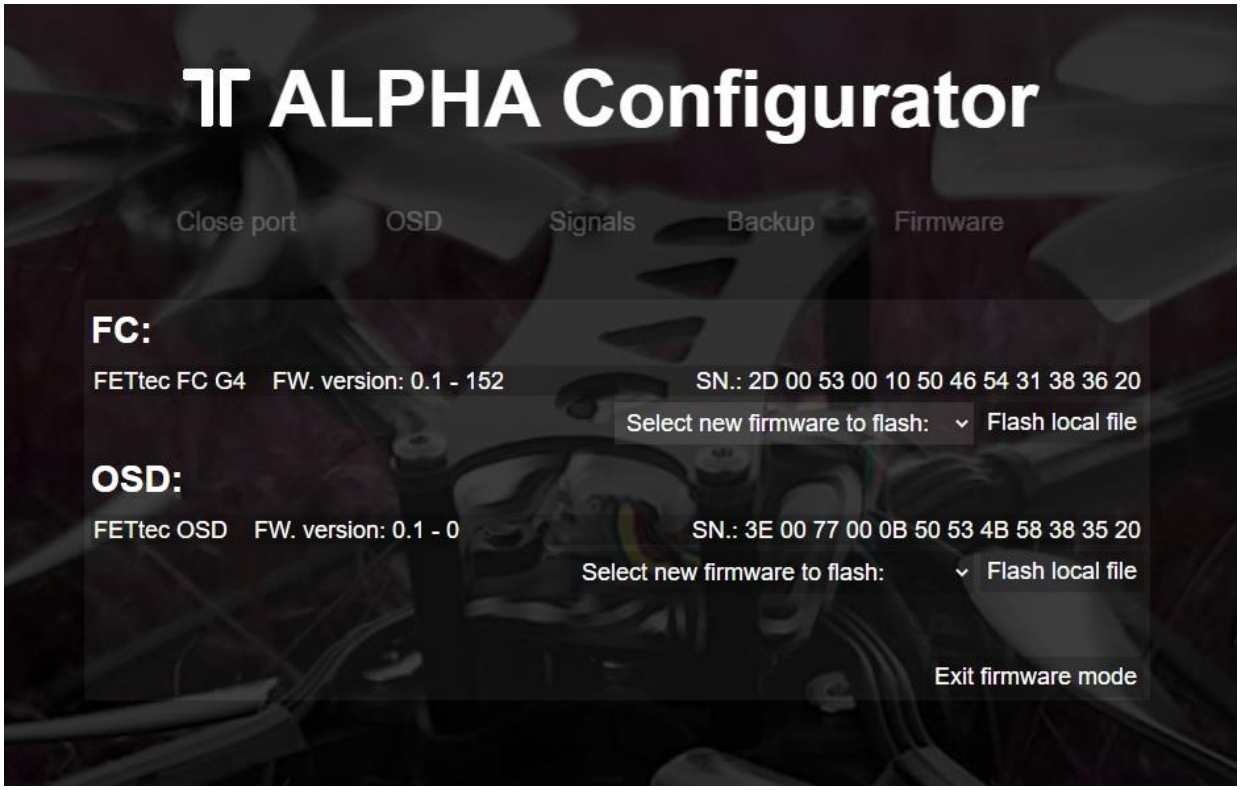
7. Flashing to KISS FC firmware done.



