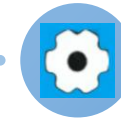# EFT

Z20
Debugging&Inspection Tutorial

(V1.0)

EFT Electronic Technology Co. Ltd.

2024.11

CONTENT

1. Parameters Setting

2. Electronic Devices Inspection

3. Flight Operation Inspection

To ensure smooth operations with the Z20, please refer to this tutorial to complete parameter configuration and device function checks after assembling the drone. (Note:This tutorial provides recommended parameters for general drone operations, which can be adjusted as needed based on actual requirements.)

1. Parameter Setting

Step 1: Turn on the Remote Control and Drone

Note: Before installing the battery, ensure all cable plugs are correctly and tightly connected. After power-on, the motor should make a self-check sound and electric modules should be normal with no shaking, overheating or smoking.

1.Before power-on, check the CAN resistance value according to the pictures. The CANS resistance value is 120Ω. When the FC module and altitude radar are installed, the CANR resistance value is 60Ω.(±3Ω resistance variation is normal.)


3.Insert the battery. Short press, then press and hold for 3 seconds to turn on..(Note: Insert the battery into the drone when it's powered off)

2.Long press the Switch on the remote control to turn it on.

Step 2: Connect the Remote Controller to the Drone

1.Open the H20/G20 APP and click **WIRELESS PARAMETER CONFIGURATION**. It will show "**Not Connected**". Open the front drone cover,long press the receiver **button** on the front PDB until the indicator light flashes. Click **FREQUENCY MATCHING,** after successfully matching, it will display '**Connected**'.
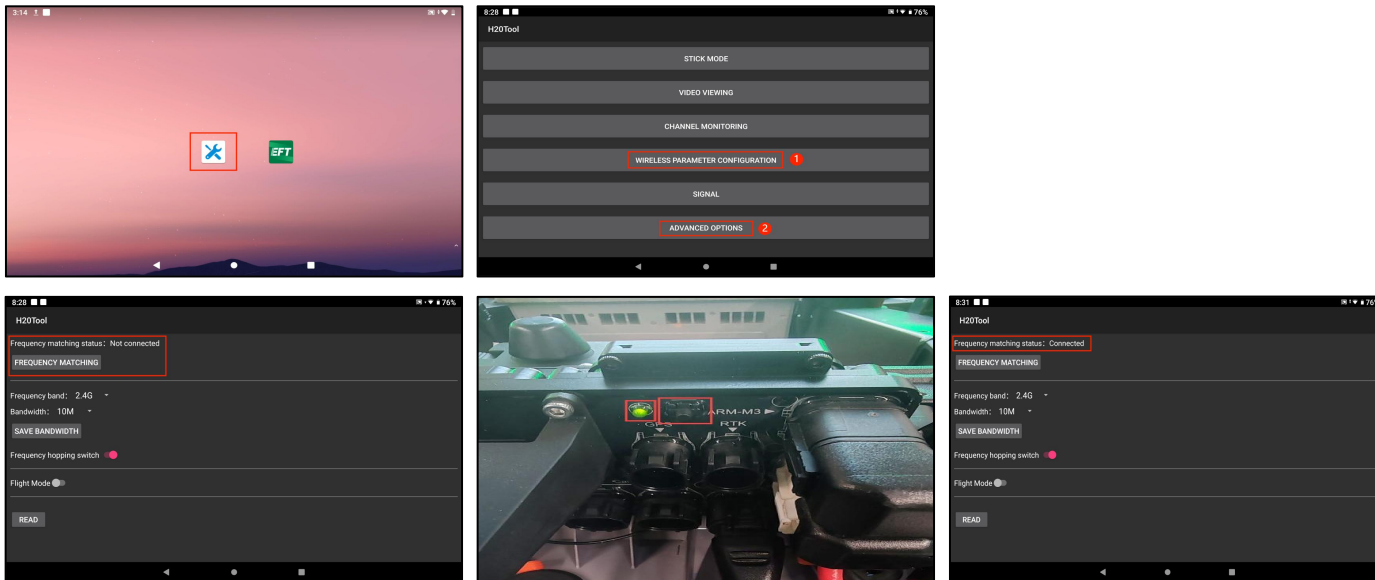
2.Click **ADVANCED OPTIONS,** enter the password 999, click **BAUD RATE SETTING**, set the **UART0 — 115200 ,UART1 — 115200**, then click **SAVE SETTINGS**;
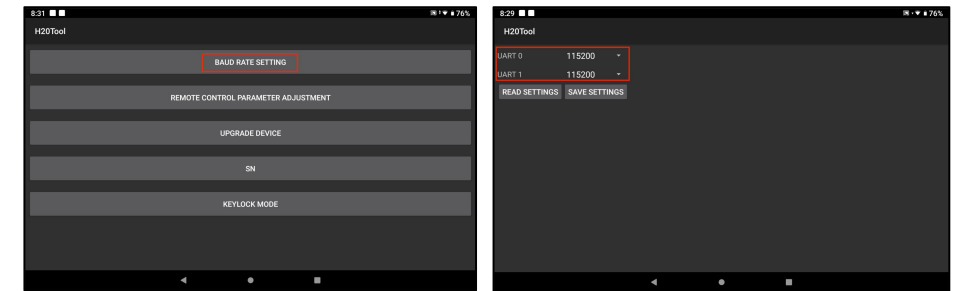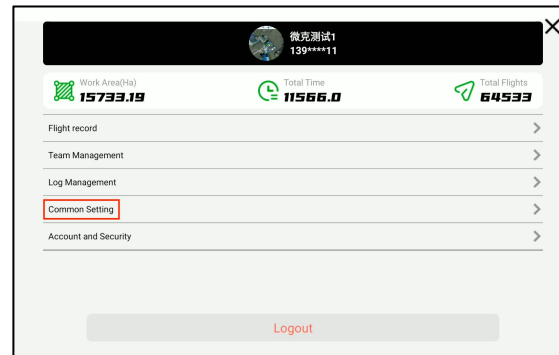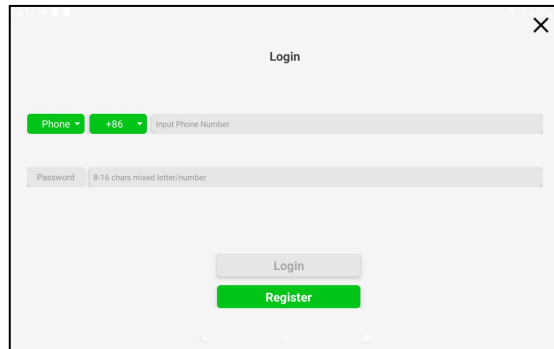

3. Close H20/G20 APP,open EFT APP. The **"Connected"** indicates the remote has been matched with the drone successfully.
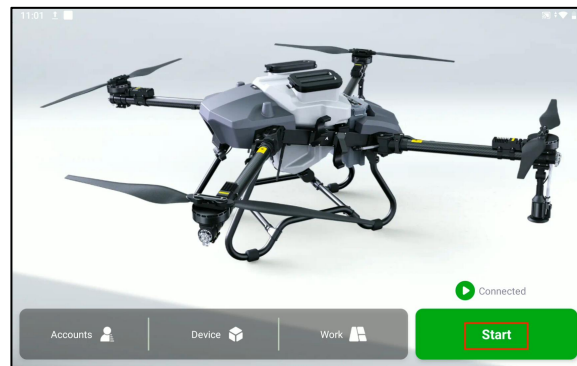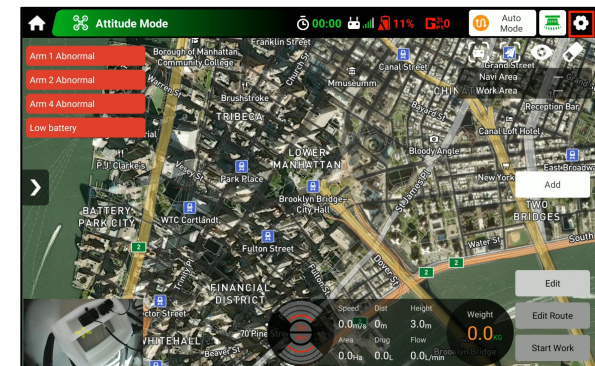
Step 3: Login EFT APP and Select Map Type

1.Click **ACCOUNTS** on the EFT APP, fill in the password and log in. Click "**Common Settings**". Select the **Map Provider** and

Unit Area as needed; (Note: New users need to register account first.)

2. After selecting the map, return to the Home page and click **Start**;

3. Click the **Settings button** ⚙ to set parameters.

Step 4: Controller Parameter Setting

1. Rocker Mode:

The default setting is **Left Throttle**, and pilots can choose Right Throttle,Left Throttle or Rev-left Throttle as needed;

2.H20/G20 Channel settings (Recommendation):

Button	Function
B1	N/A
B2	N/A
H	Home
L1	Obstacle(Ready)
L2	Terrain Follow (Ready)
LIGHT	CentrifugalSwitch (Ready)
PUMP	Pump Switch (OFF)
R1	N/A
R2	N/A
STOP	N/A
SW1	Mode（GPS）
AUX1	Gimbal pitch angle

| Flight (Recommendation)	
Departure/Return Altitude (m)	6m
Departure/Return Speed (m/s)	5m/s
Low Volume Protection	Hover
RC Protection	Home
Done Act.	Hover
Work After Losing Contact	Off
Turn Type	U-Turn
Max Speed Switch	On
Max Speed (m/s)	10
Led Switch	Off
Len Brightness (%)	20
Head Direction	Follow
Sensor Calibration	Magnetic calibration: Calibration is not required when equipped with RTK and only required before the first flight, if no RTK. Hort. calibration: No need as it's been done before delivery.
Arm Sensor	On
Smart Drug Breakpoint	Off
Flight Safety Limit	Fence Radius: 1500m
Flight Safety Limit	Fence Height: 30m
Flight Simulator	Simulator Mode: Off

Step 6: Spraying Setting

1. Switch **ON** the **Spraying System** ;

2. **Nozzle Mode:** Choose **Double Nozzle or Four Nozzle** according to actual number of nozzles ,and in Four Nozzle mode, choose **Auto Double Open** (Keep the two rear nozzles spraying.) or **All Open** (Four nozzles spraying at the same time) according to the operation needs;

3. **Real-time data of the spraying system** : When the drone is spraying, view the real-time data here.

