

3WWDZ-U25A Agricultural UAV

User Manual

December 2023

catalogue

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Product Overview

Brief Introduction

The third-generation 3WWDZ-U25A series agricultural unmanned aerial vehicle newly developed by Huida Technology has a spraying box of up to 25L , a four axis stable architecture, and two centrifugal nozzles as standard. The maximum flow rate of 2 centrifugal nozzles can reach 20L/minute, and the maximum flow rate of 4 centrifugal nozzles can reach 28L/minute. The double-layer spray disc design ensures more uniform atomization and adjustable droplet size, comprehensively improving work efficiency and quality.

Equipped with 360 degree rotating radar and ground simulation radar as standard, it can adapt to various working terrains and make flight safer.

The newly upgraded intelligent remote control is equipped with a 6-inch high brightness display screen and a built-in Huida drone app, which further improves the smoothness and stability of operation. Equipped with RTK high-precision positioning module as standard, it can achieve centimeter level route planning. Supports both built-in and external battery power supply, with an overall range of up to 8.5 hours, fully meeting the needs of long-term and high-intensity operations.

Feature highlights

The 3WWDZ-U25A agricultural unmanned aerial vehicle adopts a folding frame structure, achieving the best balance between strength and lightweight. It can be quickly folded, making it convenient for single person transfer, handling, and transportation. The airborne high-precision RTK positioning module can achieve centimeter level high-precision positioning flight on flight routes, while supporting dual antenna anti magnetic interference direction finding technology; Front facing FPV high-definition camera, capable of monitoring the forward field of view environment, real-time viewing of flight conditions, and ensuring flight safety.

The leading intelligent route operation mode can calibrate various obstacles inside and outside the plot, achieving intelligent navigation and fully autonomous operation; The addition of accurate prediction function for drug cut-off points has achieved optimal matching of drug dosage and electricity, resulting in larger unit electricity operation area, more automated operation, and higher operation efficiency. Supporting intelligent endurance point function, allowing beginners to achieve high battery utilization.

The aircraft is equipped with 360 degree rotating radar and ground simulation radar, as well as automatic obstacle avoidance and ground simulation flight functions, which can

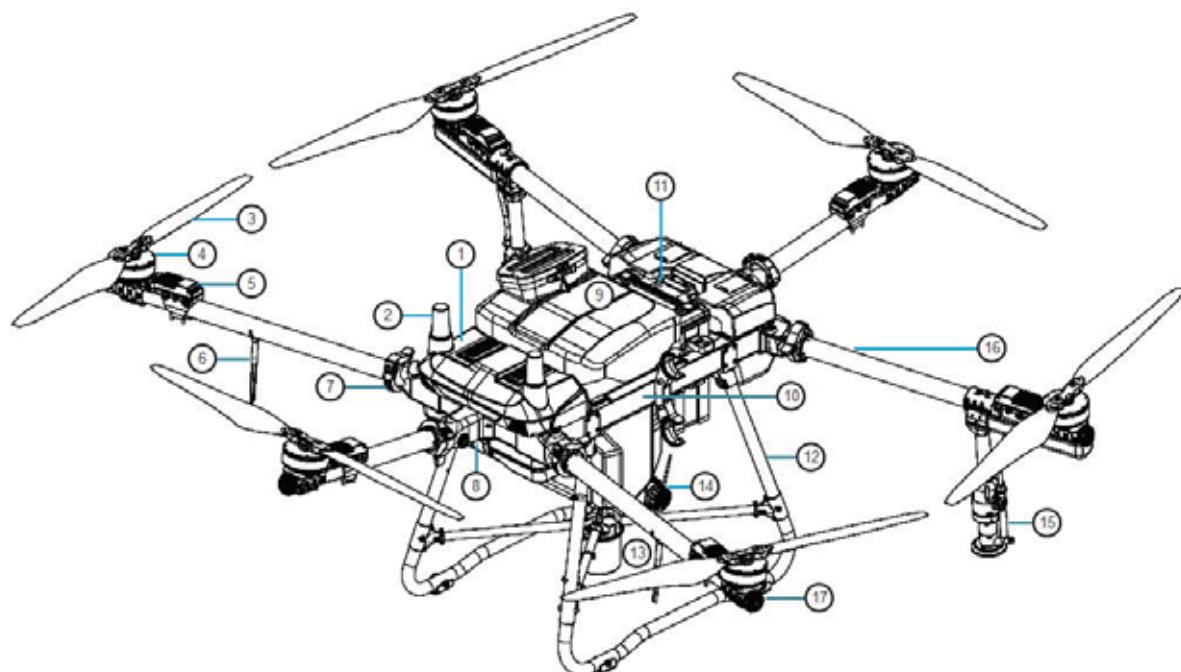
identify common fixed and moving obstacles during the operation process, making the operation safer.

Two high-speed and high flow centrifugal nozzles, tested to achieve the optimal spraying amplitude of 9 meters, with a maximum flow rate of 20L/minute. The droplet size can be adjusted as needed, suitable for field and economic crop spraying operations. And it can be extended to 4 centrifugal modes, with a maximum flow rate of 28L/min, meeting the requirements of ultra high flow operations.

The new generation of dial type spreader can sprinkle up to 110KG of fertilizer per minute. With the latest optimization algorithm, the precise and controllable amount of fertilizer per acre ensures higher sowing quality.

3WWDZ-U25A agricultural unmanned aerial vehicle is dust-proof, waterproof, and corrosion-resistant. The core components adopt three-layer protection, and the overall protection level of the aircraft can reach IP65 (referring to the International Electrotechnical Commission IEC 60529 standard). The aircraft body can prevent splashing.

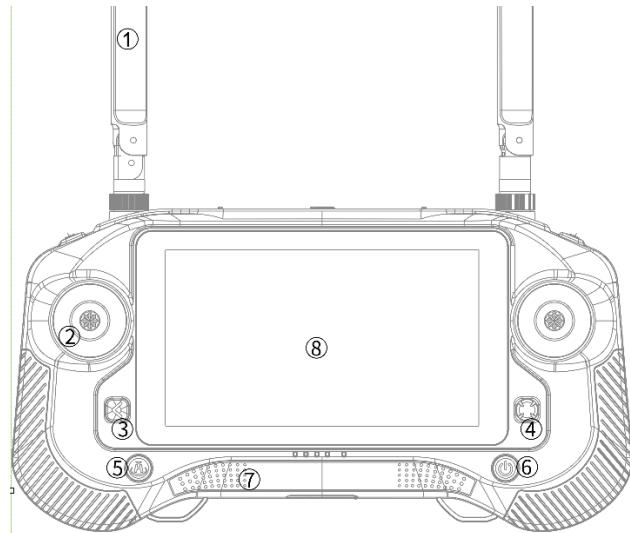
Name of Aircraft Component



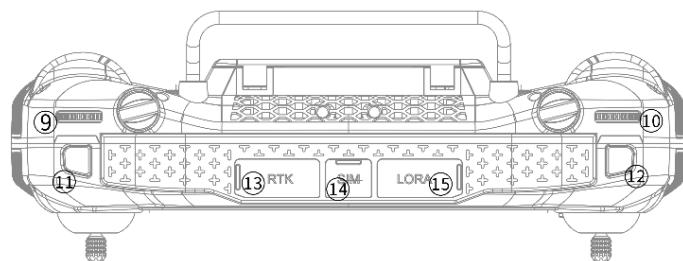
- | | |
|-------------------------|------------------------|
| ① Avionics module | ② RTK antenna |
| ③ awe | ④ electrical machinery |
| ⑤ Electrical regulation | ⑥ SRD antenna |
| ⑦ Arm lock buckle | ⑧ Front FPV camera |
| ⑨ medicine chest | ⑩ rack |
| ⑪ Smart Battery | ⑫ Tripod |

- | | |
|-------------------------|--------------------------|
| (13) radar | (14) Impeller water pump |
| (15) Centrifugal nozzle | (16) Arm carbon tube |
| (17) Navigation light | |

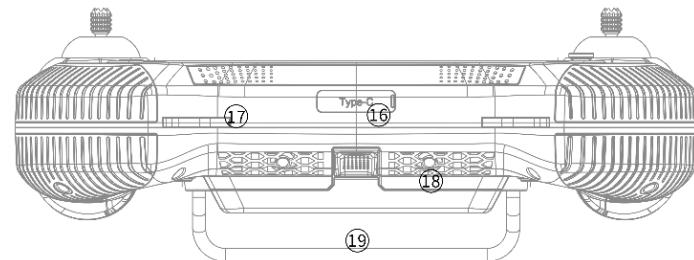
Name of Remote Control part



- | | | |
|----------------------------|-----------------|-----------------|
| ① antenna | ② Joystickarm | ③ Return button |
| ④ Five dimensional buttons | ⑤ Return button | ⑥ Switch button |
| ⑦ Speaker sound hole | ⑧ touch screen | |

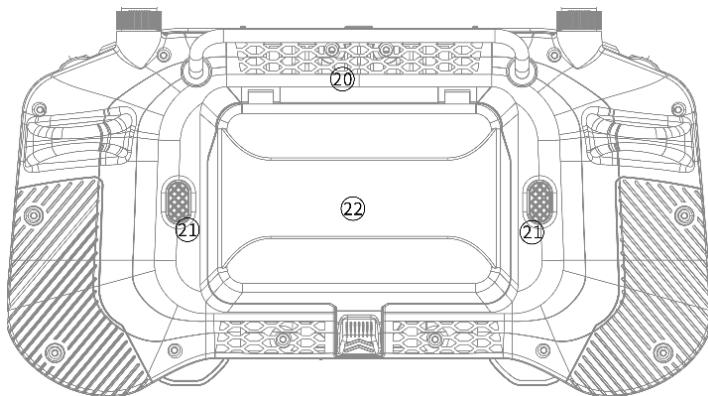


- | | | |
|-----------------------|-------------------------------|-----------------|
| ⑨ Reserved wave wheel | ⑩ Spray flow adjustment wheel | ⑪ Radar switch |
| ⑫ Spray switch | ⑬ External RTK interface | ⑭ SIM card slot |
| ⑮ LORA interface | | |



- | | | |
|----------|---------------------|-------------------------|
| ⑯ Type-C | ⑰ Hanging rope hole | ⑲ Heat dissipation hole |
|----------|---------------------|-------------------------|

⑯ handle

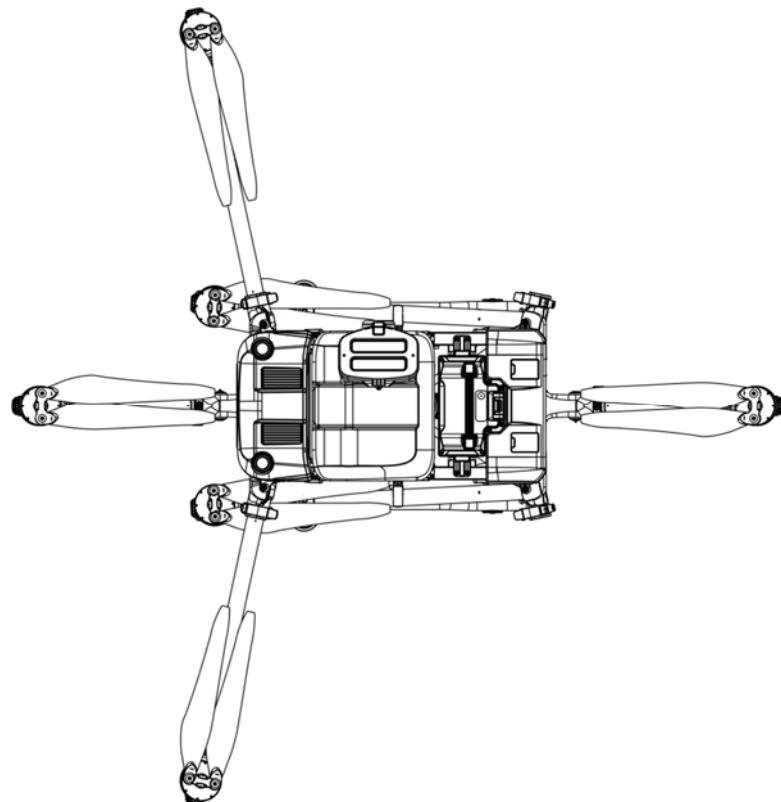


㉐ Heat dissipation hole

㉑ Custom buttons

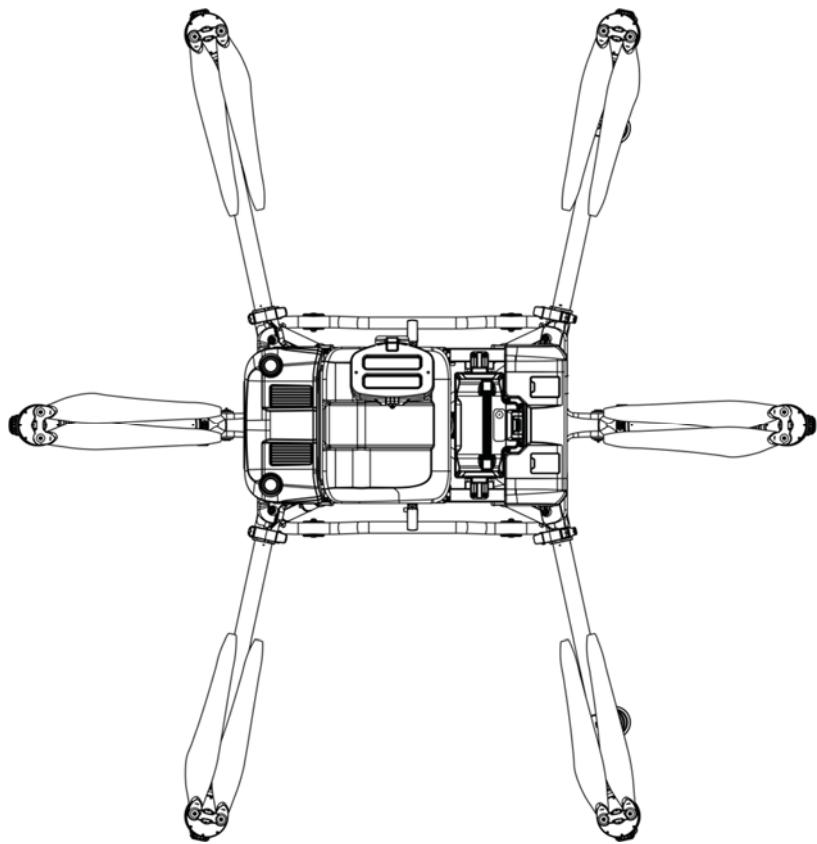
㉒ Battery cover

Preparation of Aircraft before Flight

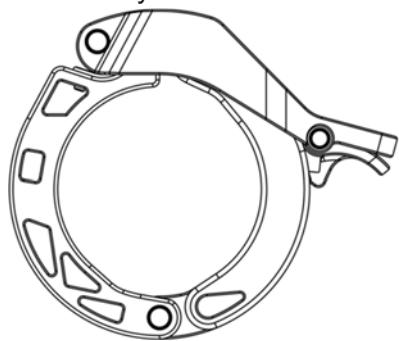


Please note: Before unfolding the boom, please make sure to release the boom buckle and unfold it before unfolding the boom.

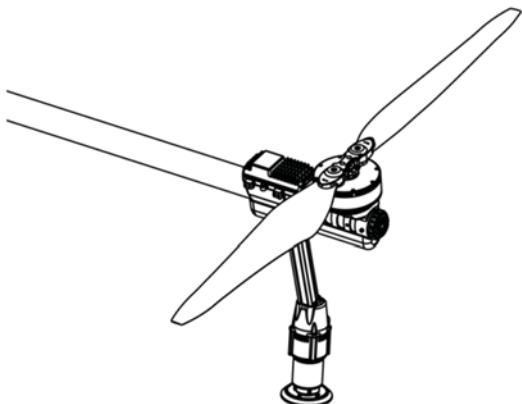
For the 3WWDZ-U25A unmanned aerial vehicle: when deploying the arms, deploy them in the order of M2 and M6 arms first, then M3 and M5 arms; After fully deploying the boom, ensure that all 6 boom buckles are securely fastened.



When fastening the arm with the buckle, you can feel a significant resistance and press down firmly to lock the buckle

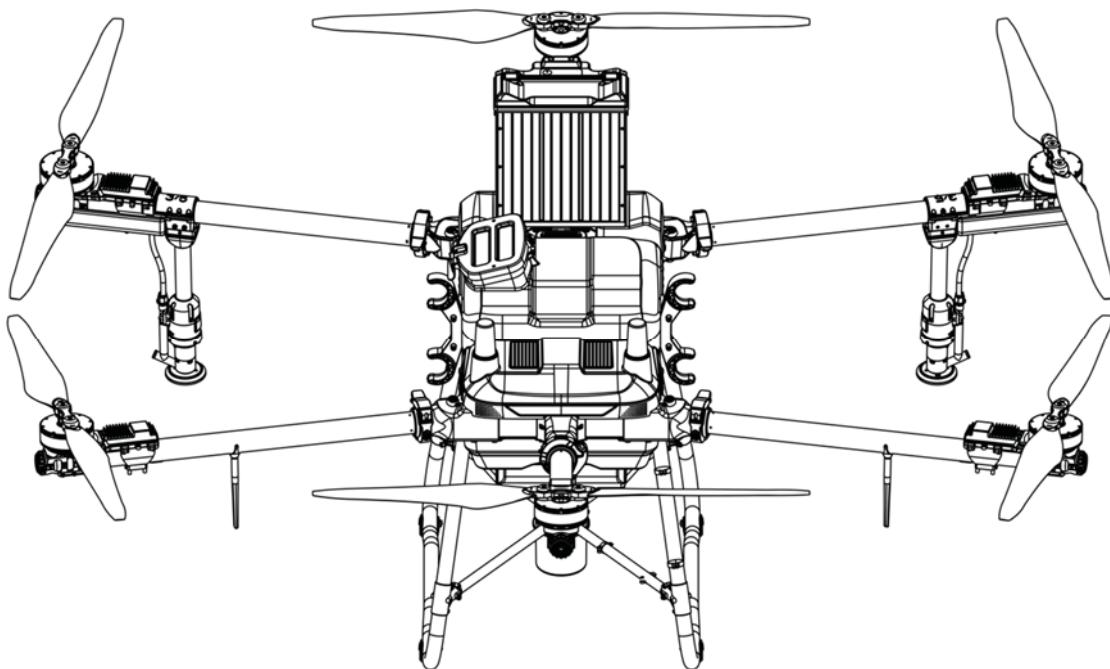


Unfold the propeller blades separately



Gently place the battery into the battery compartment and hear the battery snap.

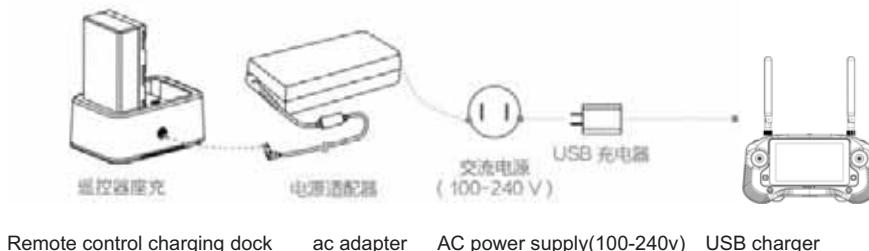
Please note: When inserting the battery into the battery compartment, make sure that the battery power is turned off



Remote Control Preparation

Charging

Use an external battery charging dock and power adapter to charge the external battery.
Use a USB charger and USB-C cable to charge the built-in battery of the remote control.



