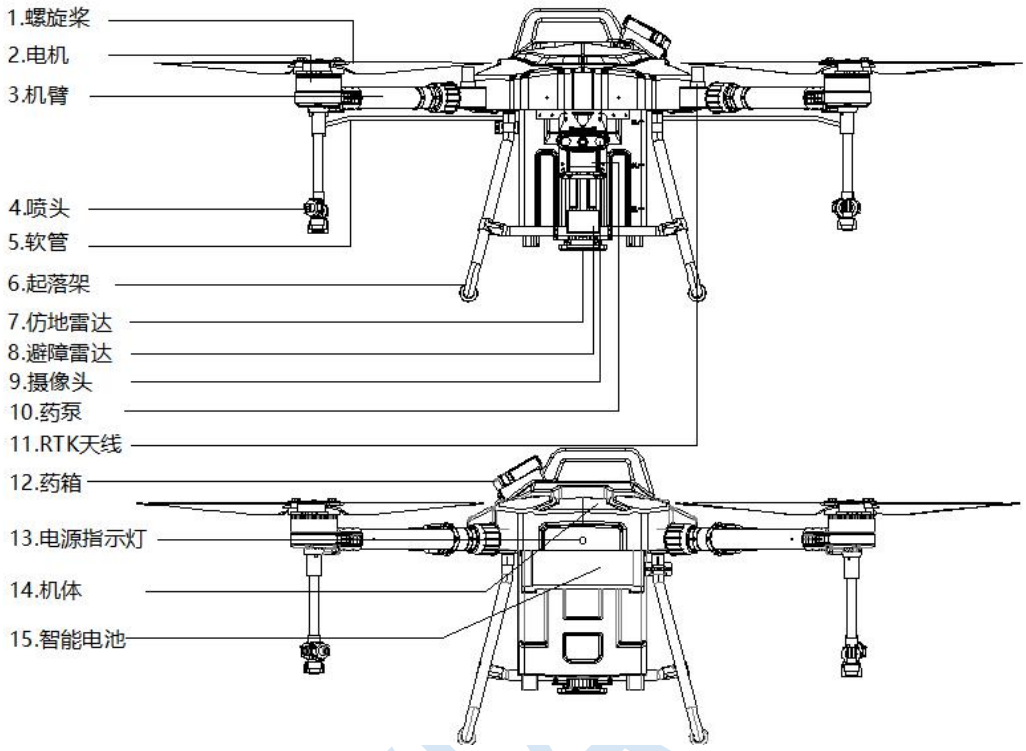
TTA M6E-G300 USER INSTRUCTIONS V1.2

TTAVIATION



Beijing TT Aviation Technology Co.,Ltd.

Make sure the pilot is well-trainned in operating UAVs before going on mission.



1	Propeller	2	Motor
3	Arm	4	Sprinkler
5	Hoses	6	Landing Gear
7	Terrain Follow Radar	8	Collision Radar
9	Camera	10	Pump
11	RTK Antenna	12	Tank
13	FC Indicator	14	Frame
15	Smart Battery		

Drone Parts Overview

Version Records

Version	Data	Contents	Editor
V1.0	2022/02/24	First release	Chris
V1.1	2022/03/10	Update “3.4 Smart Charger”	Chris
V1.2	2022/03/10	Update propeller and motor orientation description in “2.1 Preparing the Aircraft”	Chris

TT AVIATION

Contents

1.Use Instruction....1
1.1 Safety Instruction....1
1.2 Chemical Usage....2
1.3 Inspection....3
1.4 Environment....3
1.5 Operation....3
1.6 Compass Calibration Requirements....4
2. Product Introduction....5
2.1 Preparing the Aircraft....5
2.2 Preparing Remote Controller....7
3.Product Introduction....9
3.1 UAV....9
3.1.1 UAV Introduction....9
3.1.2 UAV Parameters....9
3.2 Remote Controller....10
3.2.1 RC Introduction....10
3.2.2 Function Assignment....11
3.2.3 RC Parameters....11
3.3 Intelligent Battery....12
3.4 Smart Charger....14
3.4.1 Charger Specification....15
3.4.2 Startup....15
3.4.3 Status Indicator....16
3.4.4 Safety Rules....16
4. Prepare for Work....17
4.1 Software Installation....17
4.2 Registration Procedure....18
4.2.1 Registration Procedure....18
4.3 Registration and Login....18
4.3.1 Registration....18
4.3.2 Login....18
4.3.3 Account Update....19
4.4 Connect....20

TTAVIATION

4.5 Add Drone to Your Account....21
5. Autonomous Mission Planning and Performing....24
5.1 Autonomous Mission Work Flow....24
5.1.1 Mapping....24
5.1.2 Mission Assignment....27
5.1.2.1 How to share your ground to everyone nearby?....28
5.1.2.2 ADD a ground from “Around Ground” into my ground list....29
5.2 Start Mission....30
5.2.1 Route Adjust....30
5.2.2 Start Spraying....31
6. AB Mission....32
7.Drone Settings....34
7.1 RC Calibration....34
7.2 Parameters Settings....34
7.2.1 Compass Calibration....34
7.2.2 Battery Settings....36
7.2.3 Spray Settings....36
7.2.4 Flying Parameters....37
7.2.5 Pump Settings....37
7.3 Battery and Radar Settings....38
7.3.1 Smart Battery....38
7.3.2 Terrain Follow Radar....39
7.3.4 Obstacle Avoidance Settings....40
7.4 Other Settings....41
8.Remote Controller....42
8.1 H12 Tool....42
8.2 Flying Control....44
8.2.1 Manually Arming and Take-off....44
8.2.2 Disarming....44
Appendix Ⅰ Implication of Indicator....46
Appendix Ⅱ Important Attentions and Clauses....47

TTAVIATION

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 Chemical Usage

- All chemicals are poisonous. Please be careful and work strictly according to the safety instructions of chemicals.
- 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 chemical 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 chemicals; After chemical spraying, please clear your skin, copter and remote control.
- When changing chemicals to spray, user should clean spray system completely, or there will be interaction between different chemicals
- Spraying shall be carried out in windless sunny day, don't spray under high temperature at noon. Pilot should stand in the upwind area outside the operating area; Not suggested to perform missions if wind speed is above 5.4m/s
- 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.
- Chemical effect and the solution concentration, spray rate ,copter high from crops ,wind direction, wind speed and so on are close related. When using chemical 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 chemical , 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 UAV away from the crowds, dangerous goods, high buildings, high-voltage wires and others. Please fly the UAV in a dedicated space.
- Please ensure the UAV fly within the operator's eyesight.
- The UAV working temperature is between 0℃-40℃.
- Ensure the UAV fly within the permit of local law and regulations.
- To fly the UAV safely as required, please fly it within in the height of 50 meters. If it has local flying height limit within 5ometers, please make sure obey the related regulations.

1.5 Operation

- Please ensure the multi-rotor UAV 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 UAV when it is in power.
- Do not touch the joy stick mistakenly, and prevent start the UAV.
- 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 UAV 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.
- 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 as 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 another place from the previous one.

TTAVIATION

2. Product Introduction

2.1 Preparing the Aircraft

Lift the drone from aviation case.

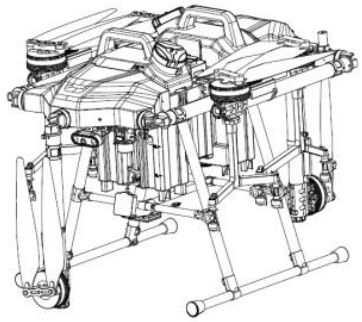


Figure 0 1 Fully Folded Drone

Unfold six arms and tighten the six arm sleeves.

Note: Pushing or lifting arms against the folding direction will make it easier to tighten sleeves.

Mount 6 sets of propellers onto the aircraft.

Motor spinning direction are shown as **Figure 02;** Propeller models are shown as **Figure 03** below.

Arm and Propeller orders are distributed as **Figure 04** below. Pay attention that propeller orientation should be in consistent with motor spinning direction.



Figure 0 2 Motor Spinning Direction(CCW and CW)



Figure 0 3 CCW & CW propeller

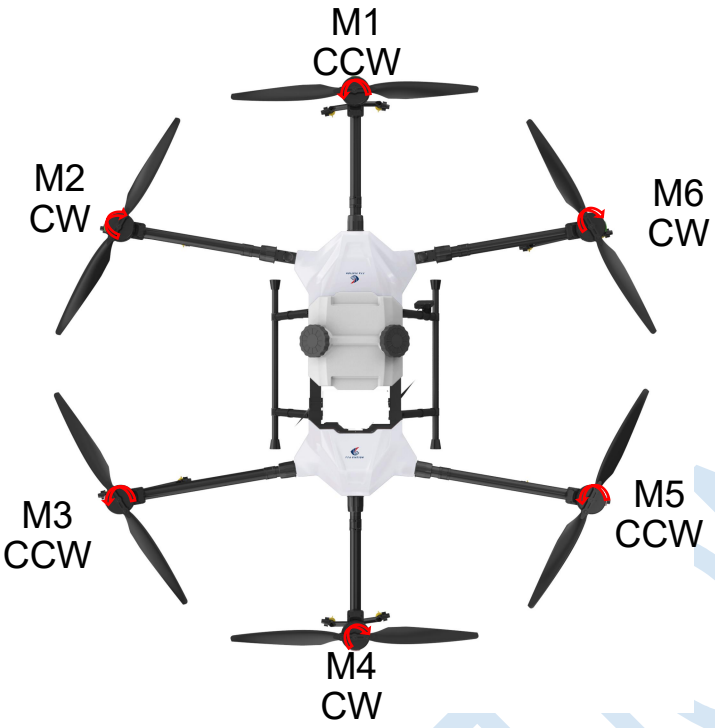


Figure 0 4 Arm and Propeller Distribution

Unfold All propeller blades

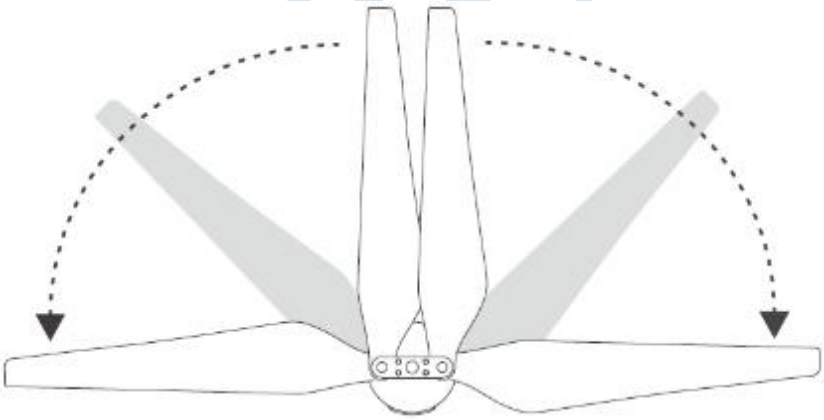


Figure 0 5 Unfold propeller blades

Insert the Smart battery into the aircraft. Battery will be inserted in place when you hear a **Click**!



Figure 0 6 Insert Battery

Attentions:

1. Always TURN on remote controller first before insert battery into aircraft.
2. Ensure that the battery is firmly inserted into the the aircraft.
3. When folding arms, make sure to fold Arm 3 and Arm 5 first, and then fold Arm 2 and Arm 6. Otherwise, the arms may be collided and damaged. Lift and lower M1 and M4 gently to avoid nozzle damages, wear and tear.

2.2 Preparing Remote Controller

H12 remote has a high-performance Android tablet with a 5.5inch ultra bright screen, light and compact.

- **Turn on**

Press power button for 4 seconds to turn on remote controller. Ensure the built-in battery has enough remaining capacity for operating.

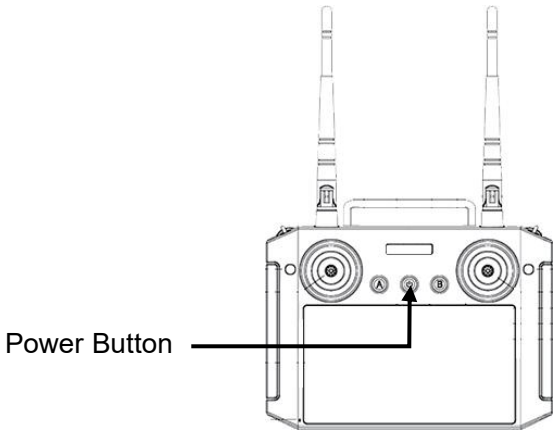


Figure 0 7 Remote controller

- **Unfold Antenna**

To reach a further control distance, remote controller antenna should keep straight up when operating.

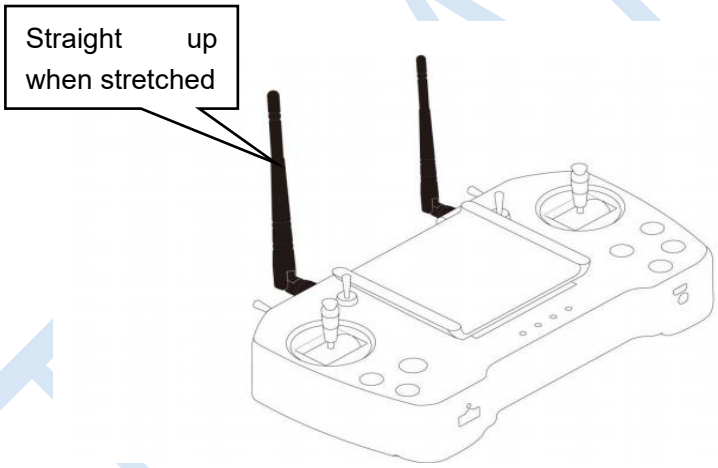


Figure 0 8 Antenna Direction

3.Product Introduction

3.1 UAV

3.1.1 UAV Introduction

The G300 agricultural drone is a convenient, efficient and economical folding 6-rotor drone sprayer. The excellent atomization effect of the pressure nozzle can generate tiny droplets, and the downward airflow generated by rotors helps to largely improve the penetrability of droplets, rustling in excellent performance of drone sprayer. The fuselage adopts a convenient embracing body design and modular maintenance design. Its dual-pump precise metering and spraying system supports one-key setting of the amount per ha. It is equipped with auxiliary operating systems such as FPV and obstacle avoidance, which makes the sprayer control simple and safe; based on 4G The intelligent data platform of the high-speed network can efficiently transmit the flight data, and the background server system performs synchronous analysis and processing, making the management visible and controllable in real time.

