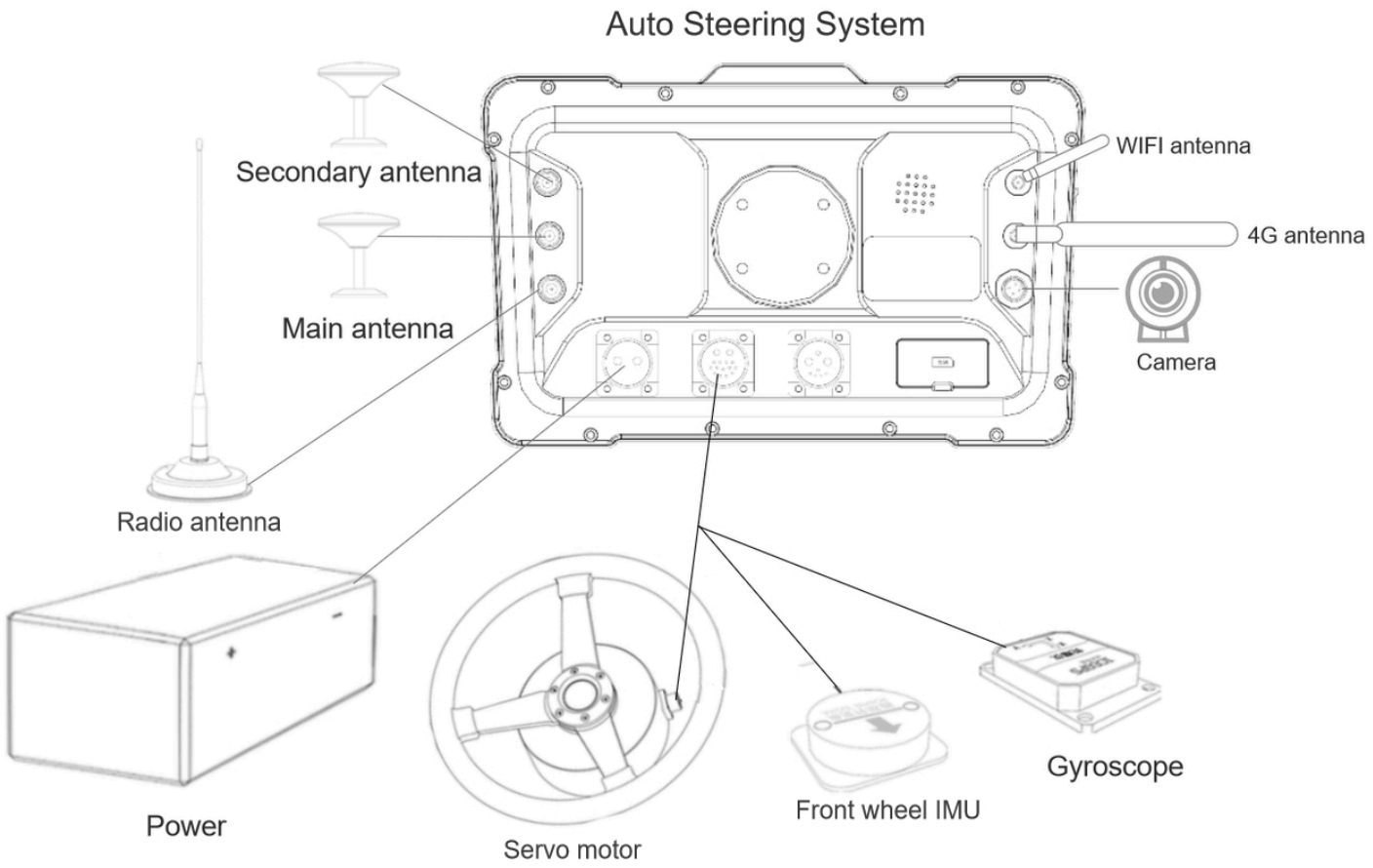
Auto steering system Installation & Instruction Manual

1. Preface

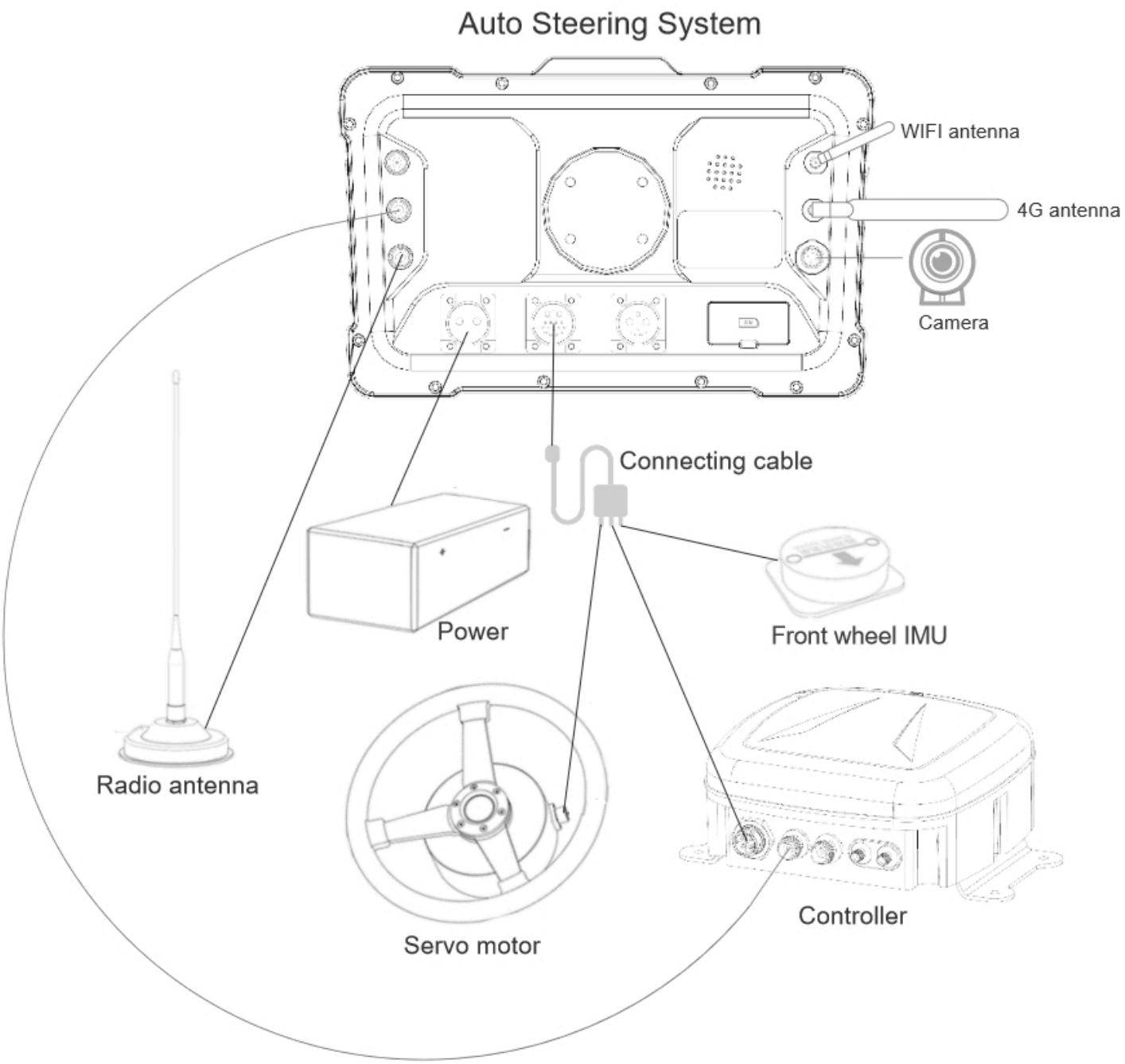
- Thank you for purchasing the Glacier Navigation Agricultural Machinery Driver Assistance System. Please read this instruction before using it.

2. Schematic diagram of vehicle-machine connection

Schematic diagram of dual antenna connection

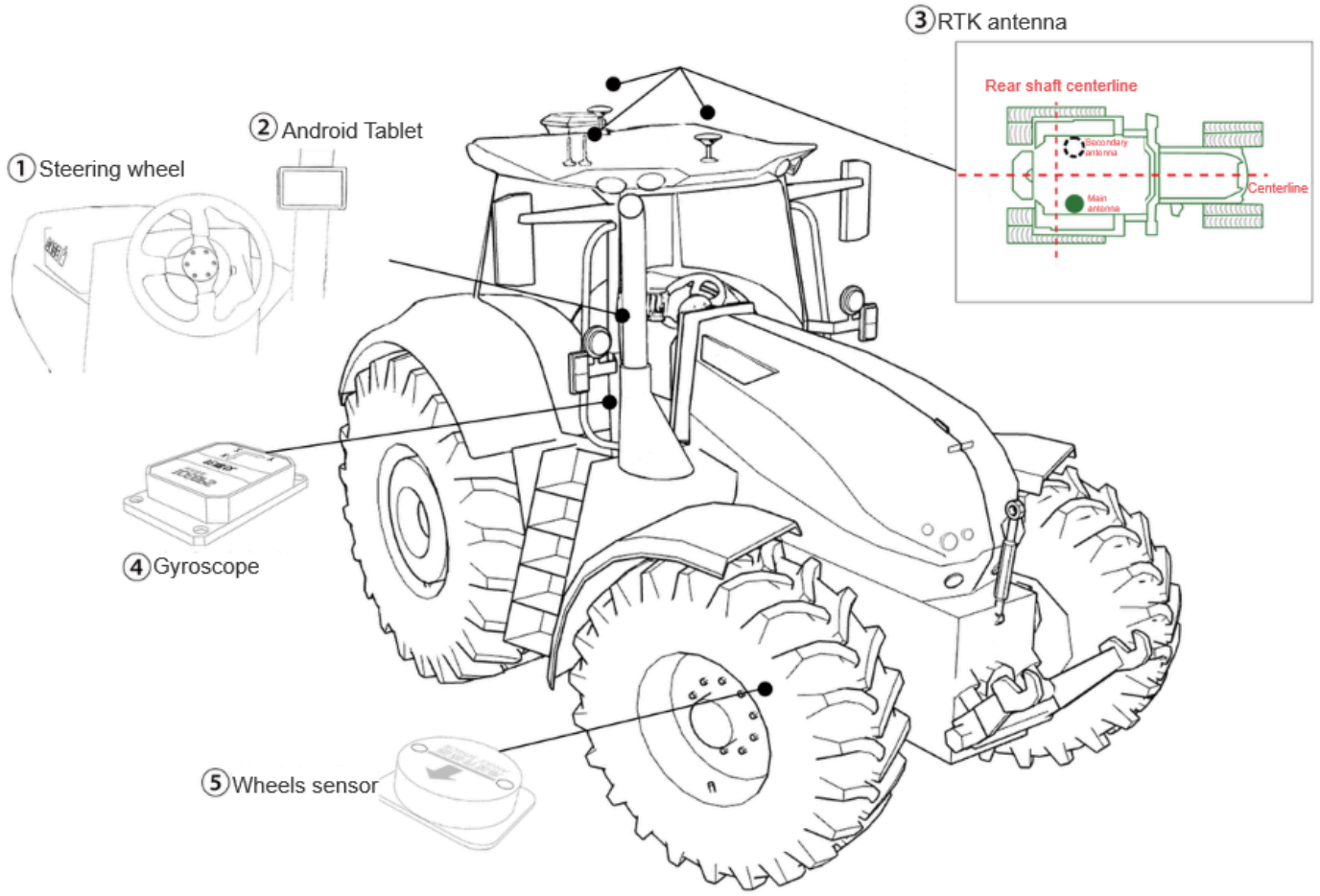


Schematic diagram of a single antenna connection

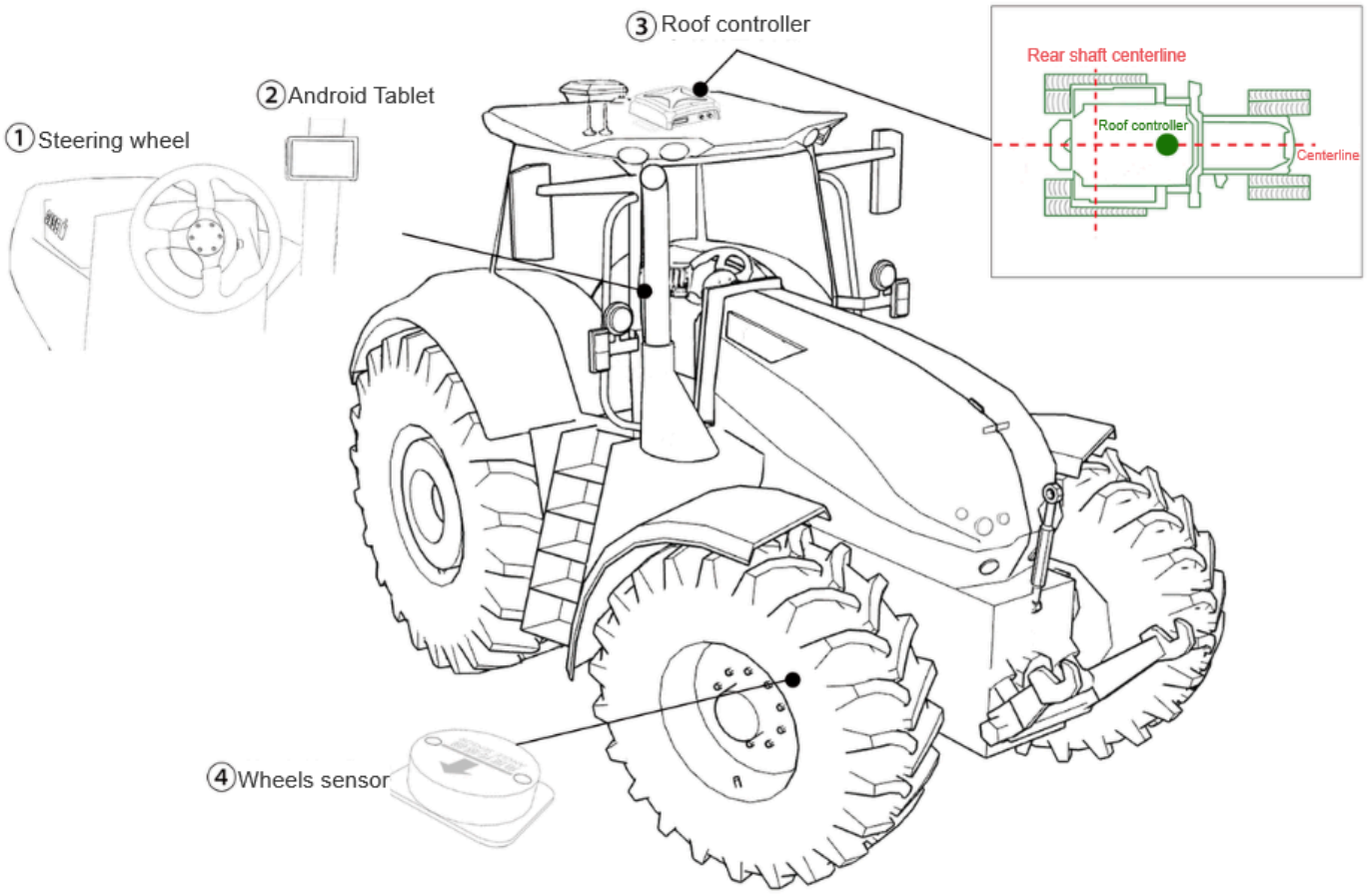


3. Schematic diagram of product installation

Schematic diagram of dual antenna installation



Schematic diagram of a single antenna installation



3.1 Basic Accessories

Dual-antenna version	Single-antenna version
Steering wheel	Steering wheel
Sleeve	Sleeve
Android Tablet	Android Tablet
RTK antenna	Roof controller
Gyroscope	Sensor
Sensor	RTK antenna cable
RTK antenna cable	Power cable
Power cable	Handle
Handle	Tablet holder
Tablet holder	Steering wheel mount
Steering wheel mount	

