
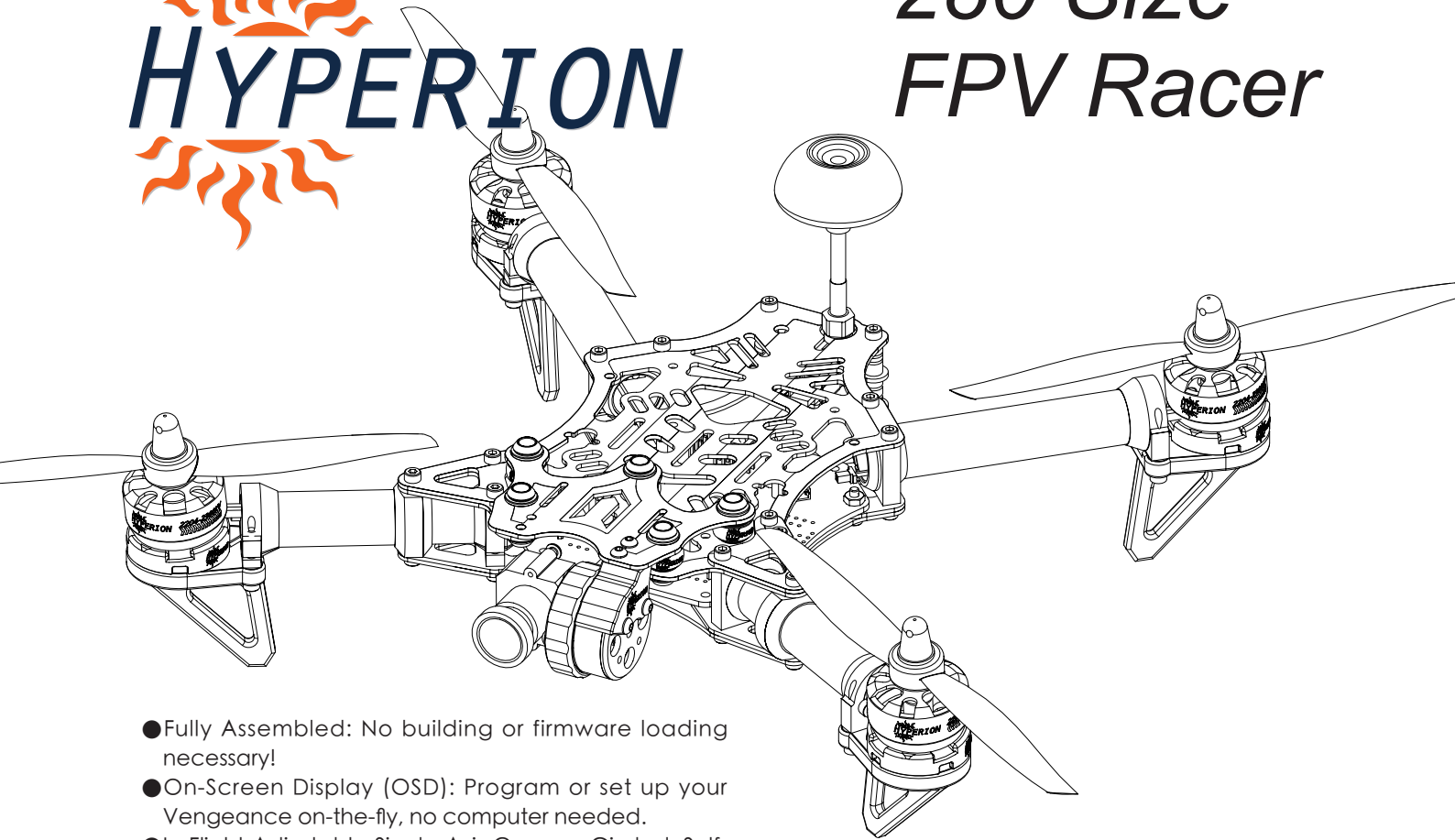


# VENGEANCE

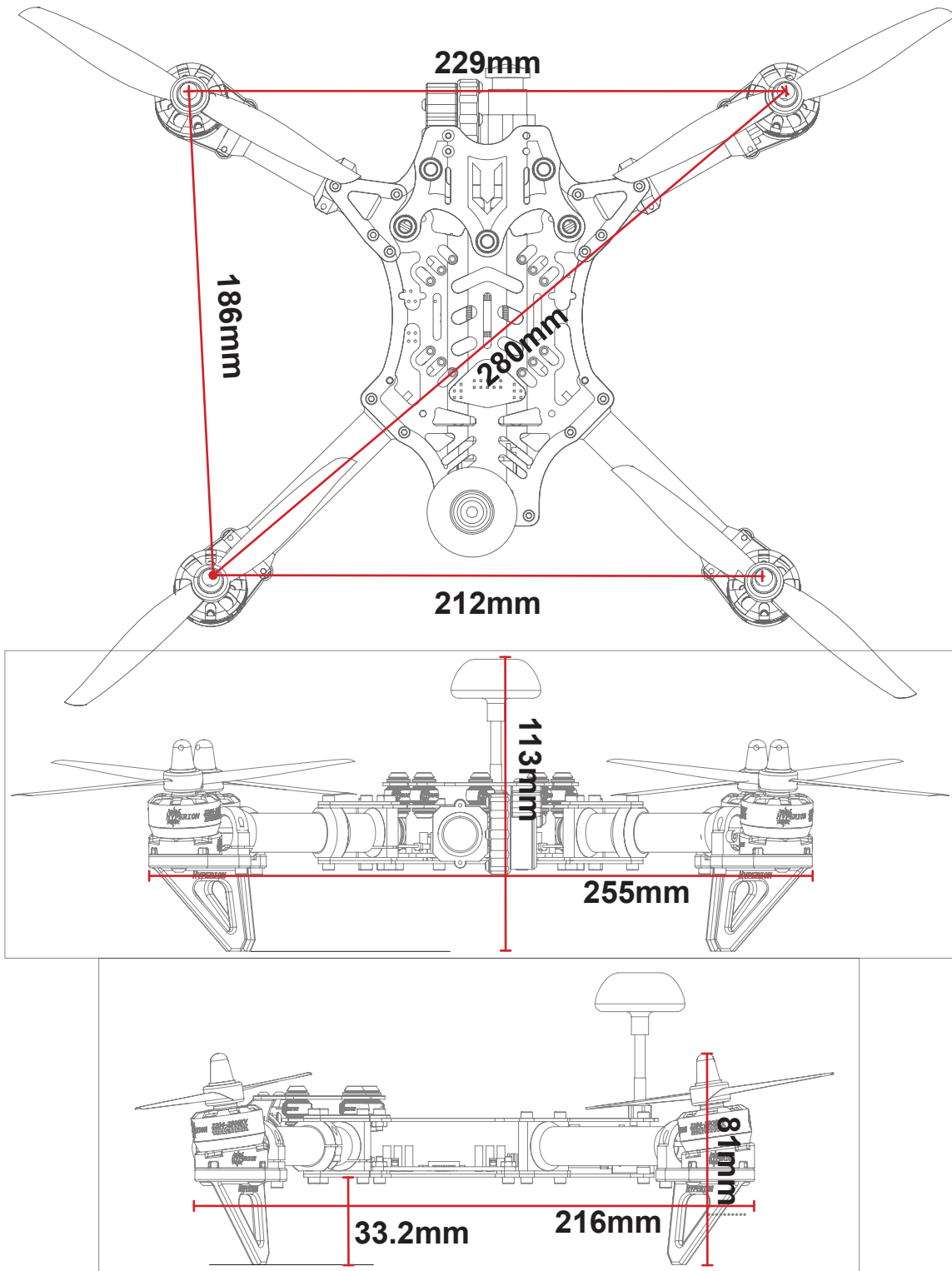
**HYPERION**

*280 Size  
FPV Racer*



- Fully Assembled: No building or firmware loading necessary!
- On-Screen Display (OSD): Program or set up your Vengeance on-the-fly, no computer needed.
- In-Flight-Adjustable Single-Axis Camera Gimbal, Self-leveling during flight.
- Vibration Dampened Second-Camera Mount.
- Robust, Pure Carbon-Fiber Frame with Carbon Exoskeleton Reinforcements.
- Stress-Flex Designed to Withstand Impacts, Mass centralized for high-rate turning.
- Black-Anodized, High-Strength CNC Aluminum Boom Mounts.
- Tough, Translucent Polymer Landing Legs with Built-in Directional Red-Green LED.
- 8° Forward-Tilt Motor Mounts for Aerodynamic Efficiency and Top Speed Performance.
- Four 2204, 2300Kv High-Output Brushless Motors.
- Custom Compact BL-Heli 20A Motor Controllers (ESC).
- Visual LED Flight Mode Indicator. Easy to confirm your flight mode.
- Pre-loaded with Three Flight Modes: Normal, Altitude Hold, or Acro Mode.
- NAZE Spec 32 Bit Flight Controller 7DOF (with BMP sensor).
- Altitude Hold via Integrated Barometric Pressure Sensor (BMP).
- 3S and 4S Battery Compatible. Hyperion G6 HV LiPo Suggested.
- 5.8GHz Auto-Scan 40CH Video Transmitter (VTX) w/ Race Band VTX selectable for either 25mw/200mw output.
- Tuned 5.8GHz CloverLeaf Skew-Planar Antenna.
- Plug-n-Play Ready for Optional GPS modules.
- Built-in Low-voltage Audible Alarm.
- Compatible with Single Wire\* or Traditional Receivers (\*S-Bus, Horizon Spektrum™ Satellite, or Hyperion Compatible receivers).
- Box includes Carry Handle and Foam Racer Cradle + Parts Holder, for service as field case.
- One Set 6x4 CC/CCW Propellers Included.