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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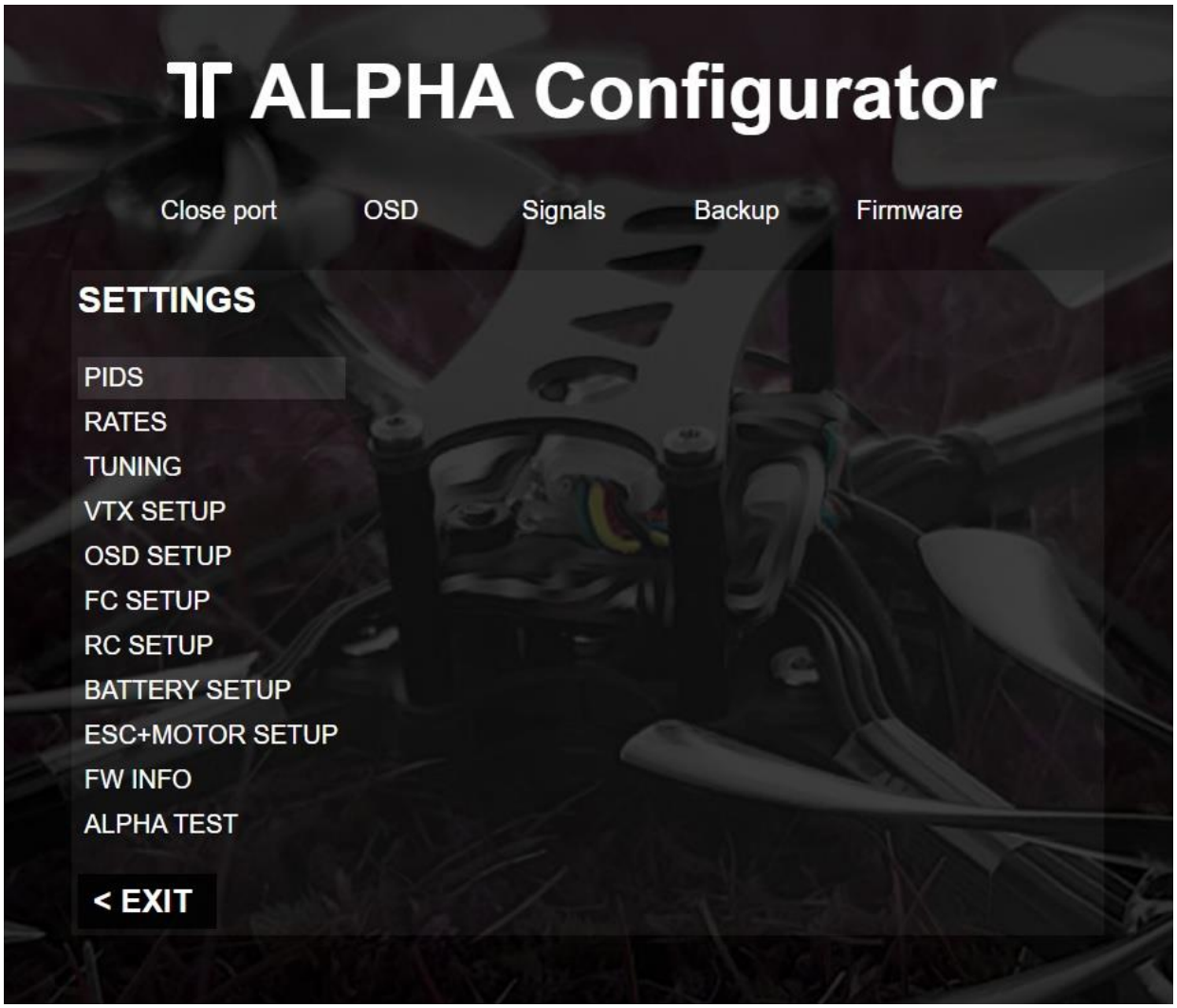