4. Installation Instructions

4.1 Steering wheel installation

i. **Remove the steering wheel of the original car:**

- Remove the steering wheel of the original car and keep the steering axle nut of the original car.

ii. **Install the splined sleeve and motor:**

- Make sure the socket spline fits, use screws to connect the splined sleeve and the motor together.
- Install the motor of the connected splined sleeve on the steering axle of the vehicle and tighten it with the original car nut.

iii. **Install the steering wheel connecting plate:**

- Fix the steering wheel connecting plate and fix it with screws, and then install the steering wheel and nameplate.

iv. **Fixed Motor Hoop:**

- Take out the motor hoop and install it on the steering shaft according to the corresponding hole position at the bottom of the motor to prevent the motor from rotating.

4.2 Android tablet installation

i. **Install the computer holder:**

- Find a suitable position in the cab and fix the car computer holder with screws.

ii. **Install the car computer:**

- Install the other end of the bracket on the back of the on-board computer, and fix it after adjusting the position of the docking.

4.3 Antenna Installation

Dual-antenna installation

i. **Preparation:**

- Connect the antenna to the antenna post, install a two-hole insulating strip on the main antenna, and connect the data transmission antenna.

ii. **Clean the roof:**

- Clean the roof of your car to make sure it's clean and free of debris.

iii. **Install the antenna post:**

- Remove the 3M glue from the bottom of the antenna column and install the antenna column on the left and right sides of the roof in the rear position, or use screws to fix it.

iv. **Connecting cables:**

- Connect the cables related to the antenna, note the main and secondary antennas, and look forward from the back of the car, with the right side as the main antenna and the left side as the secondary antenna.

Single antenna mounting

i. Preparation:

- Prepare the roof controller, clean the roof and make sure the roof is clean and free of debris and dust.

ii. Installation location and installation method:

- Glue 3M glue to the bottom of the roof controller, with the arrow on the controller housing facing the same direction as the front of the car, and glue it horizontally on the central axis of the roof to ensure that it is stable and does not fall off (if possible, it is best to use screws to fix it).

4.4 Body gyroscope installation

i. **Installation Position:**

- A rigid plane under the seat or under the foot pad in the cab, as far as possible on the central axis of the vehicle.

ii. **Fixed Gyroscope:**

- Place the gyroscope horizontally, making sure the X-axis is facing forward and the cable is facing backwards, and use screws to secure the gyroscope to a rigid plane under the bottom of the seat or under the footpads to ensure that it is stable and will not shake and fall off.

4.5 Front wheel angle sensor installation

i. **Install the gyroscope:**

- Install the front wheel angle sensor horizontally on the knuckle of the right front wheel, fix it with screws, making sure that the arrow on the housing is facing forward.
- After installation, confirm that the sensor can swing with the wheel.
- Note: After installation, you need to drive for about 100 meters to initialize the front wheel sensor.

ii. **Install a mechanical angle sensor:**

- Align the center of the angle sensor with the oil seal on the steering pin.
- The recessed points and cantilever should be aligned with the front axle as much as possible.
- Make sure that the fixed arm is parallel to the original disc of the angle sensor.
- If the angle angle is not suitable, tap the corner code with a hammer to adjust to the appropriate bending angle, and then tighten the corner code screws.

iii. **Connecting cables:**

- Align the relevant wires with the interface.
- Pay attention to avoiding the moving parts of the vehicle and the hot parts of the vehicle when routing the line.

- Use cable ties to secure the cables, ensuring that all cables are not pulled, tightened, folded, or compressed.

At this point, the equipment on the car is installed.

4.6 Portable Base Station Installation (skippable without base station)

i. **Prepare and connect your device:**

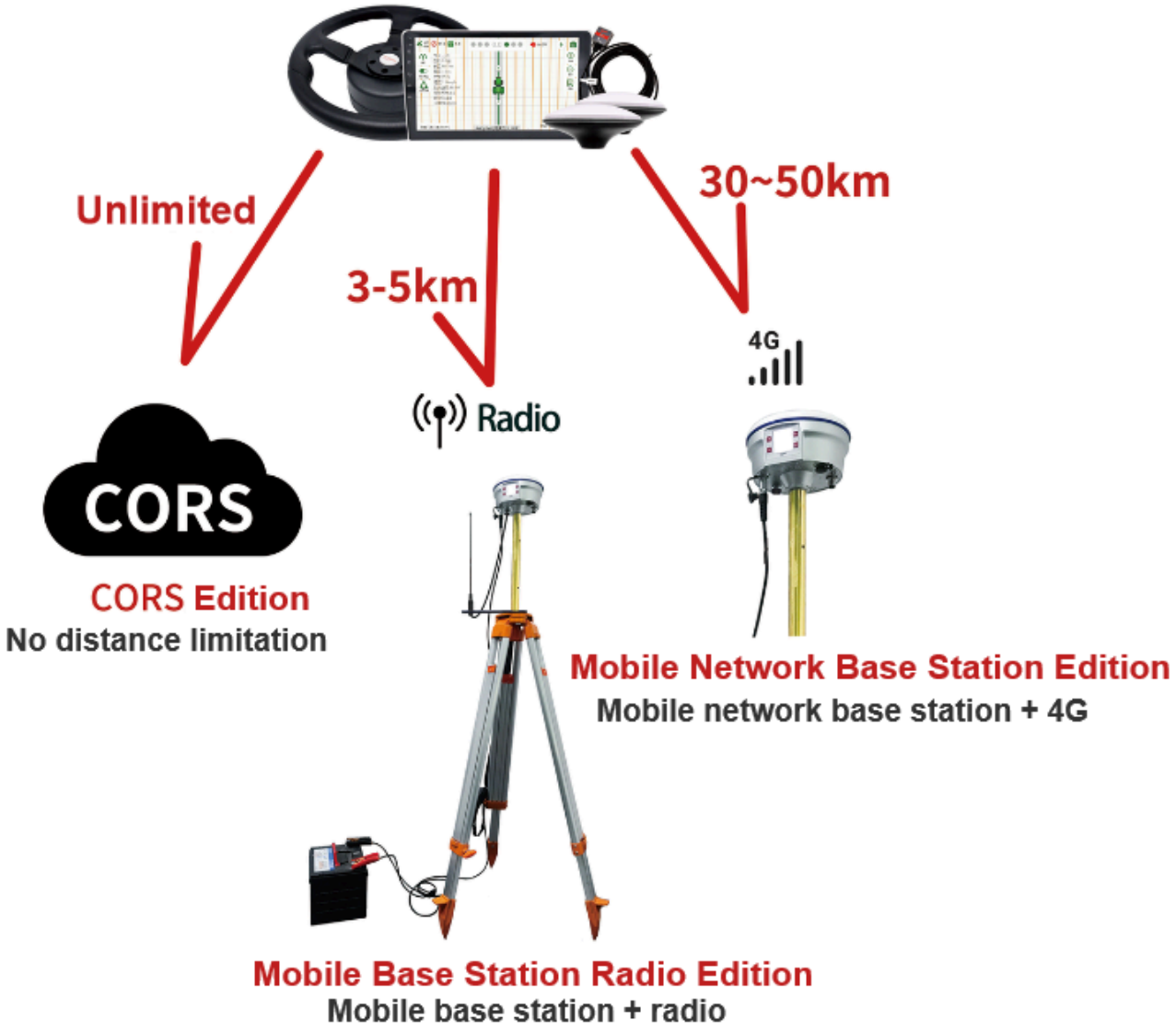
- Connect the connecting rod, two-hole insulating strip, data transmission antenna and base station, and connect the tripod and power supply.

ii. **Choose the right installation location:**

- Set up base stations in unsheltered open space to ensure that they are not under trees, high voltage lines, cell towers or next to buildings.
- Make sure there are no obstructions or structures blocking the sky.
- The base station must be set up firmly to avoid shaking in the wind.

iii. **Network Base Station Mode:**

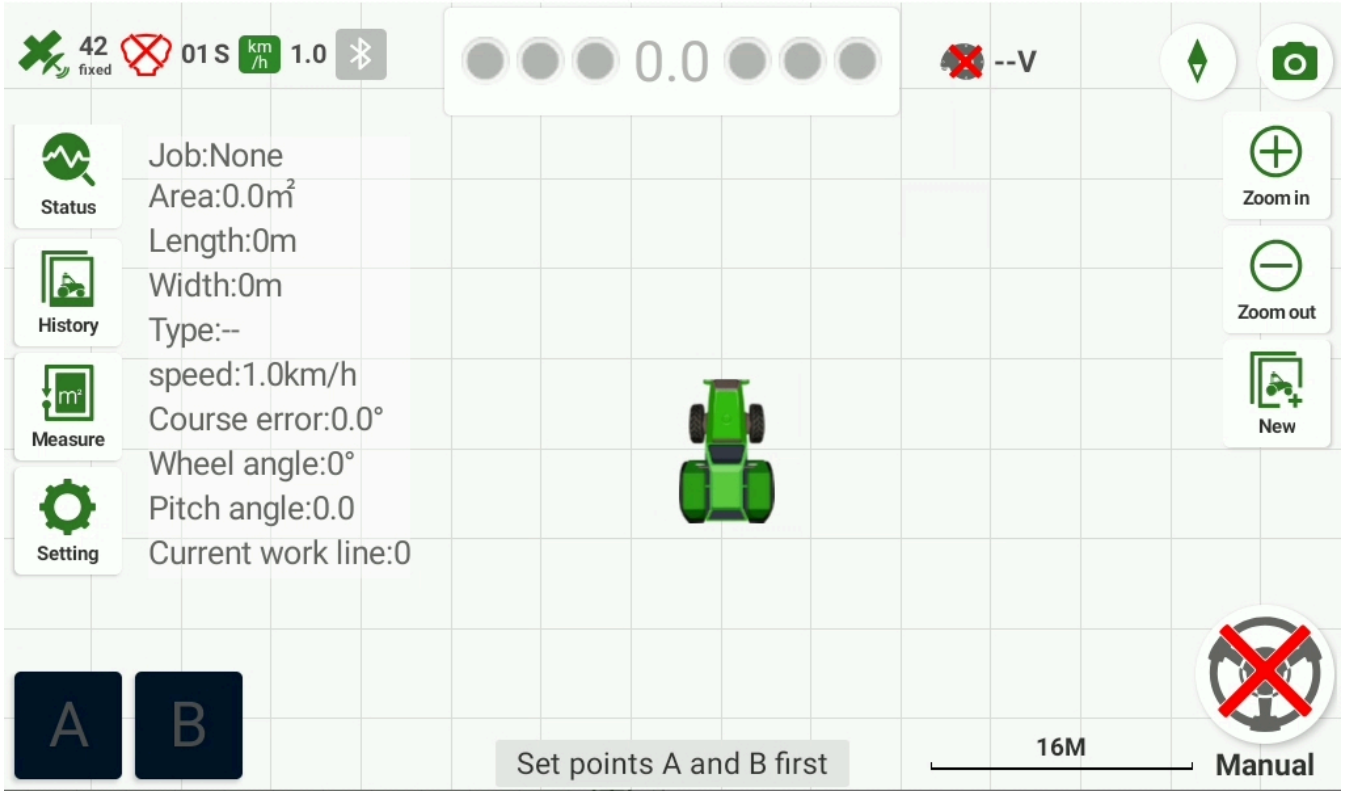
- The base station can be set up on its own roof for use, with an effective coverage radius of 30-50 km.