○ Specifications

○ Length : 216mm	Channels : 6~8ch	Motors : Hyperion 2204-2300kV
○ Width : 255mm	Camera : 600tvl 1/3" CMOS Camera	ESC : BL Heli 20A
○ Diagonal Base : 280mm	VTX : 5.8Ghz 25-200 0mW selectable w/ 40Ch's	Propellers : 6040 CW & CCW
○ Weight : 435g (w/o battery)	Battery : 3~4S Compatible	Controller : Naze32 w/ OSD & Altitude Sensor

Left / Right Reinforcement Plate



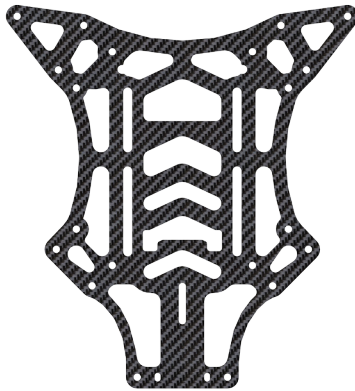
Lower Front Reinforcement Plates



Main Carbon Fibre Frame



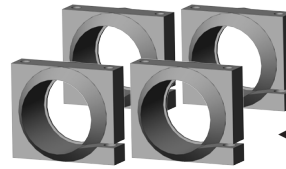
Lower Main Carbon Fibre Frame



Camera Mounting Plate



Lower Rear Reinforcement Plates



Main Frame Mounting Clamps X4

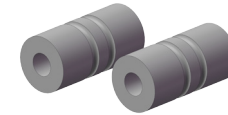


Motor Mounting Clamps X4

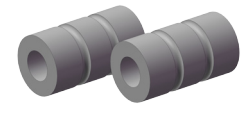


Front Arm Reinforcement Clamps X2

Vengeance Carbon Fiber Frame Kit



Rear Frame Standoff 9mm X2



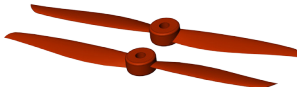
Rear Frame Standoff 10mm X2



Hyperion Silicon Dampeners Soft X5



6x4 CW + CCW Prop Set (Black)



6x4 CW + CCW Prop Set (Orange)



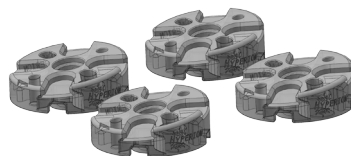
Front Arm Tubes 15x73mm X2



Rear Arms Tubes 15x83mm X2



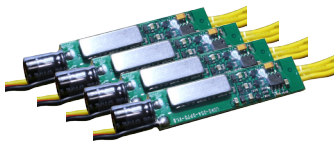
Hyperion 2204-2300kv Brushless Motor CW X2  
Hyperion 2204-2300kv Brushless Motor CCW X2



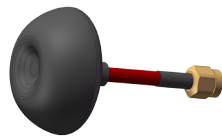
Eight Degree Forward Tilt Motor Mounts X4



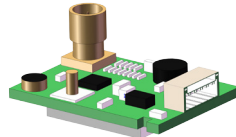
Vengeance Translucent Landing Gear X4



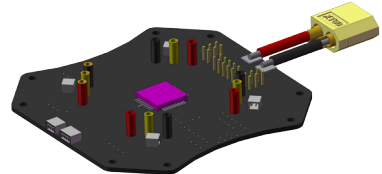
BL Heli 20A 2S-4S ESC X4



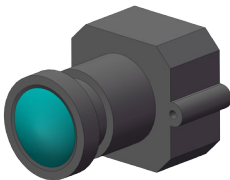
5.8GHz Cloverleaf RHCP Antenna (RP-SMA)



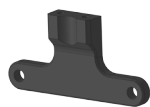
5.8GHz Selectable 25mW / 200mW Video Transmitter



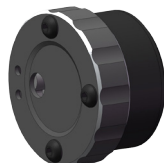
Flight Controller with OSD, and Altitude Sensor



1/3" 600tvl CMOS Camera



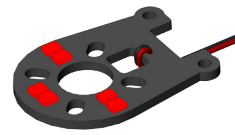
Camera Mount Bracket



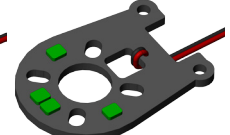
Vengeance Gimbal Motor with Sensor (1-axis Pitch)



Gimbal Mount Bracket



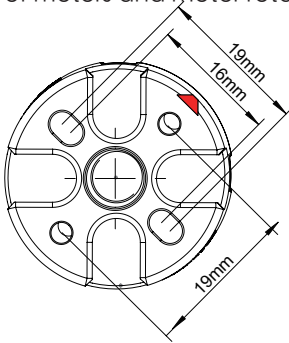
LED Landing Gear PCB (Red)



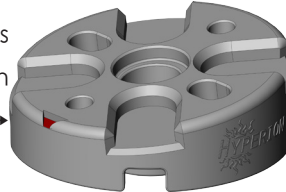
LED Landing Gear PCB (Green)

# 1.Motor & Arm

The Vengeance's unique motor mount design allows for superb forward flight and cornering performance. Please note that during installation that you install each arm in the proper location and the angle of motors and motor rotation corresponds to the picture enclosed.



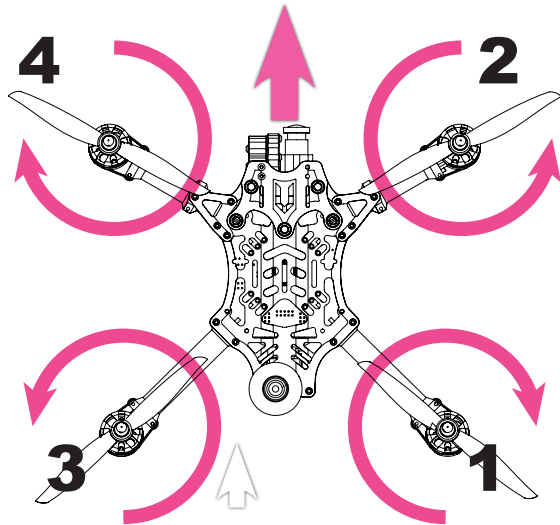
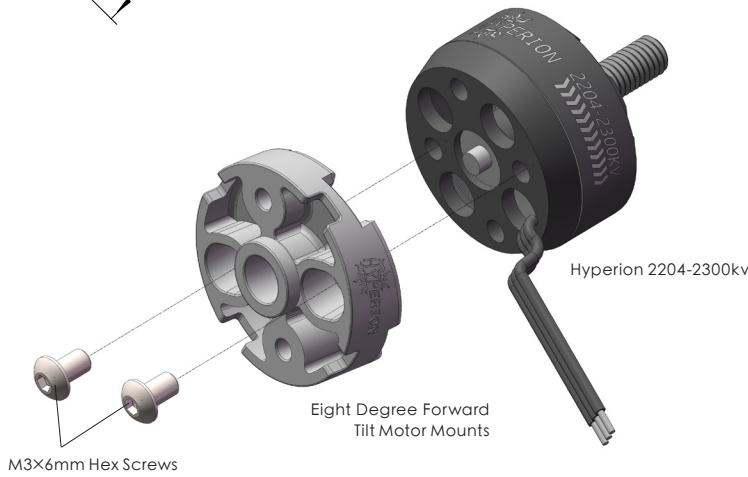
Motor mount arrows indicated forward position of the motor. →



▲ Clockwise Rotation <<<< Motor Rotation Indicators.



▲ Counterclockwise Rotation >>>> Motor Rotation Indicators.

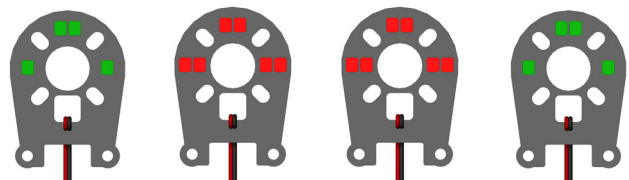


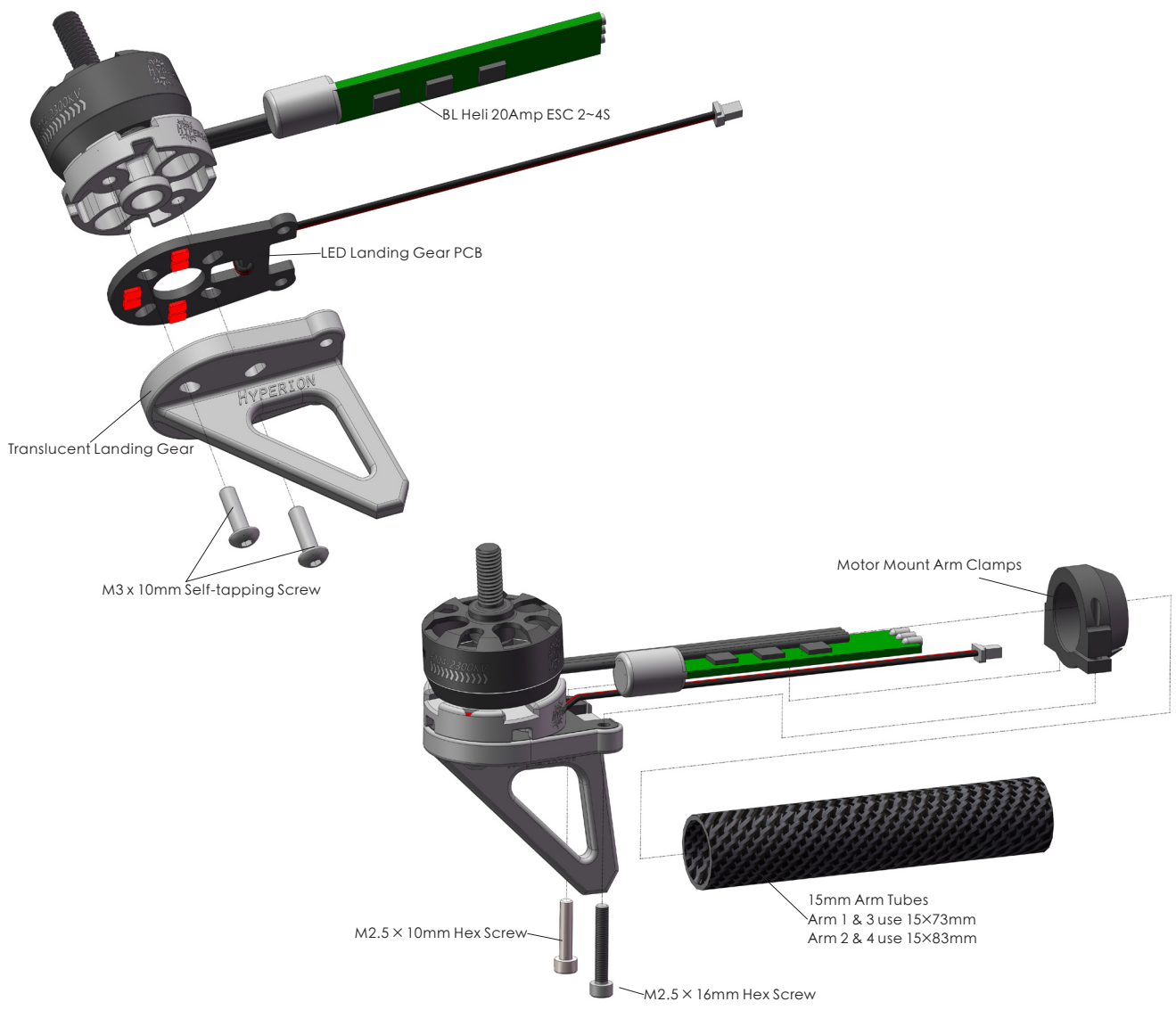
↑ 1-4 Motor Rotation Chart.



