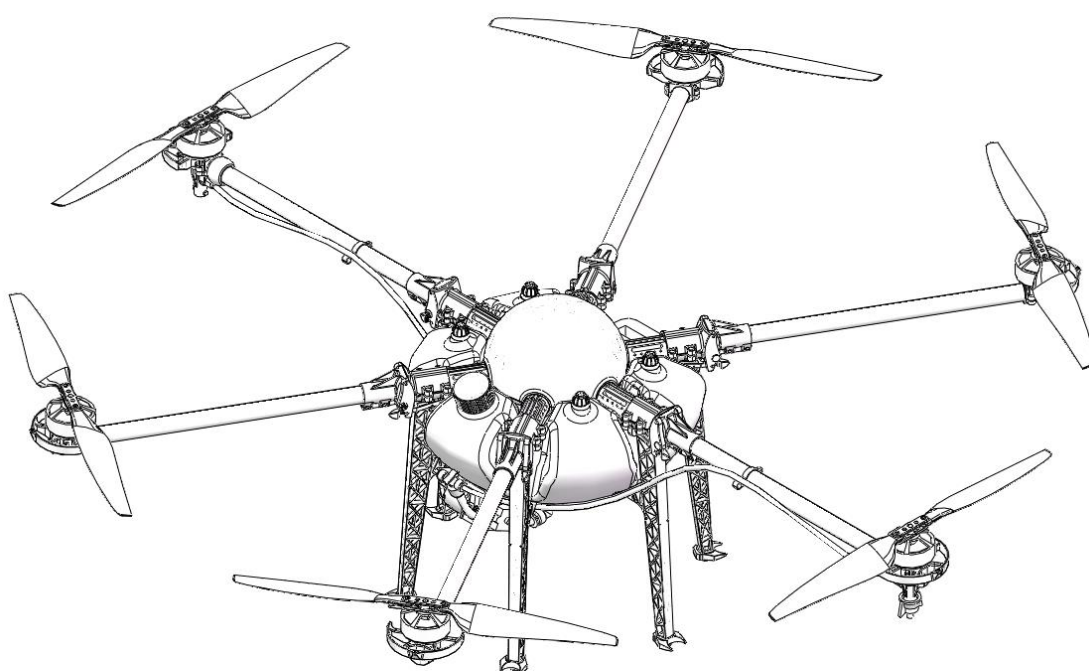
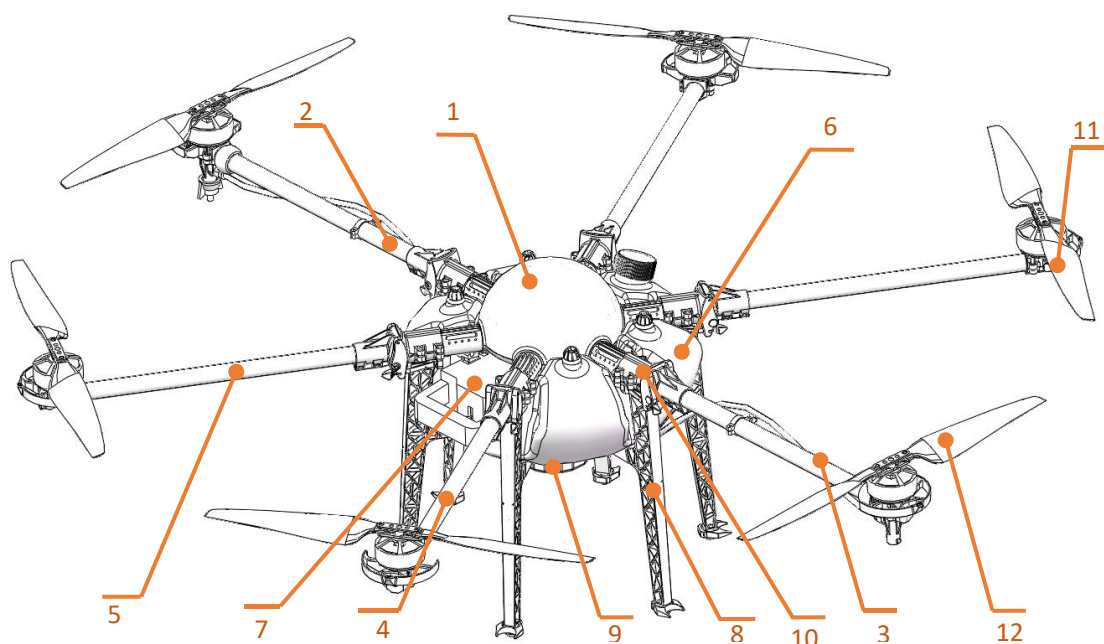


TIANNONG M6E

USER INSTRUCTIONS V1.1



Beijing TT Aviation Technology Co.,Ltd.



TIANNONG M6E Structure Picture

Item	Component	Item	Component
1	Fuselage	7	Intelligent Battery
2	Clockwise Arm with LED	8	Landing Gear
3	Counter Clockwise Arm with LED	9	Functional Tank Lid
4	Clockwise Arm	10	Arm Joint(Fuselage)
5	Counter Clockwise Arm	11	Propeller (clockwise)
6	Water Tank	12	Propeller (Counter clockwise)

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1.Use Instruction

1.1 Safety Instruction

- ◆ The product is not suitable for the ones who are less than eighteen or who do not have full capacity for civil conduct.
- ◆ The product have bigger fuselage size, high speed rotary and strong flight dynamics. At runtime have a certain dangerousness . Not in accordance with the requirement operation and usage will cause to potential danger and hurt.
- ◆ When using this product, please keep away from airport, railroad, high speed road, high buildings ,electric wire and other dangerous environments.
- ◆ When using this product, please keep away from mobile phone base stations, high power transmitting equipment, and other high electromagnetic interference environments.
- ◆ When using this product, please keep away from army and kinds of manned craft flight area.
- ◆ Don't use this product in rain, thunder, sandstorm, fog snow ,high wind ,and low temperature and other bad environments.
- ◆ When flying in more than three kilometers. Environmental factors can lead to flight performance degradation, please care of using it.
- ◆ When operating this product fly in low sky .Please always keep UAV and people & animals in a safe distance of ten meters
- ◆ When using this product in desert area, please keep UAV within the range of operator's eyes
- ◆ Don't hover or fly over the crowd, Don't be delight in scaring others.
- ◆ When it is close to the crowd ,please land this UAV as soon as possible and guide people to keep and avoid potential accident.
- ◆ Don't operate it in the area of children playing.
- ◆ If not in the extreme necessary condition, please do not power off when flying in the air.

- ♦ You can not fly it you are in drinking , tied, drugs, physical ,discomfort, etc. .
- ♦ Please inspect it before using very time, including but not limited to parts of fastness, organism and propeller of cracks, and abrasion ,battery ,the effectiveness of light. When error happens, please stop using immediately and replace the corresponding parts.
- ♦ Abnormal working state of the UAV maybe happen accidentally, don't open the propellers and forcibly fly with wrong.
- ♦ Do not try to prevent the moving parts while working.

1.2 Pesticide Usage

- ♦ All pesticides are poisonous. Please be careful and work strictly according to the safety instructions of pesticides.
- ♦ When dispensing, please use clear water. If not, will cause jams mesh of impurities. If it is blocked, please clear it before reuse
- ♦ When dispensing , please note that liquid sparks and the pesticide residue in fuselage will be harmful to human body.
- ♦ When dispensing, please pay more attention and use protective tools, and do not let body directly touch with the pesticides; After pesticide spraying, please clear your skin, copter and remote control.
- ♦ When using pesticide, there will be interaction between different pesticides , user should clear cartridge or keep a certain interval time.
- ♦ Spraying shall be carried out in windless sunny day, don't spray under high temperature at noon. While breezing, the operator should be standing above the wind and spraying; do not work when wind is four.
- ♦ When spaying ,if you feel uncomfortable ,headache or dizzy, please leave the site at once and rest. If once severe symptoms occur, immediately be sent to hospital.
- ♦ Pesticide effect and the solution concentration, spray rate ,copter high from crops ,wind direction, wind speed and so on are close related. When using pesticide should consider the above factors, to achieve the best effect. Please make sure that do not damage the human beings and animals and surroundings during the process of

sprayings.

- ◆ When using pesticide , do not pollute river and drinking water

1.3 Inspection

- ◆ Before flying, ensure the battery is enough
- ◆ Ensure all the parts are installed firmly, and all the screws are tight as required.
- ◆ Ensure all the wires are correctly linked.
- ◆ Ensure all parts goes well. If it is broken or aging, please replace timely.
- ◆ Before flying, carefully check the propellers installation direction 、 rotation direction, control and others.
- ◆ Ensure all the propellers are fine, no any scratch and tightly installed.
- ◆ Ensure the sprayer is fluent without any clogging and work normally.

1.4 Environment

- ◆ While flying, please ensure the drone away from the crowds, dangerous goods, high buildings, high-voltage wires and others. Please fly the drone in a dedicated space.
- ◆ Please ensure the drone fly within the operator's eyesight.
- ◆ The drone working temperature is between 0℃-40℃.
- ◆ Ensure the drone fly within the permit of local law and regulations.
- ◆ To fly the drone safely as required, please fly it within in the height of 50 meters. If it has local flying height limit within 50meters, please make sure obey the related regulations.

1.5 Operation

- ◆ Please ensure the multi-rotor drone flying height is within 8 meters, except the special requirements.
- ◆ Before remote control calibration 、 hardware update, parameter setup, please remove the propellers and avoid the potential moving suddenly.
- ◆ Remove the battery if it does not fly, to avoid flying it when touching the remote control once.
- ◆ Please remove the batteries once landing. Do not move the drone when it is in power.
- ◆ Do not touch the joy stick mistakenly, and prevent start the drone.

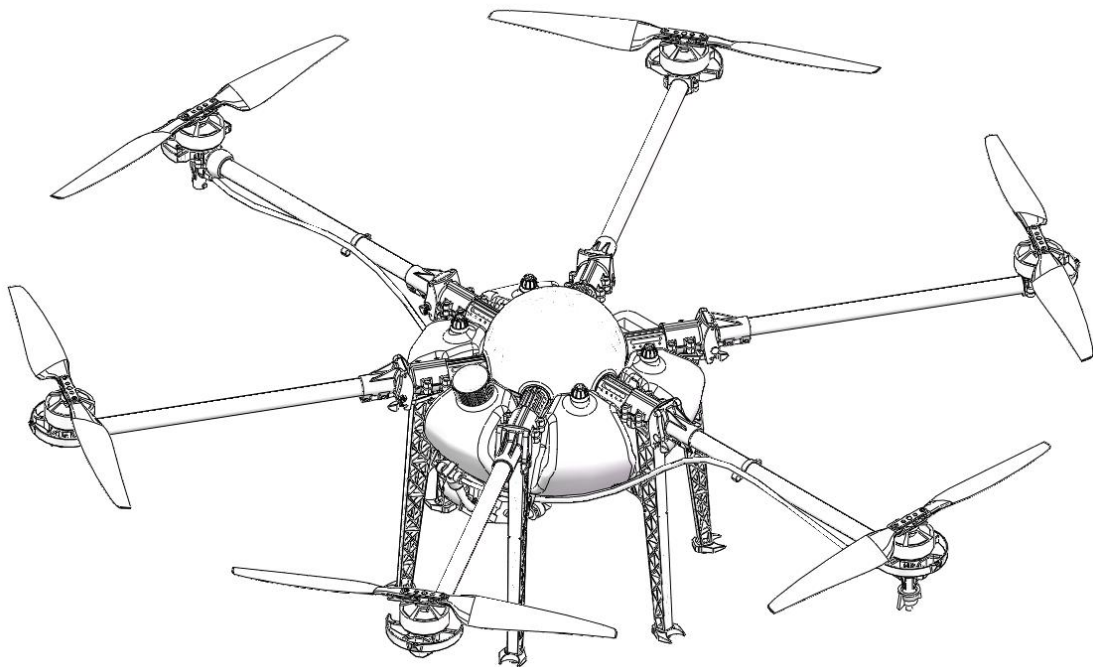
- ♦ When it is powered, please stand in the safe distance of above 10 meters.
- ♦ Ensure the propellers completely stop and power off.
- ♦ Please switch it to the manual operation mode when errors happen. When the manual operation mode does not work, please press the emergency bottom. Please keep away from the crowd.
- ♦ When the battery is damaged, please ensure it is stored in the disposal area and avoid spontaneous combustion. In order to protect environment, please don't throw batteries randomly. And consult the maker about the proper disposal method.
- ♦ During the flight, don't fly overload and do not cause any potential dangers.
- ♦ When low battery is warning, please return as soon as possible.
- ♦ Ensure that the remote control and battery is enough, to ensure that firmware has been updated to the latest version.
- ♦ Ensure flying sites outside of the restricted areas and is proper for flight . .
- ♦ Please make sure do not fly or operate the drone when you are drunk or with medicine limitation.
- ♦ Be familiar with the remote control operation & each flight mode, and ensure you know how to operate the control condition.
- ♦ User shall know and obey all the law and regulations in flying location.

