SOUTH

SurvStar

Target your success

User Guide v1.0.0

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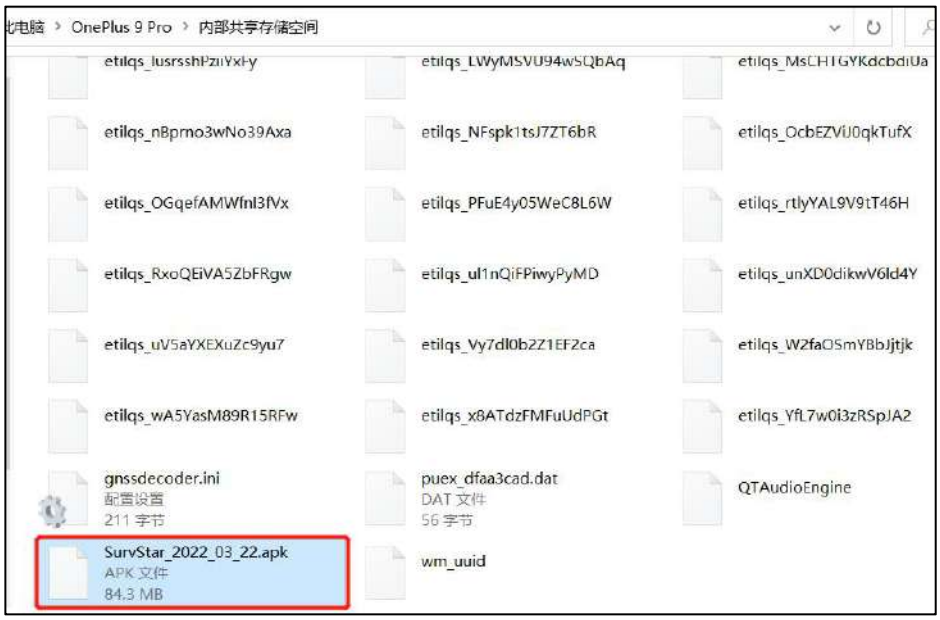
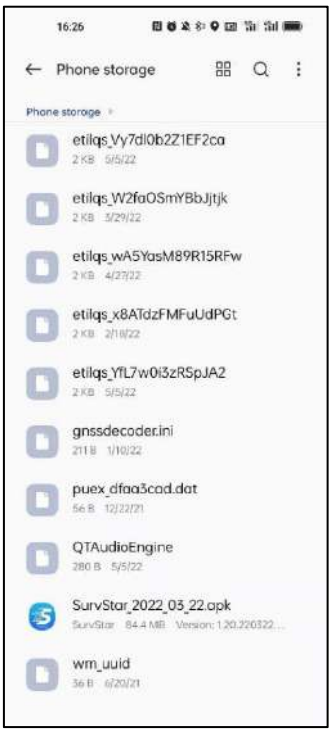
Chapter 1 Installation & Uninstall

