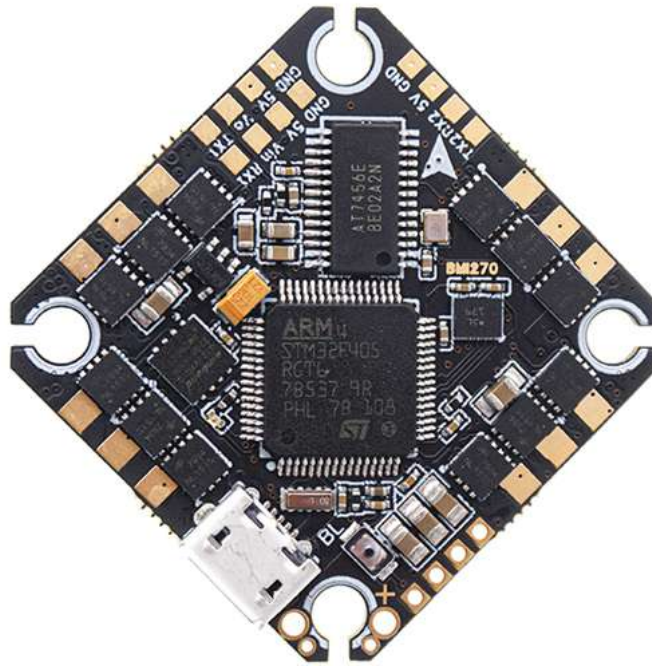


Poly F405 2S-4S AIO Manual

Overview & Setup Guide



TUNERC

OVERVIEW

The Goal of Making this Poly F405 AIO

This Poly F405 2S-4S AIO is designed for FPV micro community and it's made to be super versatile, so pilots can use this AIO board in different builds like agile toothpick or long range quad or creative X6/X8 quads. So this AIO board is integrated blackbox, current meter and features 5 UARTs to suit needs for different builds. Apart from versatility, we have made this AIO board high performance to make sure it could hold up well on powerful quads. To achieve this goal, this AIO board comes with powerful F405 chip and high quality 20A mosfets and excellent heat dissipation ability.

Specifications

Hardware Specs

- FC MCU: STM32F405RGT6(Cortex®-M4 168Mhz)
- Built-in OSD: AT7456E
- Built-in IMU: BMI270
- Built-in 4MByte Blackbox
- Built-in Current Meter
- ESC MCU: EFM8BB21 (8bit 50MHz)
- UART: UART1 (for VTX by default), UART2, UART3, UART4(supports SBUS), UART5
- Other interfaces: IIC (IIC2) , LED_Strip, Buzzer
- The through holes for power lead: big enough to fit 16AWG wire
- 8 Motor Outputs

Electronics Specs

- Input Voltage: 6.50-20.0V(2S-4S LIPO/LIHV)
- Power Output: 5V 2A
- Continuous Current: 20A
- Peak Current: 28A

Firmware

- FC Target: TUNERCF405
- ESC Firmware: Bluejay P-H-25

Motor Size Supported

- 11xx, 12xx, 13xx,14xx

Recommended Capacitor

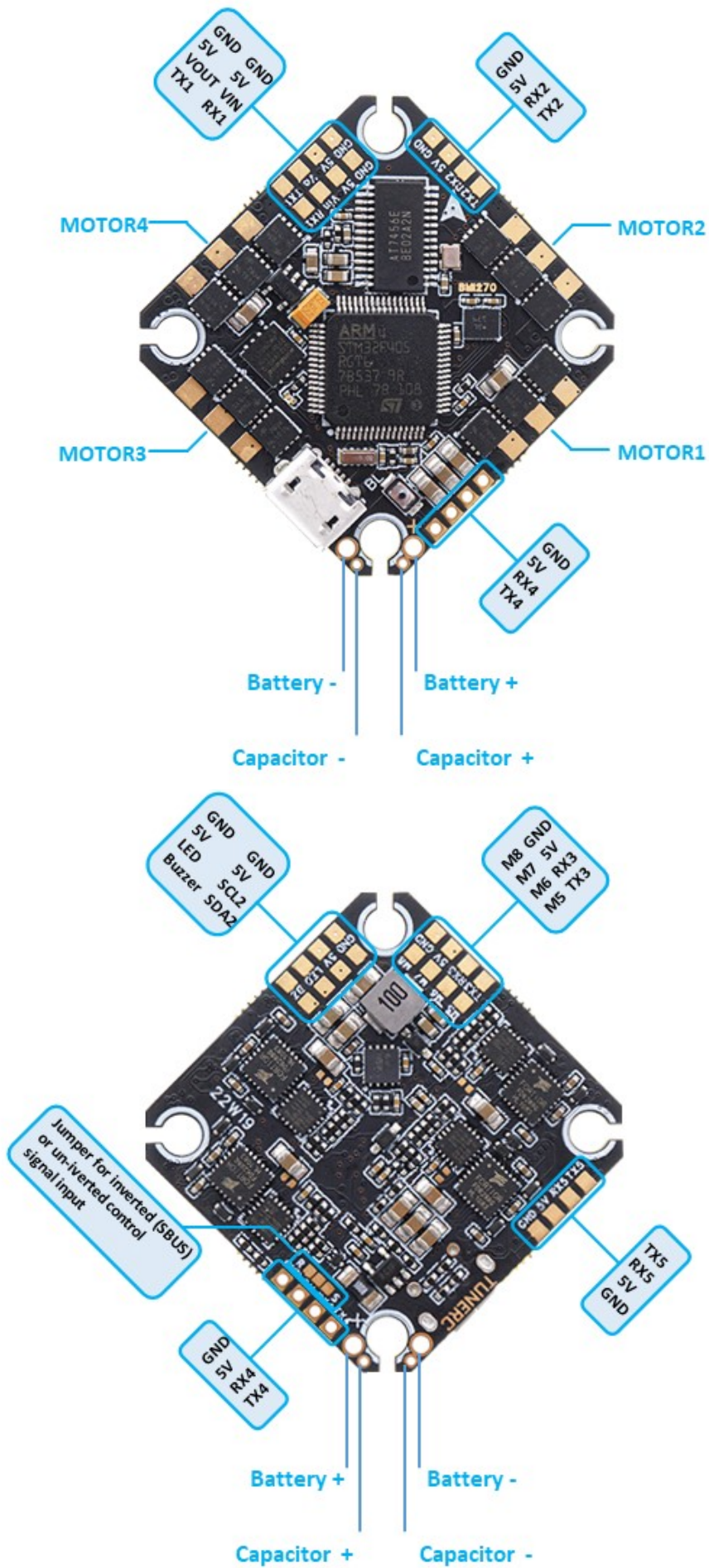
- A 35V 220uf capacitor is included. A 35v 220-470uf capacitor with low ESR is recommended if you want to swap the default one.