1.6 Compass Calibration Requirements

- ♦ Compass has to be calibrated before using the first time. If else, it cannot work and will affect flying safety. Calibration tips:
- ♦ Please do not calibrate it in the place close to the high-magnetic field or big metal materials, such as high-voltage, magnet, parking lot, concrete iron building, etc.
- ♦ When calibrating, please do not bring the magnetic materials, such keys and cellphone.
- ♦ If it is calibrated indoor, please do not re-calibrate it outdoor. It prevents that the two magnet differences cause the potential flying data errors.
- ♦ Magnetic field location is different, please make sure re-calibrate when it changes to the place far away from the previous one.

2. Product Introduction

TIANNONG M6E, the multi-rotor UAV, is the most economic integrated solution for all the agriculture spraying services. This UAV is waterproof and easy to repair, long-time flight with high-strength & light fuselage material. The big power brushless motor guarantees the sensitiveness and flexibility. The Lipo batteries guarantee the power supply and easy to repair and maintain. Various spraying tests proves the best performances of this UAV.



2.1 TIANNONG M6E Parameter

Weight (without battery)	9KG	Max Pitch Angle	$\leq 35^{\circ}$
Standard Takeoff Weight	23KG	Best Spraying Speed	4--6m/s
Max Takeoff Weight	24KG	Max Spaying Speed	10m/s
Max Thrust-weight Ratio	2.25(Flying weight23Kg)	Working Time	6--12min/flight

Battery	TTA Intelligent Battery(12S)	Max Climbing Speed	5m/s
Max Power	12000W	Max Landing speed	3m/s
Hovering Power	3100W	Max Flying Speed	15m/s
Hovering Time	Empty flight ≥25min Full flight ≥7min	Recommended Working Temperature	10-35C°
Hovering Accuracy	Horizontal ±1.0m Vertical ±0.5m	Max Anti-wind Strength	12m/s
Spraying Height	2--4m	Max Flying Altitude	3500m
Max rotation angle	360°	Best Storage Temperature	10-25C°

2.2 TIANNONG M6E Agriculture UAV Specification

Frame		Diagonal Wheelbase	1290mm
		Arm Length	435mm
		Unfolded Height	465mm
		Folded Height	590mm
		Folded Width	530mm
		Sprayer Distance	1290mm
Power System	Motor	Motor Model	TTA6215
		Stator Size	62mm
		KV	180KV
		Max Thrust	9KG
		Max Power	2000W
		Weight	325g
	ESC	Max Continuous Working Current	50A
		Max Peek Current(3s)	100A
		Max Voltage	14S Lipo
		Working Voltage	12S(44--50.4v)
		Working Pulse Width	1000--2000us
		Compatible Signal Frequency	50--400Hz
		Drive PWM frequency	400Hz
	Foldable Propellers	Material	High strength engineering plastic
		Diameter /Screw pitch	2280 (L=558.8mm)
		Weight	95g
	Battery	Capacity	14000MAh

Spraying System	Water	Payload	10L
	Sprayer	Model No.	Pressure Type (Sector)
		Quantity	2 pcs
		Sprayer Diameter	1.0-2.0mm
		Spraying Speed	4--6m/s
		Spraying Volume	1.8--2.2L/min
		Spraying Width	4-6m (up to height)
		Spraying Droplet Diameter	80--200 μ m (adjustable)
Remote Controller	Remote Controller	Model No.	R2
		Working Frequency	2.4Ghz
		Effective Signal Distance	1.2km
		Charging	100-240V
		Working Environment	0--40C°
		Best Storage Temperature	10--25C°
		Best Charging temperature	10--25C°

2.3 Preparation Before Takeoff

2.3.1 Installation of the Fuselage,water tank and landing gear.

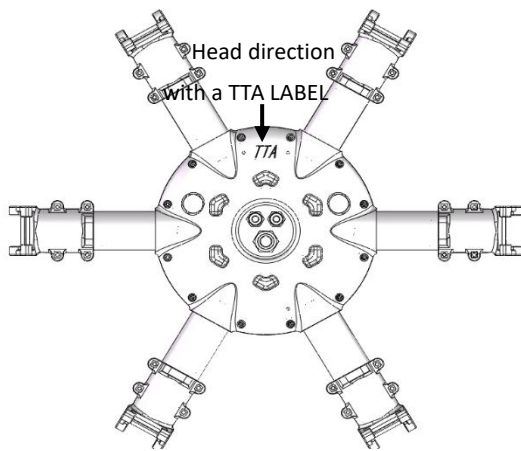


Figure 1

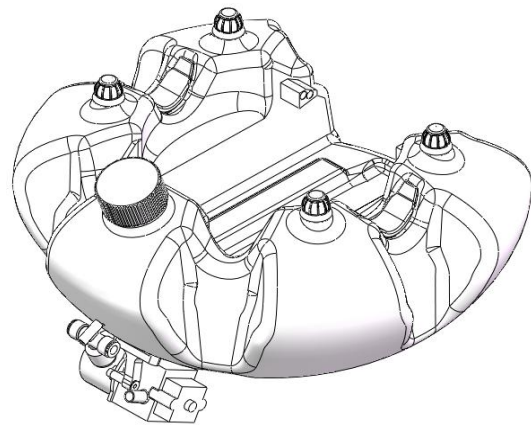


Figure 2

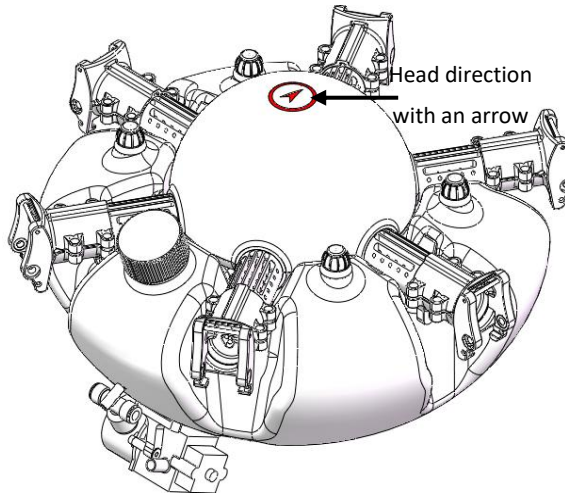


Figure 3

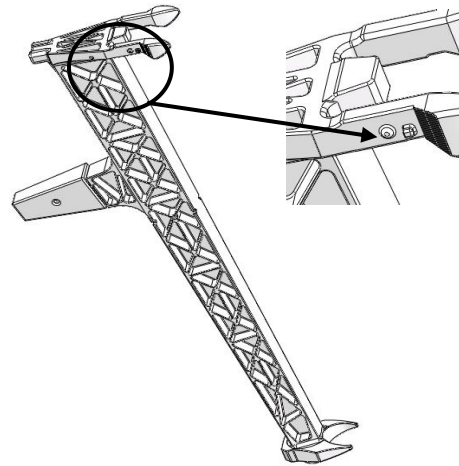


Figure 4

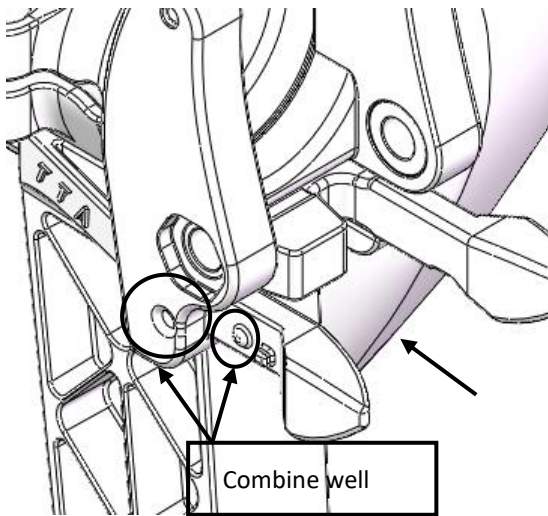


Figure 5

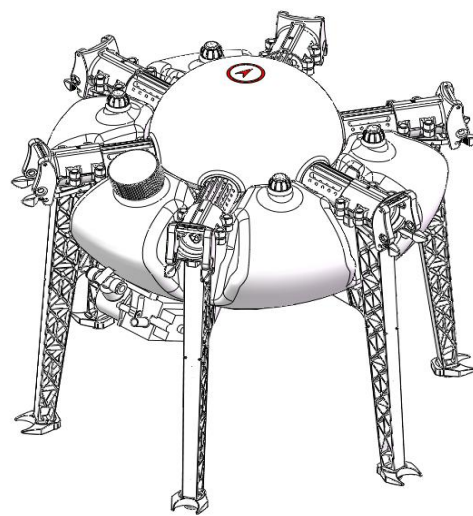
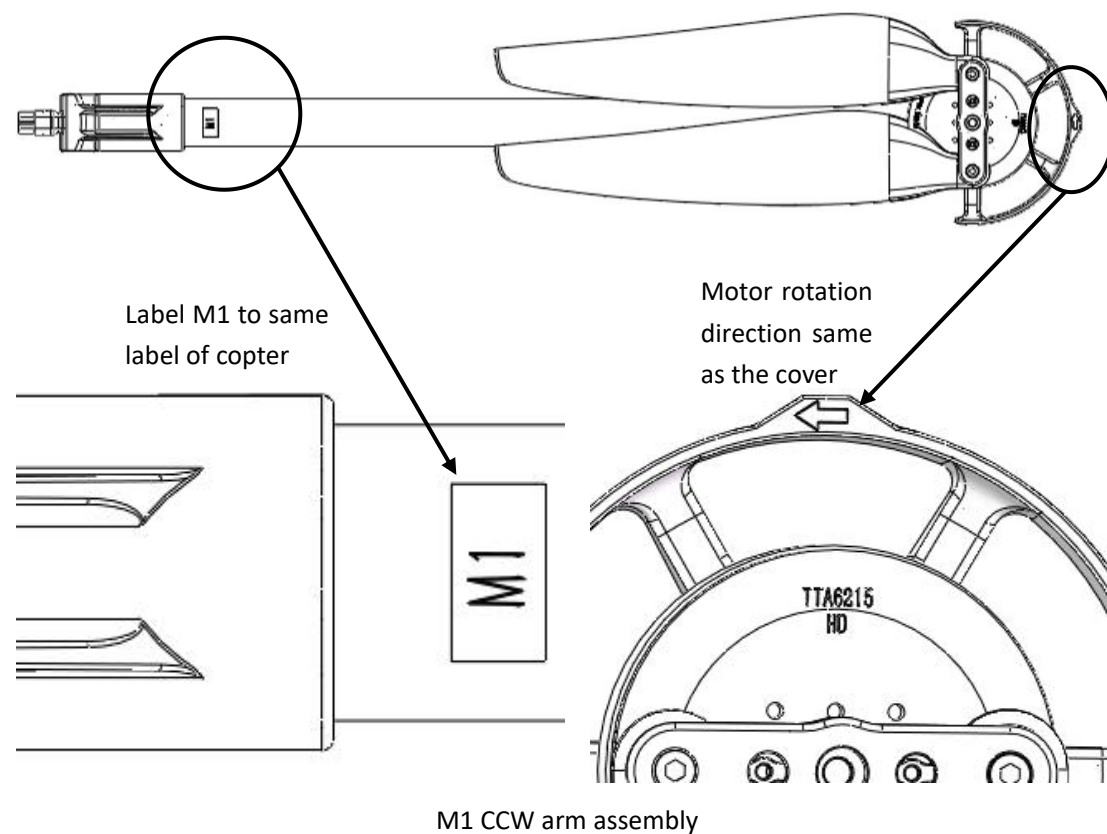


