

CHCNAV TD73

USER MANUAL



Machine Control | Apr 2026

Table of content

CHCNAV TD73	1
USER MANUAL	1
Table of content	2
1. Preface	4
1.1. Copy right	4
1.1.1. Copy right 2026	4
1.1.2. Trademarks	4
1.2. Safety warning	4
1.3. Introduction	4
1.4. Technical support	5
1.5. Disclaimer	5
1.6. Your comments	5
2. Product Overview	5
2.1. Introduction	5
2.2. Product Components	5
3. Installation	6
3.1. Product Package	6
3.2. Installation Preparation	6
3.2.1. Tools Preparation	6
3.2.2. Notes	6
3.3. Installation Steps	6
3.3.1. AT315 Antenna Installation	6
3.3.2. IS300 Sensor Installation	8
3.3.3. MC300 Installation	8
3.3.4. MCPad300 Installation	9
3.3.5. SW02 Installation	9
3.3.6. Cable Connection	9
3.3.7. CV102 Valve Installation	11
4. Calibration	12
4.1. Power On	12
4.2. Calibration Wizard	13
4.2.1. Control Type	13
4.2.2. License Check	14
4.2.3. Receiver Settings	14
4.2.4. Project	15
4.2.5. Antenna Type	16
4.2.6. Sensor ID	16
4.2.7. Sensor Mounting-Blade	16
4.2.8. Sensor & Antenna Mounting Verification	17
4.2.9. Park Dozer	17
4.2.10. Move Blade	18

4.2.11. Mark Position & Data Collection	18
4.2.12. Dimensions	19
4.2.13. Move Blade	20
4.2.14. Antenna & Rod Height	20
4.2.15. Measure Mark	20
4.2.16. Valve Type	21
4.2.17. Joystick Config	22
4.2.18. Lift Vavle Config	23
4.2.19. Tilt Valve Config	23
4.2.20. Valve Calibration - Blade Down	24
4.2.21. Valve Calibration - Blade Up	24
4.2.22. Valve Calibration - Tilt Left	25
4.2.23. Valve Calibration - Tilt Right	25
4.2.24. Valve Calibration - Speed	26
4.2.25. Valve Voltage Offset	26
4.2.26. Valve Speed Check	27
4.2.27. Control Parameters	28
4.2.28. Designs management	29
4.2.29. Backup File	30



1. Preface

1.1. Copy right

1.1.1. Copy right 2026

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1.1.2. Trademarks

All product and brand names mentioned in this publication are trademarks of their respective holders.

1.2. Safety warning

When using the CHCNAV TD73 Bulldozer 3D Control System, please observe the following safety warnings:

- Read and fully understand this manual before installation, operation, and maintenance.
- Install and operate the system only by qualified and trained personnel.
- Disconnect power and hydraulic supply before wiring, installation, or disassembly.
- Avoid short circuits, open circuits, or damage to cables and connectors.
- Do not modify the system hardware or software without authorization.
- Keep the control panel, sensors, and antennas away from strong vibration, moisture, and high temperature.
- Follow local machine safety regulations and construction site rules during operation.
- In case of abnormal conditions (error alarms, unstable control, malfunctions), stop operation immediately and troubleshoot.
- Keep this manual for future reference.

1.3. Introduction

The TD73 user manual provides a detailed description of the installation, calibration, and operation of the Bulldozer 3D Control System, which serves as an introductory document for the design and use of the software. The language style of this guide is



designed to be concise and accessible, and the operational processes are elaborated in a clear and simplified manner, enabling beginners to master each operational step easily, quickly, and accurately.

1.4. Technical support

If you have a problem and cannot find the information you need in this manual or CHCNAV website www.chcnav.com or contact your local CHCNAV dealer from which you purchased the system(s).

If you need to contact CHCNAV technical support, please contact us by email support@chcnav.com

1.5. Disclaimer

Before using the system, please make sure that you have read and understood this User Guide, as well as the safety information. CHCNAV holds no responsibility for the wrong operation by users and for the losses incurred by the wrong understanding about this User Guide. However, CHCNAV reserves the rights to update and optimize the contents in this guide regularly. Please contact your local CHCNAV dealer for new information.

1.6. Your comments

Your feedback about this user guide will help us to improve it in future revision. Please email your comments to support@chcnav.com

2. Product Overview

2.1. Introduction

This chapter describes the mechanical configuration of the bulldozer 3D control system, and the components of each configuration. The purpose of this is to let the installer know which components need to be installed for each configuration and to find relevant installation information in this manual.

2.2. Product Components

The TD73 Bulldozer 3D Control System is a 3D machine control solution developed by CHCNAV to improve the quality and efficiency of earthworks construction. Adopting high-precision GNSS-RTK positioning technology, inertial sensor technology and hydraulic control technology, combined with the independently developed GR-Tech



bulldozer model algorithm, the system calculates the 3D coordinates of the bulldozer blade in real time. It controls the blade attitude dynamically according to the 3D design drawings displayed on the on-board tablet, achieving centimeter-level operation accuracy during earth leveling.

3. Installation

3.1. Product Package

List of main components: [Attachment 1](#)

3.2. Installation Preparation

3.2.1. Tools Preparation

List of the tools : [Attachment 2](#)

3.2.2. Notes

Safety shall be taken into account during equipment installation.

Routing shall be arranged to avoid passing through the cab doors and windows as much as possible.

Equipment installation shall not affect the operator's field of vision. Ensure that the machine operator can perform the following operations:

- The display is visible to the operator under normal viewing conditions.
- The SW02 automatic control switch can be operated in a normal sitting posture.
- The installed equipment does not interfere with normal machine maintenance.
- The normal operation of the machine shall not be affected.

3.3. Installation Steps

This chapter focuses on the deployment, installation of system components and the layout of cables.

3.3.1. AT315 Antenna Installation

a. Adjust the blade left and right horizontal level.

Position the bulldozer on firm ground, and use a spirit level to adjust the blade to

horizontal in the left - right direction.



b. Weld the base of the antenna bracket.

Weld the antenna bracket bases horizontally on the left and right sides of the blade.

Two key points shall be noted during welding:

- Ensure the left and right antenna brackets are symmetrical about the central axis of the bulldozer.
- Perform repeated fine adjustments during welding until the mounting surface of the antenna brackets is horizontal in both the parallel and perpendicular directions relative to the blade.



c. Antenna mast installation

- After welding, install the antenna bracket vertically on the base, fit the cover plate and tighten the screws.
- Fine-tune the bracket angle during tightening and use a spirit level to keep it vertical.
- Finally, mount the AT315 antenna on the bracket.

3.3.2. IS300 Sensor Installation

- The IS300 inertial sensor is typically mounted on the antenna bracket base of the right blade.
- First adhere the sensor base to the antenna bracket base, then fasten the sensor to the mounting plate with bolts.
- Install the sensor with its connector facing to the right.



3.3.3. MC300 Installation

The MC300 receiver is supplied with a mounting plate from the factory.

- One side of the plate is equipped with 3M adhesive. During installation, peel off the adhesive and secure the plate at the rear of the cab.
- Then fasten the MC300 to the plate with bolts.
- Ensure the indicator lights of the MC300 receiver are not blocked by any objects.



3.3.4. MCPad300 Installation

The MCPad300 tablet mount is installed in the front of the cab with acrylic adhesive plates, ensuring unobstructed driver visibility and convenient access to screen information.



