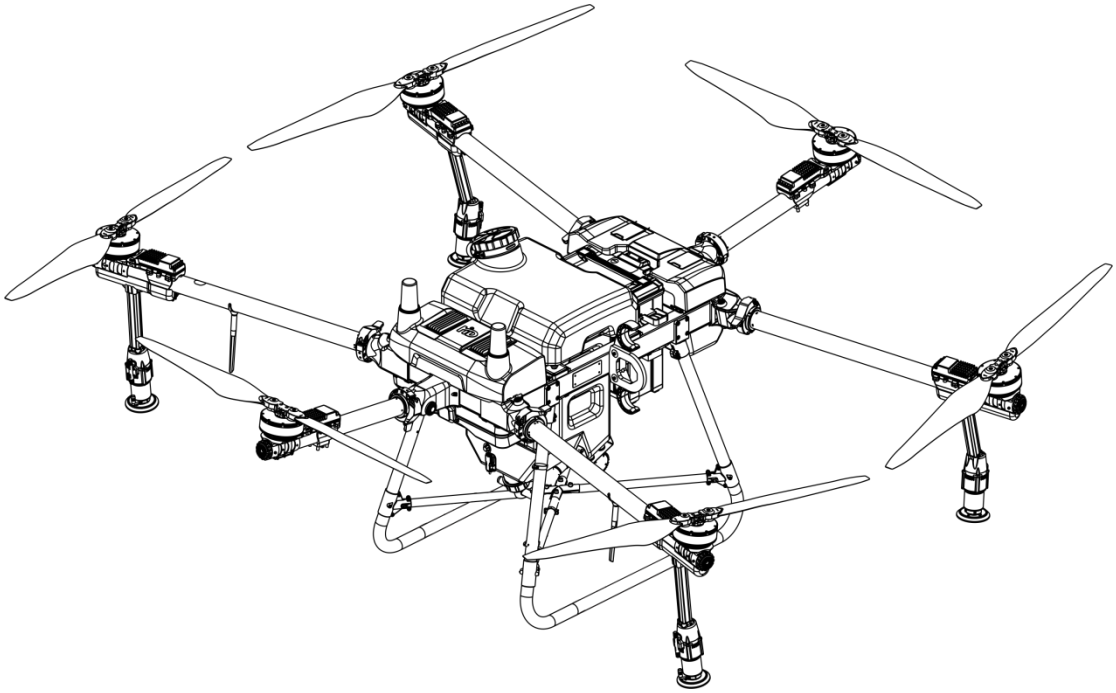
HD540 Agricultural UAV

User Manual



January 2023

catalogue

Product Overview

Brief Introduction

HD540 agricultural UAV is provided with a pesticide container of 40L and a spreading container of 60L, a six-axis stable structure, and an easy-to-use UAV remote control, which further improves the operation efficiency and effect.

The brand-new intelligent remote control is equipped with a 5.5-inch highlight display and built-in brand-new Huida UAV APP, which greatly improves the operation smoothness and stability. The remote control cooperates with RTK high-precision positioning module, which can realize centimeter-level operation planning. It could be powered by internal battery and external battery, and the overall duration of flight exceeds 7 hours, which fully meets the requirements of long-term and high-intensity operation.

Feature highlights

HD540 agricultural UAV should be a new folding truss structure, which can be folded quickly and is convenient for transportation. The fuselage has been pre-installed with airborne high-precision RTK module, which can realize centimeter-level high-precision and accurate positioning and support dual-antenna diamagnetic interference direction finding technology; Front and rear FPV high-definition cameras could monitor the front and rear visual field environment, check the flight status in real time, and ensure flight safety.

The intelligent flight route operation mode that leading the industry can calibrate various obstacles inside and outside the plot to realize intelligent flight and fully autonomous operation; It also realizes the optimal matching of pesticide quantity and power while increasing the accurate prediction function of pesticide interruption point, so that the operation area of power per unit is larger, the operation is more automatic and the operation efficiency is higher.

The aircraft is equipped with 360 degree surround and ground-simulating Obstacle avoidance system, and has the functions of obstacle avoidance and ground-simulating flight. It can identify common fixed and moving obstacles in the operation process, and cooperate with obstacle avoidance Obstacle avoidance to achieve ultra-high operation obstacle avoidance performance.

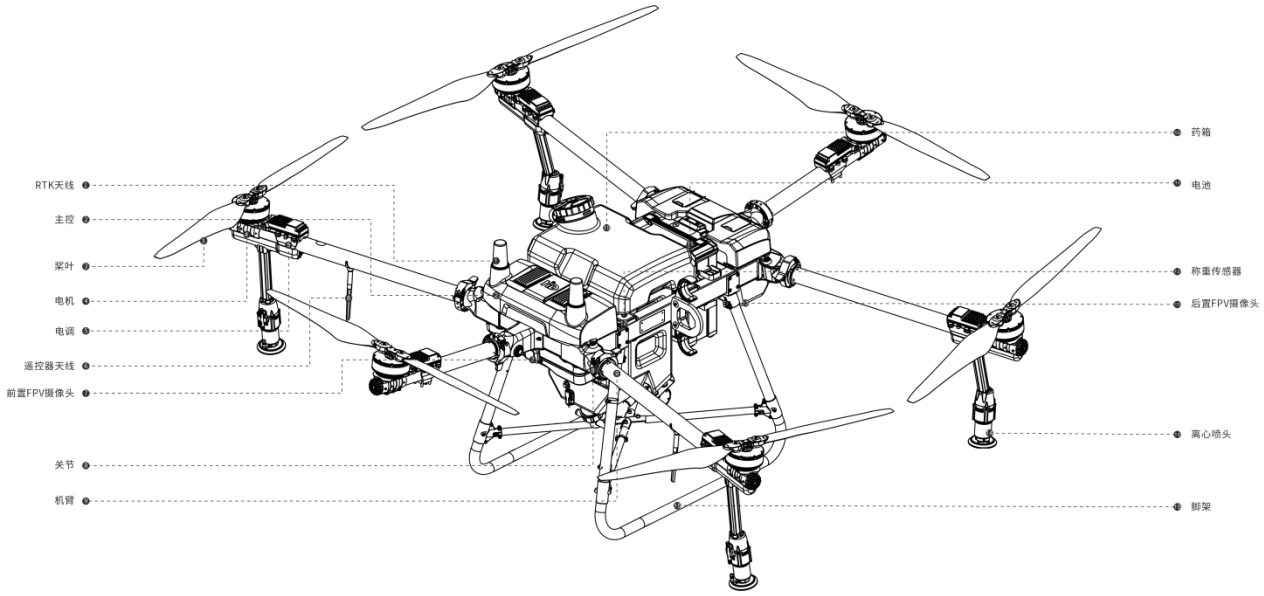
Four or two high-speed and large-flow centrifugal sprinklers can reach the optimal spraying range of 9 meters, and the size of fog droplets can be adjusted as required,

which is suitable for field and cash crop spraying.

The new generation of dial-type spreader can spread more than 100KG of materials per minute. After optimization, the algorithm is added, and the amount per mu is accurate and controllable, so that the quality of sowing is better.

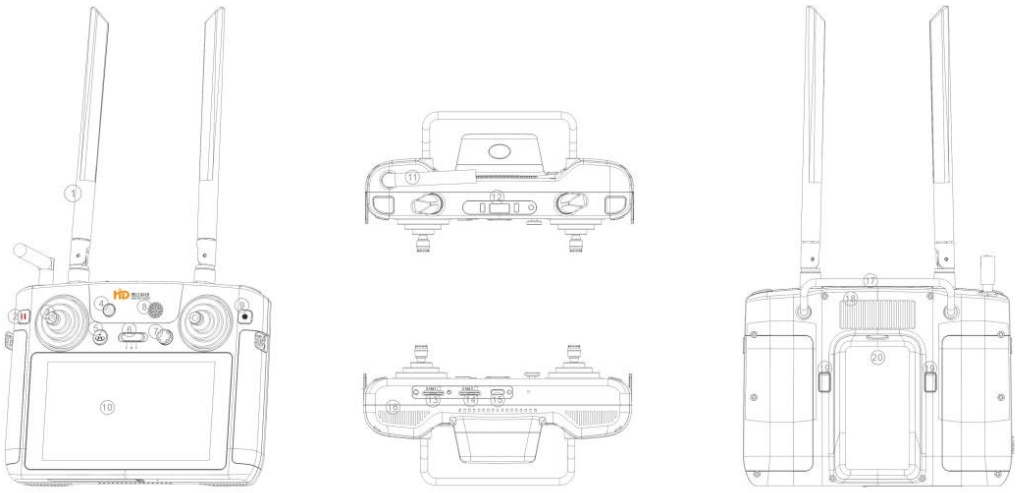
The HD540 agricultural unmanned aerial vehicle is dust-proof, water-proof and corrosion-proof. The core components adopt three-layer protection. The protection grade of the whole machine can reach IP65 (refer to IEC 60529 standard). The fuselage can prevent splashing.

Name of Aircraft Component



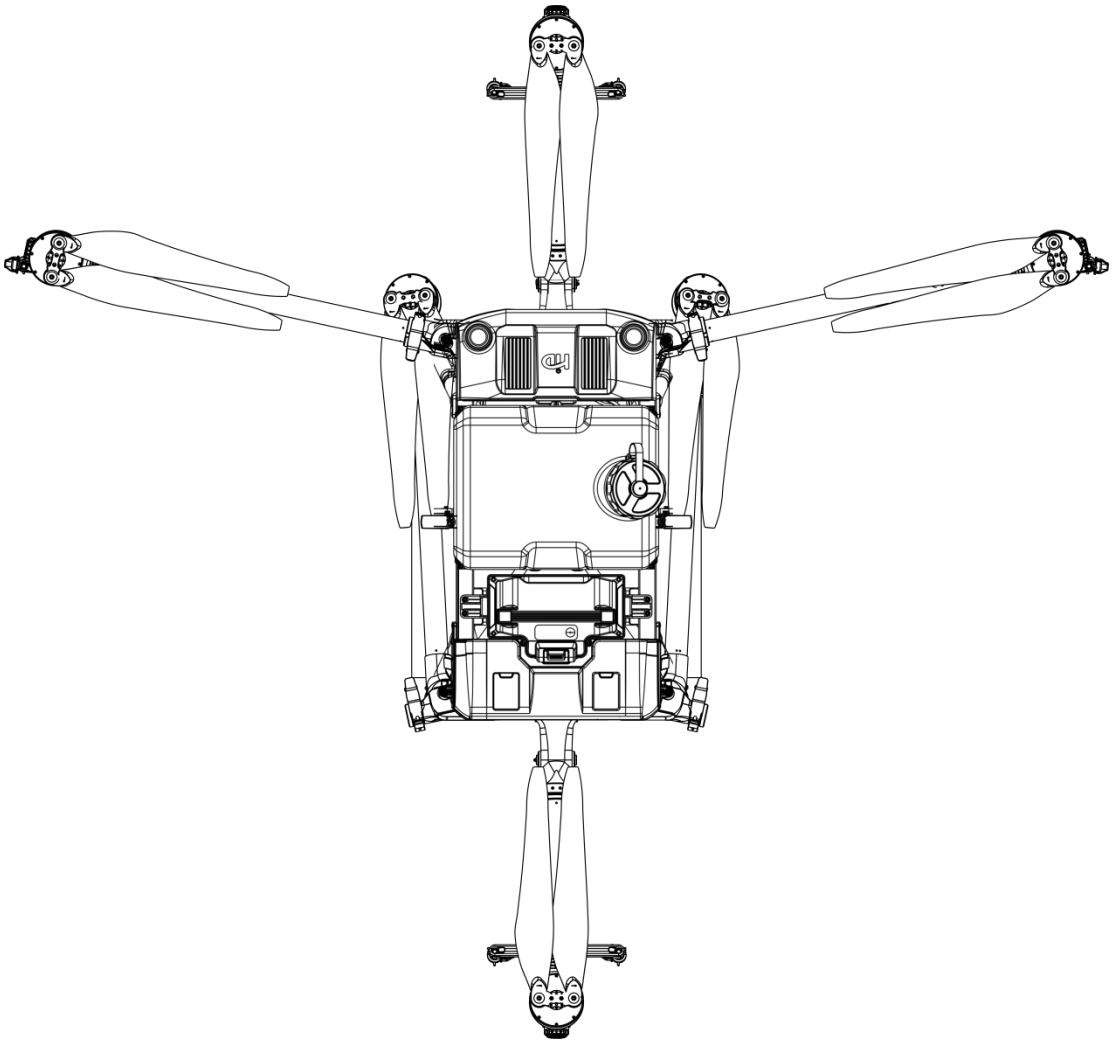
1. Airborne high-precision RTK antenna
2. Master control
3. Blade
4. Motor
5. Electronic speed controller
6. Communication antenna of remote control
7. Front FPV binocular camera
8. Arm buckle
9. Arm
10. Pesticide container
11. Battery compartment
12. Weighing sensor
13. Rear FPV camera
14. Centrifugal nozzle
16. Landing gear

Name of Remote Control part



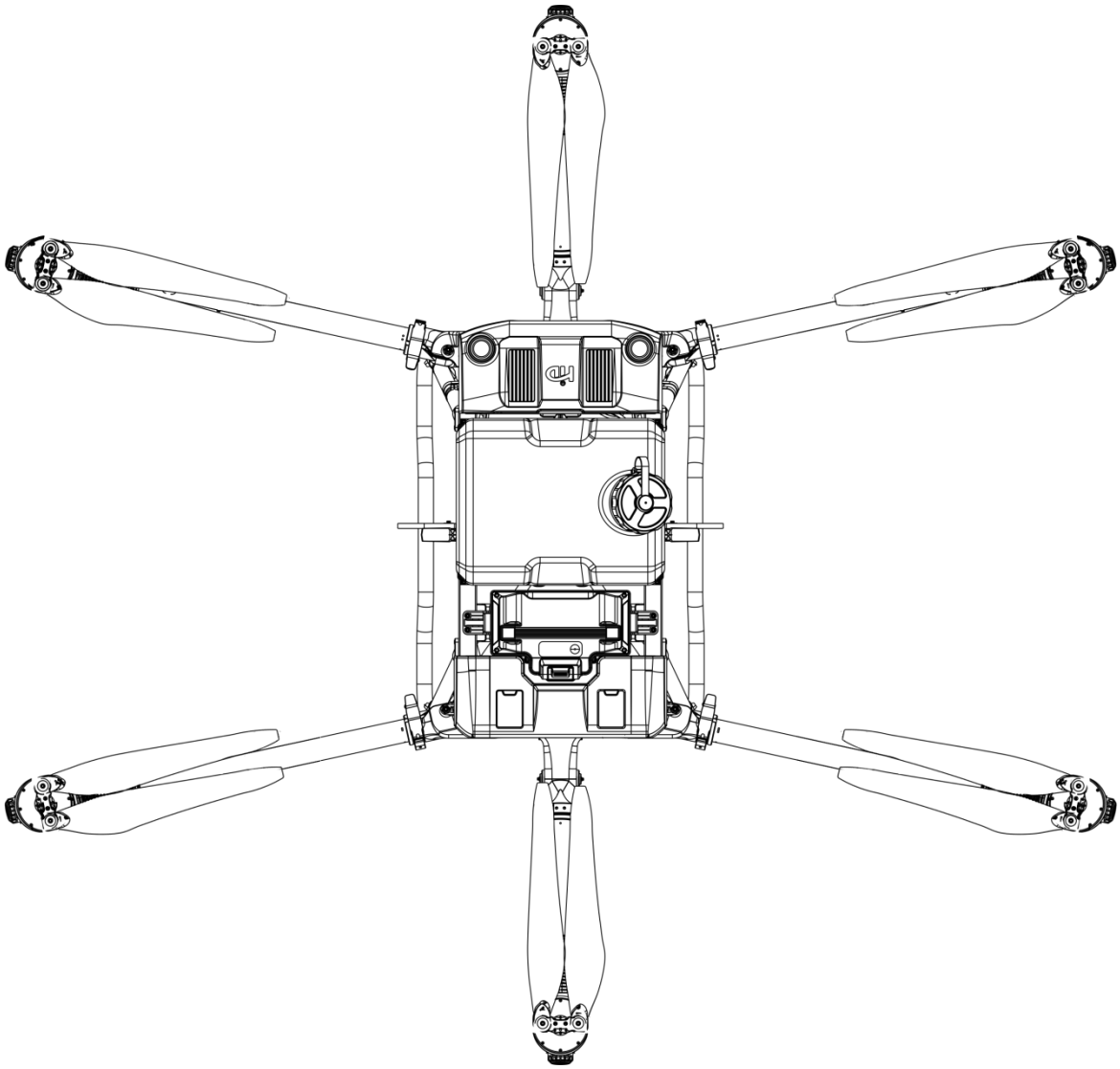
1. Antenna
2. Emergency stop button
3. Control stick
4. ON/OFF button
5. Return button
6. Flight mode button
7. Shift button
8. Horn sound outlet
9. Dotting switch
10. Touch display
11. SMA
12. RTK Interface
13. SIM1
14. SIM2
15. Micro USB
16. Heat dissipation hole
17. Handle
18. Heat dissipation hole
19. User-defined button
20. Battery cover

Preparation of Aircraft before Flight

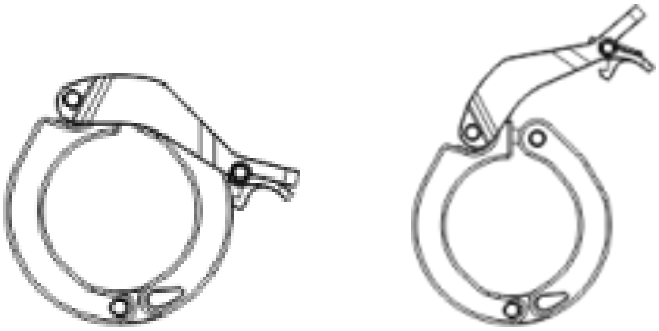


Note: Be sure to loosen the arm buckle before unfolding the arm, and then unfold the arm after unfolding.

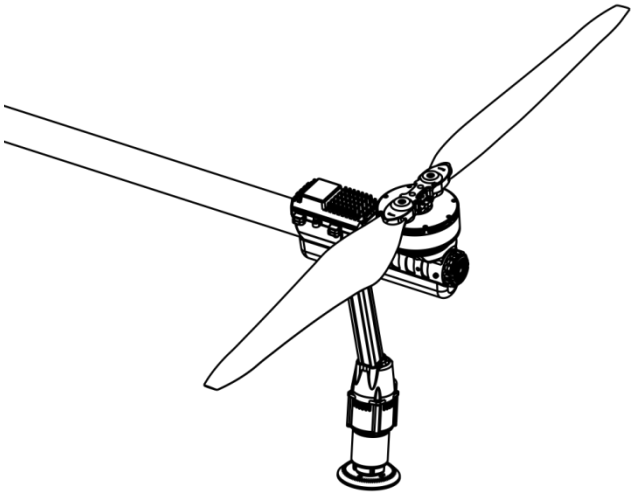
For HD540 UAV: The arms should be deployed in the order of M2 and M6 first, then M3 and M5. After the arms are fully deployed, ensure that all six arm buckles are clamped tightly.



Buckle structure diagram, When the buckle fastens the arm, you can feel a relatively large resistance, press and lock the buckle forcibly.

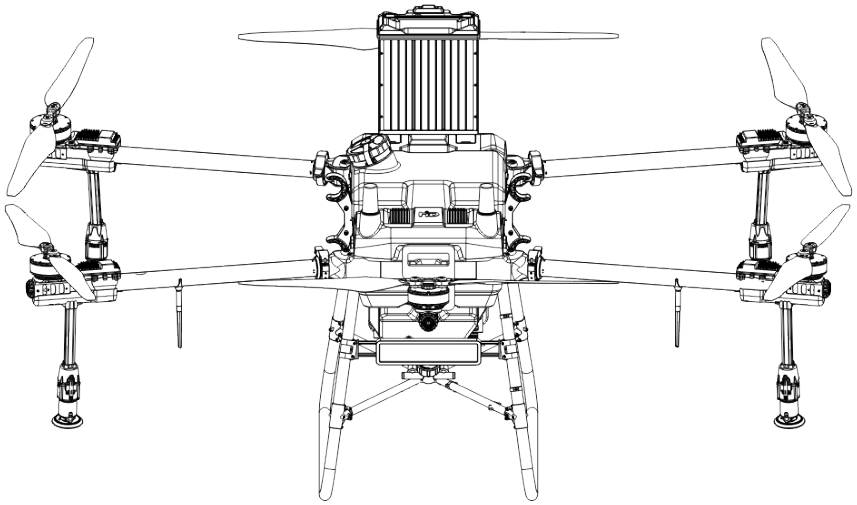


Deploy the blades separately



Put the battery gently into the battery compartment, it is in place when hearing a clamping sound.

Note: Ensure that the battery power is turned off when the battery is inserted into the battery compartment

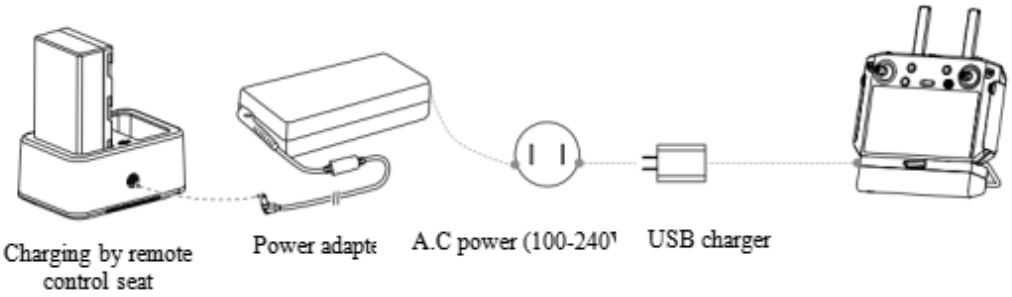


Remote Control Preparation

Charge

External battery charging stand and power adapter are used to charge the external smart battery. USB charger and USB-C cable are used to charge the built-in battery of remote control.

Note: Be sure to fully charge the battery when it is used for the first time.