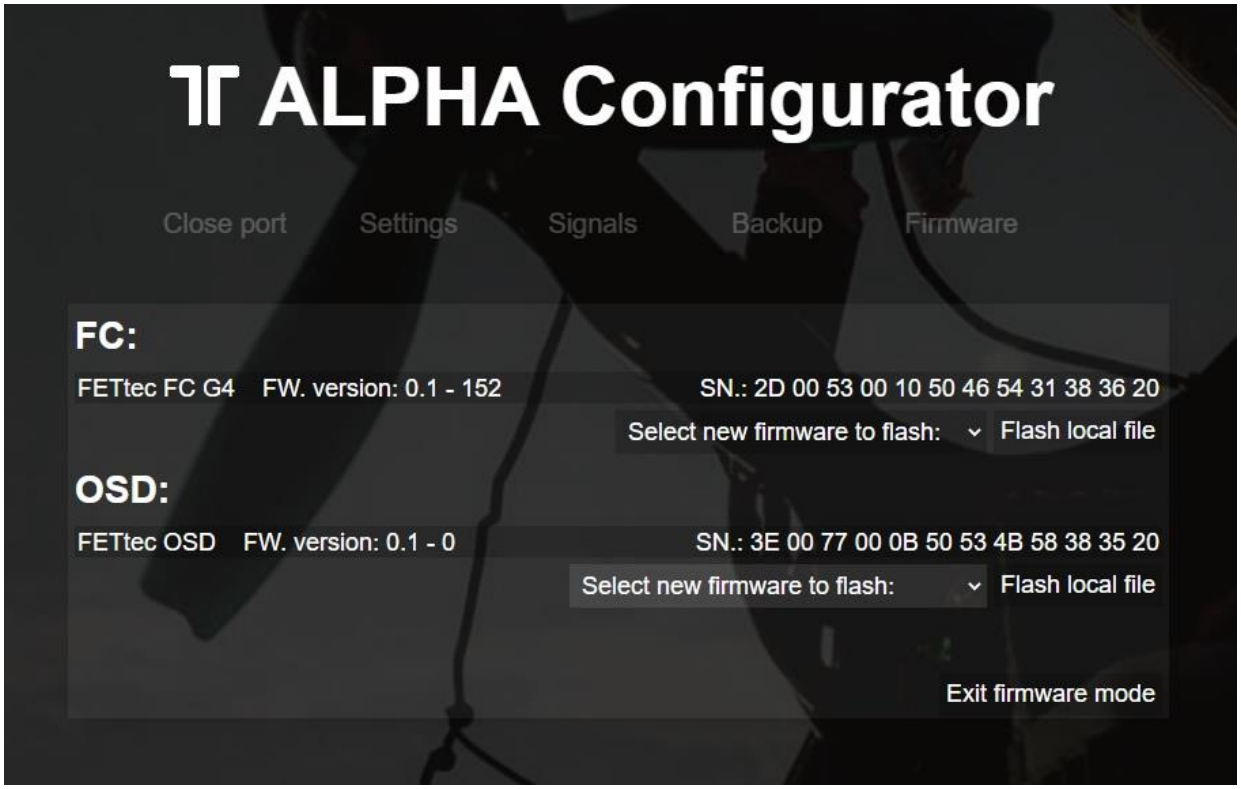
All functions are explained in the respective category.

For more information and help use the FETtec Alpha FC firmware manual available at www.fettec.net/download

