TAG66
User Guide

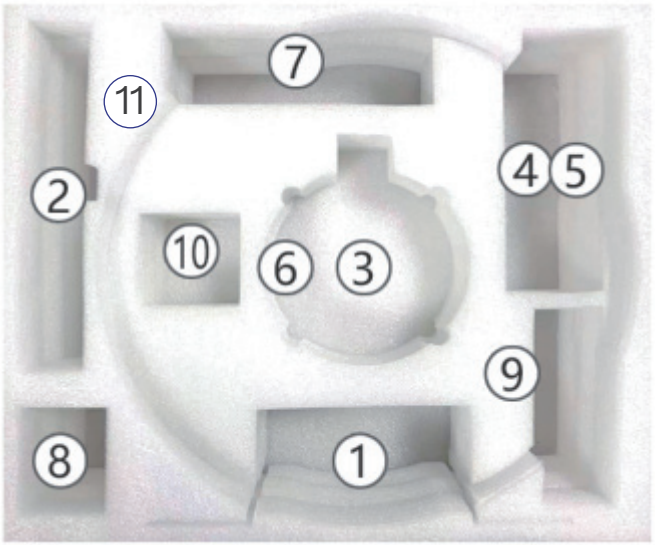
Electric Steering Wheel
Autonomous Driving System

KNOW YOUR AUTO DRIVE SYSTEM EQUIPMENT

The TAG66 Beidou agricultural machinery auto drive system, developed by Toknav Information Technology Co., Ltd., is a precision agricultural platform equipment designed in strict accordance with relevant standards. The system uses high-precision satellite positioning technology, combined with precision control technology and vehicle model precision control algorithm, to enable the automatic driving function of agricultural machinery for planning paths. It is widely used in field operations such as sowing, trenching, ridging, and intercropping.

TAG66 is the main vehicle platform for our precision agriculture series products. The biggest feature of this product is its modular design, low after-sales costs, and reduced user usage costs. It adopts electric steering control technology, eliminating the need for hydraulic components of agricultural machinery, making installation easy and fast. It is also convenient to operate, allowing farmers to quickly grasp the usage method.

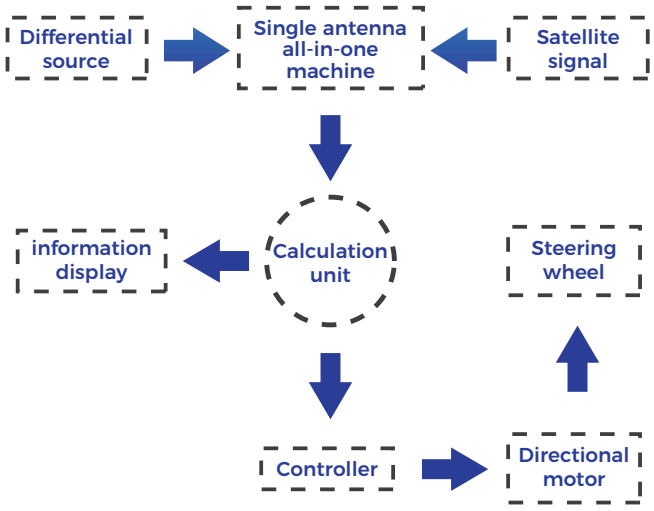
1. GNSS Receiver
2. Car -mounted Android tablet computer
3. Motor and driver
4. Main cable
5. Tablet power cord
6. Steering wheel
7. Screw accessory package
8. RAM onboard computer mounting bracket
9. Certificate of conformity, list
10. Visual camera (optional)
11. Radio Antenna



*The system mainly consists of 3 major components:
a single antenna all-in-one machine, an onboard Android tablet computer, and an electric steering wheel.

