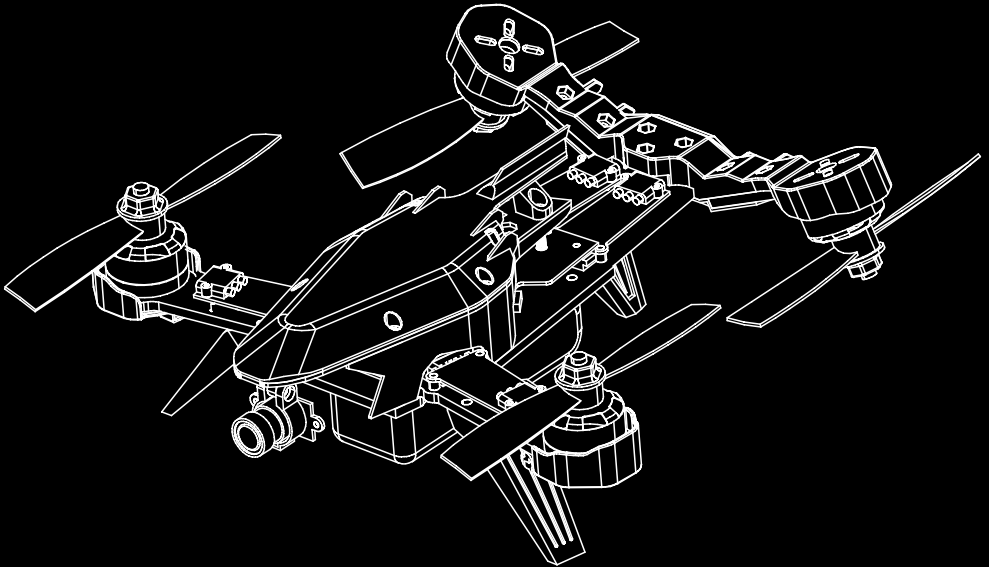# EACHINE

V-tail 210

QUICK START GUIDE

1.0 General introduction

● The Eachine V-tail 210 is a very cool FPV Racing drones. The unique shape and cool painting makes it stand out from the crowd. With a new V-tail body design and carbon fiber material , it has superior ruggedness and anti-drop ability.

● The Eachine V-tail 210 based on SP RACING F3 EVO -- the new generation hardware platform, which can provide Jaw-Dropping Flight Performance. Internal ARM Cortex-M4 72Mhz CPU with Math co-processor (FPU) for efficient flight calculations that gets more done in less time. It means that the Loop times up to ~2x as fast as previous-generation STM32F1 based boards

● The Eachine V-tail 210 employed the acclaimed EMAX RS2205 motor with Emax Lighting 20A ESC which running BLHELI latest firmware, so the aircraft has super-fast response and superior power, and bring you a very pleasant FPV flying experience.

ARF Version 1

ARF Version 2

RTF Version 1

RTF Version 2

⚠ For your safety, and avoid accidents, You must remove all the propellers when you connect the V-tail 210 to computer

2.0 Specification

Main Rotor Dia:127mm
Overall(L x W x H):224 x188 x 75
Weight:560g(include battery)
Camera: 1080P HD 90°Camera
Propeller：Gemfan 5045BN
Remote controller: Eachine I6 (Optional)
Receiver: Eachine X6 (Optional)
GPS: 7M GPS (Optional)
OSD:MWOSD R1.6
Main Controller :SPRACING F3 EVO
Video transmitter:TX58200 40CH 200mw
Brushless Motor: Emax Rs2205 KV2300
Brushless ESC: Emax 20A
Battery: Eachine 4S 1500MAH 50C

82

226
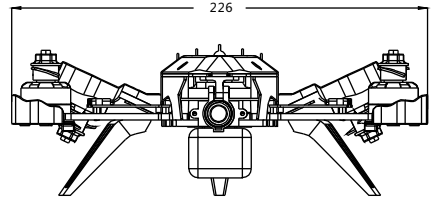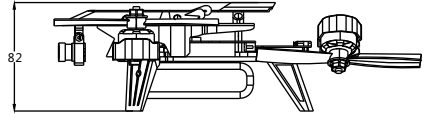
Flight controller specification:

CPU	STM32F303CPU,72Mhz inc FPU
Accelerometer	MPU9250 accelerometer/gyro/compass (connected via SPI)
Barometer	BMP280
Micro SD card slot	SD/SDHC, up to 32GB
Size	23mm*28.5mm*5mm
Weigt	4g
Firmware release	Cleanfilght SP Racing F3 EVO R1.13.0

Motor Specification:

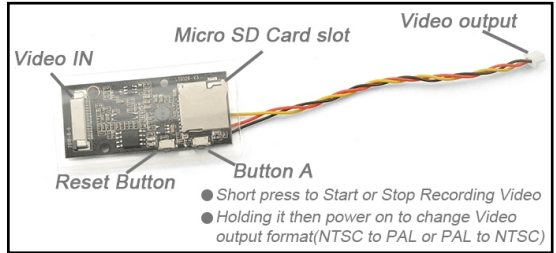| Emax RS2205	
KV	2300
Configuration	12N14P
Diameter	27.9mm
Length	31.7mm
Shaft Diameter	3mm
Weight(g)	29
Idle current(10)@10V(A)	0.35
No. of Cells(Li-po)	2~4S
Max Continuous Power(W)180S	135
Internal Resistance	118mΩ
Max Current(180S)	12A
Max.Effciency Current	(2-7A)＞83%

● **ESC Specification:**
Emax lightning-20A,support Li-po Battery: 2s-4s
Continuous current 20A,Burst current: 30A(10s)
Oneshot125 Ready,Damping light Ready

Camera specification:

Video format: NTSC or PAL Switchable
Effective pixel: 1920(H)x1080(V)
Sensor: 1/3 inch HD CMOS
Focal length:3mm
Lens angle: H:90 degree V: 90 degree
Working voltage: 5V
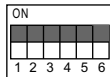Working current: 80mA
Weight: 4g

HMDVR-HD Specification:

Video format: NTSC or PAL Switchable
Records Effective pixel: 1920(H)x1080(V)
Records Frame rate:60Frames
Compress Format: MOV
Video Output size:640x480
Size:50mm x 22mm
Weight:6g
Max support 32G TF Card,Suggest Class10
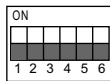Auto-save function: Auto-save every 5 minutes