OSD

Update

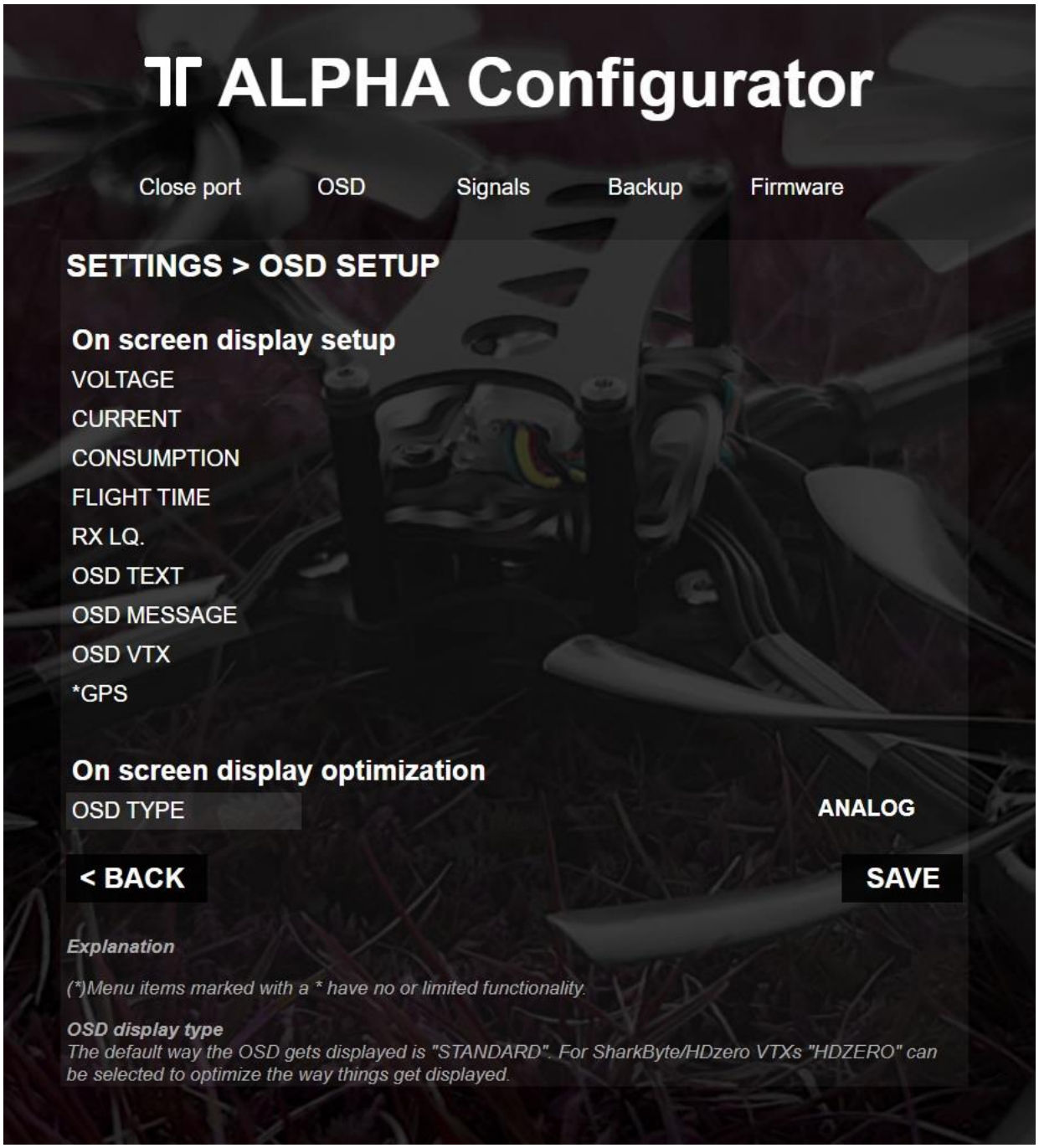
To update the FETtec OSD connect FETtec FC G4 v1.7 to ALPHA Configurator and flash via “Firmware” the latest update.



