

eSteer10 User Manual



EFIX PRECISION AGRICULTURE

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1 Instructions for Product Usage

Based on the different installation methods, the rooftop satellite antenna will increase the height of the vehicle by 10-15cm. When entering or exiting a garage or driving in areas with height restrictions, attention should be paid to the safety of the rooftop equipment to prevent damage to the antenna and cables.

When the equipment is not in use for an extended period, please disconnect the power cable to prevent battery drain.

The use of the autonomous driving system is strictly prohibited during non-operational times and in non-operational areas.

When the equipment is engaged in autonomous driving mode, the driver must not leave the driver's cabin. Without inputting information, the autonomous driving system cannot detect obstacles or other external conditions on the driving path. Please be cautious and avoid damage caused by external objects.

During equipment usage, ensure that the devices inside the driver's cabin are waterproof. Protective measures should be taken when performing vehicle cleaning or similar tasks to protect the equipment. Unauthorized disassembly or installation of the equipment is strictly prohibited. Any actions other than normal operations should be performed according to the instruction manual or through direct communication with technical personnel from our company.

Please strictly follow the instructions and refrain from making arbitrary changes to the software parameters.

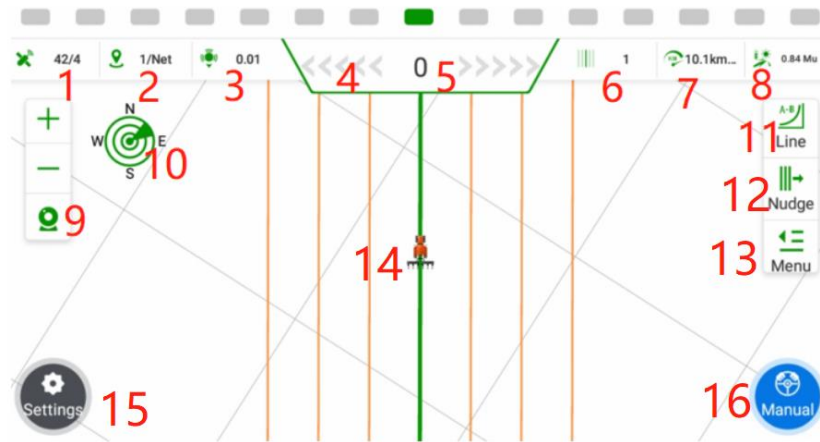
Any equipment hardware failures or damages caused by human error are not covered under the warranty.

2 Product Introduction

2.1 Introduction to Main Components

Device name	Pictures
Receiver	
Display	
Steering wheel	
Rear view camera	

2.2 Software interface



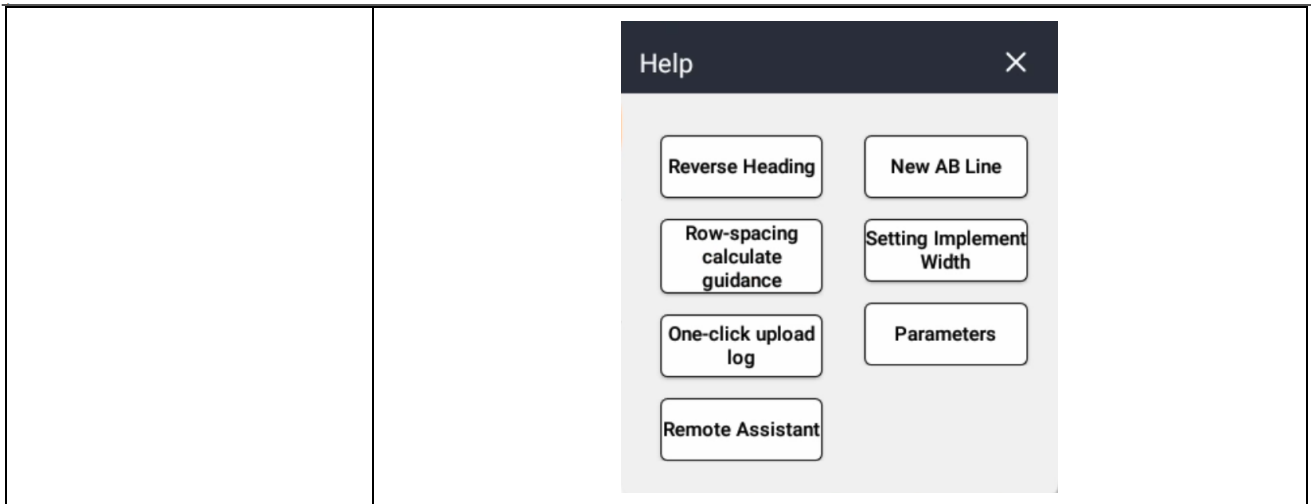
1. Satellite Information: X/Y, where X represents the number of satellites being tracked, and Y represents the differential status. When Y=4, it indicates that the RTK (Real-Time Kinematic) differential is functioning normally.
2. Base Station Signal Status: X/Y, where X represents the signal delay time, and Y can be a numerical value indicating the current channel number, or "NET" indicating the usage of network-based base stations.
3. Positioning Accuracy: This indicates the level of accuracy in determining the vehicle's position.
4. Lateral Deviation Display Bar: Each grid represents an error of 1cm (adjustable).
5. Lateral Deviation: Negative values indicate the vehicle is on the left side of the navigation line, while positive values indicate it is on the right side.
6. Current Row Number: This shows the current row where the vehicle is operating, with the original row numbered as 0.
7. Real-Time Vehicle Speed: Displays the current speed of the vehicle.
8. Work Area: The area of the field being worked on, typically measured in acres (adjustable).
9. View Zoom In/Out: Allows for zooming in or out of the view. The camera function overlays the background with the live image from the camera.
10. Compass: Shows the orientation or direction of the vehicle.
11. Quick Line Guidance: Provides a fast and efficient way to create a guidance line for the vehicle.

12. Line Offset: Indicates the offset or deviation from the guidance line.

	A:Left offset
	B:Right offset
	C: Enter the line offset distance (unit:cm)
	D:RZ

13. Menu: Parameters, Tracks, Implements, Modes, Help.

	A: Quick Adjustment of Line Entry and Travel Parameters
	B: Work Track Coverage
	C: Implement Settings, including ISOBUS VT, Plow Width and Row spacing
	D: Select Brightness Mode and Adjust Display Brightness
E: Help, including Reversing heading, One-Key Assistance, Line Guidance, Row Spacing Calculation Guidance, Width Guidance, Parameter Viewing, and One-Key Log Upload	



1. Vehicle and Navigation Line Display
2. Settings Interface, where all functions and configurations are accessible
3. Manual/Automatic State Display and Switching



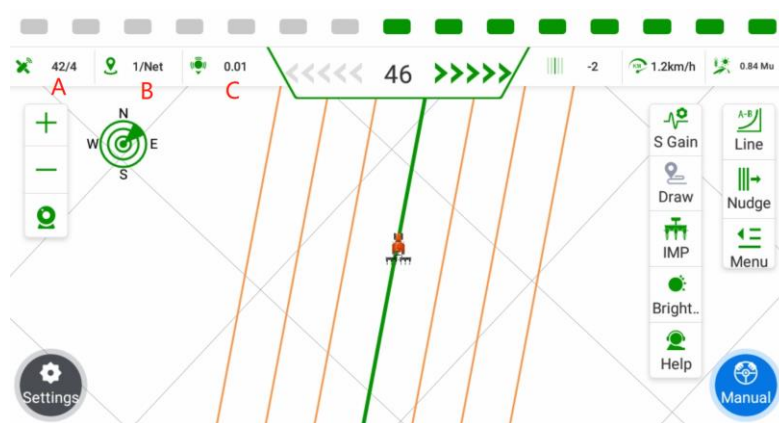
3 Product Usage

3.1 Power on



Press the red power button above the monitor and the button will turn green.