THE PRINCIPLE AND MAIN PARAMETERS OF THE SYSTEM

First, measure and calculate the dimensions of the agricultural machinery to build a 3D model of the vehicle in the computer. At the same time, set the operation path in the navigation display and calculation unit. Then, use the GNSS receiver (a single antenna all-in-one machine) to obtain the agricultural machinery's real-time position, speed, and attitude data, and use the angle sensor to monitor the steering angle of the front wheels. Next, calculate in real time the lateral displacement error between the agricultural machinery's position and the preset path, as well as the heading angle deviation error relative to the path direction. Finally, the steering wheel of the agricultural machinery is controlled by the motor control module to correct its driving direction in real time. During agricultural machinery operation, the system executes continuous closed-loop "measurement and control" operations, thereby ensuring that the machinery's travel path progressively approximates the reference path.



MAIN PARAMETER	
Tablet memory	32G
Screen resolution	10 inches, 1024 * 600
Straightness accuracy	⩽ 2.5cm
Connecting row spacing accuracy	⩽ 2.5cm
Base station signal coverage range	Mobile base station: ⩾ 5km, Fixed base station: ⩾ 15km
Input voltage	12VDC
GNSS receiver	BDS, GPS, GLONASS
Radio communication	410-470MHz

INDICATOR LIGHT	
Source	The red light indicates that the power is on, and the number of flashes represents the number of radio channels.
Differential	Flashing green light indicates that differential data has started to be sent, with a default of once per second.
Satellite	The number of flashes indicates the number of search stars.
Digtal display tube	The current number of radio channels, looping from 0 to 9, can be operated through the channel swich button.

*A **12V power** supply is recommended for proper operation..
Verify **correct wiring connections** to prevent power disruptions or equipment damage.

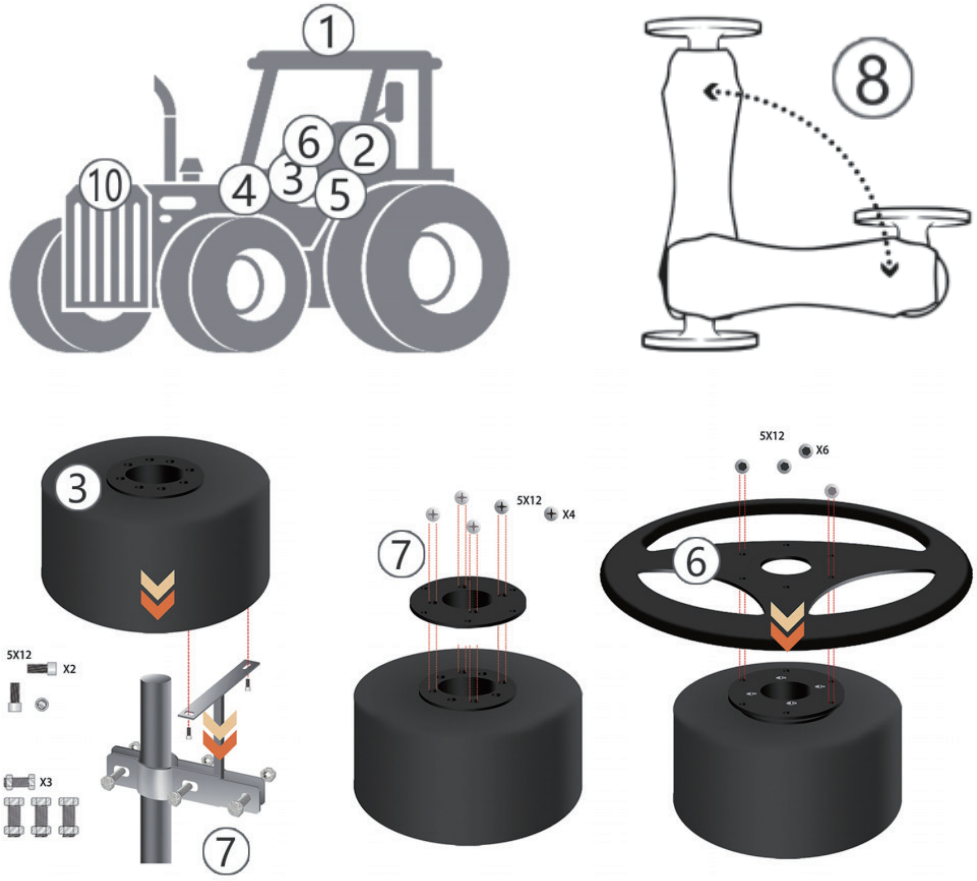
PRECAUTIONS FOR INSTALLING YOUR DEVICE

Install the display terminal using a RAM bracket in a position easily accessible to the operator.

