Agricultural Drone (T1-A) User Manual

Ver. 1.3

SHENZHEN GC ELECTRONICS CO.,LTD.

1-Security Warning:

1.1-Please be careful when using this agricultural drone, often check battery condition and screw fastening. The broken propeller blade and battery can not be used.

1.2-Do not disassemble the machine by yourself.

1.3-Do not disassemble, burning, striking and squeezing the battery. Do not be charged or disconnect the battery output. The battery should be kept in a cool place and out of reach of children.

2-Main Function and Parameter Table

(Aircraft primary table, Remote control, battery)

Description	Parameter
Model	JMR-X1100
Dimension	80x80x40 cm
Dimension (folded)	46x46x40 cm
N.W. (W/O battery)	5.7kg
Max. Take off Weight	13 kg
Payload	5 kg
Control Radius	1000~2000 meters
Max Flight Height	30 meters
Flight Speed	1 ~ 9 meters
Spray Width	3 ~ 5 meters
Hovering time (W/O load)	16~20 minutes
Flight time (spraying)	11 ~ 13 minutes
Flow of the pump	1.2 ~ 1.3L/minutes
Battery Capacity	6S 12000mAh 20C
Charger	20A Balance DC Charger
Function	**Description**
Flight Mode	Manual/Spraying work/GPS/Ground Control System
Safe Protection	Low Battery RTL/One Key RTL/Fail safe RTL
Spraying System	Pressure type pump and nozzle

3- Parts List

Items	QTY
Drone body	1 set
Propeller of 22"	3 pairs
Radio Transmitter	1 unit
Tools bag & spare screws	1 set
20A balance charger	1 unit

4-Non-Responsibility Clause

Thank you for purchasing JMR products. This product is an excellent spraying agricultural drone. Please strictly comply with the manual operation method. Strongly recommend removing the propeller during installation and commissioning, to prevent damage caused by suddenly rotation of the motor.

JMR-X1100 agricultural drone is not a toy product. Not suitable for people under the age of 18. When you use this product, it means that you accept this statement. The error modification and operation may result in property damage and casualties. The users shall bear corresponding civil and criminal liability.

Disclaimer

4.1 This product is a special item. The users will be responsible for all acts and consequences of using this product. The company does not assume any responsibility.

4.2 If breaking the public order and endangering the public security, the users must bear the corresponding legal responsibility.

4.3 Because of the following reasons (not only including the following) caused property damage and personal injury (directly or not), the company does not assume any responsibility.

1) Units or individuals to obtain the product through informal channels;
2) Removal or modification and replacement products by yourself;

4.4 Warnings

1) This product is not suitable for flight under the condition of harsh weather or bad weather.(Such as raining and the wind is greater than 4)
2) During the installation and testing process, be sure to remove the propeller, so as not to cause harm.
3) The correct switching order:

Open: First opening the remote control before the flight, and then connect the aircraft power supply.

Close: First turn off the aircraft power supply after landing, and then close the remote controller.

4) The throttle to remain above 10% during the flight.

Please do not shut down the radio transmitter power when the drone's power is switched on or during the flight.