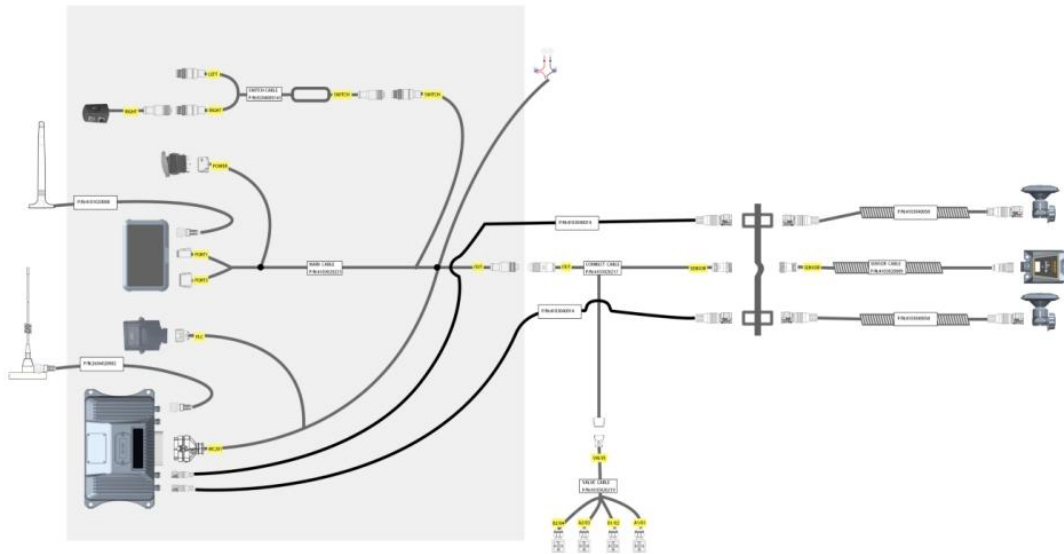
3.3.5. SW02 Installation

Fit the SW02 switch mounting bracket near the joystick with screws to ensure convenient operation for the operator.



3.3.6. Cable Connection

The cables provide the data communication and power supply for TD73 system. When connecting cables, secure them along the expected path with the ties or clasps, remove the cab floor to fix the cables.



a. Power cable installation

The TD73 system shall be connected to a 24V power supply on the bulldozer, ensuring continuous power to the entire system whenever the main power is switched on, regardless of whether the engine is running or not.

Note:

This is to allow certain calibration procedures to be performed with the bulldozer engine off.

Allow:	Forbidden: Currently 12V in this way is forbidden

b. Radio antenna installation

The vehicle radio antenna shall be connected to the radio interface of the MC300 receiver at one end, and the other end shall be mounted on the exterior top of the

bulldozer cab. The antenna cable connector shall be routed through the prefabricated hole at the bottom of the cab and connected to the receiver. The cable shall be fastened with cable clips and cable ties.



c. Hub installation

The hub shall generally be installed on the upper or front part of the bulldozer nose, for connection between the AT315 antenna and the IS300 inertial navigation sensor cables. See illustration below.



d. Cable installation inspection

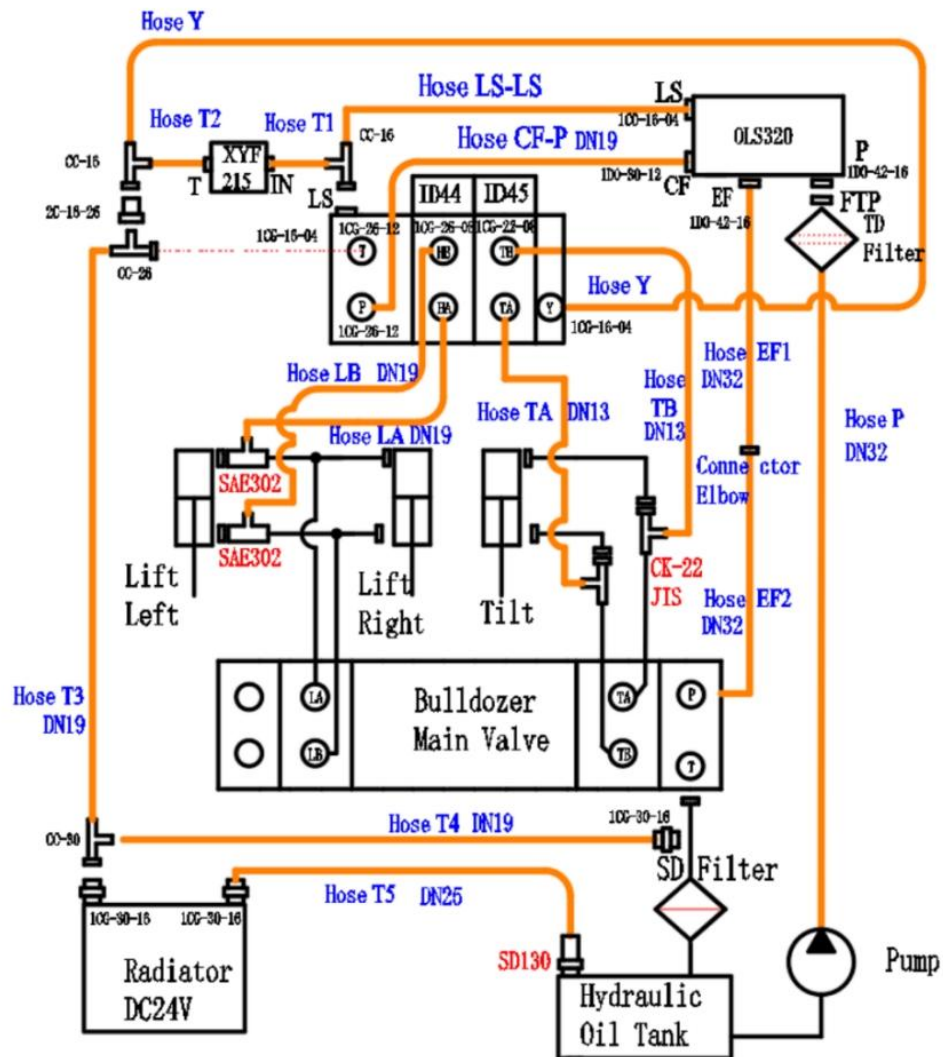
After the cable is installed, inspect the entire cable route to ensure it does not interfere with bulldozer track travel, cab door operation, or the vertical movement of the blade. Following the safety check, start the bulldozer and adjust the blade angle to verify that the harness is properly installed.

3.3.7. CV102 Valve Installation

Lower the bulldozer blade and other implements to the ground to ensure hydraulic system depressurization. Place the control lever in the park position and stop the engine. Using an electric drill and other appropriate tools, mount the CV102 valve

bracket onto the bulldozer baffle. Secure the CV102 valve to the bracket with screws, then connect the hydraulic tubing.

Hydraulic connection schematic as shown below.



SHANTUI SD16 Hydraulic modified diagram

4. Calibration

This chapter describes the calibration procedure for the TD73 bulldozer system.

For initial system calibration, click [Calibration Wizard] to start the process.

4.1. Power On

Press the red switch button to turn on the TD73 system power. The red indicator light on the button will stay on.



Press the orange button for 3 seconds, and the tablet will boot.

Note:

- Turn on the main system switch, and the tablet will power on automatically. There is no need to press the power button on the back of the tablet.
- Press the button on the back of the tablet only when you want to turn off the tablet separately.
- It is recommended that you turn off the main system switch if the device will not be in use for one day.