Video output
Micro SD Card slot
Video IN
Reset Button
Button A
● Short press to Start or Stop Recording Video
● Holding it then power on to change Video output format(NTSC to PAL or PAL to NTSC)

5.8G 40ch 200mw Video transmitter Specification：

Wireless Channel: 40CH
Modulation : Broadband FM
Support Video Format: NTSC/PAL
Video input impedance : 75 Ohm
Audio input impedance:10K Ohm
Output Signal : 23~24dBm
Output Power : 400mw(Max)
Working voltage: 5V
Working current: 500mA
Connector: RPSMA Connector
The default channel is 5917

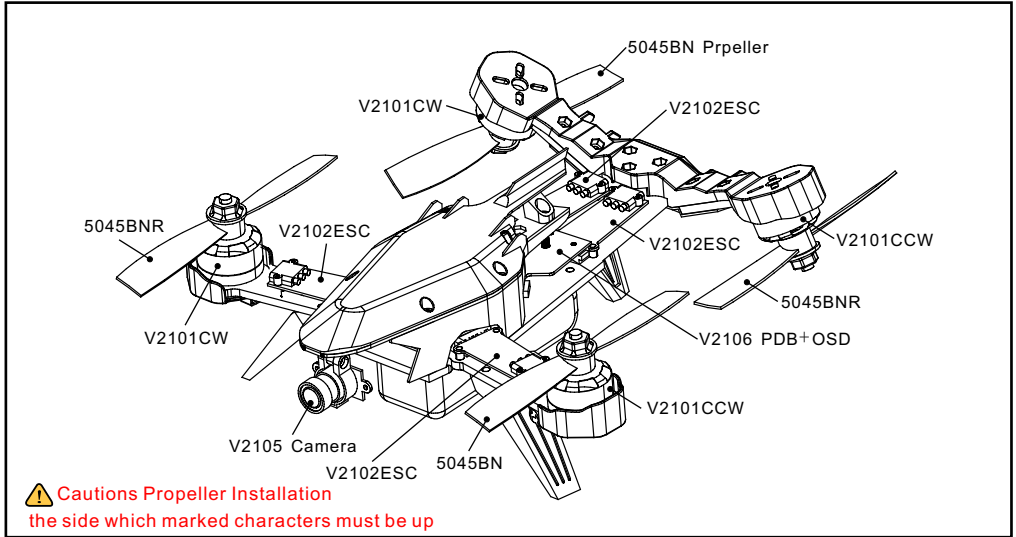Remove the Airplane protective guard, and move the DIPS 1/2/3/4/5/6 to change the channel
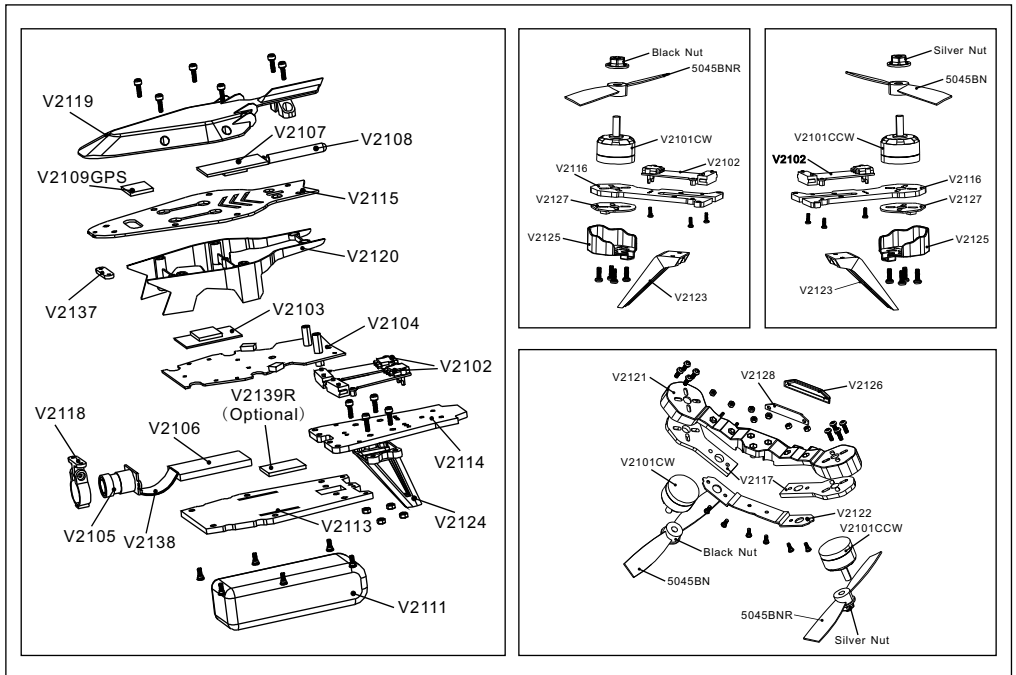
ON
1 2 3 4 5 6
Dips 1-2-3-4-5-6 are"on"

ON
1 2 3 4 5 6
Dips 1-2-3-4-5-6 are"off"

CH \ FR	A	B	C	D	E
1	5740M	5725M	5733M	5705M	5658M
2	5760M	5745M	5752M	5685M	5695M
3	5780M	5765M	5771M	5665M	5732M
4	5800M	5785M	5790M	5645M	5769M
5	5820M	5805M	5809M	5885M	5806M
6	5840M	5825M	5828M	5905M	5843M
7	5860M	5845M	5847M	5925M	5880M
8	5860M	5865M	5866M	5945M	5917M

Frequency group A	A1:5740	A2:5760	A3:5780	A4:5800
	A5:5820	A6:5840	A7:5860	A8:5860
Frequency group B	B1:5725	B2:5745	B3:5765	B4:5785
	B5:5805	B6:5825	B7:5845	B8:5865
Frequency group C	C1:5733	C2:5752	C3:5771	C4:5790
	C5:5809	C6:5828	C7:5847	C8:5866
Frequency group D	D1:5705	D2:5685	D3:5665	D4:5645
	D5:5885	D6:5905	D7:5925	D8:5945
Frequency group E	E1:5658	E2:5695	E3:5732	E4:5769
	E5:5806	E6:5843	E7:5880	E8:5917

3.0 Get to know the parts of V-tail 210

5045BN Prpeller
V2101CW
V2102ESC
5045BNR
V2102ESC
V2102ESC
V2101CCW
5045BNR
V2101CW
V2106 PDB+OSD
V2105 Camera
V2101CCW
V2102ESC
5045BN

