MCNAV TX73 Excavator Guidance System

User Manual

MACHINE CONTROL & CONSTRUCTION | Mar 2025

Table of Contents

1 Installation & Licensing

1.1 Installation

The software is installed on the tablet by default, you can click the [upgrade] button to update to the latest version.

Upgrading by a local package is possible as well. You need to copy the package to the tablet from a USB flash drive and then install it.

Note: The TX73 software supports overwrite installation, so no need to uninstall the previous version.

Uninstall the software: Find the program icon  in the tablet, press and hold the icon to move to the uninstall button in the upper left corner, and click OK to uninstall according to the pop-up wizard. (If you encounter a major version update, it is recommended to delete the CHCNAV folder in the home directory, which stores construction data and logs， please make a backup before deleting it, and operate with caution)

1.2 Operating System Requirements

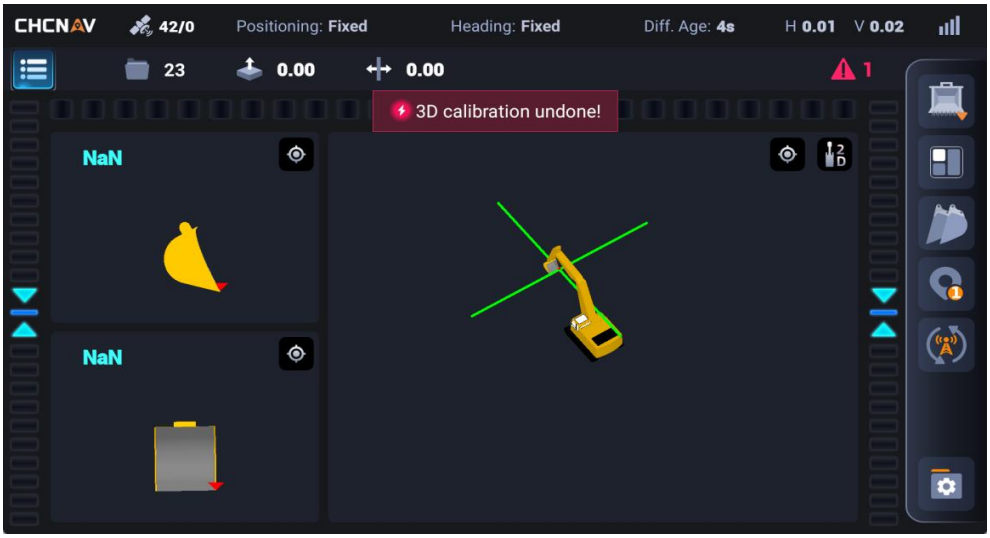
TX73 excavator guidance system software is recommended to be used in Android 10 and above versions.

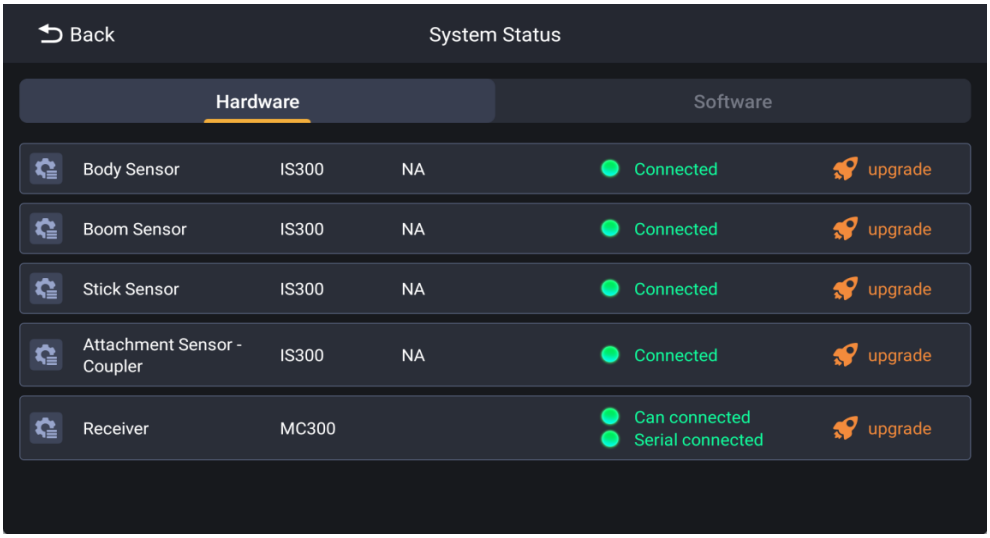
2 Software configuration process

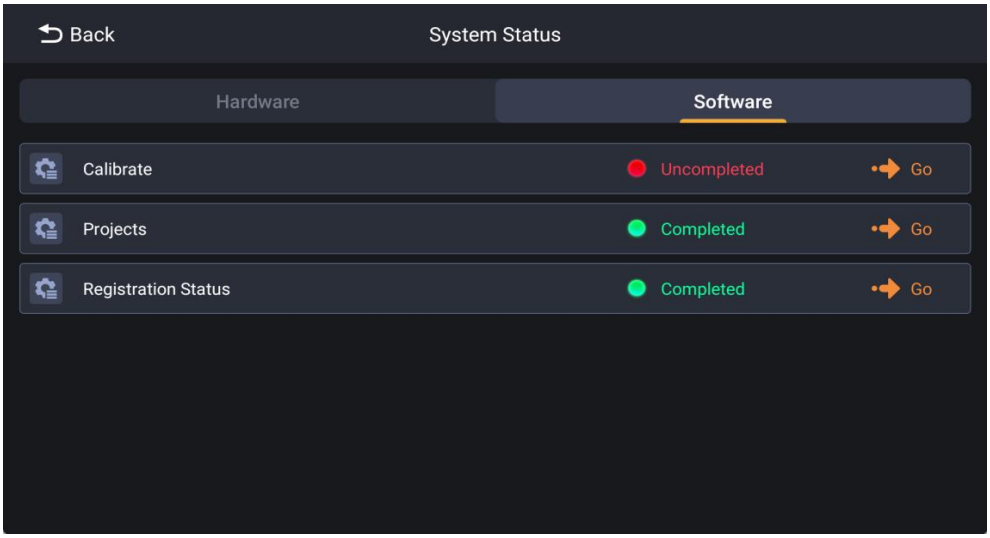
2.1 Software System Diagnostics

Click on the icon  on the tablet desktop, to enter the main interface of the software, the system will start the software diagnosis function after starting, you can

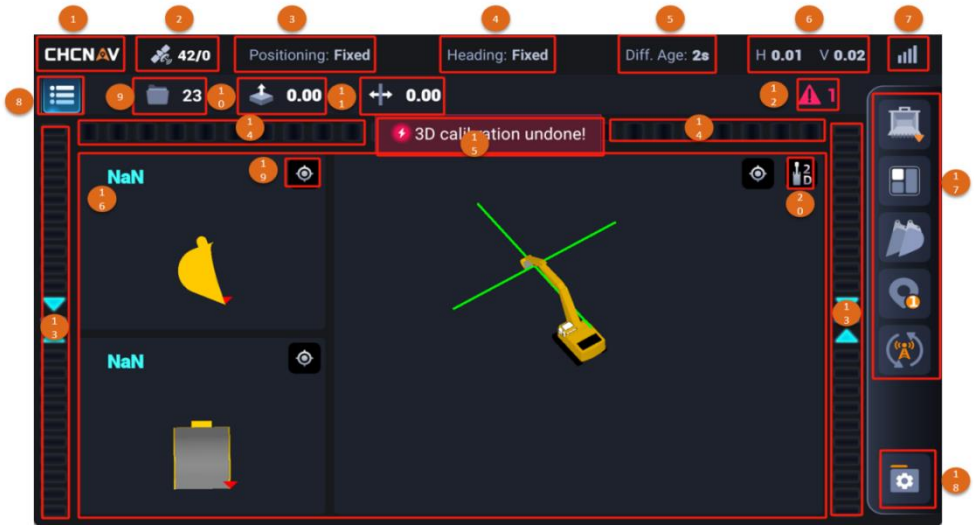
view the quantity of diagnostic abnormalities in the upper right corner of the main interface, click to quickly enter the system diagnosis interface.







2.2 Homepage



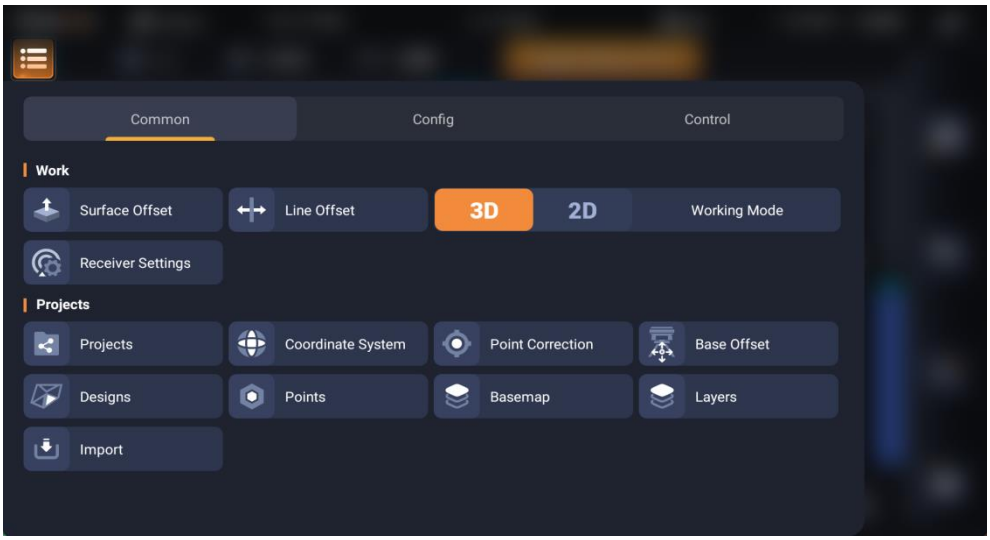
No	Name	Description	Attribute
1	LOGO	CHCNAV logo, click to enter the system information interface, and display the software version and registration validity period	Button
2	Satellite quantity	Shows the satellite quantity used (right) and the satellite quantity searched (left)	Display
3	Positioning quality (main antenna)	Displays the current positioning quality of main antenna (single, floating, fixed)	Display
4	Positioning quality (aux antenna)	Displays the current positioning quality of aux antenna (single, floating, fixed)	Display
5	Differential age	Displays the current differential age	Display
6	Positioning accuracy	Displays the H (horizontal) accuracy and V (elevation) accuracy of the current GPS positioning accuracy index	Display
7	4G signal	Displays the current 4G signal	Display
8	Menu	Click to open the system menu, which is divided into three units secondary menus: Common/Config/Control	Button
9	Base map and design data	Click to enter the base map and design data interface, which can hide/use base map or design data	Button