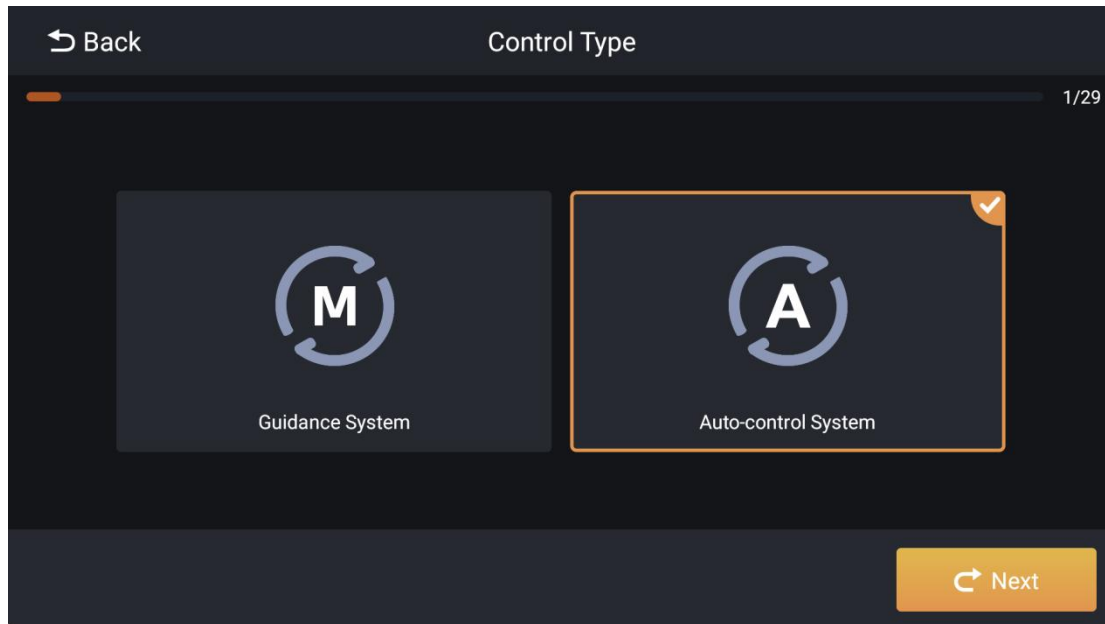


4.2. Calibration Wizard

4.2.1. Control Type

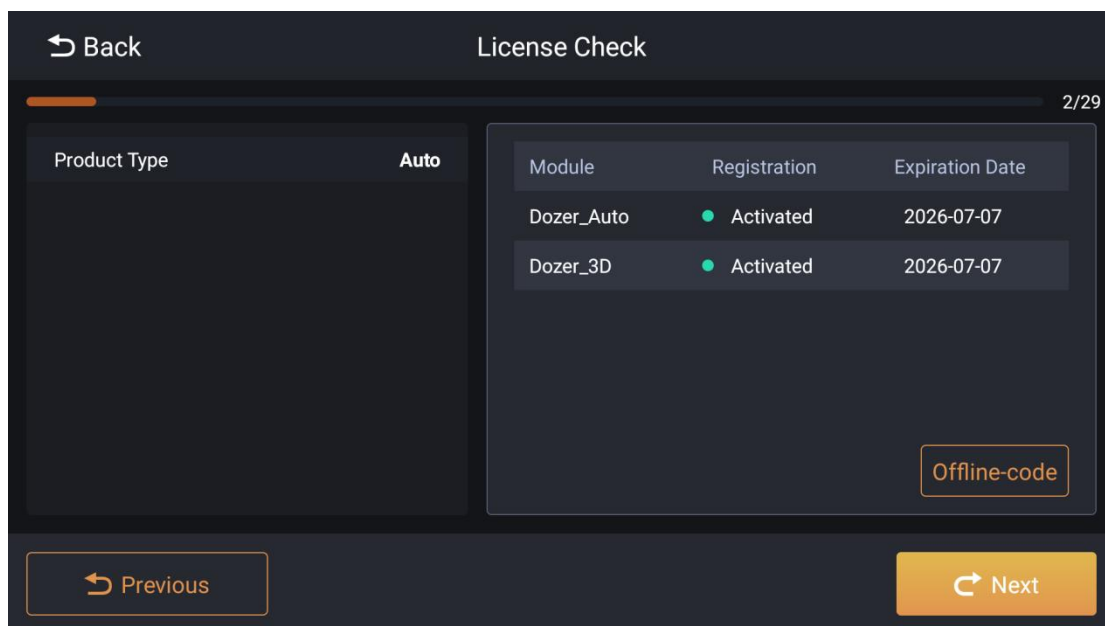
- When [Guidance System] is selected, the operator can manually adjust the blade movements for construction operations according to the parameters displayed on the tablet.

- When [Auto-control System] is selected, the operator can set construction types such as flat surface or slope on the tablet, and the blade will adjust automatically to complete the work.
- After making your selection, tap [Next].



4.2.2. License Check

The bulldozer control software can only be used after authorization. If not authorized, please click [offline-code] , enter the correct registration code, and after successful registration and authorization, click [Next].



4.2.3. Receiver Settings

In this step, you need to configure the differential information. The system supports

the following base station types.

- Radio base station
- CORS
- APIS
- External radio

After configuration, select the data source, verify that the antenna differential data status is normal, then click [Next].

Back
Receiver Settings
More

Diff. Age0s
Solution type(Main)Fixed
Solution type(Aux)Fixed
Satellites(Main)0/0
Satellites(Aux)0/0
RTK timeout60
Elevation mask angle2
Heading Angle84.93°

★ ygy Login successful
CORS
Address out.wegnss.com Port 2102
Source XJRTCM32 User Name nycs0036

tyyyyyyy
APIS Station ID 3798308
Address APIS1.huace.cn Port 9901

ttt
Radio

Previous
Good Positioning
Next

4.2.4. Project

Click [More] to create a new project file, select the project file, then click [Next].

Back
Projects
More

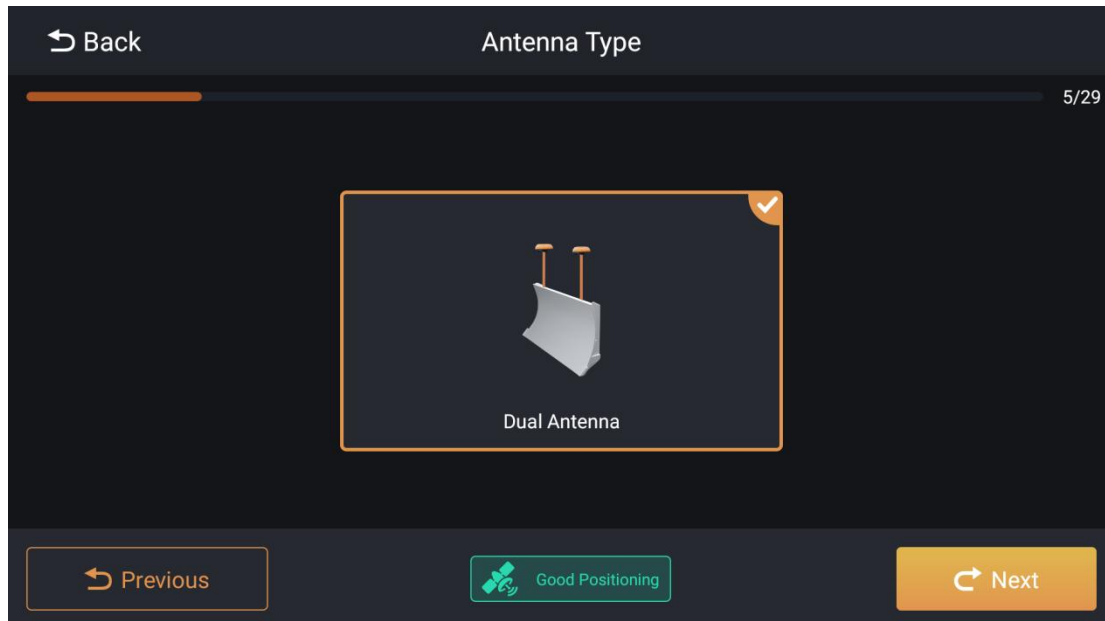
★ 2026-04-07 22-42
coord1775572973487 2026-04-07 22:42:56
Description
Details
Local