4. **Drug type**: **Flow Meter** is recommended;

5. **Weight calibration**: If there is a significant deviation in the weight data, recalibrate it here

6. **Spray calibration**: When the flow meter or water pump displays data or functions abnormally, recalibrated it here;
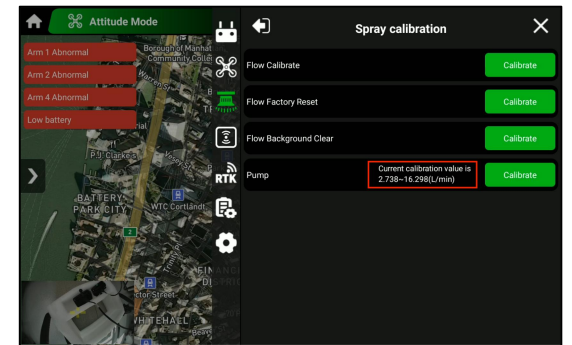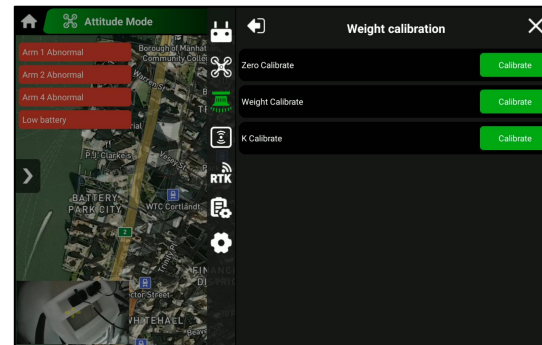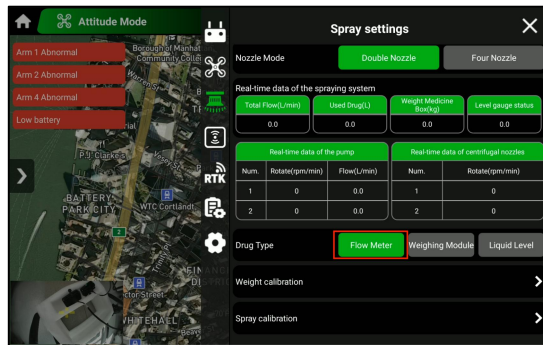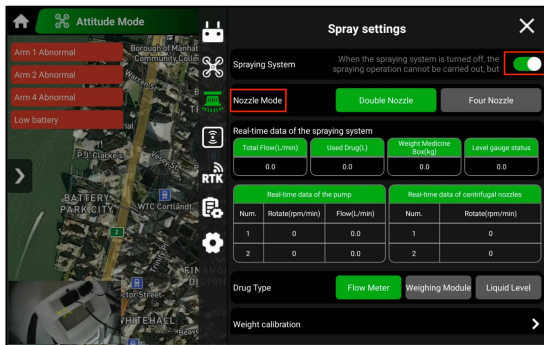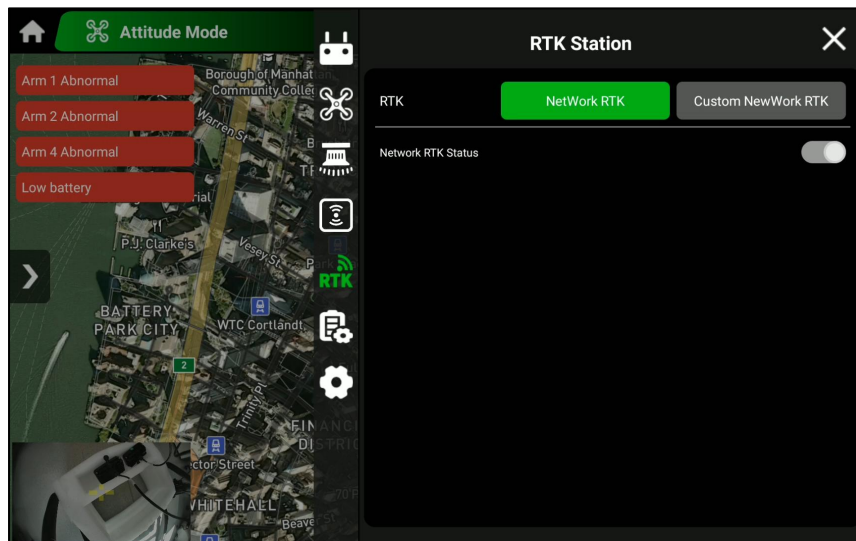
| Radar settings (recommendation)	
Obstacle Radar	On
Terrain Radar	On
Manual Height	On
Obstacle Dist.	10
Obstacle Avoidance Action	Hover
F-Radar Sensitivity	Meddle
B-Radar Sensitivity	Meddle
Radar Sensitivity	Meddle
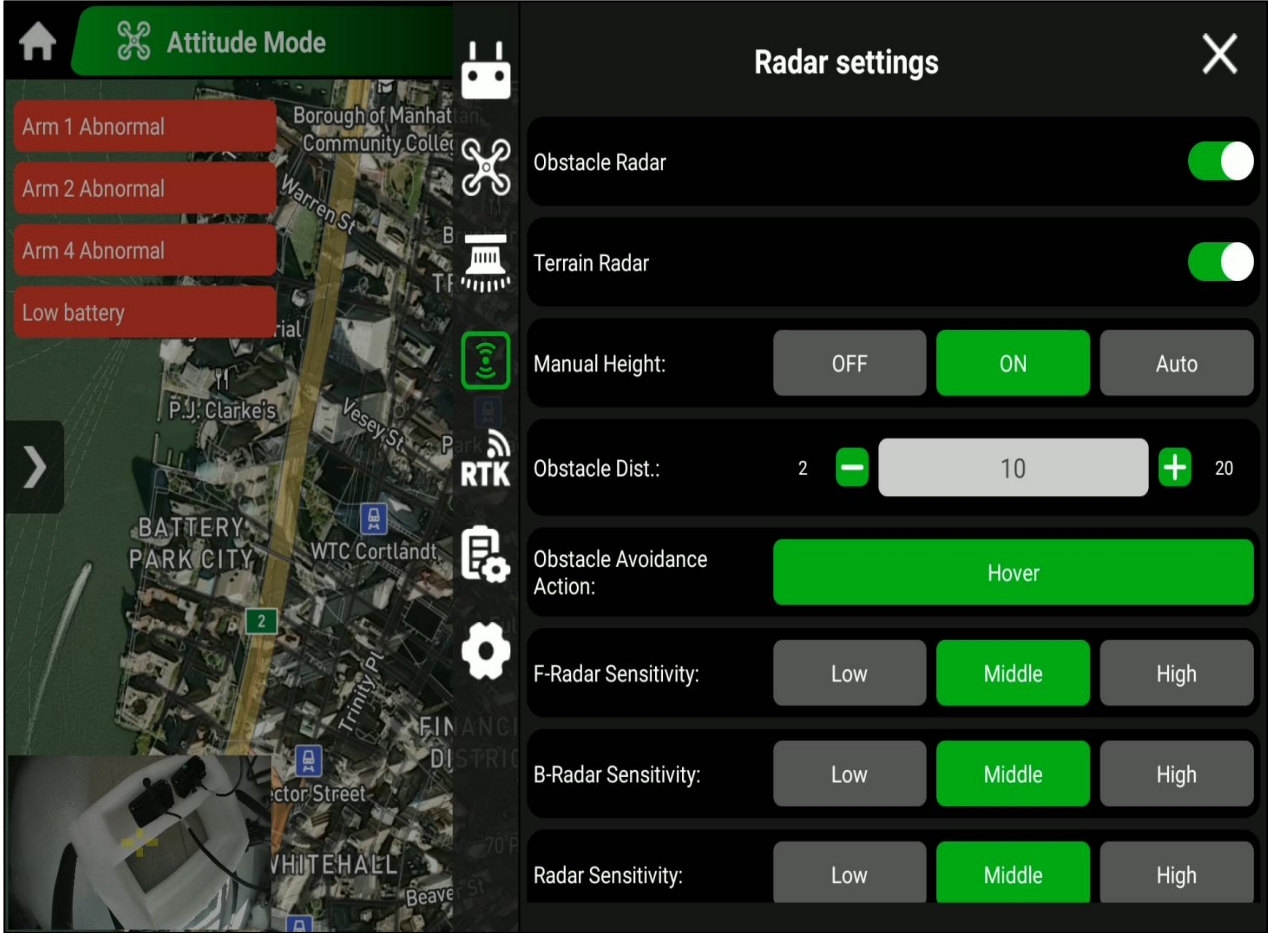
Step 8: RTK Parameter Setting

