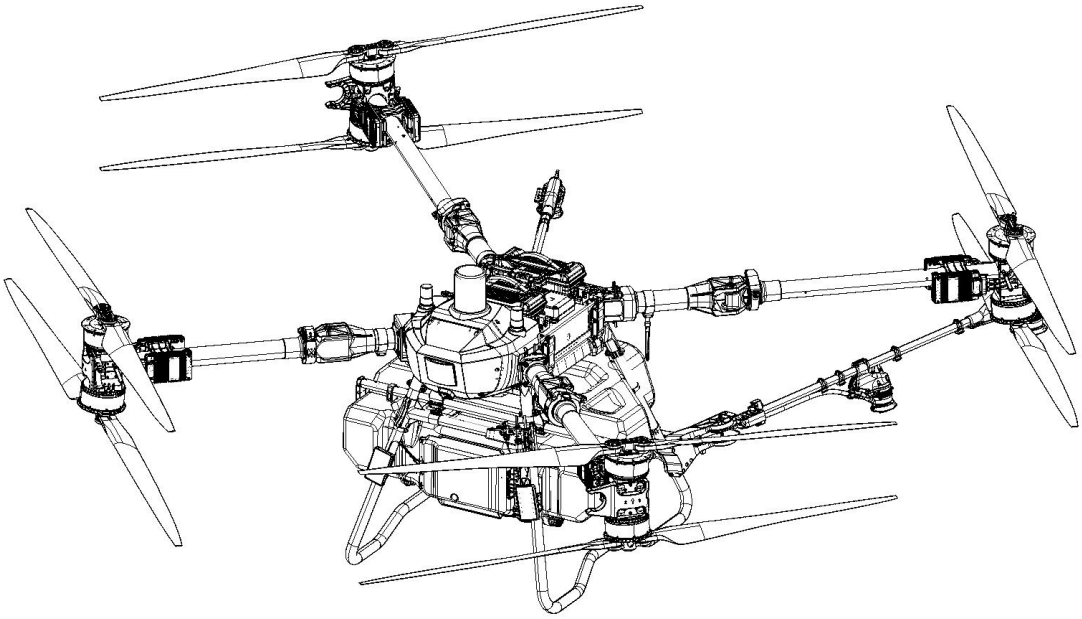
V180 Agricultural Drone

User manual

V1.6 2026.09



Revision History

Version	Revision Date	Revision Department	Change Description	Remarks
V1.0	2026-05-18	Test Service Department	Initial release	
V1.1	2026.07.14	Test Service Department	Updated parameters.	
V1.2	2026.07.28	UAV Test Department	1. Added Prescription Map Import Instructions and One-Controller-Two-Aircraft Operation Method 2. Updated parameters.	
V1.3	2026.08.12	UAV Test Department	Added aircraft type classification for the UAV	
V1.4	2026.08.14	UAV Product Operations Department	Updated emergency propeller stop operation.	
V1.5	2026.08.20	UAV Product Operations Department	Updated remote controller GNSS.	
V1.6	2026.09.08	UAV Product Operations Department	Added adjacent wheelbase data	

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1. Disclaimer

- Before using this product, please read this user manual carefully. Once you activate this product, it is deemed that you have known, understood, acknowledged and accepted all the terms and contents herein.
- Agricultural drones fall under the category of larger unmanned aerial vehicles, and their operation carries inherent risks. The company strictly prohibits the sale of drones to minors and will not assume any liability for the consequences resulting from the use of drones by individuals under the age of 18.
- Users are prohibited from operating the drone while under the influence of alcohol, drugs, or any form of anesthesia, or if they are experiencing dizziness, weakness, nausea, or any other physical or mental condition that may impair their ability to fly the drone safely.company will not accept liability for any consequences resulting from such actions.
- This product is a multi-rotor agricultural drone. It must be operated within the scope required by applicable laws and regulations and under the premise of ensuring safety. The company shall not assume any direct or indirect liability for any unintended consequences arising from its use.
- This product must not be modified privately or used with non-official accessories. The company will not assume any direct or indirect responsibility for the outcomes produced by such unauthorized modifications or the use of third-party accessories.
- To optimize product functionality and improve user experience, you understand and agree that during the use of this product, it will automatically upload and save relevant flight records and data to the company’s data center by default. You also agree that the company may lawfully collect, store, and use all data related to your use of this product. If your failure to upload and save flight records and data prevents the company from storing or analyzing such data, and this affects your flight safety or the quality of the product or service, the company shall not bear any liability.
- To the fullest extent permitted by law, company shall not be liable for any damages arising out of your failure to operate the product as per the instructions provided in the user manual. Furthermore, company disclaims any responsibility for indirect, consequential, punitive, incidental, special, or exemplary damages, including but not limited to those arising from your purchase, use, or inability to use the product.
- During the use of the product, accidents may occur due to improper operation, the surrounding environment, network communications, or a combination of these and other factors. You acknowledge that such accidents are reasonable and acceptable risks

inherent in the use of the product. Company will not assume any liability for such accidents.

- Under no circumstances shall the purchaser or user fail to comply with the applicable laws, regulations, or policies of the country or region where the product is used. The company assumes no liability for any consequences arising from the purchaser's or user's violation of such laws, regulations, or policies.
- To the maximum extent permitted by law, the company reserves the right to update the contents of this manual. Any updates will be published on the official website without prior notice.
- Resale or Transfer

  Transferring the agricultural UAV after purchase, whether activated or not, is your personal act. The company has no right to interfere and assumes no liability for any risks arising from the transfer process.
- Compliance with Export Control Laws

  The export, re-export, or transfer of this product is subject to China’s export control laws and other applicable export control laws. Unless permitted by applicable export control laws or authorized by the relevant export control authorities, your use, sale, transfer, lease, or other handling of this product must ensure that:

a. It does not violate the embargo policies under applicable export control laws;
b. It does not involve transactions with end-users prohibited by applicable export control laws;
c. It is used solely for civil purposes and not for military, nuclear, chemical/biological weapon, or missile-related purposes.

- The company will provide necessary export compliance guidance and product classification information, but the user is solely responsible for ensuring that the end use complies with local and export country laws.
- You must comply with all applicable laws and regulations of the country and region where the product is used. Operators must hold the appropriate operator license, or complete real-name registration and training, in accordance with local laws and UAV classification. Agricultural operations must also comply with local agricultural aviation operation standards.
- This aircraft is equipped with a built-in Remote Identification (Remote ID) module, which automatically broadcasts identity and location information during flight. Users must not block, modify, or remove this module without authorization; doing so may render the aircraft unable to take off or may result in violation of laws and regulations.

⚠Warning

Users are advised to thoroughly read the user manual prior to operating the drone and associated products, and to obtain a UAS operation license qualification that is approved by company, or as required by the laws, regulations, and policies of the country or region in which the products are being used.failure to do so may result in improper operation of the drone and its ancillary products, which could lead to severe injury to yourself or others, as well as product damage and property loss. It is imperative to maintain a strong safety consciousness when operating this product. Furthermore, this product is not intended for use by children and individuals under the age of 16, individuals with limited civil capacity or legal incompetence, or persons with mobility impairments as defined by law. Users must operate this product in strict adherence to the guidelines outlined in the user manual of company and do not use any parts other than those provided by company for product repairs.

2. Product overview

2.1. Introduction

The company's newly developed V180 agricultural drone, an unmanned aircraft for farming operations, is equipped with an efficient agricultural operation system. The standard configuration provides four centrifugal nozzles, and the maximum flow rate can exceed 35 L/min. The innovative double spray disc design ensures a more uniform atomization process, with droplet sizes that can be finely tuned from 50 to 500 microns. The V180 model comes standard with a 360°rotating obstacle avoidance radar and a terrain-following radar, with lidar as an optional upgrade. Its adjustable monocular camera features digital fpv gimbal technology and supports low-light night vision.incorporating the company's most robust suite of intelligent safety features, the V180 ensures significantly safer operation flights.

The newly enhanced intelligent remote controller features a vibrant 8-inch display and an integrated drone app, markedly refining the operational smoothness and stability. It is also equipped as standard with an RTK high-precision positioning module, capable of achieving centimeter-level route planning for enhanced accuracy. The remote control supports both built-in battery power and external battery supplies, offering a combined endurance of up to 7 hours to accommodate the demands of prolonged, high-intensity operations.

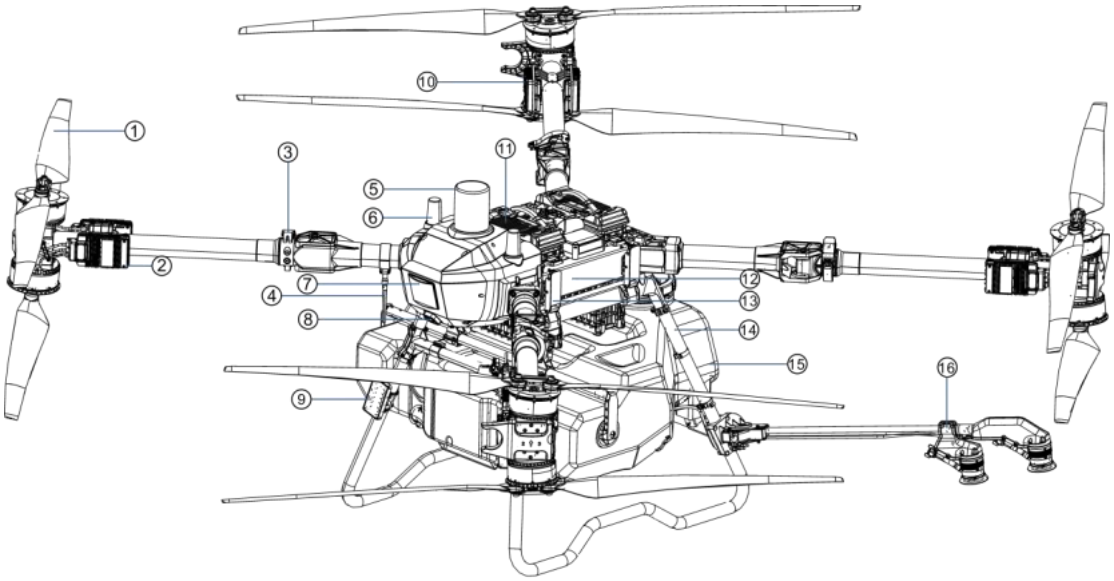
The V180 agricultural drone features dustproof, waterproof, and anti-corrosion properties. Its core components employ a three-layer protection system, granting the entire machine an IP65 rating (per the IEC 60,529 standard). The airframe can be washed with water.

2.2. Item List

Item name		Quantity
V180 Agricultural Drone Main Unit		1
Drone Remote Controller Complete Set	RC8P Remote Controller Main Unit	1
	RC8P Remote Controller External 21700 Battery	2
	RC8P Remote Controller Charging Dock	1

	Power Adapter	1
	RC8P Remote Controller Pointing Device (RTK Module)	1
	RC8P LoRa Antenna	1
V180 Agricultural Drone User Manual		1

2.3. Parts Of Drone



① Propeller Blade

② Navigation Light

③ Arm Lock

④ Video Transmission Antenna

⑤ Rotation Radar

⑥ RTK Antenna

⑦ Laser Radar

⑧ Front Fpv Camera

⑨ Searchlight

⑩ Motor

⑪ Smart Battery

⑫ Airframe

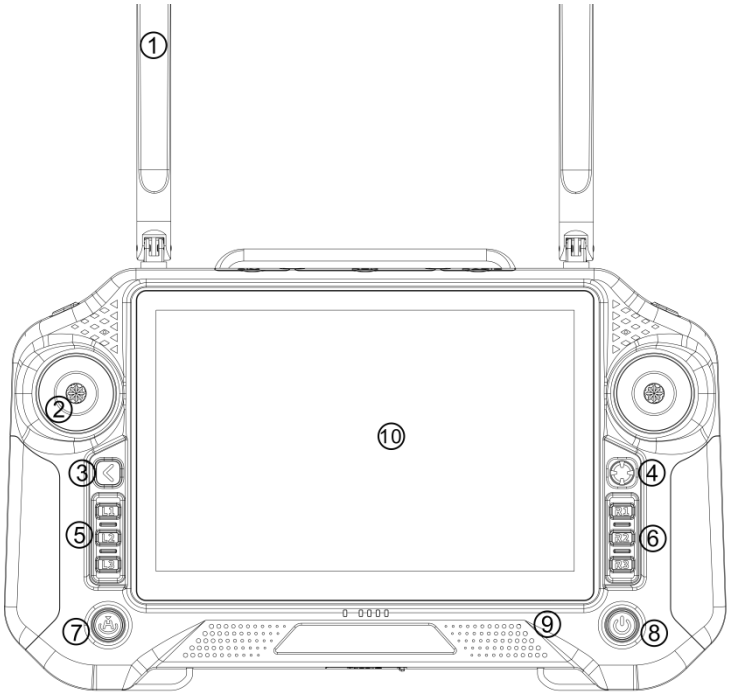
⑬ Airframe Lock

⑭ Landing Gear

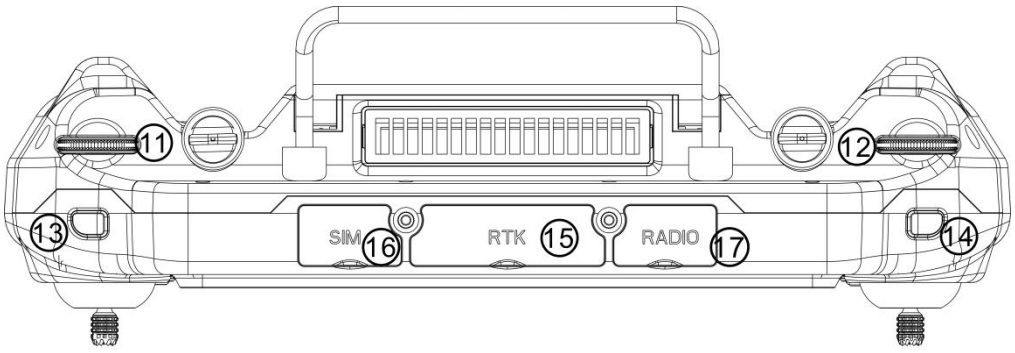
⑮ Agrochemical Container

⑯ Centrifugal Nozzle

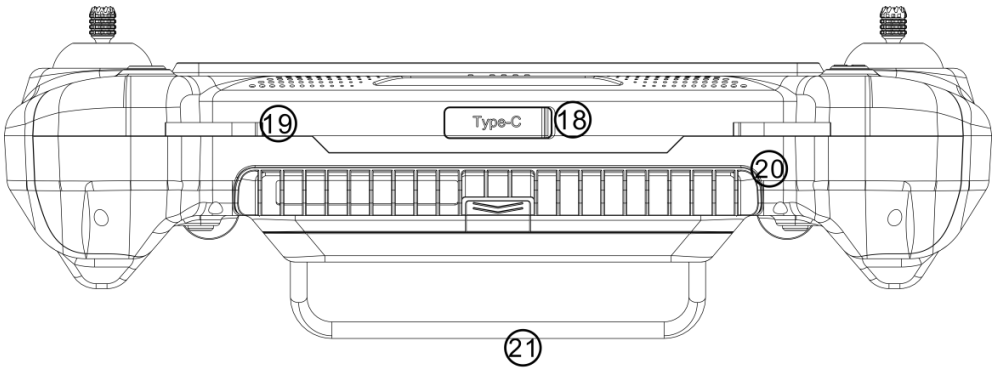
2.4. Parts Of Remote Controller



① Antenna
② Joystick
③ Return Button
④ 5d Button
⑤ Left Function Button
⑥ Right Function Button
⑦ Return To Home (Rth) Button
⑧ Switch Button
⑨ Megaphone Speaker
⑩ Touchscreen



⑪ Thumb Wheel 1
⑫ Thumb Wheel 2
⑬ Obstacle Avoidance Radar Switch
⑭ Operation System Switch
⑮ External RTK Interface
⑯ SIM Card Slot
⑰ RADIO Interface

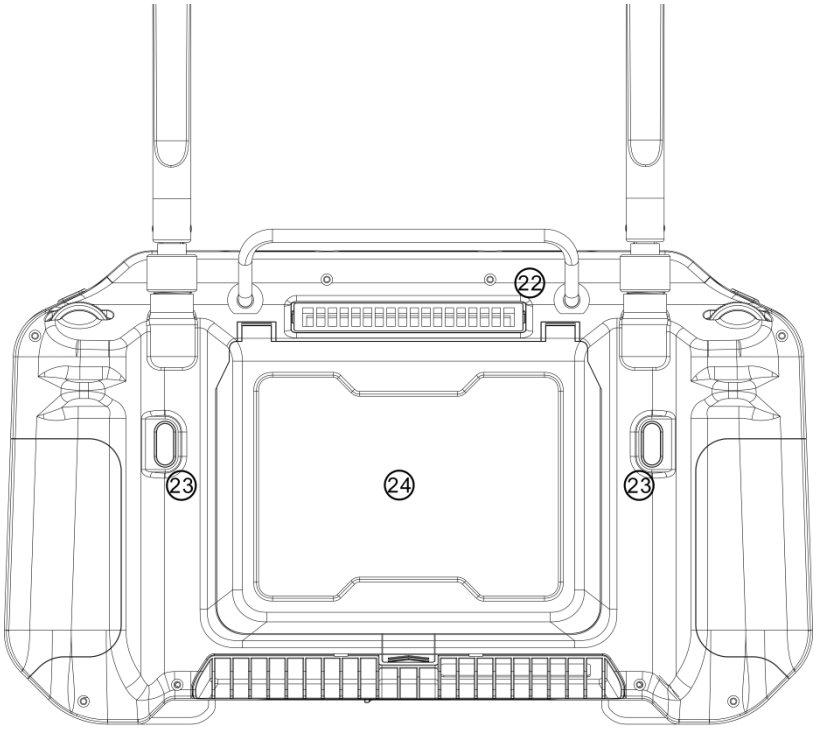


⑱ Type-c

⑲ Lanyard Hole

⑳ Heat Hole

㉑ Carrying Handle



㉒ heat hole

㉓ custom key

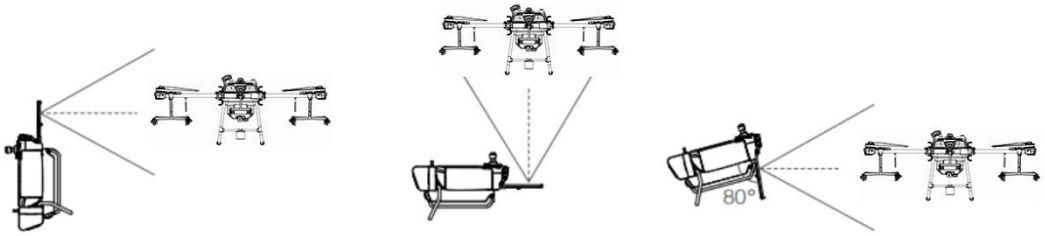
㉔ smart battery cover

2.5. Remote Controller Antenna Angle

By unfolding the remote controller's antenna and adjusting its position, operators can experience varying signal strengths depending on the antenna's placement.for optimal signal quality between the remote controller and the drone, it is recommended to position the antenna at an angle of either 80 or 180 relative to the back of the remote controller, ensuring the antenna plane is oriented towards the drone.

When maneuvering the drone, always keep the drone in optimal communication range.

adjust the orientation or distance between the operator and the drone in a timely manner to ensure that the drone is always within optimal communication range.

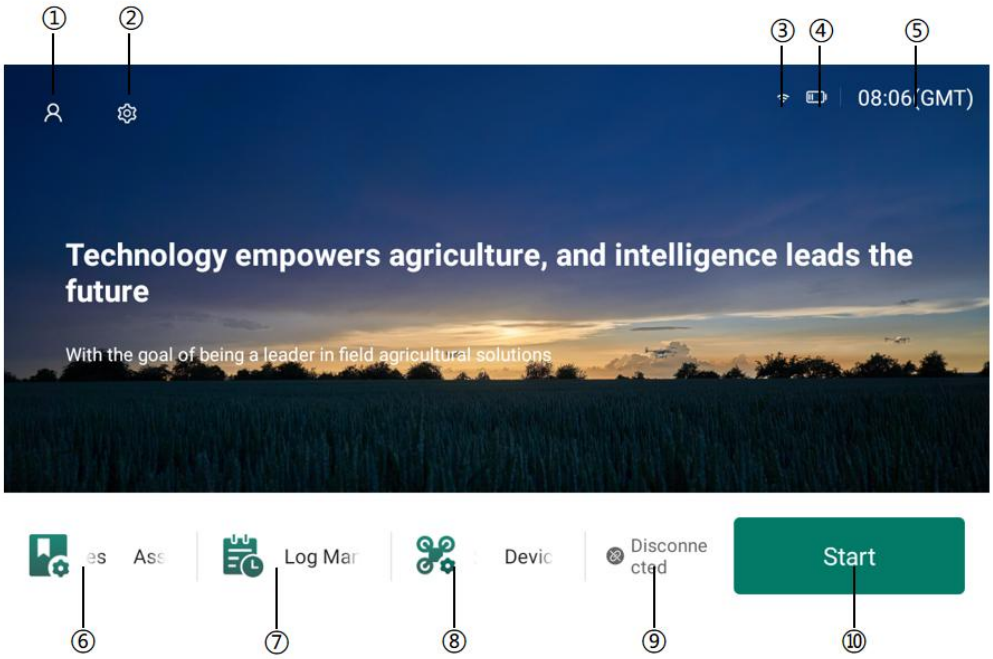


⚠Warning

If you are using the RTK high precision positioning module for RTK planning, you need to remove the module after planning is complete, otherwise it may affect the communication performance of the remote controller.

2.6. Drone App

The Drone app is specially designed for agricultural applications, with a clear and simple interface, users can easily get started with text and voice prompts. During the operation process, users are provided with real-time updates on drone operation information, and can monitor the health status of all devices linked to the remote controller. In the event of any device anomalies, immediate feedback is sent to the user, ensuring timely response. Additionally, the app offers real-time data protection for plot data and tasks in progress, thereby ensuring that no user data is lost.



① **User Information**: View my user profile, team information, mission record statistics, and detailed mission logs.

② **Settings Button**

③ **Wi-Fi Connection Status**

④ **Remote Controller Battery Level**

⑤ **Current Time**

⑥ **Mission Resources**: UAV mission data.

⑦ **Log Management**: View/update versions of the UAV, remote controller, and charger.

⑧ **Device Management**: View status of the UAV, remote controller, smart batteries, charger, RTK mobile station, and RTK module.

⑨ **UAV Connection Status**

⑩ **Start Mission**: Enter the mission interface homepage; defaults to manual operation mode.

3. Flight Safety Guidelines

3.1. Safety Precautions

3.1.1. Flight environment requirements

- Do not operate in strong wind conditions. Flying is prohibited when the wind force is level 5 or above.
- Do not fly in bad weather, such as foggy weather with low visibility, windy weather , rain, snow, etc.
- Choose an open area without tall buildings around as the flying site. Tall buildings will block gnss(global navigation satellite system) signals, which may cause the UAV's RTK (real-time kinematic) positioning to fail and pose a significant flight safety risk.
- Always fly within visual range and away from any obstacles, people, water, animals, etc.
- Verify that the operation area and its immediate surroundings are free from electromagnetic interference sources, including high-voltage power lines, communication base stations, and transmission towers.
- Ensure that the GNSS signal is strong and the RTK antenna is not obstructed during flight.
- Do not operate the drone indoors.
- For night-time operations, activate the searchlight prior to commencing flight. due to the reduced effectiveness of the visual system in low-light conditions, ensure the obstacle avoidance radar is engaged and exercise caution during flight.
- Drone load capacity decreases with decreasing atmospheric pressure, with a 10% reduction in gross take-off mass for every 1 km increase in altitude (please note that it is not a 10% reduction in load capacity).
- At altitudes exceeding 2,000m above sea level, environmental factors can degrade the performance of the drone's smart battery and power system, thereby impacting overall flight performance. exercise caution and vigilance during such operations to ensure safety.
- Drone app features intelligent software that dynamically restricts the maximum take-off mass based on the current flight environment. The mass of the loaded liquid must not exceed the established maximum limit. An agricultural drone is equipped with a real-time load weighing system, which will prevent take-off and lock the drone if the load exceeds the allowable threshold.

3.1.2. Operation precautions

- Maintain a safe distance from the rotating propellers and motor at all times.
- Adhere strictly to the specified maximum take-off weight and do not exceed this limit during flight to avoid danger.
- Fly within visual range.
- Maneuvering a stick or otherwise stopping the motors during flight will result in the drone crashing. Please use this function only in case of emergency.
- Do not answer phone calls during flight, and never operate the drone while under the influence of alcohol or drugs.
- Please start the drone's flight back to its home point in case of low battery alert.
- If the operating environment does not meet the working conditions of the radar module, the drone will be unable to autonomously avoid obstacles during automatic return; in such a case, if the remote control signal remains stable, you can control the flight speed and altitude through the remote control.
- Upon landing, turn off the drone prior to switching off the remote controller to avoid losing the remote control signal and causing the drone to start automatically.
- Please maintain control over the drone during the entire flight process and do not overly rely on the information provided by the drone app. The radar obstacle avoidance function will not be available in certain flight modes or flight environments. Please make sure you have a full view of the surrounding airspace, make rational judgments regarding flight conditions based on visual observation, to avoid obstacles in time, and set the appropriate flight and return altitude according to the flight environment.
- In case there are high-voltage power lines within the operation area, please rationally plan the route and maintain a safe distance to prevent collision. In the event that the drone hits a power line, do not touch the drone with your hands as there is a danger of electric shock.
- Takeoff and Landing Position Offset in GPS Mode

The drone may experience positional drift when taking off or landing in GPS mode.

The camera-assisted landing feature is not yet implemented in the current software version.

Be cautious when operating on trailers or uneven platforms, as this may cause landing deviations.

- Takeoff Angle & Surface Level

If the drone is placed on a tilted surface, it may take off at an angle, resulting in unstable lift-off.

Ensure the takeoff surface is flat and level.

- Use the Safe Point Feature & Avoid Flying Over People

Always enable and use the Safe Point function.

Flying over people is strictly prohibited to avoid pesticide exposure or injury in case of crash.

- Authorized Personnel Only

Untrained individuals and minors are strictly prohibited from operating the drone.

- Safe Battery Handling

Never insert or remove the battery while the drone is powered on.

To replace the battery, first power off the battery, wait at least 3 seconds, then proceed with insertion or removal.

- Do Not Leave Pesticides in Tank Overnight

Pesticides should not be left in the tank overnight, as this can severely corrode or clog the pump and flow meter.

Always clean the drone thoroughly after daily operations.

- Do Not Transport the Drone with Battery Inserted

Always remove the battery before transportation, and

Never transport the drone while it is powered on.

- Daily Battery Connector Maintenance

Clean battery connectors daily using alcohol.

If the connectors are heavily worn or blackened and cannot be cleaned, replace them immediately.

Worn connectors can lead to overheating and potential crashes.

- Avoid Overheating Under Sunlight While Idle

Do not leave the powered-on drone exposed to direct sunlight for extended periods without flying.

This may cause the flight controller to overheat, resulting in over-temperature faults.

- Trailer Safety Requirements

Trailer work areas must be equipped with guardrails, sunshades, and anti-collision barriers

This is to prevent falls, heatstroke, or injuries to the operator.

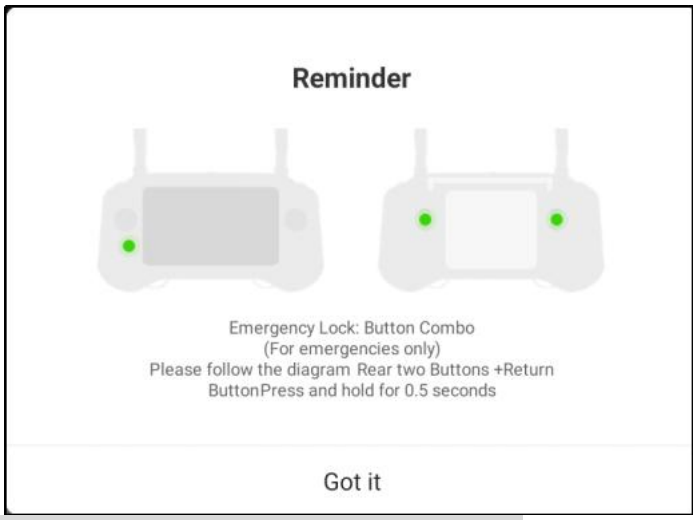
- Maintain Distance from Power Lines

Always maintain a minimum distance of 60 feet (20 meters) from high-voltage power lines.