testProject
coord1769413356656 2026-01-26 15:42:38
Description
Local

Previous
Good Positioning
Next

4.2.5. Antenna Type

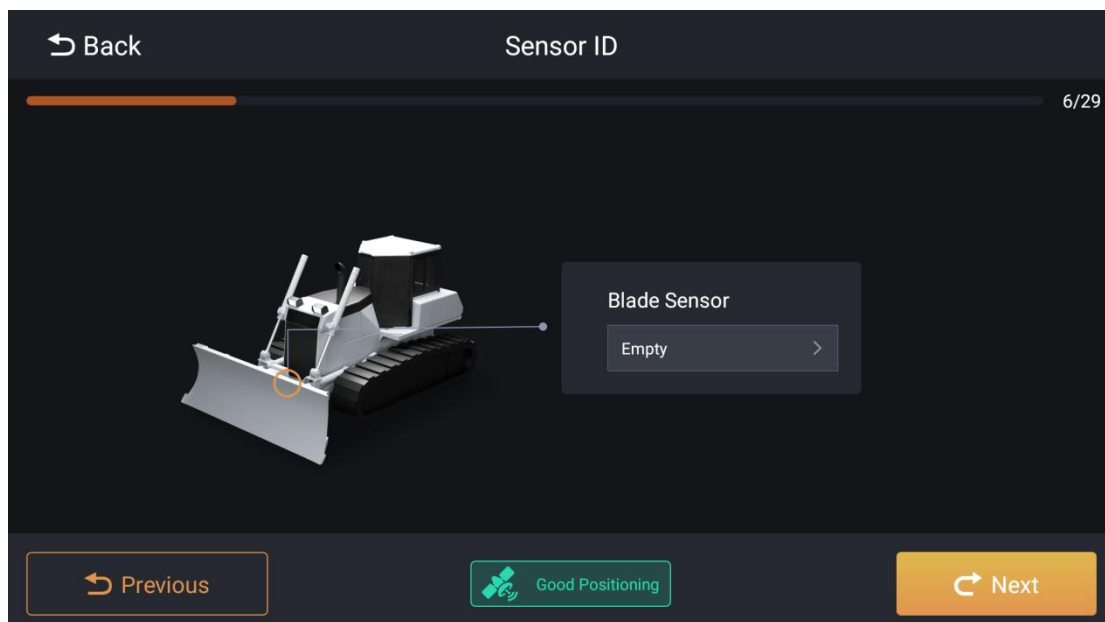
According to the product type (dual-antenna system / single-antenna system), select the installed antenna type, then click [Next].



4.2.6. Sensor ID

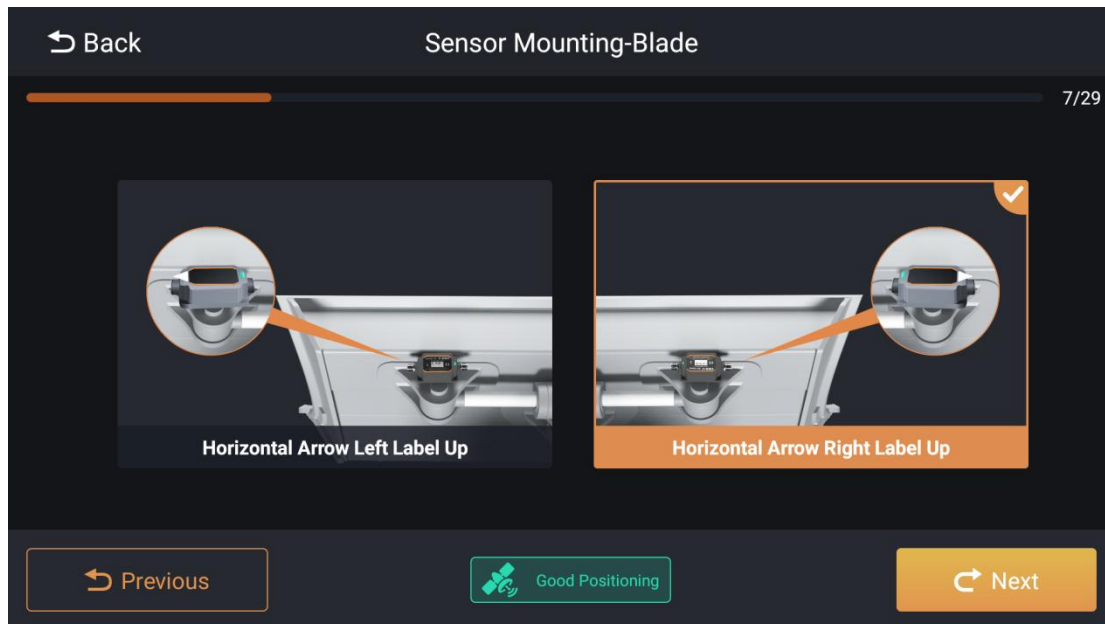
The system will automatically recognize the sensor SN information.

Click the drop-down box of the blade sensor and select the sensor SN.



4.2.7. Sensor Mounting-Blade

According to the actual installation direction of the sensors on the system, select the correct sensor label and ensure the arrow is facing backward, then click [Next].

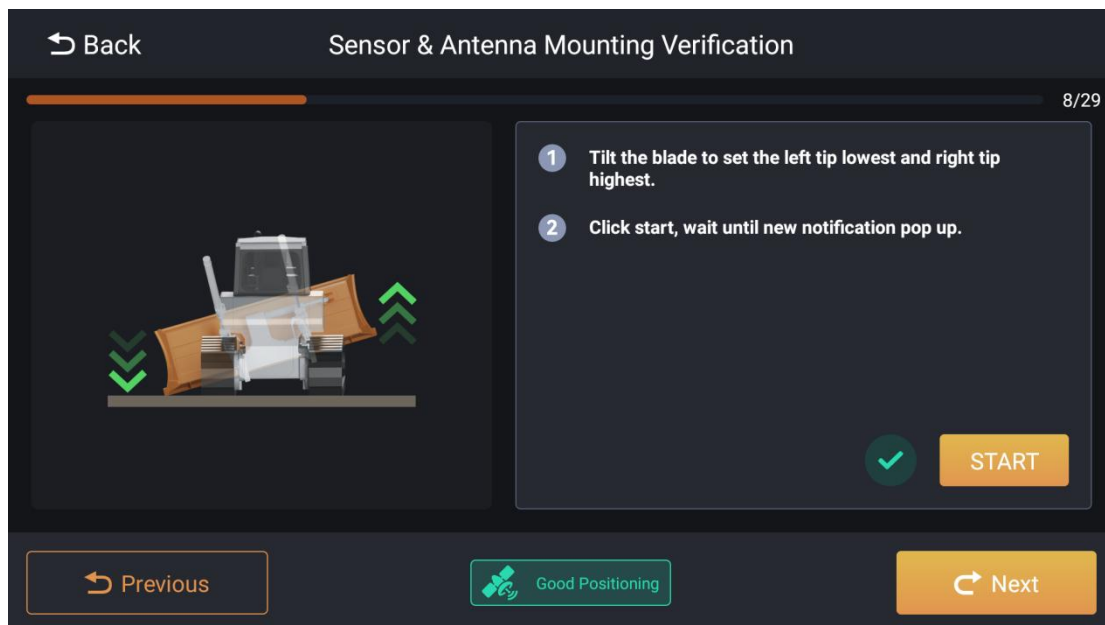


4.2.8. Sensor & Antenna Mounting Verification

Manually adjust the blade to a low-left, high-right attitude.

After adjustment, click [Start] and wait for the system to automatically verify the sensor and antenna positions.

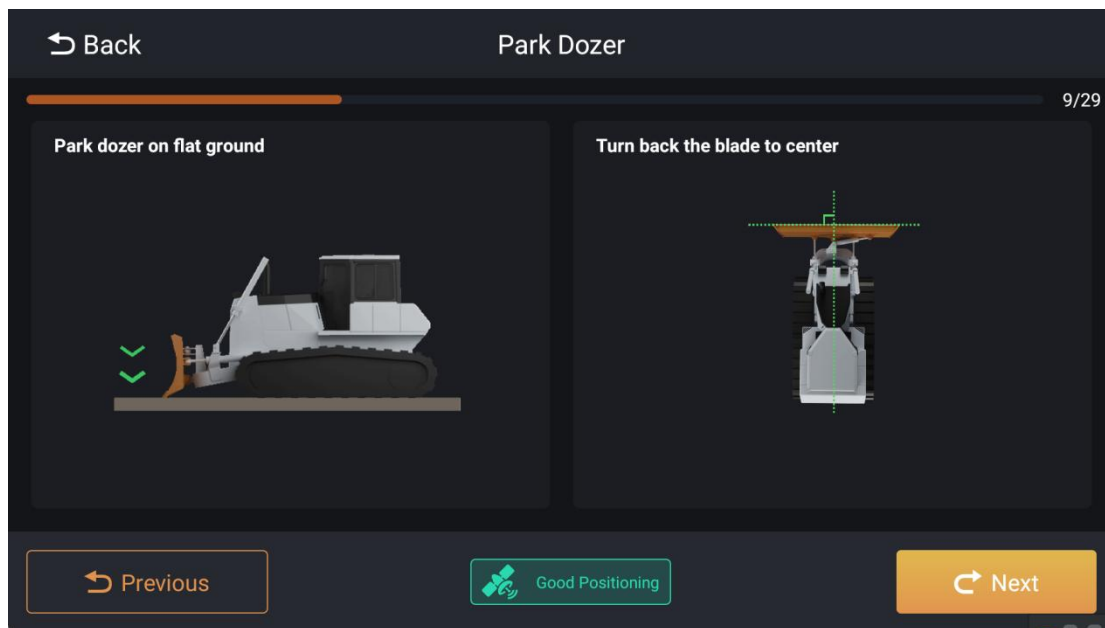
Upon successful completion, click [Next].