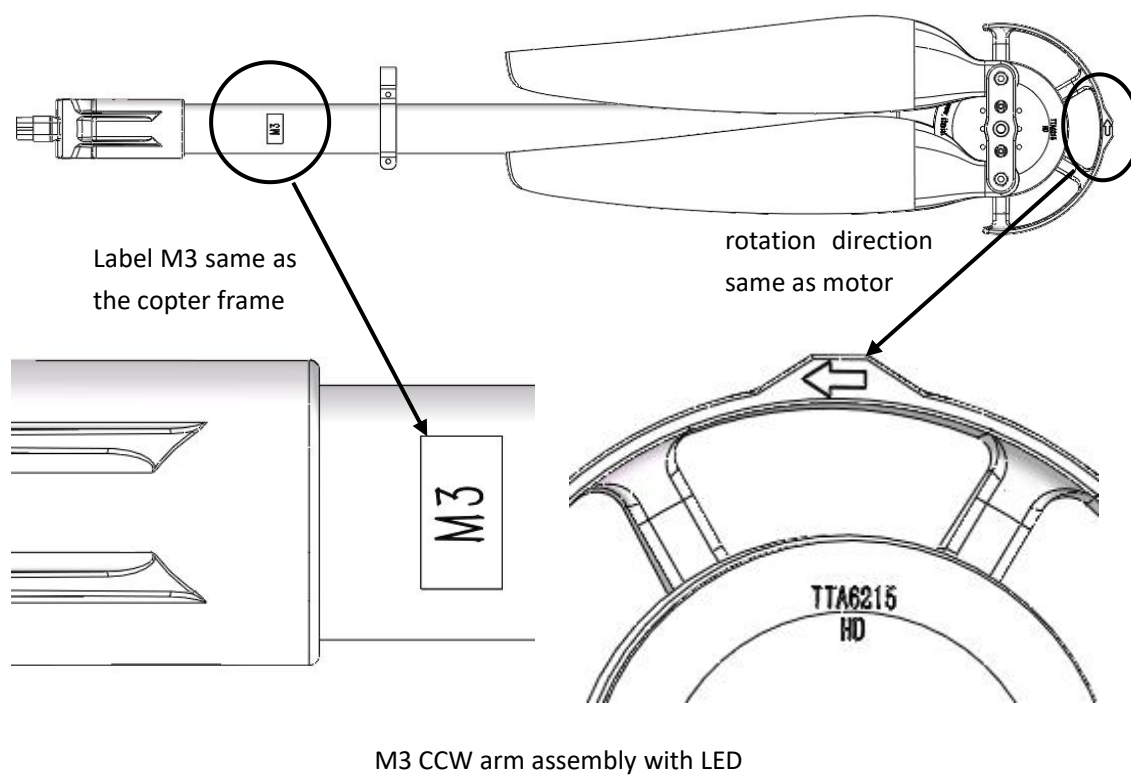
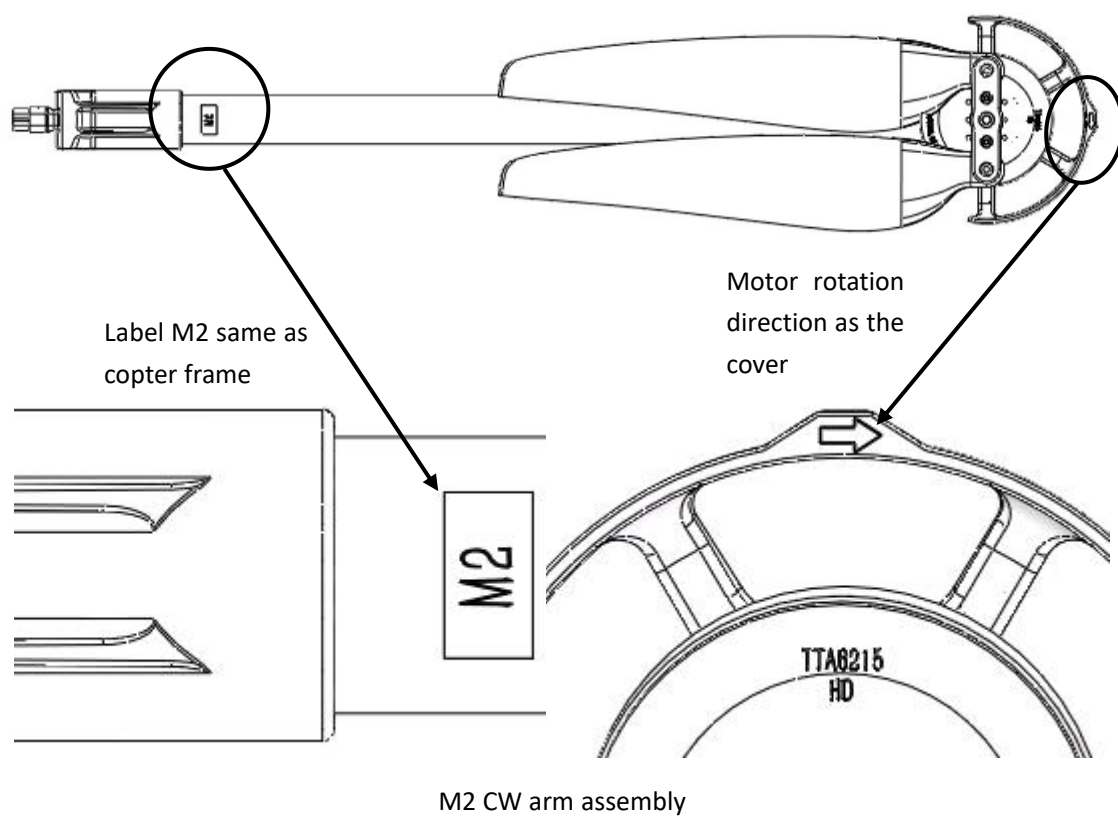
Figure 6

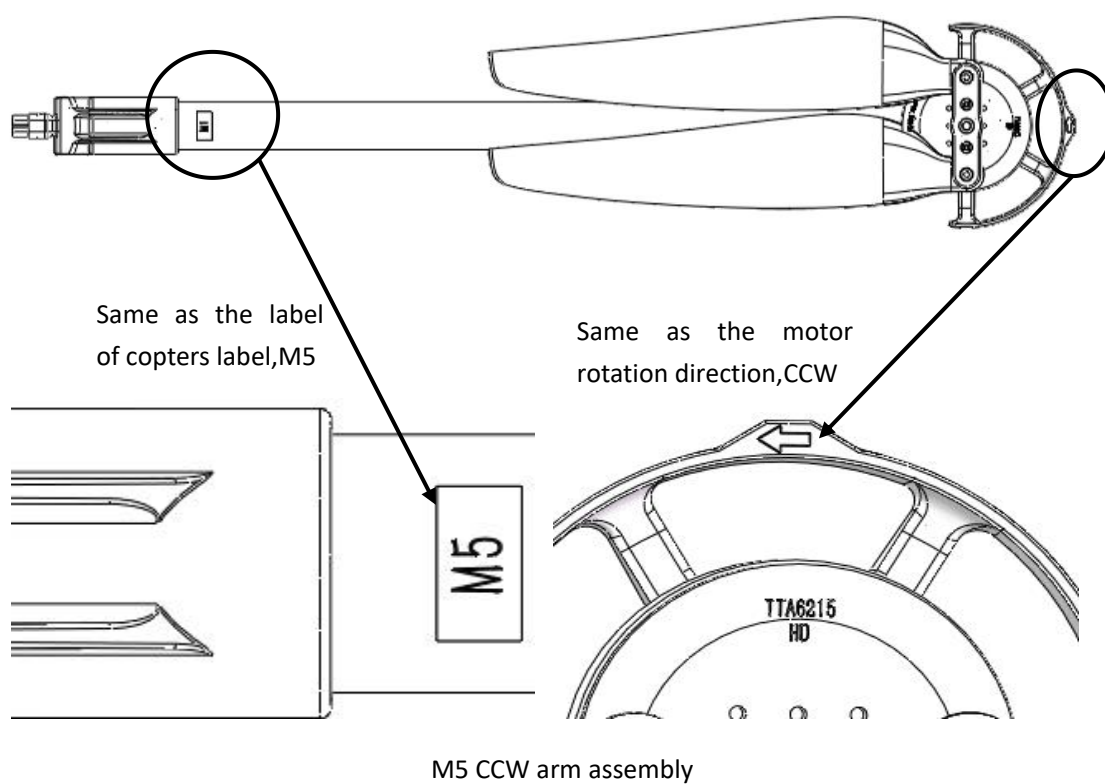
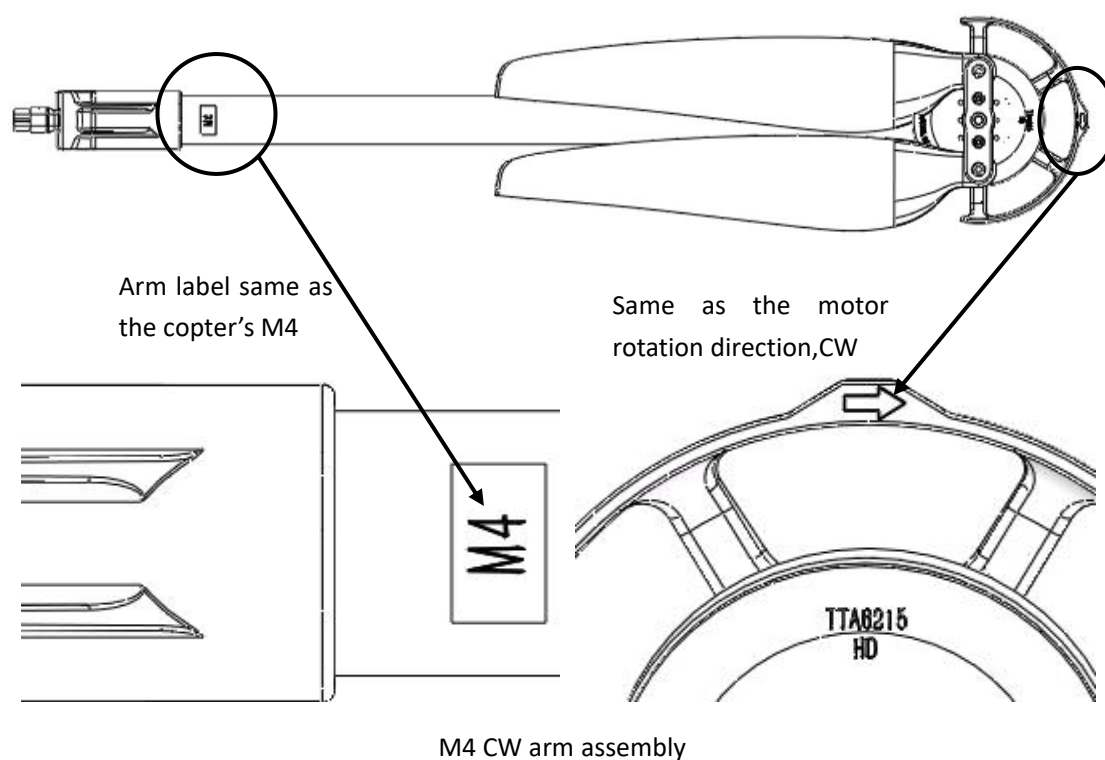
- 1) Marking on the corresponding position of the fuselage and water tank kit as the Figure1-2.(The arrow on the copter frame and down shell of the copter is the head direction,tank lid is the tail direction)
- 2) Put the fuselage bottom upward as the Figure1.
- 3) Install the fuselage and the water tank kit according to the mark ,1-3,2-4. It will be completed like Figure3.
- 4) Marking on the corresponding position of the 6 landing gears as Figure 4.
- 5) Slip the landing gear gently into the curve as the “Mounting Direction” arrow of Figure5.
- 6) The rest 5 landing gears should be installed as above. It will be completed like Figure 6.