Dimensions

- Size: 33mm x 33mm
- Mounting Holes Pattern: 25.5 x 25.5mm Room for M3.5 grommets to make M2 mount
- Weight: 5.8g

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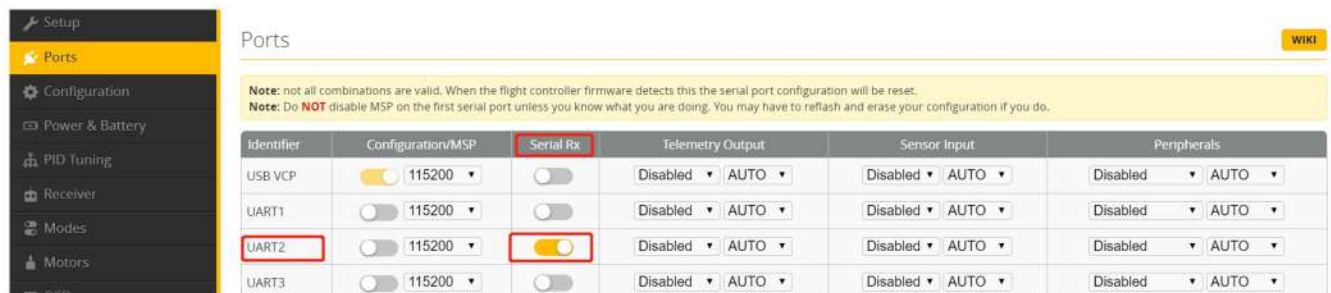
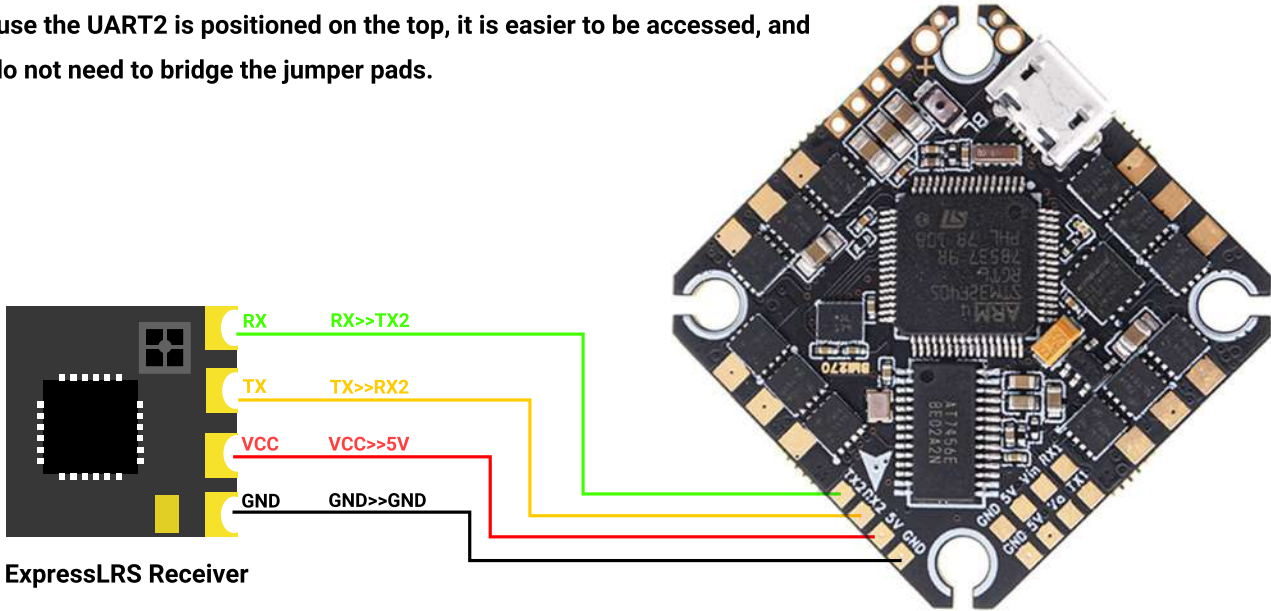
PINOUT DIAGRAM