Absolutely no operations should be conducted directly beneath power lines.

3.1.3. Emergency propeller stop

- Do not stop the motor during flight, otherwise the drone will crash. Unless a special situation occurs (e.g.the drone may crash into a crowd), where an emergency stop of the motors is required to minimize injuries.
- Emergency Propeller Stop Operation:As shown in the figure below, press and hold the two buttons on the back and the return button simultaneously for more than 0.5 seconds. The motors will be unconditionally powered off and stop rotating, causing the drone to fall.



3.1.4. Flight restrictions and laws and regulations

- Please consult the company for detailed data on flight restrictions and flight bans, or consult the local air traffic control department to comply with local laws and regulations. If necessary, users need to apply for authorization to use the drone from the relevant authorities.
- When using the agricultural drone in non-China regions, please strictly comply with the laws and regulations of your respective country.

3.1.5. Electronic fence

- The electronic fence of the agricultural drone is turned on by default, which will restrict the drone's flight height, flight speed, and maximum flight distance.
- You can set safety restrictions on the drone's flight height and the maximum flight distance (centered on the remote controller) in the agricultural drone app settings.

3.1.6. No-fly zone

- According to the ICAO and national ATC regulations on airspace control and the management of drones, drones must be operated within the designated airspace. For flight safety reasons, the flight restriction function will be enabled by default, including no-fly zone restriction and electronic fence restriction, to help users use agricultural drones more safely and legally.

- No-fly zones include global ATC no-fly zones and user-defined no-fly zones. For drones, no-fly zones are not allowed to fly into.
- The drone will automatically slow to a hover when approaching the no-fly zone boundary.
- If the drone flies into the no-fly zone due to failure to receive positioning signal, it will land automatically once the signal restores, and after landing, it cannot take off in the no-fly zone.

> ⚠**Warning**
>
> When the gnss is enabled, the drone is under the combined effect of no-fly zone and height restrictions. When gnss is disabled, drones are only subject to height restrictions and will not actually fly above a maximum height of 30 m.

3.1.7. ingress protection rating

- Under normal operating conditions, the drone is dust-proof, waterproof and corrosion resistant. Under controlled laboratory conditions, the airframe (excluding the smart battery) features IP65 (refer to the international electrotechnical commission IEC 60,529 standard) level protection, and the airframe is splash-resistant.
- Protection is not permanent and may deteriorate due to aging and wear caused by long-term use.damage due to immersion in liquids is not covered by the warranty.
- Circumstances in which protection may fail:

(1) Deformed seal due to collision;

(2) Cracking and breaking of the enclosure seal;

(3) Failure to install or loosening of the port protection cover or waterproof rubber plug.

3.1.8. drone airframe safety warnings

Charging warning sticker



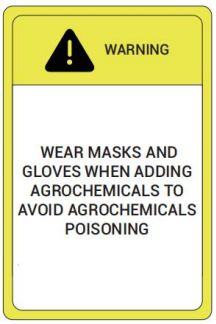
Motor rotation warning sticker



Arm locks warning sticker



Agrochemical container warning sticker



3.1.9. safety illustrations

① Recommended areas



Fly in open area | Strong gnss signals | Visual line of sight (vlos) | Fly below 30m

② Areas not recommended

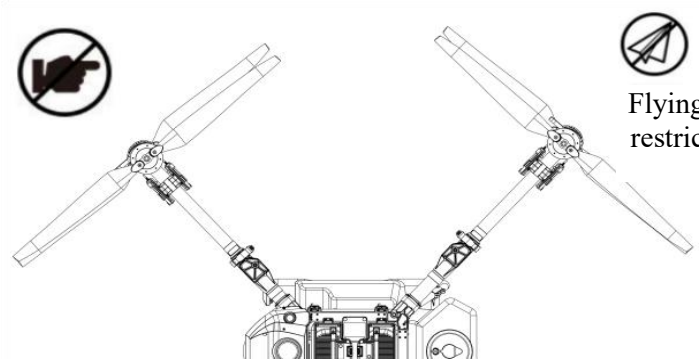


Avoid flying over or near crowds, power lines, tall buildings, airports and signal towers.
Radio transmission towers, high-voltage lines, and substations may interfere with the remote control signal and threaten flight safety. Therefore, ensure safety precautions are strictly observed during flight operations.

③ Prohibited areas



④ Dangerous behaviors



Flying in flight restricted zone

3.2. Preparation Before Use

3.2.1. Charging

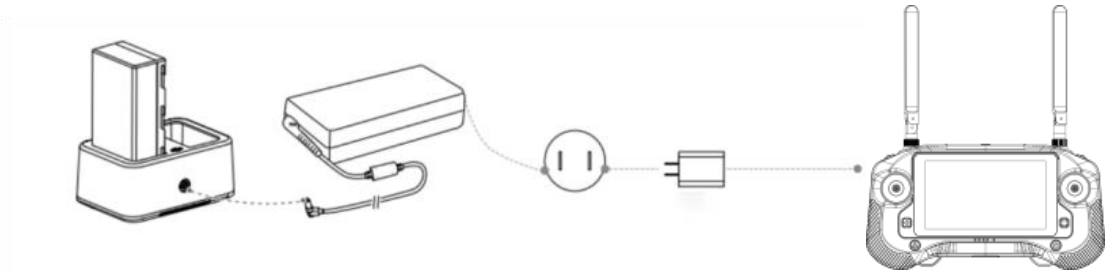
■ Smart battery charging

Please use the standard 18S12000W all-in-one charger to charge the smart battery.
When using the generator to charge the smart battery, please connect the high power thick wire fast charging plug to charge. If you use a generator from another brand for charging, be mindful of the generator's output power to ensure compatibility.

> ⚠**Warning**
> For the initial charge of the smart battery, it is advisable to use a low power setting (3000w) to facilitate slow charging until the battery is fully charged (100%).

■ Charging the RC8P remote controller external battery

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



Remote controller charging cradle | Power adapter | AC power supply (100-240V) | Usb charger

■ Installing external battery

①press the battery compartment cover opening button on the back of the remote controller to open the cover.
②insert the smart battery into the battery compartment and push it up to the top.
③close the compartment cover.

■ Installing 4G SIM card

Please pay attention to the installation direction of the SIM card and do not insert it reversely.

Insert the sim card and wait for 30 seconds, then check the 4g detection status. If it shows that the SIM card is inserted, it means the installation is correct. Then check whether the network is smooth.

> ⚠**Warning**
>
> If 4G network is unavailable in your area, please use the small base station HD201 product as the network signal source for RTK service, or turn off the UAV's RTK detection and fly with GPS positioning.

3.2.2. Safety Inspection for Takeoff and Landing Points

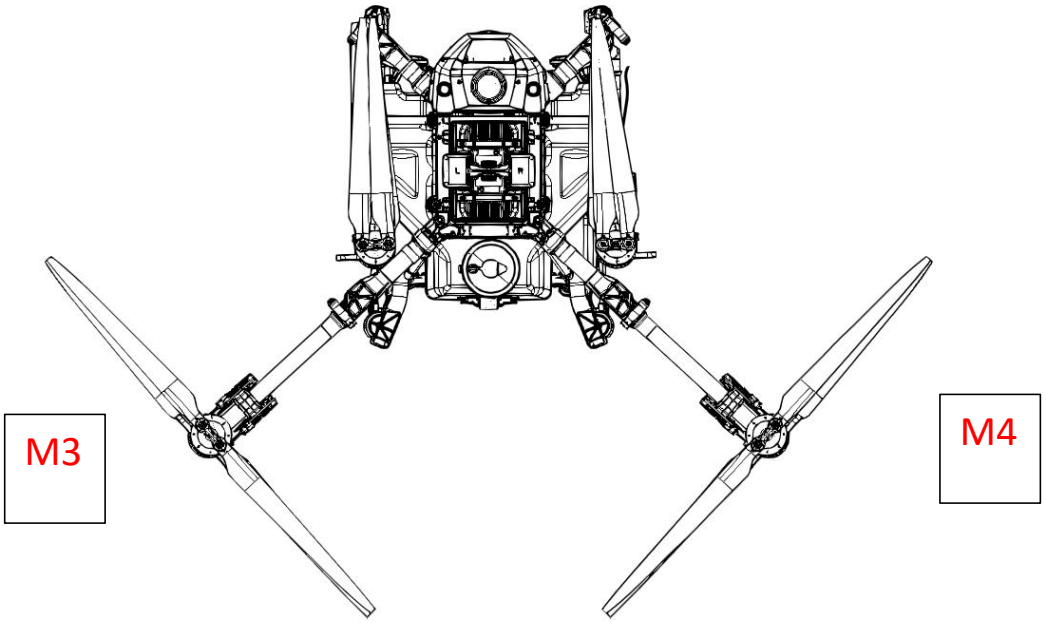
a. The takeoff and landing area must remain open and flat. Any unevenness may cause the UAV to land unstably, leading to tilting or crashing, which could damage the equipment.
b. Ensure all debris is cleared from around the takeoff and landing points. Otherwise, such debris may be drawn into the propellers during takeoff or landing, resulting in damage to the aircraft.
c. Confirm that there are no obstacles above the takeoff and landing points to avoid collision incidents during these operations.
d. Before takeoff, ensure all personnel stay at least 20 meters away from the takeoff and landing points to guarantee operator safety.
e. Personnel must wear helmets and safety vests.

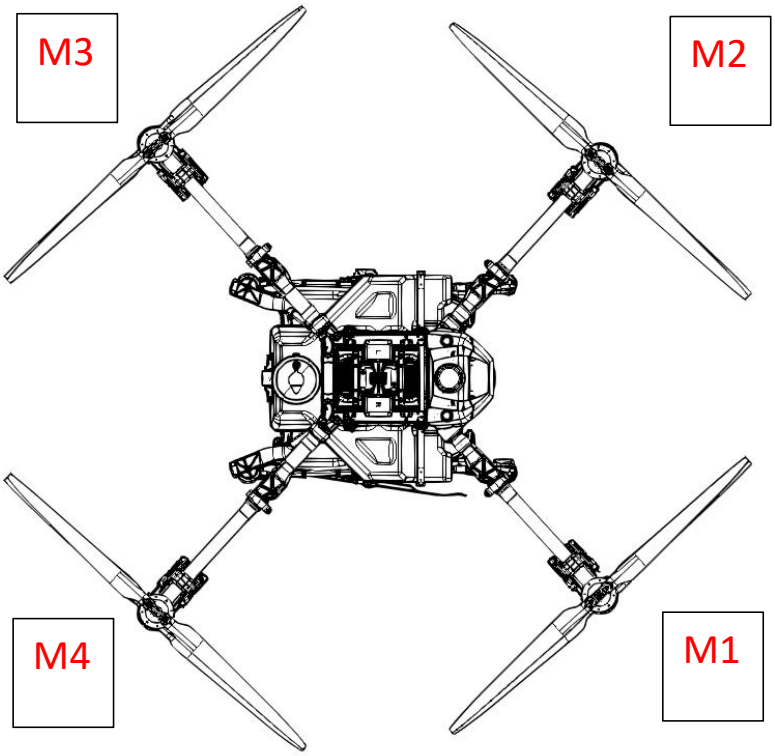
3.2.3. Flight Operating Area Safety

a. Before performing the operation, ensure all obstacles within the flight area have been clearly marked.
b. During the operation, the operating area shall be secured, and entry by unauthorized personnel or equipment is strictly prohibited to prevent interference with operational safety.
c. While controlling the UAV, the operator must remain highly focused and prevent any unauthorized personnel from interfering with the work.
d. Ensure there are no steep slopes above ground level within the flight area.
e. Before takeoff, the pilot must maintain a distance of at least 20 meters from the aircraft.

4. Product use

4.1. Precautions Before Use

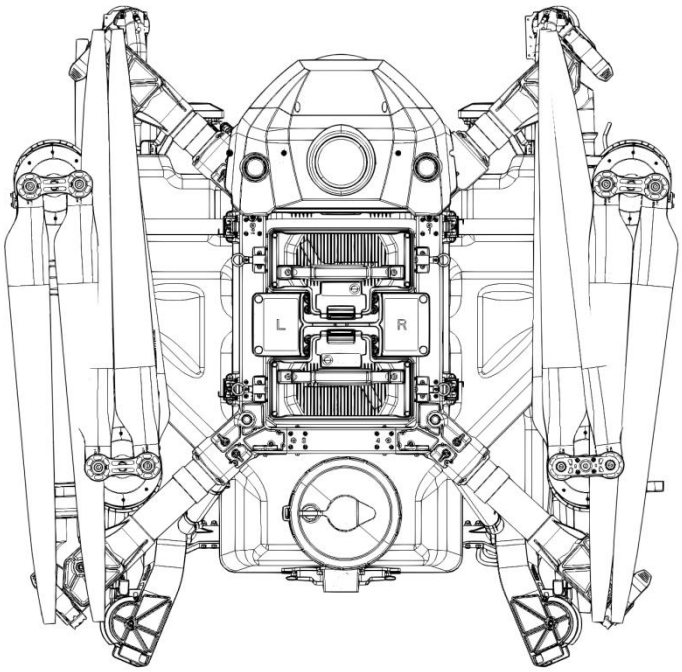




⚠Warning

Before unfolding the arms, be sure to release the arm locks, and unfold the arms one by one. First unfold M3 and M4, then unfold M1 and M2 (the reverse order applies when folding). After all arms are fully unfolded, confirm that all four arm locks are

securely locked.



⚠Warning

Ensure the battery is powered off before inserting it into the battery compartment. Do not remove the battery from the drone while the battery is powered on. When the drone is powered on, do not plug or unplug any wiring harness on the drone.

4.2. Pilot Account Registration

(1) Agricultural Services App Installation

Search for APP on mobile phone "google play" to download the Agricultural Services App.

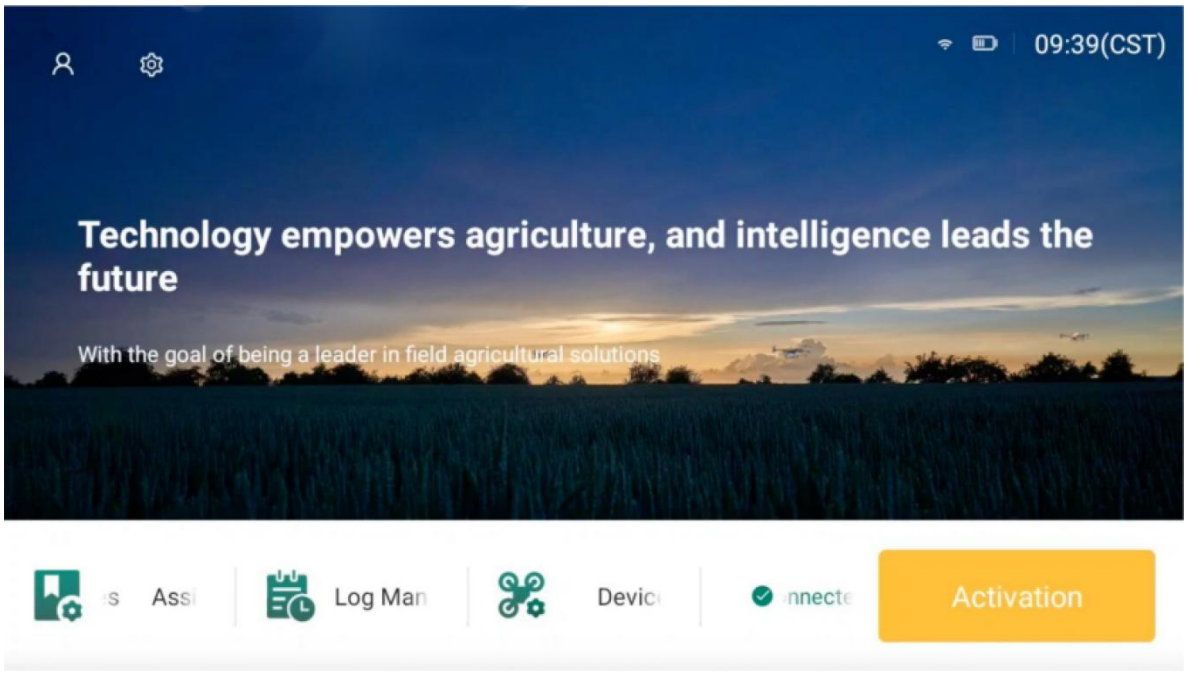
(2) Account Registration

Through the Agricultural Services App to register an account, query and download operation records and flight paths.

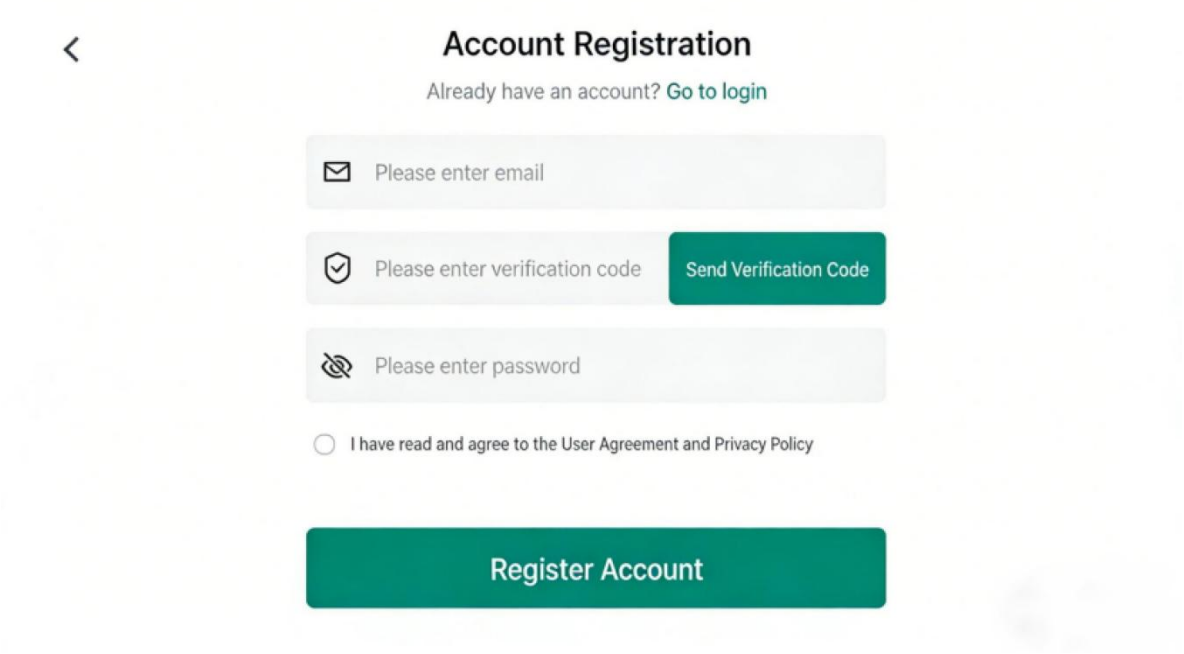
Through the telecontroller to register an account.

Turn on the remote controller and connect to the network;

On the remote controller's main interface, tap "Account".



Enter your email address, set a login password, fill in the verification code correctly, then tap "Register Account".



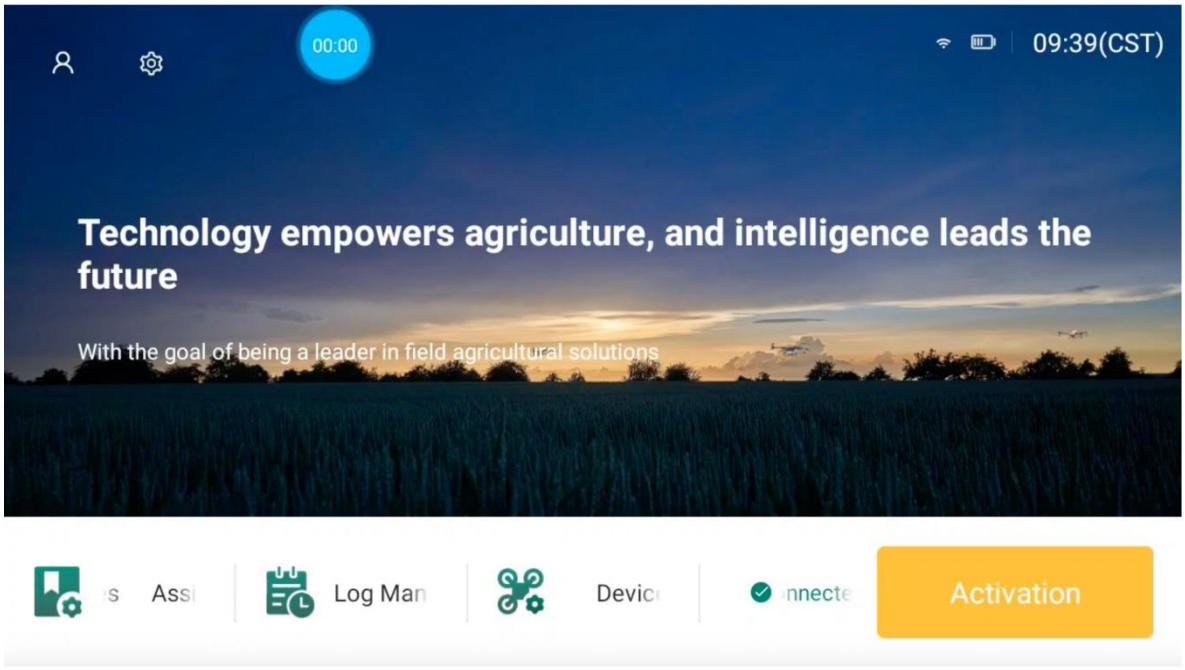
> ⚠**Warning**
>
> The platform account and password are shared between the Remote Controller App and the Agricultural Services App. The Agricultural Services App is only supported on Android.

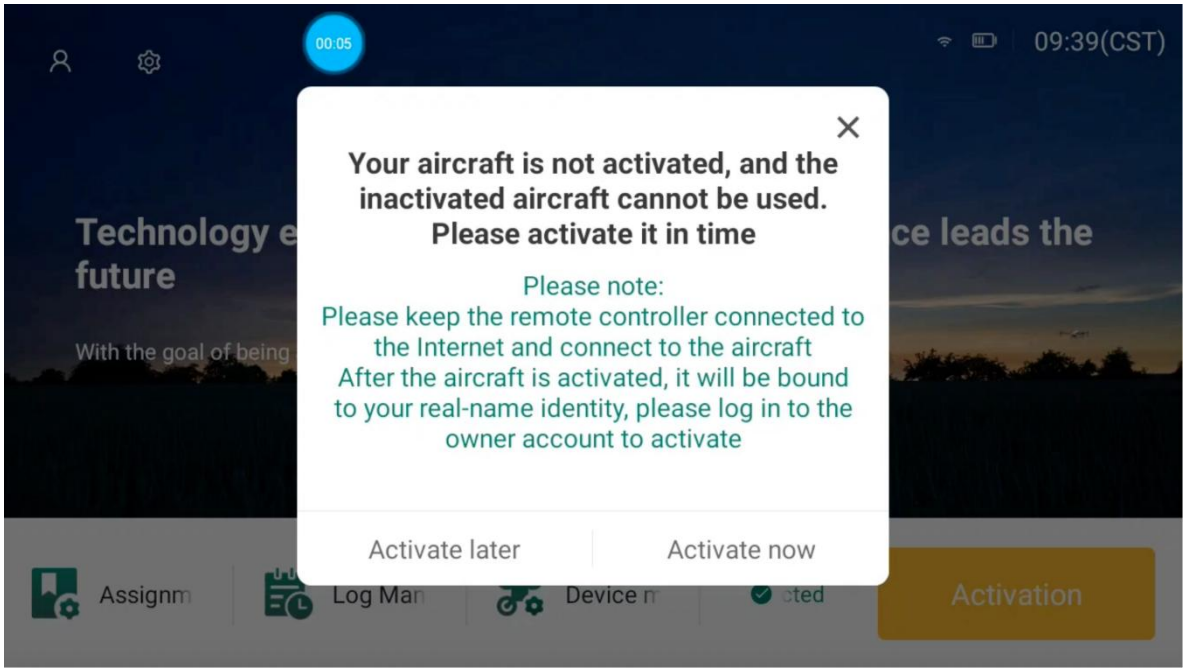
4.3. Drone activation

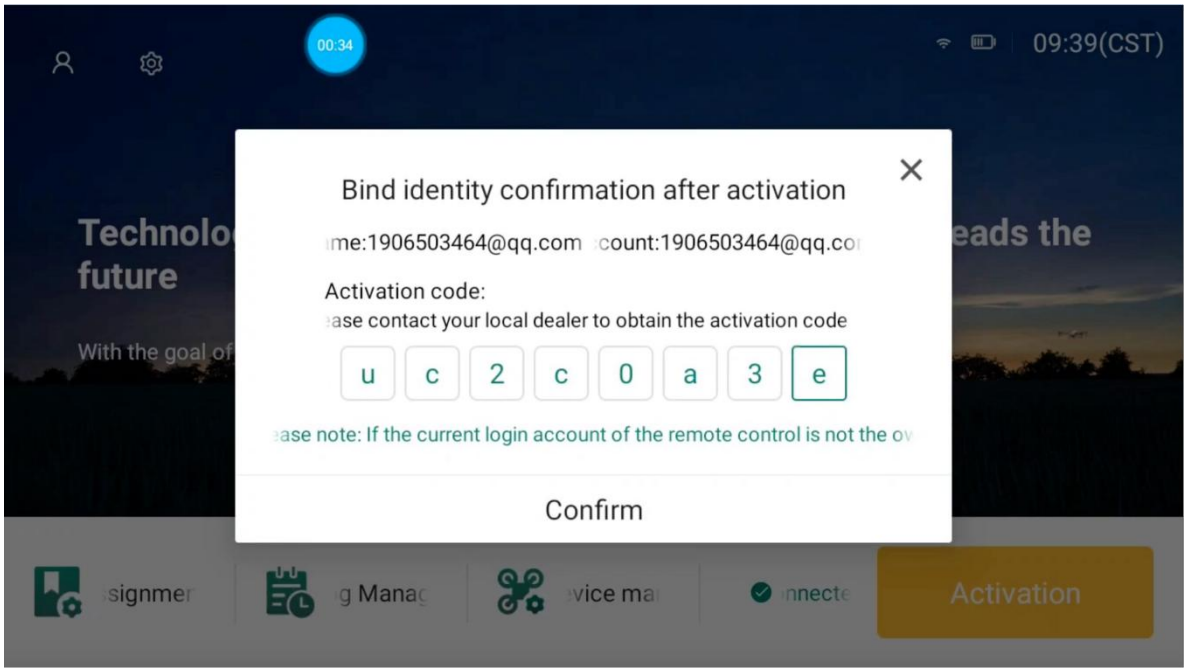
- Switch on the remote controller and connect it to the network;
- Affix the smart battery in place and switch the drone on;
- After the drone is successfully connected to the remote controller, log in the account of the app via the remote controller "Account";

> ⚠**Warning**
>
> You need to select the area code of the corresponding country.

- After logging in to your account, tap on "Drone connected" to enter the intelligent detection screen.
- Tap"Flight permission"In the intelligent detection interface.