1. Without RTK, no settings are required;

2. With RTK, open **Network RTK** (for use in China);

3. If using NTRIP, users need to fill in the information in **Custom Network RTK** , then **Confirm** it. (for use outside China)。
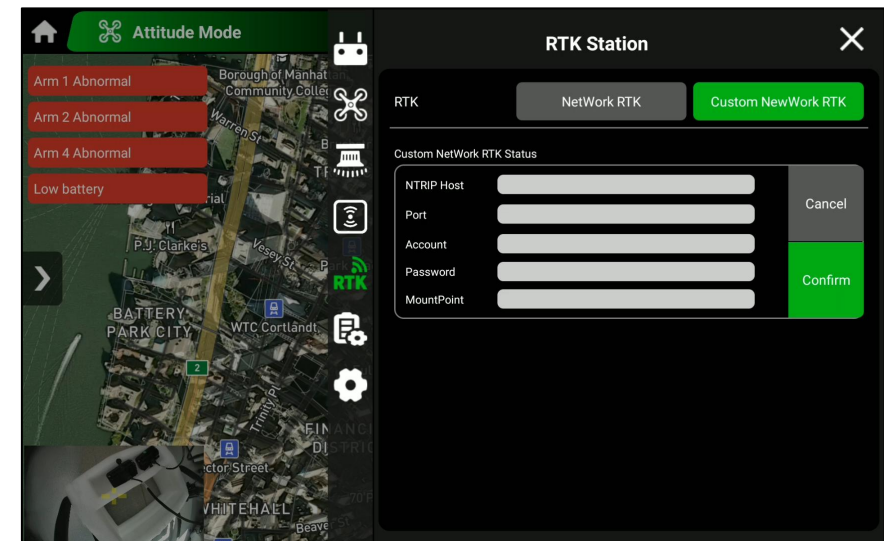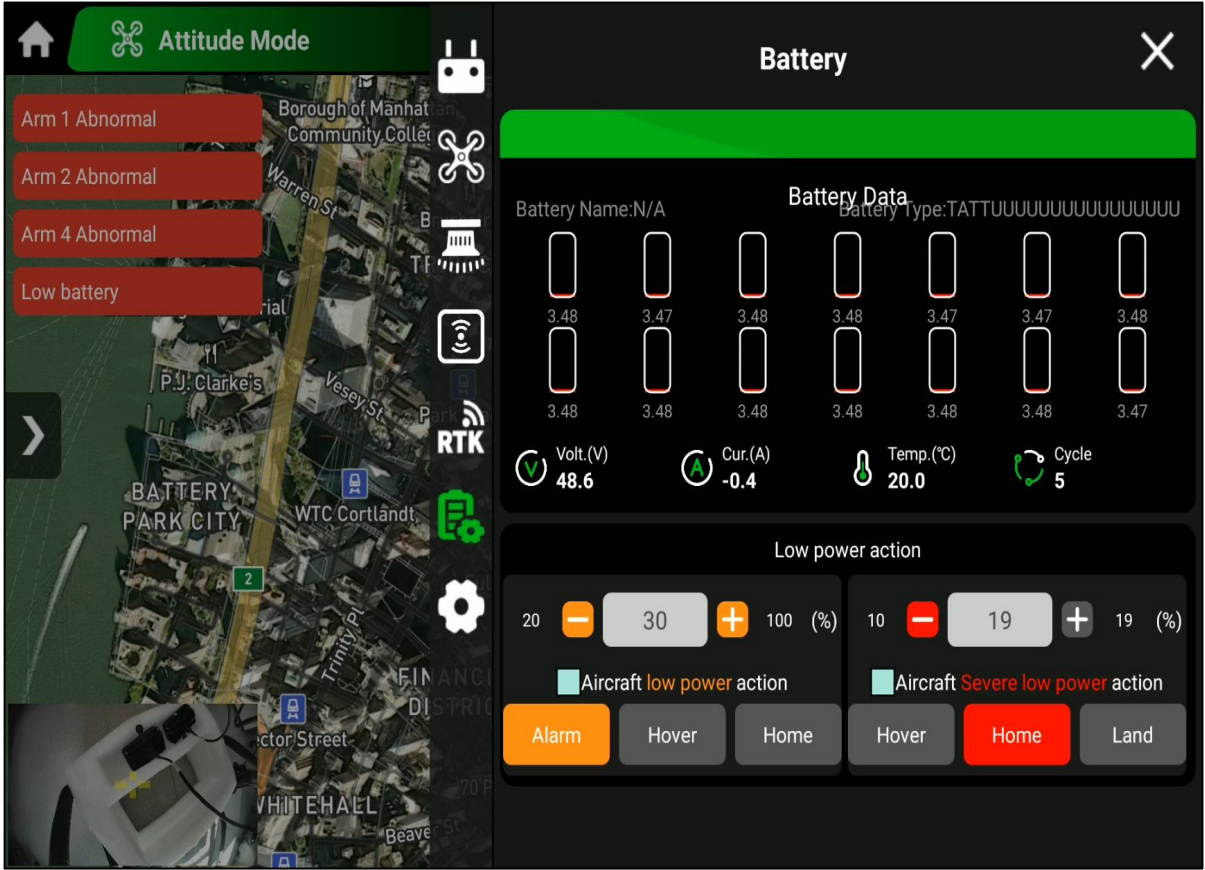
1. **Battery Data:** Check all battery related datas here, including Voltage, Current, Temperature and Cycle.

2、 Low power action：

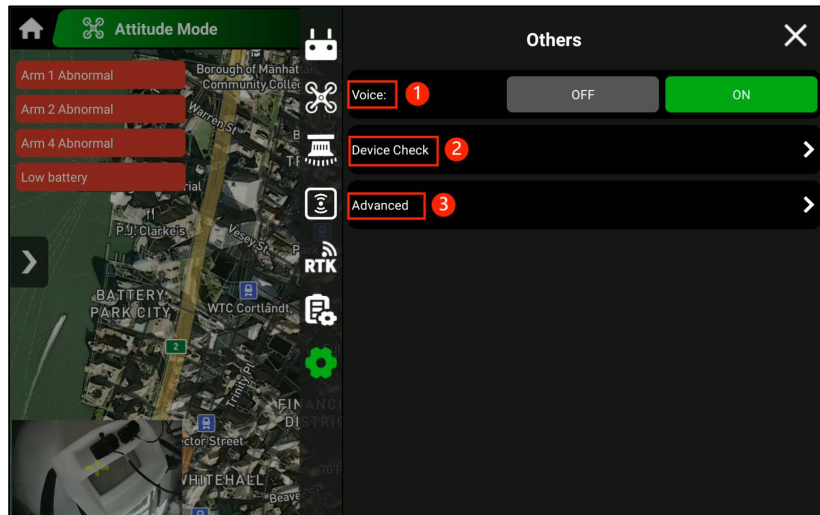|	Level 1 power	30%
Low power action (Recommendation)	Aircraft low power action	Alarm
	Level 2 power	19%
	Aircraft severe low power action	Home

Step 10: Others

1. **Voice :** Switch **ON**, as shown in picture ① ;

2. **Device Check** : Check the Power System, including mode, throttle, voltage, current, temperature, usage time, and speed, as shown in picture ②. Normally, the four motors should all be in PWM mode. If they are in CAN mode, click Settings to reconfigure it to PWM;

3. Seeding System, Spraying System, and Radar System are not open yet ;

4. **Advanced :** Only avaliable for manufacturer account **.** (Note: Unauthorized adjustments are prohibited.For any questions, please contact EFT.)

2. Electronic Devices Inspection

Step 1: GPS, Battery Communication, Camera Inspection

1.After the drone is powered on and connected to the remote, enter the EFT APP to check GPS connection, as ① shown in picture ; (Note: Indoors, the GPS signal will be 0; Satellites can only connect properly in open outdoor area.)

2. Check whether the battery power is displayed in %, as ② shown in picture; (Note: Battery level will display as voltage if communication errors .)

3. Check if the camera image is clear and turn the top-right dial on the remote controller to ensure smooth angle adjustment, as ③ shown in picture.
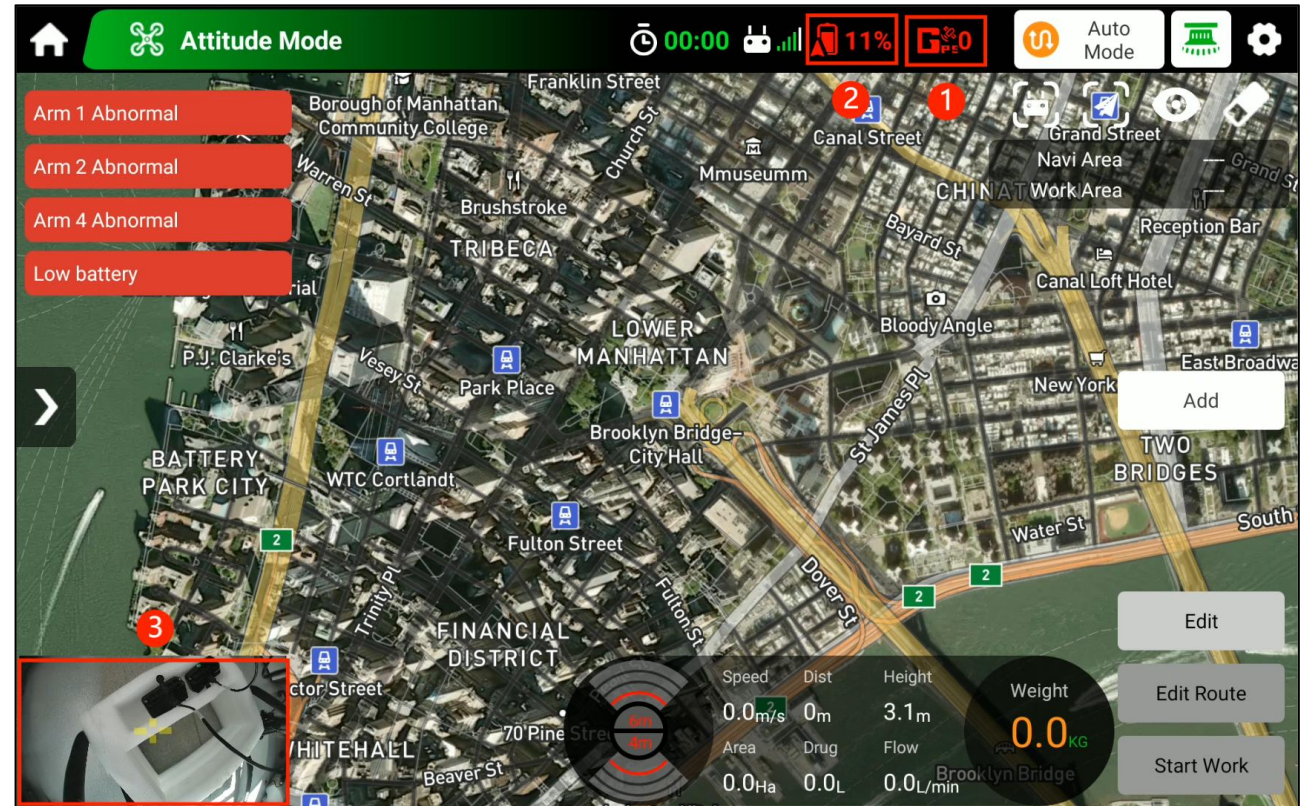
Step 2: Radars Inspection

1.Check if the radar is functioning properly.

Front radar detection distance, as ① shown in

picture .Rear radar detection distance, as ② shown

in picture. The red number is distance between radar

and obstacle.