Installing the external battery

① Press the battery compartment cover opening button on the back of the remote control to open the compartment cover

② Install the smart battery into the battery compartment and push it up to the top

③ Close the cover

Install 4G SIM Card

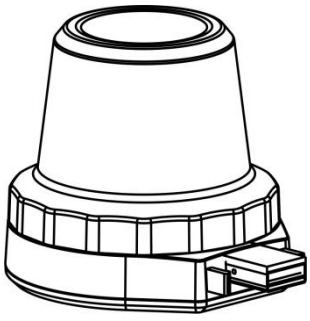
Note: Follow the SIM card installation direction, do not install it backwards

Waiting for 30s after inserting the SIM card, check the detection status of the 4G card, when it indicates the SIM has been inserted, it means that the installation is correct, and then test whether the network is unobstructed.

Note: If 4G network is not available in the area where you are located, you can use Huida small base station HD201 product as the network signal source of RTK service, or turn off RTK detection of aircraft and use GPS to locate the flight.

Install RTK High-precision Positioning Module

If RTK planning is used to plan the working area, the RTK high-precision positioning module should be inserted into the USB interface of the remote control

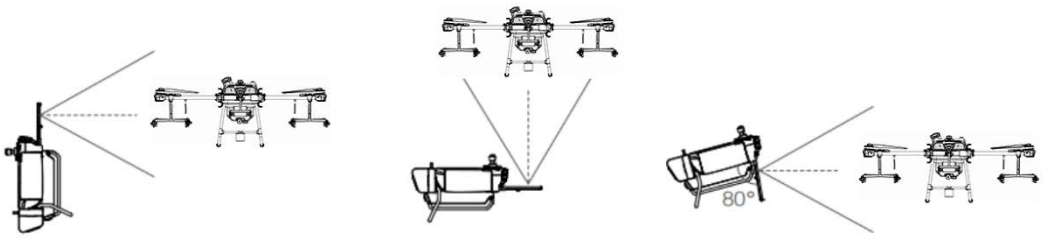


Check the Power Level

When returning to the homepage of Huida UAV APP, you can see the remaining power of the built-in battery and the remaining power of the external battery. Please ensure that the remote control is full of power before the flight

Deploy the remote control antenna and adjust the antenna position. Different antenna positions will receive different signal strengths. When the antenna and the back of the remote control are at an included angle of 80° or 180°, and the antenna plane is facing the aircraft, the signal quality between the remote control and the aircraft could be in the best state.

When operating the aircraft, ensure that the aircraft is in the best communication range. Adjust the azimuth or distance between the operator and the aircraft in time to ensure that the aircraft is always in the best communication range.



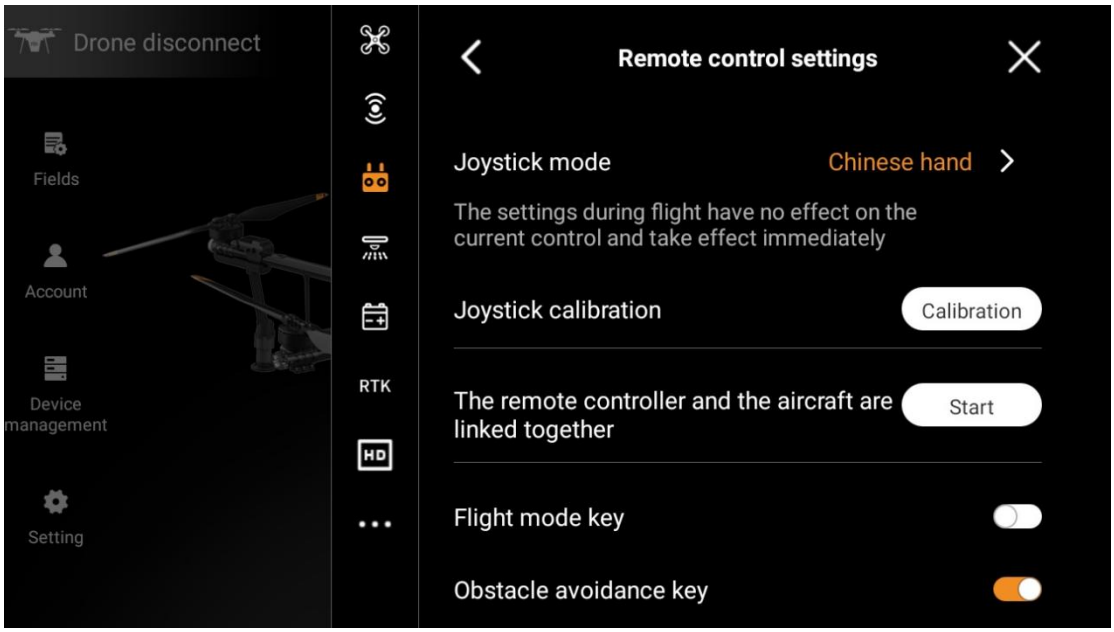
Attention:

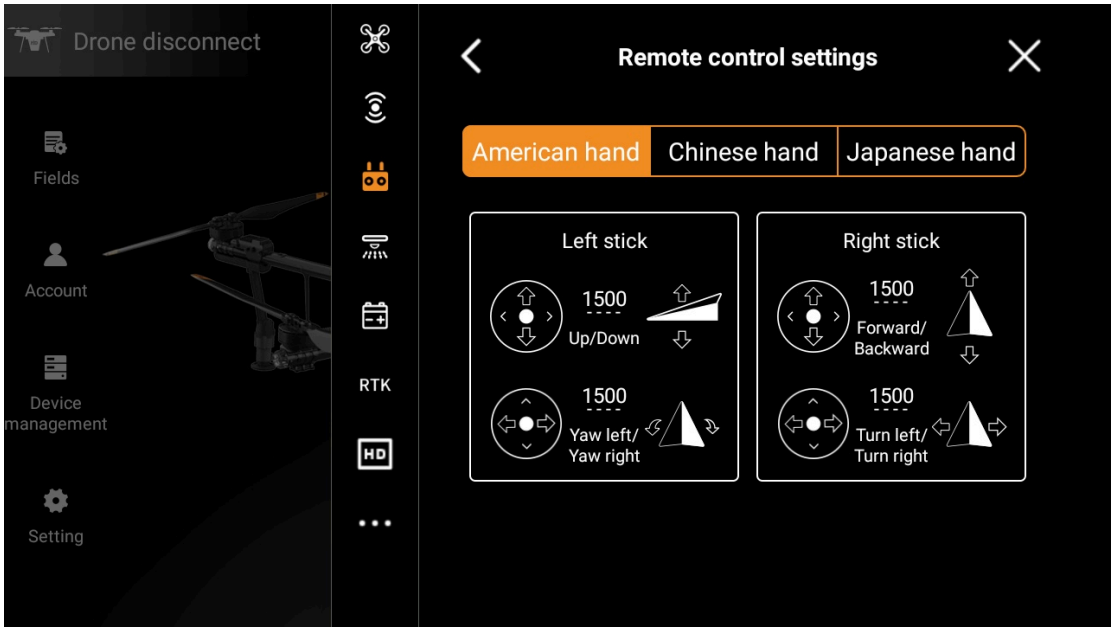
Do not use other communication equipment in the same frequency band at the same time, in order not to interfere with the remote control signal.

Set Rocker Mode

Please check the rocker mode before flying. It supports three rocker modes: US operation mode, Chinese operation mode and Japanese operation mode. Please choose the most familiar rocker mode to control the UAV.

Joystick Mode


Drone disconnect
Fields
Account
Device management
Setting
RTK
HD
Remote control settings
Joystick mode
Chinese hand
The settings during flight have no effect on the current control and take effect immediately
Joystick calibration
Calibration
The remote controller and the aircraft are linked together
Start
Flight mode key
Obstacle avoidance key


Drone disconnect
Fields
Account
Device management
Setting
RTK
HD
Remote control settings
American hand
Chinese hand
Japanese hand
Left stick
1500
Up/Down
1500
Yaw left/
Yaw right
Right stick
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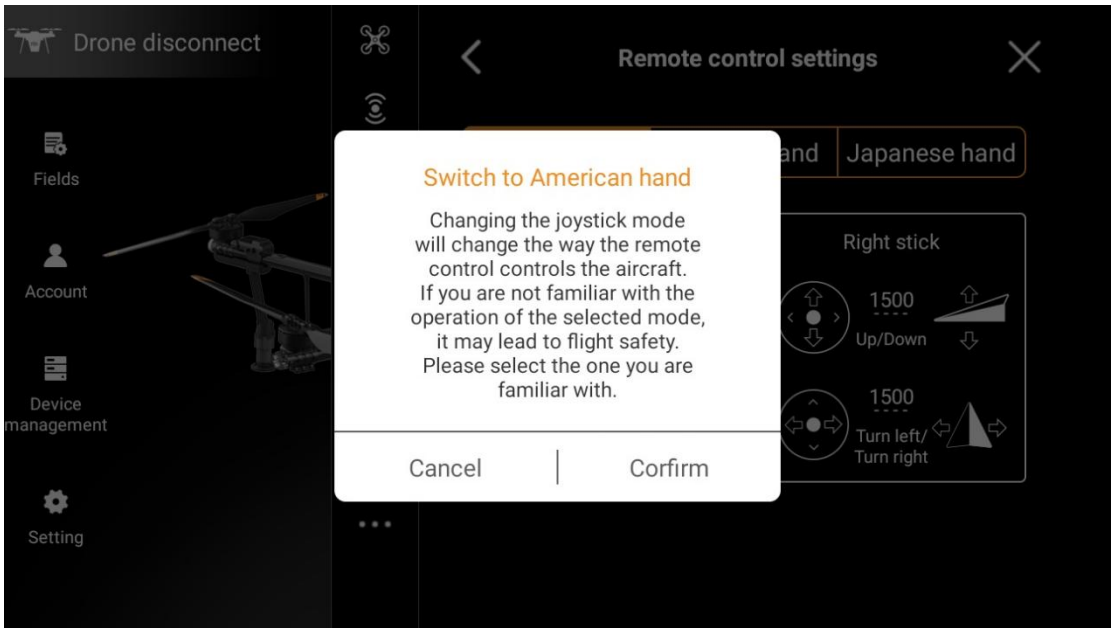
Forward/
Backward
1500
Turn left/
Turn right

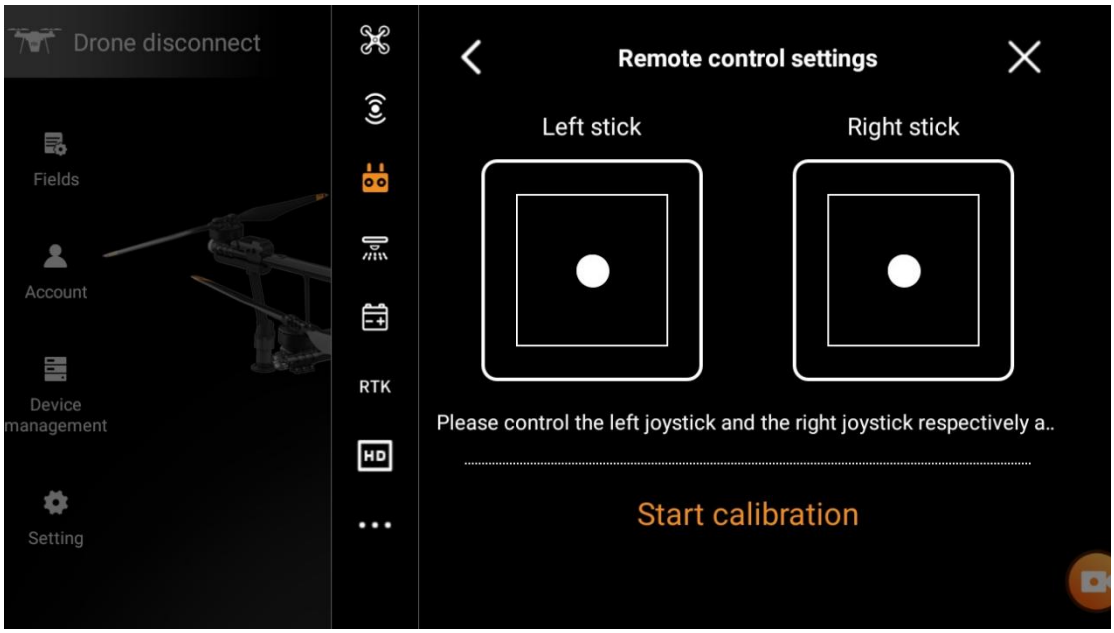


Rocker calibration

The original remote control has been calibrated from the factory. If you find any deviation in the process of using the rocker to push joystick, you can calibrate the rocker to solve the problem.

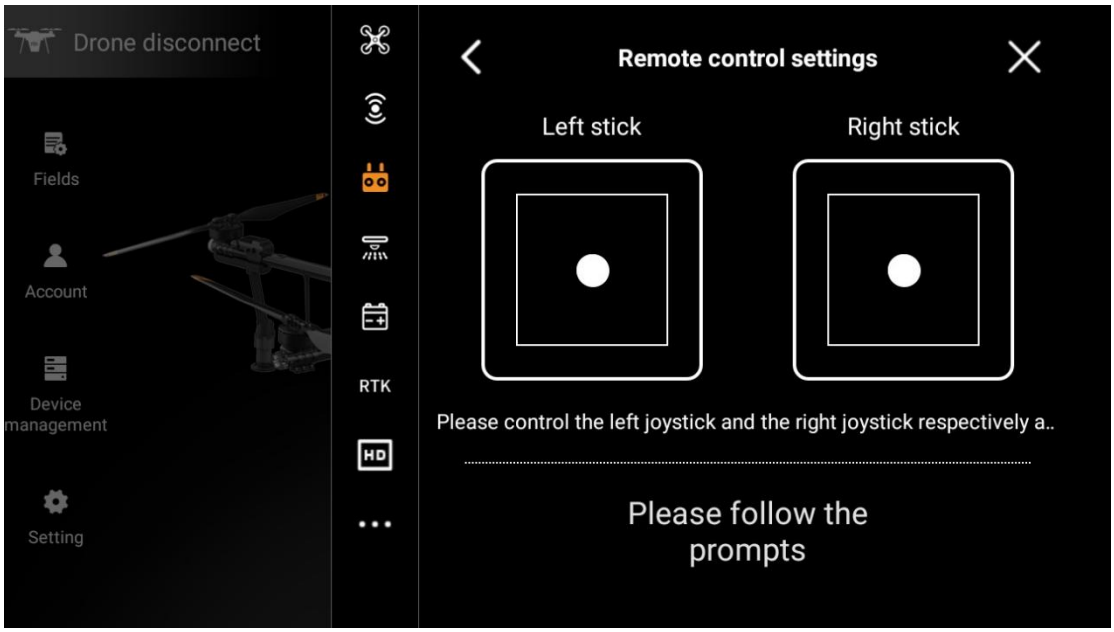
Note: When calibrating the rocker, please ensure that the UAV is not powered on.

Enter the setting interface on the right side of the agricultural UAV APP home page, find the remote control setting button, and click to enter the remote control setting interface

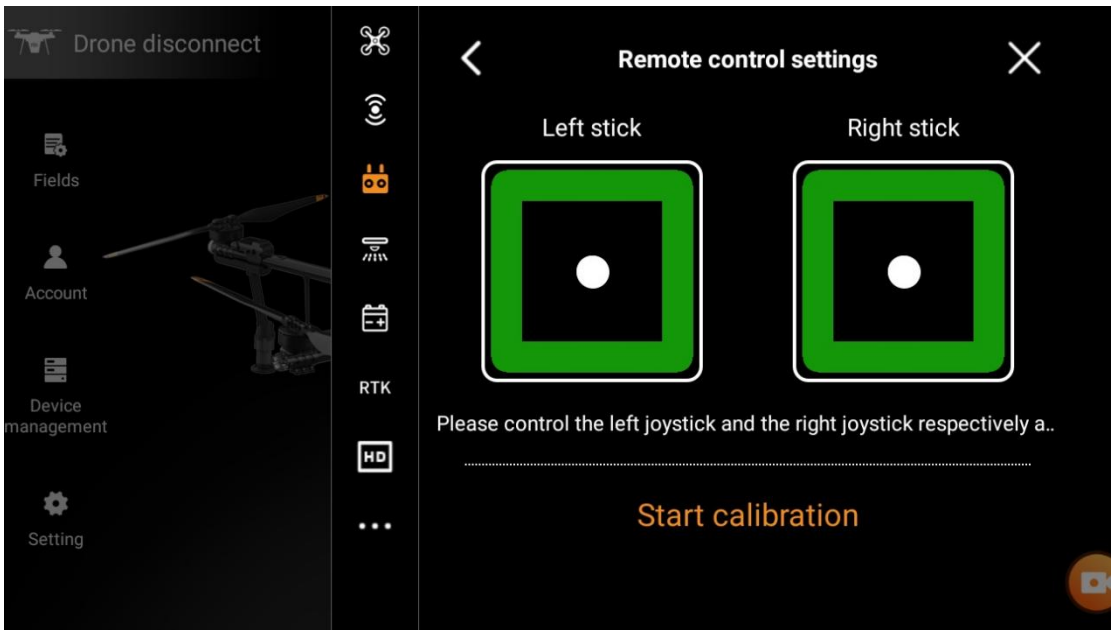


Click "Joystick Calibration" to enter the rocker calibration interface, and click "Start

Calibration" below
Operate the left and right rocker strokes according to the prompts on the interface



The rocker calibration can be completed after the square ring is filled



Activate the Aircraft

Register an User Account of UAV

Overseas users should log in to the PC platform via http://drone.huidatech.cn to register UAV account. After the successful registration, the account can also be used

on the PC platform and the remote control APP side.

Activation

After logging in to the remote control APP, if the aircraft is not activated, it will automatically pop up a box to remind the user to activate, and click according to the prompt to complete the automatic activation.

Note: When activating, please check whether the account logged in to the remote control is your own account, and the activated account is considered as the owner account.

Firmware Upgrade

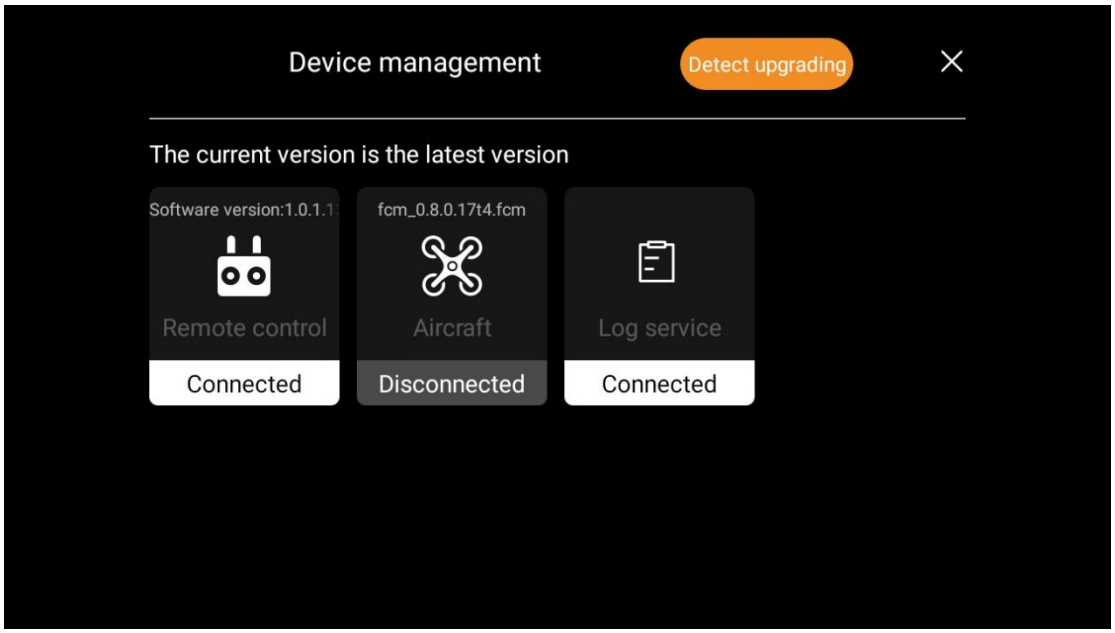
UAV APP supports online upgrade of the latest remote control firmware and aircraft firmware.

Access the Device Management interface on the home page of the agricultural UAV APP. When there is a new firmware, the version number of the latest firmware that can be upgraded will be prompted. Click the version number and press the operation to complete the upgrade.

Note:

1 To upgrade firmware, you need to download the latest firmware from the background of Huida UAV. Please keep the network unblocked.

2 Turn off the aircraft power when upgrading the remote control firmware, and keep the blades folded when upgrading the aircraft firmware.



Aircraft

Safe Parking Steps

During the operation of UAV, sometimes there are sudden special situations, so it is necessary to use special operation procedures, and correct response can ensure better operation results.

1.One-click return

If App prompts disconnection during operation, it can be returned by operating remote control rocker at close distance, and can be automatically returned by pressing the return button at long distance.

2.RTK detection

RTK positioning can achieve higher precision flight positioning, while high precision RTK positioning data comes from Qianxun network. If you cannot receive Qianxun data locally, enter the setting interface, turn off RTK detection to carry out the operation

3.Duration after disconnection

After using the functions of returning and emergency landing, the spraying system is abnormal and error is reported. At this point, the waypoint system will automatically suspend the operation, record the disconnection point and save in the ongoing module of land parcel management. After troubleshooting the system, the task in progress can be called in the plot-in progress, and the unfinished route operation can be directly executed after the call. The function of duration after disconnection can avoid re-spraying and leakage, and ensure the operation effect.

Startup and Shutdown

Startup: Press the button 1 shortly + press and hold it for 3-5s to turn on the battery power of aircraft, and the aircraft is powered on at this time.
Shutdown: When the battery power of the aircraft is turned on, Press the button 1 shortly + press and hold it for 3-5s to turn off the battery power, and then the aircraft is powered off.

Charging of Flight Smart Battery
Please use the charger provided by Huida to charge the smart battery. Please use it after being fully charged for the first time.

Please note: connect to the American plug for quick charging, and connect to the national standard plug for mains charging. The maximum power is 8000W. Please pay attention to the input power. If the power is insufficient, there may be power safety risks. Please pay attention to the charging safety.

Flight Mode

The aircraft flies in P mode by default. If the attitude mode is allowed to be turned on in the App, it can be switched by the flight mode physical key switch of the remote control.

P mode (positioning): RTK high-precision positioning module is used to realize accurate hovering of aircraft. When GNSS signal is better, GNSS can be used for accurate positioning; When RTK function is turned on and differential data transmission is normal, centimeter-level positioning can be obtained. When the GNSS signal is weak or the compass is disturbed, it will passively enter the attitude mode.

A mode (attitude): GNSS module is not used for positioning, only attitude augmentation is provided. The flight speed of aircraft in attitude mode is related to environmental factors such as wind speed.