4.2.9. Park Dozer

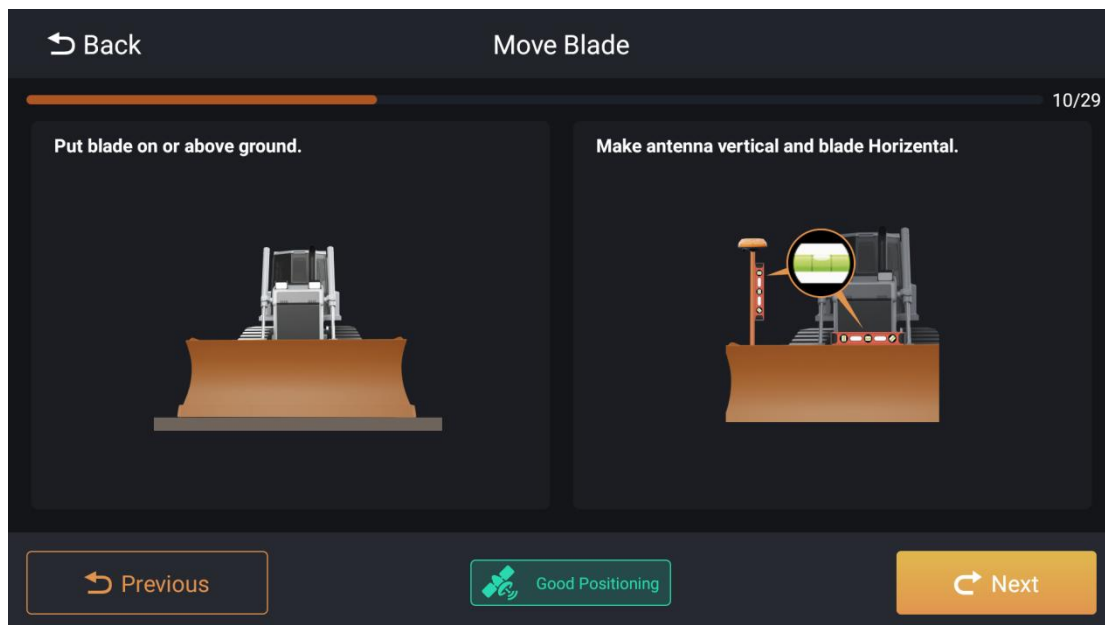
- Park the bulldozer on flat ground.
- Use a tape measure to measure the distance from both sides of the blade to the fixed points of the boom. Adjust the blade rotation until the distances from both

sides of the blade to the boom fixed points are equal, click [Next].



4.2.10. Move Blade

- Put the blade on the ground, or to a position 10cm above the ground.
- Using a spirit level, verify that the antenna is vertical and the blade is horizontal. Click [Next].



4.2.11. Mark Position & Data Collection

- Keep the bulldozer mechanical stationary and shut down the engine.
- Use plumb bobs to determine the ground projection points of the left and right blade tips, mark these projection points on the ground with a marker pen, then

click [Next].

Back

Mark Position & Data Collection

11/29

Do not move from this step onward.

Shut down the engine and never operate it until notice.



Mark the projection points of the two blade tips on the ground.



Previous

Good Positioning

Next

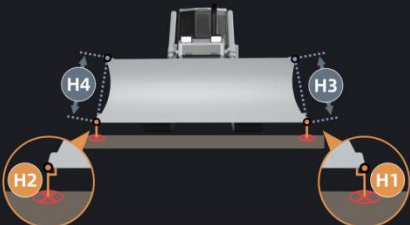
4.2.12. Dimensions

- Use a try square to measure the vertical heights H1 and H2 from the left and right blade tips to the ground respectively, and enter the values into the corresponding fields in the software.
- Use a tape measure to measure the blade heights H3 and H4 on the left and right sides respectively, and enter the values into the corresponding fields in the software.
- Click Collect after entering all values. Upon completion of collection, the longitude and latitude of the left and right antennas will be displayed on the left side of the screen. Click [Next].

Back

Dimensions

12/29



Left
B:31.769706447
L:118.727337143
H:46.564

Right
B:31.769698014
L:118.727309954
H:46.556

Input the dimensions then click Collect .