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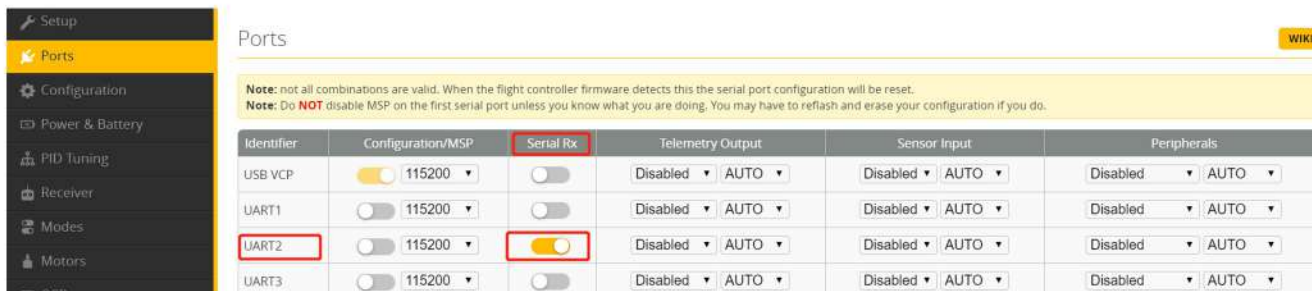
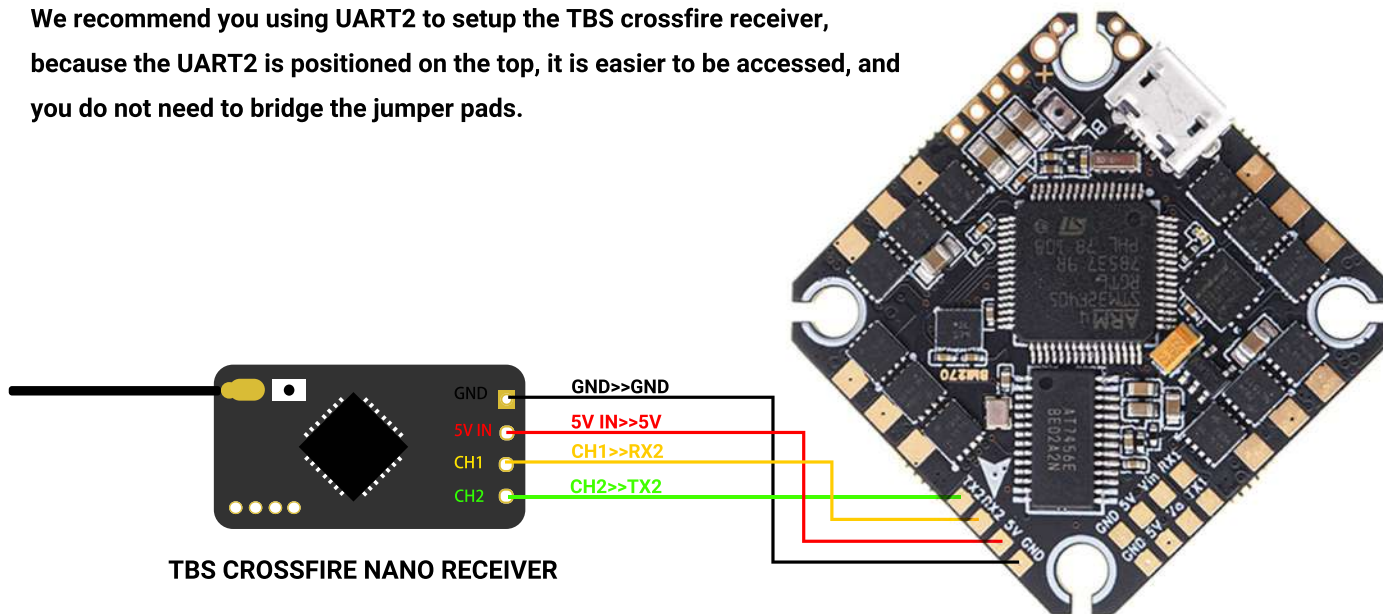
RECEIVER WIRING

We recommend you using UART2 to setup the expresslrs receiver, because the UART2 is positioned on the top, it is easier to be accessed, and you do not need to bridge the jumper pads.



RECEIVER WIRING

We recommend you using UART2 to setup the TBS crossfire receiver, because the UART2 is positioned on the top, it is easier to be accessed, and you do not need to bridge the jumper pads.



RECEIVER WIRING

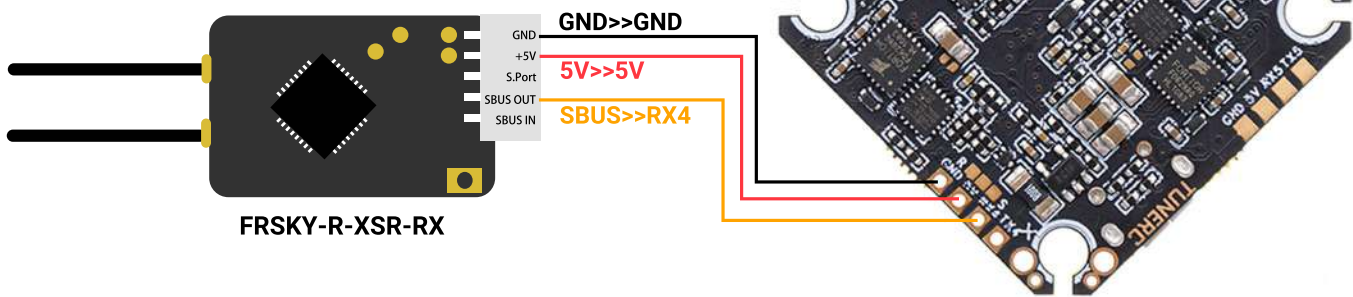


“R” for “RX” “S” for “SBUS”

This is jumper for inverted (SBUS) or un-inverted control signal input.

The RX4 has a hardware inverter, which can be selected by jumper.

Please bridge the RIGHT TWO jumper pads for the receiver pad to work if you use inverted (SBUS) control signal input.



- Configuration
- Power & Battery
- PID Tuning
- Receiver
- Modes
- Motors
- OSD

0 FPV Camera Angle [degrees]

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.

SBUS Serial Receiver Provider

- Setup
- Ports
- Configuration
- Power & Battery
- PID Tuning
- Receiver
- Modes
- Motors
- OSD
- Video Transmitter
- Blackbox
- CLI

