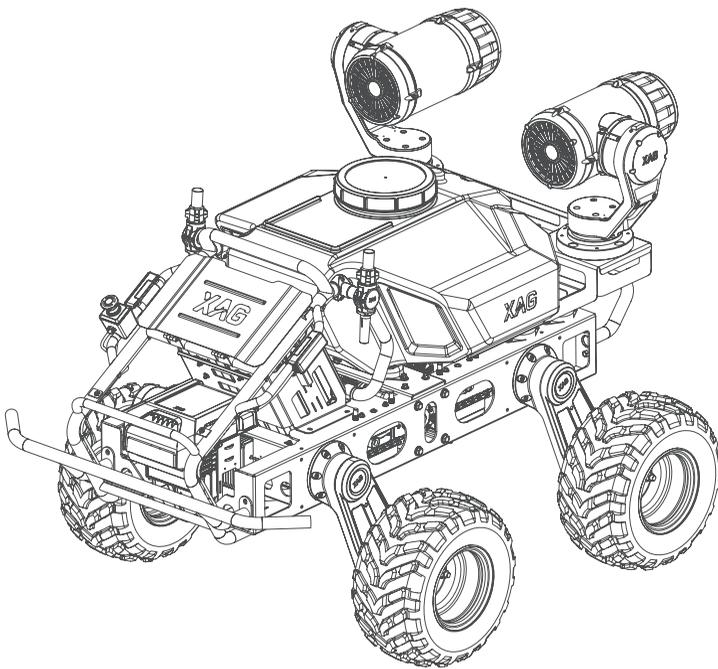


R150

Unmanned Ground Vehicle (Spray Version)

User Manual

Version 1.0 **EN**



To Users

Hi there. Thank you for choosing XAG products.

For safety reasons and the best experience possible, XAG recommends that you read the User Manual and Disclaimer contained in this document before attempting to use the R150 Unmanned Ground Vehicle.



Click to View

See the Contents below for a quick overview of this document. While browsing the digital version, clicking on each title will redirect you to the corresponding page.

Contact Us

If you have any questions about this document, please contact our Technical Support team via email: info@xa.com

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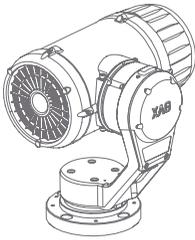
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Product Profile

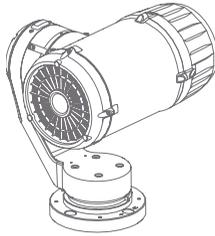
XAG R150 Agricultural Unmanned Vehicle (R150) is intended for next generation farming with concise modular design, robust on-board carrier, powerful scalability, and multiple operation modes. When equipped with the XAG JetSprayer™ System, XIoT™ Agriculture IoT System, or other smart agriculture options, the R150 can offer a wide range of services from precision crop protection, field scouting to on-farm material delivery. By delivering industry-leading autonomous solutions that lead to better operating performance and higher operating efficiency, XAG is committed to moving beyond business success alone and bring benefits to both the environment and society.

List of Items

Please check carefully to ensure that this package contains all the items listed below. Contact your dealer if there are any missing items.



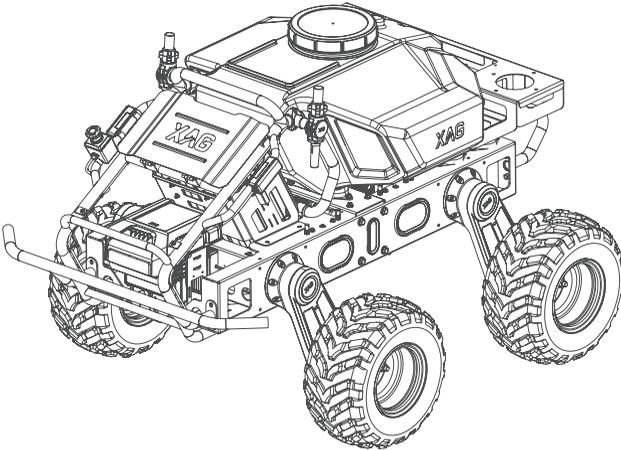
Jet Sprayer with Pan Tilt (Left)
×1



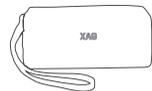
Jet Sprayer with Pan Tilt (Right)
×1



ACS2 ControlStick + RTK
×1



Vehicle
×1



Tool Kit
×1

About the R150 Unmanned Ground Vehicle

Structure

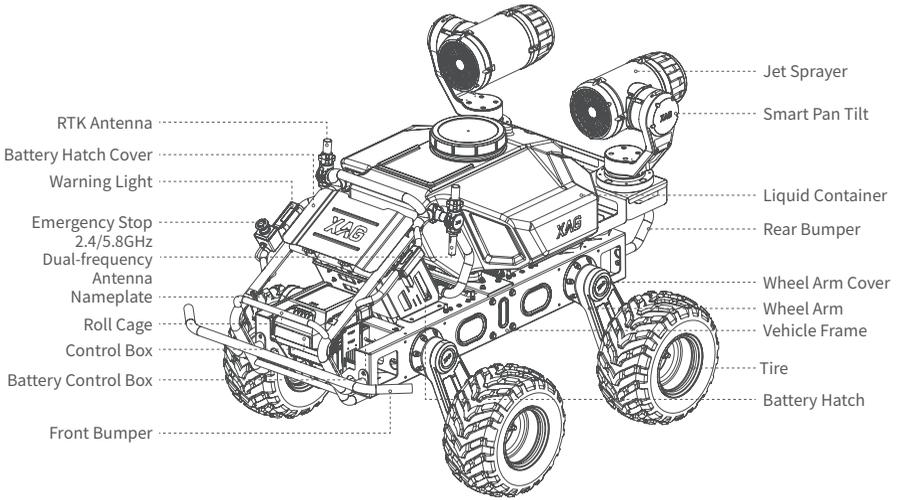


Figure 1: Vehicle Module Structure

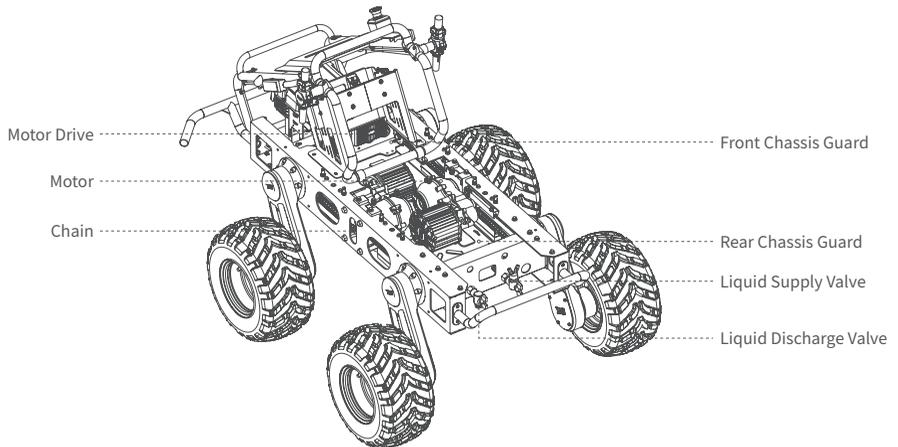


Figure 2: Frame Module Structure

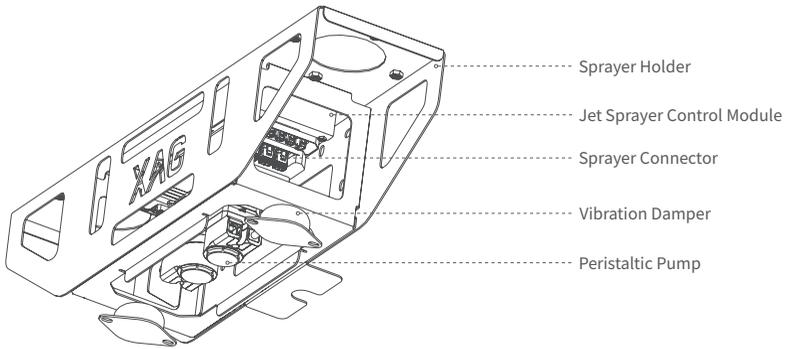
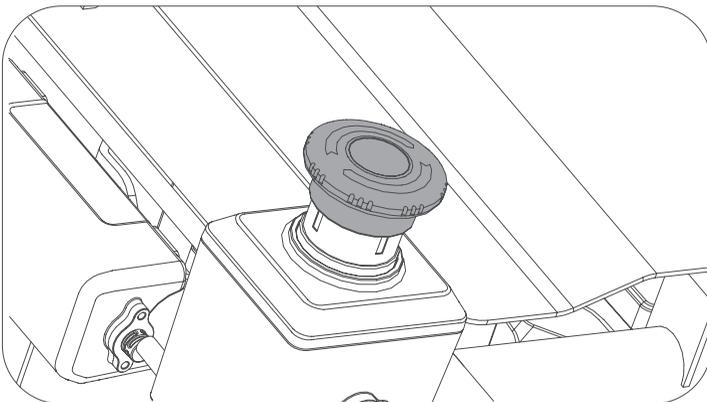


Figure 3: Module Structure in Liquid Pump Control Box

Emergency Stop

Each time before you turn on the power, make sure the red emergency stop button is not pressed; in case of emergency while driving, press the emergency stop button, and the braking device will cut off the power and stop the vehicle. Gently rotate the emergency stop button and it will pop up.



Note

 Pressing the emergency stop button only cuts off the power supply to the vehicle motor, not the jet sprayers. Before you attempt any cable work on the sprayers, be sure to first power down the smart battery.

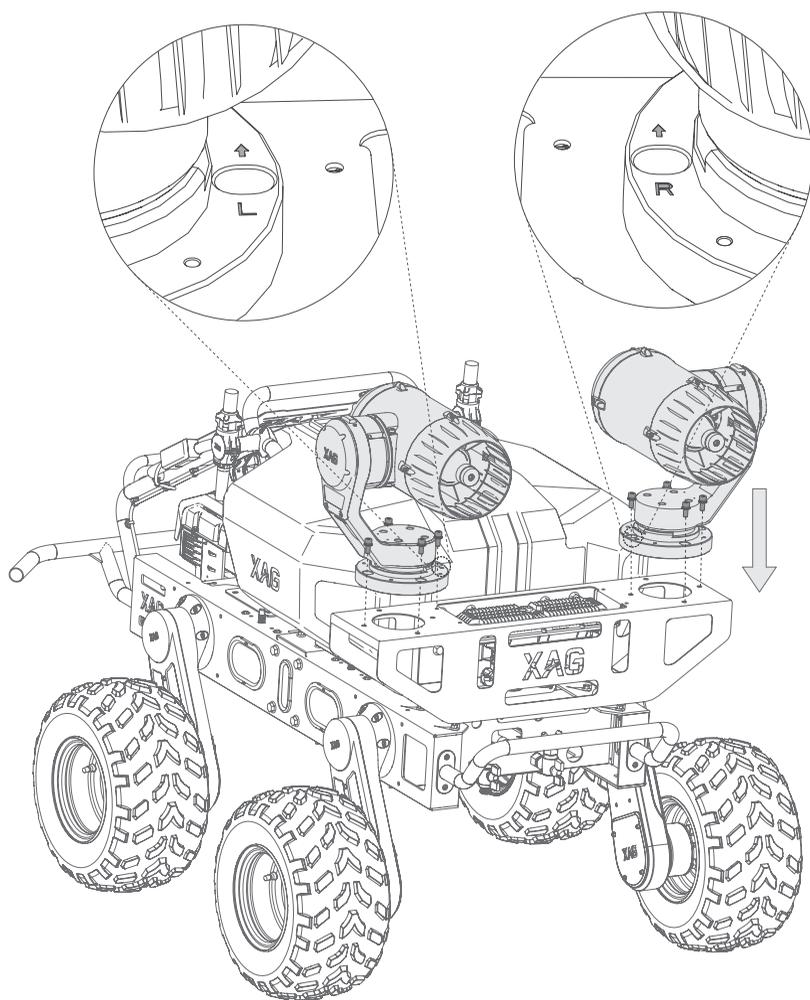
Vehicle Assembly

Assemble jet sprayer

Fix the left and right jet sprayers on the vehicle and tighten the fixing screws (M8*20).