3.2 Confirm RTK Signal Status



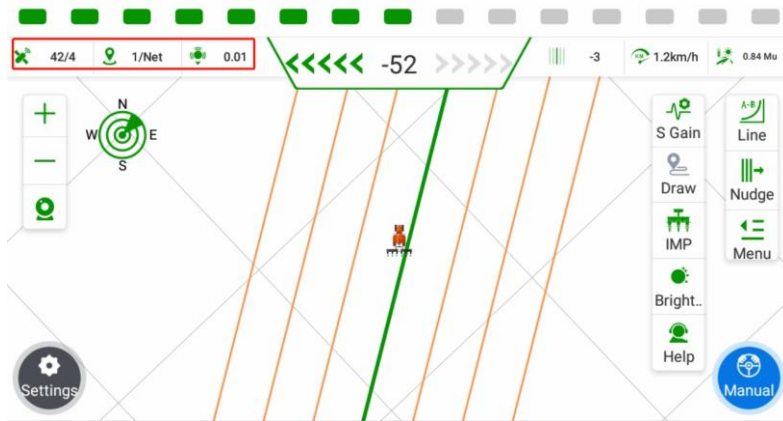
A: X/Y, where X represents the number of tracked satellites, and Y indicates the signal status.

B: X/Y, where X represents the current satellite signal delay, and Y represents the current signal mode (NET for network base station mode, and a numerical value for radio base station mode indicating the currently used channel).


C: Current positioning accuracy error.

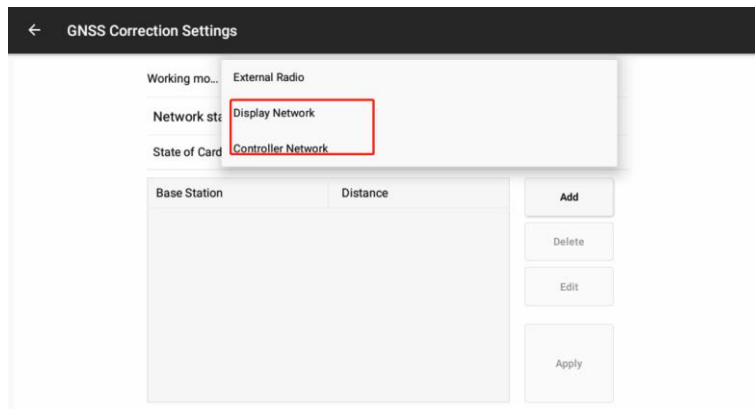
3.3 Receiver Settings

If the signal is not normal, you can click on the signal box in the top-left corner to access the receiver settings interface.

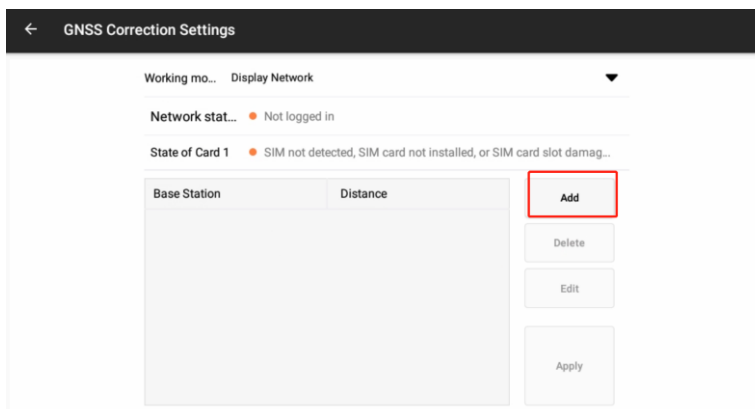


Controller/Display Network Mode

- Click on the "Work Mode" button, located at the back, followed by the "[]" symbol. From the options that appear, select " **Controller/Display Network.**"

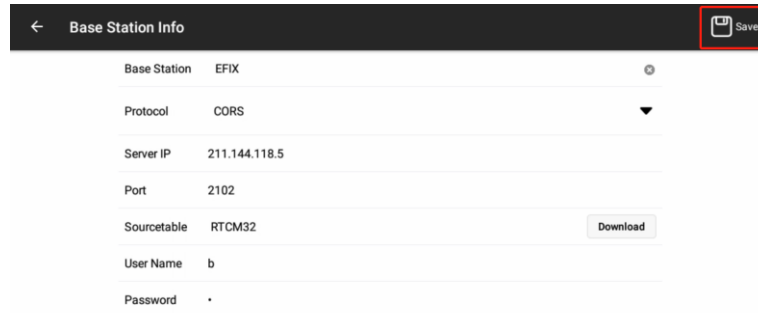


- In the Differential Settings, click on "Add" to add the corresponding base station information.



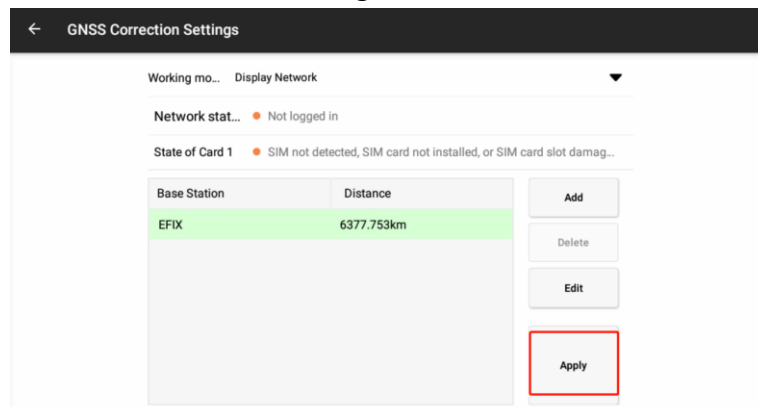
Enter the corresponding base station information: (You can input multiple base station information and switch to use them at any time)

- Set the base station name according to your preference.
- Select the default protocol as CORS.
- The address, port, username, and password may vary depending on the region. Please obtain this information from local technical personnel or distributors.



③ To return to the differential settings interface, select the configured base station, and click on "Apply" to connect to the base station.

After returning to the main interface, if all three icons in the top-left corner are gray and the numbers are not zero, it indicates that the base station signal is normal and available.



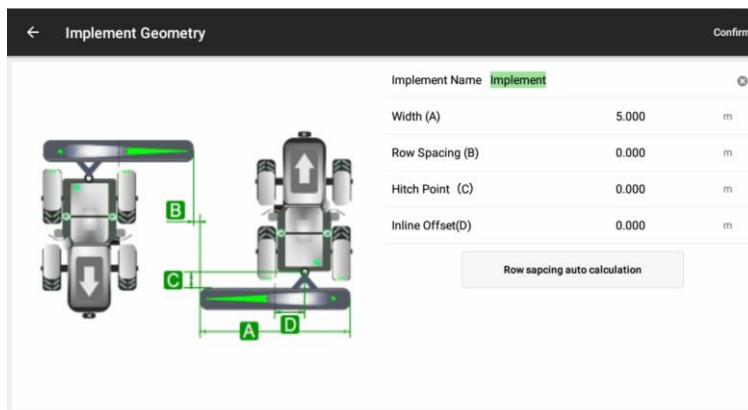
④ After applying the base station, the interface will display a successful application message. Click on the top-left corner [←] icon to return to the main interface. If all three signal icons in the top-left corner of the main interface are gray and not zero, it indicates that the signal is normal and available.

3.4 Implement Settings

Click on the "Menu" button on the right side of the screen, then select the "Implement" option to enter the implement settings menu.



Click on the "Plow Width" option to enter the implement management for adjusting the working width of the implement.



Implement Width (A): Enter the effective working width of the implement, which refers to the actual width from the leftmost to the rightmost working point of the implement (e.g., for a seeder, it would be the width between the leftmost and rightmost seed outlets).

Row Spacing (B): Set the distance between rows during operation, which determines the spacing between each row of the implement.

Axle-Implement Distance (C): This parameter represents the distance between the tractor's steering axle and the hitching point of the implement. It is usually set to the default value of "0" unless there is a specific requirement to adjust it.

Center Offset (D): Enter the distance between the implement's centerline and the vehicle's centerline. This parameter is used to address any misalignment or offset of the implement when attached to the vehicle. Providing an accurate measurement and inputting it here can help resolve issues related to row transitions caused by implement misalignment. For detailed instructions on calculating and adjusting row transitions, refer to section 4.2 in the documentation.