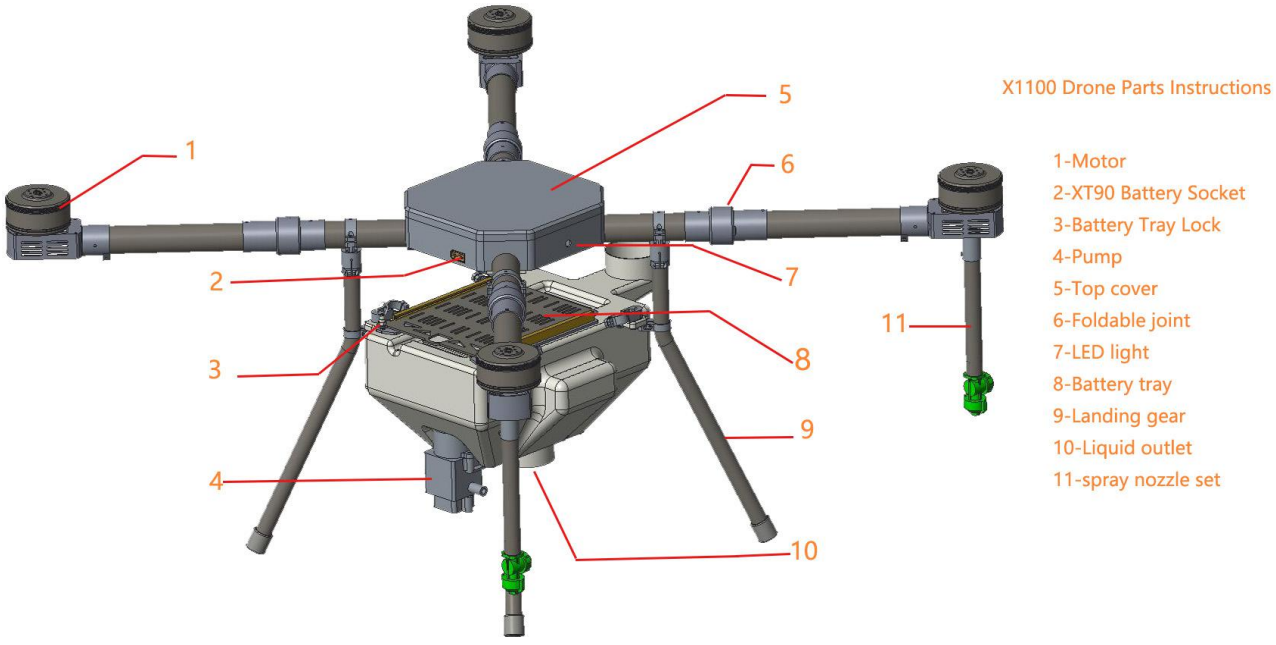
5) Please landing immediately when the battery voltage is too low.
6) Please do not fly in no-fly zone, strong magnetic, high-voltage wire, wireless base station, radio interference and other regional.
7) Do not fly overload, do not use the damaged battery and propeller.
8) Do not fly in densely populated areas.
9) Flying near tall buildings may affect the signal intensity of GPS.

5-Operating Methods

5.1 Safety precautions

1) Please power on/off the drone and radio orderly according to the correct steps.
2) Before start the drone, please try to make the machine placed in the flat area for take-off and landing.
3) People should maintain a safe distance above 10 meters when the machine taking-off and landing. Do not take-off and land in the crowd nearby.
4) Please check the aircraft arms, and check screw fastening of the propellers to see whether they are flexible.

5.2 Agricultural Drone Parts Instructions



5.3 Preparations for Pre-flight

Safety check before flight:

1) Please check the power of the battery, 6S battery charged voltage is about 25.2V. Checking the battery appearance to see whether it is damaged and the plug is loose or not. Opening the radio transmitter switch, checking the voltages. The full power of the remote control is about 12.5V. If the power is lower than 11.1V, please charging before flying.

2) Opening every aircraft arm, putting them in a horizontal level and tightening the knob to lock the machine. Checking the machine arms whether they are tightly fixed connections or not. Each blade is screwed on the motor seat paddle of the corresponding color according to the fixed blade color. Please checking whether the installation of the blade fastening. Do not use the damaged blade!

3) Please checking the GPS mode whether is in the right direction, and checking whether the GPS mode is loose or not. The direction of arrow for the GPS shall point to the flight direction of the agricultural drone. (LED lights for the direction of the tail)

4) The remote control has set the model name: JMR-V1000. Checking the main screen to see whether it shows the model name when opening. If changing to other model name, it will cause the agricultural drone can not start or it is in danger of out of control.

5) Please checking the spraying switching of remote control is in the initial state, so as not to trigger spraying power when energized.

6) Please using the straps to fix the battery firmly.

7) Please transfer the liquid through the filter funnel into the tank, pay attention to avoid the liquid spilling into the body center plate and battery plug.

5.4 Flight Working Methods

1) As the picture shows:

2)

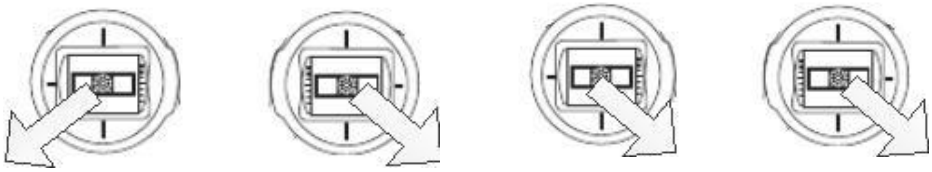
2)The remote control is divided into left-hand throttle and direction (lifting and steering). The right-hand rocker is to the left and right side and around about flying.