2. Altitude radar detection distance,as ③ shown in

picture;(Note: altitude radar detection distance must

be greater than 1m)

3. If the radar is obstructed, the data will display as

0m.
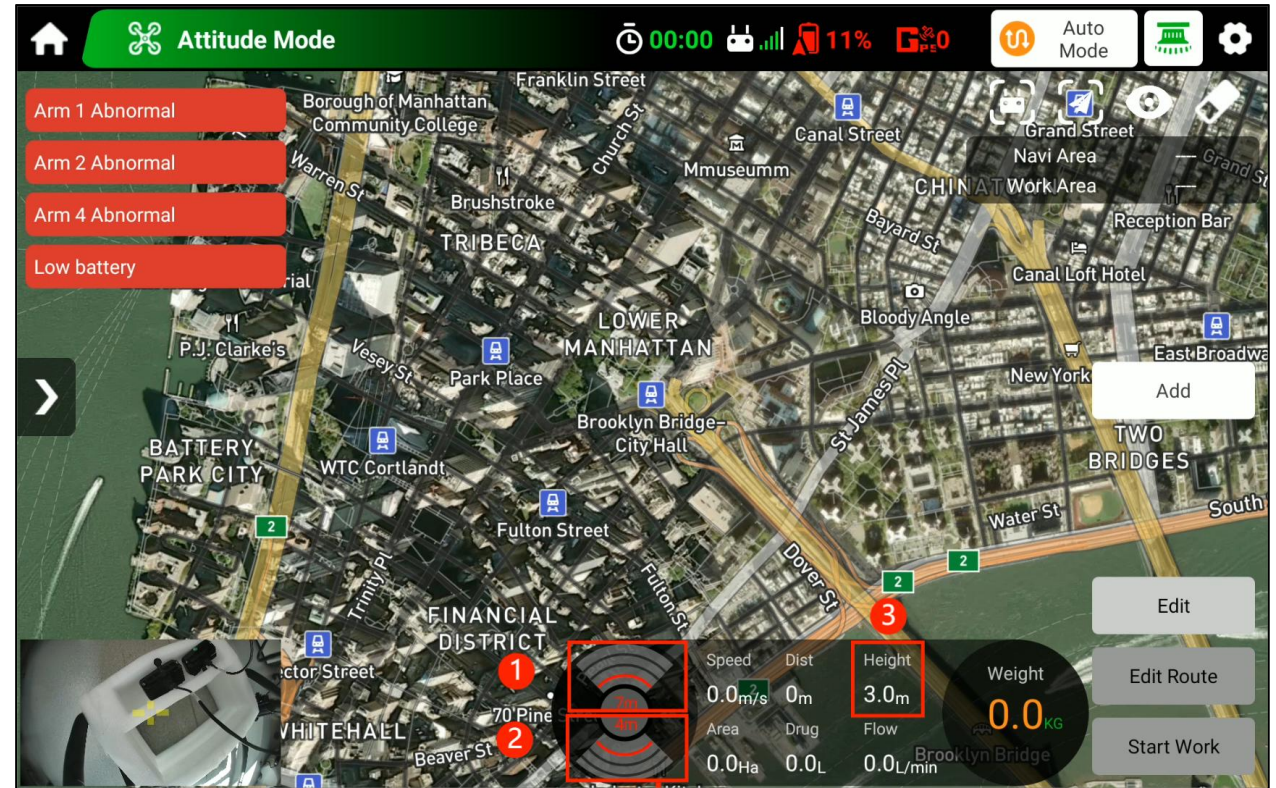
1.In EFT APP, **Settings** ⚙ - **Spray Settings** 🚿 - **Weight calibration**, click **K Calibrate**, as ① in the picture, and check if all the K values same as the numbers on the weighing module. If not, please modify it accordingly;

2.Click **Zero Calibration** as ② in the picture, make sure the tank is empty ,;

3. Return to operation page and check whether the weight is 0; then pour 10Kg water into the tank and check whether the weight is around 10Kg. If the number deviates greatly, recalibration is required, as ③ in the picture.
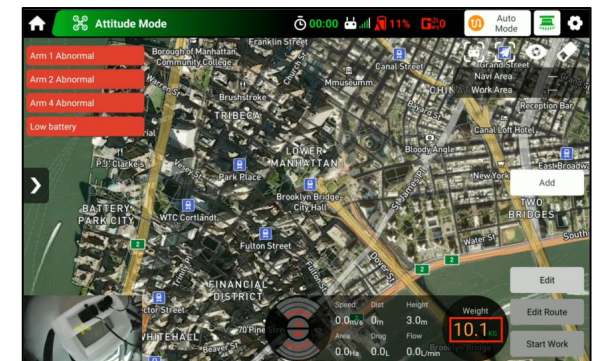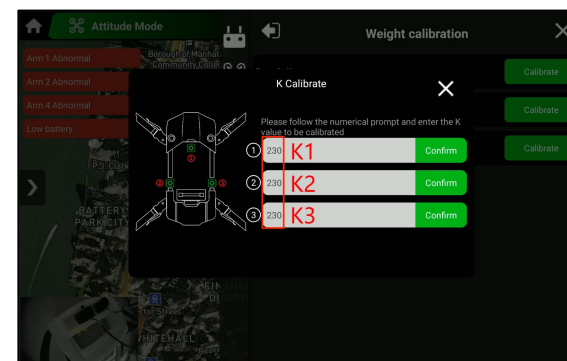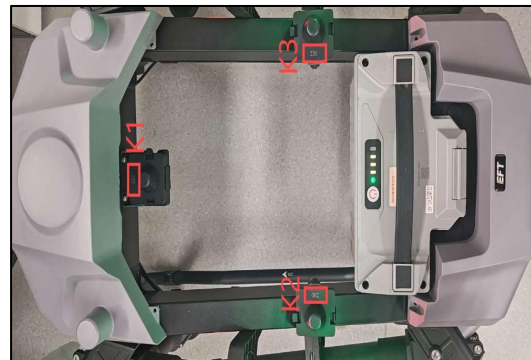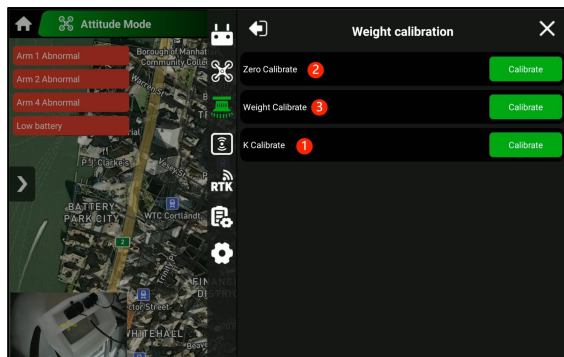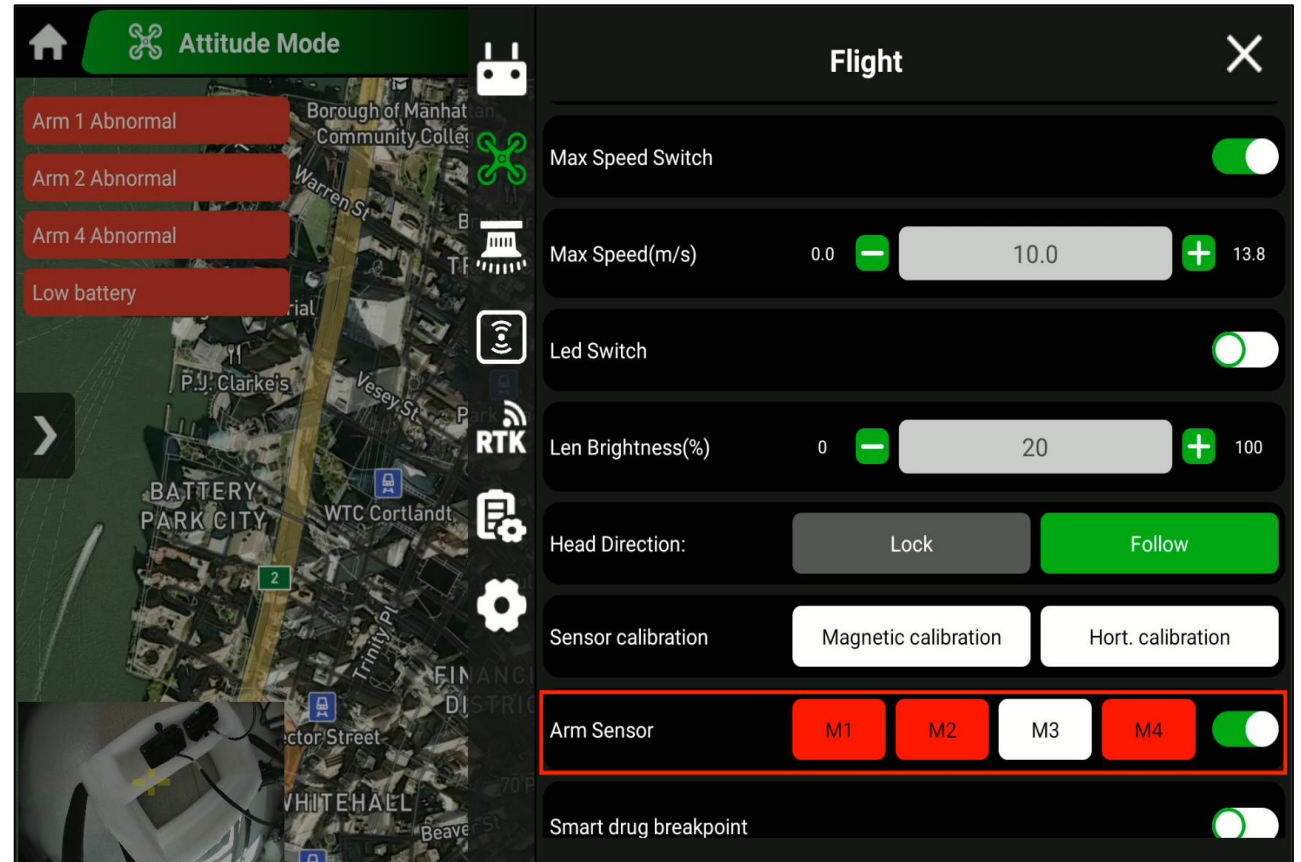
Step 4: Arm Sensors Inspection

1.In the EFT APP settings-Flight-Arm Sensor, turn the switch on.