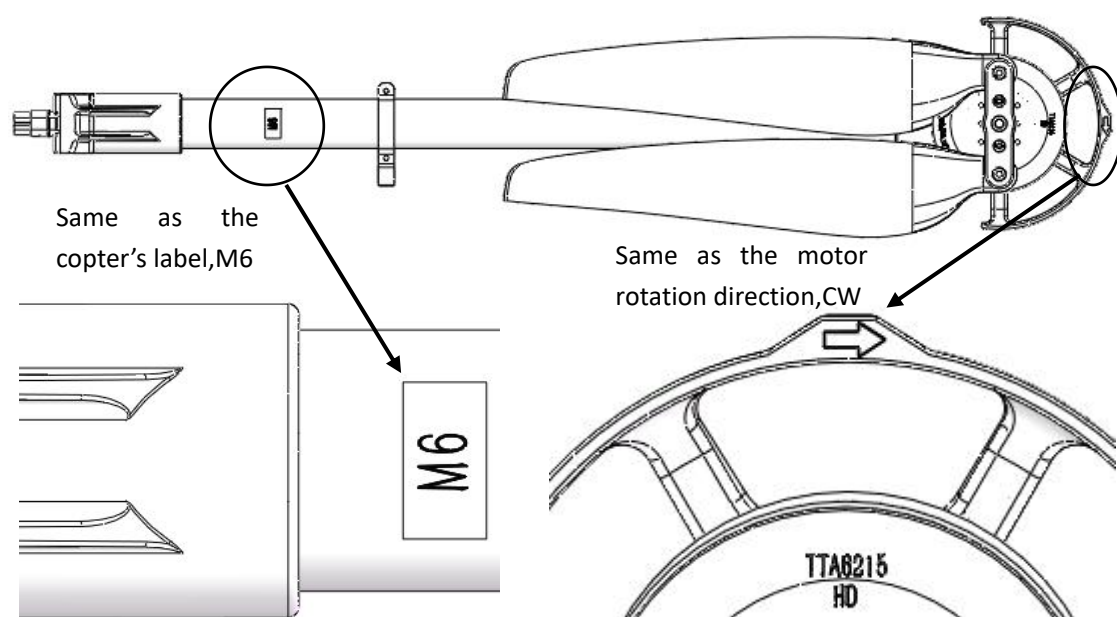
2.3.2 Arm Installation

Make all the arms ready: 1 clockwise(CW) arm with LED, 1 counter clockwise(CCW) arm with LED, 2 CW arms and 2 CCW arms. Totally 6 arms.

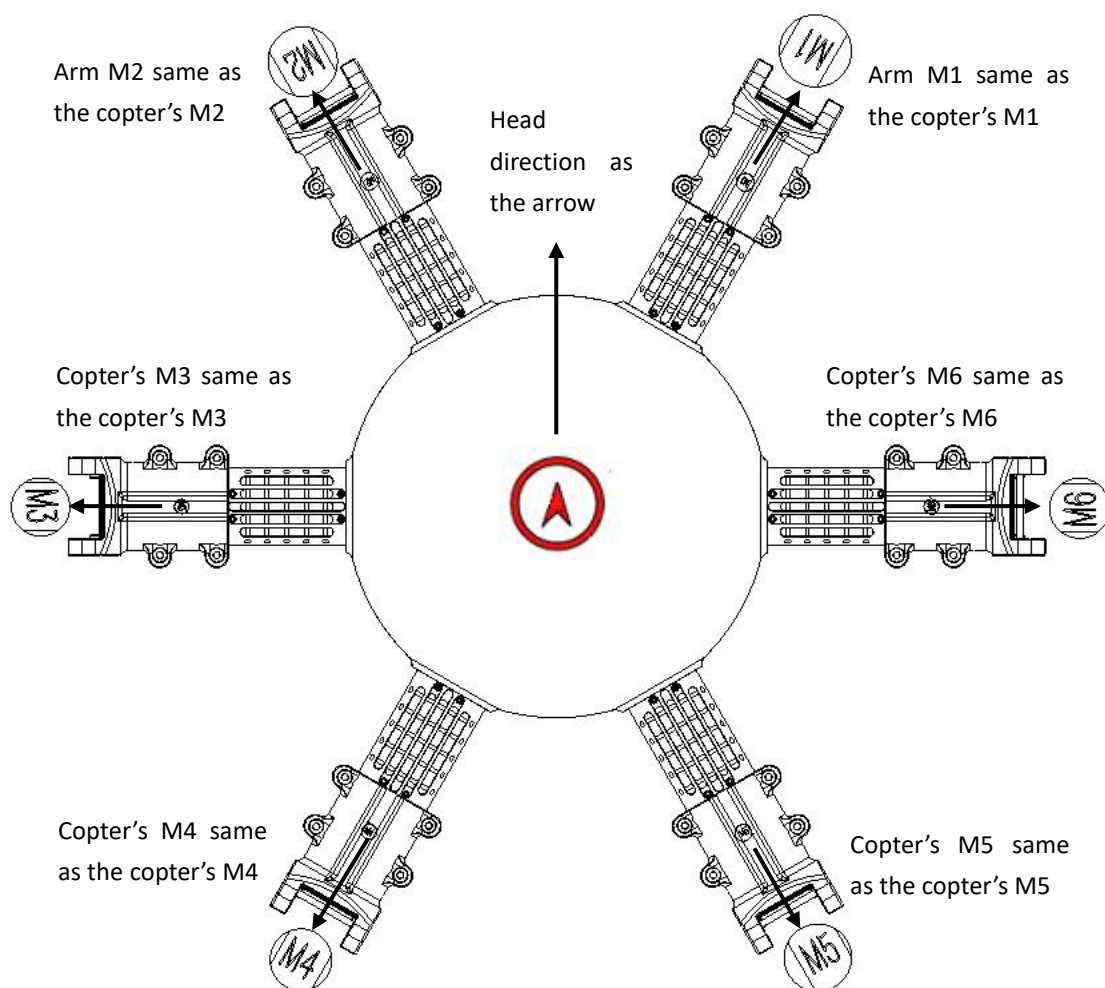








M6 CW arm assembly with LED



Arm and copter installation figure

- 1) Arm M1-M6 should be matched with copter's.
- 2) Match the arm's MT60 female connector with copter's MT60 male connector, see figure 8.
- 3) Match 6mm inner hole of arm clamp with copter's main part 6mm inner hole, see figure 9.

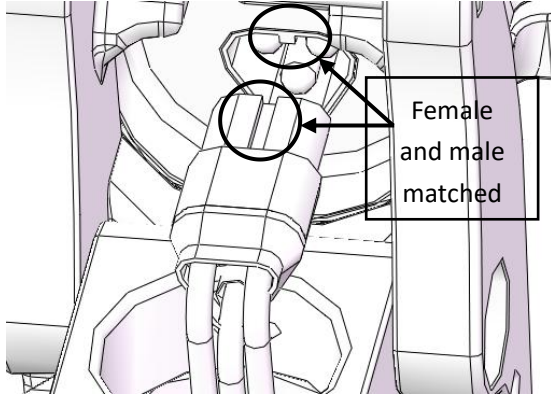


Figure 8

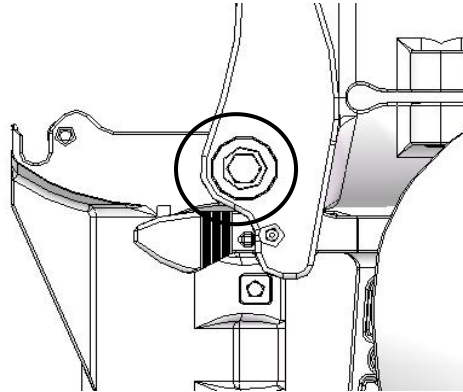


figure 9

- 4) Install the M5*49 plug screw from the hexagon side of the 6mm hole on fuselage arm joint, see figure 10.
- 5) Lock the plug screw with a M5 nut from the other side, the bolt end should be the same as the nut, that means lock works, as Figure 11

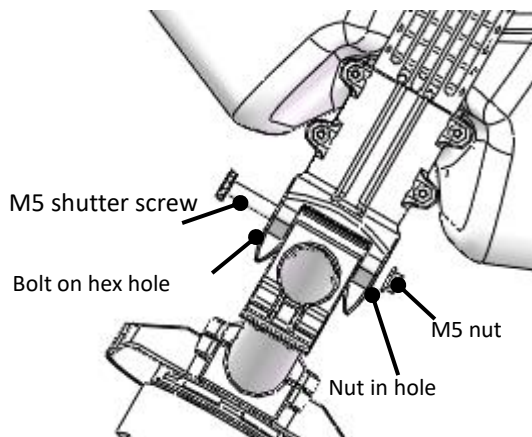


Figure 10

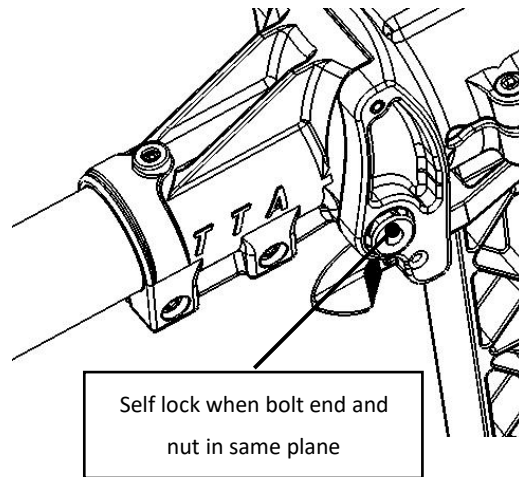


figure 11

- 6) Install the rest 5 arms as above, it will be completed like Figure 12.

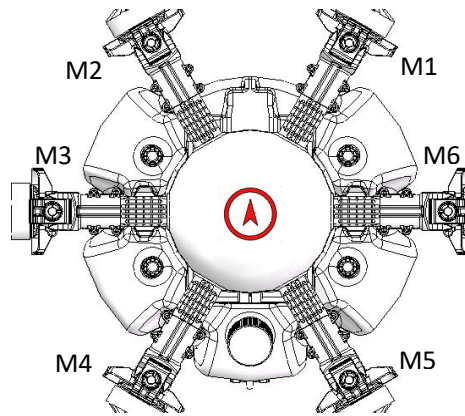


Figure 12

**Attention:**

- 1) The difference between CCW arm and CW arm is different rotation direction of the propellers which produce lift force. There is a mark arrow on every motor holder to help differentiate. CCW arrow means CCW arm, you need to install the CCW propeller, otherwise it will be CW arm which you need to install the CW propeller.
- 2) The difference between Arm with LED and normal Arm is that there are LED ring and spraying system on the Arm with LED and the other doesn't have.
- 3) There is a indicate arrow on the Dome which show the nose.
- 4) According to the Figure 7, install CCW arm on M1 and M5, install CW arms on M2 and M4, install CCW Arm with LED on M3, install CW Arm with LED on M6.
- 5) Arm could only fold down instead of up during the installation, arm should be in an horizontal level with ESC

2.4.3 Spraying Tube Installation

- 1) First, insert the $\Phi 8$ spraying tube into the three-way connector as Figure 14-1. Second, through the spraying tube from the tube holder as Figure 14-2. And then inset the other side of the spraying tube into the one-way connector at the nozzle place as Figure 14-4. Install the other spraying tube the same way.
- 2) It will be completed like Figure 14-3.

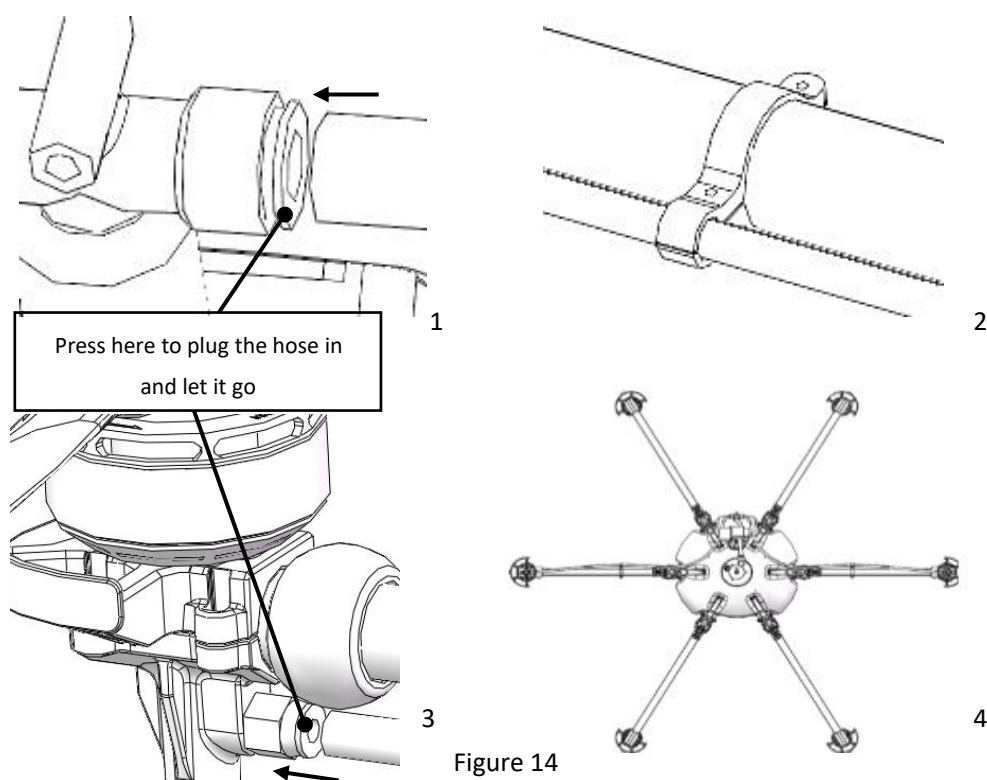


Figure 14

2.3.4 Intelligent Battery Installation

- 1) Push the Intelligent battery into the water tank as Figure 15-1, due to interference fit, it will be installed well when the battery wear pad stuck into the position Mark 3 in the Figure 15-2. It will be completed like Figure 15-3.
- 2) The whole copter will be completely installed like Figure 15-4.