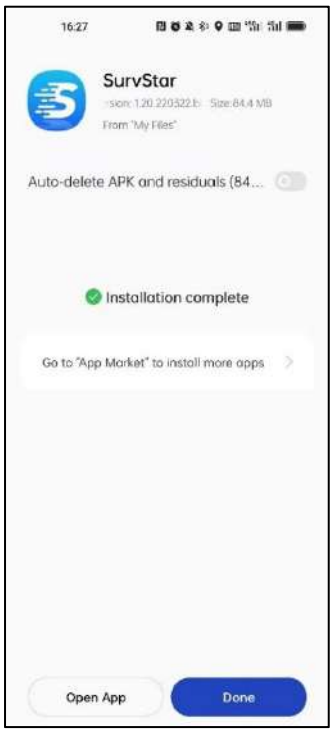
1-1 Installation

1. Copy the APK installation file into android device.



2. Find the APK installation file in android device and click it to install SurvStar.





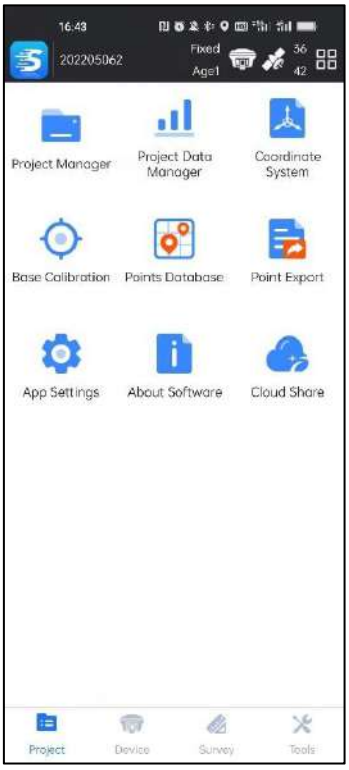
1-2 Uninstall

Find the SurvStar icon in android device, and long press it, and then click Uninstall, the system will uninstall it.

Chapter 2 Main Interface

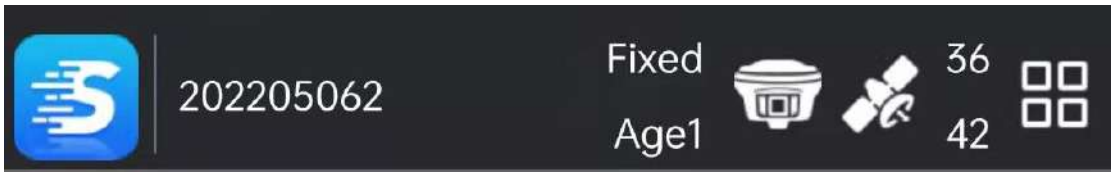
2-1 Introduction

Below is the main interface of SurvStar, it includes: general information at the top, function modules at the bottom and detailed function buttons in the middle.



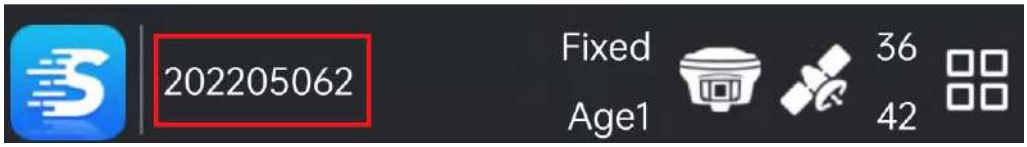
2-2 General Information

Below is the general information bar, where we can see the current project's name, current solution status and satellites.



Click  , we will enter to About Software page. In that page, we can see the current version of SurvStar, register the SurvStar and check new version.

This is the name of current project.



Solution status: includes Single, Float, DGPS and Fixed.

Age1: current differential delay is 1.

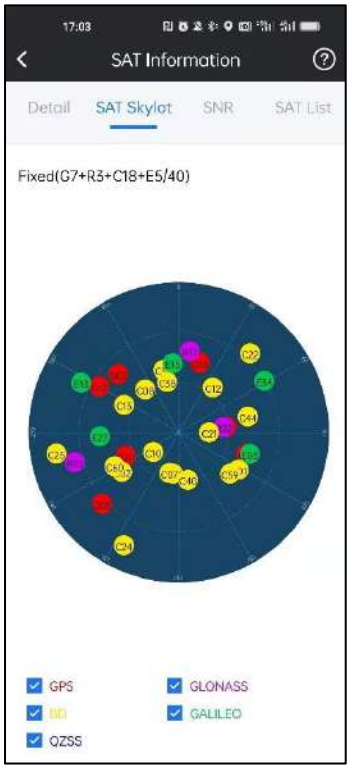
e.g., Single, 0, current solution is single, and differential delay is 0.

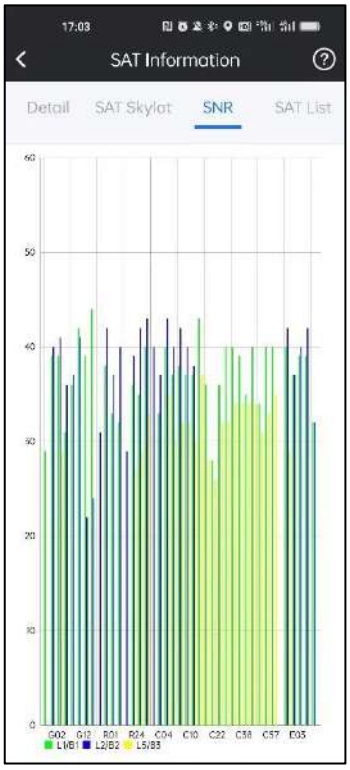
Fixed, 1: current solution is fixed, and differential delay is 1.