		 : Apply  : Hide  : Part of design data/basemap hided  : Use elevation guidance of the design data/basemap  : Cancel use elevation guidance of the design data/basemap  : Use horizontal guidance of the design data/basemap  : Cancel use horizontal guidance of the design data/basemap	
10	Project offset	Click to enter the project offset interface, you can raise or lower the height of the design surface	Button
11	Line offset	Click to enter the line offset interface, select the target line, and you can offset the target line to the left or right	Button
12	System status	Click to enter the system status interface, displaying the hardware, SN number, connection status, and upgrade shortcut keys; Displays the completion status of the software (calibration, project, registration status) and shortcut buttons	Button
13	Cut/Fill light target	Display the elevation difference between the current bucket tip and the design data, long-time press to enter the target configuration interface, you can turn on/off the target display, modify the step value of the target, and configure the display content of the left target, right target, and upper target	Button

14	Line distance light target	Display the distance difference between the current shovel tip and the nearest line, press and hold to enter the target configuration interface, you can turn on/off the target display, you can modify the step value of the target, and you can configure the display content of the left target, the right target, and the upper target	Button
15	Self-check information	Display the quantity of software self-check failures	Display
16	Views	Displays the default view as well as the user-configured view	Display
17	Quick icon	Display the shortcut icon of the user configuration, click to use the function, and long-time press to enter the configuration interface	Button
18	Quick drawer	Store the common shortcut icons of the default or user-configured shortcut, click to expand or collapse the drawer, click Edit then long-time press, you can drag to the shortcut icon column (17), and click Save to save the configuration	Button
19	Positioning	Click to center the view	Button
20	2D/3D view switching	Click to switch to 2D/3D view	Button

2.3 Software operation

Click the menu button  in the upper left corner to enter the menu interface, which is divided into three units sub-menus: Common, Config, and Control



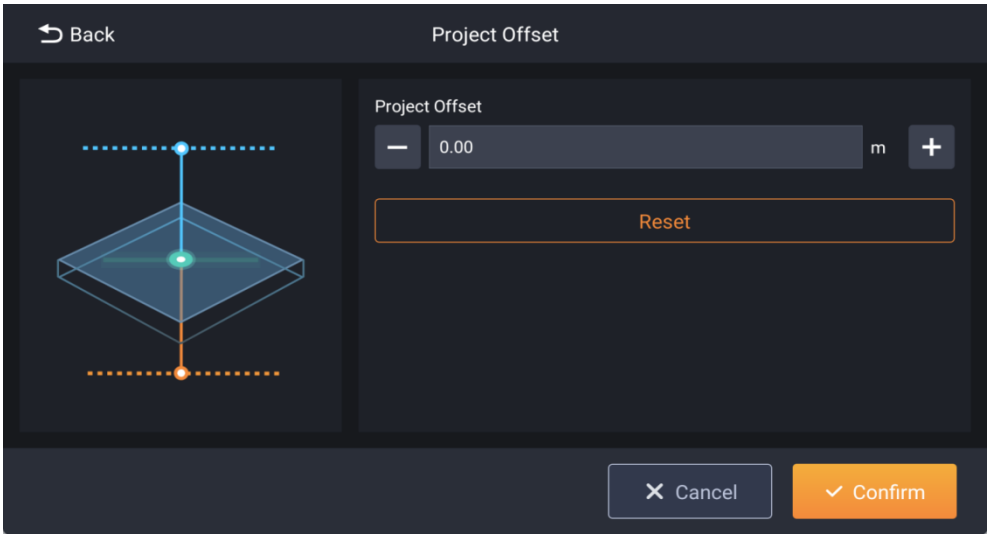
2.3.1 Common

2.3.1.1 Work

①Surface offset

After entering the value, and clicking the [Confirm] button, you can raise or lower the corresponding height of the design surface (positive value for lifting, negative value for lowering)

Click the [Reset] button to quickly remove the offset value



②Line offset

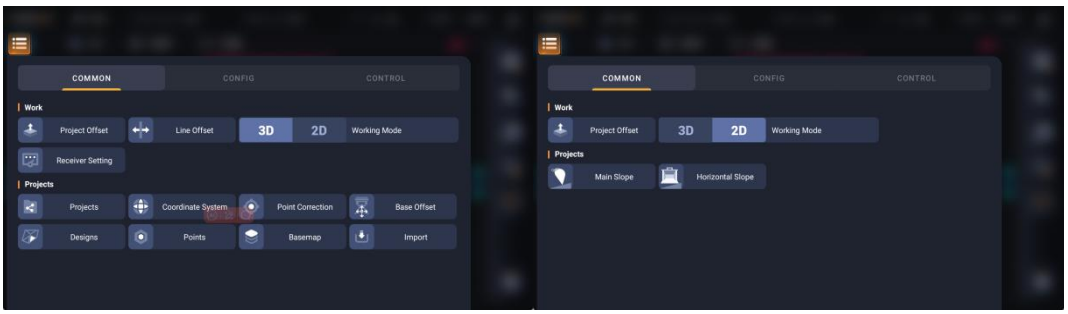
Select the target line element, enter a value, and click the [Save] button to offset the target line element by the corresponding distance to the left or right (When select the [L] button, the line element is offset to the left, and when select the [L] button, the line element is offset to the right.)

You can also enter an elevation offset to raise or decrease the elevation of the line element

Click the [Reset] button to quickly remove the offset value

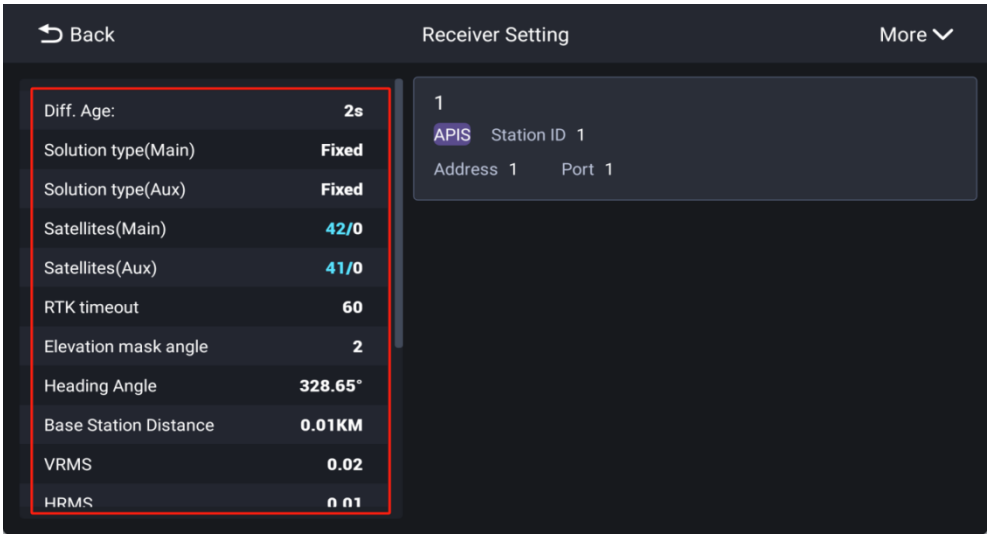
③Working model

Click to switch between 2D/3D working mode



④Receiver settings

Displays the current differential information: differential age, differential state of the main and auxiliary antennas, satellite quantity of using/ satellite quantity of searching, RTK timeout, elevation mast angle, heading angle, base station distance, VRMS/HRMS/PDOP, longitude, latitude and elevation of the main and auxiliary antennas



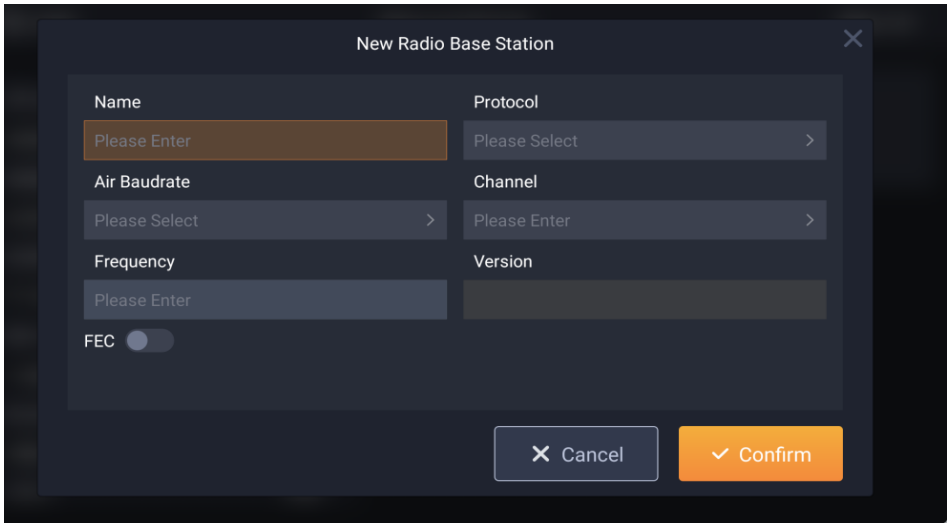
Click [More] to create a base station

The differential format supports RTCM3.X

The radio protocol supports TT450S/Transparent/Satel-AS/Huace

Create [radio base station]

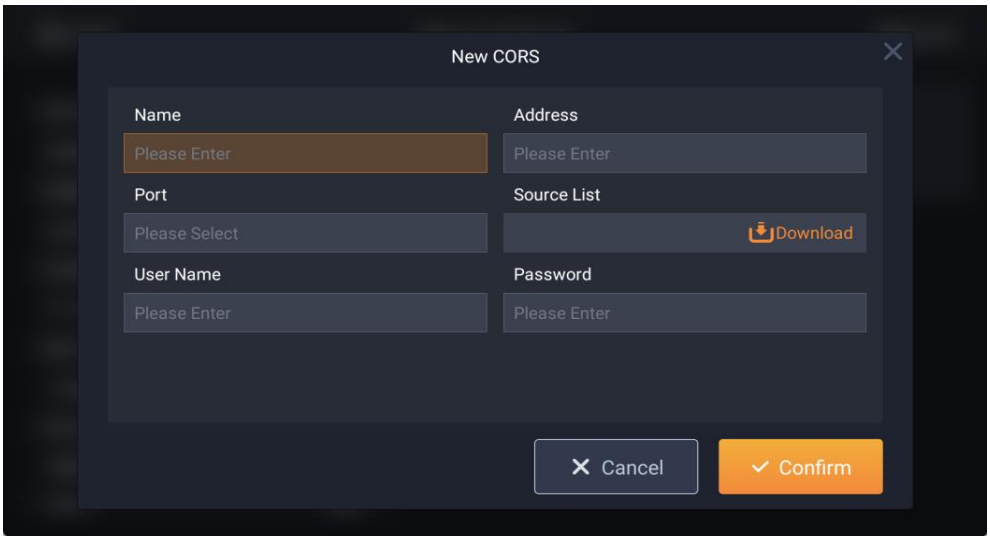
Enter the name, protocol, air baud rate, channel, frequency and other information of the radio base station, and click [Confirm] to save