⚠ Cautions Propeller Installation
the side which marked characters must be up

Parts exploded views

V2119
V2107
V2108
V2109GPS
V2115
V2120
V2137
V2103
V2104
V2102
V2118
V2139R (Optional)
V2106
V2114
V2105 V2138
V2113 V2124
V2111

Black Nut
5045BNR
V2101CW
V2116
V2102
V2127
V2125
V2123

Silver Nut
5045BN
V2101CCW
V2102
V2116
V2127
V2125
V2123

V2121
V2128
V2126
V2101CW
V2117
V2122
V2101CCW
Black Nut
5045BN
5045BNR
Silver Nut

Parts List

Part description	Part NO	Part description	Part NO
Emax RS2205 KV2300 CW Motor	V2101CW	Airplane mounted frame	V2120
Emax RS2205 KV2300 CCW Motor	V2101CCW	V-tail arm protection guard	V2121
Emax Lightning 20A ESC	V2102	V-tail arm Reinforcement part	V2122
GEMFAN 5045BN Propeller	5045BN	Front landing gear	V2123
GEMFAN 5045BNR Propeller	5045BNR	Rear landing gear	V2124
SP RACING F3_EVO Flight controller	V2103	Motor protection guard	V2125
PDB_OSD Main board	V2104	Rear LED guard	V2126
1080P Camera	V2105	Front LED module	V2127
HMDVR-HD 1080p	V2106	Rear LED module	V2128
5.8g 40ch 200mw wireless video transmitter	V2107	Aluminum hexagonal columns	V2129
5.8g Antenna	V2108	Aluminum Studs	V2130
Eachine 7M GPS	V2109	Battery cable ties	V2131
Bluetooth module	V2110	Screws combo	V2132
Eachine 4S 1500mAh 50c battery	V2111	Allen wrench	V2133
Charsoon DC-4S Blance charger	V2112	DSM Cable+ PPM/SBUS Cable	V2134
Bottom carbon board	V2113	PPM Cable for Eachine X6 receiver	V2135
Rear carbon board	V2114	Velcro tape	V2136
Top carbon board	V2115	Sponge damping for camera	V2137
Front carbon arm	V2116	Connection cable for Camera	V2138
Rear carbon arm	V2117	Eachine I6 transmitter	V2139T
Camera mount	V2118	Eachine X6 Receiver	V2139R
Airplane protective guard	V2119		

PDB_OSD Main board Connection diagram
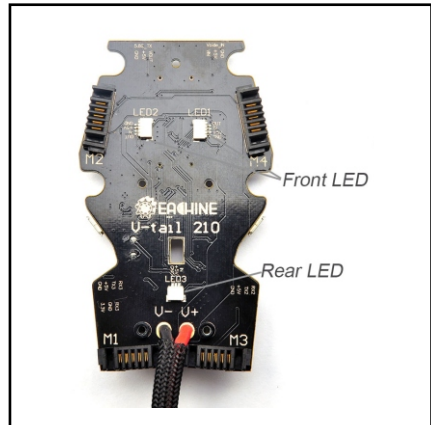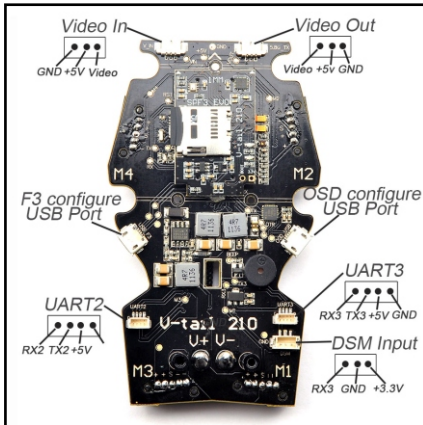
- ● VIDEO IN: Camera video in
- ● VIDEO OUT: 5.8G VTX video out
- ● F3 Configure USB Port: Connect to computer, accept Cleanflight and Betaflight.
- ● OSD Configure USB Port: Connect to computer, configure OSD with MWOSD GUI, must power the battery.
- ● UART2 : Used for PPM/SBUS Receiver input or GPS
- ● UART3: Used for GPS or Telemetry module, unavailable when DSM Input used
- ● DSM INPUT: Used for DSM/DSM2/DSMX Receiver input, unavailable whenUART3 used

4.0 Get to know your remote controller(Optional)

● There is a Remote controller comes with the RTF version.
● The V-tail 210 feature 2 useful flight modes, STABILIZE / ADVANCED(Rate mode) Flight modes are
 selected by the MIX switch(SWB)
  *Select the appropriate mode according to your flight skills
  *For your first test flight with a new quad, always start with the STABILIZE mode

MODE 2 (Throttle stick on the left)	Left stick	THRO/RUDD stick
	Right stick	ELEV/AILE stick
	Left trim	THRO trim
	Right trim	ELEV trim
MODE 1 (Throttle stick on the right)	Left stick	ELEV/RUDD stick
	Right stick	THRO/AILE stick
	Left trim	ELEV trim
	Right trim	THRO trim

STABILIZE Flight Mode	ADVANCED Flight Mode
MIX Switch to "2"	MIX Switch to "1"

1、Handle
2、Antenna
3、Switch A
4、Switch B
5、Switch C
6、Switch D
7、Left stick
8、Left trim
9、Right trim
10、Right stick
11、Left trim
12、Right trim
13、Up
14、press the Enter key
15、Down
16、Short press the Cancel key
17、Code keys
18、Switch
19、LCD Display

EACHINE
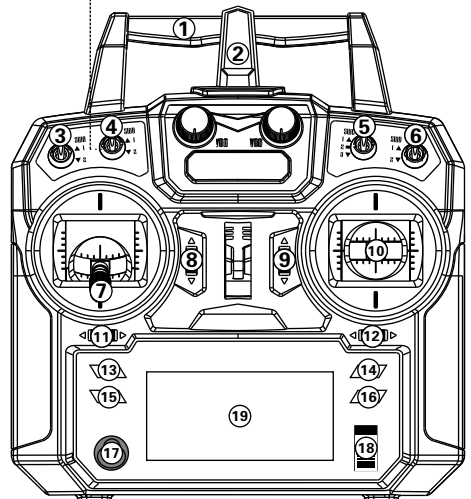
5.0 Receiver Configure (ARF Version)

The V-tail 210 ARF Version need a receiver and radio controller , V-tail 210 support PPM/SBUS/DSM/DSMX receiver input.