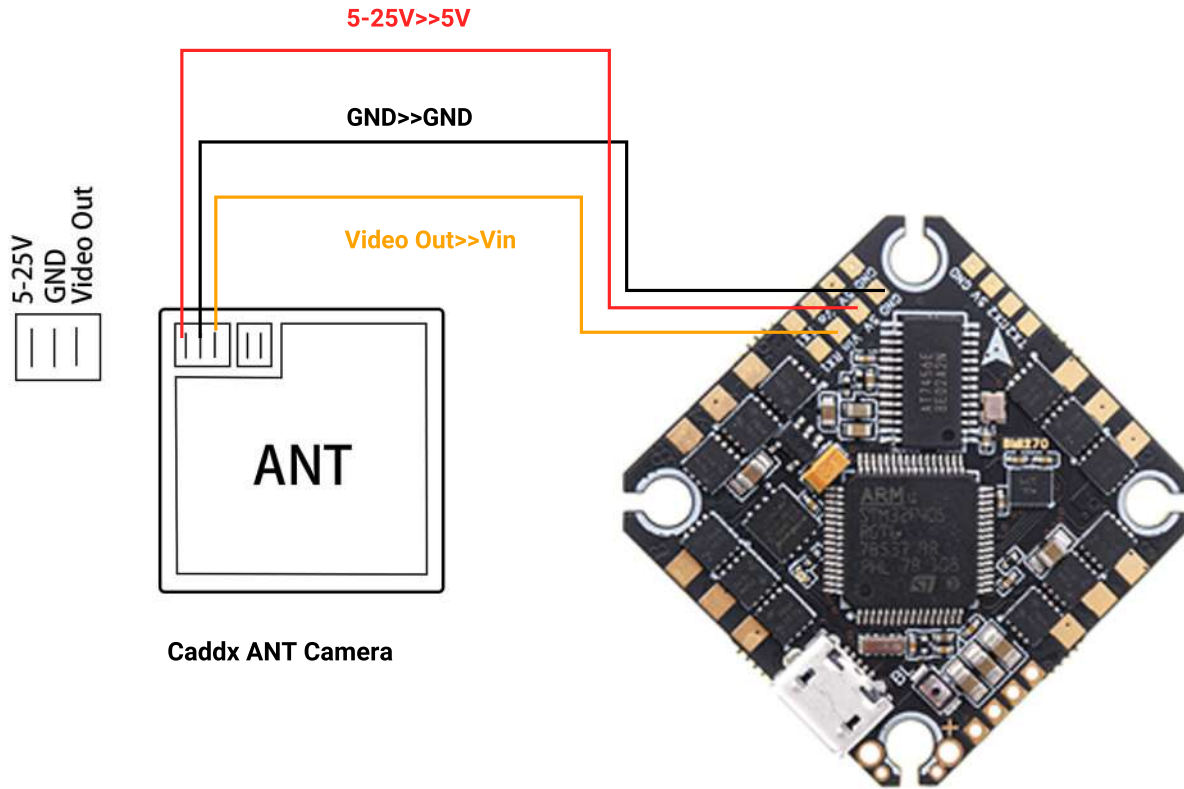
Ports WIKI

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.
Note: Do **NOT** disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you do.

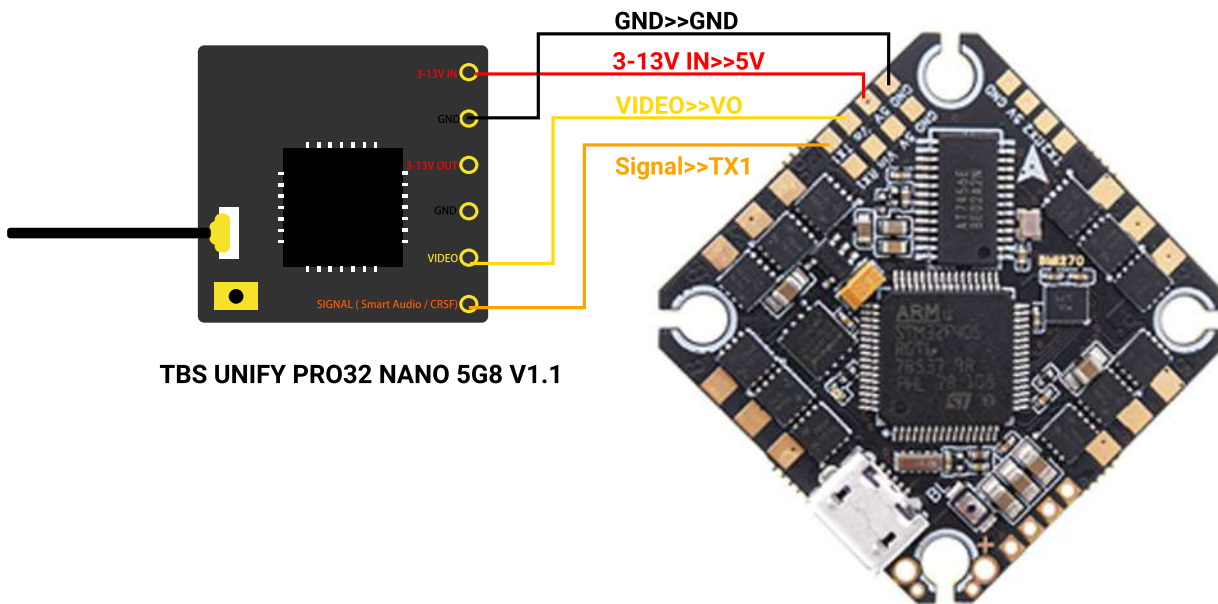
WARNING: The VTX table has not been set up correctly and without it VTX control will not be possible. Please set up the VTX table in Video Transmitter tab.

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART1	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	VTX (TBS Sm) AUTO
UART2	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART3	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART4	<input type="checkbox"/> 115200	<input checked="" type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART5	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO

CAMERA WIRING



VTX WIRING



Setup

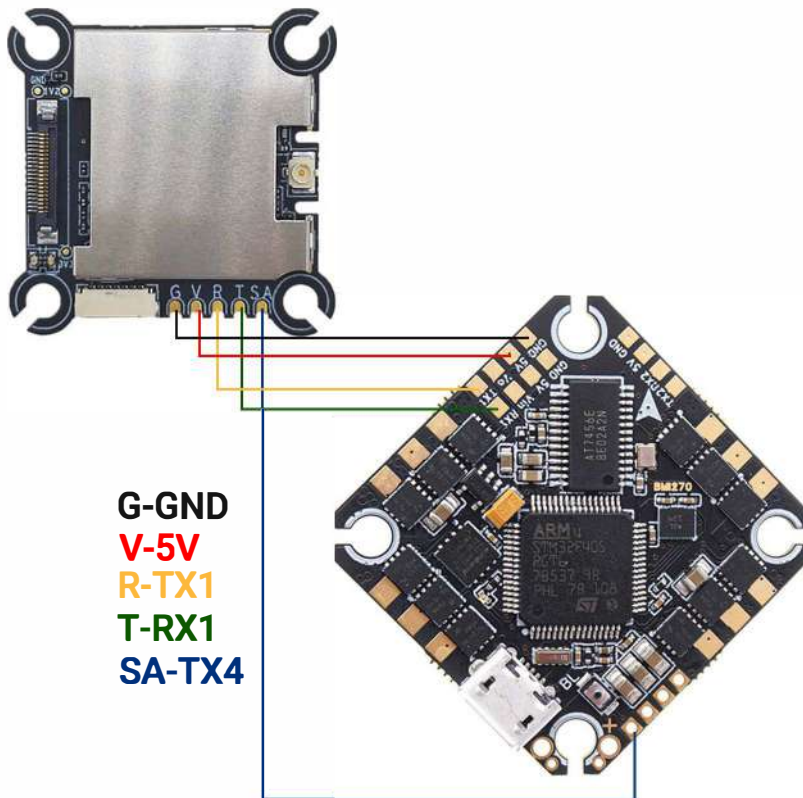
Ports WIKI

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.
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USB VCP	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART1	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	VTX (TBS Smt) AUTO