Installing external batteries

- ① Press the battery compartment cover open button on the back of the remote control to open the compartment cover
- ② Insert the smart battery into the battery compartment and push it up to the top
- ③ Close the compartment lid

Installing a 4G SIM card

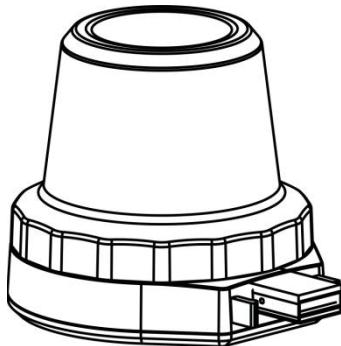
Please pay attention to the installation direction of the SIM card and do not install it upside down

After inserting the SIM card and waiting for 30 seconds, check the 4G card detection status. If the SIM card is inserted, it indicates that the installation is correct. Then, test whether the network is smooth.

Note: If you are unable to use 4G network in your area, please use a small base station HD201 product as the network signal source for RTK service, or turn off aircraft RTK detection and use GPS positioning for flight

Install RTK high-precision positioning module

If the RTK planning method is used for planning the work area, the RTK high-precision positioning module needs to be inserted into the USB interface of the remote control



Check battery level

Returning to the homepage of the Huida Drone APP, you can see the remaining power of the built-in battery and the remaining power of the external battery. Please make sure that

the remote control is fully charged before flying

Adjusting antenna angle

Expand the remote control antenna and adjust the antenna position, as different antenna positions receive different signal strengths. When the antenna and the back of the remote control are at an angle of 80 ° or 180 °, and the antenna plane is facing the aircraft, the signal quality between the remote control and the aircraft can reach the optimal state.

When controlling an aircraft, it is essential to keep it within the optimal communication range. Timely adjust the orientation or distance between the controller and the aircraft to ensure that the aircraft is always within the optimal communication range.



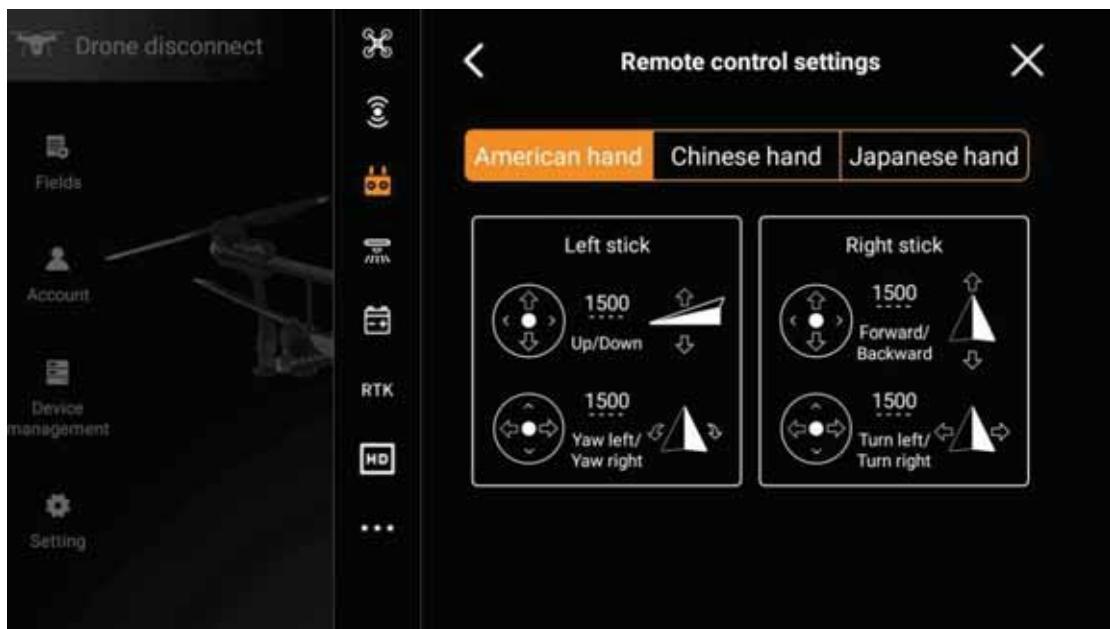
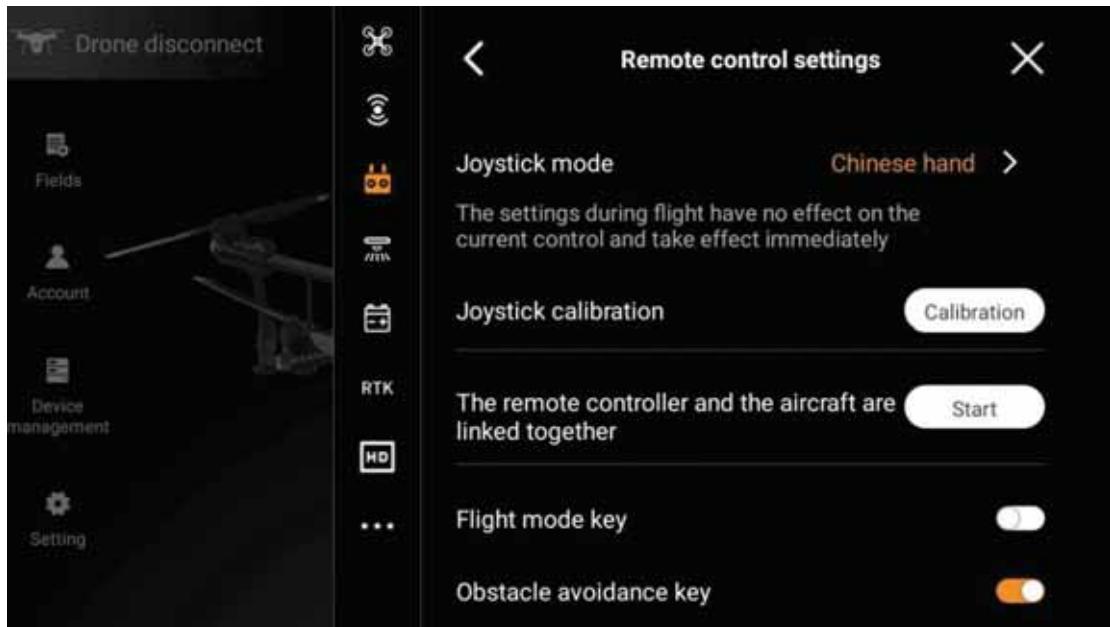
Attention:

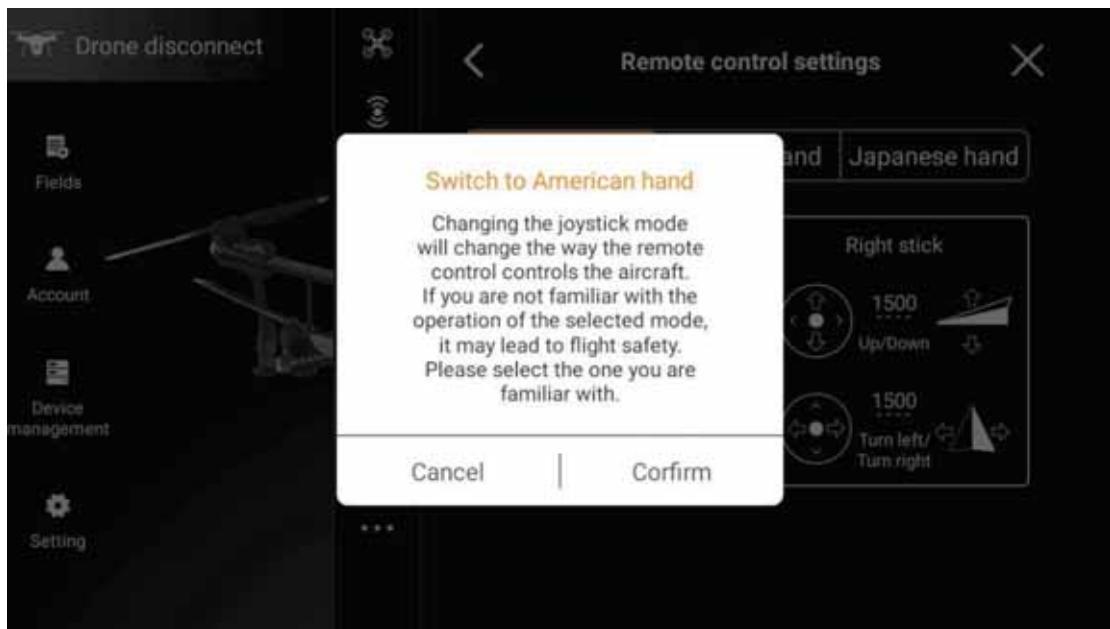
Do not use other communication devices in the same frequency band at the same time to avoid interference with the remote control signal.

If using the RTK high-precision positioning module for RTK planning, it is necessary to remove the module after the planning is completed, otherwise it may affect the communication performance of the remote control.

Set joystick mode

Before flying, please make sure to check the joystick mode. The Huida HD402 remote control supports three joystick modes: American, Chinese, and Japanese. Please choose the joystick mode that you are most familiar with to control the drone.



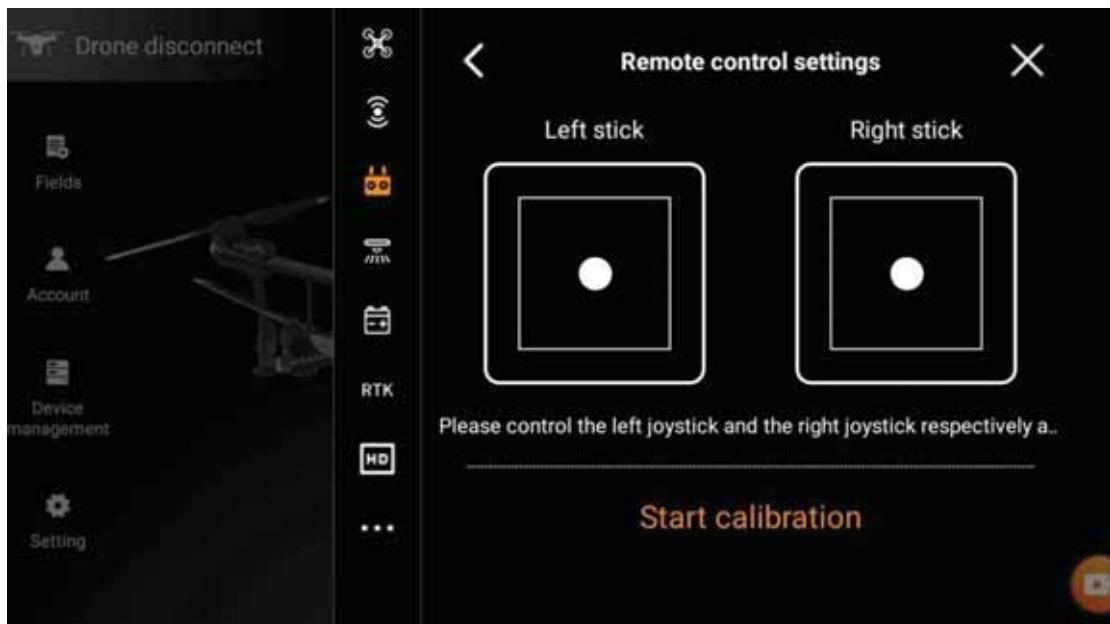


Joystick calibration

The remote control has been calibrated before leaving the factory. If you find any deviation in the amount of the joystick during use, you can solve it by calibrating the joystick.

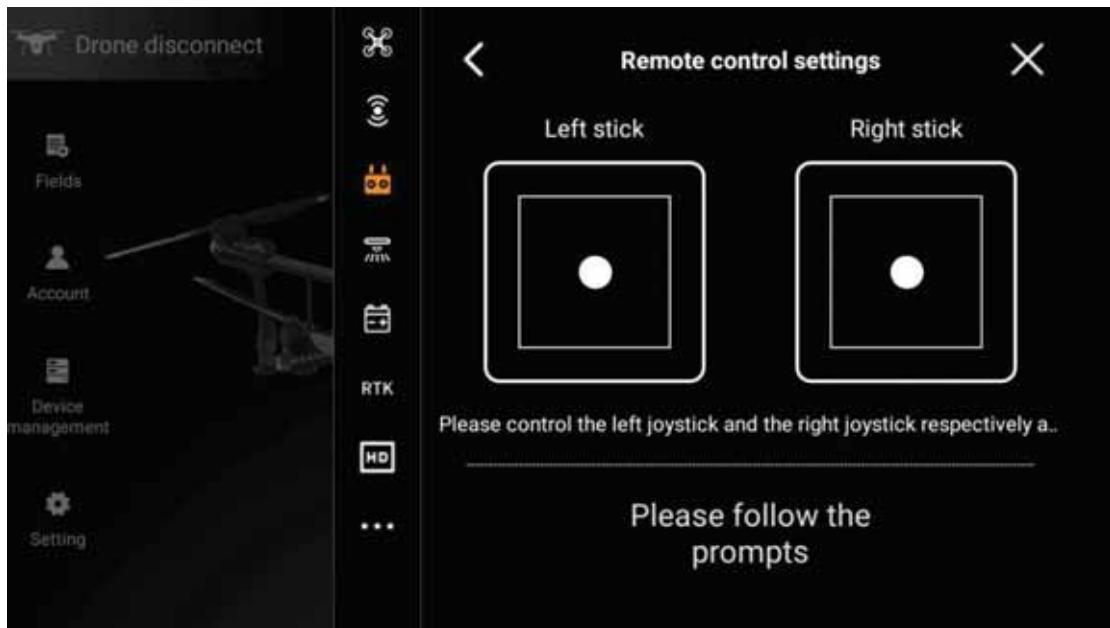
Attention: When calibrating the joystick, please make sure that the drone is not powered on.

How to calibrate: On the right side of the homepage of the Huida Drone APP, enter the settings interface, find the remote control settings button, and click to enter the remote control settings interface

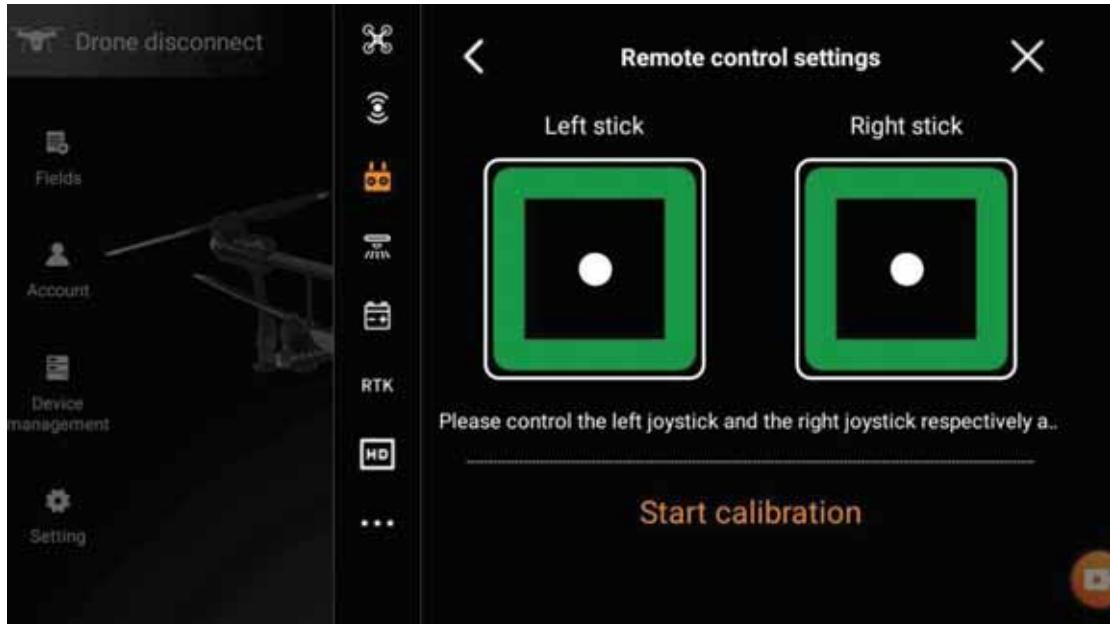


Click "Calibration" to enter the joystick calibration interface, and click "Start Calibration" below.

Follow the prompts on the interface to control the left and right joysticks separately.



After filling in the square ring shape, the joystick calibration can be completed.



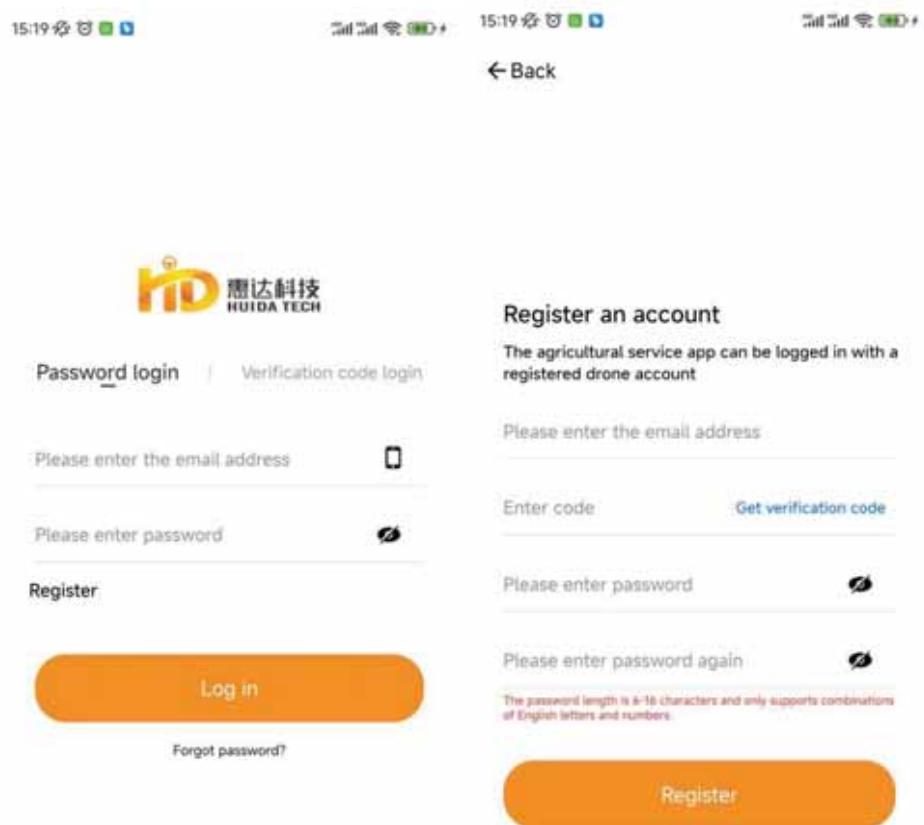
Activate and Firmware Upgrade

Register a Huida drone user account.

Please download the Huida Agricultural Service APP first and follow the guide to register a Huida drone user account.

After successful registration, follow the prompts to pass real name authentication, and you can enter the registered account password on the remote control to log in to the remote control app; Registered users can also log in to the remote control app by scanning the

QR code through the agricultural service app.



activation

After logging into the remote control app, if the aircraft is not activated, an automatic pop-up will remind the user to activate it. Follow the prompts and click to complete the automatic activation. If activation fails, please contact customer service in a timely manner.

Attention: When activating, please check if the account logged into the remote control is your own account. The activated account is considered to be the machine owner account.