Tractors without a cab should be protected from prolonged sun exposure and rain, and the device should avoid being dropped or subjected to strong impacts.

Always disconnect the power supply before installing or removing cables.

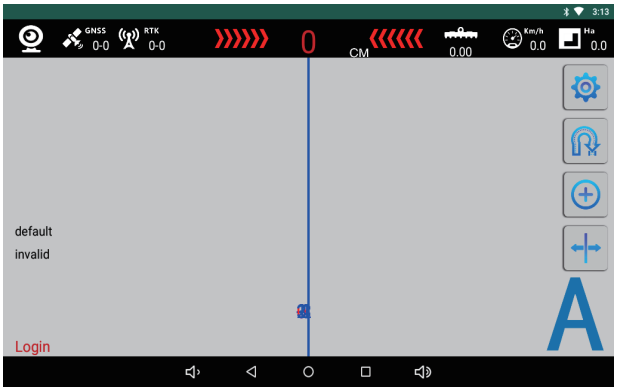
- Avoid using hard objects when operating the screen.
- Strictly follow the requirements in this manual when connecting the device.
- Before the operating season, verify that the device functions normally, the installation position remains secure, and the control system operates correctly.
- When powering the device, ensure it is connected to a 12V DC power supply.
- Implement lightning protection measures to reduce the risk of lightning damage.
- Damage caused by force majeure (lightning, high voltage, collisions, etc.) is excluded from warranty coverage.
- Unauthorized disassembly of this product voids the warranty.
- When autonomous driving is engaged, an operator must remain in the cab.
- Operate the system in unobstructed open areas.
- Keep the equipment away from sources of electromagnetic interference (EMI), such as strong electromagnetic fields, high-voltage power lines, and broadcast transmission towers.

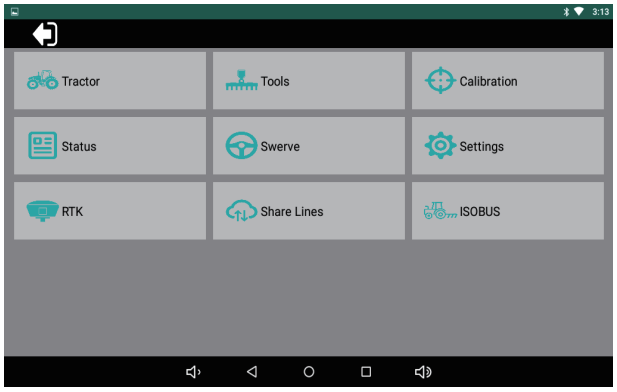


*After installing the System, due to the installation of a single antenna integrated machine above the roof, when entering or exiting the garage or driving at a limited height, attention should be paid to the safety of the antenna equipment to prevent collision damage.