HDZero Whoop Lite Wiring



Actually, you can wire HDZero Whoop Lite VTX to any spare UART pads on Poly F405 board. The following wiring diagram is only for reference.

You just need to make sure the "R" pad is wired to spare TX pad on the Poly board and "T" pad is soldered to spare RX pad on the FC board. And wire the "SA" pad to any spare TX pad on the Poly.

HDZero Whoop Lite Betaflight Setup

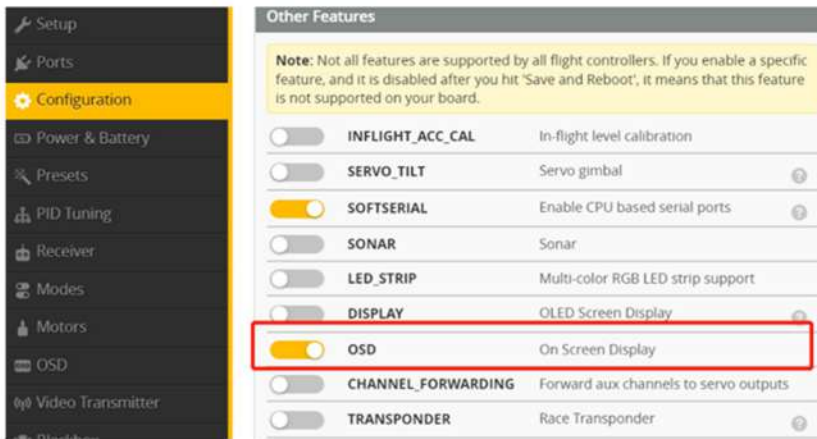
Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART1	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	VTX (MSP + C) AUTO
UART2	<input type="checkbox"/> 115200	<input checked="" type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART3	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO
UART4	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	VTX (TBS Sm) AUTO
UART5	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled AUTO	Disabled AUTO	Disabled AUTO

1. In Betaflight 4.4, please enable "Configuration MSP" and choose "VTX (MSP + Displayport)" for corresponding uart under "Ports" tab.

2. To setup smart audio in Betaflight 4.4, please choose "VTX (Smartaudio)" under "Peripherals" for the corresponding uart in the "Ports" tab.

HDZero Whoop Lite Betaflight Setup

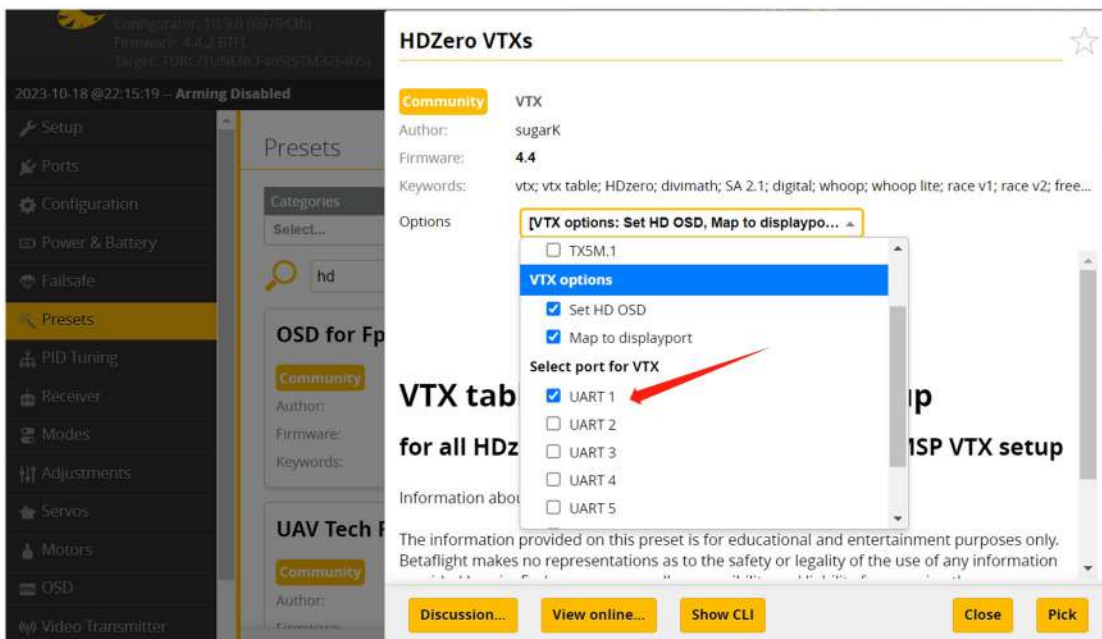
3. Enable "OSD" feature under "Configuration" tab.