Firmware Upgrade

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

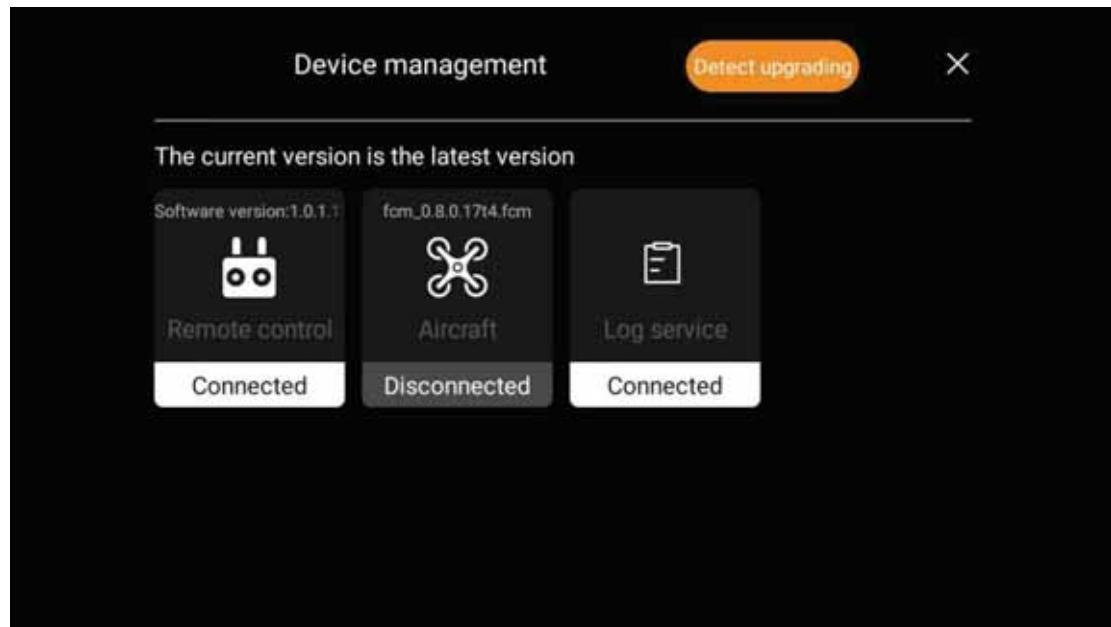
Access the Device Management interface on the home page of the agricultural UAV APP. When there is a new firmware, the version number of the latest firmware that can be upgraded will be prompted. Click the version number and press the operation to complete

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

Startup and Shutdown

Turn on: Short press once+long press for 3-5 seconds to turn on the battery power of the aircraft, at which point the aircraft is powered on.

Off: With the aircraft battery power turned on, press and hold briefly for 1 time and for 3-5 seconds to turn off the battery power. At this time, the aircraft loses power.

charging

Please use the standard HE202 all-around charger to charge the smart battery.

When using fuel to charge smart batteries, please connect a high-power thick wire fast charging plug for charging.

If you use other fuel powered generators for charging, please pay attention to the output power.

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.

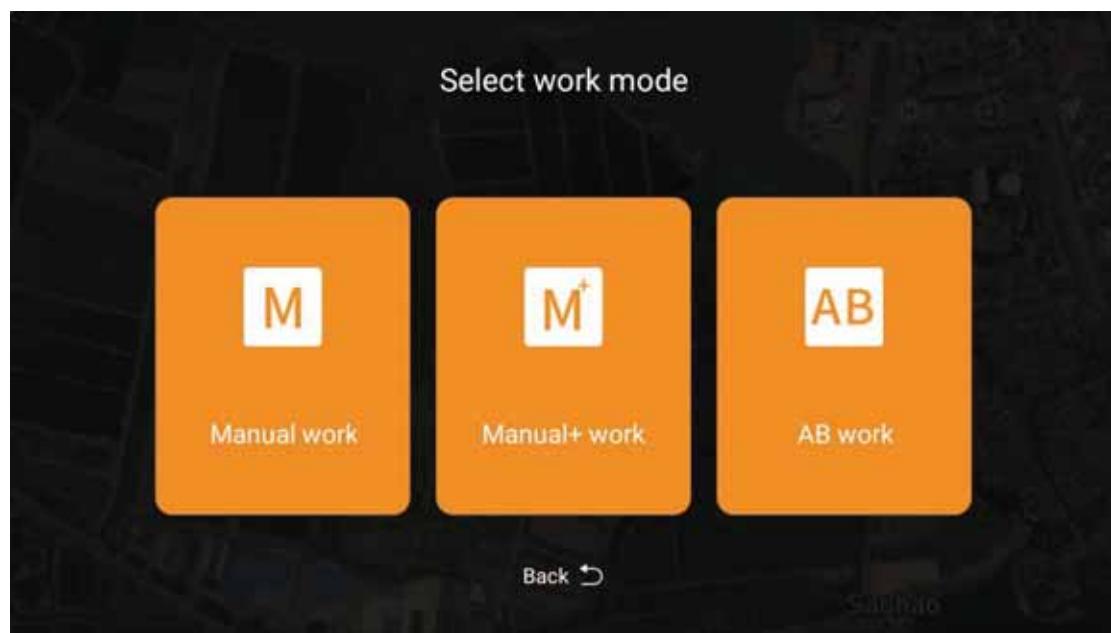
A mode (attitude): GNSS module is not used for positioning, only attitude augmentation is provided. The flight speed of aircraft in attitude mode is related to environmental factors such as wind speed.

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.

Work Mode

3WWWDZ-U25A 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

Users use the intelligent planning operation system of the Huida Drone APP to measure land parcel boundaries and obstacles. After setting the waypoint, the app will calculate and generate the best route based on this data, achieving intelligent planning of operations. 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 3WWDZ-U25A agricultural unmanned aerial vehicle has functions such as intelligent departure, intelligent supply reminder, intelligent endurance point, abnormal interruption operation recovery, and can use radar systems for altitude determination, obstacle avoidance, and detour.

Users can adjust the spraying/broadcasting amount, flight speed, etc. in real-time on the app interface, which is very suitable for regular and irregular large-scale operations.

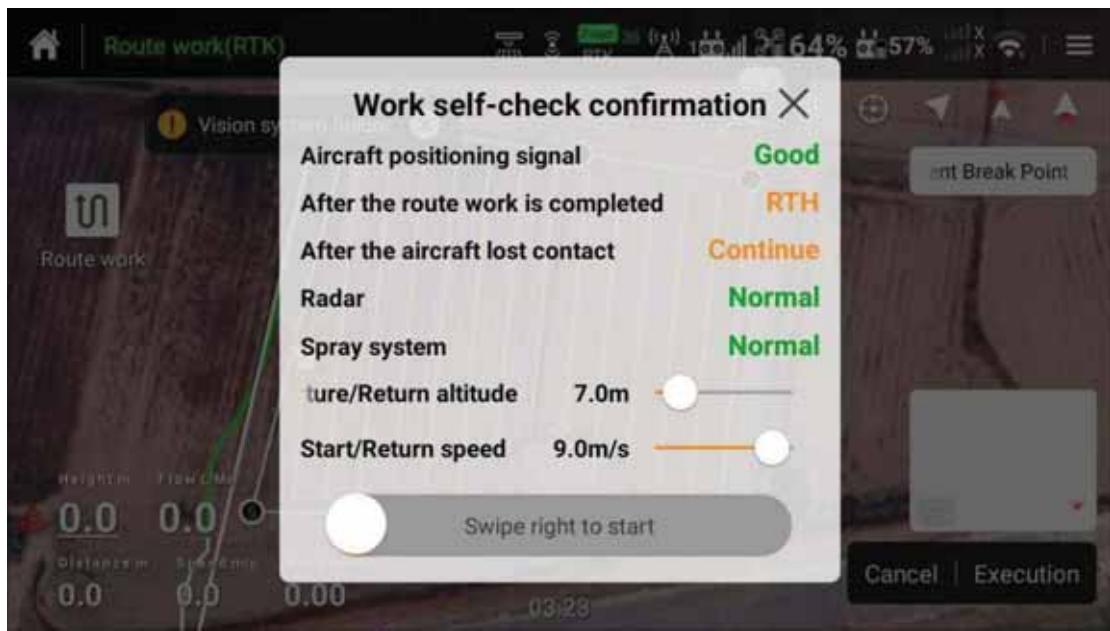


Start the homework, enter the manual homework homepage, and call the target plot



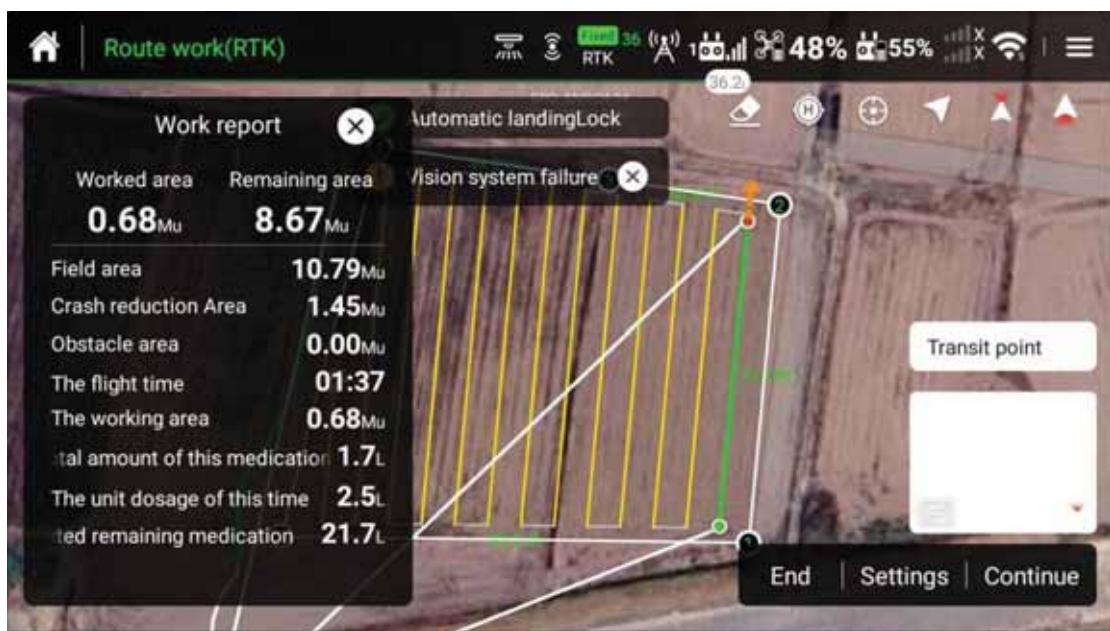
After completing the call, you can enter the fully autonomous operation mode, and then set the operation parameters as needed





Call, synchronize route information with remote control and drone, and confirm pre operation parameter settings and drone status





After completing the assignment, you can view the assignment report

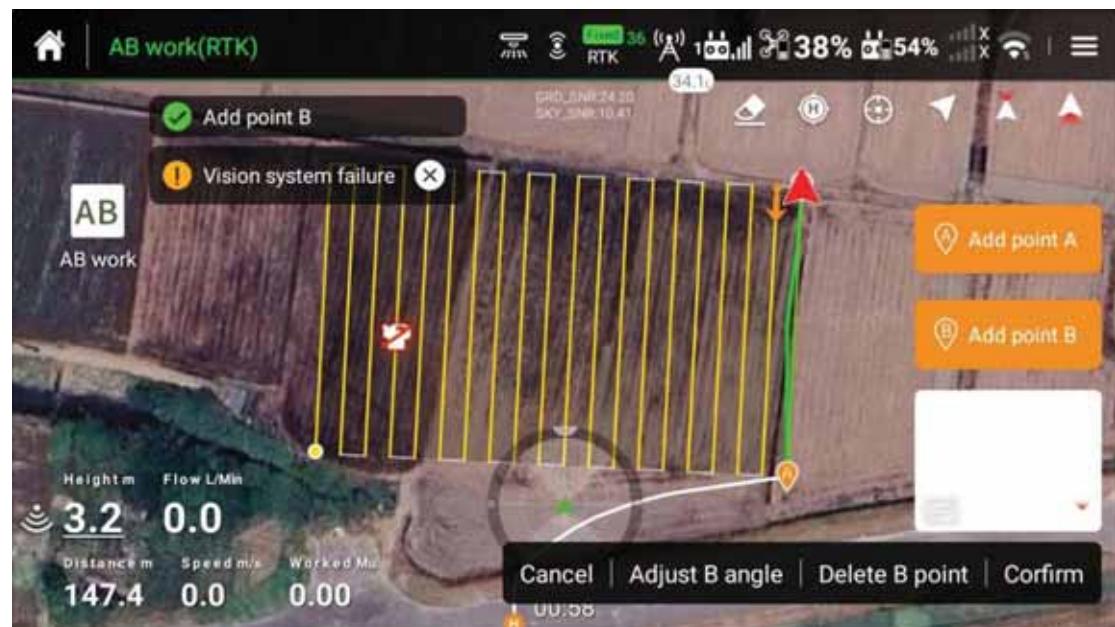
A-B point work mode

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.

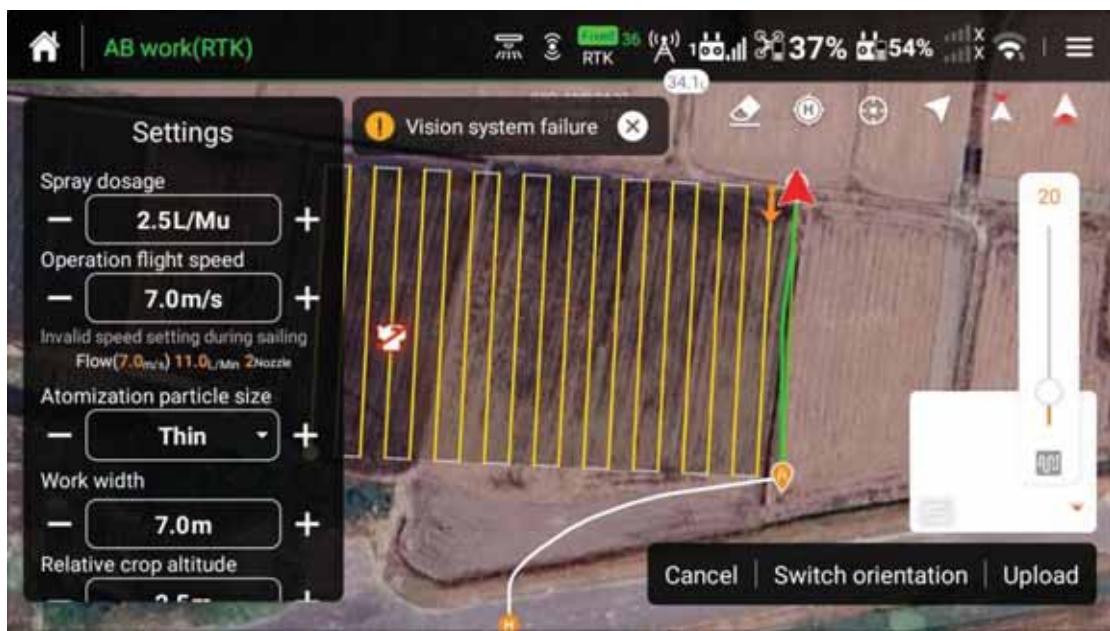
The 3WWDZ-U25A agricultural unmanned aircraft has the functions of intelligent departure, intelligent supply reminder, abnormal interruption operation recovery, and can use the radar system for altitude determination, obstacle avoidance and automatic obstacle avoidance.

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.

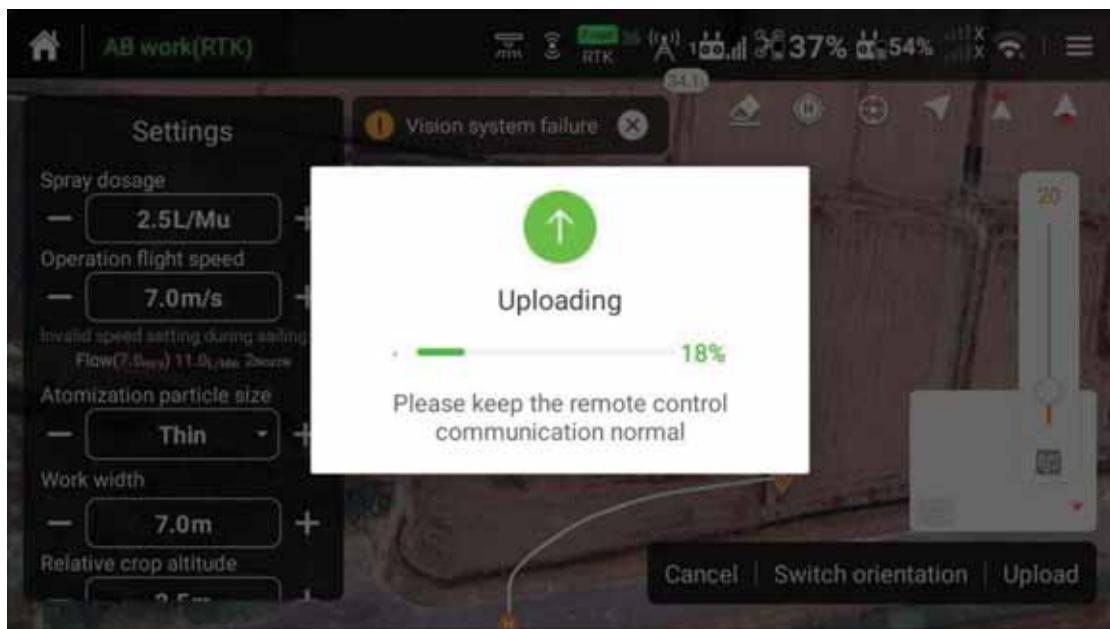
Add A-B points

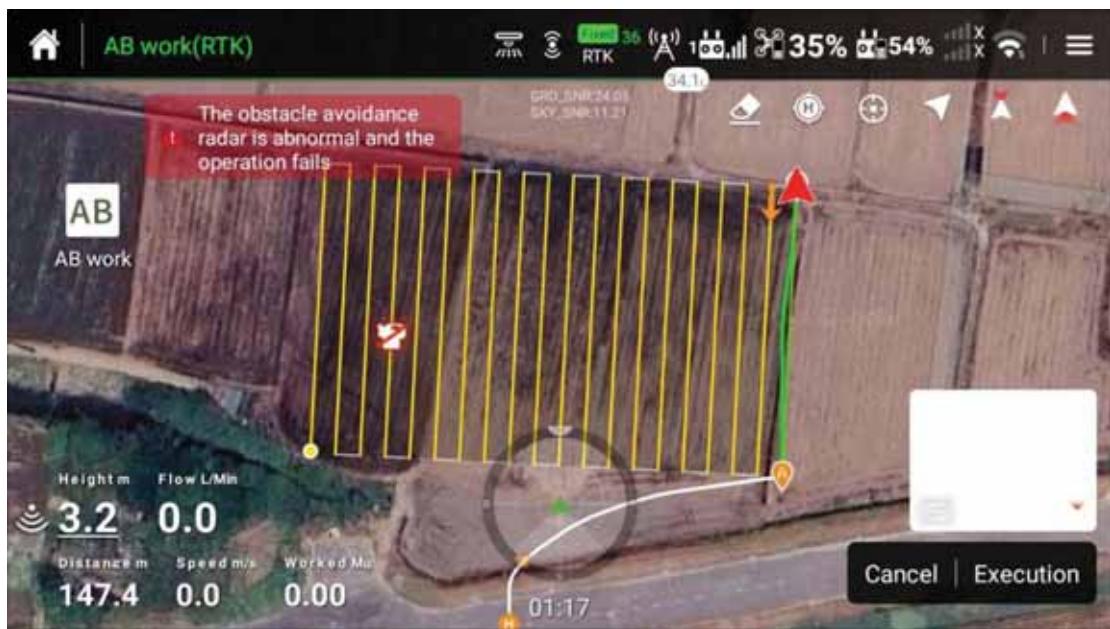
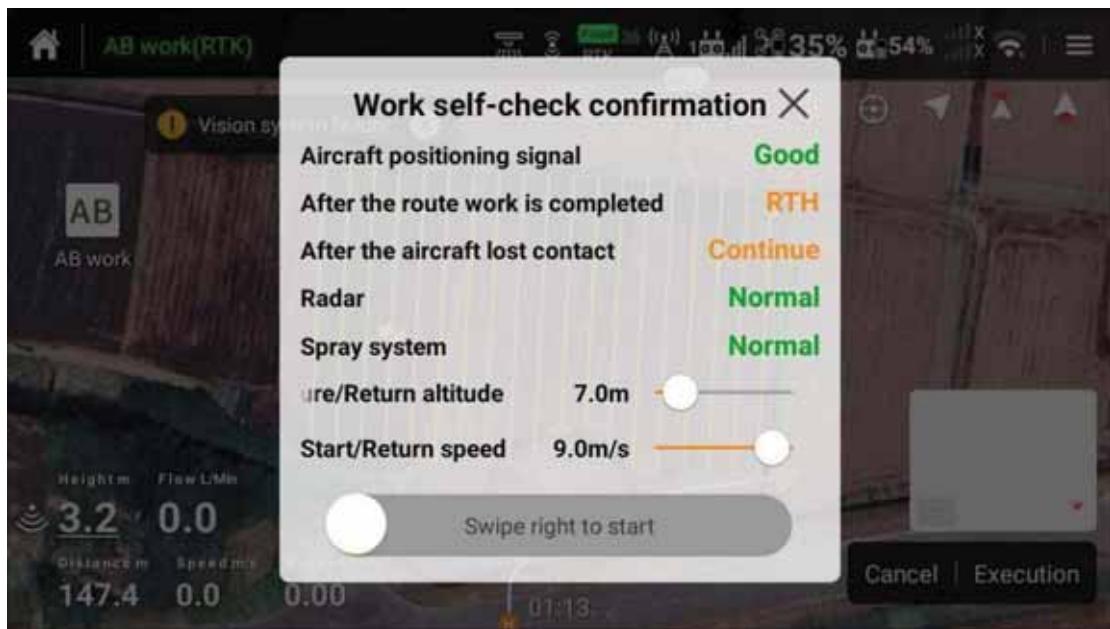


Set the number of routes and operational parameters



Execute A-B point assignments





Manual homework 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.