INTRODUCTION TO SOFTWARE SETTINGS TEACHING

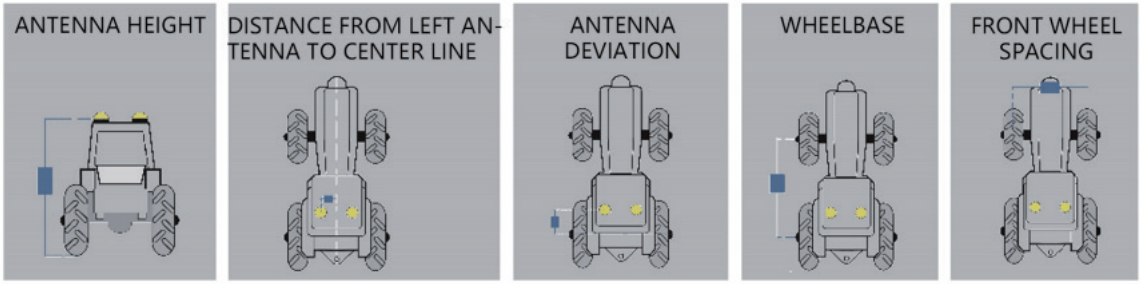
First, open the software"Autopilot"→Read the disclaimer→Click on I accept□
Check if the 4G and 5G signals on the tablet are normal, then check the number of satellites on the upper left (normal value, 40 up and down), as well as the differential, heading (normal value: fixed), and whether there is a red date in the lower left corer (no text is permanent). Next, explain the setings function and open the settings.





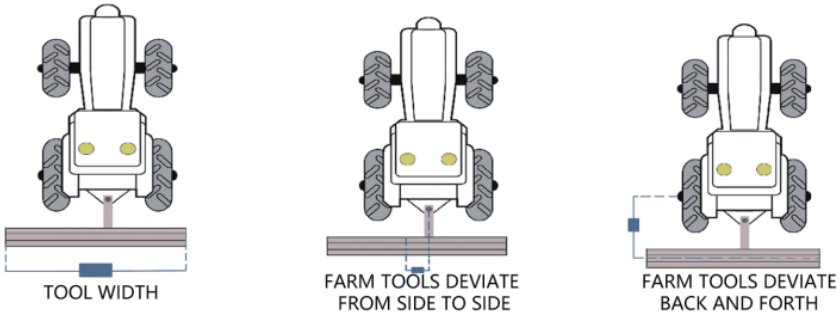
Vehicle settings

From the main interface, enter Settings Administrator (administrator password 1234) Vehicle Settings
The installation personnel prepare a tape measure with numerical standards, measure them in order, input the dimensions one by one, and click complete.
Normally used for the first debugging after installing navigation. After debugging is completed, if the navigation antenna position is not removed, the settings do not need to be changed.



Agricultural tool settings

From the main interface, enter Settings Administrator (administrator password 1234) Agricultural Tool Settings
Measure the actual value of the hanging agricultural tools (adjust the width of the tools according to the actual situation of different tools).

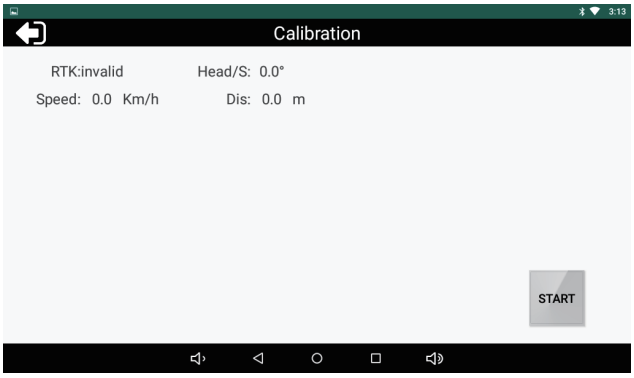


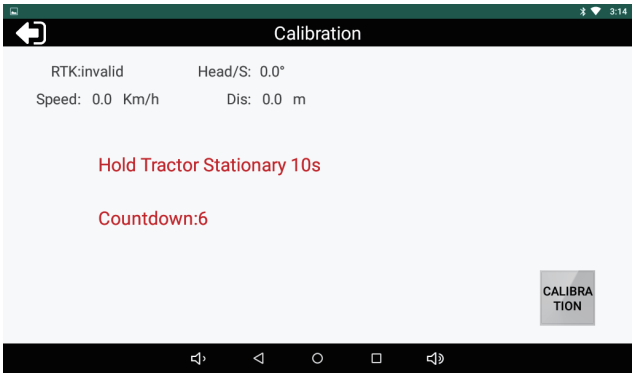
*Normally, it is used for the first debugging after the installation of navigation. After the debugging, if no other farm tools are replaced, the Settings do not need to be changed.

