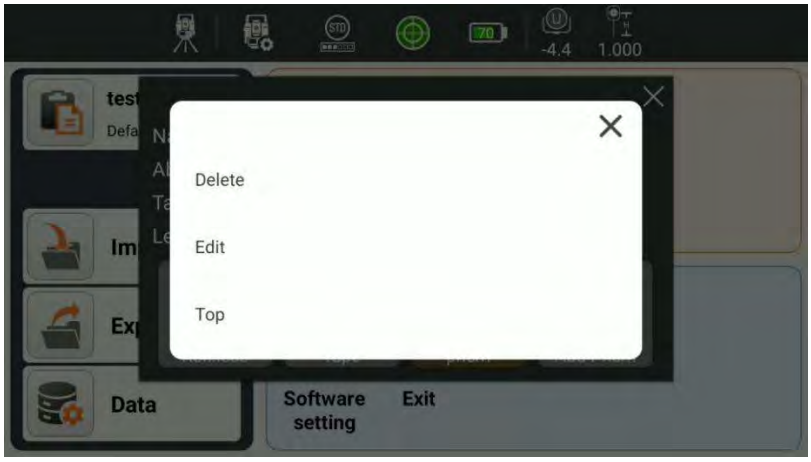
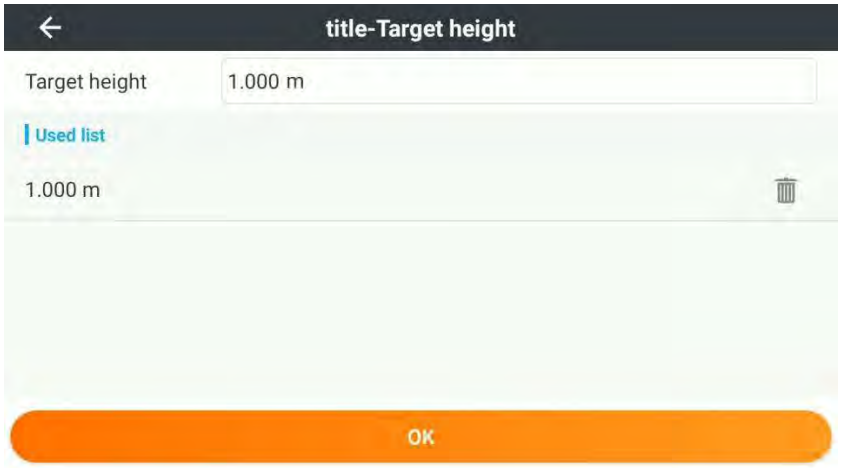
Long press the non-default prism to delete, edit, and top.



Click the prism height  , will jump to the prism height setting interface, the top can enter the prism height, the bottom record the prism height historical data.

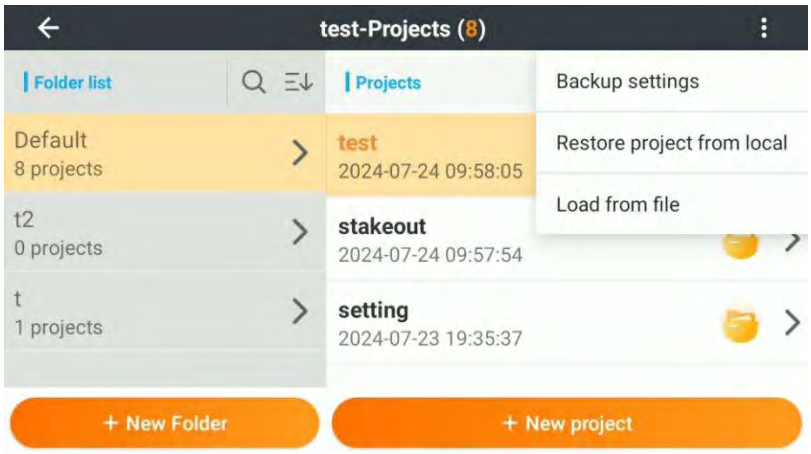


2.Project and data

This chapter introduces:

- Project
- Import
- Export
- Points
- Lines/Arcs
- Layers

2.1 Project



Operating instructions:

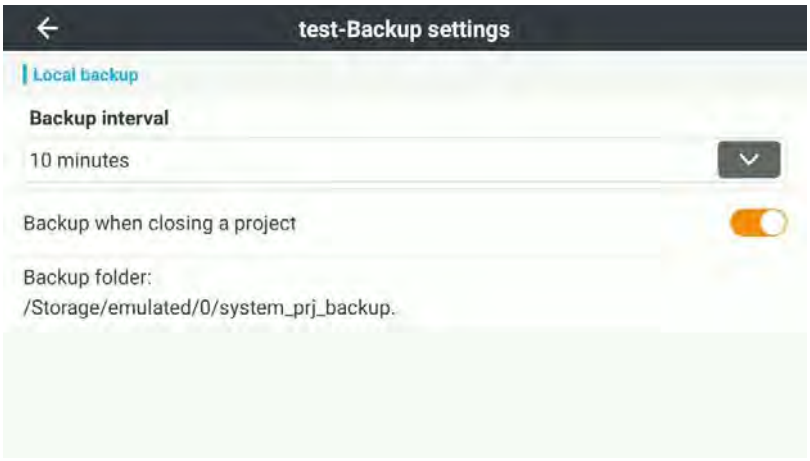
On the main interface, click [Project] to enter the project management interface, click New, enter the project name, enter the creator (optional);

Project Settings can choose to use the default parameters, or click to enter the corresponding modification Settings.

On the project page, you can **delete** and **open** projects by right-click the project.

There are three types of project source: **New project**, **Restore project from local**, **and Load from file**.

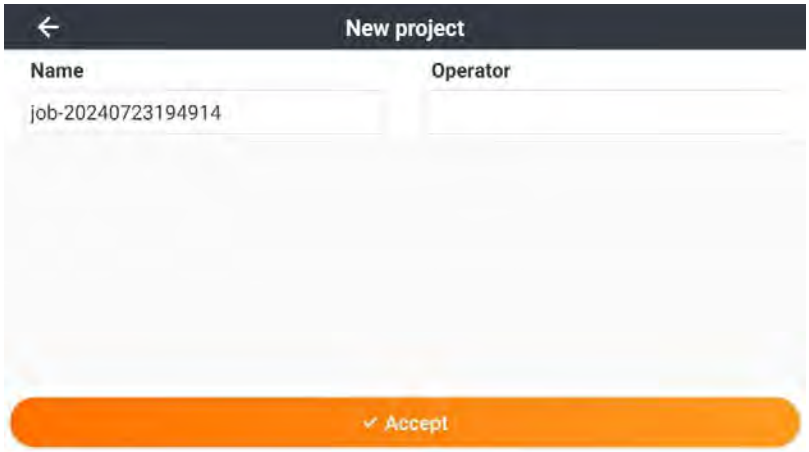
Project local backup: Click Backup Settings to set project backup parameters.



2.1.1 New

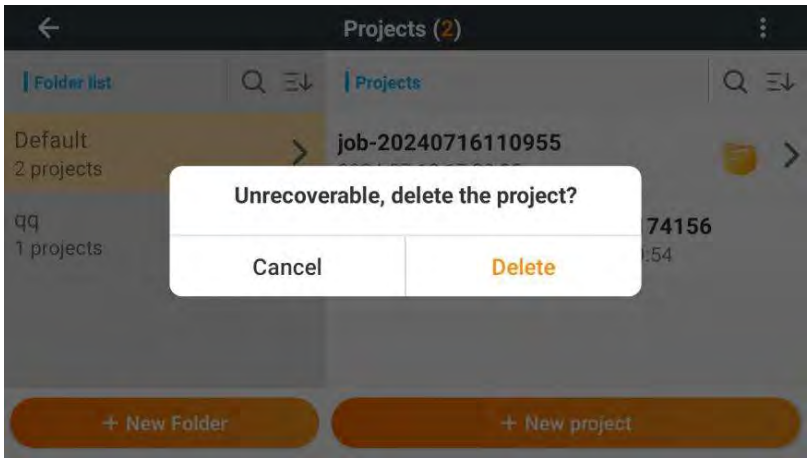
No matter what kind of operation mode, you must first create a project to manage the data, click "New", the new project dialog box will pop up, as shown below.

In Project Name, enter the project name. "Operator" means the founder of the project.



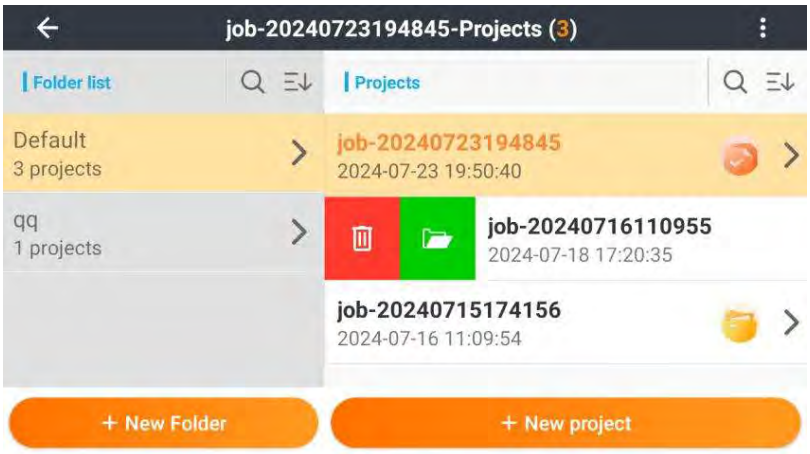
2.1.2 Delete

Select the project, drag to the right and click "Delete", delete the project file, will pop up a dialog box "Unrecoverable, delete the project?", select Delete to delete the project file. Choose cancel, do not delete the project file.