3.1.2 UAV Parameters

Weight (without battery)	27.8KG	Max Pitch Angle	≤25°
Standard Takeoff Weight	38.3KG	Max Spaying Speed	10m/s
Max Effective Takeoff Weight	68.3KG	Max Operating Flight Speed	7m/s
Battery	14S (28000mAh 51.8V)	Max Landing speed	2m/s
Max Power Consumption	12000W	Max Wind Resistance	8m/s
Hovering Time	Empty flight ≥20min; Full Tank flight ≥8min	Recommended Working Temperature	10-35°C
Hovering Accuracy	With J-RTK Enabled：Horizontal ±10 cm, Vertical ±10 cm; With J-RTK Disabled：Horizontal ±0.6m，Vertical ±0.3 m (with radar function enabled：±0.1 m)		
Recommended Spraying Height	2--4m (above crop)	Max Flying Altitude	2000m

Max rotation angle	360°	Best Storage Temperature	10-25°C

3.2 Remote Controller

3.2.1 RC Introduction

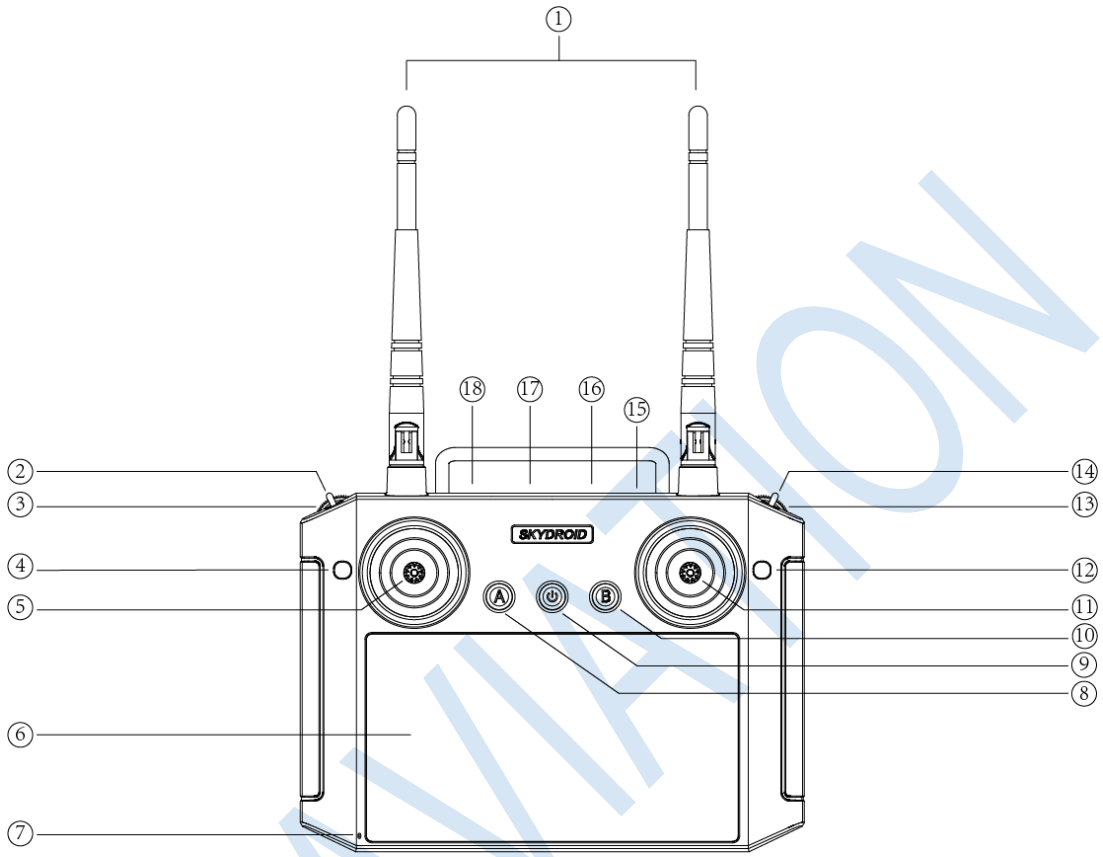


Figure 0 9 Remote Overview

No.	Specifications	No.	Specifications
1	2.4G 3DB Antenna	10	Button B
2	3-Segment Lever E	11	Joystick X2, Y2
3	Dial G	12	Button D
4	Button C	13	Dial H
5	Joystick X1, Y1	14	3-Segment Lever F
6	5.5 Inch Screen	15	Speaker
7	MIC	16	SIM Card Slot
8	Button A	17	Charge Port
9	Power Button	18	PPM Output

TTA AVIATION

3.2.2 Function Assignment

Switch	Function	Left Position	Middle Position	Right Position
E	Flying mode	Attitude mode	GPS mode	AB mode
F	AB recording	Recording Point B	Recording Point A	/
G	Pump Switch	OFF	/	ON
H	Terrain following	ON	/	OFF
Dial	Channel	Top Position	Middle Position	Right Position
A	Avoidance Function	Disabled	/	Enabled
B	Home Return	OFF	/	Triggered

Note:

1.The flying altitude can be set in Agri Assistant APP (operations refer to **Chapter 4**) after Terrain following radar has been activated.

2.Pump mode and flow rate can be adjusted in Agri Assistant APP.

3.2.3 RC Parameters

No.	Item	Specification	Remarks
1	Model	H12	
2	Working Voltage	3.7V	
3	Frequency Band	2.400-2.483GHz	
4	Firmware Upgrade	Online Upgrade	
5	Dimension	190mm*152mm*94mm	
6	Endurance	6~20 hours	
7	Quantity of Channels	12	
8	Modulation	FHSS	
9	Weight	530g	
10	Battery capacity	5000mA*2	
11	Charge port	TYPE-C	

3.2.4 Attentions

- ◆ Please use the official charger to charge the transmitter.
- ◆ Any damaged,smoking or abnormal heating situations, stop using immediately.
- ◆ Charging should not be continued in condition of smoking,smelly,weeping.
- ◆ Charging should not be in the area of baby playing.
- ◆ Charging should not at temperature more than 60℃.

3.3 Intelligent Battery

The 14S HV intelligent battery pack is the new generation of UAV Lipo battery. It features rapid-charge, easily swappable, tough, integrated intelligent protection, rapid heat dispassion, waterproof, etc..

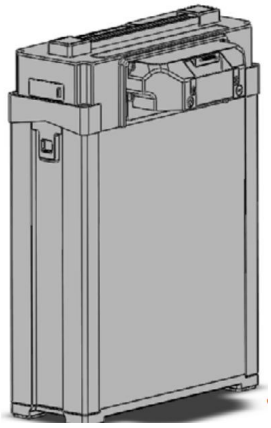


Figure 0 10 Battery Overview

Table 3.3: Battery Technical Parameters

No.	Item	Specification
1	Rated voltage	53.2V(14S HV)
2	Rated capacity	28000mAH
3	Charging voltage	60.9V(4.25V/Cell)
4	Charging current	Max.60.0A
5	Charging time (50A)	20min (reference value)
6	Operation temperature(discharging)	-10℃－+60℃
7	Operation temperature(charging)	0℃－+45℃
8	Storage temperature	-10℃－+35℃
9	Weight of Battery pack	9100±200g
	Dimensions	91±1.5mm*236±1.5mm*279±2.5mm

Attentions:

- Never assemble the battery by yourself;
- Inspect and Do a charge-discharge cycle to maintain battery immediately when you receive a new battery.
- Battery shall be maintained properly and regularly, or it would be damaged.
- Damages caused by improper use or improper maintenance will not be covered by warranty.
- For More use, maintenance and safe instructions, refer to <.Battery Use and

Maintenance Instruction> please.

3.3.1 Indicator Specifications

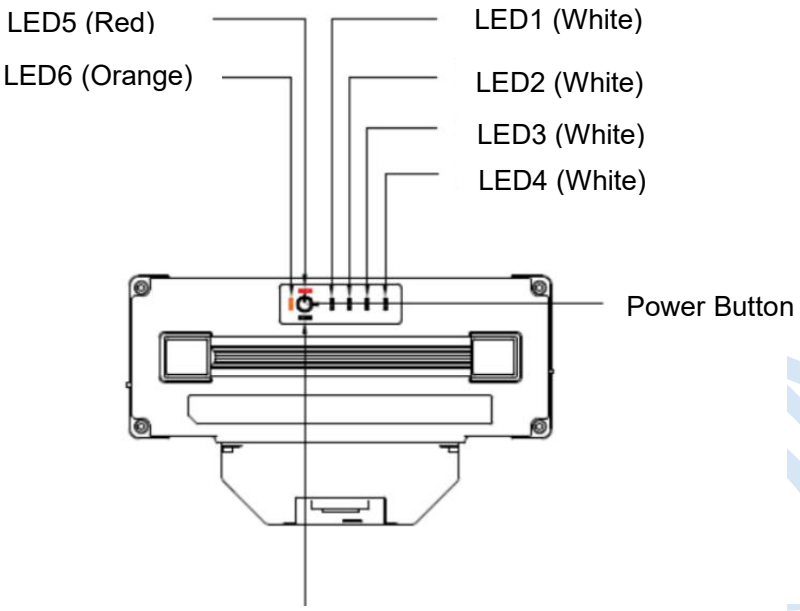


Figure 0 11 Indicator Distribution

Note:

1. LED1, LED2, LED3, LED4 is white. They show the remaining capacity and life cycle.
2. LED5, LED6, LED7 are status indicators. They show the battery warnings.

Battery Status Check

After a short press of the power button, the battery status can be judged by the display mode of the status indicator.

- ✧ Red LED: Battery is in 2nd Level warning. Not recommended to use.
- ✧ White LED: Battery is in 1st Level warning. Shall not be used.

Table: Status Indicator Specifications

Red(LED 5)	Orange(LED6)	White(LED7)	Warnings
◉	○	○	2nd Level Over-temperature
●	○	○	2nd Level Cell Voltage Error
●	○	○	Critical Low Capacity
○	○	◉	1st Level Over-temperature
○	○	●	1st Level Cell Voltage Error
●	○	●	Over-discharge, short-circuit, etc.

○ OFF ◉ Flash ● Solid ON

3.4 Smart Charger

U6Q is integrated with the charge butler. It can charge 4 sets of lithium batteries at the same time, with a maximum output power of 3000W. Two modes of charging and maintenance can be selected. The charging current can be adjusted among slow charging, normal charging and fast charging. It has over-current protection, over-temperature protection, and disconnection protection, fast balancing, display status indication and other functions.

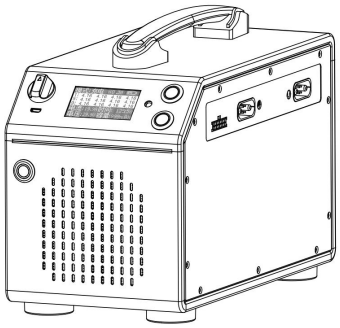
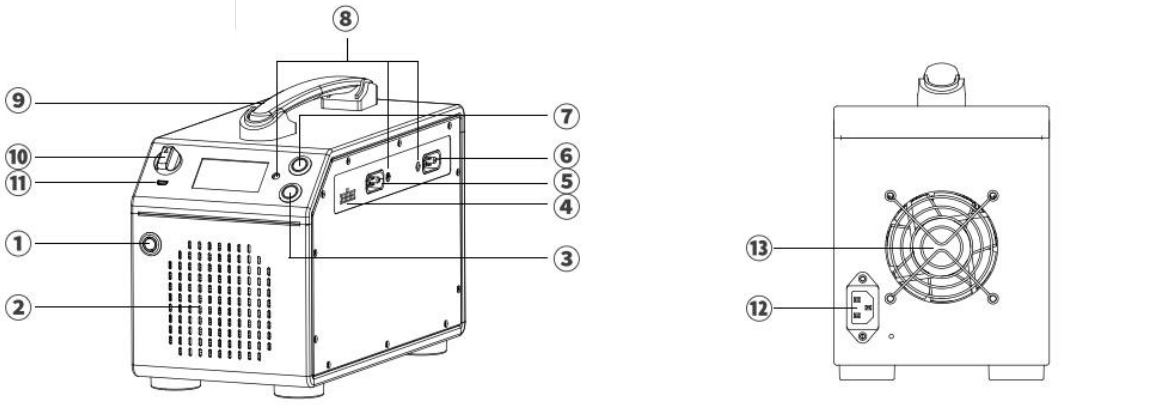


Figure 12 U6Q Overview

Operating Mode:

- Slow charging mode. **4pcs** of battery can be charged simultaneously.
- Normal charge mode. **2pcs** of battery can be charged simultaneously.
- Fast charge mode. **1pc** of battery will be charged at a time. If multiple pieces of batteries are connected, batteries will be charged alternatively.



① Main switch
② Inlet
③ Charging button
④ Balance mouth
⑤ Charging port 1
⑥ Charging port 2
⑦ Maintenance button
⑧ LED indicator
⑨ Handle
⑩ Current adjustment knob
⑪ MICRO_USB Upgrade interface
⑫ AC Input
⑬ cooling fan

Figure 13 Part Number

④⑤ form a set of charge port. ⑥ itself is a independent charge port without balance port. The opposite side is the same.

3.4.1 Charger Specification

1) Input voltage: AC110V-180V / AC180V-240V

2) Max output power: 1500W (AC110V-180V) / 3000W(AC180V-240V)

3) Charging Mode: 50A/60A

4) Battery supported: 14S HV LIPO

5) Operation temperature: 5-40℃

6) Operating channels: 4

3.4.2 Startup

1) Connect AC power to charger. Then press power button to turn it on.

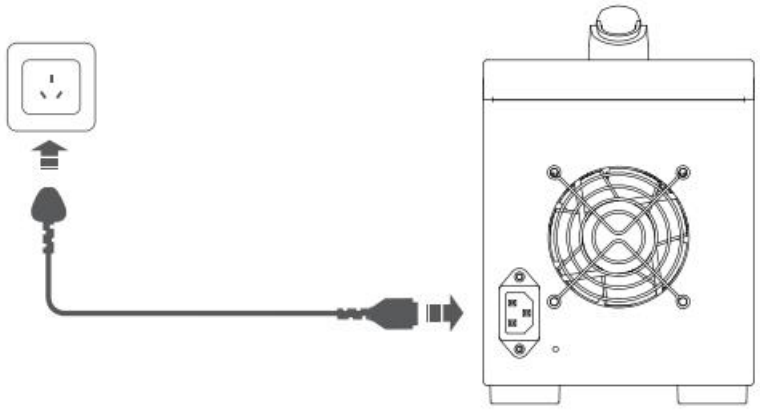


Figure 14 Connect to AC

2) Connect battery to charger with adapter cables.

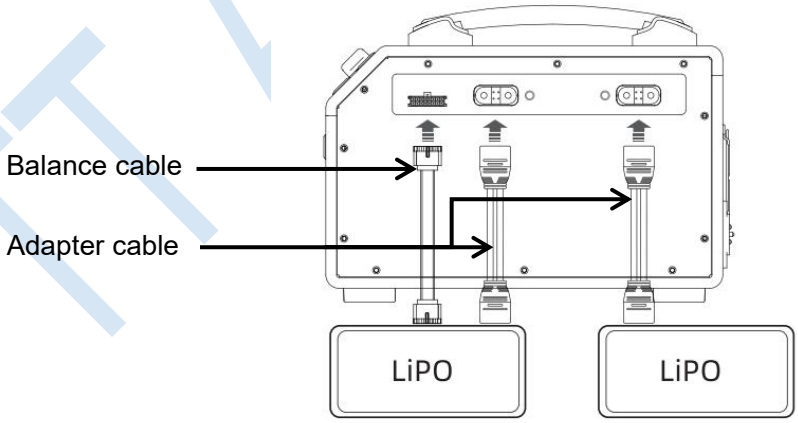


Figure 15 Plug In battery

Note: Charge port with balance port is recommended to be preferred to use. Balance charging helps to increase battery service life.