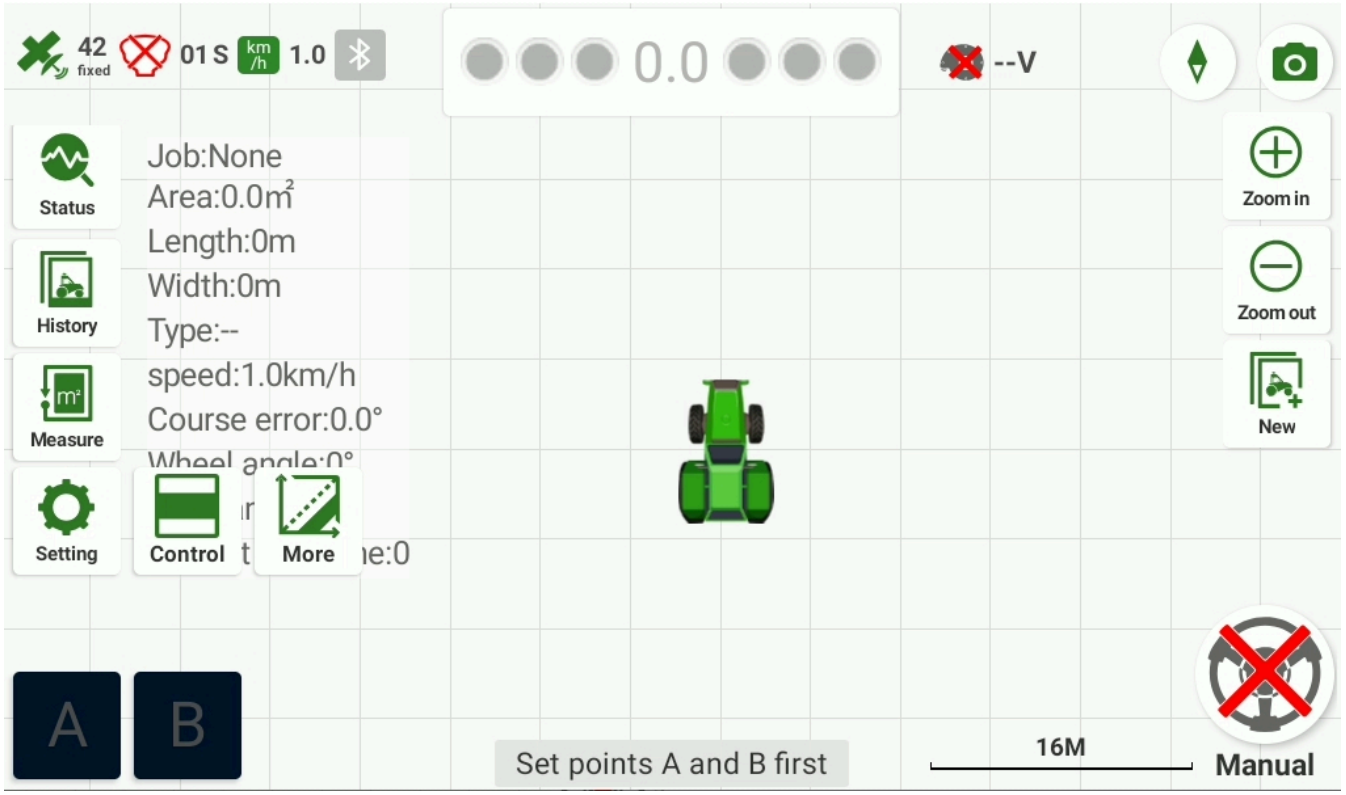


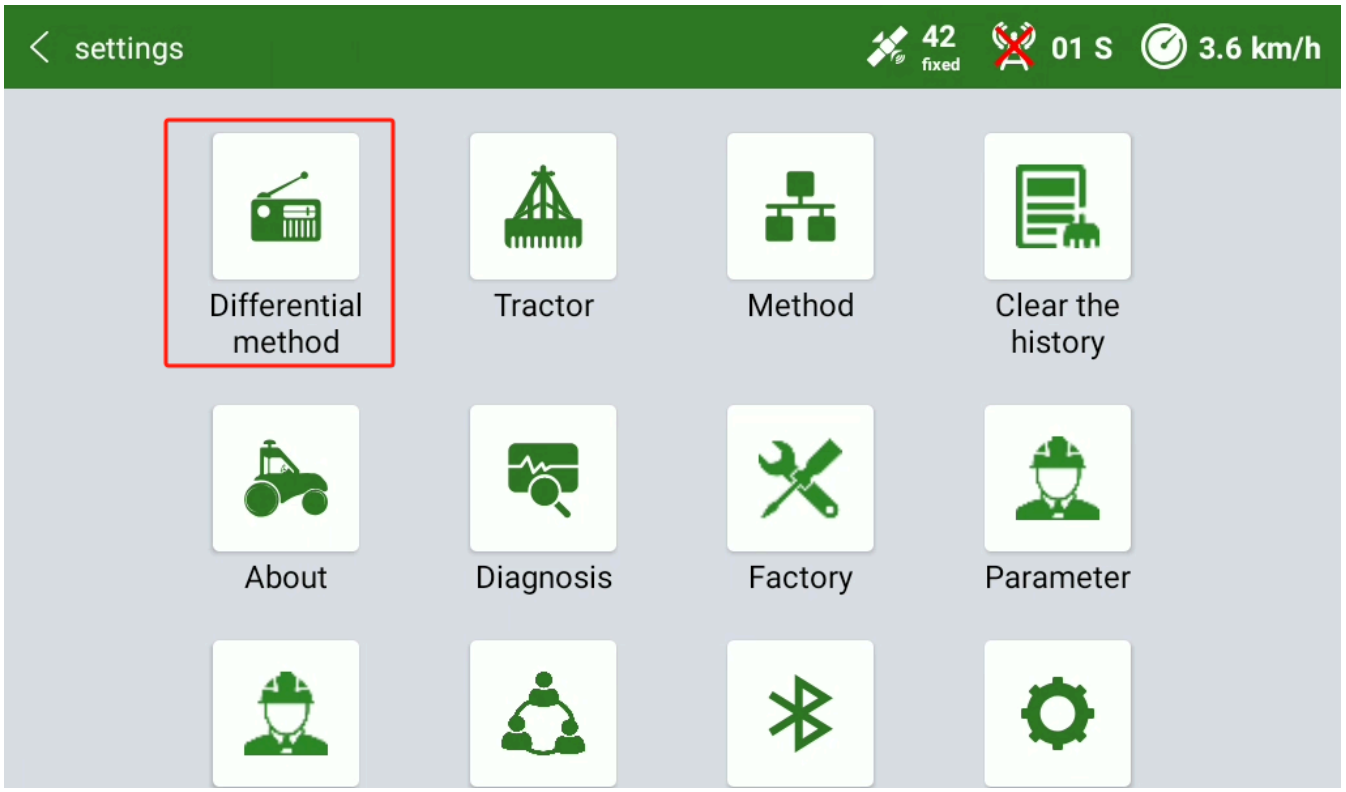
5. Basic system settings

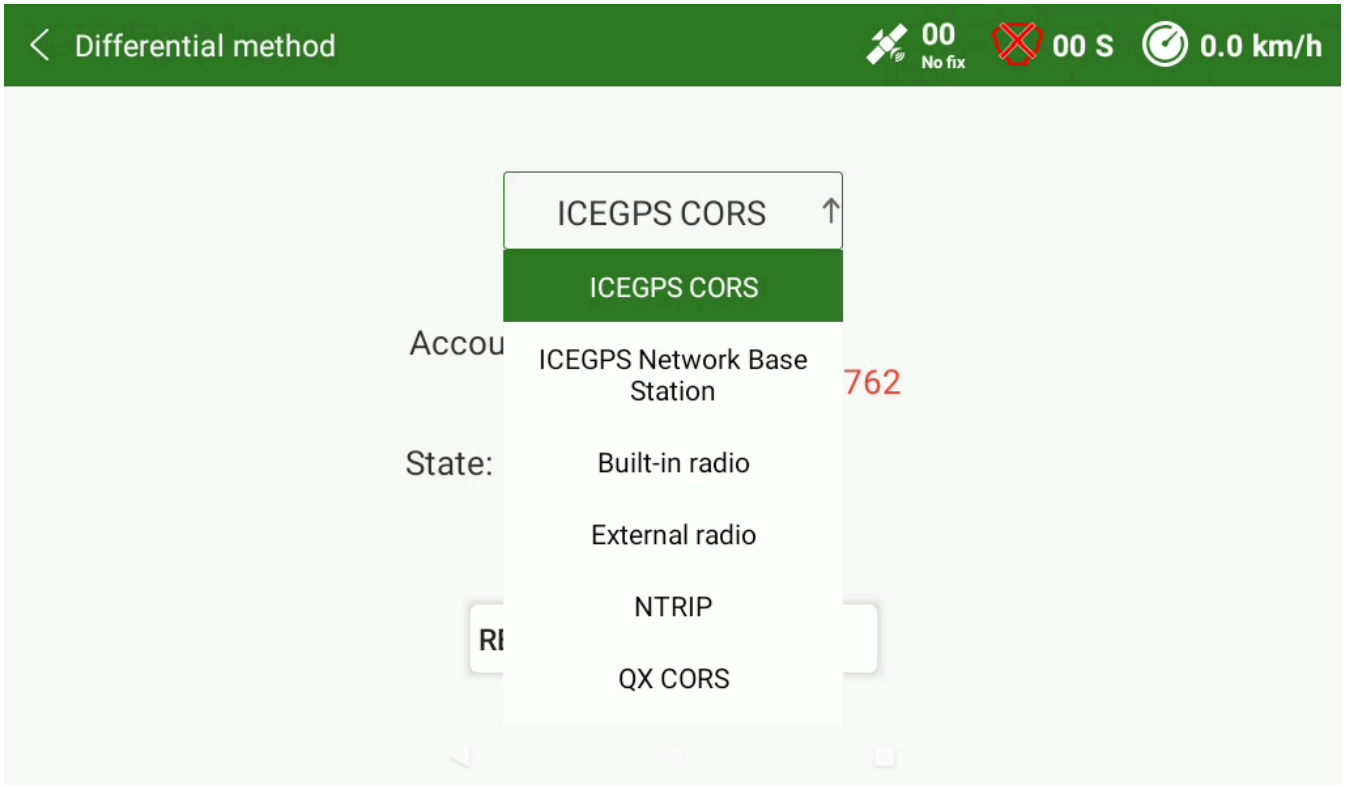
5.1 Differential Settings

- Procedure: Setting→ more →differential methods.


42
fixed
01 S
km/h
1.0
0.0
--V
Status
History
Measure
Setting
Job:None
Area:0.0m²
Length:0m
Width:0m
Type:--
speed:1.0km/h
Course error:0.0°
Wheel angle:0°
Pitch angle:0.0
Current work line:0
Zoom in
Zoom out
New
A
B
Set points A and B first
16M
Manual

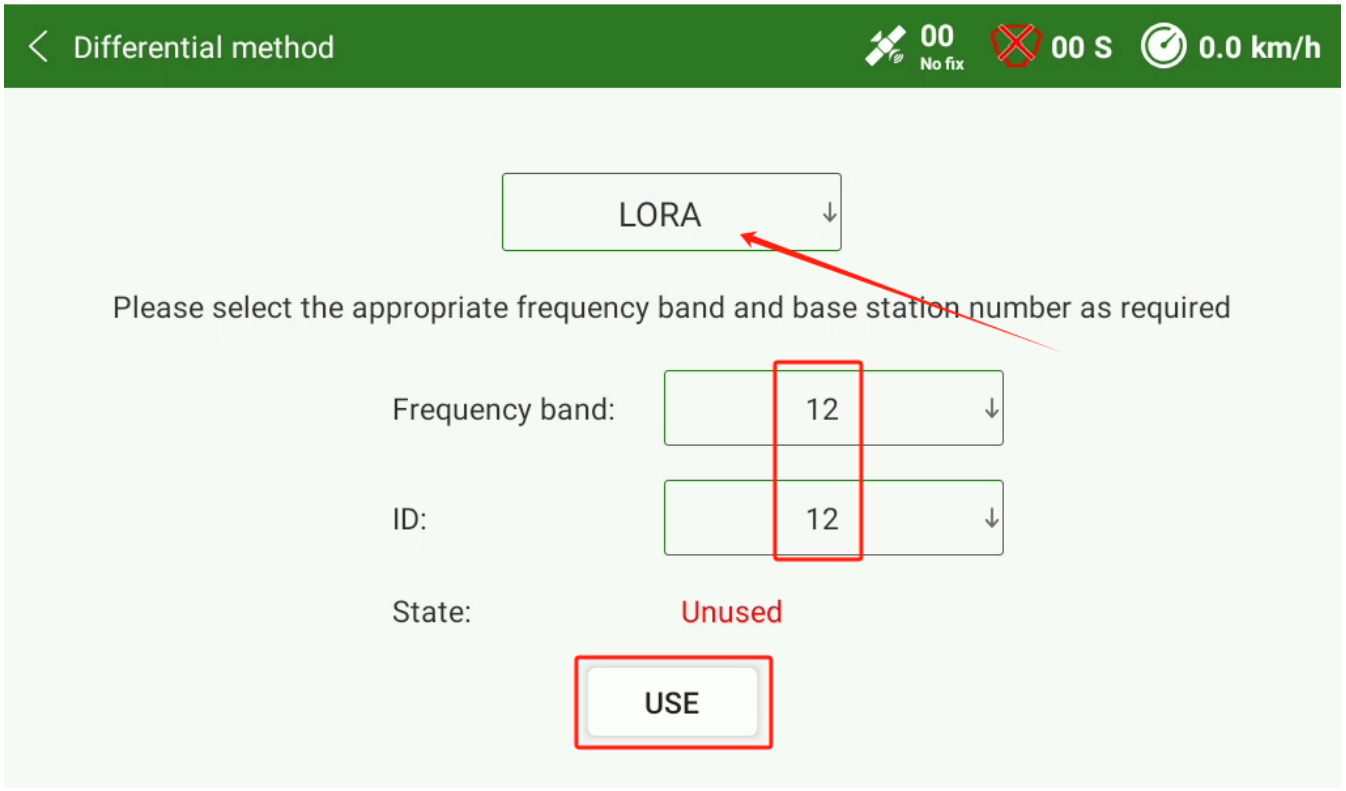

42
fixed
01 S
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Status
History
Measure
Setting
Control
More
Job:None
Area:0.0m²
Length:0m
Width:0m
Type:--
speed:1.0km/h
Course error:0.0°
Zoom in
Zoom out
New
A
B
Set points A and B first
16M
Manual