00:00
09:39(CST)
Technology empowers agriculture, and intelligence leads the future
With the goal of being a leader in field agricultural solutions
Log Man
Activation


00:05
09:39(CST)
Your aircraft is not activated, and the inactivated aircraft cannot be used. Please activate it in time
Please note:
Please keep the remote controller connected to the Internet and connect to the aircraft
After the aircraft is activated, it will be bound to your real-name identity, please log in to the owner account to activate
Activate later
Activate now
Activation



- If the drone is not activated, it will show "Flight permission"Abnormal and "Drone status"Not active, tap "Activate now" in this interface.
- Tap"Activate now"In the pop-up window.
- Enter the activation code and tap "Confirm".

> ⚠**Warning**
>
> The activation code is provided by the dealer. After activation, the current login account will be deemed as the owner, before activation, please make sure the login account is the owner account.

4.4. Charger activation

Charger can be activated only after drone activation.

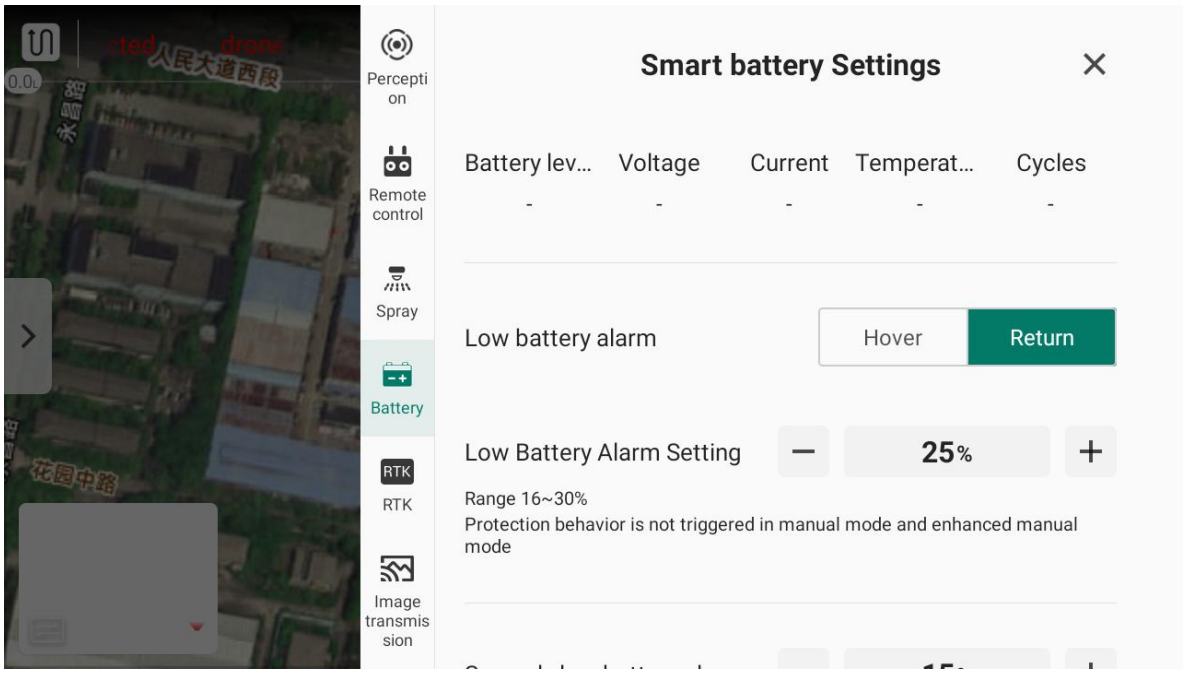
- Connect the charger to power and switch on;
- Switch on Bluetooth via the charger settings;
- Search for the charger ID in the remote controller's Bluetooth list and connect;
- Tap "Device engagement"-"Charger"-"Activate"On the homepage of the drone app to complete the charger activation.

4.5. Smart battery activation

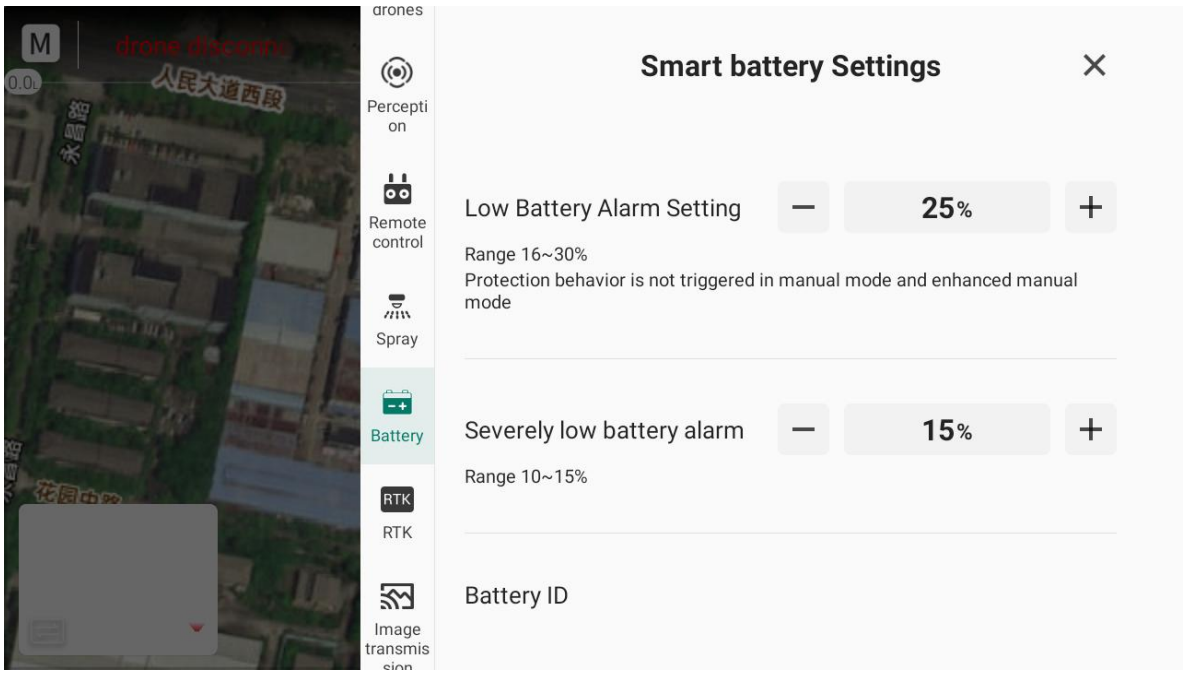
Smart battery activation needs to be performed on the drone.

- Make sure the remote controller is connected to the drone.

- Access the settings interface on the right-hand side of the drone app's homepage, and find the smart battery settings button.
- In the smart battery setting interface, tap the "Activate" button.



- Follow the prompts to complete the smart battery activation. After activation, you can view the smart battery activation area and activation time in the smart battery setting interface.



4.6. Firmware upgrade

4.6.1. Information Collection

1. **Confirm UAV Model:**Carefully check the markings on the UAV body, the product manual, or your purchase receipt to accurately identify the specific UAV model.

Firmware varies by model; using the wrong upgrade package may render the UAV inoperable.

2. **Obtain Official Upgrade Resources:**Visit our official website or contact our technical support team to obtain the latest firmware upgrade package and related documentation corresponding to your UAV model.

4.6.2. Equipment Preparation

1. **Fully Charged Batteries:**Ensure the UAV battery and remote controller battery are fully charged before starting the upgrade to prevent power loss during the process. An unexpected power failure may corrupt the firmware, preventing normal startup.
2. **Stable Network Connection:**A network interruption may cause the upgrade to fail.

4.6.3. Environmental Preparation

1. **Choose a Safe Location:**Perform the upgrade in an open, flat area away from crowds, buildings, and obstacles (e.g., a large open field, empty farmland). Avoid indoor, confined spaces, or areas with strong signal interference to prevent potential hazards if the UAV activates unexpectedly.
2. **Suitable Weather Conditions:**Preferably perform the firmware upgrade on a clear, windless, or calm day without rain or snow. Adverse weather may affect equipment performance and increase the risk of upgrade failure.

4.6.4. Upgrade Process

1. Download Firmware Upgrade Package

Upgrade Package:The firmware upgrade package will be pushed by manufacturer technicians as needed.

2. Connect Devices

UAV Connection: Start the UAV with a short press followed by a long press of its power button. Turn on the remote controller, launch the UAV App, locate and enter the Device Management option from the App's main interface.

Battery/Charger Connection: Power on the battery/charger. Then, connect the battery/charger to the remote controller within the Device Management interface.

4.6.5. Perform Upgrade

UAV/Remote Controller Upgrade: Tap Remote Controller/UAV Upgrade. When the App prompts that the upgrade is about to begin, carefully review the upgrade version number and description to ensure the operation is correct. After confirming, tap "Download and Update" to officially start the upgrade process.

Battery/Charger Upgrade: In the Device Management interface, tap the "Charger/Battery" icon to enter its management screen. Find the "Check for Updates"

option and tap the "Upgrade" button. Tap Update and wait for the device upgrade to complete successfully.

Wait for Completion: The upgrade process, involving automatic data transfer and program updates, may take several minutes. The duration depends on the firmware size and device performance. During this time:

Maintain stable device connections.

Do not perform any other operations such as powering off, unplugging cables, or closing the App.

The upgrade progress will be displayed as a percentage on the App interface.

4.6.6. Post-Upgrade Verification

Check Firmware Version: After both UAV and remote controller upgrades are complete, verify the success via Version Check in Device Management. A successful upgrade will show "Matched".

The Version Check screen displays the current version numbers. Matching UAV and remote controller versions will be highlighted in green.

Perform Functional Test: Conduct a brief functional test in a safe area:

Short-distance flight test to check stability and control responsiveness.

Test operational systems like spraying or spreading (if equipped).

Verify the accuracy of obstacle avoidance and positioning (e.g., RTK/GPS) functions.

If any abnormalities are found, consult the upgrade documentation or contact technical support immediately.

4.6.7. Upgrade Precautions

1. Avoid Interrupting the Upgrade

Monitor Throughout: Do not leave the site during the upgrade. If issues arise (e.g., device freeze, prolonged progress stall), do not take arbitrary action. First, consult the troubleshooting section of the upgrade documentation or contact technical support.

Prevent Interference: Keep the environment free from strong electromagnetic interference (e.g., high-voltage power lines, communication towers, microwaves), as it may disrupt data transfer and cause upgrade failure.

2. Responding to Upgrade Failure

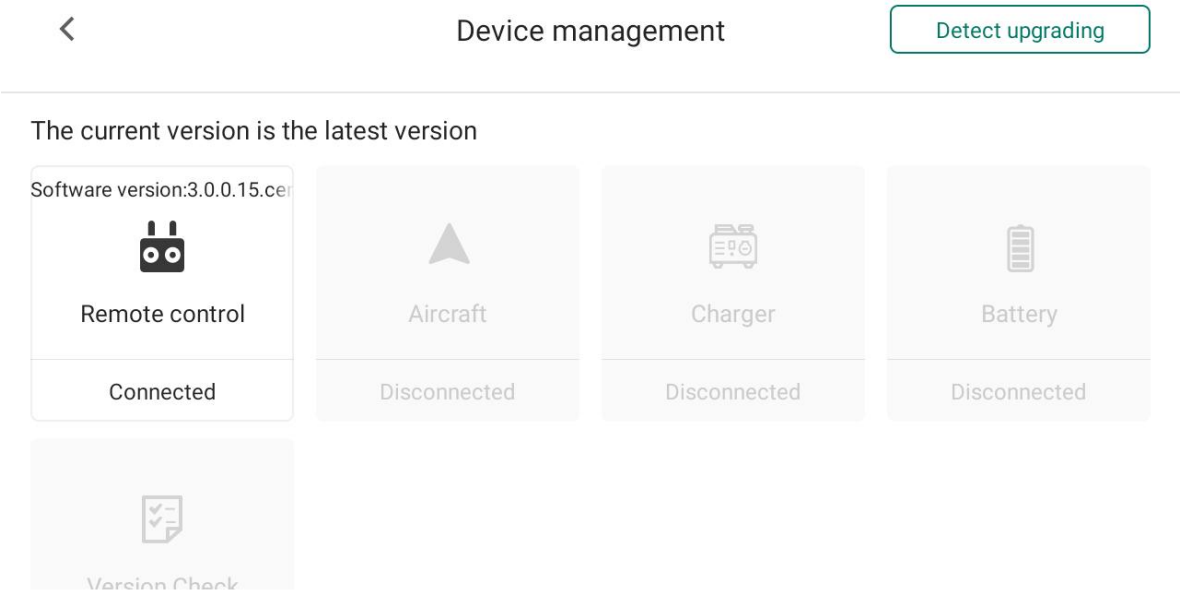
Do Not Immediately Retry: If an error occurs (error code, interruption), do not restart the upgrade immediately. First, check device connections and network stability, and carefully read the error message for troubleshooting steps.

Contact Technical Support: If the issue cannot be resolved independently, contact technical support promptly. Provide detailed information: error messages, the step where

failure occurred, etc., for accurate diagnosis and solution. Follow the technician's guidance, which may involve retrying the upgrade.

3. Backup and Restore Data

Backup Important Data: Before upgrading, ensure critical UAV data (e.g., field maps, mission records) is backed up as described in previous sections. This data may be lost during the upgrade, and a backup allows for restoration if needed.



4.7. Log Upload Procedure

4.7.1. Preparations

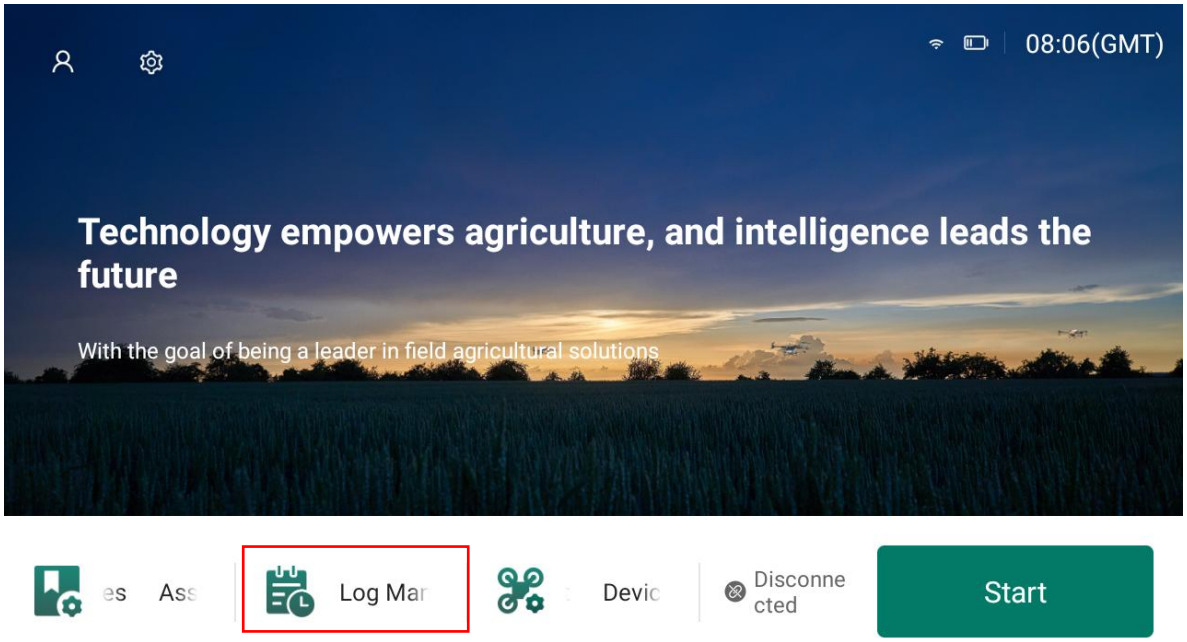
1. UAV: Ensure the UAV is powered off and parked safely, with propellers locked to avoid unintended rotation during the operation.
2. Remote Controller: The remote controller should have sufficient battery—recommended above 50%—to prevent interruption due to low power during the entire upload process. Also, ensure any previous connection between the remote controller and the UAV is terminated (if they were connected earlier).

4.7.2. UAV Log Upload Procedure

1. Connect the UAV to the mobile device:

① Press and hold the power button on the UAV (short press + long press) to turn on the UAV.

② Open the UAV App. On the App's main interface, locate Log Management.



2. On the main interface, select "Log Management".
3. Enter the log reading interface: Click Refresh UAV List. The App will attempt to communicate with the UAV and read the flight log data stored internally. The reading process may take from a few seconds to several minutes, depending on the log file size and data transfer speed between the UAV and the mobile device. Once log reading is complete, the App interface will display all stored log files from the UAV in a list.
4. Select log files to upload: From the log file list, select the desired file(s) by checking the checkbox in front of the filename. To select multiple files, check the boxes for each required file. (Note: One log file is generated per power cycle. If troubleshooting a current issue, power cycle the UAV to generate a new log.)
5. Initiate upload: Click the "Upload" button, enter the reason for the log upload, and confirm. The App will begin uploading the selected log files to the designated server. A stable internet connection is required. Weak or unstable networks may cause upload failure or interruption. During upload, the App will display real-time progress, including uploaded/total file size and a progress bar.
6. Wait for completion: After successful upload, the App will generate a Log QR Code. Take a photo of this QR code and provide it to manufacturer technical support.
7. Error handling: If an error occurs during upload, the App will display an error message. Check your network connection, device settings, etc., based on the prompt, and retry the upload operation.

4.7.3. Remote Controller Log Upload Procedure

1. Similarly, open the UAV App, find Log Management on the main interface. On the Log Management page, select "Remote Controller". Click on it, choose the remote

controller log from the corresponding time period, and upload.

4.7.4. Charger Log Upload Procedure

1. The remote controller connects to the charger via Bluetooth. Ensure Bluetooth is enabled on the charger before uploading (press the charger's settings button to activate Bluetooth).
2. Open the UAV App, find Log Management on the main interface. On the Log Management page, select "Charger".
3. Click Search, then connect to the charger.
4. Return to the Log Management interface. Once the charger status shows "Connected", click Log Management.
5. Click Charger Logs, then click Upload. Provide the generated QR code to technical support.

4.7.5. Battery Log Upload Procedure

1. The battery log upload process is similar to the charger's. First, ensure the battery is on and Bluetooth is enabled for connection.
2. With Bluetooth active, the battery's serial number can be found in the battery information interface for connection.
3. Enter the Battery Management interface and click Upload Log.
4. Select the log from the relevant time period and click Upload. Similarly, provide the log's QR code to technical support.

4.7.6. Common Issues & Solutions

1. Connection Issues

(1) Unstable or frequently dropped connection:

a) Check if the device power is on normally.

b) Check if the battery level is sufficient.

c) Close and reopen the App, or restart the mobile device, UAV, and remote controller, then retry.

d) Check if the distance between devices is too far. Stay within the effective range (typically ~10 meters for Bluetooth, may vary).

e) Check for environmental interference (strong magnetic fields, other wireless devices). Move away from interference sources and retry.

f) Update the App to the latest version, as older versions may have compatibility issues.

g) Check if the UAV and remote controller firmware is up-to-date. If not, perform an official firmware update before retrying.

2. Log Upload Issues

(1) Upload failure:

a) Check the mobile device's network connection. If unstable, switch networks (e.g., from mobile data to Wi-Fi, or vice versa) and retry.

b) Check if the log file size exceeds server limits. If too large, try uploading in batches or contact technical support.

(2) Slow upload speed:

a) Insufficient bandwidth may cause slow uploads. Use a strong, high-bandwidth network (e.g., high-speed Wi-Fi).

b) Server congestion from many concurrent users. Try uploading during off-peak hours (e.g., late night).

(3) Important Notes

a) Before uploading logs, carefully read the UAV and remote controller user manuals to understand specific requirements and avoid damage or data loss.

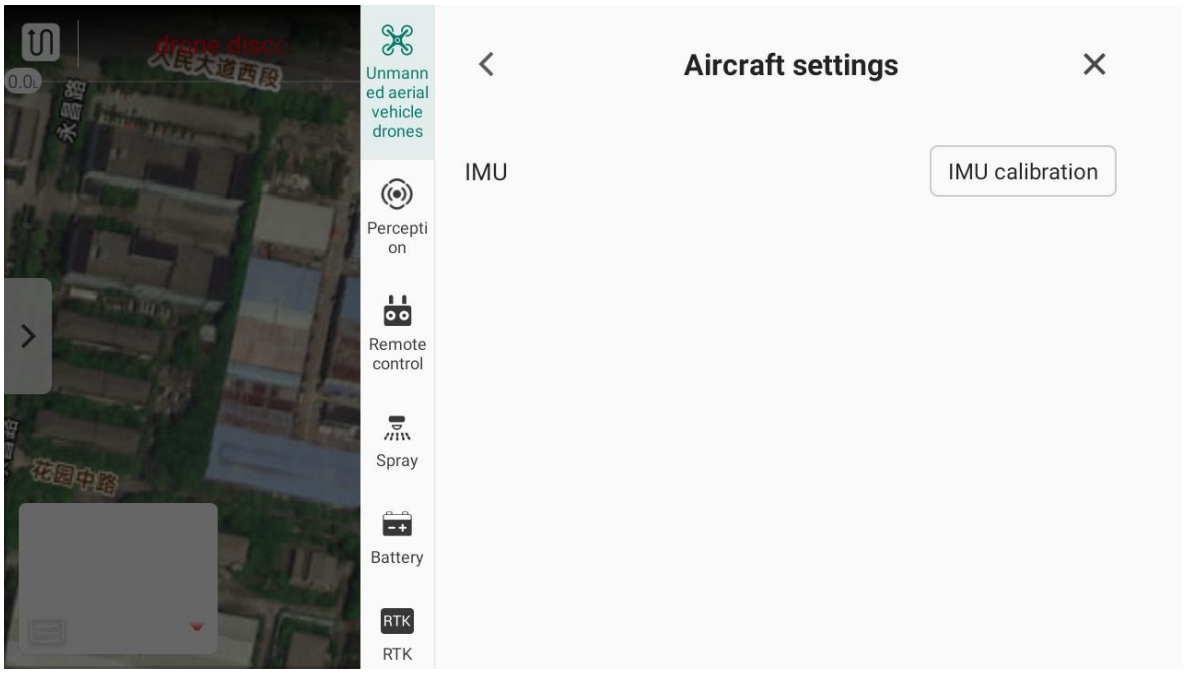
b) During upload, ensure the mobile device is placed securely and stably to prevent operation interruption or damage.

c) If any issues arise during upload, do not attempt unofficial methods or tools, which may cause irreversible damage. Contact us for professional assistance.

5. Related Calibration

5.1. IMU calibration

- Access the settings interface located on the right-hand side of the app's homepage, and find the drone settings button.
- Tap "Advanced settings"In the drone settings interface;

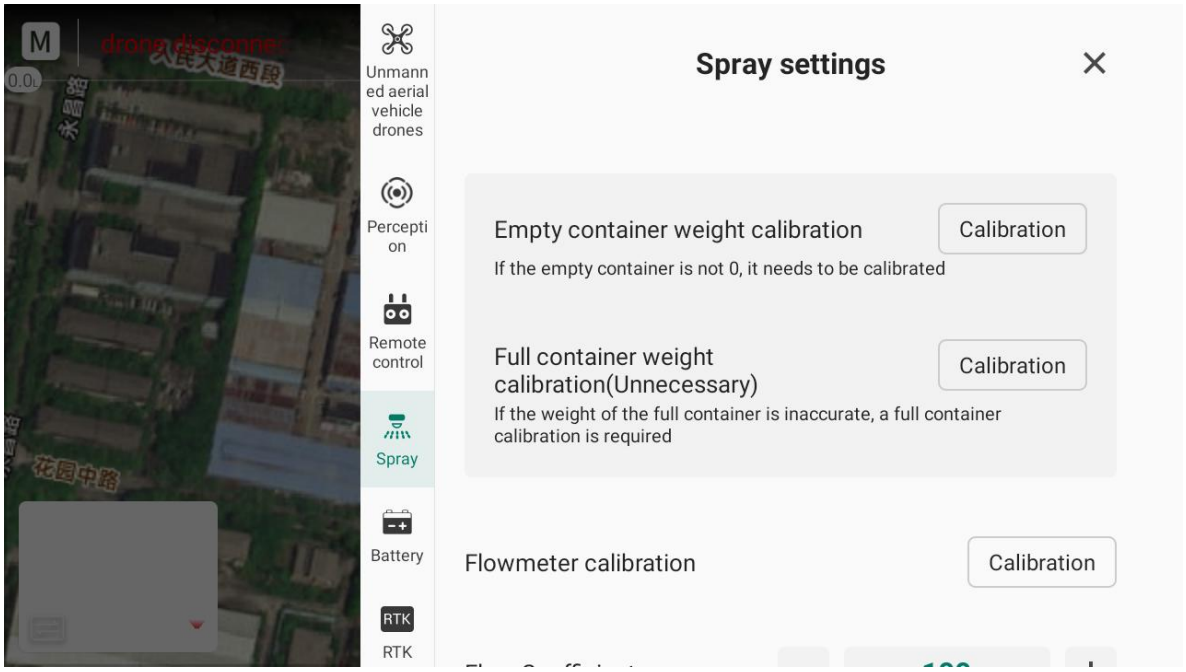


- Click "IMU calibration";
- Click "IMU calibration"Until the remote controller shows "Calibration successful"Prompt.

> ⚠**Warning**
> When calibrating the IMU, the drone should be placed on a level ground.

5.2. Empty container weight calibration

- The container needs to be emptied before calibration.



5.3. Flowmeter calibration

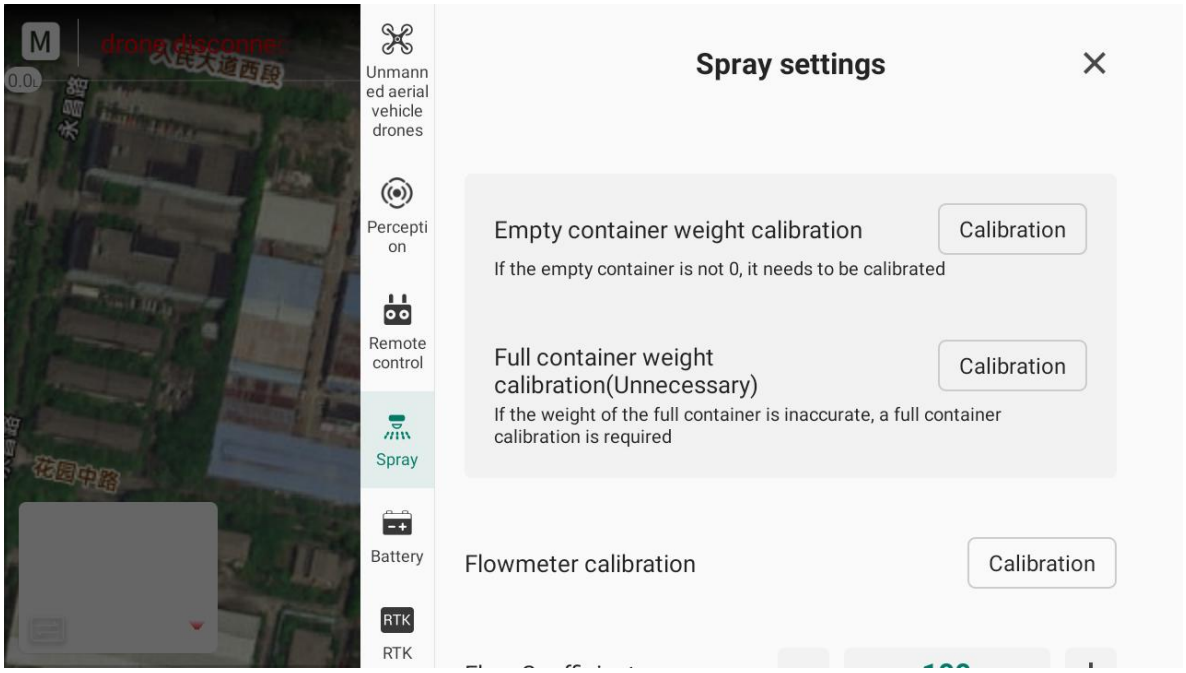
- Please calibrate the flowmeter before spraying with the drone for the first time to avoid inaccurate spray dosage due to inaccurate flow rate.