Attentions:

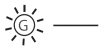
①Before connecting battery, ensure all ports are clean without dust and water.

② Plug battery connectors in place to avoid potential danger caused by loose connection.

3) Press “Charge” or “Storage” button to put battery into charge mode or storage mode.

4) Remove battery timely when charge or storage finish

3.4.3 Status Indicator

	Flashing green	Standby
	Solid red	Working
	Solid green	Completed
	Green and red flashing alternately	Error

3.4.4 Safety Rules

Please noted and comply with the following rules in case of property damage or fire case.

1) The charger only support 14S HV LiPo battery.

2) If find out any malfunction after power on the charger, stop operating it immediately and check the manual.

3) Be sure charger is far away dust,moisture,rain,heat source,direct sunlight,vibration and some other unsuitable environment.

4) Battery and charger must be placed on uninflammable,insulated surface.

5) Do not charge unattended.

TTAVIATION

4. Prepare for Work

Software Operation Flow of A New Drone

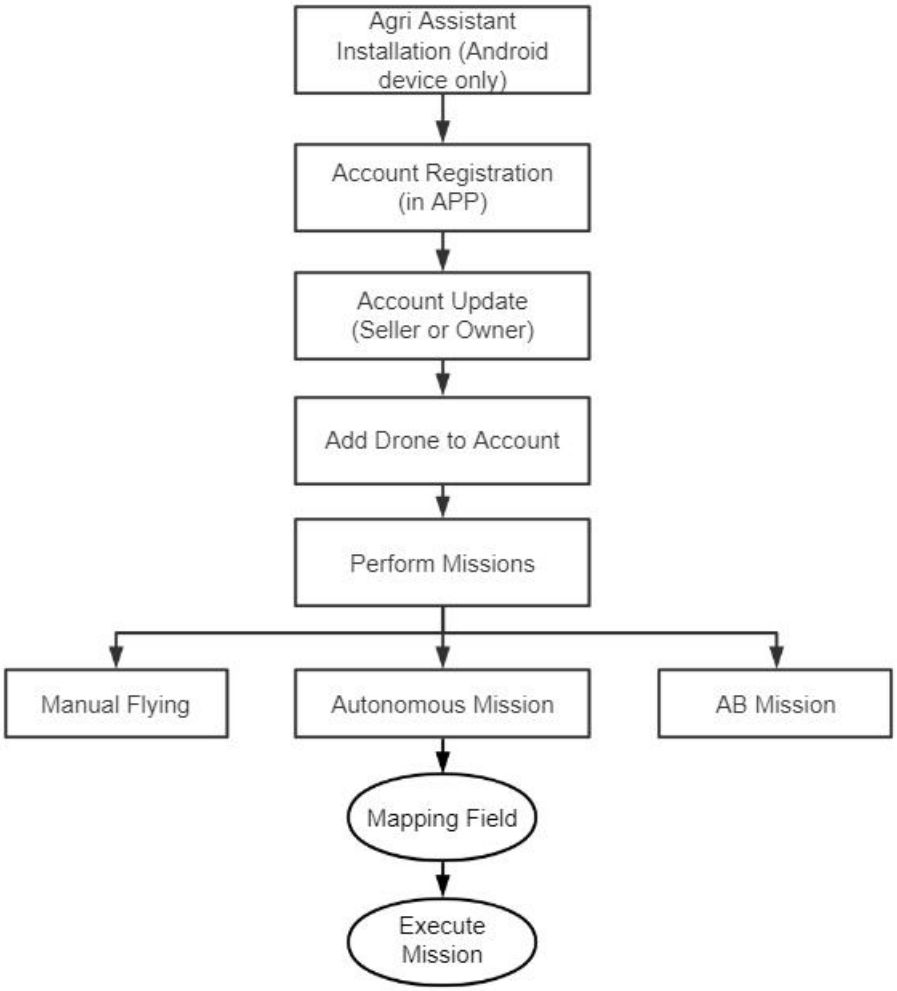


Figure 16 Work Flow of New Drone

4.1 Software Installation

1. Please download and the GCS software in the following link:

https://www.ttaviation.org/downloadcat/app



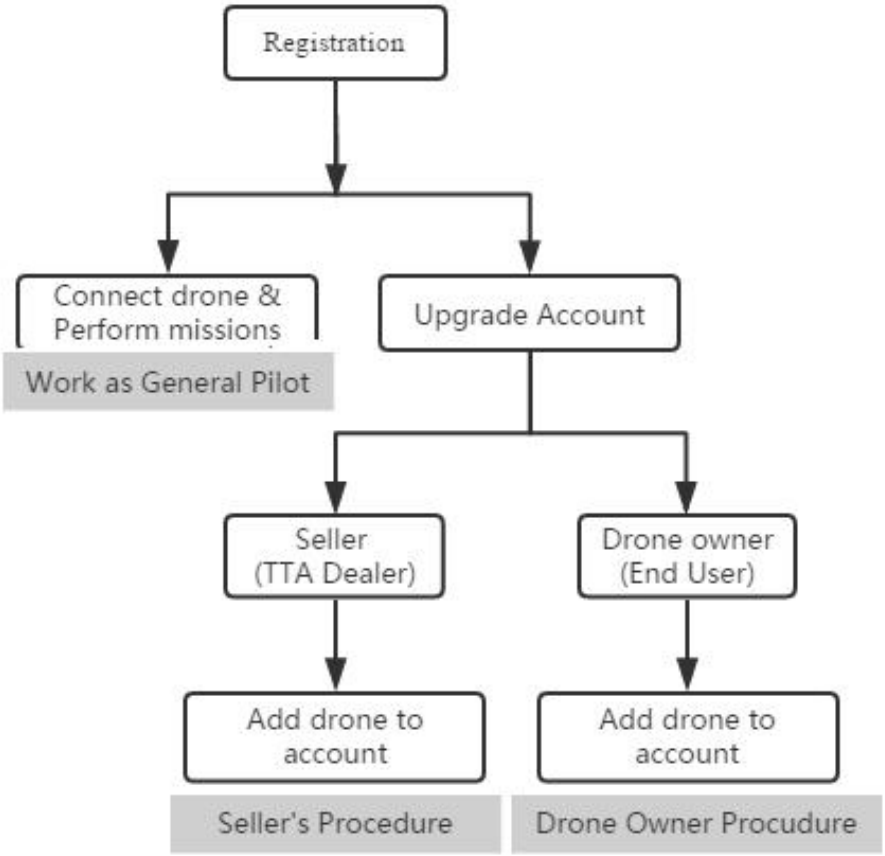
Figure 5-1

2. After GCS installation,the label will be appeared as figure 5-1.

⚠ TTA GCS support Android 4.0 or above

4.2 Registration Procedure

4.2.1 Registration Procedure



Attention: Account has two selectable level, Seller and Owner. Customer can apply to the corresponding level to update. One drone can only be added to one account of one level.

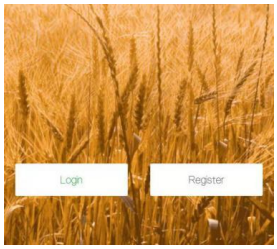
4.3 Registration and Login

4.3.1 Registration

(1) Click “Register” to start registration.
(2) Use phone number or email to receive the verification code.
Attention: When using email to register, please view the junk mail list as the verification mail may be recognized as junk mail.

4.3.2 Login

(1) Click “Login” to enter the login page
(2) Input your account to log in.



4.3.3 Account Update

There are four classes of account type: Manufacturer (TTA), Seller (TTA's dealer), Owner(drone owner), Normal.

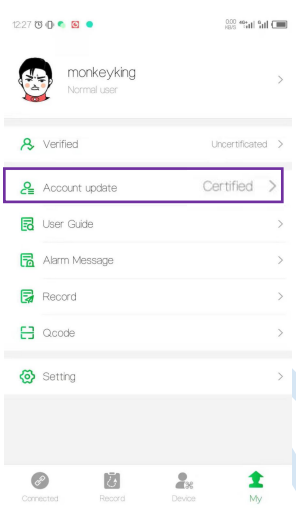
User shall upgrade the account's class for getting according rights. Upgrading process is as follow.

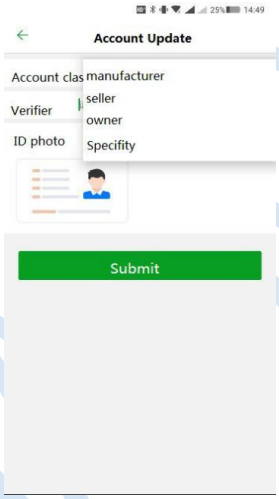
◆ **"Normal" Upgrading to "Seller"**

(1) Click "Account update" to enter the upgrading page.

(2) Select the according account class - "seller", input "**19801108966**" as the Verifier, and upload the photo of relevant materials for applying for the account class.

(3) Click "Submit", and then contact TTA AS engineer to notice them for further verification.





◆ **"Normal" Upgrading to "Owner"**

(1) Click "Account update" to enter the upgrading page.

(2) Select the according account class - "owner", input "**19801108966**" as the Verifer, and upload the photo of relevant materials for applying for the account class.

(3) Click "Submit", and then contact TTA AS engineer to notice them for further verification.

4.4 Connect

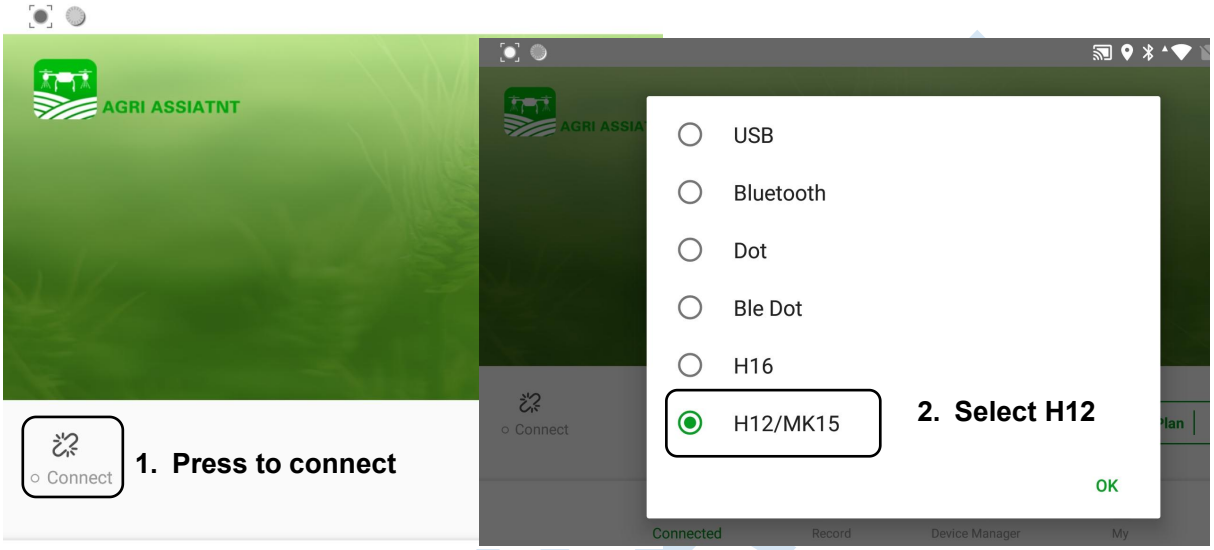
(1) Power on Remote controller.

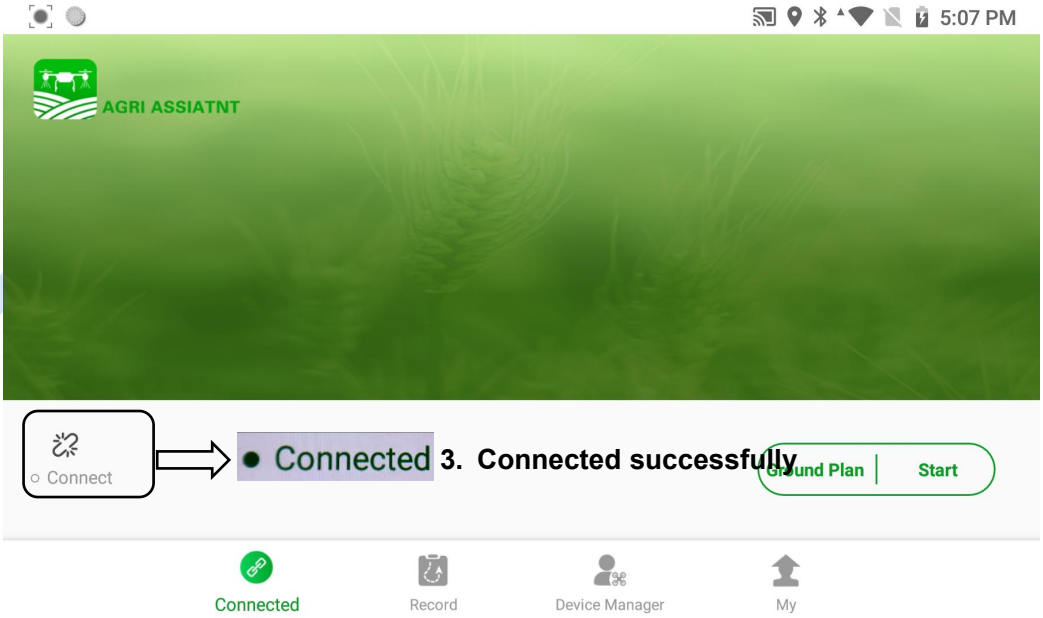
(2) Power on the drone

(3) Open the Agri Assistant APP.

(4) Log into your account

(5) Press [Connect], select [H12]. The [connect] icon will turn to [connected] after connecting successfully.





4.5 Add Drone to Your Account

(1) Connect App to drone.
(2) Click "Device" in the lower right corner and click "Plane Add"; Then click "Completed" to finish adding as **Figure 4.6.2**.