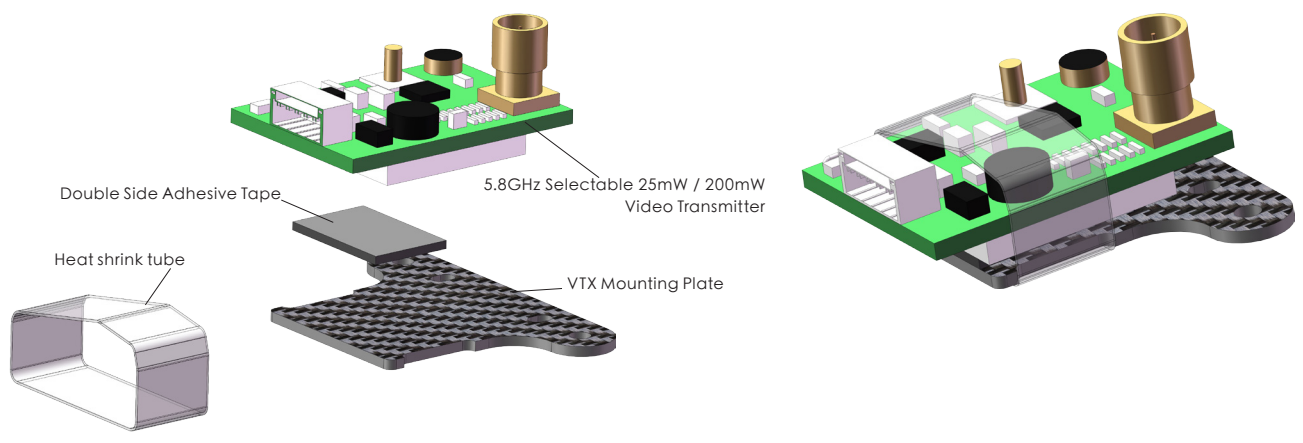
Motor Mount Assembly ↗ Direction Chart.

LED Landing Gear Assembly Chart →

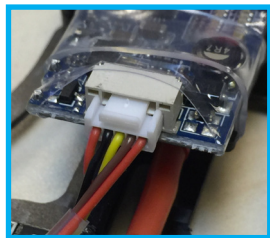
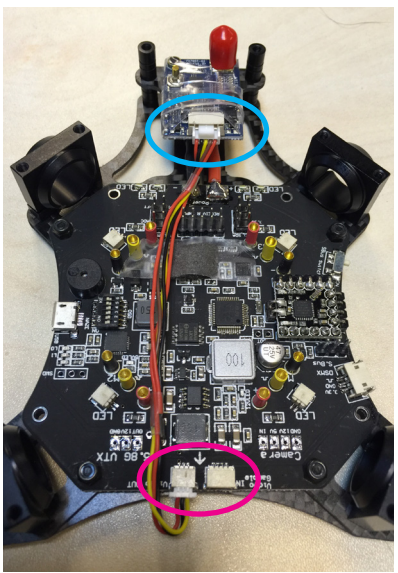
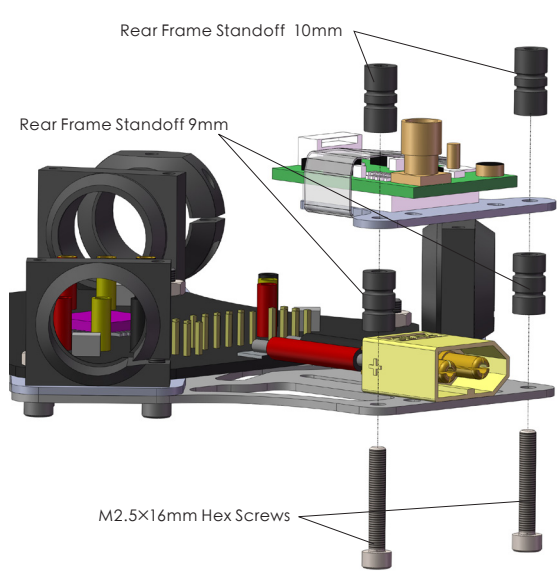
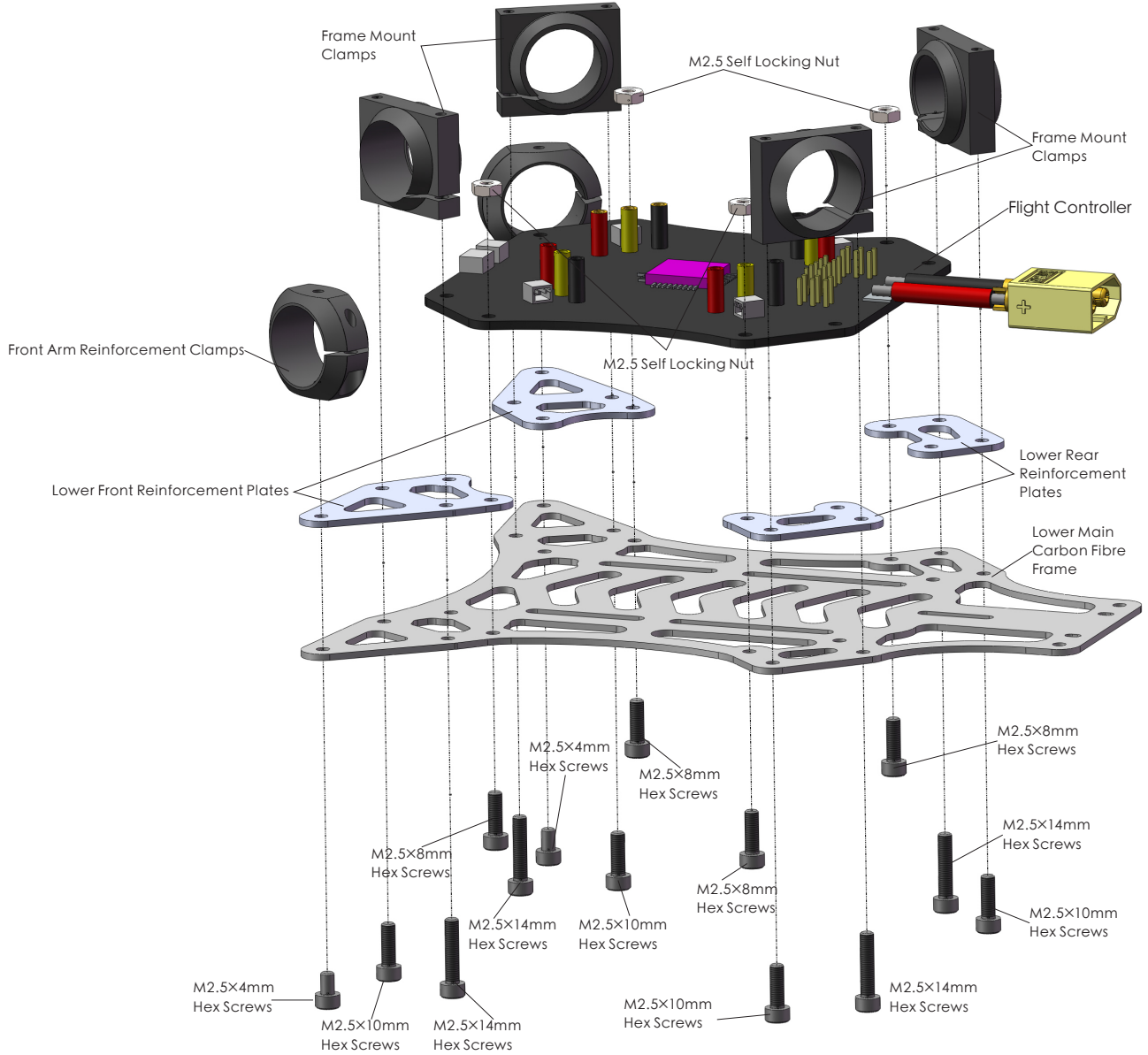




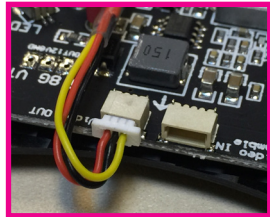
## 2.VTX Assembly



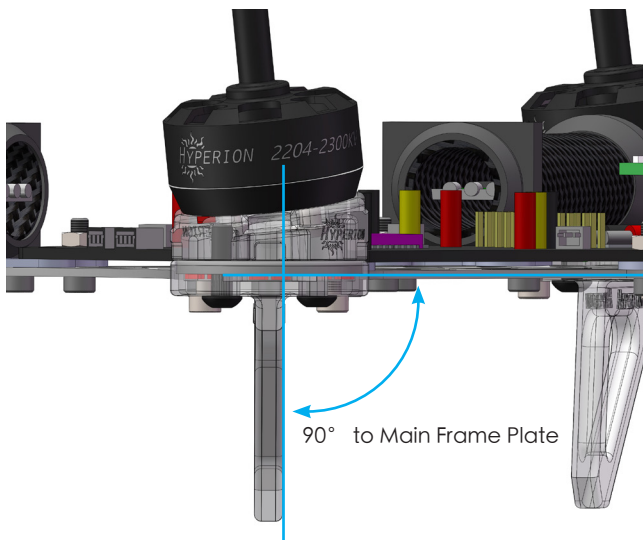
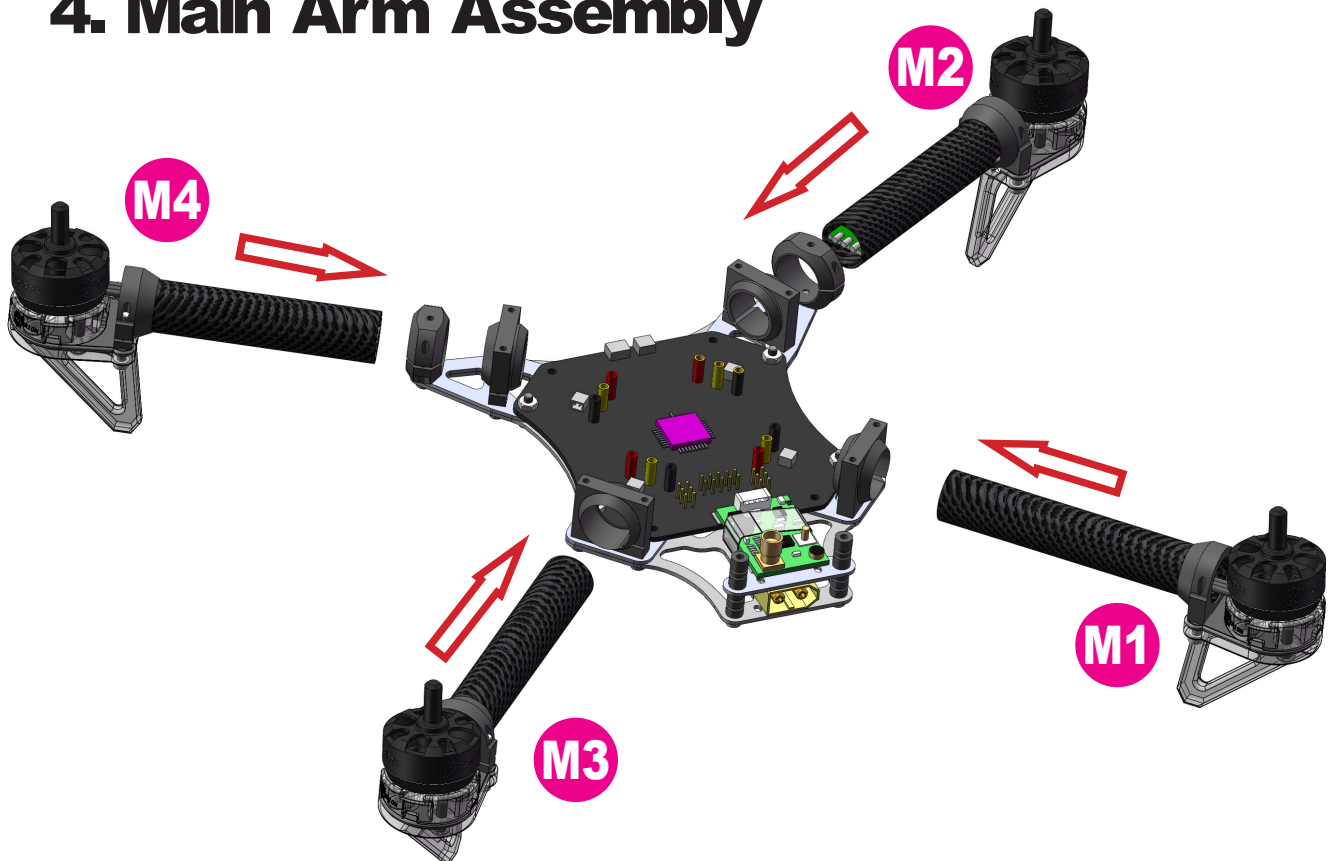
# 3.Main Frame Assembly