(1) Add more than 20 l of fresh water to the agrochemical container;

(2) Tap the Spray button to purge air from the lines, then turn off the spray switch;

(3) Access the settings interface on the right-hand side of the drone app's homepage, and find the spray settings button;

(4) Find flowmeter calibration, tap "Calibrate";

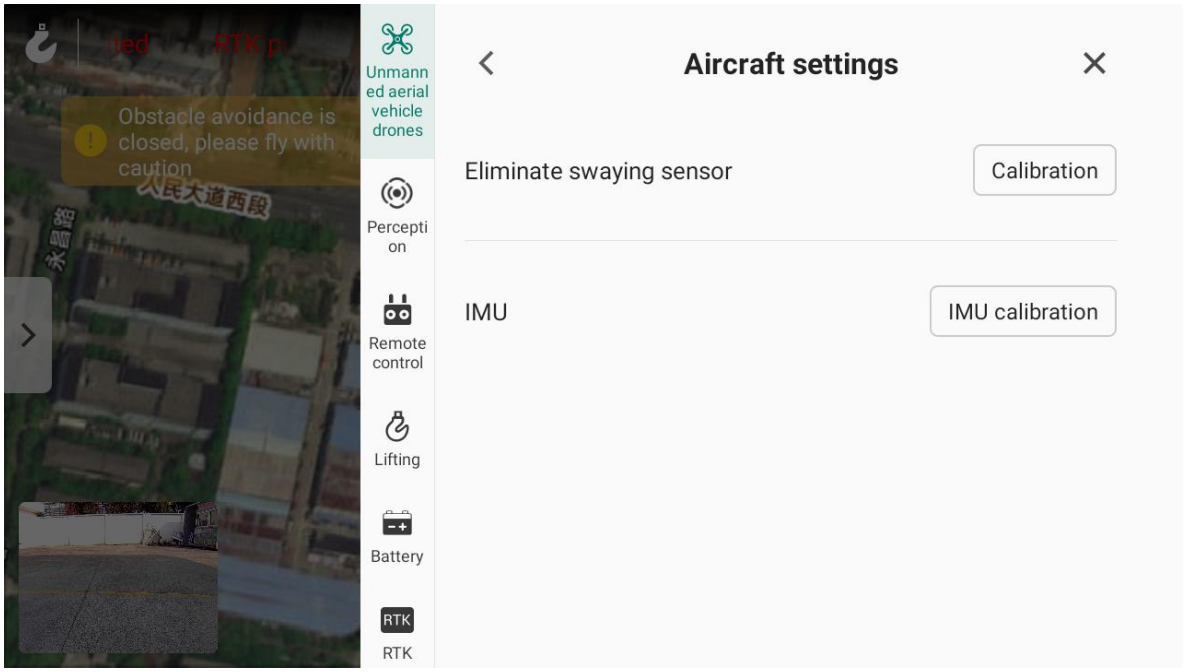


- Follow the prompts to complete the flowmeter calibration.

> ⚠**Warning**
>
> The flowmeter needs to be recalibrated if you find that the flow rate is not accurate. Recalibration of the flowmeter is required when replacing operating system accessories.

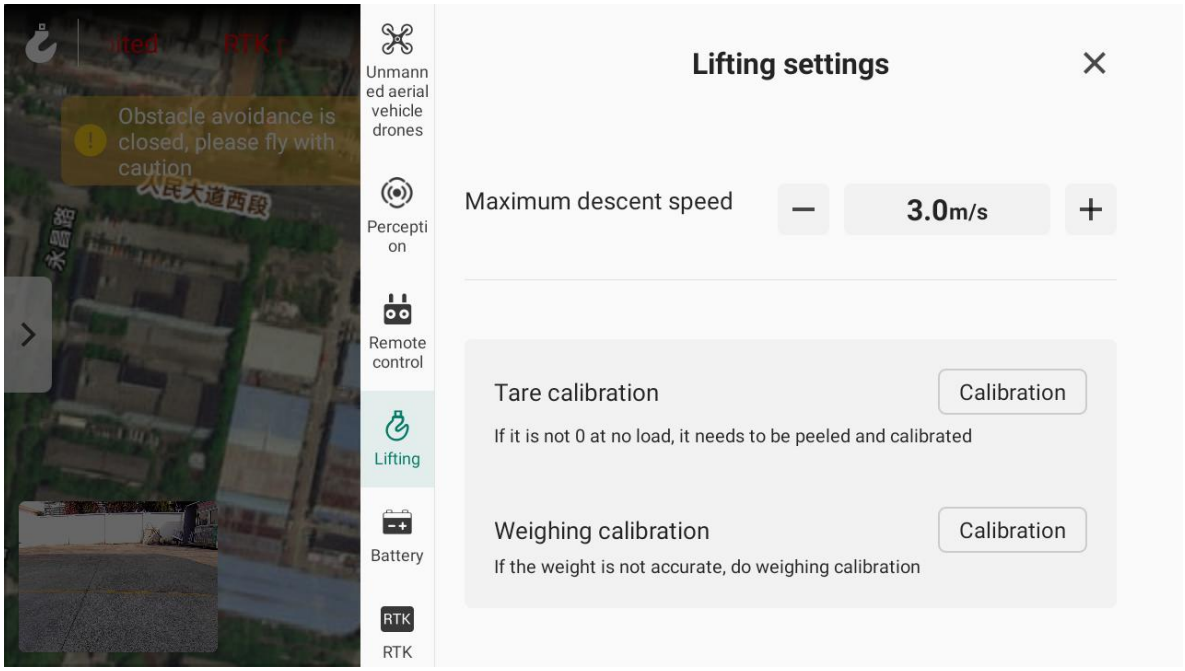
5.4. Anti-sway Calibration

- On the main interface of the UAV App, enter the settings menu from the right side and locate the "UAV Settings" button.
- In the UAV Settings interface, tap "Advanced Settings", then click "Anti-sway Sensor Calibration" and proceed until the remote controller prompts that calibration is successful.



5.5. Tare Calibration

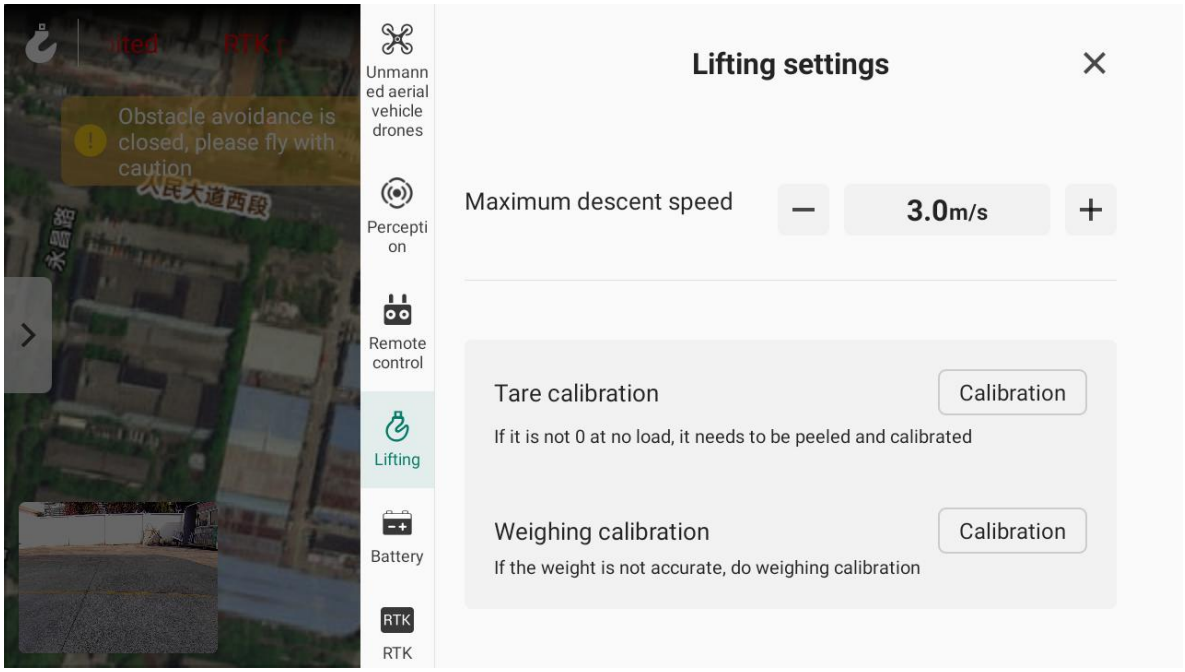
- On the main interface of the UAV App, enter the settings menu from the right side and locate the "Operation System Settings" button.
- In the Operation System Settings interface, tap "Tare Calibration".



- Tap "Calibrate" and hold until calibration is successful.

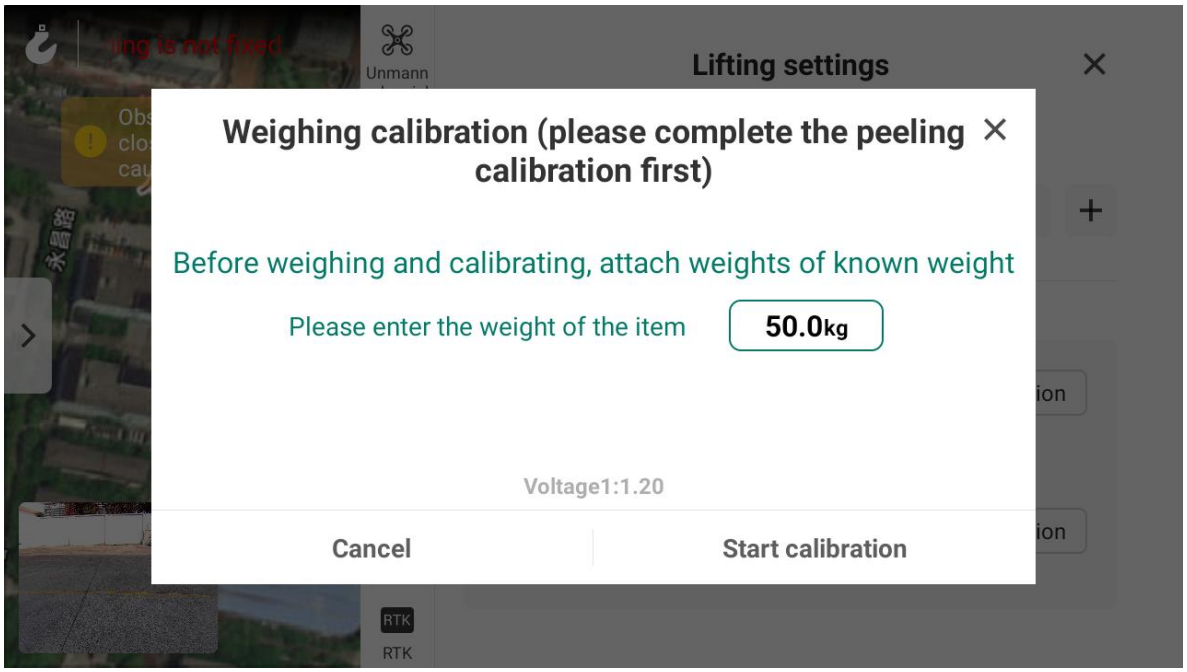
5.6. Weighing Calibration

- Before performing weighing calibration, ensure that tare calibration has been completed.
- On the main interface of the UAV App, enter the settings menu from the right side and locate the "Operation System Settings" button.
- In the Operation System Settings interface, tap "Weighing Calibration".



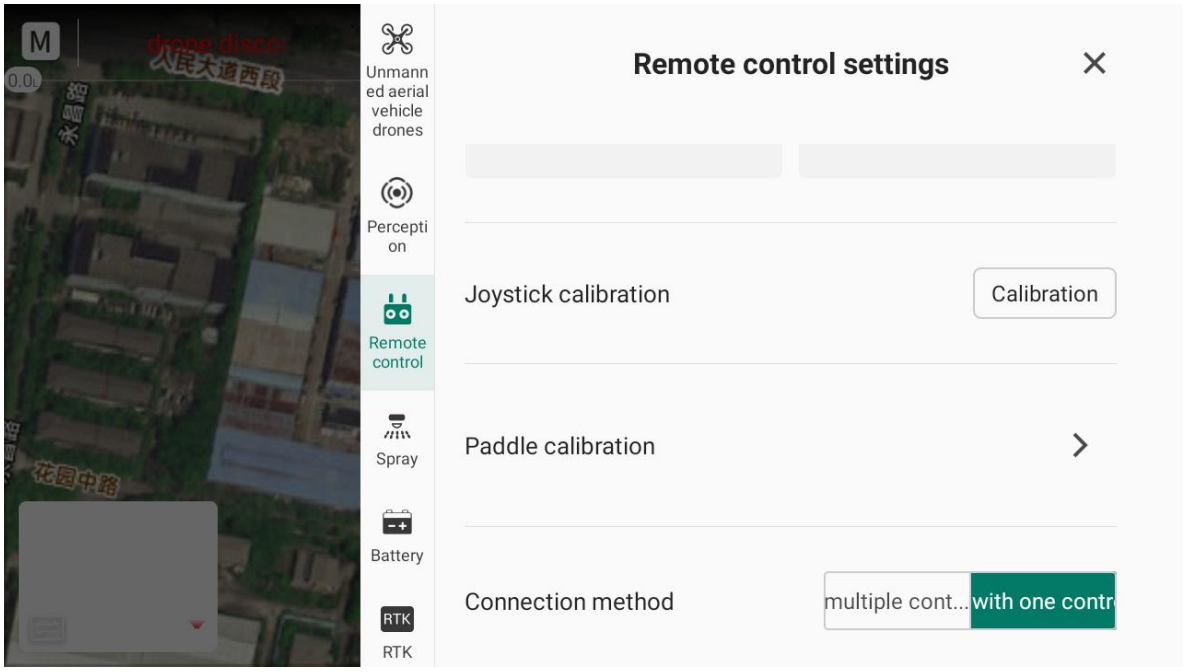
- Before performing weighing calibration, attach a known weight and ensure the entered weight matches the actual weight (recommended: approximately 50 kg).

- Tap "Calibrate" and proceed until calibration is successful.

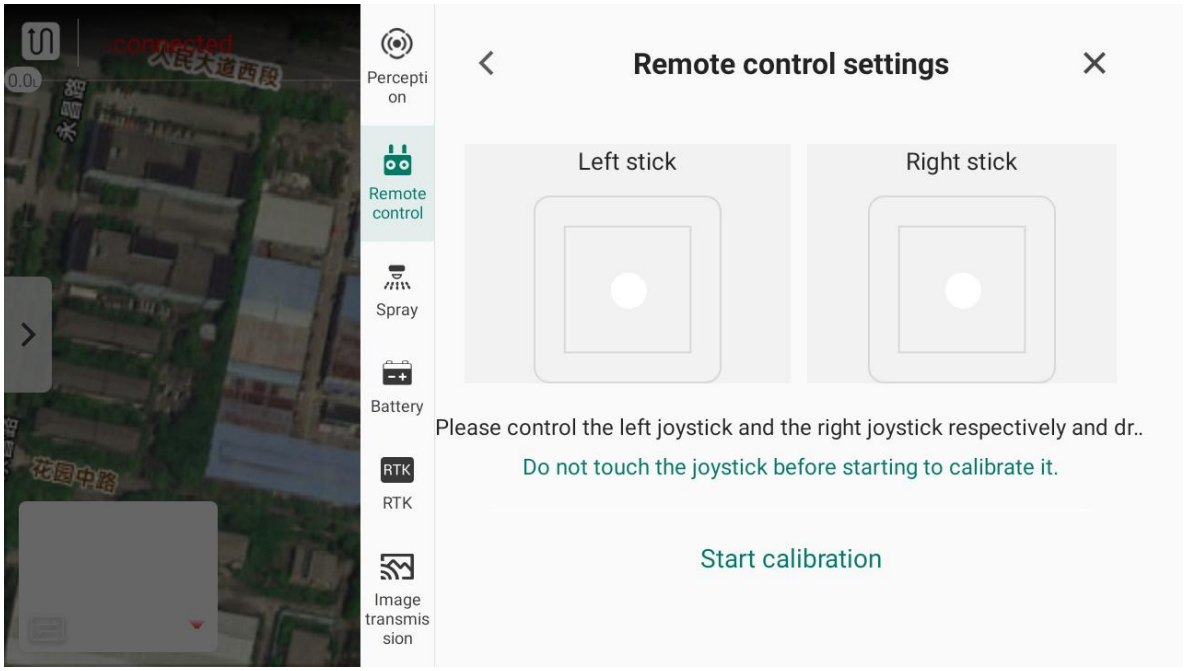


5.7. Joystick calibration

- Access the settings interface on the right-hand side of the drone app's homepage, and find and tap the remote controller settings button to go to the remote controller settings page.



- Tap"Calibrate"To enter the joystick calibration page, and tap"Start calibration"Below.

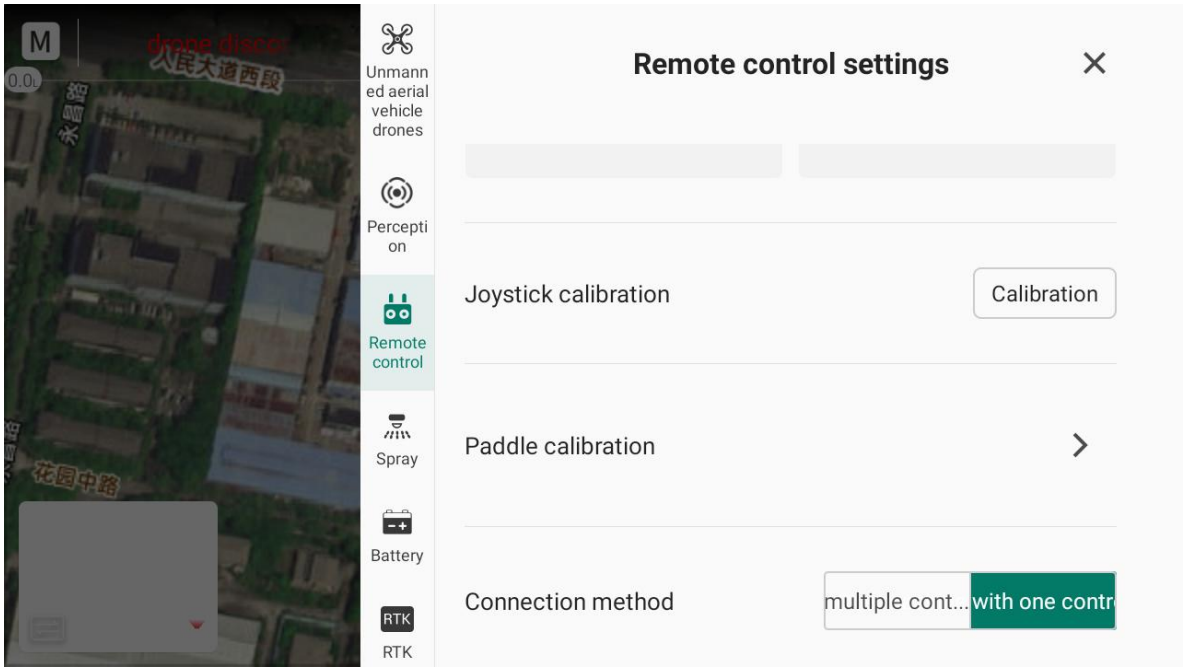


- Follow the instructions on the interface to maneuver the left and right joysticks.
- The joysticks are considered as being calibrated when the square rings are completed in green.

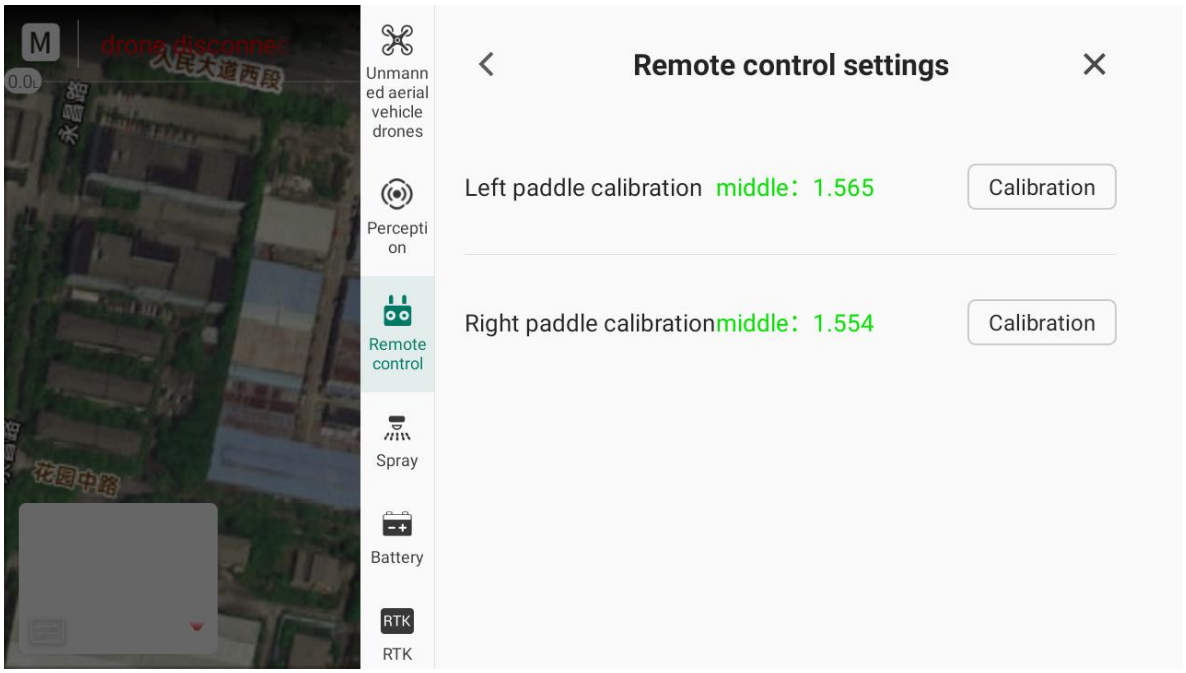
> ⚠**Warning**
>
> The remote controller has been calibrated at the factory. If you notice any discrepancy in the lever movement during operation, you can rectify the issue by recalibrating the joysticks.
>
> When calibrating the joystick, please make sure the drone is not powered on first.

5.8. Thumb wheel calibration

- Access the settings interface, then tap the remote controller settings button to go to the remote controller settings page.



- Tap "Thumb wheel calibration"To enter the thumb wheel calibration interface, and then tap "Calibration".



- Tap "Start calibration"And follow the prompts to complete the calibration.
- The "Calibration"Mode for the right dial is the same as that for the left dial.

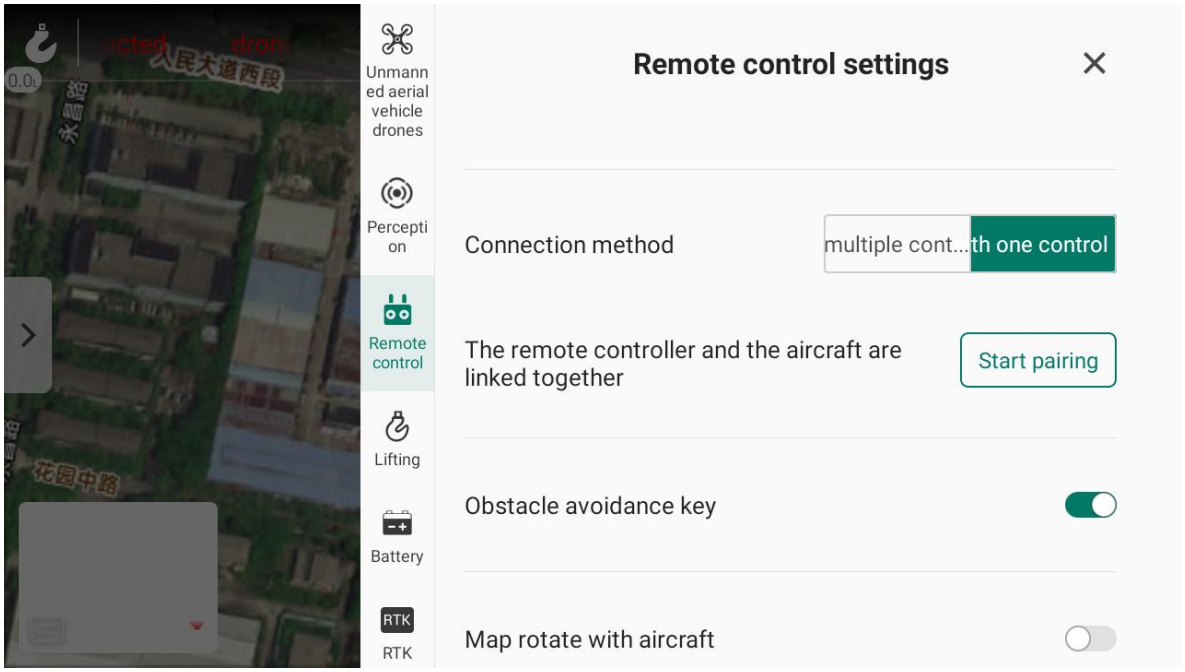
5.9. Remote Controller Pairing

The remote controller and the UAV are pre- paired at the factory and can be used directly after power- on. However, if the remote controller is replaced, re- pairing is required before operation.

1．Turn on the remote controller, launch the UAV App, and tap the remote controller function button in the App. Locate the UAV- remote controller pairing function and tap Start Pairing.

2．Power on the UAV, then press and hold the power button for 10 seconds until the status LEDs (both LEDs) flash yellow, indicating entry into pairing mode. Continue until the UAV prompts that pairing is successful.

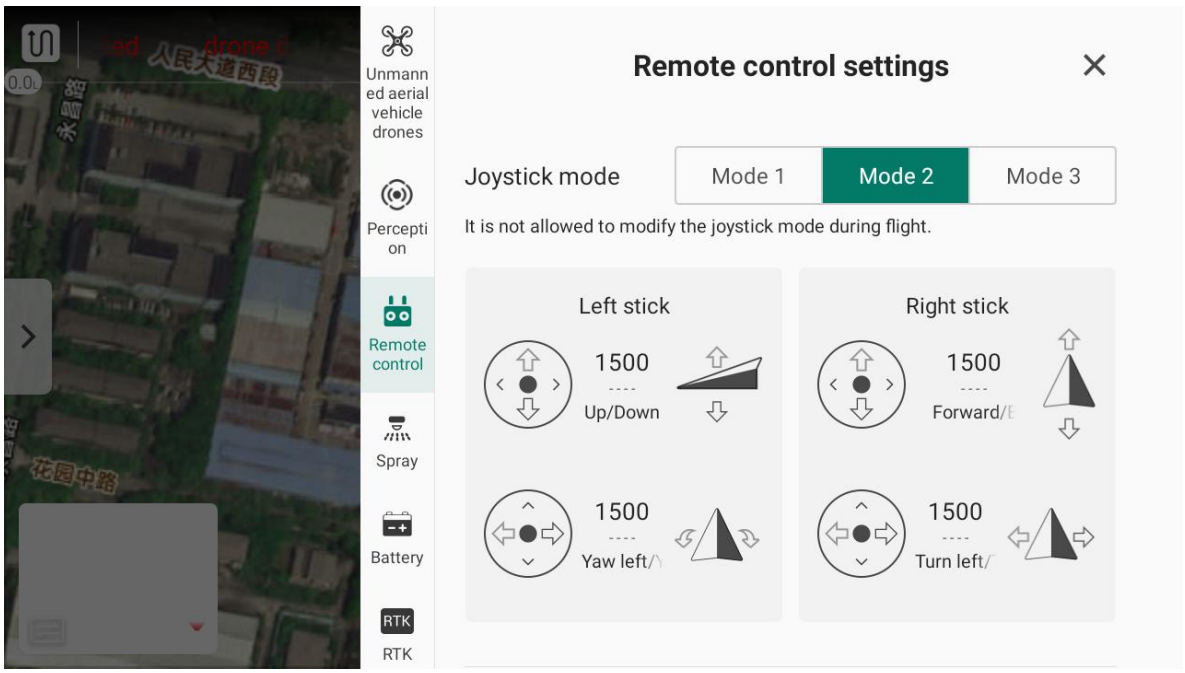
Once paired, return to the UAV App. The upper- right corner of the remote controller interface will indicate that the UAV is connectable, and the UAV icon will turn green.