Settings

In the ALPHA Configurator

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

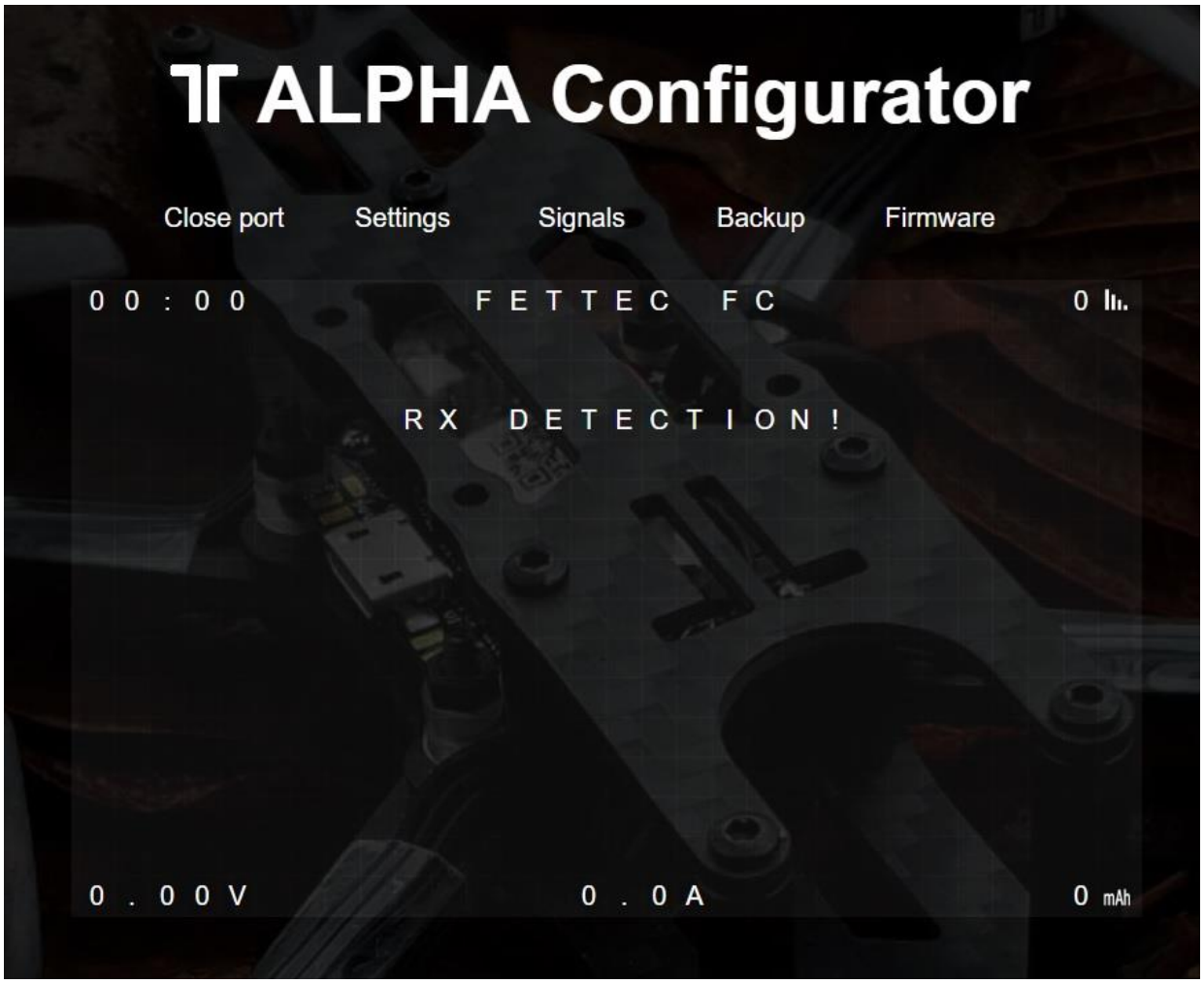


All parts of the OSD can be enabled/disabled and selected in their position.

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”

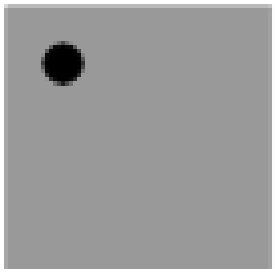
Here you can get an overview of how the selected settings look in the OSD

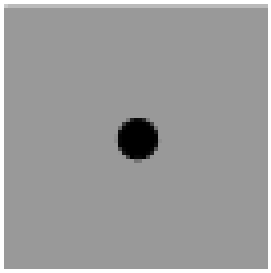


In the OSD menu

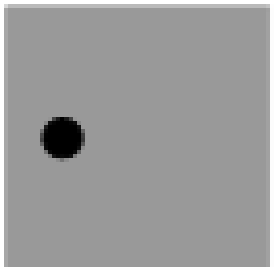
All settings can also be set up directly in the OSD menu through the goggles.
To get in the menu move the sticks in the shown direction at the start:
Throttle 50%, then move Yaw left, Pitch up

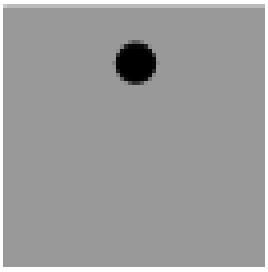
Mode 1:





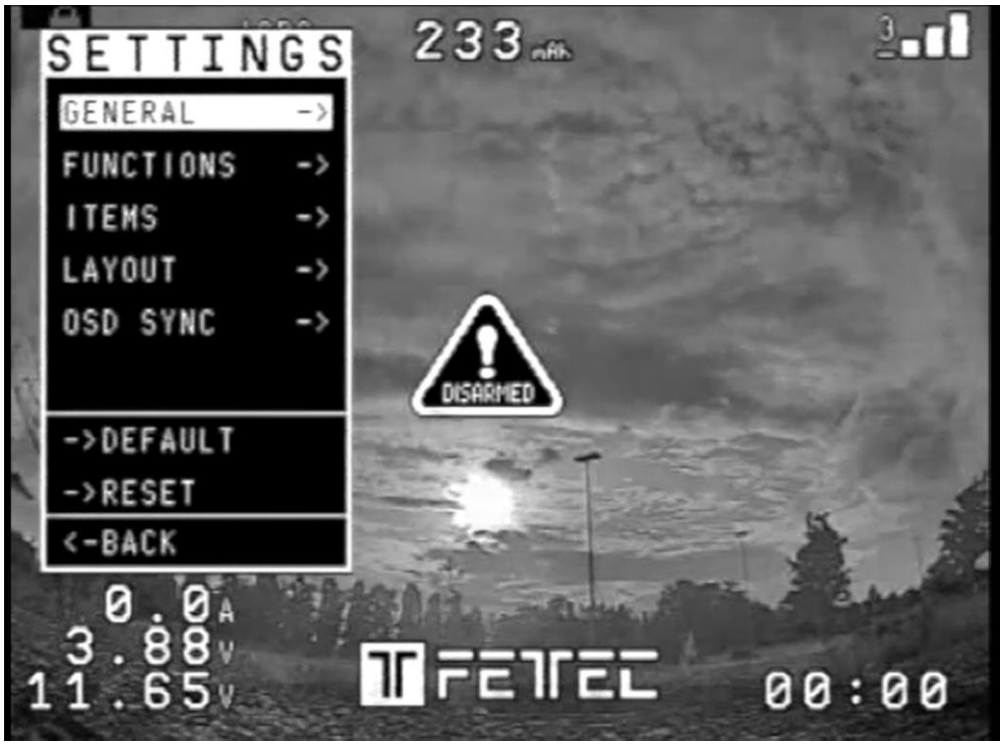
Mode 2:





In the menu:

OSD settings:



Issues in the picture

1. OSD SYNC → AUTO SYNC
2. in case of unsharp lines play with LEFT/WITH values try to avoid WITH values above 400
3. make a PAL/NTSC layout reset

Move elements in the OSD menu

Choose LAYOUT → SET POSITIONS in the SETTINGS.
Now the elements are movable along the grid.
Skip between the elements and select them to set new position.