Please input the respective values for each parameter according to your specific implement and operational requirements.

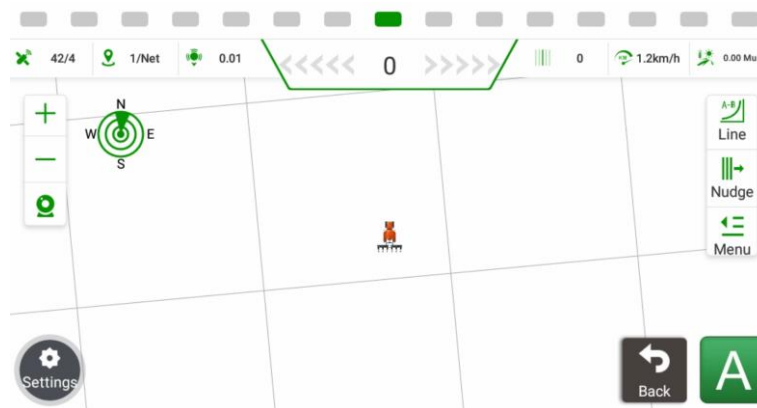
3.5 Line Guidance

A. Quick Line Guidance

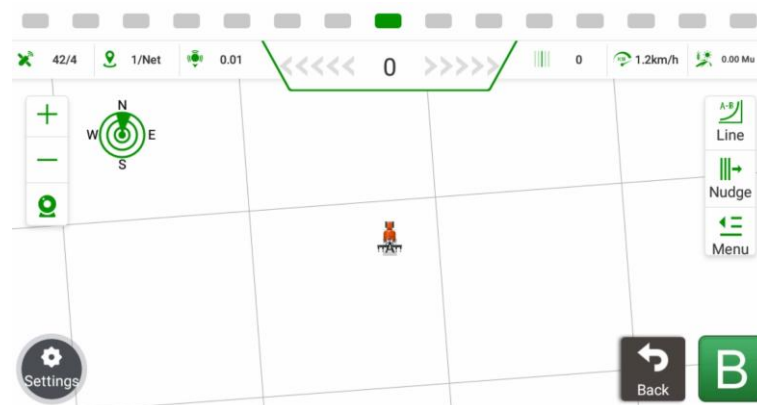
Click on the button on the right side of the screen to access the Quick Line Guidance menu.

Select the "AB Line" option to enter the AB Line setup.

Drive the vehicle to the field headland and align it with the desired travel direction (align with the opposite headland). Once the vehicle is stationary, set the A point.

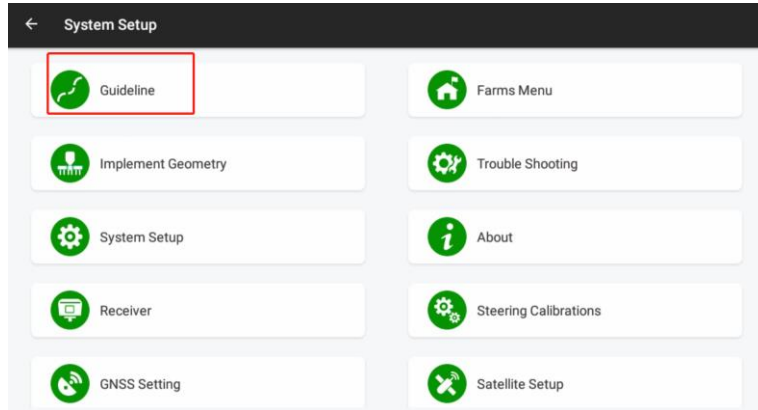


Manually drive the vehicle to the opposite end of the field (leaving one row unplowed). Once the vehicle is stationary, click on "B" to set the B point. Ensure that the direction between the A and B points is consistent. After setting the B point, the navigation line will be automatically saved, and the generated navigation line will appear on the screen, indicating that the line setup is complete.

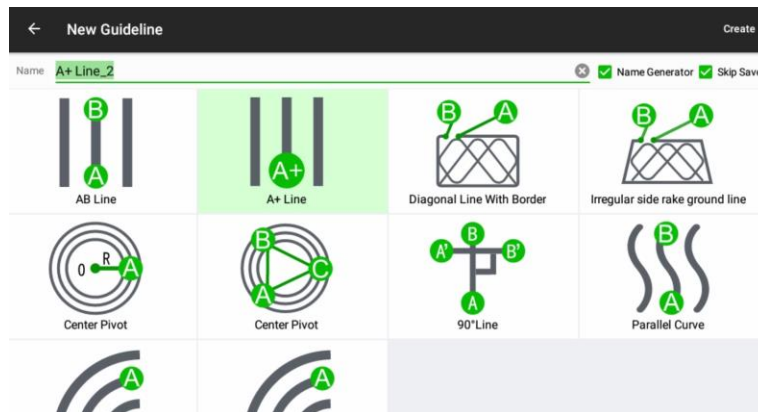


B. Regular Line Guidance

Step 1: Click on "Settings" and then "Line Guidance" to access the Line Guidance management interface.



Step 2: Click on the "Add" button on the right side of the screen. Select the desired type of line guidance to be created. Enter a name for the line, keeping it distinguishable for easy identification. Click on the "Create" button on the right side to proceed.




The available line types include:


- AB Line
- A+ Line
- 90° Line
- Harrowing line
- Center Pivot
- Parallel Curve
- Identical Curve
- Parallel Curve
- Curve Advanced

Please select the desired line type based on your specific requirements and operational needs.

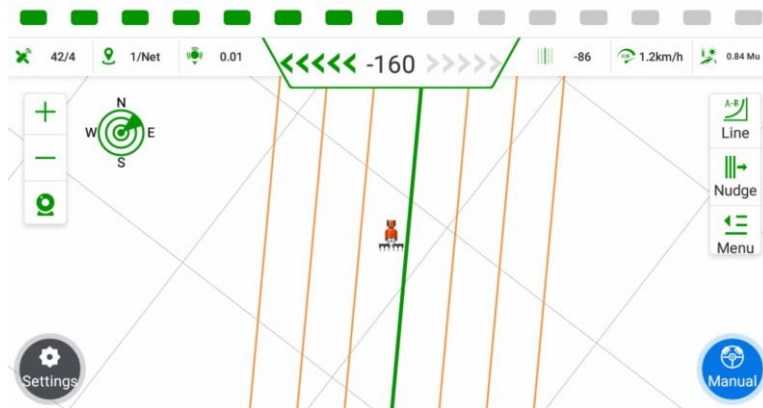
Step 3: Click on the "Create" button in the top-left corner to go back to the main interface and start the line guidance process.

3.6 Auto steering

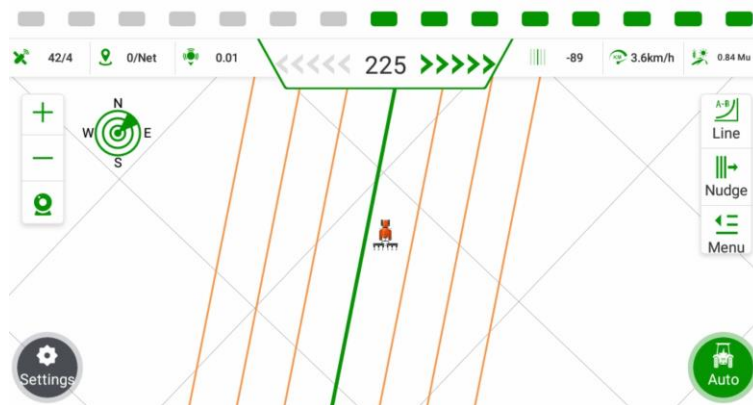
When the button  in the bottom-right corner of the screen is displayed in gray with the label "Manual Mode," it indicates that the system is currently under manual control.

When the button  in the bottom-right corner of the screen is displayed in green with the label "Auto Mode," it indicates that the system is currently under automatic control.

Clicking on this button allows you to switch between the two modes, toggling between manual and automatic control.