1) Create [CORS]

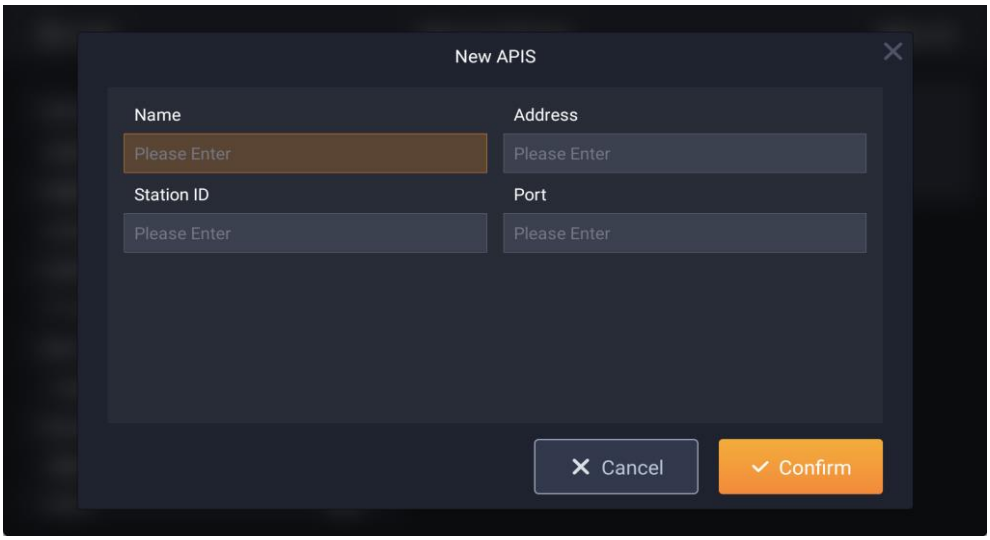
Enter the name, address and port number of the CORS network base station, click [Download] to get the source list, and enter the username and password.

If it is unable to obtain the source list, check the network, address, and port number.

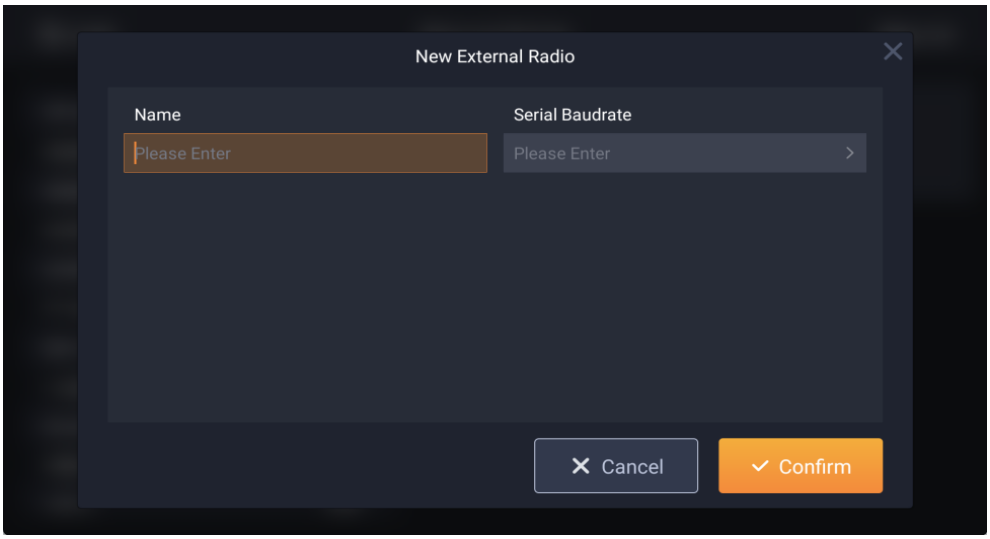


2) Create [APIS]

Enter the APIS network base station name, address, base station ID and port number, and click [Confirm] to save the base station information.



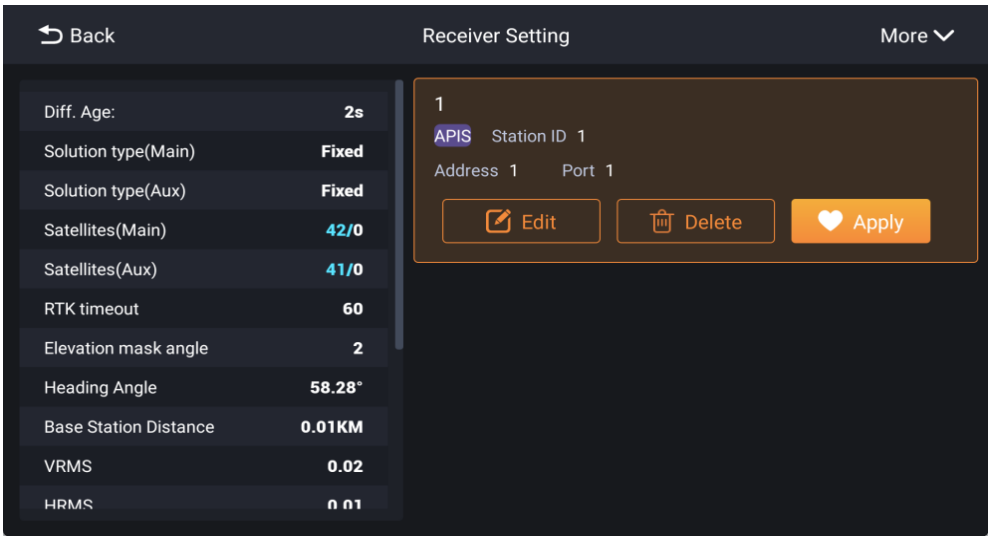
3) Create [External Radio]



Select the base station you want to use and click the [Apply] button to apply the base station.

Click [Edit] to edit the base station information.

Click [Delete] to delete the base station.

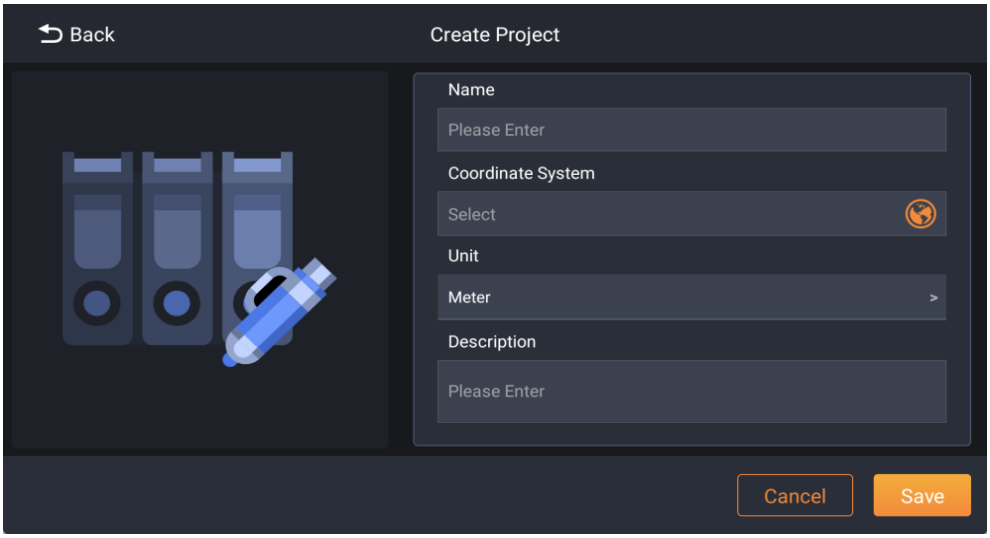


Note: This function can only be used when using SATEL radio, please make sure that the SATEL external radio module is connected.

2.3.1.2 Projects

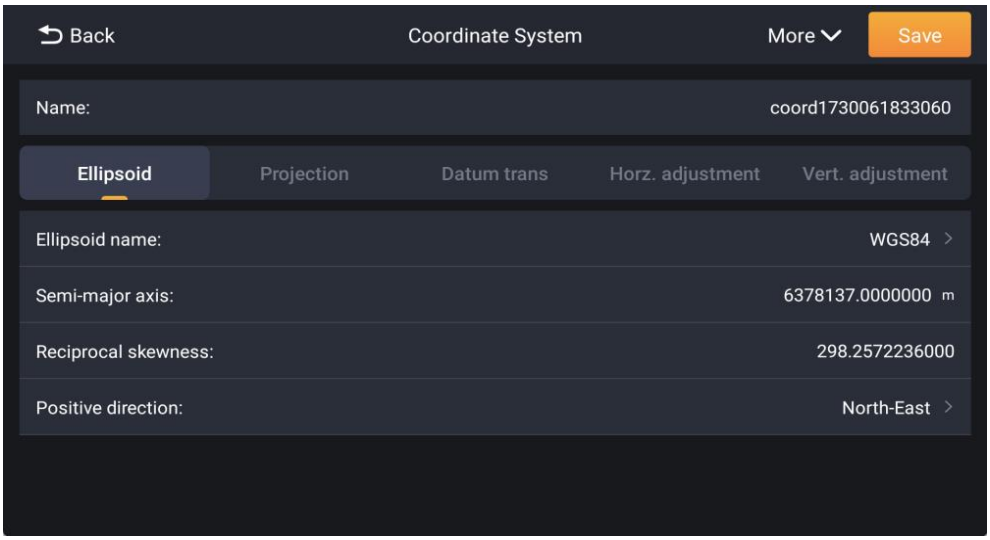
①Projects

Click [More] - [Create new project] to configure the name, coordinate system, units, description, and other information of the project