2.1.3 Open

If you want to continue a certain job, you can open the previous project, drag to the right and click "Open". When you want to open another project, select the project you want to open in the "Project" interface and click "Open".



2.2 Import

2.2.1 Text file Import

[Format]: Various types of file formats, including.txt \.csv \.dat \.xls \.xlsx, etc., can meet most customer needs;

[Path]: Select the path where the data file is stored and select the data file to be imported.

[Parameter]: customize the style of the imported file.

2.2.2 Map files import

[Format]: AutoCAD DXF \ DWG Files (*dwg, *.dxF) format is currently supported.

2.3 Export

2.3.1 Text file Export

The function of the derived point is to export the point coordinates to the desired format.

[Format]: .txt \.csv \.dat \.xls \.xlsx type file format, a variety of fixed arrangement format optional, can meet most customer needs, users can also customize the file format. By default, the file is exported to the project directory. If there is a file with the same name, a message is displayed indicating that "**A file with the same name already exists, overwrite it?**" You can also quickly select the directory

After selecting the file format, you can also filter the exported data. The filtering fields include:

[Filter-Type]: Survey, Enter, Control, Station can be selected.

[Filter-Measurement time]: You can choose **today**, **1 Week**, **All**, or customize the **Start data** and **End data**.

[Filter-Keyword]: including **Name**, **Code** and **Description** keywords.

[Path]: Export file path, there is a default export folder.

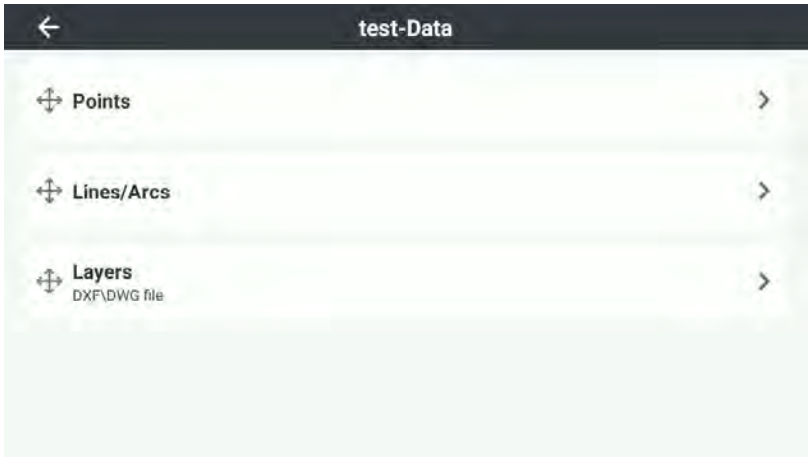
2.3.2 Map files Export

[Format]: Mainly export the required format, currently support AutoCAD DXF 2007 (.DXF), AutoCAD DWG 2007 (.DWG) files.

2.4 Data

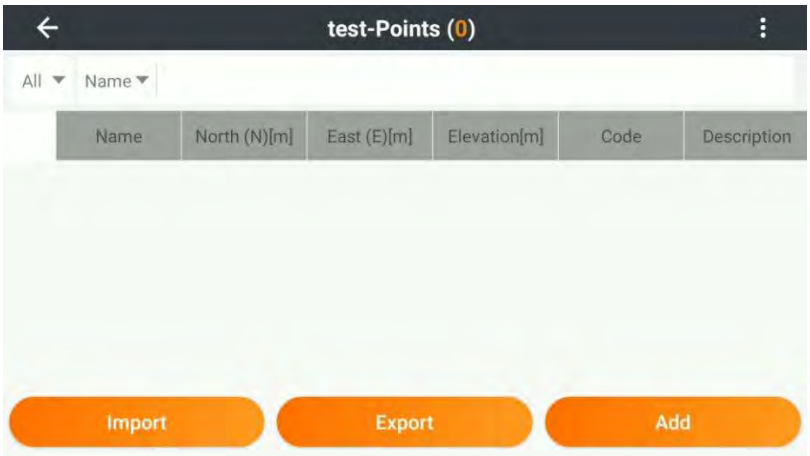
2.4.1 Points

Data includes points, line/Arcs and Layers.



Points is used to manage all types of coordinate points in a unified manner. In point management, the coordinates of enter points, survey points and control points can be viewed.

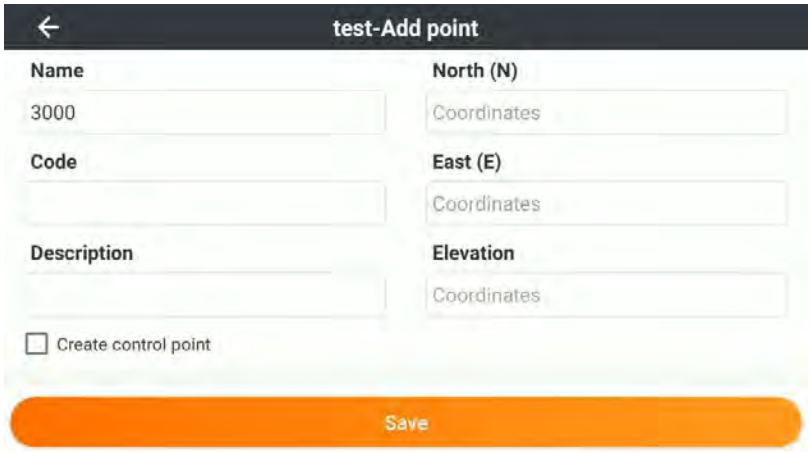
Points management includes delete, details, add, query, recycle bin and many other content.



2.4.1.1 Add point

Click **Add** to create the point. When creating a point, the following attributes are included: Name, code, Description, North coordinate, East coordinate, elevation coordinate, whether to save as a control point, enter the coordinates of the point to be created, the code and description are not required.

Set the above values, click **[Save]**, a point coordinate can be built.



2.4.1.2 Search point

The search criteria can be queried by any of the conditions such as the type, name, code, and description of the point.

Point type: It can be queried by survey point, enter point and control point

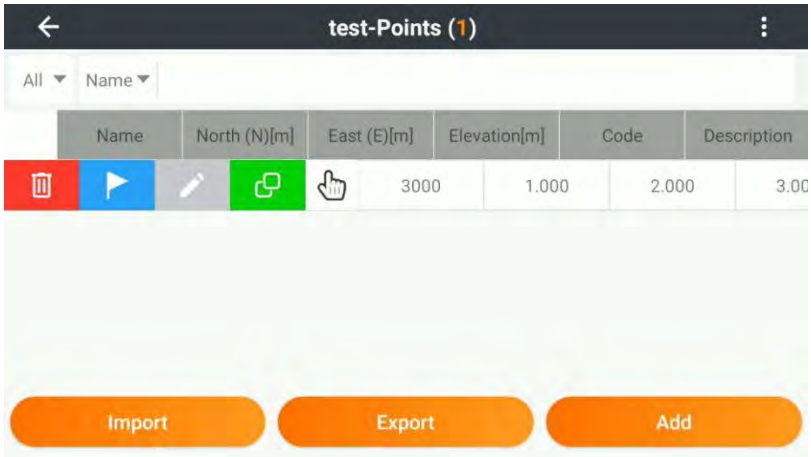
Name: Full match filtering can be done by name.

Code: Can be accurately filtered by code.

Description: Can accurately filter by remarks.

2.4.1.3 Delete point

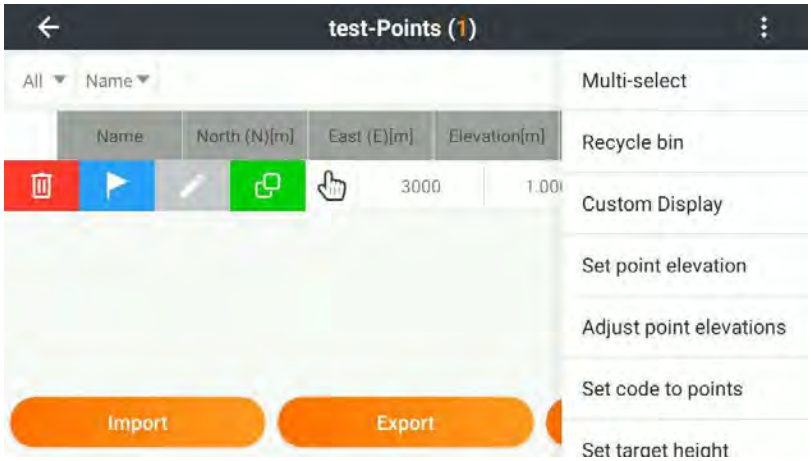
Select a point and swipe right to delete, stakeout, editing, copying the point, such as: delete point.



2.4.1.4 More operate

The three small dots  in the upper right corner have Select multiple, recycle bin,

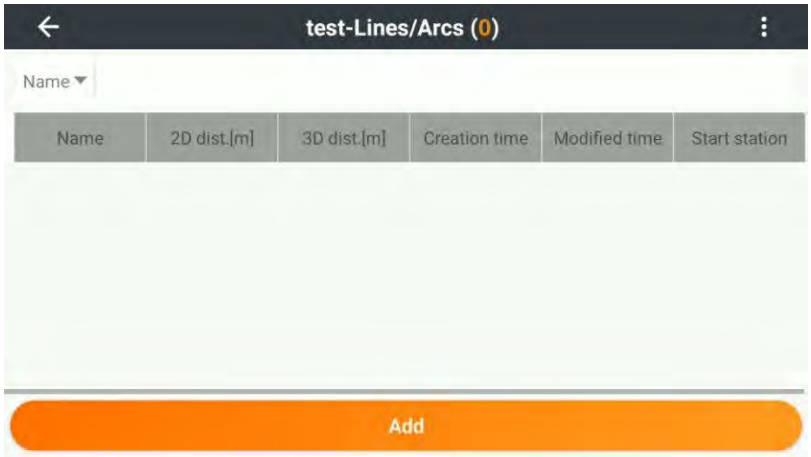
custom display,set point elevation, etc.