INTRODUCTORY SOFTWARE SETUP TEACHING

Navigation calibration

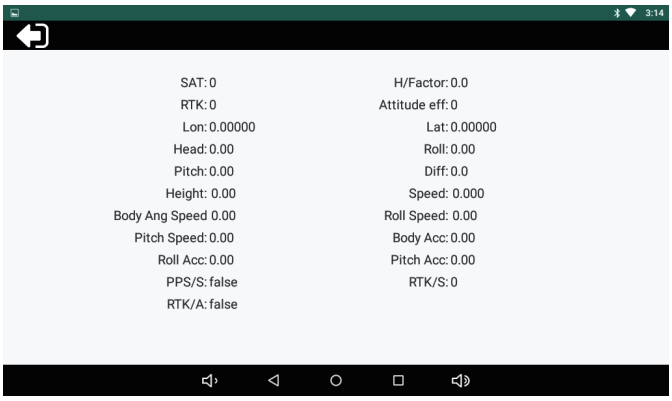
Enter -Settings -Navigation Calibration from the main screen
Click Start callbration and follow the system prompts to operate
It is normally used for the first debugging after the navigation is installed. After the debugging is complete,if the navigation is not removed, you do not need to change the Settings.





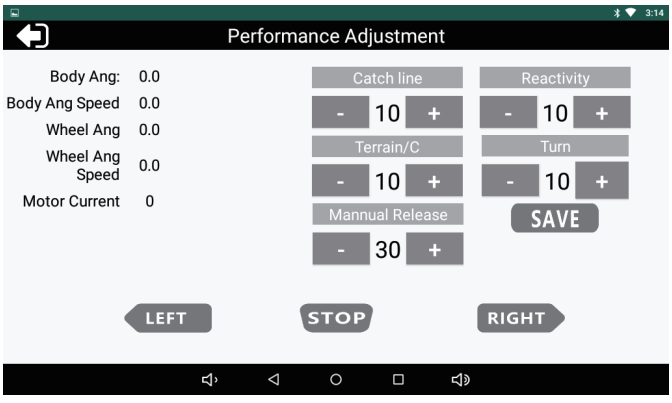
Beidou positioning

Enter-Settings-Beidou Positioning from the main screen
The real-time parameters obtained by the system are displayed here, such as signal, positioning state, body speed, body Angle, latitude and longitude.



ECU setup

Go to -Settings -ECU Settings from the home screen
Here I am mainly responsible for the fine tuning of the body hardware (to solve some differences caused by different tractors and unknown factors)
After the navigation equipment is installed, the left, right and stop functions of the steering wheel can be controlled here in real time. (Remote is also available)

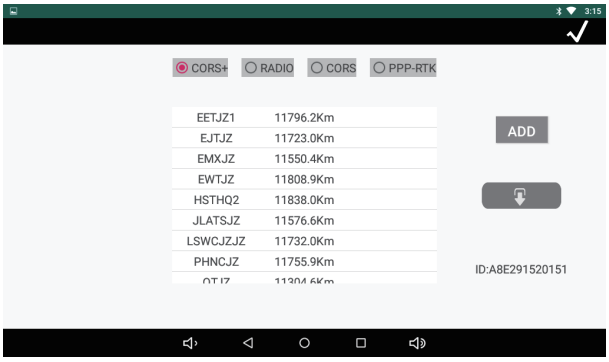


* Do not carry out tractor ignition operation while the navigation equipment is running. In case of vehicle flameout, please power off the equipment and start the vehicle ignition, and then turn on the equipment power after the vehicle flameout.