Note: Manual homework requires a start button to record data such as work area

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 3WWDZ-U25A 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

3WWWDZ-U25A 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

3WWWDZ-U25A 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

3WWWDZ-U25A 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 radar 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

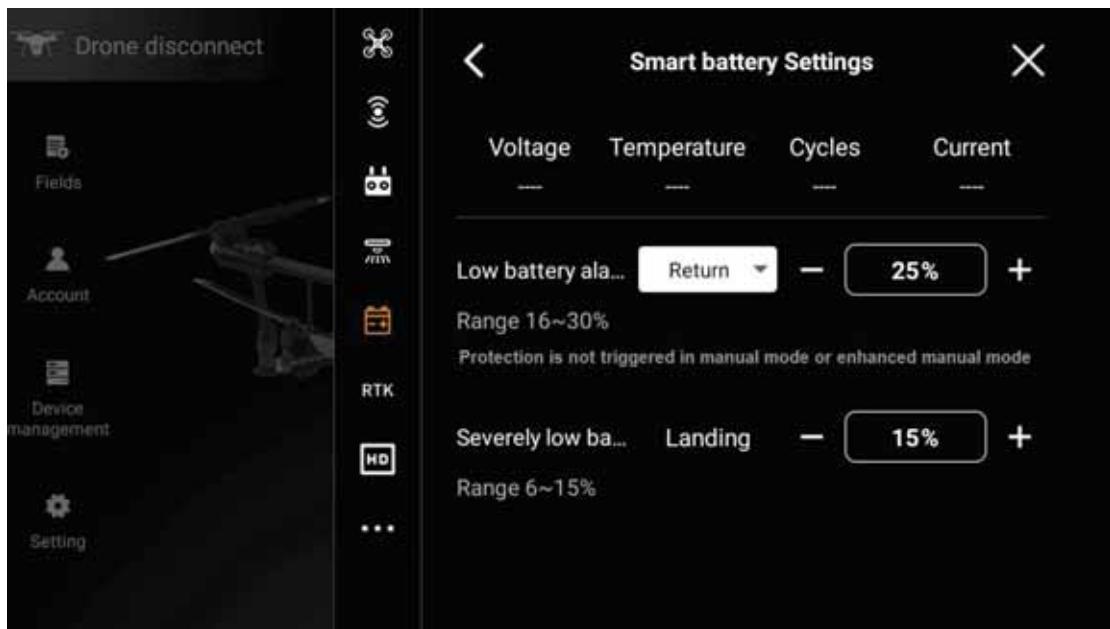
Low Power and Ultra-low Power Protection

3WWWDZ-U25A 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.

3WWDZ-U25A 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	Green light flashes slowly
		With GNSS	
		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

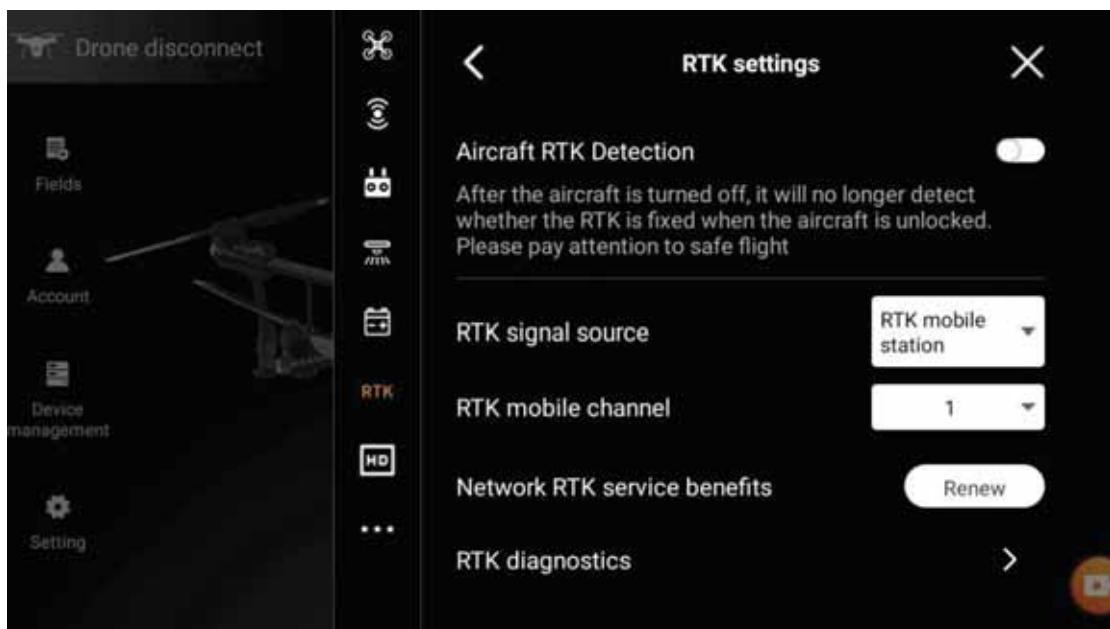
Compared with the compass module, the airborne high-precision RTK module of 3WWDZ-U25A UAV not only has higher accuracy, but also provides strong anti-electromagnetic interference capability, ensuring reliable operation flight in the environment of high-voltage lines, metal buildings and other strong magnetic interference. Dual antenna direction finding will be automatically enabled when GNSS signal is good.

3WWDZ-U25A 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.

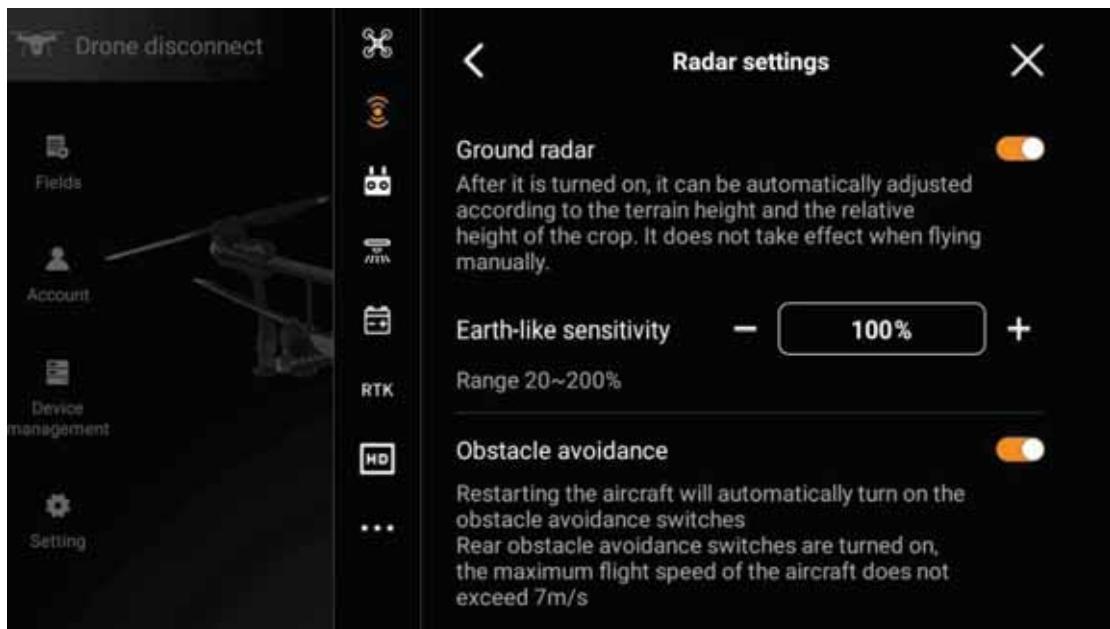


Radar system

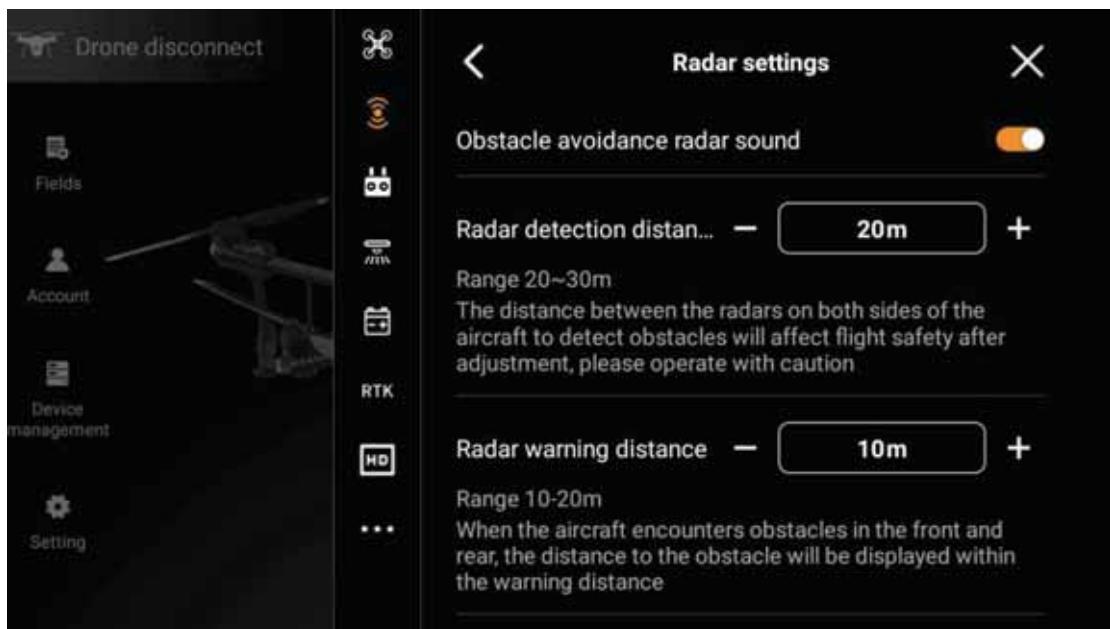
Ground radar: the ground radar switch is turned on, and the aircraft can automatically adjust the relative height according to the height of crop fluctuation

Obstacle avoidance: the obstacle avoidance switch in four directions, front, rear, left and right, can be opened to detect obstacles within the set distance and emergency brake

Radar prompt sound: when encountering obstacles and different distances from obstacles, the remote controller will remind users with different sounds

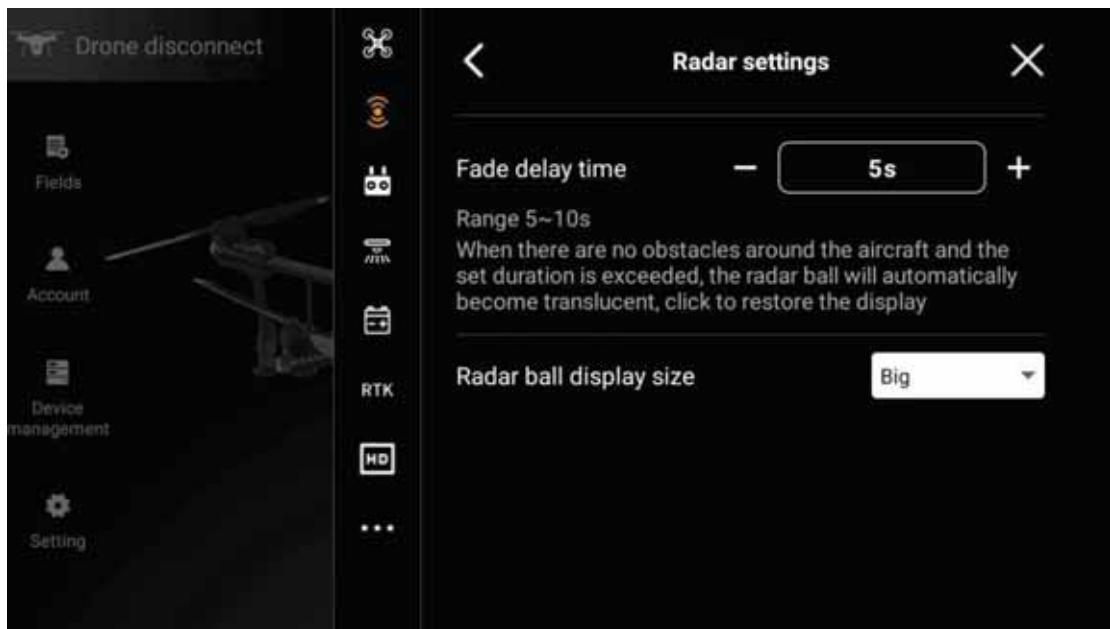


Radar detection distance: the distance of radar detection of obstacles. The larger the setting, the more obstacles will be detected, but the error rate will also be greater



Radar warning distance: when the aircraft encounters obstacles in the front, back, left and right sides, the distance from the obstacles will be displayed within the warning distance, and different colors will be displayed according to the distance to remind the user

Fade delay time: the radar ball is displayed translucent after the obstacle free time exceeds the set time, which is convenient for viewing other operation information



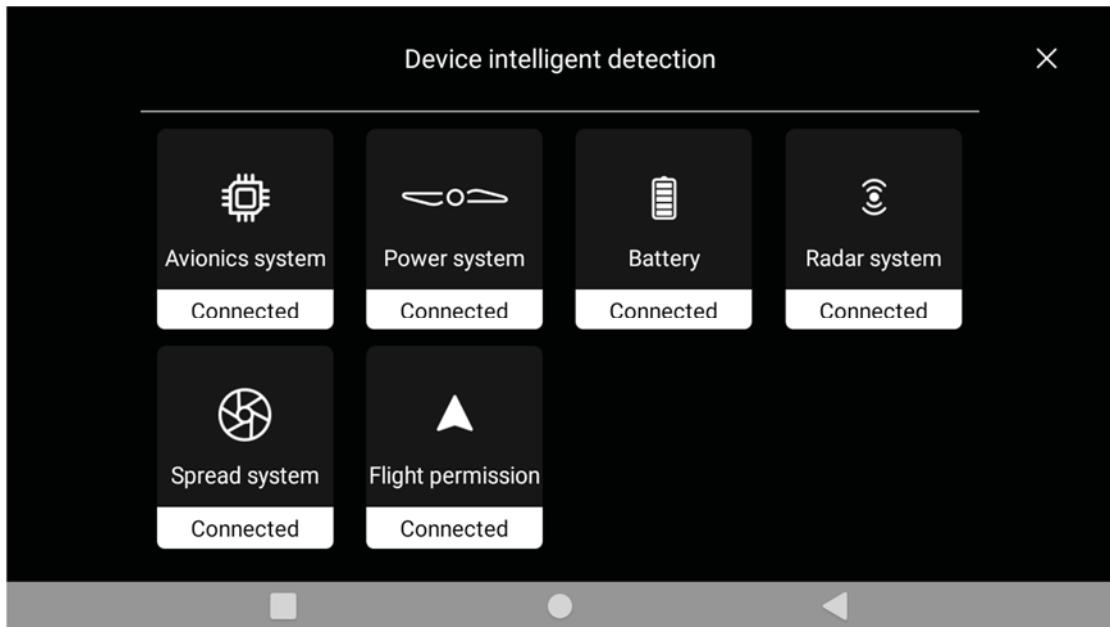
Radar ball display size: display the size of the radar ball at the APP end, and select large and small

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.

Flight

Flight Environment

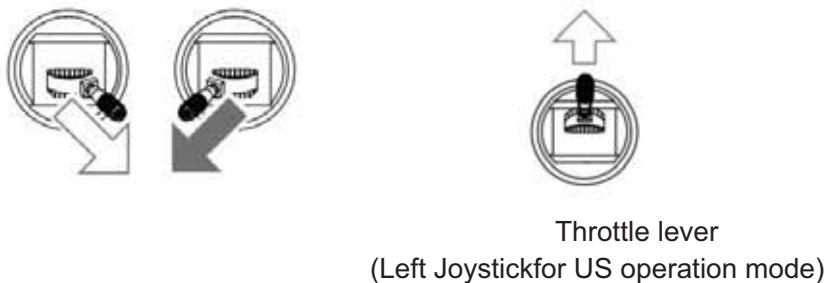
1. Do not spray in windy environment, and flight is not allowed when the wind level is below grade 5.
2. Do not fly in bad weather, such as foggy weather with low visibility, windy weather (wind speed is 8m/s and above), rain and snow, etc.
3. Select an open place without tall buildings around as the 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.



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 3WWDZ-U25A 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.

Common settings for drones

IMU and magnetometer calibration

The IMU and magnetometer have already been calibrated before leaving the factory. After being transported over a distance of 500KM, it is recommended to calibrate the magnetometer

Motor bias angle inspection

After the vibration of the drone increases or the power sleeve is replaced, this item needs to be checked

Automatic fine tuning of line spacing

When the row spacing cannot cover the entire plot evenly, this function can be turned on, and the row spacing will be automatically adjusted according to the width of the plot to cover the entire plot evenly.