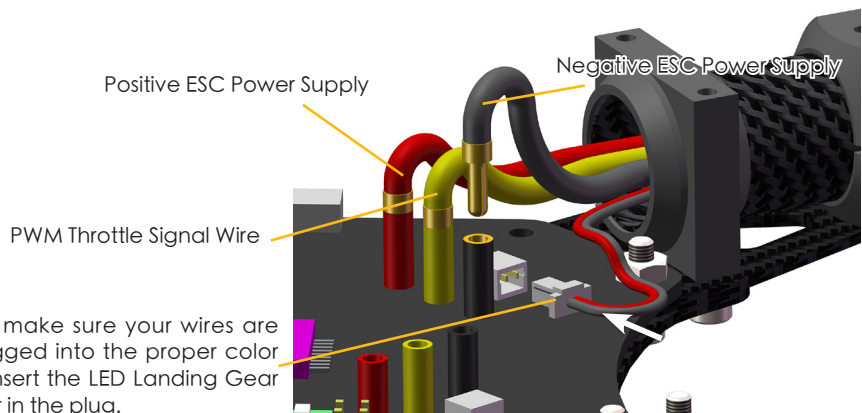
NOTE: use the "Video Out" plug to connect to your VTX. "Video IN" plug is used to connect to the Camera.



# 4. Main Arm Assembly



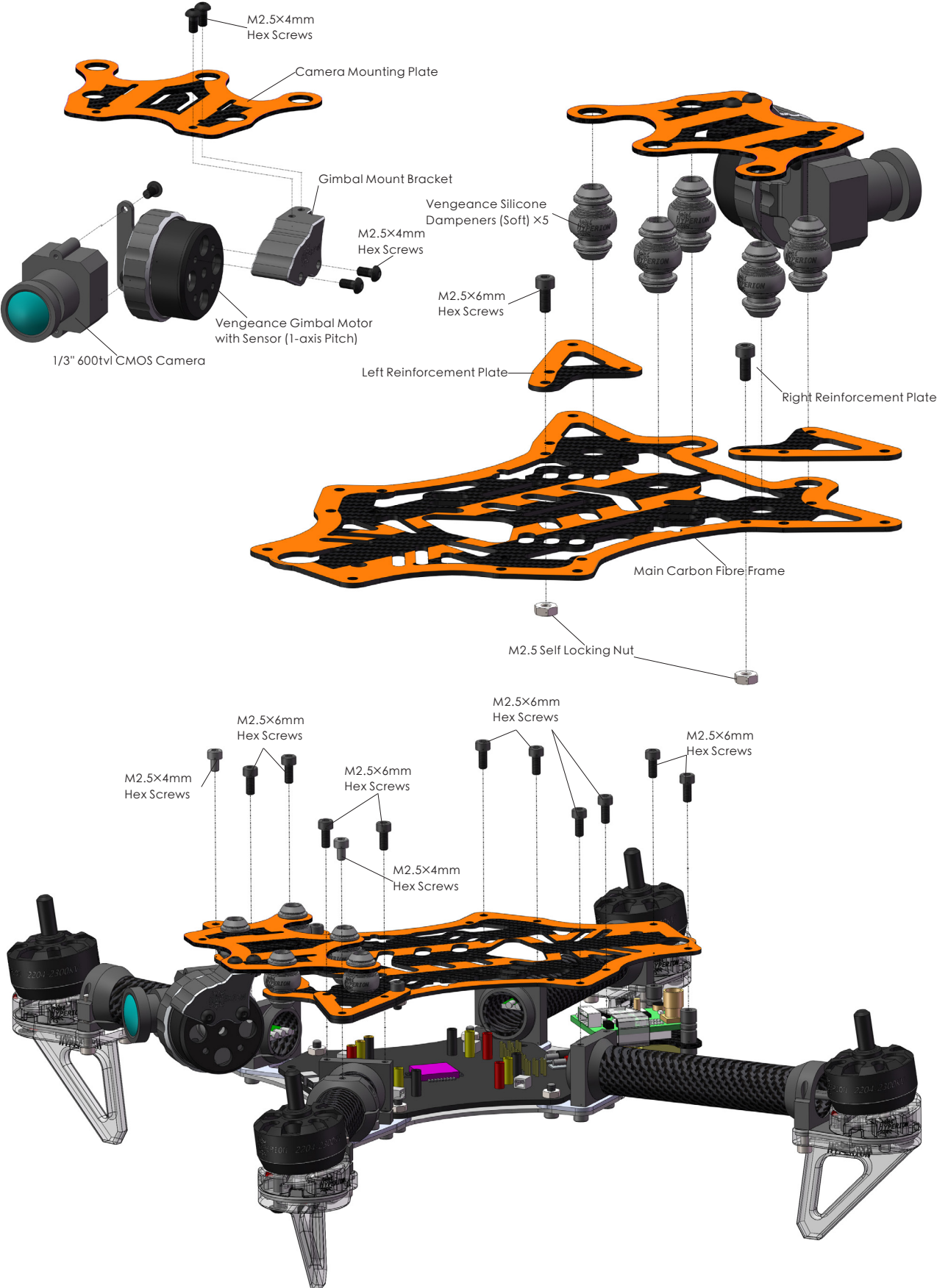
← Make sure that the landing gear plate is 90° to the main frame plate.  
 ↑ Once you have confirmed the landing gear plate is 90° to the main frame plate you can then fasten the clamp screw.



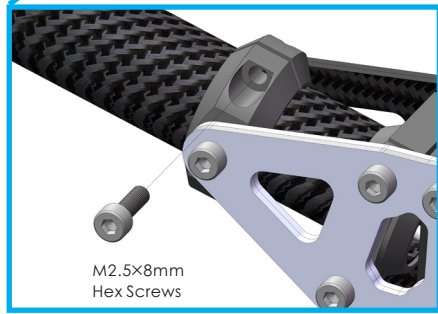
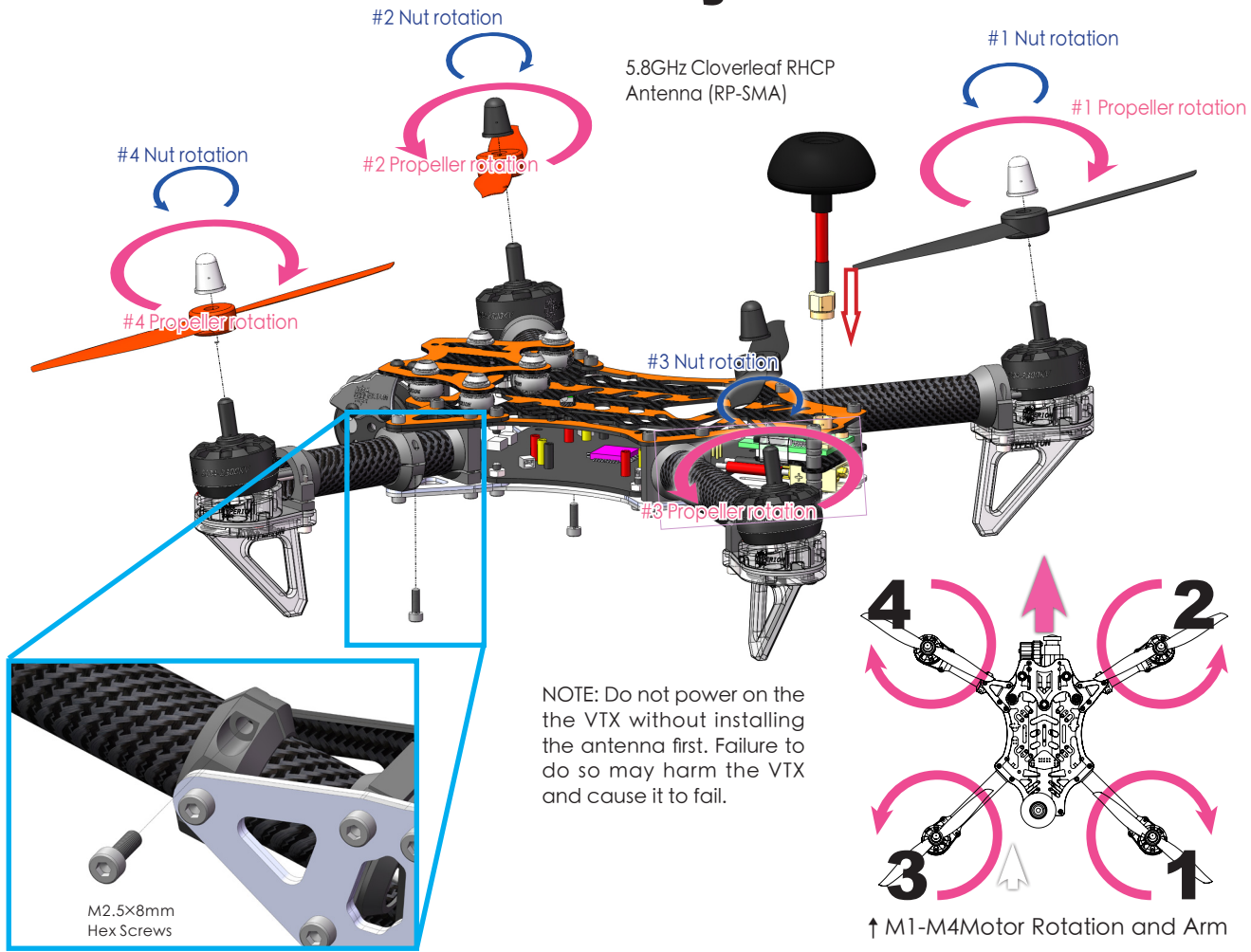
→ Before Flying make sure your wires are correctly plugged into the proper color receptacle. Insert the LED Landing Gear Light Indicator in the plug.