● **PPM Receiver configuration**

Plug the PPM receiver to UART2 port, then set receiver mode to RX_PPM in Cleanflight configurator.

Ports   DOCUMENTATION FOR 1.13.0

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.

Identifier	Data	Logging	Telemetry		RX	GPS	
USB VCP	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼	AUTO ▼	Serial RX		57600 ▼
UART1	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼	AUTO ▼	Serial RX		57600 ▼
UART2	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼	AUTO ▼	Serial RX		57600 ▼
UART3	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼	AUTO ▼	Serial RX	●	57600 ▼

Receiver Mode

◉ RX_PPM   PPM RX input

○ RX_SERIAL   Serial-based receiver (SPEKSAT, SBUS, SUMD)

○ RX_PARALLEL_PWM   PWM RX input (one wire per channel)

○ RX_MSP   MSP RX input (control via MSP port)

Serial Receiver Provider

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

```
SPEKTRUM1024
SPEKTRUM2048
SBUS
SUMD
SUMH
XBUS_MODE_B
XBUS_MODE_B_RJ01
IBUS
```

● **SBUS Receiver configuration**

Plug the SBUS receiver to the UART2 port, Then Enable Seria_RX for UART2 and Set Receiver mode to RX_SERIAL. Select SBUS signal in Cleanflight configurator.

Ports

DOCUMENTATION FOR 1.13.0

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.

Identifier	Data	Logging	Telemetry		RX	GPS
USB VCP	● MSP 115200 ▾	○ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	○ Serial RX	○ 57600 ▾
UART1	● MSP 115200 ▾	○ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	○ Serial RX	○ 57600 ▾
UART2	○ MSP 115200 ▾	○ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	● Serial RX	○ 57600 ▾
UART3	○ MSP 115200 ▾	○ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	○ Serial RX	● 57600 ▾

Receiver Mode

○ RX_PPM — PPM RX input

◉ RX_SERIAL — Serial-based receiver (SPEKSAT, SBUS, SUMD)

○ RX_PARALLEL_PWM — PWM RX input (one wire per channel)

○ RX_MSP — MSP RX input (control via MSP port)

Serial Receiver Provider

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

```
SPEKTRUM1024
SPEKTRUM2048
SBUS
SUMD
SUMH
XBUS_MODE_B
XBUS_MODE_B_RJ01
IBUS
```

● DSM/DSM2/DSMX Receiver configuration

Plug DSM/DSM2/DSMX receiver to the DSM Port, Enable Seria_RX for UART3 and Set Receiver mode
RX_SERIAL ,Select Spektrum1024(DSM/DSM2) or Spektrum2048(DSMX) in Cleanflight configurator.
⚠ **Please Connect GPS to UART2 when you used DSM/DSM2/DSMX Receiver**

Ports

DOCUMENTATION FOR 1.13.0

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.

Identifier	Data	Logging	Telemetry	RX	GPS
USB VCP	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼ AUTO ▼	Serial RX	57600 ▼
UART1	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼ AUTO ▼	Serial RX	57600 ▼
UART2	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼ AUTO ▼	Serial RX	● 57600 ▼
UART3	MSP 115200 ▼	Blackbox 115200 ▼	Disabled ▼ AUTO ▼	● Serial RX	57600 ▼

Receiver Mode

○ RX_PPM — PPM RX input
◉ RX_SERIAL — Serial-based receiver (SPEKSAT, SBUS, SUMD)
○ RX_PARALLEL_PWM — PWM RX input (one wire per channel)
○ RX_MSP — MSP RX input (control via MSP port)

Serial Receiver Provider

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

```
SPEKTRUM1024
SPEKTRUM2048
SBUS
SUMD
SUMH
XBUS_MODE_B
XBUS_MODE_B_RJ01
IBUS
```

6.0 ⚠ Attention before flight

•The V-tail 210 Quadcopter is recommended for piots,14 years or older, with RC hobby experience.
•Only fly the V-tail 210 in dry weather, with low wind, please do not fly in rain or heavy foggy conditions.
•Always choose large open fields for flying. Check local LAW and ordinances for legal flying areas.
•Always keep at least 10 feet distance to the aircraft when armed, to avoid injury from high-speed propellers on the ground or while flying. Always disarm before handling the aircraft.
•Do not fly close to high-voltage power lines, cell phone towers, or radio towers, as these may disrupt your control signal.
•ALWAYS check local laws BEFORE flying. NEVER fly over crowds, concerts or sports stadiums.

7.0 Charge the battery

•Connect the power cable to the wall-outlet, the power adapter accept voltage from 100V to 240V. When correctly powered the charger LED Screen will be display
•Insert the Lipo battery balance plug into the Charsoon DC-4S charger
•During charging the Led screen will display total battery voltage and single cell voltage cyclically. When charging is completed, the total voltage should be 16.8v(±0.1v~0.2v) in the LED Screen.

⚠ **IMPORTANT ISSUE YOU MUST PAY ATTENTION TO:**

•The DC-4S Charger can ONLY used for 2s/3s/4s batteries.
NEVER EVER attempt to charge more than one battery at any time, the charger may get damaged or catch fire.
•During charging, the DC-4S should be placed in a dry and ventilated place, far away from head sources and far away from flammable or explosive substances.
•Always remove the battery from the aircraft before charging.
Never charge unsupervised, stay close and keep an eye on the charger for the entire duration of the process.
•Always allow the battery to cool down before charging, at least 10 minutes.
Overheated batteries may swell or catch fire while charging.
•Before connecting the battery, make sure the correctness of polarity
•Avoid dropping charging battery
•DO NOT charge a damaged battery, if the battery have cuts, swelling or bend, do not charge.
•Dispose of damaged batteries by submerging in a pot of salt-water for 30 minutes, then give to battery recycling place.
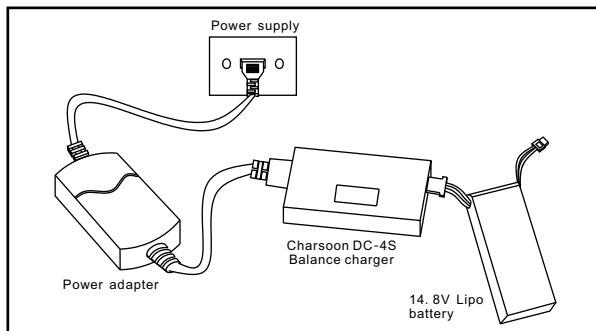
8.0 Ready for Flight

● **Install propeller**

Fix the 5045BN propeller (Counterclockwise) onto the M1（CW motor Inverted mounted） M4 motor (CCW motor), and fix the 5045BNR propeller (Clockwise) onto the M2(CW motor), M3 motor (CCW motor Inverted mounted) Counterclockwise to tighten the Black propeller Locking Nut and Clockwise to tighten the Silver propeller Locking Nut. Tighten the propeller locking nut manually and make sure the propeller is installed in proper way and fastened.