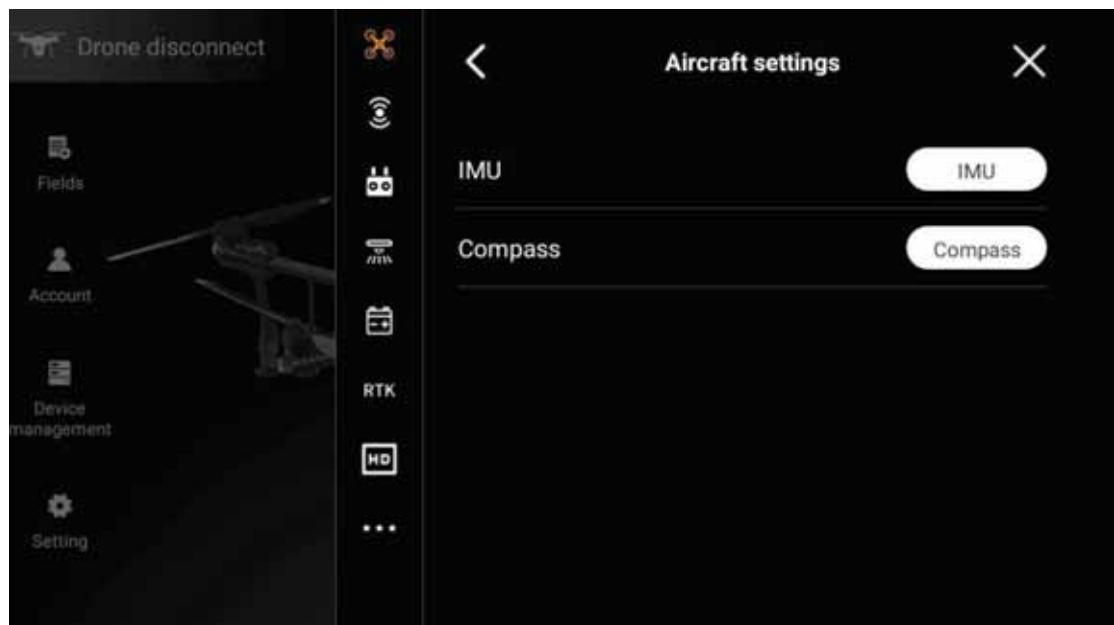
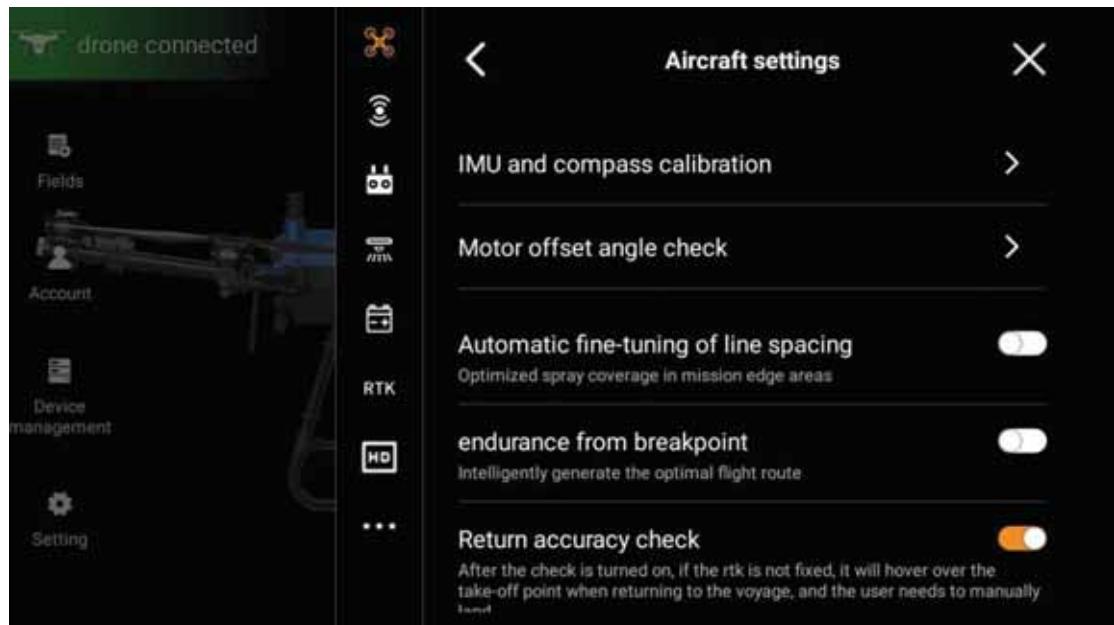
Intelligent endurance point

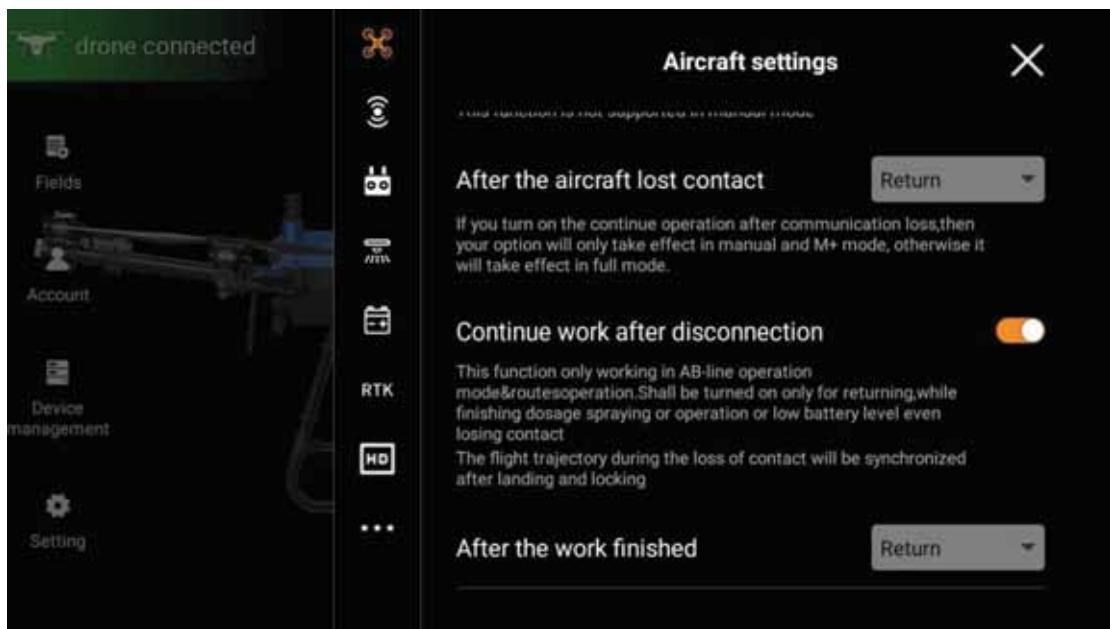
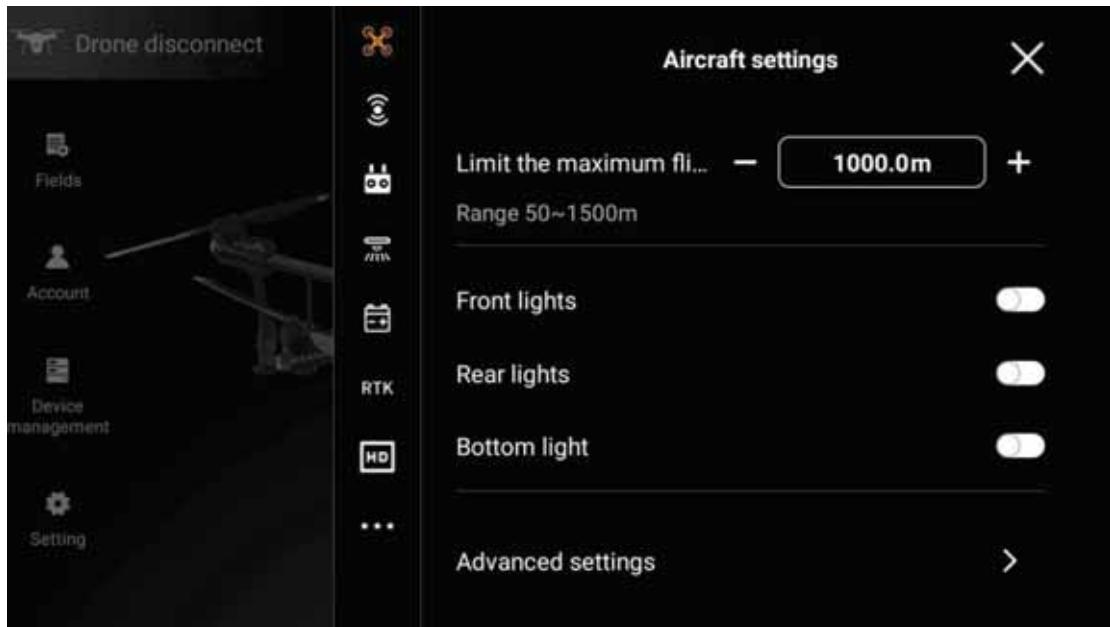
Suitable for use on fast and long routes on the earth, it can trigger intelligent endurance points in scenarios where the distance from the cut-off point to the departure point is not suitable for full load air flight, which can improve battery utilization and reduce operating costs.

Return accuracy inspection

If there are many obstacles near the HOME point and the landing environment is complex, you can turn on this switch. When the RTK single point is reached, the drone will hover

over the HOME point after returning, and the landing will be manually taken over to prevent a large error from landing in a non safe position.





Remote Controller

Overview of Remote Control

The HD402 remote control, which comes standard with the 3WWDZ-U25A agricultural unmanned aerial vehicle, is a new generation of unmanned aerial vehicle remote control independently developed by Huida Technology. This remote control adopts advanced image and data communication technology, with a maximum communication distance of 2 km; Equipped with a 6-inch high-definition touch screen and built-in Android system, it can

directly run the Huida Drone App for route planning, land editing and management, configuration of route and manual operations, and real-time viewing of aircraft status; Support online firmware upgrades for drones and remote controls, and support Bluetooth connection to external devices; Support multiple quick and convenient auxiliary functions (quick screenshots, recording, etc.)

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

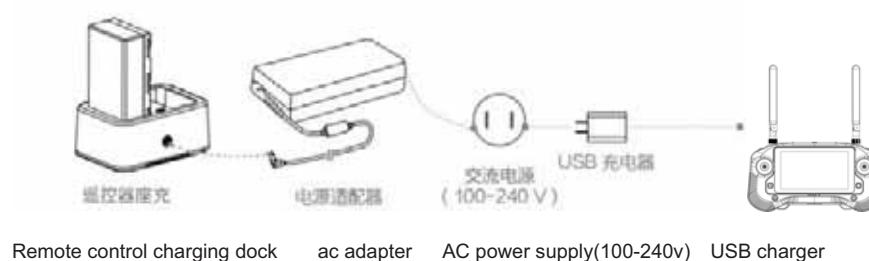
Charge

Built-in Batteries

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

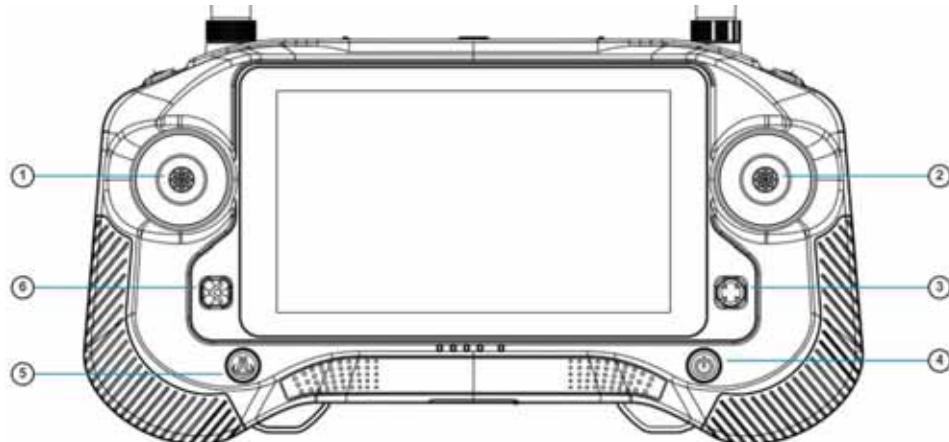
External Battery

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

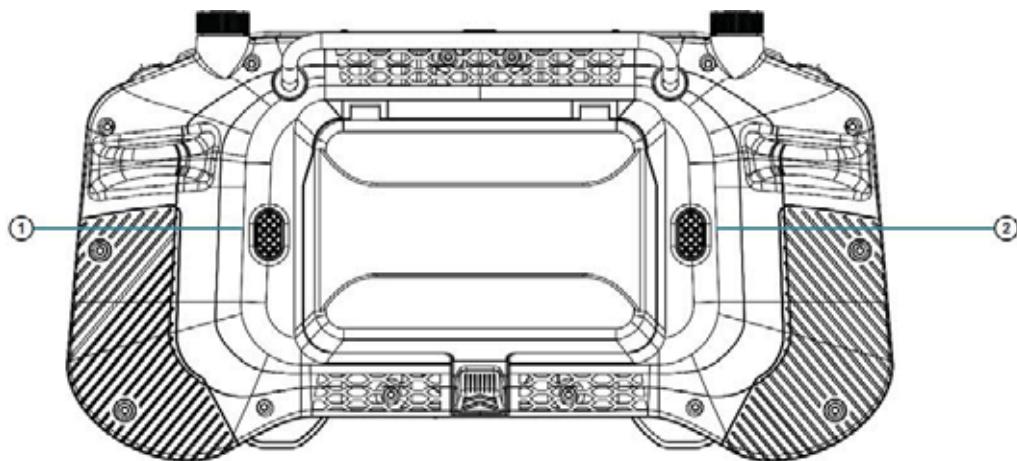


Key Operation of Remote Control

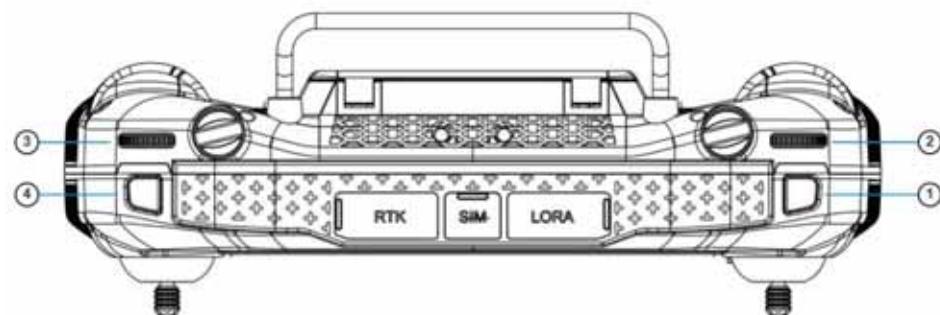
Distribution Diagram of Physical Keys of Remote Control



- ① Left Joystickarm
② Right Joystickarm
③ Five dimensional buttons
④ Switch button
⑤ Return flight button
⑥ Return button



- ① Custom buttons1
② Custom buttons2

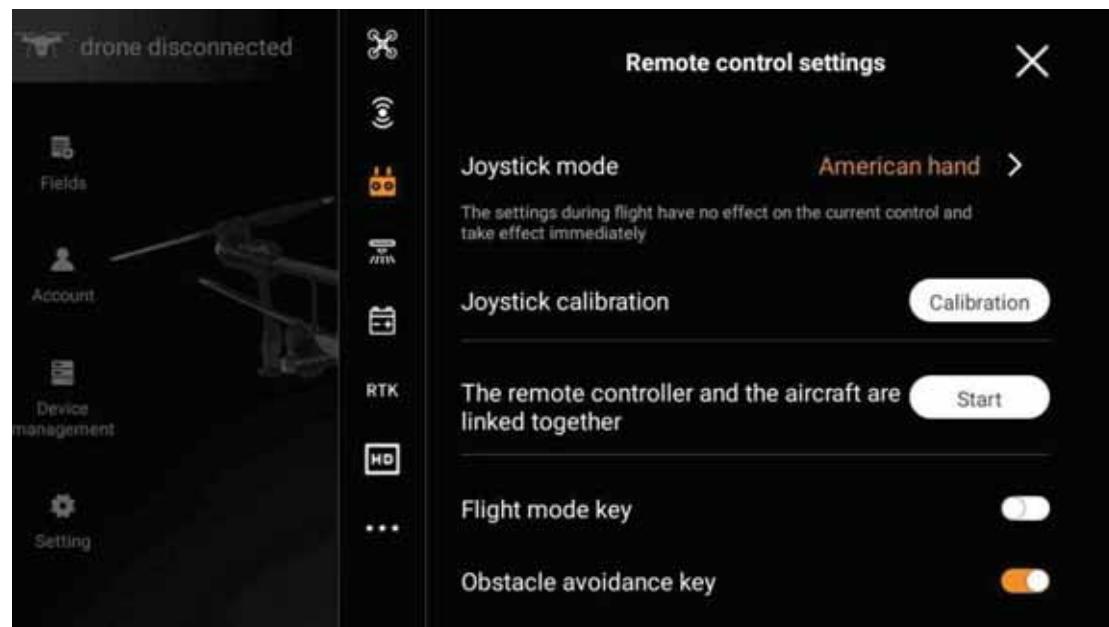


- ① Operating system switch button
② Operating System Flow Adjustment Wave Wheel
③ Pan tilt camera adjustment wheel
④ Radar switch button

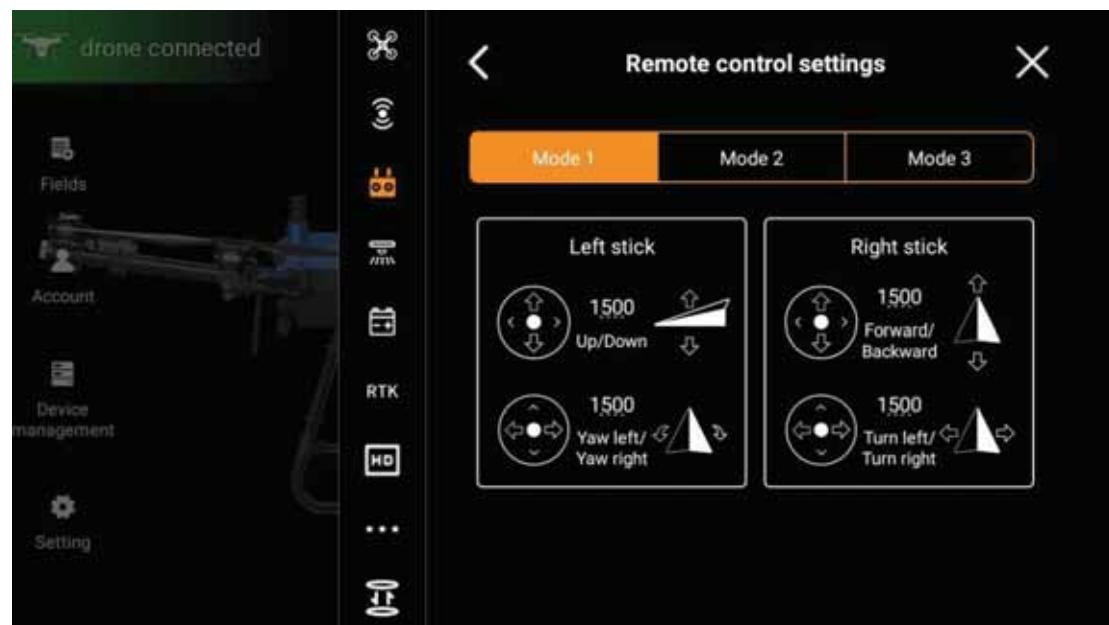
Joystick control

To control the joystick, you need to first set the joystick mode according to your own control habits

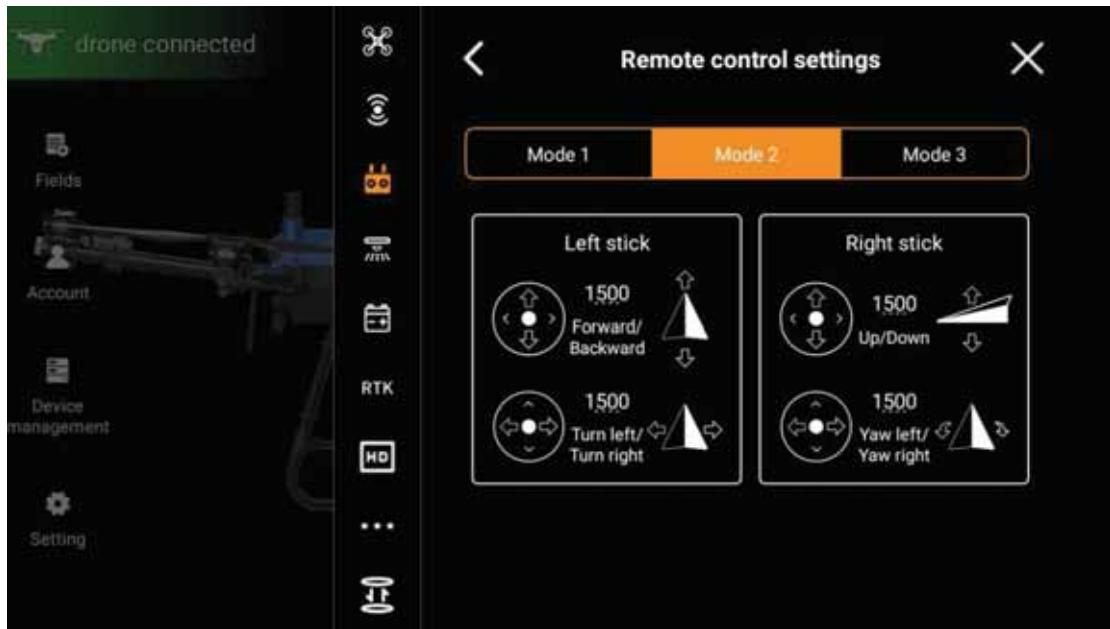
Note: Do not unlock takeoff without permission when unsure of joystick mode