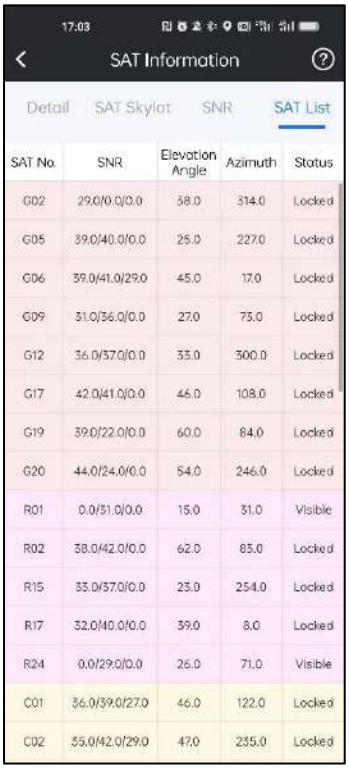
36/42: Used satellites and detected satellites.

Click  , we will enter to Communication page. In that page, we can search the device and pair with it.

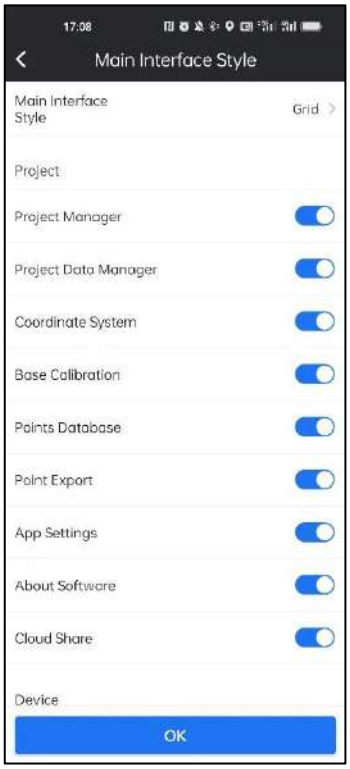
Click  , we will enter to SAT Information page. In that page, we can check the position information, accuracy, base position, SAT skylot, SNR and SAT list.