6. Drone Operations

6.1. Drone maneuvering

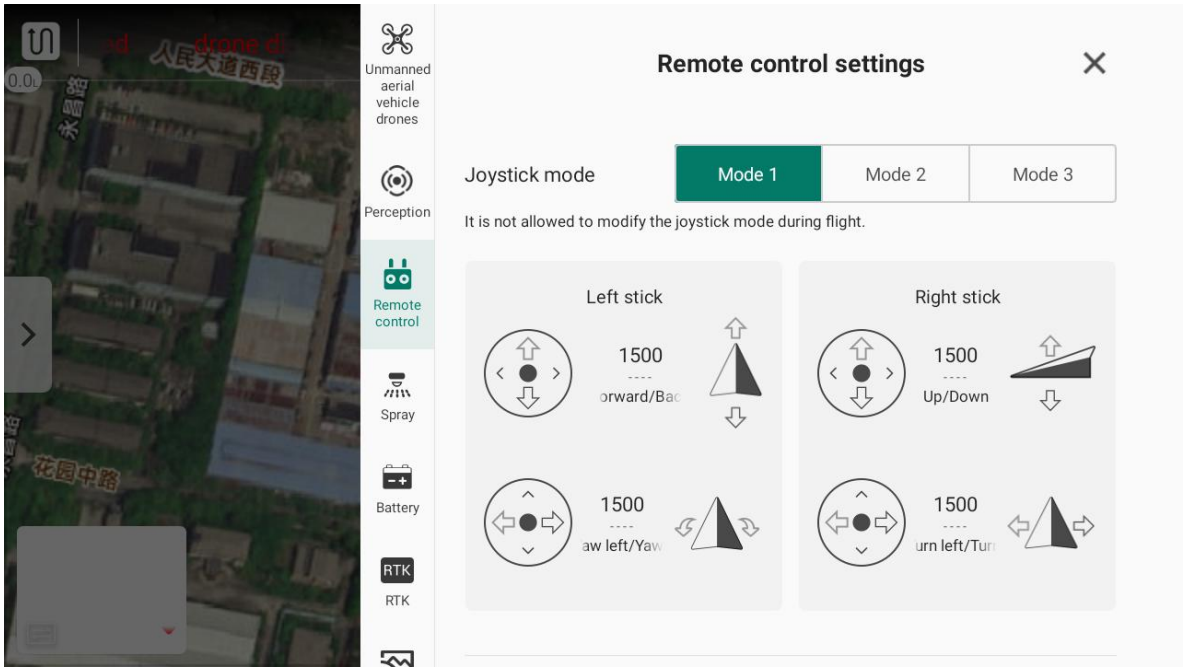
- There are three joystick control modes available: Mode 1, Mode 2, and Mode 3.



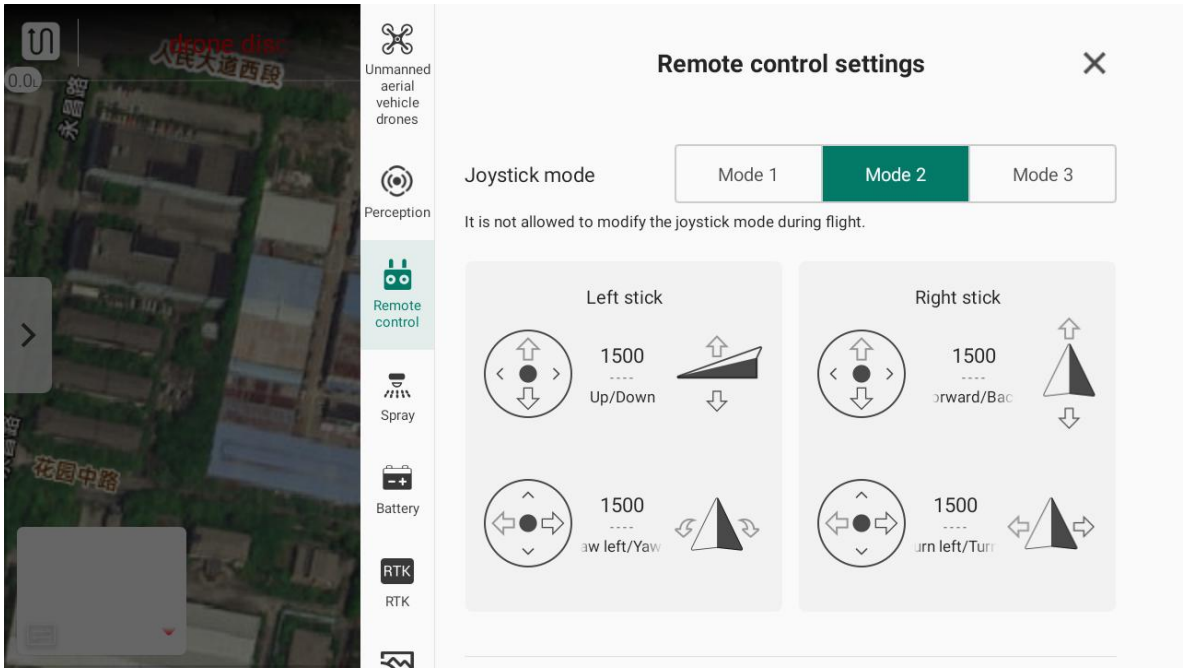
- The default control mode of the remote controller from the factory is Mode 2, and this manual uses Mode 2 as an example to explain the control mode of the remote controller.

> **⚠Warning**
>
> Do not unlock for takeoff until you are certain of the joystick mode.
>
> Joystick control should be set in the first place to match your personal operating preference.

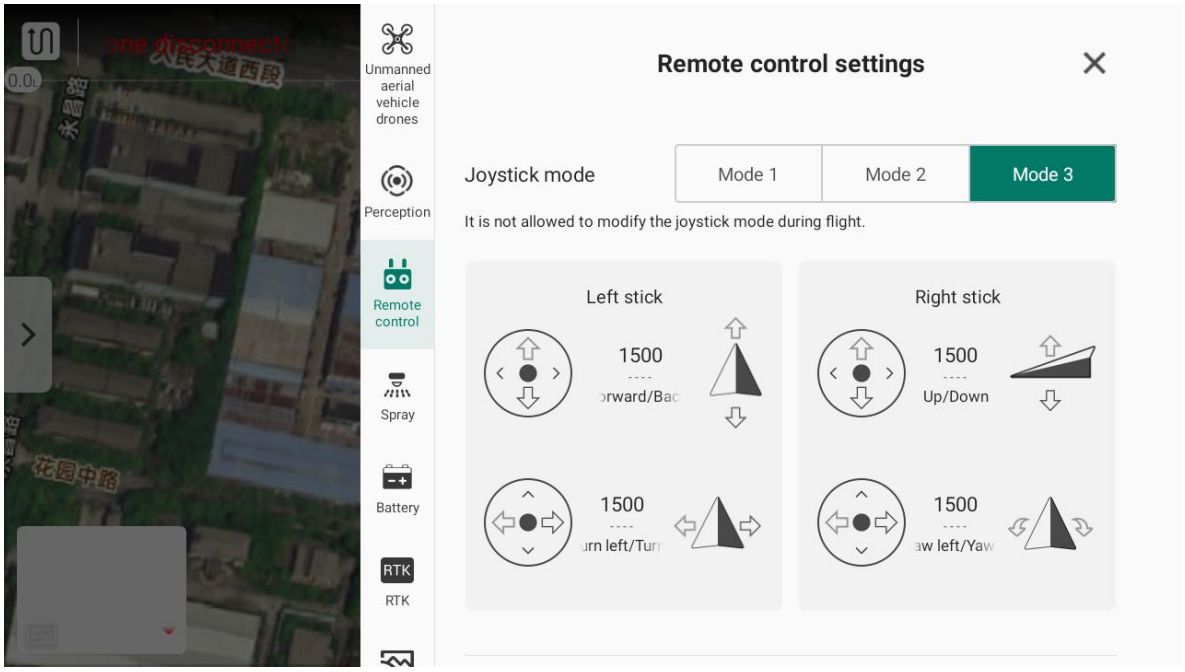
Mode1


Unmanned aerial vehicle drones
Perception
Remote control
Spray
Battery
RTK
Remote control settings
Joystick mode
Mode 1
Mode 2
Mode 3
It is not allowed to modify the joystick mode during flight.
Left stick
1500
Right stick
1500
Up/Down
1500
1500

Mode 2

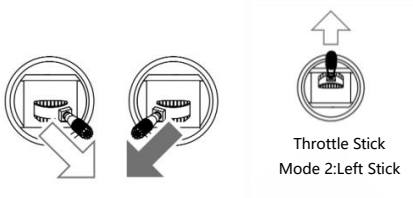

Unmanned aerial vehicle drones
Perception
Remote control
Spray
Battery
RTK
Remote control settings
Joystick mode
Mode 1
Mode 2
Mode 3
It is not allowed to modify the joystick mode during flight.
Left stick
1500
Up/Down
Right stick
1500
1500
1500

Mode 3



6.2. Manual takeoff

- Perform the following stick movement to start the motors, then push the throttle stick upward to take off.



6.3. Manual landing

- Pull the throttle stick downward until the aircraft lands on the ground. After the aircraft touches down, you can stop the motors in the following way:



- After the aircraft lands, pull the throttle stick to the lowest position and hold it. The motors will stop after 5 seconds. Then release the stick.
- High-speed rotating propellers are dangerous. When in use, maintain a safe distance from the aircraft and keep it away from crowds, animals, or other obstacles.
- Before the aircraft motors stop, be sure to keep the remote controller in hand and ensure the aircraft is fully under control.
- During flight, never stop the motors, otherwise the aircraft will crash. Unless special

circumstances occur (e.g., the aircraft may crash into crowds), emergency motor stop is needed to minimize harm. After landing, turn off the aircraft first, then turn off the remote controller.

6.4. Motor startup

- When the UAV battery is sufficient, the remote controller communication is normal, and the aircraft's RTK positioning is available, in the start operation interface, unlock the motors by performing the eight-direction unlock with the left and right sticks of the remote controller.
- After the motors start, release the sticks immediately and push the throttle to take off as soon as possible. If you don't take off, do not perform the stick movement to start the motors, otherwise the aircraft may lose balance, drift, or even take off automatically, causing personal injury or property loss.

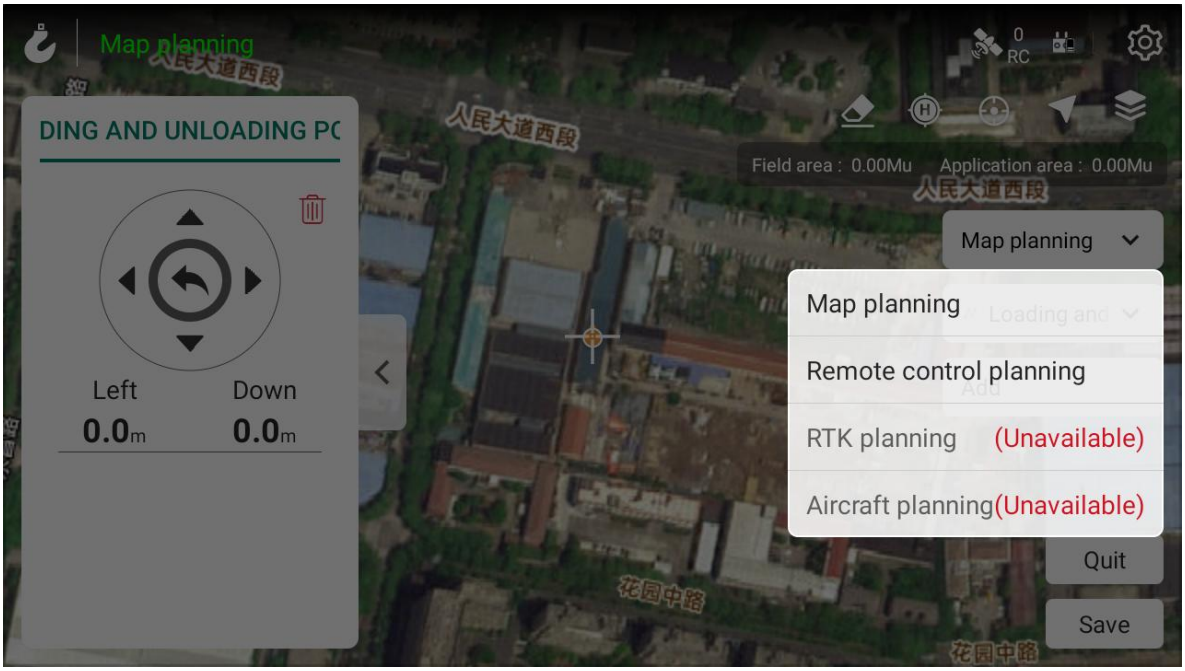
6.5. Motor stop

- After the aircraft lands, pull the throttle stick to the lowest position and hold it. The motors will stop after 5 seconds.
- Note: High-speed rotating propellers are dangerous. When in use, maintain a safe distance from the aircraft and keep it away from crowds, animals, or other obstacles.
- Before the aircraft motors stop, be sure to keep the remote controller in hand and ensure the aircraft is fully under control.
- During flight, never stop the motors, otherwise the aircraft will crash. Unless special circumstances occur (e.g., the aircraft may crash into crowds), emergency motor stop is needed to minimize harm.
- After landing, please turn off the drone first, then turn off the remote controller.

6.6. Route management

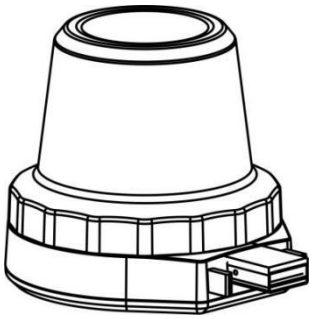
6.6.1. Route planning

- The app provides four ways to plan routes: RTK planning, UAV visual planning, remote controller planning, and map planning.

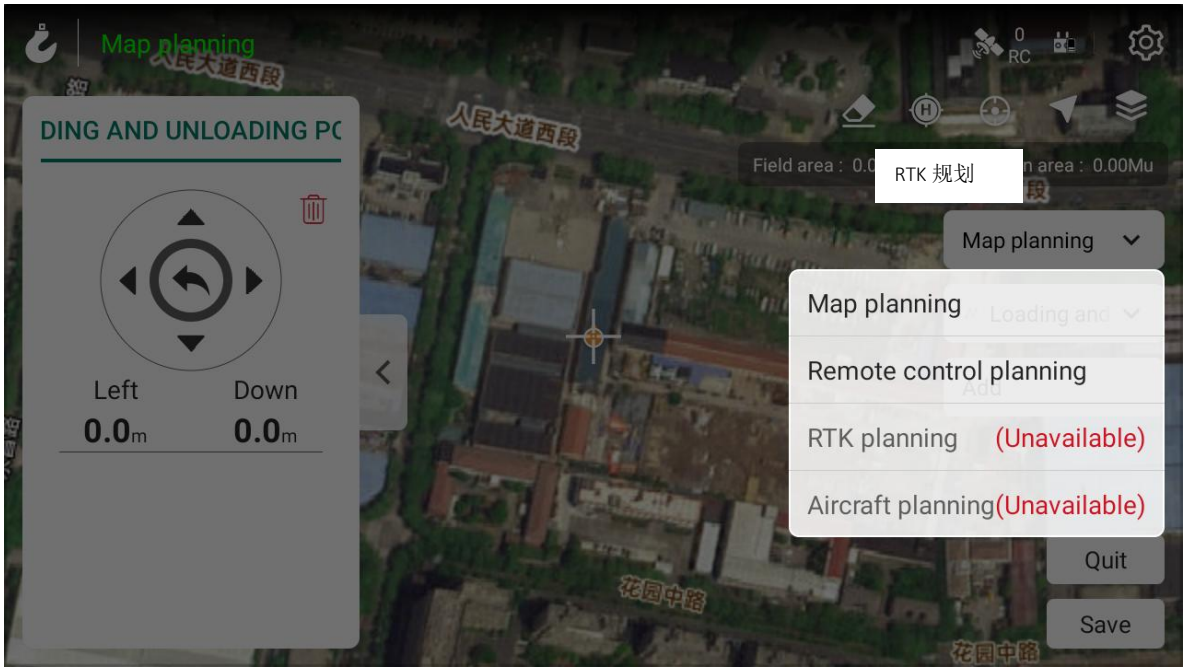
- 

1) RTK planning

- When implementing RTK planning, the RTK high-precision positioning module must be installed in the USB port of the remote controller for accurate measurement.



- Tap"Plan plot"On the app homepage, and select"RTK planning";
- Wait until the RTK positioning status bar at the top left of the interface turns green, and the accuracy for GPS point position determination is less than 50 cm;

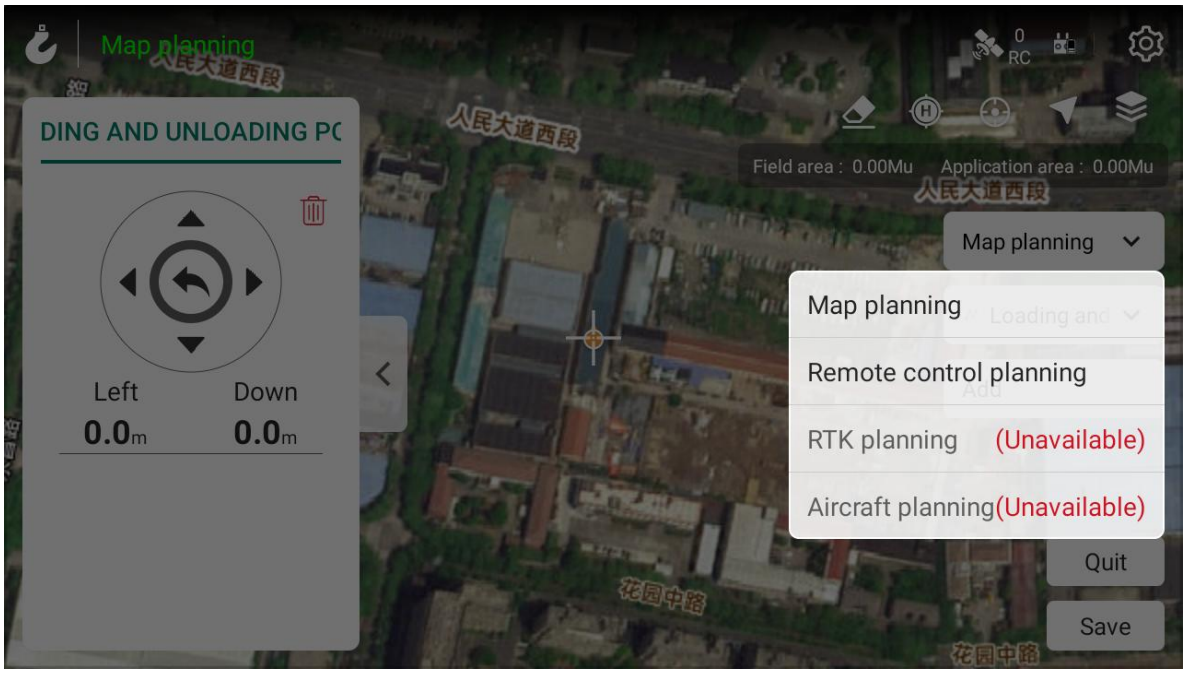


- Hold the remote controller to the desired position, and then tap the "Add" button on the app to add waypoints, planning the plot boundaries and obstacles.

> **⚠Warning**
>
> For your safety, always ensure that the drone is powered off when using RTK planning function.

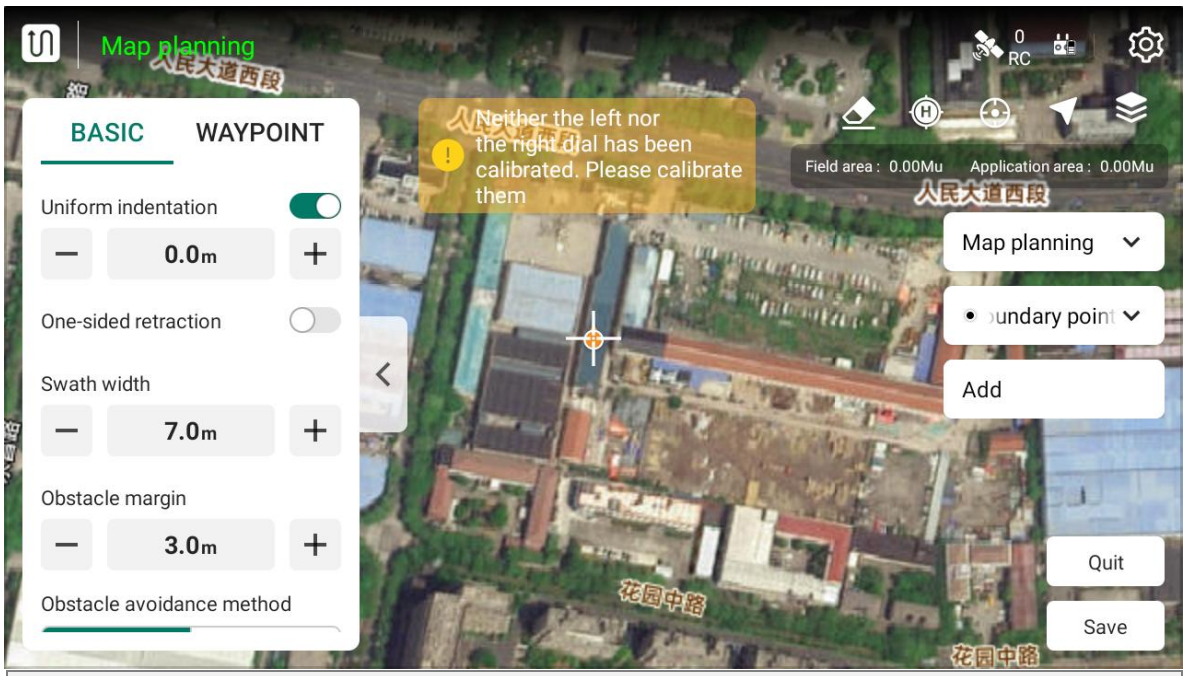
2) Drone planning

- Tap "Plan plot"On the app homepage, and select "Drone planning";
- Maneuver the remote controller to the position as desired, and then tap the "Add" button on the app to add waypoints, planning the plot boundaries and obstacles.



3) Map planning

- Enter the homepage of the app, tap "Plan plot", randomly select one of the available planning methods, enter into the planning plot interface, and select "Map planning" Via the planning method selection button;
- Swipe the screen to adjust the reticle to the position as desired, and then tap the "Add" button on the app to add waypoints, planning the plot boundaries and obstacles.



⚠Warning

Map planning requires that there are no obstructions within the plot and that the plot boundaries are clearly visible.

If map planning is adopted, waypoints for the plots can be precisely adjusted using the drone or remote controller before commencing operations.

4) Remote controller planning

- The planning method is the same as the RTK planning method, please refer to the RTK planning method.

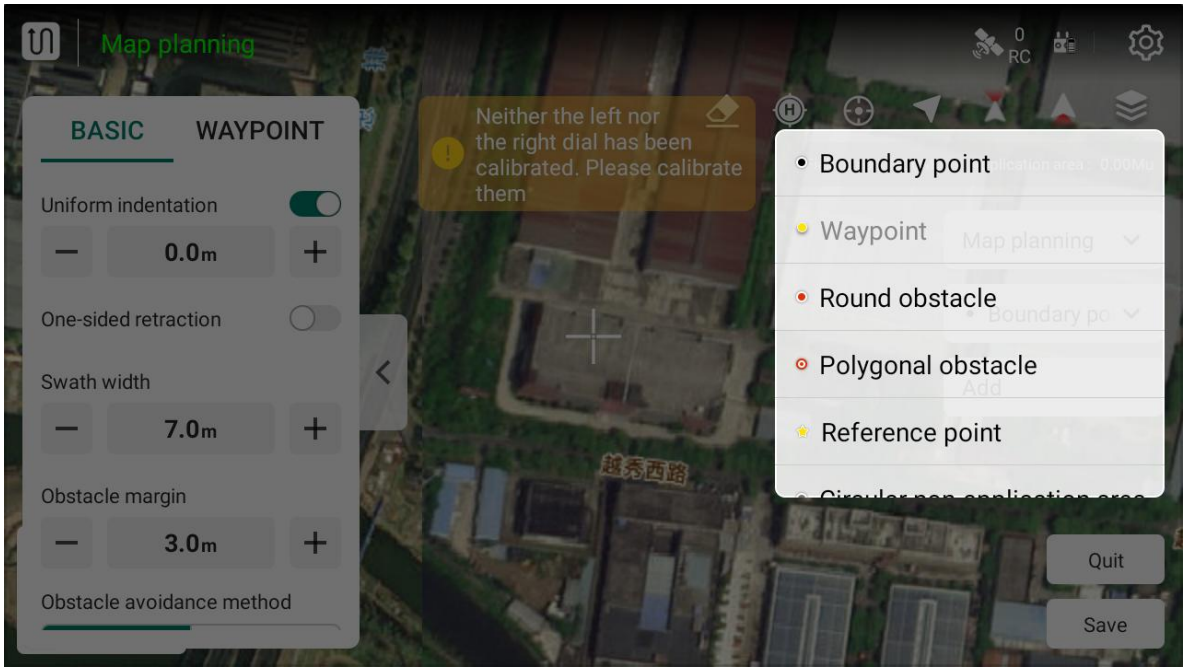
⚠Warning

The accuracy of remote controller planning is lower than that of RTK planning.

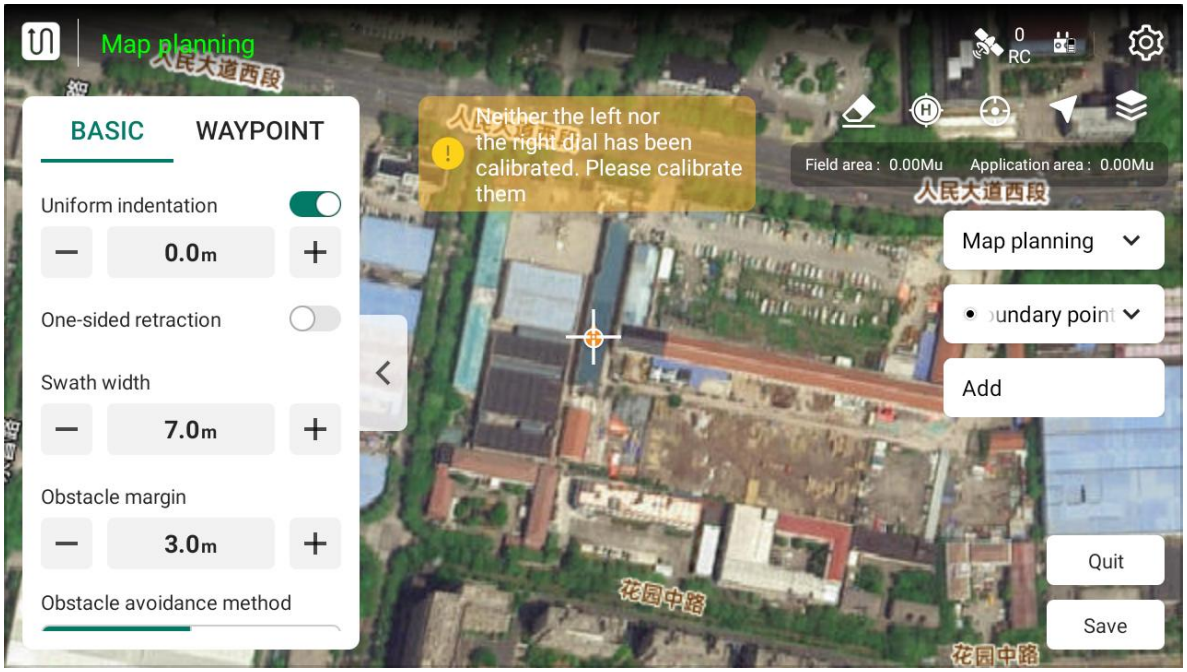
For your safety, always ensure that the drone is powered off when using the remote controller planning function.