H1	0.079 m	H3	1.090 m
H2	0.115 m	H4	1.090 m



Collect

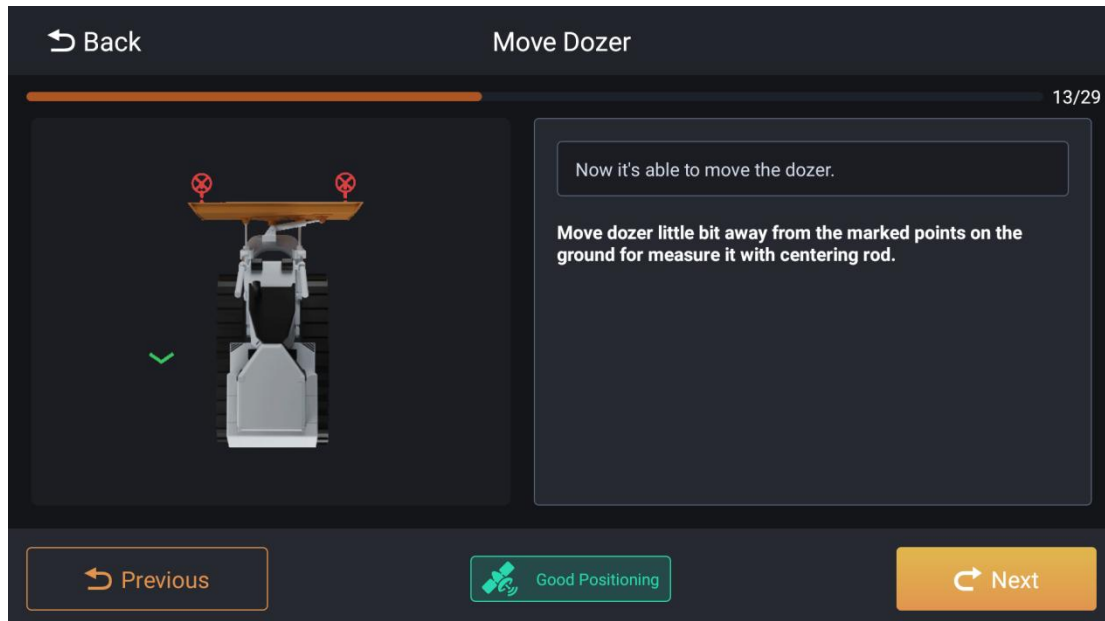
Previous

Good Positioning

Next

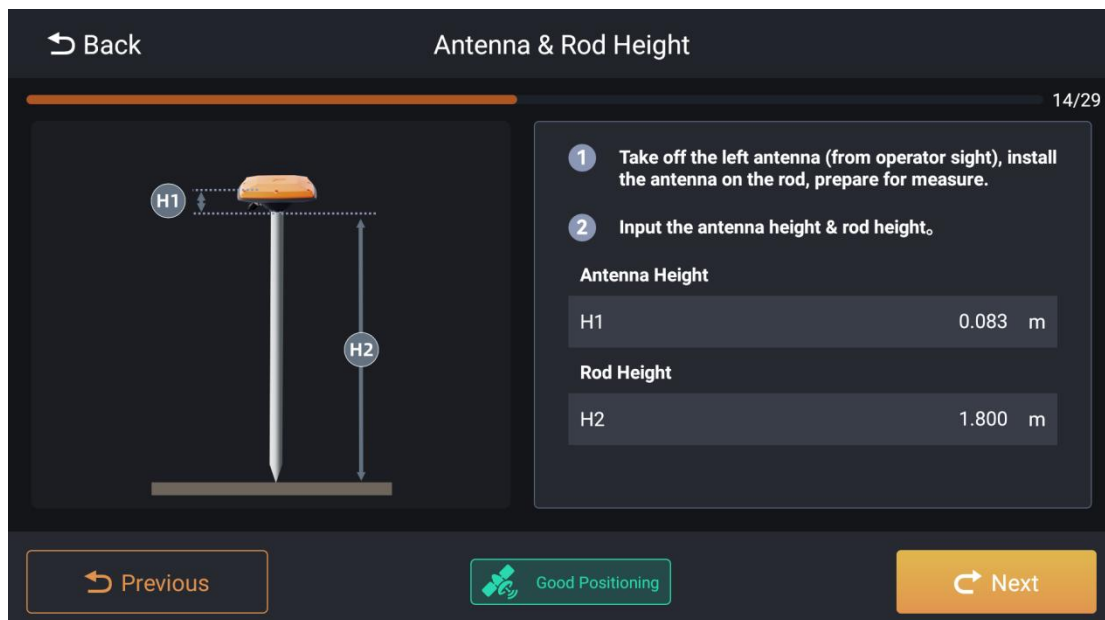
4.2.13. Move Blade

Move the bulldozer backward until the centering pole can be stably set up at the projection point, then click [Next].



4.2.14. Antenna & Rod Height

Remove the left antenna from the operator's view and install it on the centering pole. Then enter the antenna height (default: 0.083 m) and the centering pole height (usually adjusted to 1.8 m), and click [Next].



4.2.15. Measure Mark

- Place the antenna-mounted centering pole on the left bucket tip projection point

marked in Step 11. Center and hold the bubble level on the centering pole, then click [Measure] next to the left marker until the measurement is completed.

- Next, place the centering pole on the right bucket tip projection point marked in Step 11. Center and hold the bubble level again, then click [Measure] next to the right marker until finished.
- Once this step is done, model calibration is complete. Click [Next] to proceed to the solenoid valve calibration phase.

Back
Measure Mark
15/29

Left	Right
B:31.769705103	B:31.769694867
L:118.727340931	L:118.727308674
H:45.544	H:45.513

- Use rod & antenna to measure **left** mark on the ground. ✓ Measure
- Use rod & antenna to measure **right** mark on the ground. ✓ Measure

Previous

Good Positioning

Next

4.2.16. Valve Type

Click the drop-down box for valve type, select the valve group type matching the machine, and then click [Next].

Note: Currently supported valve group types include: PV100, PV300, CV200, CV101/102, CAT CAN, KOMATSU, JOHN DEERE. The last three are electronically controlled types.



4.2.17. Joystick Config

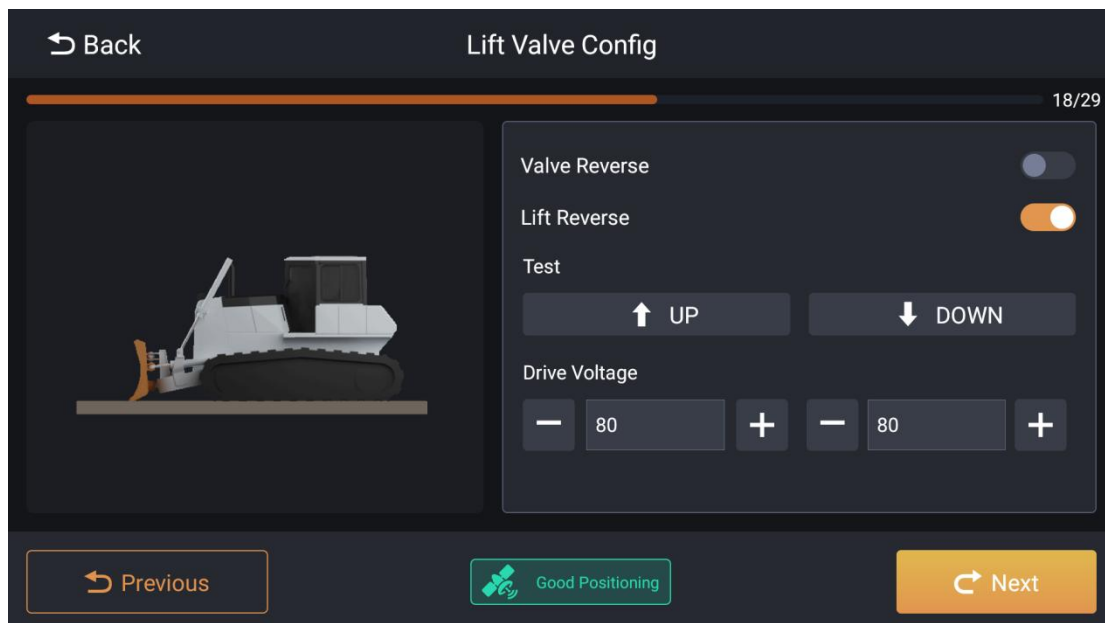
- First, set the handle type to ****SW02**** in this step. In ****Function Configuration****, set the up and down keys to control the vertical offset of the blade pitch angle. Pressing the up and down keys simultaneously reverses the tilt angle of the design slope.
- The [Tolerance] at the bottom sets the minimum vertical offset unit of the blade for each key press, which is generally set to 0.01 m. After configuring all parameters as required, click [Next].

Note: Electronically controlled models can select the corresponding electronic control handles. Currently supported types include: CAT INPUT, CAT INPUT D3K, LIU GONG, JOHN DEERE.



4.2.18. Lift Valve Config

- The goal of this step is to adjust the lift valve. First, click the [Raise/Lower] button to observe the actual movement of the blade:
- If commanding the blade to raise or lower causes the blade to tilt left and right instead, click [Valve Inversion].
- If commanding the blade to raise results in actual lowering, and commanding lowering results in actual raising, click [Lift Valve Inversion].
- Drive Voltage is adjusted according to the tested blade raising/lowering speed and the required working speed. Reduce the drive voltage if the movement is too fast; otherwise, increase it.
- After completing the adjustments for Valve Inversion, Lift Valve Inversion and Drive Voltage, click the Raise/Lower buttons under Test again for verification. Once confirmed correct, click [Next].



4.2.19. Tilt Valve Config

- The purpose of this step is to adjust the tilt valve. First, click the [Clockwise/Counterclockwise] button to check the actual tilting direction of the blade.
- If the actual tilting direction of the blade is opposite to the commanded clockwise or counterclockwise direction, click [Tilt Valve Inversion]. If the actual movement is consistent with the operating direction, no inversion is required.
- Similar to the Drive Voltage setting for the lift valve, adjust the drive voltage to change the tilting speed of the tilt valve, so as to match the required operating speed for actual construction.
- After finishing the settings of Tilt Valve Inversion and Drive Voltage, click the

[Clockwise/Counterclockwise] button] to verify. Once confirmed normal, click [Next].

Back

Tilt Valve Config

19/29



Tilt Reverse

☐

Test

CW

CCW

Drive Voltage

-

30

+

-

30

+

Previous

Good Positioning

Next

4.2.20. Valve Calibration - Blade Down

Lower the blade to its limit position and click [Collect]. Once the collection is finished, click [Next].

Back

Valve Calibration - Blade Down

20/29



Pitch

-1.13°

Put blade down to the ground, click "Collect".