To exit the ´move menu´ hold stick Yaw left for a few seconds

Display connection

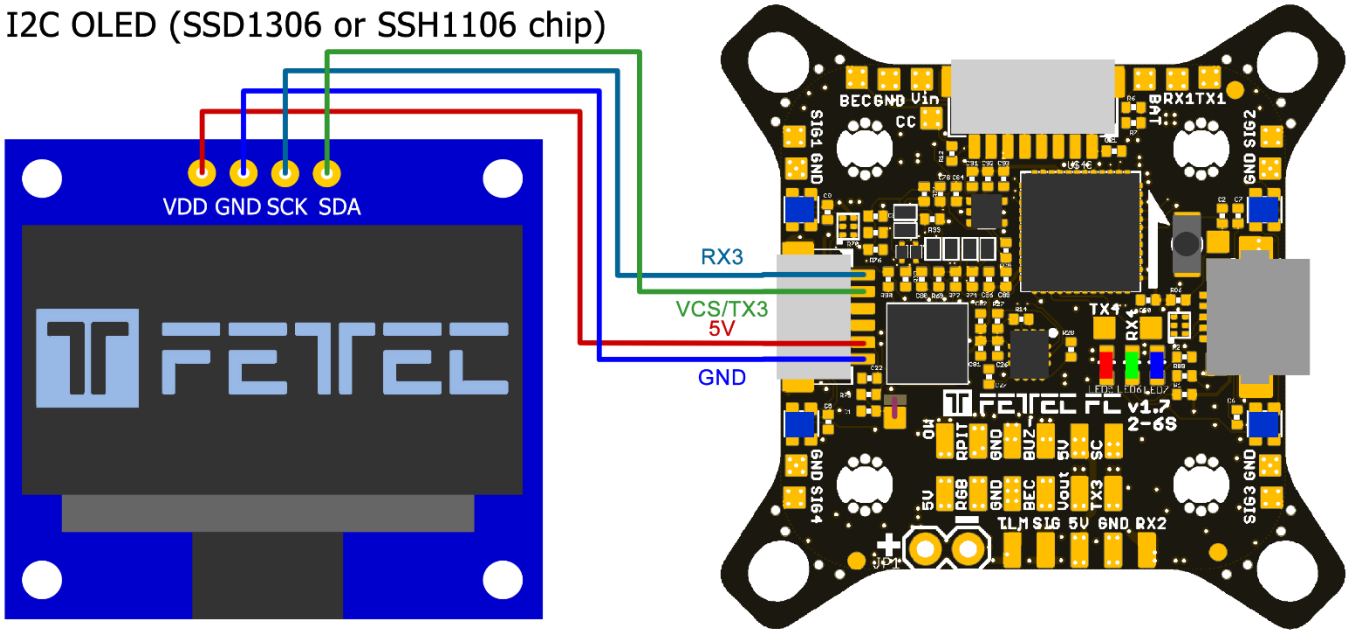
I2C O-LED to FETtec FC G4

I2C O-LED display can be used to show the OSD menu and telemetry in order to be able to set up settings without computer or FPV goggles (FPV OSD).

The I2C connection will block serial 3 which is mostly used for digital OSD or analog VTX control (VCS).

The O-LED must be connected on power up to initialize but can be unplugged after set up is done.

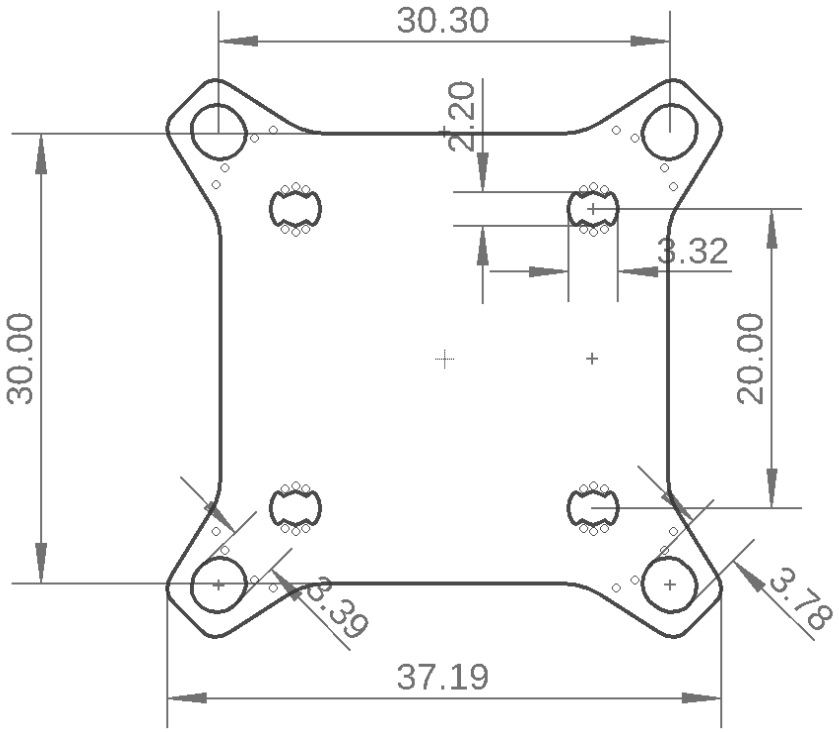
Supported display types:



Required resolution 128 x 64px

We recommend the 1,3” (SSH1106) version as the text size will be very small on the 0,96” (SSD1306) display.

Dimensions



Maximum outside dimensions: 37,2 x 37,2mm, without outside tips 30 x 30mm
Mounting hole arrangement:

- 20 x 20mm with M2 mounting hole (expandable to M3)
- 30 x 30mm with M3 mounting hole
- 30 x 30mm mounting hole tips are removable to reduce overall FC size

Overall height: 7,9mm
Highest part on each PCB side: 3,2mm

Weight: 5,37g