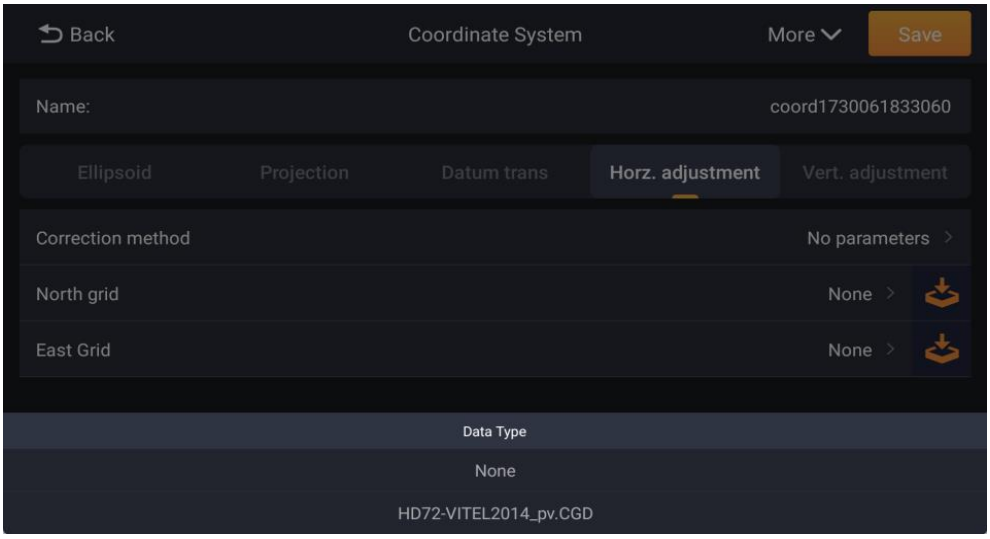
1) Coordinate

Click [select] in the coordinate system box to enter the configuration page of the coordinate system, where you can configure parameters such as ellipsoid, projection, datum trans, Horz adjustment, and Vert adjustment



Click the [More]-[Preset] to select a standard coordinate system template.

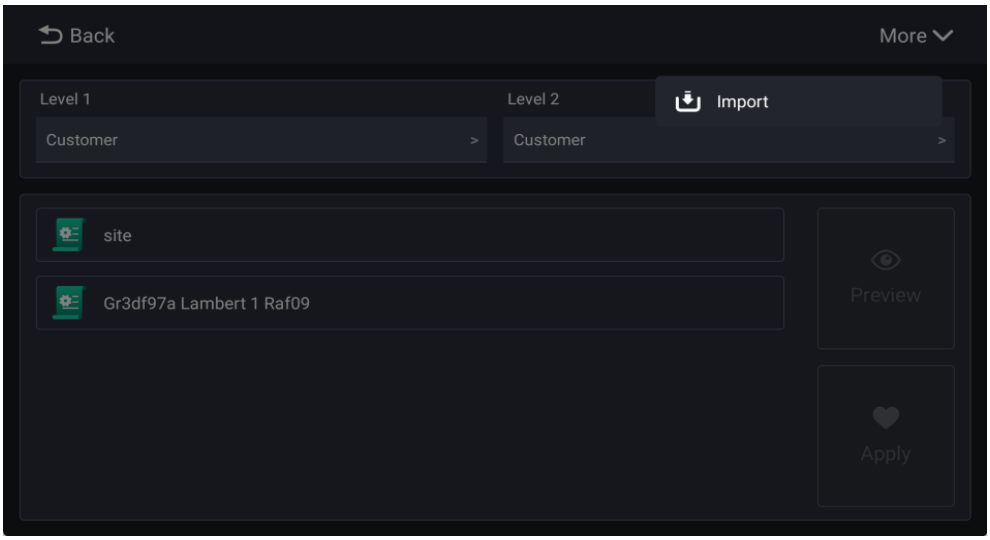
Note: The standard coordinate system in some countries needs to be imported the North Grid, East Grid and geoid models, click the [Import] button, select the grid file in the USB drive, click [Import] button  , and select in the list and apply



Note: The following formats are supported in horizontal: [.grd], [.stg], [.pxy], [.osgb], [.cgd], [.GRT], [.dat], [.DATCZ]

The following formats are supported in vertical: [ggf], [.bin], [.gsf], [.grd], [.gri], [.asc], [.stg], [.gbl], [.gxy], [.osgb], [txt], [.cgd], [.jasc], [.gsa], [.gsb], [.byn], [.grt], [.dat], [.datcz], [.gtx], [.negrid], [.gdf]

If you already have a coordinate system, you can import it through the [Preset] - [More] - [Import] button

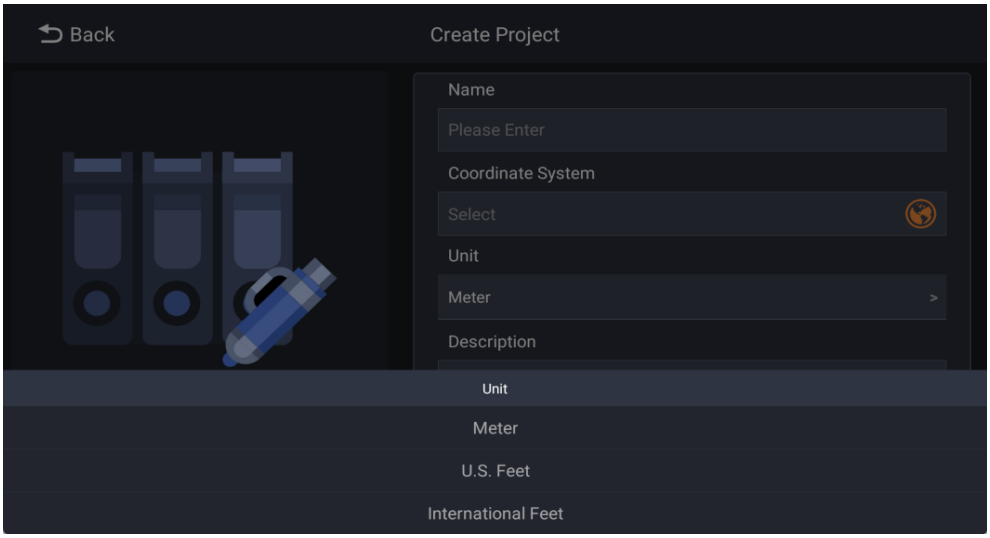


Note：The system supports coordinate systems in [.xml], [.crd], [.lok], [.dc], [.jxl], and [.cal] formats.

If the [.cal] coordinate system requires the import of a geoid model, import and apply it in Elevation Fitting.

2) Unit

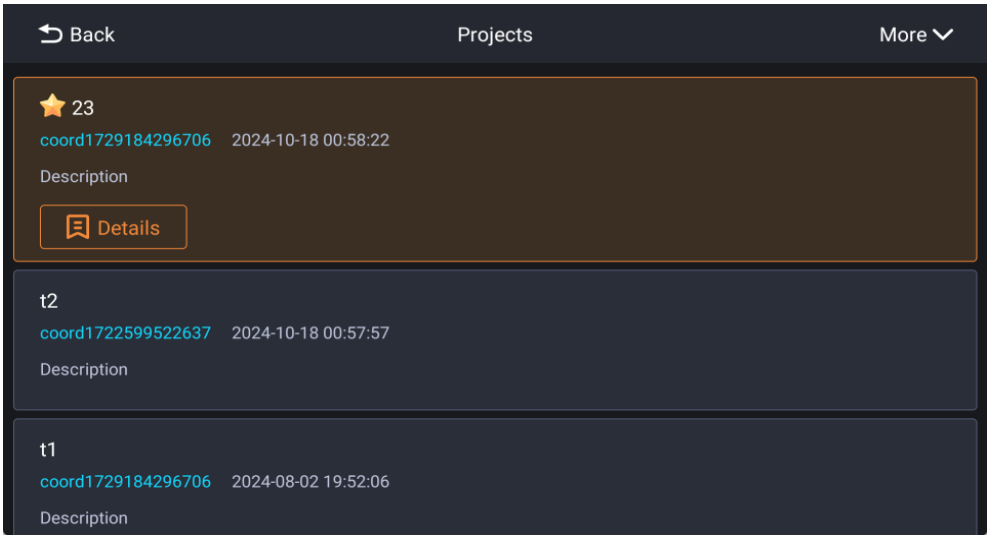
Select the unit for the project (meters, US feet, international feet)



Note: After setting the units on this screen, all the size units in the software will be the same as the settings

2) Other

Click [project], the list of created projects is displayed, and you can edit, delete, and apply them (the project being applied cannot be edited on the details page)