6.6.2. Waypoints types

- Drone app provides 8 types of waypoints, which are: Boundary points, circular obstacles, polygonal obstacles, reference points, circular no-fly zones, polygonal no-fly zones, auxiliary lines, and markers.



- **Boundary points:** A polygonal set of points that define the plot boundary
- **Circular obstacle:** Add a circular obstacle with an adjustable radius to the operation plot



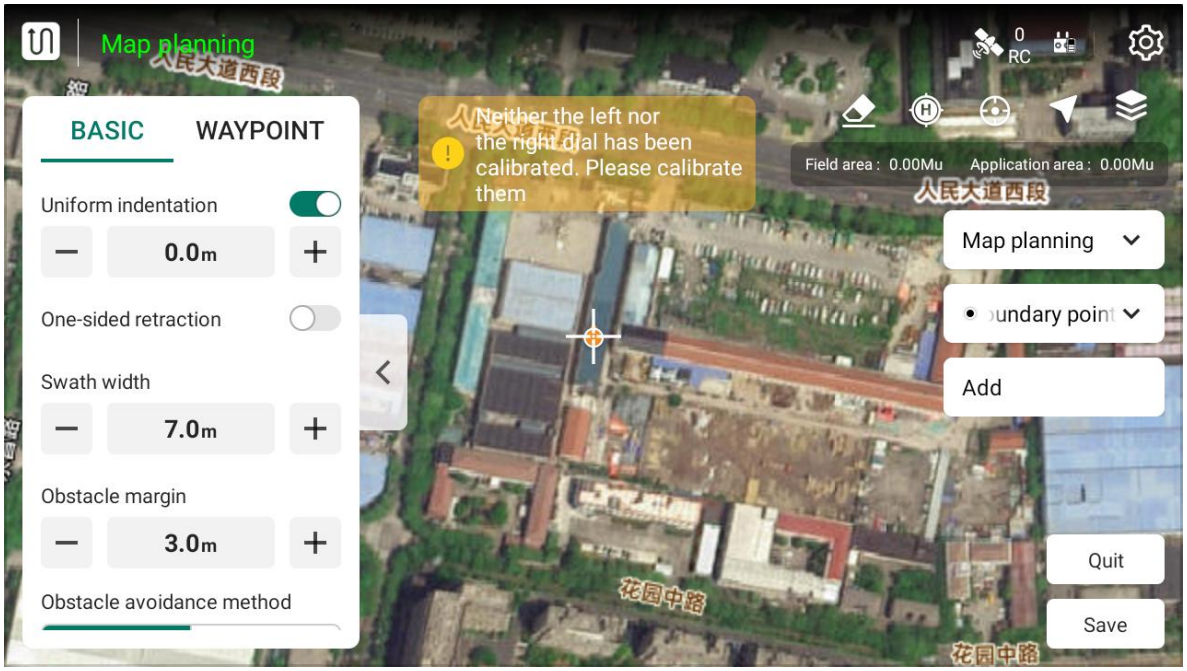
- **Polygonal obstacle:** Add multiple obstacle points, and draw a polygonal obstacle in the order of the obstacle points.
- **Reference point:** For route correction, it is recommended to choose a fixed marker as the reference point.
- **Circular no-fly zone:** Add a circular no-fly zone with adjustable radius in the plot.
- **Polygonal no-fly zone:** Add multiple no-fly points in the plot, and draw a polygonal no-fly zone according to the order of no-fly points.
- **Auxiliary line:** Add two auxiliary points outside the plot to form an auxiliary line.

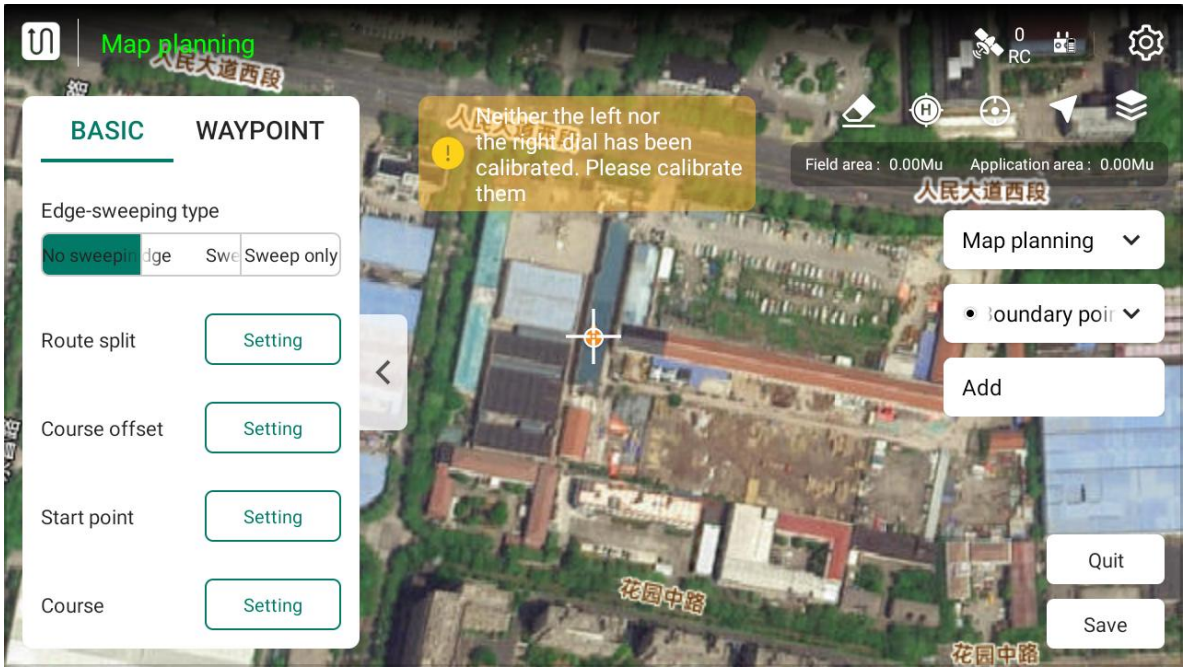
- **Marker:** Mark the points in the plot that need to be marked.

6.6.3. Editing plot

1) Editing waypoint route

- Adjust indent: By default, a consistent indent is applied, ranging from a minimum of 0 to a maximum of 10 m, with a standard setting of 2 m. You can tap to select the desired edge line of the plot, and adjust the one-side indent.
- Operation line spacing: The default spacing is set at 7 m, with options ranging from 1.5 m to 40 m.
- Obstacle margin: By default, the margin is set to 3 m, with options ranging from 0 m to 6 m.





- Route Splitting:This function allows you to split off sections of the route that do not

currently require operation, retaining only the segments needed for the task.



- Route Offset:Corrects deviations in the field boundaries.



- Set Starting Point:Select a reasonable entry position into the route based on the takeoff/landing point location to begin the operation.



- Heading:Supports fine-tuning via sliding adjustment, with each click adjusting by 1 degree.
- Quick Route Direction Adjustment: Click the boundary line of the target field to align the route parallel to that line.



⚠Warning

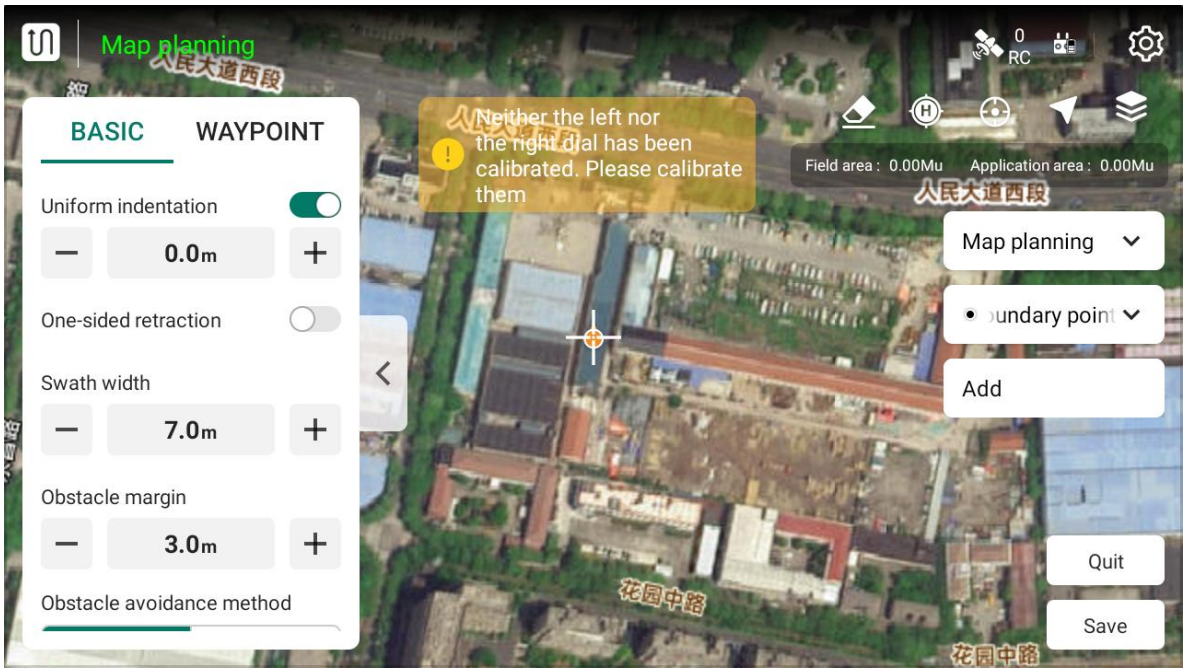
Route splitting is performed based on the percentage of routes, not the percentage of field area.

2) Editing waypoints

- Editing boundary points： Drag boundary points to move them, or fine-tune their

positions using the adjustment buttons. After moving a point, the route is intelligently and automatically re- planned in real- time..

- Delete boundary points: Delete unwanted boundary points, after deletion, the route will be automatically re-planned in real-time.
- Add boundary point: Upon adding a new boundary point, the route will promptly undergo an intelligent re-planning process.



3) Editing obstacles

- Add obstacles: Reference can be made to planning circular obstacles and non-circular obstacles respectively
- Delete obstacle points: Select an obstacle point and tap "Delete"To delete the obstacle point.
- Delete circular obstacles: Tap to select a circular obstacle, and tap "Delete" to delete the circular obstacle.
- Move obstacle points: Tap to select an obstacle point, drag or fine-tune the button to move the obstacle point to the target position.
- After the obstacle is edited, the route will be intelligently re-planned in real-time.

4) Editing reference point

- Add reference point: Select a relatively fixed and iconic point as reference point to facilitate subsequent route corrections, ensuring greater convenience and precision.
- Delete reference point: Tap the reference point and tap "Delete"To delete the reference point.

5) Undo operation

- If you want to withdraw the operation of adding, deleting or moving, tap the "Undo"

button to complete the undo operation.

6.7. Prescription Map Import Instructions

6.7.1. Overview

This instruction describes how to import a local prescription map file into the remote controller through a coordinated approach using the "remote controller + web browser". Once the import is complete, the file can be accessed in the Prescription Chart list under Assignment Resources.

General principle: The remote controller starts a local upload service (IP address + port). An external device accesses this address via a browser, uploads the local prescription map ZIP file to the remote controller, and then the import is confirmed on the remote controller side.

6.7.2. Prerequisites

(1) The remote controller is powered on and has entered the main operation interface.

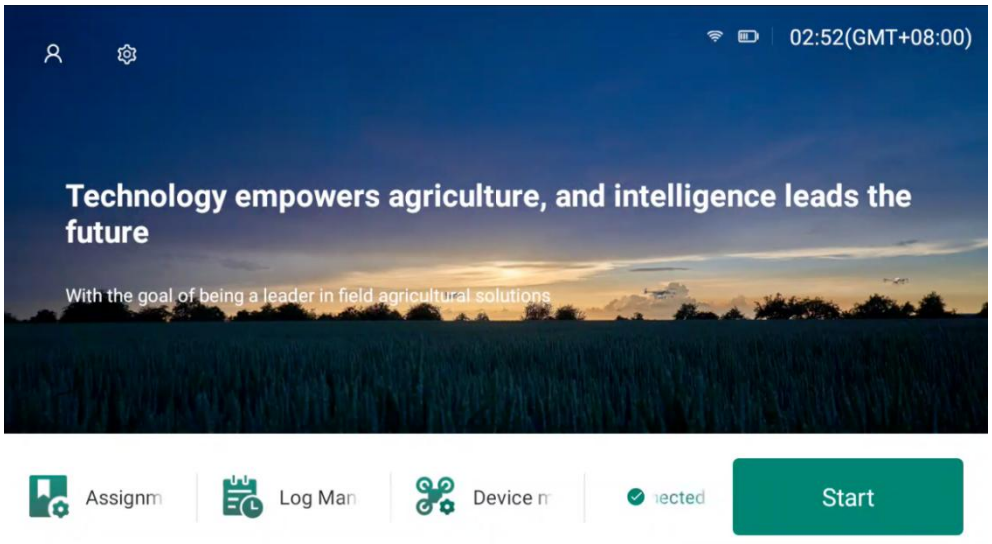
(2) The source prescription map file is ready, in ZIP format.

(3) An external device (computer) is on the same Wi-Fi network segment as the remote controller (i.e., both are connected to the same Wi-Fi).

6.7.3. Operation Procedure

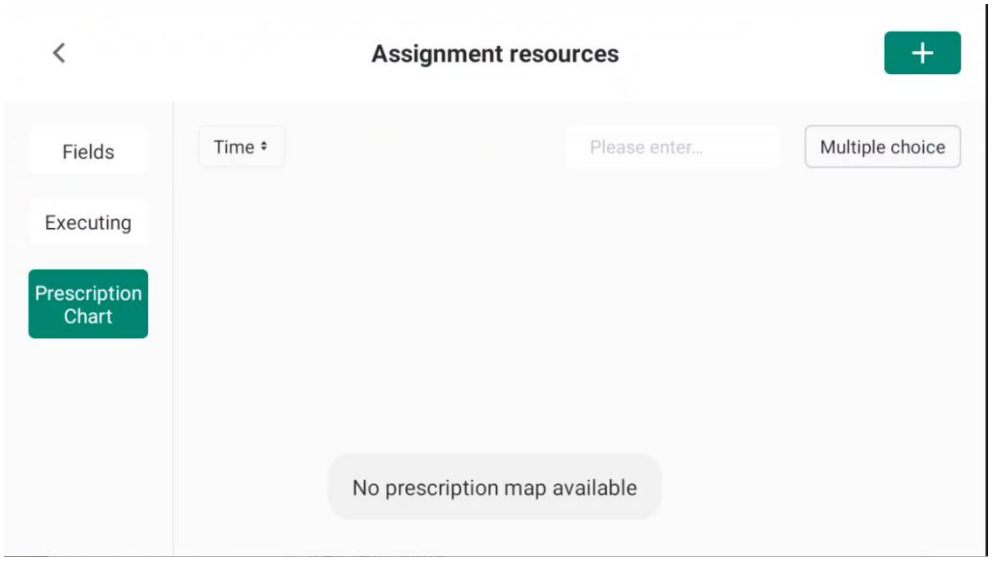
6.7.3.1. Remote Controller Side: Enter the Prescription Map Interface

Step 1: On the remote controller main interface, tap the Assignment resources entry in the lower-right corner.



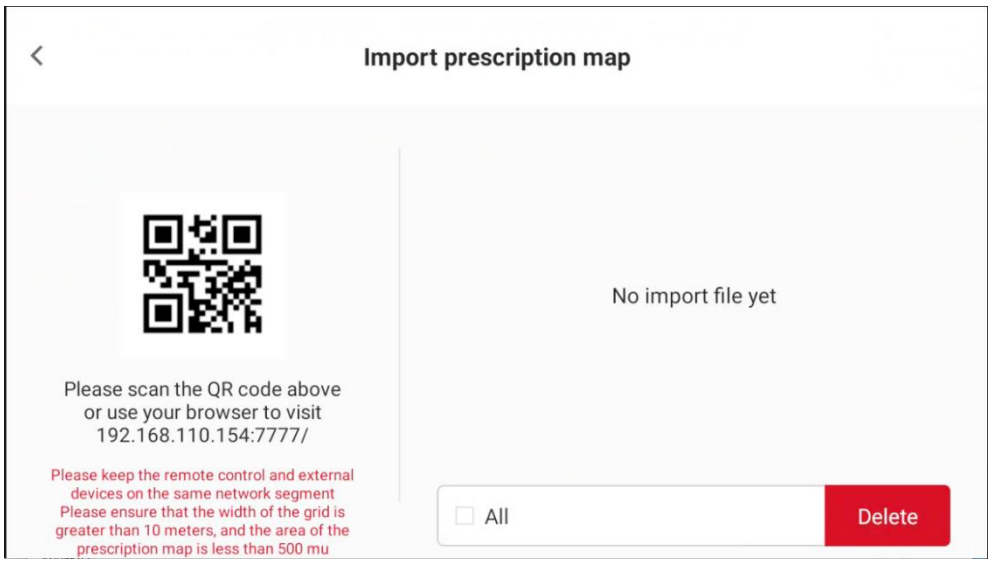
Remote Controller Main Interface

Step 2: After entering the Assignment resources page, select the Prescription Chart tab from the left panel. When used for the first time, the list is empty and the prompt "No prescription map available" is displayed.



Prescription Chart Tab

Step 3: Tap the "+" button in the upper-right corner to enter the Import prescription map interface. The left side of the screen will display a QR code and an upload address (example: 192.168.110.154:7777/), while the right side shows "No import file yet".



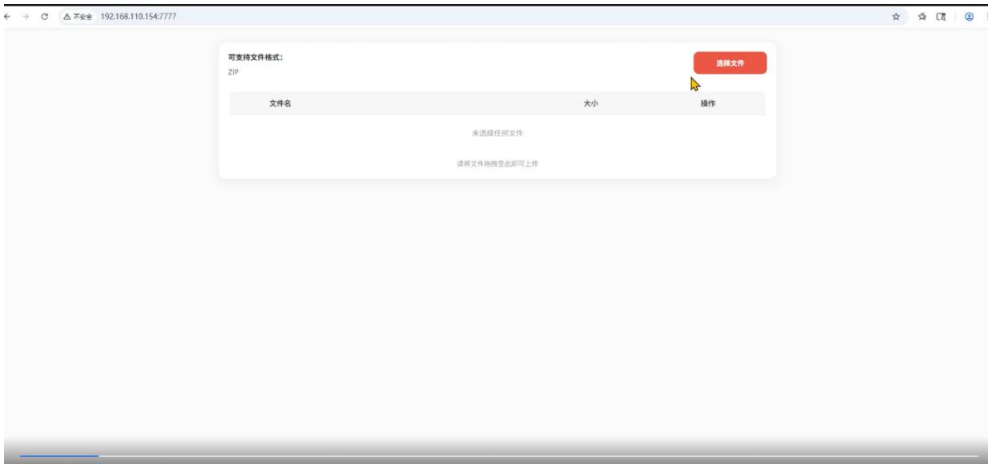
Import Prescription map Interface (QR Code and Upload Address)

Note: Ensure that the remote controller and the external device are on the same network segment (connected to the same Wi-Fi).

6.7.3.2. Web Side: Upload Prescription Chart

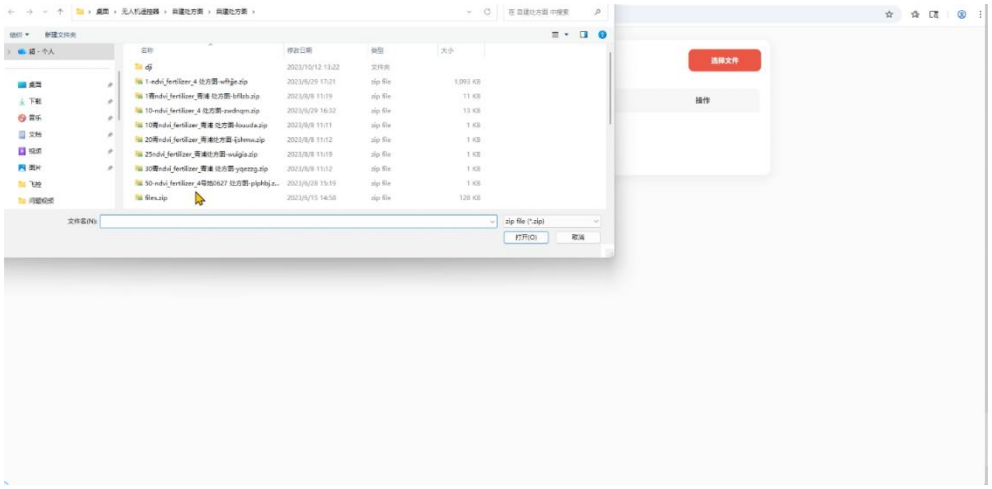
Step 4: In the computer browser, enter the address displayed on the remote controller interface (e.g., 192.168.110.154:7777/), or directly scan the QR code on the interface to

open the upload page. The page will show the message "Supported file format: ZIP". Click the "Select File" button.



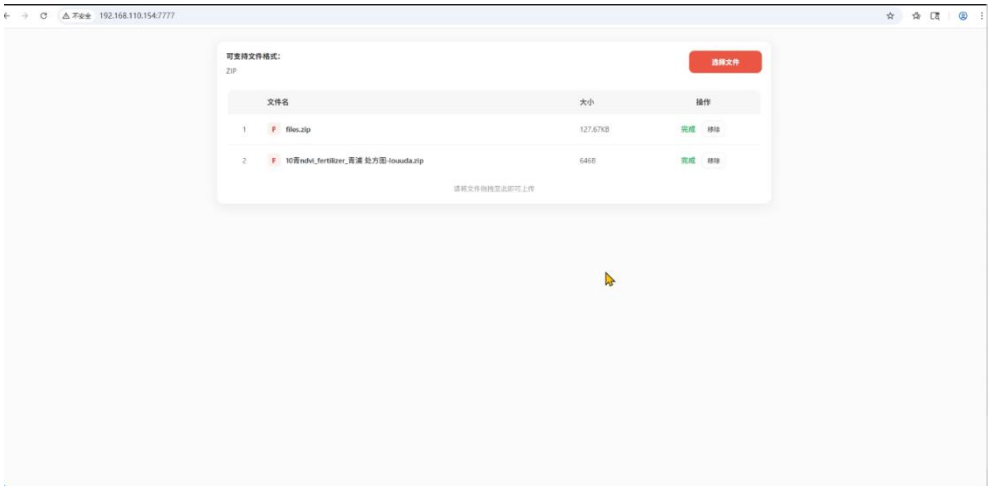
Web Upload Page

Step 5: In the file selection dialog that appears, navigate to the local folder where the prescription map is stored (example: Desktop > Drone Remote Controller > Custom Prescription maps > Custom Prescription maps), select the .zip file to upload, and click "Open".



Select Local ZIP File

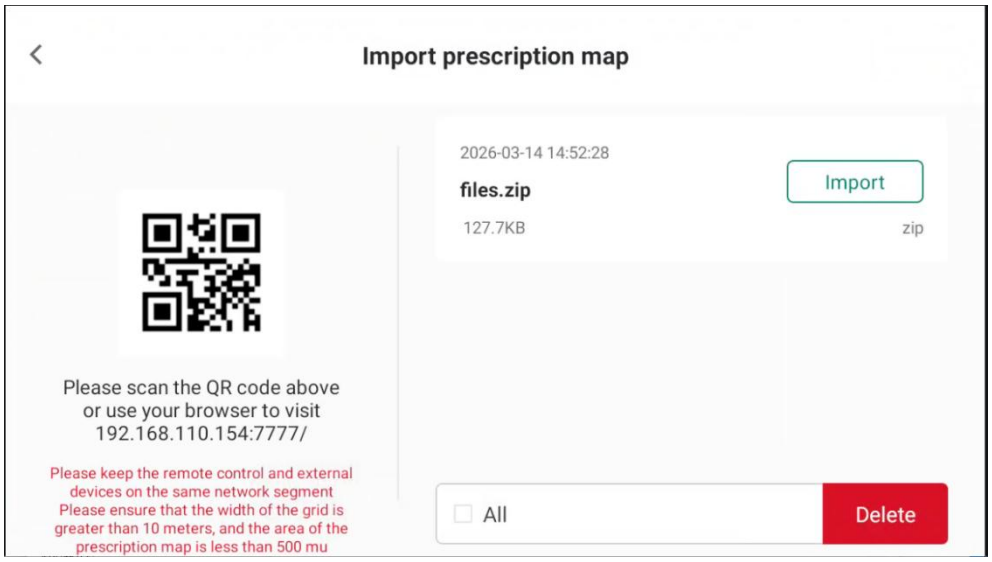
Step 6: After the file is successfully uploaded, the list on the page will display the file name, file size, and the "Completed" status for the uploaded file. You can repeat steps 4 - 5 to upload multiple prescription maps.



Web Upload Complete

6.7.3.3. Remote Controller Side: Import Prescription map

Step 7: Return to the Import prescription map interface on the remote controller. The file list on the right side will automatically display the uploaded prescription map files (including file names and sizes). After selecting the desired file, tap the Import button in the lower-right corner.



Remote Controller Interface with Uploaded Files and Import Button

Step 8: After the import is completed, the system automatically returns to the Prescription Chart list, where you can view the imported prescription chart (including name, area, and other information). This prescription chart can be directly used in subsequent operations.



Imported Prescription Chart List

6.7.4. Notes

NO.	Notes
1	The remote controller and the external device must be connected to the same Wi-Fi; otherwise, the browser will not be able to access the remote controller address.
2	The uploaded file format must be ZIP; other formats are not recognized. (The ZIP package must include both .tfw and .tif files.)
3	The IP address in the upload link is dynamically assigned by the remote controller and may vary each time it starts. Please refer to the address shown on the remote controller interface.
4	After the import is complete, it is recommended to verify the prescription map name and area in the Prescription Chart list before proceeding with operations.

6.7.5. Troubleshooting

Symptom	Possible Cause	Suggested Action
Browser cannot open the upload address	External device and remote controller are not on the same Wi-Fi network; or the IP address is entered incorrectly	Check the Wi-Fi connection; re-enter the address as shown on the remote controller interface
No file appears on the remote controller after uploading via the web page	Network interruption or upload incomplete	Check whether the web page shows "Completed" status; re-upload the file
Abnormal area displayed in the Prescription Chart list	Incorrect coordinate or grid settings in the source file	Re-check the parameters in the software used to generate the prescription map

6.8. One-Controller-Two-Aircraft Operation Method

6.8.1. Function Definition and Application in Transport Scenarios

One-Controller-Two-Aircraft means one transport UAV is paired with two remote controllers. It is specifically designed for transport operations in mountainous areas, long-distance flights, signal-obstructed environments, and scenarios where loading and unloading points are separated.

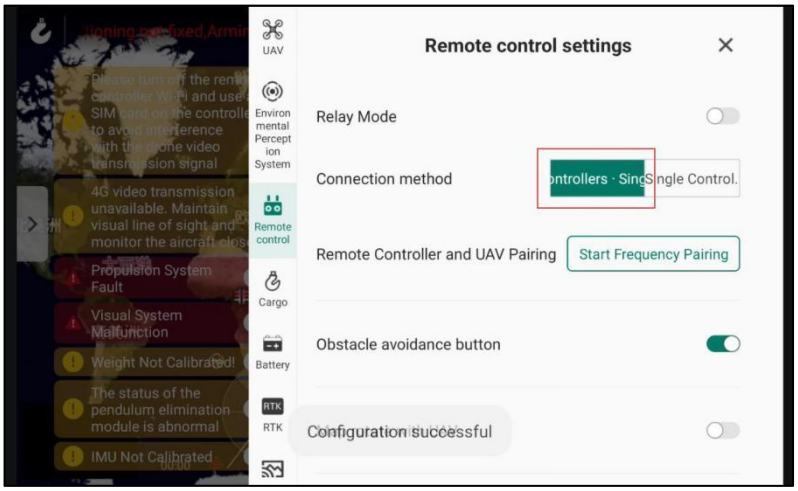
6.8.2. Dual-Controller Pairing and Binding Procedure

Pre-check device firmware: Ensure that the aircraft and both remote controllers are updated to the latest firmware versions, and disable third-party hotspot interference.

