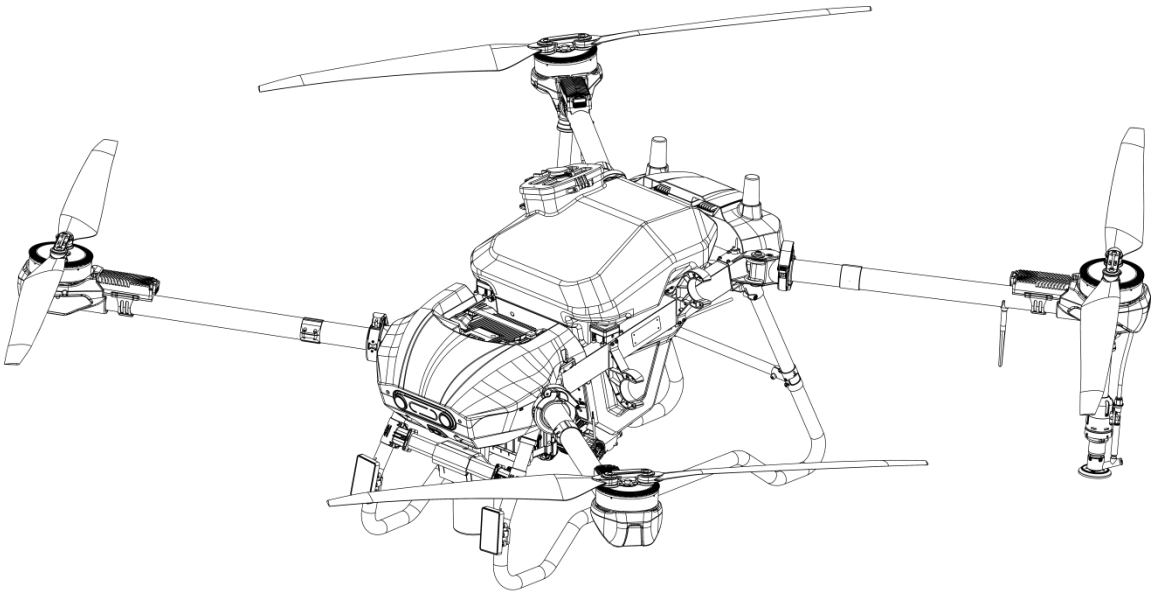
Agricultural Drone Instruction Manual

Remote Control Functions Overview

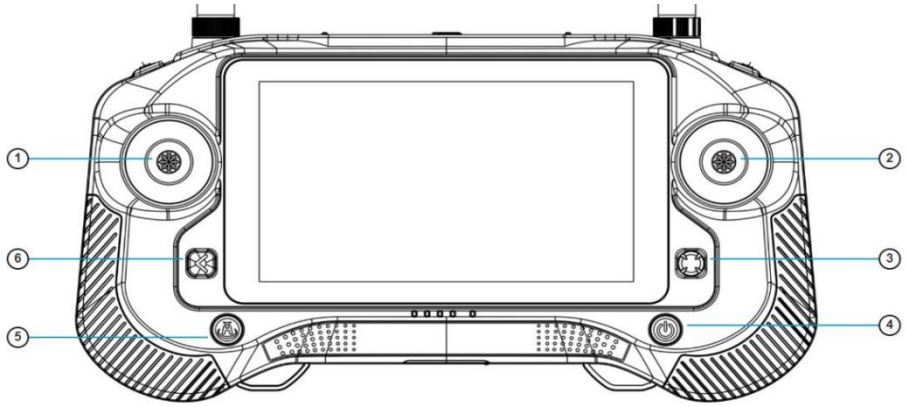
Version 1.0



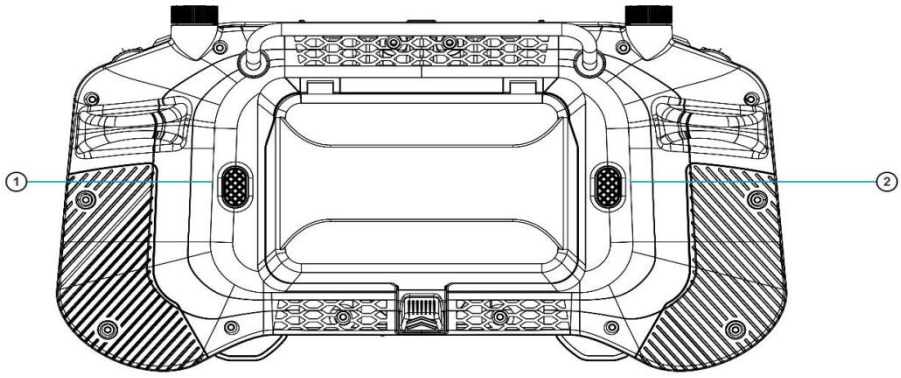
VECTOR AGR

Remote Control Function Overview

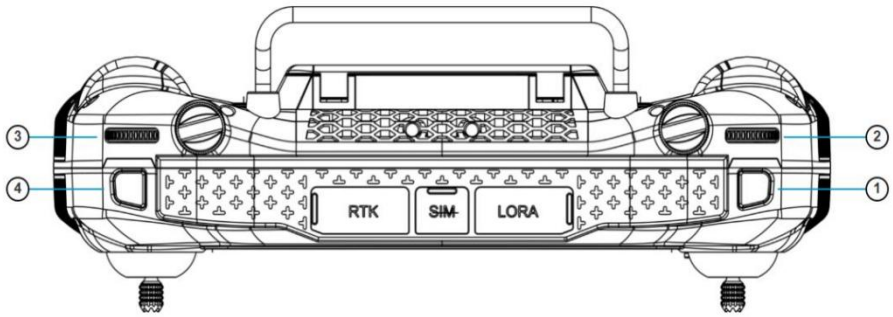
Remote Controller Hardware Buttons



①Left Joystick ②Left Joystick ③5D Button ④Power Button ⑤Return Button ⑥Back Button

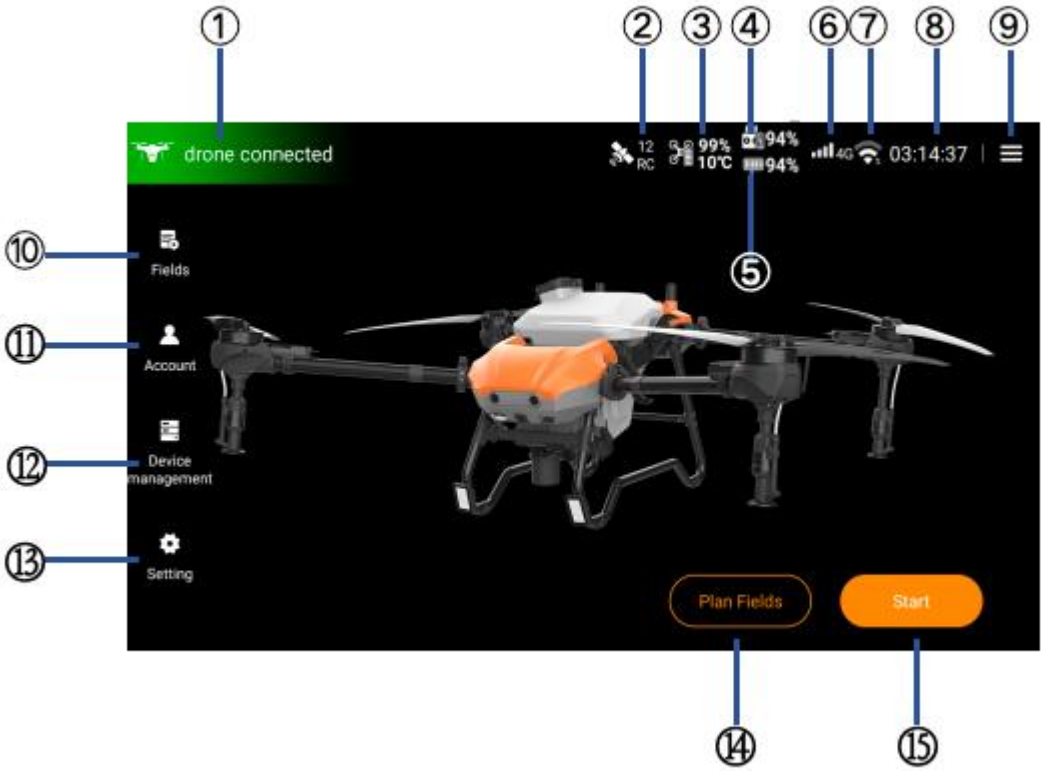


⑦Custom Button ⑧Custom Button



①Spray Button ②Paddle 2 ③Paddle 1 ④Radar Button

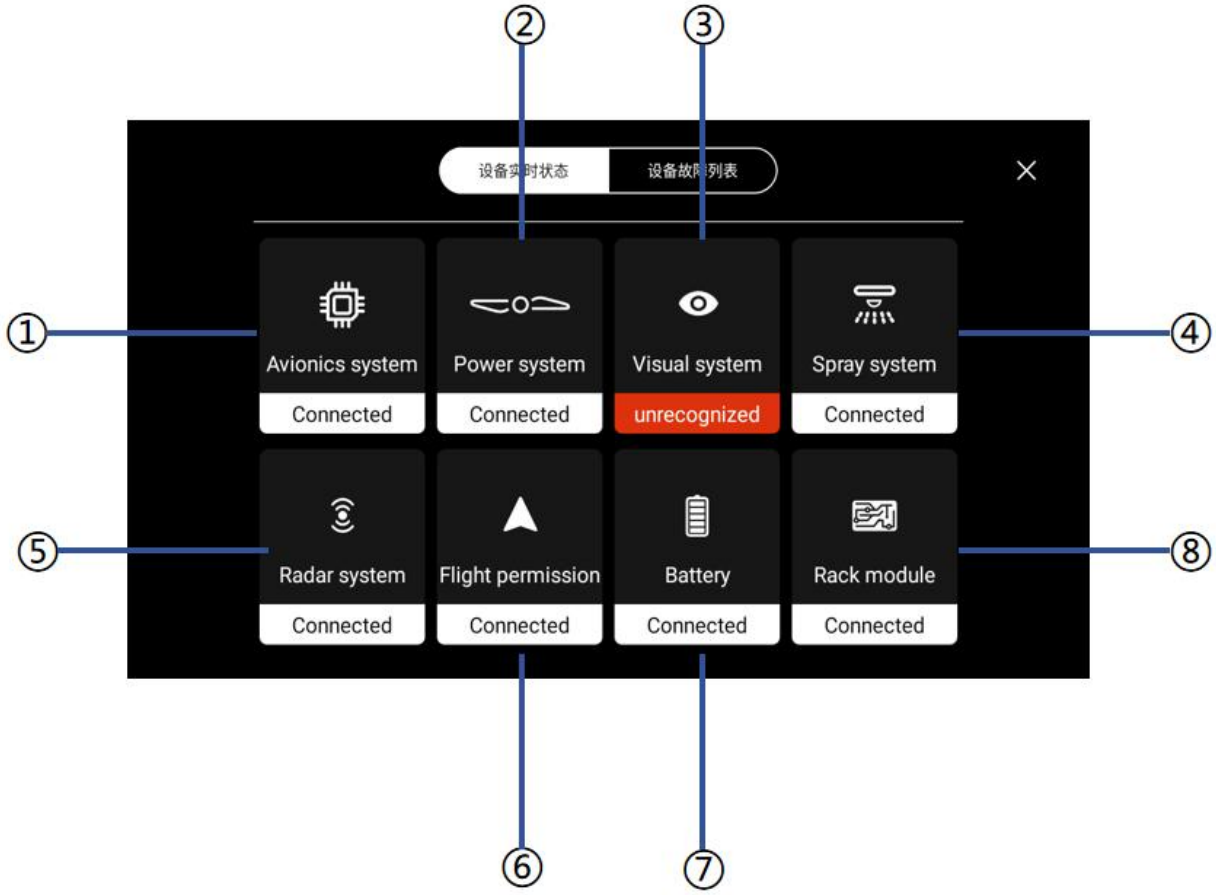
Remote Control Main Interface Functions



No.	Name	Function
1	Drone and remote control connection	View real-time status of systems
2	Satellites	Number of Satellites Detected
3	Smart battery	State of Charge and Temperature of the Smart Battery
4	Built-in battery	State of charge of remote control built-in battery
5	External battery	State of charge of remote control external battery
6	Network	Network status
7	WIFI	WIFI connection status
8	Time	Current display time
9	Hamburger menu	Drone-related settings
10	Fields	Fields management
11	Account	Pilot information
12	Device management	Drone, remote control, other system statuses
13	Setting	General settings and Android system settings