Manual mode



Auto mode

3.7 Powering off




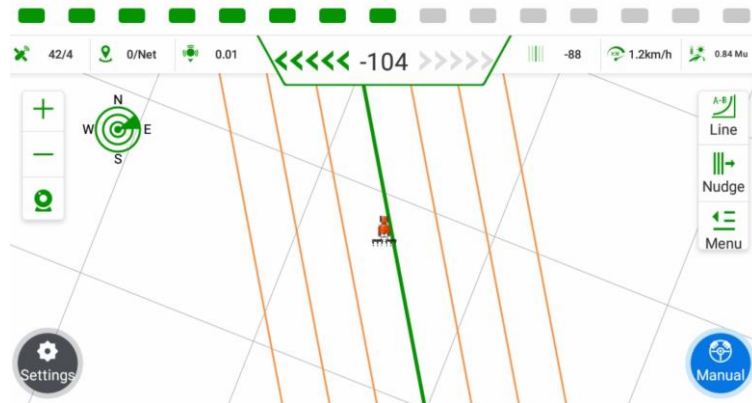
There is system power switch attached with the display, press it to turn on/off the whole system.

4 Common functions

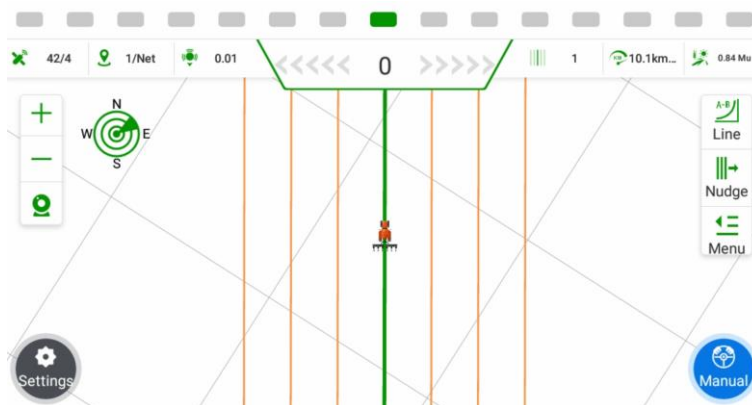
4.1 RZ function

To reset the AB Line and align it with the current position of the vehicle, follow these steps:

1. Click on the button  located on the top-right corner of the screen.
 2. Select the "RZ" option from the menu that appears.
 3. This action will reset the AB Line and move it to the current position of the vehicle.
- Note: It is important to align the vehicle's direction as closely as possible with the AB Line before performing the zeroing operation.



Before RZ



After RZ

4.2 Row spacing calculation

If the navigation system has been installed and calibrated as required, but there are issues with the row spacing during operations (i.e., inconsistent row sizes where adjacent rows are consistently one large and one small), this phenomenon is likely caused by misalignment of the implement. The fundamental solution is to adjust the installation position of the implement, ensuring it is mounted on the vehicle's centerline. If on-site adjustments are not possible, the software's transition row adjustment method can be used.

Note: When measuring row spacing, avoid areas within 20 meters of the field headland and areas with significant curvature.

Quick Adjustment Method

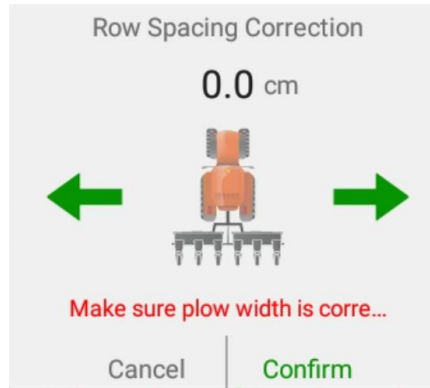
To use the quick adjustment method for transition rows, it is important to ensure that the total width (implement width + row spacing) is correctly set. Please refer to Chapter 3, "Implement Settings," for instructions on how to set the implement width accurately. Do not use the quick adjustment method if you have not measured the actual working width of the implement.

To quickly adjust the transition rows, follow these steps:

1. On the main interface, click on "Menu" -> "Implement" -> "Transition Rows."
2. The system will display a dialog box for transition row adjustment.
3. If you want the vehicle to shift in a specific direction, click on the corresponding arrow in the dialog box.
4. Adjust the corresponding distance by clicking the arrow multiple times. Each click adjusts the distance by 1cm.
5. After making the desired adjustment, click "OK" to confirm.

It is important to note that once you have used the quick adjustment method, further adjustment is not required unless you disassemble or move the implement. For example, if the transition row on the left side is 10cm larger and you want the vehicle to shift left, click the "←" arrow 10 times and then click "OK."

The quick adjustment method provides a convenient way to fine-tune the transition rows without the need for extensive manual adjustments.



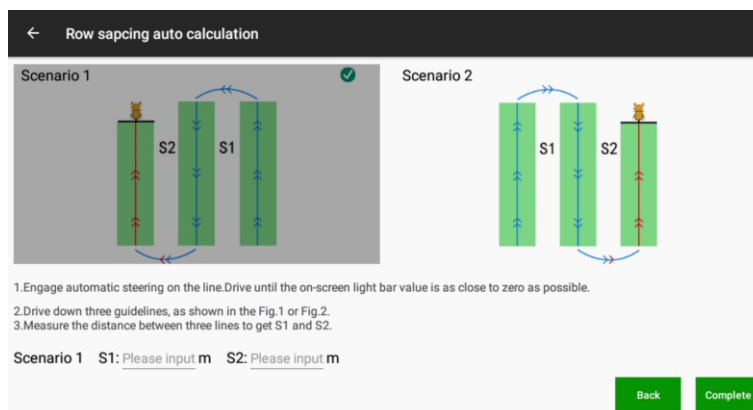
Standard Adjustment Method

To use the standard adjustment method, it is essential to follow the instructions provided in Chapter 4, "Implement Settings," of the user manual. Additionally, perform the following steps:

- Engage the automatic driving mode and drive the vehicle for three rows.
- Measure the row spacing of two transition rows during the automatic driving.
- On the main interface, click on "Implement" -> "Width" -> "Transition Row Auto Calculation" to enter the automatic calculation interface for transition rows.
- Select the appropriate diagram or scene that represents the automatic driving for three rows.
- Input the measured data (S1 and S2) for the two transition rows in meters.
- After entering the data, click "Done" to initiate the automatic calculation of the transition row data. The system will modify the values for "Implement Width" and "Center Offset" accordingly.

Note: Pay special attention to the orientation of the first row in Scene 1 and Scene 2. In Scene 1, the first row turns left, while in Scene 2, the first row turns right. Selecting the wrong scene may result in incorrect transition row calculations.

Following these steps and accurately inputting the transition row data will ensure the automatic calculation of transition rows and proper modification of the implement width and center offset values.



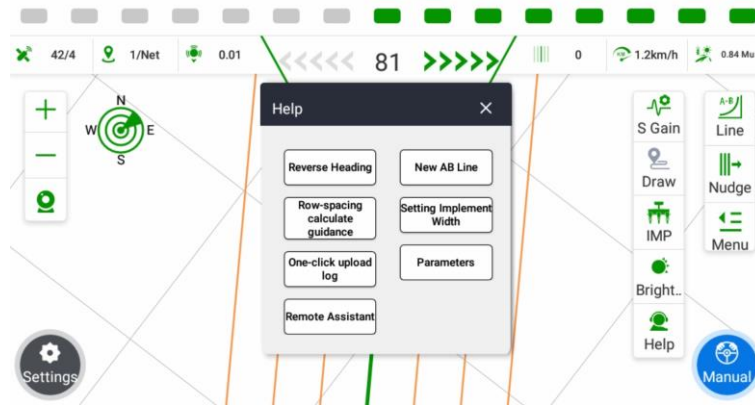
4.3 Help

To access the Help interface, follow these steps:

From the main interface, click on the "Menu" button.

In the menu options, click on "Help."

By doing so, you will enter the Help interface, where you can find various assistance features and functionalities.



The "Help" interface provides seven main functionalities: Reverse Heading, Line Guidance, Transition Row Calculation Guidance, Width Guidance, One-Click Assistance, Parameter Viewing, and One-Click Log Upload.