2.(Note: When arm locks are locked, M1 to M4 are all white; when arm locks are loosened or sensors fail, M1 to M4 are red, and Warnings will appear on page.)

Manually locking or loosening the arm locks to test if the sensors working well .

1.Check if **Rotate (rpm)** is normal, in **Setting** ⚙ -

Spray Settings ⛲ -**Real-time data of the pump**, it

should be 0 if pump is off, as ① in picture ;

2.Check if **Flow (L/min)** is normal, it should be 0

when no water flows through the flow meter, as

② in picture;

3.Check if **Rotate (rpm)** is normal, In Real-time

data of centrifugal nozzles, it should be 0 if the

nozzles are off, as ③ in picture; (Note: If the

water pump, flow meter, and centrifugal nozzle

datas are displayed as" ----", it means CAN devices

fail.)
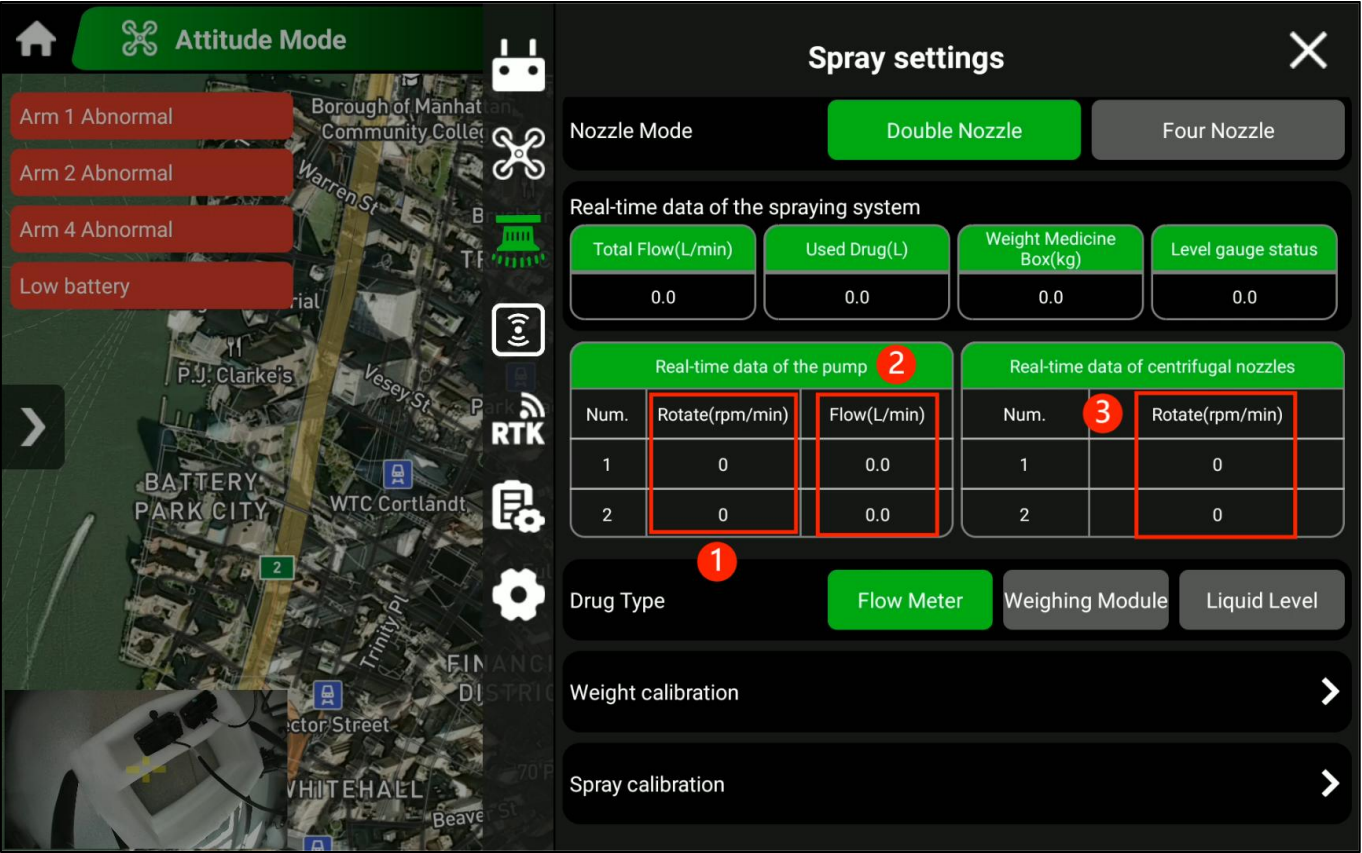
1. Enter **Settings** ⚙ - **Others** ⚙ - Device Check, check the 4 motors in Power System . Please keep a safe distance, then tap **Check** of four motors in turn and inspect the rotation direction, running status, and abnormal noise of the motors;

(Note: When testing indoors, please ensure propellers are not installed. Otherwise , please move to an open area .)

Device Check

Power System	Seeding System	Spraying System	Radar System

	CODE	MODE	THR.	VOLTAGE	CURRENT	TEM.	TIME	SPEED		
M1	8000	PWM	0	48.20	0.00	28	0	0	Settings	Check
M2	8000	PWM	0	48.20	0.00	28	0	0	Settings	Check
M3	8000	PWM	0	48.20	0.00	27	0	0	Settings	Check
M4	8000	PWM	0	48.30	0.00	27	0	0	Settings	Check

3. Flight Operation Inspection

Step 1: Frame Inspection

1.Visually check the screws, components and fittings are properly mounted, no screws missing, and ensure the frame is stable by shaking it manually;

2.Check whether the arm buckles are locked, and ensure buckles is tight when shaken by hand.

3. Check whether the motors and propellers are installed correctly (Note: MI,M3 should be CCW of motors and propelles, M2, M4 should be CW), whether the screws are tight, ensure the motor doesn't move when pushed;

4. Ensure battery is installed tightly and without shaking.

M2 CW   M1 CCW

M3 CCW   M4 CW
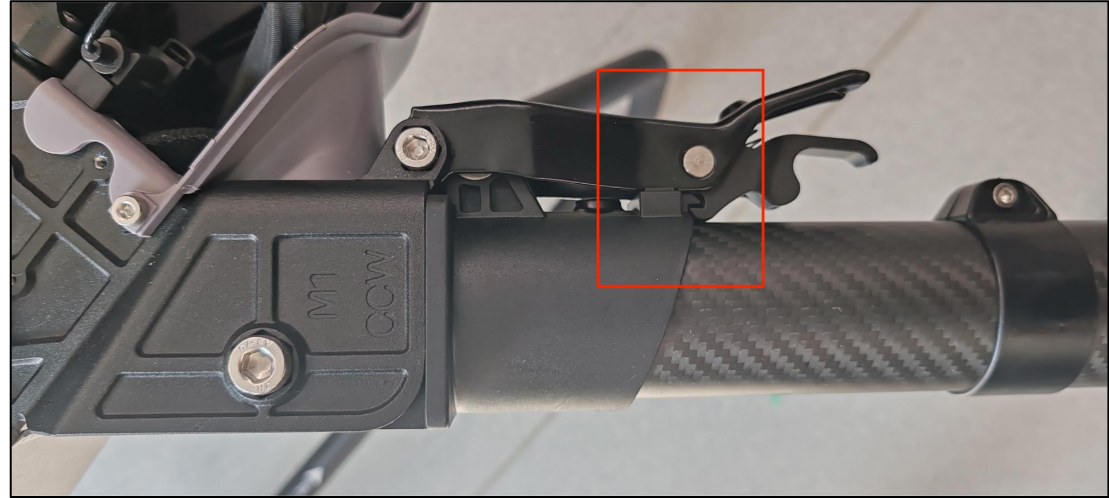
Step 2: Controller Calibration

1. Enter **Settings** ⚙ -**Controller** 🎮 -**Calibrate Controller**;

2. Click **Calibrate** to enter the calibration page;

3. Tap all (except Return) buttons on calibration page twice：first on and then off.

4. Then move the left and right joysticks to the full extent. Repeat this step twice;

5. After completing all the above actions, click **Confirm**.

(Note: For the first takeoff, the remote controller needs to be calibrated.)
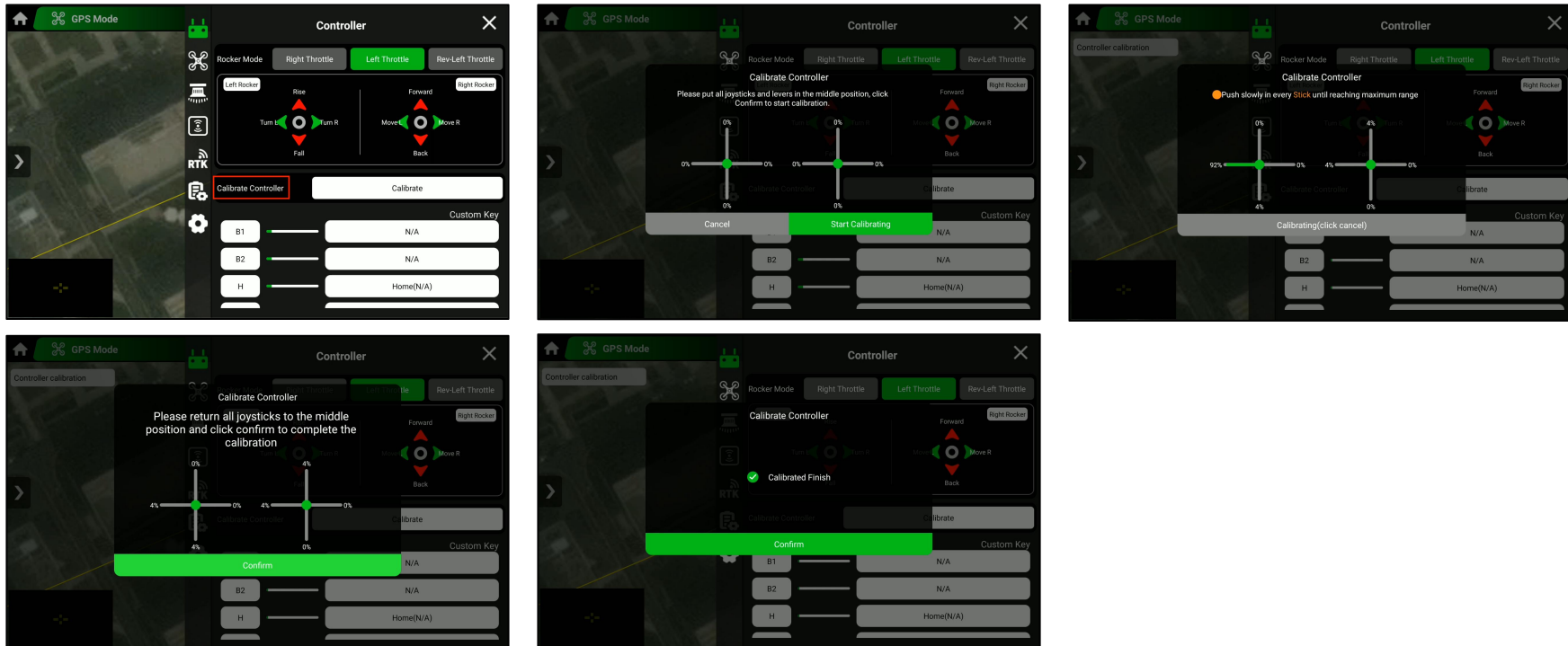
Step 3: Magnetic Calibration