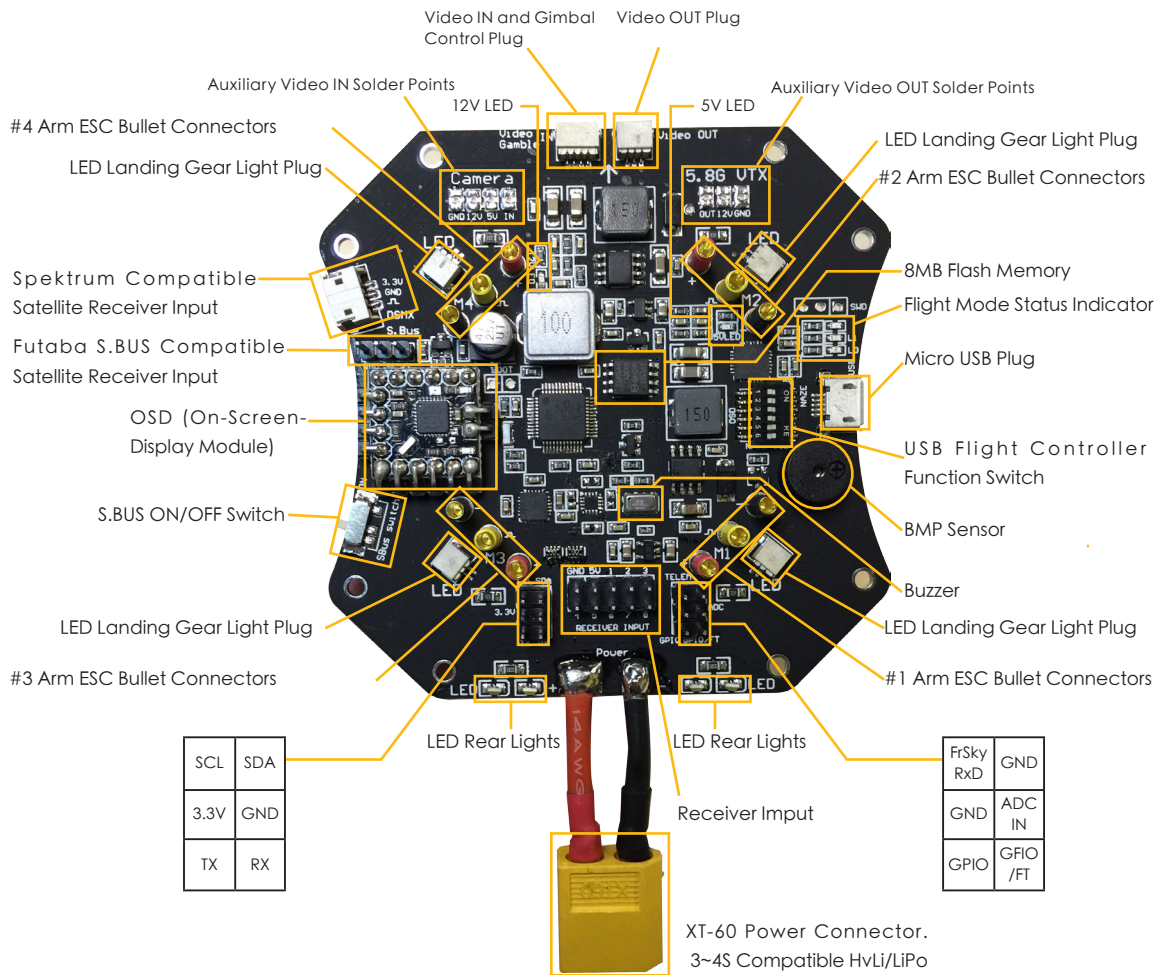
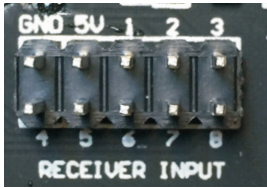
# 5. Camera Mounting Assembly



# 6. Frame Final Assembly



# 7. Vengeance Flight Controller Details

This is the PWM Input Receiver Channel Chart. Plug each corresponding servo lead into the correct channel with the correct polarity. After wire installation has been made please make sure to check in CleanFlight Software that your "Channel Map" is consistent with your brand of Transmitter. DO NOT ARM Vengeance with propellers on for the first time without checking!

### Receiver Connection

GND	—	GND -
5V	—	DC5V + (to Receiver)
1	—	Roll (AIL)
2	—	Pitch (ELE)
3	—	Throttle (THR)
4	—	Yaw (RUD)
5	—	AUX1 (Fly mode)
6	—	AUX2 (Camera Gimbal)
7	—	AUX3
8	—	AUX4

### Flight Controller Function Switch

ON	□	□	□	□	□
1	2	3	4	5	6

Flight Controller Programming & Upgrade

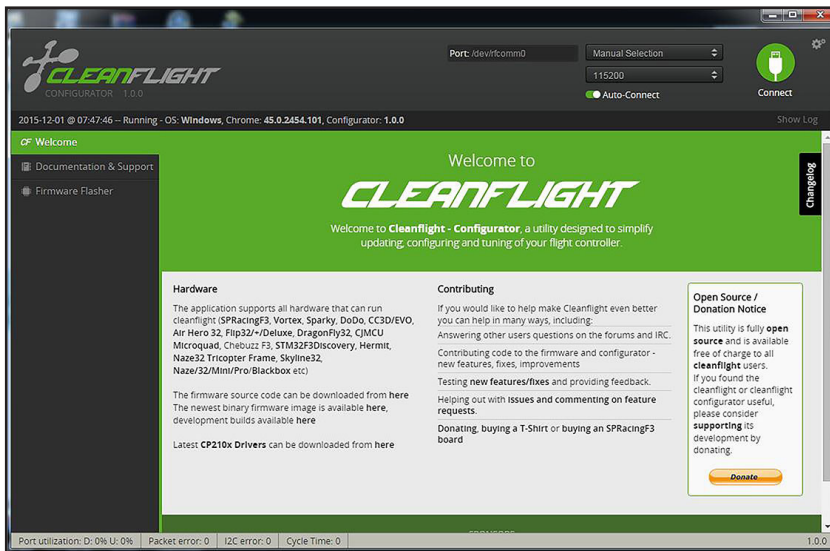
ON	□	□	□	□	□
1	2	3	4	5	6

OSD Programming & Upgrade

ON	□	□	□	□	□
1	2	3	4	5	6

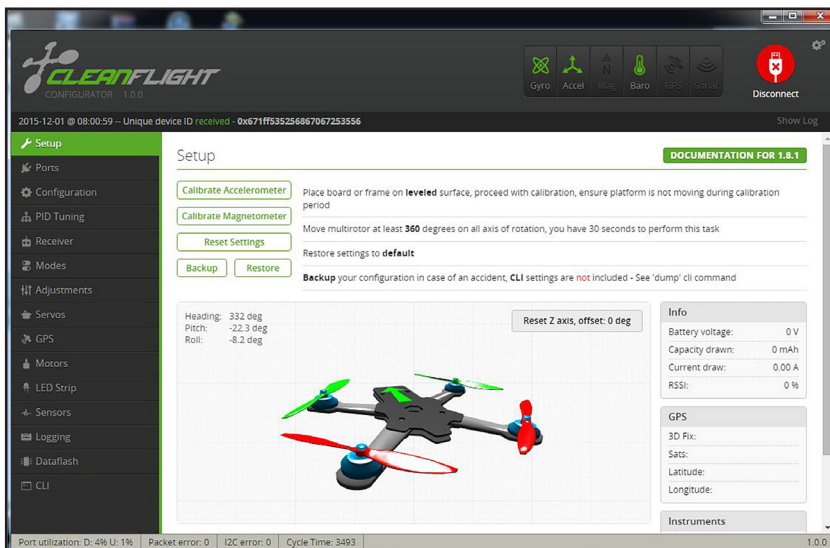
Flight Mode (must be selected for flight)

# 8. SetUp CleanFlight.



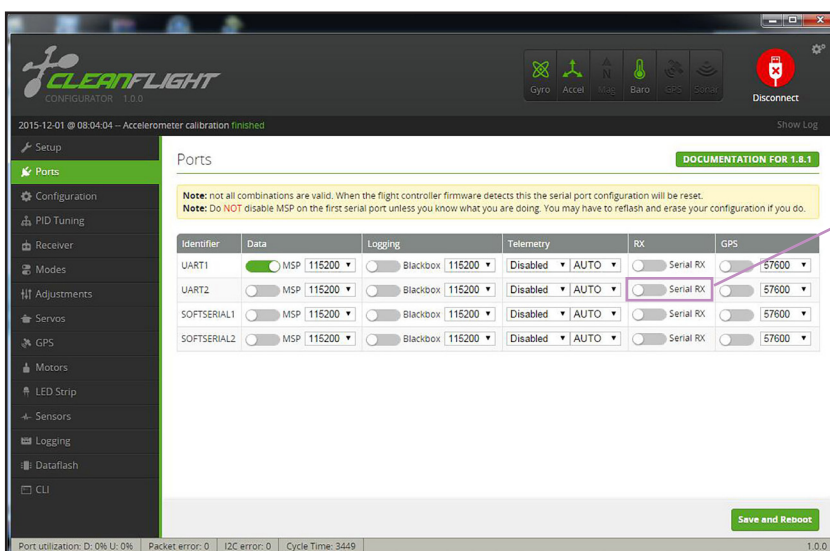
Download Google Chrome Browser, go to Chrome Application Webstore and download "CleanFlight" and install it.

If it is your first-time installation of Cleanflight you must click "Here" to download and install "CP210X Drivers"



After properly connecting the Vengeance via the Micro USB plug to CleanFlight Software the program should resemble your quadcopters position.