3) Putting the agricultural drone placed in the relatively flat ground, then according to the correct switching order: first opening the remote control power switch, pay attention to the throttle lever, to see whether it is arranged in the bottom position. Then connect the battery to the main plug.

4) After the machine is powered, putting the flight mode switch into GPS mode. Please observe the LED indicator status in the safe distance.We recommend waiting until the power LED only flash a red light or no red light flashes (only green flashes) before take-off.
Please refer to:

GPS Signal Status Alert (LED Lamp)			
One flash Three flash	One flash Two flash	One flash One flash	One flash No flash
Very Poor: satellite < 5	Poor: satellite = 5	Good: satellite = 6	Very Good: satellite > 6

5) Taking-off:
As the picture shows: (The Americans use the picture1 to unlock, the Japanese use the picture 2 to unlock)



LOCK UNLOCK

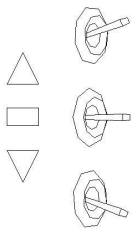
After pulling rod, motor will unlock the idle rotation, then slowly pushing the throttle for more than 50%, the agricultural drone will stationary vertically take-off. Pay attention to the accelerator, do not push it to the top. The throttle is pushed back to the position of 50% when the altitudes reaches a height of 2-3 meters. The agricultural drone will maintain the current height hover.
Note: After unlock, the throttle is less than 10%, the motor will automatically stop locking.

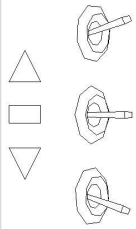
Hovering after take-off
In the conditions of GPS mode, after reaching the required altitude, keeping the throttle in the 50% position, the machine will maintain the current height hover.

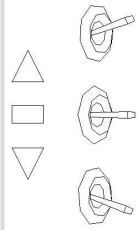
6) Landing:
Choosing a relatively flat ground when landing. Controlling the rate of decline, falling slowly to prevent collision damage of the machine. When the agricultural drone touches the ground, then putting the throttle into the bottom(0%), the propeller will stop turning.

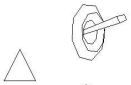
6) Flight:

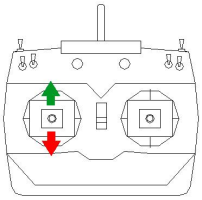
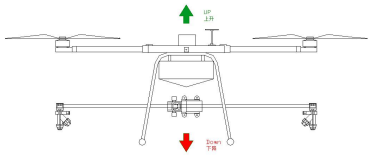
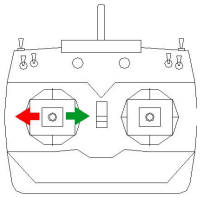
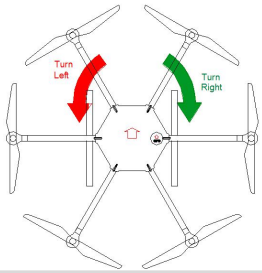
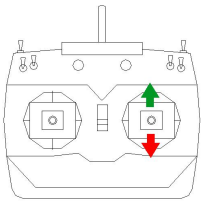
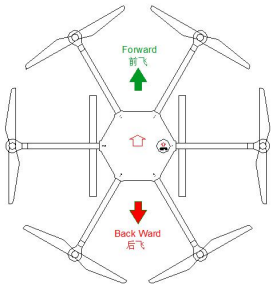
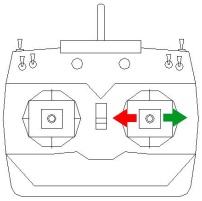
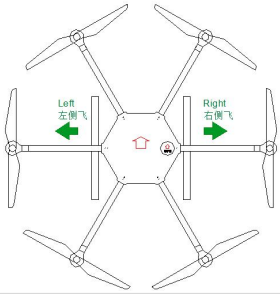
Switches

6CH（SW-C）		Description
	A	N/A
	B (middle)	Spray switch on GPS/Manual Mode
	C	One key RTL, Record the break point

5CH（SW-G/Flight Mode）		Description
	A	GPS Mode, can Keep position and height
	B	Spraying Work Mode
	C	Manual Mode,can keep height only

7CH（SW-E/record A/B）		Description
	A	Record point A
	B	N/A
	C	Recorder point B

8CH（SW-A/excute AB mode)		Description
△  ▭  ▽ 	A	Switch Off A/B mode
	B	N/A
	C	Execute A/B mode

Radio Motion	Direction Of Flight
	
	
	
	

In the Following situations, under out of control protection, the agricultural drone will automatically rise to an altitude of 20 meters. Staying for 15 seconds, then it will return towards to take-off point. At this time, please stay away from the take-off point. If you need to regain the control of the machine, you must change the flight mode switch(CH5) into manual mode when the machine flies in the distance of control. Then you can regain the control of the flight.