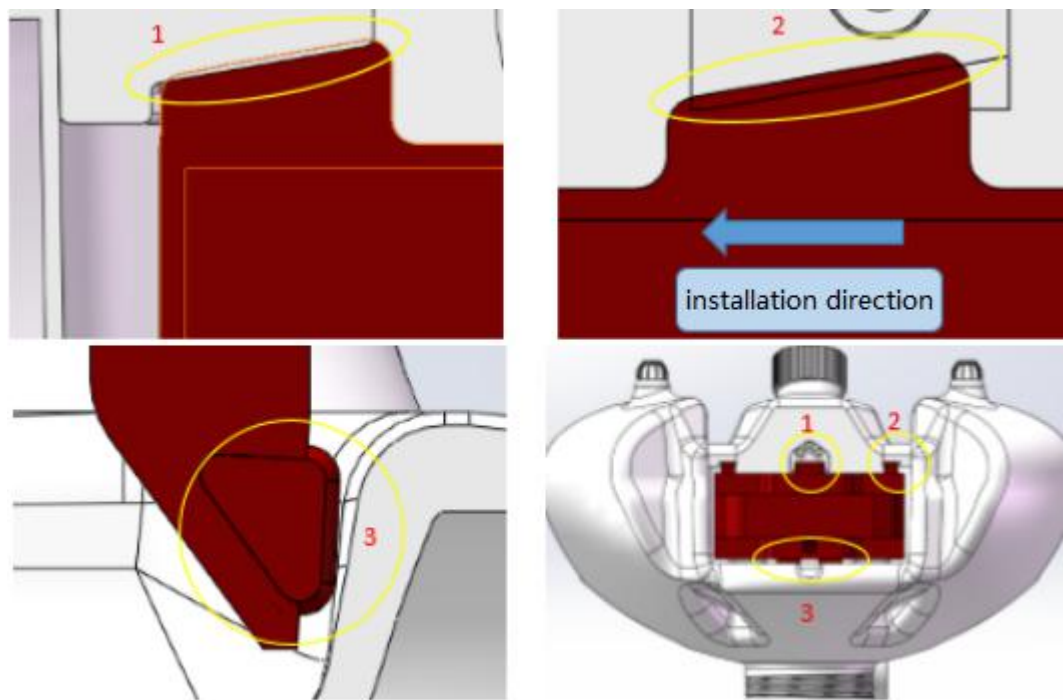


figure15

3.Intelligent Battery Instruction

3.1 Keypad Function

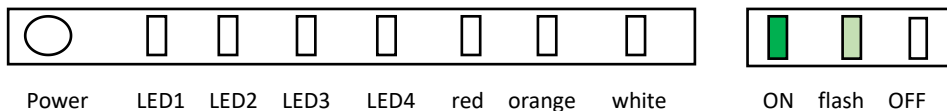
- 1) Short press 1S to check the battery real-time electricity.
- 2) Long press 5S to check the battery residual life.
- 3) Short press 1S + Long press 2S to turn on the battery and charge.
- 4) Short press 1S + Long press 2S to turn off the battery.

Attention:

The battery need to be power on when charge and discharge, the charge port will be opened when the battery power on and be closed when the battery power off.

3.2 Electricity Inspection

When the battery is power off,you can check the real-time electricity with a short press.



Attention:

Electricity indicate light represents both the quantity of electricity when charge and discharge and also the life of the battery.

Battery Indicate Light

Indicator LED1-LED4	Battery Electricity	Green LED1	Green	Green LED3	Green LED4
	0%~12%	Flash	OFF	OFF	OFF
	13%~24%	ON	OFF	OFF	OFF
	25%~37%	ON	Flash	OFF	OFF
	38%~49%	ON	ON	OFF	OFF
	50%~62%	ON	ON	Flash	OFF
	63%~74%	ON	ON	ON	OFF
	75%~87%	ON	ON	ON	Flash
	88%~100%	ON	ON	ON	ON

3.3 Lifetime Inspection

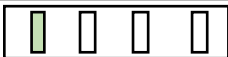

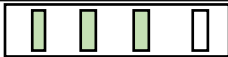
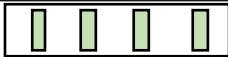
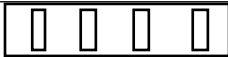
Battery lifetime means rest service time,electric quantity indicator means battery lifetime by keeping pressing power button for 5 seconds in the status of power off.All of indicator will be off if let go the button for 3 seconds.

Indicator LED1-LED4	Green LED1	Green LED2	Green	Green	Green
	ON	ON	ON	ON	ON
	ON	ON	ON	Flash	ON
	ON	ON	ON	OFF	ON
	ON	ON	Flash	OFF	ON
	ON	ON	OFF	OFF	ON
	ON	Flash	OFF	OFF	ON
	ON	OFF	OFF	OFF	ON
	Flash	OFF	OFF	OFF	Flash

3.4 Charging

- 1) Setting, connecting intelligent battery and charger. Step1: Turn on the battery by a short press and a long press according to the instruction. Step2: Connect balance connector and then XT 60,then XT90S or AS150 anti spark connector. Step3: Start regular charging automatically.
- 2) Electric indicator will flash in cycle and displays the current electric quantity.
- 3) It means the intelligent battery has been full when electric indicator is OFF.Please take down the charger and charging has been finished.
- 4) The charging temperature of intelligent battery is 10℃ to 40℃,it's forbidden to charge above 45℃ or less than 5℃.
- 5) Please do not charge the battery without people.
- 6) Forbid to charge with the output connector and forbid to use the battery power when charging.

Attention: Please disconnect the discharging cable before charging.

Indicator LED1-LED4	Battery	Green	Green	Green LED3	Green
	0%~25%	Flash	OFF	OFF	OFF
	26%~50%	Flash	Flash	OFF	OFF
	51%~75%	Flash	Flash	Flash	OFF
	76%~99%	Flash	Flash	Flash	Flash
	100%	OFF	OFF	OFF	OFF

3.4.1 Charging Protection Function

- 1) The best charging current for intelligent battery is 0.5C, 20A is maximum supported, large charging current will not benefit to prolong battery lifetime, it's forbidden to charge higher than charging current.
- 2) If there is abnormal (short circuit of charging end) during charging status, charging will be interrupted automatically in order to ensure not damage to battery cell.
- 3) It will benefit to battery lifetime to set highest protection voltage of each cell according to different charging current.

Attention:

Restart should be done after any protection to ensure the abnormal has been eliminated and protection has been effective.

3.5 Reminding Functions

3.5.1 Maintenance Reminder

The red indicator will be kept on to remind to maintain before using if there is too high voltage difference of batteries or over discharging.

3.5.2 Low Voltage Alarm

System will take it as low voltage if 2.5V~3.65V per cell checked, charging will be reminded and orange LED will be on.

3.5.3 Storage Reminder

Over high voltage for long time will lead to battery cell expansion, thus system will remind user storage status and decrease the voltage to reasonable range in long time storage or

over high temperature, LED will keep white at the same time.

Error Indicator

Red LED5	Orange LED6	White LED7	Instructions
ON			battery maintenance remind
	ON		battery voltage is too low
		ON	battery is in storage status

3.6 Self Balance and Self Storage in Storage

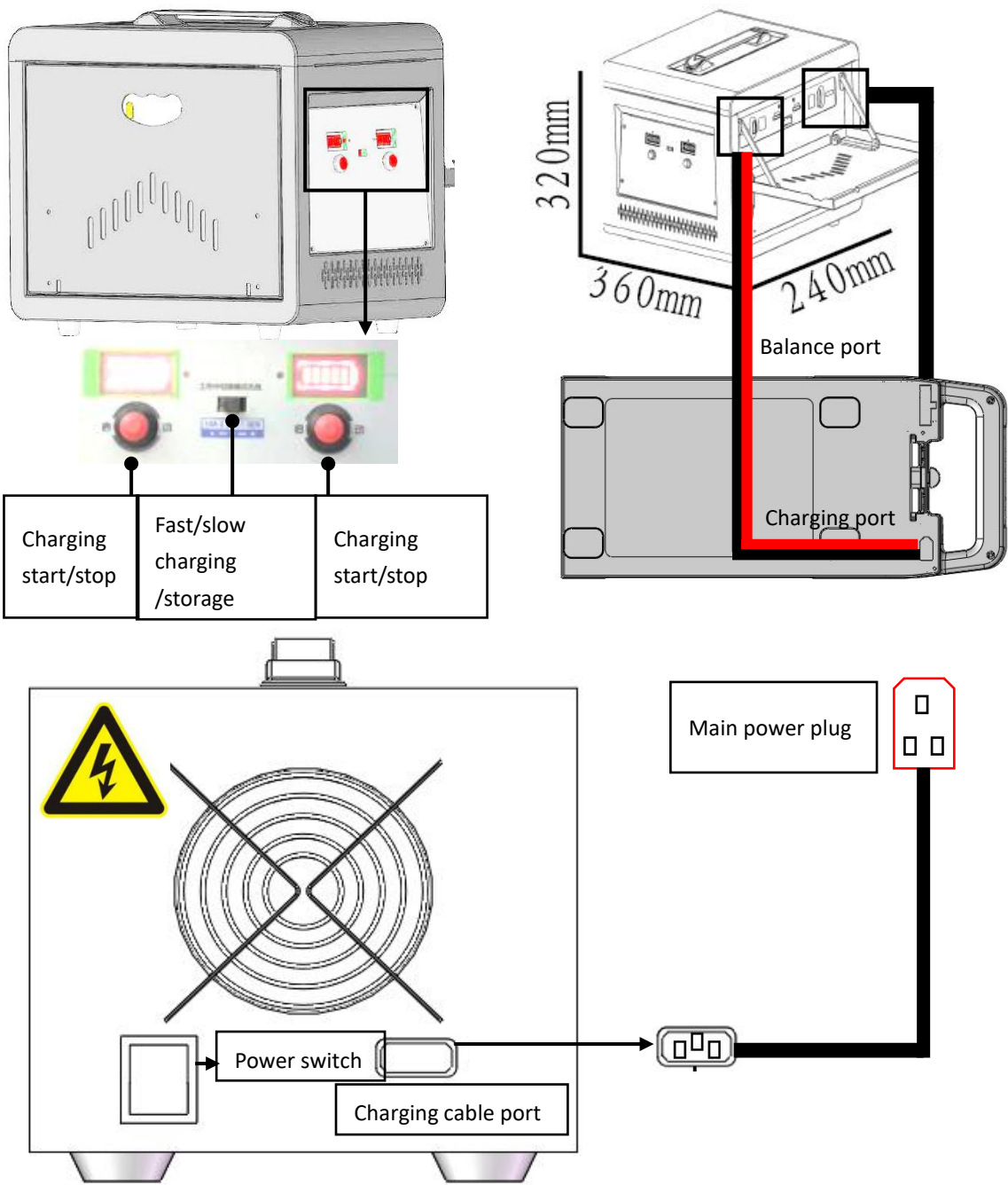
- 1) Intelligent balance: inside battery balance will adjust little to prolong charging and discharging time.
- 2) Intelligent storage: battery will adjust to the most suitable storage capacity automatically for long term storage.

4. Charger Station Introduction

4.1 Production Parameters

- 1) Input voltage: 190V~ 220V AC
- 2) Max. charging current: CH1:20.0A CH2:20.0A
- 3) Max. charging power: CH1:1000W CH2:1000W
- 4) Output voltage: CH1:50.4V CH2:50.4V
- 5) Max. balance current: 400mA
- 6) Max. static power consumption: 320mA
- 7) Display mode: LED
- 8) Supported battery cells: 12S
- 9) Charging working temperature: 5-45℃
- 10) Weight: 16KG
- 11) Production size: 360*340*320

4.2 Wiring diagram



4.3 Indicator Instruction

Indicator Status	LED0	LED1	LED2	Instruction
	Flash			Battery communication abnormal
		Constant		Please check battery connection line or battery voltage status
	Flash			Charging electric circuit abnormal
			Constant	Please contact after sales of factory

Advice:

- 1) Please do not disconnect battery with charger after charging so that battery could be balanced well and its life could be extended.
- 2) The minimum single battery cell voltage will be adjusted to less than 3.85V or the group voltage will be less than 46.2V during storage status. Storage status will end if total voltage is more than 46.2V or battery is not balanced any more, it cost longer for bigger battery unbalance.