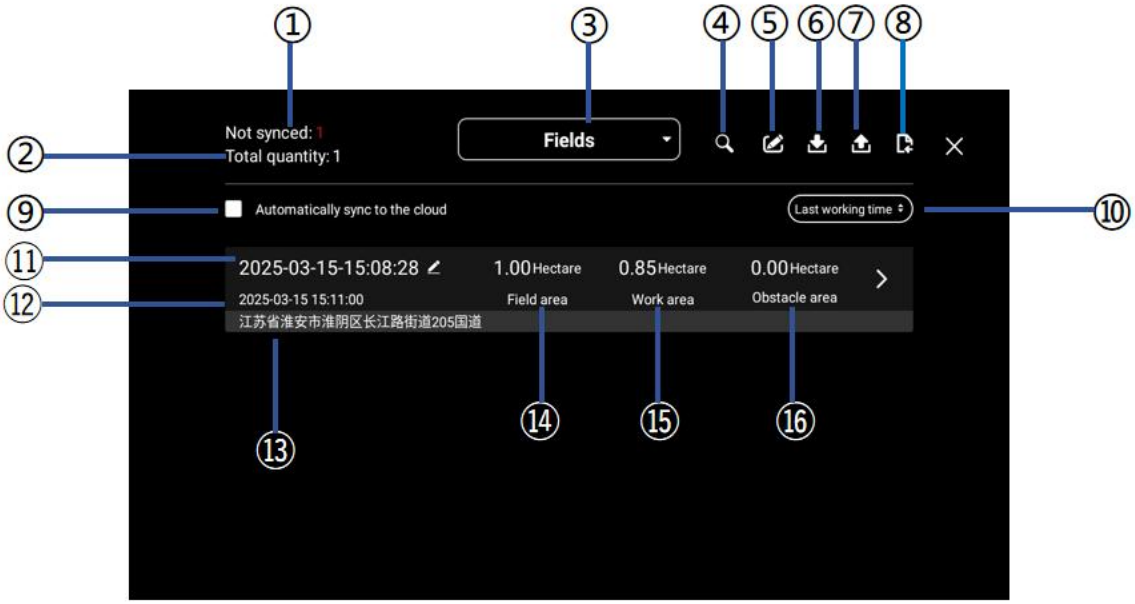
14	Plan plot	Plot planning method selection
15	Start operation	Main operation interface

Drone Connected Functions



No.	Name	Function
1	Avionics system	Avionics system status
2	Power system	Power system status
3	Visual system	Visual system status
4	Spray system	Spray system status
5	Radar system	Radar system status
6	Flight permission	Pilo, drone, permission
7	Battery	Battery status
8	Rack module	Rack module status

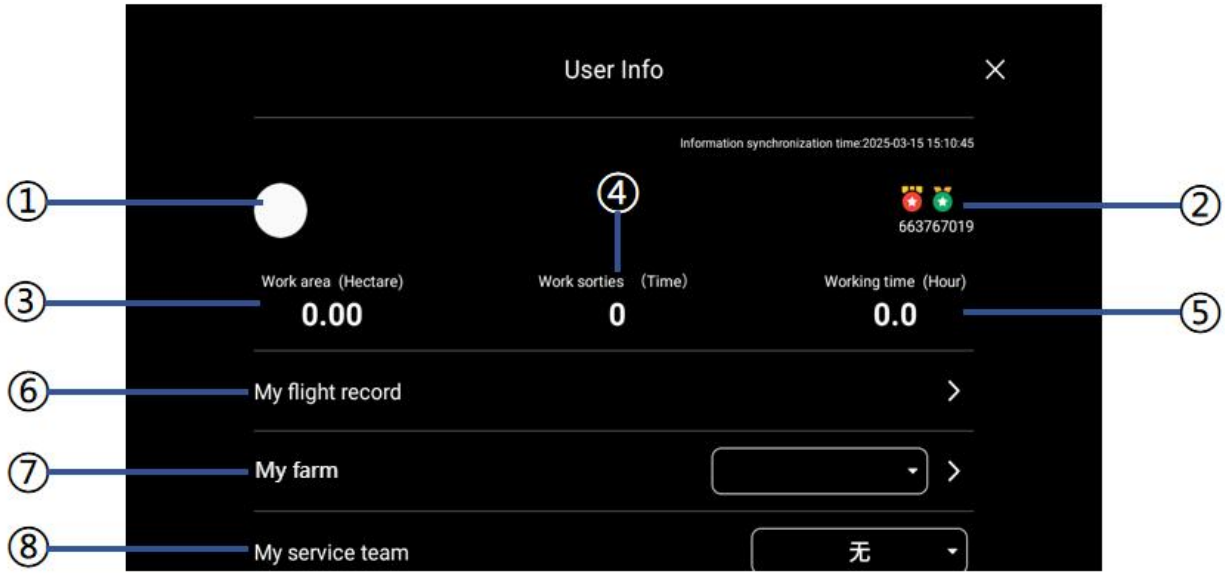
Fields Management Functions



No.	Name	Function
1	Not synced	Number of unsynced fields to cloud
2	Total quantity	Total number of fields
3	Fields	Total fields, ongoing fields, prescription map switch
4	Search field	Search field function
5	Edit field	Edit field function
6	Download field	Download field function
7	Upload field	Upload field function
8	Import field	Import field function
9	Automatically sync to the cloud	Automatically sync field to the cloud
10	Last working time	Sort fields by time
11	Field name	Edit field name
12	Field creation time	Field creation time
13	Field location	Field location

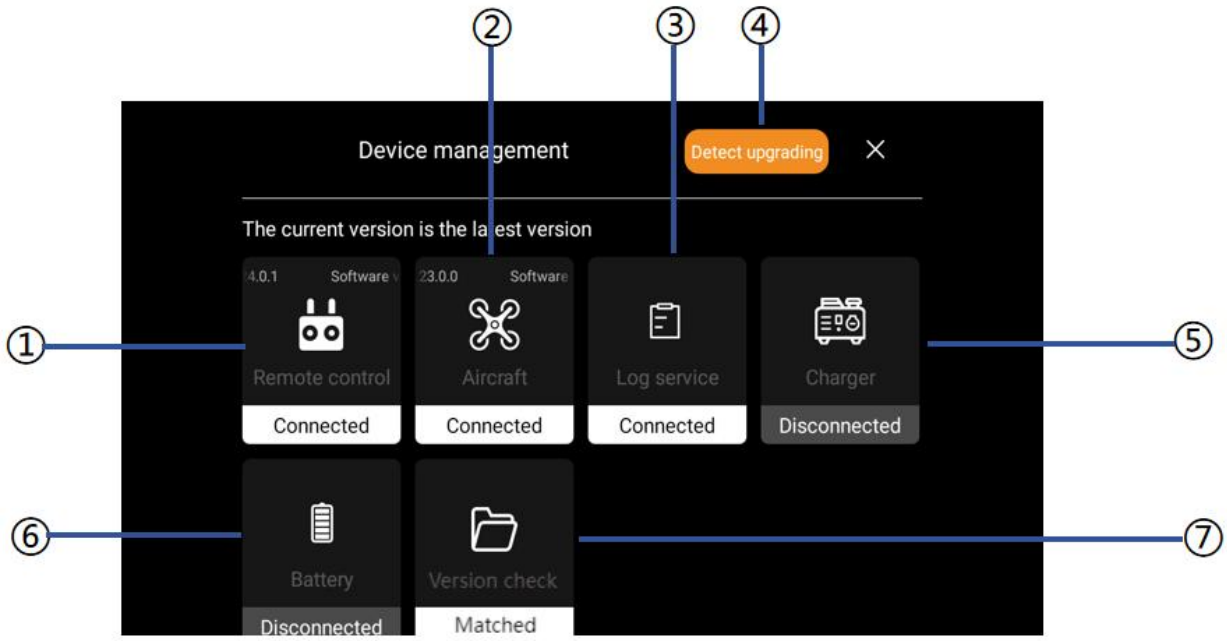
14	Field area	Field area
15	Work area	Workable field area
16	Obstacle area	Obstacle area within field

Account management function



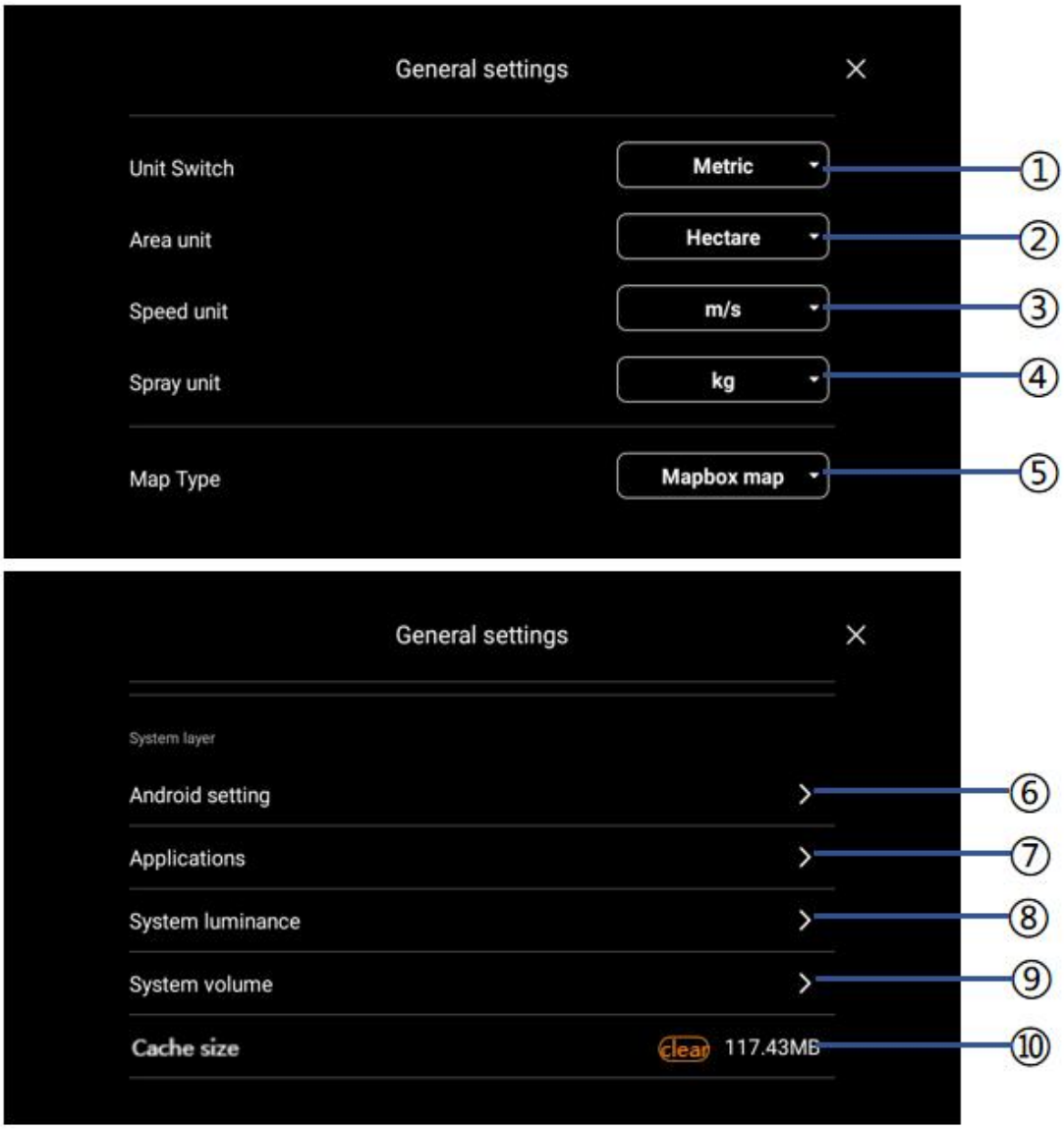
No.	Name	Function
1	Pilot infomation	Pilot name
2	Pilot certification	Real-name authentication, pilot certification
3	Work area (hectare)	Total work area (Hectare)
4	Work sorties (Time)	Total work sorties (Time)
5	Working time (Hour)	Total working time (Hour)
6	My flight record	My flight record
7	My farm	My farm
8	Temporary no-fly zone	No-fly zone

Device management function



No.	Name	Function
1	Remote control	Remote control software version
2	Aircraft	Aircraft software version
3	Log service	Upload log service
4	Detect upgrading	Version refresh
5	Charger	Charger software version
6	Battery	Battery software version
7	Version check	Version self-check