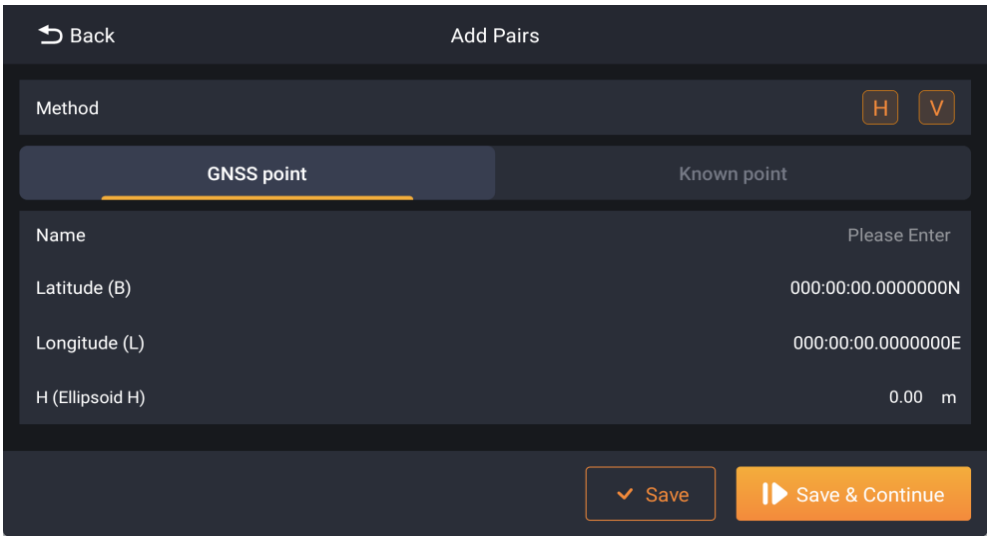


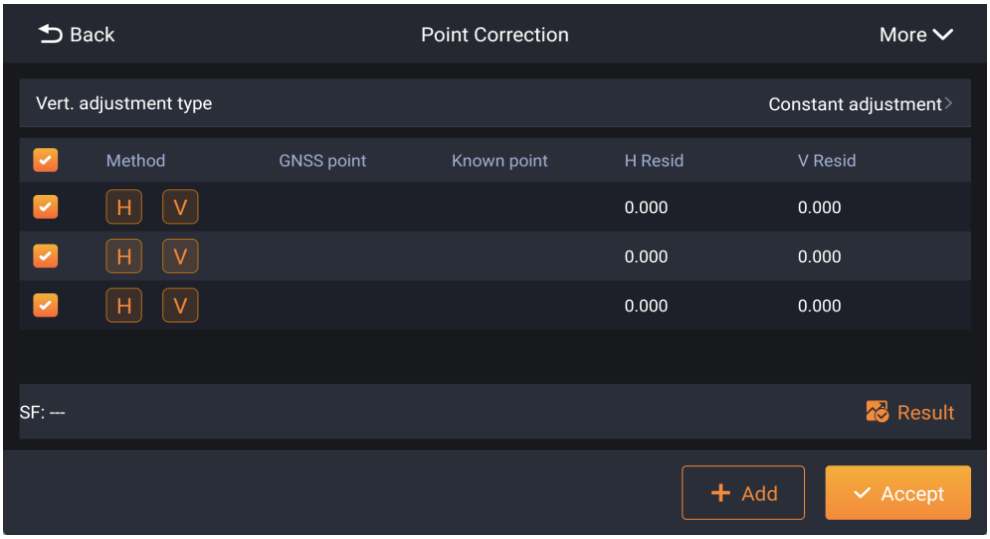
②Coordinate system

Refer to the coordinate system in the project

③Point correction

Coordinate system parameters can be calculated through four or more sets of control point information (GNSS point information and known point information), and all the points information can be imported, which currently supports [.loc]



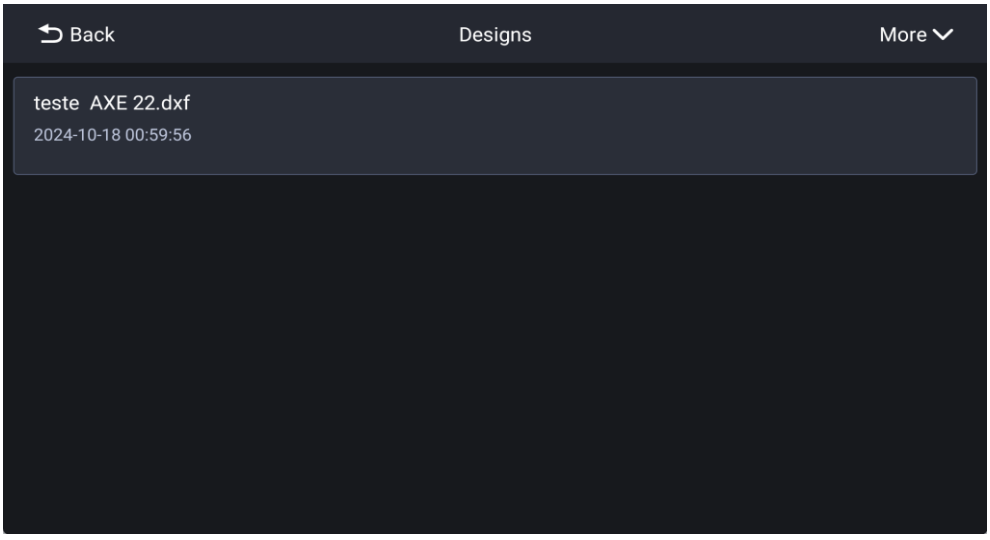


④Base offset

This function is used in the portable mobile base station scenario, enter the N、 E high offset, and click Save to complete the base station offset

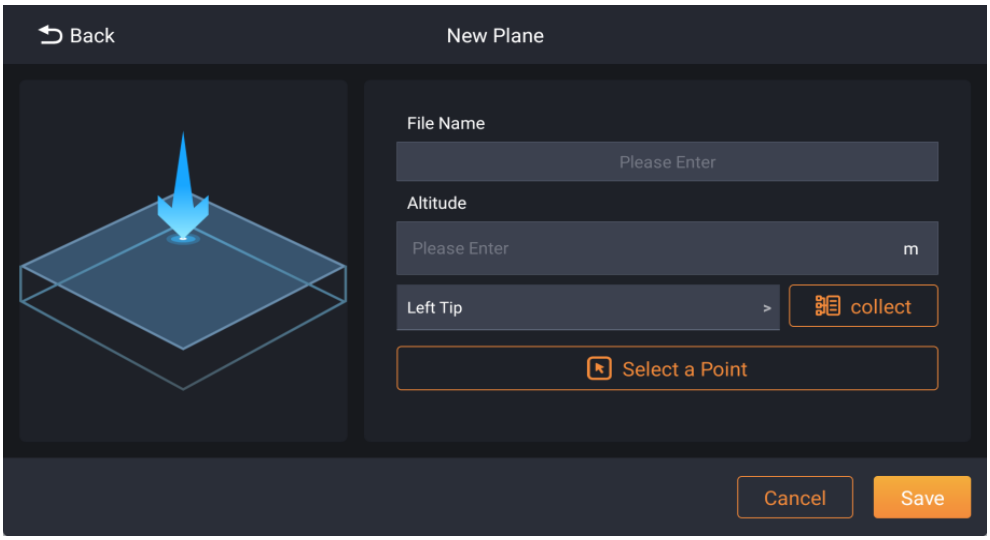
⑤Designs

Display the list of design data and base map, you can also click [more] - [import] to import the required design data and base map, the design file currently supports: [json], [rodx], [dxf], [hct], [xml], [dwg] formats, base map files support [dwg],[dxf]



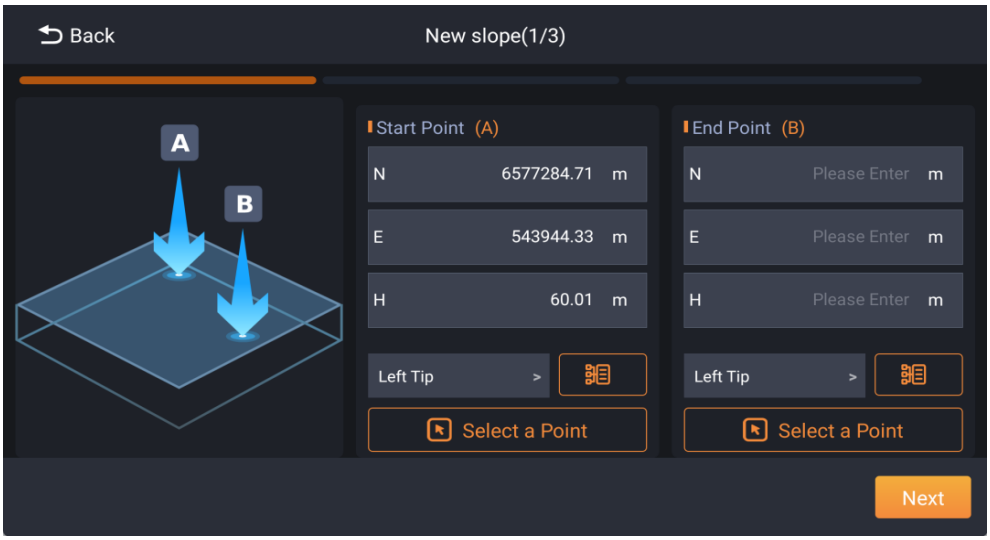
1) New plane

Place the bucket tip on the target elevation, click [Collect] button to create a new plane with that elevation, or you can select from the list of point elements and collected points



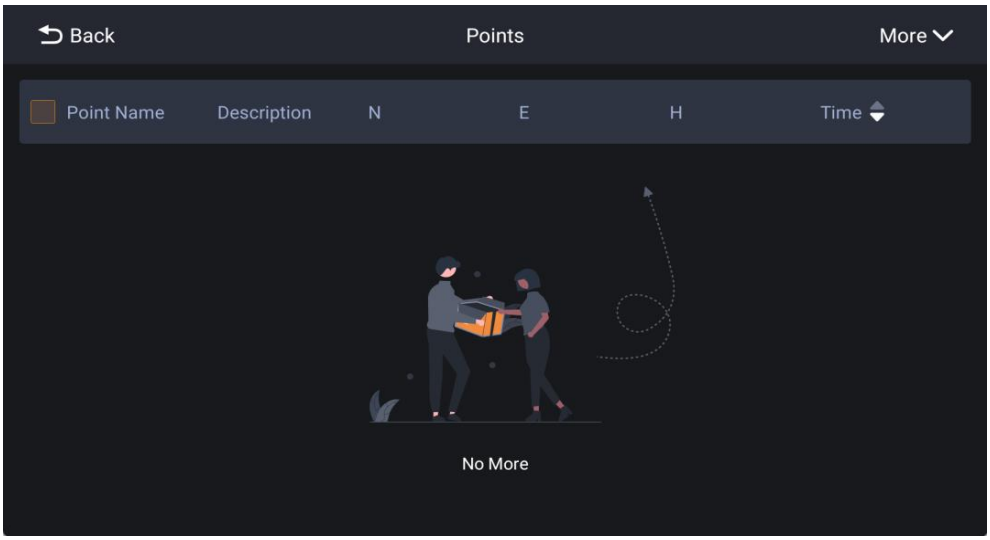
2) New slope

Place the bucket tip at the target point (A and B points), click [collection] button, enter the slope information, or select from the list of collected points



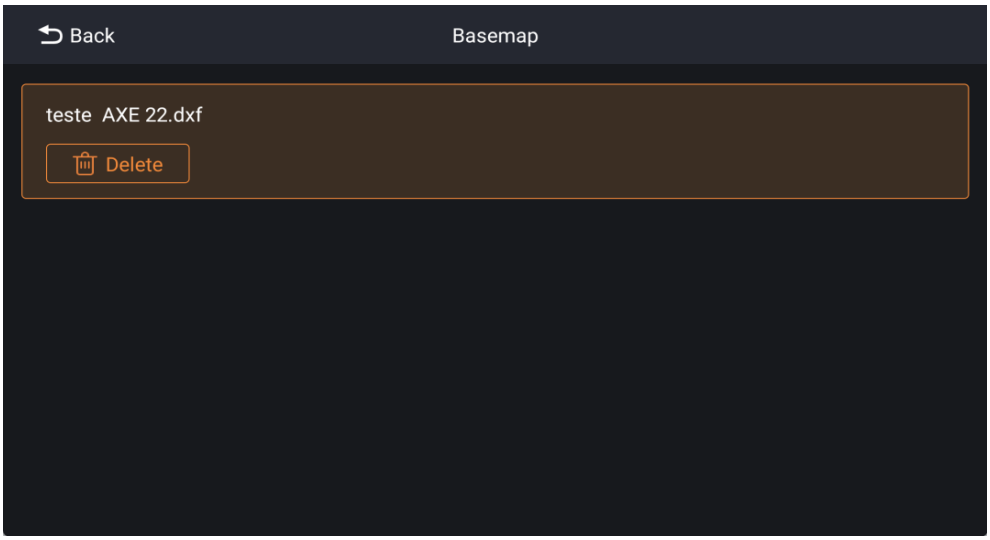
⑥Points

Manage collected or added points, export and delete them, or manually enter point information