UNDERSTAND YOUR BASE STATION SETUP

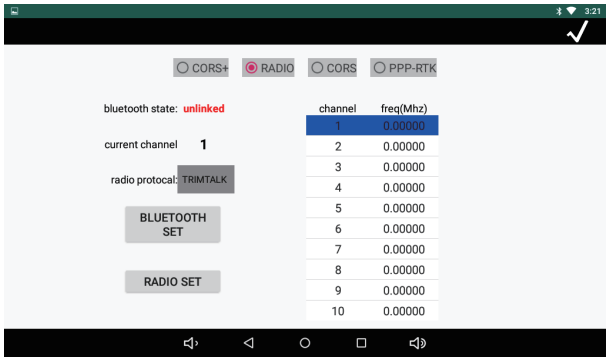
Base station setup 1 of 4 - Network differential

Enter-Settings-Network Difference from the main screen
Click Refresh, select the nearest base station, OK
(If there is no nearby base station, please go to paid cors base station)
Website setup non-professional personnel do not debug



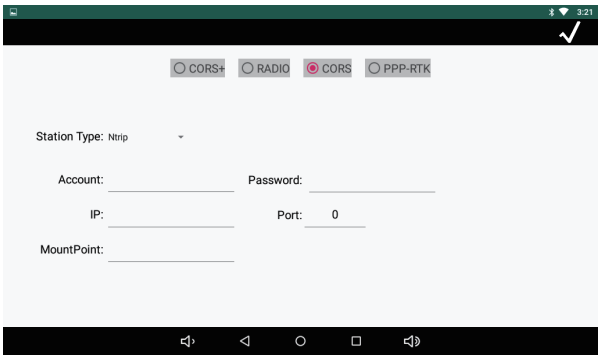
Base station setup 1 of 4 -Radio base station

Go to-Settings-Radio base Station from the main screen
This function requires the company to install the factory radio module.



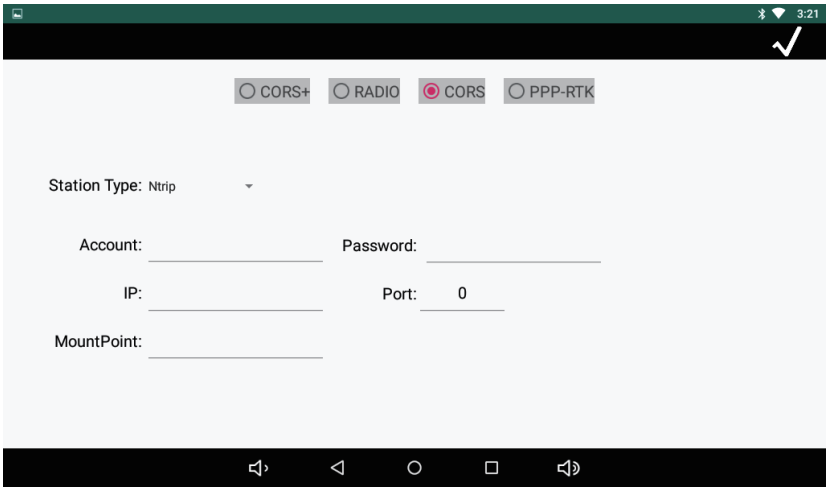
Base station setup 1 of 4 -cors base station

Enter the -Setting-CORS base station from the main interface, enter the account and password configured by the company, and the IP will change according to the mobile and Chihiro sianal service providers
Move to: 120.253.239.161, mount point: RTCM33 GRCEJ, Chihiro: 203.107.45.154, mount point: AUTO
Port unification: 8001.8002. Website setting Non-professional personnel do not debug.