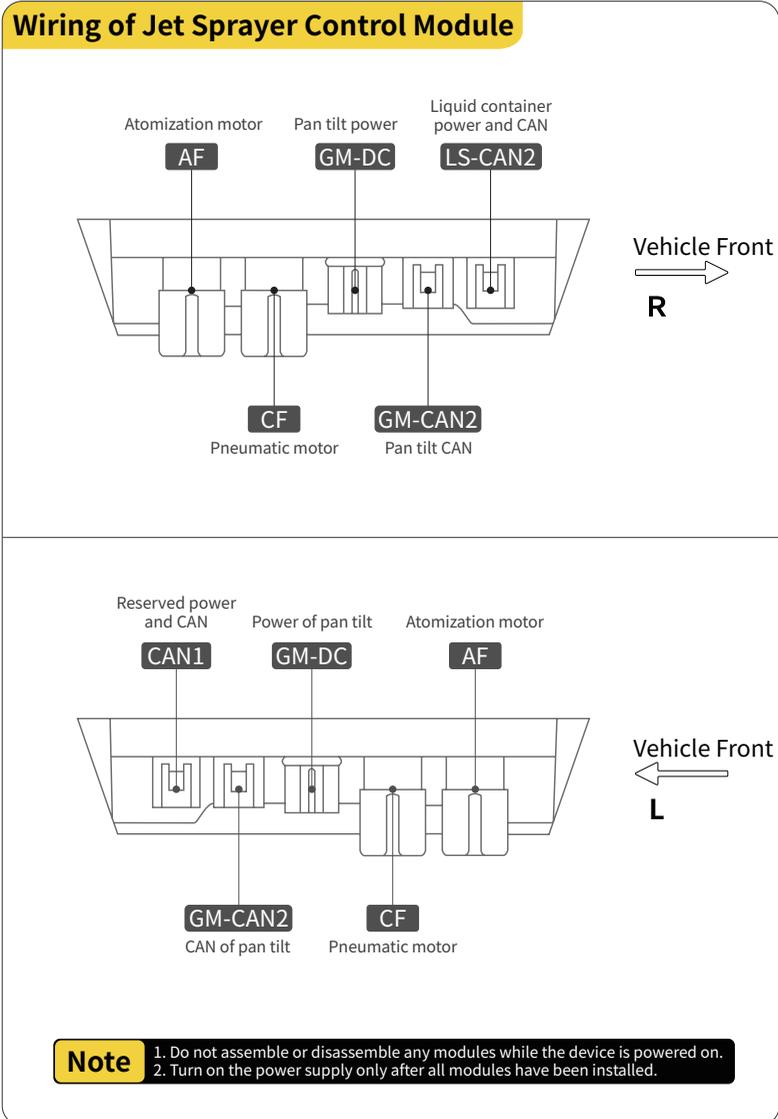
Note

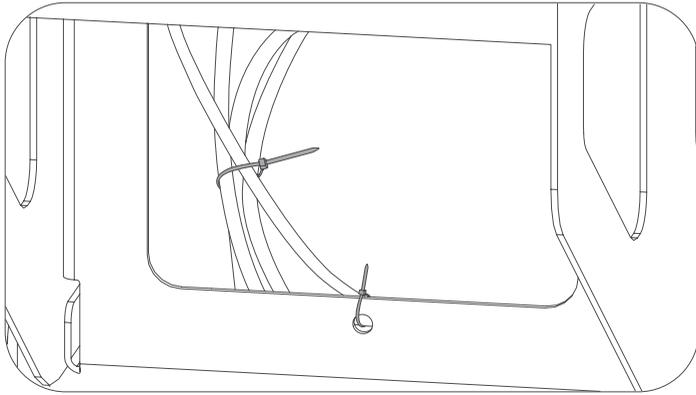
-  Inspect underneath the sprayers to distinguish between the left unit and the right one, as shown in the figure below: the arrow points to the vehicle front, L stands for left, and R stands for right.



Wiring guideline for jet sprayer control module

After the jet sprayers are fixed, plug the sprayer connection cable into the sprayer connector on the water pump control box. See the figure below for wiring instructions.



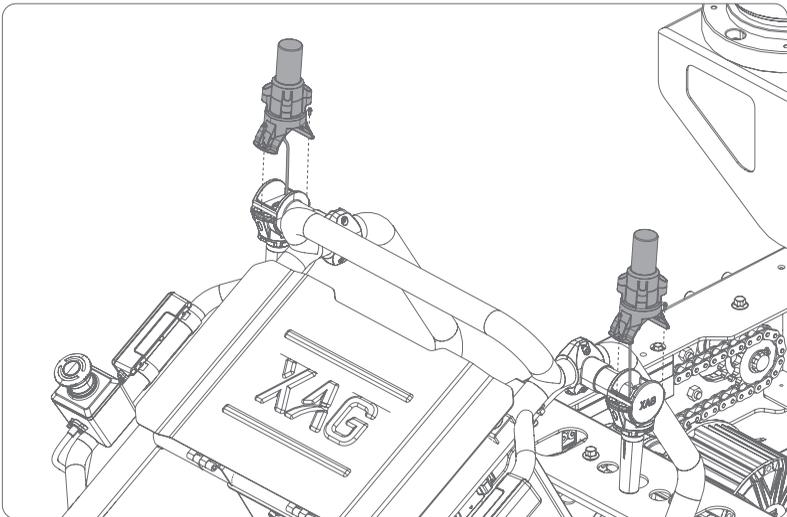


⚠ Note

⚠ After the connection cable is plugged in, please use zip ties to affix the cable to the control box holder to avoid cable loosening or wear caused by bumps while the vehicle is in motion.

Install RTK antennas

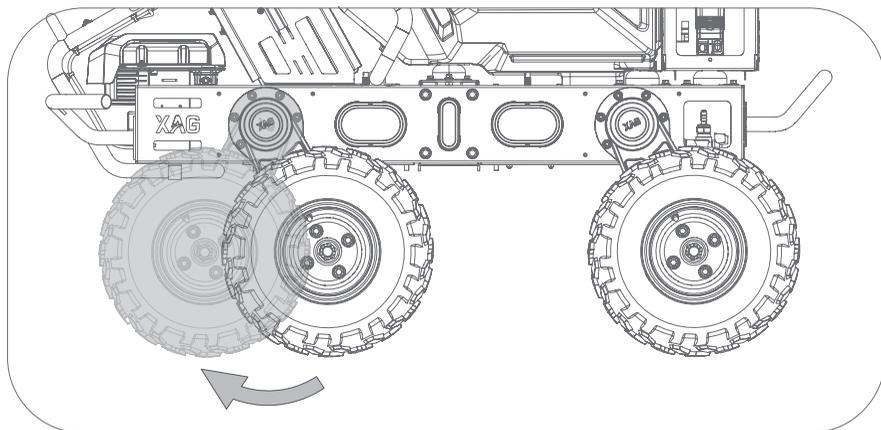
Fix the left and right RTK antenna on the vehicle and tighten the fixing screws (M3*8*6).



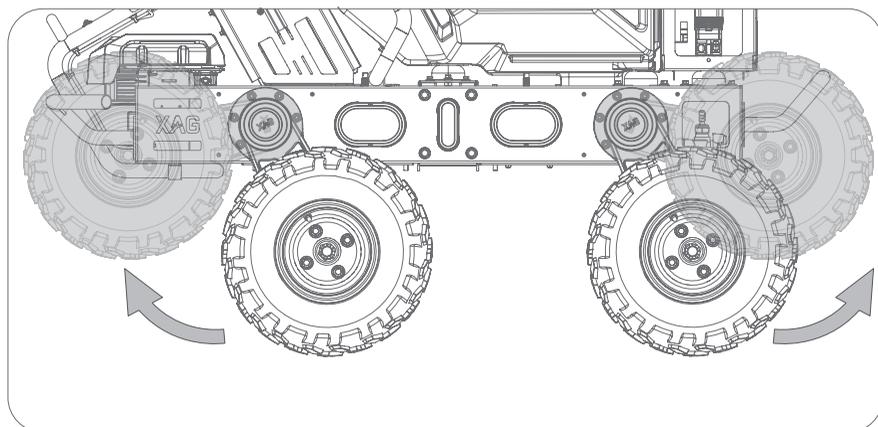
Adjust wheel arm

Both front and rear wheel arms can be adjusted. You may change the vehicle's wheelbase or chassis height by either adjusting the front wheel arms individually or adjusting both front and rear arms collectively. Changes made to the wheelbase can improve the vehicle's climbing performance.

Adjust front wheel arms alone



Adjust both front and rear wheel arms



Use R150

Activate

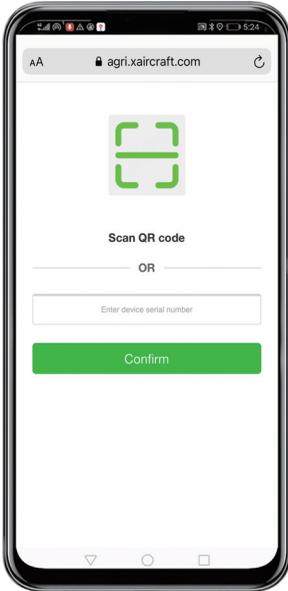
Steps



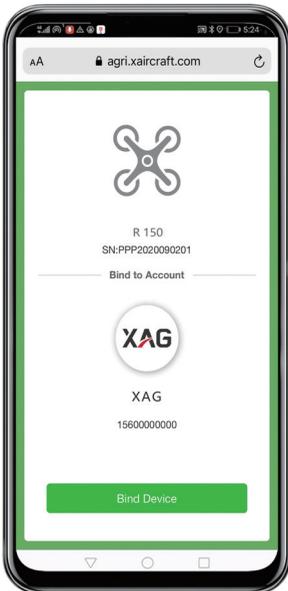
- Visit our User Registration Website at: <https://agri.xaircraft.com/pm/#!/login>, register and log in.



- Choose "Me" on the homepage, and then click "Scan QR" to begin the process of activation.



- Enter your activation code (to be acquired from your dealer), and click "Confirm".



- Check your account information and click "Bind Device". Then your device should be activated.

Download XAG AGRI App

Before using the R150, please first scan the QR code below to download and install the XAG AGRI App (Android only. Coming soon on iOS).



Scan QR code
to download/install XAG AGRI App

Connect to ACS2 ControlStick

In order to control the vehicle with ACS2, please first connect the ControlStick to the XAG AGRI App.