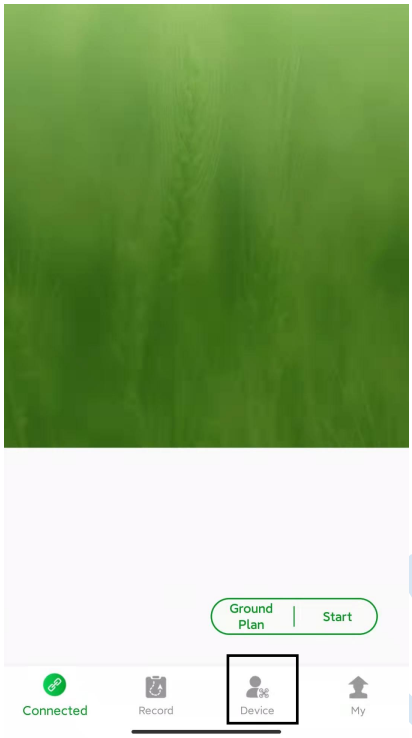


Figure 17 Device

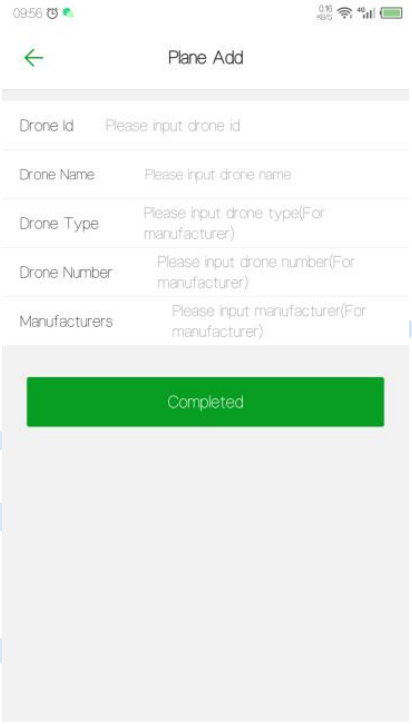


Figure 18 Add Drone

4.6 Operation View

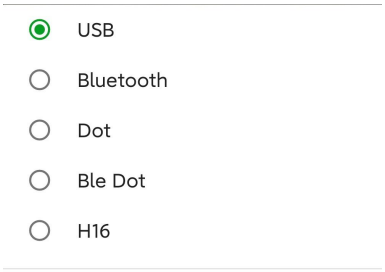


(1) Back to home page

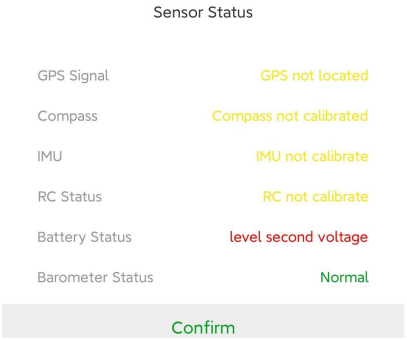
(2) Connection Button

If no device is not connected, press it to select the device to be connected.

With devices connected, press it to view the drone status



Connection Method



Drone Status

(3) RTK Icon

“Red” indicates not connected; “Green” indicates connected; “Grey” indicates not installed yet.

(4) Remote control connection status

The upper part represents the signal strength of the remote controller, and the lower part represents the image transmission signal strength.

“Green” means the remote control is connected; “Gray” means the remote controller is not connected

(5) Battery display

A green S icon represents a smart battery connection, and white represents an ordinary battery connection. The upper part represents the ordinary battery voltage, and the lower part represents the smart battery voltage.

(6) Number of satellites

(7) Flight mode

‘**A’** indicates Attitude mode; ‘**M**’ indicates Manual work mode, equal to GPS mode; ‘**AB** mode’ indicates AB work mode; ‘**M+**’ indicates M+ work mode.

(8) Spray Mode

(9) Terrain Following Radar

Drone height to ground can be set when radar has been connected.

“Green” indicates connected, and “Gray” indicates not connected; Parameters can not be reset unless radar has been connected.

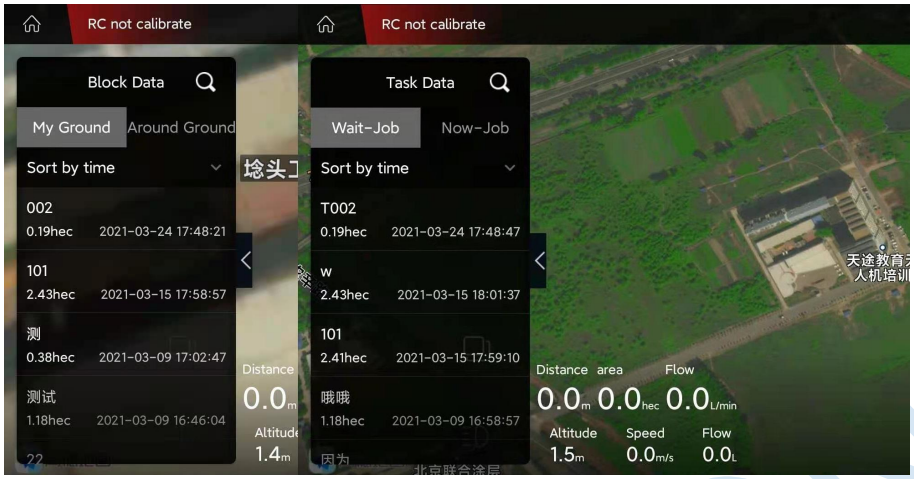
Attention: Drone will descend or ascend to the set height and maintain the height after pilot activate the terrain radar. PS. If height value set to 0, Drone will descend and land after activate the radar.

(10) APP Settings

(11) Ground List or Task list

Ground list: My Ground, Around Ground

Task List: Wait-Job, Now-Job



(12) One-key RTH

One-key return to home

(13) Flight Mode Switch

“A” is attitude mode; “M” is manual work mode(GPS mode); “AB” is AB mode;

(14) Map Compass

(15) Clear Flight Track

(16) Switch between normal map and satellite map

(17) Locate “my” location or aircraft’s location

(18) FPV image display

Press the small window to switch between video transmission display and map display

(19) Camera LED Switch

(20) Display "Speed", "Flow Rate", "Altitude", “area”, and "Distance" information (Altitude is the drone height to ground when terrain radar is activated.)

TTAVIATION

5. Autonomous Mission Planning and Performing

5.1 Autonomous Mission Work Flow

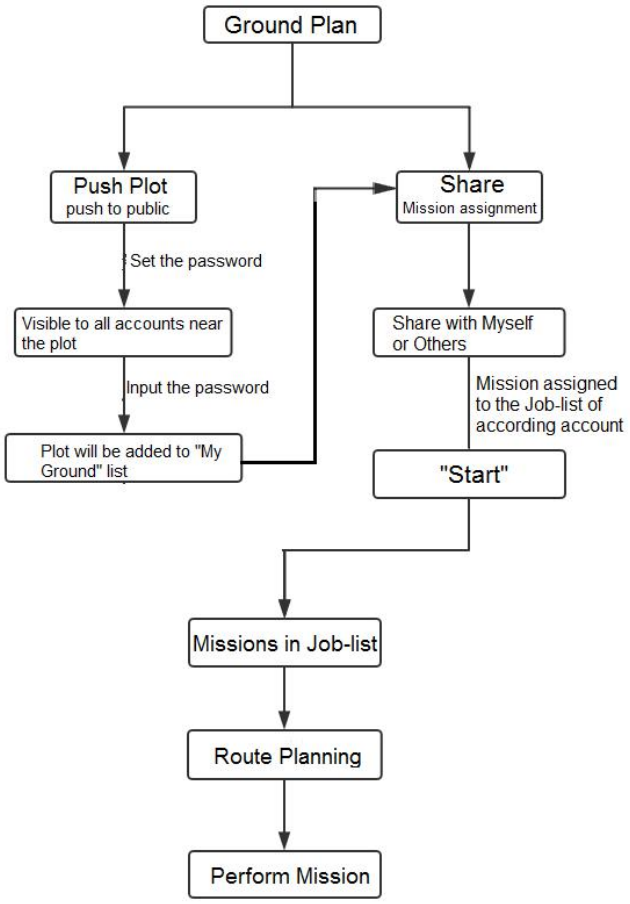


Figure 19 Work Flow

5.1.1 Mapping

Click [Ground Plan] 

to enter the Plot Mapping page

1) Press [Block management]  to view the marked blocks and online blocks nearby.

[**My Ground**]: User have rights to operate ground in this list, such as performing, sharing, editing, etc. This ground list includes the ground created by you and the ground added from the [Around ground].

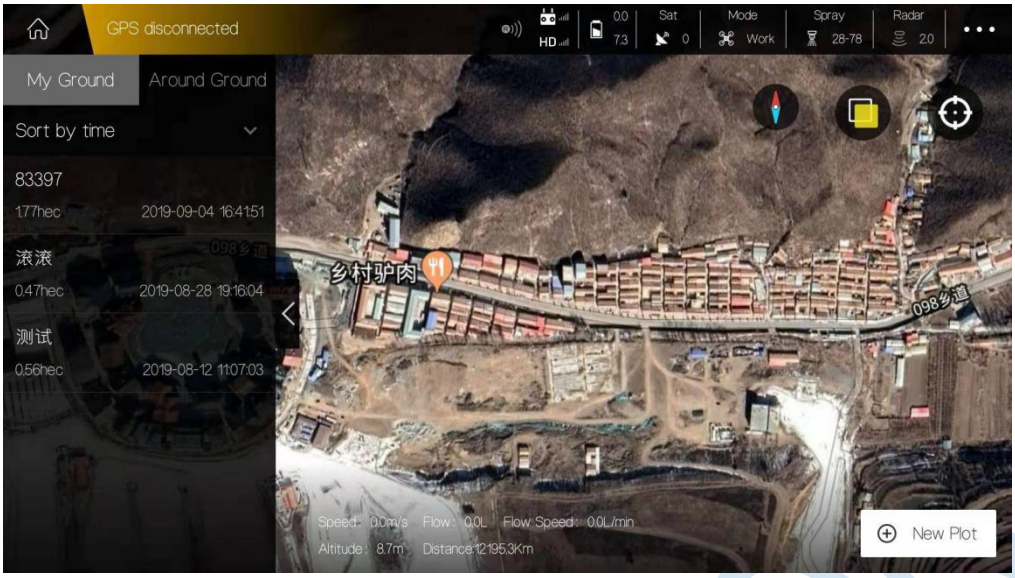


Figure 20 Ground List

[Around Ground]: Ground will be displayed here when its position is nearby and it has been posted to the public by others or yourself.

2) Press [New Plot] to start mark blocks and select mark method.

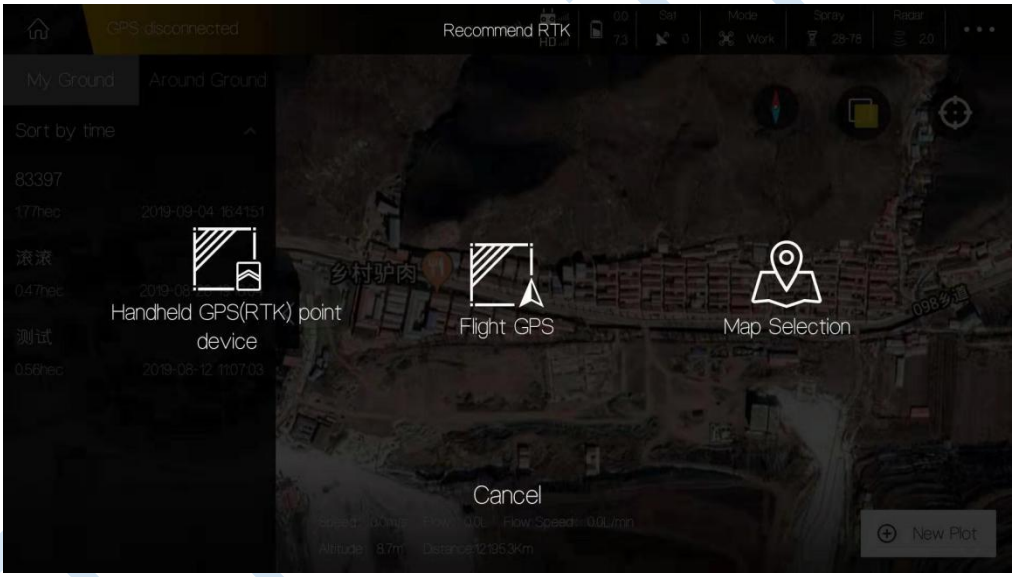


Figure 21 Mapping Method

[**Handheld GPS(RTK) point device**]: use portable marked device to mark out boundary point.

[**Flight GPS**]: use drone as mark device and fly drone to the boundary point location and mark it out.

[Map Selection]: mark out boundary points manually on map.

Here will use [Map Selection] as an example.

- ✧ Press [**Map Selection**[]
- ✧ Input contact name, cellphone number, block name to define the blocks.

✧ Mark area. Slide the map to place the Mark icon on the expected point, press [Boundary point] to mark one boundary point.

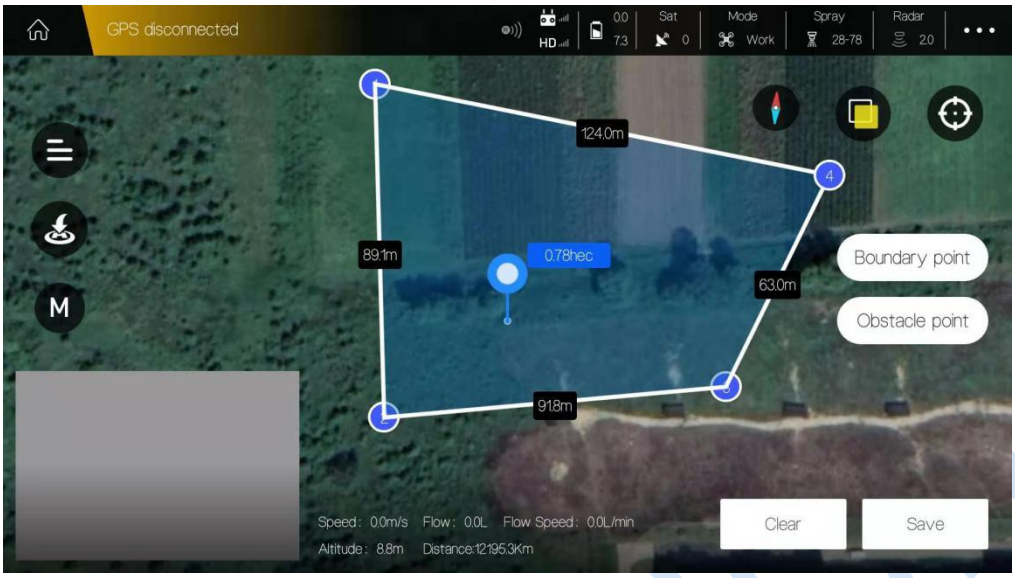


Figure 22 Mark Out Spray area

✧ Add obstacles. Press [**Obstacle point**] to select the shape of obstacle

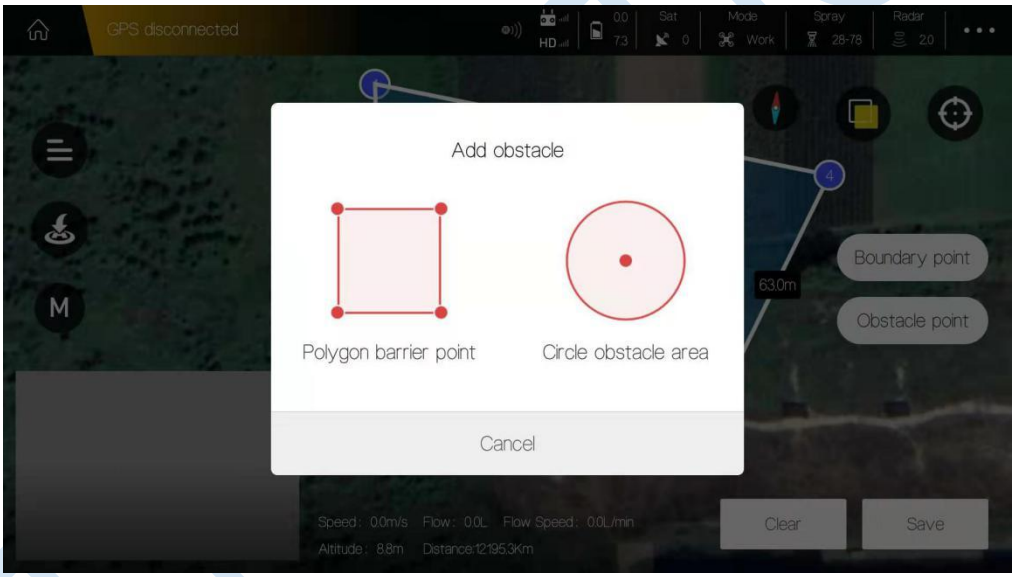


Figure 23 Obstacle Type Selection

Take a circle obstacle as an example. Slide the map to place the Mark icon on the proper point,and press [RBI] to mark one red obstacle point. Then press the obstacle point to edit it.