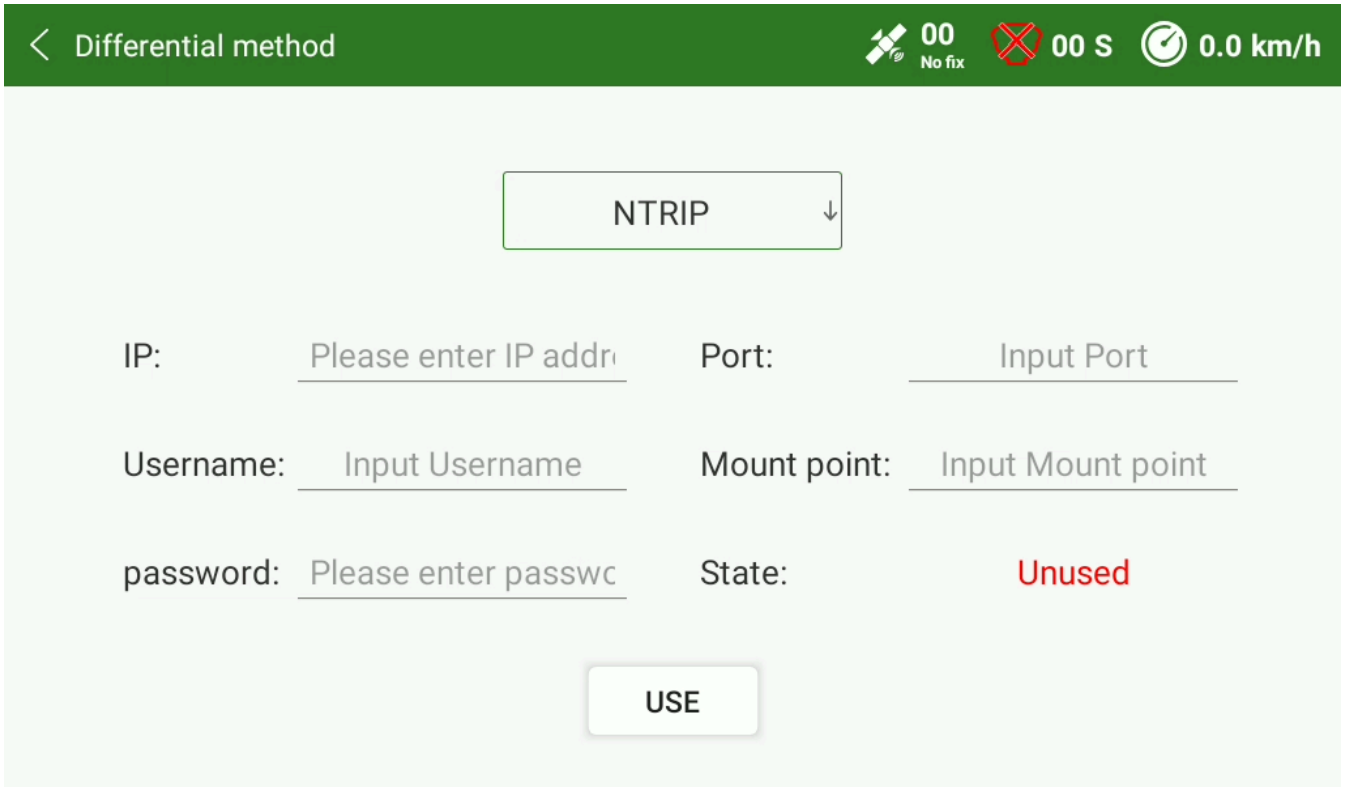
5.1.1 Radio base stations

- Radio base station: power on and wait for the base station to be fixed in the upper left corner of the screen.
- In-vehicle computer: Select "Laura differential" for differential mode, set the frequency band and base station ID to be consistent with the base station, and then click Use.



5.1.2 NTRIP

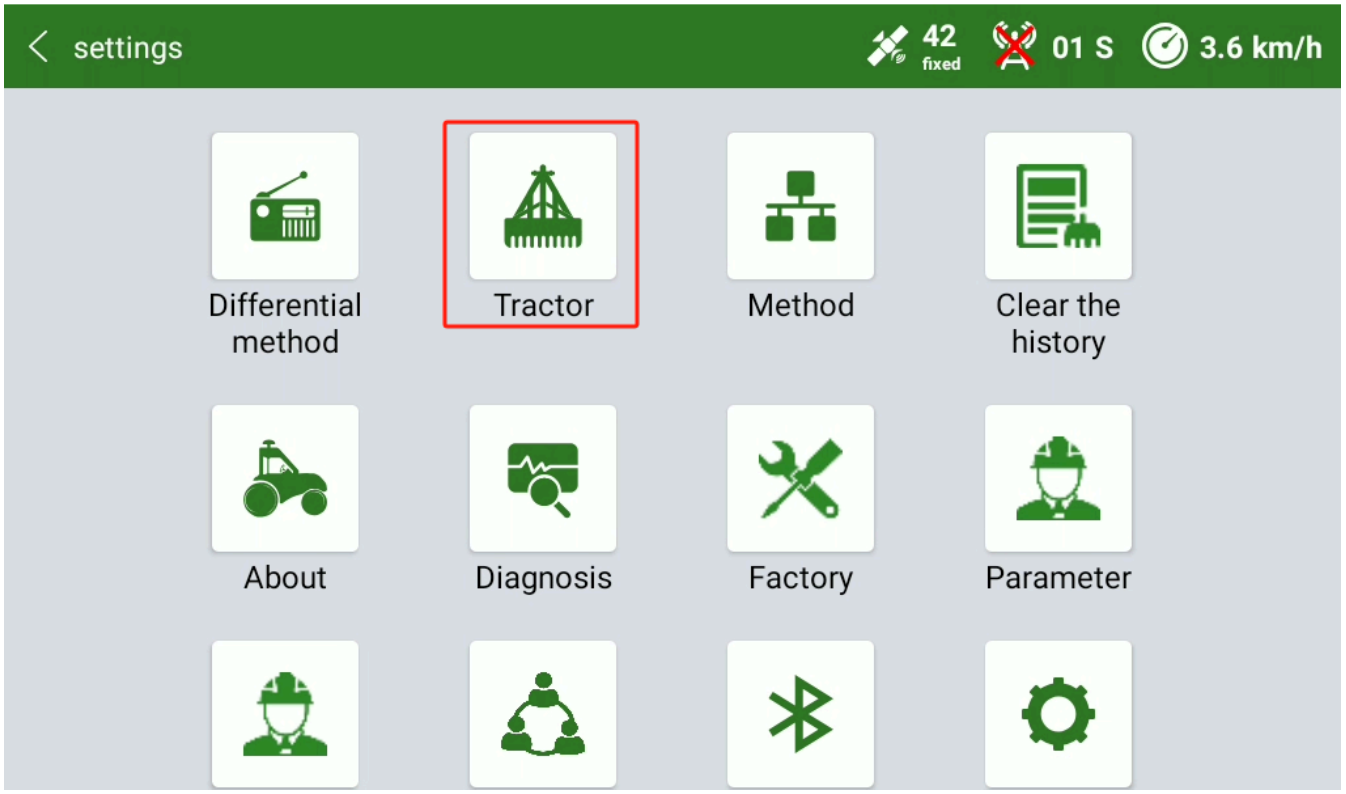
- Make sure your on-board computer is connected to the Internet, then enter your full NTRIP account number and click Use.



6. Configuration of relevant parameters such as vehicles, farm tools, etc

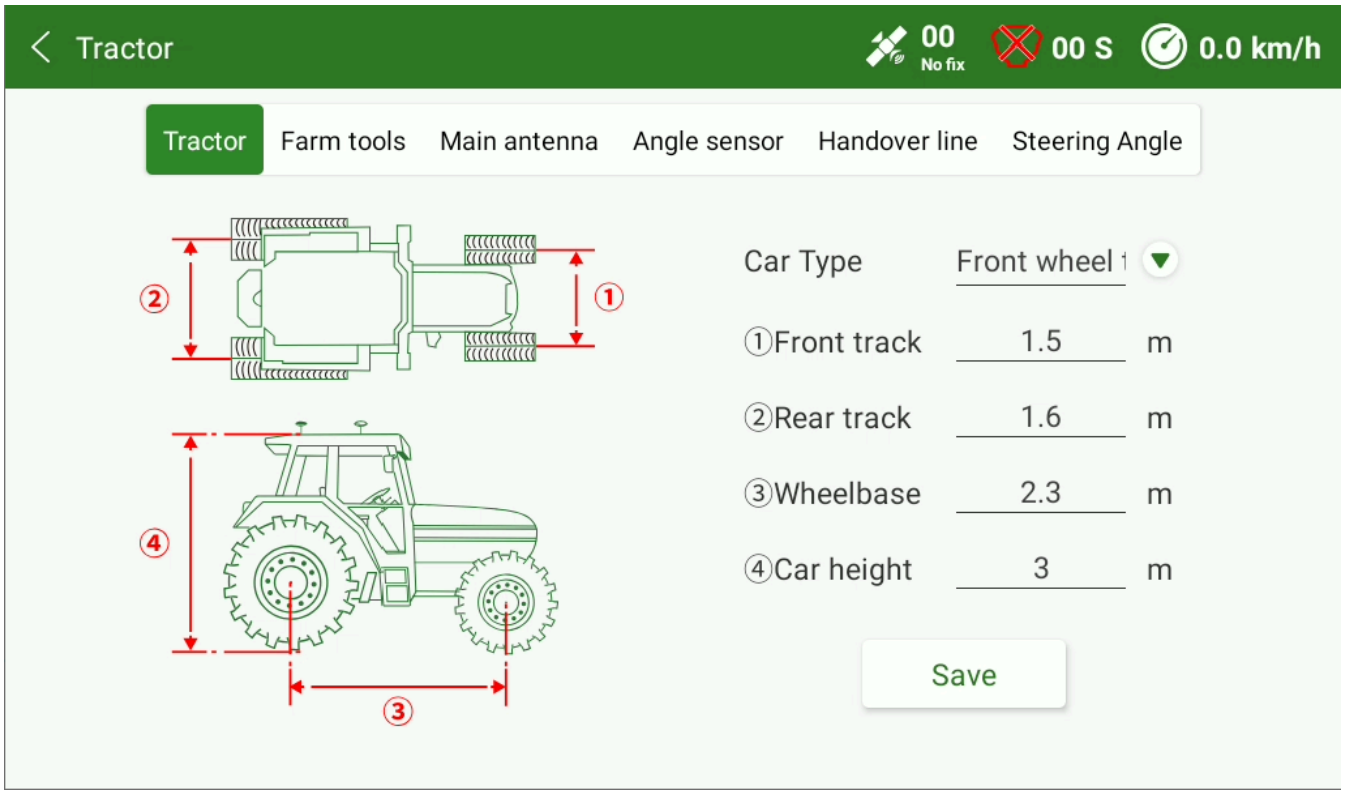
6.1 Agricultural machinery and tools setup

- Steps: Set → more settings → agricultural machinery and farm tools.
- Configure and calibrate the vehicle, farm implements, main antenna, angle sensor, handover line, and steering angle according to the relevant content of the interface, and then restart the device to take effect.