Available control mode combinations include:

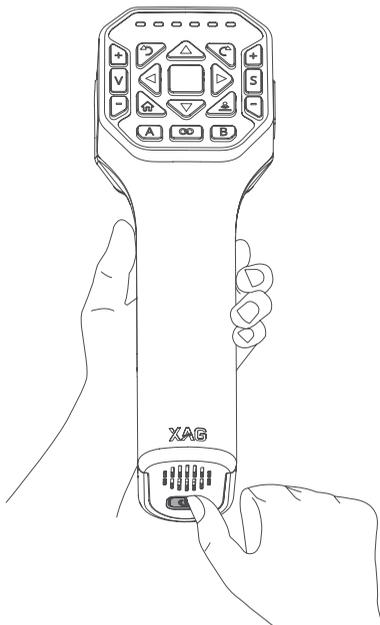
ACS2 RTK + smartphone

ACS2 vehicle control module + smartphone

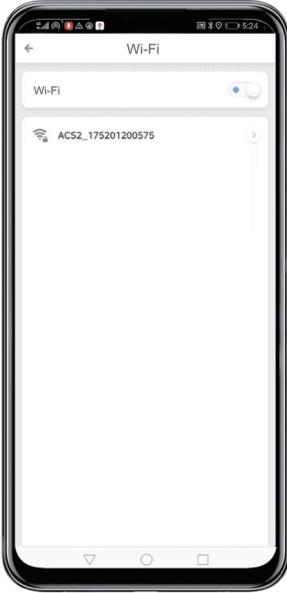
Power ON/OFF

When the ControlStick is on/off, press and hold the Power button for approximately 2 seconds until the six indicator lights flash at the same time.

Release and then press and hold the Power button again for 2 seconds until a voice prompt is heard from the ControlStick.



Connect to XAG AGRI App



- Go to WiFi settings on your phone, tap ACS2 ControlStick, and enter the default password.
- The default hotspot name is "ACS2_XXX", where **▲**XXX is the serial number marked on the top of the ControlStick, and the default password is 20070401.

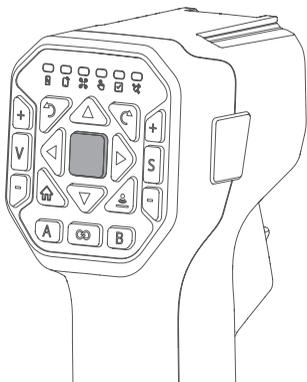


- Open the XAG AGRI App and log in to your account. When the icon  on the homepage lights up, it means the phone and the ControlStick are successfully connected.

ControlStick Buttons

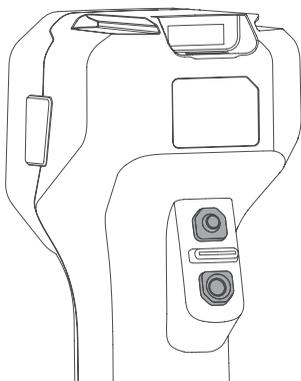
After successful pairing, you may control the vehicle as directed by the following guide.

Autonomous/remote control switch



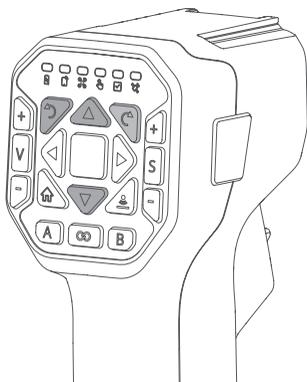
- Press and hold the middle button to switch to autonomous mode. Press any button to switch back to remote control mode.

Unlock/Unpark



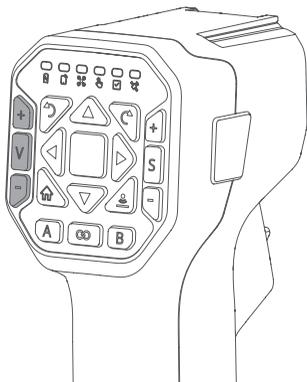
- Press and hold the two buttons on the back of the ControlStick at the same time to unlock the vehicle, and press again to lock.
- After unlocking the vehicle in manual mode, press and hold the lower button for 1.5 seconds to deactivate parking, then the vehicle can be moved freely.

Motion control



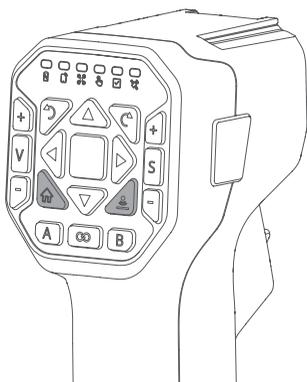
- Press the Forward/Backward button (Δ / ∇) to drive the vehicle forward/backward.
- Press the Turn Left/Turn Right button (\curvearrowright / \curvearrowleft) to turn the vehicle left and right, respectively.

Speed settings



- Press the button **V** to broadcast the current speed level (Level 1: 0.4m/s, Level 2: 0.8m/s, Level 3: 1.2m/s).
- Press the button **+** to accelerate the vehicle.
- Press the button **=** to decelerate the vehicle.

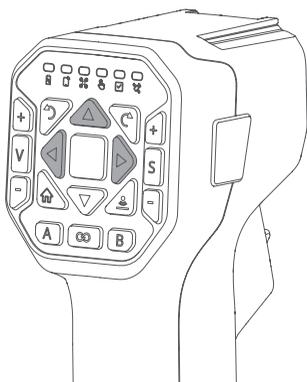
Smart mode



- Double click the button **🏠** to enter/exit follow-me mode.
- Double click the button **🚊** to enter/exit shuttle mode.

⚠ You have to exit the current mode before switching to another operating mode.

Cruise control



- Press and hold the button **△** until the voice prompt "Enter cruise control mode" is heard. The vehicle will begin to drive ahead automatically.
- Press the Left/Right button (**</>**) to move the vehicle back to its lane in case of deviation.
- Press **↶/↷/▽** or the blank button to exit cruise control mode.

⚠ You need to exit the current mode before switching to another operating mode.

⚠ Left/Right button (**</>**) only works when the vehicle is in the cruise control mode.

Smart Battery Preparation

Install

The R150 comes with the B13860S Smart Battery by default, and can be powered by either one or two B13860Ses. Open the battery hatch cover and insert the smart battery into the slot. A “click” should be heard, which indicates that the battery is in place.

Note

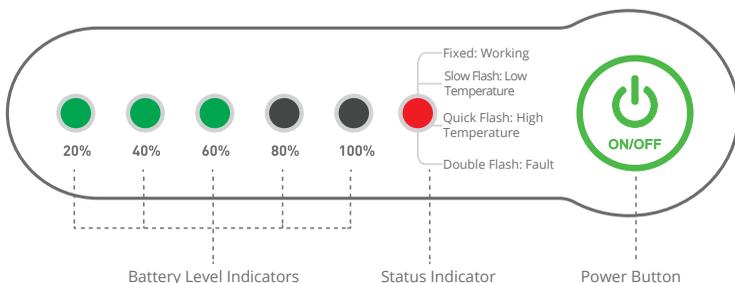
Do not use smart batteries of different models in the same device.

Battery ON/OFF

Press and hold twice the power button to turn the battery on/off. When the battery is OFF/ON, connect the vehicle or charger, press and hold the power button for at least 1 second, and release the button after all battery level indicator lights flash at the same time; then press and hold the button for at least 1 second again until a beep is heard from the battery and the status indicator is on. This indicates that the battery has been powered on/off successfully.

Button/indicator light

The smart battery has one power button and six indicator lights.



Checking Battery Level

When the battery is OFF, press the power button once to display the battery level.

When the battery is ON, check the indicators to see the battery level.

Battery Level LED	Status	Battery Level
1 LIGHT FLASH	● ● ● ● ●	0%–10%
1 LIGHT ON	● ● ● ● ●	10%–30%
2 LIGHTS ON	● ● ● ● ●	30%–50%
3 LIGHTS ON	● ● ● ● ●	50%–70%
4 LIGHTS ON	● ● ● ● ●	70%–90%
5 LIGHTS ON	● ● ● ● ●	90%–100%
2 LIGHTS DOUBLE FLASH	● ● ● ● ● Self-locked	Battery is locked due to low power level. Please contact customer support to unlock the device.
3 LIGHTS DOUBLE FLASH	● ● ● ● ● Remotely locked	Battery is locked remotely. Please contact customer support to unlock device.
4 LIGHTS DOUBLE FLASH	● ● ● ● ● Tampering lock	Battery is disabled. Please contact customer support to unlock device.

Checking Battery Status

When the battery is ON, check the indicators to see the battery status.

Battery Level LED	Status	Battery Level	
RED LIGHT ON		Normal	Normal
RED QUICK FLASH		Overheated	Temporarily locked. Prohibited from charging and usage.
RED SLOW FLASH		Low Temperature	Low temperature triggers charging protection. Please keep battery temperature at over 10°C.
RED DOUBLE FLASH		Battery Malfunction	Stop using immediately.

Battery Use Instructions

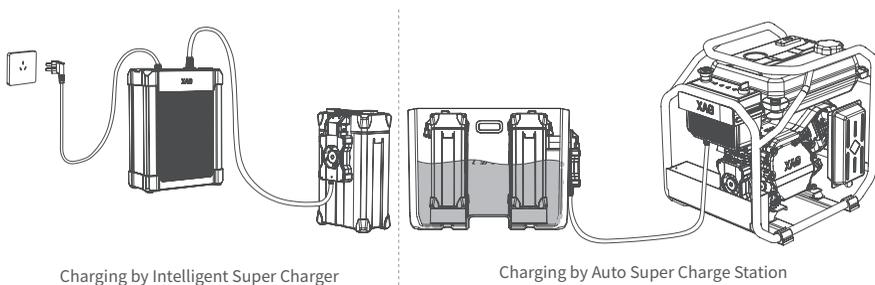
- Do not plug or unplug the battery when it is turned on, otherwise the power connector may be damaged.
- Check the battery firmware for updates before use. The loss caused by the user's failure to update the battery firmware in time will be borne by the user.
- The battery should be used between 10°C and 45°C (ambient temperature). Overheating (>45°C) may cause the battery to ignite or explode.
- Do not connect the positive and negative poles of the battery with a wire or other metal objects, to avoid short circuit.
- Do not immerse the battery in a corrosive liquid. When the battery is placed in clean water for heat dissipation, please keep the water level between the Max and Min levels. Do not leave the battery in water for more than 60 minutes. Otherwise, the liquid may flow into the battery and cause damage.
- If there is liquid or foreign matter on the battery terminal, wipe it away as soon as possible and keep it clean. Otherwise it may cause poor contact, resulting in loss of energy or charging failure.
- Please handle with care during use. Do not disassemble it, puncture its case or manually press the battery, including but not limited to the following: Sitting on the battery, placing heavy objects on the battery or otherwise putting pressure on the battery.
- Regularly check the battery terminal, plug and other components before use. Do not use alcohol or other flammable agents to clean charging devices. Do not use a damaged charging device.
- When charging, place the battery and charging devices on the flat ground that is free of flammable or combustible materials. Battery charging shall be watched over to prevent accidents.
- For safety, when charging, a distance of more than 30cm shall be kept between two batteries, or between a battery and a charger, to avoid the malfunction of the charger or the battery, and even serious consequences such as fire due to overheating.
- Before each operation, make sure the battery has finished charging; never operate with a full load when the battery is not fully charged.
- It is strictly forbidden to use batteries other than those provided by XAG, or to dismantle or replace a battery without authorization. For repairs or replacement, please contact XAG or a designated dealer.
- The user shall bear the responsibility for battery accidents, flight failures or other accidents caused by the use of batteries or components not provided by XAG.
- If a single green light flashes after operation, please charge the battery to 40%-60% capacity before storage. The battery should be recharged and discharged every 90 days to maintain its activity.
- The battery should be stored in a dry environment at a temperature between 10-30°C . Do not place the battery in a location that is too damp or has leakages.
- Do not charge the battery in a damp environment. Product damage caused by liquid immersion due to reasons other than product quality (such as a damaged battery case) is not covered by the warranty.
- It has been tested under controlled experimental conditions to be resistant to splashes and water.