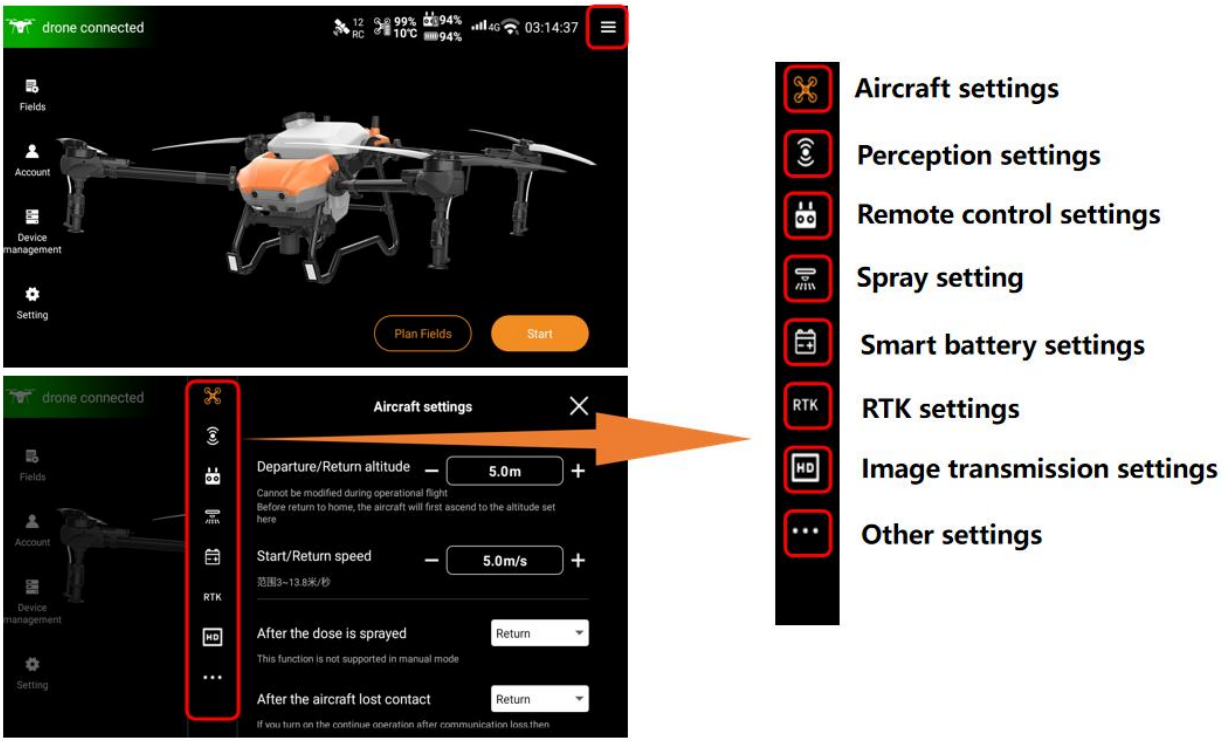
Setting functions



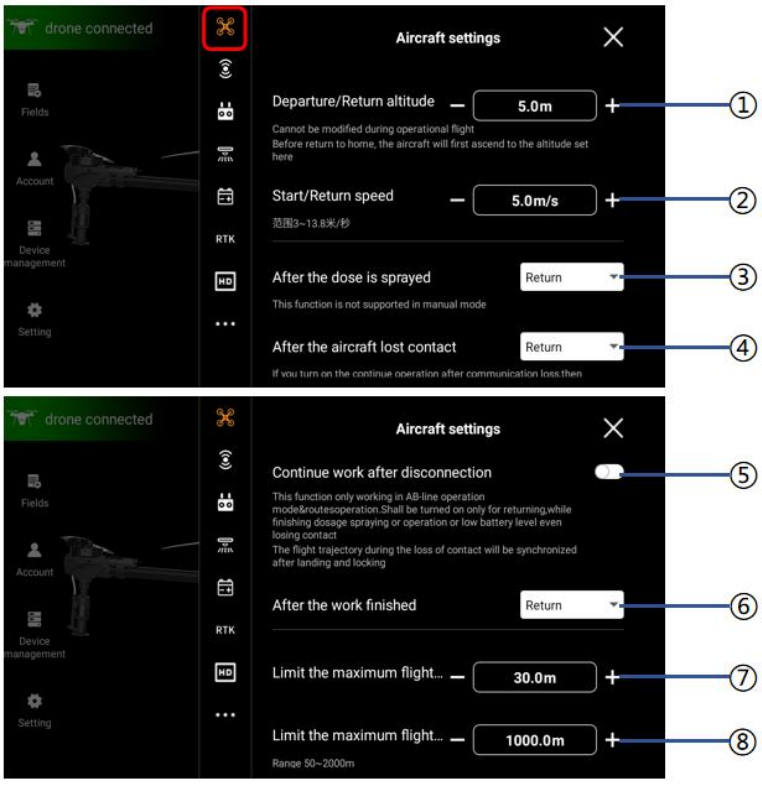
No.	Name	Function
1	Unit Switch	Measurement unit switch: Metric / Imperial
2	Area unit	Area unit switch: Mu / Hectare / Are
3	Speed unit	Speed unit switch: m / km
4	Spray unit	Spray unit switch: L / kg
5	Map type	Map type switch: Tian / Google / Mapbox
6	Android setting	Android setting
7	Applications	All applications
8	System luminance	Remote control brightness adjustment

9	System volume	Remote control volume adjustment
10	Cache size	Clear cache

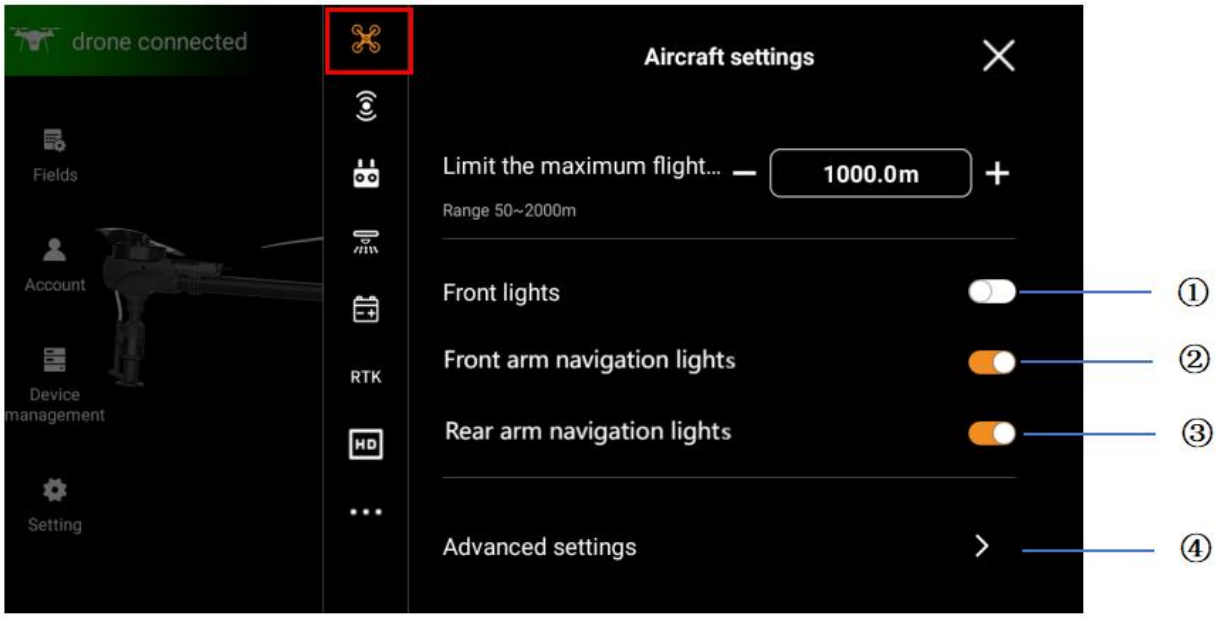
Drone hamburger menu



Aircraft settings

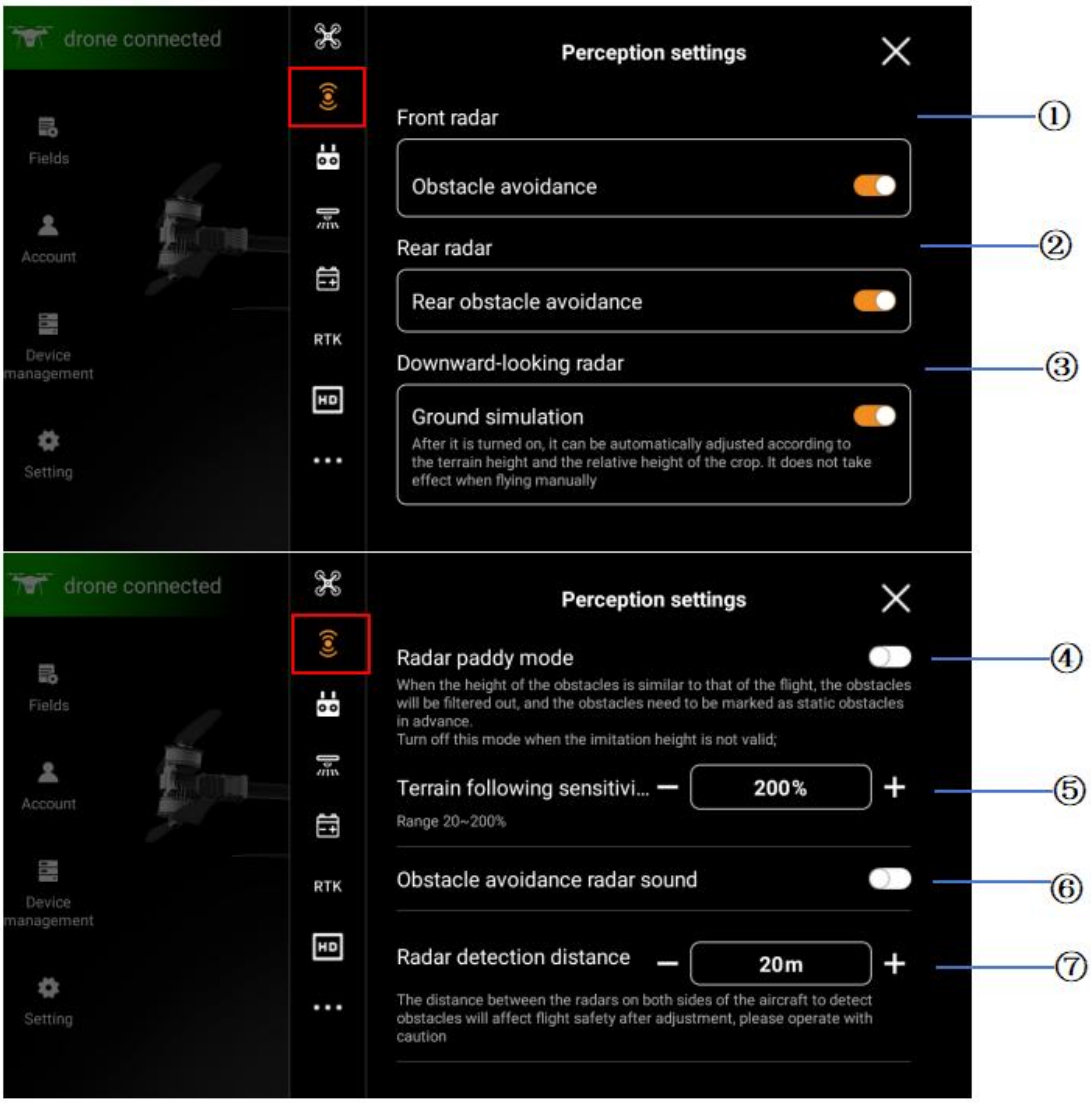


No.	Name	Function
1	Departure/Return altitude	Set range: 2 m/s – 30 m/s
2	Start/Return speed	Set range: 3 m/s – 13.8 m/s
3	After the dose is sprayed	After the dose is sprayed: Hover or Return
4	After the aircraft lost contact	After the aircraft lost contact: Hover / Return / Land
5	Continue work after disconnection	Continue work after disconnection: On / Off
6	After the work finished	After the work finished: Hover or Return
7	Limit the maximum flight altitude	Limit the maximum flight altitude: 20–30 m
8	Limit the maximum flight distance	Maximum flight distance between the drone and the remote control (Set range: 50 m – 2000 m)

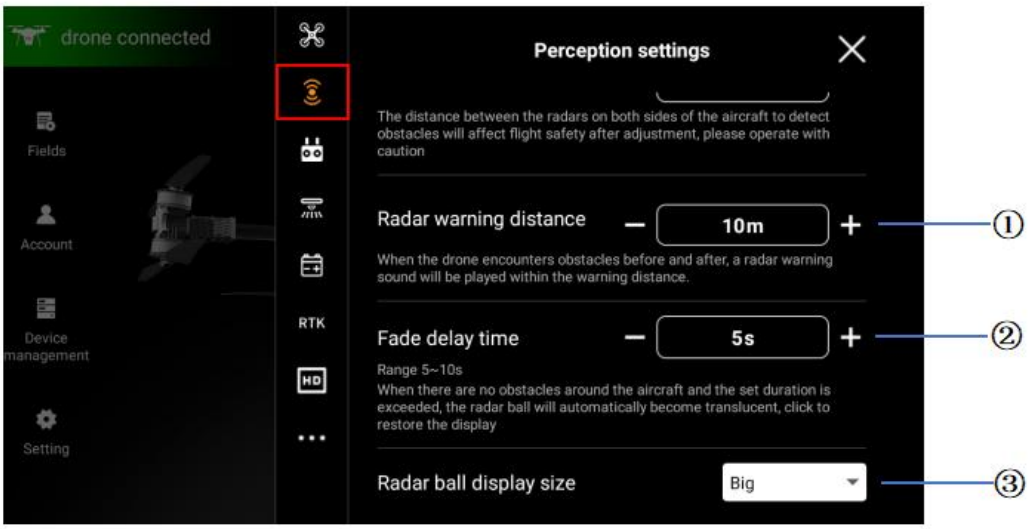


No.	Name	Function
1	Front lights	Front lights switch
2	Front arm navigation lights	Front arm navigation lights switch
3	Rear arm navigation lights	Rear arm navigation lights switch
4	Advanced settings	Includes IMU and compass calibration, endurance from breakpoint, Breakpoint Optimization, Return-to-home accuracy check, Real-time drone frame status

