FORTINI F4

Flight Controller

USER MANUAL VERSION 1.2

Please contact us if you need further assistance:
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Website: http://furiousfpv.com/

Contents

Change Log

v1.1

- Add guideline configuration OSD with TRUE VISION CONFIGURATOR V1.0
- New OSD Menu Index
- How to set up CMS CANVAS mode on Betaflight
- Change information in diagrams

v1.2

- Add Tips setup Fortini F4 with Damper
- Connect with Lightning PDB
- Assambly with ESC 4 in 1
- Connect with TBS Crossfire micro receiver v2

Introduction

After a full year of study & experience with the Radiance & KOMBINI Flight Controllers, we've gathered every aspect of customer feedback in an ultimate effort to produce the single most cutting edge Flight Controller the FPV market has ever seen. Hold on - you don't want to miss this.

Enter the all new Fortini F4 - the culmination of years of research and application as we push forward into the outer limits of FPV. With a new high performance, low noise 32kHz Invensense 20602 gyro that features ultra-high sensitivity, this FC is designed for outright performance, offering ultra-crisp flight characteristics that will be felt in every move you make. Want more? Don't worry - just look below.

With a massive array of (5) UARTS, the Fortini F4 allows simultaneous connection of SBUS, S.PORT, OSD, USB and either a TBS Smart Audio System or Immersion RC Tramp. Furthering this, the Fortini F4 is the very first Flight Controller that offers built in input & output Inrush Voltage Protection to protect the BEC and other electronic components in the case of extreme voltage spikes.

Soft mounted for the ultimate in vibration protection, the Fortini F4 features 16MB of integrated flash memory, allowing BlackBox functionality to review all data after your flight. The Fortini F4 is also the very first FC to allow S.PORT direct connection with the receiver without any aspect of receiver modification.

The Fortini F4 is the full up package, breaking new ground in true FC brilliance. Toss compromise out the window and open your FPV world to the most functional and feature packed FC you have ever seen before.

Features

- Invensense 20602 gyro for high speed 32khz, lowest noise floor and highest sensitivity

- Separate power supply for gyro with LDO low noise and high accuracy

- Gyro located as close as possible to the center

- Integrated vibration dampening dummies

- Built in driver inverter for S-BUS

- Built in driver inverter for Smartport connection directly to FC

- MCU: STM32F405

- Voltage and current ADC pins, for full voltage and current monitoring

- 16MB of flash memory Blackbox

- 5x Serial UARTs for USB, OSD, SMART AUDIO or TRAMP, SPORT, SBUS

- RX powered via USB
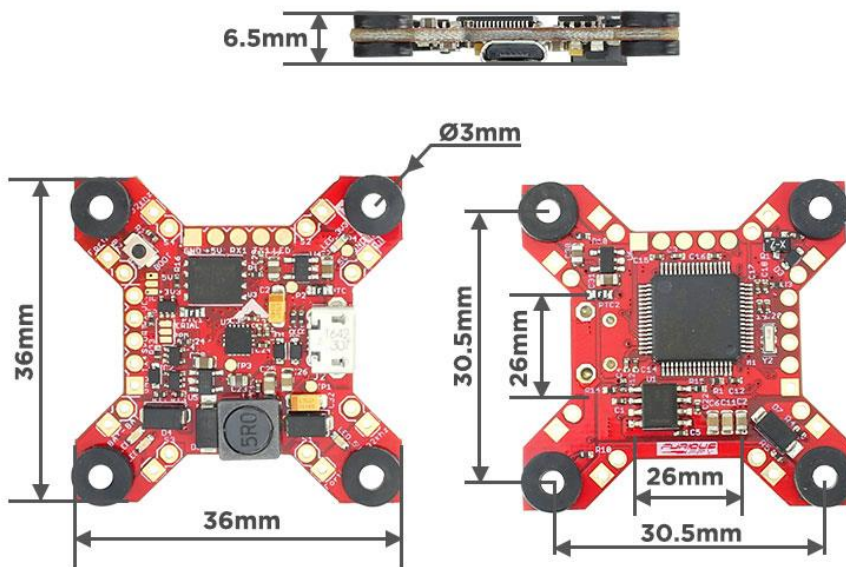
- Selectable 3.3V or 5V for RX
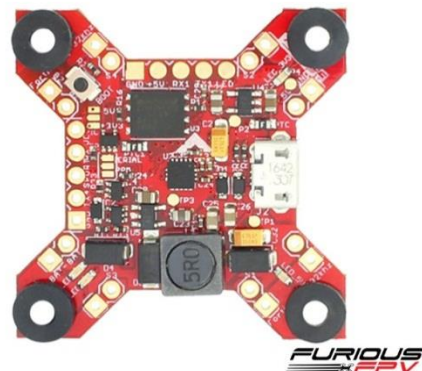
- LED Driver for WS2812b programmable LED

- Integrated buzzer driver

- Built-in BEC 5V-2A supports direct 2-6S Lipo connection

- Inrush Voltage Protection Input and Output by Transient Voltage SuppressorBoard Layout

- Weight: 5.5gr
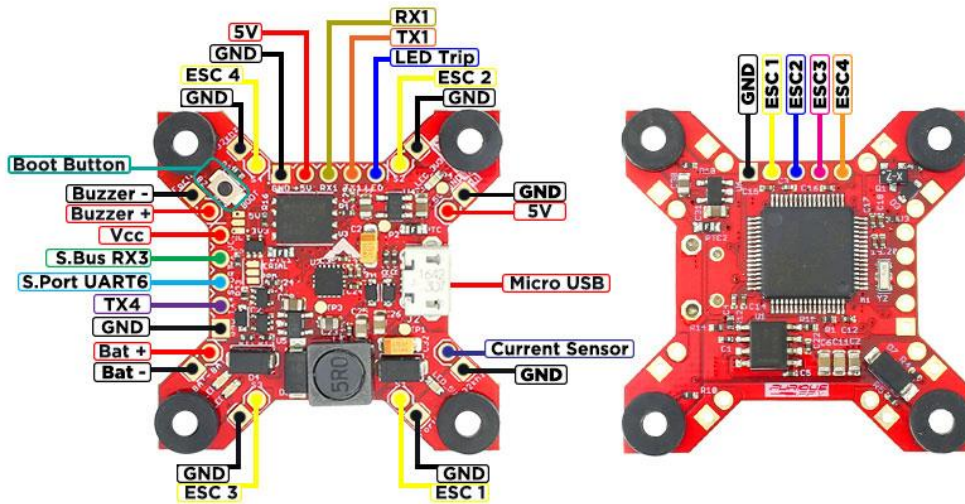
FORTINI F4
PINOUT information

Dimensions

Connections

*WARNING: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.
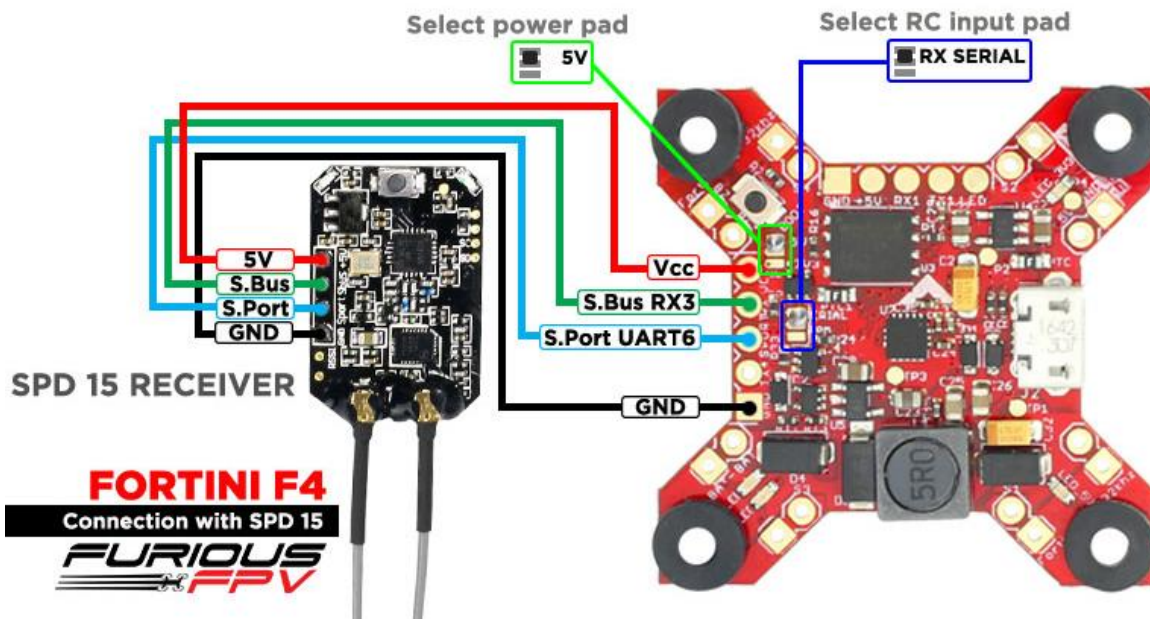
Connect with Receiver:

❖ Using SPD15 Receiver:

> * NOTE: If you are using S.Port with firmware 3.1.7, please enter CLI mode and type the following commands:
>
> set sport_halfduplex = OFF
> save

You can buy SPD15 Receiver right here: https://goo.gl/FTnrpR

❖ Using LR1000D Receiver:

You can buy LR1000D Receiver right here: *https://goo.gl/4Cr0Hl*

* NOTE: If you use **LR1000D** Receiver please go to **CLI** and type the following commands:

set sbus_inversion = OFF

save

❖ Using XSR FrSky Receiver:

* NOTE: If you are using S.Port with firmware 3.1.7, please enter CLI mode and type the following commands:

set sport_halfduplex = OFF
save

Port Identifier	Configuration	Serial Rx	Telemetry Output		Sensor Input	
USB VCP	MSP 115200 ▾	Serial RX	Disabled ▾	AUTO ▾	Disabled ▾	AUTO ▾
UART1	MSP 115200 ▾	Serial RX	Disabled ▾	AUTO ▾	Disabled ▾	AUTO ▾
UART3	MSP 115200 ▾	Serial RX	Disabled ▾	AUTO ▾	Disabled ▾	AUTO ▾
UART4	MSP 115200 ▾	Serial RX	Disabled ▾	AUTO ▾	Disabled ▾	AUTO ▾
UART6	MSP 115200 ▾	Serial RX	SmartPort ▾	AUTO ▾	Disabled ▾	AUTO ▾
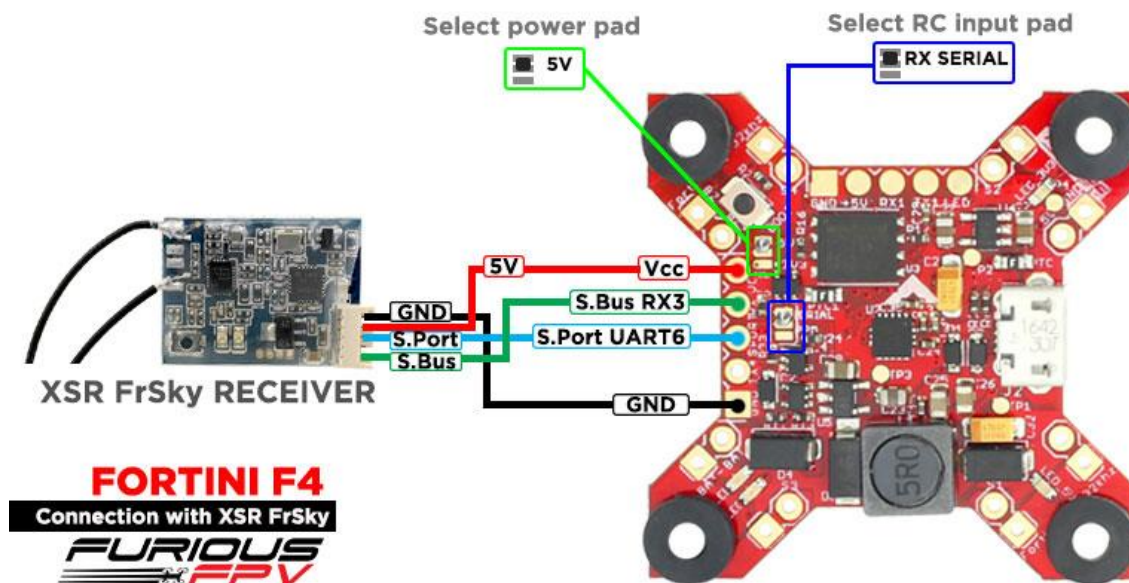
*NOTE: If **telemetry** of XSR is **not working** with FORTINI F4, please **update firmware** for XSR receiver
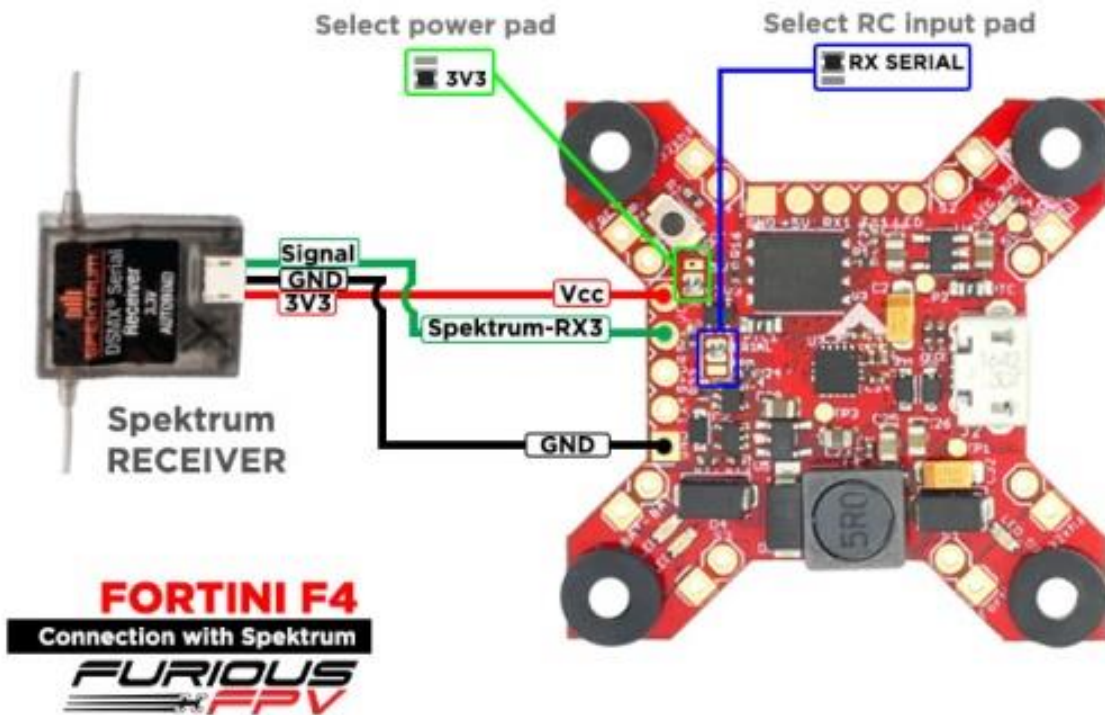
Download firmware at here: https://goo.gl/t1LMT5

❖ Using Spektrum Satellite Receiver:

NOTE: When use Spektrum Satellite for Fortini F4, you must use battery for FC's power

❖ **Using TBS Crossfire Receiver:**

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	🟠 115200 ▾	⚪	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾
UART1	⚪ 115200 ▾	🟠	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾
UART3	⚪ 115200 ▾	⚪	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾
UART4	⚪ 115200 ▾	⚪	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾
UART6	⚪ 115200 ▾	⚪	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾	Disabled ▾ AUTO ▾

Battery 2s-6s

FORTINI F4

Connection with TBS CROSSFIRE
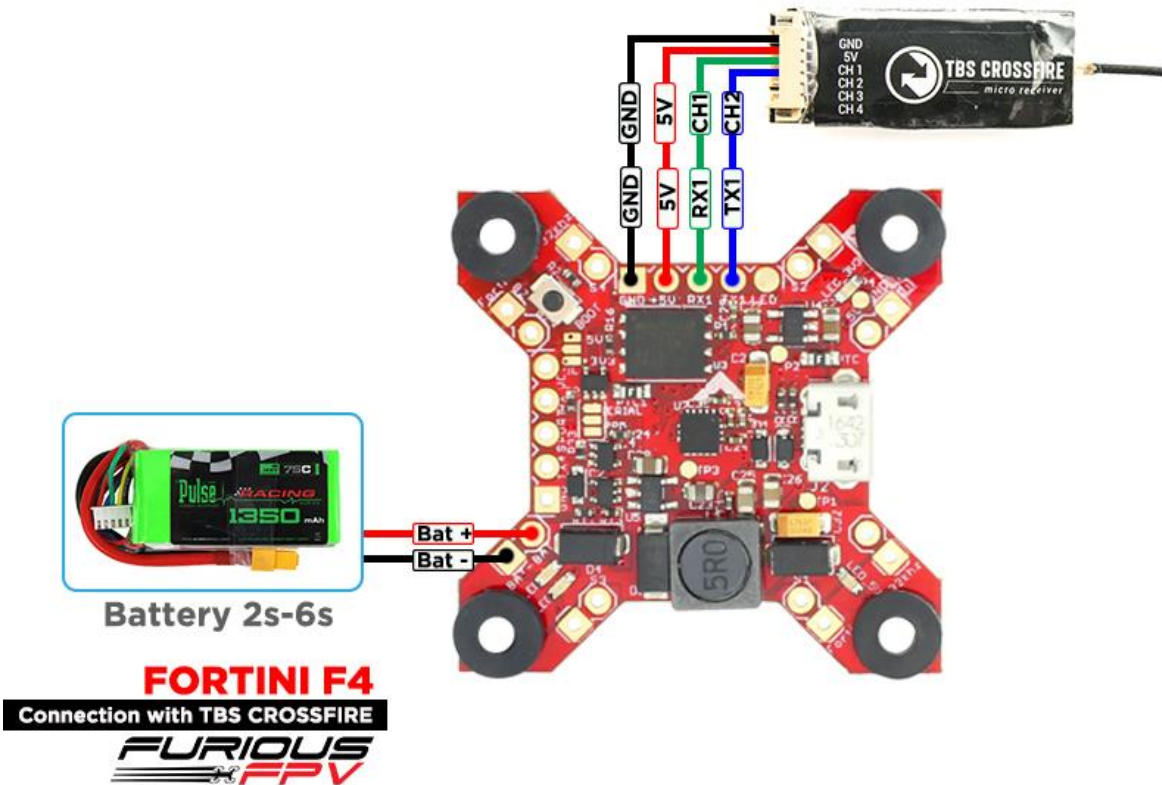
Receiver

Serial-based receiver (SPEKSAT, S ▾)   Receiver Mode

Note: Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX_SERIAL feature.