However, such protective performance becomes less effective over time, and may diminish due to daily wear and tear.

- When the battery is found swollen, leaking, deformed, or damaged, stop using the battery immediately and contact XAG or your dealer promptly.
- The liquid inside the battery is highly corrosive. If it is inadvertently contacted with your skin or eyes, rinse with clean water and seek medical advice immediately.
- When disposing of the battery, please follow local laws and regulations. Protect the natural environment, and do not discard it irresponsibly.

Charging Battery

While charging, the battery level indicators corresponding to the current battery level will be on, while the remaining lights will flash in sequence, indicating that the battery is charging. Once charging is complete, the buzzer will beep for 30 seconds. During this time, all battery level indicators will flash for 2 minutes before the battery turns off automatically.



Charger Status Indicators

Status Type	LED	Status	Description
Power Output	GREEN LIGHT ON 	Normal	Normal input
	GREEN LIGHT FLASH 	Not Grounded	Charging at risk
	RED LIGHT ON 	Device Fault	Temporarily locked. Prohibited from output.
Charge Output	RED LIGHT FLASH 	Device Overheated	Temporarily locked. Prohibited from output.
	GREEN LIGHT ON 	Idle	Idle
	GREEN LIGHT FLASH 	No Communication	Battery not connected or communication failed.
Charge Port	RED LIGHT ON 	Charging	Charging
	GREEN LIGHT ON 	Normal	Communication succeeded. Charging normally.
	RED LIGHT FLASH 	Irregular Communication	Communication between charge port and battery failed.
	RED LIGHT ON 	Battery Overheated	Battery is overheated.

Charger Use Instructions

- Please keep all battery terminals clean and avoid contact with metallic objects.
- If there is liquid or foreign matter on the charge port, immediately clean and remove the substance. Otherwise it may cause poor contact, resulting in short circuiting or charge failure.
- Do not expose the Super Charger to sunlight or rain.
- Do not charge with AC power beyond the rated voltage range. Keep the Super Charger away from flammable and explosive materials when charging, and do not leave it alone while it is being charged.
- If an error or warning is issued during the charging process, please turn the power off immediately, and resume use only after the product has been checked for safety.
- For safety, when charging, a distance of more than 30cm should be kept between two batteries, or between a battery and a charger, to avoid charger or battery malfunction, and even serious consequences such as fire due to overheating.
- Regularly check the battery terminals, plug and other components before use. Do not use alcohol or other flammable agents to clean charging devices.
- Do not use damaged chargers. For repairs or replacement, please contact XAG's aftersales or designated dealers.
- Do not use smart batteries or chargers other than the original ones manufactured by XAG. The user shall bear the responsibility for charging accidents, battery failures, product faults or other accidents caused by the use of batteries or chargers not provided by XAG.
- Do not modify or disassemble the Super Charger without permission. The user shall be liable for any consequence caused by the unauthorized modification and disassembly of the SuperCharger.
- After use, remove the charge port from the Super Charger, and keep both in a safe, clean and cool place.
- When the Super Charger is found damaged, stop using the battery immediately and contact your dealer.

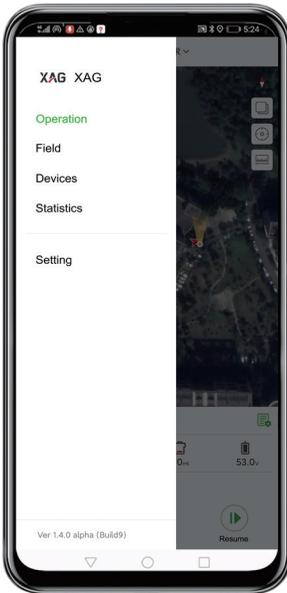
Note

- ▲ The battery must be charged using the devices produced by XAG. The user shall bear the responsibility for all consequences caused by the use of charging devices not produced by XAG.

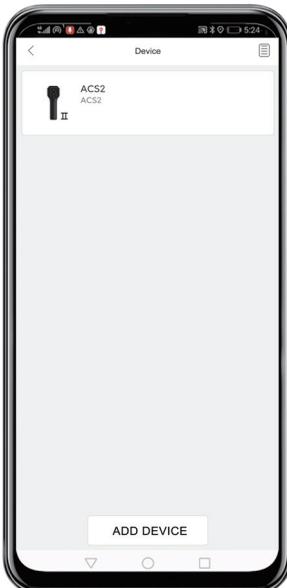
Pairing

Steps

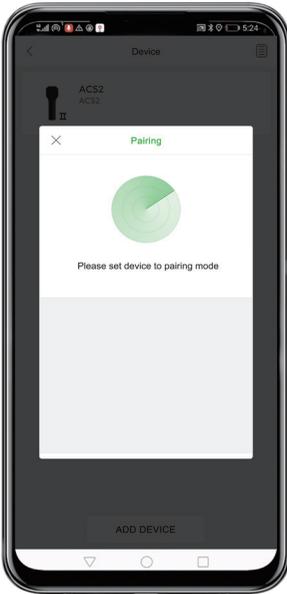
For first time use, please pair the device via the XAG AGRI App.



- Once your ControlStick and smartphone are connected, open the XAG AGRI App, swipe right on the homepage or click the profile photo, and select "Devices" to view the list of devices.

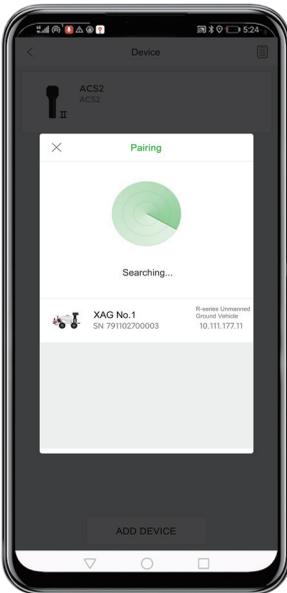


- Click "ADD DEVICE" below to search for a device.



- Power on the Smart Battery when the prompt "Please set device to pairing mode" is displayed on the screen.

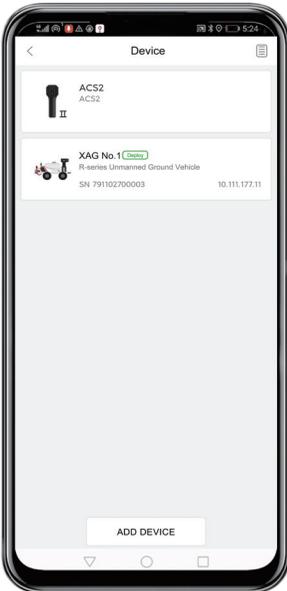
⚠ The vehicle should be powered off for more than 10 seconds before being powered on again.



- Wait until your vehicle is shown on the pairing page, and click on it to pair. Then, the phone prompts "Paired", and your vehicle will be displayed in the device list.



- Having your vehicle paired, select it in the device list and click "Deploy".

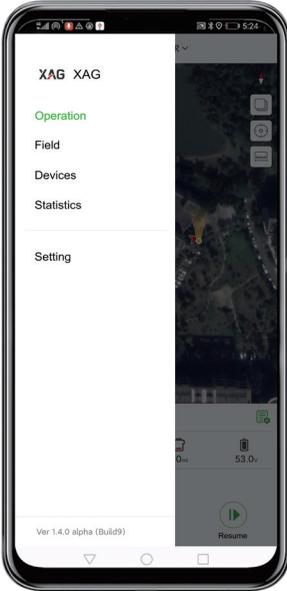


- If "Deploy" is marked next to the vehicle's name, it means it is functioning normally.

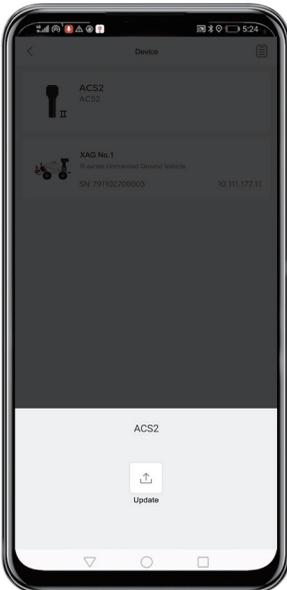
Firmware Update

Firmware (including ControlStick firmware and unmanned vehicle firmware) needs to be checked before using the R150 to confirm if there are new versions available; if so, follow the update procedure to update the firmware to the latest version.

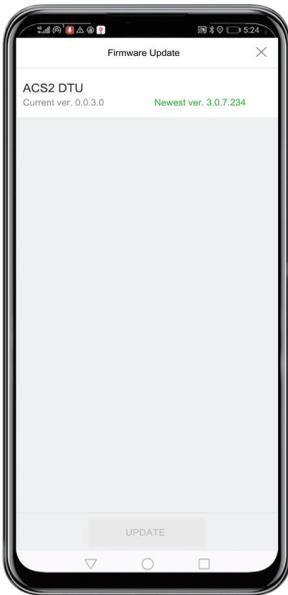
Update ControlStick



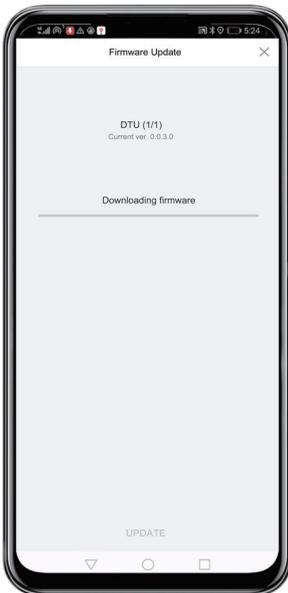
- Open the XAG AGRI App , swipe right on the homepage or click on the profile photo, and Select "Devices".



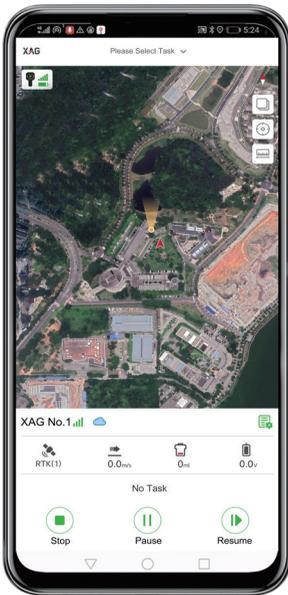
- Choose the ControlStick to be Updated, and click on "Update".



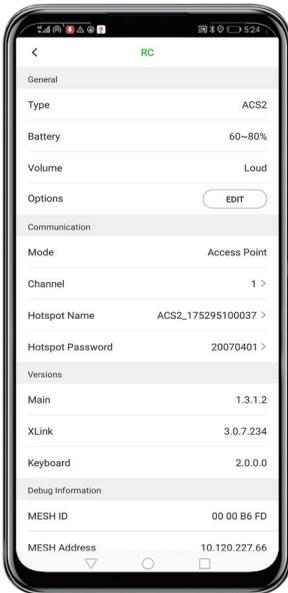
- Choose the module to be updated, and click on "Update".