Perception settings

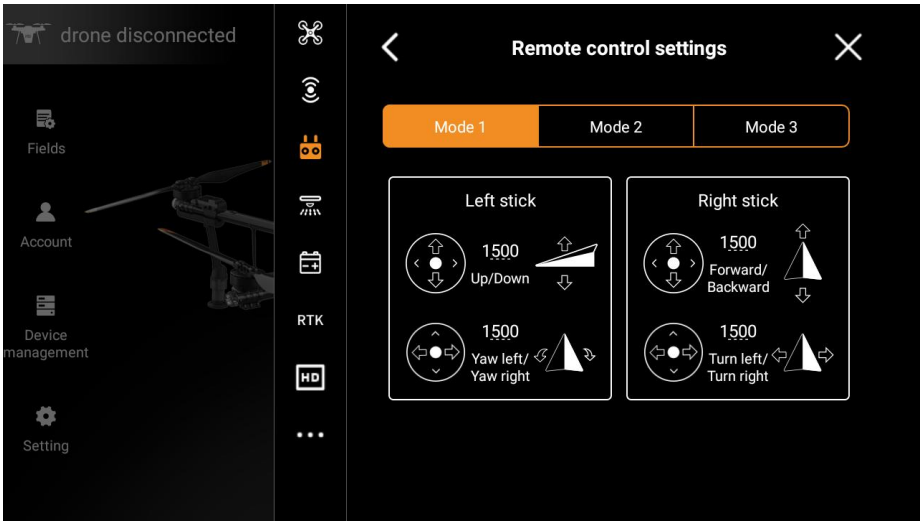


No.	Name	Function
1	Front radar	Front radar obstacle avoidance switch
2	Rear radar	Rear radar obstacle avoidance switch
3	Downward-looking radar	Ground simulation switch
4	Radar paddy mode	Radar paddy mode switch
5	Terrain following sensitivity	Set terrain following sensitivity, adjustable range: 20% –200%.
6	Obstacle avoidance radar sound	Obstacle avoidance radar sound switch
7	Radar detection distance	Obstacle avoidance radar detection range, adjustable range: 20 m – 30 m.



No.	Name	Function
1	Radar warning distance	Set the distance from the obstacle at which the drone starts displaying the warning. Range: 10 m – 20 m
2	Fade delay time	Set the radar ball display delay when no obstacles are detected around the drone. Range: 5 s – 10 s
3	Radar ball display size	Set the display size of the radar ball

Remote control settings



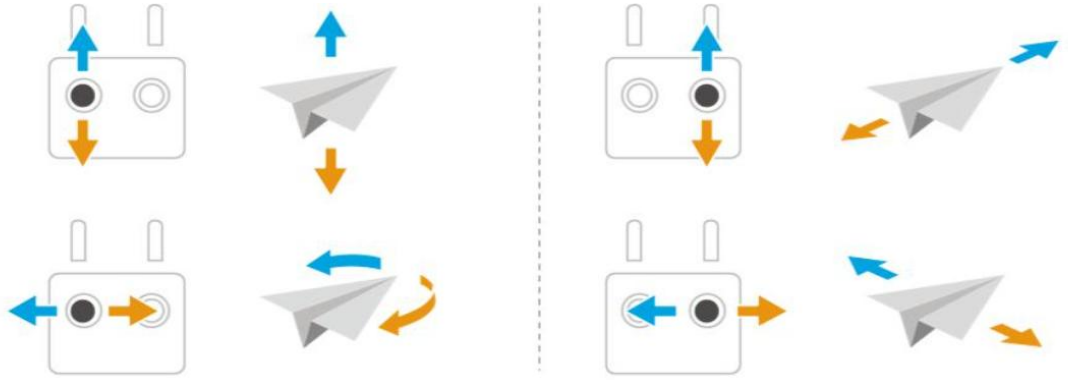
The default control mode of the remote control from the factory is Mode 1, and this manual uses Mode 1 as an example to explain the control mode of the remote control.

Note:

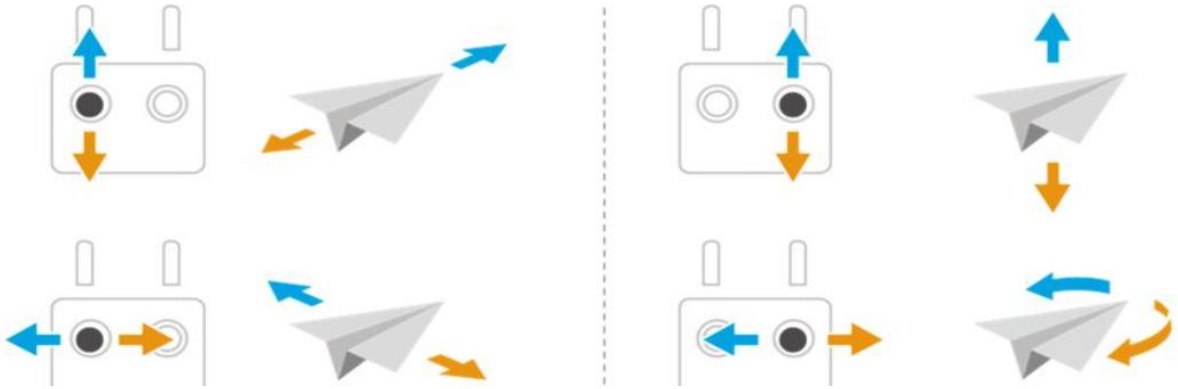
Do not unlock for takeoff until you are certain of the joystick mode.

Joystick control should be set in the first place to match your personal operating preference.