CRSF ▾   Serial Receiver Provider

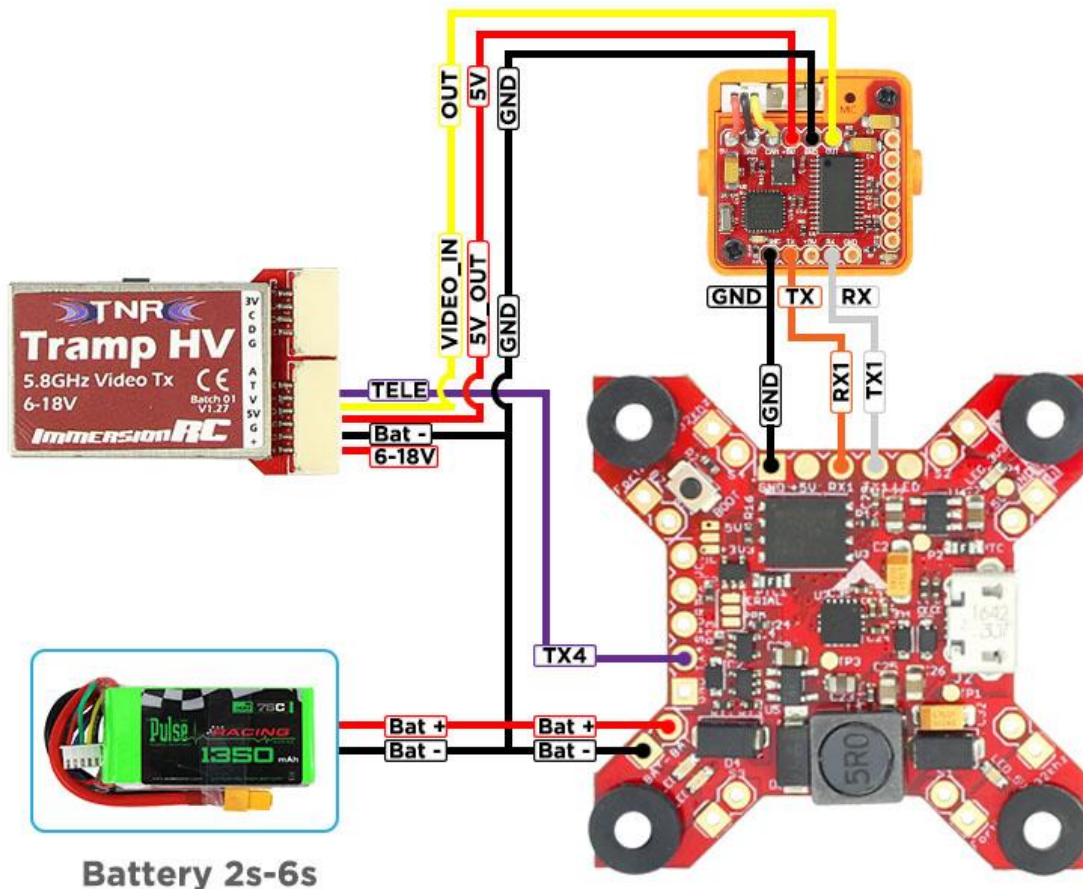## Connect with Video Transmitter:

❖ Using Tramp HV:

- **With Piggy V2 OSD**

<u>NOTE:</u> Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.

- **With Only Camera**

NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.

Battery 2s-6s

FORTINI F4
Connection with Tram HV

❖ Using TBS Unify Pro:

- ### With Piggy V2 OSD

NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.

FORTINI F4
Connection with TBS UNIFY PRO

- ## With Only Camera

NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.

FORTINI F4
Connection with TBS UNIFY PRO

❖ Using FX FX799T:

● With Piggy V2 OSD

*NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.

FORTINI F4
Connection with FX FX799T

- ## With Only Camera

*<u>NOTE:</u> Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.

Battery 2s-6s

FORTINI F4
Connection with FX FX799T

Connect with stack Mnova and Runcam:

* WARNING: Mnova is only compatible with 5V. Please solder only to 5V pad if using Mnova
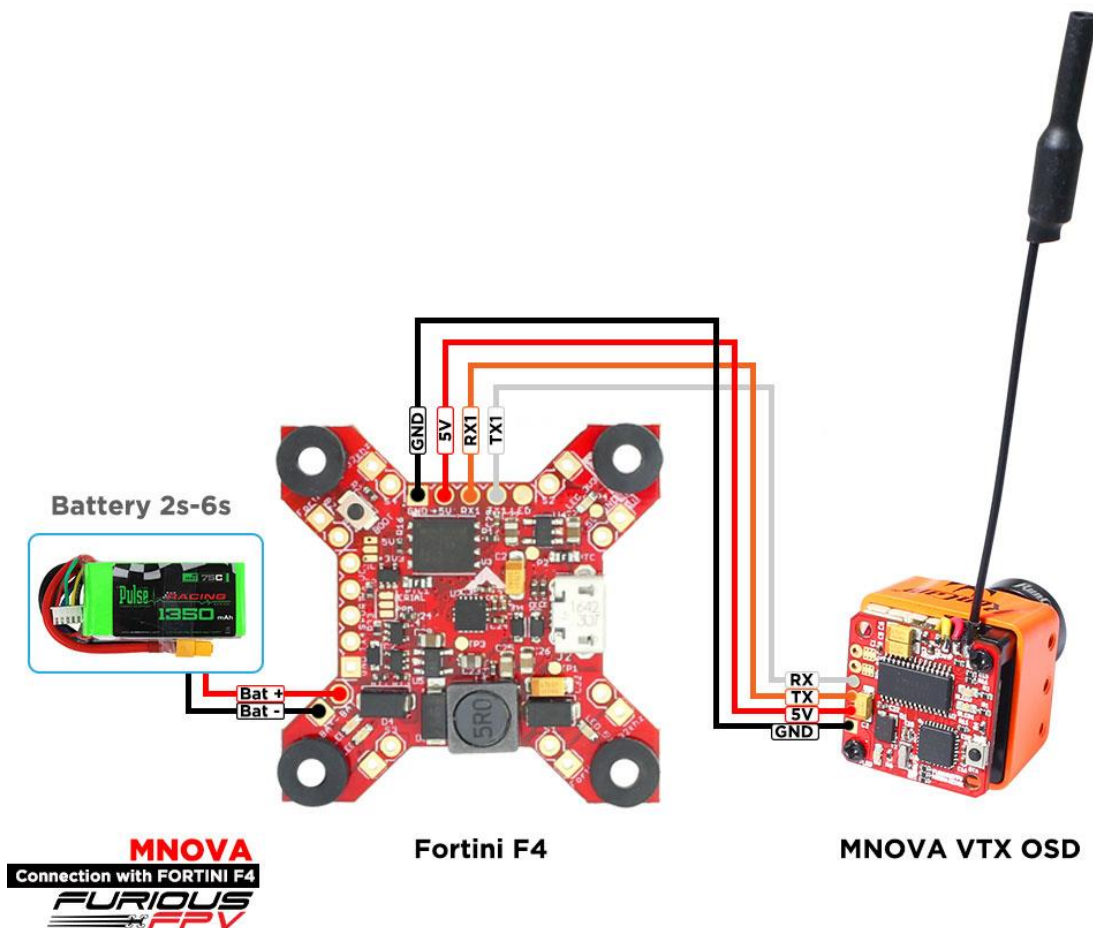
You can buy Mnova right here: https://goo.gl/JyQnds