- Once the firmware update is complete, follow the instructions to restart the ControlStick, and the system will be automatically updated.
- ⚠ Do not disconnect the smartphone and the ControlStick while downloading or transmitting data.

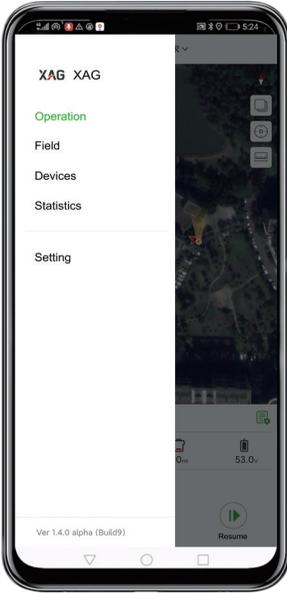


- After the update is complete, return to the home page and click on the icon  to view information on the ControlStick.



- Check whether the corresponding firmware has been updated to the latest version; if not, please follow the above steps again.

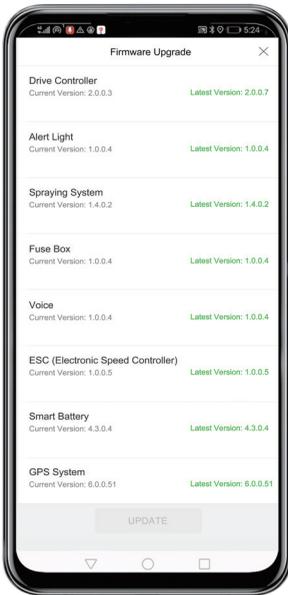
Update vehicle



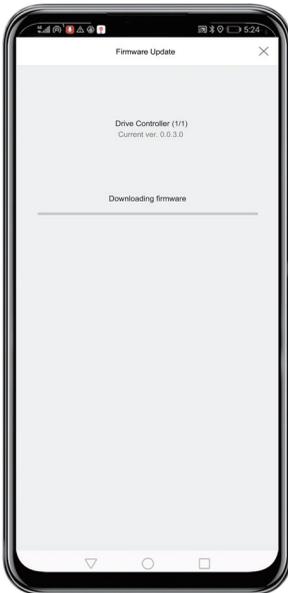
- Open the XAG AGRI App , swipe right on the homepage or click on the profile photo, and Select "Devices" .



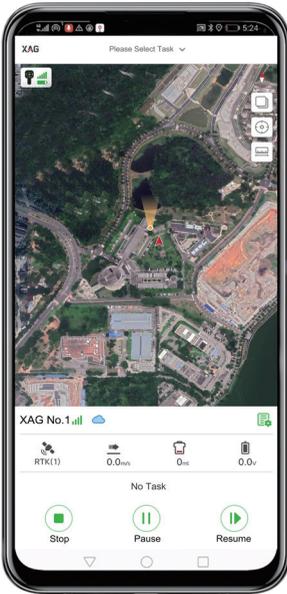
- Choose the vehicle to be updated, and click on "Update".



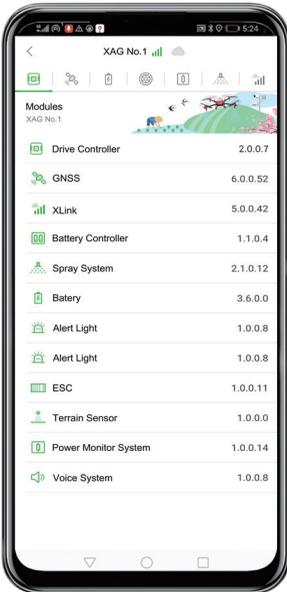
- Choose the module to be updated, and click on "Update".



- Once the firmware transfer is complete, follow the instructions to restart the vehicle, and finish the update.
- ⚠ Do not disconnect the smartphone and the ControlStick while downloading or transmitting data.



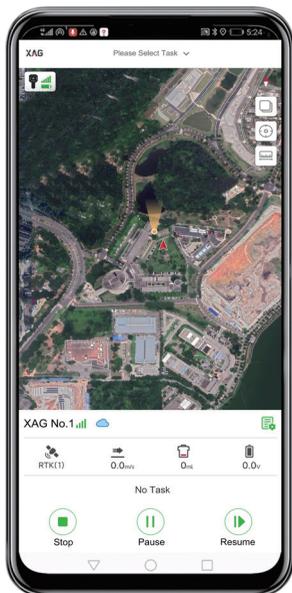
- After the update is completed, return to the homepage and click on the icon  to view information on the vehicle.



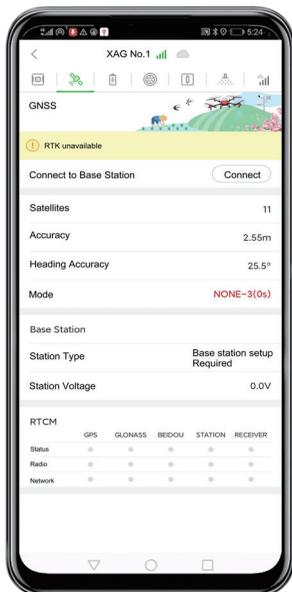
- Check whether the firmware has been updated to the latest version; if not, please follow the above steps again.

Connecting to Cloud RTK Base

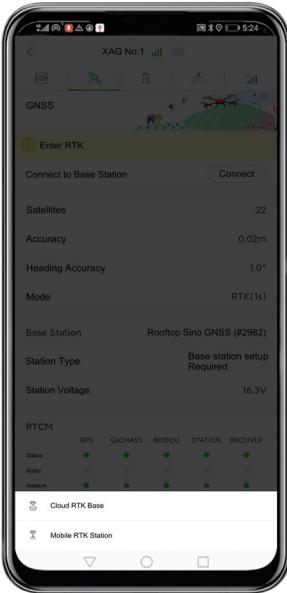
Before being operated on, the R150 needs to be connected to a base station with a strong signal, so that the vehicle can obtain stable and effective differential data during operation. If there is no Cloud RTK Base in the operation area, please refer to "RTK Rover/Portable Base" to set up a portable base.



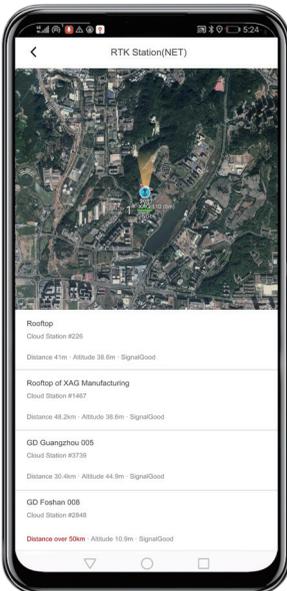
- Click on the icon  on the homepage to view the information on the vehicle.



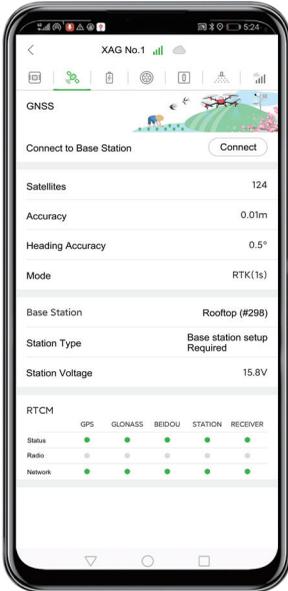
- Click on the icon  on top of the page to view parameters of the GPS system, and click on the "Connect" button on the right of "Connect to base station".



- Select "Cloud RTK Base".



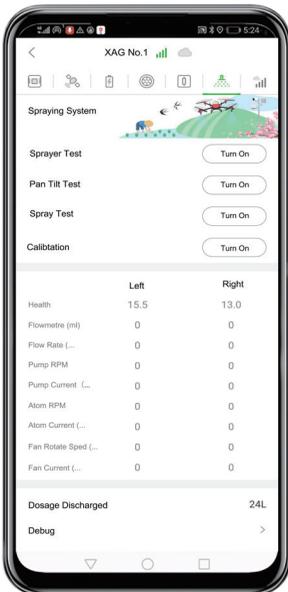
- Select the cloud RTK base with the shortest physical distance and the strongest signal, and click on "Connect".



- After a successful connection, the name of the connected station will be displayed on the right of the "Base Station" on the page displaying GPS system parameters.

Calibrating Pump

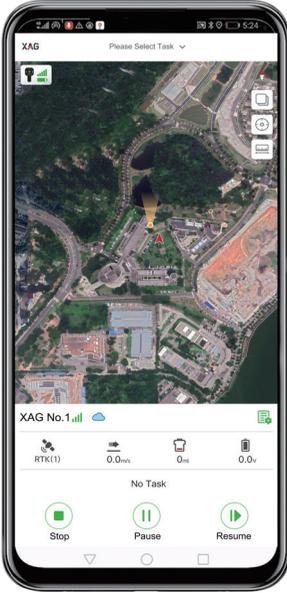
Before each spraying operation, please first calibrate the pump of the liquid container to ensure the information on liquid volume is accurate.



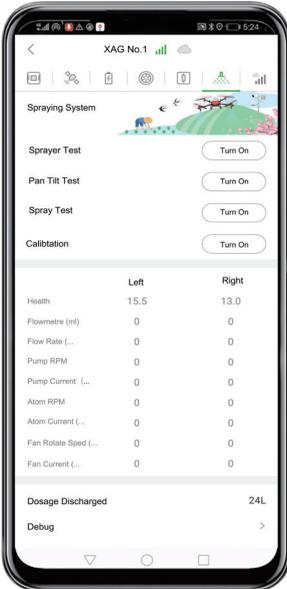
- Click on the icon  on top of the page to view parameters of the spray system, then click on the "Turn On" button to the right of "Pump Calibration" to calibrate the pump of the liquid container as required.

Sprayer Test

You may change spraying parameters and yaw angle when the vehicle is at a standstill, so that the jet sprayers can spray at a specified point or within a specified range.

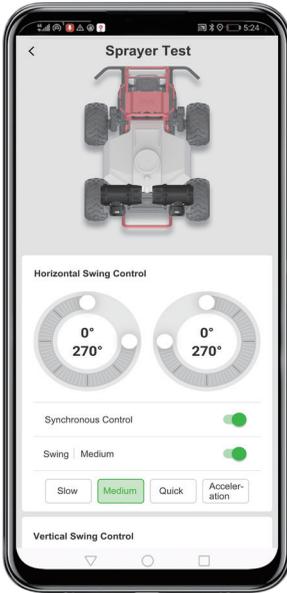


- Click on the icon  on the homepage to view information on the vehicle.



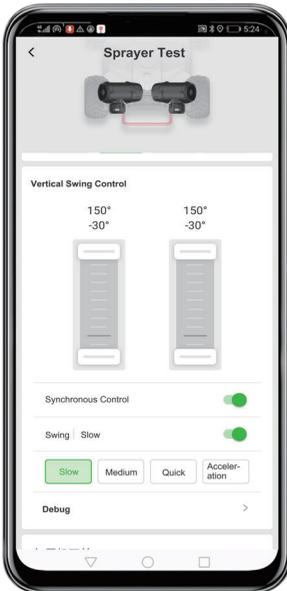
- Click the icon  on top of the page to view parameters of the spray system, then click "Settings" to set spraying parameters.