Collect

✓

Previous

Good Positioning

Next

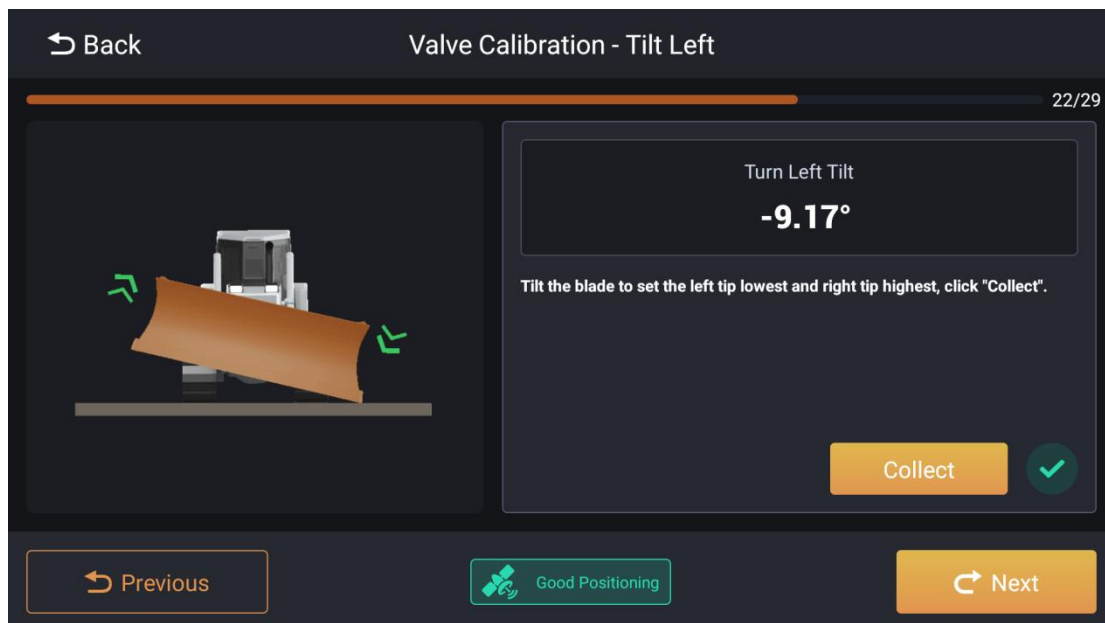
4.2.21. Valve Calibration - Blade Up

Raise the blade to its limit position and click [Collect]. After the collection is completed, click [Next].



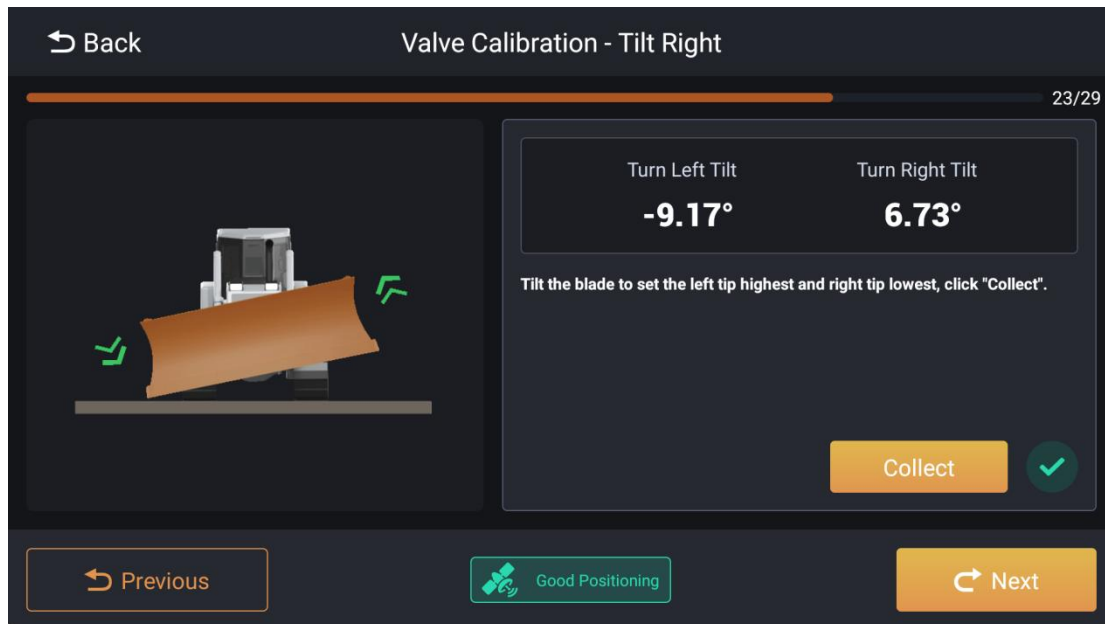
4.2.22. Valve Calibration - Tilt Left

Adjust the blade to its left-low and right-high limit position, then click [Collect]. After the collection is completed, click [Next].



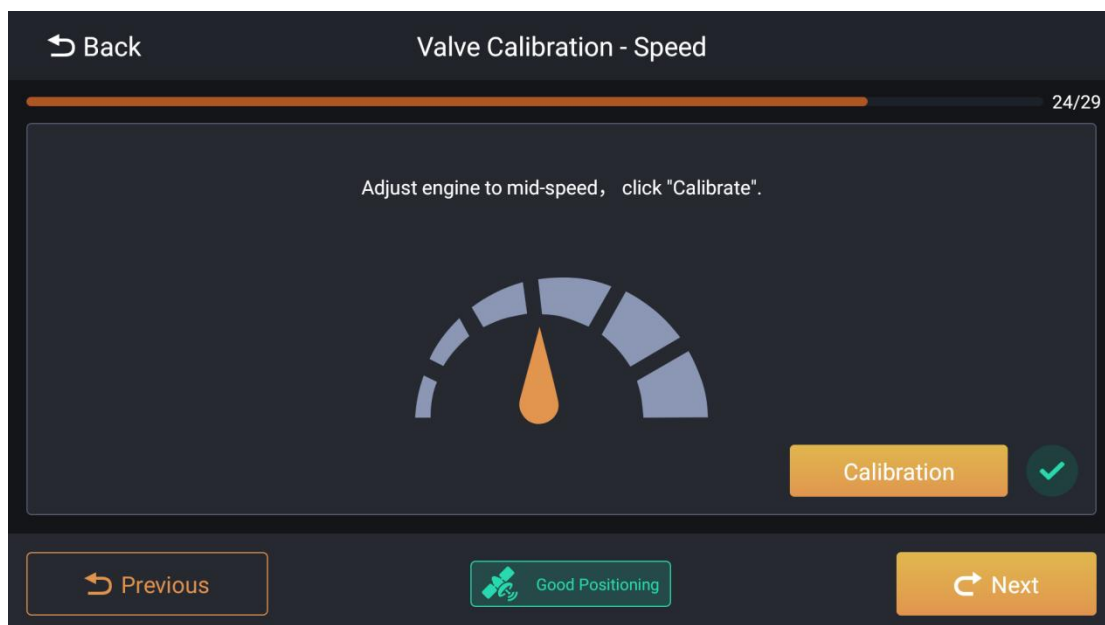
4.2.23. Valve Calibration - Tilt Right

Adjust the blade to its left-high and right-low limit position, click [Collect], and click [Next] once the collection is finished.



4.2.24. Valve Calibration - Speed

- Adjust the bulldozer engine to maximum speed and click [Calibrate].
- This automatic calibration process takes 15 to 20 minutes to complete. Click [Next] once calibration is finished.



4.2.25. Valve Voltage Offset

The objective of this step is to adjust the control percentage.

Parameter description:

- ① U-V: Minimum voltage percentage for raising
- ② D-V: Minimum voltage percentage for lowering

- ③ C-V: Minimum voltage percentage for clockwise rotation
- ④ A-V: Minimum voltage percentage for counterclockwise rotation

Press and hold the [Debug] button and observe the blade movement. If the blade moves, release the button, then press and hold [Debug] again. Repeat this operation until the blade remains stationary to finish debugging; parameters will be saved automatically. Adjust the percentage of all four movements to the critical value following the same procedure, then click [Next].

Note: The debug value decreases by 2 each time the [Debug] button is triggered.