Connect with Lightning PDB:
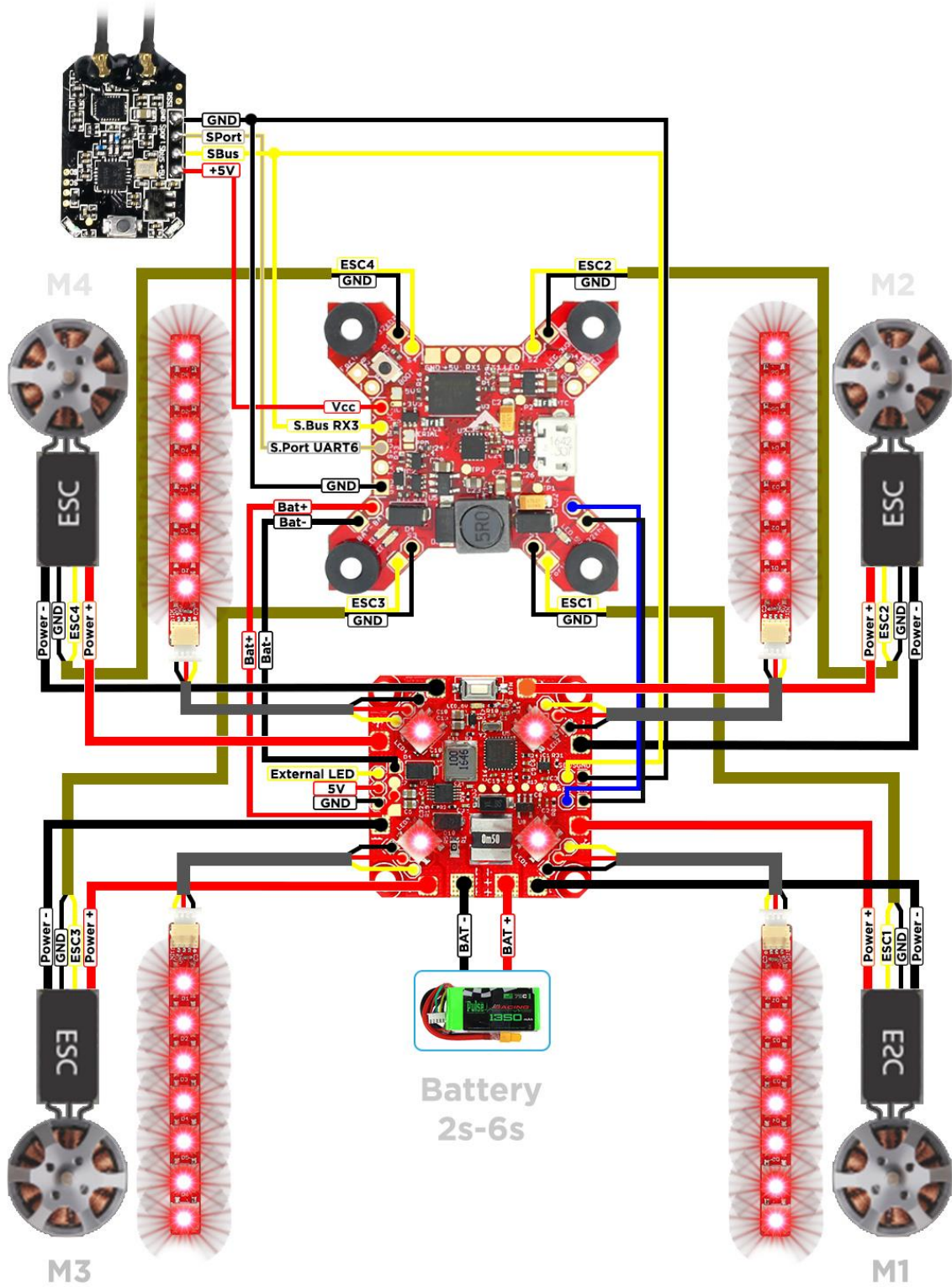
Connect with other devices:

*NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.
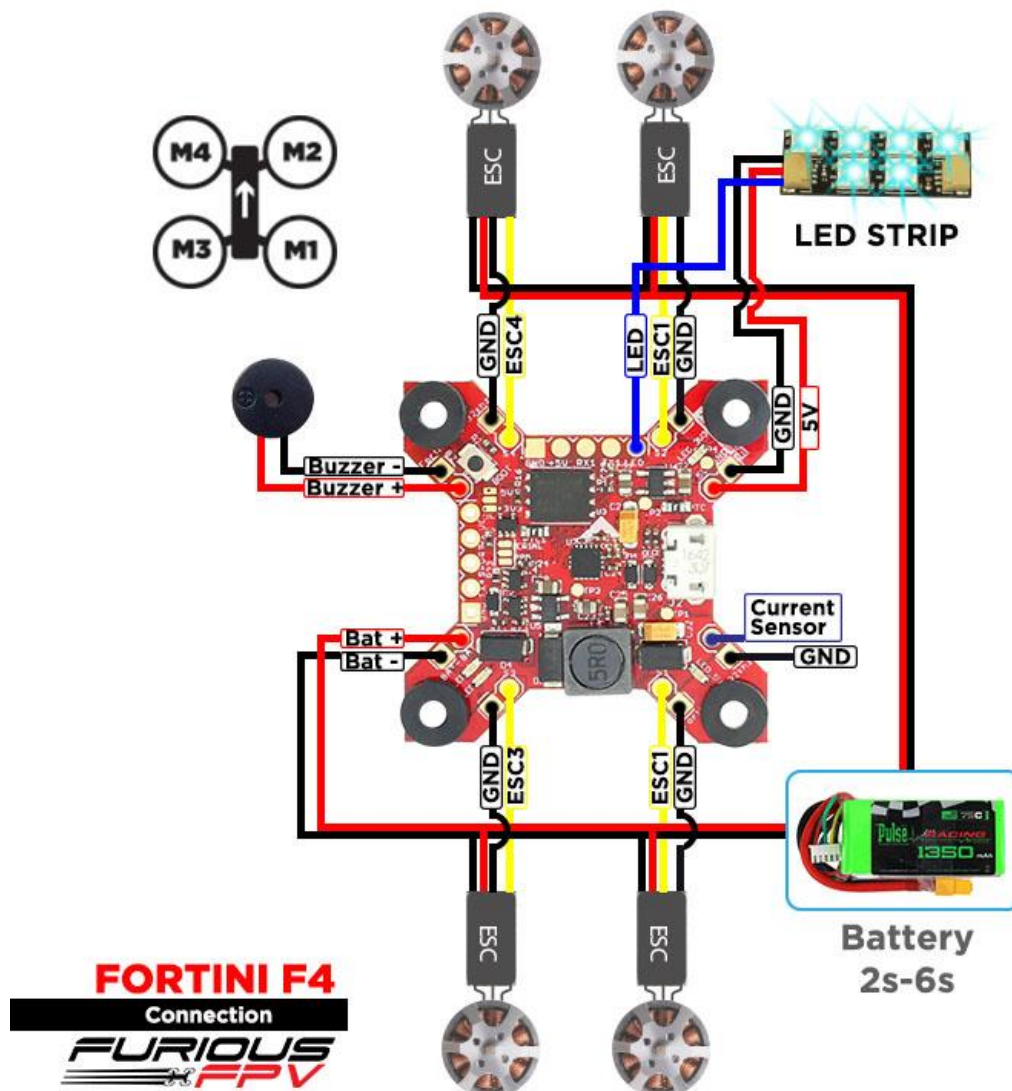
You can buy LED STRIP right here: https://goo.gl/TXwSwI

Connect with ESC 4 in 1:

❖ Using Aikon SEFM 30A:

*<u>NOTE:</u> Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.
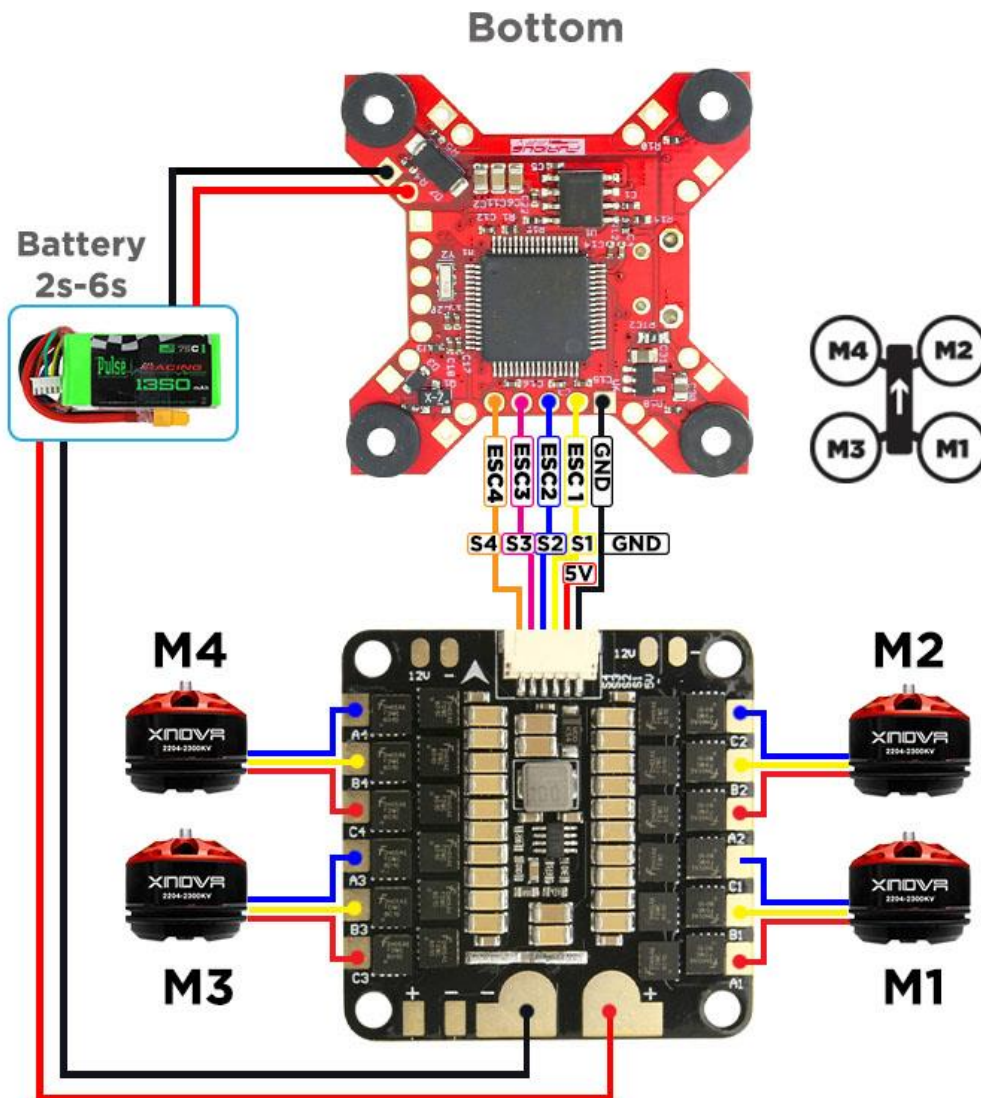
You can buy ESC Aikon SEFM 30 4 in 1 right here: https://goo.gl/IOYBEr

❖ **Using Cicada 35x4 35A:**

*NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.
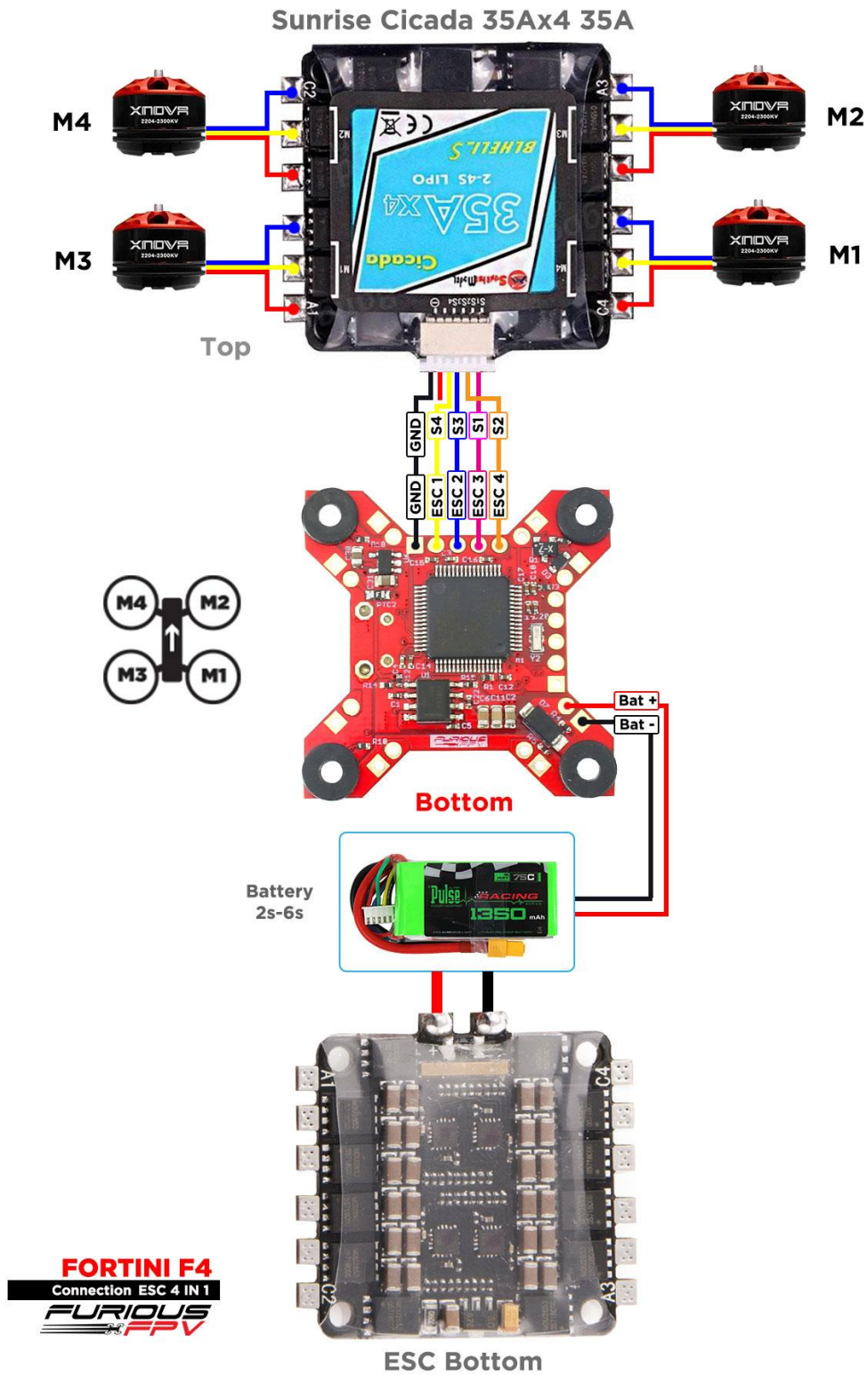
You can buy ESC Sunrise Cicada 35x4 35A right here: https://goo.gl/s08OaI

❖ Using T-Motor F 35A 4IN1-4S:

*NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.
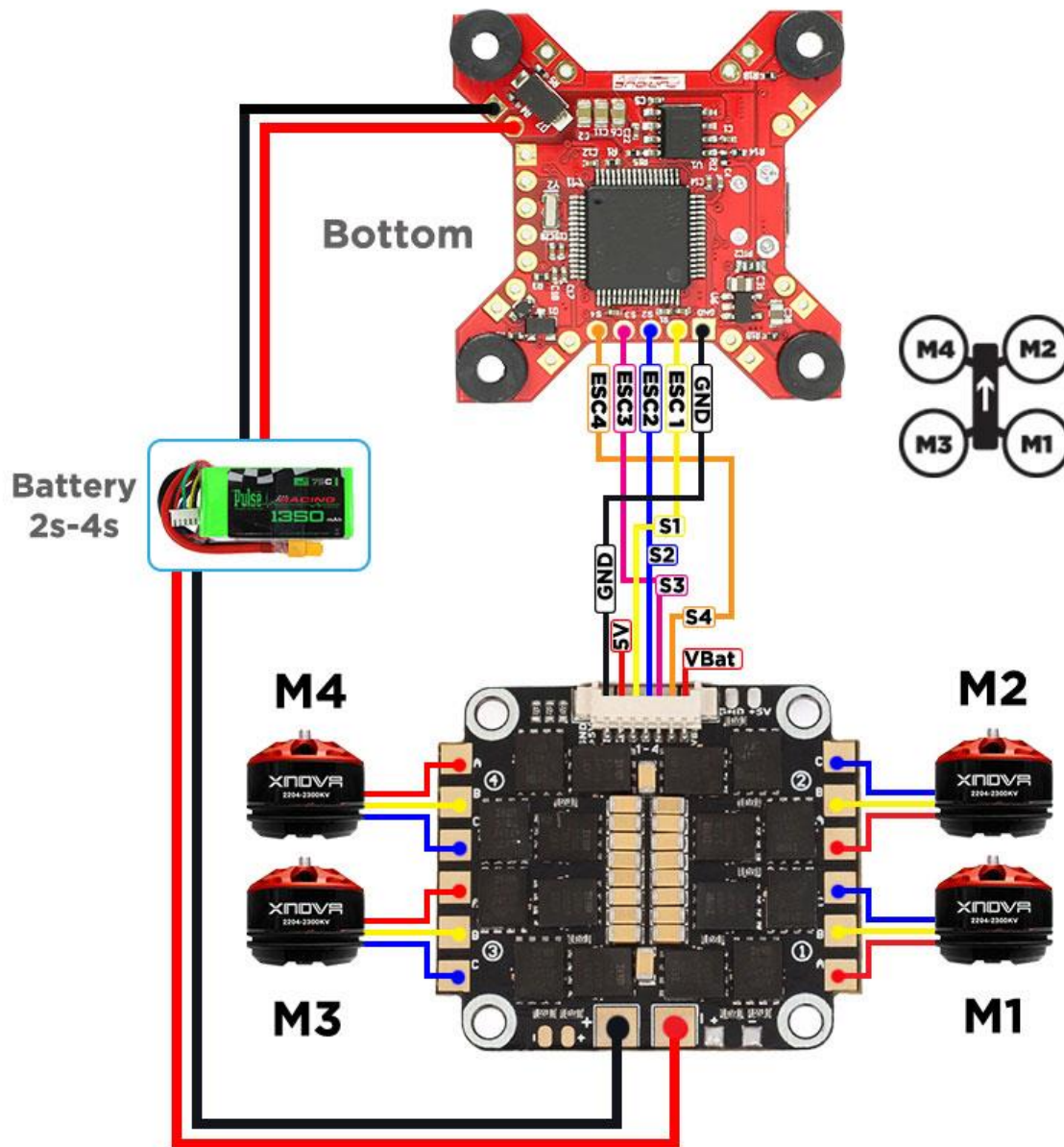
You can buy ESC F 35A 4in1-4S right here: https://goo.gl/QyM3eh