Horizontal control



- Turn on/off "Synchronous Control", and swipe the vertical control bar to synchronously/separately set the range of vertical swing of the left and right sprayers.
 - Turn on/off "Swing", and swipe the vertical control bar to synchronously/separately set the angle or range of vertical swing of the left and right sprayers.
- ⚠ "Pan Tilt Test" on the page of spray system parameters allows simulative debugging of the "Horizontal Control" and "Vertical Control" of the pan tilt.
- ⚠ "Swing" is set at four speed levels: slow, medium, fast and acceleration.

Vertical control



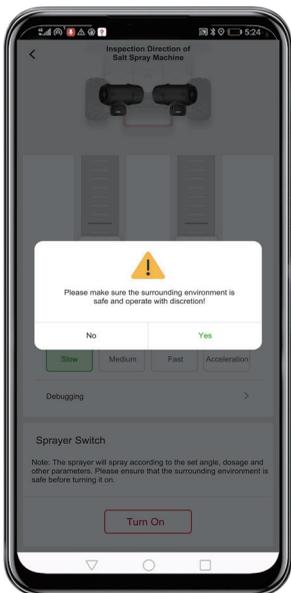
- Turn on/off "Synchronous Control", and swipe the horizontal control ring to synchronously/separately set the range of horizontal swing by the left and right sprayers.
 - Turn on/off the "Swing", and swipe the horizontal control bar to synchronously/separately set the angle or range of horizontal swing by the left and right sprayers.
- ⚠ "Pan Tilt Test" on the page of spray system parameters allows simulative debugging of the "Horizontal Control" and "Vertical Control" of the pan tilt.
- ⚠ "Swing" is set at four speed levels: slow, medium, fast and acceleration.

Spray settings



- Click "Dosage", "Atomization" or "Air Speed" to set the corresponding parameters by sliding left or right.

⚠ "Spray Test" on the page of spray system parameters allows simulative debugging of the "Dosage", "Atomization" or "Air Speed" of the pan tilt.



- After setting the parameters of horizontal control, vertical control and spraying, click "Turn On", and choose "Yes" after clearing the surroundings. Then the vehicle will start spraying according to the set parameters.

⚠ Before turning on the sprayer, please make sure that no human being (or animal) is within 5 meters of the vehicle to avoid injuries caused by spraying pesticides or other liquids.

⚠ Click the Turn Off button at the bottom or exit the current page to turn off the sprayers.

Operation Mode

The R150 can be controlled by both the ControlStick and the XAG AGRI App, with three operation modes available: waypoint mode, shuttle mode and follow-me mode. These modes are designed for different operational requirements, farmland conditions, crop types, etc. to match your personal farming needs.

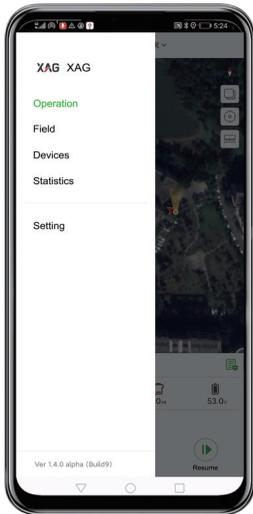
Waypoint mode

Enable autonomous operation that follows a pre-set route on the XAG AGRI App.

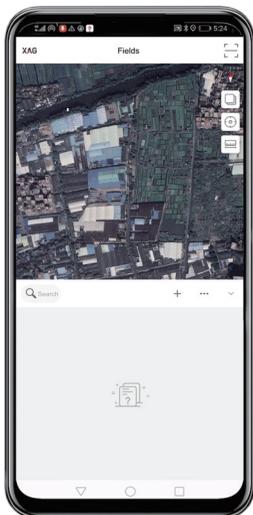
Create field

There are two ways of surveying and mapping to create a field: high definition map and ACS2 RTK. See the following for details.

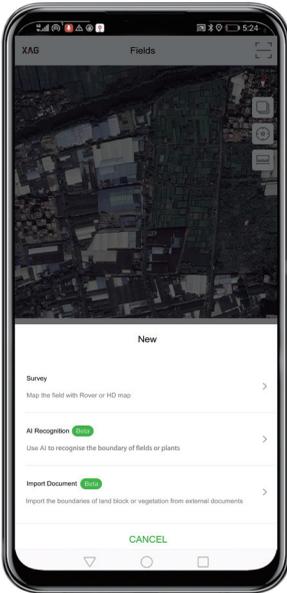
High definition map



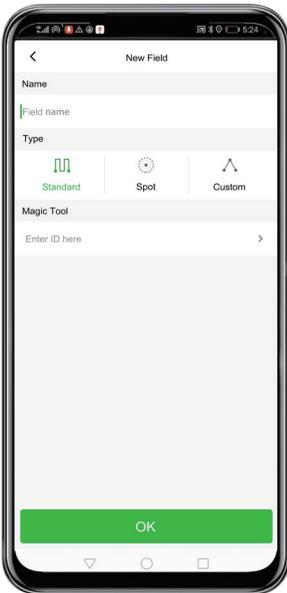
- Open the XAG AGRI App , swipe right on the homepage or click the profile photo, and select "Field".



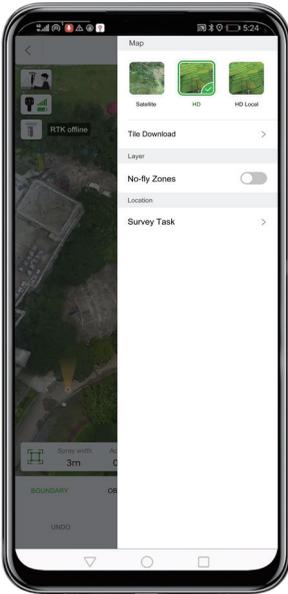
- Click the icon + to create a new field.



- Select the "Survey" mode in the pop-up menu below.



- Type in the name of the new field, select route type and click "OK" .



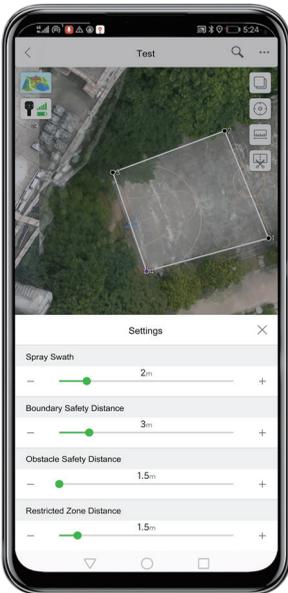
- Click on the icon  on the upper right corner, and select the "HD" mode.



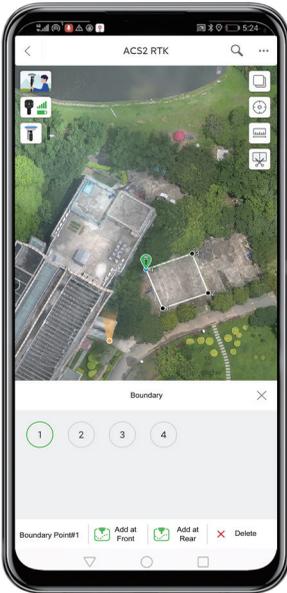
- Click the icon  on the upper left corner, and choose "Mapping By Rover" in the pop-up menu.



- Select "BOUNDARY", move the red cross cursor on the map to the desired boundary point, and click "Record" to define it as a boundary point of the plot;
- Select "OBSTACLE", move the red cross cursor within the marked field, and click "Record" around an obstacle to define its boundary points;
- Select "RESTRICTED ZONE", move the red cross cursor within the marked field, and click "Record" around a restricted area to define its boundary points.



- Click the icon  to set parameters such as spray width, safety distances from the boundary, restricted zone, and obstacle. After setting these parameters, return to the field creation page.



- Click the icon  to visit the boundary management page where you may change boundary points if necessary.

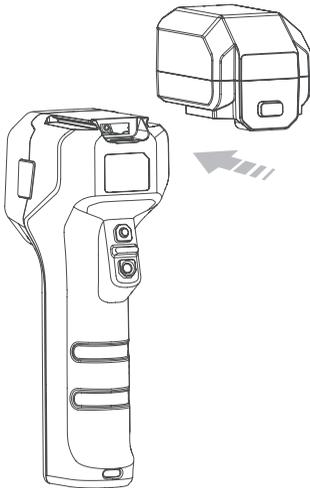


- Click any field boundary line, and the system will automatically generate a route using the boundary as the base line.

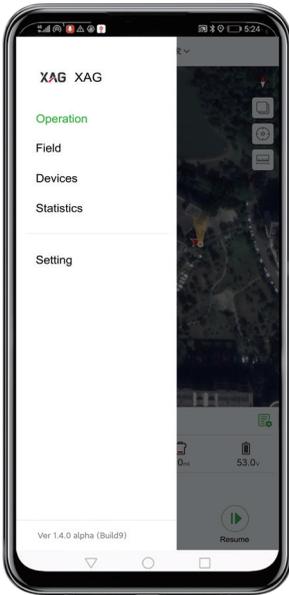


- Click the icon  on the upper right and choose "Upload" to upload the field.

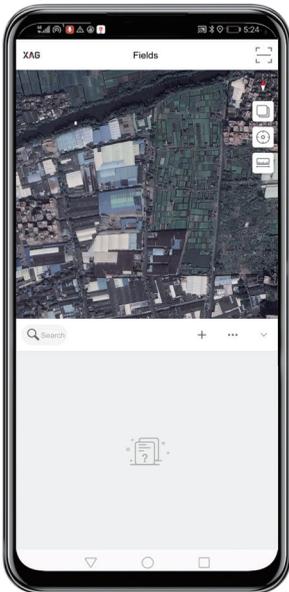
ACS2 RTK



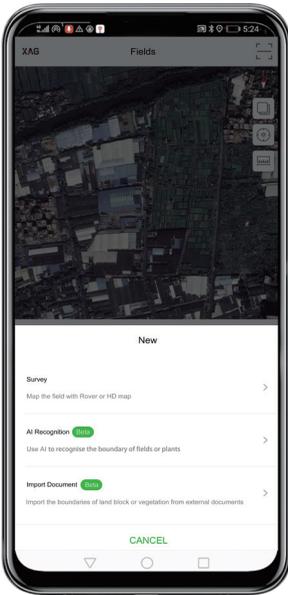
- Insert the differential positioning module (RTK) into the top of the ControlStick. A "click" will be heard when it is installed correctly.



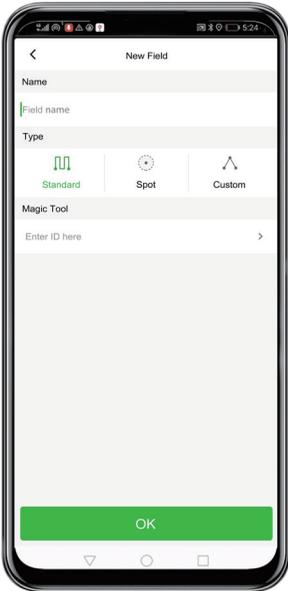
- Open the XAG AGRI App , swipe right on homepage or click the profile photo, and select "Field".



- Click the icon + on the page to create a new field.