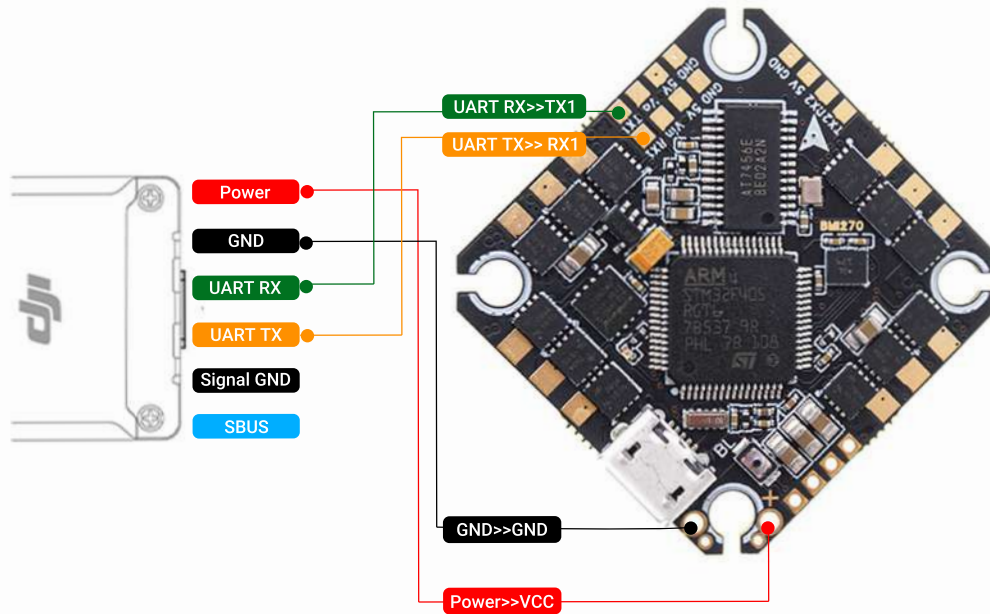
4. Enable "TELEMETRY" feature under "Receiver" tab.



5. Under "Presets" tab, search "HDZero VTXs" and select the corresponding uart you set for the HDZero VTX under "Options", finally click "Pick"

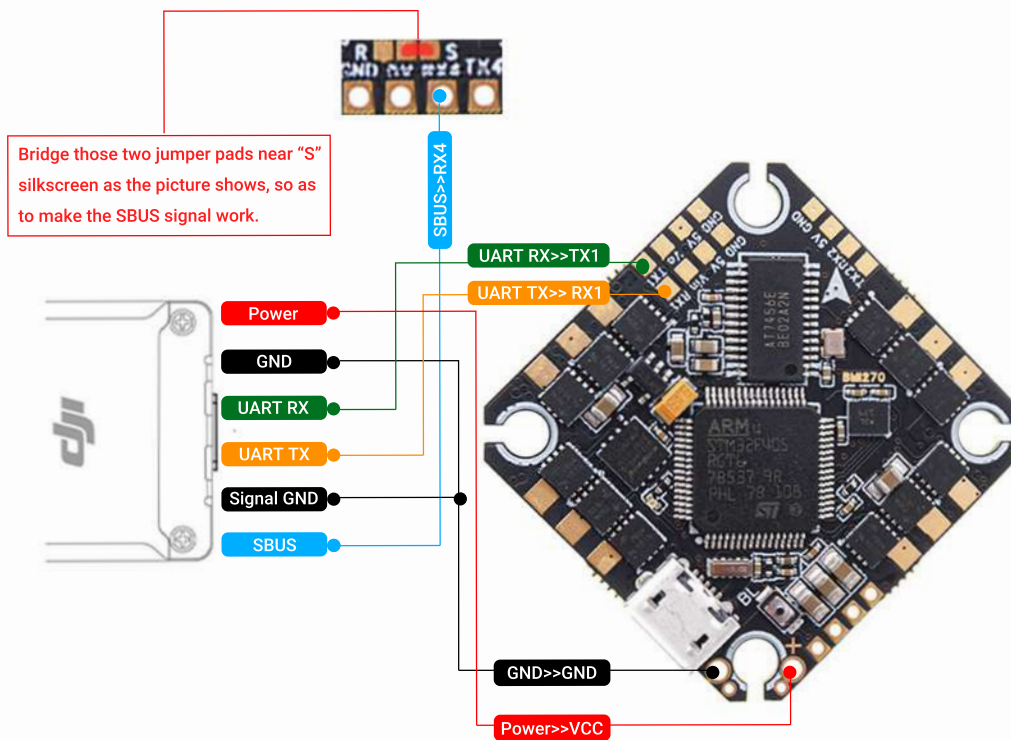


DJI O3 WIRING



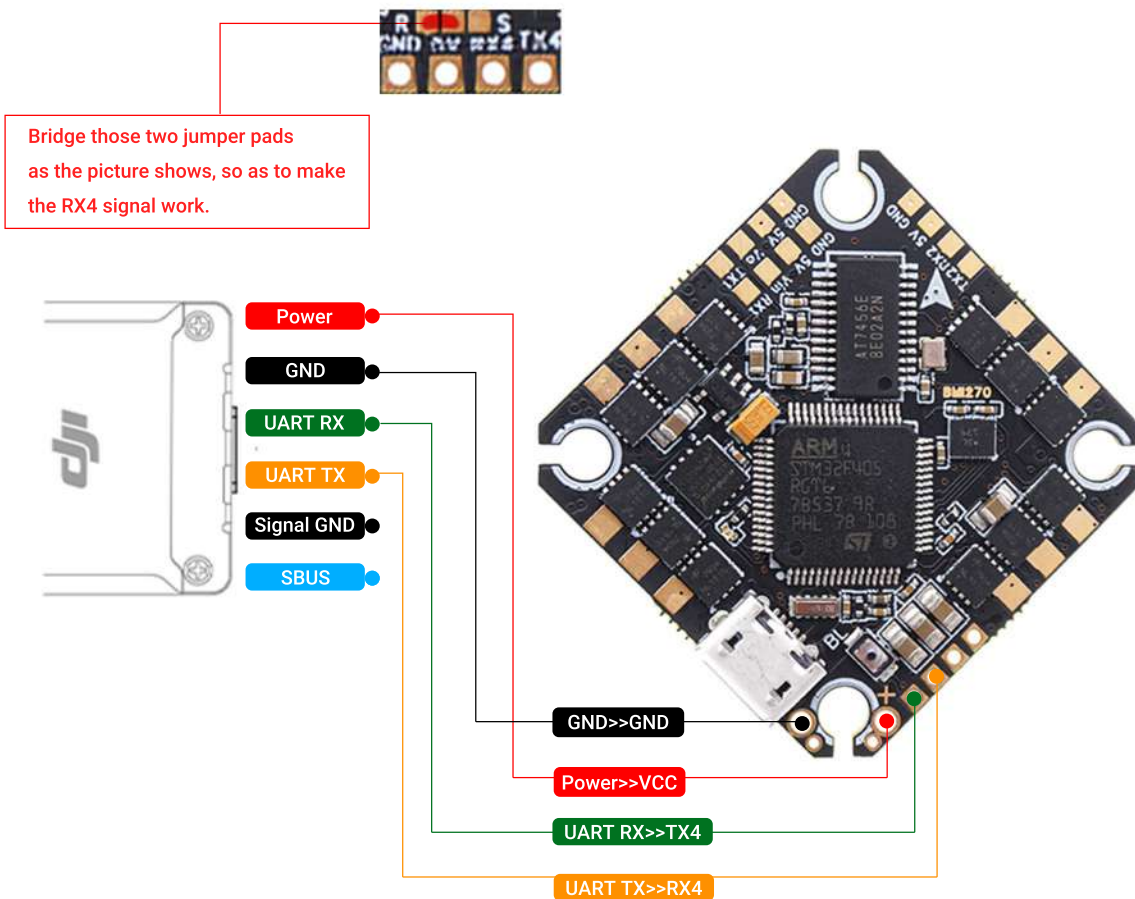
In general, you can wire the DJI O3 unit to any free UART on the Poly board. For users that don't use DJI radio controller, please refer to the diagram above. You don't need to wire the "Signal GND" and "SBUS" wire from the DJI VTX plug.