⚠ **IMPORTANT NOTES:**

The side which marked characters must be up
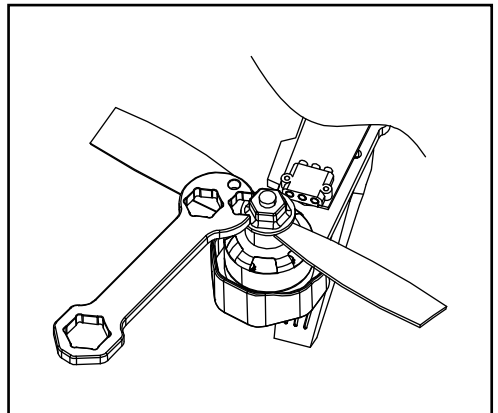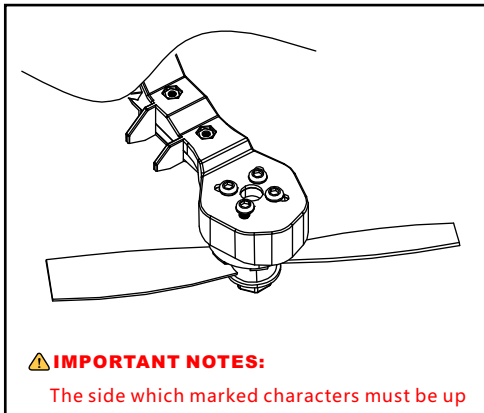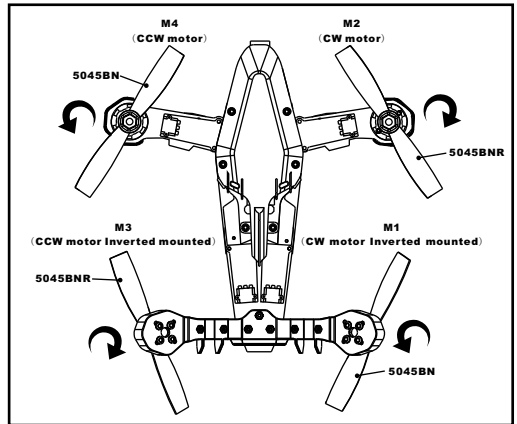
● **Battery installation**

First put the battery anti-slip mat into the bottom carbon board.

Put the battery at the bottom and move it forward-backwards as required for perfect balance and No interference with other equipment then firmly secure the battery with the velcro strap.

⚠ **Attention:**

(1)Place the aircraft in a wide open space, with the rear facing you.(This position is known as "TAIL IN")

(2)Put SWB switch to the 2 position (Please set the flight model to stabilize if yours are not RTF Version) put all trims and dials to the Middle position, move the throttle to the lowest position, then turn on the Remote Controller.

(3)A video receiving equipment is needed(such as FPV monitor with 5.8G wireless video receiver , Goggles glasses ,etc.)to display an image and OSD information.

(4)The V-tail 210 mini-quad have a low-voltage alarm beeper. And the OSD give you a visual reference for the remaining battery power、fight time, flight height, attitude line, flight speed, Coordinates, direction. When voltage reach below 14.0 volts and the beeper will sound alarm. The V-tail210 mini-quad is designed for FPV racing there is no "automatic landing mode".

⚠ **WARNING: Do not hesitate to land when you hear the alarm or see the OSD indicating 14.0 volts**

OSD information

The OSD information is visibleon your video reciever ∗Goggles, or screen with video reiever.

Latitude: 0 0 . 0 0 0 0 0 N
Longitude: 0 0 0 . 0 0 0 0 0 E
GPS: 0
Direction: S W
Filght mode: [STAB]
Speed: km/h 0
Ait/m 0 ··· Height
Battery voltage: 14.8 V
A R M E D
on min 2:18 ··· Filght Time

9.0 Motor ARM/DISARM

● The Vtail-210 ARF/RTF was set AUX1(CH5) to ARM/DISARM the motor , the AUX1(CH5) of RTF Version is SWA Switch, and for the ARF Version you need set up by yourself, you can also customize the ARM/DISARM to any switch by CLEANFLIGHT CONFIGURATOR.

Modes   **DOCUMENTATION FOR 1.13.0**

Use ranges to define the switches on your transmitter and corresponding mode assignments. A receiver channel that gives a reading between a range min/max will activate the mode. Remember to save your settings using the Save button.

ARM	AUX 1 ▼		
Add Range	Min: 1300 Max: 2100	900 1000 1200 1400 1500 1600 1800 2000 2100	

| ANGLE	AUX 2 ▼		
Add Range	Min: 1600 Max: 2100	900 1000 1200 1400 1500 1600 1800 2000 2100	

● First check that all trims are neutral, the throttle stick is ALL the way Down with the display indicating 0%throttle.

● Push the SWA MIX switch to "2" position, you will see all the LED light turn to blue color and the buzzer issues a "B~B" sound, indicating that motors are armed. Be very careful at this point, as pushing the throttle up will start the motors.You can test by pushing the stick up a little, the motors should start.

● Push the SWA MIX switch to "1" position, you will see the front LED light turn to green color and the buzzer issues a "B~B" sound, indicating that motors are disarmed.

● TEST: Push the throttle stick up a little, the motors will not start when disarmed.

Motor ARMED	Motor DISARMED
1 ▲ ▼ 2	1 ▲ ▼ 2
SWA Switch to"2"	**SWA Switch to"1"**

Proximity FPV obstacle flying
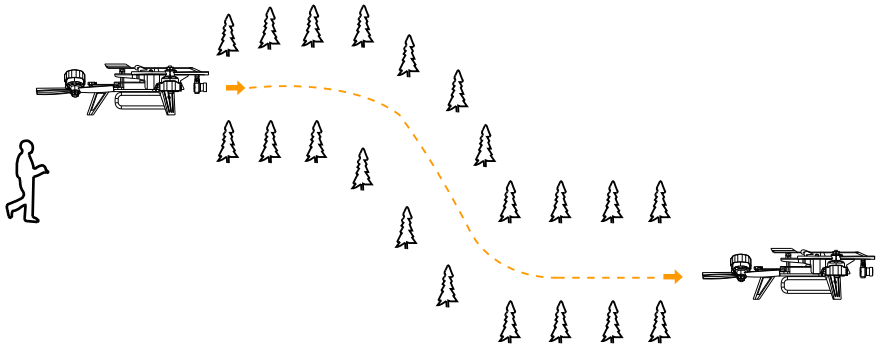
● **Attention:**

(1)Proximity FPV obstacle flying is more suitable for experienced piots, highspeed obstacle avoidance flights require advanced skills.