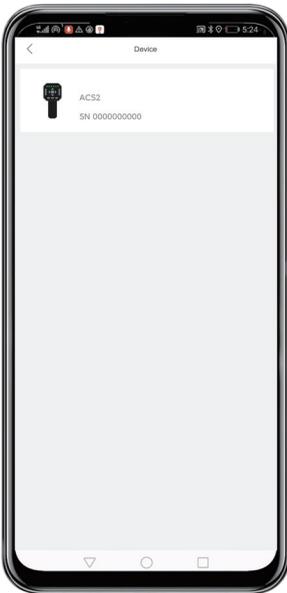
- Select the "Survey" mode in the pop-up menu below.



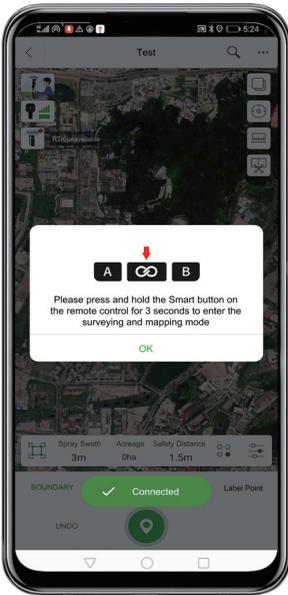
- Type in the name of the new field, select route type and click OK.



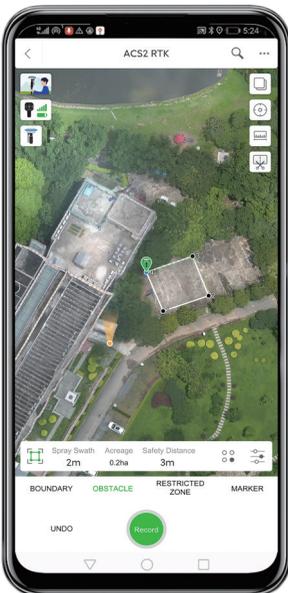
- Click the icon  on the upper left corner, and choose "Mapping By Rover" in the pop-up menu.



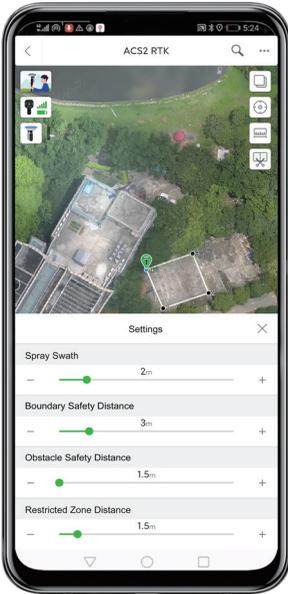
- Choose your ACS2 RTK.



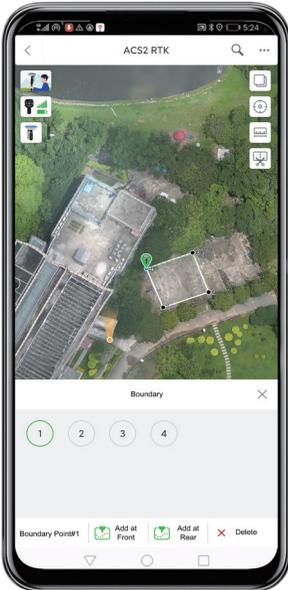
- Press and hold the  button on the ControlStick for 3 seconds to enter the surveying and mapping mode.



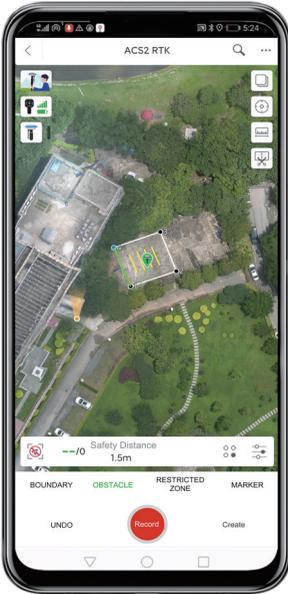
- Hold your ControlStick and move to a location, choose "BOUNDARY", "OBSTACLE" or "RESTRICTED ZONE" on the App and click "Record" to define it as a boundary point.



- Click the icon  to set parameters such as spray width, safety distances from the boundary, restricted zone, and obstacle. After setting these parameters, return to the page of field creation.



- Click the icon  to visit the page of boundary management, where you may change boundary points if necessary.

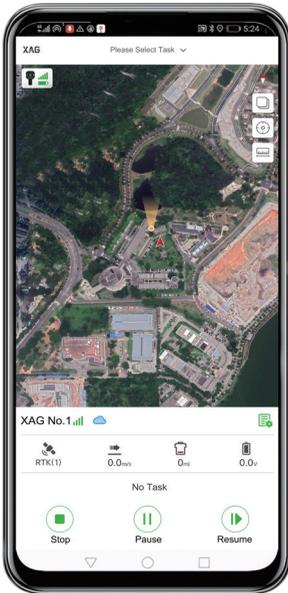


- Click any boundary line of the field, and the system will automatically generate a route using the boundary as the baseline.

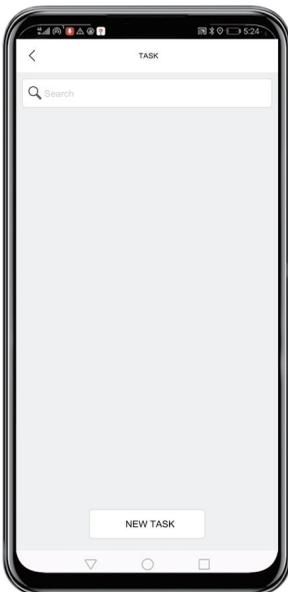


- Click the icon ... on the upper right and choose "Upload" to upload the field.
- ⚠ Upon completion, press and hold the button  on the ControlStick for 3 seconds to exit surveying and mapping mode.

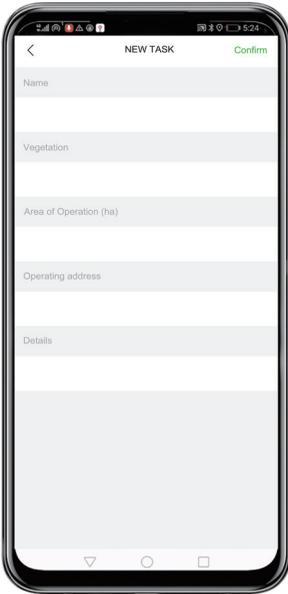
Create operation order



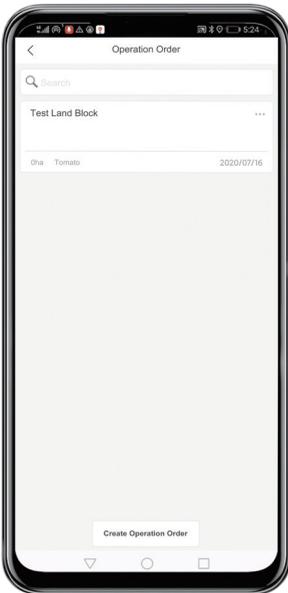
- Open the XAG AGRI App , click "Please Select Task" on top to view the list of operation orders.



- Click "NEW TASK" at the bottom.



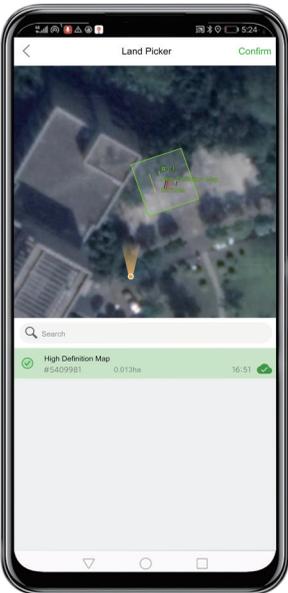
- Fill in the information on the order of operation, and click "Confirm" to return to the list of orders.



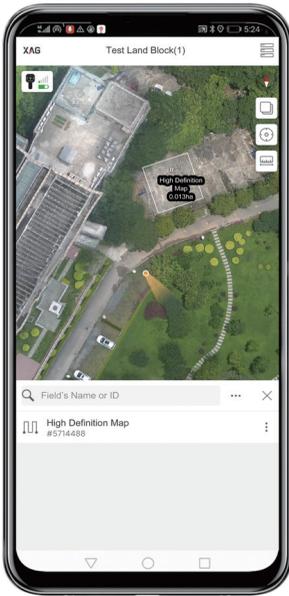
- Click the operation order created to view information on field.



- Click the icon **...**, and select **" + Add"** in the pop-up menu.



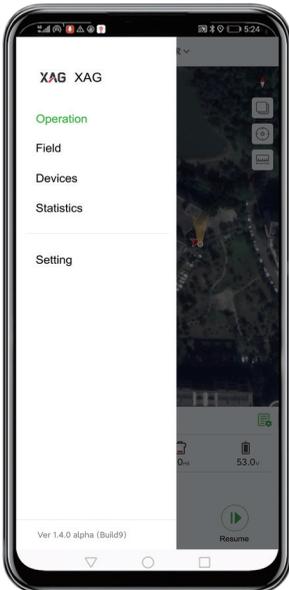
- Choose the corresponding field, and click **"Confirm"** on the upper right corner.



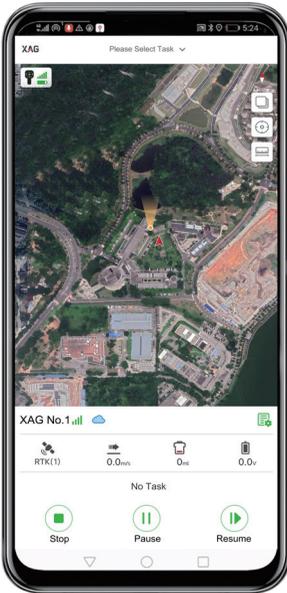
- If added successfully, the field will be displayed on the information page of the operation order (to start operation directly after this step, please jump to Page 50).

Start operation

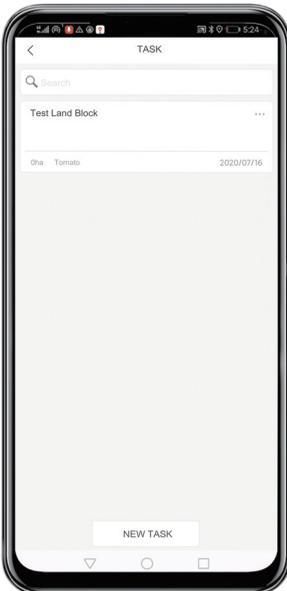
Before a spray operation, please first add an appropriate volume of liquid into the container.



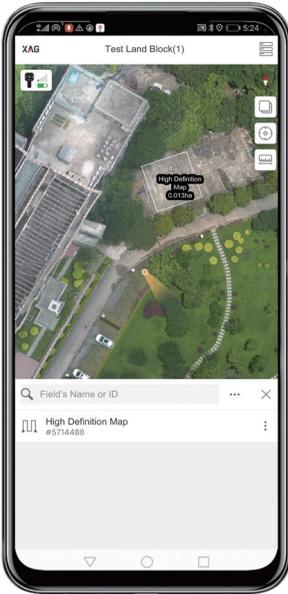
- Open the XAG AGRI App , swipe right on the homepage or click the profile photo, and select "Operation" .



- Click "Please Select Task" on top to view the list of operation orders.



- Click the operation order.



- Choose the field to be operated, and click the × icon to return to the operation page..



- Long press the name of the vehicle shown on the menu bar below or the red arrow on the map and drag it to the field.