Figure 24 Obstacle Editing

- ✧ Save mappings.
- ✧ Press “No” to stop mapping.

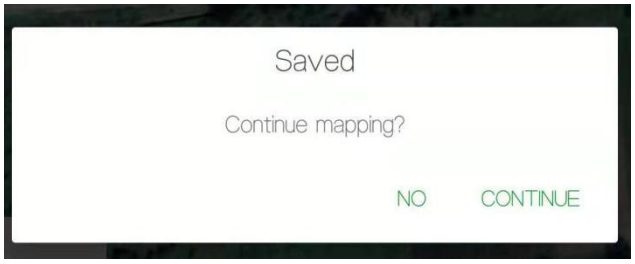


Figure 25 Mapping Complete

5.1.2 Mission Assignment

(1) After mapping, click “My Ground” to view the plot list.
(2) Select the plot you want to share with others.
(3) Click [Share] on the right corner of the interface, input task name (e.g. “sky start”), the account name which you want to share with. Crop type, Rout type.

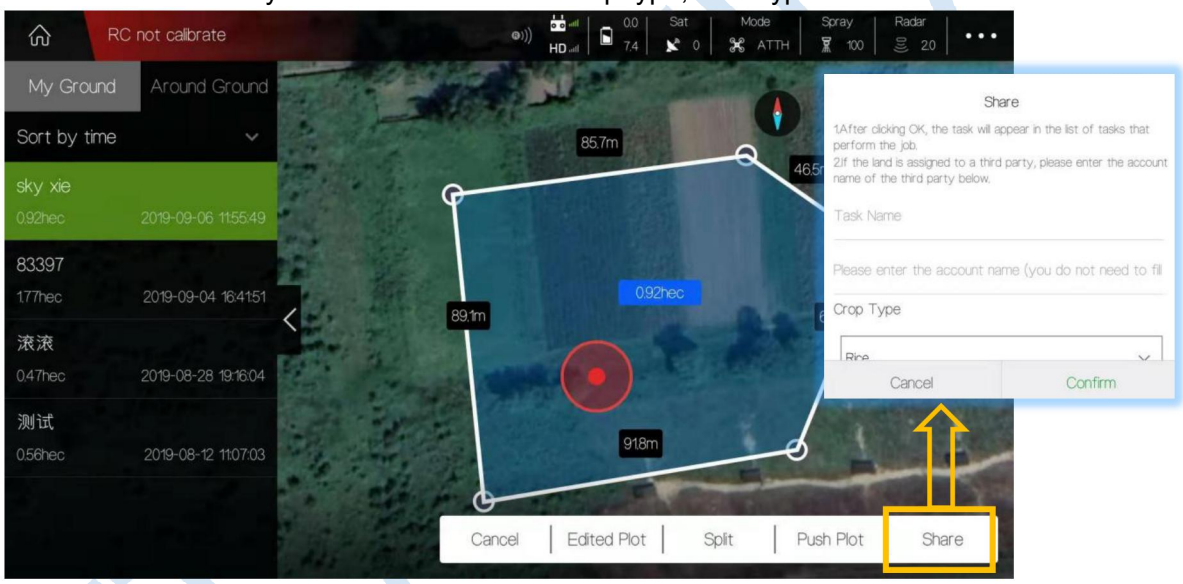


Figure 26 Share

- ● Input the “Task name”and “Account name” you want to share with.

Note: The account name do not need to fill if the blocks is shared with yourself.

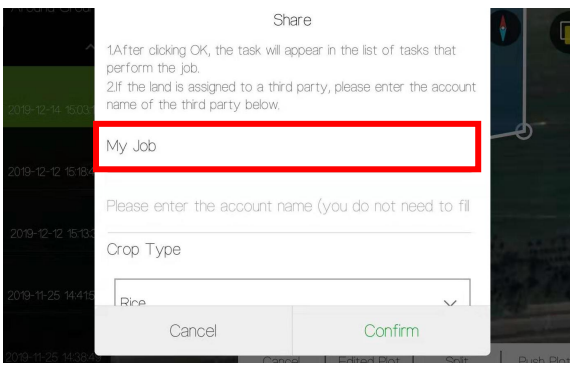


Figure 27 Share (e.g.: share with myself, and the mission is named as “My Job”)

- Back to home page and open “Start” section. The ground has already in your “Wait-job” list.

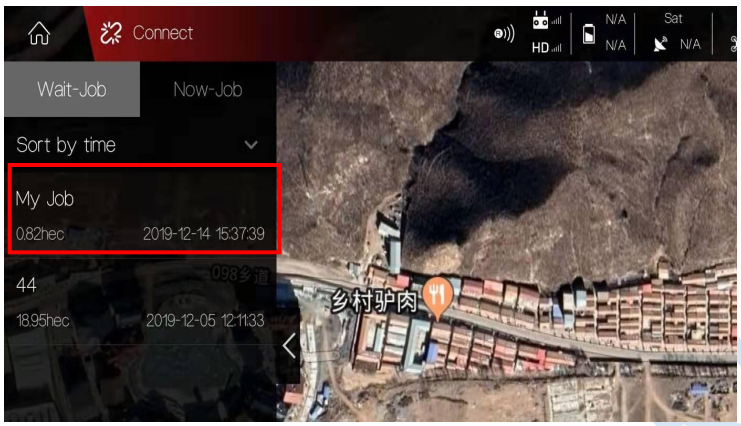


Figure 28 Assigned Mission In Job List

5.1.2.1 How to share your ground to everyone nearby?

- Select the ground in “My Ground” you want to share and Press ”Push Plot”.

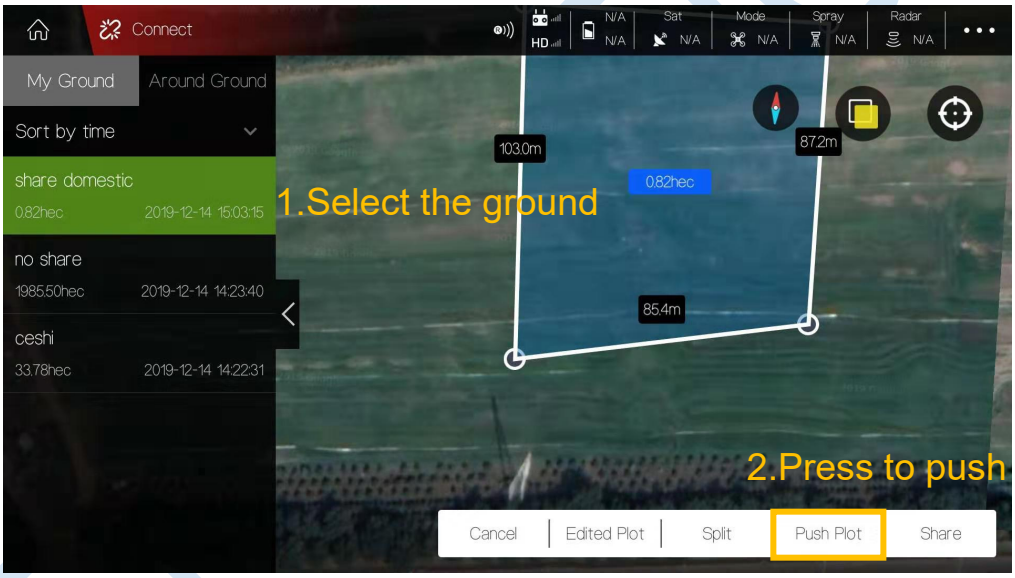


Figure 29 Push One mapping to public

- Input the password of this ground and “Confirm”.

Everybody nearby can view the shared ground in “Around Ground”.

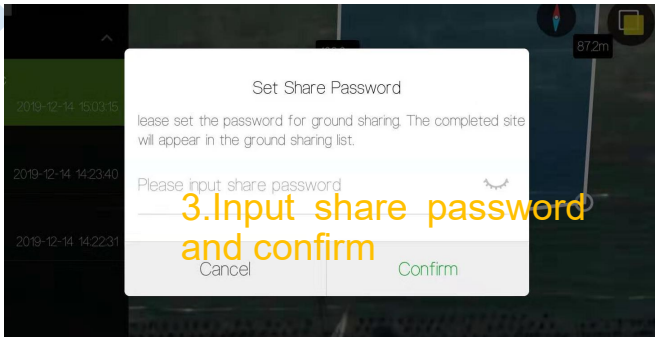


Figure 30 Set password for your Public Plot

5.1.2.2 ADD a ground from “Around Ground” into my ground list

- Select the ground in ”Around Ground” list and press “Save ground plot”



Figure 31 View list of Around Ground

- Input share password and confirm. Then ground will be added into “My Ground” list.

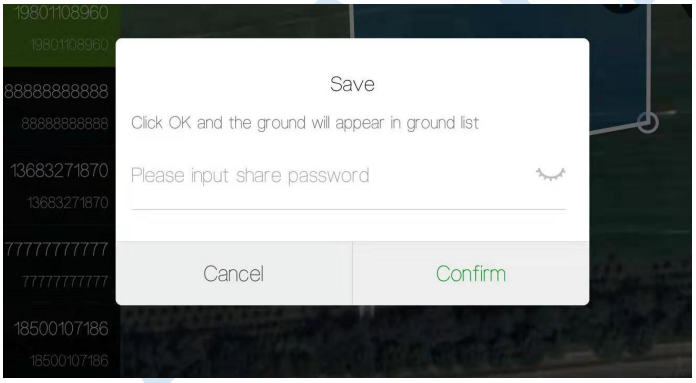


Figure 32 Add Around to Your ground list

5.2 Start Mission

5.2.1 Route Adjust

(1)Press [Task Management] to view the tasks which is assigned.
[**Wait-Job**] indicates the job need to be finished after somebody released a marked field to you.
[**Now-Job**] indicates the job you are performing now.

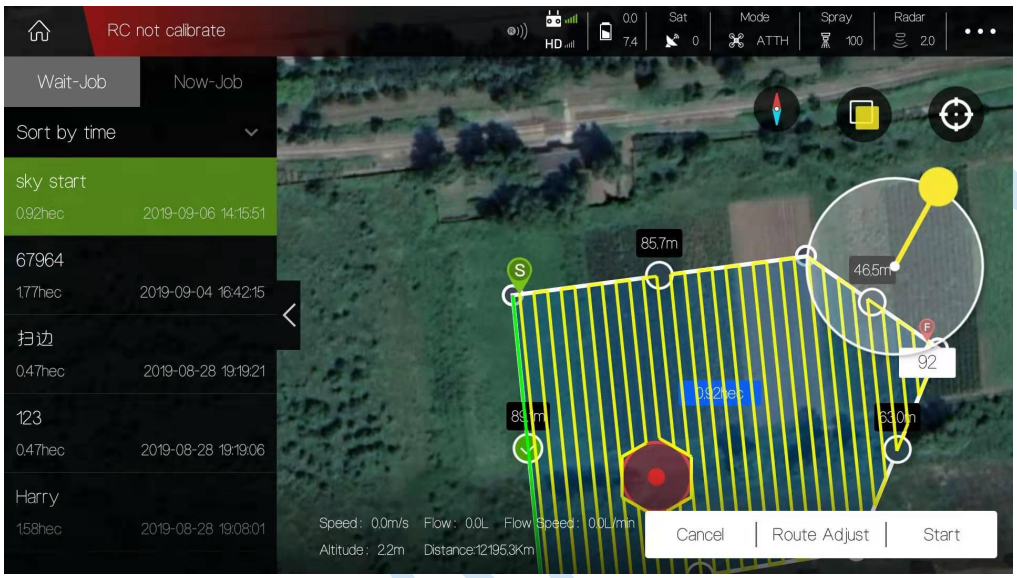


Figure 33 Mission In Job List

(2)Select the task and press [Route Adjust] to edit the route.



Figure 34 Route Planning

Spacing: adjust lateral distance between each 2 routes
Indentation: adjust the distance between route and one selected boundary line
Obstacle boundary distance: distance between obstacle boundary of nearby route.
Route Type: Route arrangement when encountering obstacles

Route settings: Position adjust of the whole routes.

2 kinds of Route types: Cross Turn back

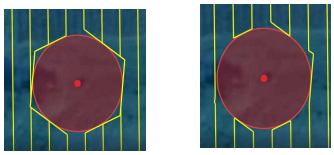


Figure 35 Obstacle Avoidance Route Type

5.2.2 Start Spraying

(1) After adjusting route completely, press [Start] to enter into spraying process.

(2) The spraying parameters can be adjusted in the spraying interface,such as spray type, flying speed, Radar etc.

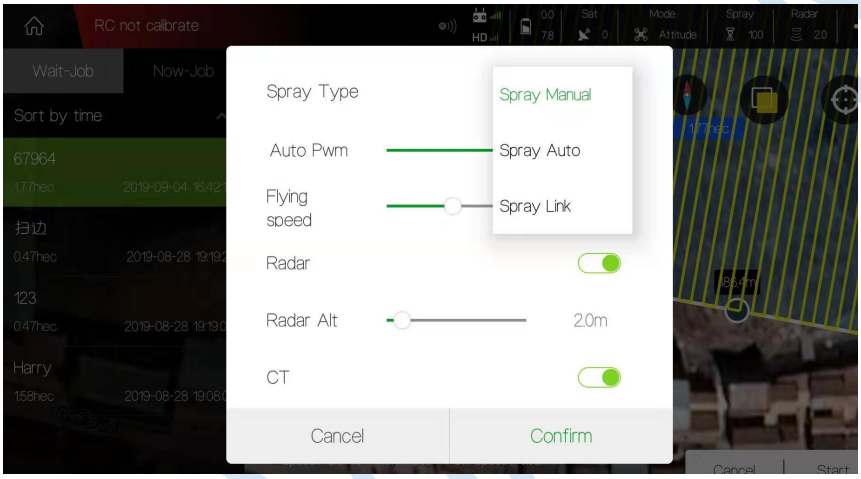


Figure 36 Spray Settings

Auto Pwm - spraying volume per area unit

CT - U type turn (coordinated turn)

(3) Press [Confirm] and the route will be uploaded by itself.