A. Reverse Heading: If the vehicle's heading is not aligned with the actual direction of travel, click on "Reverse Heading" to adjust the heading and align it with the actual direction.

E. One-Click Assistance: By clicking on "One-Click Assistance," the software will send the current vehicle positioning data and the parameters of the last 100 meters of autonomous driving to the cloud server. This allows technical support personnel to determine the vehicle's location and assist in resolving issues.

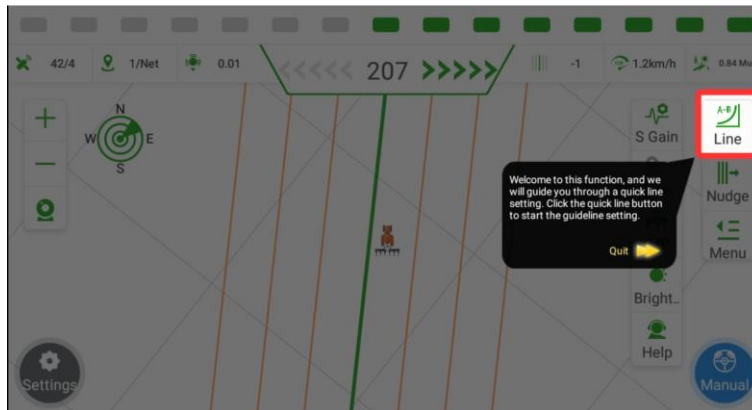
B. Line Guidance: This feature provides step-by-step guidance for setting up lines. During the guidance process, clicking on other areas will not be functional. To interrupt the guidance, click on "Exit."

Step 1: Click on "Line Guidance" in the "Help" menu to initiate AB Line guidance.

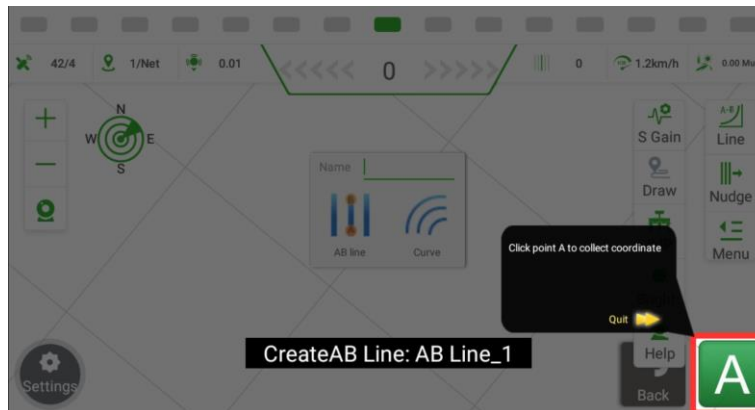
Please note that the provided translations are based on the given descriptions and may require further context or adjustment to fit the overall context of your application.



Step 2: After clicking on "Line Guidance," you will notice that the main interface restricts interaction in all areas except for the "Line" function button on the right side. This is to ensure that you can focus on the line guidance process without any distractions from other functionalities.



Step 3: Click on "Line," and you will see the appearance of the "A Point" in the bottom-right corner of the screen. At this point, stop the vehicle at the desired starting point for line setup, which is typically at the field headland.



Step 4: Manually drive the vehicle to the end of the field, ensuring that you cover one row without performing any operations. Once the vehicle is stationary, click on the "B Point" to mark the endpoint of the line. It is important to ensure that the direction from A to B is consistent with the desired line direction. After confirming the B point, click on "Save." The screen will display the automatically generated guidance line, indicating that the line setup is complete.

C. Row Spacing Calculation Guidance

Due to the issue of implement misalignment, the transition rows may not be accurate. Users can use the Transition Row Calculation Guidance feature to manually adjust the transition rows.

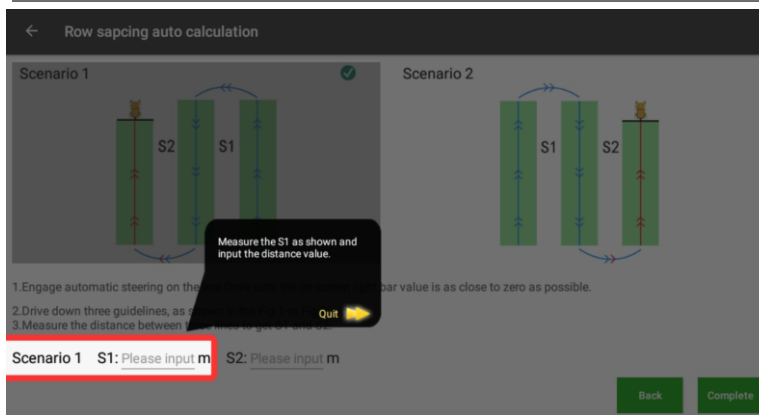
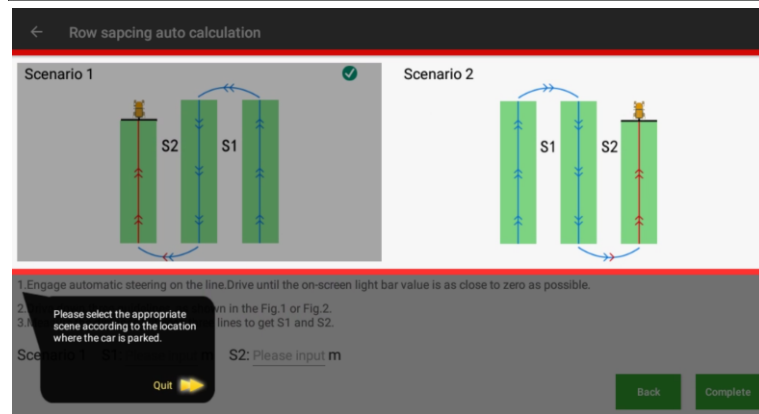
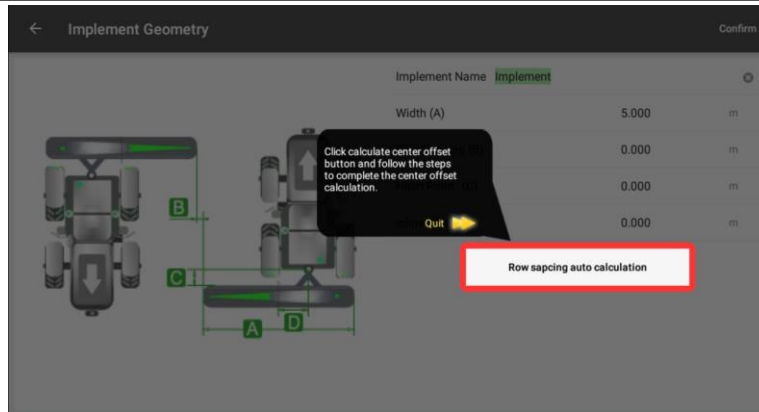
Step 1: Click on "Transition Row Calculation Guidance" in the "Help" menu to initiate the guidance for transition row calculation.



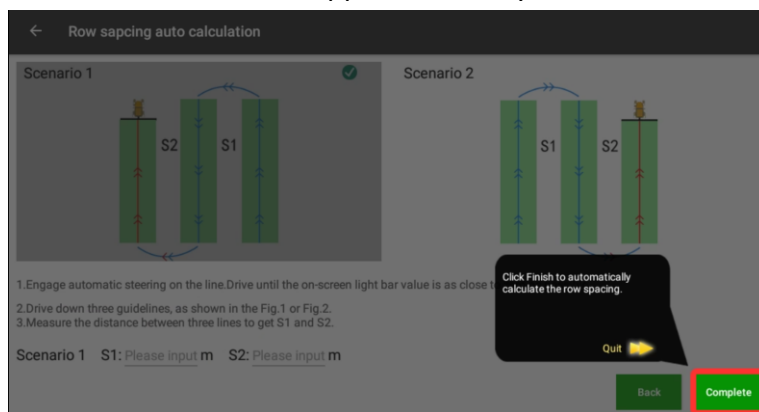
Step 2: Click on the left side "Implement" -> "Width" to enter the "Implement Management" interface.