❖ Using Hobbywing XRotor Micro 40A 4in1:

*NOTE: Fortini F4 can support up to 6s Lipo battery but make sure other devices also support it.
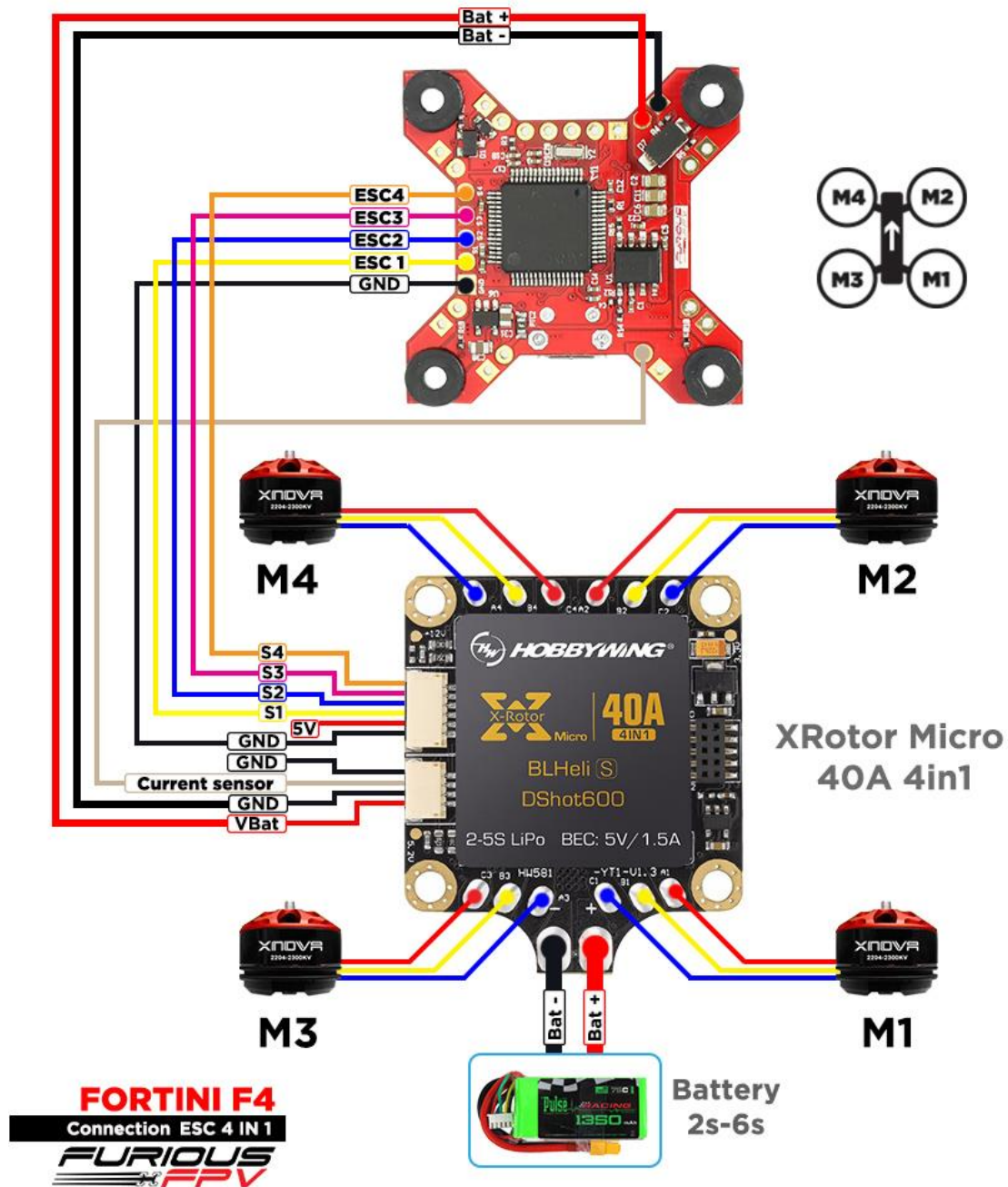
You can buy Hobbywing XRotor Micro 40A 4in1 right here: https://goo.gl/G2E9dU

Basic setup

Please, follow carefully these next steps, and always **remove** your propellers when you're configuring your quad

> **STEP 1: Connect** Fortini F4 with computer via **USB** cable and then **open** BetaFlight
>
> **STEP 2:** Configure **Ports.**
>
> (1) Turn on **MSP** of **UART 1** to use OSD.
> (2) Turn on **Serial Rx** of **UART 3** to use **Receiver Mode**
> (3) Select **SmartPort** of **UART 6** to use S.Port **UART 6**
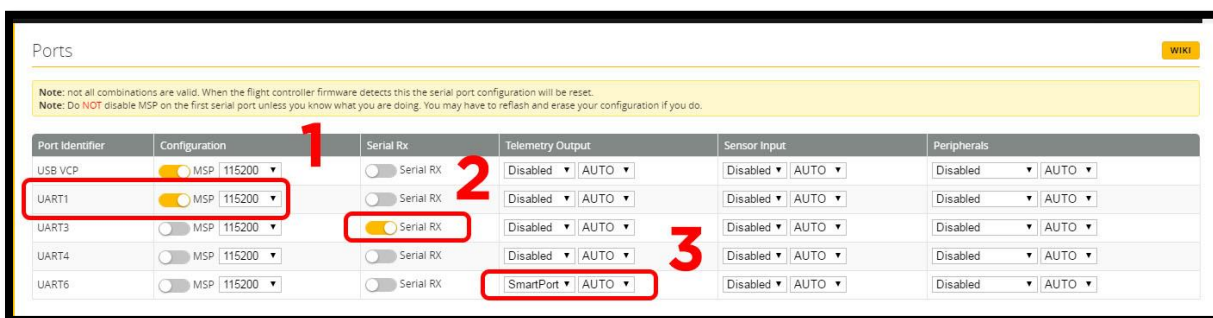
> (4) In Peripherals of **UART 4:**
> - Select **IRC Tramp** for **Tramp HV VTX**
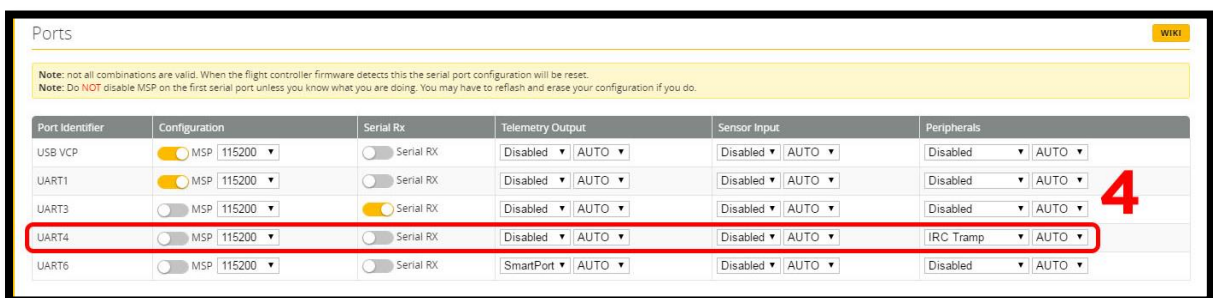
> - Select **TBS Smartaudio** for **TBS Unify Pro VTX**
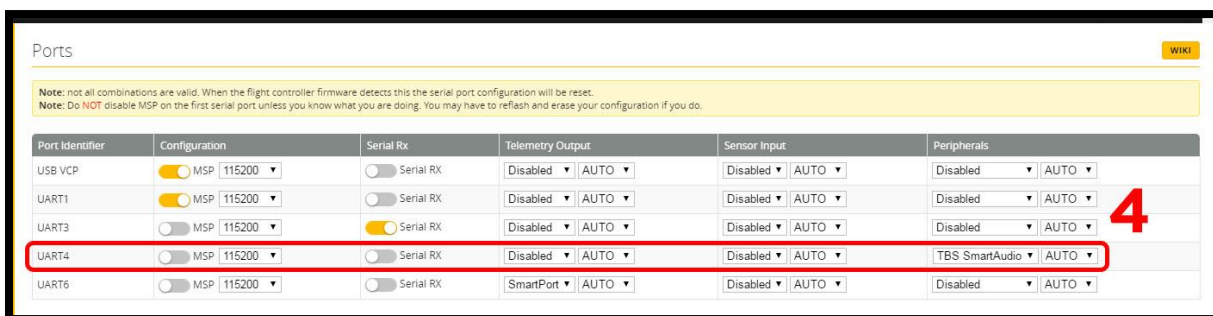
> *** NOTE:** Please make sure that all the connections are correct.