Back
Valve Voltage Offset
25/29

Long-press the Debug button
Check blade movement

✓ Blade stationary: Completed debugging

↺ Blade movement: Retune



U-V	—	100	+	Debug	i
D-V	—	100	+	Debug	i
C-V	—	100	+	Debug	i
A-V	—	100	+	Debug	i

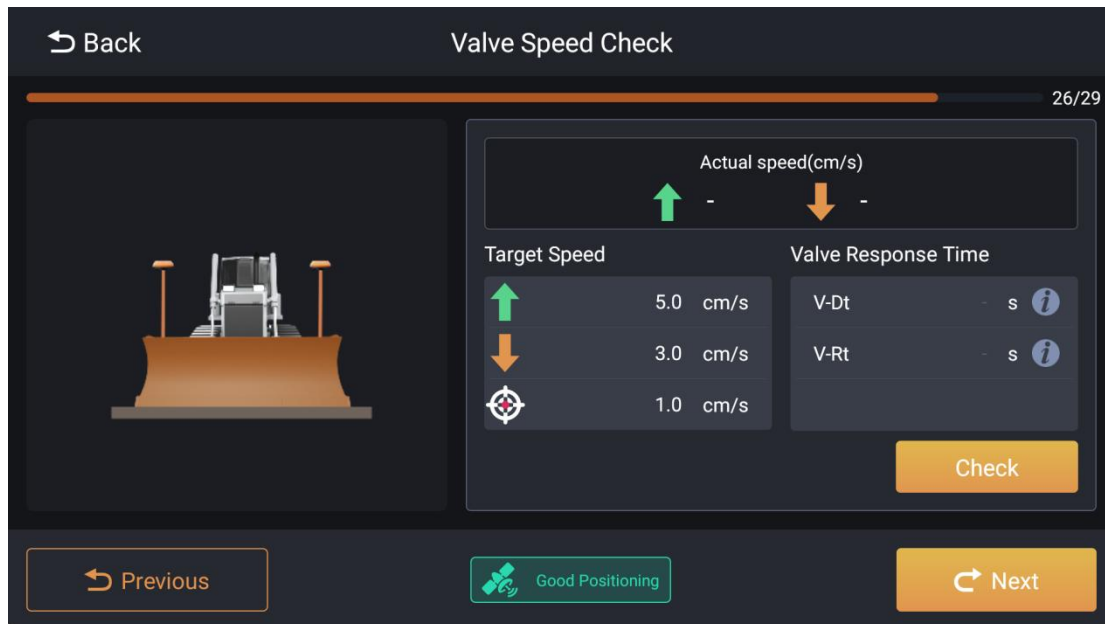
Previous

Good Positioning

Next

4.2.26. Valve Speed Check

Click [Check] to automatically verify whether the raising/lowering control speed and response time of the valve meet the requirements. Click [Next] after the verification passes.



4.2.27. Control Parameters

Raise the blade to approximately 20 cm above the ground. Select one guide point from the left, middle or right blade tip according to the current blade position to define the control plane. Then raise or lower the blade by about another 20 cm. Turn on the SW02 automatic switch, and observe the blade movement as well as the data variation curve in the upper right corner of the interface.

The blade should move to the control plane at a proper speed with slight jitter. The data curve in the upper right corner shall gradually fit to the same position over time without obvious burrs.

Automatic Control Parameter Tuning

Turn on the SW02 automatic switch and observe the blade motion posture.

- If the blade bounces up and down, tune the blade lift control parameters (H-Kp, H-Kd).
- If the blade sways left and right in the tilting direction, tune the blade tilt control parameters (A-Kp, A-Kd).
- If both phenomena occur, tune the tilt control parameters first, then the lift control parameters.

a. For left-right blade sway

Operate the bulldozer control handle to tilt the blade left and right by 3–5 cm (corresponding to 3–5 cm fill/cut value on the screen), and observe the returning

speed when the blade returns to the fill/cut value of 0.

- If the return speed is slow, increase the A-Kd value first.
- If obvious left-right sway still exists when the blade returns to zero fill/cut, decrease the A-Kd value.

When adjusting [A-Kd], synchronously adjust [A-Kp] to ensure the value of [A-Kp] is [1.5 to 2 times] that of [A-Kd].

b. For up-down blade bouncing

Operate the bulldozer blade control handle to raise the blade by 3–5 cm (corresponding to 3–5 cm fill/cut value on the screen), and observe the blade lowering speed.

- If the lowering speed is slow, increase the H-Kp value first.
- If obvious up-down bouncing remains when the blade returns to zero fill/cut, decrease the H-Kd value.

Similarly, when adjusting H-Kd, synchronously adjust H-Kp to ensure the value of H-Kp is 1.5 to 2 times that of H-Kd.

The screenshot shows the 'Control Parameters' screen with a 'Back' button at the top left. The screen is divided into several sections:

- Top Section:** Two blue buttons labeled 'NaN' with upward-pointing triangle icons.
- Left Panel:** A dark area with a yellow blade icon and a 'Current elevation 0.00m' label. Below this are three small icons representing different blade positions.
- Right Panel:** A list of parameters with their values and status icons (checkmark and information 'i').

Parameter	Value	Status
H-Kp	20.0	✓ i
H-Kd	10.0	✓ i
H-MODE	1	✓ i
A-Kp	8.0	✓ i
A-Kd	3.0	✓ i
A-MODE	0	✓ i
- Bottom Section:** Three buttons: 'Previous' (orange), 'Good Positioning' (green with a checkmark icon), and 'Next' (orange).

4.2.28. Designs management

After confirming all parameters for valve calibration, you can verify the automatic control effect by either importing design data or creating a new on-site design.

If there is no need to create new design management data at this moment, you may skip this step directly and click [Next].

↶ Back

Designs

28/29





Design data

More ▾

↶ Previous

 Good Positioning

↷ Next

4.2.29. Backup File

After confirming all parameters for valve calibration, you can verify the automatic control effect by either importing design data or creating a new on-site design.

If there is no need to create new design management data at this moment, you may skip this step directly and click ****Next****.

↶ Back

Complete

29/29



Congratulations!

Calibration successful!

Click 'Backup' to create a new backup.

Previous

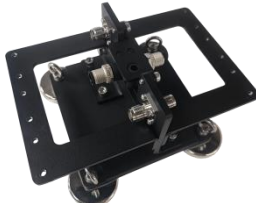
Skip

Backup

Part Number	Description	Pcs	
-------------	-------------	-----	--

0201170270	Tablet - MCPad300	1	
16001900Y9	Receiver - MC300	1	
110118001A	Sensor - IMU IS300	1	
16001900Y8	Antenna - GNSS AT315	2	
1600210073	Cable - Receiver M23 Female	1	
1600210076	Cable - Receiver M23 Male	1	
4103010067	Cable - MCPad300 Excavator	1	

1600210074	Cable - Power 5m M12-4PIN	1	
4103040144	Cable - GNSS 10m TNC/TNC Orange	1	
4103040145	Cable - GNSS 10m TNC/TNC	1	
4103040058	Cable - GNSS 5m TNC/TNC - Sprial	2	
4103040122	Cable - GNSS 0.4m TNC/TNC - Conversion	2	
16002100c8	Cable - Sensor 3.5m M12-5PIN Female/Female Protected - Spiral	1	

4103020386	Cable - Sensor 7.5m M12-5PIN Female/Female Protected	1	
4105150009	Switch - SW02 (R)	1	
0103014851	Bracket - SW02	1	
0103014852	Bracket - SW02 - Plate	1	
4102030134	Bracket - GNSS 0.4m TNC/TNC	2	
16001100YF	Cable Hub	1	

0101020497	Antenna - Vehicle Radio	1	
0101020501	Base - Vehicle Radio	1	
4101010003	Antenna - Vehicle Wifi	1	
16001900Y6	Bracket - Tablet Acrylic	1	
2604090010	Connect - TNC Female/Female	2	
0102102626	Plug - Resistor M12-5PIN	2	
0102102625	Plug - Protection M12-5PIN	2	



FCC Warning

15.19 Labeling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

15.21 Information to user.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.
3. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.



ISED Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

ISED Radio Frequency Exposure Statement:

This equipment complies with ISED exposure limits set forth for an uncontrolled environment. This equipment shall be installed and operated with minimum distance 20cm between the radiator & body.

Déclaration d'ISDE sur l'exposition aux radiofréquences :

Cet équipement est conforme aux limites d'exposition d'ISDE établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et le corps.