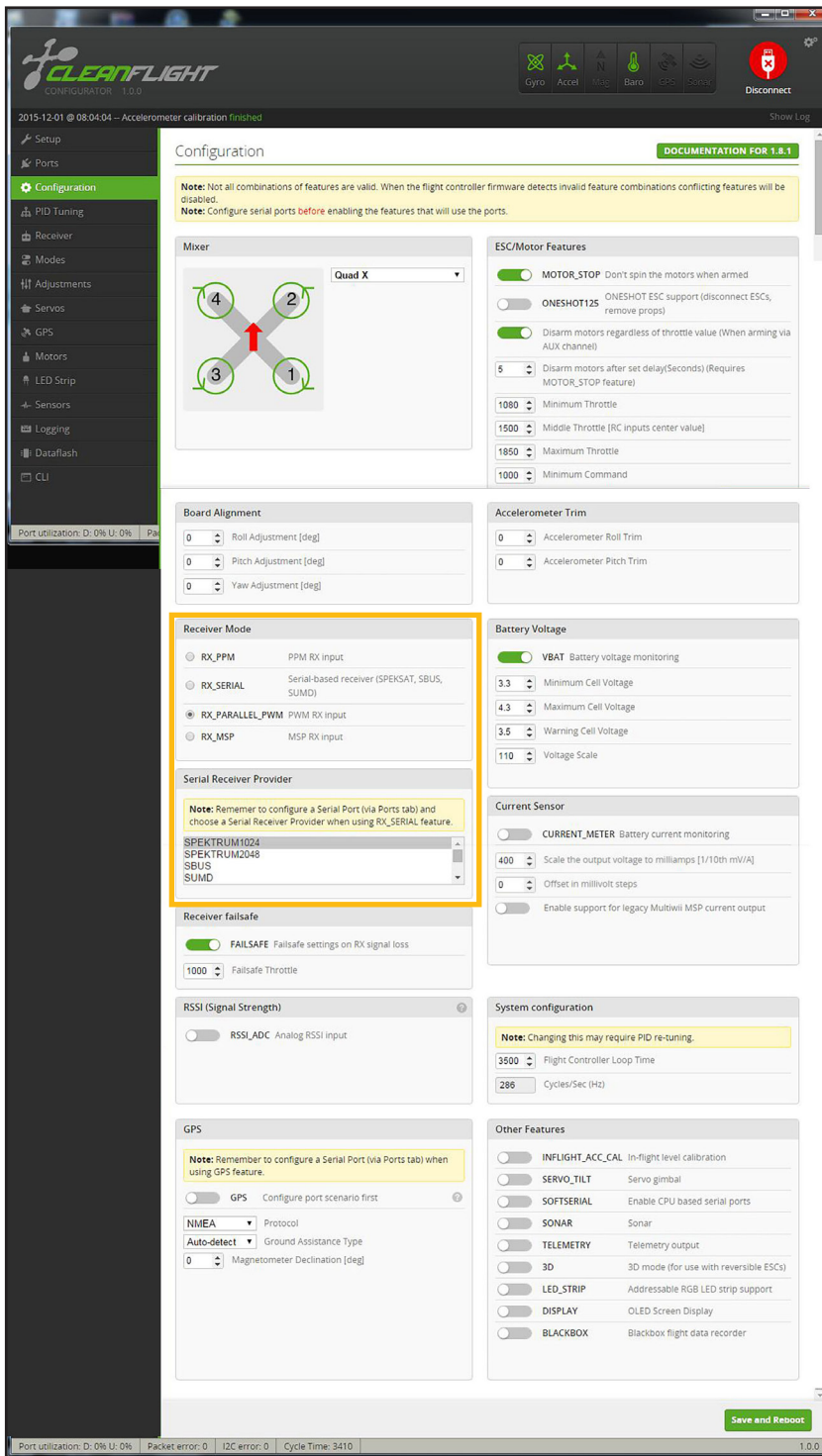
Here is the Main Menu options page. You may Calibrate and update your flight parameters and other settings. You can also update and backup your flight controller settings.



By default select UART1 for standard PWM input Receivers.

When using Spektrum or other PPM input receivers you must select UART2 Serial RX and turn ON

DO NOTE! You must "Save and Reboot" to save changes onto your flight controller.



By default the Vengeance comes loaded with all preset options. The Default parameters are to be used with standard PWM input receivers. If you would like to use a PWM or S.BUS style receiver you must configure these settings yourself.

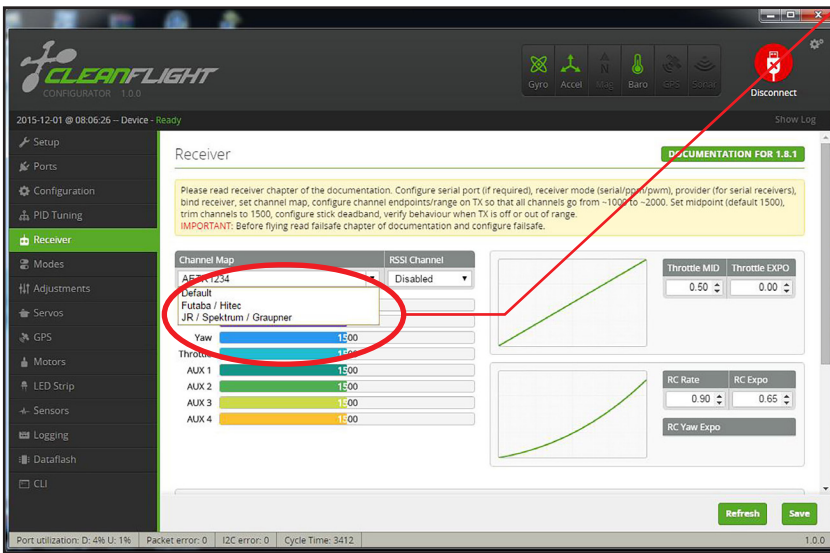
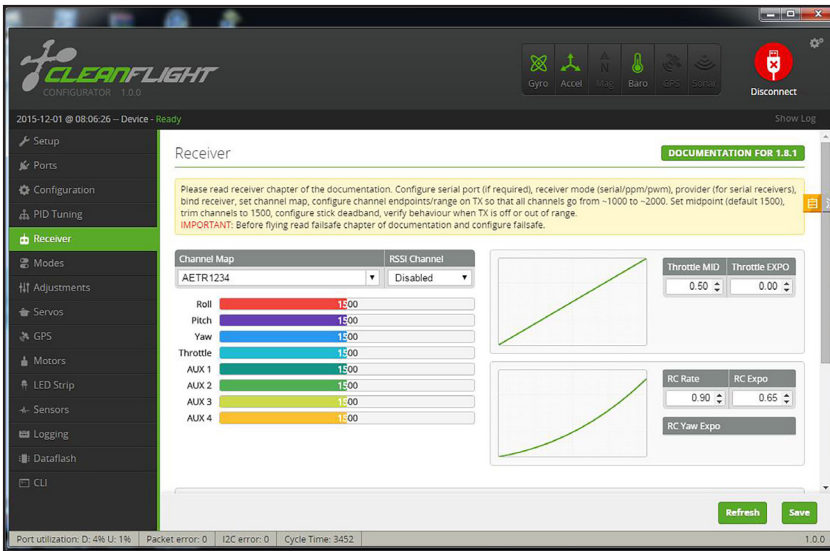
Receiver Mode: If you are using a Satellite Receiver or PPM input you may select the type of Receiver here. For example: Spektrum PPM or Futaba S.BUS.

By default the Vengeance is setup to use standard PWM signal. The user must use a 6Ch Transmitter to utilize the Vengeances standard functions ( 5Ch. Flight Mode Selection, 6Ch. Gimbal Control)

"Serial Receiver Provider" option allows you to select the type of PPM (single-line) input Receiver you are using.

If you edit the Receiver Input type please make sure DO NOT ARM motors until you have verified that your "Channel MAP" corresponds to your Transmitter. Failure to do so can lead to possible bodily damage.

DO NOTE! You must "Save and Reboot" to save changes onto your flight controller.



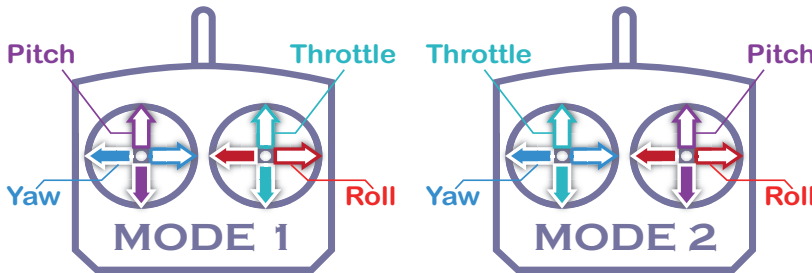
The "Receiver" directory of CleanFlight helps to show you your Channel Map and the position of your Transmitters controls with respect to the Flight Controller.

Under the "Channel Map" option please choose if you are using Futaba / Hitec or JR / Spektrum / Graupner.

DO NOTE! You must "Save and Reboot" to save changes onto your flight controller.

Channel Map			
	Default	Futaba Hitec	JR Spektrum Graupner
1	Roll	Roll	Throttle
2	Pitch	Pitch	Roll
3	Throttle	Throttle	Pitch
4	Yaw	Yaw	Yaw
5	Aux1	Aux1	Aux1
6	Aux2	Aux2	Aux2
7	Aux3	Aux3	Aux3
8	Aux4	Aux4	Aux4

Radio Channel Revers				
	Futaba Hitec		JR Spektrum Graupner	
1	Roll	Reverse	Throttle	Normal
2	Pitch	Normal	Roll	Reverse
3	Throttle	Reverse	Pitch	Normal
4	Yaw	Normal	Yaw	Reverse
5	Aux1		Aux1	
6	Aux2		Aux2	
7	Aux3		Aux3	
8	Aux4		Aux4	



The colored indication bars in CleanFlight represent your real time channel PWM signal. Make sure to turn your Transmitter ON so you may check your trim and to make sure your channels moves in the correct direction.

Roll	Left	1500	Right
Pitch	Pitch UP (Stick Low)	1500	Pitch Down (Stick High)
Yaw	Left	1500	Right
Throttle	Low	1500	High
AUX 1	Flight Mode Change	1500	Flight Mode Change
AUX 2	Gimbal DOWN	1500	Gimbal UP
AUX 3		1500	
AUX 4		1500	

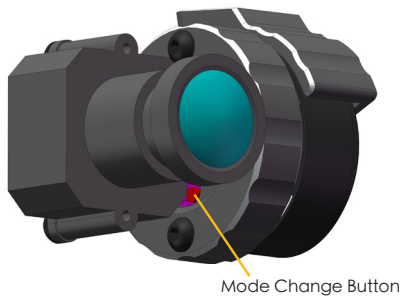
Radio End Point / ATV Setting				
	Futaba Hitec		JR Spektrum Graupner	
1	Roll	110/110%	Throttle	120/120%
2	Pitch	110/110%	Roll	120/120%
3	Throttle	110/110%	Pitch	120/120%
4	Yaw	110/110%	Yaw	120/120%
5	Aux1	110/110%	Aux1	120/120%
6	Aux2	110/110%	Aux2	120/120%
7	Aux3	110/110%	Aux3	120/120%
8	Aux4	110/110%	Aux4	120/120%

It is important to note that when you move your Transmitter sticks that your Transmitters Travel Adjustment (ATV) must move to less than 1100 and more than 1900. If your Transmitters Travel Adjustment is not properly setup than your Vengeance will not ARM. To ARM your Vengeance move your YAW/RUDDER stick to the Bottom and RIGHT position for 1-2 seconds. DO NOT ARM Vengeance with propellers on for the first time!

# 9. Gimbal Mode and Settings

The Vengeance utilizes a brushless gimbal for pitch dampening and view adjustment.

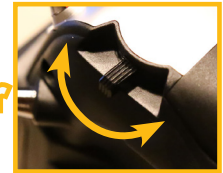
1. When turning ON the Vengeance please keep the Vengeance level and do not move for about 5 seconds. The gimbal sensors must detect the horizontal position.
2. Make sure that the Gimbal's wires are not tangled and are able to move freely. Failure to free the Gimbal head from obstructions may lead to the Gimbal motor to fail.