Step 3: Click on the "Transition Row Auto Calculation" function. First, select the corresponding scene that matches the actual situation. Then, based on the diagram, measure and input the distances of the two transition rows (in meters).



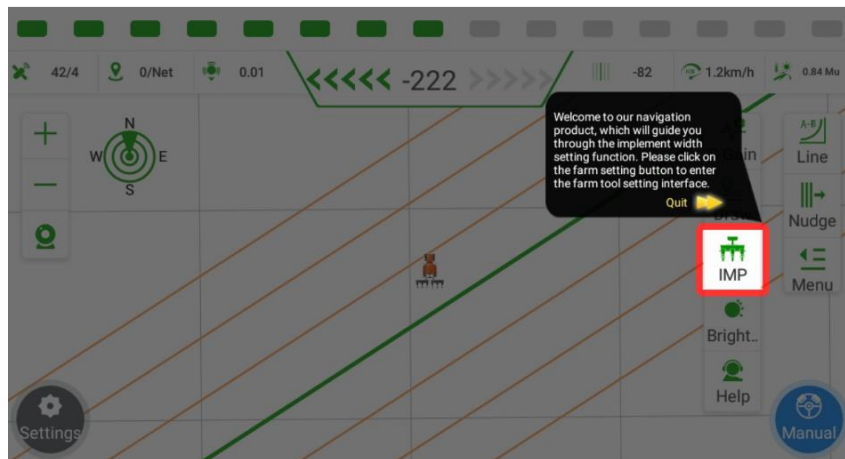
Step 4: After inputting the distances, click on "Done" to complete the configuration of the implement center offset. The next set of transition rows that occur during the back and forth operation will validate whether the modification has been applied correctly.



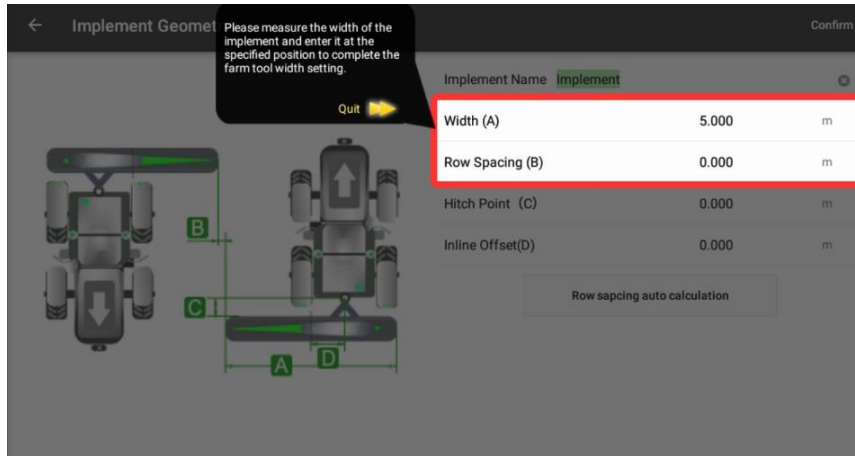
D. Width Guidance

This feature is designed to guide users in adjusting the implement width after replacing the implement.

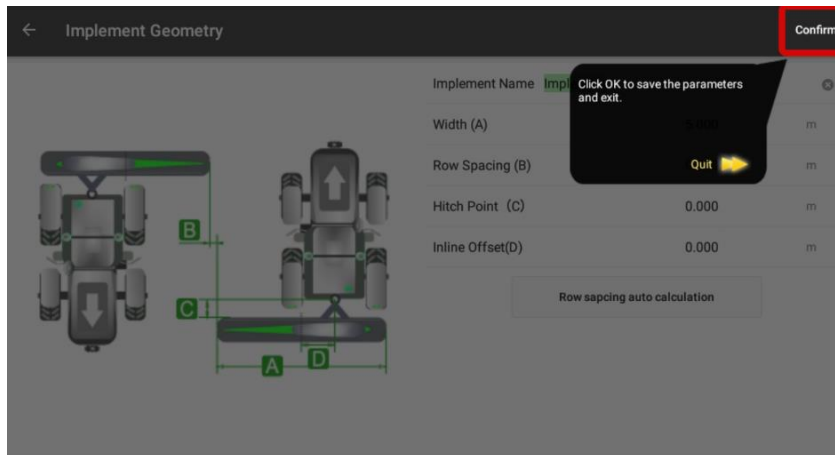
Step 1: Click on "Width Guidance" in the "Help" menu to enter the "Implement Management" interface.



Step 2: Click on the blank space next to "Implement Width" and "Row Spacing" to modify the implement width and row spacing.

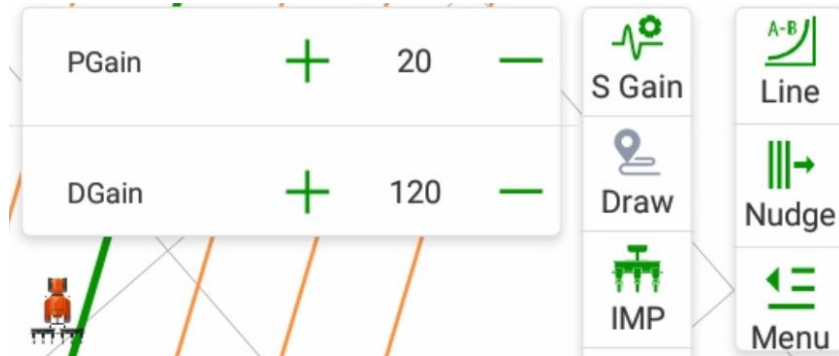


Step 3: After making the necessary modifications, click on "OK" to confirm the changes.



4.4 Parameters adjustment

Click on the right side "Menu" -> "Parameters" to open the parameters interface.



PGain: (Interval: 5, Range: 15-35)

If there is a slow response in steering and vehicle body movement, increase this value. Increasing the value will result in a higher steering adjustment force and can address the issue of insufficient driving force causing sluggish turning.


If there is excessive steering wheel movement, decrease this value. Decreasing the value will result in a lower steering adjustment force and can address issues such as jerky turns and oversteering caused by excessive driving force.

DGain: (Interval: 20, Range: 80-200)

If the steering wheel movement is slow and increasing the proportional gain does not yield significant results, increase this value. This is necessary when the steering frequency is low, causing delayed steering adjustments or sluggish turns.

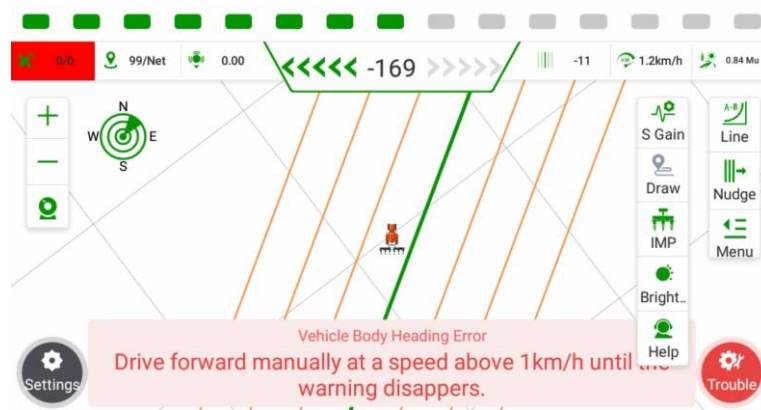
If there is excessive steering wheel oscillation and decreasing the proportional gain does not yield significant results, decrease this value. This is necessary when the steering frequency is high, leading to excessive steering wheel and wheel oscillation or erratic turns.

4.5 Camera



By clicking on the "[]" button located at the top right corner of the main interface, you can open the camera. The camera view will replace the background of the main interface. To close the camera, simply click on the button again.