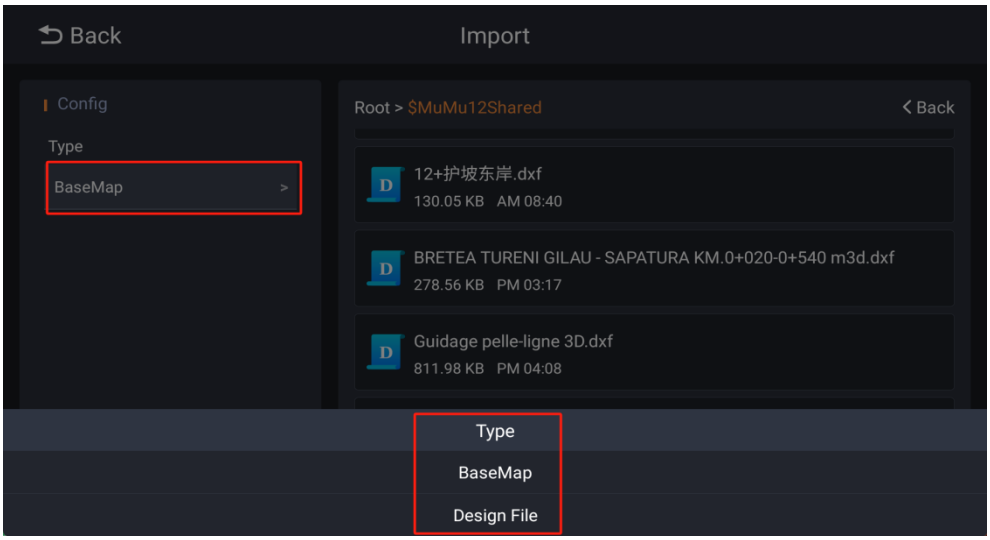
⑦Basemap

Display the list of basemap and you can import or delete a basemap



1) Import

Import the required design data and basemaps, and the design files currently support: [.json], [.rodx], [.dxf], [.hct], [.xml], [.dwg] formats, basemap files support [.dwg], [.dxf]

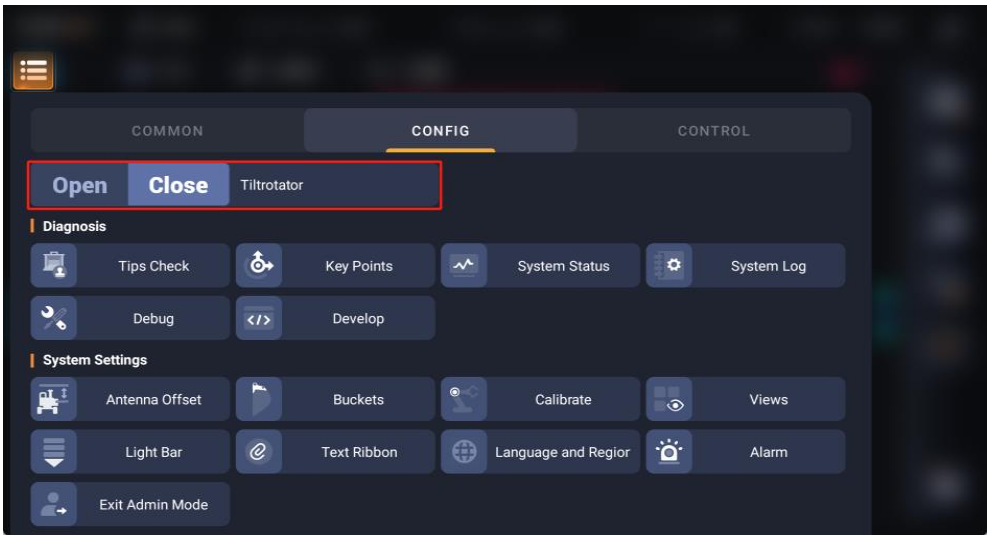


Note: Once a project is created, coordinate systems, point corrections, base station offsets, design management, points, basemap, and mechanical elevation offsets belong to the project

2.3.2 Config

2.3.2.1 Tiltrotator switch

The tilter switch can be turned on/off, and when the tiltrotator is removed from the device, the switch can be turned off without recalibration

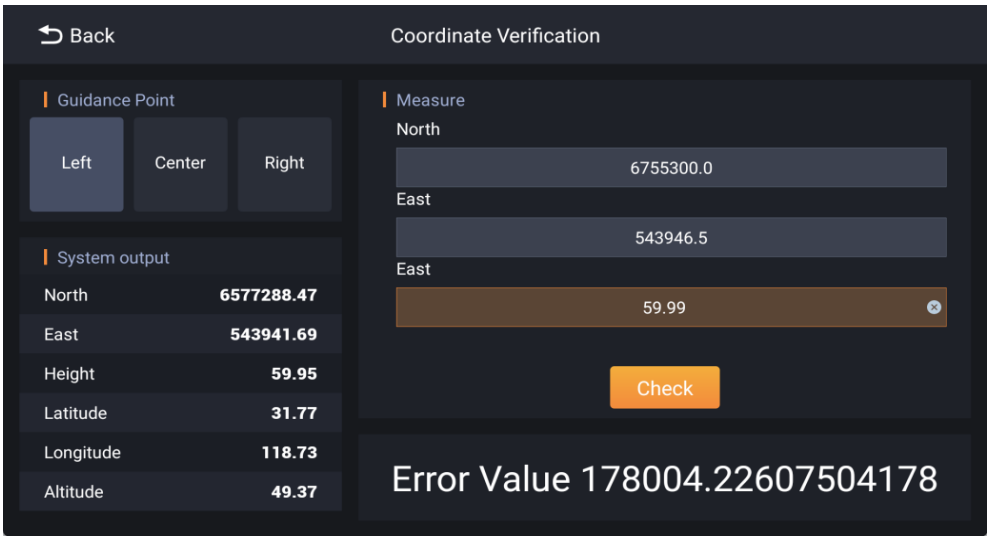


2.3.2.2 Diagnosis

①Bucket tip check

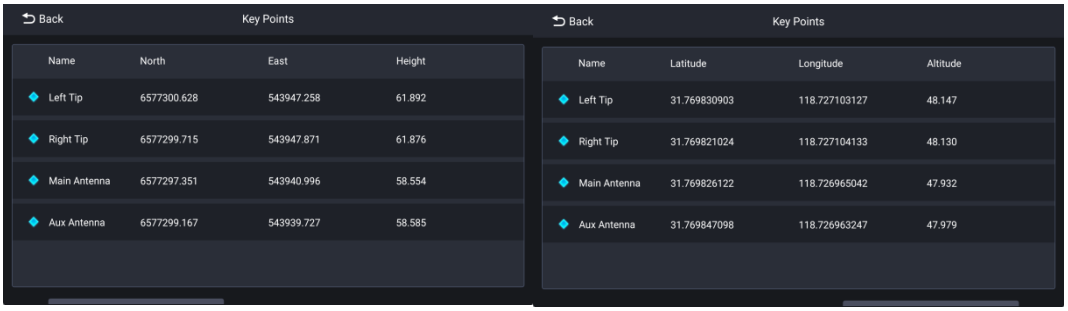
Displays the N, E, H, longitude, latitude, and elevation information of the guide point

You can also enter the RTK's elevation check error



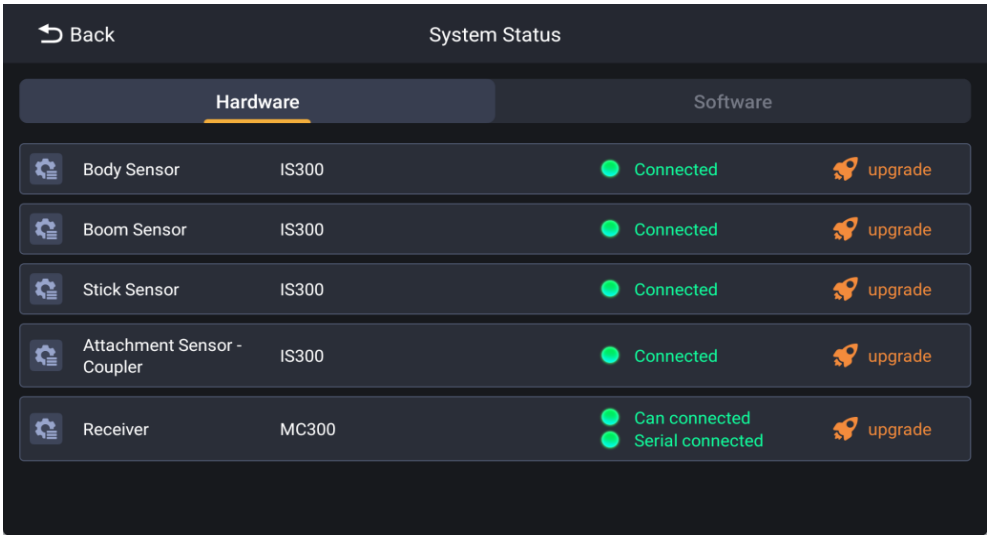
②Key points

Display the north-east-high information of key points (left bucket tip, right bucket tip, main antenna, aux antenna), and slide to the right to display longitude and latitude and elevation information



③System status

Display hardware, SN, connection status, and upgrade shortcuts; Displays the completion status of the software (calibration, project, registration status) and shortcut buttons