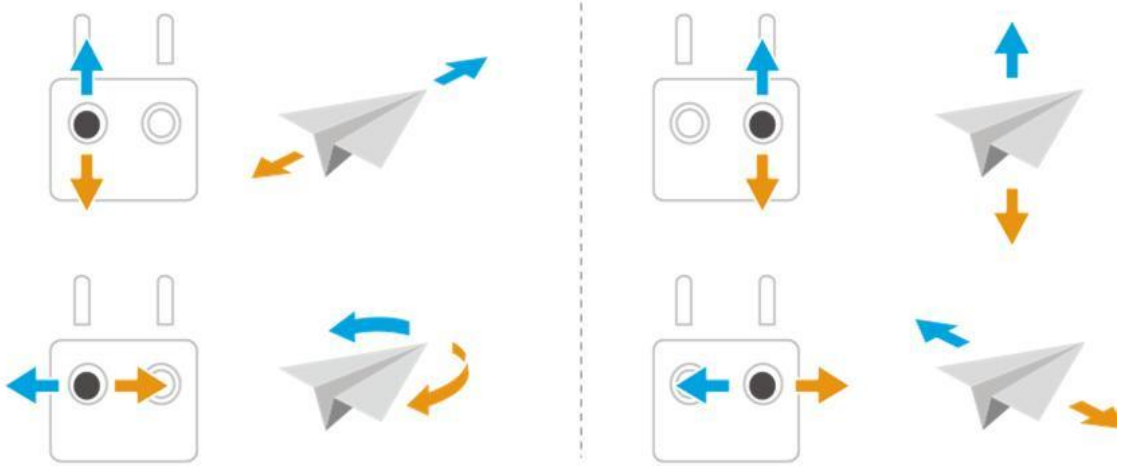
Mode 1 （American ）



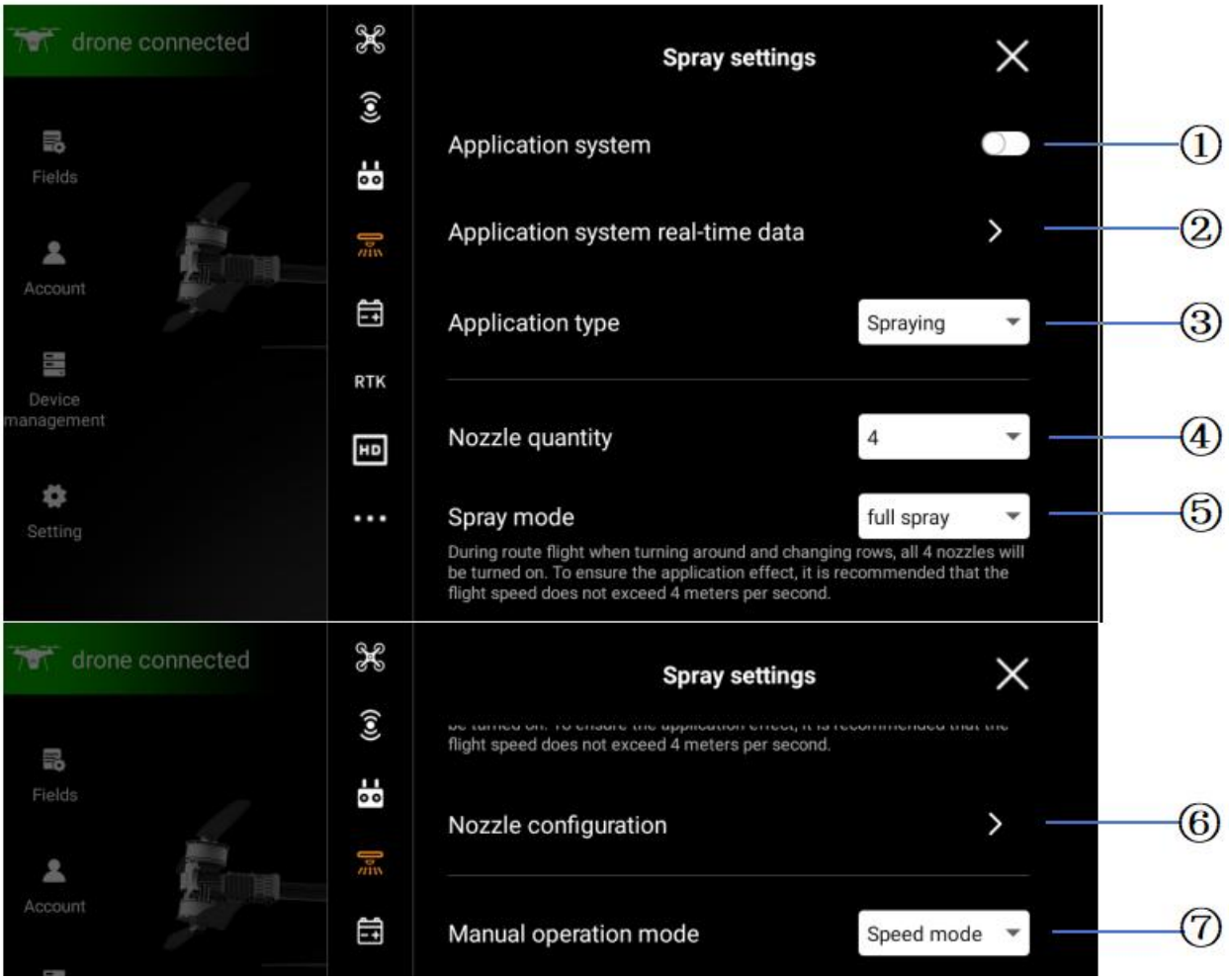
Mode 2 （Chinese）



Mode 3 （Japanese）

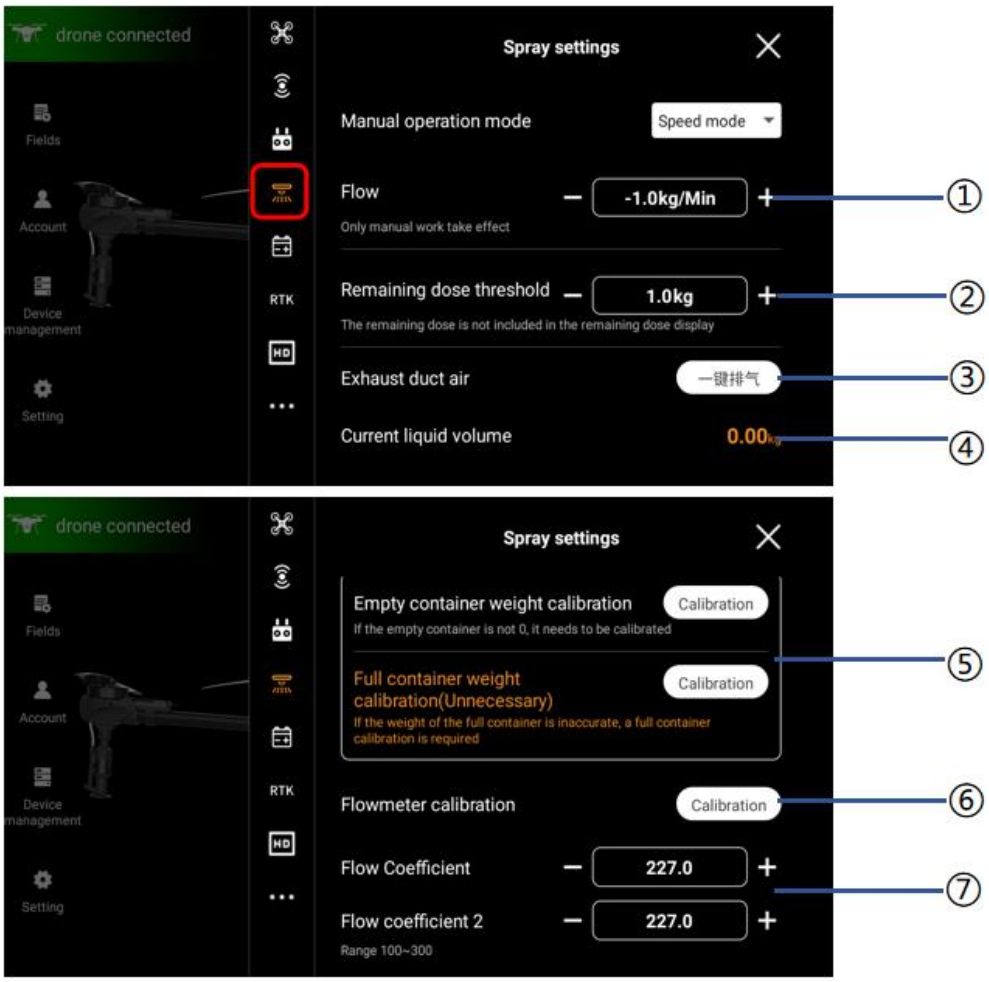


Operation system settings

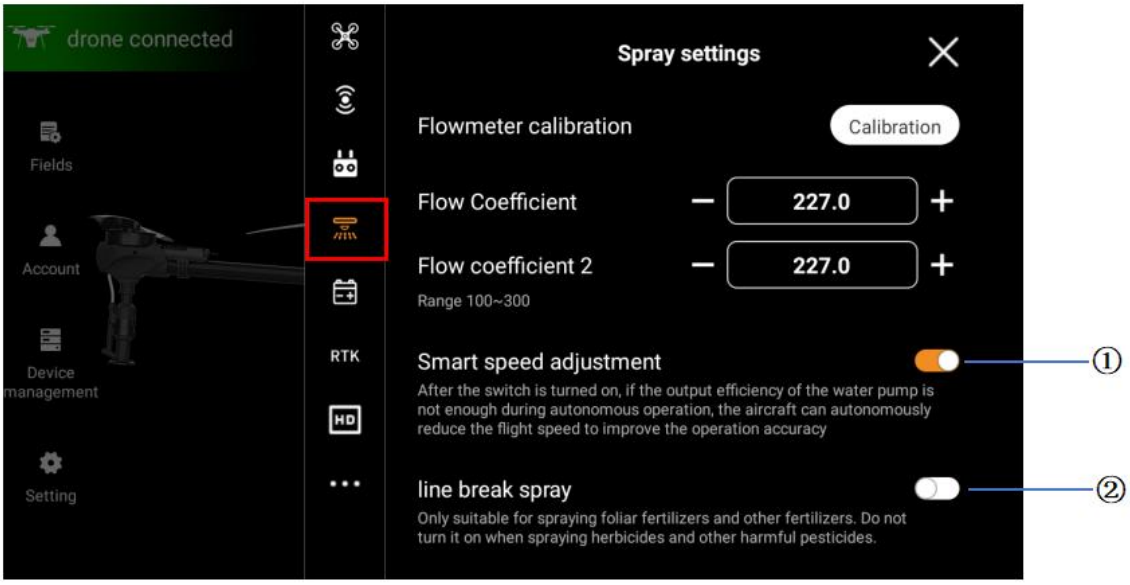


No,	Name	Function
1	Application system	When turned on, the drone cannot operate autonomously without liquid. When turned off, autonomous operation is allowed even without liquid.
2	Application system real-time data	Real-time data during spraying operation.
3	Application type	Select the type of operation: Auto recognition, spraying, or spreading.
4	Nozzle quantity	When using four centrifugal nozzles, you can switch to two nozzles as needed.
5	Spray mode	Spray mode selection
6	Nozzle configuration	Nozzle testing and coding are required when replacing nozzles.
7	Manual operation mode	Switch during manual flight; supports speed-following mode and on/off mode.

Operation system settings

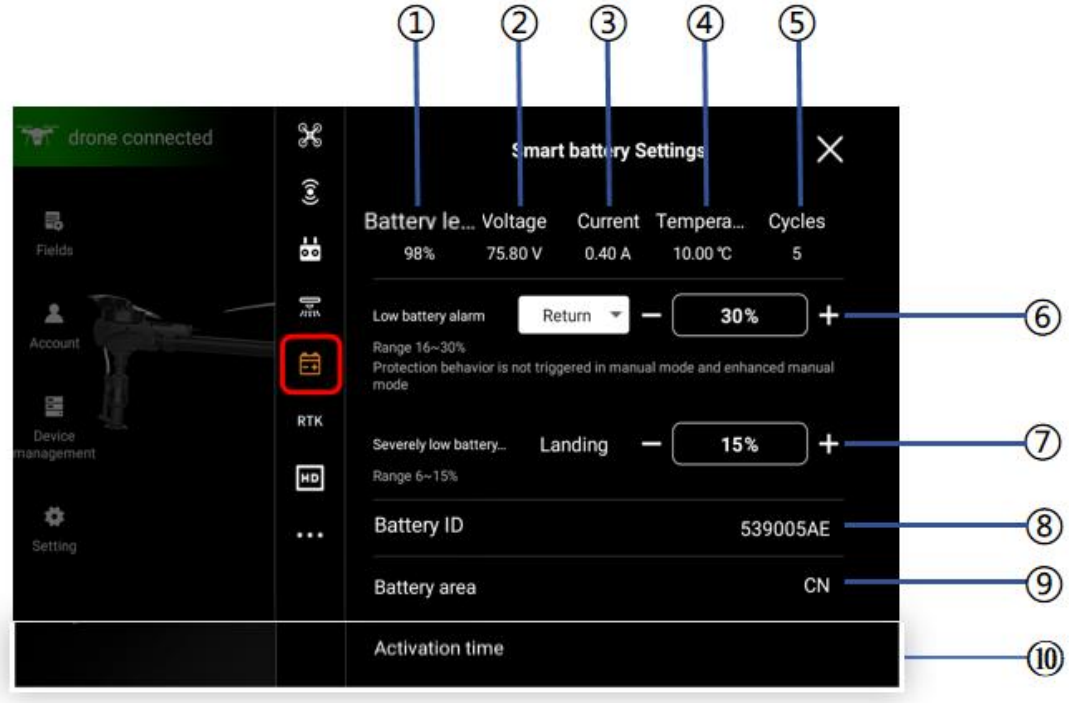


No.	Name	Function
1	Flow	Adjust application rate and flow speed in manual mode
2	Remaining dose threshold	In autonomous mode, the drone stops operation when the liquid volume falls below the threshold. Setting range: 0.3 L – 40 L
3	Exhaust duck air	One-click exhaust to remove air from the tubing
4	Current liquid volume	Current total weight of the agrochemical container
5	Empty container weight calibraiton	Calibrate the lweighing sensor when switching between spraying and spreading modes
6	Flowmeter calibration	Flowmeter calibration button
7	Flow coefficient	Used to fine-tune the application rate. Represents the number of flowmeter pulses per 1L of liquid. Setting range: 100 – 300



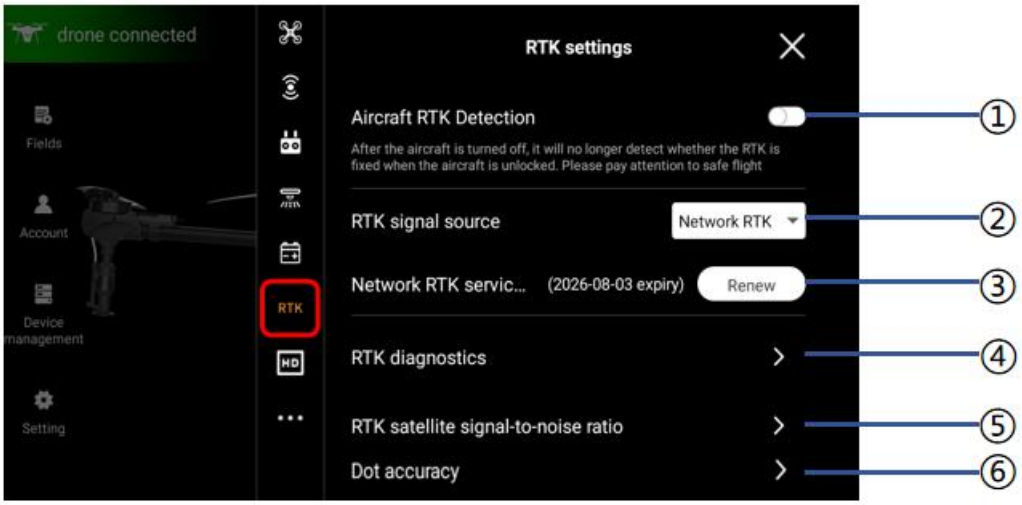
No.	Name	Function
1	Smart speed adjustment	When enabled, the drone will automatically reduce flight speed during autonomous operations if the pump output is insufficient, in order to improve spraying accuracy.
2	Line break spray	Enables spraying during route transitions to improve operation efficiency and ensure even spray coverage.

Smart battery settings



No.	Name	Function
1	Battery level	Real-time battery percentage
2	Voltage	Real-time battery voltage
3	Current	Battery discharge current
4	Temperature	Real-time battery temperature
5	Cycles	Battery cycle count
6	Low battery alarm	Set threshold for low battery warning. When the level drops below this value, the drone will perform the configured action (Hover or Return). Range: 16%–30%
7	Severely low battery alarm	Set threshold for critical battery warning. When the level drops below this value, the drone will land automatically. Range: 6%–15%
8	Battery ID	Battery ID
9	Battery area	Battery usage area
10	Activation time	Battery activation and activation time information