4.6 Error Message Viewing

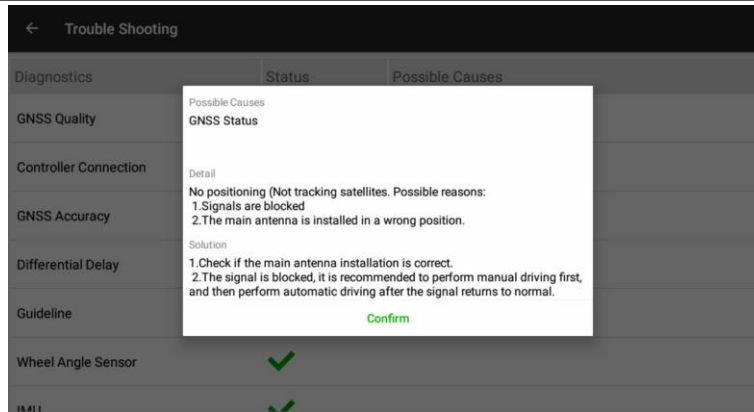
This software has a self-diagnosis feature. When there is a software or hardware failure that prevents normal automatic driving, the automatic driving button will turn red and display "Fault".



By clicking on "Fault," you can access the error information viewing interface, as shown in the image below.

- ① The number area represents the diagnostic items, which can help you identify the specific component or area where the problem occurred.
- ② The number area represents the status bar. The "[]" symbol indicates an abnormal working state, while "[]" indicates a normal working state.
- ③ The number area displays the error cause or reason.

Trouble Shooting		
Diagnostics	Status	Possible Causes
GNSS Quality 1	 2	GNSS Status 3
Controller Connection		
GNSS Accuracy		
Differential Delay		
Guideline		
Wheel Angle Sensor		
IMU		

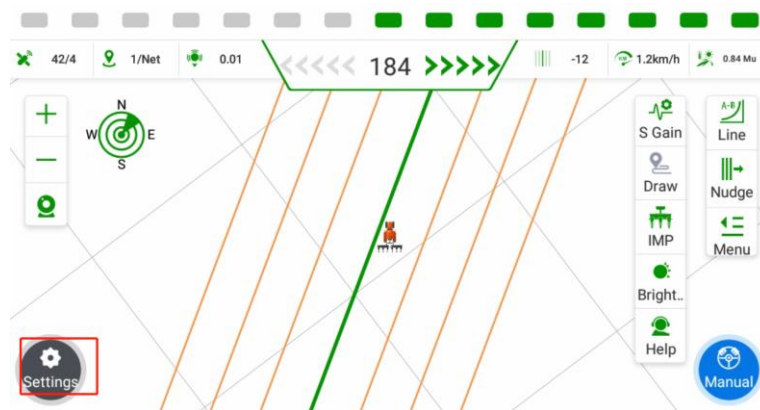


By clicking on area number 3, you can access the specific problem analysis interface, as shown in the image above. You can follow the suggested solutions to try to resolve the issue on your own. If your attempts are unsuccessful, you can send the error information to local technical support, which will help them in troubleshooting and resolving the problem.

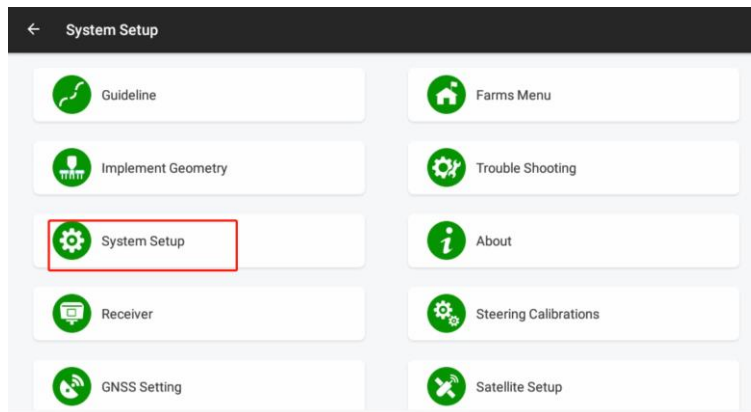
4.7 Minimum Speed Setting

The software allows you to set the minimum speed for enabling automatic driving. When the vehicle's speed falls below the set speed, the vehicle can activate automatic driving (the automatic driving icon turns green), but the vehicle will not engage in automatic driving. The default minimum working speed is set to 0.7 km/h. If you need to adjust the minimum speed, please follow the steps below:

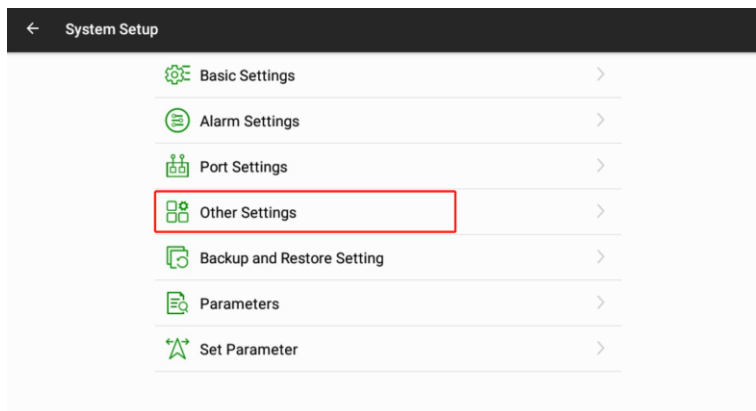
Click on the "Settings" button in the main interface.



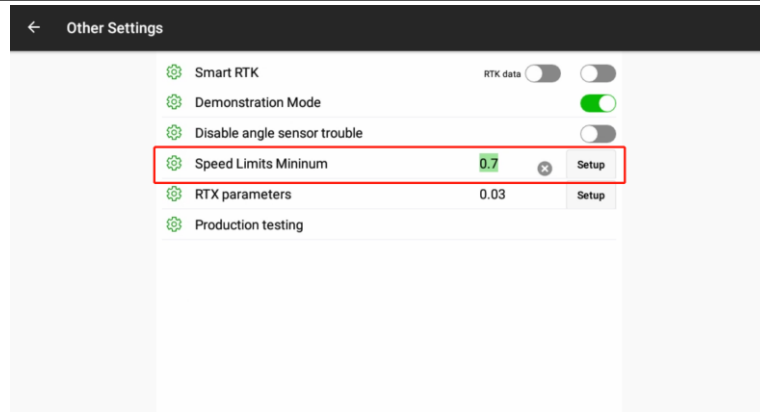
Click on "System Setup"



Click on "Other Settings."



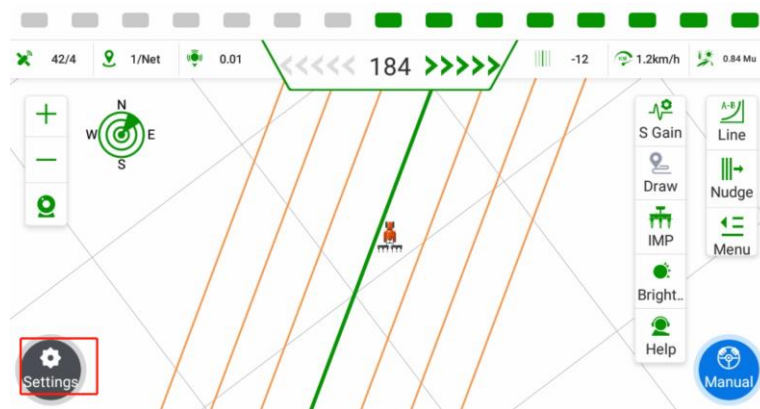
Enter the desired minimum speed and click on the "Set" button located next to it. Wait for the software to display the message "Minimum speed setting successful" to confirm that the setting has been successfully applied.