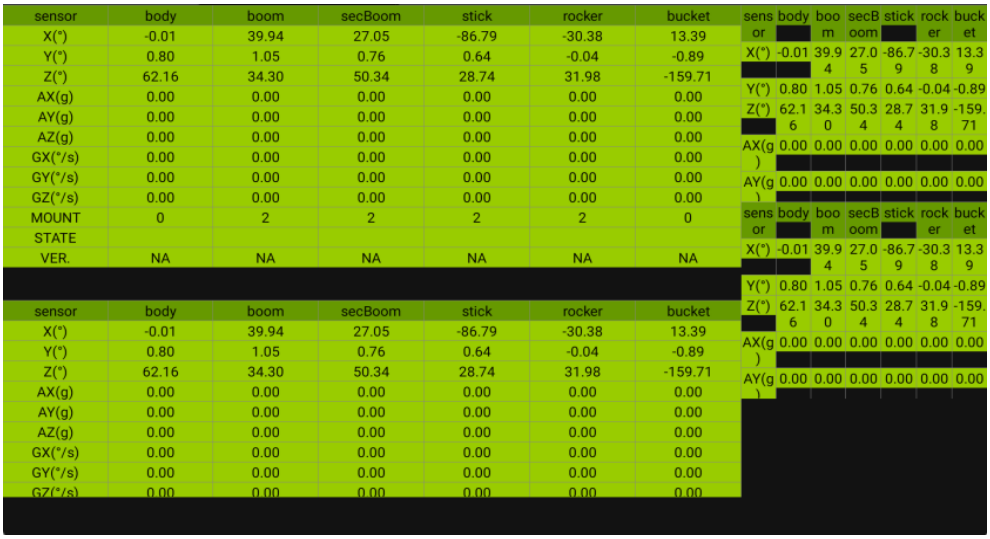


④System log

Select the sensor or host log, turn on the automatic log function, click the [package] button, and the log will be packaged to the root directory

⑤Debug

Real-time information on sensor angles is displayed



⑥Develop

Advanced menu, please use it under the guidance of an engineer

2.3.2.3 System settings

①Antenna offset

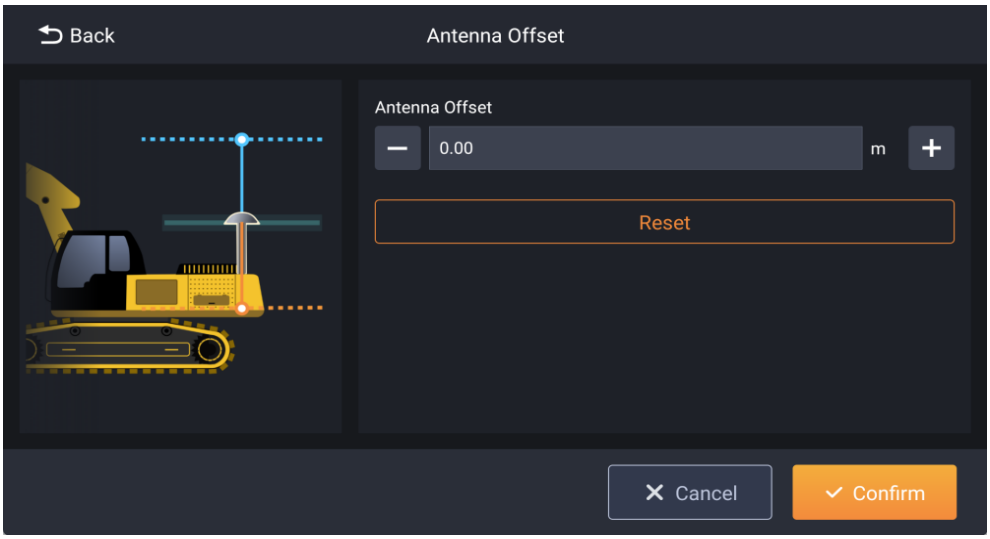
When there is a fixed error between the system elevation and the actual elevation, the error can be eliminated by adjusting the antenna elevation

When the system elevation is higher than the actual elevation, the antenna elevation offset is negative

When the system elevation is lower than the actual elevation, the antenna elevation offset is positive

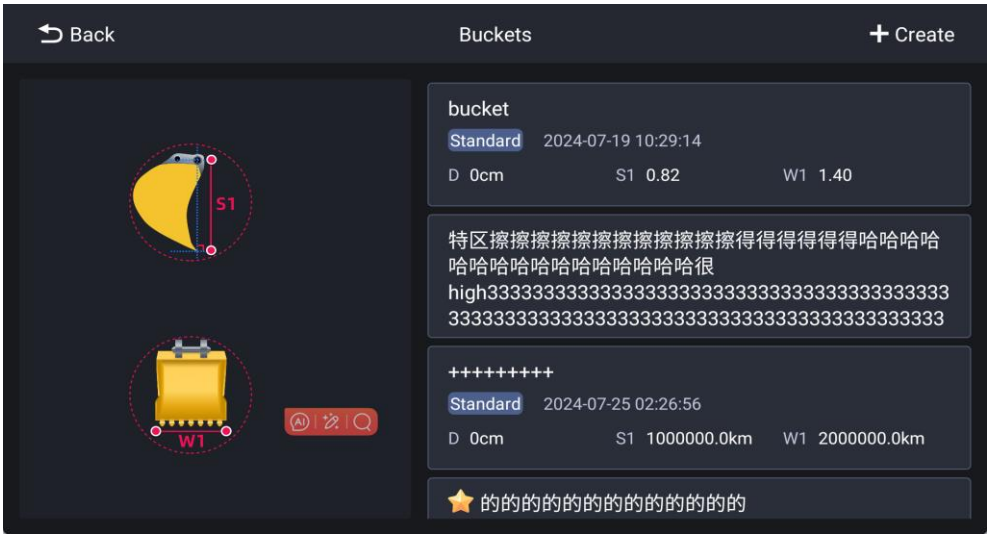
Click [Reset] to quickly reset the antenna elevation offset to 0

Please calculate the fixed error by at least 3 attitudes



②Buckets

Preview the bucket list and bucket size information, edit/add/delete the bucket, please refer to the 《TX73 Installation and Calibration Manual》 - Bucket Configuration for details



③Calibrate

Advanced menu, hidden by default, click Admin model, enter password: mcnav2025, you can unhide the menu

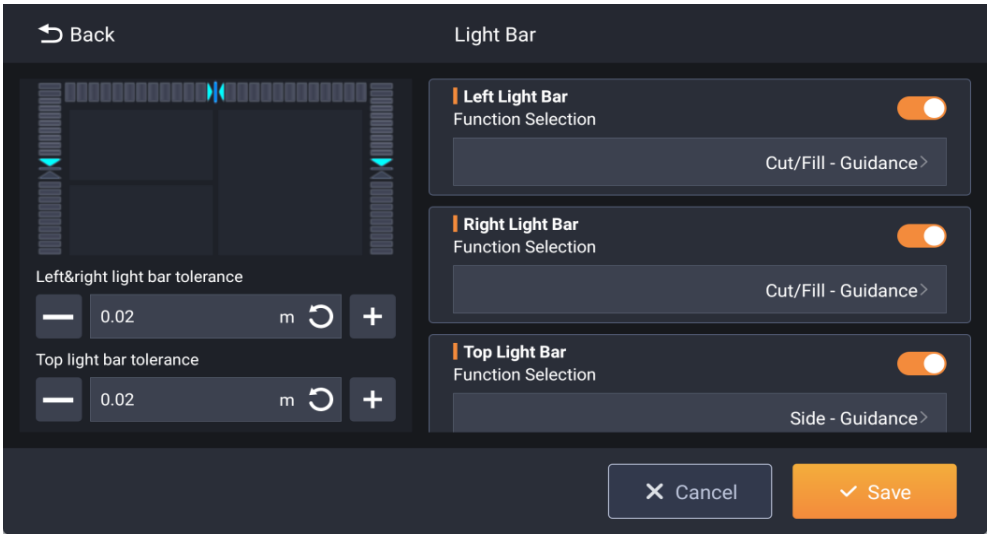
Please refer to the 《TX73 Installation and Calibration Manual》 for the calibration method of the system.

④Views

According to your preference, you can configure different presets, you can choose 3D view/side view/front view/fill view

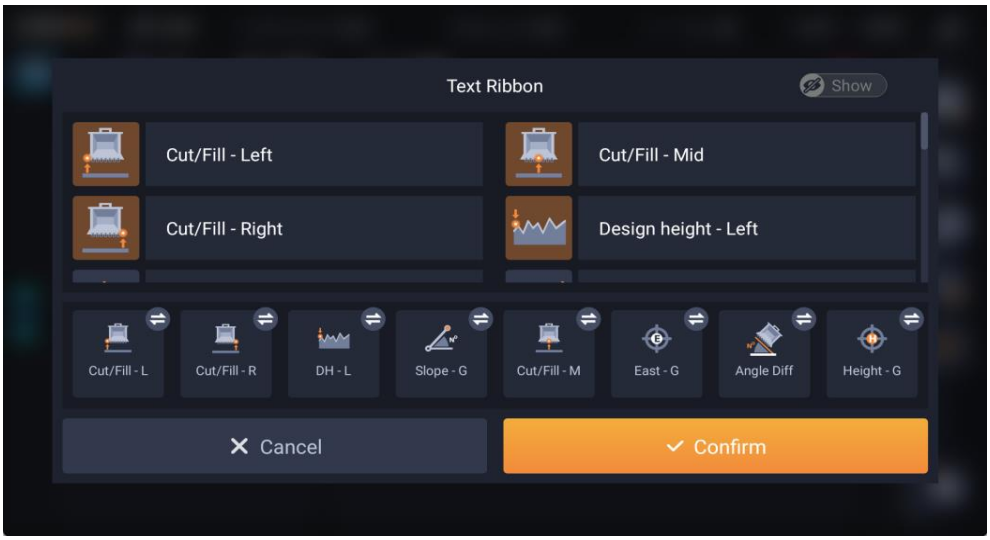
⑤Light bar

The target display can be turned on/off, the target step value can be modified, and the display content of the left target, right target, and upper target can be configured