If finding the agricultural drone flight instability or it has been seriously disturbed with a wrong direction, please immediately convert GPS flight of flight mode switch into attitude control mode. And pay attention to the amount of the throttle servo. To prevent high-speed crash and to check again after

LED Status	turn to {  } (∞)	Lost Transmitter Signal

landing.

5.4

Flight Training Methods

Primary flight training step (Please be sure to keep a safe distance when flying!)

1) Practicing take-off and landing: Putting the agricultural drone in the flat ground, facing the direction of LED taillights of the machine, then standing for operation. Keeping a distance of 10 meters, then practicing take-off and landing repeatedly in accordance with the practicing methods.

2) Practicing forwards and backwards in a straight line flight: After stable taking-off and landing, standing behind the side of the machine, to prevent accidents occurring while flying backward. The height is controlled at about 3 meters after taking-off. Slowly pushing the right-hand rocker forward, to let the machine slowly fly forward about 15meters. Then slowly pushing the rocker backward, to let the machine slowly fly to the taking-off point. It may be appropriate to increase the flying distance forward after repeatedly practicing proficiency.

3) Practicing left-right side flight: Standing in the rear of the machine. The height is controlled at about 3 meters after taking-off, Slowly pushing the right-hand rocker to the left, to let the machine slowly fly about 10 meters to the left. Then slowly pushing the rocker to the right, to let the machine slowly fly to the taking-off point. It may be appropriate to increase the lateral distance of the flight after repeatedly practicing proficiency.

4) Practicing steering: Standing in the rear of the machine. The height is controlled at about 3 meters after taking-off. Slowly pushing the right-hand rocker to the left, the machine will slowly rotate anti-clockwise in situ. Then slowly loosen rocker back in place, the machine will stop rotating. Then slowly pushing the rocker to the right, the machine will slowly rotate clockwise in situ. Slowly loosen rocker back in place, the machine will stop rotating. After repeatedly practicing to fly to speed up the

rocker movements until skilled.

5) Practicing mouth-shape flight: When the front steps are familiar with, you can practice the mouth-shape flight. Controlling fly clockwise in the side length less than 20 meters of square line.

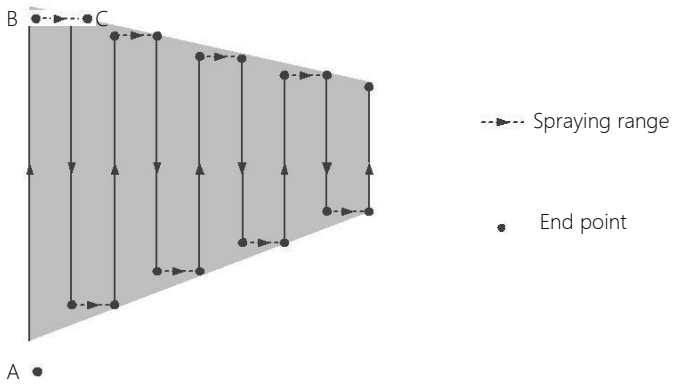
With a slow speed flying training at first, you can be changed to anti-clockwise flying after skilled.

5.5 Spraying Work Mode

5.5.1 Semi Auto Work

In the Spray mode, the drone reaches the work starting point (home point), go forward automatically by commend. After receiving instruction of changing line, aircraft will automatically to the left or the right fly, then hover, waiting for continuing operation command.

Pls see below work routes:



work routes

In the figure, point "A" is starting point when working, aircraft go forward automaticlly by commend on point"B" and receive commend to change the line to the right, at point "C" received backward flight instruction.

The operation mode can not only improve the work efficiency, but also adapt to the irregular working area.

Operation Process

When in operation, it is necessary to ensure that the aircraft is visiable.

During operation, the flight mode is required to be switched to work mode.

Step1. Start the aircraft at the start point (Home) and hover over the appropriate height (1~2 m above the crop).

(1) If the aircraft does not record the interruption points during flight, it is need to put the throttle position to 50% position.