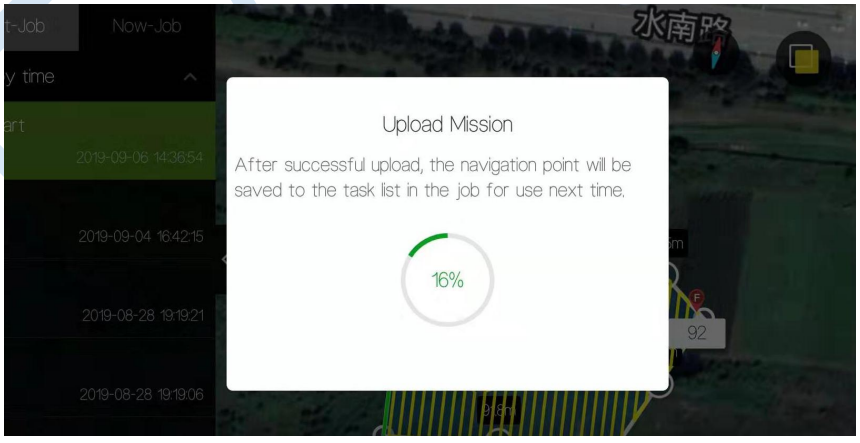


Figure 37 Mission Upload to Drone

(4) After uploading complete, the “Task Check” will pop up. Ensure all parameters are normal. Forbid taking off if any sensor is incorrect such as the pictures below.

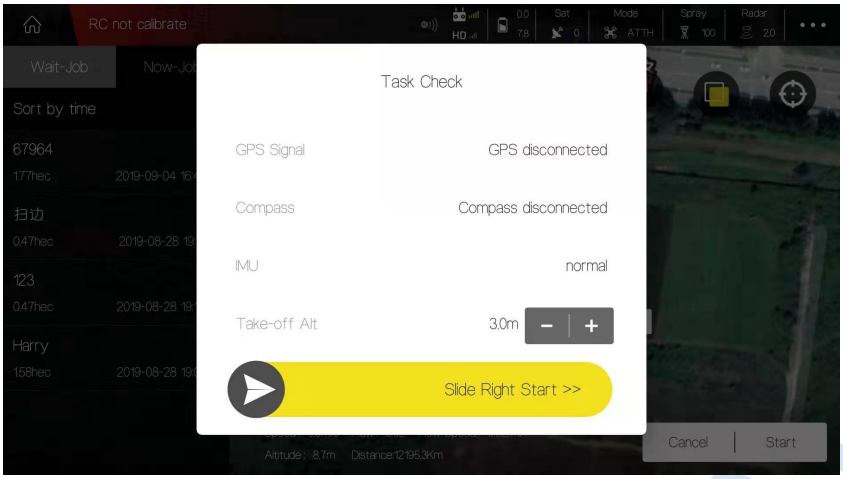


Figure 38 Drone Status Check

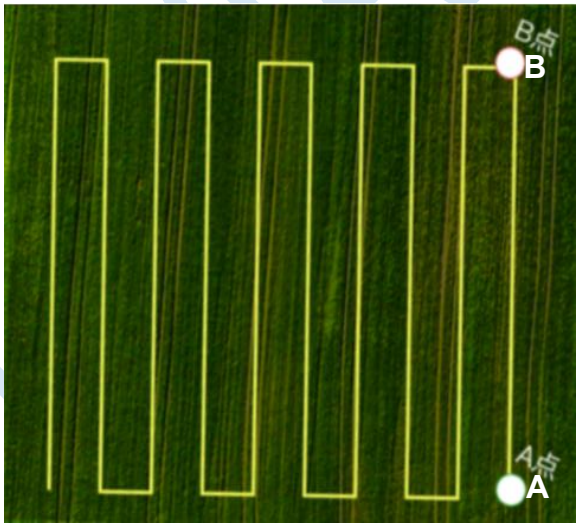
(5) Slider the arrow rightward to start the task.

(6) If needed, operator can press the [RTH] icon to make drone return to home.

6. AB Mission

AB mission mode is a simple and easy mission mode particular suitable for regular blocks. By setting the two boundary points A and B, a simple regional flight can be created as show below

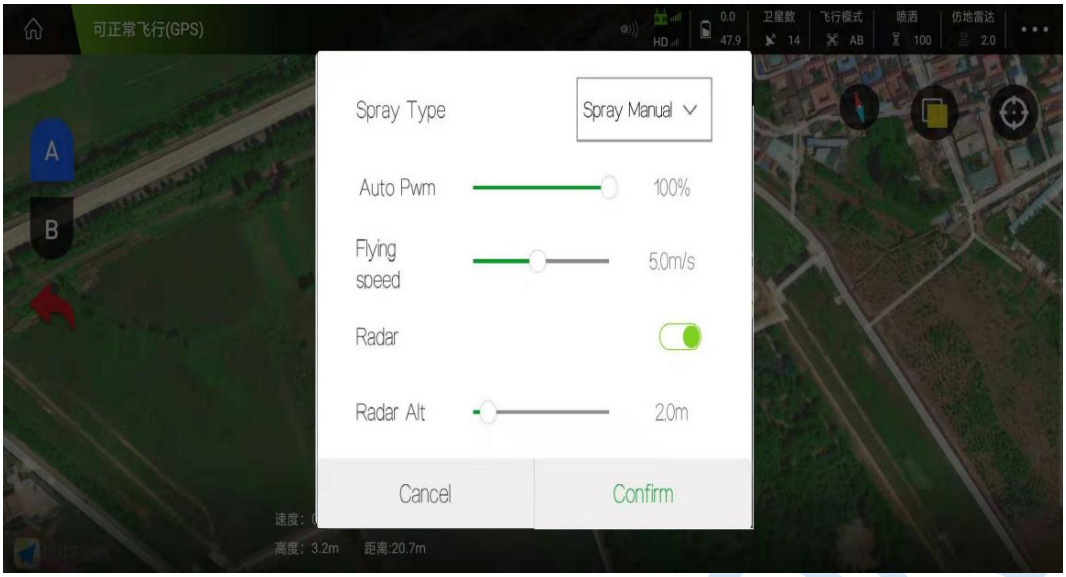
Note: Before record AB points, previous AB data must be removed by moving the F lever rapidly from top to bottom.



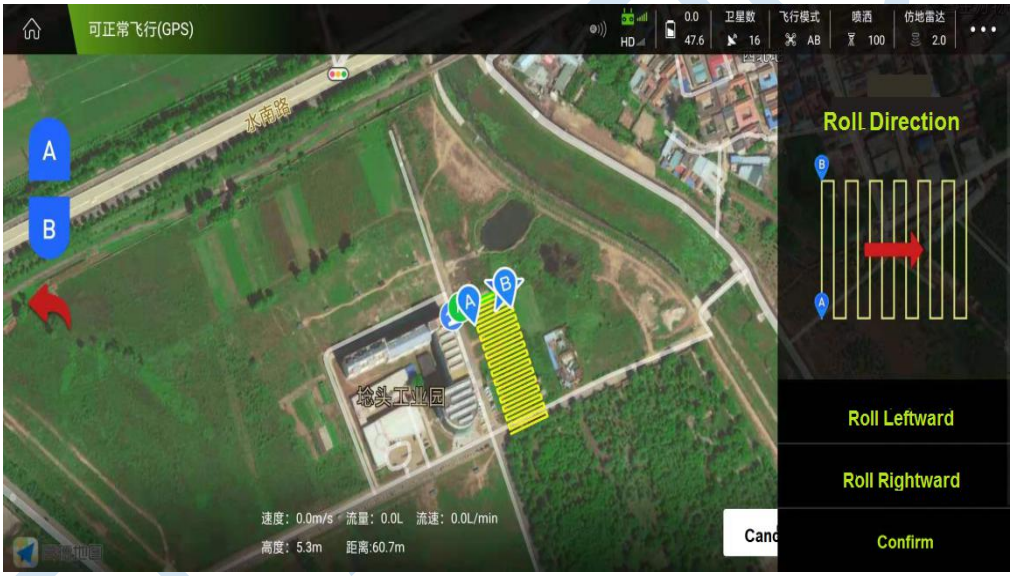
(1) AB recording.

- Switch the flight mode to AB mode.
- Fly the drone to expected A point and click “A” icon to record point A .

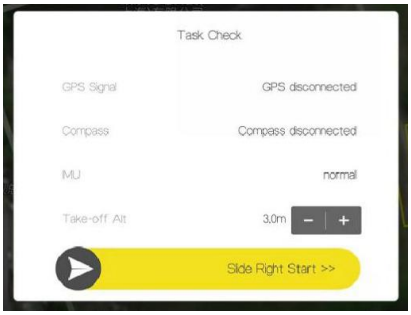
The below window of spraying settings will pop up for setup parameters.



◆ Record Point B, and select the roll direction.



(2)Check the drone state and ensure all are normal before take off.



Note: User can adjust the take off altitude, extend or shorten the course with the remote control during the flight.

7.Drone Settings

7.1 RC Calibration

(1) “RC Calibration” is used to calibrate the maximum and minimum values of the remote control, and finally display the middle value.

Attention: Do ‘RC Calibration’ when drone receiver or transmitter is changed.

(2) “RC Mode” is used to select the stick mode of RC.

After switching, one beep sound from the remote control indicates successful change.

(3) “Fail-Safe” is used to set the protection action when RC is out of control.

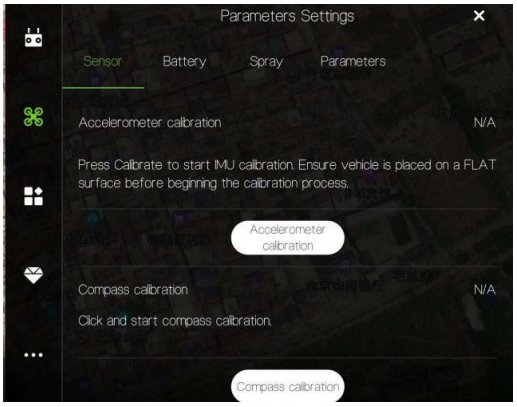
(4) “Fail-Safe Continue”. After turn it on, drone will continue performing the missions instead of triggering Fail-Safe protection action when drone is out of control.



7.2 Parameters Settings

7.2.1 Compass Calibration

Compass calibration is compulsory for drone. The calibration results affect flight safety. Drone may malfunction if compass is not calibrated properly.



▼Situations when need calibration

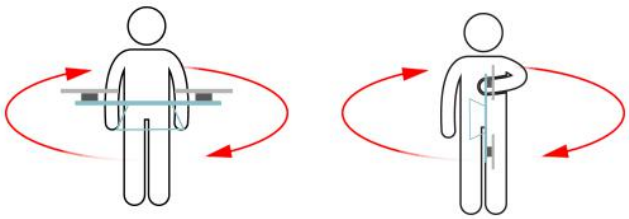
1) Everytime you transport the drone to another place, the compass have to be calibrated .
2) If you fly in the mountain , every time you move from one hill to the other one , do the compass calibration .
3) **Everytime you get new drone or a repaired drone , do the compass calibration .**
4) Once you find that the drone cannot stay when it's hover in GPS (it might be moving like a cycle), do the calibration .

▼Calibration order

Two kinds of method of compass calibration:
Click the button “Compass calibration” to enter into calibration status.
Switch switch “E” back and forth more than 4 times to enter into calibration status.

▼Calibration Step

ensure GCS has been connected to the drone, compass has been mounted properly, and copter is outdoor. Clicking calibration, yellow LED of copter will be 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.

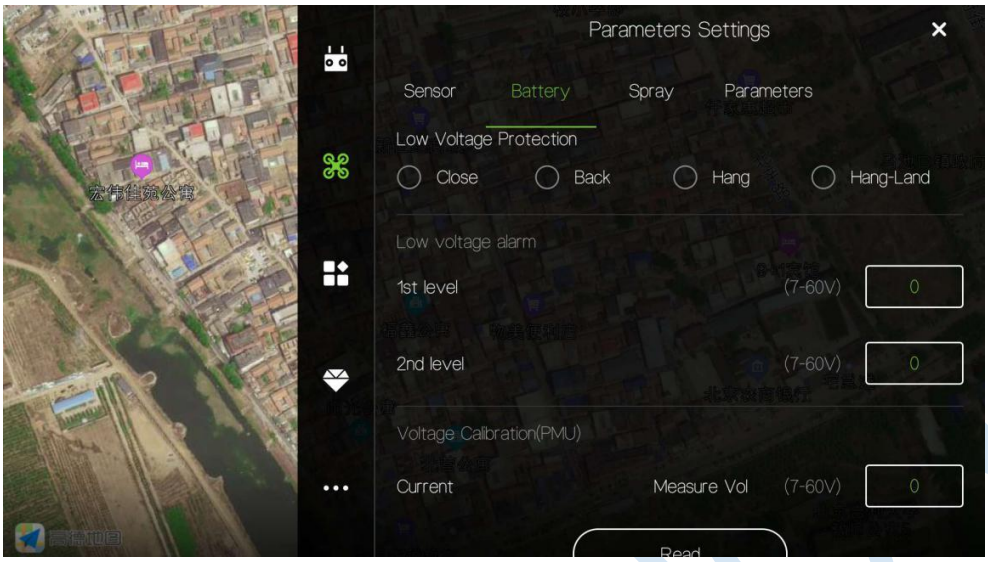


After vertical calibration,calibration mode will be exited automatically and LED will flash normally if successful. If fails, LED will keep red for 3 seconds, then user need to calibrate again.
Please power again after successful calibration.

▼Attention

Calibration should be done in outdoor,wild and far away from high tension line tower which is easy influenced by magnetic interference.
Keep horizontal and vertical during the slow calibration.
Clockwise is the only direction.

7.2.2 Battery Settings



Before doing any settings, click “Read” on the bottom to read the current settings.

(1) Low Voltage Protection

When battery voltage drops to the “2nd level” of low voltage alarm, the protection will be triggered.

Five voltage protection actions for user to select: Close(close the protection), return(auto home landing), Hang(hovering), Hang-Land(hovering and then landing).The default is Return(Home landing).

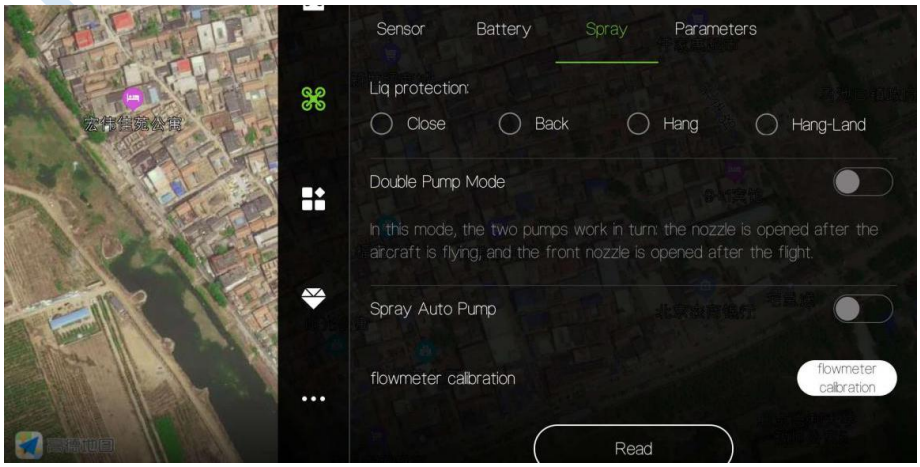
7.2.3 Spray Settings

(1) Liq protection

When liquid is out, “Liq protection” will be triggered, then drone will execute the set protection actions.