3. When power is plugged in on the Vengeance if the gimbal vibrates and oscillates uncontrollably then reset the power and power again.

4. After the gimbal is set and detects horizontal positioning after 5 seconds you may rotate the gimbal with your hand to find your desired camera view angle.

5. Ch.6 on your PWM Receiver can be used to control the Gimbal rotation UP or DOWN.



OR

Roll	1:00	1:00
Pitch	1:00	1:00
Yaw	1:00	1:00
Throttle	1:00	1:00
AUX 1	1:00	1:00
AUX 2	Gimbal Down	Gimbal UP
AUX 3	1:00	1:00
AUX 4	1:00	1:00

## How To Change Gimbal Stabilization Modes:

There are two types of gimbal stabilization modes. First mode (by default) is "Race Mode". The second mode is "Self-Level Mode". To change between modes quickly press the "Mode Change Button" twice with a small tool. DO NOTE: Mode switching cannot be remembered by the gimbal after unplugging the battery. When you unplug the battery from the Vengeance the gimbal will reset to "Race Mode" by default.

RACE Mode (Preset)

**RACE MODE (Default):** While in Race Mode the camera will dampen any oscillations during flight while viewing in the Vengeances general preset camera view angle. Oscillations under 0.4seconds will be dampened out. Race Mode is designed to dampen rapid changes in pitch thus stabilizing your view.

SELF-LEVEL Mode (Preset)

**SELF-LEVEL MODE (Secondary):** While in Self-Level Mode the gimbal will fully stabilize the camera angle parallel to the ground. This mode is recommended for beginners or people wanting a more stabilized view.

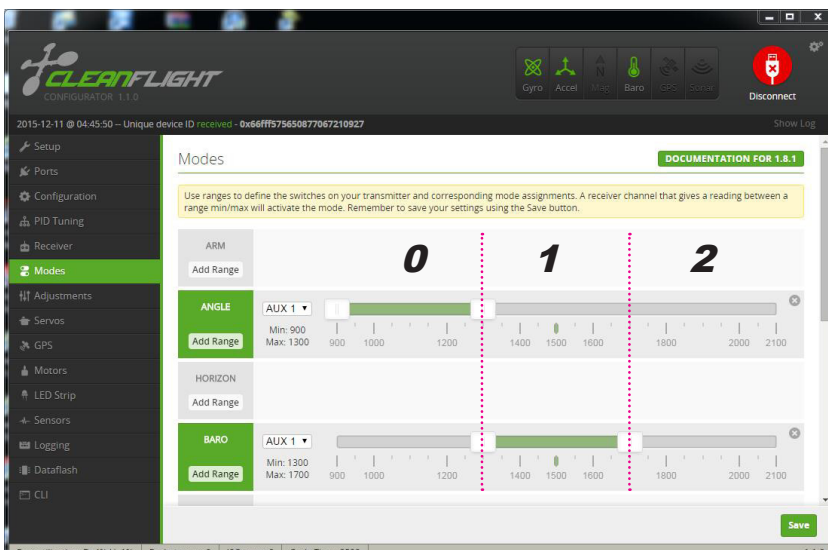
PPM Receiver and Gimbal Note: While using RACE MODE adjusting the camera angle via PPM is not supported. SELF-LEVEL MODE is not supported via PPM wire. If you wish to have full-access to your camera gimbal you must use a standard PWM receiver.



PID Tuning Configuration. PID Tuning is used to adjust the flight characteristics. Default PID settings for the Vengeance is set for beginners and intermediate pilots. If you wish to fly faster you may reduce the ROLL and PITCH PID settings both by -0.2 for reduced sensitivity.

If you wish to increase the sensitivity of the Vengeance's ROLL / PITCH/ YAW you may increase the PID settings to no more than 0.8, otherwise it will be difficult to control.

DO NOTE! You must "Save and Reboot" to save changes onto your flight controller.



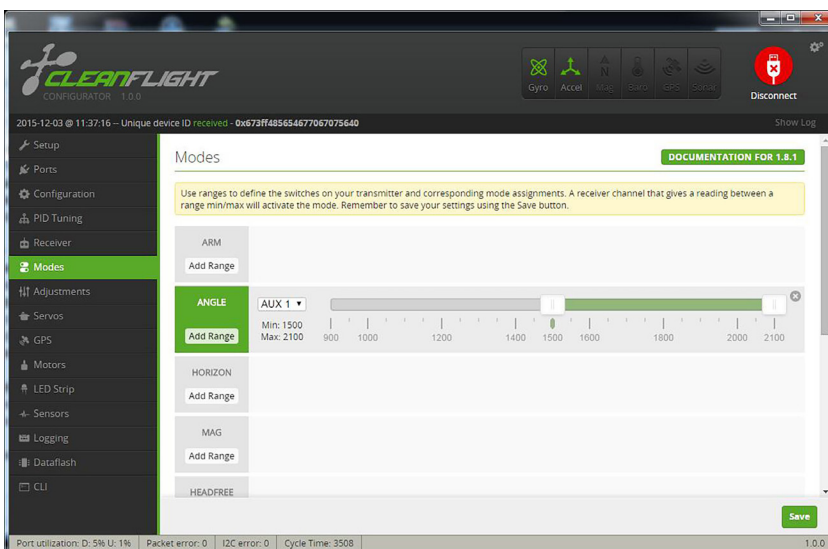
The Vengeance includes three preset flight modes. The flight mode switch is used on Ch.5 of your transmitter, a three-position toggle switch is recommended.

0: ANGLE: For beginners use. Features automatic level stabilization. \*Due to the eight degree forward motor-tilt the Vengeance will naturally try to fly slightly forward while hovering.

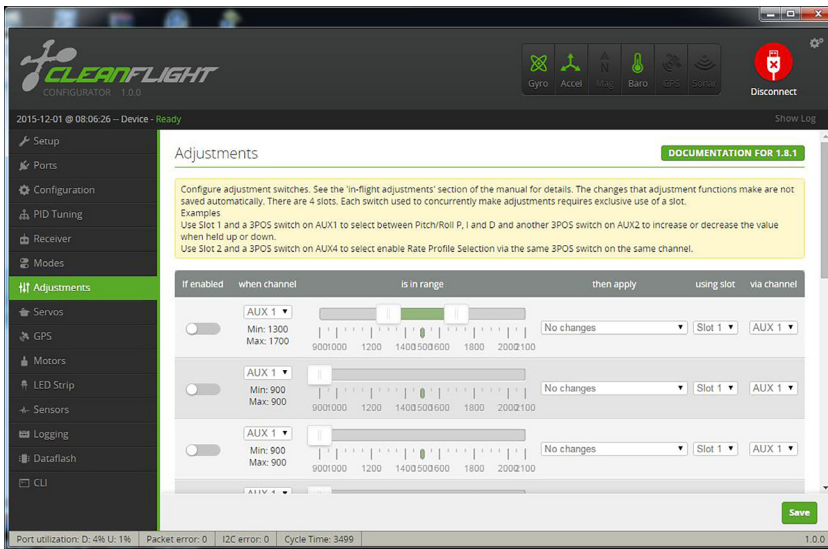
1: ANGLE + BARO: For beginners use. Features automatic level stabilization. Integrated BMP sensor will automatically will try to hold the flight altitude.

2: Manual: For advance use. Disables automatic level stabilization. Used for rolls and flips.

DO NOTE! You must "Save and Reboot" to save changes onto your flight controller.

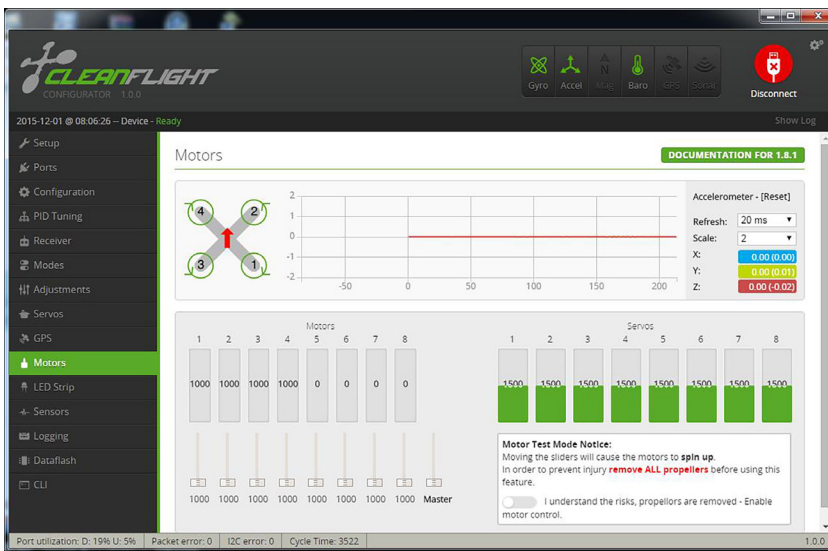






"Adjustments" Configuration Page: Here is where you can set advanced features on the Vengeance via AUX channels on your Transmitter.

It is important to understand all the functions that you enable. Check your AUX channel's by looking at the "Channel Map" configuration page.

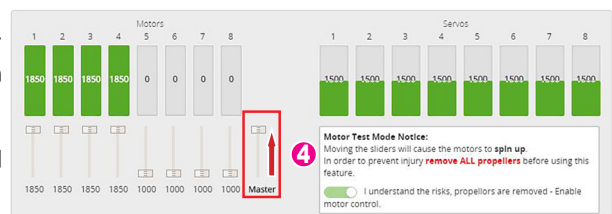
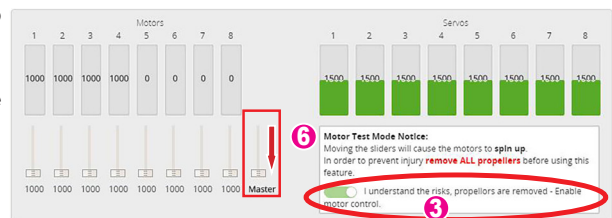


Motor Configuration Page: This page is used to adjust your motor settings if you wish to do so, though the Vengeance becomes already pre-configured. Before testing this feature make sure to remove ALL propellers before trying. Failure to do so may result in bodily harm.