(2)Recommended FPV range 200m depending on environment.

(3)Avoid flying over people, animals, do not fly over crowds, concerts or sports stadiums. Avoid flying close to power lines and cell phone towers as these may crash you.

● **END FLIGHT**

Land the aircraft, disarm(lock) the aircraft.

First Power off the aircraft by unplugging the battery, then turn off the radio.

Finally, remove the battery from the aircraft.

. . . .

10.0 Firmware flsh for The V-tail 210

The following tutorial covers flashing Cleanflight Firmware onto the F3 EVO Flight Controller.

Betaflight is the same steps like Cleanflight.

● **Installing the ST drivers:**

(For Windows Only)

Download and install the DfuSe demo package.

Open an explorer window and browse to (assuming you've installed to the default path) C:\Program Files (x86)\STMicroelectronics\Software\DfuSe v3.0.5\Bin\Driver Browse two folders deeper to the folder relative to your Operating System version, and x86-32bit or x64-64bit variant. Click the dpinst_x##.exe to install the driver.
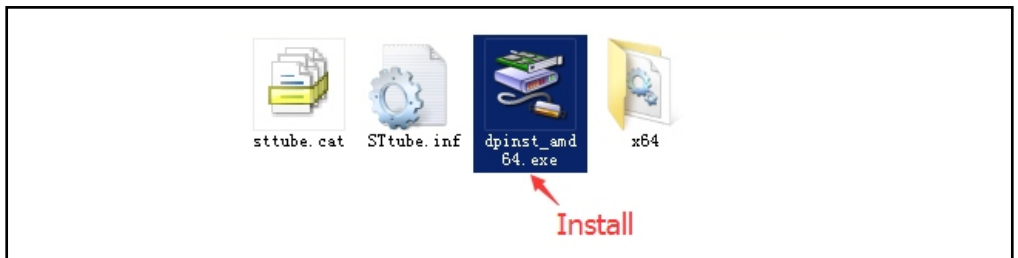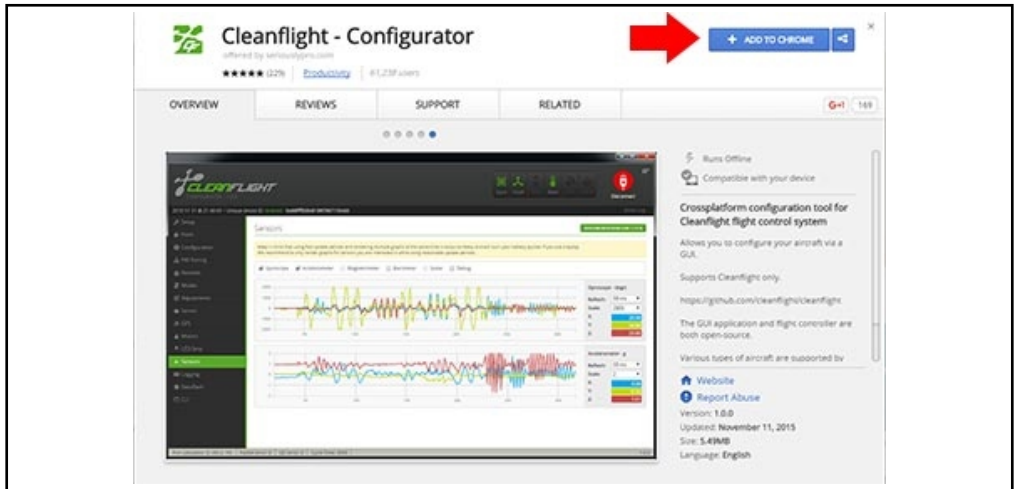
● **Installing Cleanflight Configurator:**

(For Windows Only)

Suggest to use Cleanflight Configurator v 1.2.3 or ,it's the newest release.

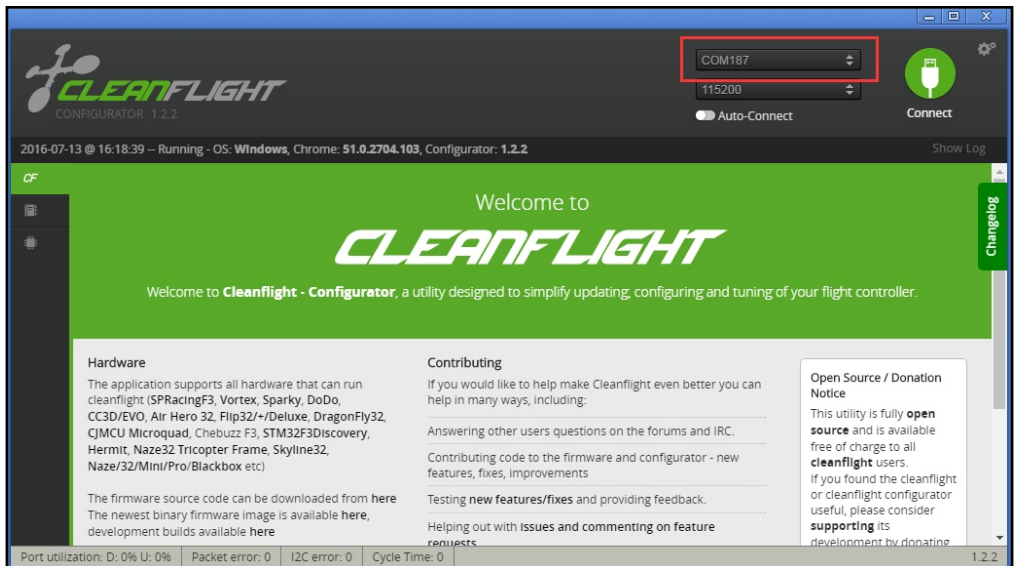The following assumes you also have the Chrome Browser installed.