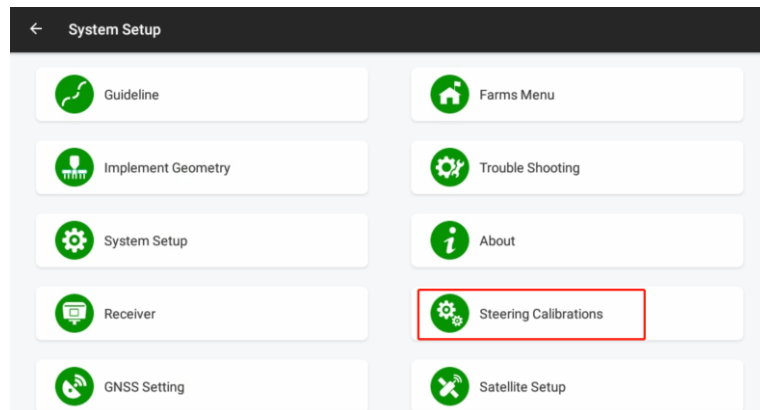
4.8 Scene Mode Switching

This software provides the functionality to switch between different application scenarios, allowing for optimized performance in various terrains and working conditions. When the automatic driving performance is not satisfactory, you can try switching the scene mode to improve the operation. The steps to switch the scene mode are as follows:

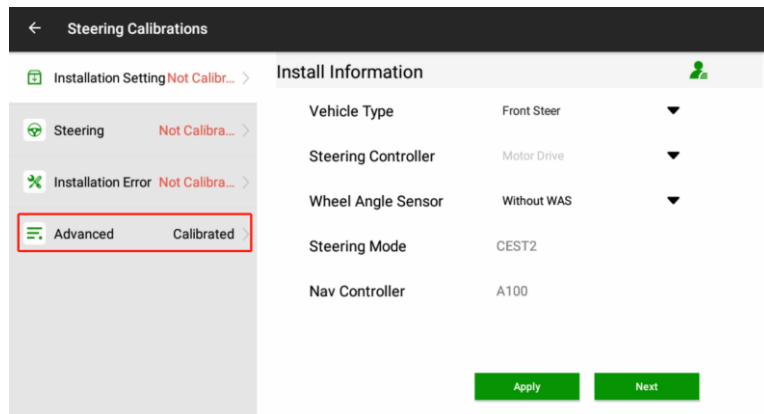
Click on the "Settings" button in the main interface.



Click on "Steering calibrations"



Click on "Advanced," enter the password, and then click on "OK" to access the scene parameter modification interface.



Once you have entered the parameter scene switch interface, you can click on the corresponding scene. After selecting a scene, click on "Apply" and wait for 3-5 seconds. When the software displays a message indicating successful application, it means that the scene has been switched successfully.

4.9 Data backup and restore

This software provides a data backup and restore feature to protect against unexpected situations.

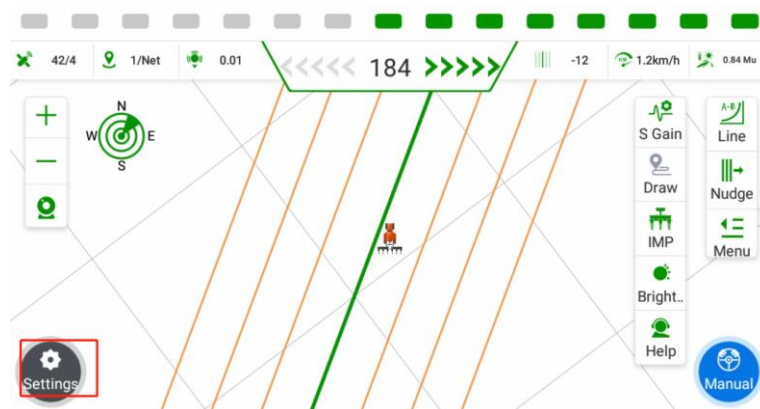
4.9.1 Data backup

The software supports both automatic and manual data backup methods.

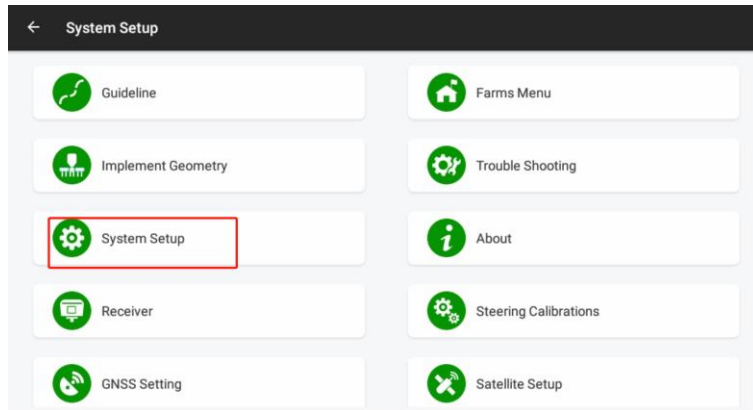
Automatic Data Backup: The system automatically backs up the current configuration file every 3 hours and overwrites the previous backup.

Manual Data Backup:

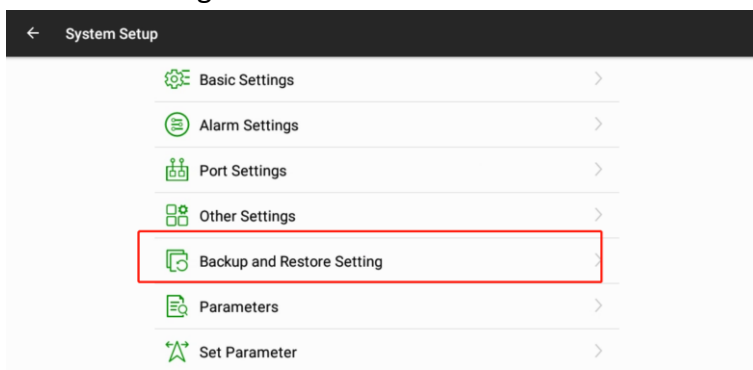
Click on the "Settings" option on the main interface.



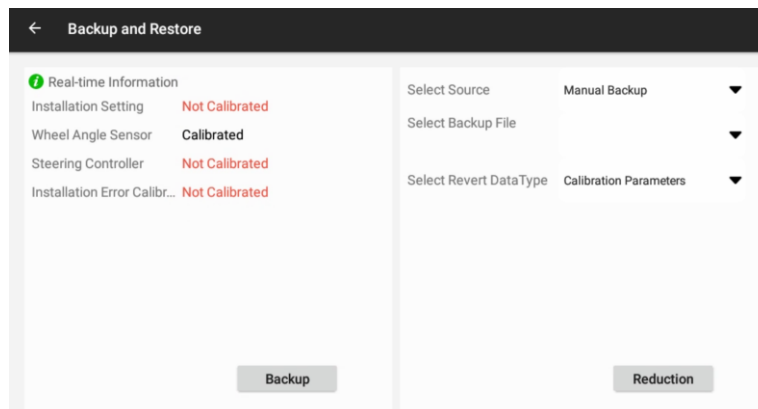
Click on "System Setup"



Click on "Backup and Restore Settings".



Once you are in the backup and restore settings, you will be able to view the current real-time information. To backup the current information, click on "Backup" and the software will display a prompt saying "Backup Successful".



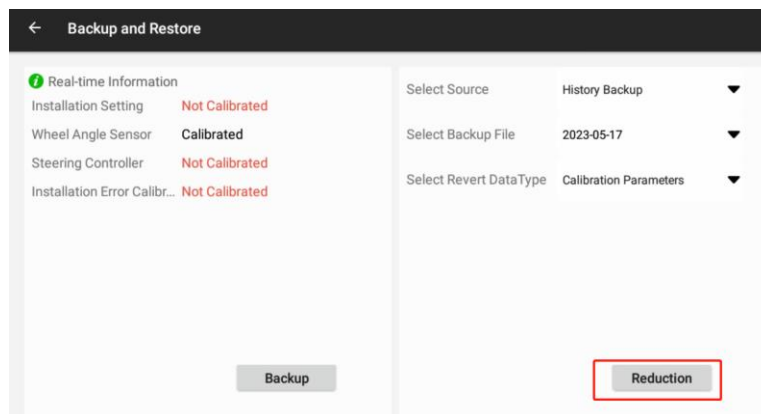
4.9.2 Manual Data Restoration

After entering the "Backup and Restore" settings, click on "Select Backup File" to display all the backup files, including automatic and manual backups.

Manual backup files are named "Local Backup File".

Automatic backup files are named "Network Backup File".

Based on the names and dates associated with the backup files, choose the backup file you want to restore the settings from. Once selected, click on "Restore" and wait for the software to display a prompt saying "Restore Successful" to confirm the successful restoration.



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