1. Enter **Settings** ⚙ -**Flight** ✖ -**Sensor calibration;**

2. Click **Magnetic calibration—Start Calibrating;**

3. According to the prompts, Lift the drone by two people and perform horizontal calibration first;

4. After completion, perform vertical calibration, ensure drone head is facing downward;

5. When the page shows **Calibration Finished**, place the drone on the ground and **Confirm**;

6. After the magnetic calibration is completed, Please power off ,then restart it for normal operation.
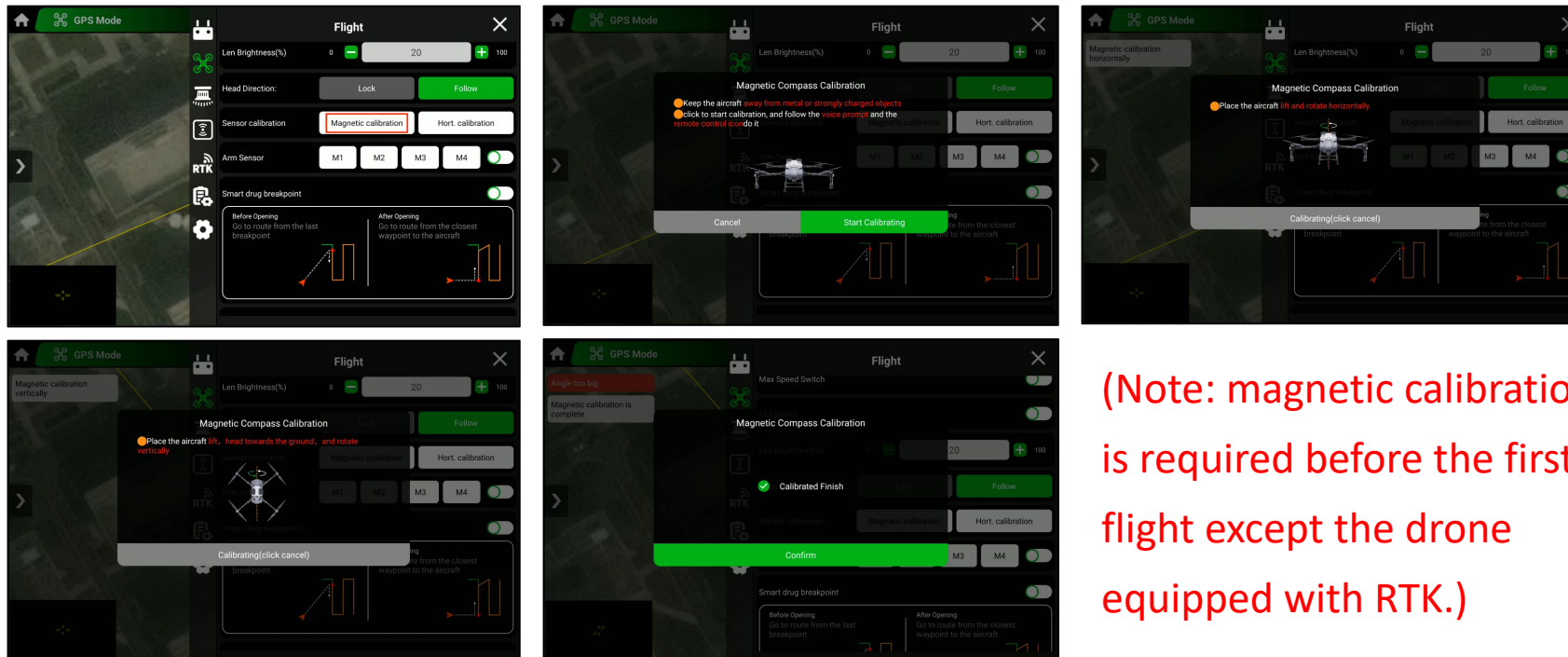
(Note: magnetic calibration is required before the first flight except the drone equipped with RTK.)

Step 4: Pump Calibration

1. Before pump calibration, pour more than 20 kg of water into the tank;

2. Enter **Settings** ⚙ -**Spray settings** 🚿 , tap **Double Nozzle**, click Spray calibration to calibrate pump;

3. Manually open the pump to exhaust the air in water hoses ;

4. Then tap **Calibrate** to start automatic calibration. Do not press the tank during the calibration;

5. Until the **Calibrated Finish** , then **Confirm**.

6. Close the APP and reopen it to check whether pump calibration values are within the normal range.

(Note: Pump calibration is required before the first flight. In Double Nozzle mode, the normal range of min flow rate is 1 - 5L/min and the normal range of max flow rate is 14 - 18L/min)
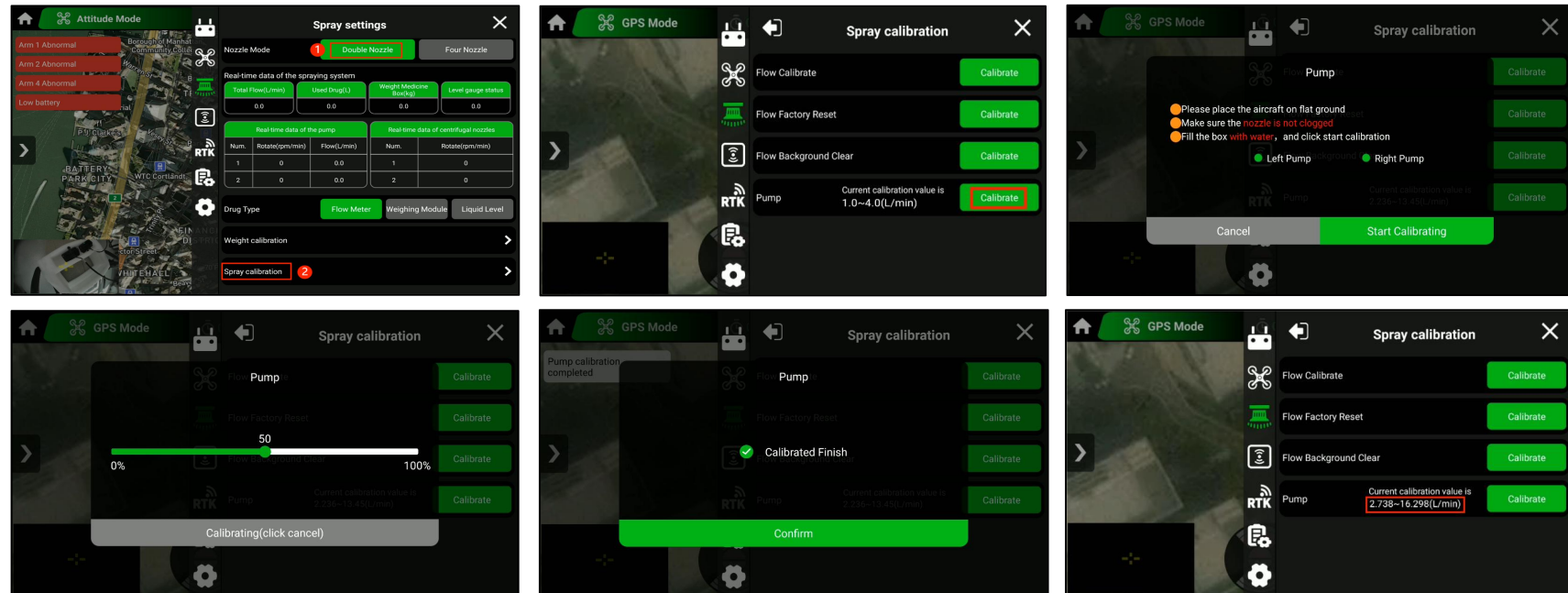
Step 4: Pre-flight Inspection

1. Make sure the drone flight mode is GPS;

2. Check the battery power. It is recommended to use a fully charged battery for flight testing;

3. Check the number of GPS satellites. In normal, the number should be greater than 20.

4. Make sure the arrow direction on APP map matches the drone head direction.

5. Ensure the Roker mode matches actual use (the default mode is Left Throttle);

6. After all parameter settings are confirmed, unlock the drone for flight test. The remote joysticks can be unlocked in both inward and outward turn as picture.

Step 5: Flight Test (with no load)

1.**Takeoff test:** Slowly push the left roker up (Left Throttle mode) to take off the drone slowly and stably and fly 2m above the ground. Then slowly push the right roker up and the drone will slowly fly forward.

2.**Hovering test:** When the drone fly to a safe area ,Keep Hovering-visually observe its altitude and positioning status. Then check the motors data in App according to the environment (3-5M flight height is recommended);

3. **Rocker test:** Test the roker operations separately, for left and right flight, forward and backward flight, turning, half throttle, full throttle, and observe the drone's response speed and stability;

4. **Flight test:** Please do flight tests according to the on-site conditions to observe the flight stability. Pay attention tothe battery power changes.