2.4.2 Lines/Arcs

Lines/Arcs management is used to manage line files of all kinds types in a unified manner. On the line management page, you can view the line name, line length(2D distance and 3D distance), creation time, modified time,and start station of all line files.

You can also delete, stakeout, and edit any line.



2.4.2.1 Add line

Click [Add] to create a line, you can create a line, polyline, arc, circle, as follows:

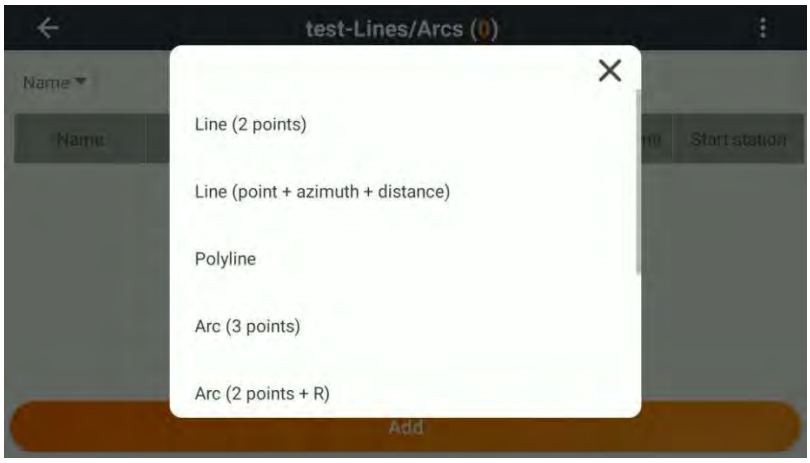
1.Create Line

Way one: Select two points to create a line.

Way two: Select a point + azimuth + distance to create a straight line.

2.Create Polyline

Way: Select two or more points to create a polyline.



3.Create Arc

Way one: Select three points that are not in the same line to create the arc.

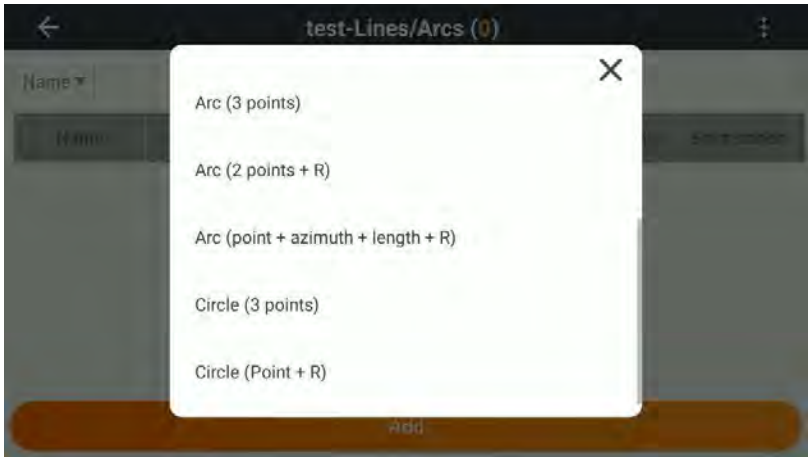
Way two: Select two points + circle radius to create an arc.

Way three: Select a point + azimuth + length + radius to create an arc.

4.Create Circle

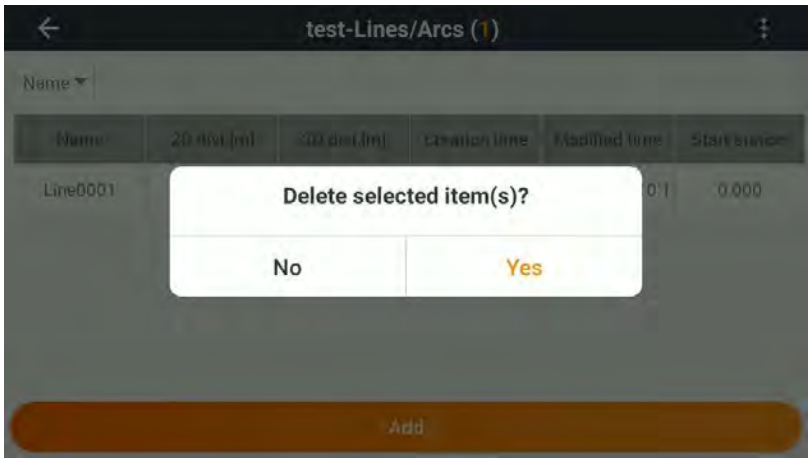
Way one: Select three points that are not in the same line to create the circle.

Way two: Select one point + circle radius to create an circle.



2.4.2.2 Delete line

When the line is selected, swipe right and select [Delete], the deletion confirmation dialog box "**Delete selected item(s)?**" will pop up. If the option is **Yes**, delete the record; If you select **No**, the record will not be deleted.



2.4.2.3 Stakeout line

Select the line and swipe right and click [Stakeout] to jump directly to the line stakeout.

2.4.2.4 Line details

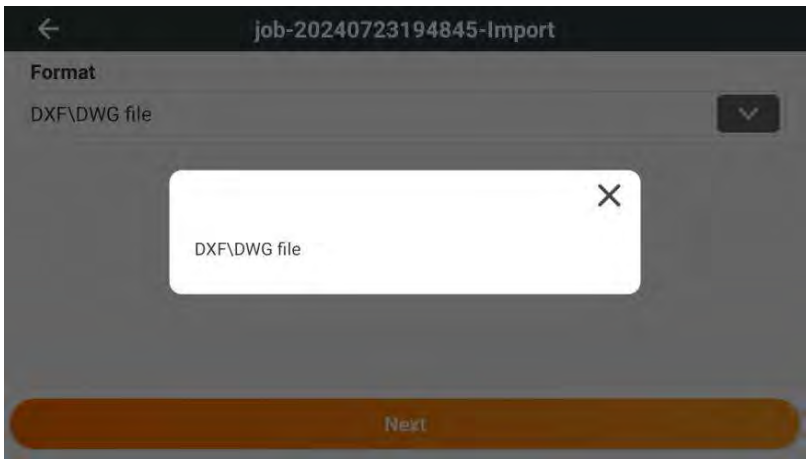
Select the line, swipe right and click [Edit] to view the detailed information of the selected line.

2.4.3 Layers

Layers management used to unified management of imported DXF\DWG file, layers management can view any imported base map layer information, you can delete, map adjustment, edit properties.

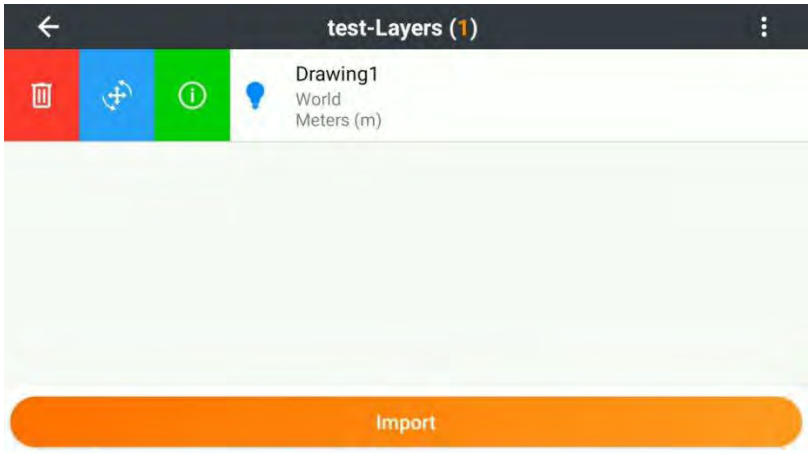
2.4.3.1 Import Map

Click **[Import]**, select the format to be imported, then select the path of the file to be imported, select the map file to be imported, and click Import.



2.4.3.2 Delete Map

Select a base map, click **[Delete]**, the deletion confirmation dialog box will pop up "**Points and lines associated with the layers will be deleted, continue?**" If yes, delete the base map. If you select No, the base map will not be deleted.

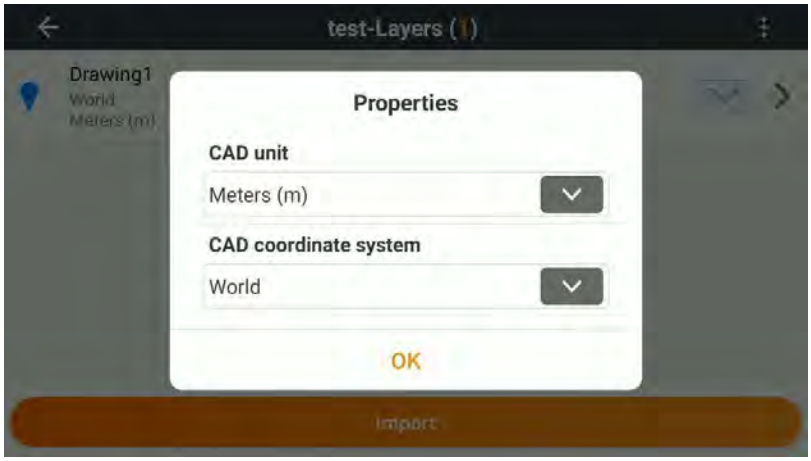


2.4.3.3 Map adjustment

Select a map and click [Map adjustment] to enter the calculation display interface. You can add point pairs to calculate adjustment parameters.

2.4.3.4 Map properties

Select a map, click [Properties], enter the map properties interface, you can modify the unit and the CAD coordinate system of the map, .