(2) Double Pump Mode

“Double Pump Mode” is specially for drones with dual pumps and the two pumps work alternatively.



7.2.4 Flying Parameters

User can reset the parameters in this page. .
Click the button “Read” to get the current flying parameters. After resetting, click button “Save” to save the changes.
Note: It’s not suggested to reset the Max Angel.

’**Work End Action**’ refers to what drone will do after mission is completed.

‘**U Open**’ refers to the turn shape.

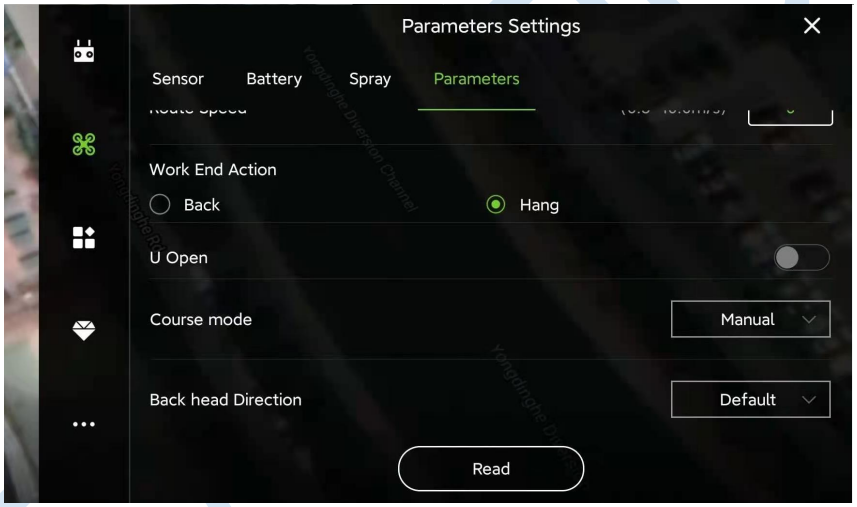
‘**Course Mode**’ refers to the drone heading direction when drone is performing missions.

‘**Manual**’ indicates drone will keep the heading direction in AB mode or autonomous route mode,unless turn it manually.

‘**Auto**’ indicates drone will keep the heading direction to flight routes, and drone won’t turn.

‘**Target**’ Indicates drone heading direction always point to the next target point.

‘**Back Head Direction**’ refers to the heading direction when flying to home automatically.

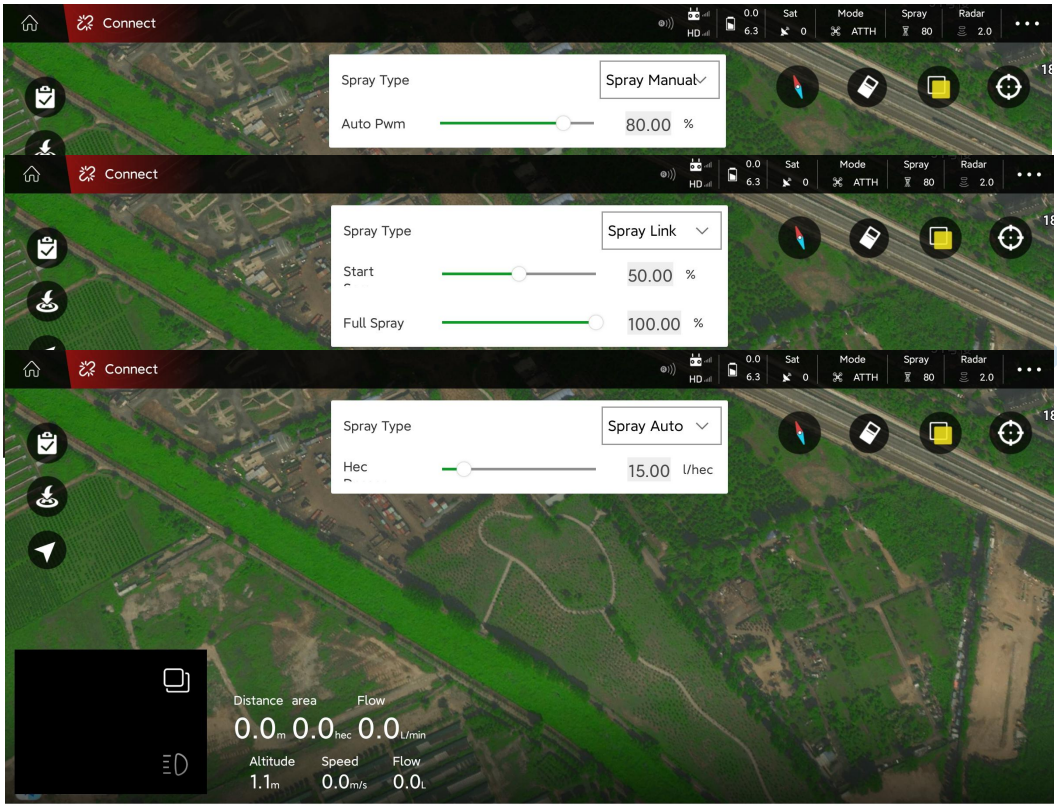


7.2.5 Pump Settings

‘**Spray Manual**’: the flow rate is fixed once pilot set it up. But it can be adjusted at any time during flying.

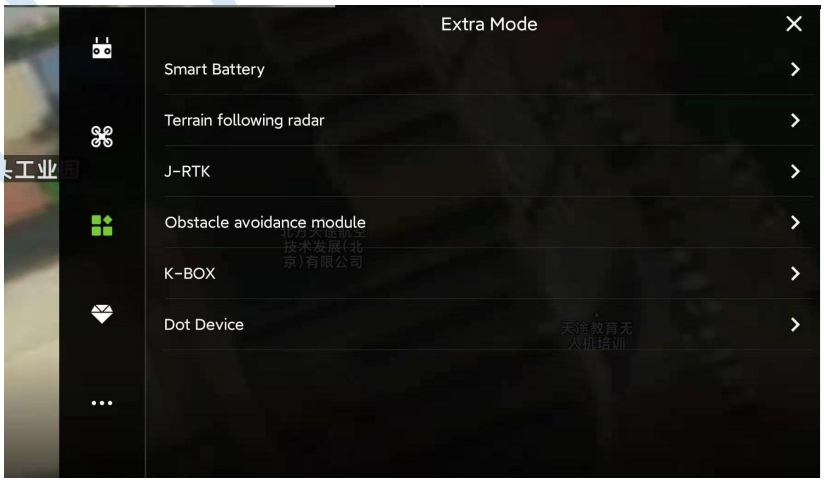
‘**Spray Auto**’: It is precise spraying. Drone can spray a certain amount of liquid per hectare. The spray amount can be set in APP before each flight.

'**Spray Link**': The flow rate is relative to flight speed. Pilot can set the flying speed for controlling the pump. At which speed, pump will start to be turned on from the min setup flow rate; At which flying speed, pump will reach its max setup flow rate. The faster the flight speed, the bigger the flow rate. Besides, pilot can choose the min and max flow rate as a percentage of the Max pressure of pump.



7.3 Battery and Radar Settings

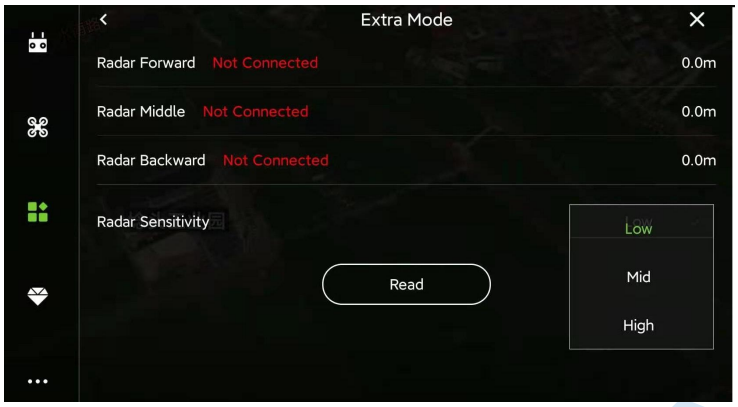
This section is used for setting external modules, including smart batteries, terrain following radar, etc..



7.3.1 Smart Battery

Battery status can be reviewed in this section.

7.3.2 Terrain Follow Radar



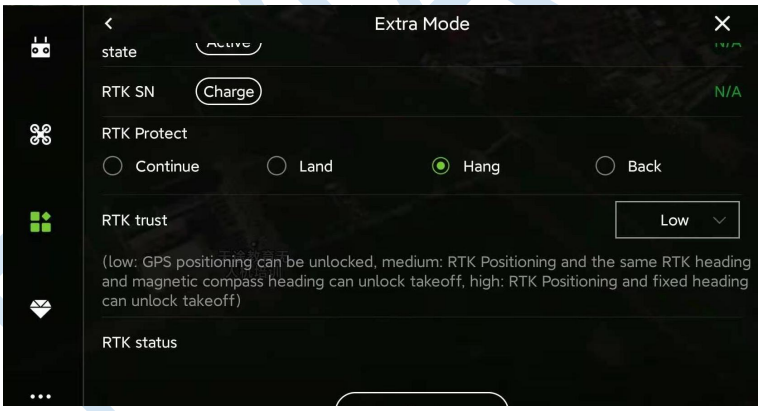
Terrain following sensitivity: Control the drone to follow the height change of the terrain, and keep the relative distance from the ground fixed at all times.

1) **Low sensitivity**: suitable for high-stalk crops (such as sorghum, corn, etc.). It can prevent falling and twitching caused by high loft lodging and uneven high loft.

2) **Medium sensitivity**: suitable for most scenarios and non-stalk crops (such as rice, wheat, soybeans, etc.). The speed of the simulation is moderate, and the response is moderate.

3) **High sensitivity**: It is suitable for demonstration effects and some non-operational entertainment places. It is sensitive to imitation, rising fast and falling fast.

7.3.3 J-RTK



'**RTK Location Status**' display the yaw angle fixed status; If RTK module has been mounted on aircraft, its status should be Fixed before takeoff.

'**RTK Diff_Age**' display the latency of RTK differential data. If the value changes between 1~3. it indicates the RTK signal status is good.

'**RTK Protect**' display the protection action when RTK fails.

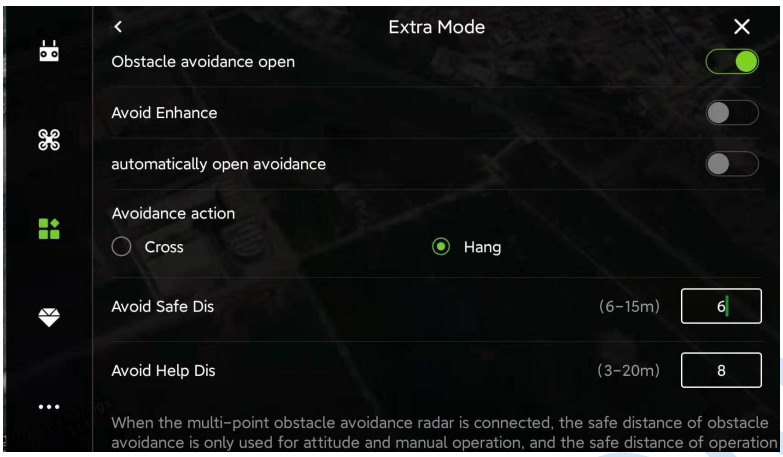
'**RTK trust**': recommended to set on Mid.

'**Hight**': Drone can't be armed, unless RTK positioning and **RTK Location Status** is fixed

'**Mid**': Drone can't be armed, unless RTK positioning is fixed, and RTK yaw angle is the same with compass yaw angle.

'**Low**': Drone can be armed when GPS positioning is fixed.

7.3.4 Obstacle Avoidance Settings



'**Avoid Enhance**': Enhance the detection sensitivity of radar.

'**Automatically open avoidance**': Avoidance radar will be activated only when drone is performing AB mission or Autonomous mission.

'**Avoidance action**': what drone will do when detected any obstacle.

"**Cross**": Drone will plan and execute the routes to avoid obstacles automatically when detected obstacles.

'**Hang**': Drone will hover when detected obstacles.

'**Avoid Safe Dis**': After the aircraft detects the obstacle, the distance between the final hovering position of the aircraft and the obstacle (generally set 8-10 meters).

"Avoid Help Dis": When triggering the **Cross** avoidance action, the actual avoidance flying distance = swath*2 + Avoid Help Dis, referring to the **Figure 7.3.4**. Only valid in AB mission and autonomous mission.

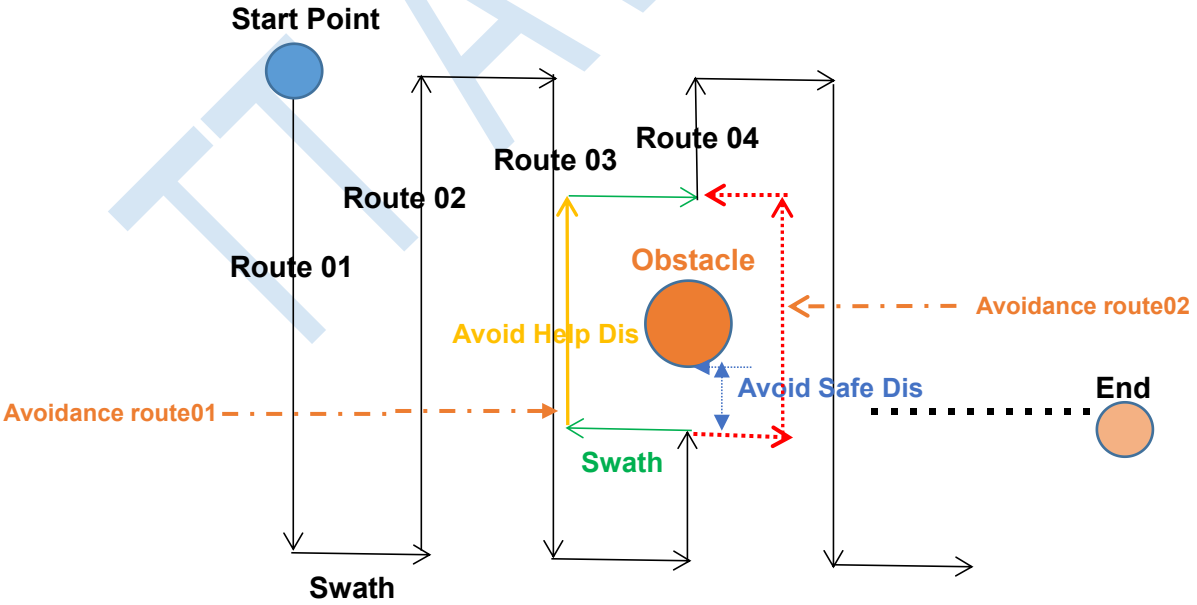


Figure 7.3.4 Auto Avoid Route

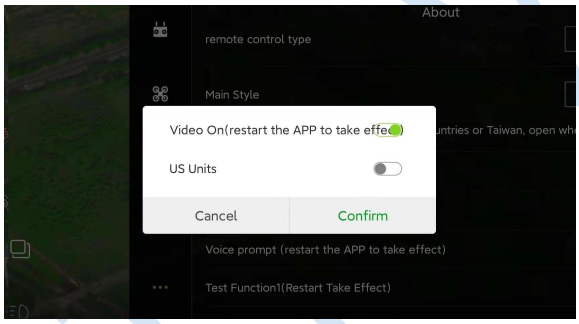
When Cross Avoidance is triggered, drone will always fly to **Flied Area** to avoid obstacles.