4.4 Product Function Feature

- 1) Balance charging
- 2) Rapid charging
- 3) Input and output reverse connection protection
- 4) Low static power consumption
- 5) Folding charging planet

4.5 Operation Instruction

- 1) When power on 220V/110V, leave power switch in the position OFF means input power is shut off, charger does not work.
- 2) When power on 220V/110V, leave power switch in the position POWER, input power has been open, battery figure L0 on the screen is lightened, inner fan begin to rotate and charging channel close at the same time.
- 3) **How to charge: Turn on the battery by a short press and a long press according to the instruction 3.1 first, then connect power connector and balance connector separately, progress bar of battery type signal flash, electric quantity indicator displays red, inner fan and outside fan run together, it means the state of charging.**
- 4) During charging, charging or abnormal status will be stopped if start button has been pressed.
- 5) If charging status is displayed not good after charging, please do not disconnect battery without urgent use, thus battery life will be prolonged.
- 6) Battery will discharged by charger for full charge storage, discharging will be stopped when single cell voltage lower than 3.85V or total voltage lower than 46.2V, but balance current will not be stopped until battery balanced or disconnected. Please do not disconnect battery to avoid total voltage less than 46.2V but storage status has been reminded if battery is not balanced, and it will costs long time.

Safety Warning :

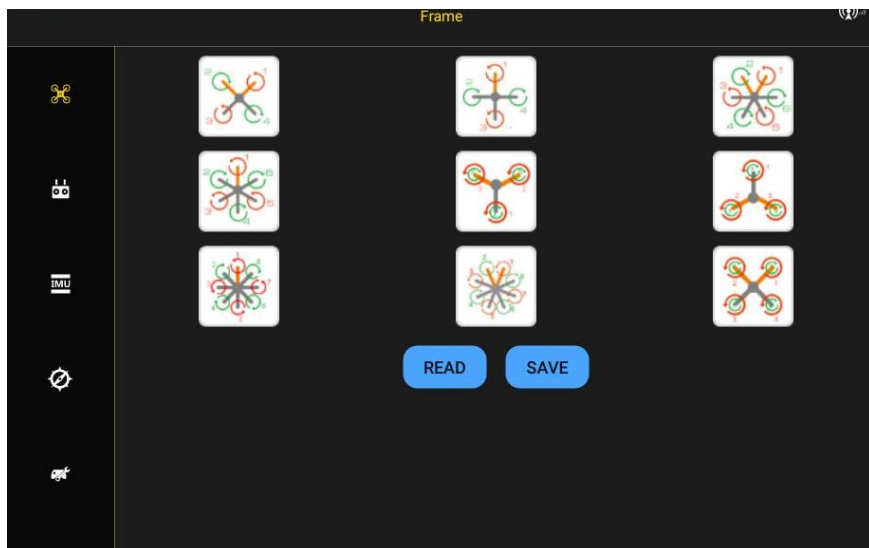
- 1) Charger will not work normally or be damaged for too high or too low input voltage.

- 2) 12S(50.4V) LiPo battery is suitable to this product, correct battery should be chosen.
- 3) Please take care of charging status when charger connecting, stop operation for any abnormal phenomenon.
- 4) Be sure charger is far away dust,moisture,rain,heat source,direct sunlight,vibration and some other unsuitable environment.
- 5) Battery and charger must be placed on nonflammable,insulated surface.
- 6) Please follow the strict instructions.

5. App Setting of Copter

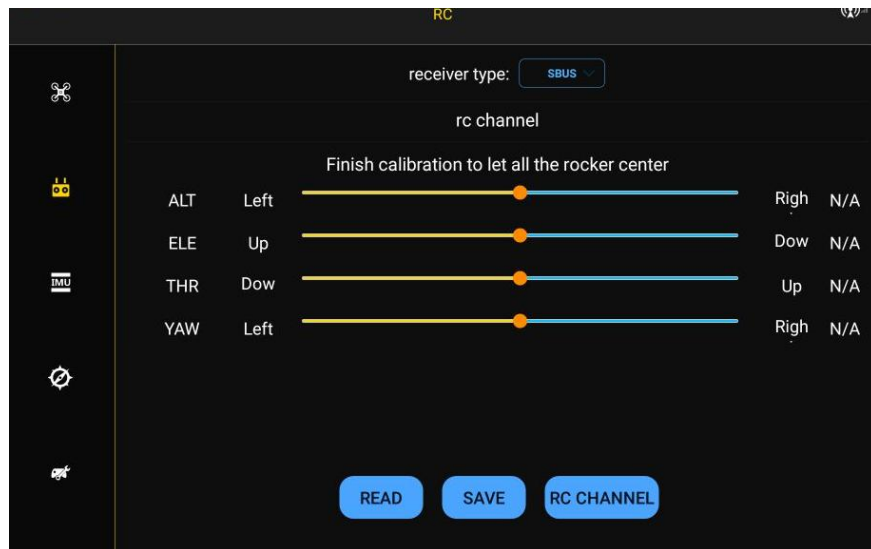
5.1 Software Configuration

5.1.1 Multicopter Type



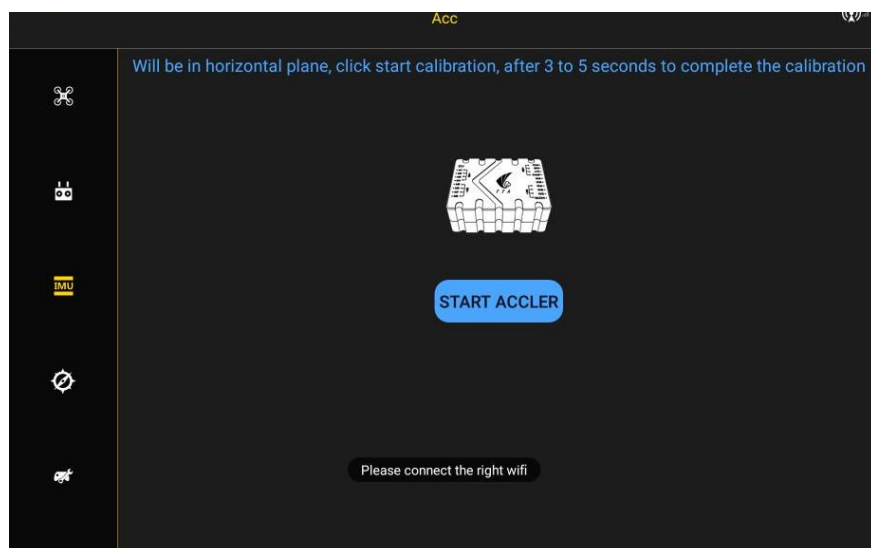
Factory default setting is “X Hex ”(label on the top right most).

5.1.2 Transmitter Calibration



- 1) Calibration start: Ground Control Station connects with copter, click "Calibration start", move stick to the maximum and the minimum value 4-5 times.
- 2) Calibration stop: click "Calibration stop" and stick calibrations have been finished, stick status of corresponding channel could be observed.
- 3) Transmitter setting: choose and check Normal or Reverse for corresponding channel.

5.1.3 IMU Calibration



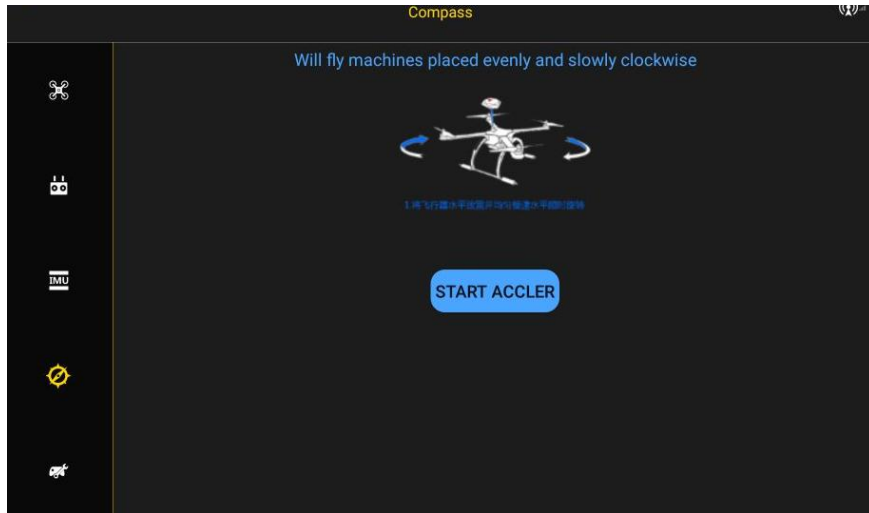
Keep the copter horizontal and still, click "Calibration", calibration is finished after 3-5 seconds.

Attention :

Calibration has been done before it leave factory, it is not recommended to calibrate by user to avoid calibration error.

Calibration is recommended to be done if temperature difference between last calibration is too big.

5.1.4 Compass

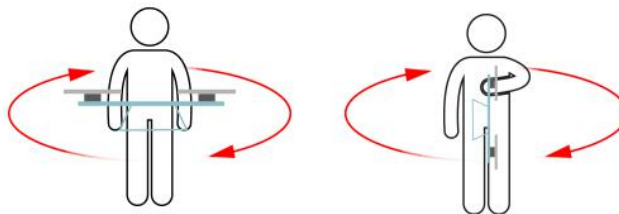


5.1.4.1 Calibration Command

- 1) Calibration mode begins when click "calibration start".
- 2) Compass calibration mode starts when SA of transmitter goes back and forth more than 4 times.

5.1.4.2 Calibration step

- 1) Confirm GCS communication well, compass installation correct and copter outside.
- 2) Clicking calibration, yellow LED of copter is on, hold and keep copter rotating clockwise and slowly, leave copter head to the ground when green led is on, rotate copter clockwise and slowly till LED flash in red, green and yellow alternately.



- 3) After vertical calibration, calibration mode will be exited automatically and LED will

flash normally if successful, LED will keep red for 3 seconds if fails and recalibration should be done.

- 4) Please power again after successful calibration.

Attention :

- 1) Compass should be done after changing flying area.
- 2) Calibration should be done in outdoor, wild and far away from high tension line tower which is easy influenced by magnetic interference.
- 3) Keep horizontal and vertical during the slow calibration.
- 4) **Clockwise** is the only direction.

5.1.5 Sensitivity Settings

Sense			
basic gain(1-1000%)			
roll	1~1000	pitch	1~1000
yaw	1~1000		
control gain(1-500%)			
pitch/roll	1~500	yaw	1~500
vertical	1~500		
other			
brake coefficient	0~20	max speed	0~20
damp	0~5		
max angel	1~30	route speed	1~10
back height	0~30		
READ		RESTORE	

5.1.5.1 Basic Sensitivity

Basic sensitivity means copter sensitivity of roll and pitch. **It could be adjusted between 0% to 1000%**, default is 60%, 60%, 100%. The bigger the value, the sensitive and the fast respond speed, and **jitter** is easy to get; the smaller the value, the less stable and slow reaction.

5.1.5.2 Control Sensitivity

Control sensitivity is used to adjust respond speed, **range is from 0% to 500%**, default is 60%, 60%, 100%, the bigger the value, the fast of response, too big value will lead to

stiffness and too small value will lead to soft response. It's suggested to use big control sensitivity in small frame and small sensitivity in big frame to get a better flight experience. The initial value is 100%, it's suggested to change 10% every time to get a good feeling.

Attention:

- 1) Sensitivity adjustment should be 0%-10% every time, it's not stable if change too much.
- 2) Basic sensitivity is prior to control sensitivity, bigger value means more fierce reaction, smaller value means slow reaction.

5.1.5.3 Other Parameters

Factory default value: brake coefficient :5.00 max speed:6m/s damping:3m/s

Max angle:25degree route speed:6m/s back height: 20m

5.1.6 Low Voltage Protection

5.1.6.1 Settings of Low Voltage Protection

There are three reactions could be chosen for the low voltage protection: automatic return ,automatic land, led display, LED+BACK+CLOSE (pump). Users can set it according to real demands. The default value is automatic land.