Step 6: Flight Test (with full load)

1.**Takeoff test:** Slowly push the left roker up (Left Throttle mode) to take off the drone slowly and stably and fly 2m above the ground. Then slowly push the right roker up and the drone will slowly fly forward.

2.**Hovering test:** When the drone fly to a safe area ,Keep Hovering-visually observe its altitude and positioning status. Then check the motors data in App according to the environment (3-5M flight height is recommended);

3. **Rocker test:** Test the roker operations separately, for left and right flight, forward and backward flight, turning, half throttle, full throttle, and observe the drone's response speed and stability;

4. **Flight test:** Please do flight tests according to the on-site conditions to observe the flight stability. Pay attention tothe battery power changes.
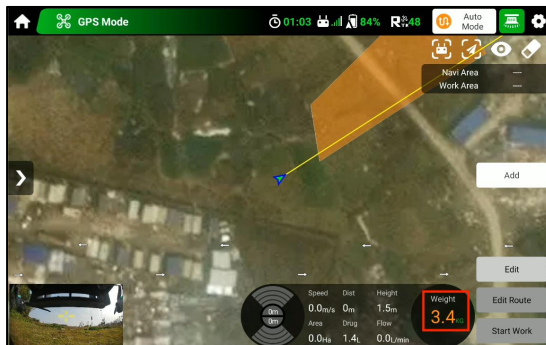
Step 7: Devices Feedback Tech

1. Camera images: During flight or hovering, check whether the image transmission in the EFT APP is clear, smooth without delay ;
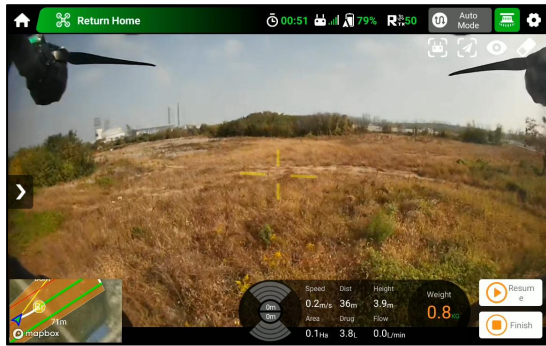
3. Weight data: During flight or hovering , check whether the weighing data is accurate without large fluctuation .
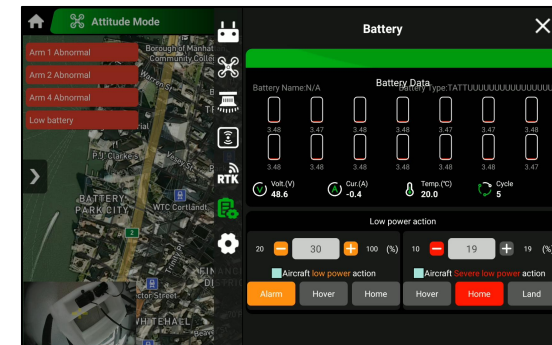

2.Radar data: During flight or hovering, check whether the front, rear, and altitude radar detection distances are normal and displayed accurately.
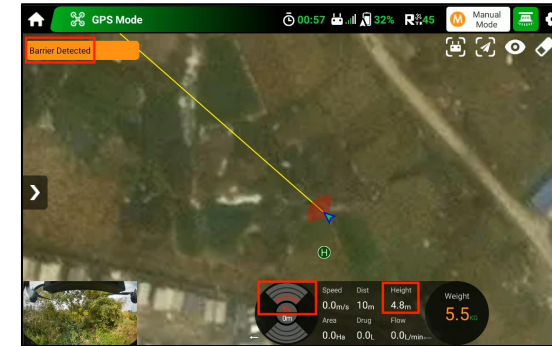

4. Receiver signal: The control distance in an open area shall be ≥ 1500m;

5. Battery data: Check if the battery power and the voltage of each cell are steadily decreasing without large fluctuation.

Step 8: Manual Mode Test

1.Tap **Start -** select **Manual Mode**, tap to expand **Work Parameters** ❯ . Select **Fixed** or **Dynamic** , then set spraying parameters, or directly call the saved operation template.

2.**Fixed:** Set the Spray （L/min）, Nozzle speed (%) and Max speed (m/s) here. When the drone flies to the operation area, just turn on the switch,and the pump and nozzles will keep spraying as settings.

3.**Dynamic:** Set the Spray quantity (L/ha), Nozzle speed (%) and Max speed here. When the drone flies to the operation area, Open the pump and nozzles ,the drone will spray while flying and auto-shutoff when the drone stops;(Note: This mode is suitable irregular areas or small plots.)
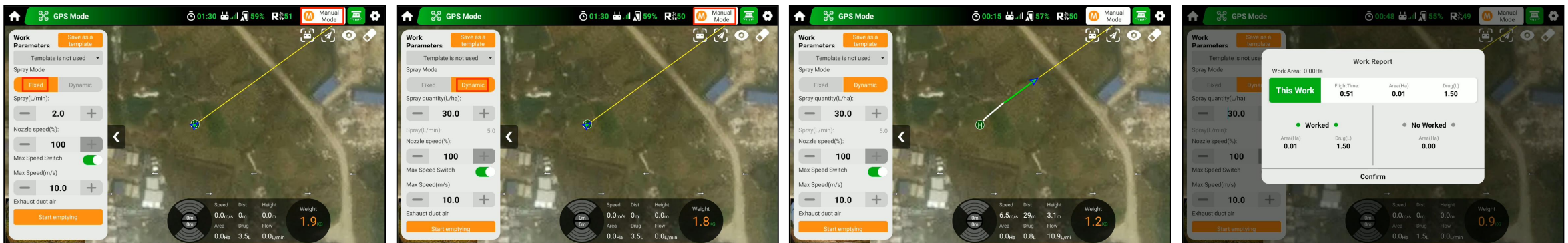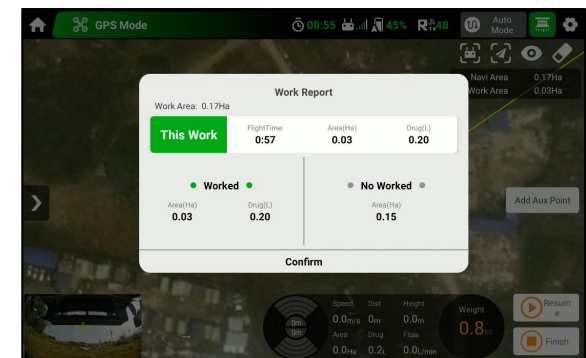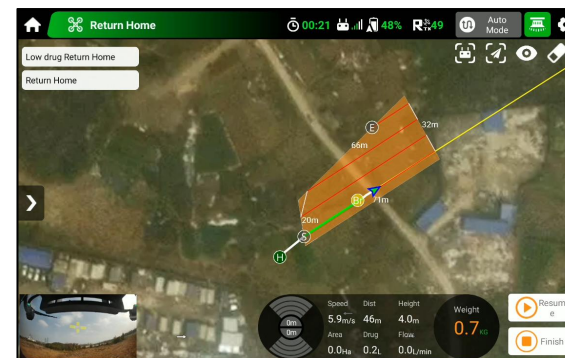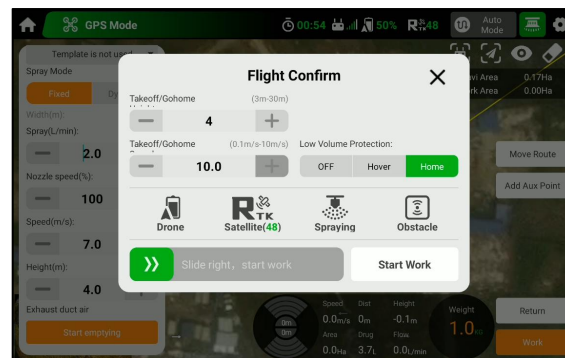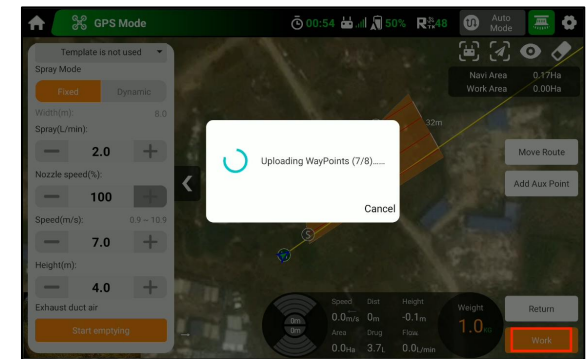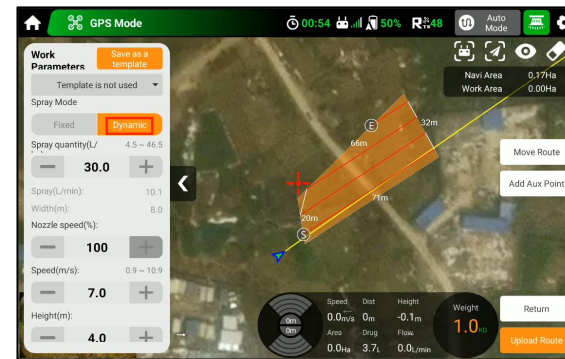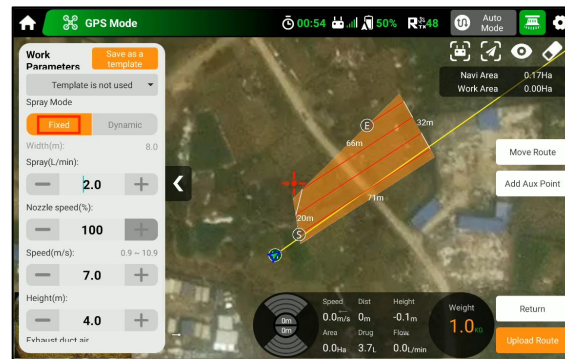
1. In EFT APP,select **Auto Mode** ;

2. Before operation, tap **Add** to build a new block areaor call the saved block area. After choosing the block, click **Edit Route** and the

Route Parameters bar appears left;

3. According to the actual needs,set **Width(m), Obstacle Safe Dist.(m), Safe Dist.(m),Set Start Point and Plant Type,** and then click **Save**.