(2) If the aircraft has recorded the interrupted point during fligt, it need to push the throttle lever to 60% position, and then return to the 50% position to take off, the aircraft will fly automatically to the break point to continue operation.

Step2. Push forward roll / pitch lever more than 15% position, the aircraft will automatically achieve highest speed, set the height and fly forward in fixed speed to achieve constant flow spraying.

During the flight, when the roll / pitch lever is loosened, the aircraft will automatically slow down. When it is hovering, there is no spraying.

In the course of the flight, you can adjust the flight height by controlling the throttle lever according to the actual situation. When the throttle in the middle, the aircraft will maintain the current height.

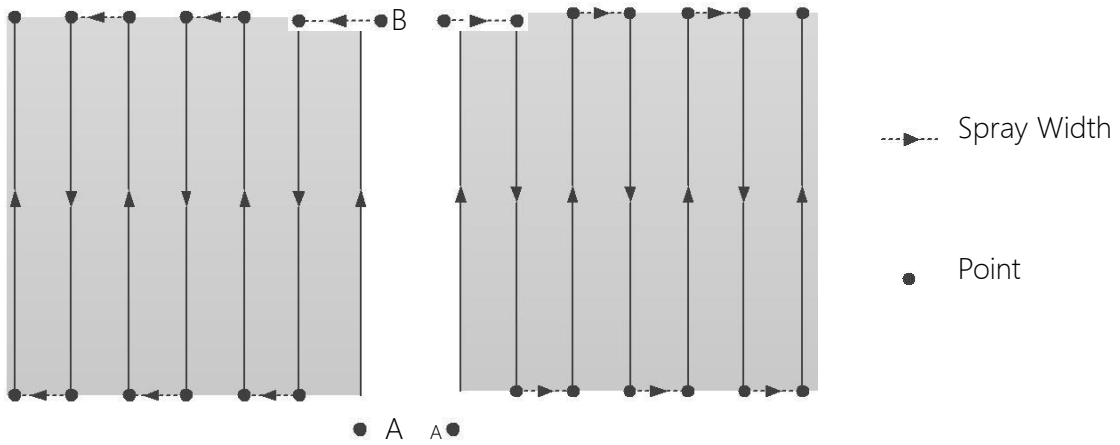
Step3. When the aircraft flies to the node, you can turn left / right toggle roll / pitch lever and immediately return middle, the aircraft will carry out the left / right flight cover the distance of one work interval and hover. Work interval namely spraying range and it can be set in assistant software.

Step4. Repeat step 2~ step 3 to complete the process.

5.5.2 AB mode auto work

Spraying ways

After record the A and B points, Switch CH-8 (SA) ON, the drone receiver the order of left or right, Then it will fly and spraying follow the lines in the picture. The spraying will be automatic when the drone from A to B or B to A , But from A-A or B-B it will stop the spraying. The width of A to A or B to B can be set in the software.



Spraying process

During Spraying ,Please make sure the drone in visual range.
AB points only can be recorded in GPS or Semi-auto spraying Mode.

Setp 1. Record A : Fly the drone to the start point of A, switch CH7 (SE) to A position to record A point.The LED will indicate RED color 10 times. (🔴 (10))

If not record B, then 1st point is A at anytime;If Already record B ,then record A must be 8 meters between B. If record A , Then all B point will be deleted. Have to record B again.

Step 2. Record B : B point must be 8 meters away from A , Switch CH7 (SE) to B position to record B point, The LED willbe indicated green color 10 times. (🟢 (10))

If want record the new point of B, can fly the drone to the new point B and within the radius of 8 meters from B, switch CH7 to record the new B point.

Setp 3. Switch CH8 (SA) to C position, Execute the AB mode, LED indicate Bluecolor 8 times. (🔵 (8))。

Cannot execute AB mode if drone on land.

Step 4. Push the sticker to Left Or Right side and release, the drone will fly to left or right ,Then start the spray follow the lines.

During Spraying and flying, If drone forward A direction, the LED indicate Red 3 times（🔴（3）），If B point direction , LED will be indicated green color 3 times.（🟢（3））。

During the flying,Can adjust the height by throttle. If throttle hold in middle position, the drone will keep the height.

Delete AB point

(1) delete the break point can delete the AB point at the same time;
(2) quickly swith CH7 (SE) 8 times can delete the AB points. And LED indicate yellow 10 Times.
(3) Escape AB Mode, and record A,B again.
(4) If no record the break point, when the drone landed, the AB points will be deleted.