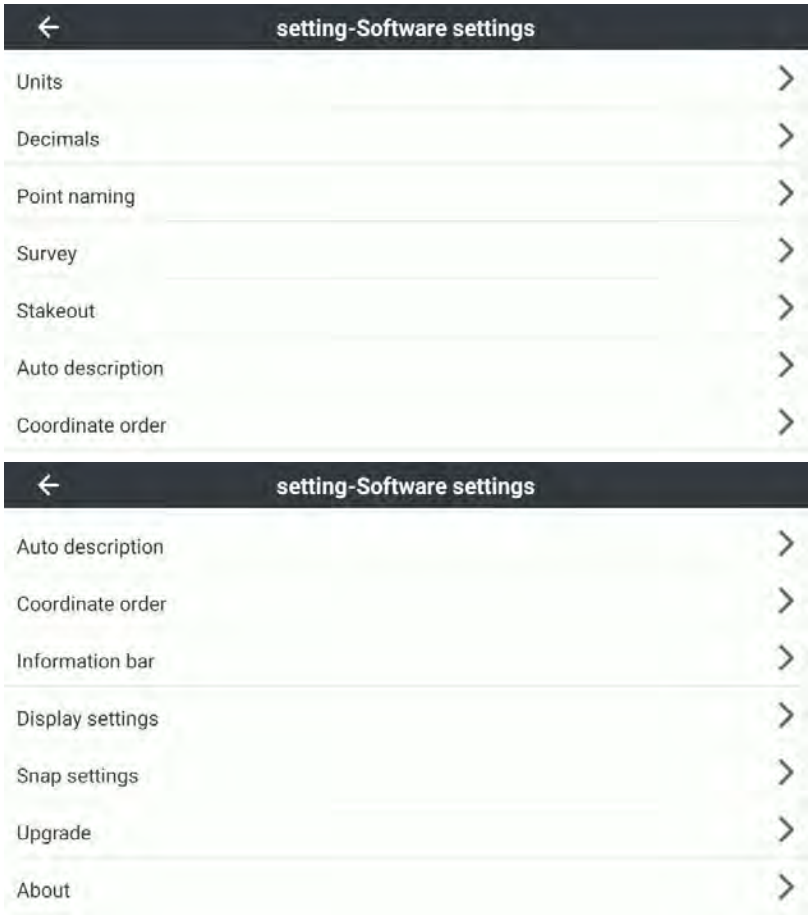
3.Settings

This chapter introduces:

- Software Setup
- Exit

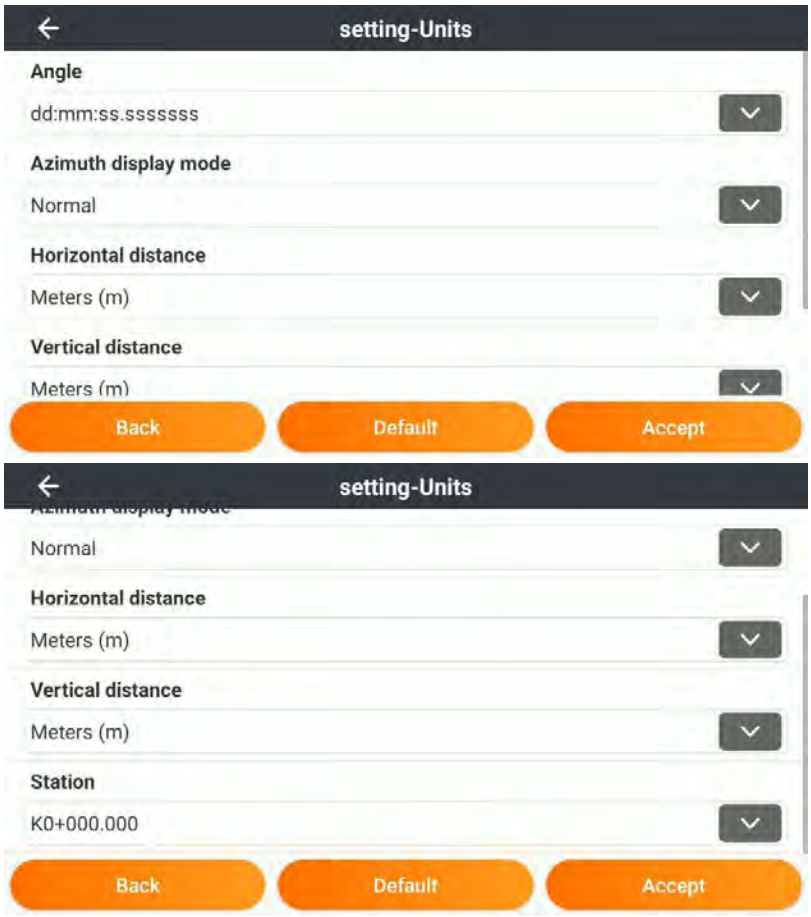
3.1 Software Setup

Software Settings include units, decimals, point naming,survey, stakeout, auto description, coordinate order, information bar, display Settings, Snap Settings, upgrade, and about.

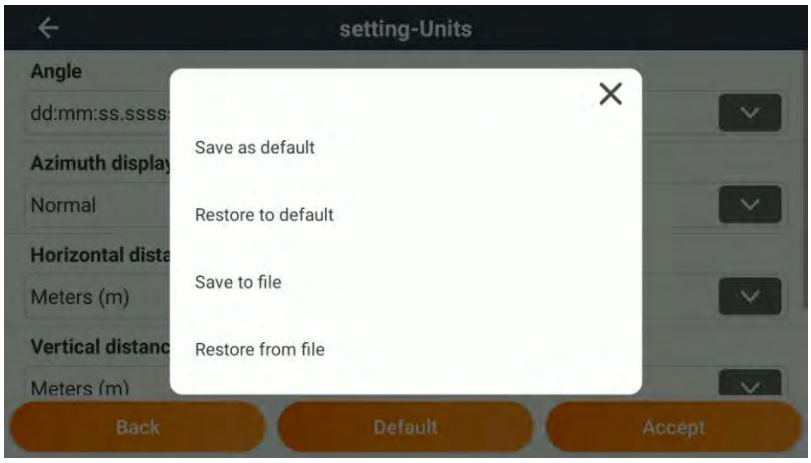


3.1.1 Units

Angle unit, azimuth display mode, horizontal distance unit, vertical distance unit, station display can be set.



Click **Default**, and a dialog box will pop up. You can choose to **Save as default**, **Restore to default**, **Save to file**, or **Restore from file**. This option is available for other Settings.



3.1.2 Decimals

Angle, horizontal distance, vertical distance, slope decimal can be set.

3.1.3 Point naming

You can configure the **Auto increment name interval**, stakeout(point) naming method, and stakeout(line) naming method.

[**Auto increment name interval**] : can be a positive integer and a negative integer greater than or equal to -10. This rule is used for measurement point name, point name starts with 1 by default. This rule is also used when the point stakeout name and line stakeout name are selected for **Auto increment**. The point name starts from 1000 and 2000 by default. Input points also use this rule, and point name start at 3000 by default.

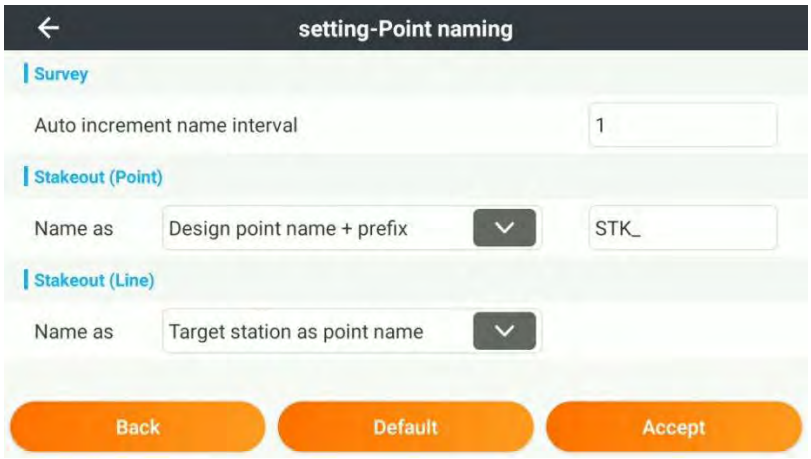
Examples of **Auto increment** rules:

When auto increment point name step is positive 1: When the end of point name is a number, such as a1, the next point name is a2. If the point name ends with a letter, such as 1a, the next point name is 1b. If the point name ends with another character, such as 1-, the next point name is 1-1.

When the auto increment point name step is negative -1: point name is a pure number, such as 1, and the next point name is 0. The point name is not a pure number, such as 1a, the next point name is 1a-1, and the next point name is 1a-2.

[Stakeout name (Point)] : point name rules have **prefix + design point name**, **design point name + suffix**, **design point name + constant**, **Auto increment**.

[Stakeout name (line)] : point name rules have **Target station as point name**, **Real time station as point name**, **Auto increment**.



3.1.4 Survey

Survey settings can be configured with the **number of measurements**, **Accuracy check**, **Read Direct & Reverse** set.

[Number of measurements] : The number of measurements in a single measurement.

[Accuracy check] : including **Horizontal Angle**, **Vertical Angle**, **Distance**, **Elevation**, any data exceeding the limit difference will give a hint when measuring.

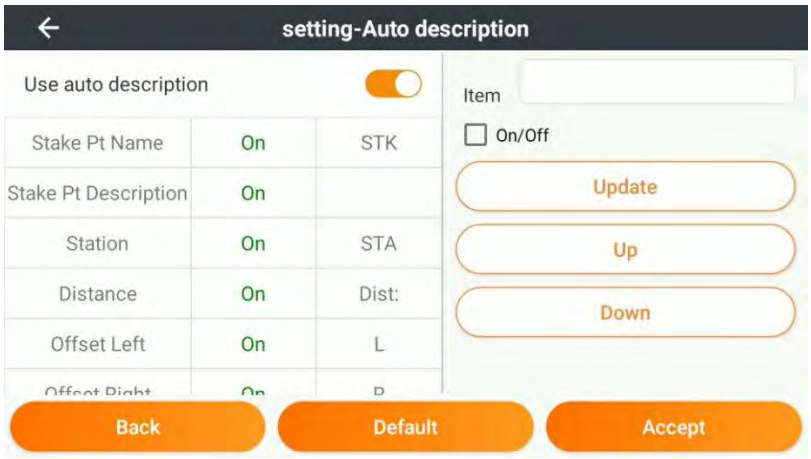
[**Read Direct & Reverse**] : including **Backsight - Read Direct & Reverse** set and **Traverse - Read Direct & Reverse** set. When the switch is turned on, the average value of each Direct & Reverse measurement should be taken as the result.