In situation as above Figure 7.3.4, drone will perform Avoidance Route01, instead of Avoidance Route02.

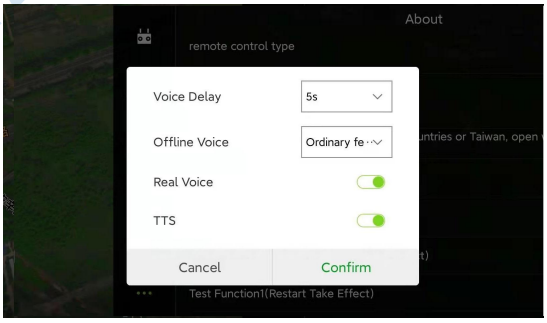
7.4 Other Settings



[FC] On the FC page, users can view the flight control firmware version, serial number, IOT version number, lease control status and lease management expiration date.
[flight time] User can view the total flight time in this page.
[Map type] User can chose proper map tape according to the working country.
[Correct coordinates] It is suggested to turn it on when the positioning deviation is large.



fpv/unit

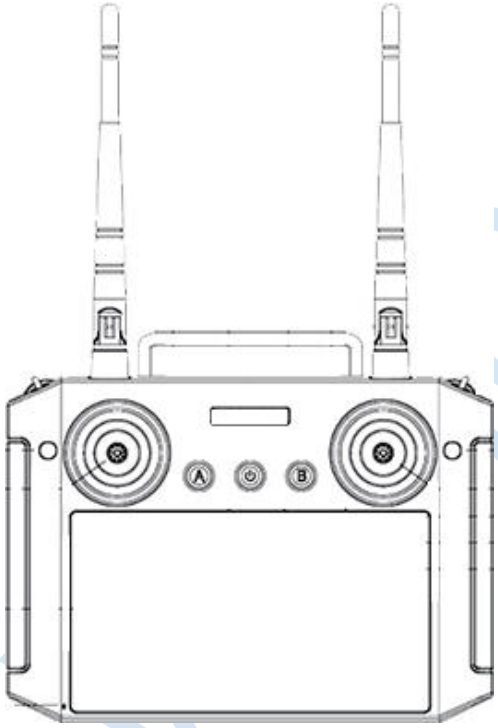


Voice Prompt

[fpv/unit] Turn on or off FPV display; Switch to Metric Unit or US unit
[Voice Prompt] Turn on or off the voice prompt of APP.
[Unlock Password] Set the password of arming drone.
[US Units] Switch statistic unit between Metric Unit and US Unit.
[SIYI] “SIYI”is used to adapt to SIYI remote controller.

8.Remote Controller

- Charger output more than 5V should not be used.
- Remote controller charging current should be not more than 2A.
- Any damaged,smoking or abnormal heating charger should not be used.
- Charging should not be continued in condition of smoking,smelly,weeping.
- Charging should not be in the area of baby playing.
- Charging should not at temperature more than 60℃.



8.1 H12 Tool

H12 Tool is the application for adjusting RC setting.

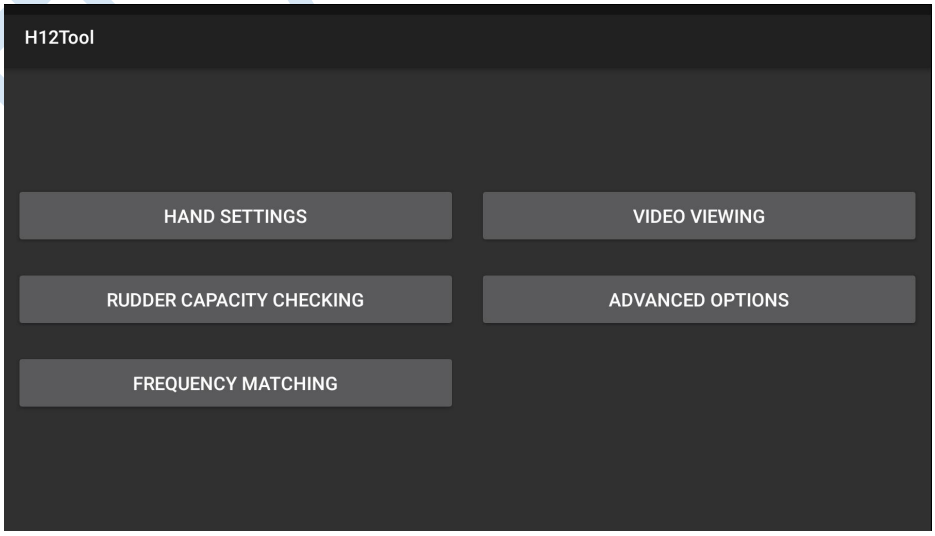


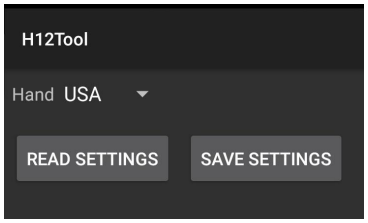
Figure6.3 H12 Tool

Caution:

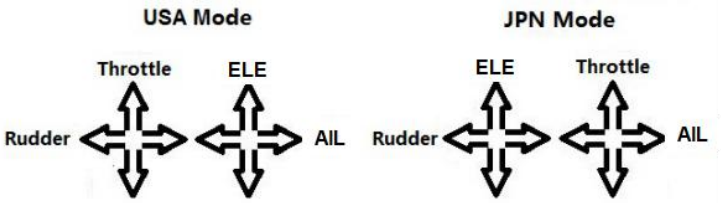
Don't do change any settings, unless under professional introduction. Otherwise, any consequences caused are undertaken by users.

(1) Hand settings

Use can chose handing setting in this page. The specifications of USA mode JPN Mode are showing as picture below.



Hand Change

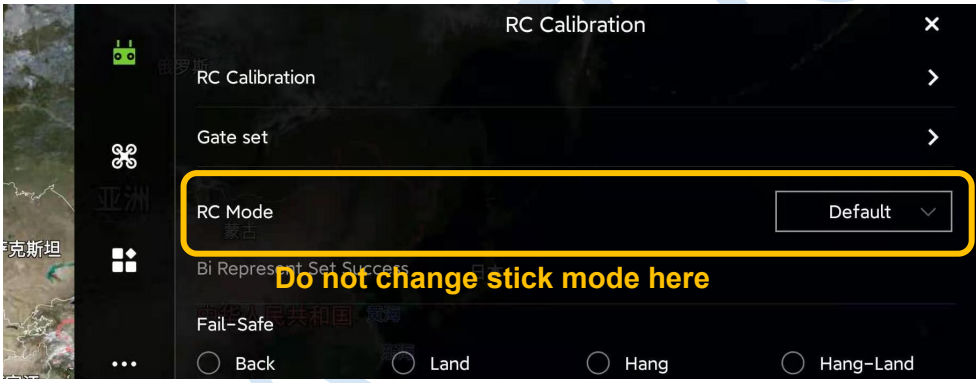


Hand Mode Specification

Note:

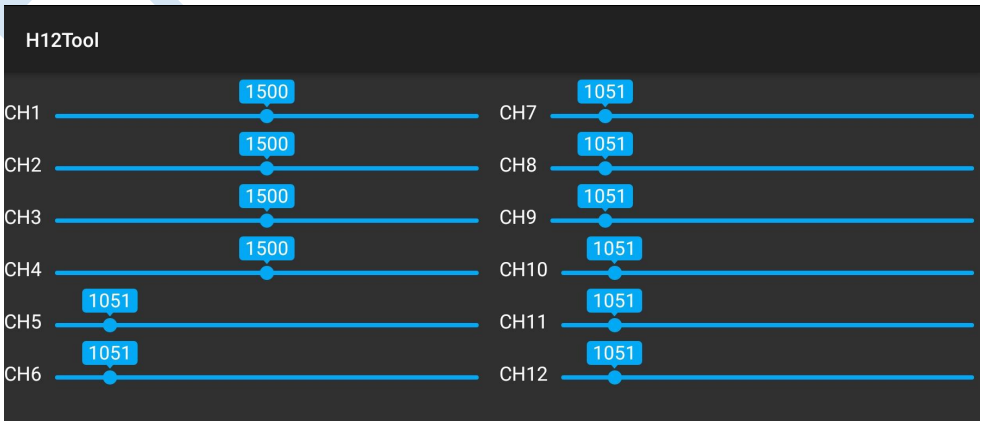
①The default mode is USA mode / mode 2.

②Do not change stick mode in "RC Mode" of "RC Calibration" page.



(2) RUDDER CAPACITY CHECKING

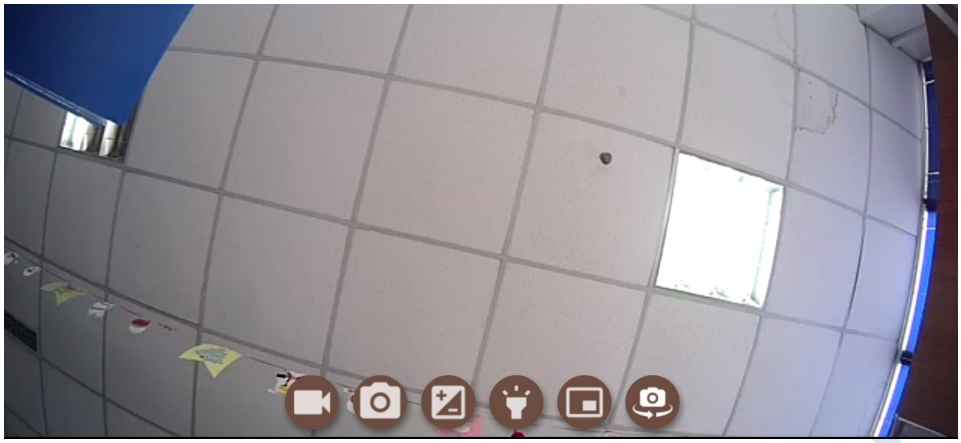
Monitor the value range of each channels. The proper range of each channel should be 1050~1950, or transmitter needs calibration.



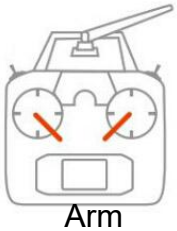
(3) VIDEO WATCHING

Real-time FPV images can be monitored here.

Attention: Ensure to exit this page before open the Agri Assistant.

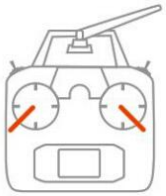


8.2 Flying Control



Arm





Emergency Disarm

8.2.1 Manually Arming and Take-off

1) Switch to **Attitude** mode.
2) Pull control sticks to the bottom inside corners to arm drone.
3) After armed, switch to **GPS** mode. Then push the throttle above the neutral position to take off.
4) After unlocked, motor will be stopped and locked automatically if user do not push the throttle above the 10% position from neutral in 3 seconds.

Note:

(1) Before arming, ensure no human is within 10 meters of the drone.

(2) Drone can only be armed in **Attitude** mode. After arming, pilot should switch to GPS mode before take off drone.

(3) It is suggested to take off in GPS mode, when satellites is more than 14, no magnetic field interference and all parts of aircraft are in good condition.

(4) Before take off, please check the **stick mode** and confirm the current settings is the mode you want. If not, never reset by yourself without the introduction of TTA 's engineer.

8.2.2 Disarming

After landing the aircraft, push the throttle down and hold for 3 seconds. The motors will

be stopped, and drone will be disarmed at the same time.

Emergency disarming: Pull control sticks to the bottom outside corners to lock drone(only for emergency use. This operation can control motor stop spinning immediately when flying).

 Cautions:

1. During autonomous mode or AB mode, missions can be **interrupted** by switching the flight mode manually. After that, operator can **fully take over** the aircraft.
2. When drone executes protection action such as low-voltage protection and low-liquid protection, operator can **take over control** by switching the flight mode manually if needed.

TT AVIATION

Appendix Ⅰ Implication of Indicator

Items	Indicator light	Priority
Flying Mode		
Gyro mode(stabilization,attitude)	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

TTA AVIATION

Appendix Ⅱ Important Attentions and Clauses

1. Ingress Protection Rating

Drone has a certain degree of waterproof, dustproof, when it is functioning normally. However, this protection rating is not permanent and may reduce over time after long-term use due to aging and wear. The product warranty does not cover water damage.

2. Battery Maintenance

(1) Charge batteries with balance cable connecting.

(2) Never use deformation or bulge batteries.

(3) Drone battery needs maintenance regularly.

- Generally balance battery voltage every 5 work days.
- In long-term storage, charge battery in storage mode every 20 days, as battery itself is discharging all the time. Otherwise, battery may be damaged because of over self-discharge.
- In long-term storage, charge and discharge battery to activate battery every 2~3 month. Otherwise, battery performance will be largely reduced.

More details, referring to <Battery Use and Maintenance Instruction>.

Any losses caused by improper battery maintenance and storage shall be taken by users.

3. Drone Idle Time Protection

To maximize the service life of drone electronics, TTA presets a relative protection on drone idle time. If Agricultural drone is powered on for over 30mins without flying, once every takeoff, drone have a possibility of losing control, which may crash caused by.

In case of staying over 30mins with battery connected, disconnecting and re-connecting drone battery will make drone ready for takeoff.

Hereafter any crashed by the over 30min ground issue, any crashed losses caused shall be responsible for users.

4. Drone Payload Weight

Each time the flying altitude is increased by 1000m, the tank payload should be reduced by 2KG.

5. Radars

- The radar can only function properly in flat field, and cant work properly in sloping

field with an inclination of more than 10° or field with sudden elevation changes.

- Be extra careful when flying on inclined surfaces. Recommended maximum inclination at different aircraft speeds: 10° at 0.9 m/s, 6° at 3.2 m/s, and 3° at 4.5 m/s.
- Pay attention that obstacle avoidance radar will be adversely affected when aircraft pitch angle exceeds 15° .

TT AVIATION

TT AVIATION

This content is subject to change.

If you have any questions, please contact TTA: lan.li@ttaviation.com

Copyright@2022 TT Aviation All rights reserved.