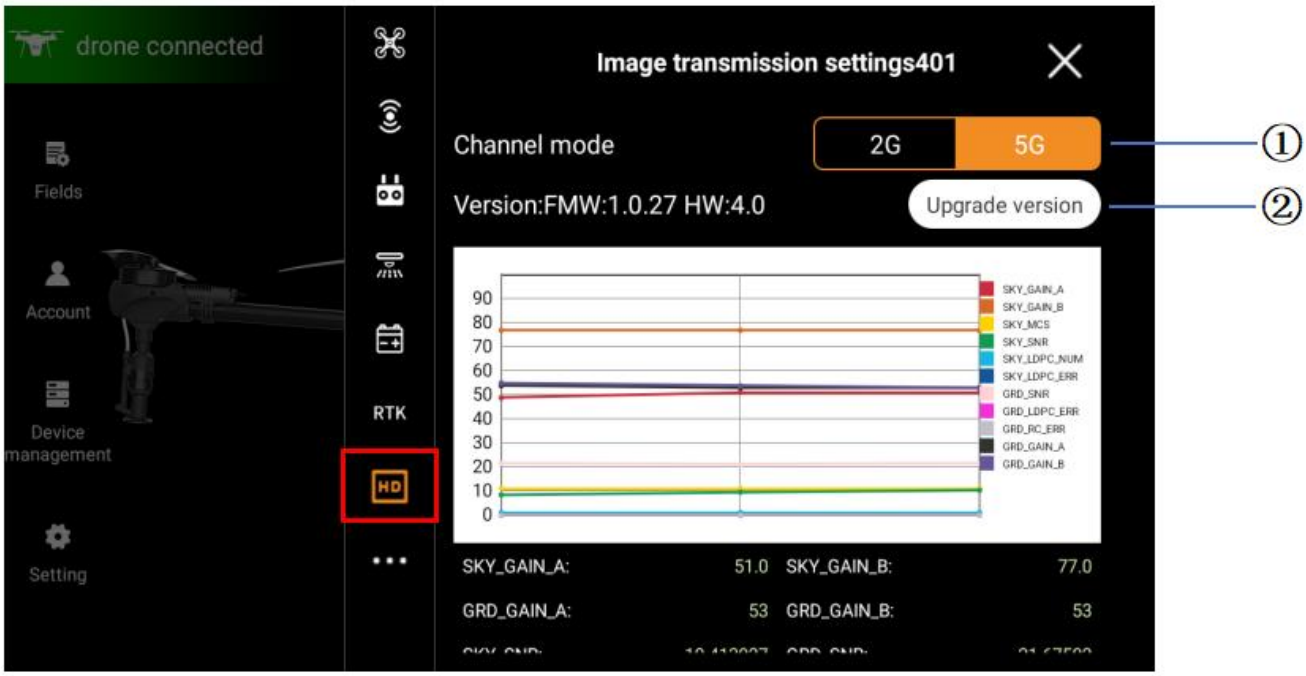
RTK settings



No.	Name	Function
1	Aircraft RTK Detection	Aircraft RTK Detection Switch

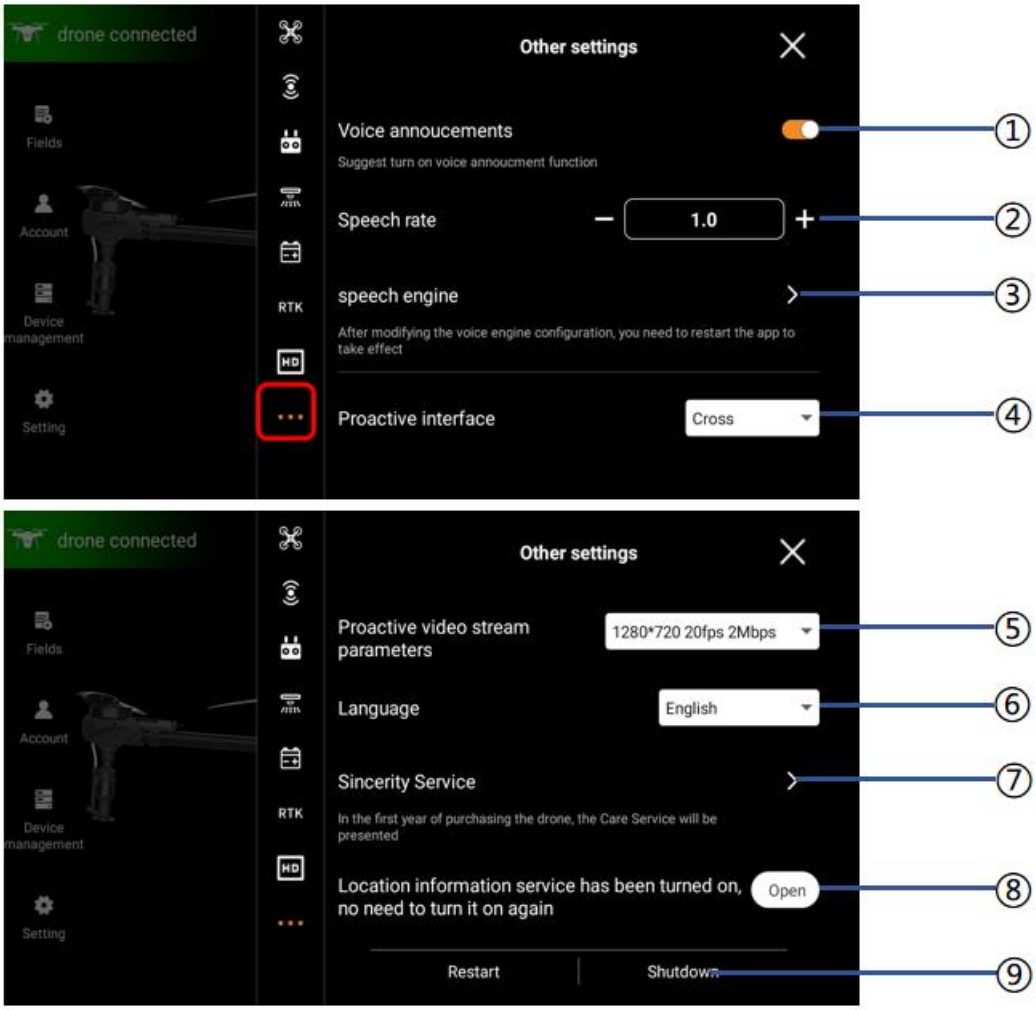
2	RTK signal source	RTK Signal Source Selection: Network RTK / RTK Mobile Station
3	Network RTK service entitlement	Tap to display QR code for Huida Agricultural Services App to scan and renew Network RTK service
4	RTK diagnostics	Enter RTK Diagnostics Interface
5	RTK satellite signal-to-noise ratio	Enter RTK Satellite SNR Interface
6	Dot accuracy	Dot Accuracy Setting: 0.4–4 meters

Image transmission settings



No.	Name	Function
1	Channel mode	Auto Mode/ 2G Mode/ 5G Mode
2	Version	Video transmission version, upgrade video transmission software

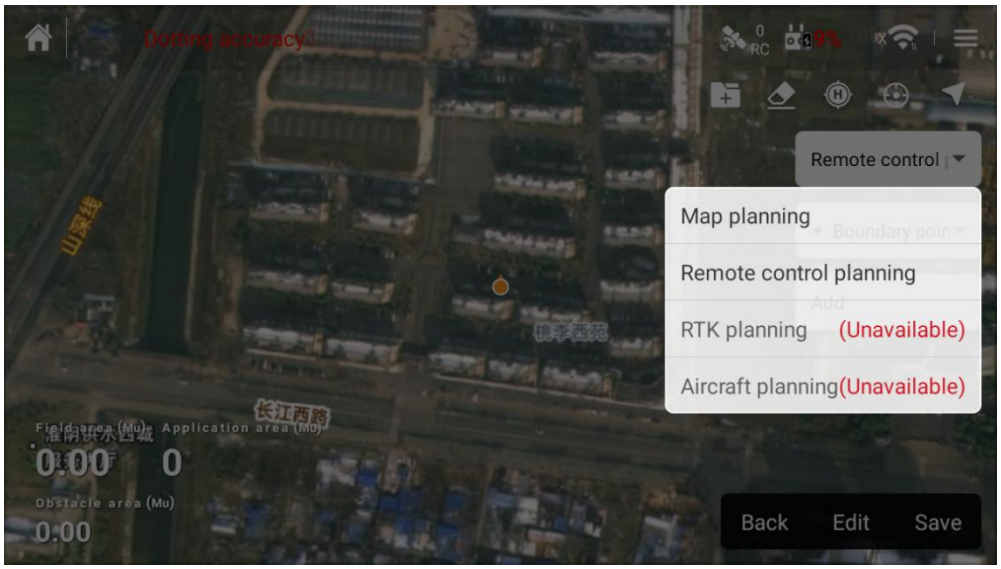
Other function settings



No.	Name	Function
1	Voice announcements	Remote control voice broadcast switch
2	Speech rate	Voice broadcast speed adjustment
3	Speech engine	Speech synthesis and recognition engine
4	Proactive interface	Front camera interface overlay: None, Crosshair, Grid
5	Proactive video stream parameters	Front camera video stream parameter selection
6	Language	Language selection: Follow system / Simplified Chinese / English / Korean / Russian, etc.
7	Sincerity Service	Third-party liability insurance and drone damage insurance status & renewal
8	Location information service has been turned on,	Remote control location service has already been enabled

No.	Name	Function
	no need to turn it on again	
9	Restart, Shutdown	Remote control reboot and power-off buttons

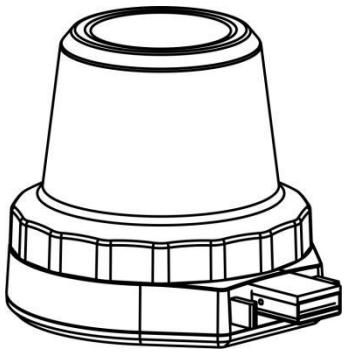
Plan Fields Interface Functions



The Huida Drone App offers four ways to plan plots: RTK planning, drone planning, remote controller planning, and map planning.

RTK planning: When implementing RTK planning, the RTK high-precision positioning module must be installed on the remote controller for accurate measurements.

1. Install the RTK high-precision positioning module;
   If you use RTK planning to plan the operation area, you need to connect the RTK high-precision positioning module to the USB port of the remote controller.



2. Tap 'Plan Fields' on the Huida Drone App homepage, and select 'RTK Planning';

3. 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 50cm;
4. Hold the remote controller to the position as desired, and then tap the 'Add' button on the Huida Drone App to add waypoints, planning the plot boundaries and obstacles.

Note:

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

Drone Planning:

1. Tap 'Plan Fields' on the Huida Drone App homepage, and select 'Drone Planning';;
2. Maneuver the remote control to the position as desired, and then tap the 'Add' button on the Huida Drone App to add waypoints, planning the field boundaries and obstacles.。

Map planning:

3. Enter the homepage of Huida Drone 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;
4. Swipe the screen to adjust the reticle to the position as desired, and then tap the 'Add' button on the Huida Drone App to add waypoints, planning the plot boundaries and obstacles.

   Note:

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

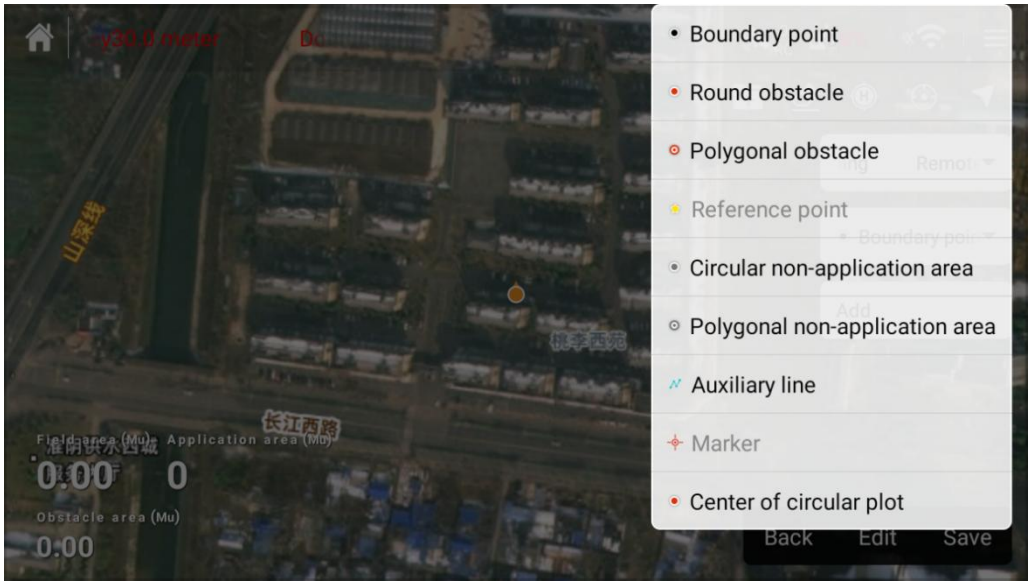
   If map planning is adopted, waypoints for the plots can be precisely adjusted using the drone or remote controller before commencing operations.

Remote Control Planning: The planning method is the same as the RTK planning method, please refer to the RTK planning method.

Note:

5. The accuracy of remote controller planning is lower than that of RTK planning.
6. For your safety, always ensure that the drone is powered off when using remote controller planning function.

Waypoint Types



Huida 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.

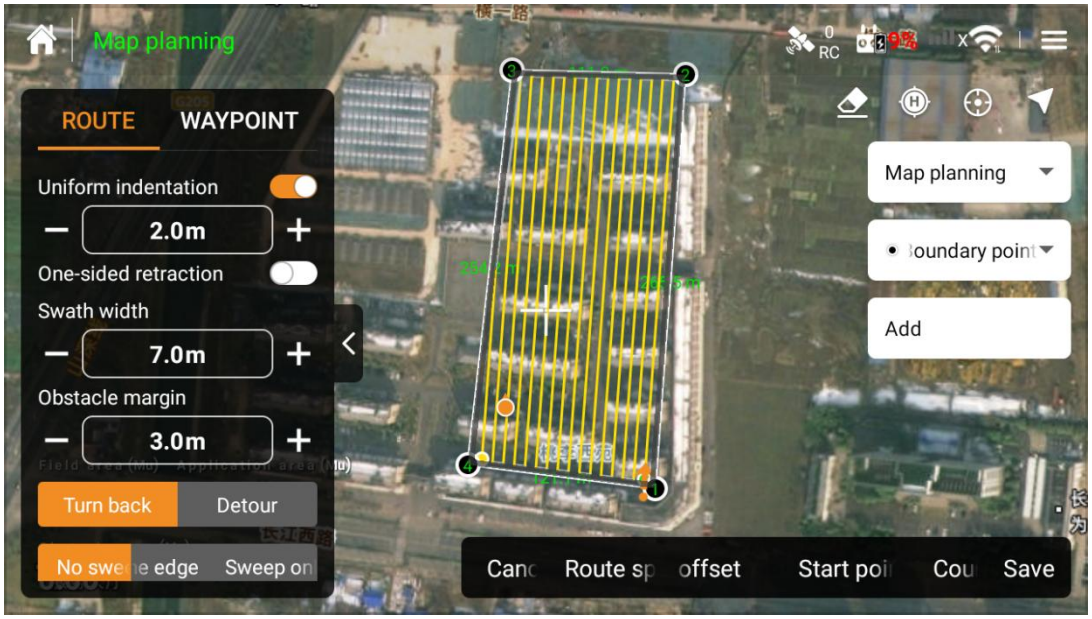
Boundary points: a polygonal set of points that define the plot boundary
Circular obstacle: add a circular obstacle with an adjustable radius to the operation plot
Polygonal obstacle: add multiple obstacle points, and draw a polygonal obstacle in the order of the obstacle points.
Reference point: for 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.