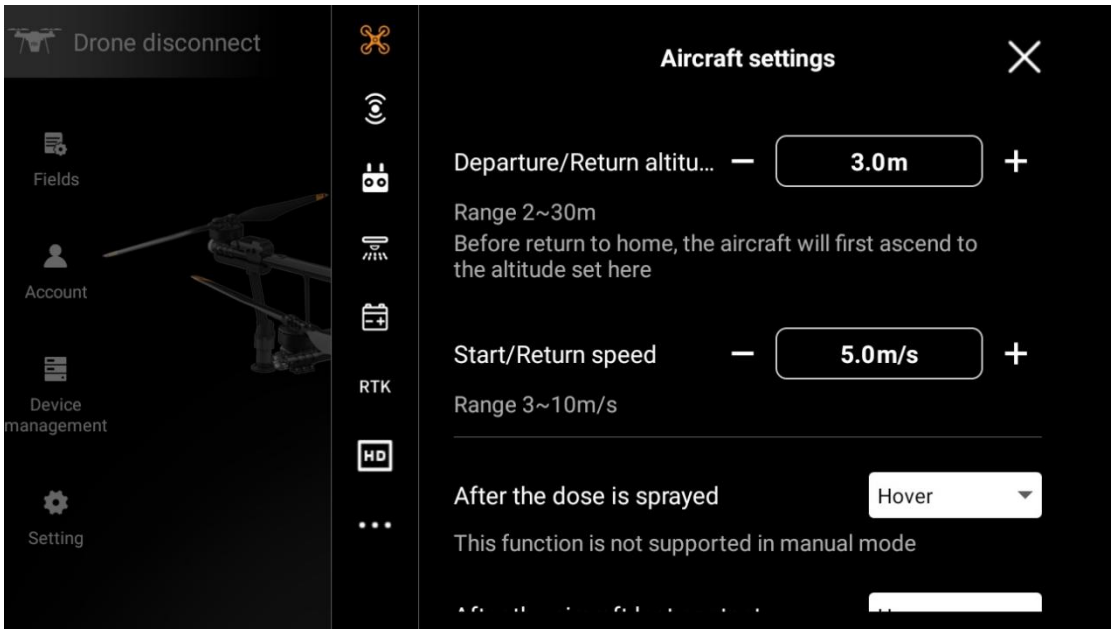
Attitude Mode Considerations

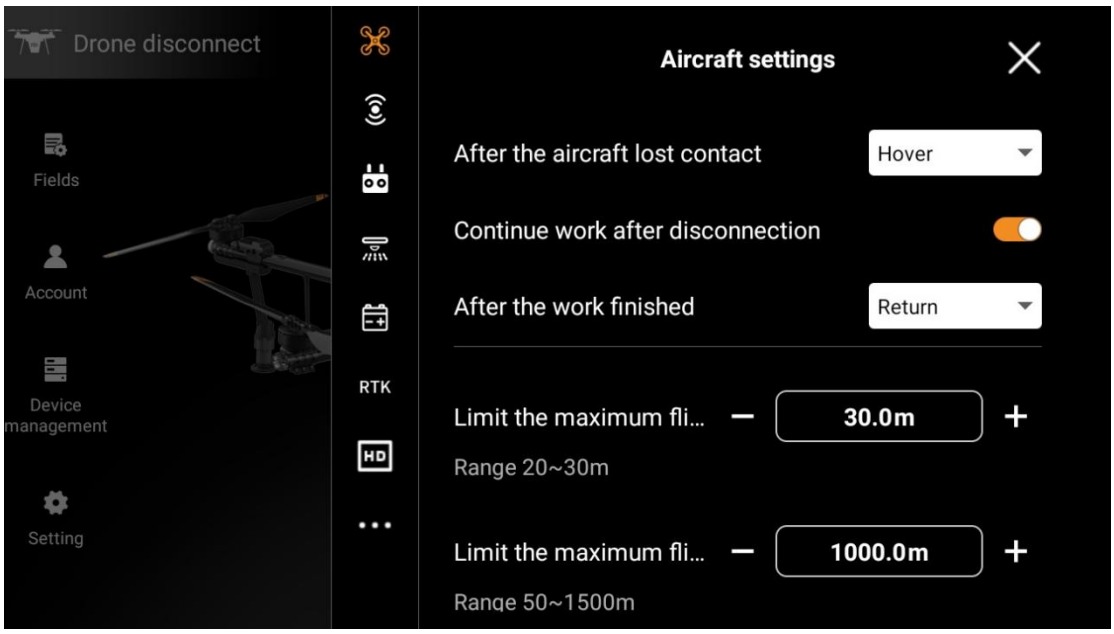
In attitude mode, the aircraft is easily disturbed by the outside world, resulting in drift in the horizontal direction. Thus, in this mode, the aircraft cannot achieve fixed-point hovering, and the user needs to manually control the remote control to achieve aircraft hovering. In this mode, the control difficulty of the aircraft will greatly increase. If you need to use this mode, you must be familiar with the behavior of the aircraft in this mode and be able to control the aircraft skillfully. When using, do not fly the aircraft out of a long distance, in order to avoid the risk caused by losing the judgment of the attitude of the aircraft because the distance is too long. Flying in the environment with poor GNSS satellite signal and obstructions (such as near tall buildings) and narrow space should be avoided as far as possible, in order to avoid passively entering attitude mode and causing flight accidents.

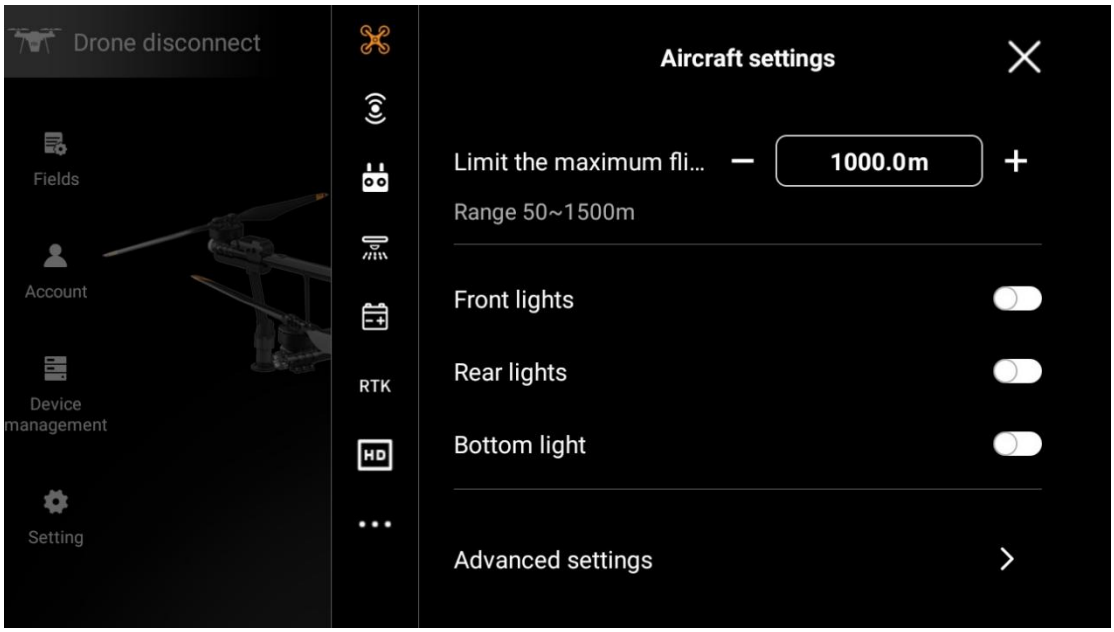
Aircraft setup

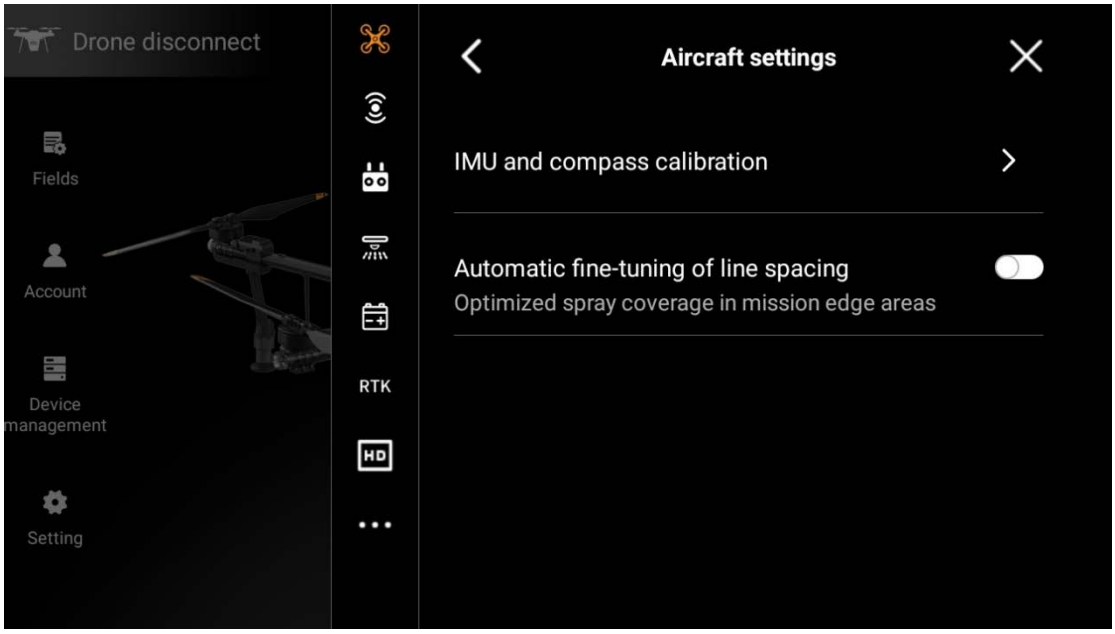
Support in aircraft setting: departure/return altitude, departure/return speed, hover or return after spraying the dosage (manual and manual enhancement are not supported), continue operation after aircraft loss of contact (hover, return, landing), continue operation after aircraft loss of contact (only support full autonomous route mode), after operation completion (return, hover), limit maximum flight altitude, limit maximum flight distance, front light switch, rear light switch Bottom light switch, advanced setting (IMU and compass), automatic fine adjustment switch of line

spacing (only effective when fully autonomous route)









Flight

Flight Environment

1.Do not spray in windy environment, and flight is not allowed when the wind level is below grade 5.

2.Do not fly in bad weather, such as foggy weather with low visibility, windy weather (wind speed is 8m/s and above), rain and snow, etc.

3.Select an open place without tall buildings around as the flight site. Tall buildings will block GNSS signals, which may lead to RTK positioning failure of aircraft, and have great flight safety risks.

4.Always fly within sight range and stay away from any obstacles, people, water surface and animals.

5.No electromagnetic interference such as high-voltage lines, communication base stations or transmission towers in and around the operation area.

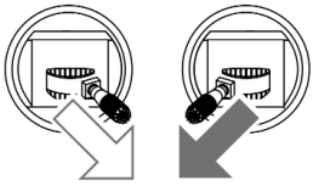
6.Do not fly above 4km above the sea level.

7.Ensure that GNSS signal is good and RTK antenna is not blocked during flight.

8.Do not operate the UAV indoors.

Manual takeoff

Execute one of the following joystick pushing actions to start the motor, and then push the throttle lever up to take off.



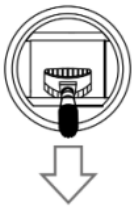
Throttle lever
(Left rocker for US operation mode)

Note: unlocking the motor for takeoff can only take effect in the operation interface or aircraft planning plot interface, and other interfaces cannot unlock the motor

Manual Landing

Pull the throttle lever down until the aircraft lands on the ground. After the aircraft landing, the motor can be stopped in the following two modes:

After the aircraft landing, pull the throttle lever to the lowest position and hold 5s before the motor stops.



• The propeller rotating at high speed is dangerous, so you should keep a safe distance from the aircraft and keep the aircraft away from people, animals or other obstacles.
• Be sure to keep the remote control in hand before the aircraft motor stops and ensure that the aircraft is completely under control.
• Do not stop the motor during flight, otherwise the aircraft will fall. Unless there are special circumstances (such as the aircraft may crash into people), it is necessary to

stop the motor urgently to minimize the injury.
• After landing, please turn off the aircraft first, and then turn off the remote control.

Electronic Fence

The electronic fence is turned on by default, which will limit the flying height and maximum flying distance of UAV.

The flying height and the farthest flight distance (centered on the remote control) of the UAV can be safely restricted in the APP setting of Huida UAV.

No-fly Zone

According to the regulations of ICAO and air traffic control in various countries on airspace control and the regulations on UAV management, UAV must fly in the prescribed airspace. For flight safety reasons, the flight restriction function is turned on by default, including no-fly zone restriction and electronic fence restriction, to help users use HD540 more safely and legally.

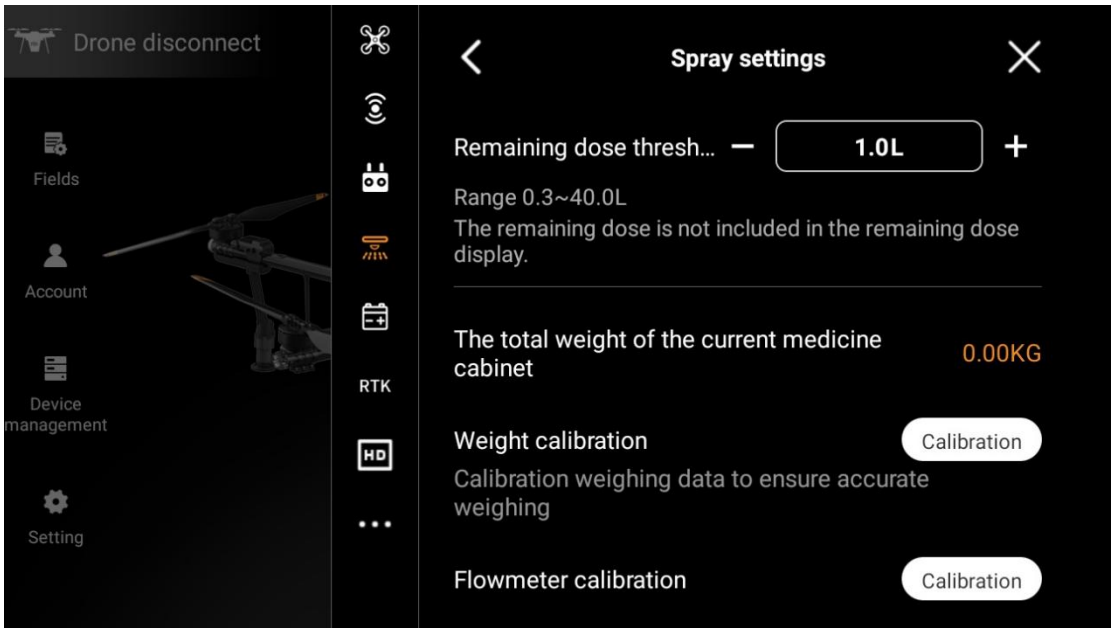
No-fly zones include the no-fly zone of the Global Air Traffic Control Bureau and the no-fly zone defined by users. For UAV, UAV should not fly in the no-fly zones. In the absence of positioning, after the UAV flying into the no-fly zone, the aircraft will automatically land with positioning, and after landing, it cannot take off in the no-fly zone.

Calibration before operation

Weighing calibration

Before weighing and calibration, it is recommended to empty the Pesticide box or seeding box.

After the weighing calibration is operated according to the prompt, first lift the Pesticide box or seeding box, and then put it down after the prompt is put down.



Flowmeter calibration

For the first time of using UAV for spraying, please calibrate the flow meter first to avoid inaccurate amount per mu caused by inaccurate flow

How to calibrate:

First add more than 20L of clean water into the Pesticide box, enter the home page of the agricultural UAV APP, click "Start Operation", the right setting drop-down, select the spray setting, click "Flowmeter Calibration", and wait for the system to complete the flow meter calibration. If it fails, you can try again.

IMU calibration and compass calibration

Compass calibration is very important, and the calibration results directly affect flight safety. Failure to calibrate compass may lead to abnormal operation of aircraft.

Do not calibrate in areas with ferromagnetic materials, such as telephone poles and walls with steel bars.

Do not carry ferromagnetic materials with you during calibration, such as keys and mobile phones.

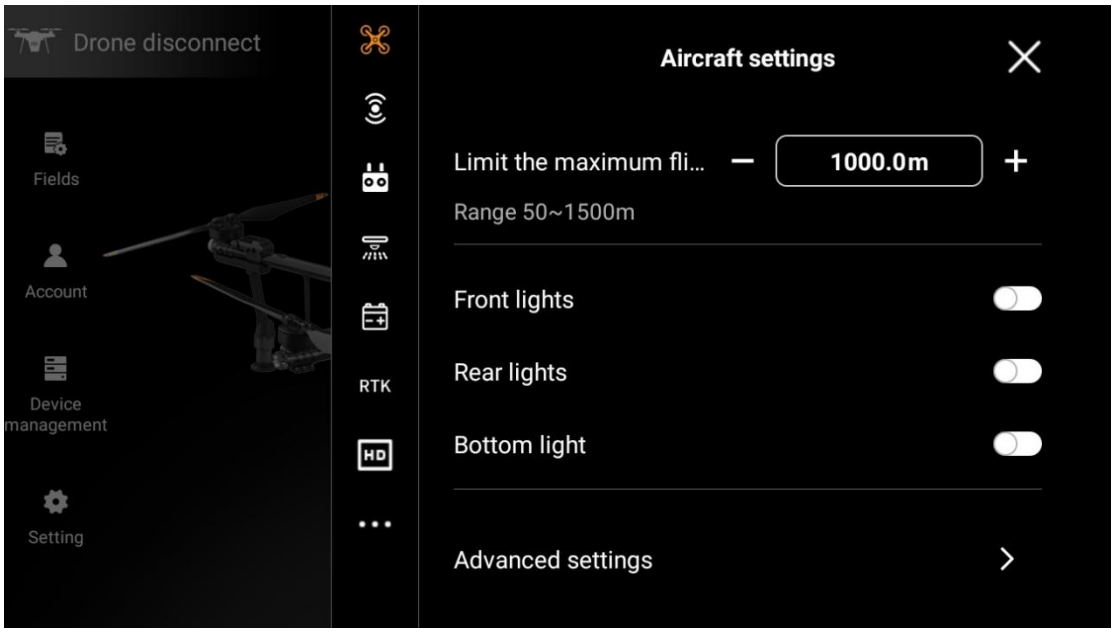
If the red light of aircraft status indicator flashes after calibration, the calibration fails. Please re-calibrate the compass.

After successful calibration, put it on the ground, and the compass is abnormal, which is probably due to metal objects underground. Please change the position to check whether the anomaly is eliminated.

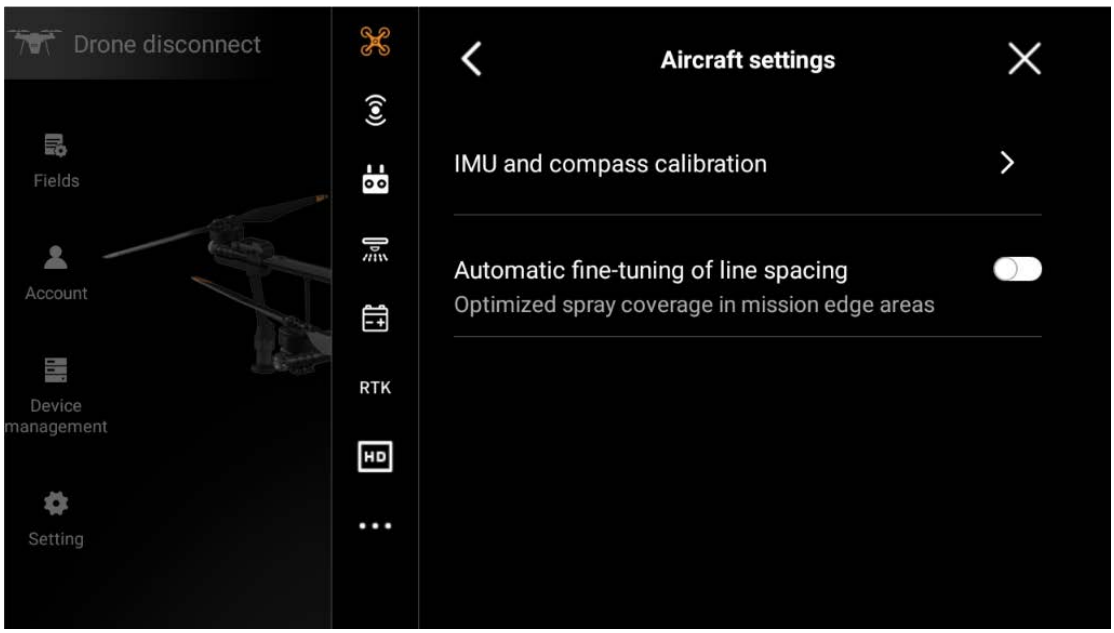
How to calibrate

1.Enter the home page of agricultural UAV APP, click "Start Operation", and select "Aircraft Settings" from the setting drop-down on the right

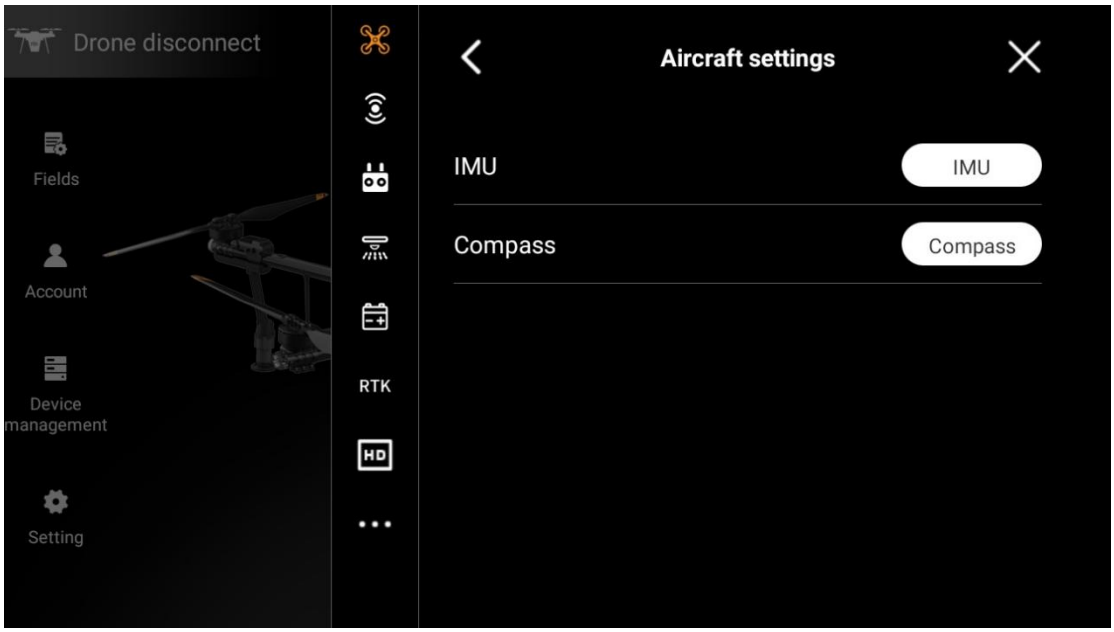
2.Select "Adjusted Settings", select "IMU and Compass Calibration", click "Compass Calibration", and follow the prompts on the interface. Two people lift the UAV and turn horizontally in the specified direction. When the remote controller prompts that the calibration is successful, the UAV can be put down.
3.If the calibration fails, try again according to the above steps
Note: Before calibrating the compass, please connect to the network to maintain the positioning information, and keep away from metal, signal transmission tower, objects with strong electricity and magnetism, about 1 meter from the ground, and rotate the aircraft horizontally for 3 circles or more.



click”IMU and Compass Calibration”



Follow the prompts to calibrate the IMU and compass respectively



Start/stop the Motor

Start motor

Under the condition that the UAV battery is full of power, the communication with the remote control is normal, and the RTK positioning of the aircraft is available, the starting motor can be unlocked by unlocking the left and right rockers of the remote control in the start operation interface.