3.1.5 Stakeout

Stakeout is set with Distance tolerance and Elevation tolerance. When the distance or elevation difference between the measuring point and the stakeout target exceeds the limit tolerance, the software will give corresponding prompts.

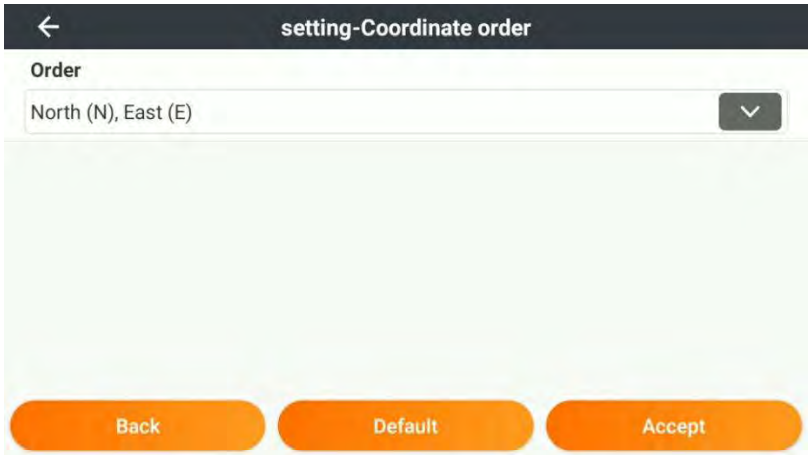
3.1.6 Auto description

After auto description are enabled, the stakeout points obtained during stakeout will automatically generate description according to the corresponding stakeout information. The information that can be configured includes stake Pt Name, Stake Pt Description, Station, Distance, Offset Left, Offset Right, Cut, Fill.



3.1.7 Coordinate order

You can set the coordinate order. The default value is North(N), East(E). You can select East(E) and North(N).



3.1.8 Information bar

The information bar setting can set the display information of Measure, stakeout point and stakeout line respectively.

1.Measure

By default, the information displayed in the information bar of the measurement interface includes [Horizontal angle - HA], [Vertical angle - VA], [North - N], [East - E], and [Elevation - Elev.]. The information not displayed by default includes [Horizontal distance - HD], [Slope distance - SD], and [Different in height - dH].

[Horizontal angle - HA] : instrument horizontal angle

[Vertical angle - VA] : instrument vertical angle

[North - N] : The north coordinate of the measurement position

[East - E] : The east coordinate of the measurement position

[Elevation - Elev.] : Measuring position elevation

[Horizontal distance - HD] : The plane distance between the measuring position and the instrument

[Slope distance - SD]: The slope distance between the measuring position and the instrument

[Different in height - dH]: measuring position elevation minus instrument elevation

2.Stakeout point

In the stakeout interface, when the stakeout target is a point, the default information displayed is [Go], [Stake distance - Dist.], [Cut/Fill], Other optional information is [Design elevation - Dsn Elev.], [Elevation - Elev.], [dN], [dE], [dZ], [Horizontal angle - HA], [Vertical angle - VA], [Horizontal distance - HD], [Slope distance - SD], [Different in height - dH], [North - N], [East - E].

[Go]:Include Go Farther away /Come Near + Go Left /Go Right, the reference direction is the connection between the station and the measurement point.

[Stake distance - Dist.]: Distance between measuring point and stakeout target

[Cut/Fill]: Measuring point elevation minus stakeout target elevation, positive is cut, negative is fill, and the display value is taken as absolute value.

[Design elevation - Dsn Elev.]: Elevation of the stakeout target

[Elevation - Elev.]: The elevation of the measuring point

[dN]: Measuring position north coordinates minus stakeout target north coordinates

[dE]: Measuring position east coordinates minus stakeout target east coordinates

[dZ]: Measuring position elevation minus stakeout target elevation

[Horizontal angle - HA]: Instrument horizontal angle

[Vertical angle - VA]: Instrument vertical angle

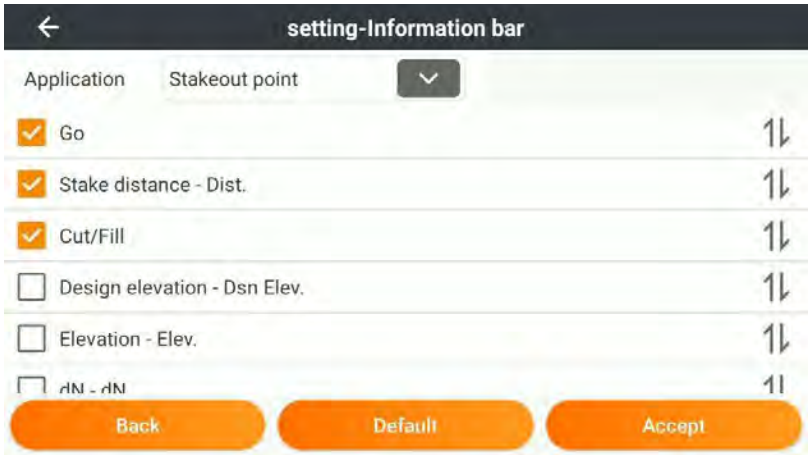
[Horizontal distance - HD]: The plane distance between the measuring position and the instrument

[Slope distance - SD]: The slope distance between the measuring position and the instrument

[Different in height - dH]: measuring position elevation minus instrument elevation

[North - N]: Measuring point north coordinates

[East - E]: Measuring point east coordinates



3.Stakeout line

In the stakeout interface, when the stakeout target is a line, the default information displayed is [Ahead/Back], [Inward /Outward], [Stake distance - Dist.], [Cut/Fill], [Station - Sta], [Offset - Off]. Other optional information is [Design elevation - Dsn Elev.], [dN], [dE], [dZ],, [Go], [Design station - Dsn Sta.], [Horizontal angle - HA], [Vertical angle - VA], [Horizontal distance - HD], [Slope distance - SD], [Different in height - dH], [North - N], [East - E], [Elevation - Elev.].

[Ahead/Back]: Target station minus real-time station, positive is forward, negative is backward, the display value takes absolute value.

[Inward /Outward]: The absolute value of the offset from the stakeout target, near the center line is inward, away from the center line is outward

[Stake distance - Dist.]: Distance between measuring point and stakeout target

[Cut/Fill]: Measuring point elevation minus stakeout target elevation, positive is cut, negative is fill, and the display value is taken as absolute value

[Station - Sta]: Real-time station

[Offset - Off]:the vertical distance from the current point to the line, is negative to the left

of the line and positive to the right of the line

[Design elevation - Dsn Elev.]: Elevation of the stakeout target

[dN]: Measuring position north coordinates minus stakeout target north coordinates

[dE]: Measuring position east coordinates minus stakeout target east coordinates

[dZ]: Measuring position elevation minus stakeout target elevation

[Go]:Include Go Farther away /Come Near + Go Left /Go Right, the reference direction is the connection between the station and the measurement point

[Design station - Dsn Sta.]: Stakeout target station

[Horizontal angle - HA]: Instrument horizontal angle

[Vertical angle - VA]: Instrument vertical angle

[Horizontal distance - HD]: The plane distance between the measuring position and the instrument

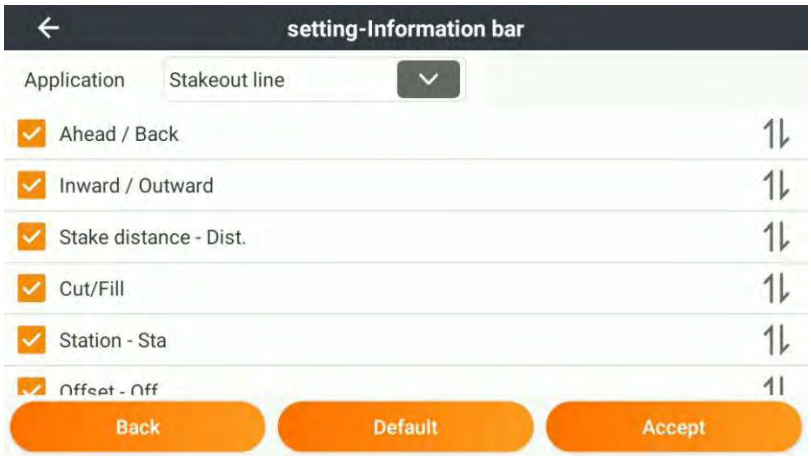
[Slope distance - SD]: The slope distance between the measuring position and the instrument

[Different in height - dH]: measuring position elevation minus instrument elevation

[North - N]: Measuring point north coordinates

[East - E]: Measuring point east coordinates

[Elevation - Elev.]: Measure the elevation of the position



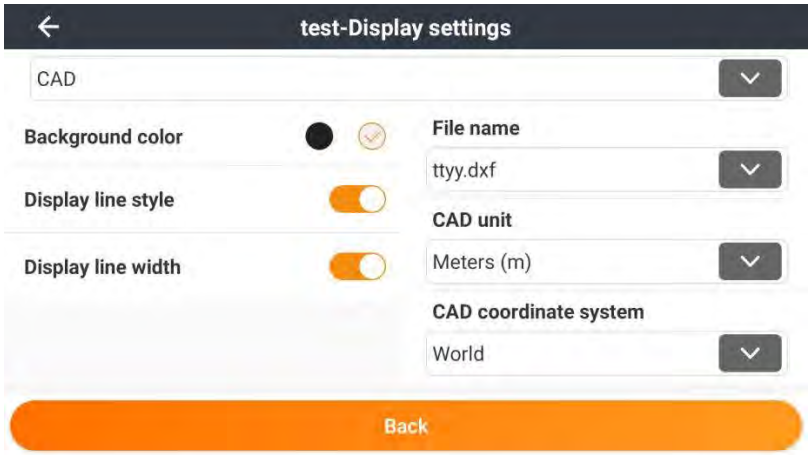
3.1.9 Display settings

Can configure CAD, point, line related display information.