DJI O3 WIRING



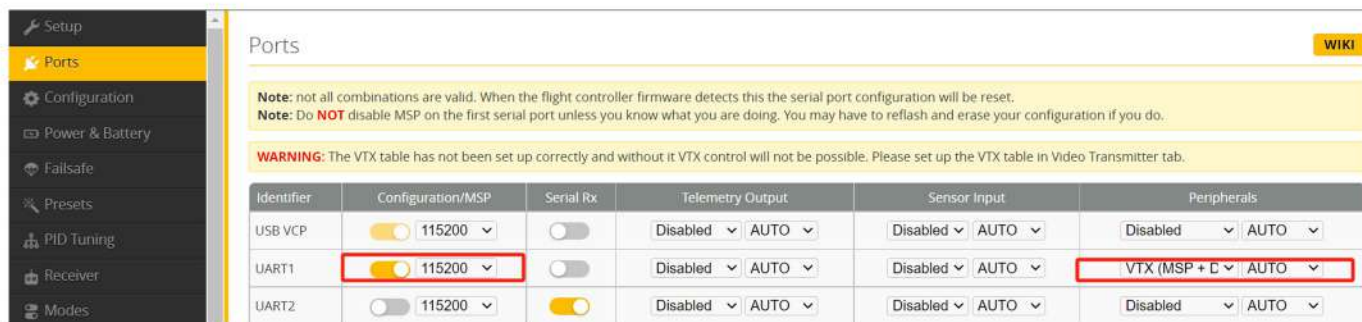
For users that use DJI radio controller, please refer to the diagram above. You need to bridge the two jumper pads near silkscreen "S" to enable SBUS signal.

DJI O3 WIRING

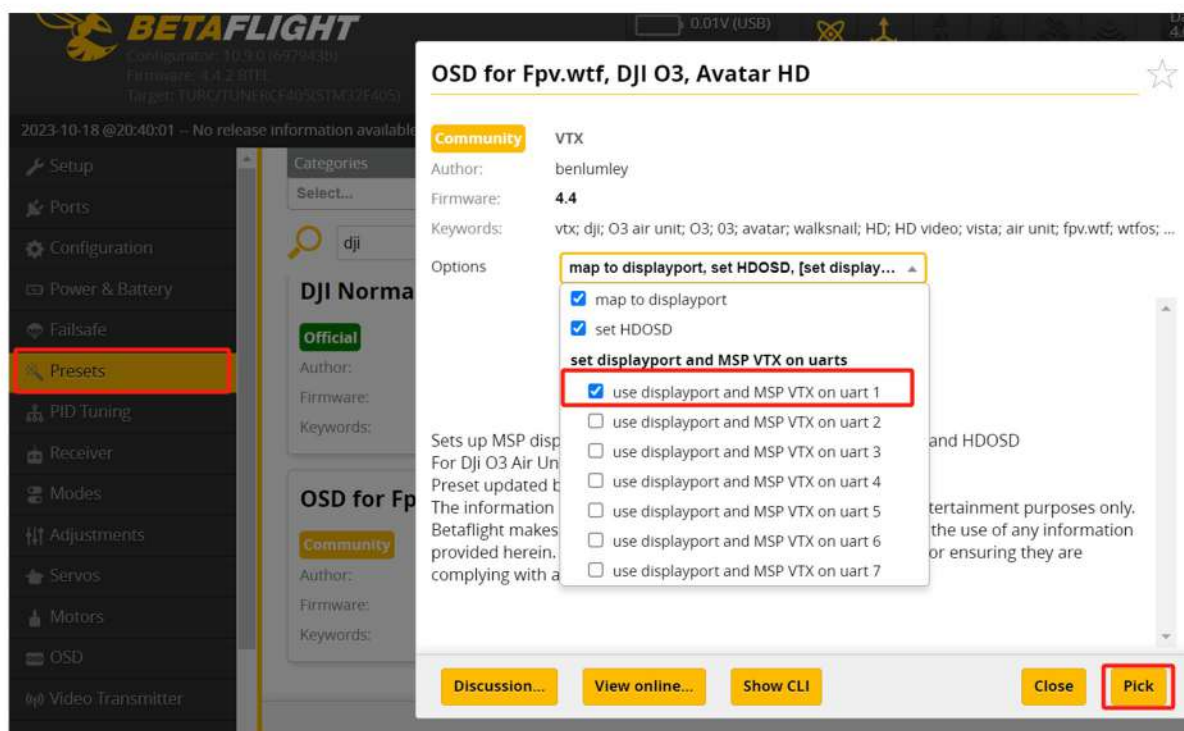


Please note that if you wire the DJI O3 unit to the UART4 on the FC, you need to bridge the two jumpers near silkscreen "R" to enable RX4.