After the motor starts to rotate, please release the rocker immediately and push joystick to take off as soon as possible. If not taking off, please do not push joystick to make the motor start to rotate, otherwise the aircraft may be out of balance, drift or even take off automatically, resulting in personal injury or property loss.

Stop the motor

After the aircraft landing, pull the throttle lever to the lowest position and hold 5s before the motor stops.

Note: The propeller rotating at high speed is dangerous, so you should keep a safe distance from the aircraft and keep the aircraft away from people, animals or other obstacles.

Be sure to keep the remote control in hand before the aircraft motor stops and ensure that the aircraft is completely under control.

Do not stop the motor during flight, otherwise the aircraft will fall. Unless there are special circumstances (such as the aircraft may crash into people), it is necessary to stop the motor urgently to minimize the injury.

After landing, please turn off the aircraft first, and then turn off the remote control.

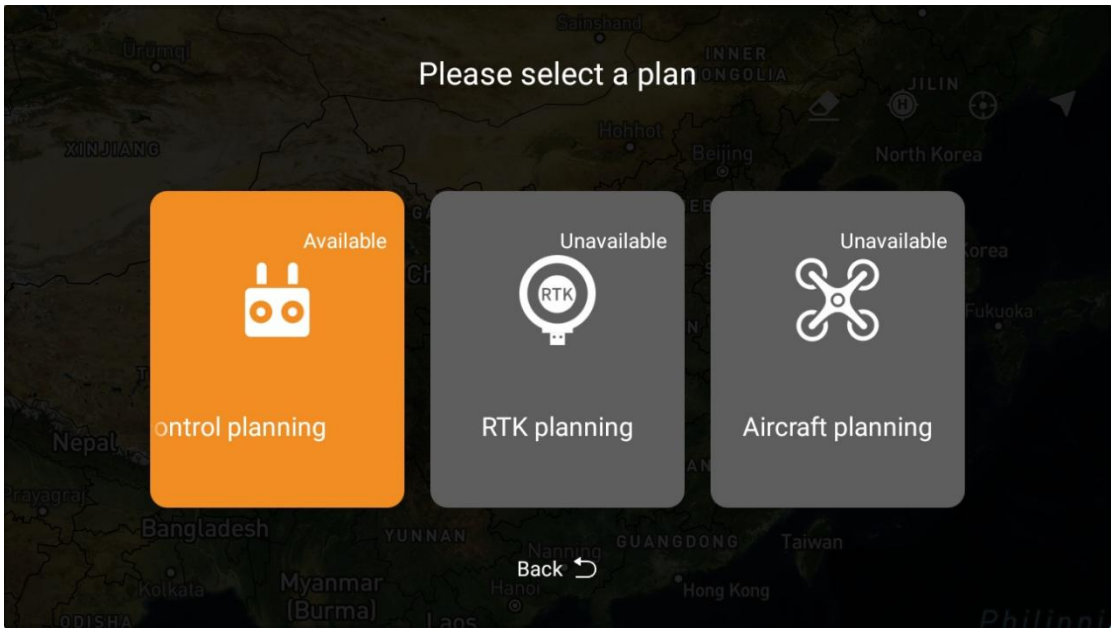
Basic Flight

1.Place the UAV in a conspicuous position in the operation plot that can ensure flight safety, and the tail faces people
2.After adding pesticide solution or spreading materials into the operation container, cover it tightly
3.Insert the UAV smart battery into the battery compartment and turn on the battery power switch
4.Turn on the power switch of the remote control
5.Ensure that the aircraft is connected to the remote control properly
6.If RTK positioning is used, ensure that the RTK function switch is turned on and the RTK signal source (network RTK or RTK mobile station) is selected correctly
7.Enter the Agricultural UAV App operation interface -RTK, open the RTK positioning function of the aircraft
8.Wait for searching the satellite to ensure that the GNSS signal is good and the RTK positioning status is normal. After the RTK positioning is fixed, perform the action of pushing joystick to start the motor (for example, if the motor is started, there will be a reason prompt or alarm in the APP interface, so try again after checking according to the prompt).
9. After the motor is started, push the throttle lever upward immediately to make the aircraft take off smoothly.
10.Select the corresponding operation mode according to the needs.
11.When requiring to descend, ensure that you have quit the operation. You can manually control the aircraft and slowly pull down the throttle lever to make the aircraft descend slowly on the flat ground.
12. After landing, pull the throttle lever to the lowest position and hold it for more than 3s until the motor stops.
13. Ensure that the motor stops before turning off the aircraft, and then turn off the remote control.

Note: During flight, if the App text or voice prompts the aircraft battery to be in a low power state, at this point, the aircraft should fly to a safe area and land as soon as possible, and then the battery should be replaced; If the App prompts that the battery of the aircraft is in a state of severe low power, the aircraft will automatically land in place (at this point, the flight cannot be controlled through the rocker, so please note the remaining battery power at any time)

Plan Fields

UAV APP provides four modes to plan plots: RTK planning, aircraft planning, remote control planning and map planning.



RTK Planning

For RTK planning, the RTK high-precision positioning module installed in remote control is used for the measurement. For your safety, please ensure that the aircraft power is turned off when using RTK planning.

1.Ensure that the RTK high-precision positioning module is installed in the remote control

2.Turn on the remote control and slide down from the top of the screen to ensure that the "USB" switch is ON

3.Enter the main interface of App, click "Planning Plot", and select "RTK Planning"

4.Enter > RTK settings, select RTK signal source (Users outside Chinese Mainland only support RTK mobile stations as RTK network sources), and complete the corresponding settings. Wait to ensure that the RTK positioning status bar above the interface is green, indicating that RTK positioning has been used

5.Walk along the boundary of the area with the remote control held, click the "Add" icon at the inflection point of the plot, and add the boundary point of the plot by default, and add the boundary point to all the inflection points of the plot in turn to complete the mapping of the plot boundary

6.Add obstacle points: For non-circular obstacles, the planning method is the same as the planning plot. Walk along the boundary of obstacles with the remote control held, select the type of planning point as "obstacle point" at the inflection point of obstacles, click the "Add" icon to complete the addition of obstacle points, and add obstacle points to all obstacle inflection points in turn to complete obstacle mapping.

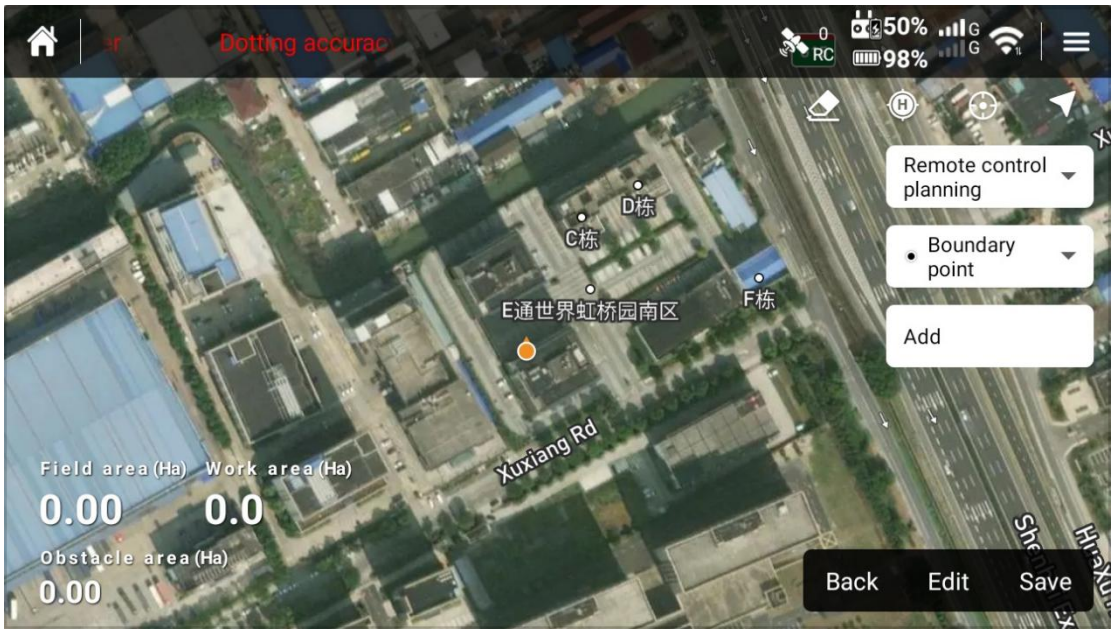
Note: When adding obstacles, for the sake of subsequent flight safety, it is recommended that the boundary planning of obstacles should keep at least 3m away from obstacles. Surely, you can also enter the plot editing and unified adjustment after planning obstacles.

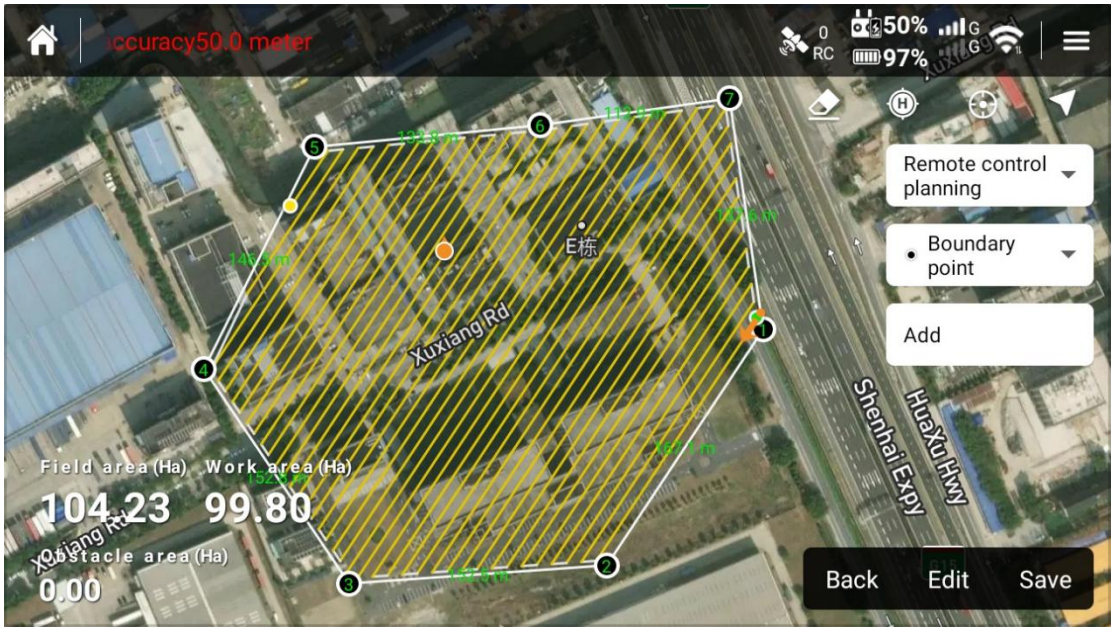
7.Add circular obstacles: Walk toward to the side of the circular obstacle with holding the remote control, select the type of planning point as "Circular Obstacle", and then click the point on the edge of the circle of the circular obstacle to drag and adjust the radius of the circular obstacle.
8.Intelligent flight course planning: After the plot is added, the flight course will be automatically generated, and after the obstacles are added, the flight course will automatically adjust the optimal flight course according to the obstacles.
9.Add reference points: If necessary, one or more reference points can be added outside the planned plot, which is convenient for flight course correction based on RTK positioning of aircraft when the plot is called.

Remote Control Planning

The user need to walk along the edge of farmland or obstacles with remote control held for measurement. For your safety, please ensure that the aircraft power is turned off when using remote control planning.

1.Power on the remote control, enter the main interface of App, click "Planning Plot", and select "Remote Control Planning"
2.Ensure that the positioning accuracy is within 2m, and refer to RTK planning for other operation steps (the same operation)





Flight Planning

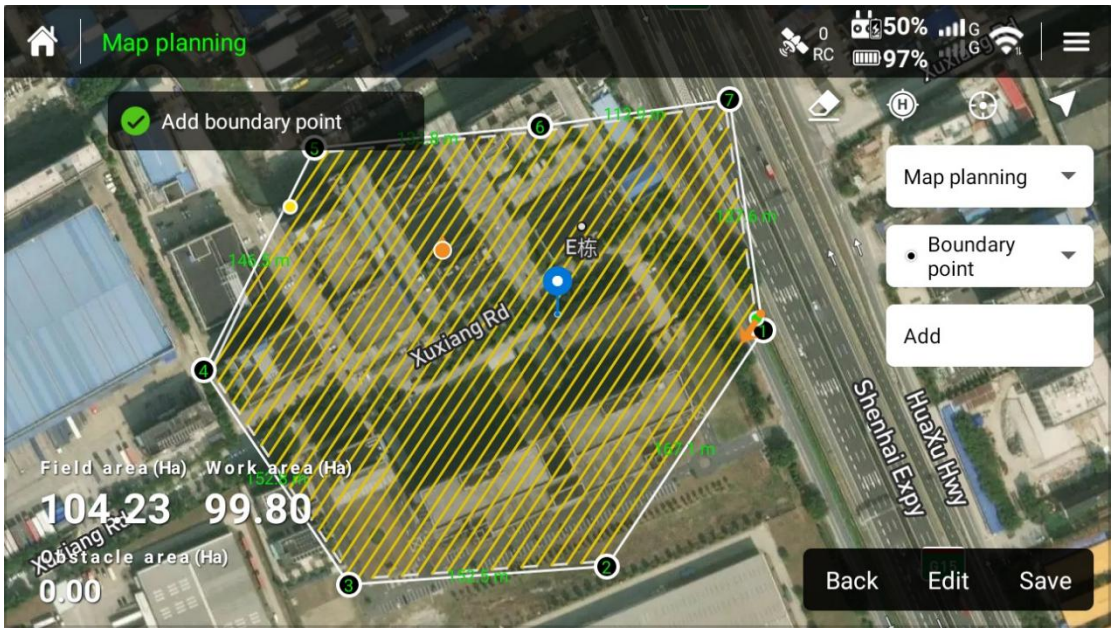
The user could control the aircraft to the required position, and then add waypoints through the remote control or App buttons to measure the edges and obstacles of farmland.

Power on the remote control, enter the main interface of App, and then connect the power of aircraft
Click "Planning Plot", select "Flight Planning"
Unlock the UAV and it takes off to hover in a safe area
Other operation steps are similar to those of RTK planning, you only need to control the aircraft instead of walking with the remote control
Note: After the plot is planned, please save it before the modification. After saving, you can upload a plot to the cloud for backup, in order to prevent it from being unable to recover after error in modification.

Map planning

You can switch from other planning methods to map planning. After switching to map planning, you can manipulate the touch screen to move the location icon to plot the planned plot.

Note: The map planning suggests that the satellite positioning accuracy be re-planned within 2 meters, otherwise the route may deviate from the plot due to excessive deviation



Edit Fields

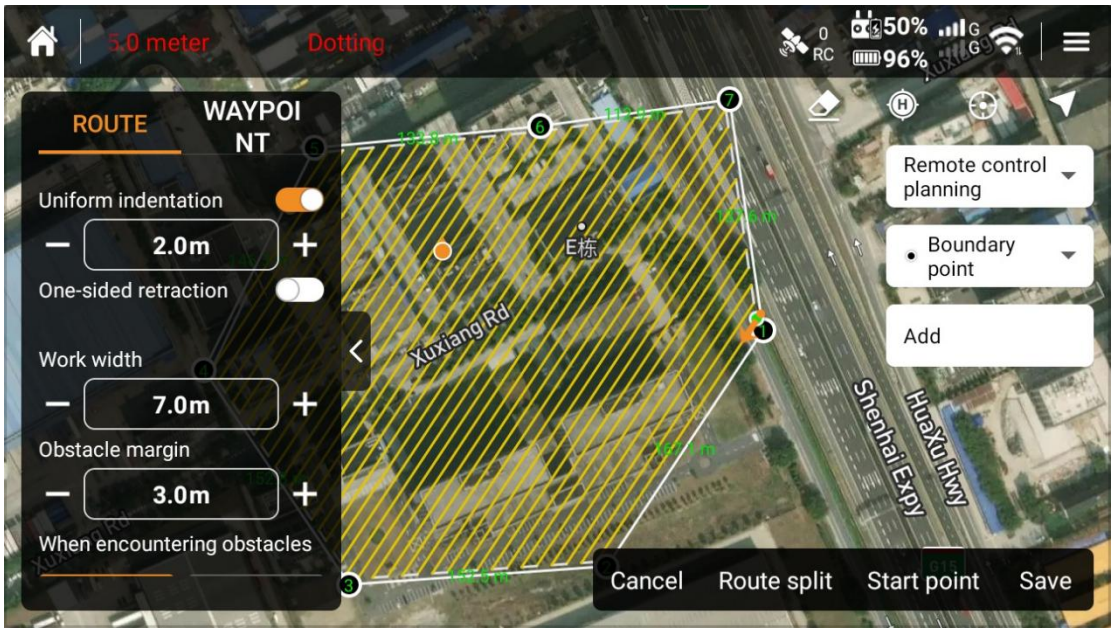
Edit the Flight Course

Adjust the indentation: The default adjustment is unified indentation, with a minimum of 0m and a maximum of 6m, and 1.5m by default. You can click the target sideline of the selected plot, and then edit the unilateral indentation value.

Operation row spacing: 7m by default, 2m by minimum and 11m by maximum

Obstacle margin: 3m by default, 1.8m by minimum and 10m by maximum

When encountering obstacles: bypass by default and turn back optionally; this is the route planning method when the flight route encounters obstacles, which can be selected according to actual needs.

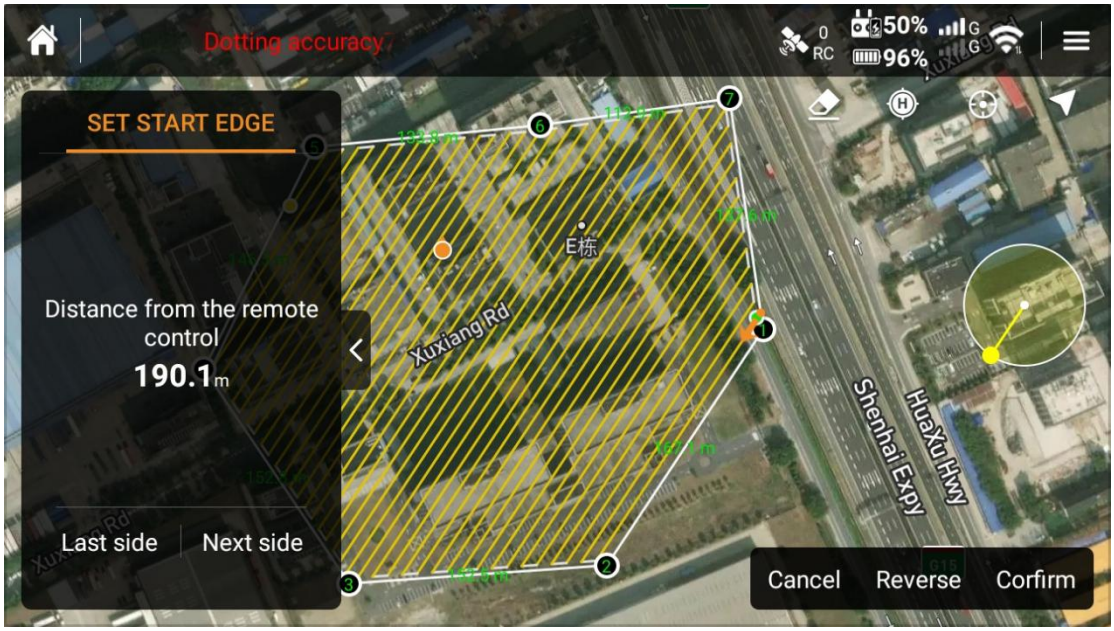


Adjustment of route direction

Support adjusting the direction by fine-tuning sliding, when each point is subject to fine-tuning, adjust +1° or -1°.

Adjust the route direction quickly: Double-click the sideline of the target plot, and the route will be parallel to the sideline.

Reverse route: Select the sideline of the target plot, and click "Reverse route" to set the starting point to the other side of the sideline (quick adjustment of route direction).