JoystickControl Diagram under Mode1



JoystickControl Diagram under Mode2

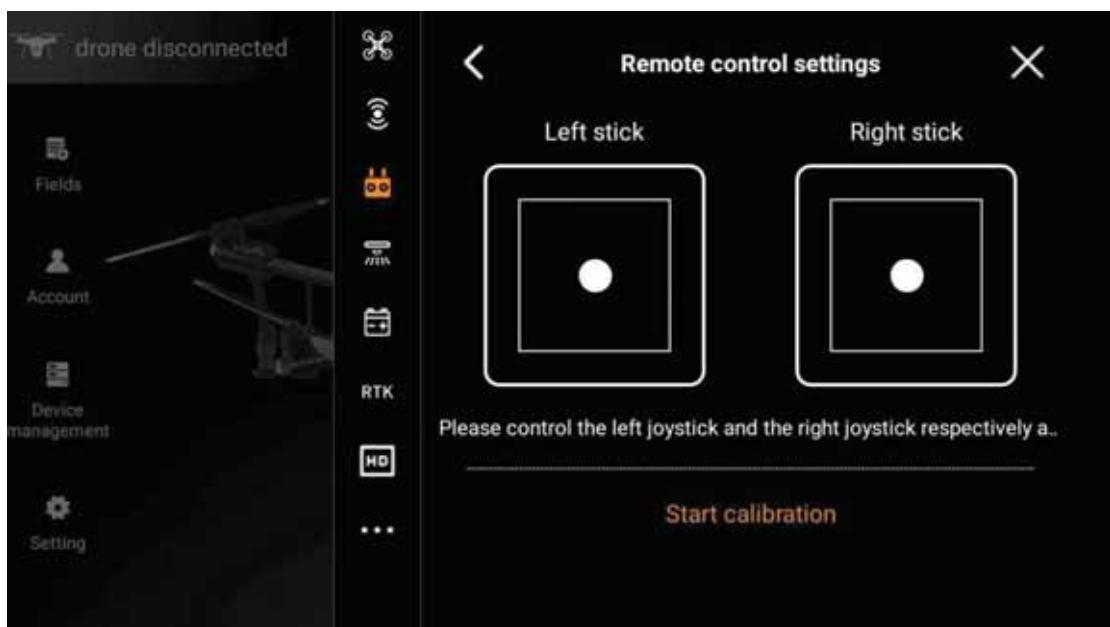
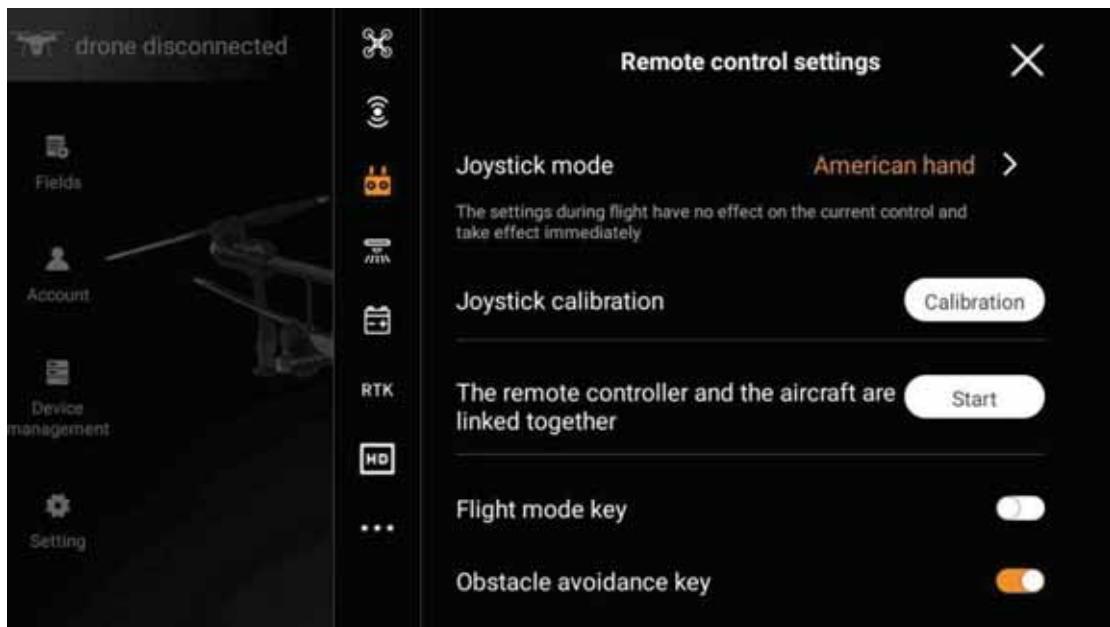


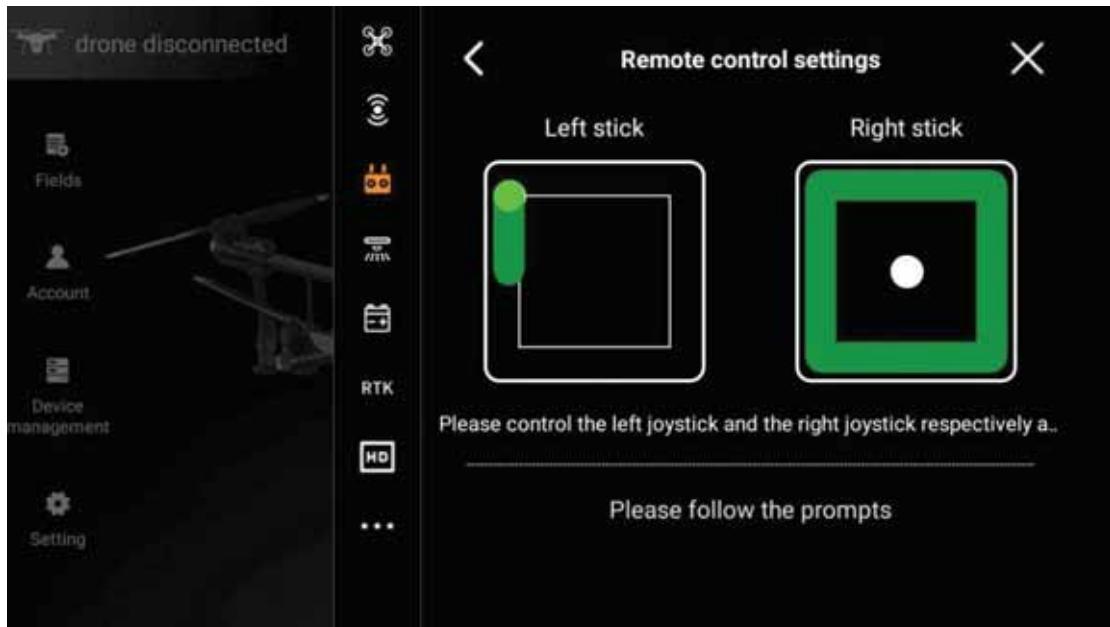
JoystickControl Diagram under Mode3



JoystickCalibration

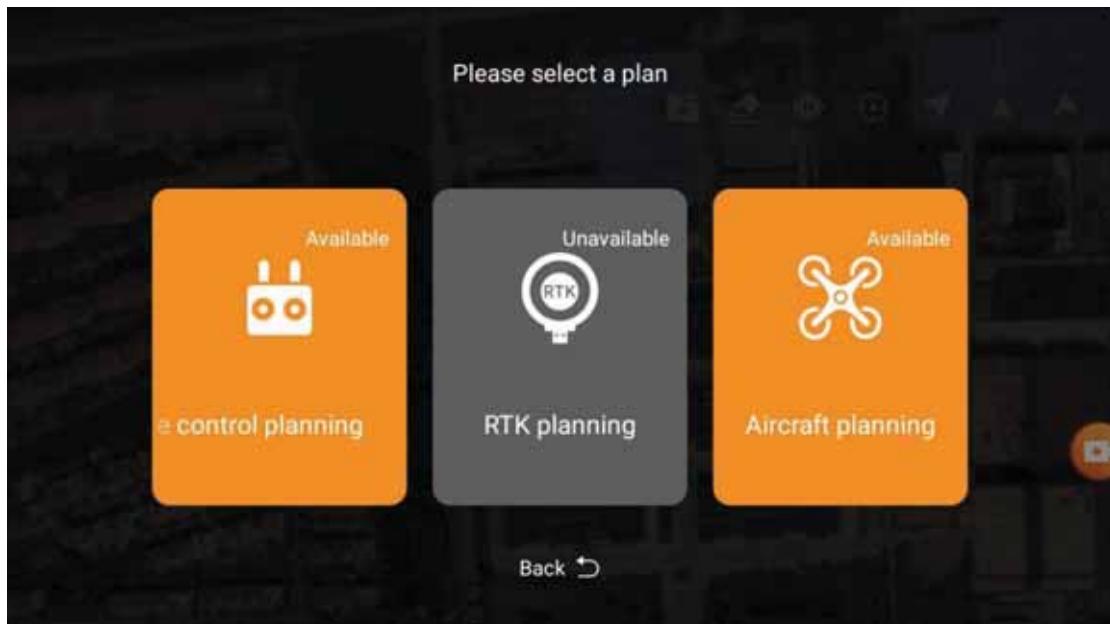
The Joystickof 3WWDZ-U25A remote control has been calibrated from the factory, but it is necessary to calibrate the Joystickbefore unlocking for the first time to prevent the problem of inaccurate Joystickcaused by transportation bumps. In daily use, this function can also be used to calibrate the remote control Joystickif the Joysticknot returning to the neutral position while pushing joystick and the offset is large.





Planning plot

The Huida Drone APP provides four ways to plan land parcels: 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.

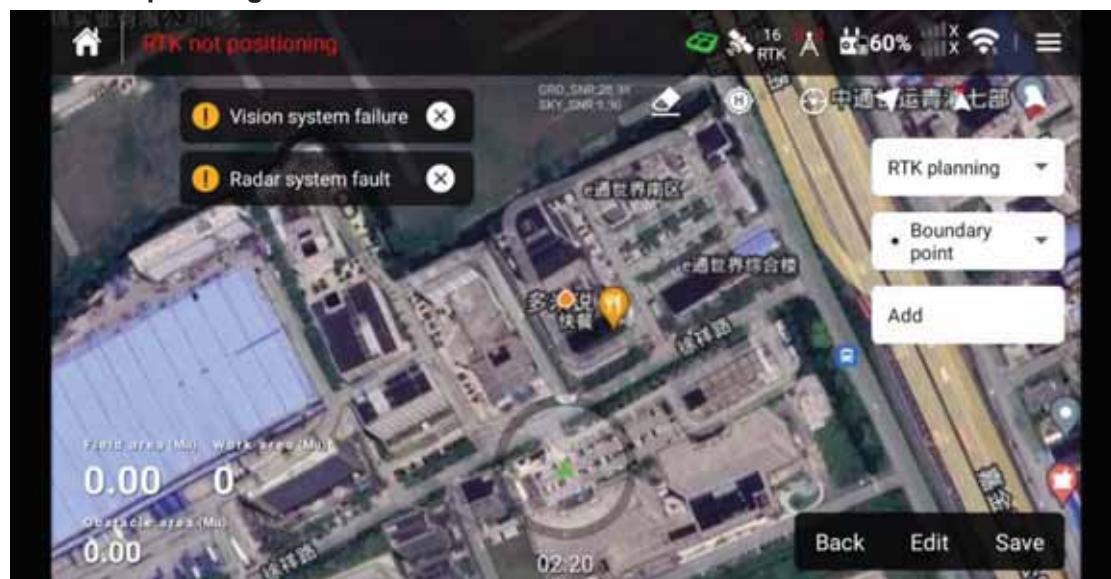
1. Ensure that the RTK high-precision positioning module is installed in the remote control

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.

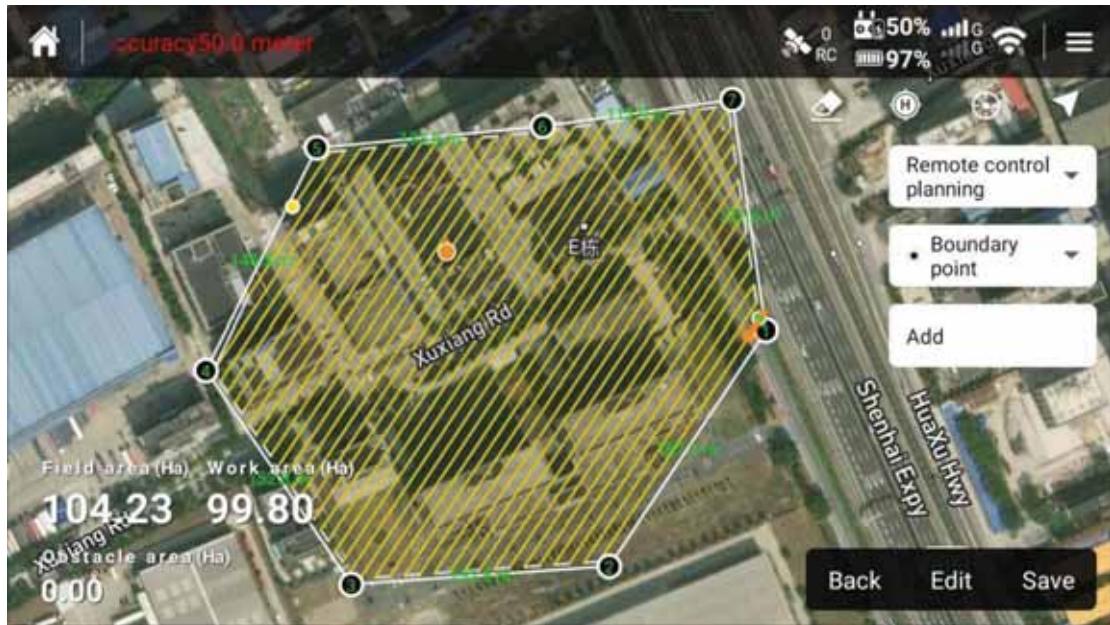
Start RTK planning



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

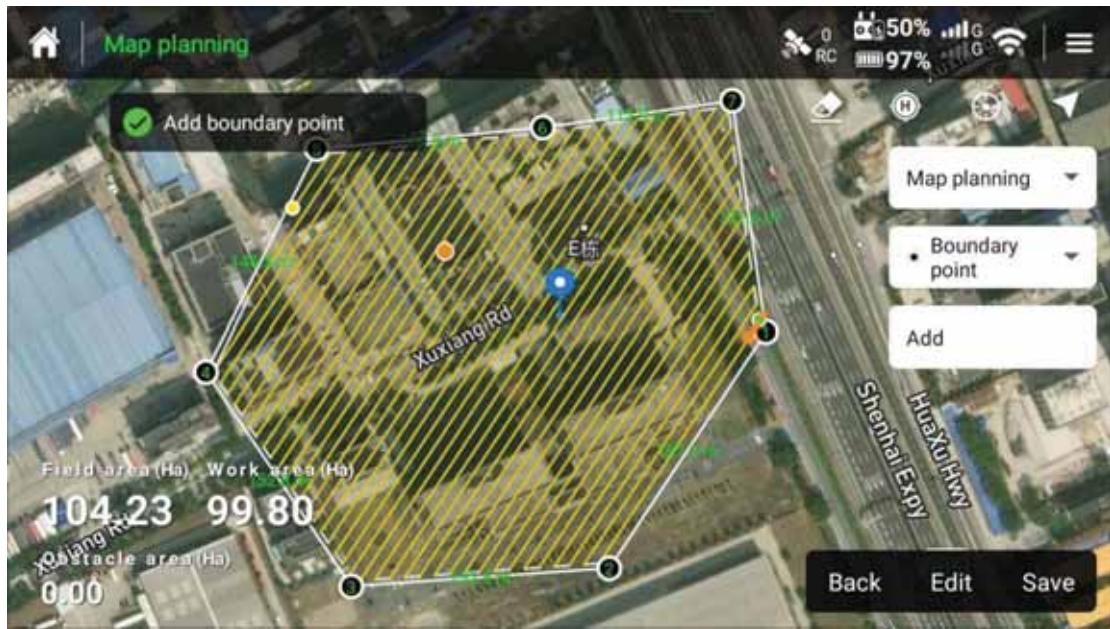
Other operation steps are similar to those of RTK planning, you only need to control the aircraft instead of walking with the remote control

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 plot

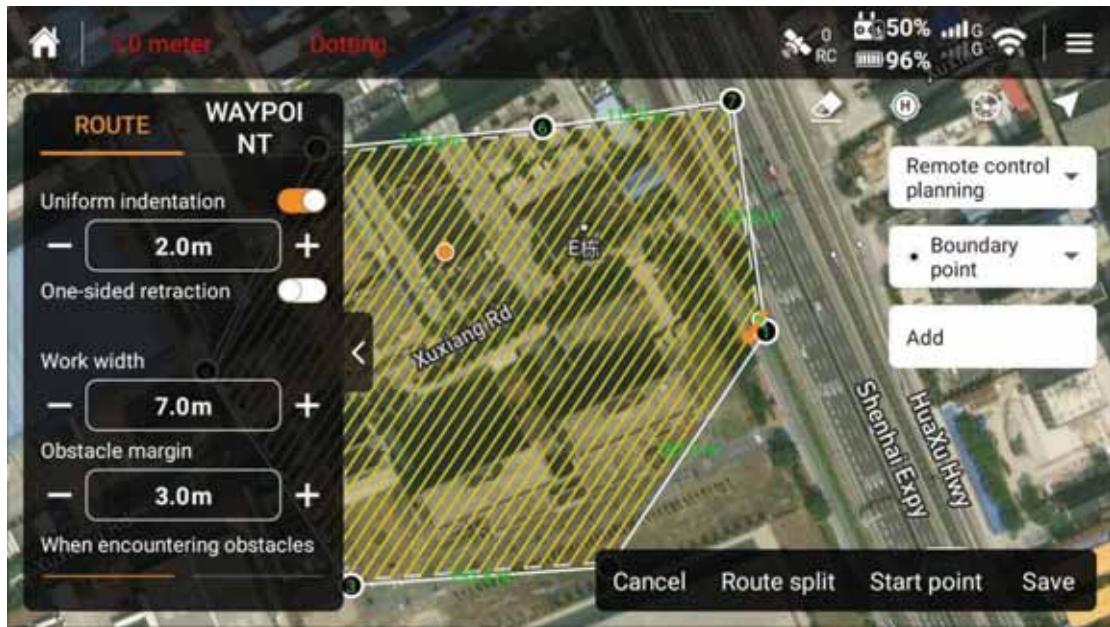
Edit the Flight Course

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.