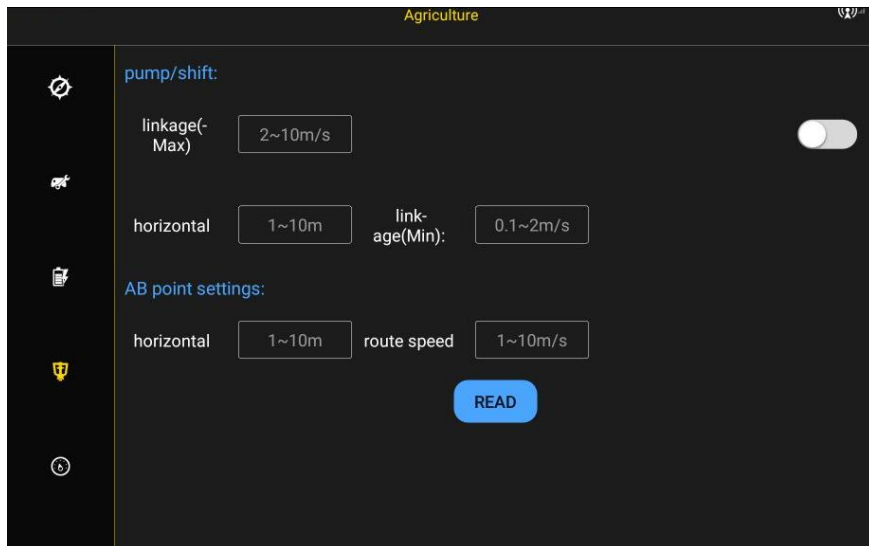
5.1.6.2 Settings of Warn Voltage (Alarm)

- 1) Setting first alarm level and second alarm level value. First alarm level is recommended as 44.4V~45V, second alarm level is recommended as 43.8V~44.4V. The default first alarm is 44.4V, the second alarm is 43.8V
- 2) LED will flash in yellow in three times in first alarm level inspected by flight controller.
- 3) LED will flash in yellow quickly and low voltage protection will be triggered in second alarm level. Returning, landing or flash will be executed according to settings of customer.

5.1.6.3 Settings of Voltage Calibration

Flight controller voltage sensor need to be calibrated if flight controller voltage sensor result is different from real voltage. Real battery voltage should be filled in measured voltage, flight controller voltage will be calibrated by clicking save. **It's unnecessary to set by user as calibration has been done before delivery.**

5.1.7 Agriculture Function



5.1.7.1 One key to Lateral Moving

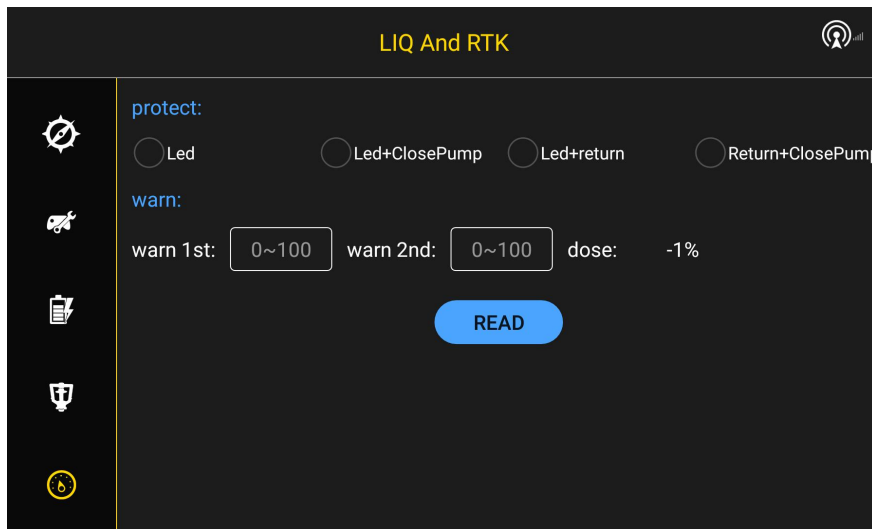
- 1) Interaction: pump is controlled interacted, maximum water flow correspond to maximum flying speed. **Factory default value: max: 6m/s, minimum: 0.2m/s.**

- 2) Interval: interval of lateral moving mode.

5.1.7.2 AB Point Settings

- 1) Interval width: interval in AB mode. **Factory default value: 4.5m.**
- 2) Speed: forward and backward flying speed in AB mode, it could be set by different pesticide and crops. **Factory default value: 6m/s.**

5.1.8 Liquid Level



5.1.8.1 Empty Liquid Protection Setting

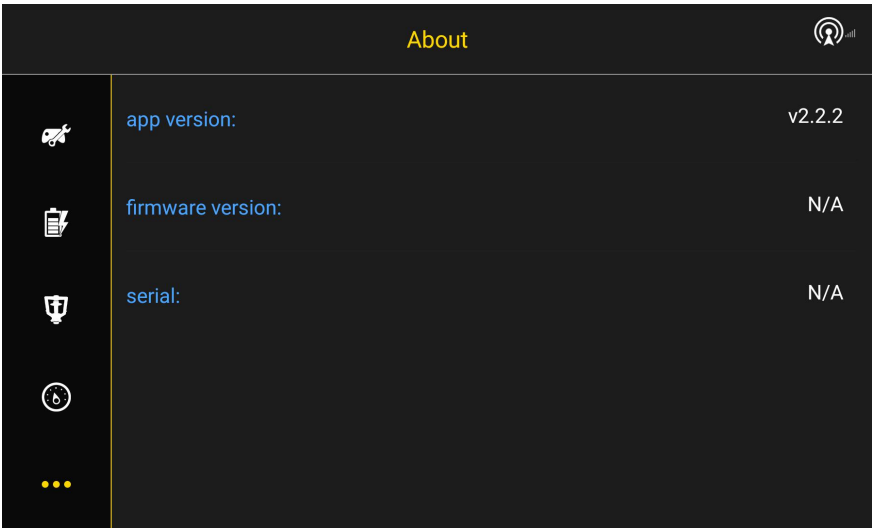
Empty liquid protection settings: Led, Led+close pump, Led+return, Return+ close pump. **Factory default is Led+Close pump.**

5.1.8.2 Low Liquid Level Warn(alarm)

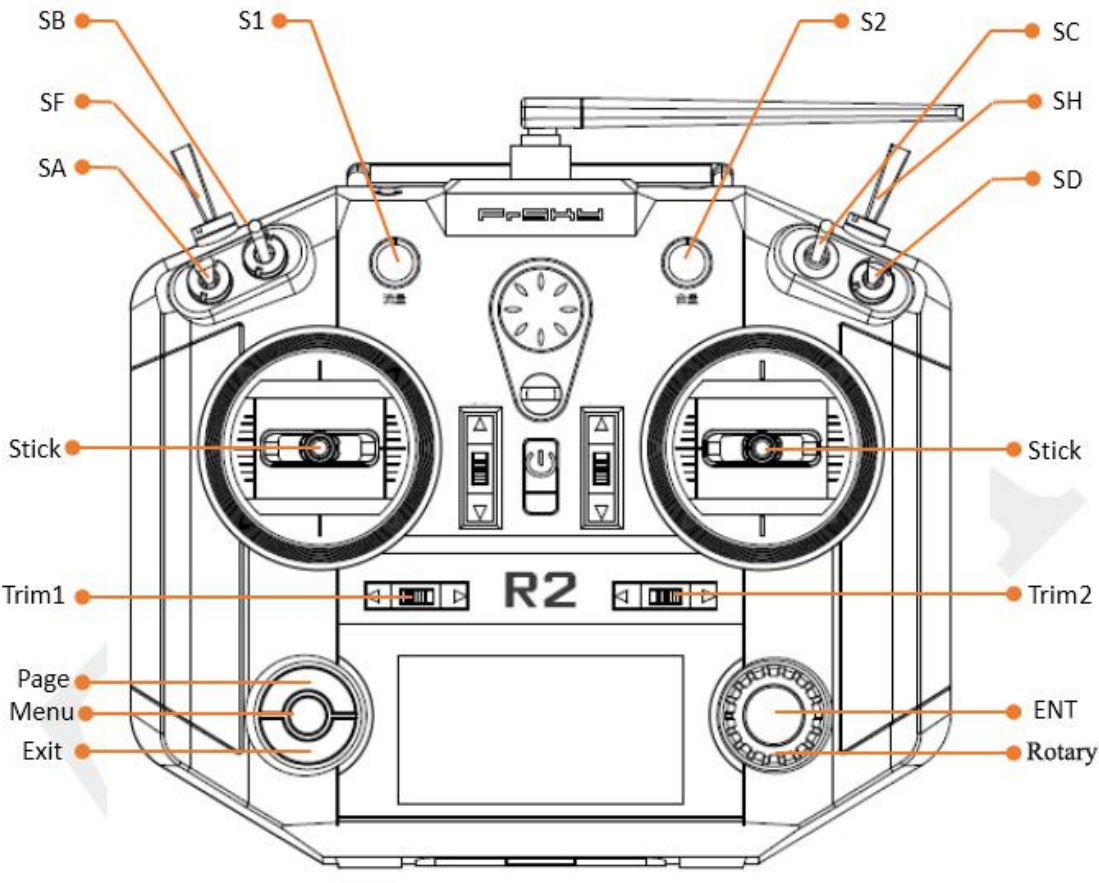
Users can set first alarm and second alarm standard themselves. **Factory default value : First alarm :60%, Second alarm:20%.** And it will display the real liquid quantity.

5.1.9 About

App and copter information could be checked in this screen.



5.2 Remote Controller



5.2.1 Channel Instruction

Channel No.	Up	Middle	Down
Stick (left)	/	/	/
Stick (right)	/	/	/
SA:Flight mode	Altitude Mode	GPS Mode	AB Mode
SB: Pump Control Mode	Manual Control		Interactive Control
SC:Pump ON/OFF	OFF		ON
SD: Record Point A and B	/	Record Point A	Record Point B
SF: Move left	It is triggered when volume button turns from middle to left and back,a width is done every time.		
SH: Move right	It is triggered when volume button turns from middle to right and back, a width is done every time.		
Trim 2: Back Landing(it is triggered by hold left for 2 seconds)	Fly normally		Return To Home and Landing
S1: Pump flow speed	To increase flow speed by clockwise rotation		
S2: Voice Volume	To increase voice volume by clockwise rotation		
Menu	Enter configuration main menu		
Page	Next page		
Exit	Last page		
ENT	Confirm current operation		
Rotary	Turn it to choose current option		

5.2.2 Broadcast Voice Introduction

The SD card need to be update or change if the broadcast voice is not corresponding with below introduction .

Function	Broadcast voice		
	up	middle	down
SA: Flight mode	Altitude Mode	GPS Mode	AB Mode
SB:Pump Control Mode	Pump manual Control		Pump combine control
SD: Record Point A and B	/	Point A recorded	Point B recorded
	Continuously turn SD, it will broadcast "points AB cleared"		

	“	
SF: Move left	Move left	
SH: Move right	Move right	
Trim 2: Back Landing(it is triggered by hold left for 2 seconds)	/	Back Landing
Water level	Tank level low	Tank empty
Voltage	Voltage low	Voltage too low
Communication	Communication disconnected	Communication connected

5.2.3 Operation Instruction

- 1) Start up: press power button for 3 seconds
- 2) Shutdown: press power button for 3 seconds
- 3) One key back landing: Hold “Trim1” left for 2 seconds

5.2.4 Change Operation Mode

- 1) Please power on the remote controller and short press the 【MENU】 button, then choose the operation mode by turn the rotary.
Note: Mode 1 please choose 【TTA-M1】 .
 Mode 2 please choose 【TTA-M2】
- 2) Please press 【ENT】 to open the operation mode has been chose, chose 【select model】 and press 【ENT】 again to complete the mode changing, and the remote controller will re-enter the boot screen . Operation mode will be changed successfully after skipping the boot screen.

5.2.5 Transmitter and Receiver Bind method

- 1) Power on the remote controller (transmitter) , short press 【MENU】 , then press 【PAGE】 to enter the second page, turn the rotary to find 【RxNum】 .
- 2) Choose and confirm the 【Mode】 to be D16
- 3) Move the cursor on “Bnd” button, then press 【ENT】 , “ Bnd” will in flash condition, and the remote controller is in code pairing status.
- 4) Power on the copter, the remote controller and the receiver will start to bind after the motors finish self-inspection 3s.
- 5) Move the cursor on “Bnd” button, then press 【ENT】 , the “Bnd” stop to flash and then

bind completed. Re-Power on the copter , it means bind successfully after you hear broadcast 【Communication connected】 .