Escape AB Mode

During spraying and flying, Switch CH8(SA) then stop the AB mode, drone will be hovering. If switch the CH8 again, the drone will continue spraying lines under the AB Mode.

5.5.3 Manual Operation

In attitude and GPS mode, users can randomly control aircraft to the areas where need to spray pesticides, turn return channel to the middle position and the spraying will be started. At this moment, the liquid spraying speed is related with the speed of flight.

In GPS mode, when push full bar, the minimum flight speed is 4.5m/s and the maximum speed is the working speed your set before. When the throttle is in middle position, the aircraft can keep the current height; the height can be adjusted by the throttle lever in flight.

Fail safe protection

5.5.4 Continue To Spray At The Breakpoint

When encountered the following situation, T1-A will record the breakpoint and can perform the function of continued spraying from the breakpoint. The omission of the operation area can be avoided.

Operation mode, attitude mode and GPS mode can all record the breakpoint; but only in operation mode, GPS mode can be performed to return breakpoints.

In fifth channel, you move lever back and forth 4 times to delete the current record breakpoint.

If the record of the breakpoint is more than 15 minutes, FC will automatically clear the current record of the breakpoint.

Shortage of Dose

During the flight, T1-A will perform the following operation when the amount of the dose is less than the warning value:

Step1. Aircraft will decelerate and automatically rise to the specified height (in assistant software you can set the height) and hover, then record the current point as breakpoint. In the rising process of aircraft, by switching mode you can stop this rising process, flight controller will still record the breakpoint.

Step2. After rising,users move return switch back and forth one time, the craft will return to start point (home point) at a certain height and along a straight line according to the preset then landing vertically.

Step3. After dosing, start the aircraft. After taking off, the aircraft will automatically rise to return height and flight to the breakpoint, and then reduce to the operating altitude to continue operation. In the process of decline, the user can push the throttle lever to abort the descent process.

Please refer "step 1" of the "working process" for the start of the aircraft.

Received return command

User actions should be as follows:

Step1. Push return switch back and forth, the aircraft will receive return command.

It will decelerate and automatically rise to the specified height (in assistant software you can set the height) and hover, then record the current point as breakpoint.

Step2. Move return switch back and forth one time, the craft will return to start point (home point) at a certain height and along a straight line according to the preset then landing vertically.

Step3. Re-start the aircraft. It will automatically rise to return height and flight to the breakpoint, and then reduce to the operating altitude to continue operation. In the process of decline, the user can push the throttle lever to abort the descent process.

Low voltage

The following operation will be carried out when the low voltage protection function is started and the first level low voltage protection is triggered:

Step1. The current record will be taken as breakpoint, the aircraft will back to the operation starting point along a straight line according to preset height.

Step2. Start the aircraft after battery charging is finished. After taking off, the aircraft will automatically rise to return height and fly to the breakpoint, and then reduce to the operating altitude to continue operation. In the process of reduced height, the user can push the throttle lever to abort the descent process.

If the aircraft doesn"t take low voltage protection, the LED light will flashing under low battery and will not return, nor record the breakpoint.

5.5.5 One-Key Go Home

You can realize "One-Key Go Home" in any kind of mode when the aircraft is in air and GPS signal is ok.

After the function of "One-Key Go Home" is triggered, the aircraft will maintain current height and heading direction, then fly to overhead point of home point in a straight line, and the LED will turn to (1) (2) ; After the aircraft arrives at overhead point of home point, it will hover for five seconds, then lands vertically, the speed of landing will be adjusted according to current height of the aircraft; after landing, the flight controller will confirm if the landing is completed, the motors will be locked after confirmation, then the landing is over.

1) When the aircraft is returning to overhead point of home point, you are able to adjust the heading direction of aircraft, but unable to adjust the position of aircraft
2) When the aircraft is landing from overhead point of home point, you can operate channel roll, pitch and yaw.

5.5.6 Fail Safe And Go Home

If the receiver you are using is SBus, there is no need to set Fail-Safe; if you are using PWM or PPM receiver, you need to set CH5 to Fail-Safe area (you can verify by shutting down the transmitter, refer to "RC setting" for more information)

LED will turn to {} (∞) After the transmitter signal is lost, the aircraft will return to overhead point of home point and land, finally lock (refer to chapter "One-Key Go Home" for more information). If the transmitter signal is resumed, the aircraft will quit "Go Home" mode, then switch to the fight mode CH5 is corresponding with currently.