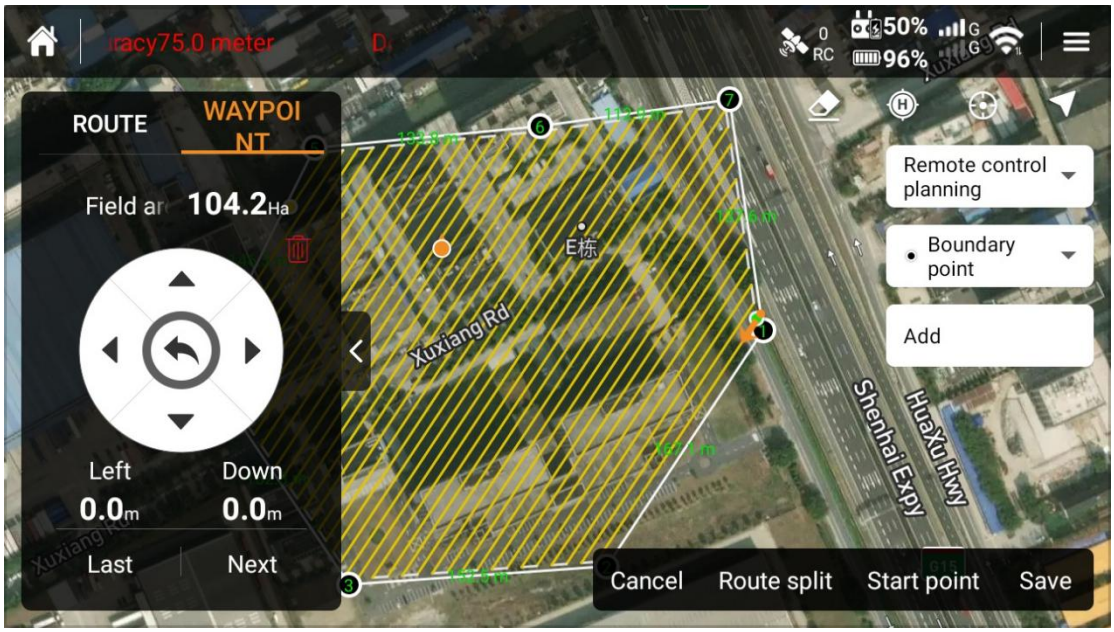


Edit Waypoint

Move boundary point: Drag or move the position of the boundary point of the plot by fine-tuning. After moving the boundary point, the route will be intelligently planned again in real time.

Delete the boundary point: Delete unnecessary boundary points, the route will be re-planned intelligently immediately.

Add the boundary point: After adding the boundary point, the route will be re-planned intelligently immediately.



Edit Obstacles

Add obstacles: the same as planned obstacles, please refer to planned circular obstacles and non-circular obstacles respectively

Delete the obstacle point: select an obstacle point and click Delete to delete the obstacle point

Delete the circular obstacle: click to select a circular obstacle and click "Delete" to delete the circular obstacle

Move the obstacle point: Click to select an obstacle point, drag or move the obstacle point by fine-tuning to the target position

After editing the obstacles, the route will be intelligently re-planned in real time

Add a Reference Point

Select a relatively fixed symbolic point as the reference point, and the subsequent route correction will be more convenient and accurate

Delete a Reference Point

Click a reference point, click "Delete" to delete the reference point

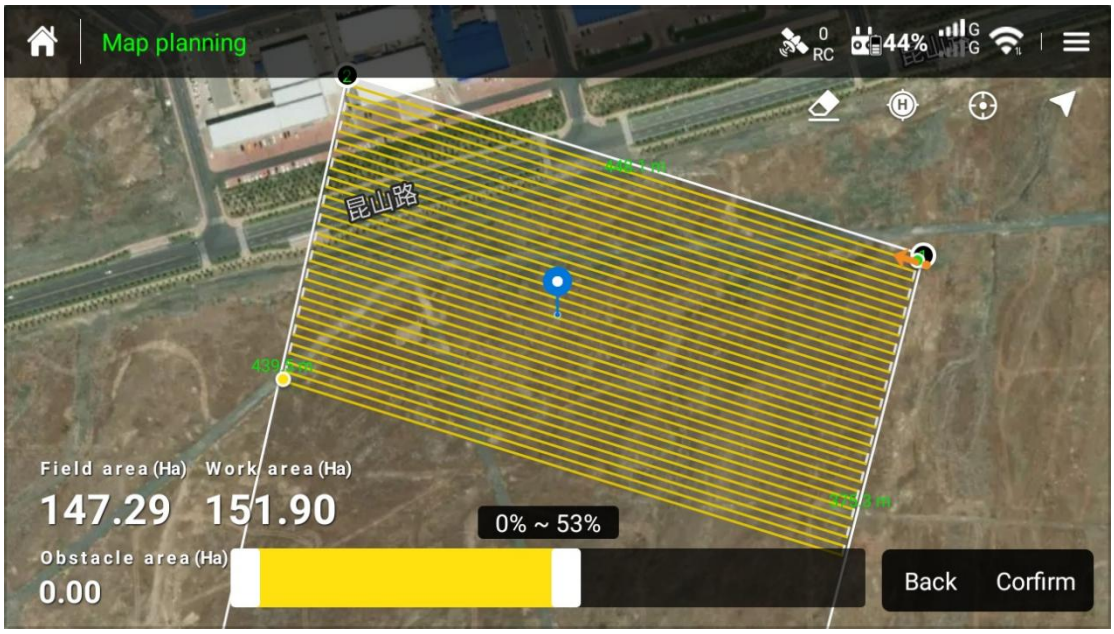
Undo Operation

If the operation of addition, deletion or movement needs to be revoked, click the "Undo" button to complete the undo operation

route Segmentation

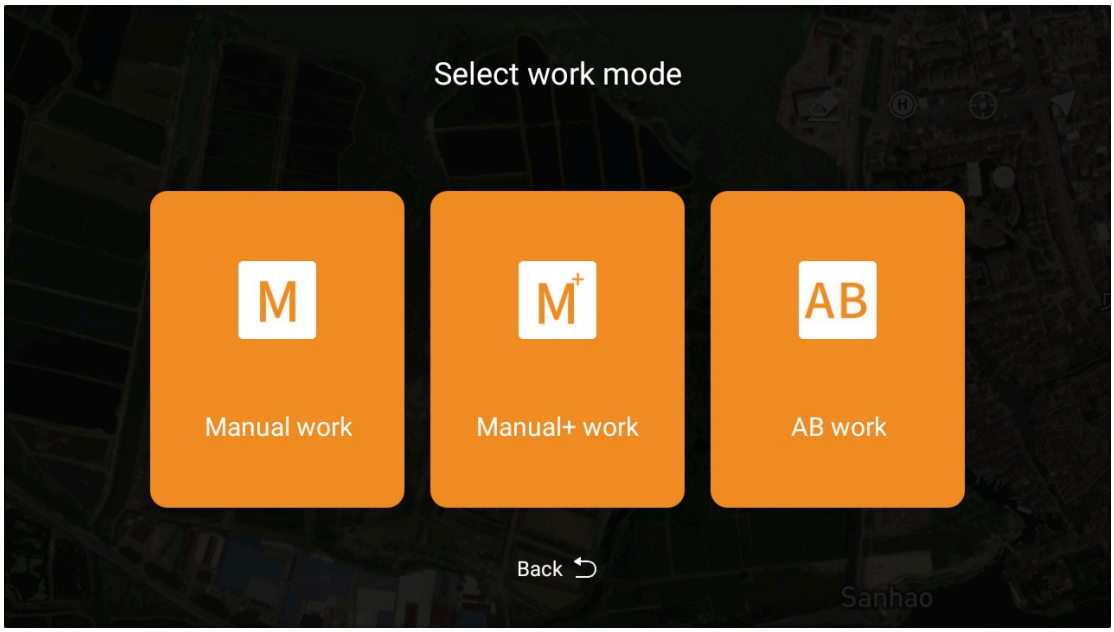
route segmentation can separate the route that do not need operation temporarily and keep the route that need operation

Note: In case of any error in segmentation operation, you can cancel Save and segment again in the Save Plot dialog box



Work Mode

HD540 agricultural UAV has route operation mode, A-B point operation mode, manual operation mode and enhanced manual operation mode, which can be switched through agricultural unmanned aerial vehicle APP



Fully autonomous work mode

After the user conducts farmland survey, obstacle survey and waypoint setting through the intelligent planning operation system of agricultural UAV APP, the App will calculate and generate the best route based on these data to realize the intelligent planning of operation.

After the planning is completed, call the operation, and the aircraft will enter the autonomous operation mode to automatically execute operations according to the route.

The HD540 agricultural UAV has the functions of intelligent departure, intelligent supply reminder, abnormal interruption operation recovery, and can use the Obstacle avoidance system for altitude determination and obstacle avoidance.

Users can adjust the amount of spraying/seeding, flight speed, etc. in real time on the App interface. This mode is very suitable for regular or irregular large plot operation.

A-B point work mode

Users can map A-B points through the intelligent planning operation system of agricultural UAV APP. After setting A-B points, adjust the direction of A and B points and the parallel of the plot boundary, and then set the number of routes to cover the plot. The App will calculate and generate the best route based on the data to realize the intelligent planning of the operation. After the planning is completed, the aircraft will enter the A-B point operation mode and automatically perform the operation according to the only planned route.

The HD540 agricultural unmanned aircraft has the functions of intelligent departure, intelligent supply reminder, abnormal interruption operation recovery, and can use the Obstacle avoidance system for altitude determination, obstacle avoidance and

automatic obstacle avoidance.

Note: It is impossible to plan obstacles in the plot at point A-B. If there are obstacles in the plot, it is recommended to use the Fully autonomous work mode, plan the plot first, and then call to execute the operation.

Manual work mode

For small plots or plots with many obstacles and complex terrain, the manual operation mode can be used. The flight path of the aircraft is completed by manually hitting the lever on the remote controller, and the spraying or broadcasting switch needs to be manually turned on. At this time, the UAV is not recommended to fly outside the range of sight distance, otherwise flight safety risks may occur.

Enhanced manual work mode

The enhanced manual operation mode can also be used for large and medium-sized parcels that have no obstacles and are relatively regular. Fly the aircraft to the expected route of the target, align the nose with the expected route, set the amount of mu, flight speed, operation line spacing, and relative crop height, and then click "Start", and then hit the rod in the forward direction. When reaching the headland, click "Left Transverse" or "Right Transverse" as required to complete the lateral movement, Then hit the stick back (note: if the HD540 uses four centrifugal nozzles and does not turn around, the UAV is flying ahead of the tail at this time), and repeat the above operation to complete the operation.

Automatic Return

Return point: When RTK positioning is available, the departure point or remote control location is the default return point

Return: The process of an aircraft automatically returning to the return point is called return

One-click Return

Intelligent return can be started by pressing and holding the return button on the remote control. Its return process is the same as that of out-of-control return, but the difference is that the user can control the height of the aircraft to avoid obstacles by pushing joystick. In the process of intelligent return, you can receive the control right of UAV by pushing joystick

Return without Carrying Pesticides

HD540 Agricultural UAV supports setting UAV action after not carrying pesticides, and you can select hovering or returning. If you select return, the UAV will

automatically fly back to the return point after spraying pesticides, and you can receive the control right of the UAV by pushing joystick at will during the return process

Return with Low Power

HD540 Agricultural UAV supports setting the UAV to operate after low power, and you can select hovering or returning. If you select return, pesticides are completely sprayed, the UAV will automatically fly back to the return point, and you can receive the control right of the UAV by pushing joystick at will during the return process

Return when Loss of Communication

HD540 Agricultural UAV supports the action after the loss of communication, and you can select hovering or returning. If you select return, the UAV will automatically fly back to the return point when it detects the loss of communication with the remote control for more than 5s. If the UAV can be reconnected during the return flight, you can receive the control right of the UAV by pushing joystick during the return process

Note: Pay attention to avoid obstacles inside or outside the plot when returning automatically

Select the Return Point

The user can select the departure point position in Agricultural UAV APP, and the remote control position is used as the return point for the UAV to automatically return

Update the return point according to the following steps:

1.Open Agricultural UAV APP, enter the operation interface

2.Click Settings and select “  ” in the return location, the current coordinates of the aircraft will be updated to the return point

3.Click Settings and select “  ” in the return location, the current coordinates of the remote control will be updated to the return point

4.After the return point is set successfully, the aircraft status indicator will display a flashing green light

Automatic Return Distance

If the UAV is within 10m of the remote control, the UAV will not trigger the automatic return function

Automatic Return Condition

If RTK positioning is available, automatic return will not be triggered when RTK positioning is unavailable

Return and Avoid Obstacles

When the environment meets the operating conditions of Obstacle avoidance module, the aircraft can return to avoid obstacles. If there are obstacles less than 20m away from the aircraft on the return path, the aircraft will slow down to hover. Subsequently, the aircraft exits the return process, and the user can manually control the aircraft

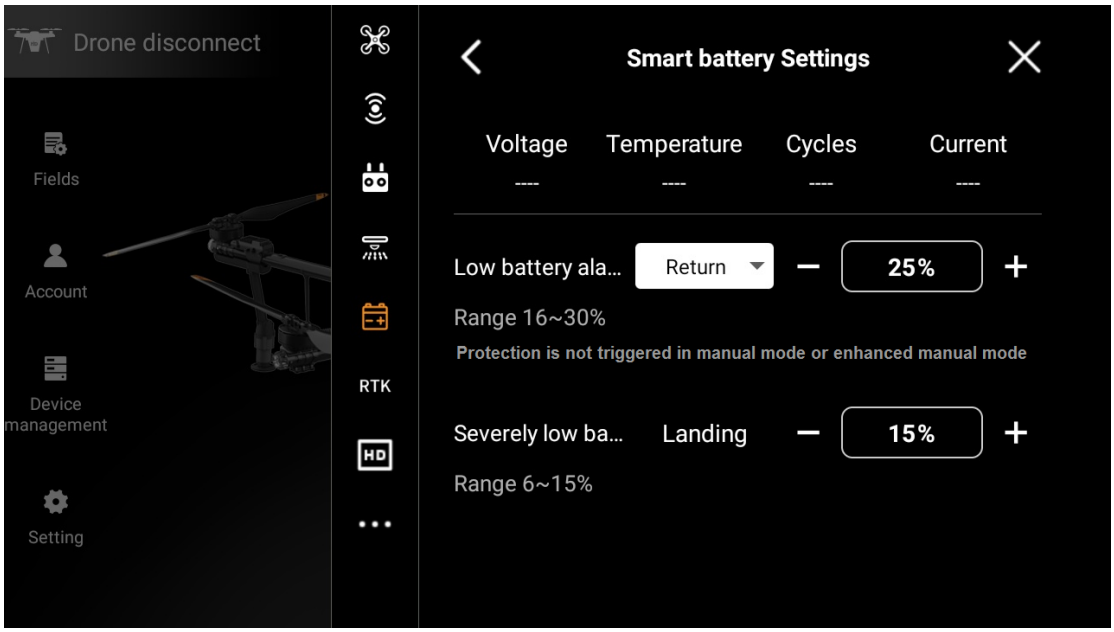
Low Power and Ultra-low Power Protection

HD540 UAV has the functions of low power alarm, severe low power alarm and low voltage alarm

1.If the App gives an alarm of low power, fly the aircraft to a safe area and land it as soon as possible, and then replace the battery. If the behavior after reaching the low power is set to return, the aircraft will automatically return after the App gives a low power alarm;

If the behavior after reaching low power is set as hovering, the aircraft will hover and wait for the user to operate after the App gives a low power alarm

Note: The specific remaining power percentage of low power can be set by the user in Agricultural UAV APP. It is suggested that the user settings should be relatively conservative to ensure flight safety



Note: The specific percentage of remaining power of low power can be set in the agricultural UAV APP. It is recommended that users set it relatively conservatively to ensure flight safety

2.If App gives an alarm of severe low power or severe low voltage (the battery voltage is less than 60V), the aircraft will be automatically landing in place, and the user cannot interfere with the landing process

Note: For severe low power, the user can set the remaining power percentage. It is suggested that the user settings should be relatively conservative to ensure flight safety.

Aircraft indicator

Aircraft arms M1 to M6 are equipped with LED lights. LED lights of arms M2 and M6 are nose indicator lights, and red lights are always ON during flight to indicate the nose direction of aircraft. LED lights of arms M3 and M5 are tail indicator lights, and the green light is always ON during flight to indicate the tail direction of the aircraft. LED lights of arms M1 and M4 are aircraft status indicators, which indicate the current status of the aircraft when the aircraft does not take off. See the appendix for specific description; when the aircraft is flying in the air, the indicator light is OFF.

HD540 Lights Meaning Table

Light Meaning	Flight control lamp	Unlock successfully, lock successfully	The green light is always ON for 1s
		Unlock failed	The red light is always ON
		Excessive vibration of IMU/Exception data	Yellow light flashes

		IMU not calibrated	
		Loss of remote control signal	Yellow light flashes slowly
		No GNSS	Red light flashes slowly
		GNSS With GNSS	Green light flashes slowly
		RTK is not located after RTK function is enabled	Yellow and green lights flash alternately
		Compass data is abnormal, compass is not calibrated	Red and green lights flash alternately
		IMU level is in calibration	Yellow light is always ON
		IMU is calibrated successfully	The green light is always ON for 1s
		IMU calibration failed	The red light is always ON for 1s
		Compass level is in calibration	Green light is always ON
		Vertical calibration of compass	Yellow light is always ON
		Successful calibration of compass	The green light is always ON for 1s
		Compass calibration failed	The red light is always ON for 1s
		Remote control is being paired	Yellow light is always ON
		Successful pairing	The green light is always ON for 1s
		Pairing failed	The red light is always ON for 1s
Others	Flight at night	Lighting system control (manual)	Support manually turning on/off the headlights, rear lights and lower lights

RTK Function

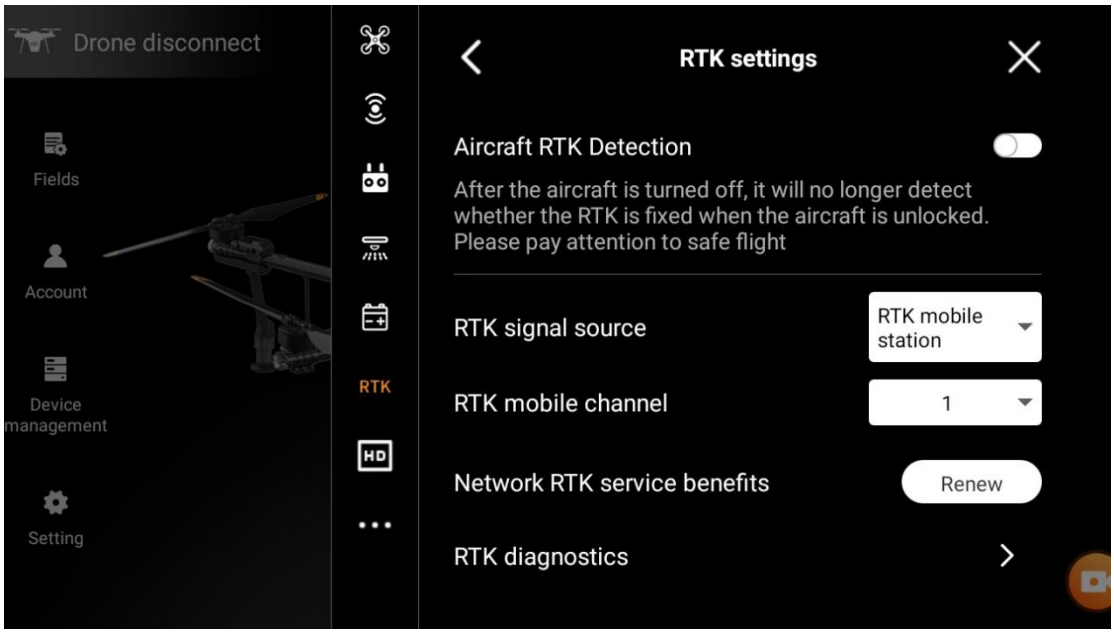
Compared with the compass module, the airborne high-precision RTK module of HD540 UAV not only has higher accuracy, but also provides strong anti-electromagnetic interference capability, ensuring reliable operation flight in the environment of high-voltage lines, metal buildings and other strong magnetic interference. Dual antenna direction finding will be automatically enabled when GNSS signal is good.

HD540 can cooperate with HD201 mobile RTK small base station to provide RTK location service. The specific use method is as follows.

Turn on/off RTK Function

Before using RTK positioning, check to ensure that the aircraft RTK positioning function is turned on and select the correct way to receive RTK signals (RTK mobile station or network RTK service), otherwise RTK positioning will not be used

Note: The aircraft uses RTK, but when RTK positioning is unavailable, the UAV will not be able to take off; The network RTK service cannot be provided in other regions and countries except Chinese Mainland.



Use in combination with Huida Tech HD201 Mobile Station

1.Complete the frequency matching between aircraft and base station and the erection of base station with reference to the description documents of relevant equipment.

2.Turn on the base station and wait for searching the satellite. The RTK status icon  at the top of the App job interface is displayed as indicating that the aircraft has acquired and used the RTK data of the base station.

Intelligent detection of equipment

Click on the homepage of UAV APP “Drone Connected”， Enter the Device Intelligent Detection interface

In the Device Intelligent Detection interface, you can view the working status of the UAV core equipment. If there is any abnormality, you can upload a log to analyze the reason.

Data protection and abnormal interruption job data recovery

In the fully autonomous operation mode or A-B point operation mode, the user can suspend the operation halfway, disconnect the power supply of the aircraft, and replace the battery or add pesticides. The operation progress, the coordinates of points A and B in the history record and the breakpoint of the operation recovery function record will be saved. After the user reconnects the aircraft power supply, the user can continue the operation at the breakpoint of the current operation task. If the aircraft operation process is manually controlled during the operation process, the user can select the return point to continue the operation after completion.
In the course of route operation, if the App crashes, the remote controller is disconnected from the aircraft and other abnormal conditions are encountered, the flight control will automatically record the breakpoint. After reconnecting to the aircraft, the App will automatically recover the breakpoint information.

Remote Controller

Overview of Remote Control

The standard remote control of HD540 Pro agricultural UAV is a new generation of UAV remote control. The remote control adopts advanced image transmission and

data transmission communication technology in the industry, and the maximum communication distance is 1.5km; With its own touch display and built-in Android system, it can directly run Huida Agricultural App for operation planning and view the aircraft status in real time; supports to connect external devices through Bluetooth and USB.