Get the latest Cleanflight Configurator (+ Add to Chrome)

● **Replacing the ST Driver with WinUSB driver:**

(For Windows Only)

1.Connect the V-tail 210 to your computer through the F3 configure USB port. Open cleanflight configurator , you should see the serial com port

2.Click "Firmware Flash" menu, select the latest firmware for F3 EVO flight controller and load firmware [online] or load firmware [Local]
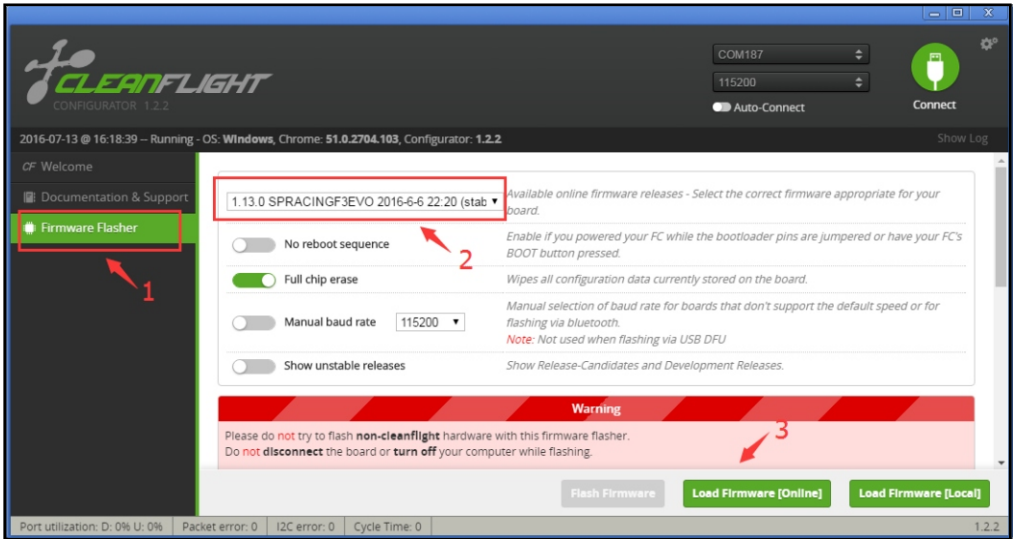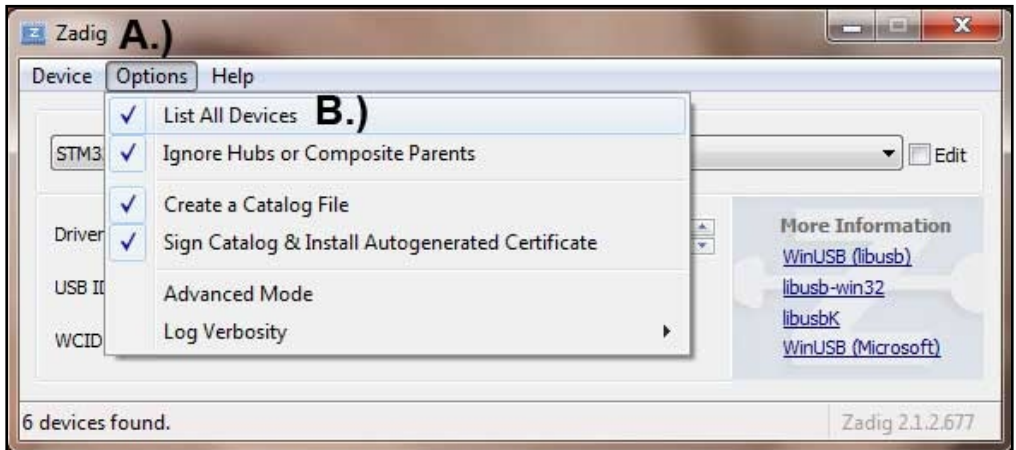

3.Click "Flash Firmware" and wait the ST DFU DRIVER Automatic installation. It's successfully installed when you see the DFU port on the Up right corner.
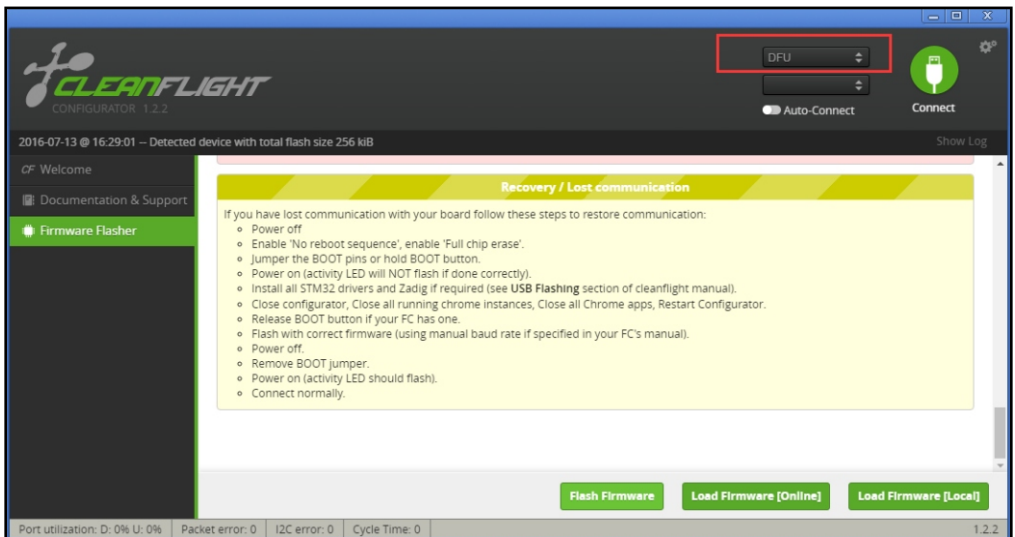

4.Download and launch Zadig.

5.From Zadig, a.) Select Options, b.) Tick List All Devices.