5.5.7 Low Voltage Protection

You can set trigger threshold of low-voltage protection in assistant software. This value is measured when the aircraft is loaded, so when the low-voltage protection is trigger, you can find the actual value is higher than trigger value you set after the aircraft landed.

There are two levels of low voltage protection, the first level protection has LED warning((∞)), during second level protection the aircraft will land automatically with LED warning((∞)), then lock after

landed.

You can switch to attitude mode to quit protection after automatic landing of low-voltage protection executed.

6-Common Malfunctions

The magnetic compass must be calibrated before the first flight. Or LED State is (∞) , Means compass abnormal.

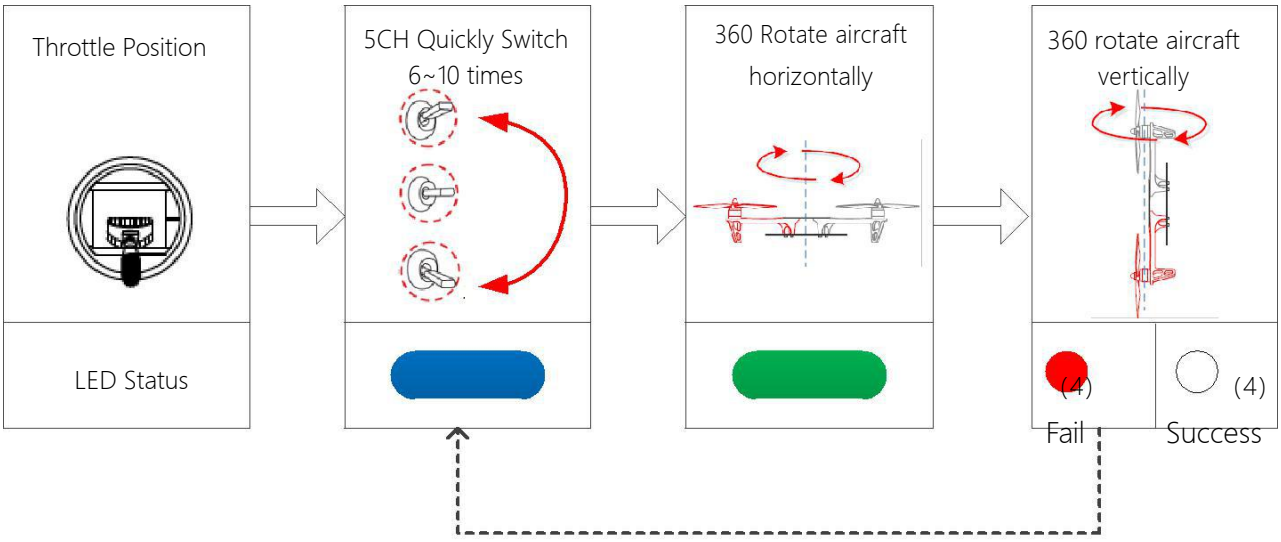
Calibration should be carried out in a clear space outside; calibration should not be done indoors or in an environment with strong magnetic fields, such as in the presence of cars or shipping containers.

You should also calibrate after re-arranging components in your aircraft or if you find it flies in circles.

Compass calibration does not need to be done every time you fly, or if you upgrade firmware without changing hardware position. However it should be done when components are moved or if the aircraft flies in unexpected ways.

Compass calibration is carried out in 2 steps: horizontal calibration, vertical calibration.

compass can be calibrated by the switch combination of CH5 on the remote control.