Startup and Shutdown

Press 1 shortly + hold 3-5s to turn on the power switch of the remote control. At this point, the remote control starts power-on, wait for 30s, and the remote control starts to enter the homepage of Huida UAV APP

When the remote control is turned on, press 1 shortly + hold 3-5s. The remote control will pop up a box to prompt whether the remote control needs to be turned off or restarted. The shutdown or restart operation can be completed by selecting as required

Charge

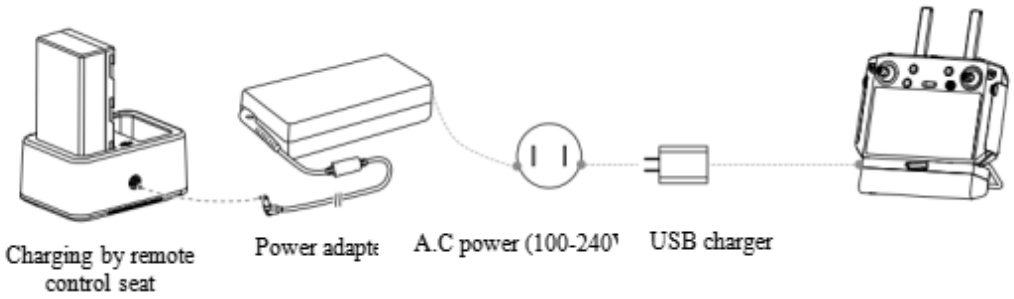
Built-in Batteries

USB charger and USB-C cable are used to charge the built-in battery of remote control

External Battery

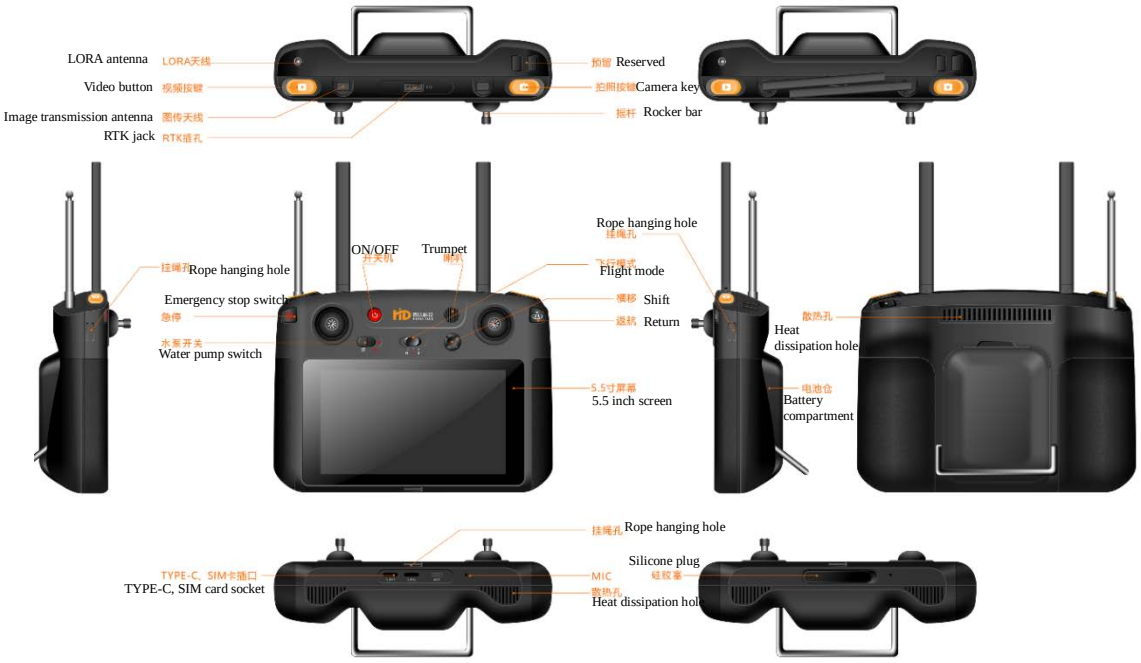
External battery charging stand and power adapter are used to charge the external smart battery

Note: When using the remote control for the first time, the battery should be fully charged



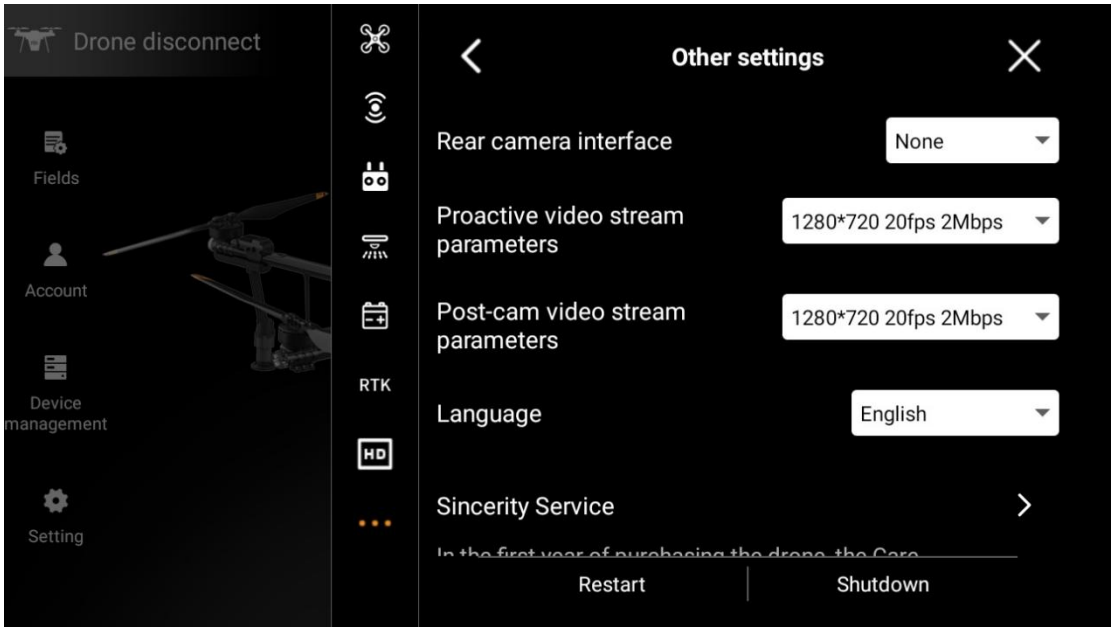
Key Operation of Remote Control

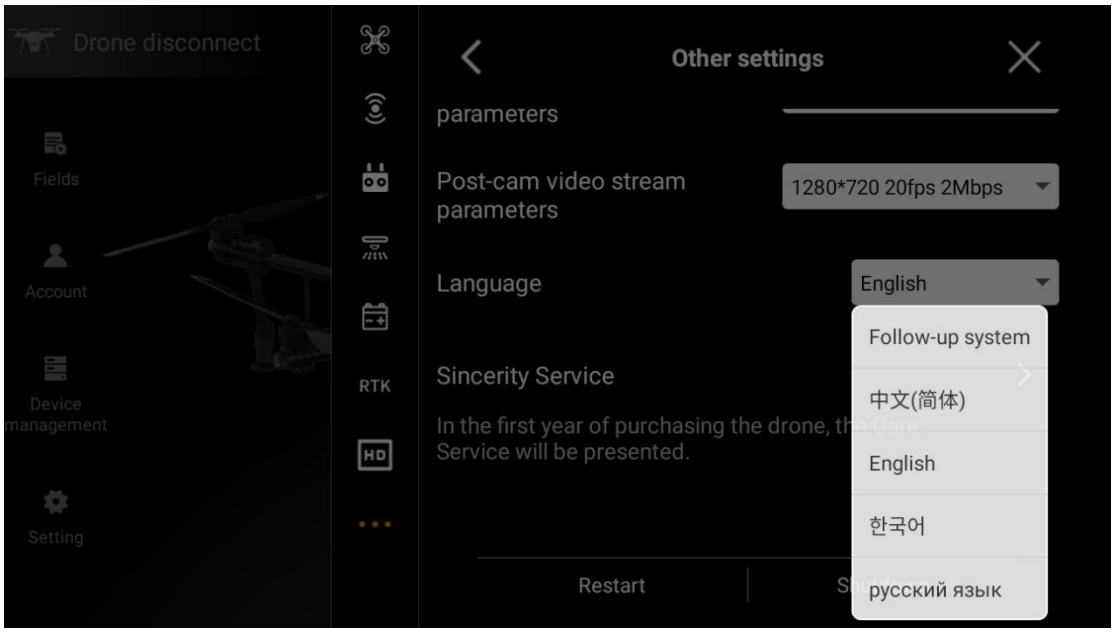
Distribution Diagram of Physical Keys of Remote Control



Language switching

The agricultural UAV APP built into the HD401 remote controller supports multiple languages, and can switch the display of different languages in APP>>Settings>>Other settings

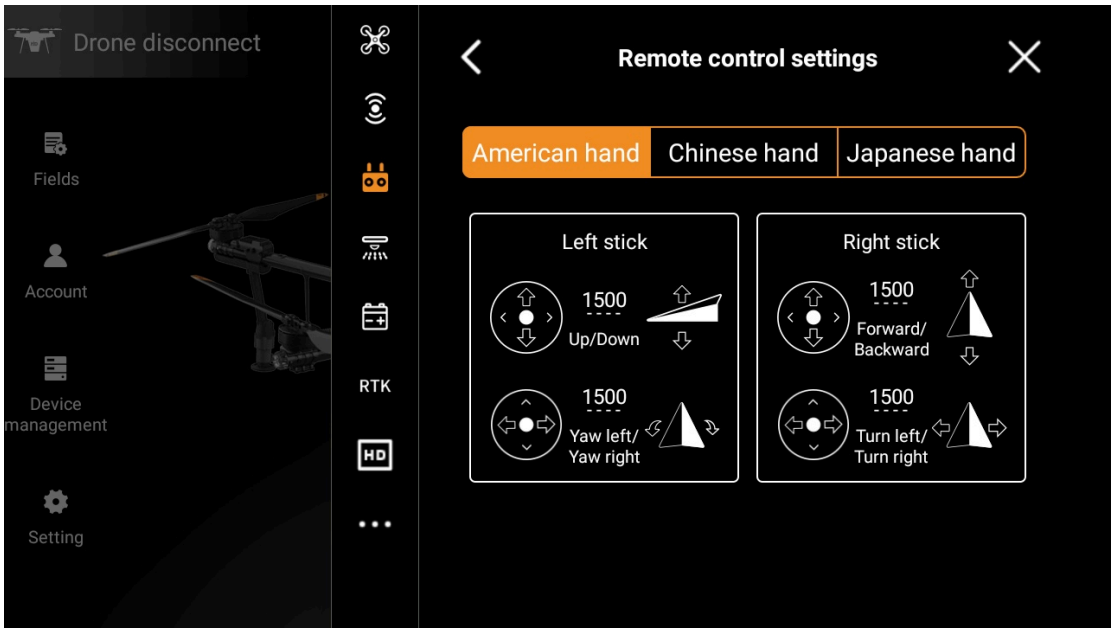




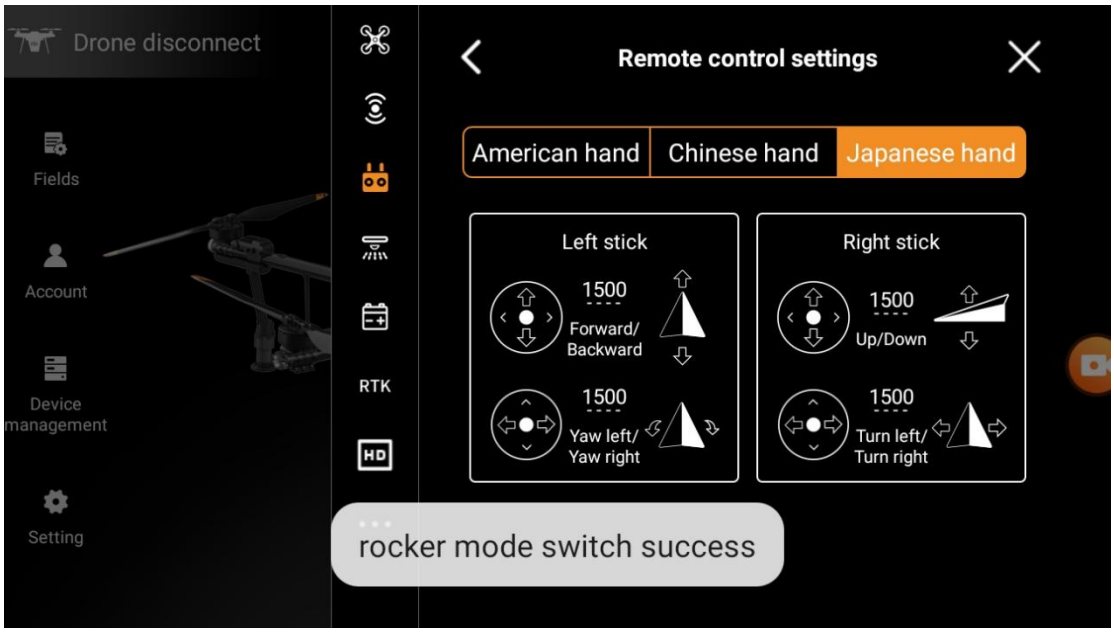
Rocker Control

For rocker control, you need to set the rocker mode according to your own control habits first. If you are uncertain about the rocker mode, don't unlock the take-off at will

Rocker Control Diagram under US Operation Mode



Rocker Control Diagram under Japanese Operation Mode



Rocker Calibration

The rocker of HD540 remote control has been calibrated from the factory, but it is necessary to calibrate the rocker before unlocking for the first time to prevent the problem of inaccurate rocker caused by transportation bumps. In daily use, this function can also be used to calibrate the remote control rocker if the rocker not returning to the neutral position while pushing joystick and the offset is large.

Note: The preparation process of the remote control has been described in detail, and will not be described here

Operation Control

Spray/spread button
In manual/manual enhanced operation mode, press the change key to open the spraying/spreading system, and press it again to close the spraying/spreading system

Note: Full-autonomous and A-B point operation spraying and spreading are automatically controlled and switched

Setting of Mu
Under Full-autonomous operation and A-B point operation mode, operation parameters (including mu) can be set before starting operation, and operation parameters (including mu) can be adjusted at any time during operation

FPV/Map Switching

In Huida UAV APP operation interface, click the camera and map switch virtual button to switch the full-screen display of the camera screen and map display

User-defined Button

User-defined button, the supported user-defined functions are including
Default: Undefined
Switching between boundary point and obstacle point: Only valid when planning plots
Add boundary point or obstacle point: Only valid when planning plots
Exhaust air: the motor is not unlocked, and it is valid when the aircraft does not take off
Turn on/Turn off obstacle avoidance function: After turning off obstacle avoidance function, a box is popped up to confirm
Map/FPV switching: map full-screen display and FPV front camera full-screen switching.
Front/rear camera switching: Switch the display of front and rear camera
Add point A: It is only effective when planning route at points A-B
Add point B: It is only effective when planning route at points A-B

M + Left shift: It only works in M + Manual Enhancement Mode
M + Right shift: It only works in M + Manual Enhancement Mode
Turn on the headlight: Turn on the headlight of the aircraft
Turn on the rear light: Turn on the rear light of the aircraft
H1 Button
H2 Button

Flight Mode Switching button

The flight mode switch is locked in P mode by default. If you need to switch to A mode, enter the App operation interface and click >,
In Advanced Settings, turn on Allow to Turn on the Attitude Mode to unlock.
After unlocking, switch the flight mode from P to A to enter A mode for flight. If the current flight mode switch is in A, it is necessary to switch to P and then switch to A before using A mode.
Even if it has been unlocked, the aircraft still flies in P mode by default every time it is turned on. Before using A mode each time, the flight mode should be switched once after the aircraft and remote control are powered on as described above

Smart One-click Return button

Intelligent return can be started by pressing and holding the return button on the remote control. Its return process is the same as that of out-of-control return, but

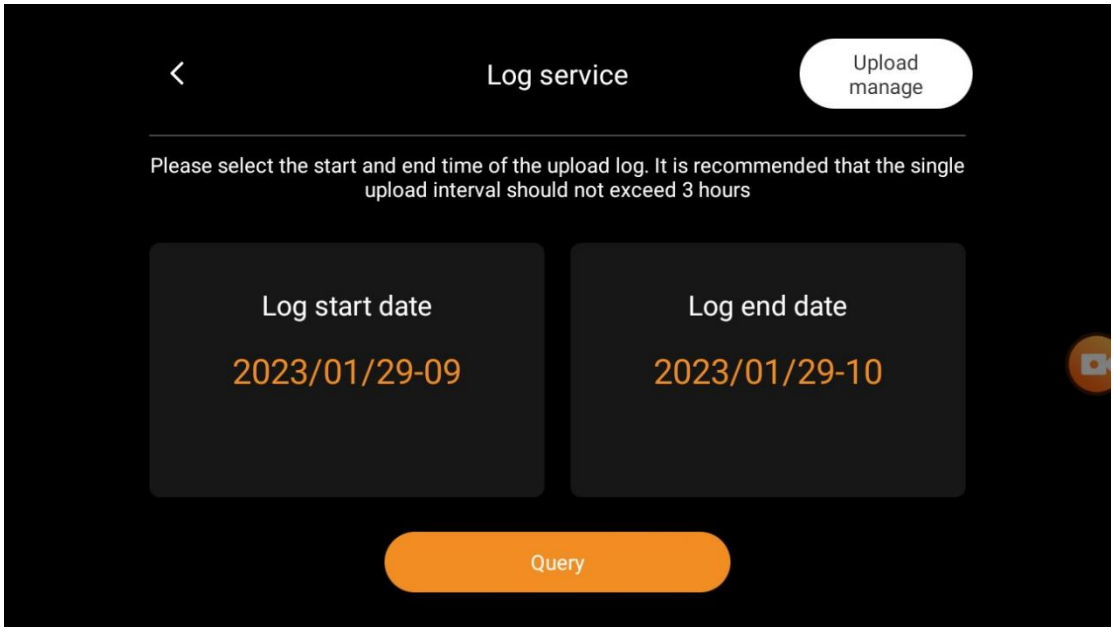
the difference is that the user can control the height of the aircraft to avoid obstacles by pushing joystick. In the process of intelligent return, you can receive the control right of UAV by pushing joystick.

Range of Remote Control Signal

When the antenna and the back of the remote control are at an included angle of 80° or 180°, and the antenna plane is facing the aircraft, the signal quality between the remote control and the aircraft could be in the best state.

Push log

When you encounter a fault when using Agricultural UAV, you can push the log during the fault to the manufacturer to obtain the first time technical analysis to get the cause of the fault and quickly solve the problem

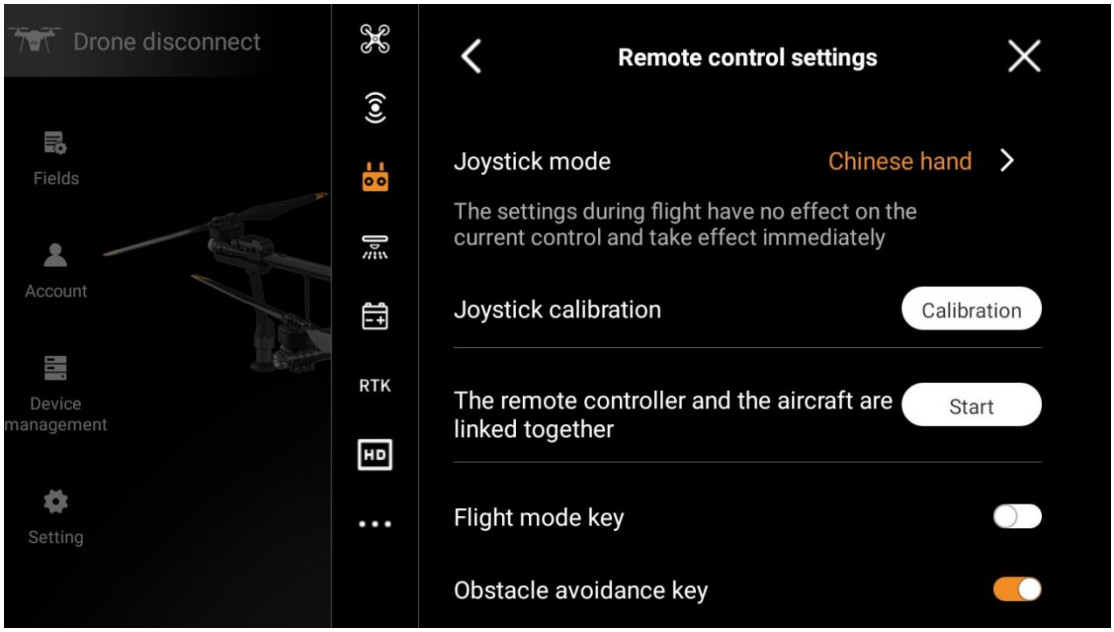


Frequency Matching of Remote Control

When leaving the factory, frequency matching has been completed for the remote control and the aircraft, and it can be used after being powered on. However, if the remote control is replaced, it needs to be re-checked before it can be used.

1. Turn on the remote control, run Agricultural UAV APP, and then turn on the aircraft power supply.

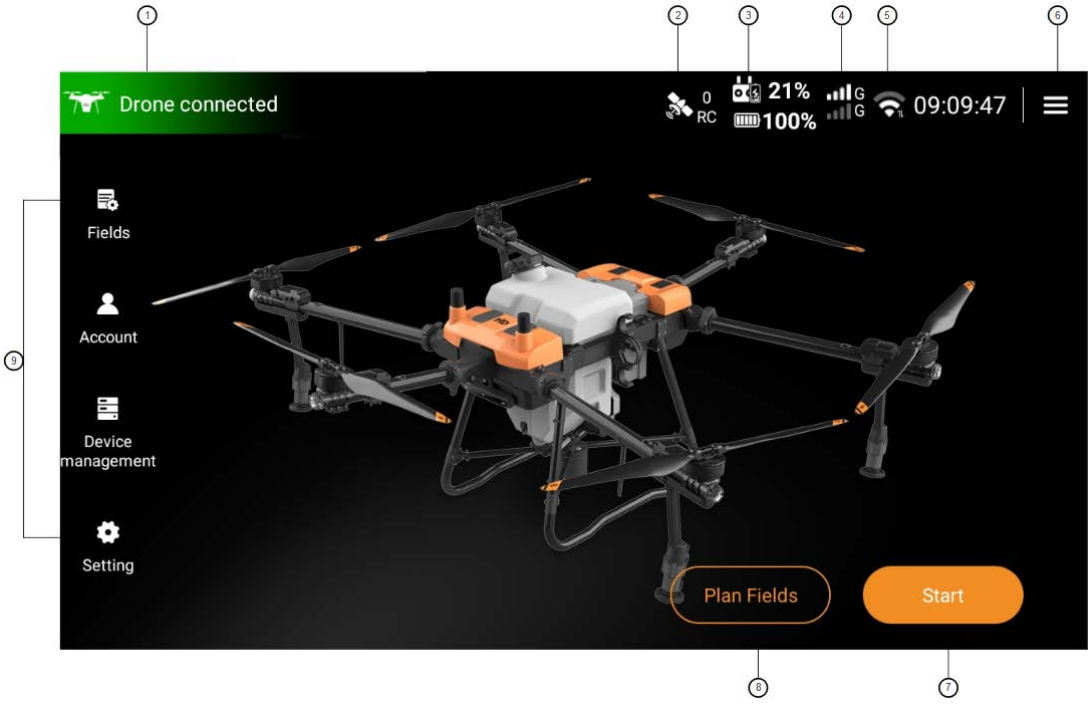
2. Click "Start Operation" to enter the operation interface, click Settings to enter the remote control setting interface, click Frequency Matching, align the opened QR code at the front camera of the aircraft for 30s, and wait for the drip prompt sound to be heard, and check that the frequency matching status indicator light flashes from red light to green, which means that the frequency matching is successful. If the frequency matching fails, it is necessary to re-enter the frequency matching state for frequency matching.