6.a.) Select STM32 Bootloader from the dropdown, b.) Choose WinUSB as the replacement, c.) Click Replace Driver. Some times the Replace progress will be slow or no response, you can close it and do it again, you will find the dropdown is no STTUB30 but WinUSB, just click replace driver from WinUSB to WinUSB .
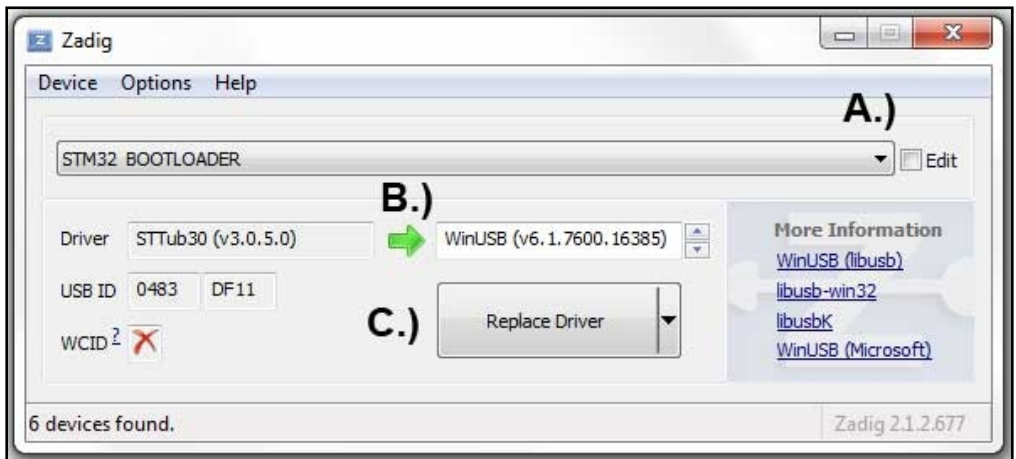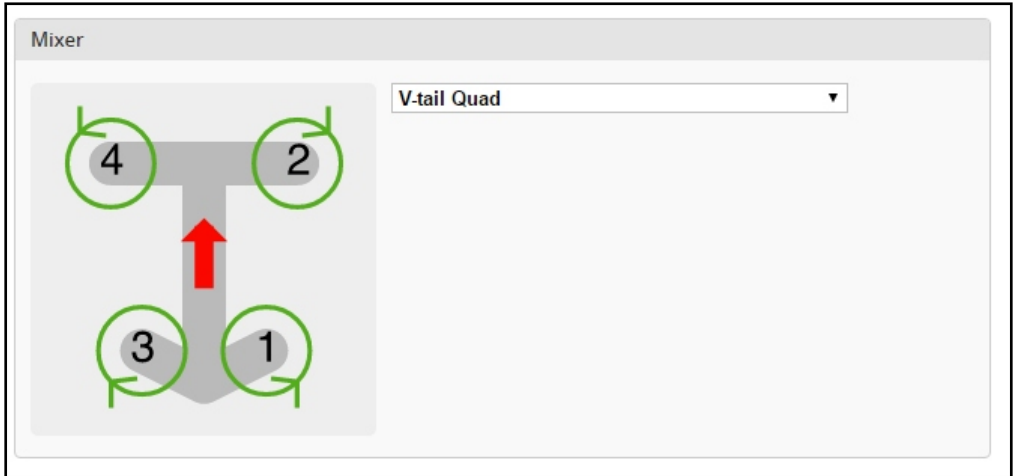

* Credits for the Zadig option – Cleanflight Docs

● **Flash Firmware**

Go back to Cleanflight configurator and Click Flash Firmware

Flash Firmware again after the Driver replace completed, and you will see the firmware flashed successfully!

⚠️ **Cautions**

Please don't forget to select the Mixer "V-tail Quad" for the V-tail 210 in the configure Tab after flashed firmware

. . . .

11.0 How to install MW OSD firmware to the V-tail 210

● **Preparation**

•Download the MW OSD software pack of your choice.

•Download the Arduino flavor that matches your system.

● **Testing Firmware communication flashing**

•Connect the V-tail 210 to the computer through the OSD configure USB port and power on the aircraft with the battery

•Start Arduino IDE.

•Choose the appropriate board: Tools > Board > Arduino Pro or Pro Mini 5V, 16MHz, w/ ATmega328.

•Select the proper serial port in menu Tools > Serial Port.

•Click on the "Upload" button and observe the serial console at the bottom of arduino. Success is noted as white text on black background stating just the binary sketch size. If messages in red letters appear, something went wrong.

● **Firmware flashing**

•Connect the OSD to the FTDI adapter, and that to the PC.

•Start Arduino IDE.

•Select File > Open. Browse to the MW_OSD folder and select 'MW_OSD.ino'

•A new Arduino IDE will appear. Close the other window as it it no longer needed.

•If you have not already done so, make sure to do the following: From the MW_OSD Arduino window, choose the appropriate board: Tools > Board > Arduino Pro or Pro Mini 5V, 16MHz, w/ ATmega328. Select the proper serial port in menu Tools > Serial Port.

•Edit the config.h tab to select the correct OSD hardware, Flight controller and aircraft type.

•Click on the "Upload" button and observe the serial console at the bottom of arduino. Success is noted as white text on black background stating just the binary sketch size. If messages in red letters appear, something went wrong.

To test the setup, close Arduino and start MW OSD GUI. It should connect and work normally with the newly flashed OSD.

● **Updating fonts**

•Connect to the OSD using the GUI.

•Select the font you require otherwise the default one will be used

•The font chosen will be seen in the simulator window

•Select upload from the GUI

•NOTE - check the FAQ - requires the OSD to be powered correctly or teh fonts will not save (upload looks OK)

● **Save OSD configuration**

⚠ If the OSD display is not full to the FPV screen or you changed Video format by short press the HMDVR-HD, you should change the Video format in the MWOSD GUI to match the video output. Don't forget to click "write" to update after you changed the settings

. . . .

12.0 How to USE Bluetooth with V-tail 210

● Enable MSP for UART3,then connect Bluetooth toUART3
(When UART3 connected Bluetooth,DSM input is unavailable), Power on the battery for the V-tail 210, Use yourAndroid mobile phone to match with the Bluetooth.

Ports
DOCUMENTATION FOR 1.13.0

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.

Identifier	Data	Logging	Telemetry		RX	GPS	
USB VCP	⬤ MSP 115200 ▾	◯ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	◯ Serial RX	◯	57600 ▾
UART1	◯ MSP 115200 ▾	◯ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	◯ Serial RX	◯	57600 ▾
UART2	◯ MSP 115200 ▾	◯ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	◯ Serial RX	◯	57600 ▾
UART3	⬤ MSP 115200 ▾	◯ Blackbox 115200 ▾	Disabled ▾	AUTO ▾	◯ Serial RX	◯	57600 ▾

● Download the EZ-GUI APP to your android mobilephone from Google Play, go to Settings, select Bluetooth option and press the "Select MultiWii BT" button. The list with available devices will be shown.Choose correct one and you are ready to go.

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