- Then the menu bar below will show the required operation parameters to be set.

Set departure speed



- Click "Departure" in the menu bar at the bottom of the operation page to set the speed for the vehicle to enter the route by swiping left and right.

Select route



- Click "Route" in the menu bar at the bottom of the operation page to set the route for operation.

Set return speed

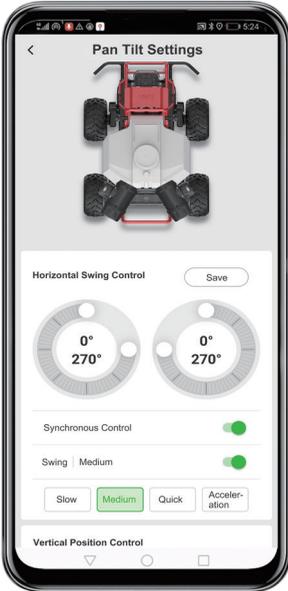


- Click "Return" in the menu bar at the bottom of the operation page to set the speed for the vehicle to exit the route and return by swiping left and right.

Spray mode

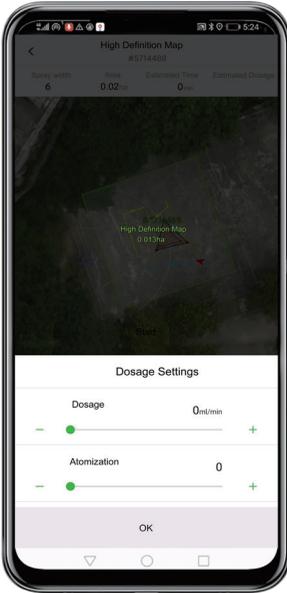


- Click "Spray Mode" in the menu bar at the bottom of the operation page to set the pan tilts of the sprayers.



- Set parameters for Horizontal Swing Control and Vertical Position Control of the sprayer's pan tilt.

Set dosage



- Click "Dosage" on the operation page to set the dosage and degree of atomization as required.



- After setting, click "Upload Route".



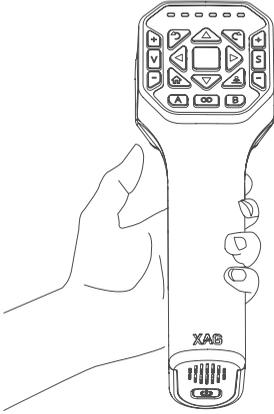
- Check if the prerequisite conditions are met and tick the boxes accordingly, and then slide the confirm button to the right. After the route has been uploaded, the vehicle will automatically start the operation.



- To pause operation, click the pause button  and the vehicle will suspend current operation. Click the resume button  and the vehicle will resume.
- To end operation, click the stop button  to finish the operation on the current field.
- To switch to another field, click the stop button and then click the icon  to operate on a new site.

Shuttle mode

Record a designated route with the ControlStick, then the vehicle can make automatically shuttles between those locations.



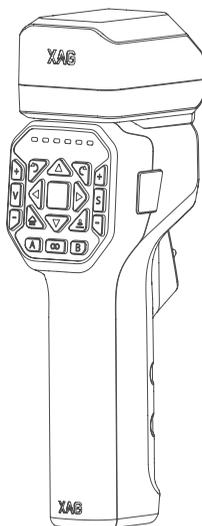
- Double click the button  to enter/exit the shuttle mode.
 - Driving the vehicle along a certain route, the system will automatically record the driving path. Press and hold the B button, then the system will learn the path.
 - Press and hold the A button or the B button again, then the vehicle will automatically shuttle according to the previously recorded path. Press and hold the A button and the vehicle will drive to the starting point along the path; press and hold the B button and the vehicle will drive to the finishing point along the path. Both operations can be repeated.
 - Double click the button  to exit the shuttle mode.
 - The system will optimize the recorded path while learning, leading to deviations from the actual path and the shuttle route. If there are some points that the vehicle must drive by, you can press and hold the button  to record them as checkpoints during the learning process. Then the vehicle will record the points and pass them at the time of playback.
-  Once you activate shuttle mode the next time after exiting, the system will delete the previously learned path.
-  Shuttle mode is not available in surveying and mapping mode.



- When the vehicle begins path learning/auto shuttle, the homepage of the XAG AGRI App will display the icon  and the status information of the vehicle.

Follow-me mode

With the aid of the RTK on the ACS2, the vehicle can move safely behind you and follow your track.



- Double click the button  on the ControlStick to enter the follow-me mode. After the sixth light on the ControlStick is on in green, press and hold the A button. A prompt "Start following" will be played on the device, then the vehicle will begin following you (more specifically, the ACS2 RTK). Double click the button  to exit follow-me mode.
- While the vehicle is following, you can also press and hold the button  to record key points (the location where the ControlStick is at), and the vehicle will drive by the recorded key points before continuing to follow you.
- Follow-me mode is only available when the  ControlStick is equipped with the RTK module.
- The safety distance between the vehicle and ACS2  RTK is about 2.5 meters. The following accuracy depends on the RTK signal. A weak RTK signal may hinder the vehicle from following you or cause it to deviate from the planned path. In such cases, you must promptly stop the vehicle using the ControlStick or by pressing the emergency stop button.
- There is a 3-second delay between recording one  key point and the next. Recorded points need to be at least 1 meter away from each other.
- Follow-me mode is not available in surveying and mapping mode.
-  To record key points more precisely, it is recommended to stop the vehicle and then  record the key point to avoid potential delays (the location may be captured earlier than desired).

Technical Specifications

Unmanned Ground Vehicle

Overall dimensions: 1515×1090×1105mm
Net weight: 200kg
Rated load: 150kg
Motor : 2x
Rated power of single motor: 1.5kW
Rated speed of motor: 70r/min
Maximum drive speed: 1.4m/s

Power battery: B13860S smart battery
Single batter capacity: 865.8Wh
Upslope angle: $\leq 15^\circ$
Downslope angle: $\leq 15^\circ$
Protection grade: IP54

Jet Sprayer

Basic parameters

Atomization range: 60~200 μ m
Maximum spray width: 12m

High-pressure atomization motor

Maximum rotate speed: 85000rpm
Outlet air speed: 160m/s

Booster fan

Maximum rotate speed: 9000rpm
Outlet air speed: 16m/s

Peristaltic pump with high pulse frequency

Maximum system flow rate: 4.8L/min
Maximum flow rate (single pump): 2.4L/min

Automatic liquid container

Rated capacity: 100L
Material: plastic (LLDPE)

Safety Instructions

- Ensure that all operations are carried out in an open area away from obstacles and crowds, and free from all kinds of risks.
- Operators should thoroughly read the Product Manual and be familiar with how to operate the vehicle.
- Before and during any operation, do make sure that no human being (or animal) is within 5 meters of the vehicle to avoid injuries caused by the jet sprayers spraying pesticides or other liquids.
- During the operation or driving of the vehicle, do not touch it or any other execution systems.
- Whenever the vehicle exits the RTK mode during operation, please press the emergency stop button to stop the operation in time.
- Please drive the vehicle mounted with jet sprayers on a flat land. Do not drive over steep slopes to overturning the vehicle.
- Never use the vehicle in environments where the water level is higher than its chassis.
- Do not drive the vehicle on urban roads, state highways, highways and other motor lanes or areas that do not support the safe operation of the vehicle.
- Do not operate the vehicle in case of fatigue, after drinking or in poor health conditions.
- The vehicle is not suitable to carry people. Do not ride the vehicle under any circumstances.
- When the vehicle is not in operation, please ensure all power sources are isolated and park the vehicle on flat ground.
- Do not park the vehicle on slopes; if the vehicle must be briefly parked, wedges must be placed under the tires to avoid slipping.
- Do not move the vehicle by dragging it to avoid damage to certain parts.
- During transportation, the vehicle should be properly fixed, with solid wedges inserted under both front and rear wheels to prevent accidents caused by slipping and falling.
- It is forbidden to modify any power supply system, motor and gearbox of the vehicle. For other modifications, please comply with the laws, regulations and safety guidelines of the place where the vehicle is used.
- Keep away from heat sources to avoid damage to electronic equipment or other components.
- The vehicle is used for plant protection operations in farmland, fruit forest or other agricultural situations. If using the vehicle for other situations or purposes, the user shall bear the corresponding responsibility.
- Do not use the vehicle in activities prohibited by national laws and regulations.

Disclaimer

01. Please read this document carefully before using this product. This Disclaimer has an important impact on the safe use of the product and your legitimate rights and interests. The use of the product shall be deemed as you have known, understood, acknowledged, and accepted all terms and contents of this document.
02. This product is not a toy, and use of the vehicle comes with certain safety risks. It is not suitable for the following consumers: 1) People under the age of 18; 2) Those who have not thoroughly read and understood the "Product Manual" and studied the XAG video courses regarding the operation instructions of the vehicle; and 3) Those who are explicitly banned by existing laws, regulations, and policies for use.
03. This product is a R-series Unmanned Ground Vehicle produced by XAG, which is designed for agricultural use only. Please read this document and the "Product Manual" carefully before using the product. You may enjoy safe and worry-free plant protection services after activating the vehicle according to the "Product Manual", with power supply and other safe use data displaying normal operation.
04. The user promises to use the product only for the purpose which it is intended to be used, and agrees to these terms and to any relevant policies or rules that may be established by XAG. Users know, understand, and accept that this product will automatically upload and save relevant drive records and data to XAG servers during use. In the event that the drive records and data fail to be uploaded and saved and XAG fails to analyze the drive records and data due to any reason caused by the user, XAG will not assume any responsibility.
05. To the maximum extent permitted by law, XAG does not under any circumstances provide any warranty, express or implied, with respect to the products, including but not limited to implied warranties of their reliability and effectiveness in application scenarios beyond the scope of use, fitness for a particular use, or non-infringement.
06. To the maximum extent permitted by law, XAG shall not be liable for all losses caused by users' failure to use the product in accordance with this document and the "Product Manual". XAG shall not be liable for any indirect, consequential, punitive, contingent, special, or penal damages, including any losses incurred as a result of your purchase, use, or inability to use the product (even if the possibility of such losses has been notified).
07. To the maximum extent permitted by law, the liability or amount of XAG under any circumstances to you for all damages, losses, and litigation arising therefrom will not exceed the amount paid to XAG by you for the purchase of the product.
08. In any case, the purchaser or user shall comply with relevant laws and regulations of the country and region where the product is used. XAG does not assume any liability arising from violation of relevant laws and regulations by the purchaser or user.
09. As laws in some countries may prohibit exemptions from liability clauses, your rights in different countries may vary. This does not mean that the contents of this Disclaimer are necessarily invalid.
10. To the extent permitted by law, XAG has the final right to interpret and modify the above terms. XAG has the right to update, modify, or terminate these terms through its official website, the "Product Manual/Operation Manual", online APP and other means without prior notice.



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the latest digital manual



Scan the QR code to visit the XAG Academy
and watch tutorial videos

Warning

Users are required to read the complete "Product Manual" and obtain the unmanned ground vehicle operator certificate recognized by XAG (or existing laws, regulations, and policies), if any. Otherwise, it may cause serious injury to yourself or others, or cause product damage and property loss. Strong safety awareness is required to operate this product. This product is not suitable for children and people under the age of 18. Do not use the parts that are not officially provided or suggested by XAG. Please strictly follow XAG's instructions to install and use the product within the intended scope of use.



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