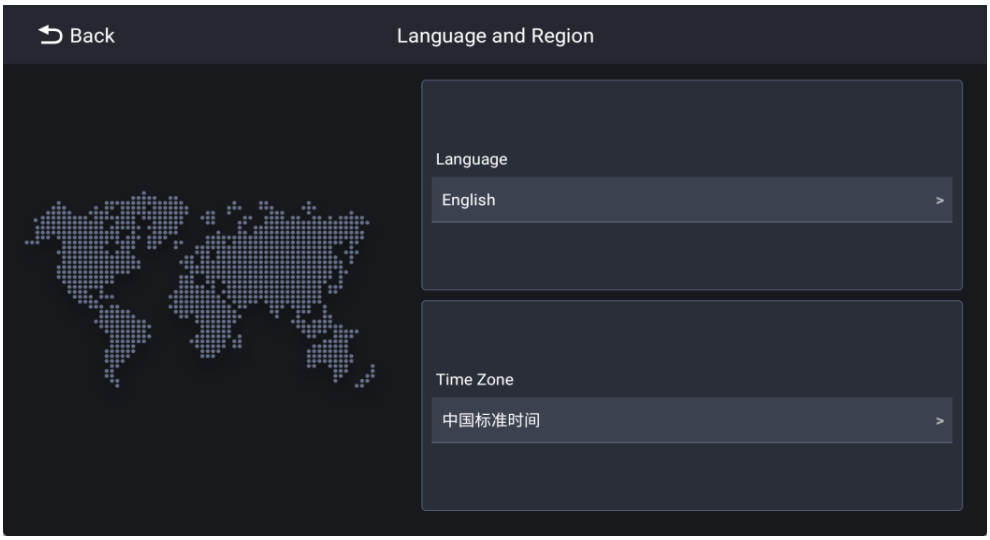
⑥Text ribbon

According to your preferences, select the reference information, click the display button, you can display the reference information at the bottom of the Home, and long-time press the bottom to quickly enter the interface



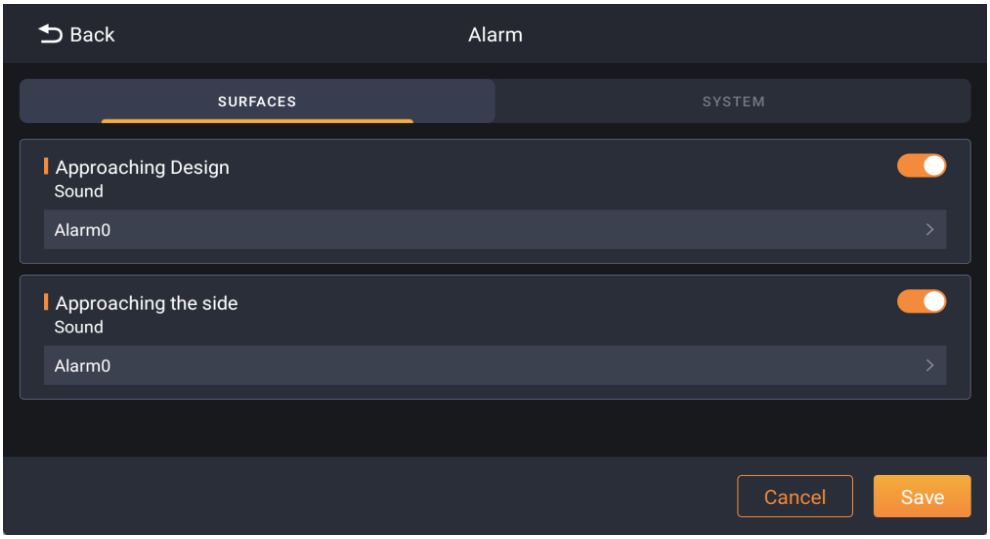
⑦Language and region

Select the desired language and time zone to switch between language and time



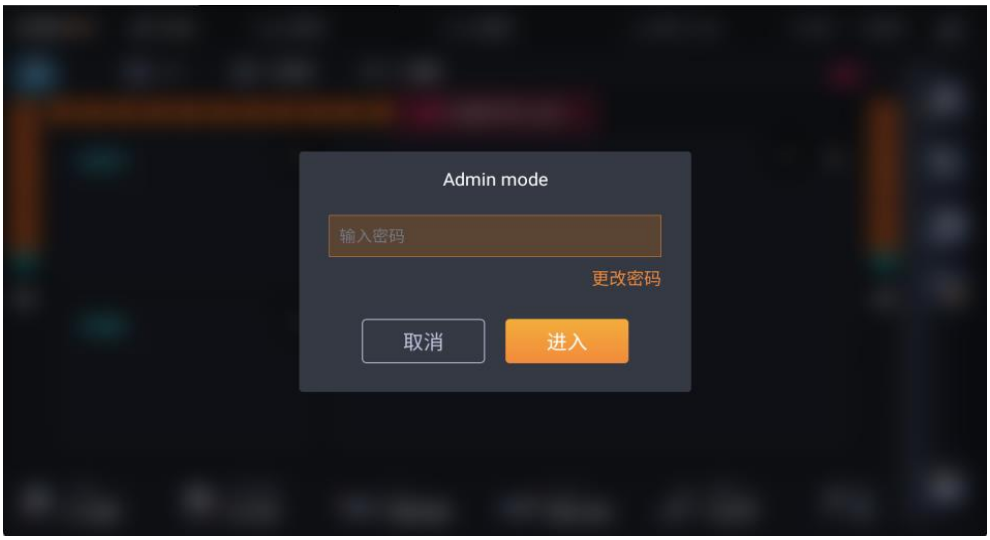
⑧Alarm

Turn on or off the alarm function for approaching the cut-and-fill amount/guide line, and configure the alarm ringtone



⑨Admin model

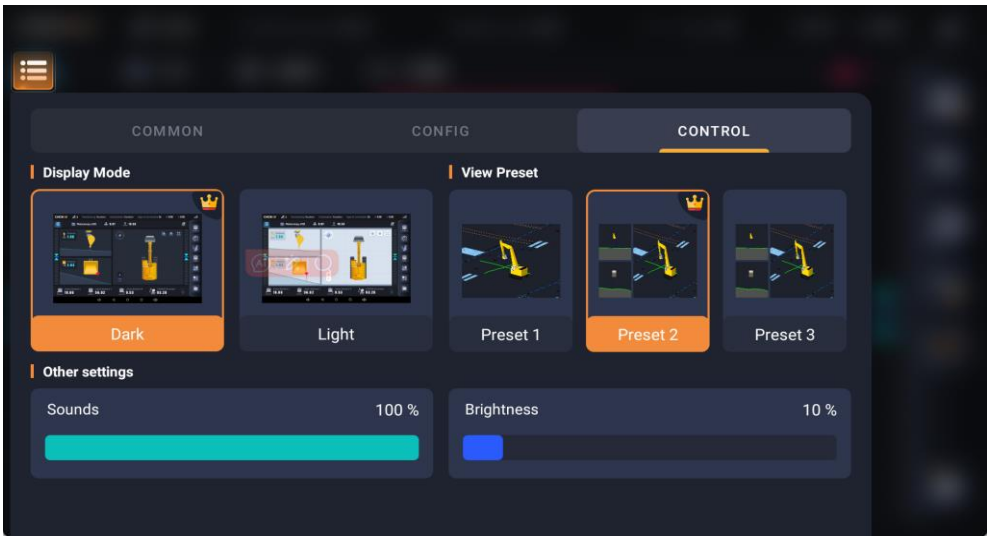
Administrator mode, default password mcnav2025, is turning off by default, when opened, the calibration menu will appear, you can change the password according to personal needs



2.3.3 Control

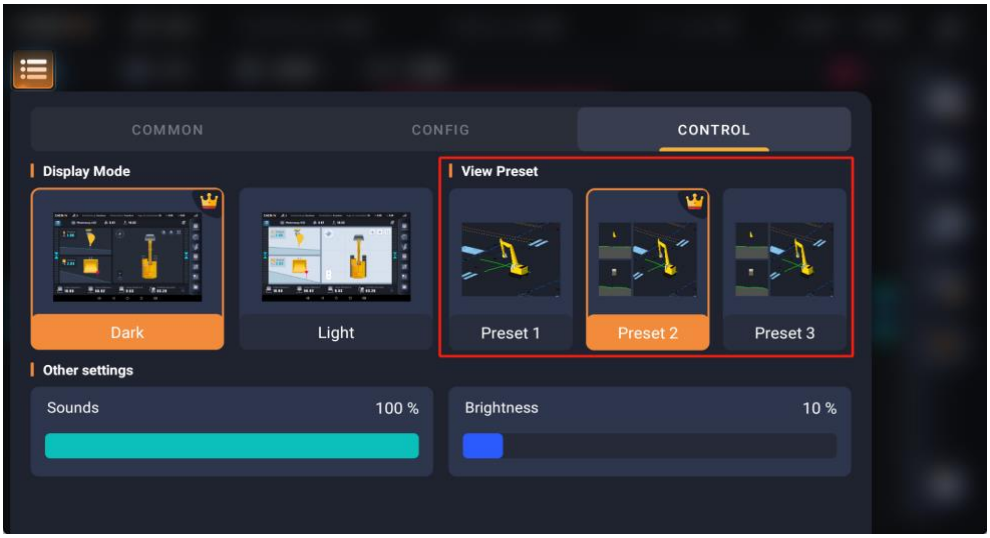
2.3.3.1 Display mode

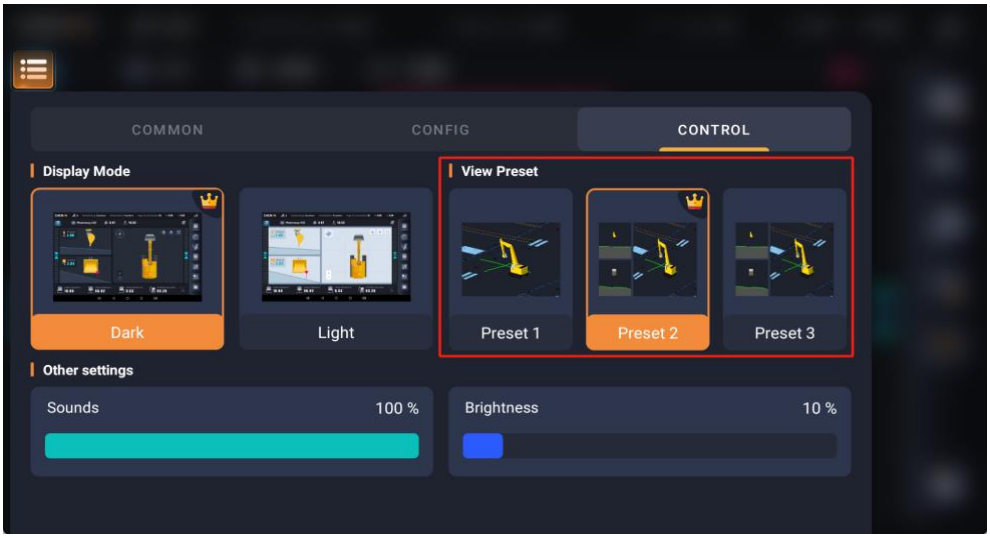
Tap to change day/night mode to adjust the brightness to protect your eyes



2.3.3.2 View preset

Adjust the preset view, and the view display content can be modified in Configuration--View Configuration





2.3.3.3 Other

Swipe to adjust the sound and brightness