DJI O3 Betaflight Setup

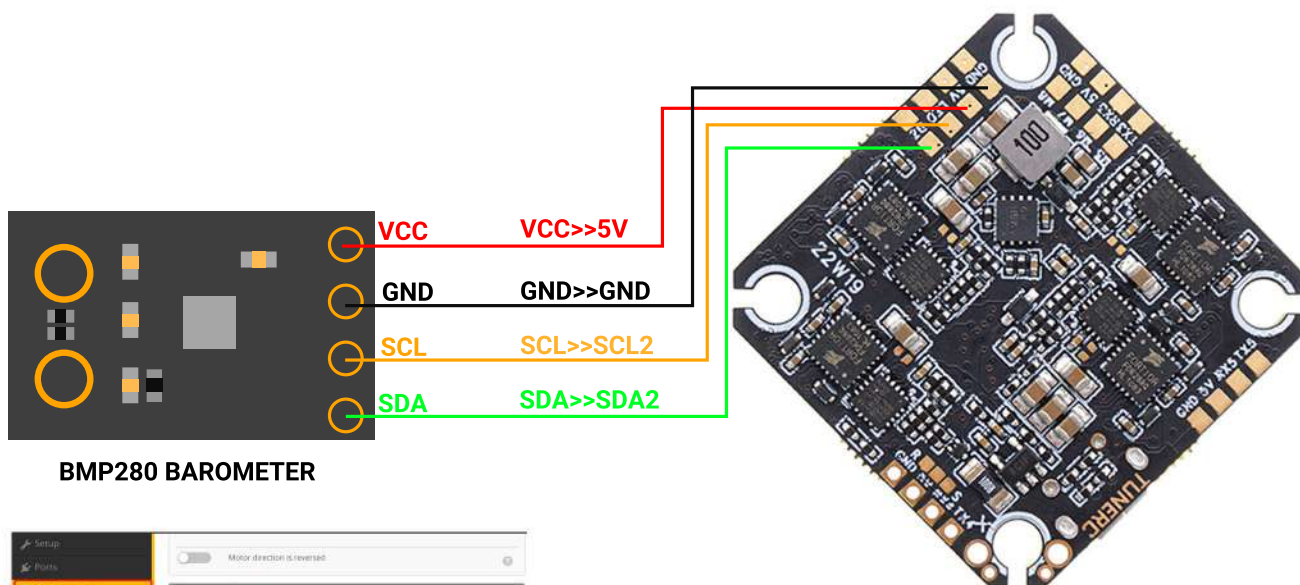
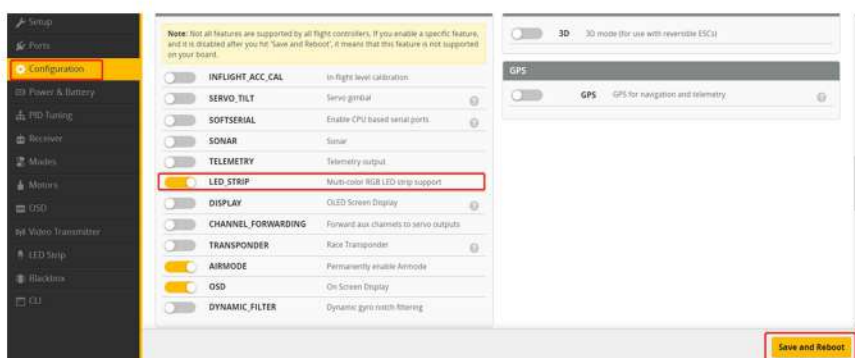
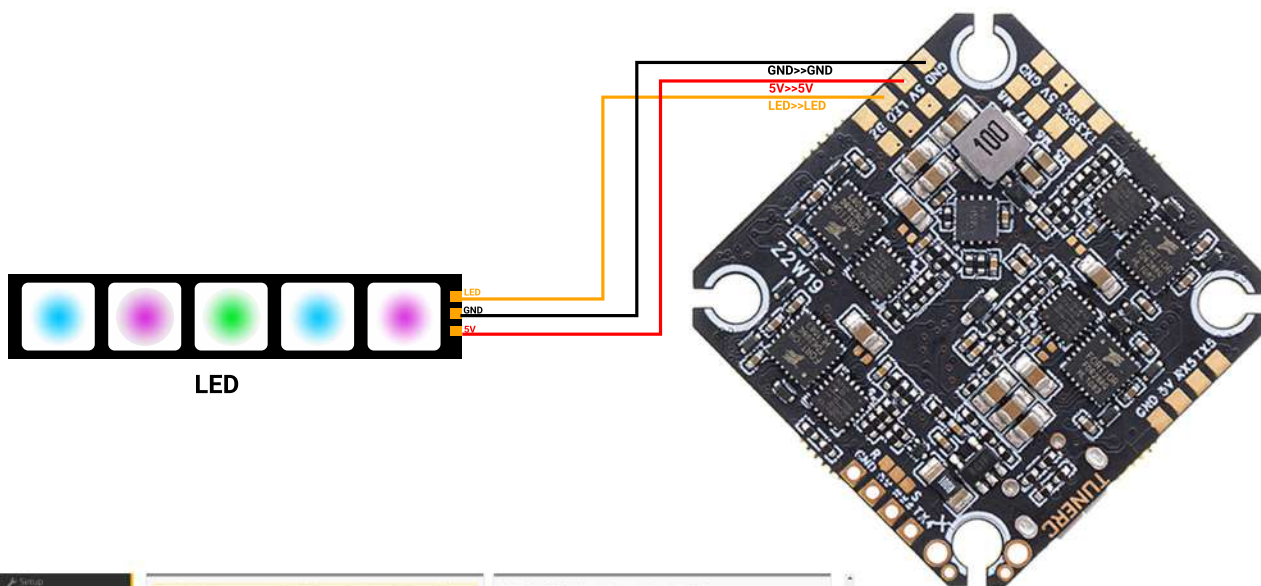


1. In Betaflight 4.4, please enable "Configuration MSP" and choose "VTX (MSP + Displayport)" for corresponding UART you set for DJI VTX under "Ports" tab.



2. Search DJI OSD under "Presets" tab, select "OSD for Fpv.wtf, DJI O3, Avatar HD" and select the corresponding uart you set for the DJI VTX under "Options", finally click "Pick"

LED & Barometer WIRING



BMP280 BAROMETER