1.CAD

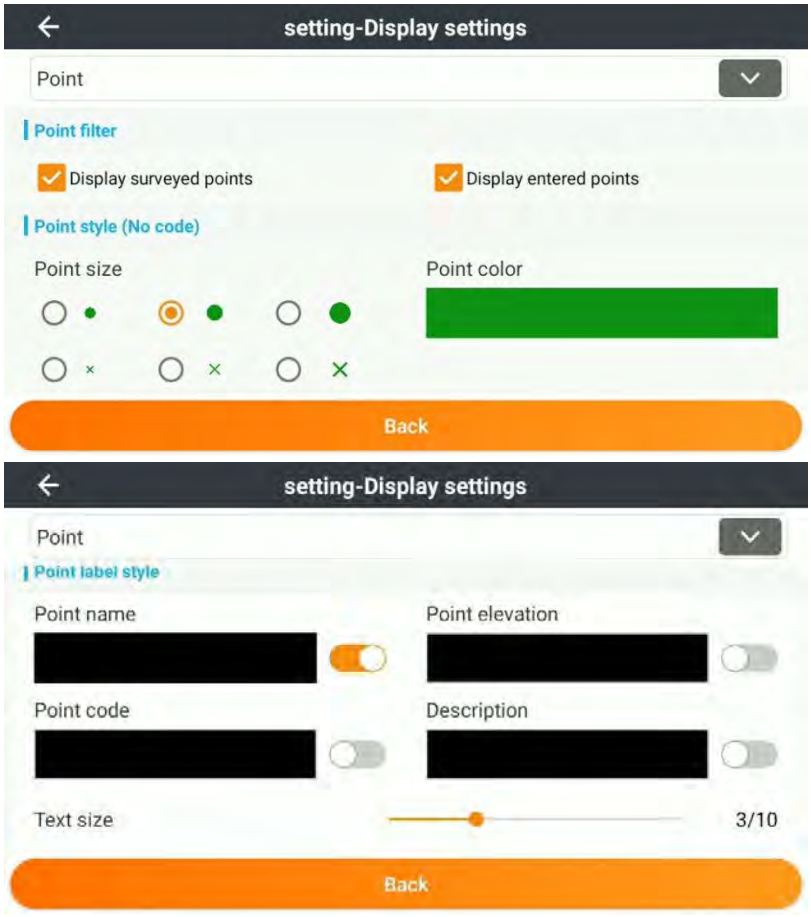
You can set the **Background color**, **Display line style**, **Display line width**, and whether **Display coordinates after point selection**.

You can also display the file name and set the CAD unit and CAD coordinate system.



2.point

You can set whether to Display surveyed points and Display entered points, point style, and point label style.



3.line

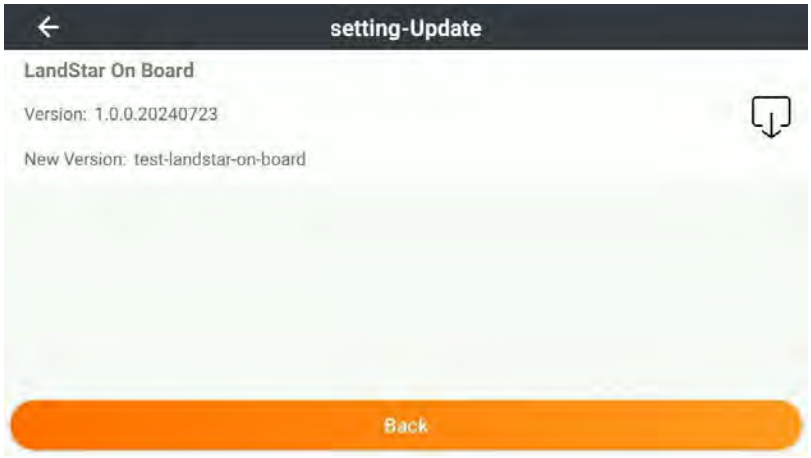
Line label style can be set.

3.1.10 Snap settings

You can configure the points you can select when snapping.

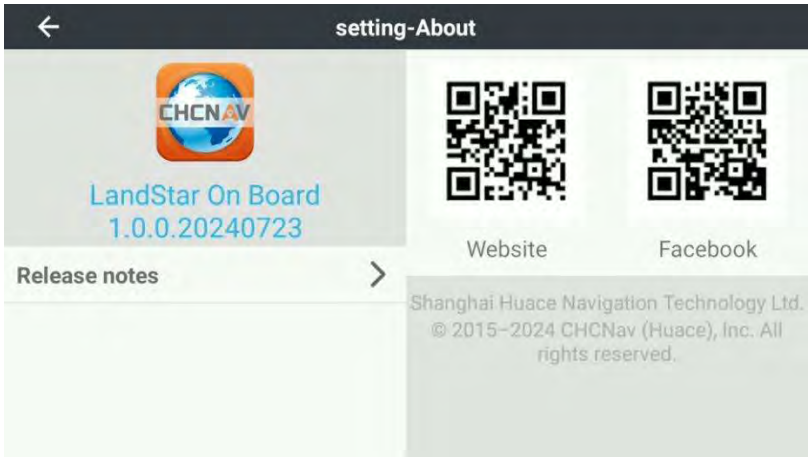
3.1.11 Upgrade

You can receive the push of the new software version and upgrade the software.



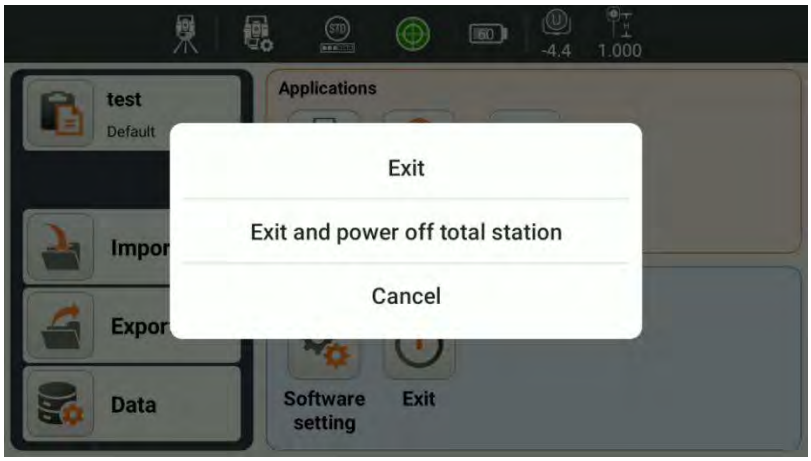
3.1.12 About

You can view the software version.



3.2 Exit

Click Exit will pop up a dialog box, you can choose to **Exit** the software, **Exit and shut power off the total station** and **Cancel**.



4.Applications

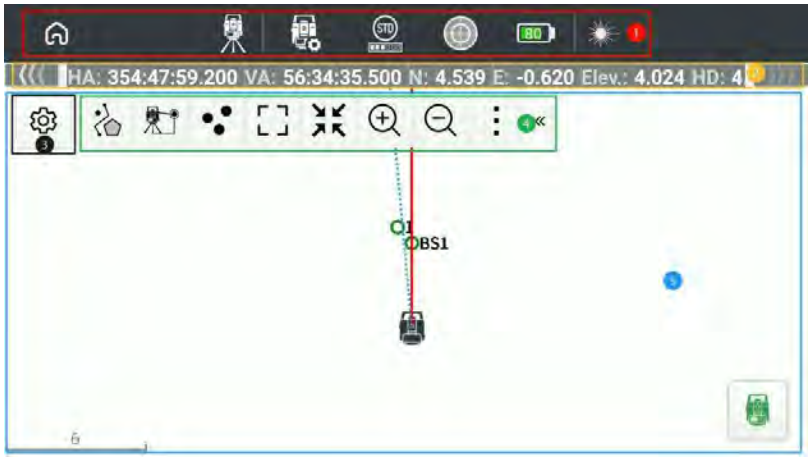
This chapter introduces:

- Station setup
- Survey
- Stakeout

4.1 Station setup

After clicking  enter the station setup  interface, which corresponds to the same function as the station setup in the status bar, but the entrance is different. For details, see 1.1.

4.2 Survey



After setup the station, you can enter the measurement interface  for point measurement. The measurement interface is composed of five parts from top to bottom: **status bar**, **information bar**, **Settings**, **toolbar** and **view**.

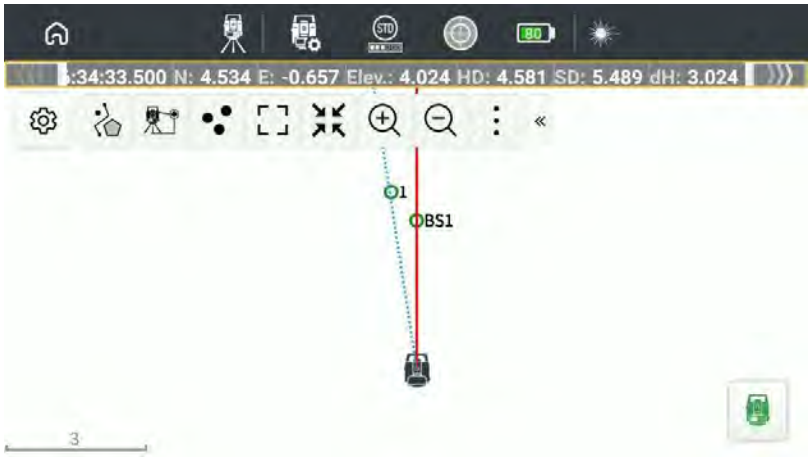
4.2.1 Status bar

The function of the status bar of the measurement interface is the same as that of the status bar of the main interface. Only a home button  is added in the upper left corner for returning to the home page. For other functions, see the Chapter 1.status bar.