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.



Line direction adjustment: precise direction tuning is supported with a sliding feature, allowing for a 1-degree fine-tuning at each point.

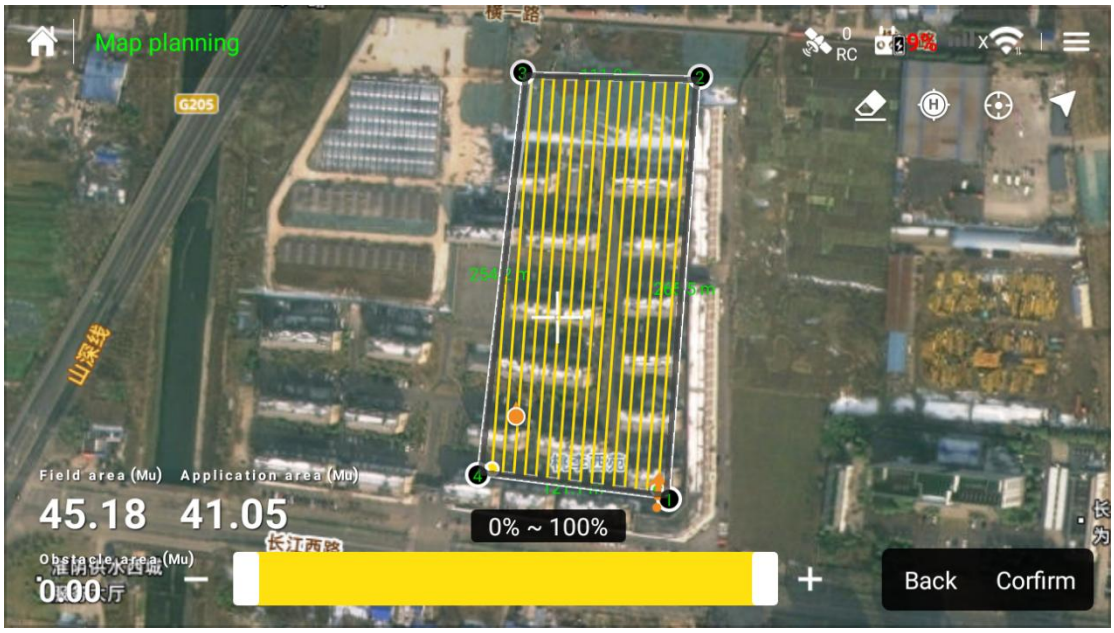
Quick adjustment of route direction: tap the target plot edge line, the waypoint route will be parallel to that edge line.

Setting start point: according to the position of the take-off and landing points, select a rational starting position to initiate the operation into the route.

Route splitting: The route splitting function allows the splitting of route segments that are not needed currently, while retaining those that are needed for operation.

Note:

Route splitting is based on a percentage of the route's length, not a percentage of the plot size.



Editing Waypoints

Move boundary points: Drag or fine-tune with buttons to move the position of the plot boundary points, and the route will be automatically re-planned in real time after moving the boundary points.

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.

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.

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.

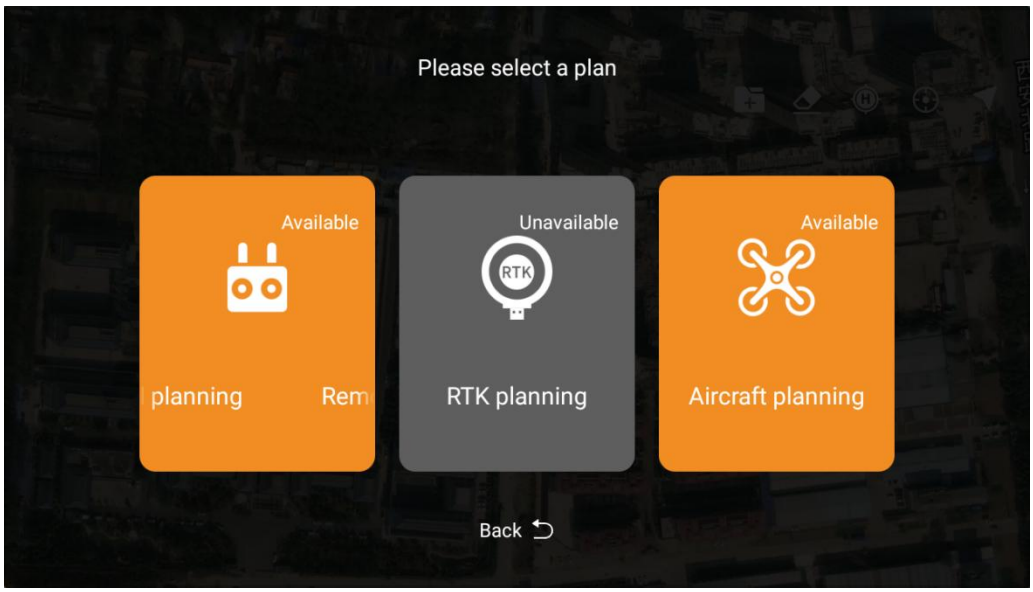
Delete reference point: tap the reference point and tap ‘Delete’ to delete the reference point.

Undo Operation

If you want to withdraw the operation of adding, deleting or moving, tap ‘Undo’ button to complete the undo operation.

Operation Mode

The HD580 agricultural drone comes with autonomous operation mode, AB operation mode, manual mode, and manual+ mode, which can be easily switched on Huida Drone App.

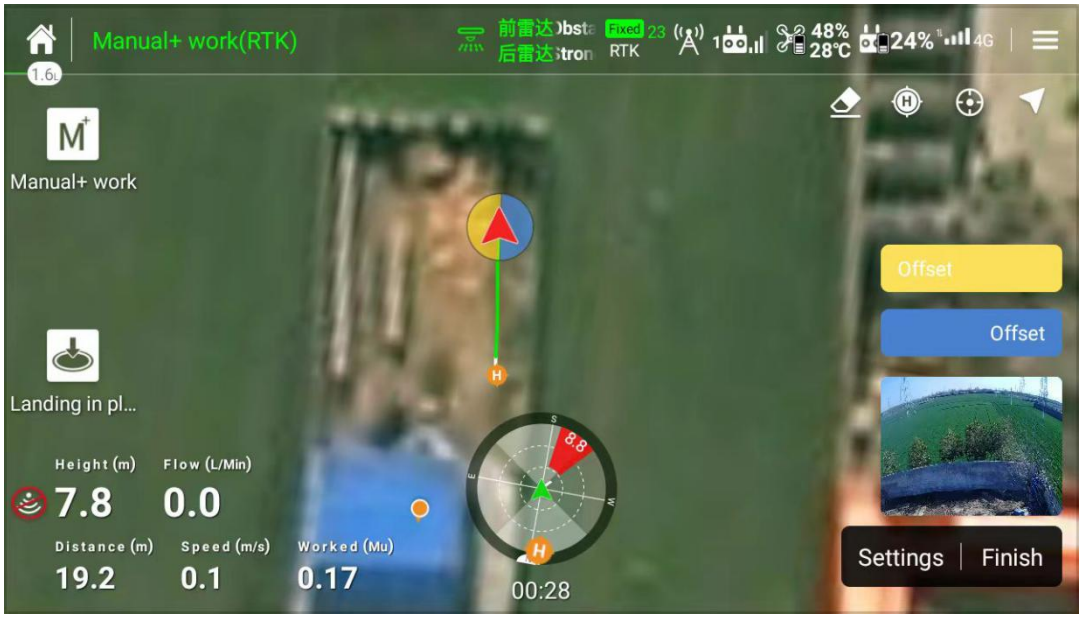


Manual Mode: For small plots or plots with too many obstacles and complex terrain, manual operation mode is advisable. In this mode, the drone's flight path is controlled via manual input on the remote control joystick, and the spraying function must be activated manually. It is not recommended to operate the drone out of sight, as doing so may pose flight safety risks.

Note:

In manual operation mode, the operation area and other data can be recorded only after 'Start' button is pressed.

Manual + Mode: For medium to large plots that are obstacle-free and relatively uniform, manual+ mode is also an option. Fly the drone to the intended route, align the nose with the route, set the spraying dosage, flight speed, operation line spacing, relative crop height, and then tap 'Finish'. Next, push the joystick forward to fly the drone to the plot, and tap 'Left Traverse' or 'Right Traverse' as necessary to execute the traverse action. Then, guide the drone to return and repeat the aforementioned steps to complete the operation.

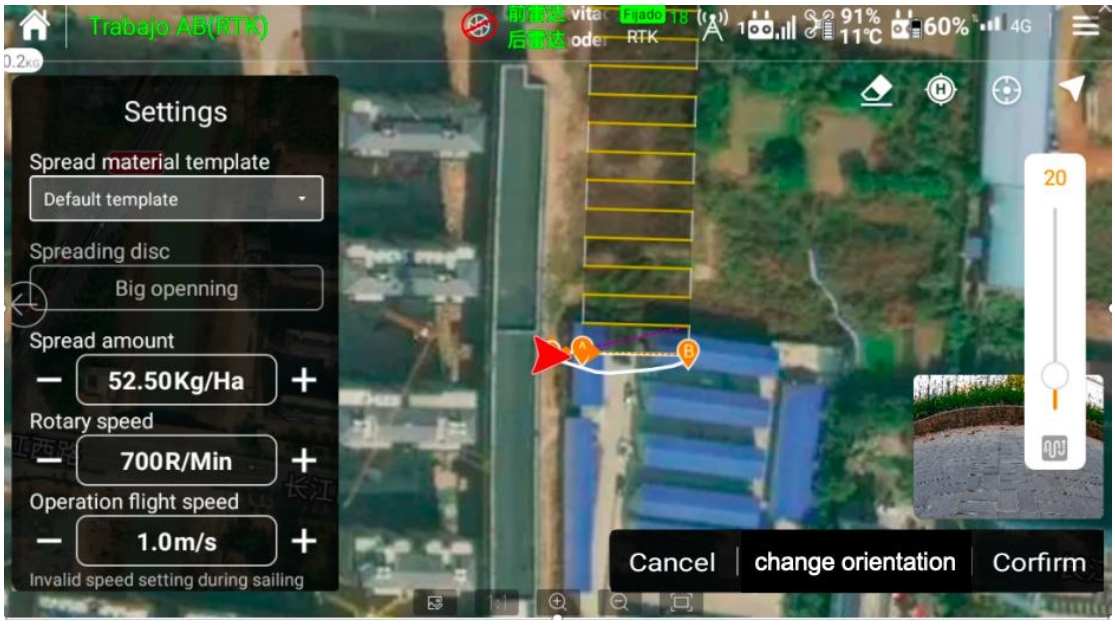


A-B Operation Mode: Users can perform A-B mapping through the intelligent planning operation system of the Huida drone App. When establishing points A and B, adjust the orientation of each point to ensure they are parallel to the plot's edge. Subsequently, input the number of routes required to cover the entire plot, and the App will analyze the data to compute and generate the optimal routes for intelligent planning. Upon the completion of planning, the drone will automatically swift itself to AB operation mode and perform the task along the routes that have been intelligently mapped out.

7. Add point A

8. Add point B

9. Set the number of routes and operation parameters



10. Tap 'Confirm' to synchronize the data between the remote controller and the drone, then tap 'Execution'; AB operation will start after confirming on the operation self-check confirmation screen.