Agricultural UAV APP

Agricultural UAV APP is specially designed for UAV agricultural application, with clear and concise interface, which can be easily operated by users with text and voice prompts. During the operation, the user can know the operation information of the UAV spraying/spreading system in real time, and can obtain the health status of all the equipment connected to the remote control in real time, and the user can be informed of the exception status of the equipment at the first time; Real-time protection of the plot and the task data in progress after the plot is called to ensure that the user data is not lost; Agricultural UAV APP supports multiple languages.

Main Screen



1.Connection status of aircraft and remote controller

Status: aircraft connected, aircraft not connected

Note: When the aircraft is not connected, the operation system, aircraft equipment management and setting functions are not available

2.Satellite connection status and strength

Status: connected, not connected

3.The remaining power of the built-in battery of the remote control

Display the remaining power of the internal battery. When the external battery is connected, display the status of the internal battery being charged

4.SIM card connection status and signal strength

5.WIFIconnection status and signal strength

6.Setting

7.Start

8.Planning Fields

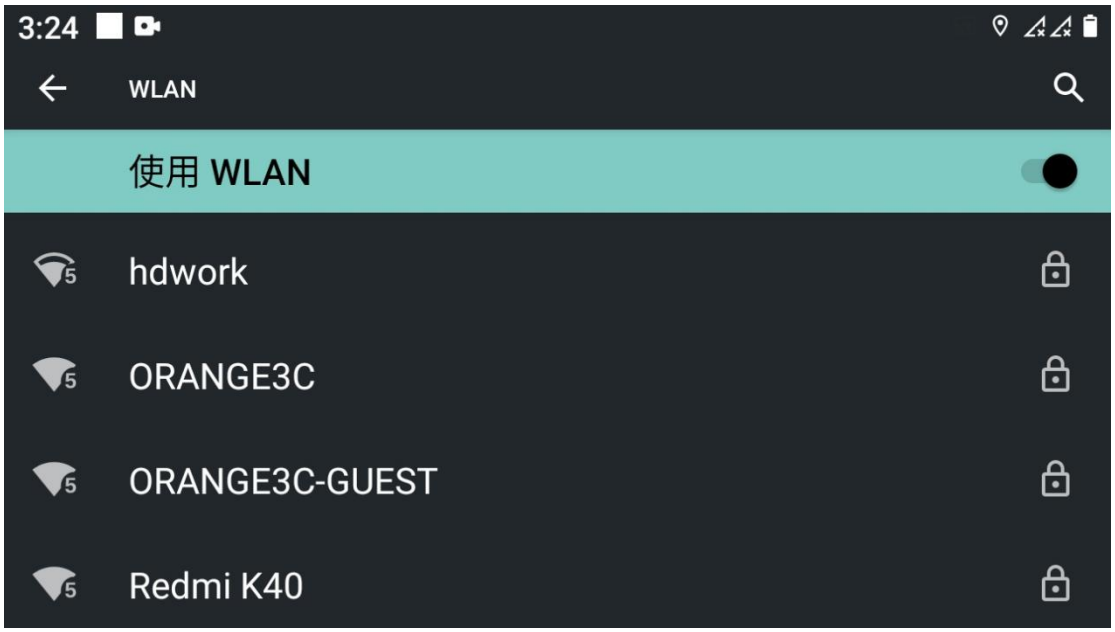
9.Fields management, account management, equipment management, Android general settings

Connect to the network

Click "Settings" on the home page of agricultural UAV APP to enter the Android general settings interface

Click "Network and Internet" on this page to enter the connection WALN interface. At this time, if the WLAN switch is turned off, wait a few seconds after it is turned on, and the system will automatically search the nearby WIFI network that can be connected

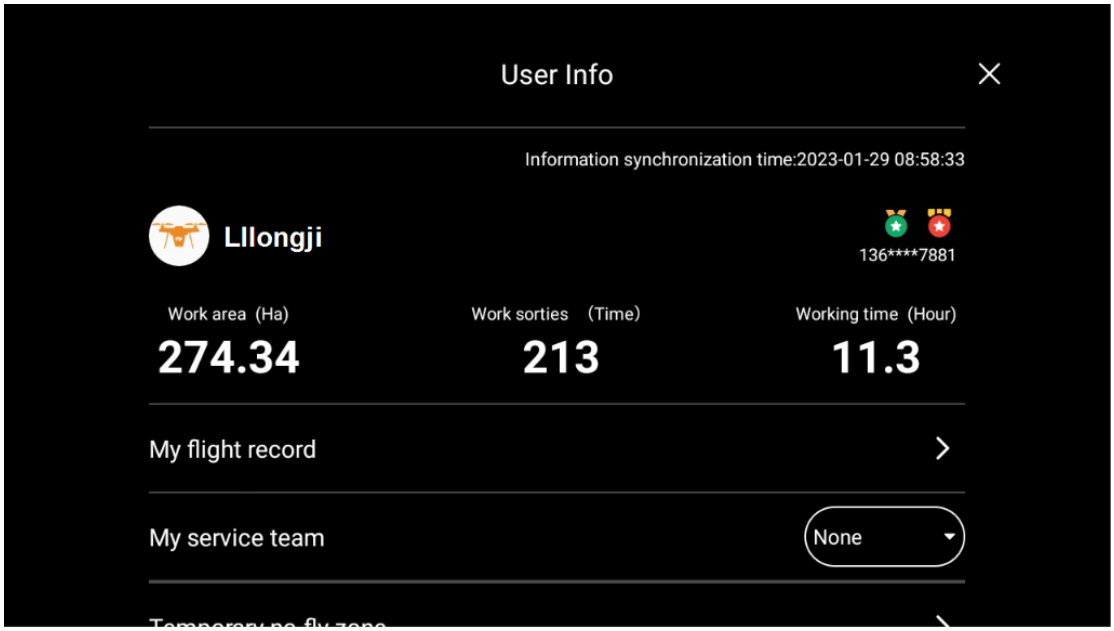
Click the WALN item to enter the list of connectable networks and find the target WIFI network



Click the WIFI to be connected and enter the connection password to complete the network connection setting

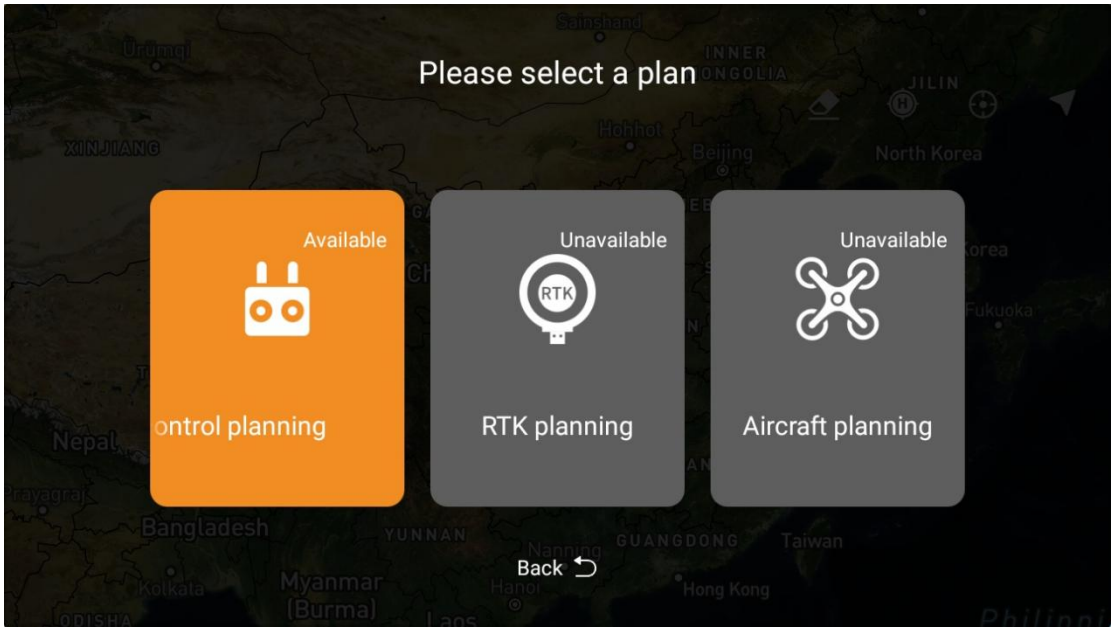
User Info

View user account information, user job records and job record statistics

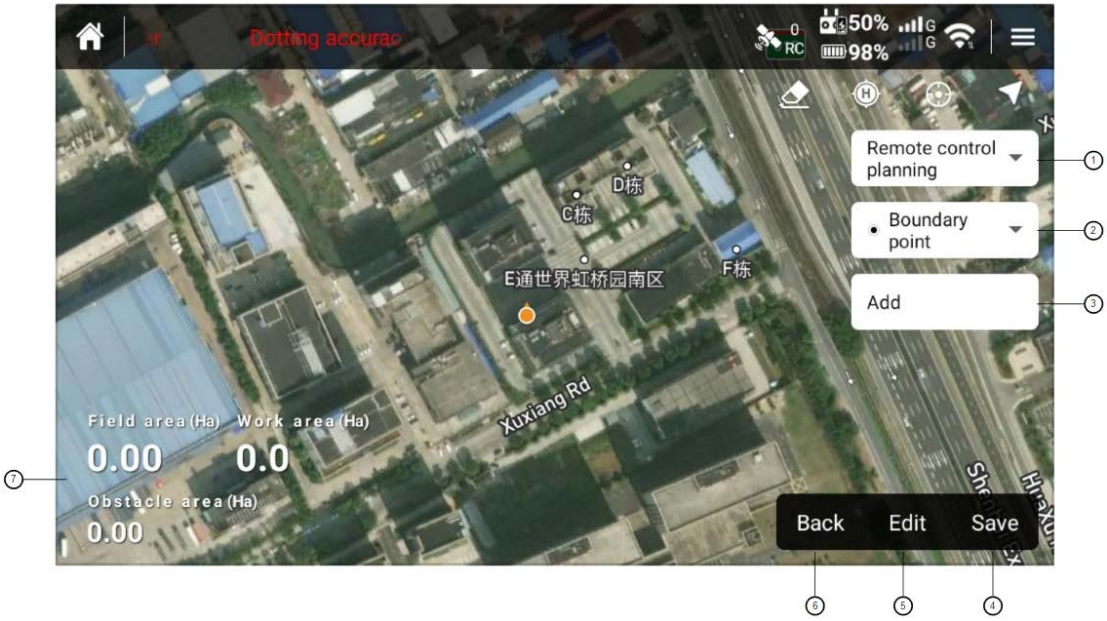


Planning Fields and Fields management

Click "Planning Plot" on the home page to enter the planning plot method selection interface, and select the planning method as required



Planning Fields Homepage



1.Display the current plot planning method.

Drop-down list box to switch planning mode

2.Options for planning objects: boundary points, obstacle points, circular obstacles, reference points, temporary no-fly zones

3.Add a point. After adding, "Done" is displayed, which means that the boundary point planning of the parcel or polygon obstacle is completed

4.Save the currently planned plot as a file and store it on the remote control

5.Edit planned parcels

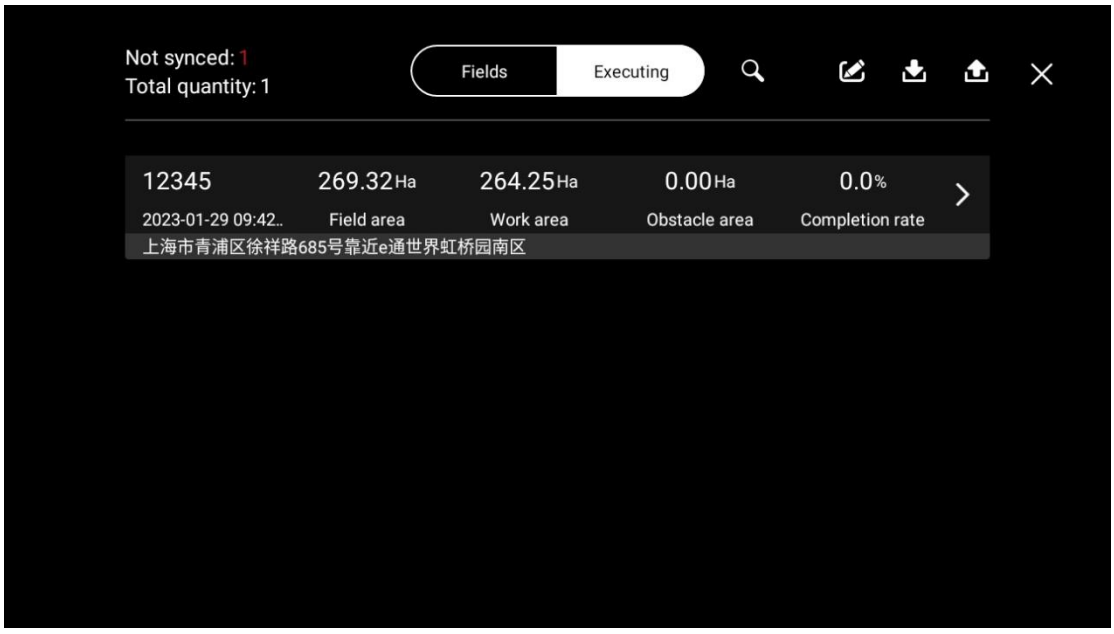
6.Return to the planning method selection interface

7.The area of the currently planned plot and the area of the currently planned obstacles (only the area of obstacles in the plot is displayed)

Fields management

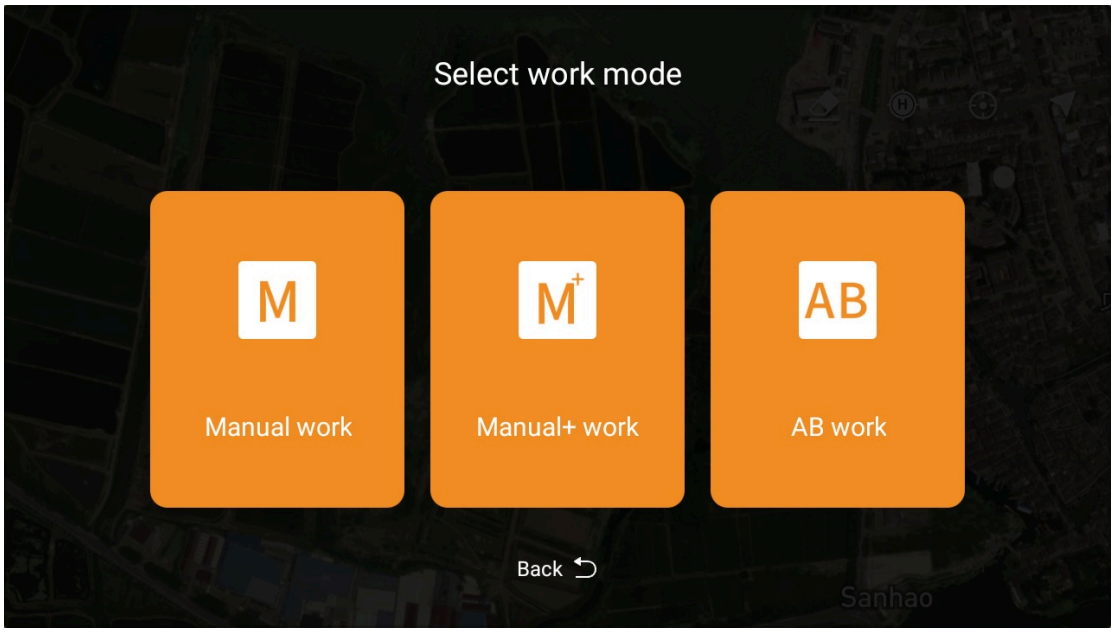
The local parcel management interface supports parcel calling, uploading, downloading parcels from the cloud, editing parcels, and finding parcels

The cloud parcel management interface supports the functions of downloading and finding parcels from the cloud



Work

Select work mode



Manual work interface is also the default work interface. This interface can switch other work modes, or call the plot to enter the fully autonomous work mode

1.Return to Homepage

Return to the homepage of Agricultural UAV APP

2.Display the current operation mode, manual by default, click to switch to point A-B, full-autonomous, manually enhance the operation mode, note that full-autonomous mode is switched through calling plot

3.Current operation mode (spraying, seeding)

4.Front and rear obstacle avoidance Obstacle avoidance status

Status: ON, OFF, Not connected, Fault

5.RTK positioning status

Status: Single point, floating point, fixed

6.Qianxun fixed base station status

Status: Normal, abnormal communication, abnormal data

7.Signal strength of remote control and aircraft link

Normal, weak signal, loss of communication

8.Remaining power of aircraft battery

Get the remaining power of aircraft battery in real time, and display it in different colors. Orange indicates that the remaining power of the battery is low, so the return distance should be noted. Red indicates that the remaining power is very low and return is required in time

9.Internal and external battery power of remote control

10.SIM card status and signal strength

11.WIFI connection status and signal strength

12.Settings

Click to enter, and you can set parameters such as aircraft, remote control, spraying system, spreading system, Obstacle avoidance, smart battery, RTK, etc.

Aircraft settings: Sailing speed, returning speed, sailing height, returning height, actions after spraying (returning and hovering) can be set.

Action after loss of communication (return, hover, landing), switch to continue operation after loss of communication, action after operation (return, hover), return position selection (return point, remote control position), electronic fence function: height limit, distance limit, flight speed limit, manual enhancement and locking route (free control after turning off, please note the safe flight), front lighting switch and rear lighting switch

Advanced settings: IMU calibration, compass calibration; Attitude mode is allowed to be turned on (turned off by default); Recovery of aircraft unfinished operation records (support for recovery of unfinished flight missions caused by anomalies)

Remote control settings: You can set rocker mode (US operation mode, Chinese operation mode, Japanese operation mode), calibrate rocker, list of paired aircraft, voice broadcast switch (note: closing of alarm voice is supported), and frequency matching (FPV camera scans QR code for frequency matching)

Obstacle avoidance setting: You can set Obstacle avoidance height setting switch, front and rear obstacle avoidance Obstacle avoidance switch, obstacle avoidance Obstacle avoidance prompt tone switch and Obstacle avoidance front and rear detection distance switch

Obstacle avoidance warning distance, emergency hovering distance, calibration detection angle, numerical display of obstacle distance, Obstacle avoidance ball

display size

Spraying setting: You can set spraying system switch, real-time display of spraying system data, display of pump flow data, display of sprayed dosage, display of remaining dosage, discharge pipe air switch, remaining dosage threshold setting, flowmeter calibration, spraying mode switch with speed

Spreading settings: You can set the switch of the spreading system, display the current total weight of the Pesticide box, peeling calibration, weight calibration, set the current remaining material quantity, switch of the spreading mode with speed, and advanced settings (when the load cell is abnormal, input the factory K value to restore the initial setting once)

Smart battery settings: You can view the current voltage, current, temperature and damage times of the battery; set the voltage threshold of returning, hovering and landing

RTK setting: You can set the positioning function switch of the built-in RTK module of the aircraft, RTK signal source (network RTK, RTK mobile station), check the network RTK status, the expiration time of network RTK service rights and RTK online diagnosis

Settings of operation equipment type: When the spreading or spraying equipment fails, it may be recognized that there will be problems. At this point, the type of operation system can be set manually

13.Clear the flight path, whether to display the route, display the current return point/remote control position, aircraft position, and switch the display of satellite map/ordinary map
Clear the flight path: The flight path of plant protection UAV outside the plot during route operation or A-B point operation can be cleared by clearing function, but the flight path inside the plot cannot be cleared
Whether to display the route: whether the planned plot displays the flight route
Display the current return point/remote control position: locate the return point/remote control position on the map quickly
Aircraft location: Search for the aircraft location on the map quickly
Satellite map/ordinary map switching: Switch between the two maps as needed

14.Image displayed by the front camera
You can switch to display of full screen. At this point, the map position and the front camera display position are changed. Click it again to switch back

15.Start work
Start manual work, turn on spraying and record flight path, work parameters and

other information

16.Display and adjustment of operation parameters
Display real-time operation parameters, in which click the horizontal line under the altitude number to adjust the flight altitude