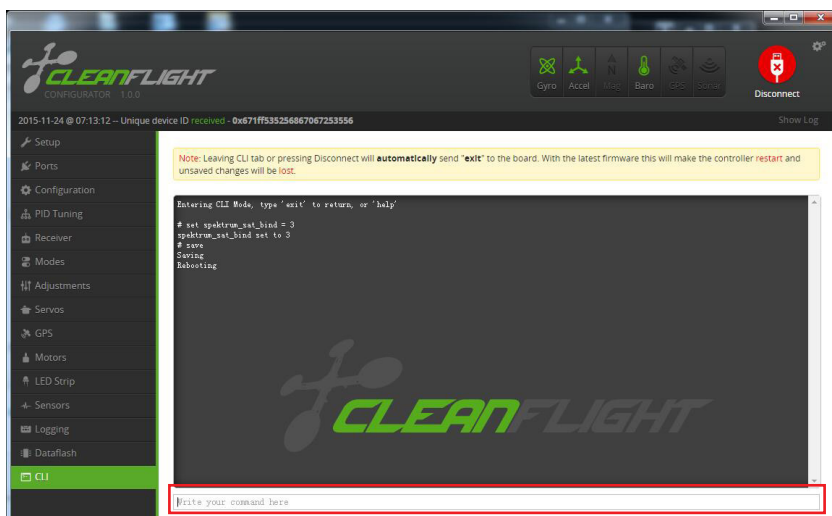
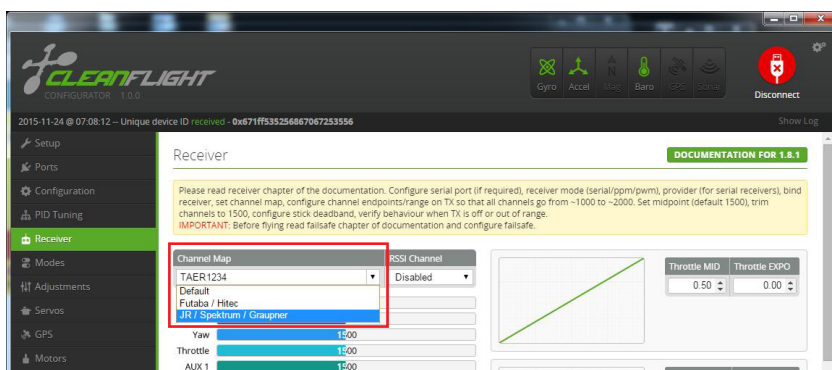
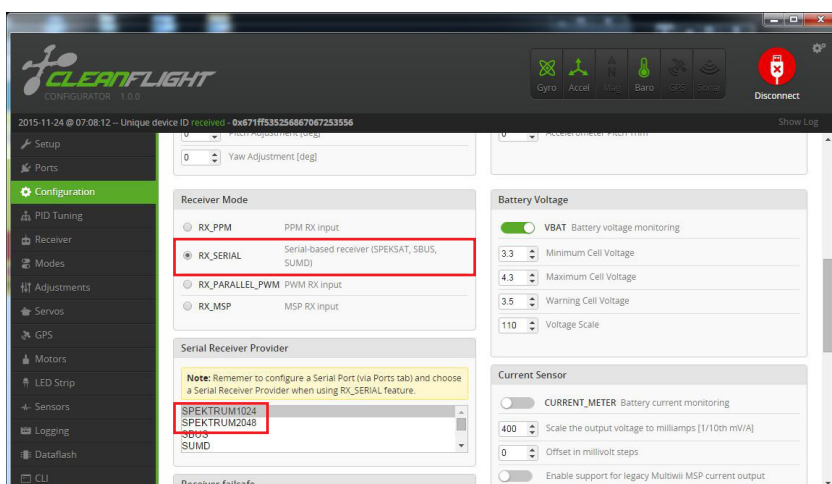
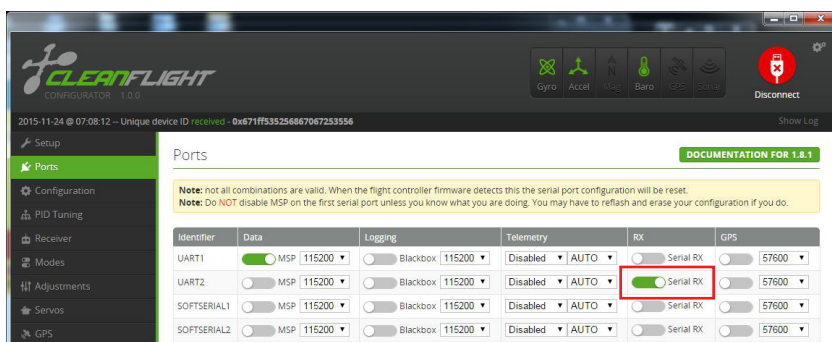
## How to configure your ESC adjustments:

The Vengeance uses four different motors and ESC's. Sometime there might be a inconsistent distrubtion of power among your Vengeance which could lead to poor flight performanc and handling. To reset your ESC and tune them properly please follow the below steps:

1. Remove ALL propellers before configuration! Failure to do so may lead to bodily harm.
2. Connect the Flight Controller to CleanFlight without the main flight battery connected.
3. Turn the motor "Test Switch On"
4. Move the "Master" switch to the maximum level
5. Connect the main flight battery to the Vengeance. Wait five seconds after the ESC makes a gradual rise in noise
6. Move the "Master" switch to the minium level, you will hear a gradual decline in ESC sound.
7. Turn OFF the Master Switch and unplug the flight battery.



# 10. How to bind Spektrum satellite receiver?



1. Go to the "Ports" page. Under the UART2 page area activate the "Serial RX" tab. (Press Save and Reboot)
2. Go to the "Configuration" page. Select the "RX\_Serial" option and whether you are using Spektrum 1024 or 2048 compatible receivers. (Press Save and Reboot)
3. Go to the "Receiver" page. Select the Channel Map for JR/ Spektrum/Graupner radios. (Press Save and Reboot)
4. Enter into the command line the following code:

```
"Set spektrum_sat_ = X"
"Enter"
```

X Value = Receiver mode

- 3 = DSM2 1024bit / 22ms
- 5 = DSM2 2048bit / 11ms
- 7 = DSMX 1024bit / 22ms
- 9 = DSMX 2048bit / 11ms

5. Insert "Save" and press Enter. A Message pop-up will appear "Save & Rebooting."
6. Unplug the USB, then immediately reconnect USB.
7. The satellite receiver LED will start to flash.
8. Hold the "Bind" switch on your transmitter and turn ON.
9. The Satellite receiver LED will dim and then reappear. You are now binded.

# 11. Configuring your VTX.

The Vengeance utilizes a 5.8GHz Selectable 25mW / 250mW Video Transmitter with 40Ch's with Raceband.

Changing Channels and Bands:

**Push button for more than 2 Seconds: Change Band.**

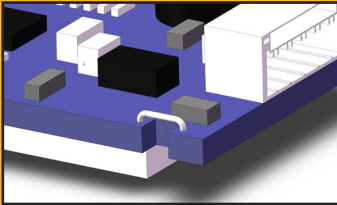
**Push button for less than 1 Second: Change Frequency Channel.**

The Vengeance's VTX utilizes a 25mW and 250mW selectable VTX. In most European and Western Countries 25mW is the maximum Rf output for 5.8Ghz. Please check with your law and regulations to make sure that you confirm with the law.

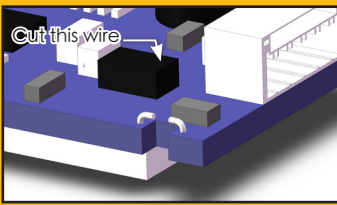
Adjusting the Rf power output for increased range. You may cut the "RF limit wire" so that you may transmit at 200mW power. If you wish to later transmit at 25mW you may solder the "RF limit wire" again.

Hyperion FXT 5.8GHz 40 Channel AV Transmitter						
Modulate		Wideband FM Modulate				
Video Format		NTSC / PAL				
Characteristics		Value			Units	
		Min.	Typ.	Max.		
1	Output Impedance	---	50	---	Ohm	
2	Output Power	FX795T-L/ 25mW	12	13	14	dBm
		FX795T-2/200mW	22	23	24	dBm
3	Frequency Range	5645-5945			Mhz	
4	Operating Voltage	7.0	12	20	V	
5	Supply current	FX795T-L/ 25mW	-	70	-	mA
		FX795T-2/200mW	-	200	-	mA
6	Output Voltage(VOUT)	VOUT=5V			V	
7	Operating Temperature	-10°C	---	+85°C		
8	Video Band Width	0	---	8.0	Mhz	
9	Audio Carrier Frequency	---	6.5	---	Mhz	
10	Video Input Level	0.8	1.0	1.2	Vp-p	
11	Video Input Impedance	---	75	---	Ohm	
12	Audio Input Level	0.5	---	2.0	Vp-p	
13	Audio Input Impedance		10K		Ohm	
14	Weight	---	7.5	---	Gram(s)	
15	Antenna Connector	SMA Female Connector				
16	Dimensions (L x W)	31x22mm				

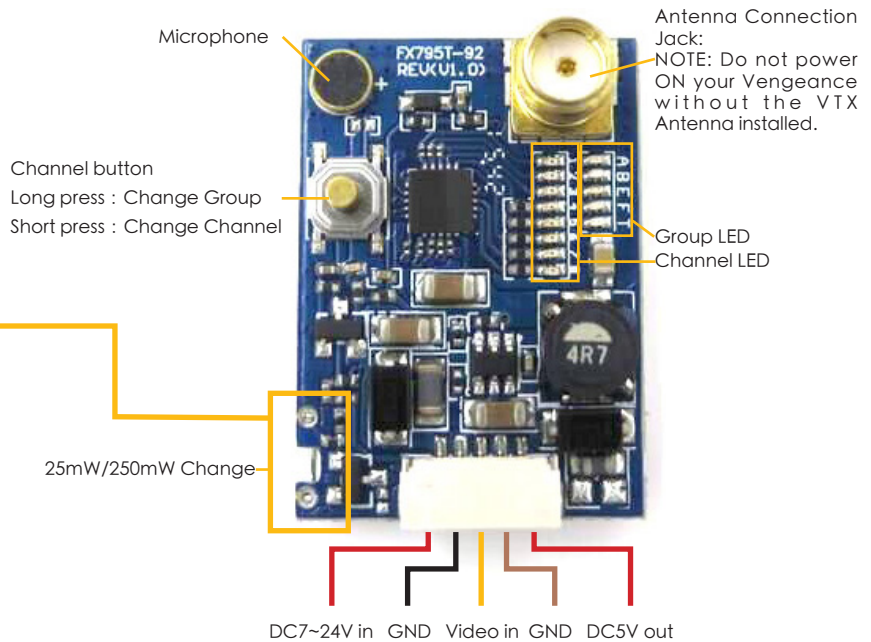
### Change RF Output?



↑ When the "mode change wire" is not cut the VTX will transmit in 25mw. (Default)



↑ To output in 250mw power you must cut the "rf limit wire".



Microphone

Channel button  
Long press : Change Group  
Short press : Change Channel

Antenna Connection Jack:  
NOTE: Do not power ON your Vengeance without the VTX Antenna installed.

Group LED  
Channel LED

25mW/250mW Change

DC7~24V in GND Video in GND DC5V out

Vengeance 5.8GHz Channel								
Group/Channel	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
Group1 (A)	5740	5760	5780	5800	5820	5840	5860	5880
Group2 (B)	5705	5685	5665	5645	5885	5905	5925	5945
Group3 (C)	5865	5845	5825	5805	5785	5765	5745	5725
Group4 (D)	5658	5695	5732	5769	5806	5843	5880	5917
Group5 (E)	5733	5752	5771	5790	5809	5828	5847	5866