4.2.2 Information bar

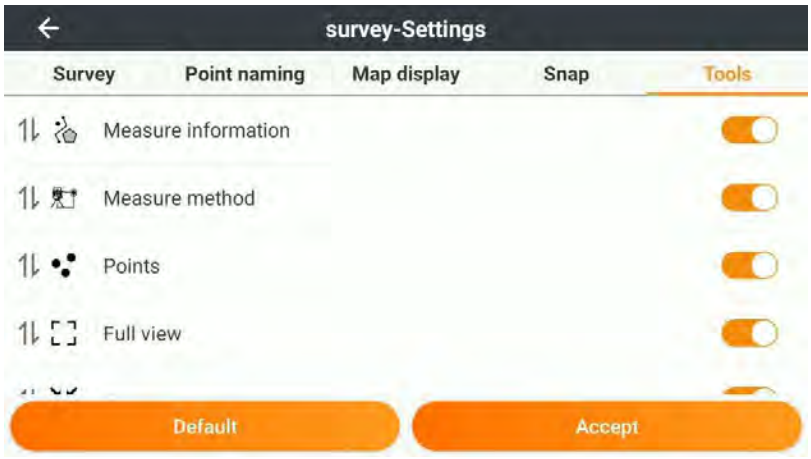
The display and order of the information in the information bar can be set in the software

Settings. The information will display the information related to the latest measurement. The information can be swipe left and right. And the position of the information bar will be recorded. The reentering page or the reentering software will display the previous position.

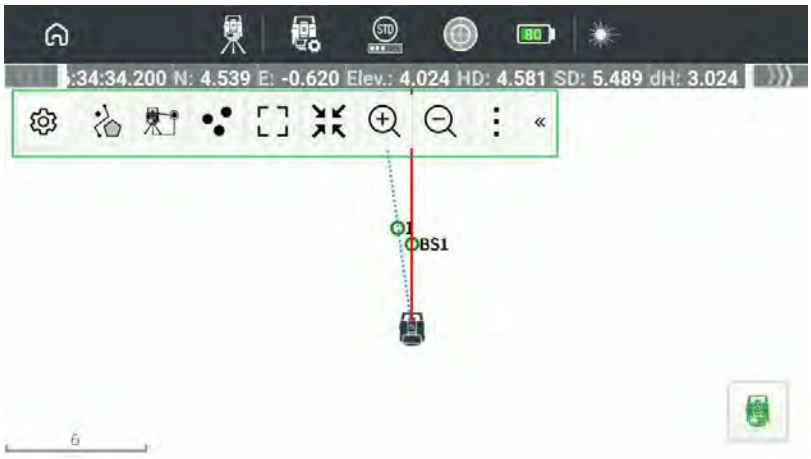


4.2.3 Settings

Settings can configure **Survey** Settings**, Point naming** Settings, **Map display** Settings, **Snap** Settings, and **Tools** Settings. Except tool Settings, other Settings can be configured in software Settings. For details, see 3.1 Software Setup. Tool settings can configure the toolbar of the measurement interface.



4.2.4 Tool bar



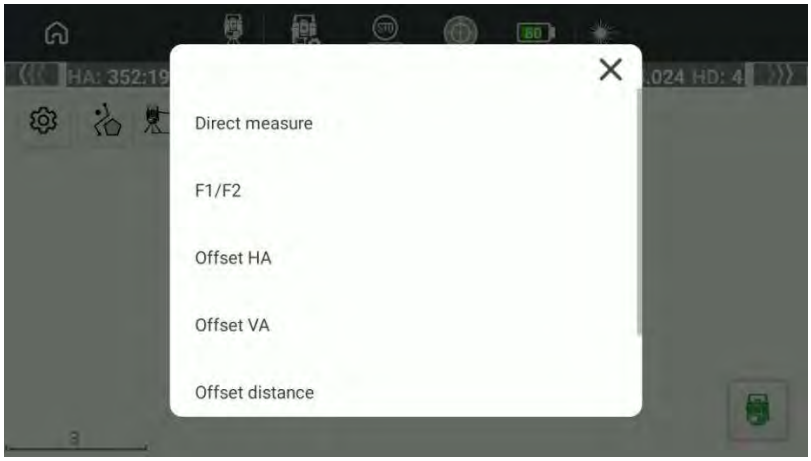
The display and order of the tools can be set in the measurement Settings. The default display tools include [Survey information], [Survey method], [Points], [Full], [Center], [Zoom in], and [Zoom out]. The default not display tools include [Redraw], [One-click Find], [Hide/show data], [Hide/show base map], [Delete previous point], and [Edit previous point]. The right side of the toolbar has [More functions] by default, and the far right side is the button to collapse and expand the toolbar.

[Survey information] : You can set the point name, code and description before survey.

When the "show every time" switch is turned on, the survey information page will pop up after measurement is completed. Otherwise, the point information will be automatically saved.

[Survey method] : The survey methods include **Direct measure**, **F1/F2**, **Offset HA**, **Offset VA**, **Offset distance**. When F1/F2 measurement is selected, the average value of each Direct & Reverse measurement should be taken as the result.When the **Offset HA** is selected, the offset coordinate is obtained by moving a horizontal Angle take the instrument as the center after measurement.When the **Offset VA** is selected, the offset coordinates are obtained by calculating the height difference with the moving vertical angle after measurement.When selecting **Offset distance**, the offset coordinates are calculated

according to the input values of front/back, left/right, up/down after measurement.



[Points] : For quick access to the point library.

[Full] : Zoom view to show all features.

[Center] : Position the instrument in the center of the view.

[Zoom in] : Enlarged view.

[Zoom out] : Reduced view.

[Redraw] : Redraws the data on the view.

[one-click Find] : Used to quickly find data on a view, such as a base map.

[Hide/show data] : Used to hide/show data, such as points and line.

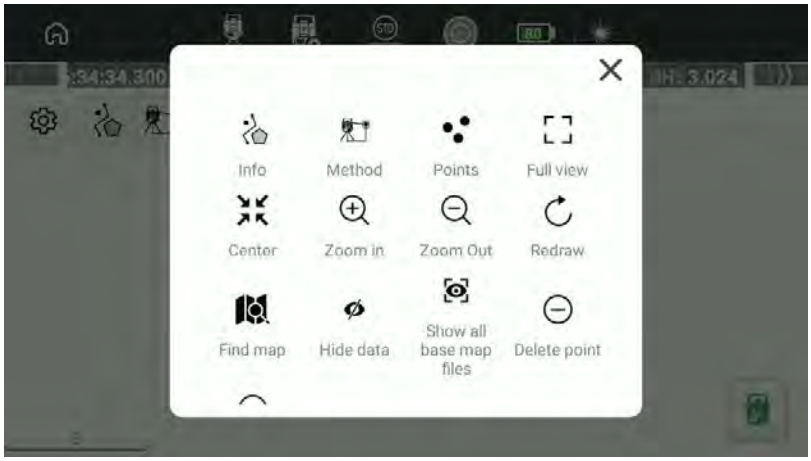
[Hide/show base map] : Used to hide or show the base map view。

[Delete previous point] : Delete the previous measurement point.

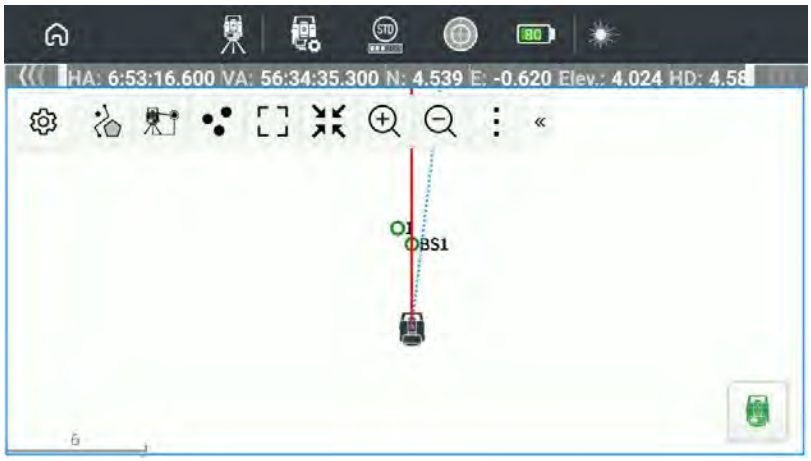
[Edit previous point] : Edit the previous measurement point.

More functions : Always in the last position of the toolbar, it is displayed by default and

cannot be edited. The multi-dialog box will disappear automatically if no operation is performed within five seconds, and all tools are displayed, which is consistent with the tool function in the toolbar.