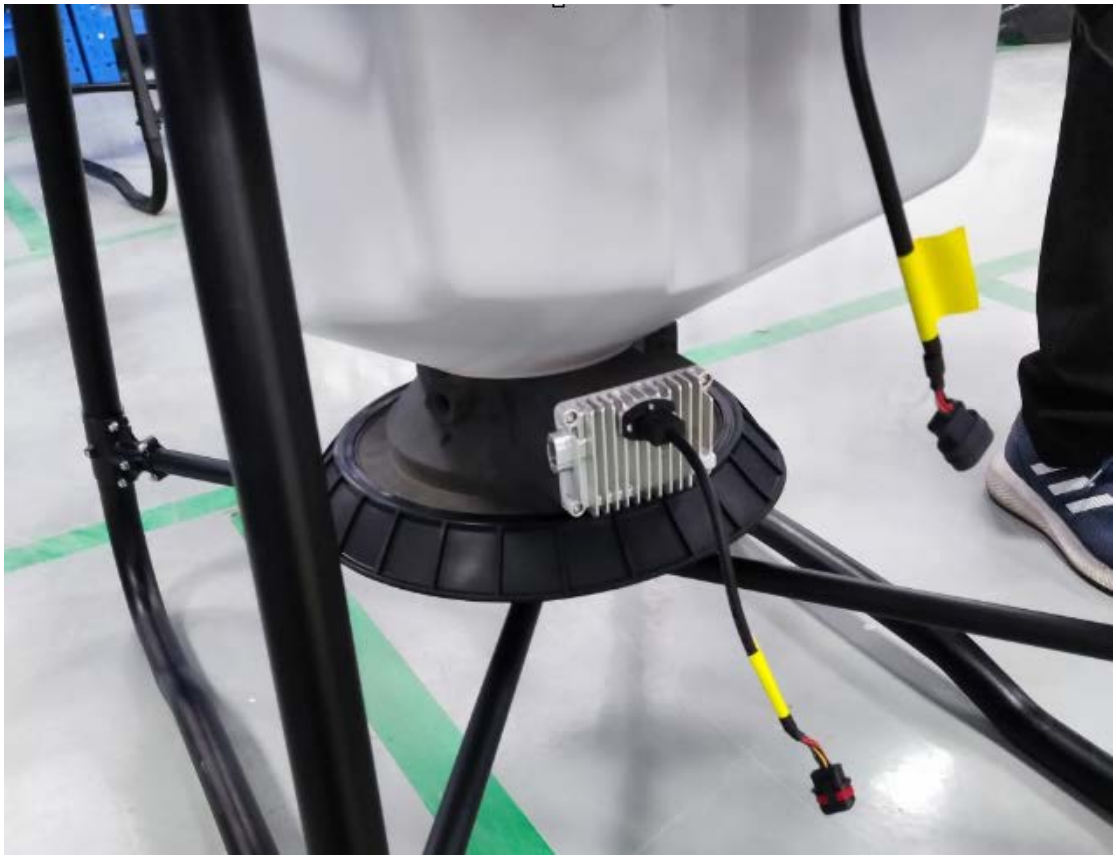
17.invoke plot
The manual operation interface is entered by default when starting the operation, and the fully autonomous operation interface is entered after invoke plot. At this time, the aircraft can automatically execute the flight mission according to the planned route

18.Switch the work mode
The manual work interface is entered by default when starting work. You can switch to manual enhanced and A-B work mode by switching work mode

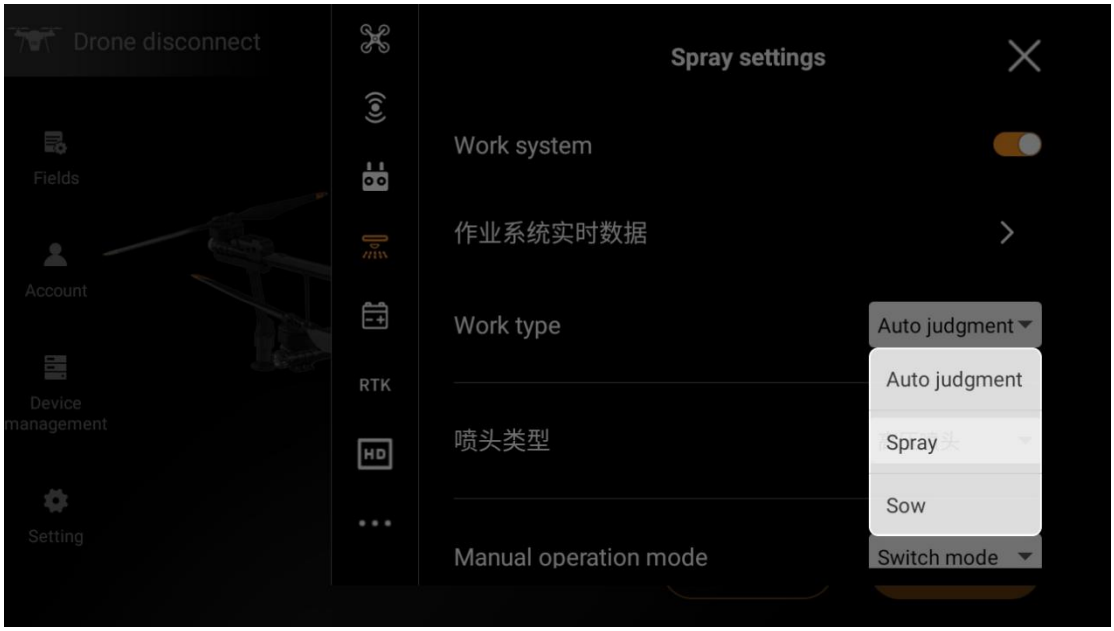
Spreading System

Spreader Installation

Please first remove the Pesticide box, two connecting water pipes and connecting lines, then insert the Spreader box in the direction, then connect the connection line of the spreader, and set the operating system in the agricultural UAV APP - switch from the spray system to the Spreading system.
Note: When replacing the Spreading system, please turn off the aircraft power switch first.



Connect the harness shown in the figure. After connecting, start the remote control first, and then start the aircraft. Check whether the setting of the operation type of the operation system is automatically identified. If the identification is not correct, you can set it manually



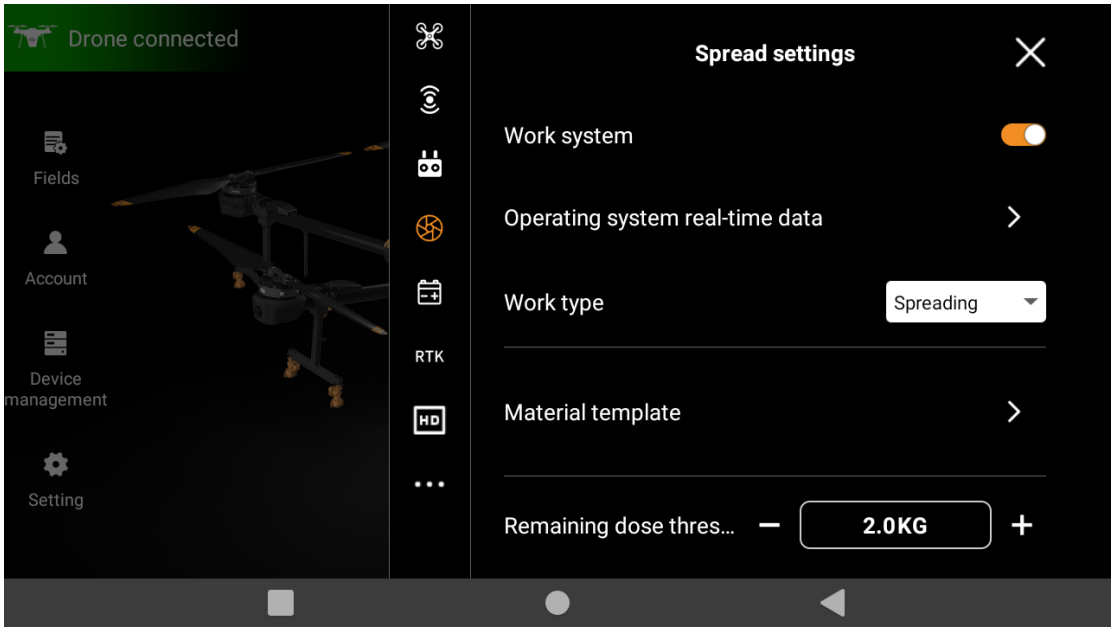
Spreader Use

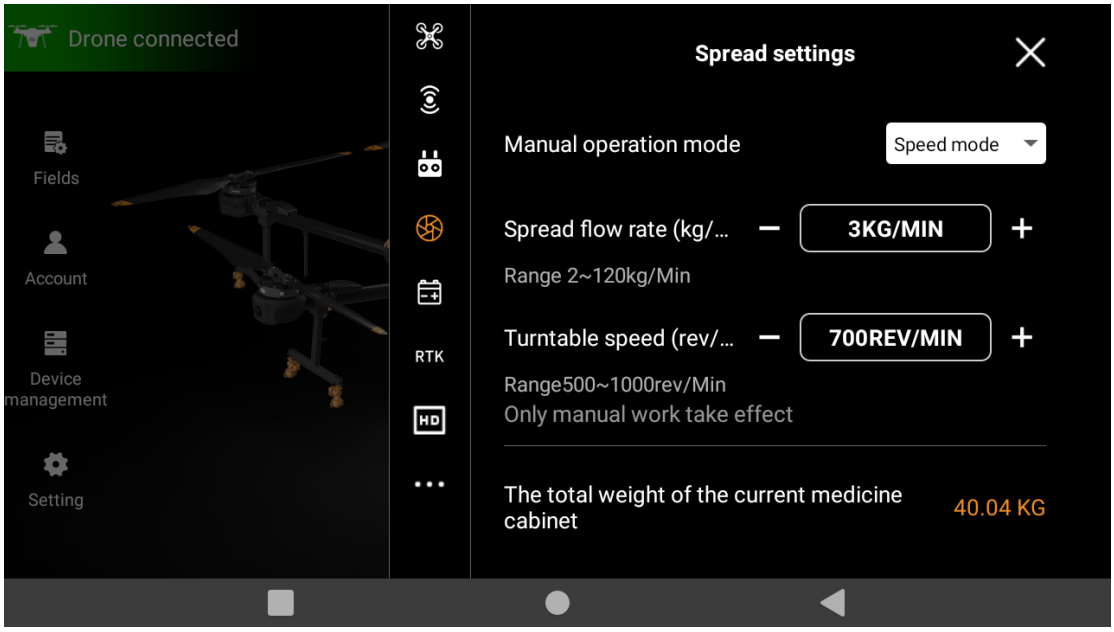
For new and unused Spreading Systems or materials that have never been broadcast,

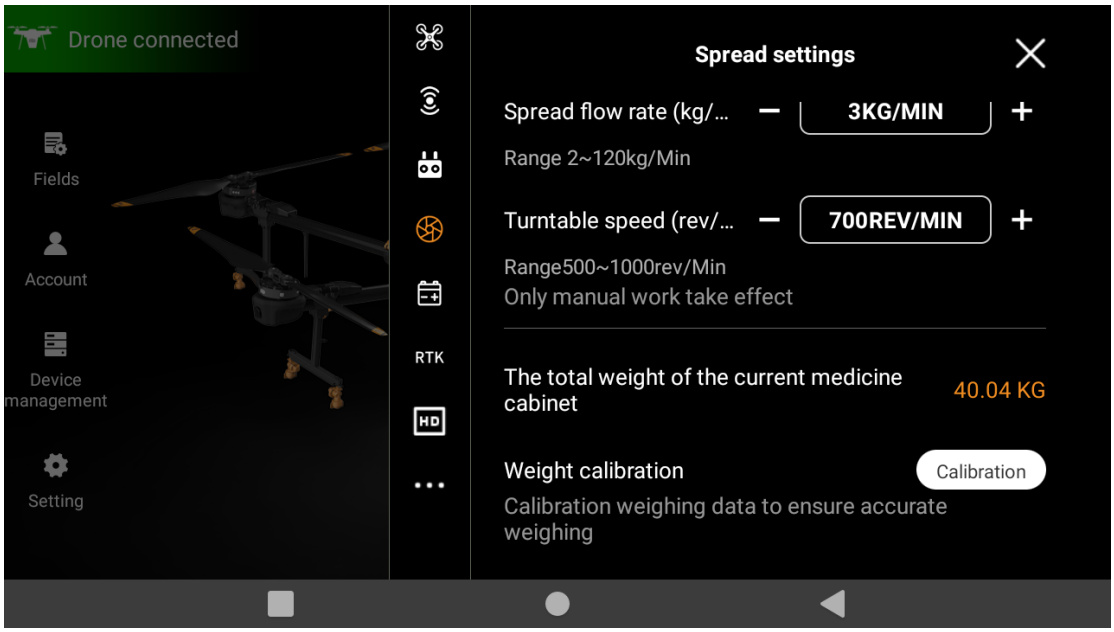
in order to broadcast the materials accurately, it is recommended that you create a broadcast material template on the APP side and calibrate the flow of the materials. The calibrated broadcast material template can be reused for subsequent broadcast of similar materials, which can save operation time.

How to calibrate the Spreading System

On the "Start Operation" homepage, click the setting on the upper right side to enter the setting interface of the Spreading System. You can perform peeling calibration and weight calibration respectively; The remaining material quantity of the Spreader box can be set.







How to create a broadcast material template

In the seeding operation interface, click "+" to create a new seeding material template after seeding the material template. After the template is created, set the rotation speed of the seeding tray and the size of the bin mouth to perform the flow calibration in place. After the flow calibration is successful, the template can be used directly after seeding similar materials.

Note: It is recommended to create different broadcast material templates for different broadcast materials

Flight intelligent battery charging

HD540 standard charger supports voltage charging in the range of 110V-220V. The thin line of the charger can support up to 2200W input power, and the thick line can support up to 8000W input power charging

Note: Please connect the charger before charging the battery. When connecting the battery, align the battery connector with the charging cable connector and then plug in the battery, otherwise the battery power interface may be damaged.

List of hazards and countermeasures

If the HD540 agricultural unmanned aerial vehicle does not comply with the operation requirements or operates blindly in the process of use, there will be hidden dangers. The specific dangerous situations and countermeasures are as follows:

S/N	Dangerous Place	Countermeasures	Remarks
1	Propeller	Keep a safe distance when the propeller rotates (over 15m)	
2	Motors	Keep a safe distance (more than 0.5m) when the motor not installed with propeller rotates; Keep a safe distance (more than 15m) when the motor installed with propeller rotates	
3	Pesticide container	The used pesticide container has pesticide residues, so it is not allowed to hold drinking water or the internal water cannot be used for grooming.	
4	Pesticide used	Pesticides should be used according to the instructions for pesticide use or the guidance of technicians in the Plant Protection Department	
5	Battery	The battery must be operated in strict accordance with the regulations on use. Do not overcharge and overdischarge	
6	Use of charger	The charger must be operated in strict accordance with the regulations on use and kept away from inflammable and explosive materials during use, fire sands or fire extinguishers should be prepared beside	
7	During the operation flight,	Do not fly in downtown areas; Keep away from the crowd and keep a safe distance (more than 15m) when working in the field	
8	In pesticide spraying operation,	The operation area is far away from the bee breeding area, and the distance is at least 60m according to the climate at that time	

Troubleshooting Instructions

Module	Alarm Source	Error Description	Error Resolution
Power electronic speed controller	Motors	When the motor is locked, please stop flying immediately	1. Position the locked-rotor motor according to the prompted motor serial number; 2. Please check whether the blades are wound and whether the motor is stuck with foreign matter; 3. If this problem still exists, please contact the nearest agent
		When the motor is overloaded, please stop flying immediately	1. Position the overloaded-rotor motor according to the prompted motor serial number; 2. Please check whether the blades are wound, deformed and damaged and whether the motor is stuck with foreign matter; 3. If this problem still exists, please contact the nearest agent
	ESC	The motor is at risk	1. Locate the motor with over-temperature risk

Module	Alarm Source	Error Description	Error Resolution
		of over-temperature	according to the prompted motor serial number; 2. Please note whether the ambient temperature is too high before flying after the aircraft cools down; 3. If this problem still exists, please contact the nearest agent
		Abnormal high voltage of electronic speed control	1. Locate the electronic speed control with high voltage according to the prompted electronic speed control serial number; 2. Please confirm whether the battery voltage is too high; 3. If this problem still exists, please contact the nearest Huida agent
Battery	Battery	Abnormal communication between battery and flight control sytem	1. Please plug and unplug the battery again and ensure that there is no foreign matter in the battery interface; 2. Please test to replace the battery to confirm whether the battery is damaged; 3. Please check whether the gold finger of the distribution board is deformed or defaced; 4. Please check whether the connection between the distributor-distributor module-avionics module is normal when the power is turned off; 5. If this problem still exists, please contact the nearest agent
		Failure of battery certification	1. Please confirm whether it is an official battery; 2. Please check whether the gold finger of the distribution board is deformed or defaced; 3. Please plug and unplug the battery again and ensure that there is no foreign matter in the battery interface; 4. Please test to replace the battery to confirm whether the battery is damaged; 5. If this problem still exists, please contact the nearest agent
		Severe low voltage of battery	
Avionics system	IMU	Navigation system anomaly (IMU), equipment is disconnected	1. Please restart the aircraft; 2. Please calibrate IMU; 3. If this problem still exists, please contact the nearest agent
			1. Please let the aircraft stand for 10s. If the problem still exists, please restart the aircraft; 2. Please calibrate IMU; 3. If this problem still exists, please contact the nearest agent
	Compass	Compass device disconnected	1. The compass is disconnected, please check in the shutdown state to confirm whether the avionics module is installed correctly, and then turn on the aircraft to check if there is any abnormality; 2. If this problem still exists, please contact the nearest agent
	RTK	Compass ground interference	1. Please confirm that there is no interference in the environment and calibrate the compass; 2. Please check in the shutdown state to confirm

Module	Alarm Source	Error Description	Error Resolution
			whether the avionics module is installed correctly, and then turn on the aircraft to check if there is any abnormality; 3. If this problem still exists, please contact the nearest Huida agent
		RTK board card is disconnected	1. Please restart the aircraft after 2min. of power failure; 2. If this problem still exists, please contact the nearest agent
		Exception of RTK dual antenna baseline	1. Please restart the aircraft; 2. If this problem still exists, please contact the nearest agent
	Image transmission module	Image transmission signal loss	
Remote controller	Image transmission module	The signal-to-noise ratio of remote control antenna is too low	1. Please check the signal interference in the "HD" setting interface, and modify the "remote control number" in the "remote control" setting to adjust the channel, and then re-check the frequency; 2. Please confirm whether there are interference sources such as signal towers and WIFI hotspots in the surrounding environment; 3 Please ensure that there is no obstruction between the remote control and the aircraft; 4. Please check whether the antenna connection of the remote control is normal; 5. If this problem still exists, please contact the nearest agent
Remote controller	Image transmission module	The remote control cannot get the signal of the aircraft	1. Please check the signal channel interference in the "HD" setting interface, and modify the "remote control number" in the "remote control" setting to adjust the channel, and then re-check the frequency; 2. Please confirm whether there are interference sources such as signal towers and WIFI hotspots in the surrounding environment; 3. Please ensure that there is no obstruction between the remote control and the aircraft; 4. Please check whether the connection of SDR antenna and remote control antenna is normal; 5. If this problem still exists, please contact the nearest agent
		The remote control can't get the lever quantity signal	1. Please calibrate the remote control rocker; 2. If this problem still exists, please contact the nearest agent
Spraying system	Electronic speed control of water pump	Water pump is not connected	1. Water pump is not connected, please restart the aircraft; 2. Please screw out the connecting wire of the water pump under the condition of shutdown and install it on other water pumps for cross test to confirm whether the water pump is damaged; 3. Please check whether the connecting wire between the water pump and the branching touch block is loose, moving and damaged; 4. Please confirm that the connection of water pump-branching module-spraying module is normal in

Module	Alarm Source	Error Description	Error Resolution
			the shutdown state; 5. If this problem still exists, please contact the nearest agent
		Failure of self-test of water pump electronic speed control	1. The self-test of water pump electronic speed control failed, please restart the aircraft; 2. Please screw out the connecting wire of the water pump under the condition of shutdown and install it on other water pumps for cross test to confirm whether the water pump is damaged; 3. Please check whether the connecting wire between the water pump and the branch module is loose and damaged; 4. Please confirm that the connection of water pump-branching module-spraying module is normal in the shutdown state; 5. If this problem still exists, please contact the nearest agent
Spreading system	Spreader	Abnormal temperature of control panel	1. Please ensure that the ambient temperature and the spreader work normally; 2. Please restart the aircraft; 3. Please restart the aircraft after 5min. of power failure; 4. If this problem still exists, please contact the nearest agent
Spreading system	Spreader	The current of material detection motor is too high	1. Please confirm whether the material detection motor is blocked and stuck, and whether there is any foreign matter in the material; 2. Please reduce the opening size of the working cabin door to reduce the flight speed; 3. Please cut off the power and clean the warehouse door before restarting the aircraft; 4. If this problem still exists, please contact the nearest agent
		The projecting disc motor cannot be started	1. Please check whether there is blockage or jamming of projecting disc in the shutdown state; 2. Please confirm whether there is any foreign matter in the materials in the shutdown state; 3. Please restart the aircraft; 4. If this problem still exists, please contact the nearest agent

Specification Parameters

Model and Name	**HD540 Agricultural UAV**
Structural layout	Six-axis layout
Maximum wheelbase	2100mm (six axes)
Overall dimensions	LxWxH 2145mm×2045mm×865mm (Arm unfolded, blades folded) 1138mm×682 mm×865mm (Arm folded)
Pesticide container capacity	40L
Seed container capacity	60L

Container installation mode	Plug-in
No-load mass (including battery)	47.5KG
Power battery	30000mAh
Battery weight	13.3KG
Batter installation mode	Quick plugging and unplugging battery
Type of spraying nozzle	Centrifugal nozzle
Rated operating pressure of machine	0.3-0.4Mpa
Number of main rotors	6
Number of spraying nozzle	2/4
Type of liquid pump	Diaphragm pump
Flow of liquid pump	13L/min
Operation spraying width	Optimal 10m (operating height 3.5m±0.5m flight speed: 3m/s), maximum 12m
Output power of charger	220V Single-phase input: 8000W (Direct connection 380V) 2200W (Direct connection with mains)
Battery charging time	Lithium battery 20%-95% about 13min
FPV camera	Front camera, rear camera
Flight parameters	
Hovering accuracy	RTK: Horizontal ±10cm, vertical ±10cm
Spraying full-load hovering	7.5min
Spreading full-load hovering	6.2min
No-load hovering time	19min
Motor rated power	2000w*6pcs
Remote control signal distance	≤1500m
Flight height limit	≤100m
Flight speed limit	≤10m/s

FCC Statement

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Statement for 3WWDZ-40-BU：

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard for wireless devices employs a unit of measurement known as

the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. *Tests for SAR are conducted using standard operating positions accepted by the FCC with the device transmitting at its highest certified power level in all tested frequency bands. Although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. This is because the device is designed to operate at multiple power levels so as to use only the poser required to reach the network. In general, the closer you are to a wireless base station antenna, the lower the power output.

For carrying around operation, this device has been tested and meets the FCC RF exposure guidelines for use with an accessory that contains no metal. Use of other enhancements may not ensure compliance with FCC RF exposure guidelines.

The FCC has granted an Equipment Authorization for this device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR infromation on this device is on file with the FCC and can be found under the Display Grant section of http://www.fcc.gov/oet/fccid after searching on FCC ID: 2BBNT3WWDZ-40-BU

FCC Radiation Exposure Statement for 3WWDZ-40.1B:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

Note : This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates,uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.