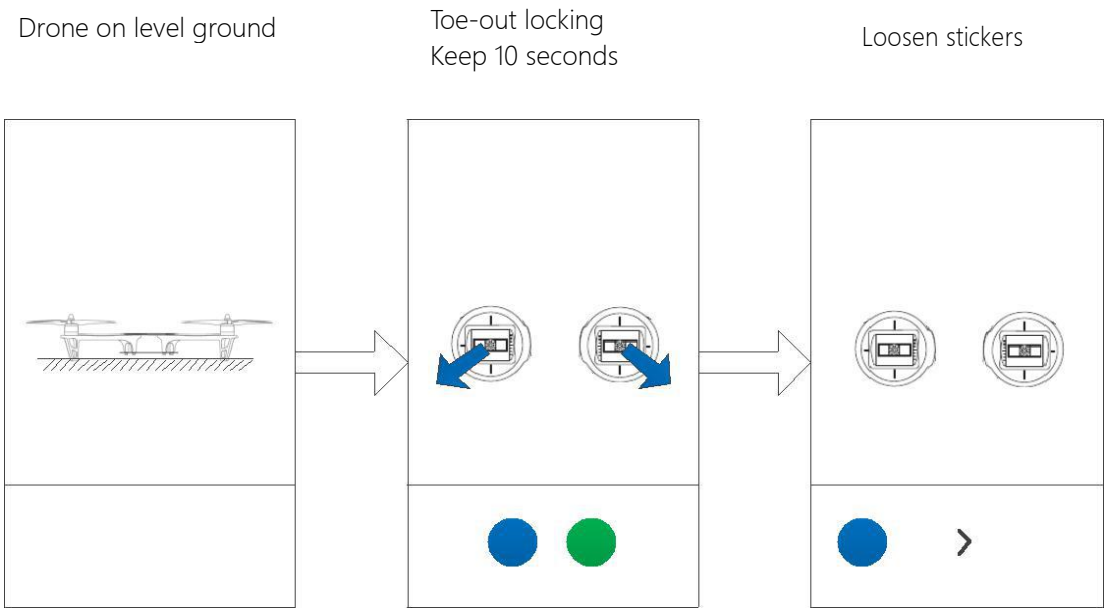
6.2 Horizontal Calibration

For the first time before a test flight, Have to do the horizontal calibration.

Step1. Put the drone on the flat floor and no vibration。

Step2. make it perform toe-out locking action for 10 seconds. When the blue and green indicator of LIU is flashing alternately,

Step3. you can loosen remote controller.After about 10 seconds, there is only LIU blue indicators flashing, then 15 seconds later, LIU is normal, which shows that the calibration is successful.



6.3.1 Agricultural drone appears a hovering circle phenomenon in GPS mode.

When the drone is hovering and rotating in a circle. You can re-install the GPS module with the following illustrations, and re-calibrate the compass.

6.3.2 Agricultural drone has a serious dither after take-off.

When the drone has a serious dither after take-off, please land the drone immediately and check it.

Please check whether the propeller blade has sticky mud and other debris or not. Due to the debris resulting imbalance of the blade balance, it will produce high frequency vibration, even the crash and other serious consequences. Do not use a little defective and damaged blades.

If the propeller blade is in a normal condition, please check:

A- Checking the battery is tight and firm, and it is in the center of symmetry.

B- Checking whether the connector or the screw is loose or not.

6.4 Common Fault of Spraying System:

6.4.1 After the spraying switch is turned on, hearing the pump is working but it doesn't spray: It is caused by air, you can loosen the bleeder valve beside the nozzle and open the pump switch. At this time, emptying the air of tube, the nozzles can spray normal. Then turning off the pump switch and tightening release valve.

6.4.2 Leaking after quickly plugging connection pipe: Because the PU pipe is not inserted in the end, please re-insert the PU pipe.

6.4.3 It doesn't work after opening the pump switch: Checking whether the line of pump power supply is loose or not. If not, taking the 12V power supply

directly to connect the pump. Then checking the pump whether it can work in 12V power supply. If the pump is working abnormally, you need to change the electronic remote control switch.

6.4.4 Cleaning the spraying system after working, please do not use the liquid containing impurities or sediment to spray, which can prevent clogging.

6.5 LED Indicator Descriptions:


(∞) means LED blinks yellow N times;


means LED blinks yellow and purple alternatively N times;


(∞) means LED continuously blinks;


(N) means LED is continuously on for N seconds.

LED State	Instruction
(2) (1)	GPS unavailable
	GPS available
	Attitude mode and GPS available
	Spray work mode, GPS available
	GPS Mode, GPS available
(10)	Record A point
(10)	Record B point
(8)	AB airway Mode executed
	Delete A,B points
	Abnormal data of IMU barometer, power OFF and power ON
(∞)	Compass Abnormal, Do Calibration or Move place
(∞)	Receiver signal lost
(∞)	First level low-voltage alert
(∞)	second level low-voltage alert
(10)	Record Home Point
(4)	Break-point memory, Can quickly switch CH5 4 times to clear it.
	Start Cali Compass horizontally
	Start Cali compass vertically
	Compass Cali success
	Compass Cali failed