Power off the aircraft and turn off both remote controllers.

Power on the UAV and the primary remote controller, complete the pairing between the aircraft and the primary remote controller, and maintain the connection.

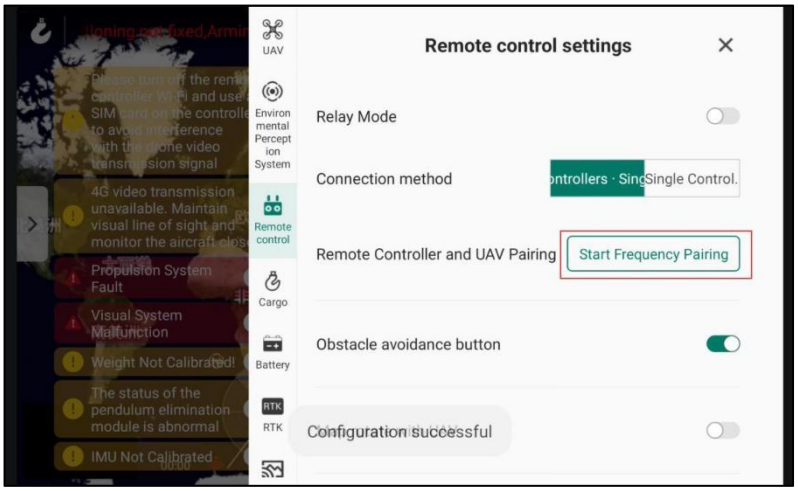
Tap sequentially: Settings > Remote Controller > Connection Mode > select One-Controller-Multi-Aircraft, and wait for the pairing to succeed.



Power on the secondary remote controller, then tap sequentially: Settings > Remote Controller > Connection Mode > select One-Controller-Multi-Aircraft and wait for the configuration to complete.

Press and hold the UAV power button for 10 seconds until the status LEDs flash, indicating that the UAV has entered pairing mode.

On the secondary remote controller, tap "Start Frequency Pairing"; the UAV serial number available for pairing will be refreshed and displayed.



After confirming that the serial number is correct, tap "Start Frequency Pairing" and wait until pairing is successful.

Both remote controllers will simultaneously connect to the UAV.

6.8.3. Control Authority Request

After the secondary remote controller enters the operation interface, tap "Request Control Authority".

Tap "Apply".

Tap Confirm and wait for the primary remote controller to authorize.

After receiving the control request, the primary remote controller can decide whether to release control authority.

If it decides to release, tap "Agree".

The secondary remote controller will prompt that it has obtained control authority over the UAV, and the secondary remote controller becomes the primary controller. Based on operational needs, they may mutually request and release control authority.

6.8.4. Usage Precautions

1. Dual-control: If the primary remote controller becomes disconnected or is powered off, the secondary remote controller will automatically become the primary controller.
2. When the secondary remote controller requests control authority, it must be connected via a normal P2P connection. In standalone 4G mode, the secondary remote controller cannot request control authority.

6.8.5. Transport Operation Procedure

6.8.5.1. Pre-operation Preparation

Complete the dual-control pairing and divide the tasks between the two pilots: the primary controller is responsible for takeoff, return-to-home, and overall safety oversight; the secondary controller is responsible for long-range route navigation and low-altitude fine -adjustment at the unloading point.

For long-distance operations in mountainous areas, the two pilots should be positioned at the takeoff/landing point and the unloading point respectively to relay control as needed.

6.8.5.2. Takeoff and Long-Distance Transport

Only the primary controller performs takeoff, climbing vertically to a safe altitude of 3 –10 meters, then hovering to confirm that the load is not swinging significantly.

Gradually accelerate toward the target area. If the primary controller signal is blocked by terrain or buildings ahead, the secondary controller will request control authority takeover.

After takeover, the secondary controller maintains a steady flight speed (≤5 m/s) throughout the journey, avoiding sudden acceleration, deceleration, or sharp turns that could amplify load swing.

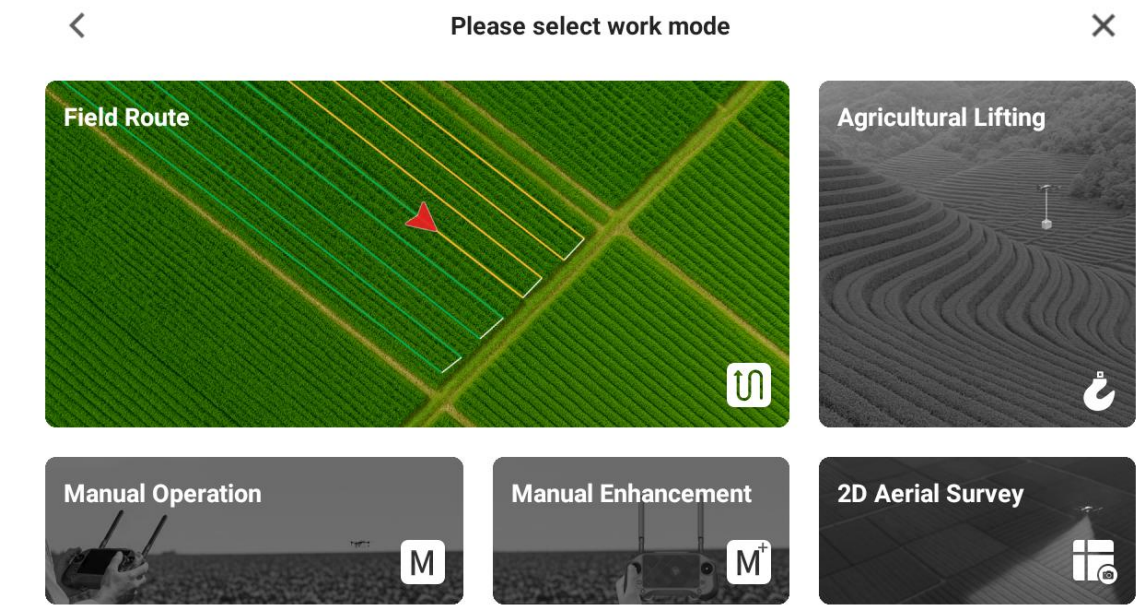
6.8.5.3. Low-Altitude Unloading Operation

Upon reaching the unloading area, the secondary controller retains control and slowly descends. The descent automatically decelerates when the load is within 1 meter of the ground.

Once the load has been stably placed on the ground, the secondary controller operates the release mechanism to detach the load.

6.9. Operation mode

The agricultural UAV is equipped with multiple operation modes, including Field Route Mode, Agricultural Transport Mode, Manual Operation Mode, and Enhanced Manual Operation Mode. 2D Aerial Survey (to be developed) can be switched through the UAV App.

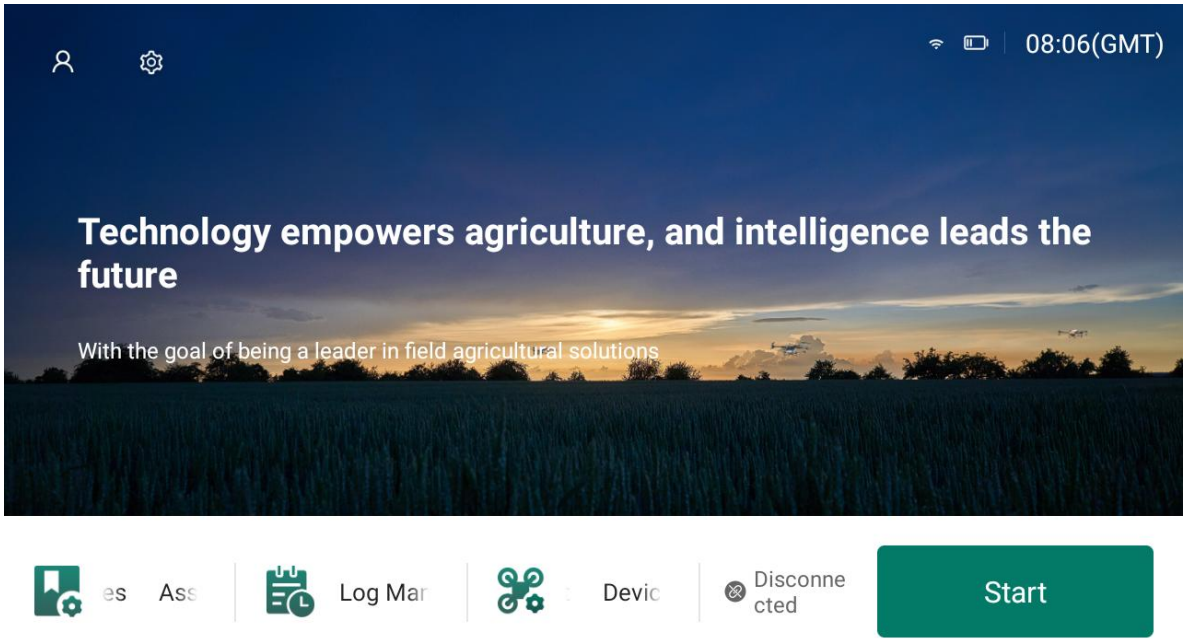


6.9.1. Field Route Mode

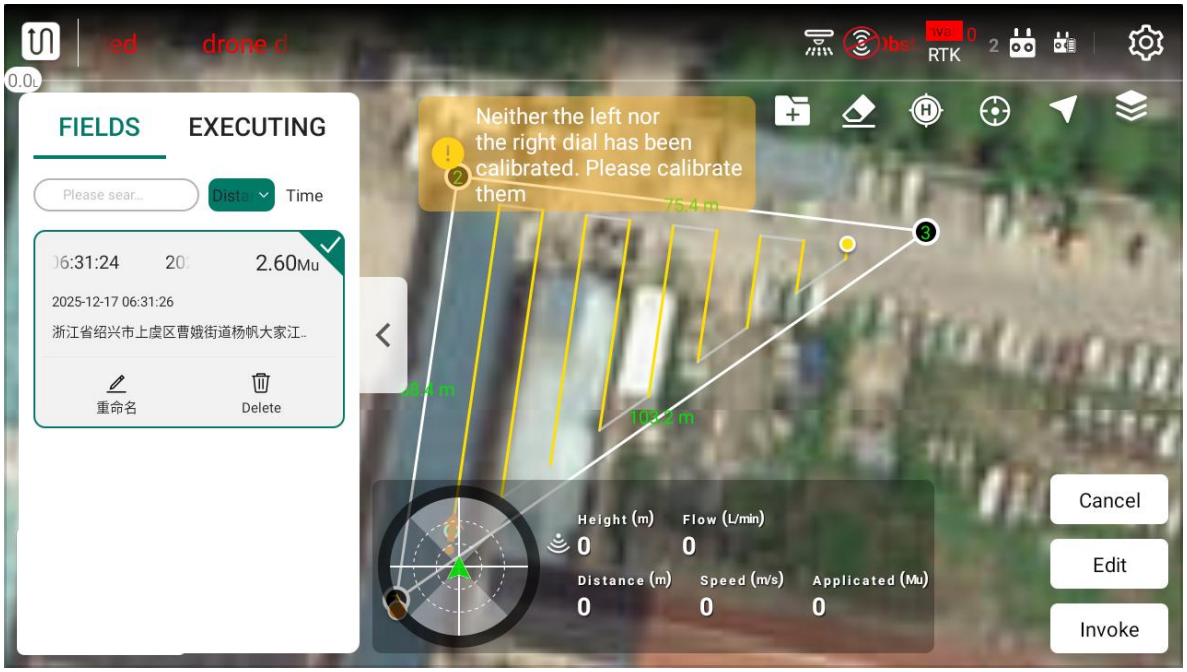
- Field Route Operation Types: Field Plot, AB Points, Free Route

a. Field Plot

- On the UAV App homepage, tap "Start Mission" to enter the mission homepage



- Select Target Field



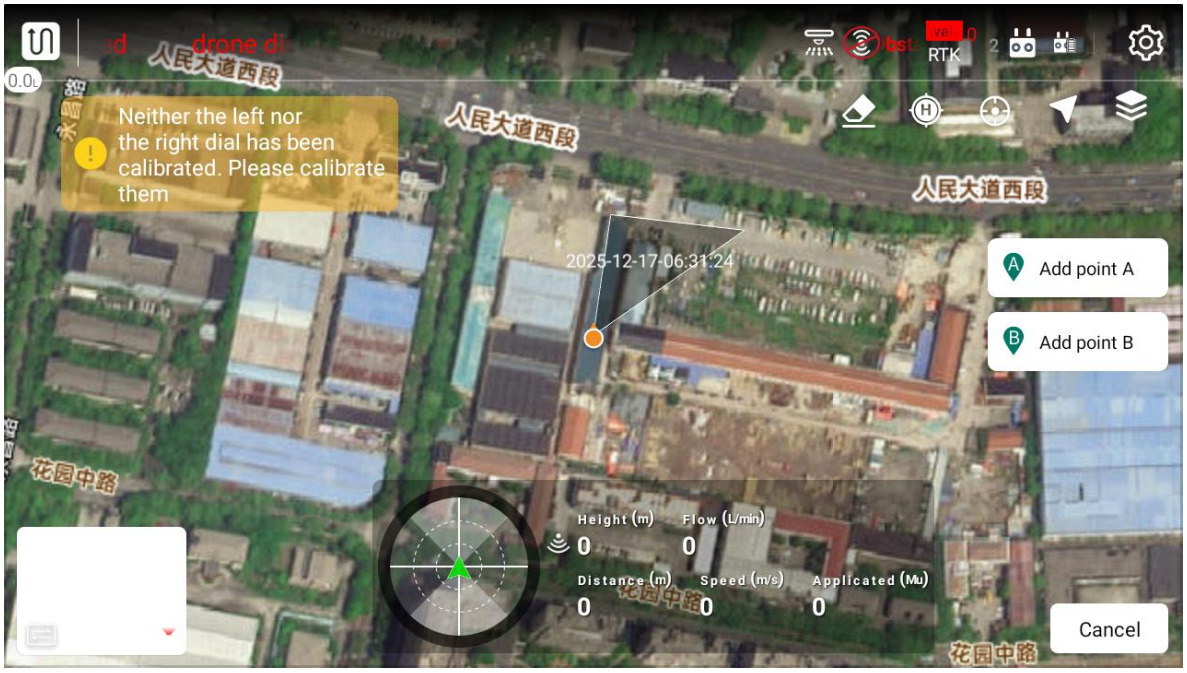
- Configure the mission parameters as needed.
- Once the parameters are set, click "Upload". After the remote controller and UAV synchronize the data, click "Execute".
- On the Mission Pre-check Confirmation screen, after reviewing the information, slide the slider to the right to start the route mission.

b. AB Points

Users can perform AB surveying through the UAV App's intelligent planning system. When setting points A and B, adjust their directions to be parallel to the field boundary respectively, then set the number of routes to cover the field. The App will calculate and generate the optimal route based on the data, enabling intelligent mission planning. After

planning is completed, start the mission and the UAV will enter AB operation mode, automatically executing the mission according to the intelligently planned route.

- On the UAV App homepage, tap "Start Mission" to enter the mission homepage.
- Select the AB Points operation type and tap the Add button.
- Configure the mission parameters.
- Add Point A
- Add Point B



- After selecting, tap "Upload". Once the remote controller and UAV have synchronized the data, tap "Execute". Confirm the details on the Mission Pre-check Confirmation screen to proceed with the AB Point mission.

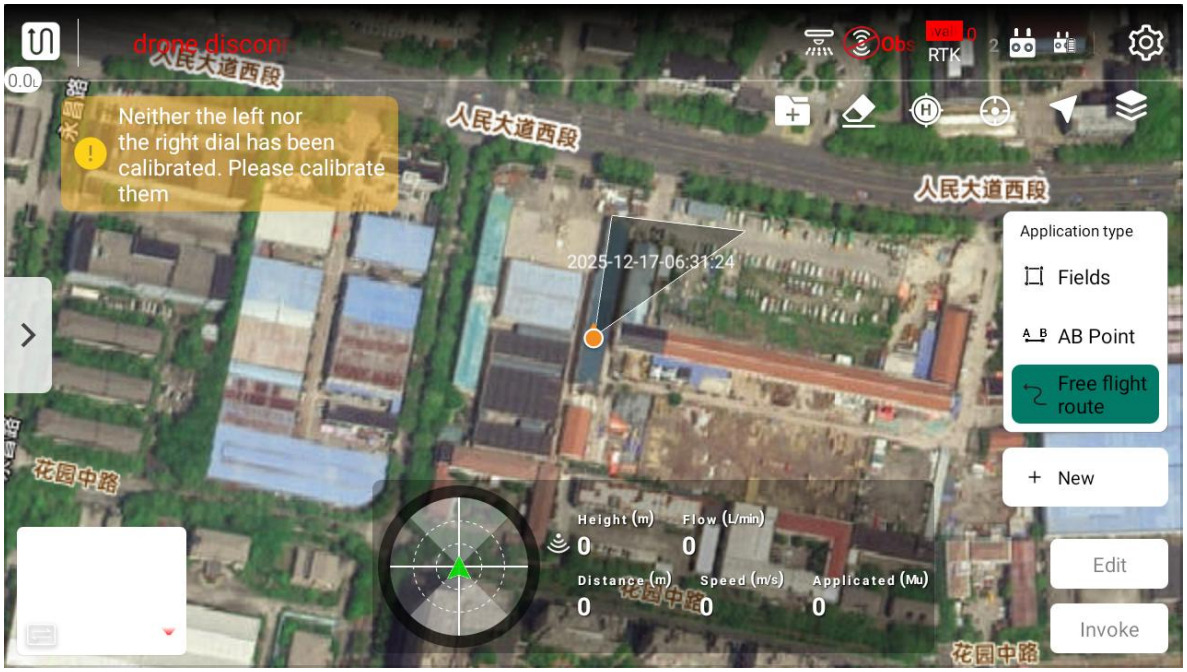
> **⚠Warning**
>
> The AB Point operation mode does not support obstacle planning within the field. For fields containing obstacles, it is recommended to use the Field Plot mode, where the field is planned first before being selected for mission execution.

c. Free Route

Based on crop distribution, field shape, and operational needs, users can manually define flight paths by placing waypoints on the remote controller's map. This allows flexible planning of non- fixed- pattern routes, such as polygonal lines, tailored to specific conditions.

- On the UAV App homepage, tap "Start Mission" to enter the mission homepage.
- Select the Free Route operation type and tap the Add button.

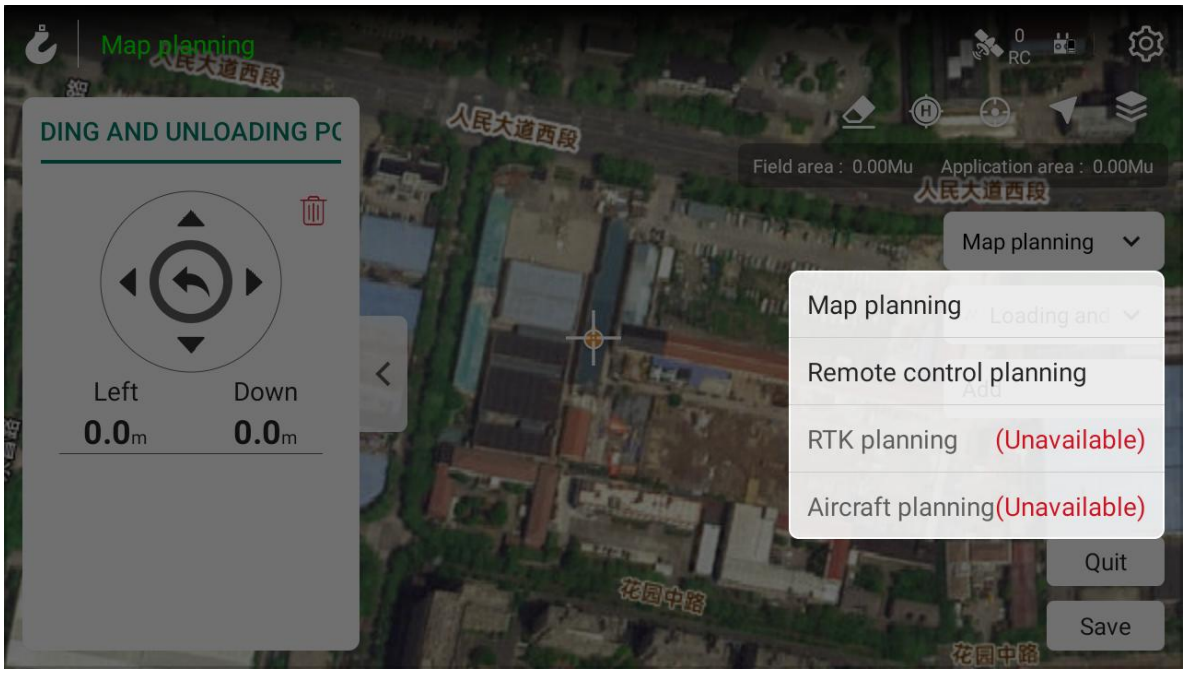
- Set the Operation Spacing.
- Define waypoints according to the terrain, then tap Save.



- Select the corresponding field and tap "Select".
- Tap "Upload". Once the remote controller and UAV have synchronized the data, tap "Execute". Confirm the details on the Mission Pre-check Confirmation screen to proceed with the AB Point mission.

6.9.2. Transport Operation Mode

Depending on operational requirements, the appropriate waypoint planning method can be selected from: UAV Planning, RTK Planning, Remote Controller Planning, or Map Planning.



- Based on the chosen planning method, add the two loading/unloading point locations.
- After saving, the field name can be edited for easier identification and retrieval.
- In the upper-right corner, based on the UAV's current position, select whether the UAV should fly to Waypoint 1, Waypoint 2, or Waypoint 3.
- After selection, tap "Upload".
- Upon successful upload, proceed to the mission pre-check confirmation. Slide the slider to the right, and the UAV will begin executing the mission according to the parameters set in UAV Settings and Transport Settings.

6.9.3. Manual Operation Mode

For small fields or fields with numerous obstacles and highly complex terrain, the Manual Operation Mode can be used. In this mode, the UAV's flight path is entirely controlled by manual joystick operation on the remote controller, and the spray switch must be manually activated. It is not recommended to fly the UAV beyond visual line of sight (BVLOS) in this mode, as doing so may pose flight safety risks.



> **⚠Warning**
>
> In manual operation, mission data (such as operation area) is only recorded after the "Start" button is tapped.

6.9.4. Enhanced Manual Operation Mode

For medium to large fields that are free of obstacles and relatively regular in shape, the Enhanced Manual Operation Mode can also be employed. Fly the UAV to the intended starting point of the route and align the aircraft nose with the desired flight direction. After setting parameters such as spray volume, flight speed, operation spacing, and relative crop

height, tap "Start". Then, push the joystick in the forward direction to begin. At the end of the row, tap "Left Lateral Move" or "Right Lateral Move" as needed to perform a roll-turn maneuver, then control the UAV back to the starting side. Repeat the above steps to complete the operation.



6.10. Automatic return

1) Return point

- The departure point is the default return point

2) Return without carrying agrochemical

- V180 agricultural drone supports behavior setting after the agrochemical is exhausted, either to hover or return; if you choose to return, the drone will automatically fly back to the return point after the agrochemical is exhausted. During the returning process, you can take over control of the drone by maneuvering any joystick.

3) Return with low battery

- V180 agricultural drone supports low battery behavior setting, either to hover or return; if you choose to return, the drone will automatically fly back to the return point once a low battery warning is triggered. During the returning process, you can take over control of the drone by maneuvering any joystick.

4) Return in the event of communication loss

- V180 agricultural drone supports behavior setting in case of lost communication, either to hover or return; if you choose to return, the drone will automatically fly back to the return point when it detects that it has lost connection with the remote controller for more than 5 s, and if the communication is restored during returning, you can take over the control of the drone by maneuvering any joystick.
- Note: If the automatic return is triggered in the autonomous operation mode, the drone is capable of avoiding the planned obstacles within the plot.

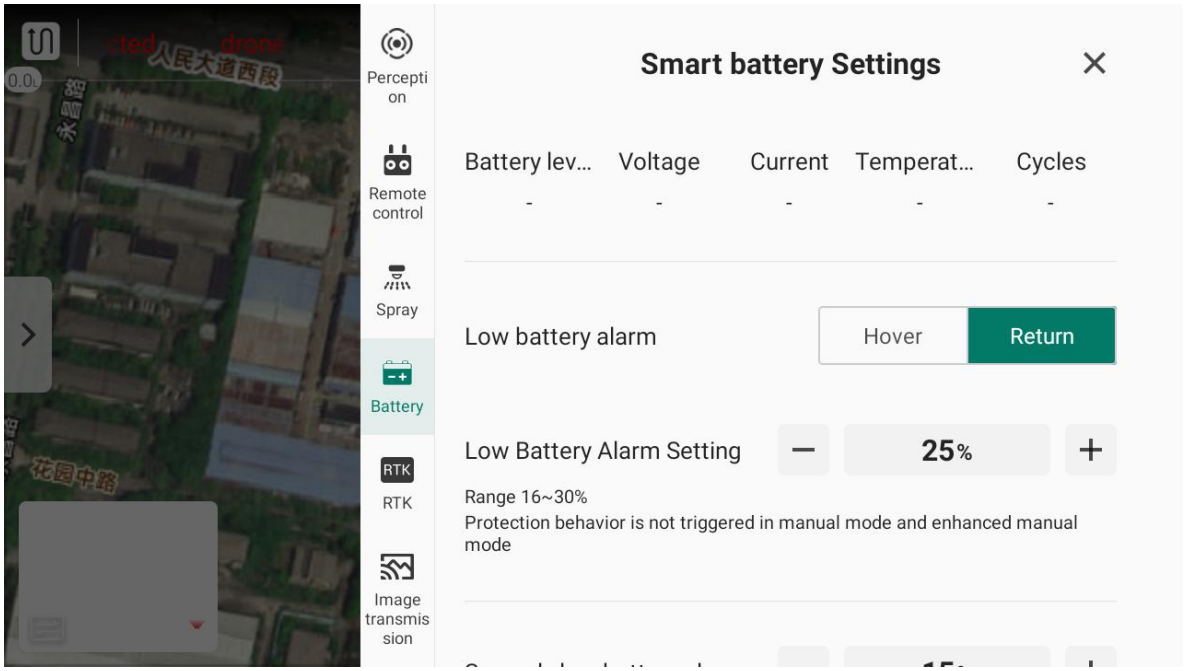
5) One-tap return

- One-tap return can be triggered by long-pressing the return button on the remote controller for 2-3 s; once triggered, the drone app will prompt first before the drone returns automatically, and you can take over the control of the drone by maneuvering any joystick.

6.11. Low battery and battery drain protection

- The V180 drone is equipped with low battery alarm, battery drain alarm and low

voltage alarm.



- If the app triggers a low battery alarm, you should fly the drone to a safe area and land as soon as possible, then replace the battery. If the low battery behavior is set to return, the drone will prompt to return automatically once the app triggers a low battery alarm.subsequently, it will proceed to return to its take-off point autonomously. If the low battery behavior is set to hover, the drone will hover and await further instructions from the operator upon the app displaying a low battery alarm.

> **⚠Warning**
>
> Pilots can set the remaining battery percentage in the UAV App; it is recommended to set it at a relatively conservative level to ensure flight safety.