Base station setup 1 of 4 -cors base station SDK account

Enter the -Setting-CORS base station from the main screen, enter the configured account, mount point: RTCM33_GRCE

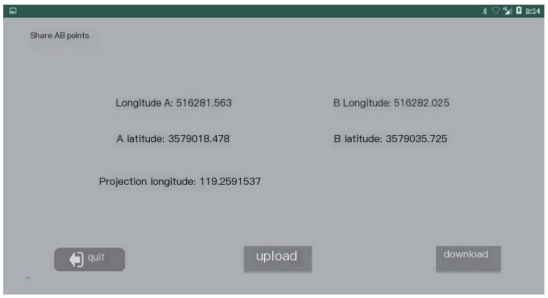


*Check the account carefully and click OK - Exit the software - open it aaain. Wait 5~120 seconds until the main screen is fixed.

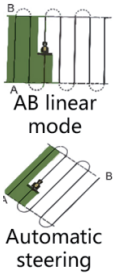
UNDERSTAND THE FEATURES OF YOUR SOFTWARE

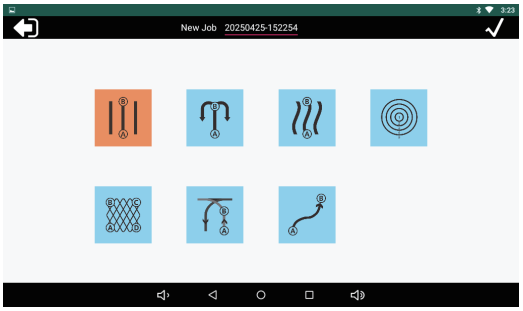
Share AB points

From the main interface, enter Settings Share AB
Enter the 4-digit combination you want to save or download for easy download next time
(Try to avoid overly simple combinations, such as 1234, 1111, 0000, etc.)



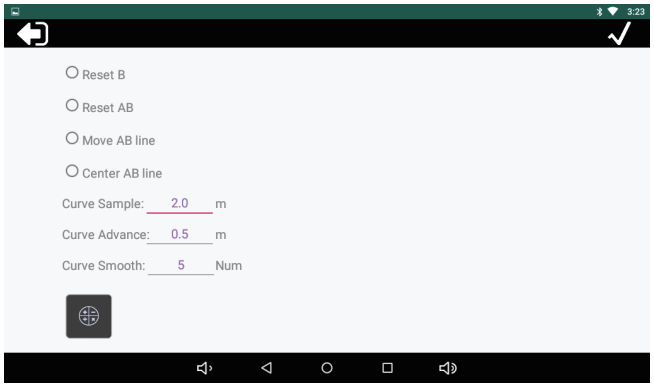
How to create a new assignment - create a new AB line





To create a new task, first let the tractor enter the farmland, lean against the edge of the field, face the front of the vehicle towards the direction of the task, and ensure that the agricultural tools behind the vehicle are close to the edge of the ground. Then click the "A" button on the screen and select point A.
Then drive the tractor along the direction of the front of the vehicle to the other end of the field and stop. Click the "B" button on the screen, set point B, and complete the setting of the AB line for the farmland. (Where A and B are the AB points we need to set,)

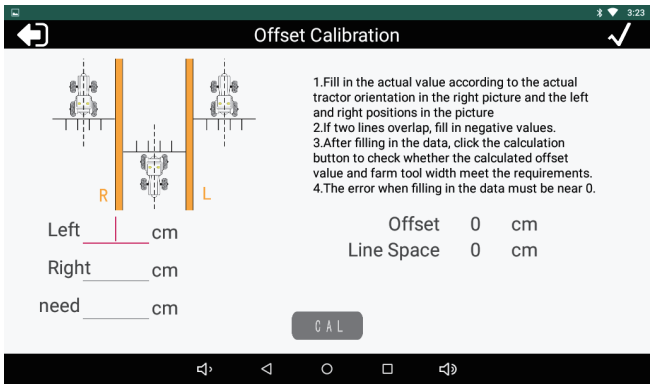
Introduction to AB Line Functions



After setting point B in the current assignment, it was found that there was an error. If point B was selected incorrectly, it can be reset
Resetting AB is to recalculate the homework in a job record.
The AB line slight shift refers to the overall movement of the AB point to the left or right based on the value you input when you cross the AB line
Move AB line to the current or homepage shortcut line. Vhen there is a slight error in the current task, it can be used to adjust the overall deviation of the navigation line, not a single line displacement!