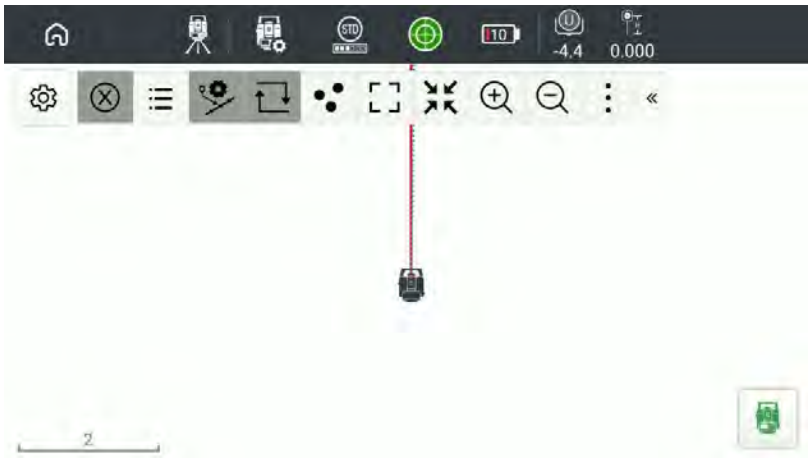
4.2.5 View and Operation



The icon of the total station is the position of the instrument, the red line is the direction of the station, and the blue line is the direction of the instrument. Point, line, and base map data can be displayed on the view. The scale is displayed in the lower left corner of the view, and the measurement button is displayed in the lower right corner. Click the measurement button to measure, and you can save the corresponding data after measuring.

4.3 Stakeout

After the station setup, you can enter the stakeout interface for point and line stakeout. Like the measurement interface, the stakeout interface is also composed of Status bar, Information bar, Settings, Tool bar and Views, but the information bar is hidden when there is no stakeout target.



4.3.1 Status bar

The status bar of the stakeout interface is exactly the same as that of the measurement interface, see 4.2.1 for details.

4.3.2 Information bar

In the stakeout interface, the information bar will display different contents according to the type of stakeout target, and the point and line stakeout display their respective information respectively. When there is no stakeout target, the information bar is hidden.

4.3.3 Settings

Settings can configure **Survey** Settings, **Stakeout** Settings, **Point naming** Settings, **Map display** Settings, **Snap** Settings, and **Tools** Settings. Except tool Settings, other Settings can be configured in software Settings. For details, see 3.1 Software Setup. Tool settings can configure the toolbar of the measurement interface.

4.3.4 Tool bar

The display and order of the tools can be set in the measurement Settings. The default display tools include [Stop stakeout], [Target selection], [Stakeout line setup], [Reversal], [Points], [Full], [Center], [Zoom in], and [Zoom out]. The default not display tools include

[Redraw], [one-click Find], [Hide/show data], [Hide/show base map], [Delete previous point], and [Edit previous point]. The right side of the toolbar has [More functions] by default, and the far right side is the button to collapse and expand the toolbar.

[Stop stakeout] ⊗ : Stop the current stakeout task, disable when there is no stakeout target.

[Target selection] ☰ : Select lofting target, you can select points, lines.

[Stakeout line settings] : Can set [line stakeout method], [Start station], [Stakeout elevation], [Stakeout interval], [Target station], [Horizontal offset], [Vertical offset] (not displayed when the elevation is ignored). Disabled when the stakeout target is not a line.

[Line stakeout method] : You can choose to stakeout to the line or Station & Offset

[Start station] : Set the start station of the line.

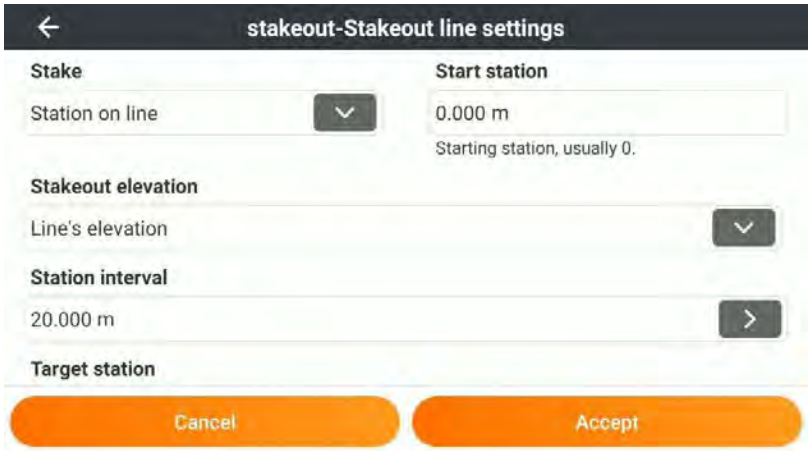
[Stakeout elevation] : can select line's elevation, Enter elevation, Ignore elevation.

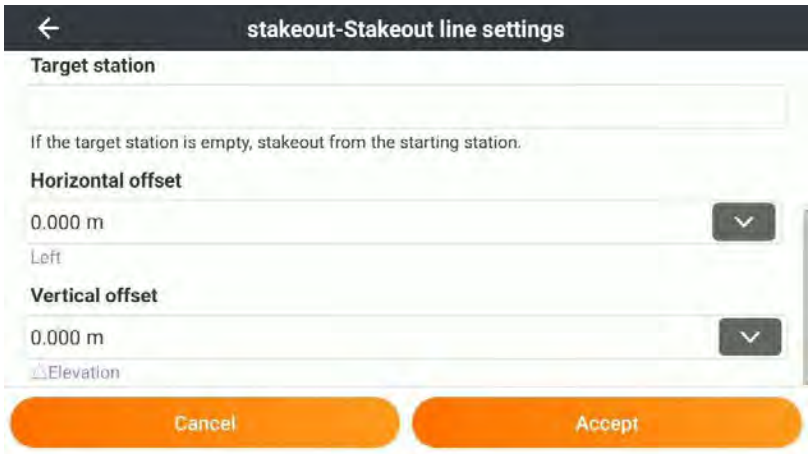
[Stakeout interval] : only display when stakeout the station, from the start station, the station is automatically generated according to the stakeout interval.

[Target station] : Set the station of the stakeout target.

[Horizontal offset] : the offset distance of the lofting target.

[Vertical offset] : The elevation deviation of the stakeout target, and the input methods are Elevation, ΔElevation, slope (Degrees), Zenith, Slope 1:N, Slope (%), Slope N:1.





[Reversal] : Change the direction of the selected line, disabled when the stakeout target is not a line.

[Points] : For quick access to the point library.

[Full] : Zoom view to show all features.

[Center] : Position the instrument in the center of the view.

[Zoom in] : Enlarged view.

[Zoom out] : Reduced view.

[Redraw] : Redraws the data on the view.

[one-click Find] : Used to quickly find data on a view, such as a base map.

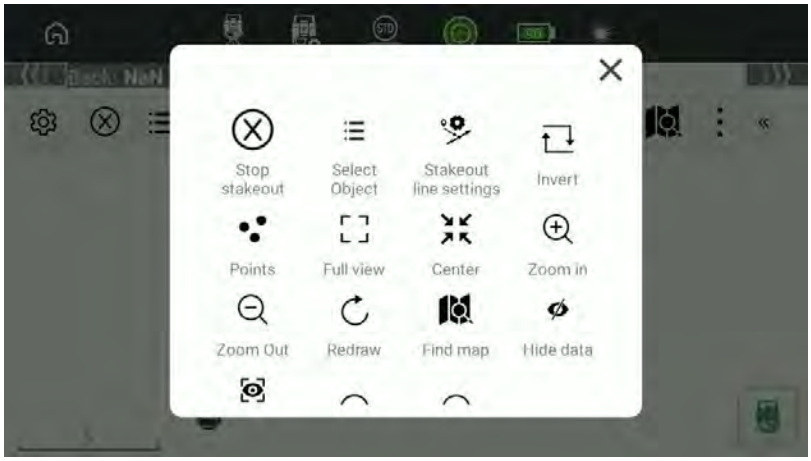
[Hide/show data] : Used to hide/show data, such as points and line.

[Hide/show base map] : Used to hide or show the base map view。

[Delete previous point] : Delete the previous measurement point.

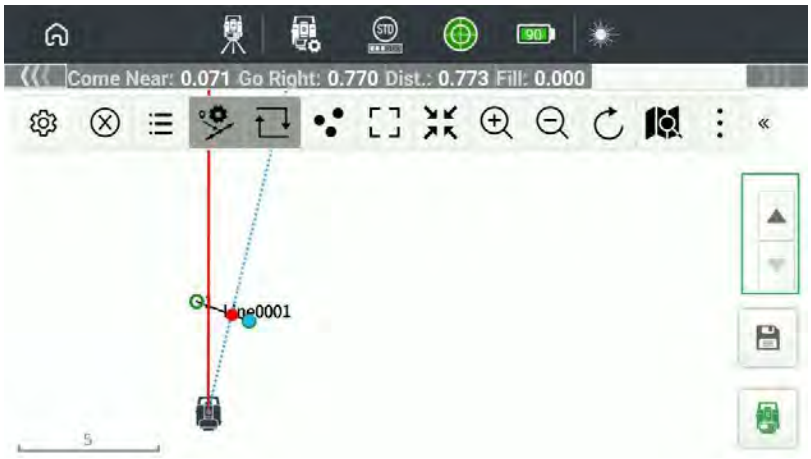
[Edit previous point] : Edit the previous measurement point.

More functions : Always in the last position of the toolbar, it is displayed by default and cannot be edited. The multi-dialog box will disappear automatically if no operation is performed within five seconds, and all tools are displayed, which is consistent with the tool function in the toolbar.



4.3.5 View and Operation

Point and line stakeout targets can be selected directly on the view, or through the [Target selection] , you can also be selected in the point management, line management right swipe stakeout.



Click the survey button , after the stakeout is completed, the Save button will appear, click save can jump to the point details page, save the results. When the stakeout target is a point, there is a button on the right side of the view, which will automatically switch the previous point/next point the point in the point library for stakeout.

CHC Navigation

Shanghai Huace Navigation Technology Ltd.

CHCNAV | Smart Navigation & Geo-Spatial Technology Park,

577 Songying Road, 201703, Shanghai, China

Email: sales@chcnav.com | support@chcnav.com

Skype: chc_support

Website: www.chcnav.com

Make your work more efficient

FCC Statement

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

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.

FCC Radiation Exposure Statement:

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

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.