STEP 3: Go to **Configuration** tab and choose **ESC/Motor** protocol in **ESC/Motor Features**
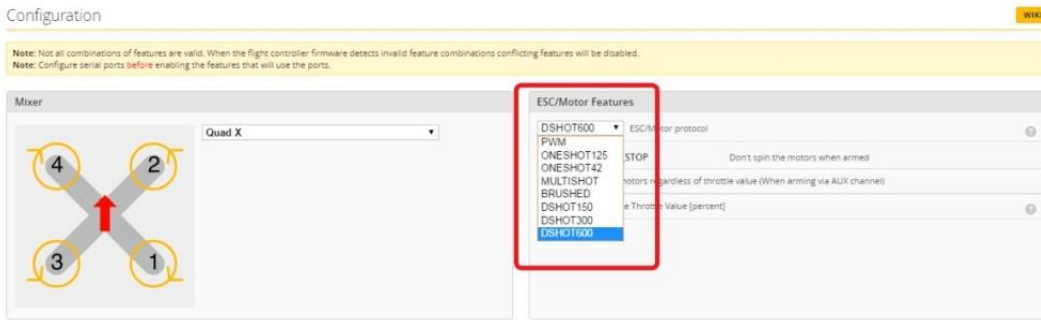
STEP 4: Select **Serial- based receiver** in **Receiver Mode**
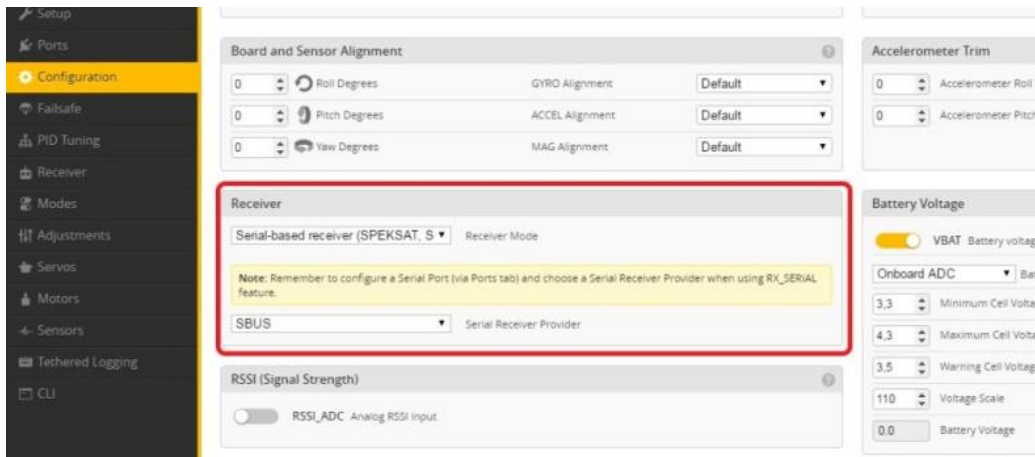
If you are using SBus, iBus or a Spektrum Satellite, you will need to pick your Serial Receiver Provider. Follow below table:

RX Type	Serial Receiver Provider
DSM2 1024bit/22ms	SPEKTRUM1024
DSM2 2048bit/11ms	SPEKTRUM2048
DSMX 1024bit/22ms	SPEKTRUM1024
DSMX 2048bit/11ms	SPEKTRUM2048
FrSky RX	SBUS
Futaba RX	SBUS
FlySky RX	IBUS
Turnigy RX	IBUS

Click "**Save and Reboot**".

Tips

4 Tips to setting up Fortini F4 FC with Damper
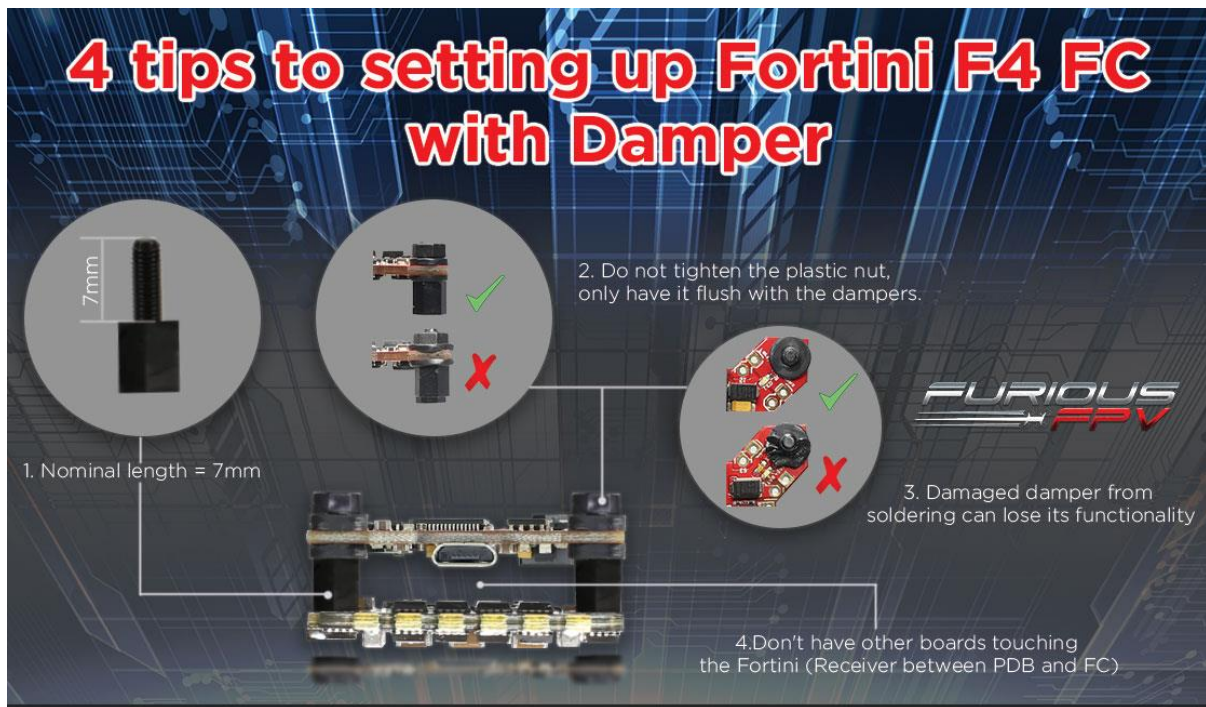
How to configure your Spektrum RX with your Flight Controller

In Betaflight Configurator:

- Go to the **Ports** tab
- Enable "**Serial RX**" on the UART 3
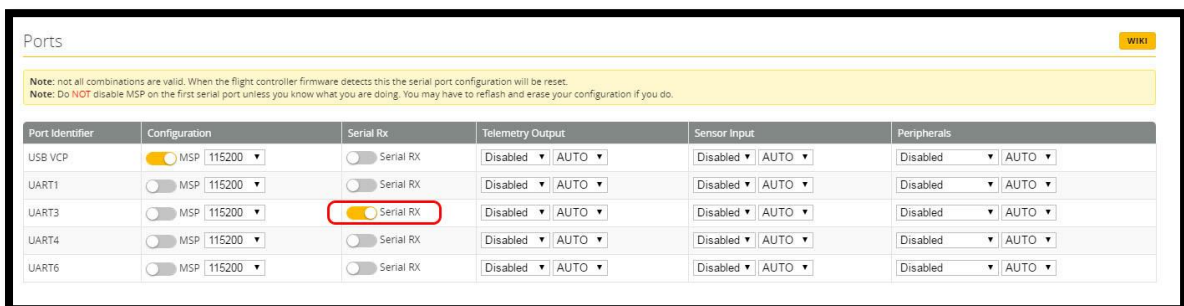
Click "**Save**".

Then go to the **Configuration** tab. Under the section labeled "**Receiver**", pick **Serial Receiver Provider** compare with your **RX Type**.