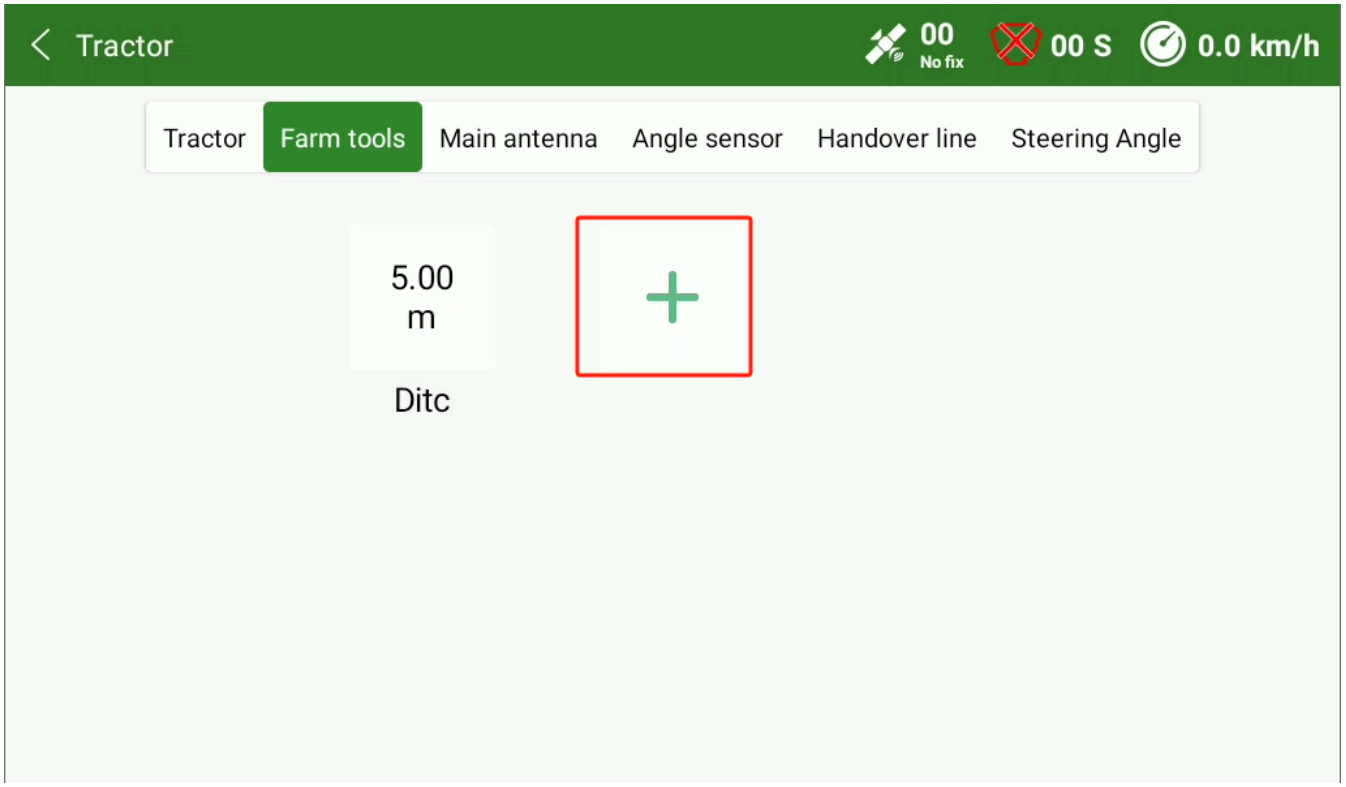
6.1.1 Vehicle Settings

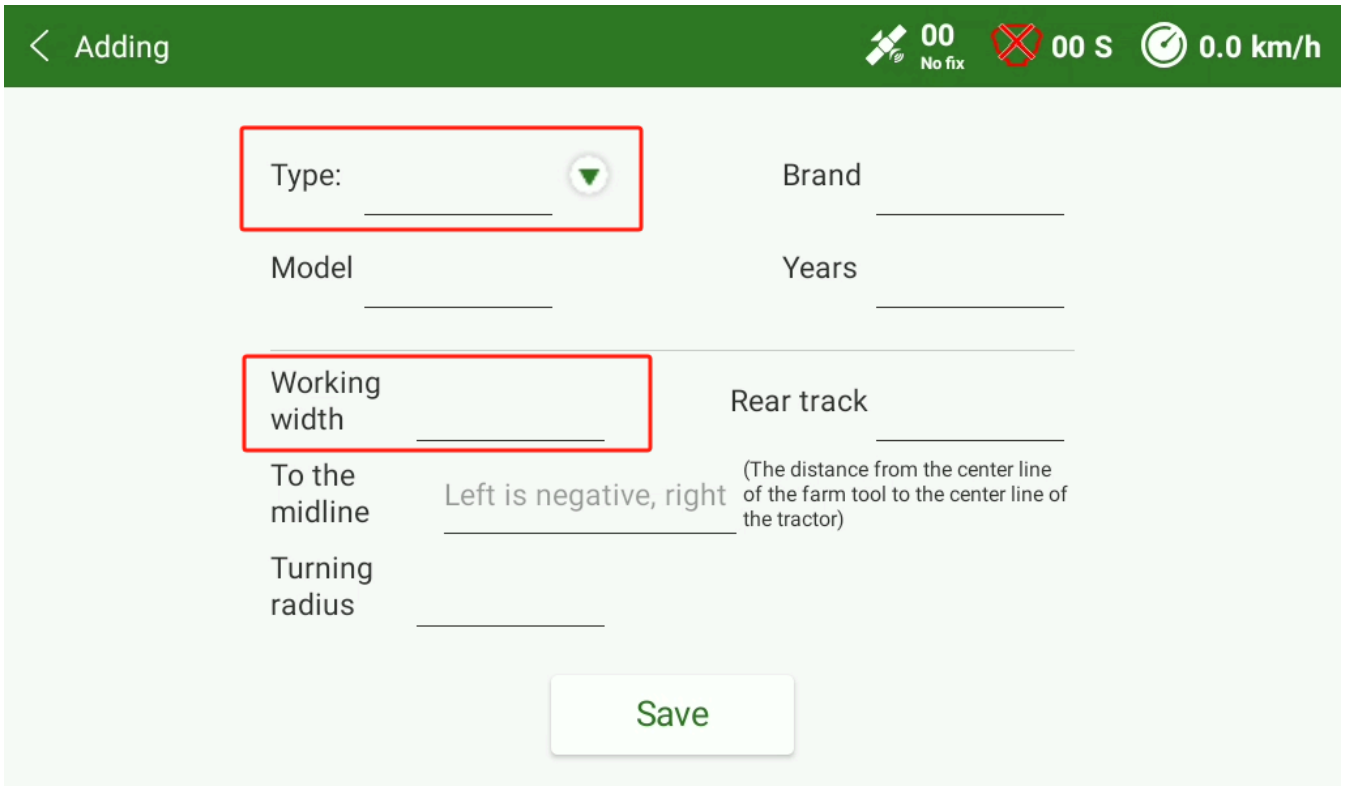
- Select the vehicle type, measure and enter the front and rear track, wheelbase and vehicle height.



6.1.2 Farm tool settings

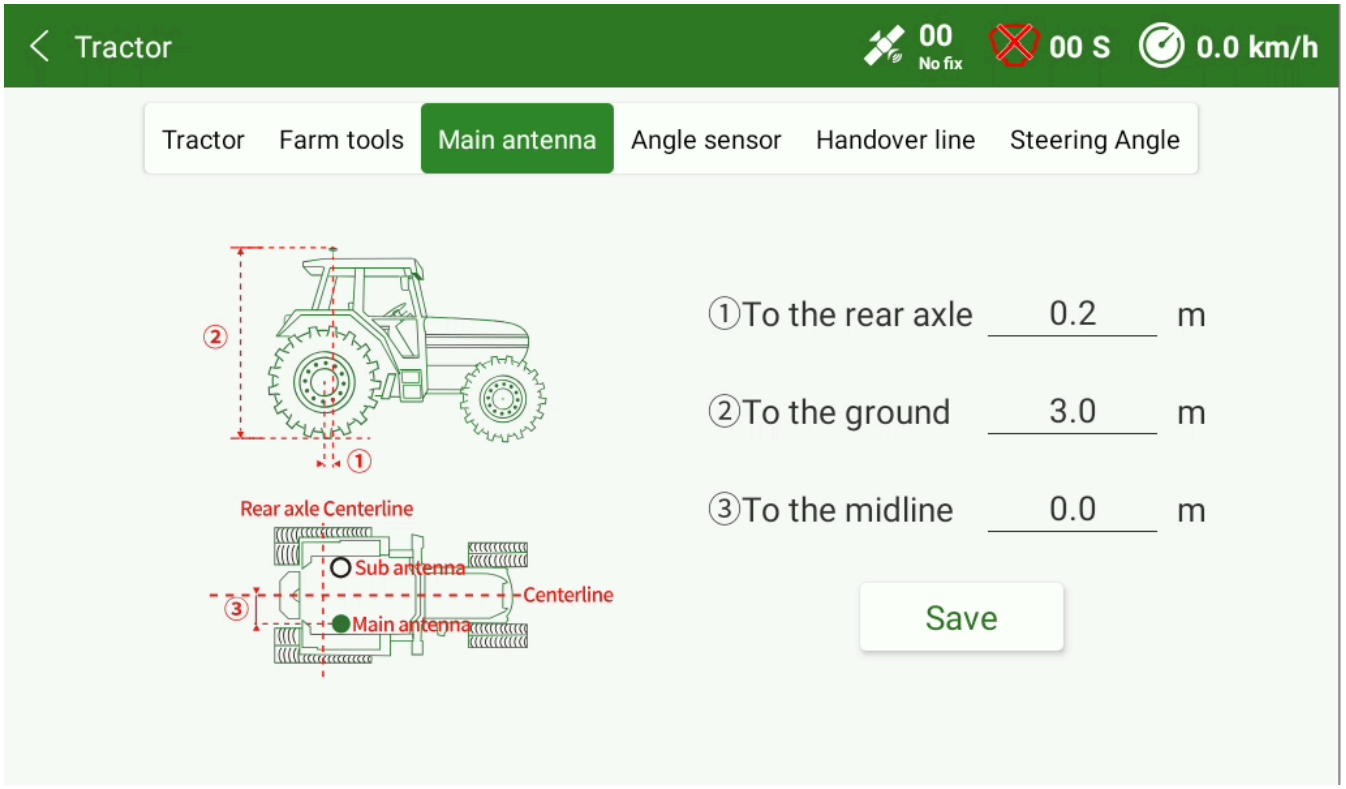
- Users can add implement types and set job widths.





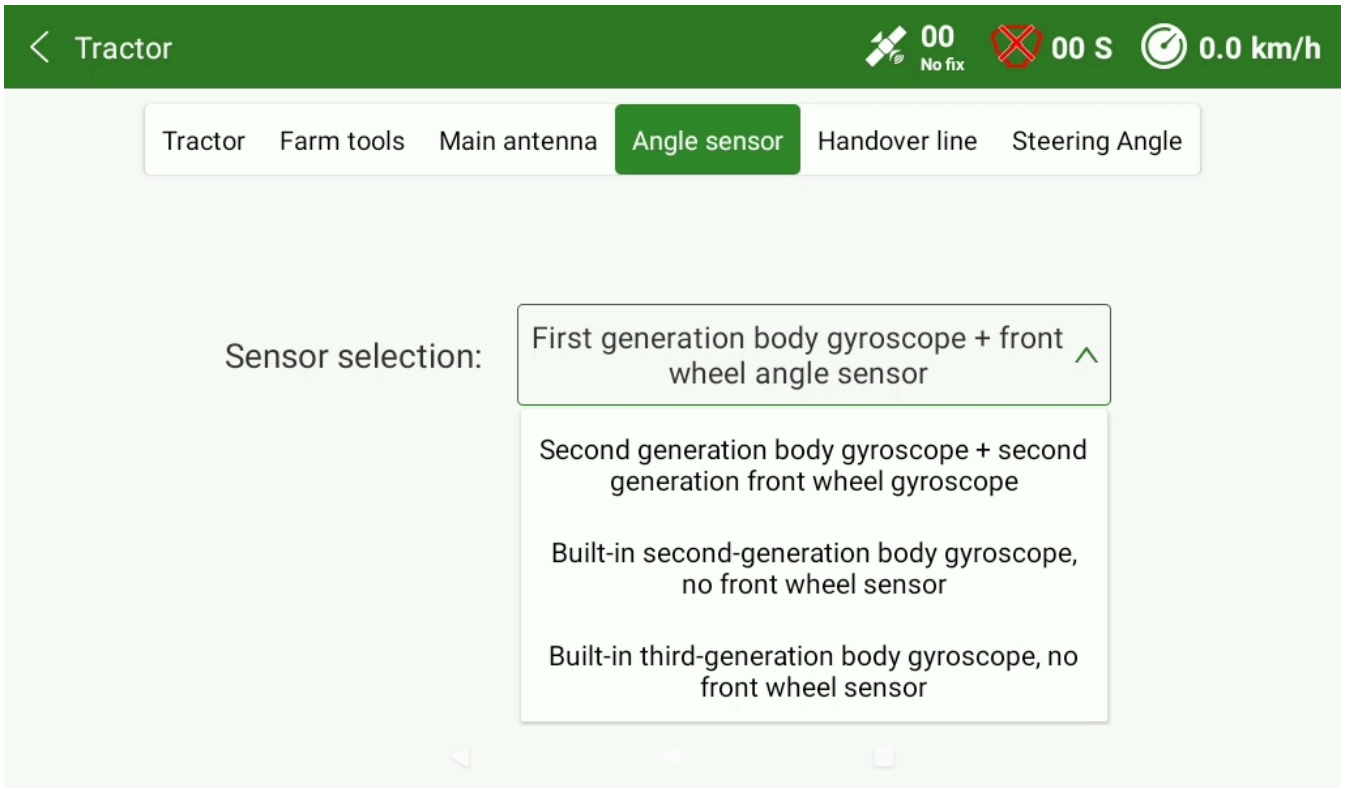
6.1.3 Main Antenna Settings

- Select the antenna mounting type, then measure and enter the antenna parameters.