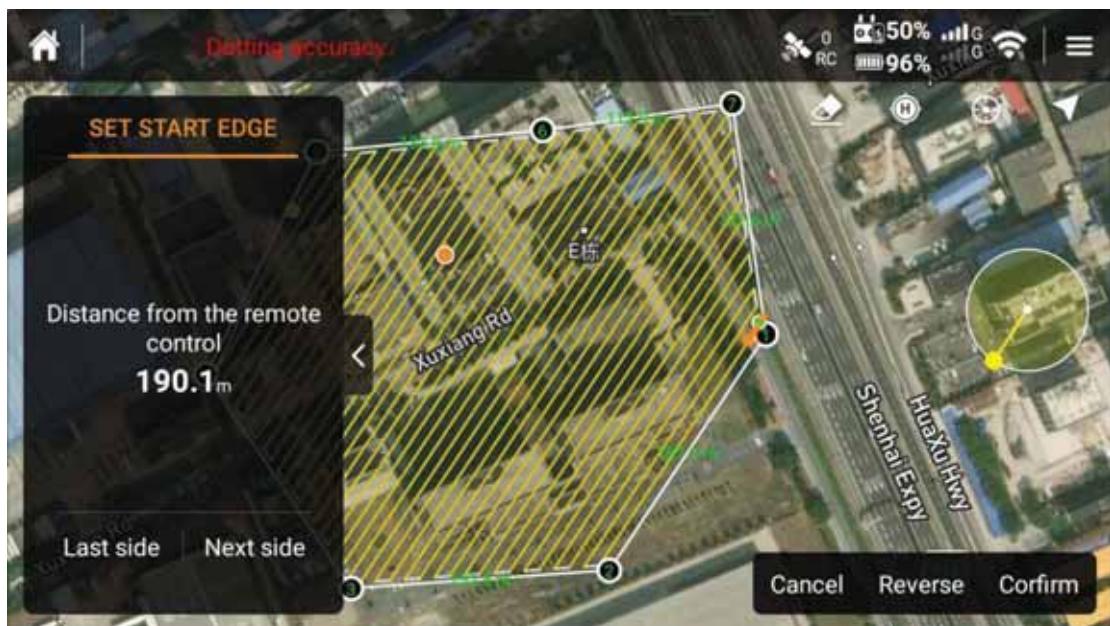


Adjustment of route direction

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).



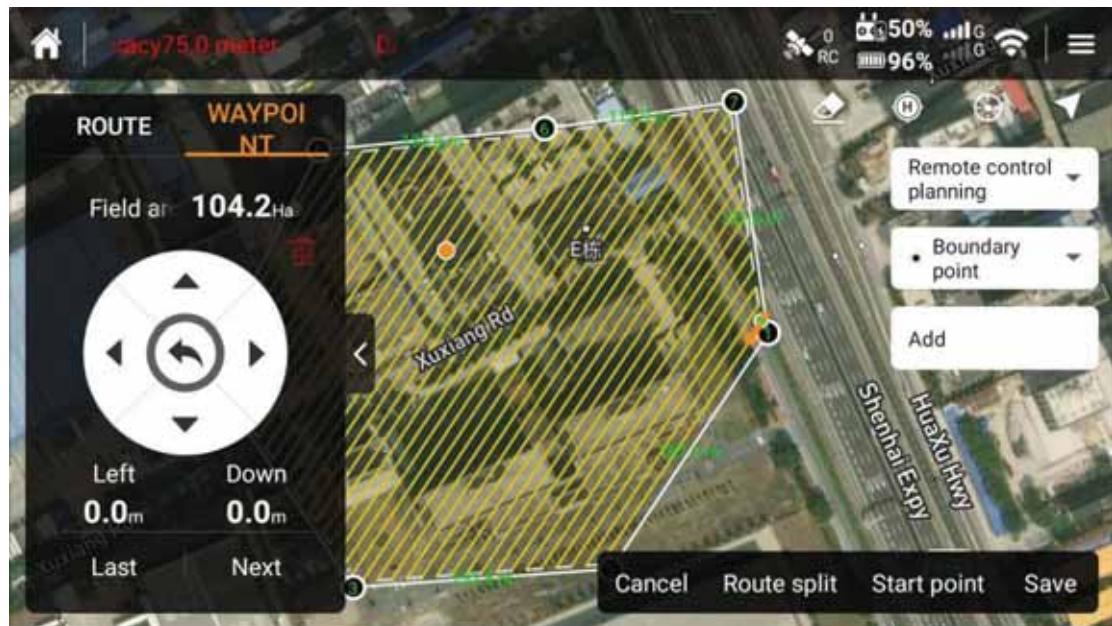
Edit Waypoint

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



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

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.

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

Smart One-click Return button

Intelligent return can be initiated by short pressing the return button on the remote control. During the intelligent return process, any lever can be manually activated to receive control of the drone.

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.

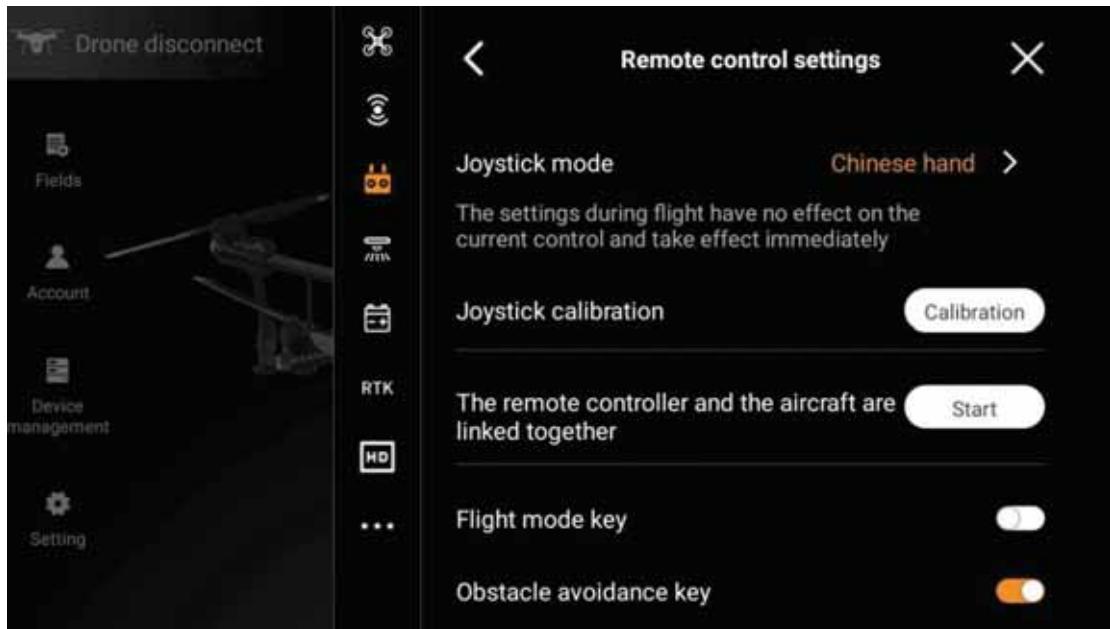
Remote control prompt sound

The Huida Drone APP will have built-in voice feedback or operation instructions after some operations, making it easier to get started using the Huida Drone APP. The prompt sound includes normal operation feedback and abnormal alarm prompts, and there are also floating text prompts for alarms in addition to voice prompts.

Frequency Matching of Remote Control

When leaving the factory, the remote control and the aircraft have completed frequency synchronization and can be used after being powered on. But if you replace the remote control, you need to recalibrate the frequency before you can use it.

1. Turn on the remote control, run the Huida Drone App, and then turn on the power of the aircraft.
2. Click on Settings - enter the remote control settings interface, click on frequency matching, lift the nose or tail of the aircraft and hold it for more than 30 degrees. When you hear a beep sound, check that the frequency matching status indicator light flashes from red to green, which indicates successful frequency matching. If the frequency matching fails, it is necessary to re-enter the frequency matching state for frequency matching.



Agricultural UAV APP

The Huida Drone App is designed specifically for drone agricultural applications, with a clear and concise interface that users can easily operate with text and voice prompts. During the user's homework process, real-time information about the drone spraying/broadcasting system can be obtained, and the health status of all devices connected to the remote control can be obtained in real time. Users can be informed of any abnormal device status as soon as possible; Real time protection of task data during land parcel and parcel calls ensures that user data is not lost; Multiple language versions will be supported in the future.

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. WIFI connection status and signal strength

6. Setting

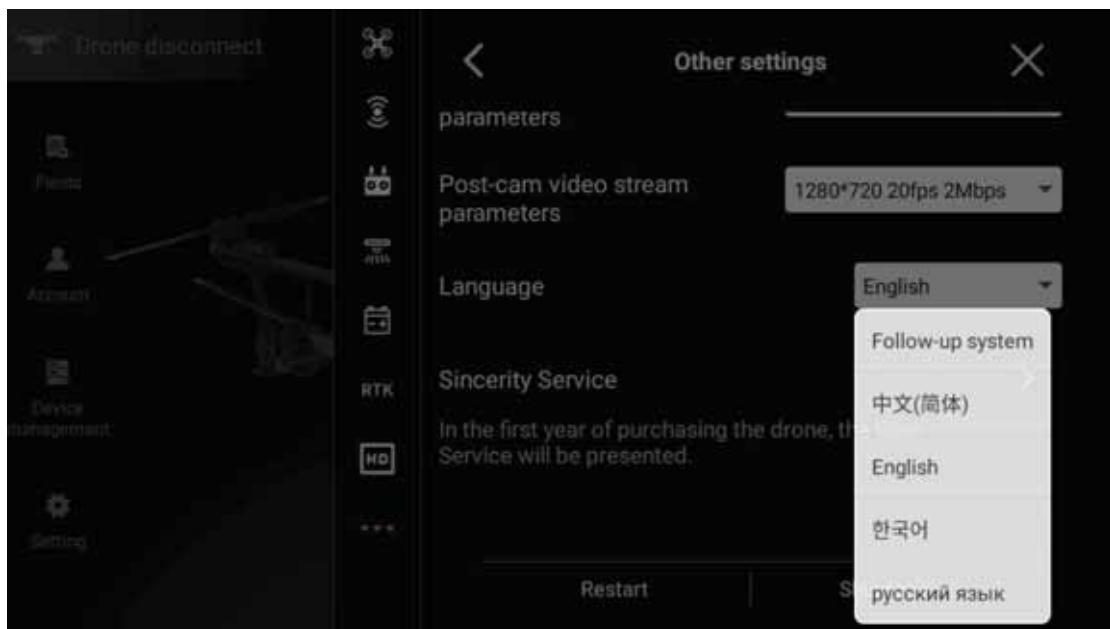
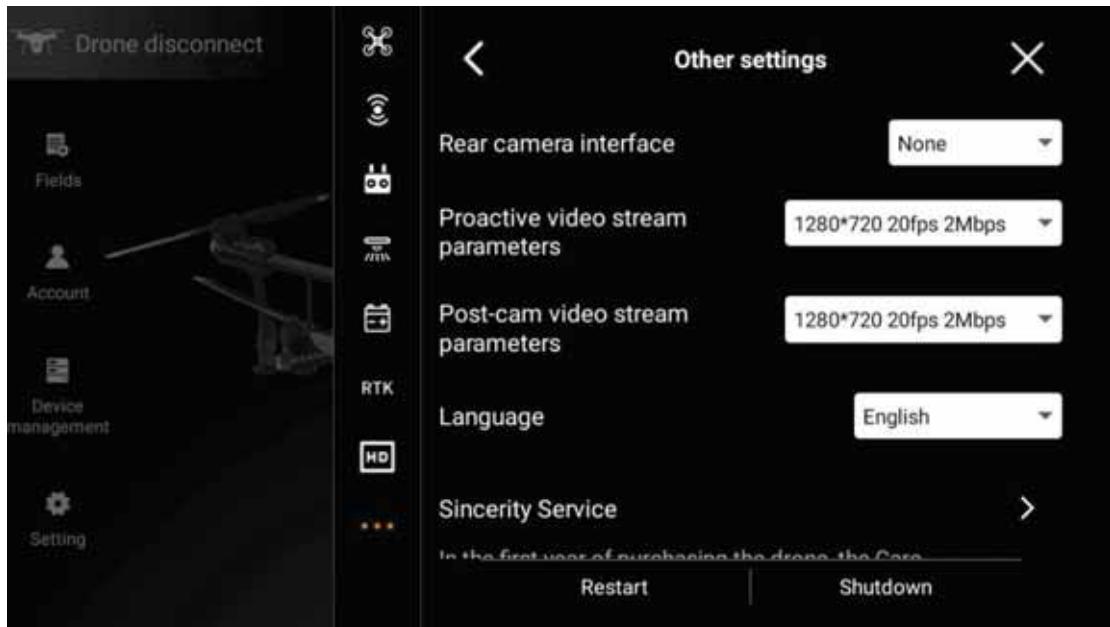
7. Start

8. Planning Fields

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

Language switching

The agricultural UAV APP built into the HD402 remote controller supports multiple languages, and can switch the display of different languages in APP>>Settings>>Other settings

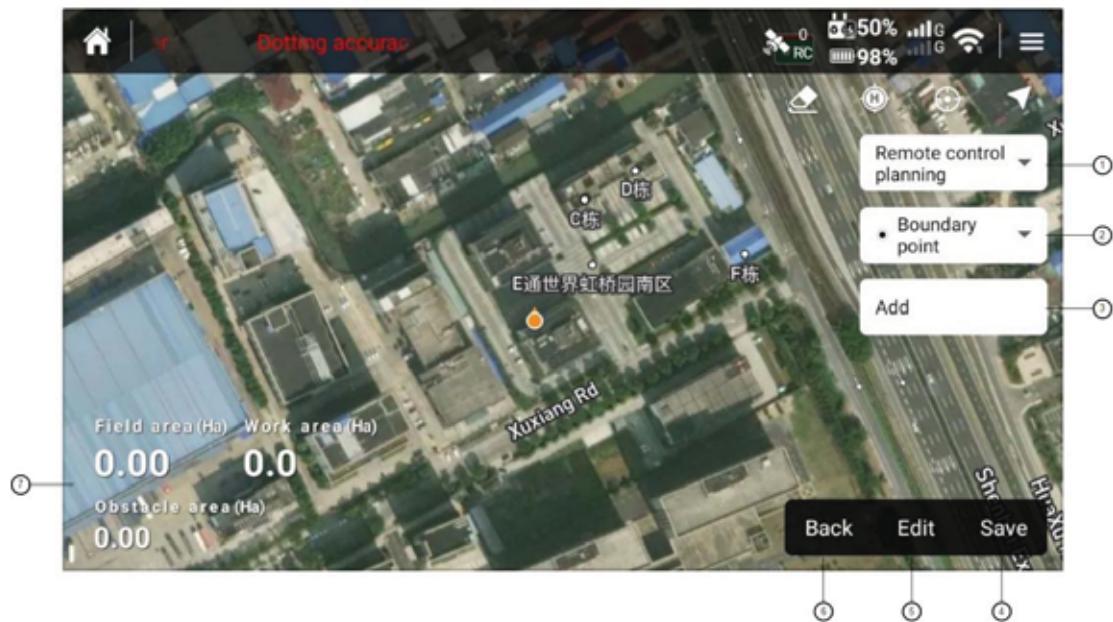


Planning Fields and Fields management

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 screenshot shows a list of parcels in a local management interface. At the top, it displays "Not synced: 0" and "Total quantity: 6". Below this is a table with four columns: Field area, Work area, and Obstacle area, along with a timestamp and location for each parcel. The first parcel is highlighted.

	Field area	Work area	Obstacle area
12345 ↗	269.32 Ha	264.25 Ha	0.00 Ha
2023-01-28 17:18:26	Field area	Work area	Obstacle area
上海市青浦区徐祥路685号靠近e通世界虹桥园南区			
6969988 ↗	56.99 Ha	54.65 Ha	0.00 Ha
2023-01-28 17:18:26	Field area	Work area	Obstacle area
新疆维吾尔自治区伊犁哈萨克自治州奎屯市乌苏街4幢靠近捷乐得别克特小区			
第一个地块 ↗	42.63 Ha	39.45 Ha	0.00 Ha
2023-01-28 17:18:26	Field area	Work area	Obstacle area
上海市青浦区徐泾镇华徐公路G15北青公路收费站(G15沈海高速入口宁波方向)			
测试一下吧2 ↗	149.63 Ha	144.35 Ha	0.00 Ha
2023-01-28 17:18:26	Field area	Work area	Obstacle area
上海市青浦区徐祥路685号靠近e通世界虹桥园南区			

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

The screenshot shows a list of parcels in a cloud-based management interface. At the top, it displays "Not synced: 1" and "Total quantity: 1". Below this is a table with five columns: Field area, Work area, Obstacle area, Completion rate, and a timestamp. The single parcel listed is highlighted.

	Field area	Work area	Obstacle area	Completion rate
12345	269.32 Ha	264.25 Ha	0.00 Ha	0.0%
2023-01-29 09:42...	Field area	Work area	Obstacle area	Completion rate
上海市青浦区徐祥路685号靠近e通世界虹桥园南区				

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 radar 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, radar, 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 Joystickmode (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)

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

Radar warning distance, emergency hovering distance, calibration detection angle, numerical display of obstacle distance, radar 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.Call the plot

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

18.Switch the work mode

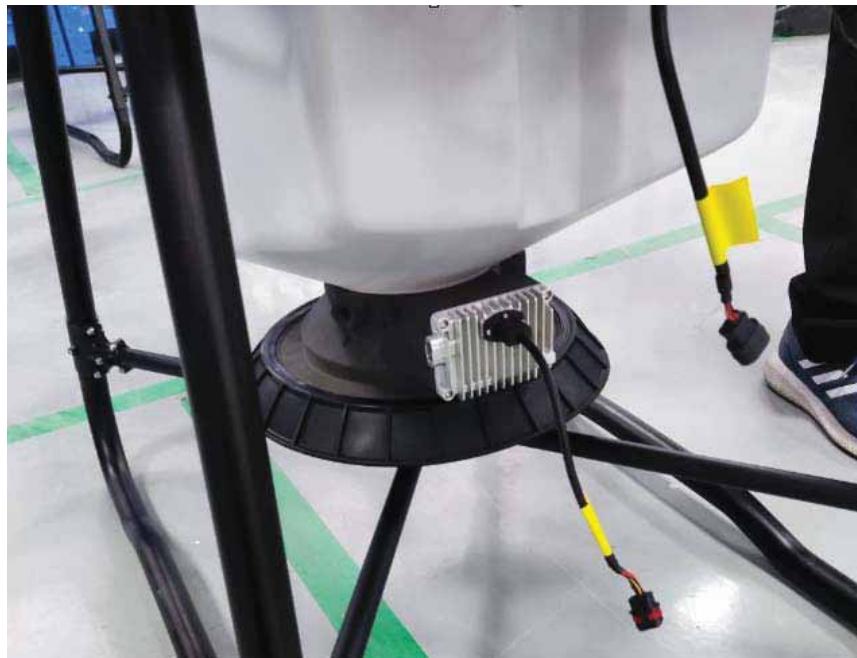
The manual work interface is entered by default when starting work. You can switch to manual enhanced and A-B work mode by switching work mode

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.