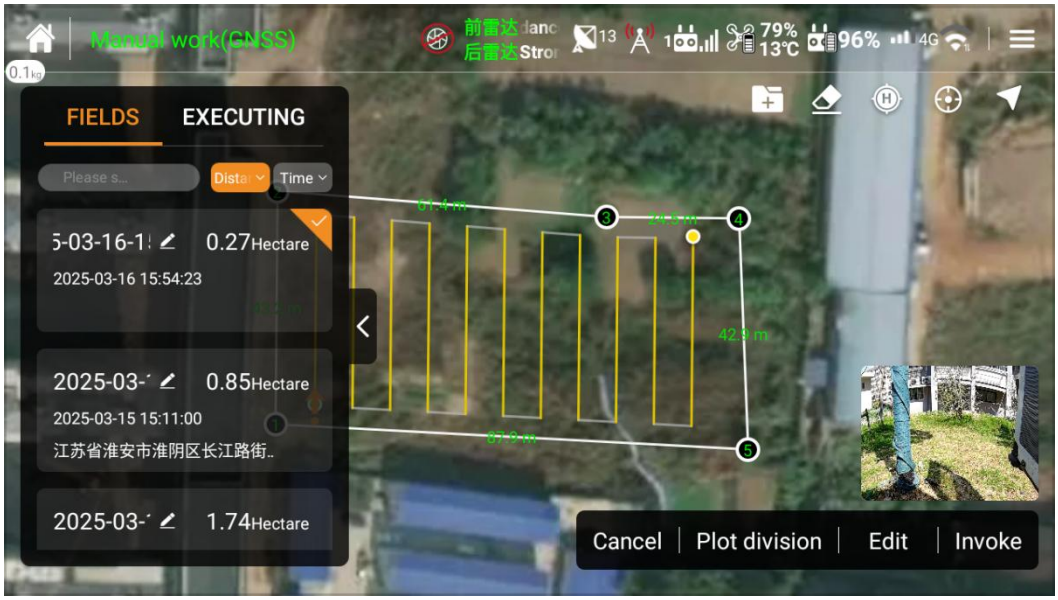
Note:

In AB operation mode, obstacle planning is not allowed, and for plots with obstacles, it is recommended to use the fully autonomous mode to plan the plots before operation.

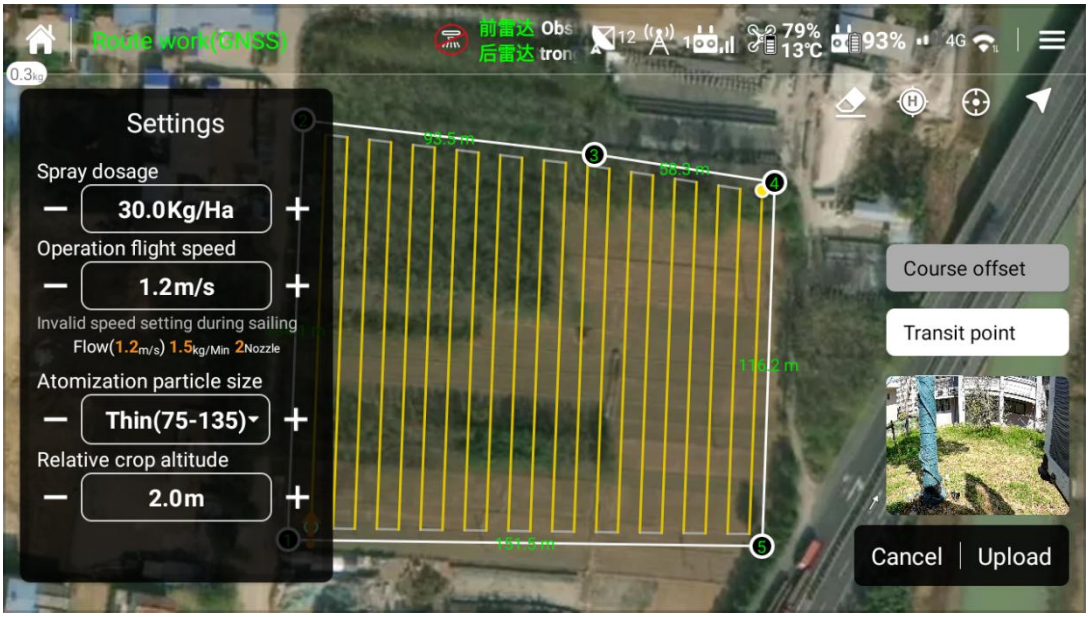
Autonomous Operation Mode

11. Tap 'Start' on homepage of Huida Drone App, to enter the homepage of manual operation;

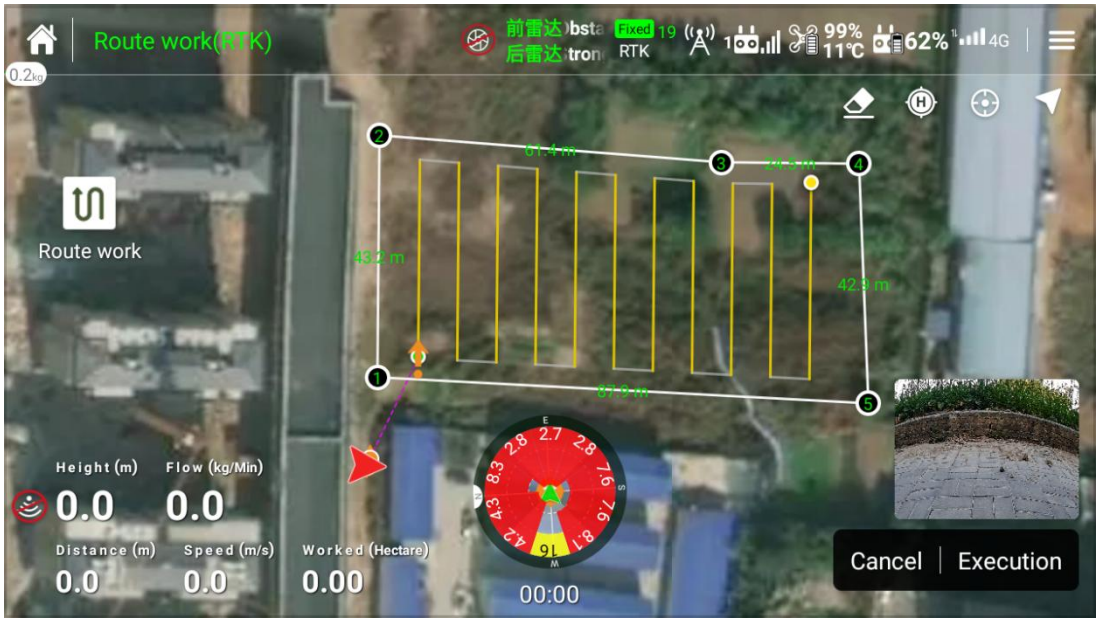
12. Invoke the target plot



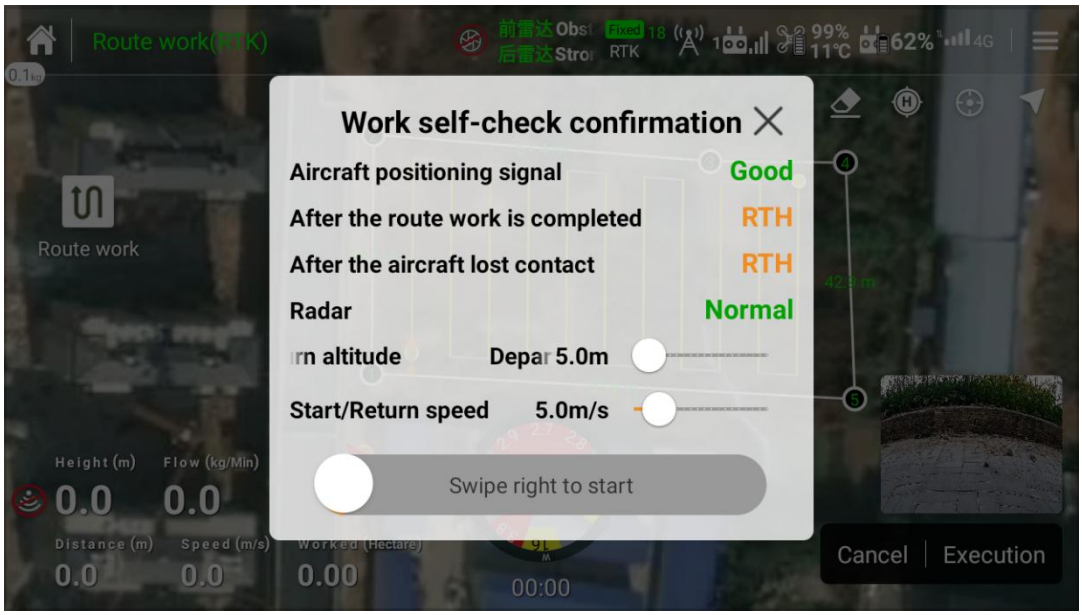
13. After that, the drone will switch itself into fully autonomous operation mode; then set the operation parameters as required.



14. Once the operation parameters are set, tap Upload to synchronise the data between the remote control and the drone, and then tap 'Execution'.



15. After confirming the information in the operation self-check confirmation interface, slide the slider to the right to start the operation along the route.



Autonomous Return-to-Home (RTH) Function

The drone will use the takeoff location as the default home point for return.

Return due to empty agrochemical container: The HD580 agricultural drone supports setting actions when the agrochemical container runs empty. You can choose to hover or return to home. If return to home is selected, the drone will automatically fly back to the home point once the spray is depleted. During the return process, manual takeover is possible at any time via joystick input.

Low battery return: The HD580 supports configuring the drone's behavior when a low battery warning is triggered. You can choose to hover or return to home. If return to home is selected, the drone will automatically return once the low battery alarm is activated. Manual control can be regained during the return flight by moving the joysticks.

Signal loss return: The HD580 supports setting actions when the drone loses connection with the remote control. You can choose to hover or return to home after a disconnection. If return to home is selected, the drone will automatically return after 5 seconds of signal loss. Once the connection is reestablished, the drone can be manually taken over using the joysticks.

Note: If autonomous return is triggered during a fully autonomous operation, the drone can avoid pre-planned obstacles within the field.

One-Key Return: One-key return can be activated by pressing and holding the Return button on the remote controller for 2–3 seconds. Once triggered, the Huida UAV app will display a prompt, and the drone will begin to return automatically. The drone can be manually

taken over at any time during the return process by moving any control stick.

Start Operating Functions

No.	Function	No.	Function
1	Drone Status	14	Remaining Liquid Display
2	Operation Mode	15	Manual Work
3	Radar Status	16	Invoke plot
4	RTK Status	17	Take Off In Place
5	Remote Control Mode	18	Flight Altitude
6	Drone Battery Level & Temperature	19	Terrain Following Radar Switch
7	Remote Control Internal/External Battery Level	20	Instant Flow Rate
8	SIM/Wi-Fi Status	21	Distance to Remote Controller
9	Prescription Map	22	Flight Speed
10	Clear Flight Path	23	Worked Area

No.	Function	No.	Function
11	Launch and recovery site	24	Radar Ball Display
12	Locate Remote Control	25	Camera View (Tap to Enter Full Screen)
13	Switch Direction	26	Operation Settings

Note:

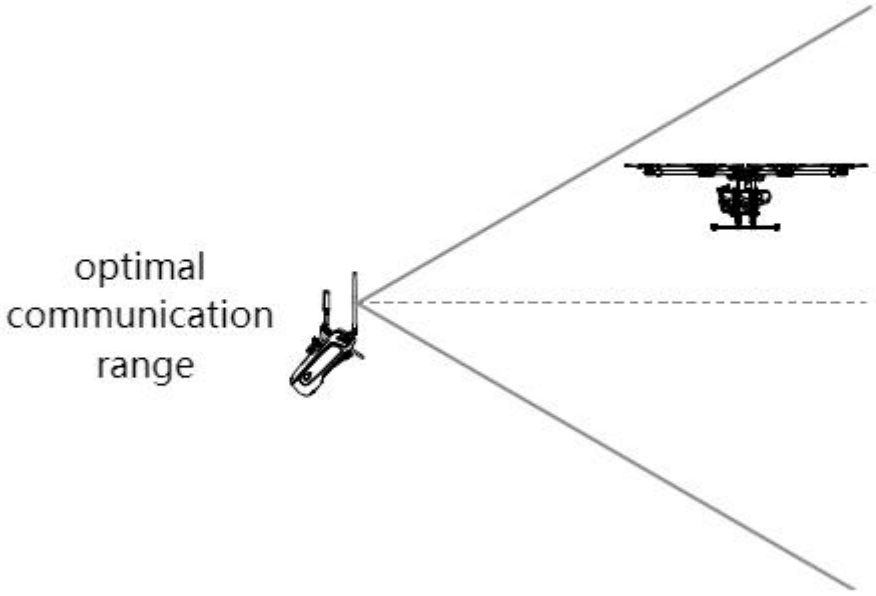
1、Always install the external battery during operation to ensure sufficient power.

2、Antennas must be unfolded: If not unfolded, transmission quality and range will be significantly reduced.

3、Do not point the antennas directly at the drone: The signal is weakest at the tip and base of the antenna. Keep the antennas parallel to the drone (when holding the controller, the antennas should point upward toward the sky).

Strong signal

Weak signal


optimal
communication
range