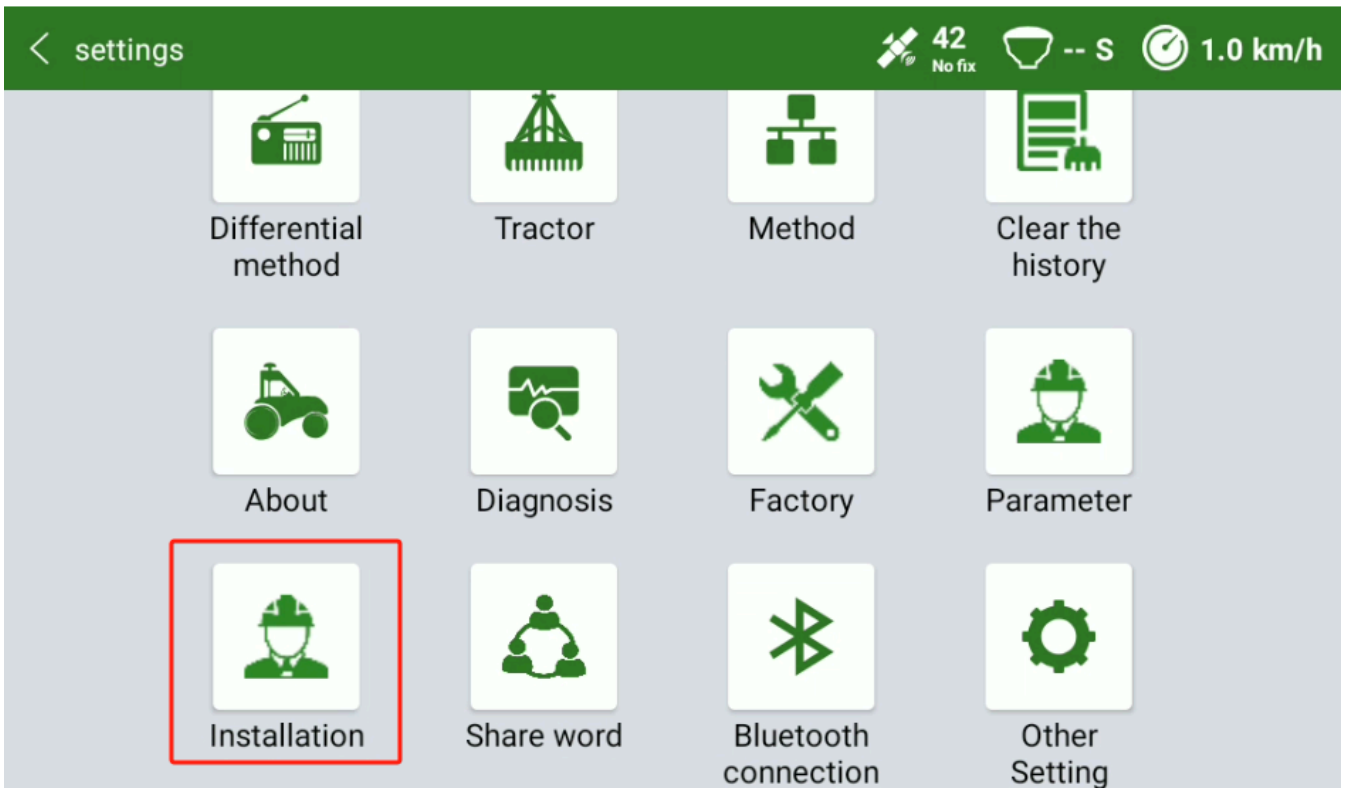
6.1.4 Angle Sensor Settings

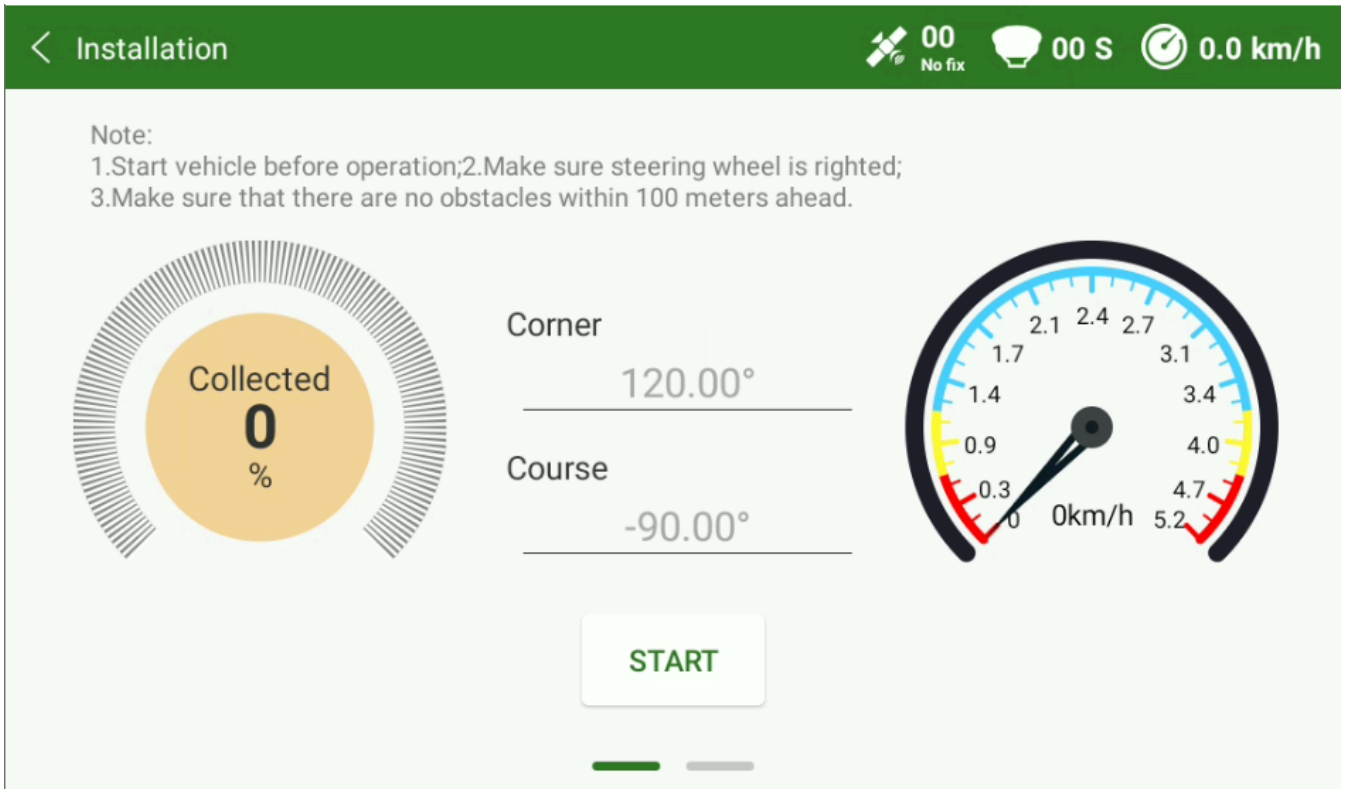
- Select the sensor type based on the sensor installed.



6.2 Installation Calibration (Purpose is to calibrate dual antenna orientation and mechanical angle sensors)

- Steps: Setting → More → Installation Calibration.
- After entering the installation calibration, select Auto Calibration, calibrate the vehicle equipment according to the interface prompts, and start working after completion.

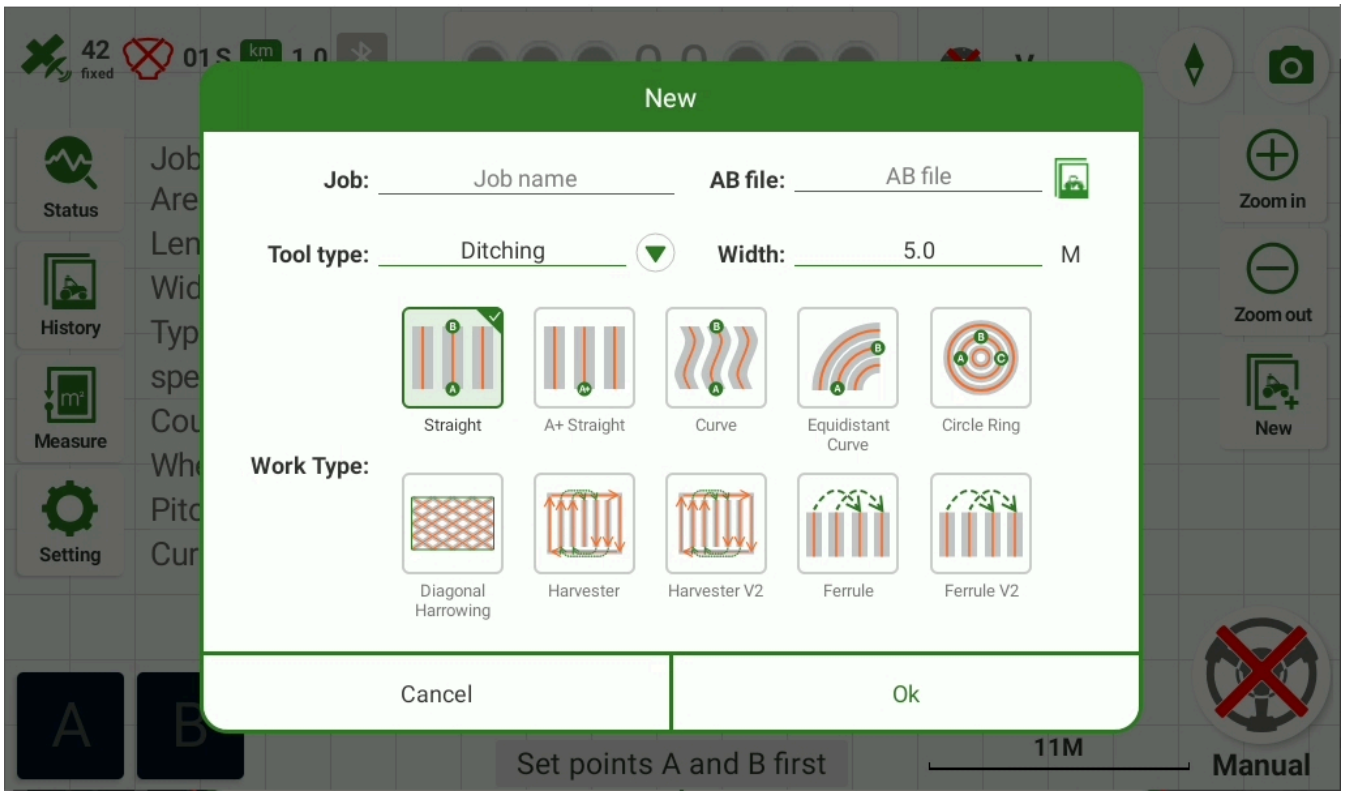


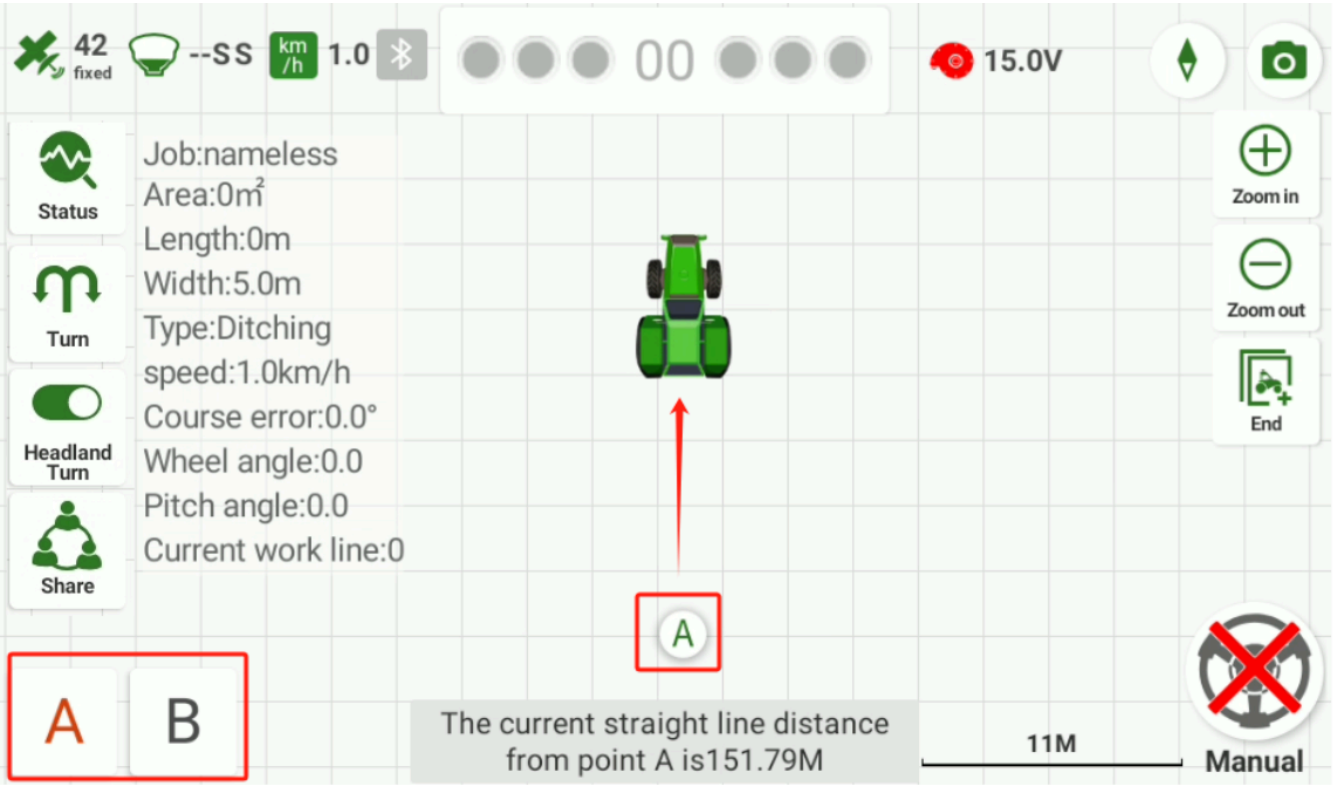


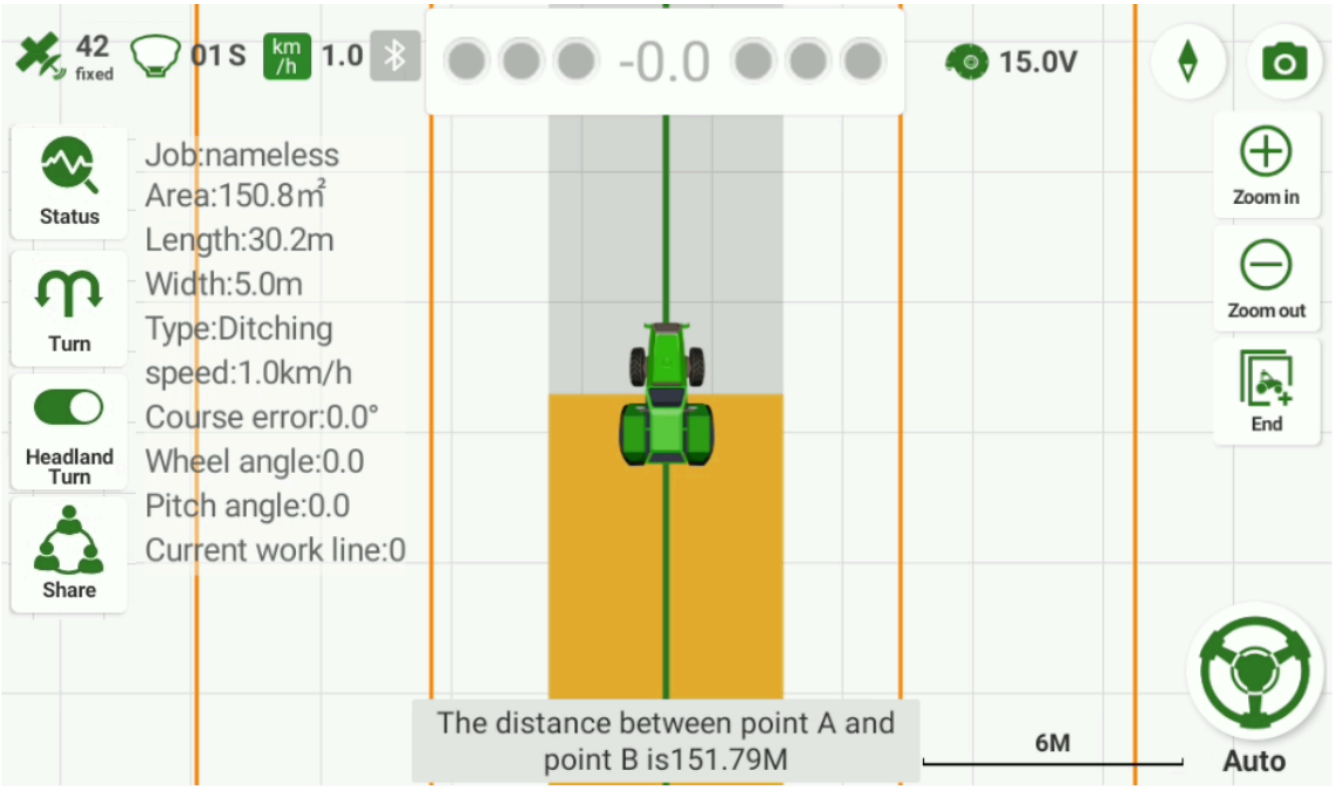
7. Introduction to the function of the operation line

7.1 AB Line

- AB Line: The user can use this function to locate points A and B, and the system will generate a line based on A-B, and at the same time, the width of the previously configured farm tool and the width of the transfer row will be added and offset out of the parallel line.