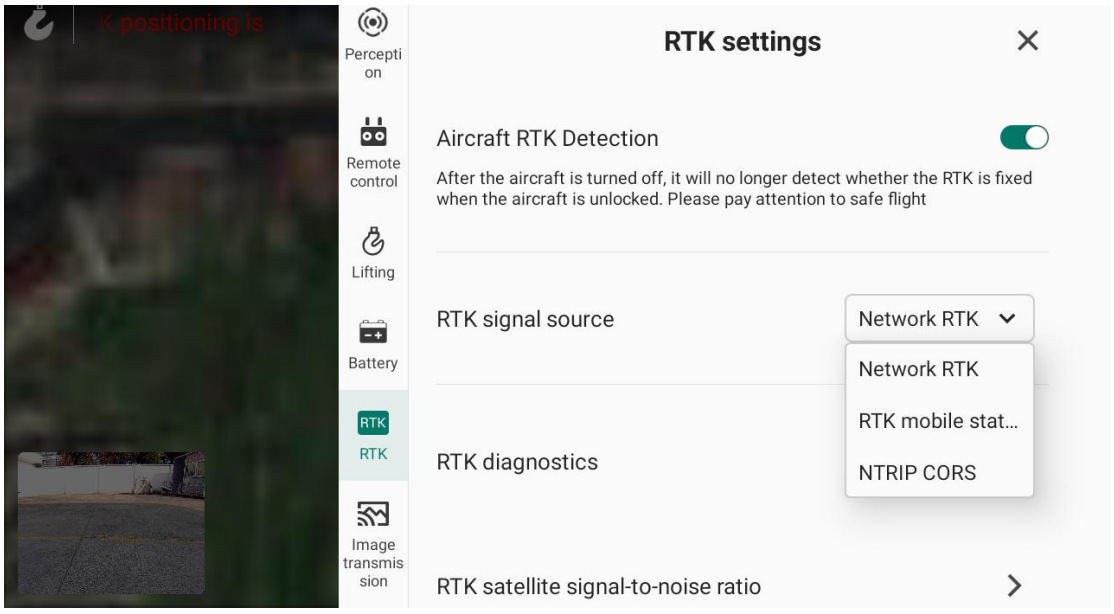
- In the event of a critical low battery or a significant low voltage alarm, the drone will autonomously execute an emergency landing procedure, during which the operator is unable to intervene in the landing sequence.

> **⚠Warning**
>
> Operators can set the battery percentage threshold that activates the alarm in the drone app, and it is recommended to set it conservatively to ensure flight

safety.

6.12. RTK function

- V180 agricultural drone is equipped with a high-precision RTK module, the dual-antenna direction-finding technology outperforms the traditional magnetometer module in terms of accuracy and robustness against electromagnetic interference. It ensures reliable flight operations even in environments with significant magnetic disturbances, such as near high-voltage lines and metal structures. Dual-antenna direction finding is automatically activated when the GNSS signals are available.
- V180 agricultural drone leverages network RTK, RTK base stations, and ntrip CORS services to achieve centimeter-level positioning precision, thereby enhancing the accuracy of agricultural spray applications for plant protection purposes. The instructions are as follows:



1) Network RTK

- Enter settings page on the right edge of drone app homepage, locate and tap the RTK settings button, and then select "Network RTK" as the RTK signal source.
- Once the connection with the network RTK server is successfully established, the RTK status icon positioned at the top of the operation interface will illuminate, indicating that the network RTK data has been successfully retrieved

and is now in use.

2) **RTK mobile station**

- Refer to the HD201 user manual to complete the frequency pairing between the drone and the base station and the setup of the base station.

3) **NTRIP CORS**

- To use CORS base station, you need to configure the IP address, port number, mount point, user name and password to retrieve CORS base station information. At this point, the remote controller needs to be connected to the network or equipped with a SIM card.
- RTK on/off
- Before initializing RTK positioning, confirm that the drone's RTK function is on and the RTK signal reception method (either RTK mobile station or network RTK service) is properly set. Otherwise, RTK positioning will not be available.

> ⚠**Warning**
>
> The drone will not be able to take off when the drone is using RTK but RTK positioning is not available.

6.13. Radar settings

1) **Terrain-following radar**

- When turned on, the drone can automatically adjust the flying height relative to crops; when the terrain following radar is turned off, the flying height relative to crops will be fixed according to the height of the take-off point.

2) **Terrain-following sensitivity**

- The more sensitive it is, the stronger the feedback will be for small ups and downs, but it is not recommended to turn on the sensitivity too much for flat land.

3) **Obstacle avoidance**

- Regardless of whether the obstacle avoidance switch is activated, the app will

display any obstacles detected by the radar. The drone will automatically avoid obstacles when the switch is turned on, but not when it is turned off.

4) **Autonomous obstacle avoidance**

- Only available in autonomous operation and ab operation mode, during autonomous obstacle avoidance, this feature can be exited by manually maneuvering the joysticks.

5) **Obstacle avoidance radar tone**

- Upon encountering obstacles at varying distances, the remote controller will alert the user with distinct auditory signals corresponding to the proximity of the obstacles.

6) **Rear radar**

- The rear radar affords obstacle detection capability while the drone is flying backwards.

7) **Obstacle avoidance radar sensitivity**

- The more sensitive the obstacle avoidance radar, the higher the probability of misjudgment.

8) **Radar detection distance**

- 20-90 m

9) **Radar alarm distance**

- When the drone encounters obstacles on its front, back, left, and right sides, it will display the distance from the obstacles within the specified alarm range, alerting the user through a color-coded system that corresponds to the proximity of the obstacles.

10) **Fade out time**

- The radar dome is rendered semi-transparent when no obstacles are detected for a duration exceeding the predefined time limit, facilitating clear visibility of other operational information.

11) **Radar dome display size**

- The radar dome size on drone app operation page can be adjusted.

⚠Warning

You can turn off the obstacle avoidance radar function when false positives are frequent and no actual obstacles are confirmed to be present; however, it is advisable to keep it active under normal circumstances.

The radar system has a detection blind spot, please fly with caution.

If the obstacle is outside the detection range, the drone cannot sense the obstacle. Accordingly, cautious flight is recommended.

Detection distances of radar module may vary for obstacles of differing sizes and materials.beyond the effective detection range, the obstacle sensing function may be compromised or fail.

If the bottom of the drone is nearly level with the top of an obstacle or higher, and the obstacle is close to the drone, the drone may fail to detect the obstacle. Therefore, cautious flight is recommended.

To ensure operational safety, it is recommended that objects such as power lines and diagonal wires be manually designated as obstacles during plot planning.

Obstacle detection may not work for small obstacles, diagonal wires, and objects that are flush with the drone's tripod, so please fly with caution.manual control of the drone is required when necessary to prevent flight accidents.

Please maintain control over the drone throughout the flight, and do not rely solely on the information provided by the radar module and the app. Please make sure you have a full view of the surrounding airspace, make rational judgments regarding flight conditions based on visual observation, to avoid obstacles in time.

6.14. Returning to break point

- With this function on, the drone app will calculate the optimal route based on the break point location and drone position, etc. to reduce the distance the drone

will fly with full load. Before starting operation, you can switch on this function, and you can also turn on/off the function in the drone settings-advanced settings interface after the drone has landed.

7. Maintenance

7.1. Maintenance Agreement

7.1.1. Basis and Purpose

Regular maintenance of the transport UAV is essential to ensure the machine remains in good technical condition, reduces failures, guarantees operational safety, and extends its service life.

7.1.2. Maintenance Levels

Maintenance is divided into: Daily Maintenance and Periodic Maintenance.

7.1.3. Daily Maintenance

Users and pilots shall perform routine checks on components before and after each flight, clean the exterior of the machine, and keep it tidy to extend its service life.

7.1.4. Periodic Maintenance

① In addition to daily maintenance, this includes operations focused on cleaning, tightening, and inspecting/replacing critical safety components.

② Maintenance Interval: Every three months, or after 400 flight cycles, or after transporting 200 tons of cargo (whichever comes first).

③ Users may choose from the maintenance plans (minor/major service) recommended by our company to ensure the UAV remains in optimal operating condition and to extend the equipment's service life.

7.2. Daily Maintenance

Maintenance Interval	System	Component	Daily Maintenance Item
Before Daily Operation	Power System	Propellers Blade Clamps	Inspect propellers/blade clamps for damage; check for gaps in propeller washers and loose screws.
		Motor	Check for gaps between motor base and adapter, and excessive play.
		ESC	Inspect ESC surface for damage; check for loose screws.
	Frame Module	Frame Arms	Check frame/arm screws for looseness or damage.
		Arm Latches	Inspect arm latches for integrity; check for deflection gaps or excessive play during folding.
	Transport System	Lifting Rope	Check for breakage, detachment, or severe wear.
		Lifting Hook	Inspect for deformation, wear, or cracks.
		Transport Anti- sway Assembly	Inspect sensor appearance; check connecting cables for looseness or damage.
	Radar System	Radar Module	Check radar surface for contamination.
	Battery	Lithium Battery	Verify lithium battery charge level is sufficient.
	Avionics System	RTK Antenna	Inspect antenna for damage.
		Video Transmission Antenna	Inspect antenna for damage.
		Avionics Module	Check avionics equipment surface for contamination.
		Power Distribution Board Assembly	Inspect PDB interfaces for wear; check limit posts and battery latches for damage.
	Remote Controller	Remote Controller	Verify remote controller battery level is sufficient.

	Charger	Charger	Check all charger functions; inspect charger port for wear.
After Daily Operation	Routine Cleaning	Transport Device Cleaning	Clean the transport device after operation.
		Airframe Cleaning	Clean the airframe surface after operation.

7.3. Periodic Maintenance

After daily maintenance of the V180 agricultural drone, regular maintenance must be performed based on the maintenance interval / operating hours, whichever comes first.

The specific maintenance items and intervals are detailed in the table below.

"★" indicates items such as inspection, tightening, cleaning, etc.

"■" indicates replacement items.

Module	Maintenance Item		Periodic Maintenance				
		Maintenance Time (×1 week)	**1**	**4**	**12**	**48**	**96**
		Operating Time (×1 hour)	**20**	**50**	**100**	**300**	**500**
Wear Parts	**Replacement & Inspection**	**Propeller**	★	★	★	■	■
		Propeller Clamp/Adapter	★	★	★	■	■
		Washer	★	★	■	■	■
Frame	**Main Frame**	Inspect front frame for cracks, damage, or structural looseness	★	★	★	■	■
		Inspect left/right frame for cracks, damage, or structural looseness	★	★	★	■	■
		Inspect rear frame for cracks, damage, or structural looseness	★	★	★	■	■
		Check frame mounting screws for looseness or breakage	★	★	★	■	■
	Joints	Inspect inner/outer joints for cracks, damage, or structural looseness	★	★	★	■	■
		Inspect carbon tubes for cracks, damage, or structural looseness	★	★	★	■	■
		Inspect joint pivot shafts for cracks,	★	★	★	■	■

		damage, or structural looseness					
		Check joint, carbon tube, and pivot shaft screws for looseness or breakage	★	★	★	■	■
Frame	**Landing Gear**	Check landing gear-to-frame screws for looseness or breakage	★	★	★	■	■
		Check landing gear-to-airframe screws for looseness or breakage	★	★	★	■	■
		Inspect entire landing gear for deformation or excessive play	★	★	★	■	■
	Frame Attachments	Check battery mount for severe wear or deformation	★	★	★	■	■
		Check propeller holder bracket for severe wear or deformation	★	★	★	■	■
		Inspect frame cables for damage, loose connectors, or deformed seals	★	★	★	■	■
Transport System	**Lifting Rope**	Check for breakage, detachment, or severe wear	★	■	■	■	■
	Lifting Hook	Inspect hook for deformation, wear, or cracks	★	★	★	■	■
	Anti-sway Assembly	Inspect sensor for physical integrity; check cables for looseness or damage	★	★	★	■	■
Perception System	**FPV Camera**	Inspect and clean for corrosion	★	★	★	★	■
		Check for proper power- on and normal function	★	★	★	★	■
	Radar	Inspect and clean for corrosion	★	★	★	★	■
		Check for proper power- on and normal function	★	★	★	★	■
Power	**Motor**	Check motor upper cover and shaft for	★	★	★	★	■

System		looseness					
		Check screws for looseness	★	★	★	★	■
		Check motor wiring terminals for breakage	★	★	★	★	■
		Check motor for outward shifting or deflection	★	★	★	★	■
		Check motor tilt angle for correctness	★	★	★	★	■
	ESC	Check ESC surface for cleanliness	★	★	★	★	■
		Check mounting screws for looseness or breakage	★	★	★	★	■
Remote Controller	**Remote Controller**	Inspect and clean for corrosion	★	★	★	★	■
		Check for proper power- on and normal function	★	★	★	★	■
Charger	**Charger**	Inspect for physical damage or corrosion	★	★	★	★	■
		Check connecting cables for integrity and functions for normality	★	★	★	★	■
Lithium Battery / Generator		Perform daily maintenance and periodic servicing according to the respective maintenance schedules for lithium batteries and generators.					

7.3.1. Periodic Maintenance Items

Perform a minor maintenance monthly and a major maintenance quarterly. All maintenance must be performed at an authorized service center.

Maintenance Type	Minor Maintenance	Major Maintenance
Maintenance Items	Exterior airframe cleaning	Deep airframe cleaning
	Component inspection and calibration	Component inspection and upgrade
	Free firmware upgrade	Free firmware upgrade

	Equipment repair as needed	Free replacement of accessories
Maintenance Details	Exterior airframe inspection, equipment repair as needed	Exterior airframe parts inspection, free replacement of certain accessories (front/rear covers)
	Structural components re- tightening	Free replacement of necessary fasteners
	Battery and interface board care	Deep cleaning of airframe and arms
	Free firmware upgrade	Deep cleaning and maintenance of motors
	Charger plug cleaning	Free firmware upgrade
	Power set ESC cleaning	Care of battery, charger, and rear interface board
	Deep cleaning of tank	Deep cleaning of pump and flow meter
	Charger heat dissipation cleaning	Exterior cleaning of charger
	Exterior airframe inspection, equipment repair as needed	Exterior airframe parts inspection, free replacement of certain accessories (front/rear covers)
Maintenance Interval	Recommended monthly	Recommended quarterly

7.4. Post-Operation Maintenance in Special Environments

7.4.1. After Operation in Humid Environments

Airframe Drying: If the UAV was operated in a humid environment (e.g., in the rain), move it to a dry, well-ventilated area immediately. Wipe off surface moisture with a dry cloth. For components prone to water ingress (motors, ESCs, battery ports), use a blow dryer on a low-heat setting from a distance to ensure no internal moisture remains. Avoid charging or powering on the UAV before it is completely dry to prevent short-circuit damage.

Rust Prevention: Inspect metal parts on the airframe and load-handling system. If rust is found, gently sand it off and apply a suitable anti-rust oil or paint to prevent further corrosion. For UAVs frequently operating in humid conditions, periodic rust-proofing of metal parts is recommended to enhance corrosion resistance.

7.4.2. After Operation in Sandy/Dusty Environments

Dust and Sand Removal: Use compressed air or a low-pressure air gun to blow out dust and sand from air intakes, cooling vents, motor gaps, and other openings. Pay special attention to cleaning dust from inside propellers, motor internals, and sensor surfaces, as buildup can impair normal operation. For stubborn residue, use a soft-bristled brush carefully to avoid scratching components.

Component Inspection and Maintenance: Check propellers for scratches or nicks caused by abrasive dust; evaluate their impact on flight performance and replace if necessary. Inspect motor bearings; if gritty or rough from sand ingress, clean with dedicated motor cleaner and apply appropriate lubricant. Also, check the seals of all sensors to ensure dust has not entered and compromised their accuracy.

7.4.3. After Operation in High-Temperature Environments

Cooling Down: After operation in high temperatures, do not charge or fly the UAV immediately. Place it in a shaded, ventilated area to cool naturally, avoiding direct sunlight. Wait until both the airframe and battery temperatures return to normal (typically battery temperature ≤ 40 °C, airframe not hot to the touch) before subsequent operations.

Battery Inspection and Maintenance: High temperatures can significantly stress batteries. After operation, carefully inspect batteries for swelling, deformation, or other abnormalities. For long- term storage after high- temperature use, maintain battery charge between 40% and 60% and avoid prolonged exposure to hot environments.

7.5. Maintenance Records and File Management

After each maintenance of the UAV and its load- handling system, detailed records must be kept, including the maintenance content, date, personnel involved, any issues found, and the actions taken. Establish a maintenance file for the UAV, and archive each maintenance record for future reference and analysis.By analyzing maintenance records, wear patterns and failure trends of various components can be identified, enabling proactive maintenance and replacement planning, thereby improving equipment reliability and availability. Moreover, when a malfunction occurs, maintenance logs serve as a valuable reference for troubleshooting.

Periodic Maintenance

Periodic maintenance shall be performed after accumulating 1 week of operation or 20 hours of runtime—whichever comes first.

Periodic Maintenance

Periodic maintenance shall be performed after accumulating 4 week of operation or 50 hours of runtime—whichever comes first.

Periodic Maintenance

Periodic maintenance shall be performed after accumulating 12 week of operation or 100 hours of runtime—whichever comes first.

Periodic Maintenance

Periodic maintenance shall be performed after accumulating 48 week of operation or 300 hours of runtime—whichever comes first.

8. Appendix

8.1. Troubleshooting Instructions

Module	Alarm sources	Error description	Solution
Power system	Motor	Motor blocked, stop flight immediately	Locate the blocked motor according to the prompted motor serial number. Check the propellers for any sign of entanglement and the motor for foreign objects. Should the issue persist, please contact your nearest authorized dealer for assistance.
		Motor overload, stop flight immediately	Locate the overloaded motor by the prompted motor serial number Please check the propellers for any signs of tangling, deformation, or breakage, and examine the motor for any foreign objects that may be obstructing its operation. Should the issue persist, please contact your nearest authorized dealer for assistance.
	Electronic speed controller (esc)	Risk of motor over-temperature	Locate the overloaded motor by the prompted motor serial number. Allow the drone to cool down to prevent overheating before resuming flight operations. Should the issue persist, please

			contact your nearest authorized dealer for assistance.
		Esc high voltage abnormality	Locate the over-voltage esc by the prompted esc serial number. Check if the battery voltage is too high If the problem persists, please contact your nearest distributor
Battery	Battery	Battery and flight control communication abnormality	Please re-insert the battery and make sure that the battery connector is free of foreign objects. Please replace the battery to check whether the battery is damaged. Please check whether the gold finger of the distributor board is deformed or damaged. Please check whether the connection between the power distribution board, agrochemical container control box assembly and avionics module is normal under the power-off state. If the problem persists, please contact your nearest distributor.
		Battery authentication failure	Please confirm whether it is an authentic and original battery. Please check whether the gold finger of the distributor board is deformed or damaged. Please re-insert the battery and

			make sure that the battery connector is free of foreign objects. Please replace the battery to check whether the battery is damaged. If the problem persists, please contact your nearest distributor.
		Severe low battery voltage	Please check whether there is any abnormality in the voltage of each cell of the battery. If the problem persists, please contact your nearest distributor.
Avionics system	IMU	Inertial measurement unit (IMU) disconnected	Please restart the drone. Please perform IMU calibration. If the problem persists, please contact your nearest distributor.
		Inertial measurement unit (IMU) status not initialized	Please leave the drone for 10 s. If the problem still exists, please restart the drone. Please perform IMU calibration. If the problem persists, please contact your nearest distributor.
	Compass	Compass disconnected	Compass disconnected, please check in the powered-off state and make sure the avionics module is correctly installed, then turn on the drone to see if there is any abnormality. If the problem persists, please

			contact your nearest distributor.
		Compass interference	Please make sure there is no interference in the flight environment and calibrate the compass. Please check in the shutdown state; please make sure the avionics module is correctly installed, then turn on the drone to see if there is any abnormality. If the problem persists, please contact your nearest distributor.
	RTK	RTK board disconnected	Please restart the drone after 2 minutes of power failure. If the problem persists, please contact your nearest distributor.
		RTK dual-antenna baseline abnormality	Please restart the drone. If the problem persists, please contact your nearest distributor.
	Image transmission module	Loss of image transmission signal	Please restart the drone. Please upgrade the drone firmware to the latest version. If the problem persists, please contact your nearest distributor.
Remote controller	Image transmission module	Signal-to-noise ratio is too low on the antenna side of the remote controller	Please check the channel interference status in the settings interface. You can modify the "Remote controller id" in the "Remote controller"Settings to adjust

			the channel, then re-pair the frequency. Check for interference sources in the vicinity, including signal towers and wifi hotspots. Please make sure there is no obstruction between the remote controller and the drone. Please check whether the remote controller's antenna connection is secure and normal. If the problem persists, please contact your nearest distributor.
		The remote control can not receive signals from the drone	Please check the channel interference status in the settings interface. You can modify the "Remote controller id" in the "Remote controller"Settings to adjust the channel, then re-pair the frequency. Check for interference sources in the vicinity, including signal towers and wifi hotspots.
		If the drone fails to receive joystick signals	Please make sure there is no obstruction between the remote controller and the drone. Please try to calibrate the remote control joystick If the problem persists, please contact your nearest distributor.
Radar	Radar	Radar esc temperature too low	Make sure the ambient temperature is normal

			Please verify that the connection between the radar-distribution module and the avionics module is normal in the power-off state. If the problem persists, please contact your nearest distributor.
		Radar esc temperature too high	Make sure the ambient temperature is normal Please verify that the connection between the radar-distribution module and the avionics module is normal in the power-off state. If the problem persists, please contact your nearest distributor.

8.2. List Of Risks And Hazards And Countermeasures

- Operation of the V180 cargo drone carries inherent risks if not conducted in accordance with specified operational requirements, or if the drone is not operated with caution. Below are the identified risks and corresponding countermeasures:

S/n	Parts	Countermeasures	Remarks
1	Propeller	Maintain a safe distance (more than 20 m) when the propeller is rotating	
2	Motor	Maintain a safe distance of 0.5 m or more from a rotating motor without a propeller, and 20 m or more from a rotating motor with a propeller.	
3	Battery	Batteries must be operated following the prescribed usage procedures to avoid overcharging and overdischarging.	
4	Charger use	The charger must be operated in strict accordance with the operating instructions and kept away from flammable and explosive	

		substances during use, and fire-fighting equipment should be readily available in proximity.	
5	During flight	Flight operations in downtown areas are prohibited; during field operations, maintain a safe distance (over 20 m) from crowds.	

8.3. Technical Parameters

Flight parameters

Model	V180
Aircraft Type Classification	Large Multi-rotor UAV
Structure layout	4-axis 8-propeller
External dimensions	1301.2mm x 1272.6mm x 1097.6mm(arms and propellers folded，sprayer version，±20mm) 3864mm x 3750.6mm x 1097.6mm(arms and propellers unfolded，sprayer version，±20mm)
Maximum wheelbase (between two motors)	2789mm（±20mm）
Wheelbase (M1–M2):	1907 mm（±20mm）
Wheelbase (M2–M3):	1964 mm（±20mm）
Wheelbase (M3–M4):	1907 mm（±20mm）
Wheelbase (M4–M1):	1964 mm（±20mm）
Rated maximum take-off weight	291.1kg
No-load mass（without battery）	
Spraying configuration	108.7 kg (equipped with spraying system, LiDAR version)

Hovering accuracy	
RTK positioning	Horizontal ±10 cm, vertical ±10 cm
No-load hovering time	16min
Full-load hovering time	4min30s
Power system	
Motor kv rating	46KV
Motor dimension	140*34mm
Motor rated power	4650W* 8
Rated rpm	1800r/min
Propeller Size	1778mm (70 inch)
Number of Propellers	8 pairs (folding propellers)
Propeller Material:	Carbon fiber
Energy system-smart battery	
Battery name	18S2565wh smart battery
Battery model	18S2565wh
Charging Voltage	78.3VDC Max
Charging current	170A Max
Battery capacity	2565Wh
Nominal Voltage	3.75V
Number of Cells	18
Operating Ambient Temperature	
Charging	0°C to 45°C
Discharging	-10°C to 45°C
Battery weight	16.2kg
Battery mounting method	Quick plug battery
Fast charging time	Approximately 8 minutes (from 30% to 95%)
Energy system-smart charger	

Charger name	18S12000w smart charger
Charger model	18S12000w
Charger input voltage	AC100-240V 1Φ/380V 3Φ
Input frequency range	50Hz/60Hz
Output power	12000W (Fast Charging)/3000W (Slow Charging)
Output channel	1
Protection function	Over-temperature, over-voltage, under-voltage, Short-circuit protection function
Operating ambient temperature	0°c-45°c
Weight	23kg

Operation system-Sprayer system

Tank Capacity	150 L
Nozzle Type	Centrifugal Nozzle
Total Nozzles	4
Effective (Maximum) Spray Swath	13 m
Droplet Size	50 μm-500 μm
Pump Type	Magnetic Impeller Pump
Pump Quantity	2
Maximum Flow Rate	35 L/min (with 4 centrifugal nozzles)

Operation system-Spreading system

Seed Tank Capacity	200L
Maximum Discharge Rate	250 kg/min
Spreading Payload	180 kg
Spreading Particle Diameter	0.5–10 mm
Maximum Spreading Width	12m

Remote control system

Model	RC8P
China Bands	
Data transmission and positioning	TE-FDD：B1/B3/B5/B8
	LTE-TDD：B34/B38/B39/B40/B41
	WCDMA：B1/B8
	GSM：900/1800 MHz
	Wi-Fi 802.11a/b/g/n/ac/ax：2.4G & 5G
	Bluetooth 5.2: 2402-2480 MHz
	GNSS: GPS、BeiDou、GLONASS、Galileo
	Radio：2KM
North American Bands	
Data transmission and positioning	TE-FDD：B2/B4/B5/B12/B13/B17/B25/B26
	LTE-TDD：B41
	WCDMA：B2/B4/B5
	GSM：850/1900
	Wi-Fi 802.11a/b/g/n/ac/ax：2.4G & 5G
	Bluetooth 5.2: 2402-2480 MHz
	GNSS: GPS、BeiDou、GLONASS、Galileo
	Radio：2KM
Eurasia Bands	

Data transmission and positioning	TE-FDD：B1/B3/B5/B7/B8/B20/B28 LTE-TDD：B38/B40/B41 WCDMA：B1/B8 Wi-Fi 802.11a/b/g/n/ac/ax：2.4G & 5G Bluetooth 5.2: 2402-2480 MHz GNSS: GPS、BeiDou、GLONASS、Galileo Radio：2KM
Image transmission	2.4/5.8G dual-frequency SRRC:3km CE:3km FCC:2.5 km (drone flying 2.5m, without interference)
GPS point device	GNSS: GPS、BeiDou、GLONASS、Galileo Positioning accuracy: DGNSS 0.5m RTK 0.02 m +1ppm
Display	8-inch touch LCD with 1920*1200 resolution
Working temperature	-20℃-50℃
Charging ambient temperature	0℃-45℃
Built-in battery life	3h
External battery life	4h(with 3 batteries)
Number of external batteries	3
Comprehensive Flight Time	≥7h
Charging power	External: 33.6W/8.4V/4A*2　Built-in: 65W Max

Charging method	External: cradle Built-in: TYPE-C
Sensing system-camera	
Front monocular	Virtual gimbal camera
Resolution	1280*720
Effective pixels	4MP
Field of view	Horizontal±45°, vertical ±85°
Night vision	Support
Sensing system-radar	
Radar Effective Detection Range	0.5-60m
Radar Detection Angle	
Rotating Radar	Horizontal 360°, Vertical ±30°
Downward-looking Radar	Horizontal ±30°, Vertical ±4.5°
Rear Radar	Horizontal ±30°, Vertical ±4.5°
LiDAR	Horizontal ±60°, Vertical ±35°
Maximum Speed during Obstacle Avoidance	18 m/s
Effective Obstacle Avoidance Height	≥1.5 m
Safety Distance	3.5 m (distance between propeller tip and obstacle after the aircraft brakes and stabilizes in hover)