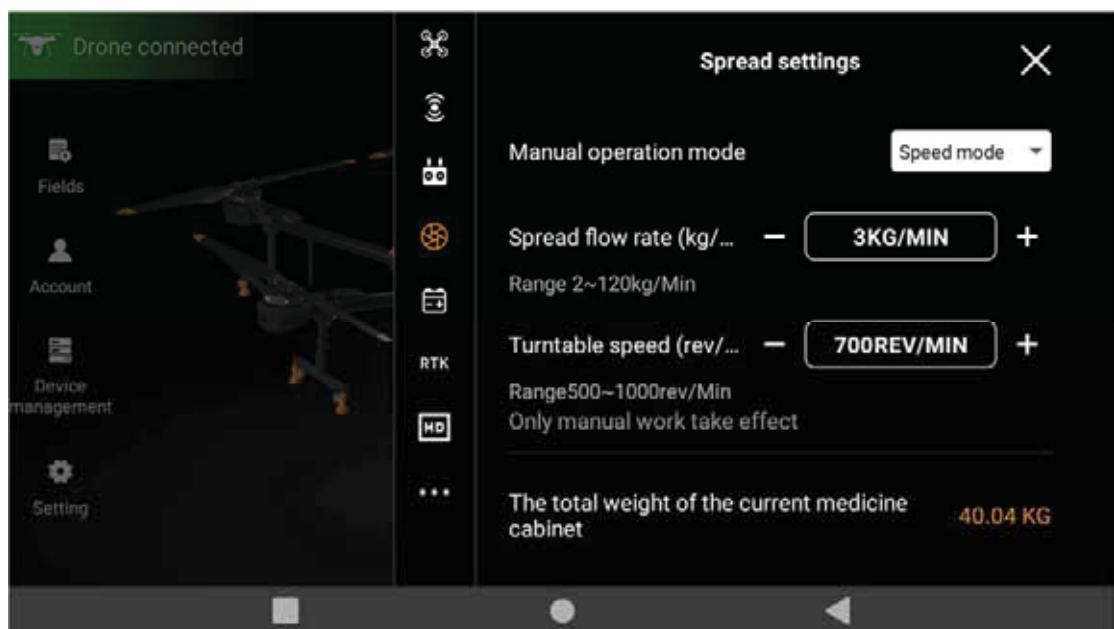
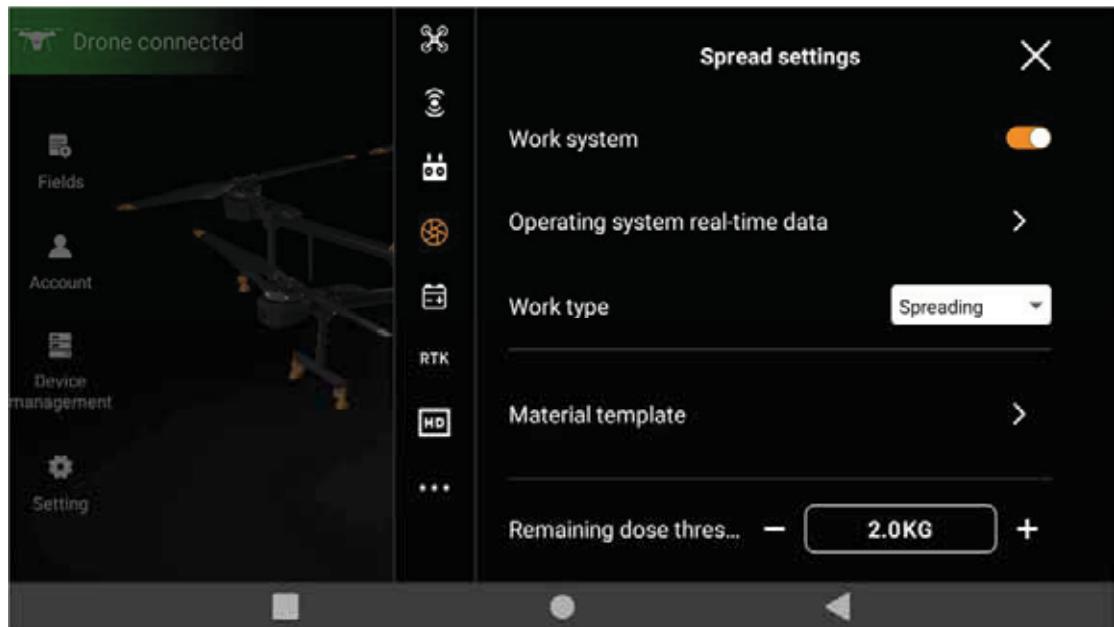
Connect the harness shown in the figure. After connecting, start the remote control first, and then start the aircraft. Check whether the setting of the operation type of the operation system is automatically identified. If the identification is not correct, you can set it manually

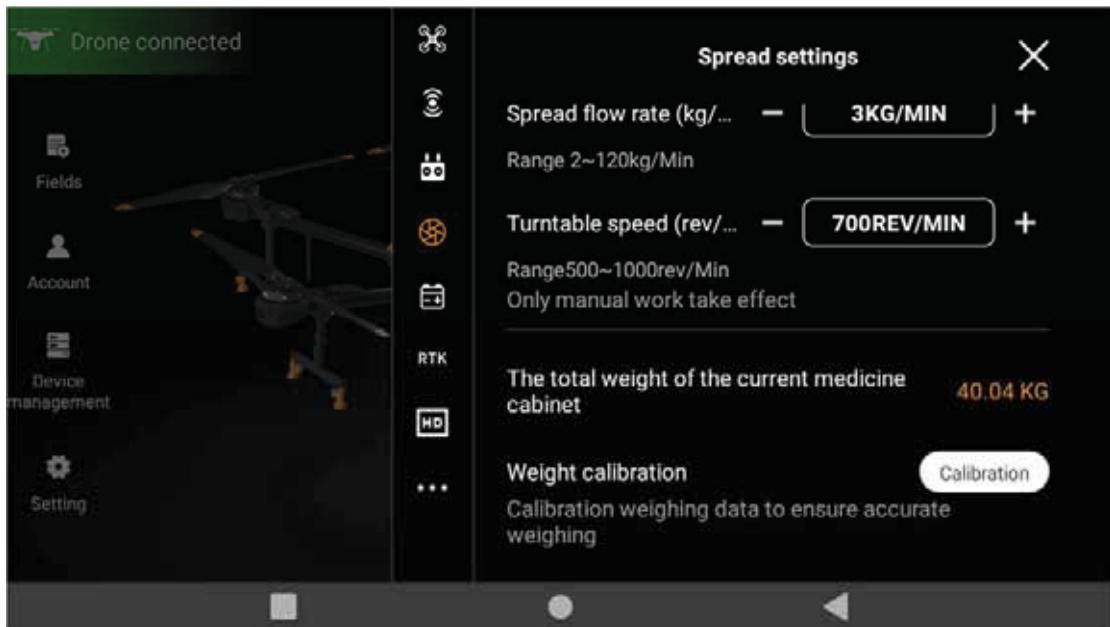
Spreader Use

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

3WWDZ-U25A 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 3WWDZ-U25A 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 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 of over-temperature	1. Locate the motor with over-temperature risk 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

Module	Alarm Source	Error Description	Error Resolution
Battery	Battery	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
		Abnormal communication between battery and flight control system	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
	IMU	Severe low voltage of battery	
		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
Avionics system	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 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

Module	Alarm Source	Error Description	Error Resolution
Remote controller		nearest agent	
Remote controller	Image transmission module	Exception of RTK dual antenna baseline	1. Please restart the aircraft; 2. If this problem still exists, please contact the nearest agent
Remote controller		Image transmission signal loss	
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	
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 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

Module	Alarm Source	Error Description	Error Resolution
			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
Radar	Radar	Temperature of radar electronic speed control is too low	1. Please ensure that the ambient temperature is normal; 2. Please confirm that the connection of radar-branching module-avionics module is normal in the shutdown state; 3. If this problem still exists, please contact the nearest agent
		Temperature of radar electronic speed control is too high	1. Please ensure that the ambient temperature is normal; 2. Please confirm that the connection of radar-branching module-avionics module is normal in the shutdown state; 3. If this problem still exists, please contact the nearest agent

Technical parameters - 3WWDZ-U25A

Model and Name	3WWDZ-U25A Agricultural UAV
Structural layout	Six-axis layout
Maximum wheelbase	2160mm (six axes) LxWxH
Overall dimensions	Overall dimensions 2152x2085x877mm(Arm unfolded、Pesticide container)

	1138×682×877mm(Armfolded, Pesticidecontainer)
Pesticide container capacity	40L
Seed container capacity	60L
Container installation mode	Plug-in
No-load mass (including battery)	49KG
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	0.15Mpa
Number of main rotors	6
Number of spraying nozzle	2/4
Type of liquid pump	Diaphragm pump
Flow of liquid pump	20L/min
Operation spraying width	Optimal 9m (operating height 3m±0.5m flight speed: 6m/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 30%-95% about 11min
FPV camera	Front camera
Hovering accuracy	Flight parameters RTK: Horizontal ±10cm, vertical ±10cm Radar: ± 0.1m
Spraying full-load hovering	7.5min
Spreading full-load hovering	6.2min
No-load hovering time	18.5min
Ranging accuracy of ground simulating radar	0.1m
Fixed height range	1-30m
Obstacle avoidance perception range	1-30m
Maximum pitch angle of obstacle avoidance radar	18°
Motor rated power	2000w*6pcs
Remote control signal distance	≤2000m
Flight height limit	≤30m
Flight speed limit	≤10m/s

Safety instructions

pesticide use

1. Pesticides are toxic, please operate safely according to pesticide usage regulations.
2. When dispensing, please pay attention to splashing the medicine to prevent pesticide residues on the body from causing harm to the human body.
3. When dispensing, please use clean water. After completing the dispensing, it is

necessary to filter before adding it to the operation box to avoid impurities blocking the filter screen. If there is any blockage during medication, please clean it promptly before use.

4. When using medication, it is essential to ensure that personnel are in an upwind position to avoid pesticide falling and causing harm to the human body.

5. When using medication, please wear protective equipment to prevent direct contact with pesticides by the human body; After applying the medication, please pay attention to cleaning the skin, aircraft, and remote control.

6. The effectiveness of pesticides is closely related to the concentration of the liquid, spraying flow rate, height of the aircraft from the crop, wind direction, wind speed, temperature, humidity, etc. When using pesticides, the above factors should be comprehensively considered to achieve the best effect.

7. Please ensure that the medication does not cause harm or impact on animals, plants, and the natural environment within the spraying or spraying range.

Polluting rivers and drinking water sources during medication is a serious illegal act.

9. Treatment of remaining liquid medicine: Reasonable planning and arrangement should be made to reduce the amount of remaining liquid medicine to the minimum level. It is recommended to spray the remaining liquid medicine and cleaning solution on the crops. If there is too much remaining liquid medicine, it is not recommended to spray the crops excessively.

10. It is prohibited to use strong acids, strong bases, high-temperature liquids, and pesticides that are explicitly prohibited by the state.

flight environment

1. Fly in open areas away from crowds.

2. Do not fly above an altitude of 4 kilometers.

3. Flight should be conducted in an environment between 0 °C and 45 °C, with good weather conditions (not heavy rain, strong winds, or extreme weather).

4. Fly within legal areas. Before flying, please consult the local flight management department to comply with local laws and regulations.

5. It is strictly prohibited to fly indoors.

Pre flight inspection

1. Ensure that the aircraft and remote control have sufficient power.

2. Ensure that all components are intact. If any components are aging or damaged, please replace them before flying.

3. Ensure that the landing gear and work box are securely installed.

4. Ensure that the propeller is undamaged, free of foreign objects, and securely installed, with the blades and arms fully extended and the arm buckles securely fastened.

5. Ensure that the aircraft motor is clean and undamaged.

6. Ensure that the spraying system is not clogged and can function properly.

7. Ensure that all devices are working properly without any abnormal alarms.
8. When the app prompts to calibrate the compass, please calibrate it before flying.

Precautions for operation

1. Do not approach the propeller and motor during operation.
2. It is necessary to fly without exceeding the maximum takeoff weight specified to avoid danger.
3. The maximum weight of the medication loaded by the user should not exceed the recommended value, otherwise it may affect flight safety.
4. Fly within visual range.
5. Performing a lever breaking action or stopping the motor in other ways during flight will cause the aircraft to fall. Please only use this feature in emergency situations.
6. During the flight, please do not answer or make phone calls, and do not operate the aircraft under the influence of alcohol or drugs.
7. Please return as soon as possible when there is a low battery warning.
8. If the working environment does not meet the working conditions of the radar module, the aircraft will not avoid obstacles on its own during automatic return. If the remote control signal is normal, the flight speed and altitude can be controlled through the remote control.
9. After landing, turn off the aircraft first and then turn off the remote control to avoid losing the remote control signal and causing the aircraft to automatically start the return mode.
10. Please maintain control of the aircraft throughout the entire process and do not rely on the information provided by the Huida Drone App. In specific flight modes or environments, the radar obstacle avoidance function will not be available. Please ensure good visibility, rely on visual observation, make reasonable judgments about flight conditions, avoid obstacles in a timely manner, and set corresponding flight and return altitudes according to the flight environment.

Protection level description

Drones can be dust-proof, waterproof, and corrosion-resistant under normal use. Under controlled laboratory conditions, the entire machine (excluding intelligent flight batteries) has a protection level of IP65 (referring to the International Electrotechnical Commission IEC 60529 standard), and the body can prevent splashing.

The protective ability is not permanently effective and may decrease due to aging and wear caused by long-term use. Damage caused by immersion in liquid is not covered by the warranty.

Possible situations where protective capabilities may fail:

1. Collision occurs and the sealing area deforms;
2. The sealing part of the shell is cracked or damaged;
3. The interface protection cover or waterproof plug is not installed properly or is loose.

maintenance

1. Please check and replace any deformed or damaged propellers before each flight, and install them securely
2. When not in working condition or during transportation, be sure to remove or empty the work box to avoid excessive damage to the landing gear
3. Aircraft are suitable for storage in environments ranging from -20 °C to 40 °C. (There is no liquid in the homework box, flow meter, liquid pump, and hose)
4. Clean the aircraft in a timely manner after homework and regularly maintain the aircraft. Please refer to the "Product Maintenance" section of the 3WWDZ-U25A Three Guarantees Manual for details

Cleaning and maintenance

fold

At the end of the assignment, when folding the machine arm, fold it in the order of M3 and M5 arms first, then M2 and M6 arms, and ensure that the arm is tightly clamped into the storage fixture on the side of the aircraft, otherwise it may be damaged. When folding the M1 and M4 arms, be careful to handle them gently to prevent collision damage.

clean up

After completing the homework every day, wait for the aircraft to return to normal temperature before cleaning the entire machine and remote control. It is prohibited to clean the aircraft immediately after the completion of the operation.

1. Fill the work box with clean water or soapy water, and spray completely. Repeat this process three times.
2. Remove the filter screen, nozzle filter screen, and nozzle from the homework box and clean them to ensure they are not clogged. Then soak them in clean water for 12 hours.
3. It is recommended to wipe and rinse the body, then clean the body with a soft brush or damp cloth, and then dry the water stains with a dry cloth.
4. If there is sand, dust, or liquid adhering to the surface of the motor, blade, or heat sink, it is recommended to clean the surface with a damp cloth and then wipe off the water stains with a dry cloth.
5. Use a clean damp cloth (wring out water) to wipe the surface of the remote control and the display screen.

Battery maintenance

If not used for a long time, charging the battery to around 60% and storing it is the best way to store the battery.

Storage and Transportation

To avoid possible injury and loss, it is essential to comply with the following

1. As wires and small parts may pose a danger to children, it is essential to keep children away from the components of the aircraft.

2. Before transportation, be sure to remove the battery from the aircraft.
3. If long-term storage or long-distance transportation is required, the work box needs to be removed or emptied from the aircraft, and the aircraft should be stored in a cool and dry place.
4. If not used for a long time, please store the battery at around 60% of its capacity.

Maintenance

To avoid possible injury and loss, it is essential to comply with the following

1. After completing the homework every day, wait for the aircraft to return to normal temperature before cleaning the entire machine. It is prohibited to clean the aircraft immediately after the completion of the operation.
 - a. Fill the work box with clean water or soapy water and spray it out completely. Repeat this process three times.
 - b. After removing the filter screen, nozzle filter screen, and nozzle from the homework box, clean them to ensure they are not clogged, and then soak them in clean water for 12 hours.
 - c. Ensure the integrity of the body structure and allow for direct washing of the entire machine. It is recommended to use a spray gun to wash the body, then use a soft brush or wet cloth to clean the body, and then use a dry cloth to wipe the water stains.
 - d. If there is sand, dust, or liquid adhering to the surface of the motor, blade, or heat sink, it is recommended to clean the surface with a damp cloth and then wipe off the water stains with a dry cloth.
 - e. Store the aircraft in a dry place.
2. After completing homework every day, use a clean damp cloth (wring out water) to wipe the surface of the remote control and display screen.
3. Every 20 hours of flight or 100 takeoffs and landings.
 - a. Check the propeller for cracks and replace it with a new one if there are any cracks.
 - b. Check if the propeller is loose, and if it is loose, replace it with a new propeller and gasket.
 - c. Check for aging of plastic and rubber components.
 - d. Check the atomization situation of the nozzle. If there is poor atomization, thoroughly clean the nozzle or replace it with a new one
 - e. Replace the nozzle filter and the work box filter.
4. After completing homework every day, if you still need to use it on a daily basis or in the near future, please slowly charge and maintain the battery at night.
5. Do not repair the aircraft without authorization. If there is any damage, please contact an authorized agent of Huida Technology

pay attention to

1. Keep the protective cover of the radar module clean. Use a soft damp cloth to wipe the surface of the protective cover, then air dry naturally.
2. Keep the FPV camera clean. Firstly, clean the surface of the camera of sand, dust, and other debris.
3. Check if all components of the aircraft have been strongly impacted. If you have any

questions, please contact customer service or authorized agents of Huida Technology.

4. When the flight speed is less than 5 meters per second and the spraying amplitude is less than 8 meters, the minimum dosage of the product per mu is 2.5 liters per mu; When the flight speed is greater than 5 meters per second and the spray amplitude is greater than 8 meters, the minimum dosage of the product per mu is 1 liter per mu, otherwise it will affect the product's endurance time

Height limit, speed limit, distance limit, and laws and regulations

The maximum flying altitude of the aircraft is \leq 30 meters, the maximum speed is \leq 10m/s, the maximum speed after the obstacle avoidance radar is turned on is \leq 7m/s, and the maximum control distance is \leq 2000 meters. Please fly within the specified limit range

Please consult the local air traffic control department to obtain the latest flight restriction policies. When flying, it is necessary to comply with local laws and regulations.

Disclaimers

Before using this product, please carefully read this user manual. Once you activate this product, it is deemed that you have understood, understood, recognized, and accepted all the terms and contents of this user manual.

Agricultural drones are relatively large drones, and there are certain risks during use. Huida Technology will not sell drones to minors. If minors operate drones, Huida Technology will not be responsible for any consequences, and the insurance gifted or purchased in the first year is also not covered by the insurance policy.

Users are not allowed to operate drones under the influence of alcohol, drug use, drug anesthesia, dizziness, fatigue, nausea, or other physical or mental conditions. Huida Technology will not be responsible for the consequences of any of these behaviors.

During the use of toxic pesticides, please carefully read the instructions for pesticide use and take personal protective measures according to the instructions. Huida Technology is not responsible for any damage or impact caused to people, animals or plants due to improper personal use.

This product belongs to the multi rotor plant protection drone, and its scope of application is limited to agriculture, forestry, animal husbandry, and fishing. It is not recommended to use it for other purposes. If any accidents occur during non agriculture, forestry, animal husbandry, and fishing processes, Huida Technology will not be responsible.

In order to better implement product functions and improve user experience, you understand and accept that this product will automatically upload and save relevant flight records and data to the Huida Technology Data Center by default during use, and cooperate with Huida Technology to legally collect, store, and use all relevant data you have during the use of this product. If, due to your own reasons, flight records and data cannot be uploaded and saved, resulting in Huida Technology's inability to store and analyze flight records and data, which affects your flight safety, product or service quality, Huida Technology will not be held responsible.

To the maximum extent permitted by law, Huida Technology shall not be liable for any losses arising from your failure to operate this product in accordance with the user manual,

and shall not be liable for any indirect, consequential, punitive, incidental, special or punitive damages, including losses suffered as a result of your purchase, use or inability to use this product.

Any product may experience unexpected events during use due to improper operation, surrounding environment, network communication, and other single or comprehensive factors. You understand that the aforementioned unexpected events are reasonable and acceptable situations during product use, and Huida Technology shall not be liable for such unexpected events.

To the maximum extent permitted by law, under no circumstances shall Huida Technology be liable to you for any damages, losses, or lawsuits resulting from such damages, losses, or lawsuits, exceeding the amount paid by you to Huida Technology or its authorized distributors for the purchase of the product.

In any case, the buyer or user shall comply with the relevant laws, regulations or policies of the country and region where the product is used, and Huida Technology shall not be liable for any liability arising from the buyer or user's violation of relevant laws, regulations or policies.

The laws, regulations, and policies of certain countries may prohibit exemption clauses, so your relevant rights may vary in different countries. But this does not mean that the content of this statement must

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This device 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 device 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 device does cause harmful interference to radio or television reception, which can be determined by turning the device 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 device and receiver.
- Connect the device 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

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

FCC Radiation Exposure Statement

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.