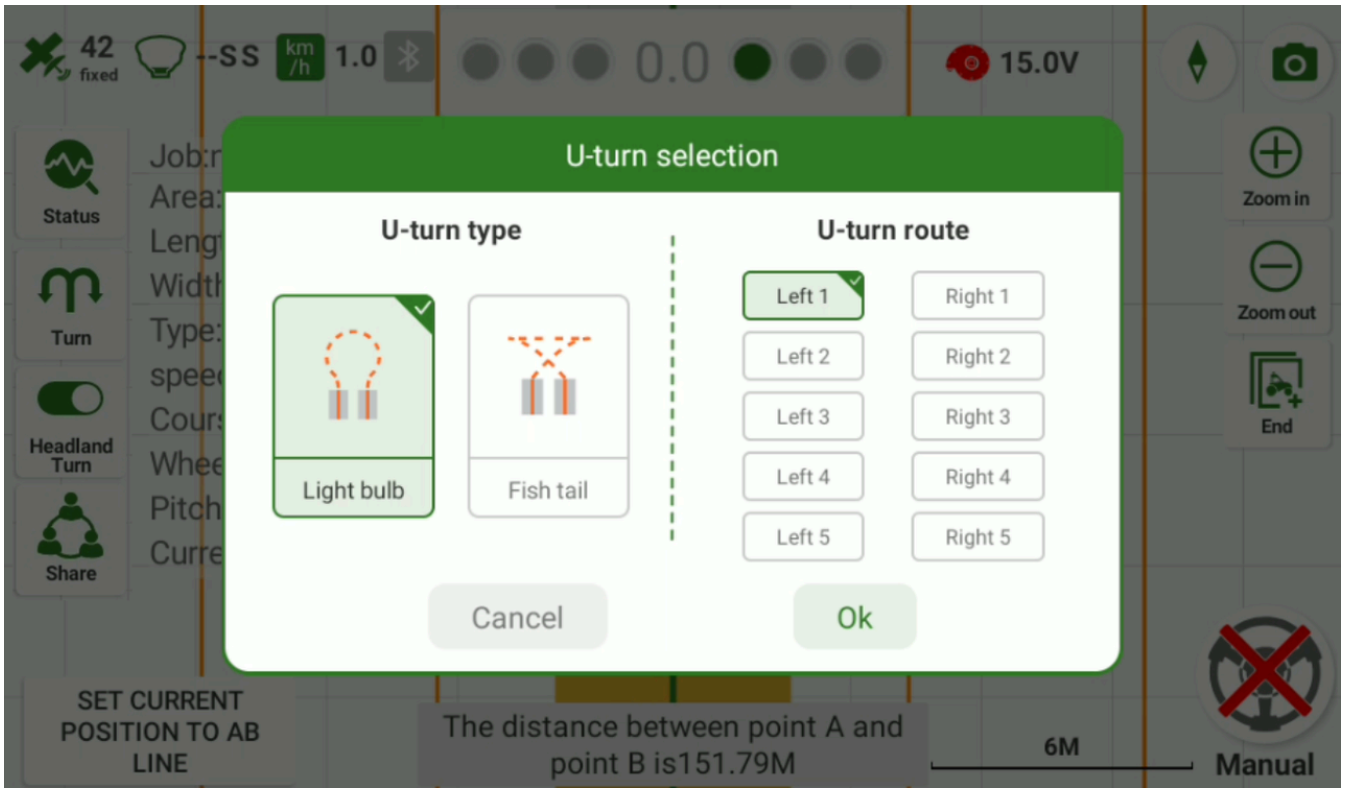






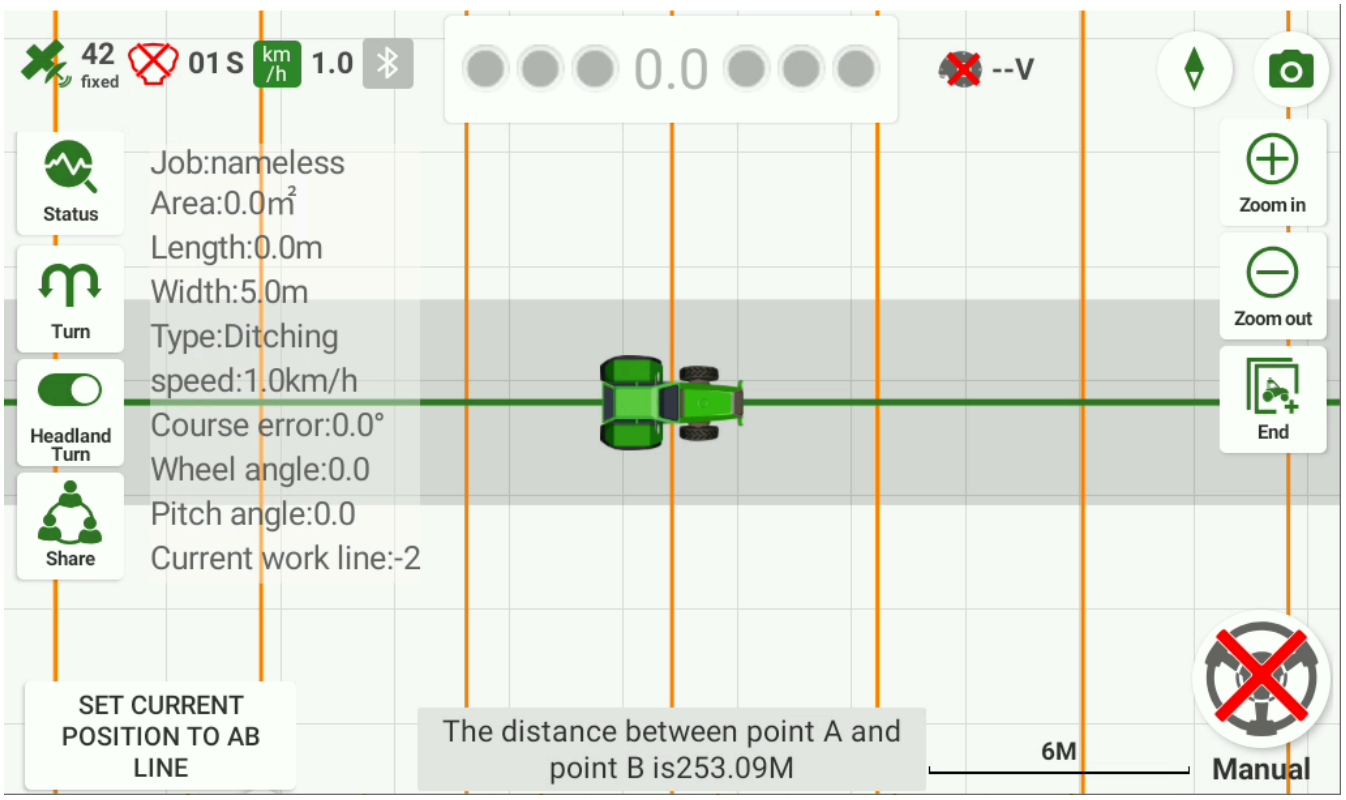
7.1.1 Auto-turn

- Auto-U-turn: When the user's automatic work line is about to drive to the end of the plot, stop the vehicle and click U-turn, select the desired U-turn type and U-turn route to automatically turn around, without switching to manual mode.



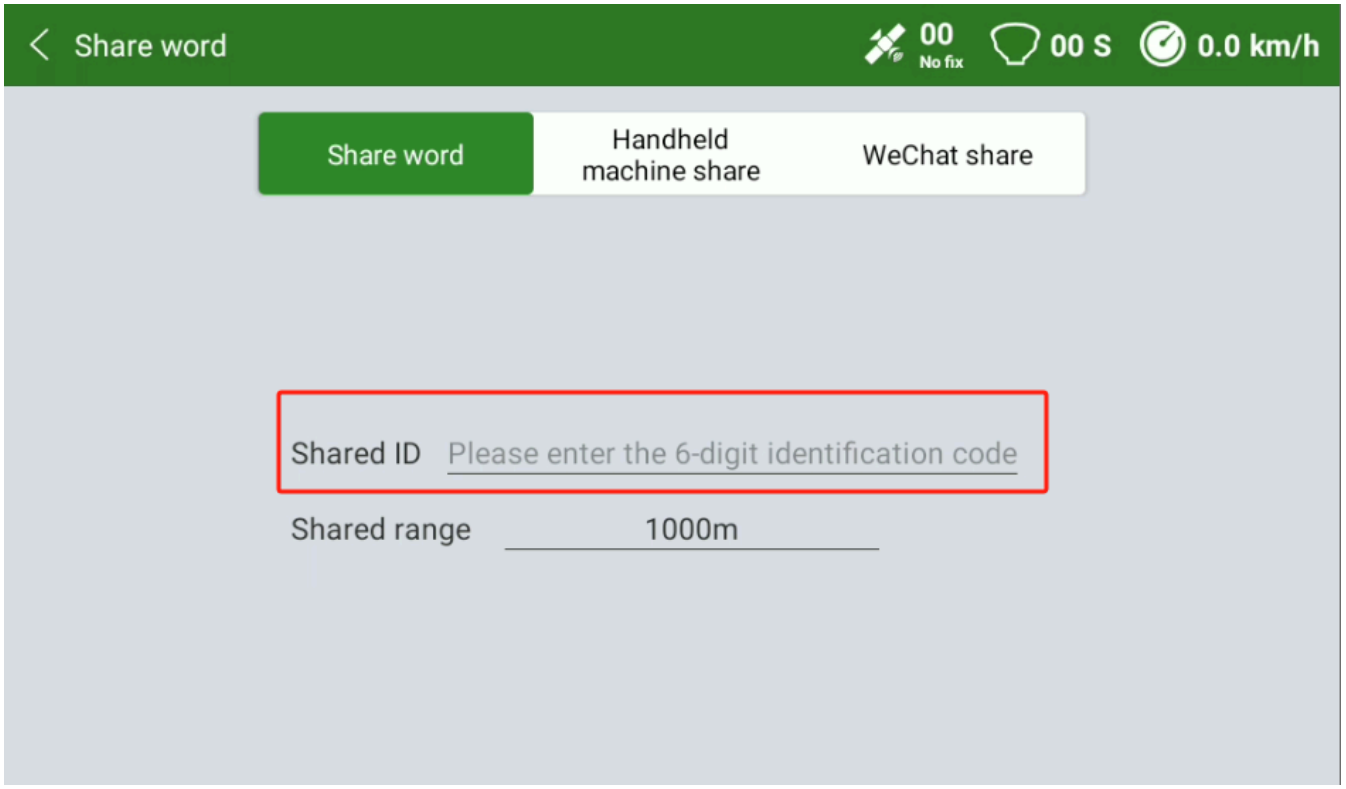
7.1.2 Cross work

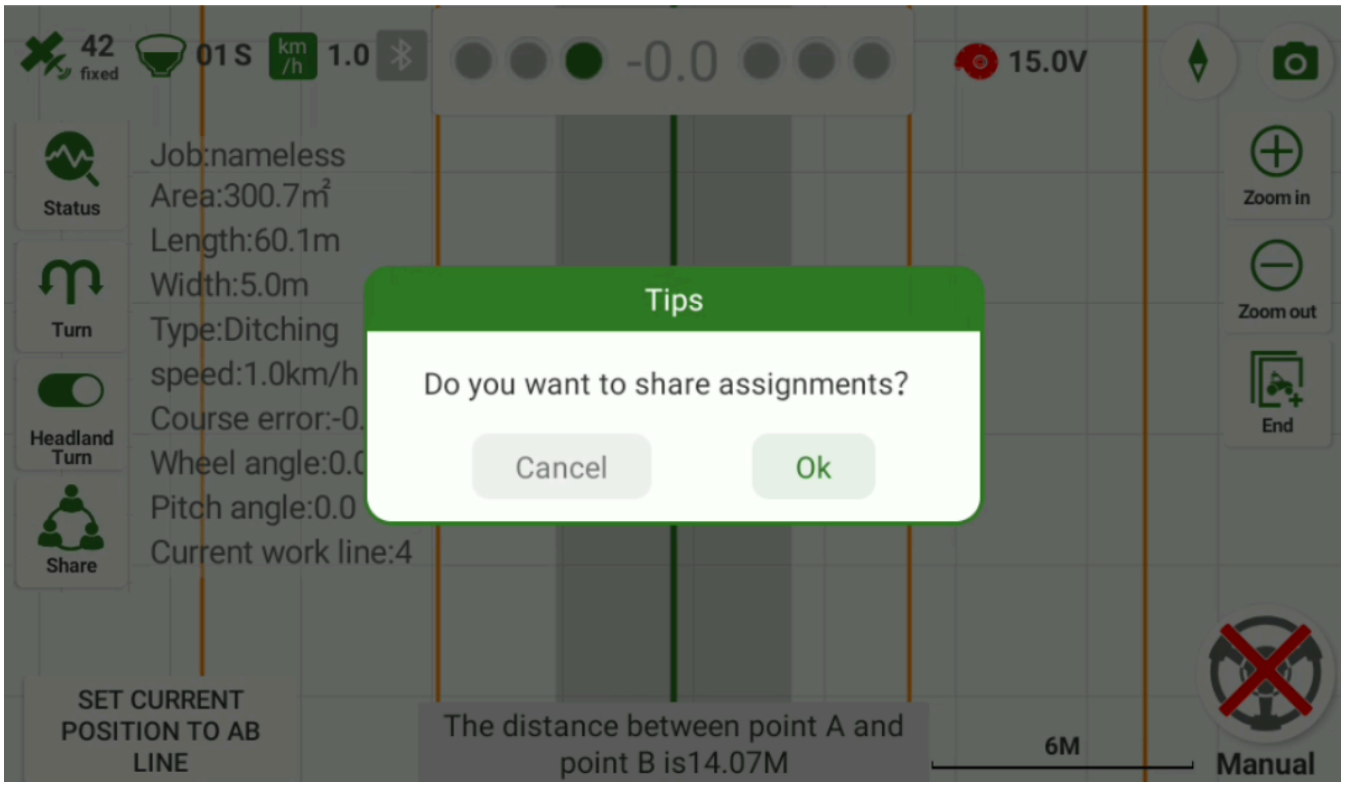
- Cross operation: When the user adjusts the direction of the front of the car to an angle of approximately 90 degrees from the direction of the work line, switching to automatic mode will generate a cross work line perpendicular to the AB line.