RX Type	Serial Receiver Provider
DSM2 1024bit/22ms	SPEKTRUM1024
DSM2 2048bit/11ms	SPEKTRUM2048
DSMX 1024bit/22ms	SPEKTRUM1024
DSMX 2048bit/11ms	SPEKTRUM2048
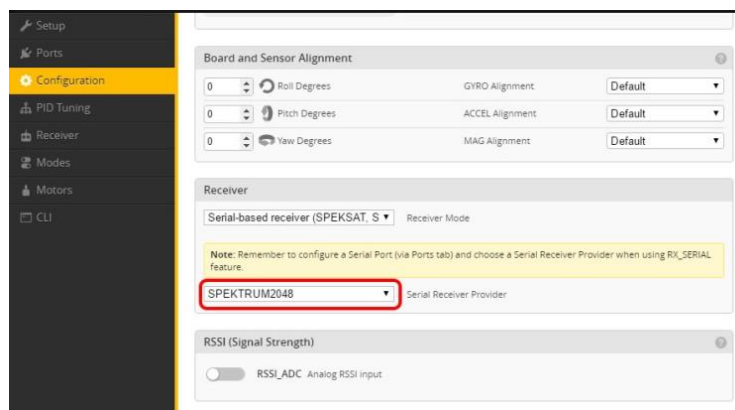
Click "**Save**".

Finally, go to the **Receiver** tab. Pull down the drop down that says "**Channel Map**" and select the "**JR / Spektrum / Graupner**" option.
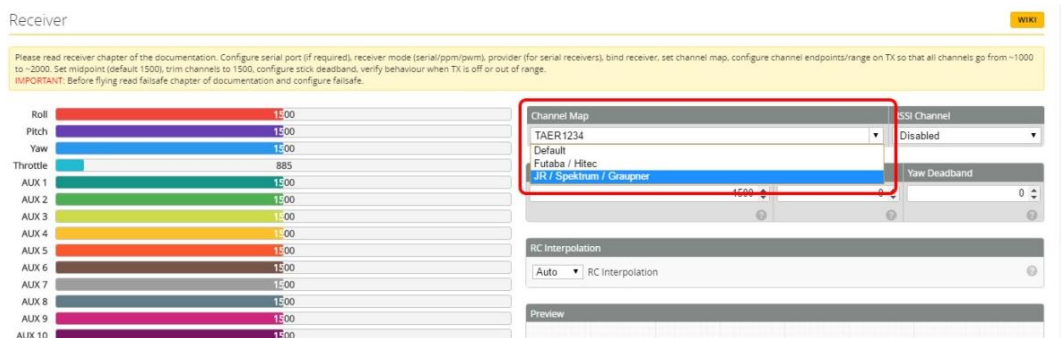
Once again, click "**Save**".

Guideline configuration OSD with TRUE VISION CONFIGURATOR V1.0

Serial Pass Through don't need CLI in Betaflight

DOWNLOAD: [Guideline install and configuration TRUE VISION CONFIGURATOR](#)

STEP 1: Connect Fortini F4 (**connected** with VTX/OSD) with PC via USB cable. Then plug battery for FC.

STEP 2: Open **True Vision Configurator** on google chrome.

STEP 3: Please select **Port COM (1)** correlative with your device, then select **UART 1 (2)** using for OSD.
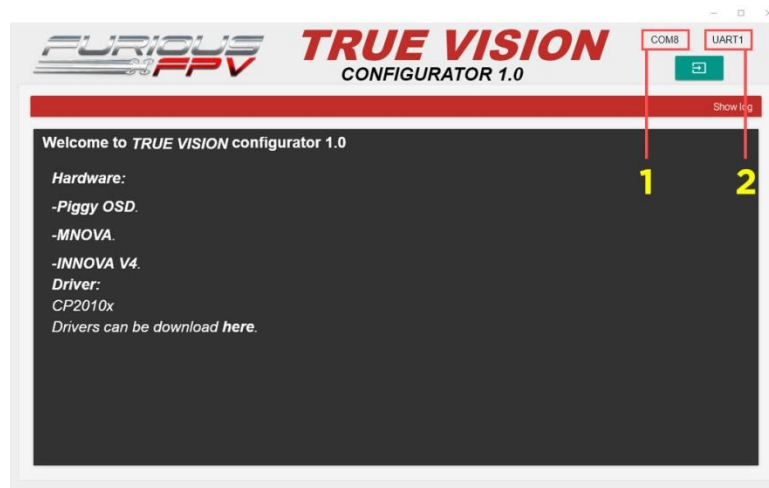
STEP 4: Plug Battery for Fortini F4, then click **Connect icon** on True Vision interface to connect and configuration OSD layout and setting.
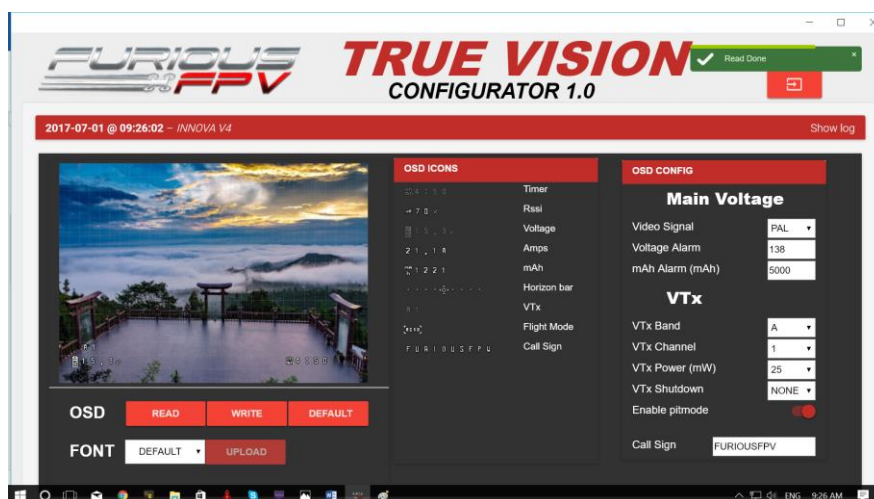
STEP 5: After configuration device please click **WRITE** to save your configuration.

How to open Piggy OSD menu by Transmitter

To access the in-built OSD menu in MW-OSD, disarm your quadcopter first.

- THROTTLE MIDDLE
- YAW RIGHT
- PITCH FULL

To navigate through menu in the OSD:

- **PITCH/ROLL** sticks are used to navigate
- **YAW** stick is used to **adjust / change** values
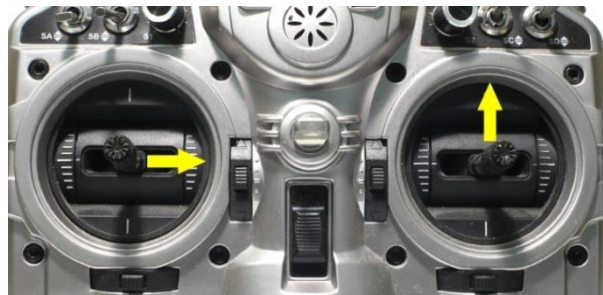
OSD Menu Index:

- PID Config/Profile 1/2 or 3:
    - Roll/Pitch/Yaw PID for many flight modes
- VTx Config:
    - Pit mode: On/Off
    - VTx Power: 25/200
    - VTx Shutdown: None/AUX1/AUX2/AUX3/AUX4
    - VTx Band: A/B/E/F/C/U/O/L/H
    - VTx Channel: 1/2/3/4/5/6/7/8
- RC Tuning (RC Rate, RC Expo, Pitch/Roll Rate, Yaw Rate, TPA (Throttle PID Att), Throttle Mid, Throttle Expo, TPA Breakpoint, Yaw RC Expo)
- OSD Config (Display Main Volts, Display Amps, Display mAH, Display RSSI, Horizon, Main Volts Alarm, mAH X100, Callsign)
- Statsistics (Fly Time, mAH Used, Max Amps, Voltage)

How to set up CMS CANVAS mode on BetaFlight

CMS activation:

- Stick command to activate the BetaFlight CMS is **THROTTLE MIDDLE + YAW LEFT + PITCH FULL.**
- (Notice that MWOSD menu activation is **THROTTLE MIDDLE + YAW RIGHT + PITCH FULL**).

OOS (Out-Of-Sync):

MWOSD is very stable, and so is the canvas mode support.

However, since the canvas mode protocol is simplex from FC to MWOSD, CMS on FC and MWOSD may get out-of-sync in a rare case, such as resetting or power cycling the MWOSD while the CMS is active.

You can tell the out-of-sync state by:

1. If you power cycle or reset MWOSD while in CMS, then MWOSD may not get out of opening screen.
2. You may see an asterisk character ('*') at upper left corner of your screen when this happens.
3. You may also see cursor character move as you input navigational stick commands.
4. Other erratic text displayed (not a screen full of random characters).

There are numbers of ways to get out of this state.

1. Enter a stick command that causes page redraw, such as menu back. (It is not a wise move to enter a stick command that causes item selection.)
2. Blindly navigate to BACK or EXIT menu item and select it.
   Reset or power cycle your flight controller.

Thank you for using our product