Calculation of handover lines in AB line

The handover line is also called a connecting line or a combination line. Since the one click handover line calculation,it has been convenient for users and greatly helped us with technical support.



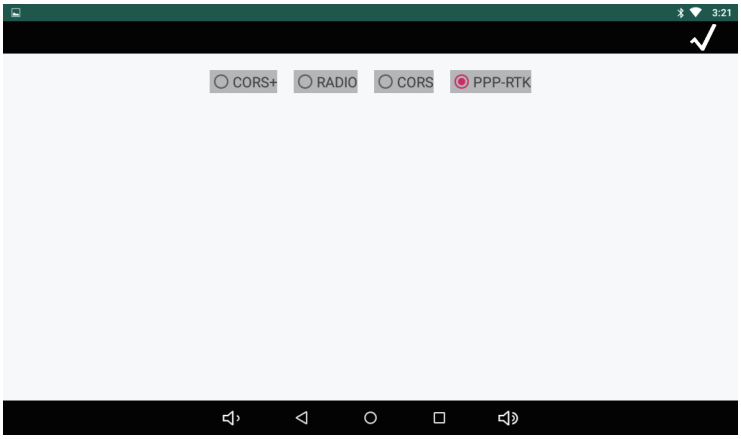
UNDERSTAND THE FEATURES OF YOUR SOFTWARE

After setting points A and B, the position of point B in the bottom right corner of the screen will change to the steering wheel. Then, manually turn the tractor around and turn on automatic driving to align it with the line on the display. The smaller the upper error value, the better. (The smaller the value, the straighter the homework), click on the steering wheel in the bottom right corner to release autonomous driving when reaching the ground. Then manually turn the tractor around and repeat the above operation

*For unused functions, try not to set them up casually. If there are any problems that cannot be solved, please contact relevant technical personnel in a timely manner. Do not set them up on your own, otherwise it may cause the system to be unusable

PPP-RTK mode

B2B and E6-HAS modes can be selected (will be supported in the new version of the software)



COMMON FAULTS AND REFERENCE SOLUTIONS

System not located

Solution:

■Check in sequence whether the antenna is obstructed, whether the antenna connection joint is loose, and whether the controller end joint is loose.

■The vehicle is severely obstructed in the warehouse or antenna. Drive the vehicle to an open area.

Network not connected

Solution:

■Pull down the tablet interface to check if the tablet has a 4G network connection.

■Switch between operator networks and select the optimal option.

Differential display with single point or excessive delay

Solution:

■The current environment is obstructed. Drive to an open area.

■If it continues to display, the following reasons need to be analyzed: first, observe whether the equipment cables on the car are properly connected and whether there is 4G. If using a mobile base station, first observe whether the signal light of the mobile base station is displaying normally, and eliminate the problem with the base station. If using a network base station, you can contact relevant personnel to check the power supply or network disconnection of the base station. Then, you can restart the device and continue to observe. If the problem still exists, please contact technical personnel in a timely manner.

When autonomous driving advances, there is a large screen display error and the front wheel swing is obvious

Solution:

■Check the installation position of the mushroom head antenna and try to install it as close to the center
of the rear axle as possible.

■Check if the pitch roll value is too large. Adjusting the installation position or replacing the host

■View sensitivity values, adjust incoming sensitivity and online sensitivity.

■The homework site is poor, and the vehicle's front axle is not weighted enough, causing it to tilt its head
Add counterweight iron to solve the problem.

■Check if the vehicle parameter measurement is accurate. Carefully measure the vehicle parameters again to determine.

■Check the condition of the car to see if there is any clearance or pressure relief on the steering wheel. The condition of the vehicle requires hydraulic oil or repair.

*Here are common questions to help everyone quickly respond and handle.