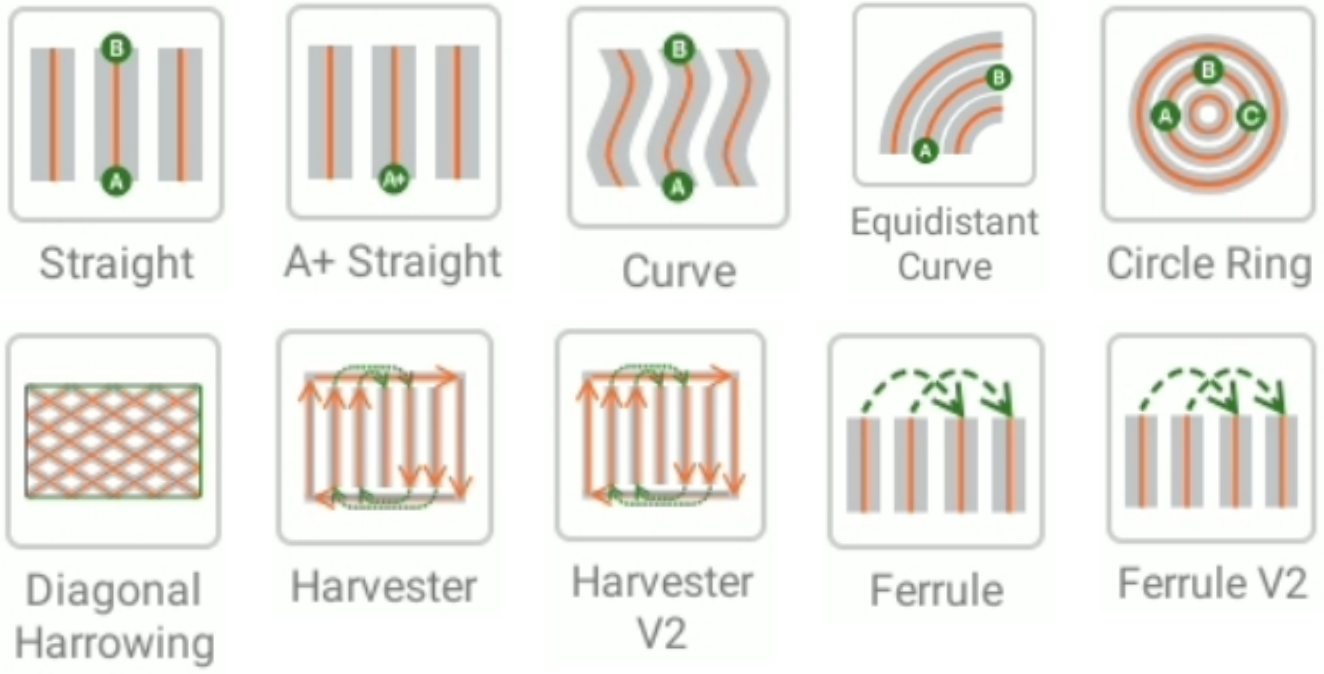
7.1.3 Share work

- Shared Job: Go to Settings → More Settings → Share Job, enter the same sharing ID code for both vehicles, and click Share Job on the job interface to share with other users.





7.2 A+ straight line, translation curve, equidistant curve, torus, nesting, diagonal raking



- A+ straight line: It is a straight line generated according to the current position and the current headway direction, and users can use this function to quickly generate a straight line.
- Curve: The user can use this function to locate the driving path from point A to point B, and generate the curve of A-B and the translation curve of the offset of the addition of the width of the previously configured farm tool and the handover line according to point A-B and the path trajectory. This function is suitable for ordinary plots, and the generated line will be expanded in the way of offset.
- Equidistant curve: The user can use this function to locate point A and point B and the path in the process of driving, and generate the curve of A-B and the equidistant curve of the offset of the width of the previously configured farm tool and the handover line according to the A-B point and the path trajectory. This function is suitable for the working scene of the ring, and the generated line will be expanded in a fan-shaped manner.
- Circle Ring: The user needs to manually drive according to the known circular path, locate the three recording points of A-B-C in the same circular path, and the system will automatically calculate the center of the circle and offset the circular path based on the addition of the width of the center of the circle and the previously configured farm tools and handover rows, which is suitable for the use of circular plots.
- Diagonal harrowing: According to the user's self-planned plot map and the corresponding width of the agricultural tool, the system automatically generates the rake route, and the user only needs to follow the generated path to carry out automatic navigation work.

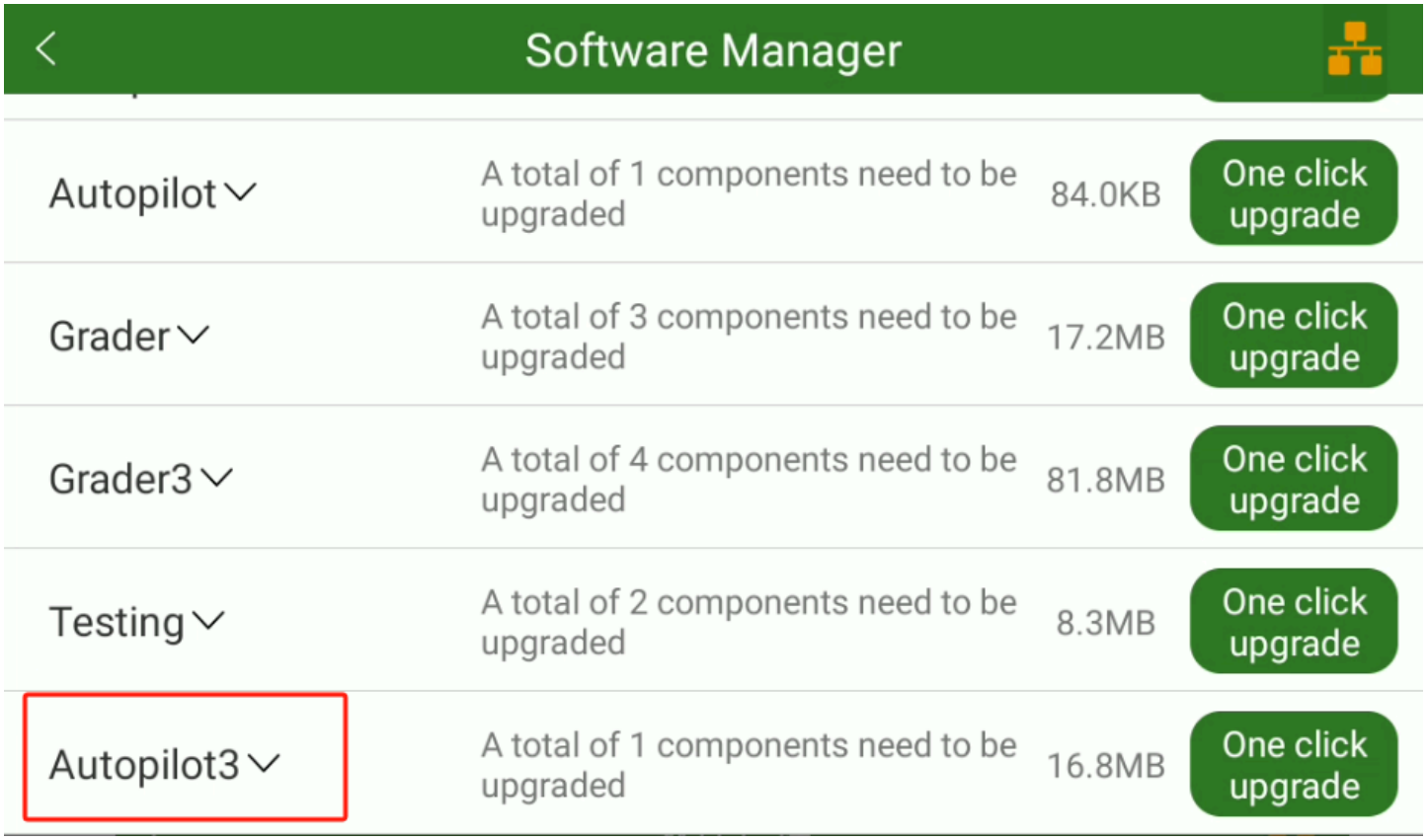
- Harvester: The user first circles the plot and demarcates four points A, B, C, and D at the four corners of the plot, and the system will automatically generate routes according to the width of the operation.
- Ferrule: The system will generate the path of nesting according to the number of nesting rows in the plot map planned by the user, and the user only needs to follow the generated path for automatic navigation.

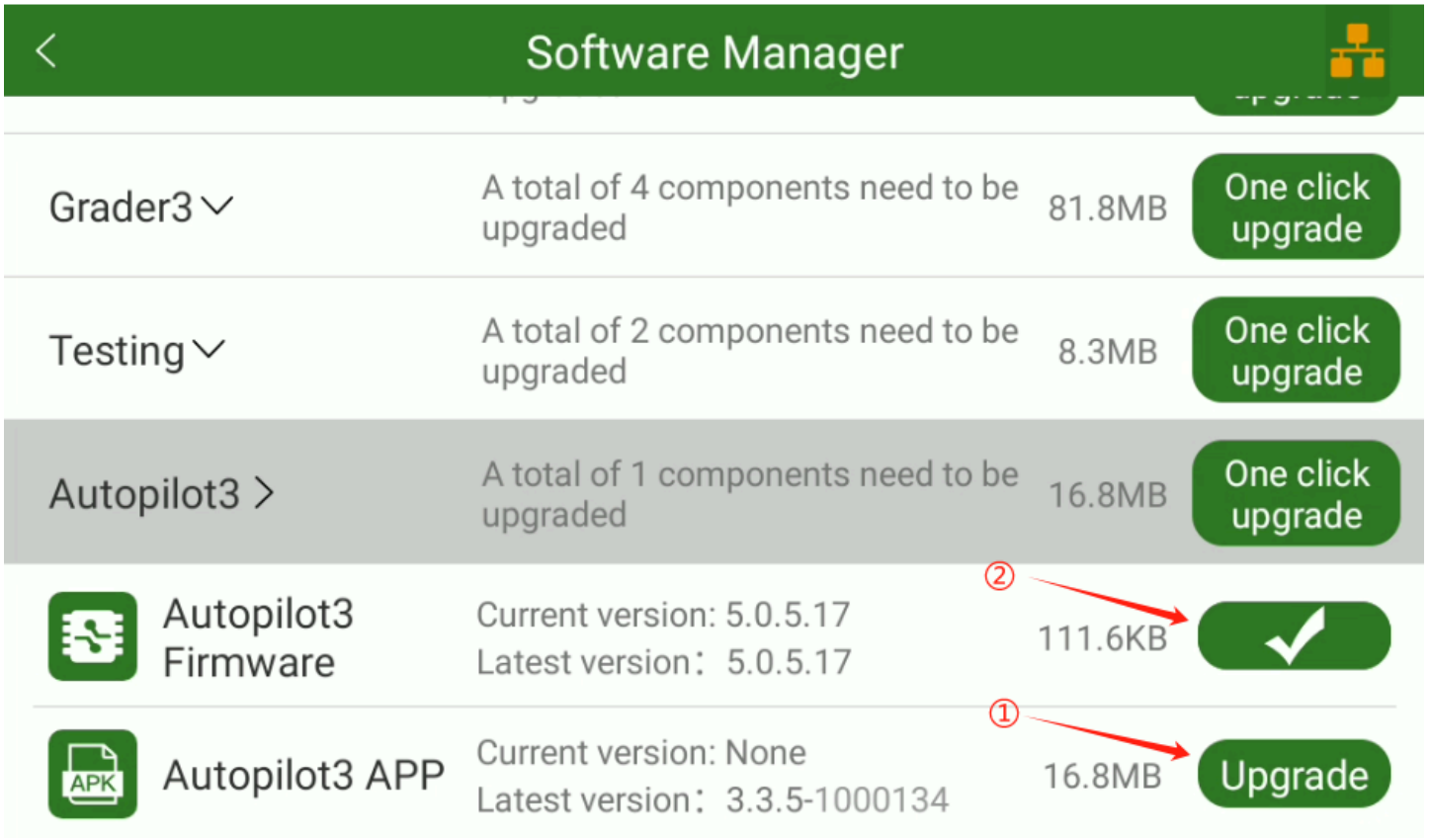
You can view the operation tutorial for the above job functions.

Tutorial website:http://www.icegps.com/videos.html

8. Software/Firmware Upgrades

Connect the computer to the Internet, open the software management APP, upgrade the 3rd generation APP and the 3rd generation firmware of autonomous driving, it is recommended Upgrade according to the APP, controller, and order.




Software Manager
Grader3
A total of 4 components need to be upgraded
81.8MB
One click upgrade
Testing
A total of 2 components need to be upgraded
8.3MB
One click upgrade
Autopilot3
A total of 1 components need to be upgraded
16.8MB
One click upgrade
②
Autopilot3 Firmware
Current version: 5.0.5.17
Latest version： 5.0.5.17
111.6KB
①
APK
Autopilot3 APP
Current version: None
Latest version： 3.3.5-1000134
16.8MB
Upgrade