Enter the parameter page and select **Fixed or Dynamic** , and then set parameters or call the saved template.
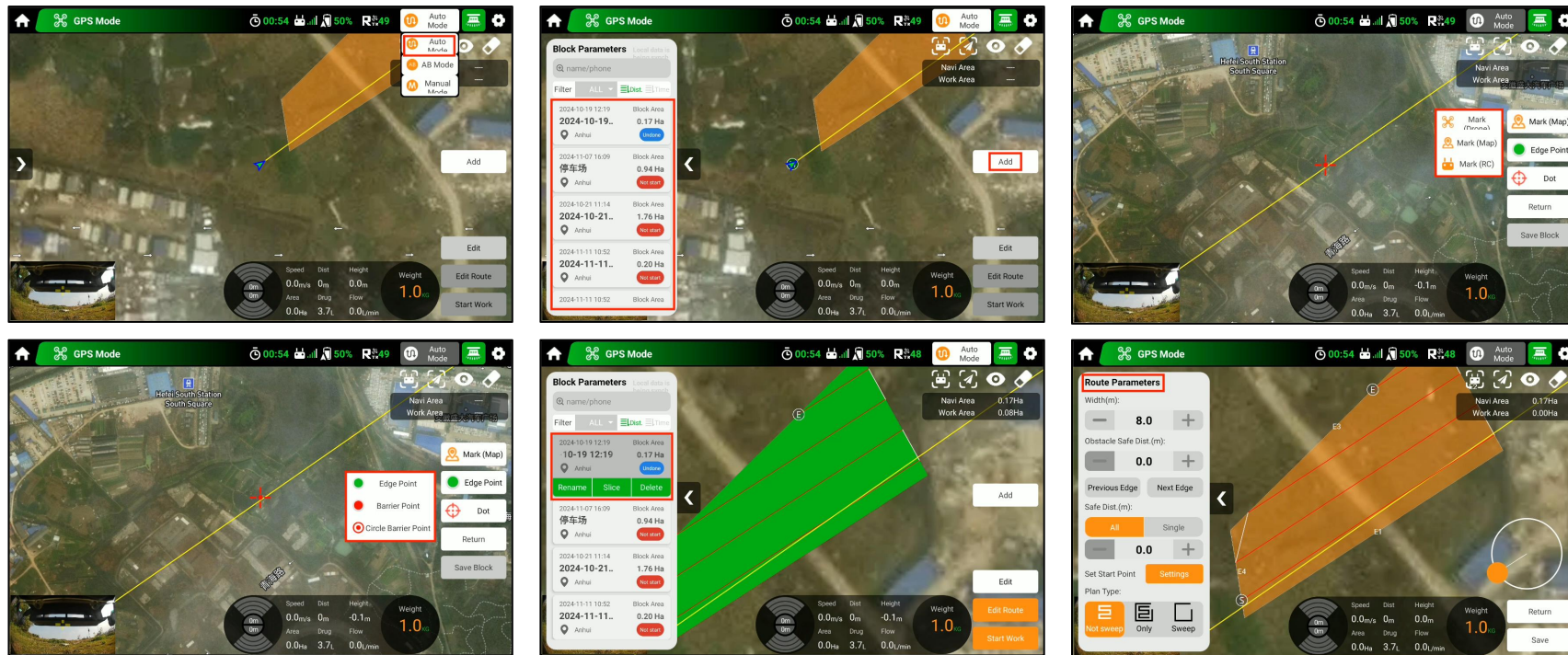
4.**Fixed mode:** Set the **Spray （L/min）, Nozzle speed (%) ,Speed (m/s) and Height (m)** here, then click **Start emptying** to exhaust duct air. Click **Work** to Uploading WayPoints. Then slide to Start Work, automatically or manully fly to the starting point to operate;

5.**Dynamic mode:** Set the **Spray quantity (L/ha), Nozzle speed (%) ， Speed （m/s) and Height (m)** here.then click **Start emptying** to exhaust duct air. Click **Work** to Uploading WayPoints. Then slide to Start Work, automatically or manully fly to the starting point to operate;

6. Check whether the spraying data is accurate after the operation.

(Note: If there are obvious obstacles such as trees or poles in the operation area, please set Barrier Point before flight.)
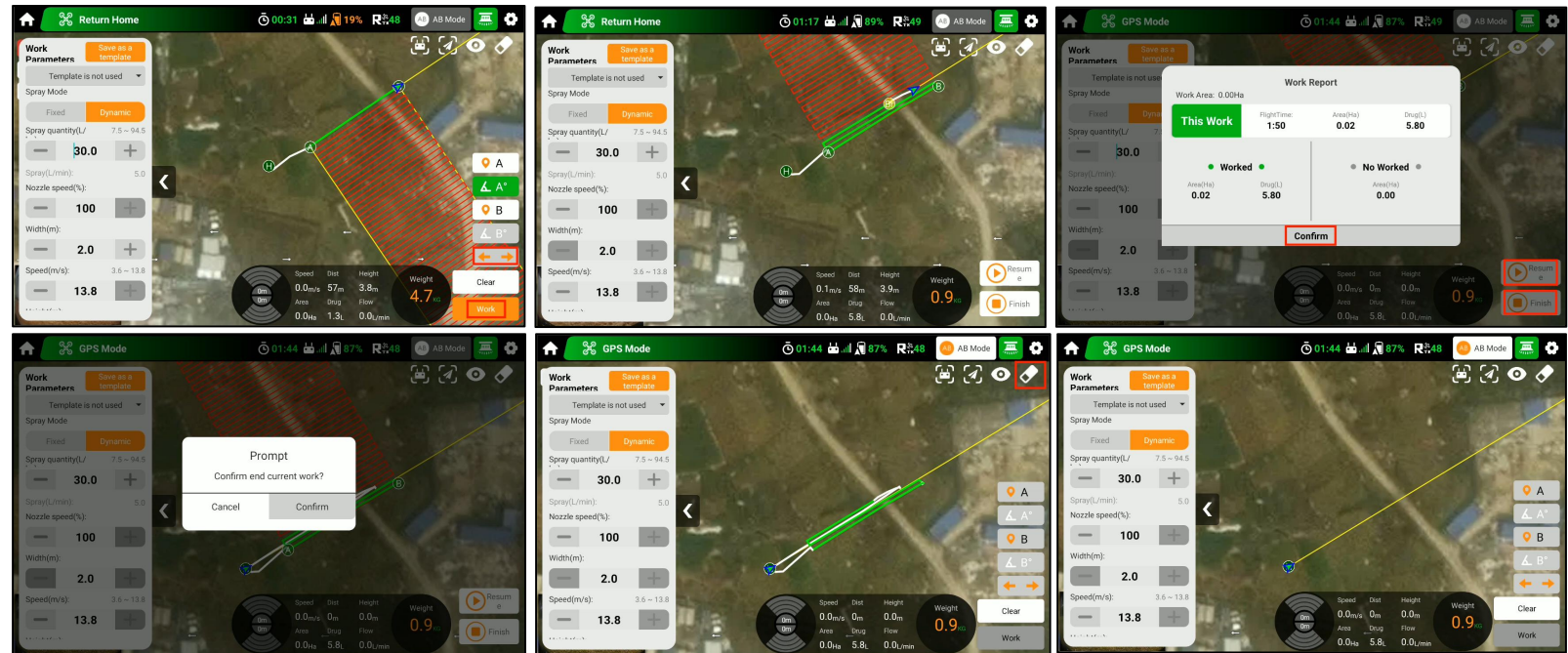
1.In EFT APP, select **Auto Mode**;

2.Expand **Work Parameters** ❯ on the left. Select **Fixed or Dynamic** for Spray Mode, and then set the parameters or call the saved template.

3. **Fixed mode**: set **Spray （L/min）, Nozzle speed (%) ,Width (m), Speed (m/s) and Height (m)** ;

4. **Dynamic mode**: set **Spray quantity (L/ha), Nozzle speed (%) ,Width (m), Speed (m/s) and Height (m)** ;

5. After selecting the mode, then click **Start emptying** to exhaust duct air.

6. Then fly the drone manually to the block starting point and hovering, clicks A on the APP, an A appearing on the map means point A is marked. Then fly the drone to the other end of the plot and hovering, click B to mark point B .
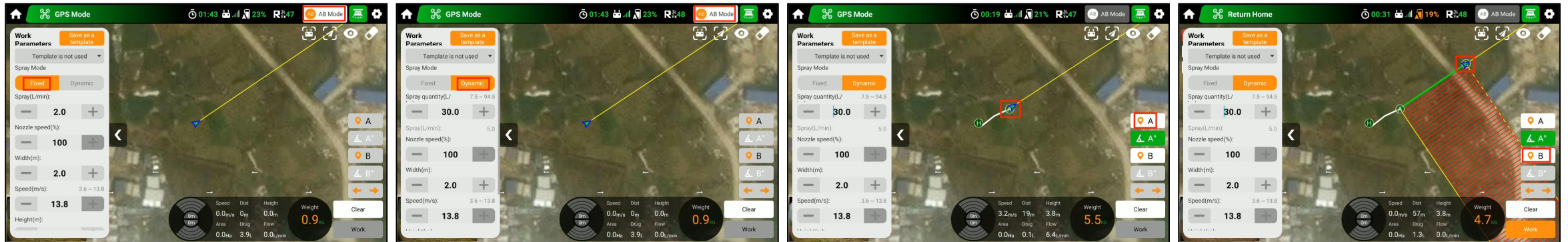
7. After marking A and B, the flight route will be generated automatically . Click ⬅️ ➡️ to switch direction and set the right routes as needed.

8. After confirming the route, click **Work** and slide to start work. The drone will spray automatically along the routes.

9. After a single spray flight, the APP will display operation data. Check if data is correct then **Confirm,** then tap **Resume or Finishe** according to needs. If completed, **Confirm end current work** ;

10. After operation is finished, click the 🧽 to delete the AB route.

Note: 1. The drone will spray automatically according to the set parameters while flying A to B.

2.If the block is a triangle or trapezoid, A and B angles can be adjusted as needed. Note that the angle should be adjusted after marking A or B.

3. AB mode is suitable for large, regular fields without obstacles.

Thanks