5.2.6 Charging

- 1) Open the battery cover from the controller, take out the battery..
- 2) Press the button on the controller charger into “6S Ni-MH”, combine the battery case and charger by wire.
- 3) Plug the charger into the power outlet, meanwhile the charger's LED indicator is red, in charging process, if the charger LED lights go out, indicating that the charging has been completed.

Note:

If not using remote controller for long time, be sure to remove the batteries out of the battery box, to avoid battery leakage.

5.2.7Antenna placement direction

In regular working situation, while the user hold the controller up side up, please be sure to keep the antenna vertical to the ground.

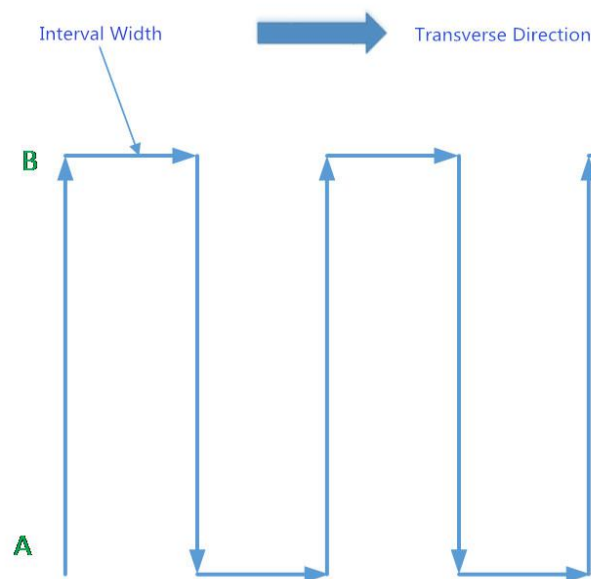
5.3 Function Control

5.3.1 Flight Mode

Flight mode	Instruction	Operate	Condition	attention
Altitude mode	Horizontal stabilization,yaw locked,fixed altitude	By transmitter	GPS satellite enough, LED does not flash red	
GPS mode	Fixed horizontal point,yaw locked,fixed altitude	Transmitter operation/empty tank reaction/others	GPS satellites enough,LED does not flash red	
AB mode	Copter will fly and spray along with AB point	Record point A and B and switch to AB mode,choose left or right for roll	GPS satellites enough, LED does not flash red	

Traverse	Copter traverse left/right to a normal width	Copter will traverse left a unit when turn volume button left; copter will traverse right a unit when turn volume button right	GPS satellites enough, LED does not flash red	
Return mode	Copter will fly back home point automatically, flying back tail to home point and then descend slowly, it could be controlled after arriving on the top of home point except throttle	Press button Home continuously/empty tank reaction/low voltage reaction/reaction of losing transmitter signal	GPS satellites enough, LED does not flash red	

5.3.1.1 AB Mode



AB mode is a more simple efficient mode with fault tolerance to operate. The working theory is above in the picture. Record the point A and B, the UAV will plan the flight line like this.

1. Operate Steps:

- 1) Record the point A, switch the mode to GPS mode. Until the drone self-hovering

steadily,switch SD to "Point A memorized".After that,the LED flash yellow for 2 seconds.The controller have voice prompt.

- 2) Record the point B,drive the drone to the position you want,be sure it is at least 10 meters away from point A.Until the drone self-hovering steadily,witch SD to "Point B memorized".After that,the LED flash yellow for 2 seconds.The controller have voice prompt.
- 3) Select the direction,switch SA (Flight mode) to AB mode, move the roll joystick to select the roll direction.Move the joystick to the left limitation,the drone rolls to the left side,move the joystick to the right limitation,the drone rolls to the right side.While the drone doing AB point flight mode,the user can stop controlling the joystick.Make sure that the water enough,the pump is under auto-controlled or manual-controlled.
- 4) AB Mode Correction
 - ①Altitude correction:Control the flight altitude by the throttle joystick, "up" for the drone to rise, the "down" for the drone to set ;
 - ②Correct the the rudder to control the direction;
 - ③Fix point A:while the drone moving from point B to Point A,push up the pitch stick to make point A 1m closer to point B,push down the pitch stick to make point A 1m away from point B.
 - ④Fix point B:while the drone moving from point A to Point B,push down the pitch stick to make the point B away from point A,push down the pitch stick to make point B 1m closer to point A.
- 5) Shut Down and Quit
 - ①When set the "no pesticide" action to self-hovering or return,in AB mode this function still works.
 - ②When set the "low battery" action to return,in AB mode the this function still works.

③After the spraying work is done,AB mode can be shut down by switching into altitude mode.

- 6) To return to the breakpoint, shut down the AB mode auto-controlled or manual-controlled. After filling the pesticide in the tank and taking off,switch SA (flight mode)to AB mode directly ,the drone would return right to the breakpoint.

2. Remove Point A and B

Struck SD (AB mode) for 4-5 times rapidly,LED alternately flash red green and yellow,AB mode removed.**Without removing last AB point,can not set new AB point.**

3. Set the Interval Width

From the software->plant protect function  to set the spraying width and working speed

Attention:

- 1) Be sure to start AB mode within turning on the pump and agitation function working.
- 2) Be sure it is at least 10 meters away from point A to point be.
- 3) Every time recording point A and B,be sure to wait until the drone self-hovering steadily in GPS mode.
- 4) Without removing last AB point,can not set new AB point.

5.3.1.2 Traverse Mode

Traverse mode assist to work,move rightwards or leftwards for one spraying width.To assist AB mode finish spraying irregular shaped field

5.3.2 Control of the Pump

- 1) Instruction of controlling the pump

Mode	instruction	control	Condition
manual-controlled	While manual-controlling, the spraying rate depends on S1, minimum rate is 0.	manual-control SB	Filled with pesticide
Linkage control	The flight controller controls the pump on and off intelligently, faster the drone moves, faster the nozzle sprays.	SB linkage controls, the drone is in airline mode	Filled with pesticide, AB Mode

2) Spraying Rate Control

At manual-control mode, the Spraying rate controlled by SB . The Spraying rate depends on the flying speed at linkage situation, and it will be automatically controlled after you set the max flying speed which match the max spraying rate.

Appendix I Implication of Indicator Light

Items	Indicator light	Priority
Flying Mode		
Gyro mode(stabilization,altitude)	Green light single flash●	Low
GPS mode (angle,speed)	Green light double flash●●	Low
AB mode	Green light triple flash●●●	Low
GPS		
GPS unconnected/GPS receive no satellite	Red light triple flash●●●	Low
GPS bad signal	Red light double flash●●	Low
GPS general signal	Red light single flash●	Low
GPS Good signal	Red light off ○	Low
Low Voltage Warn(alarm)		
First alarm level	Yellow light triple flash●●●	Low
Second alarm level	Yellow light quick flash●●●●●	High
Compass Calibration		
Horizontal calibration	Yellow light constant light●——	Middle
Vertical calibration	Green light constant light●——	Middle
Calibration failed	Red light constant light●——	Middle
Calibration succeed	Red,green and yellow light alternating flash●●●	Middle
Accelerator Calibration		
Calibrating	Red,green and yellow light alternating flash●●●	Middle
Calibration succeed	Green light constant light●——	Middle
Error		
Remote controller lose control	Red light quick flash●●●●●	High
Compass interfered/error	Yellow and green light alternating flash●●●●●	High
GPS lose satellite/error	Red and green light alternating flash●●●●●	High
IMU over vibration/error	Red and yellow light alternating flash●●●●●	High
Other Situations		
Initializtion of power on	Red,green and yellow light alternating flash●●●	High
Unlock	Red,green and yellow light alternating flash●●●	High
Unlock failed	Red light constant light●——	High

Appendix II How to connect copter to PC GCS

1 Find the correct port from the copter and open the protection cover,see figure 1:



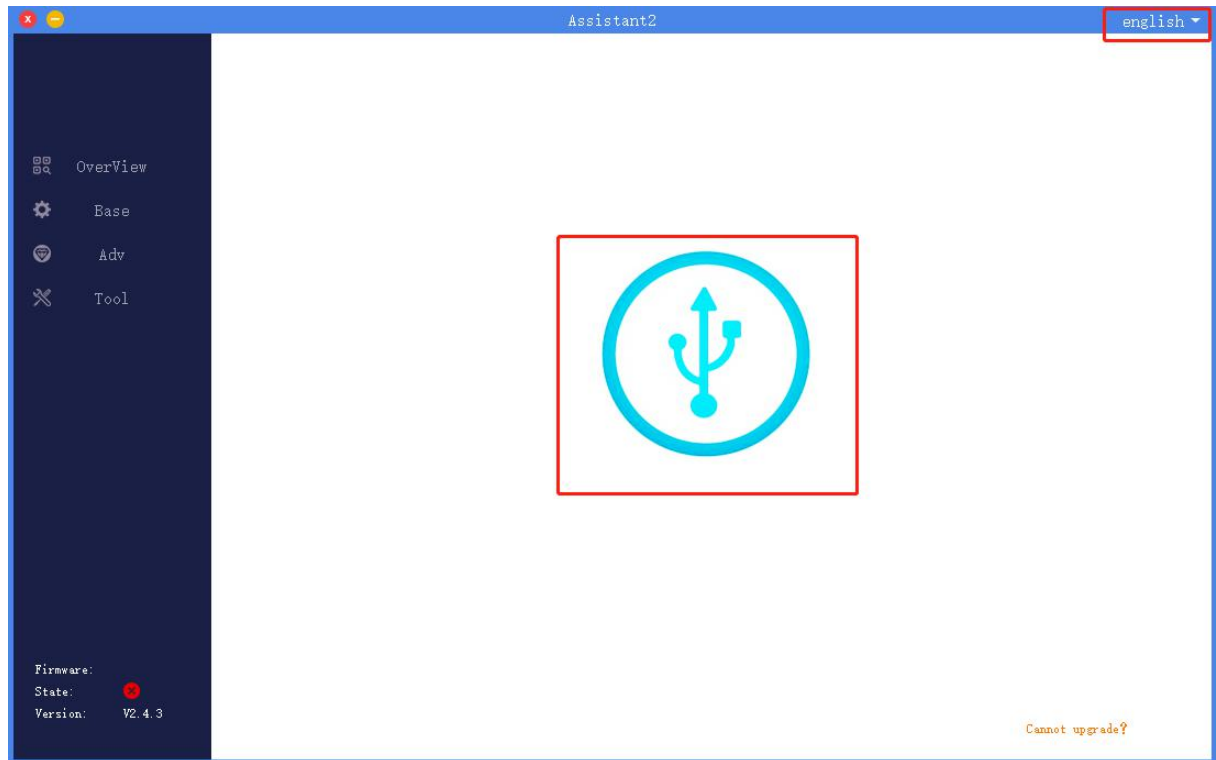
2 Find the computer connection cable from the attached bag,see figure 2:



3 One connect to computer,another end connect to copter.Waiting for a moment(It takes

few minutes to install the driver for the first connection with a new computer)

4 Open PC GCS,select the language you need.Click the connection button,see figure 3:



Disclaimer

1. To protect the legitimate rights and interests of users, please be sure to read our instruction attached carefully before using product.Be sure to understand your legitimate rights and interests, responsibilities and safety instructions; or it may cause property damage, safety accident and hidden personal safety problem.Beijing TTA reserves the right to update this document. Please be sure to in accordance with the instructions and safety instructions operating this product.
2. The users use this product directly or indirectly, any violation of the law, TTA company will not bear any responsibility.
3. This product is not suitable for under-18-year old and other who do not have full capacity for civil conduct, please avoid these people use this product.While using this product in public occasion please pay extra attention to operate.
4. Once you start using this product, deemed as you have read,recognized and accepted the product specification, disclaimer and terms and conditions of all safety instructions. It's user's commitment to their own behavior and therefore is responsible for all the consequences. Users promised to use this product only for legitimate purposes, and agree to these terms and any others policies or guidelines TTA company may develop .
5. In the process of using this product, please be sure to strictly obey the safety instructions included in this document but not limited in it.For violations of the safety

information we have informed and cause any personal injury, accident, property damage, legal disputes, conflicts of adverse events, and all others relevant responsibilities, the loss should be borne by the users themselves, TTA company will not bear any responsibility.

6. In the following situations, we do not provide any technical support and security commitments:
 - A) through informal agents or improper access to this product units or individuals;
 - B) the unauthorized modification, debugging, and replacement parts products.
 - C) warranty card, serial number, or flight data lost;
 - D) due to personal error caused personal injury and property damage.