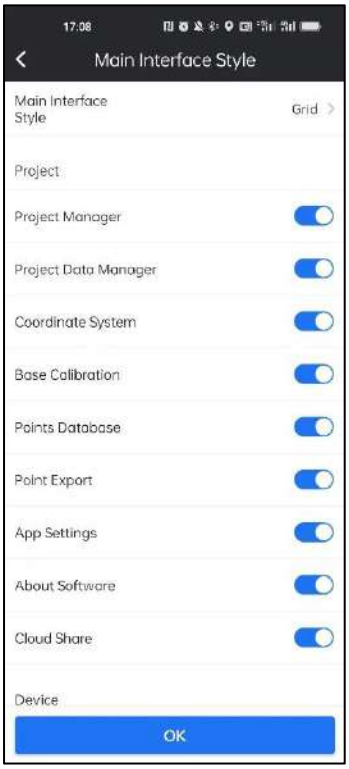


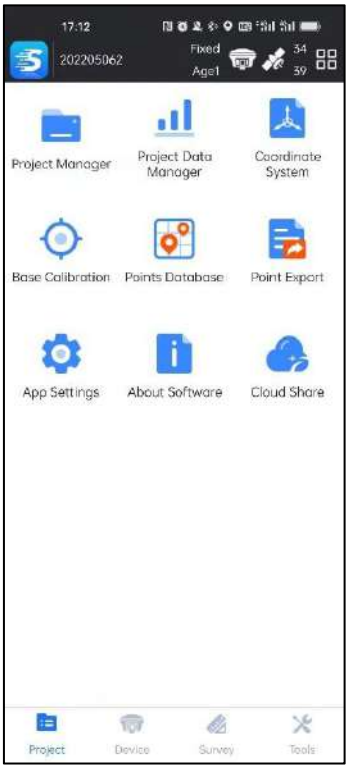




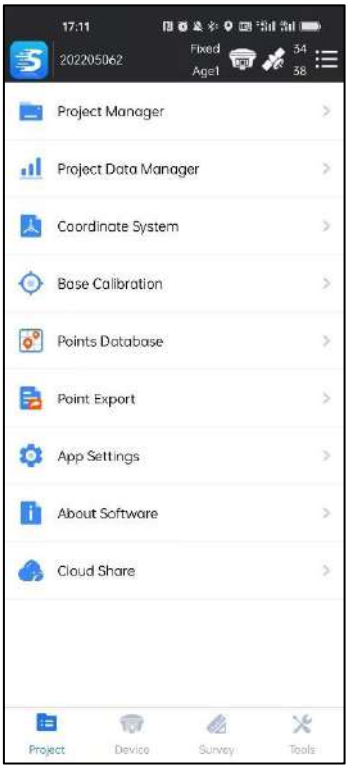
Click  , we will enter to Main Interface Style page. In that page, we can define main interface style and decide which function modules to be displayed.



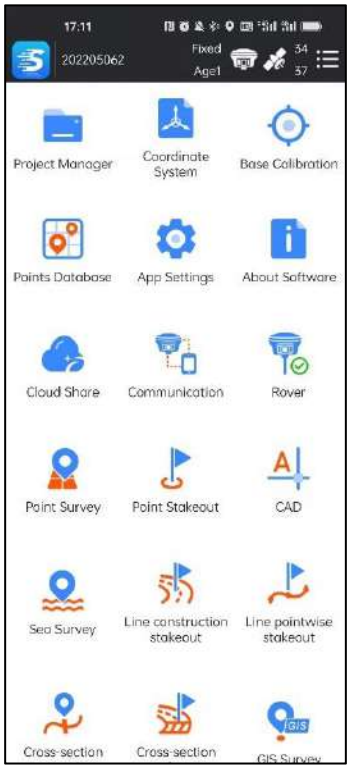




Grid



List

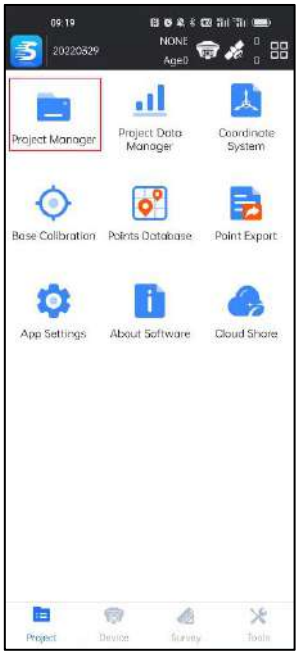


Simple

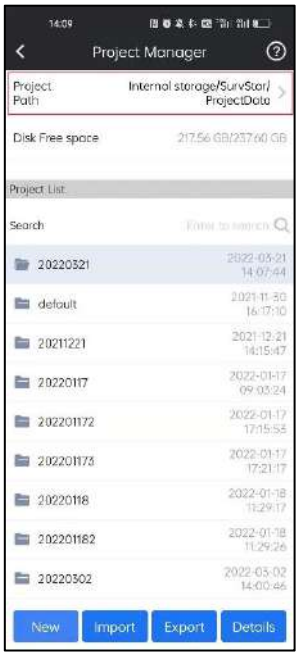
Chapter 3 Project

3-1 Project Manager

Click this icon to enter this function.

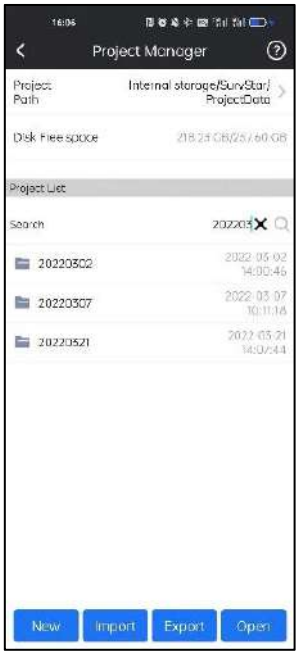


Projects we created are saved in the default directory of controller: Internal storage/SurvStar/ProjectData.



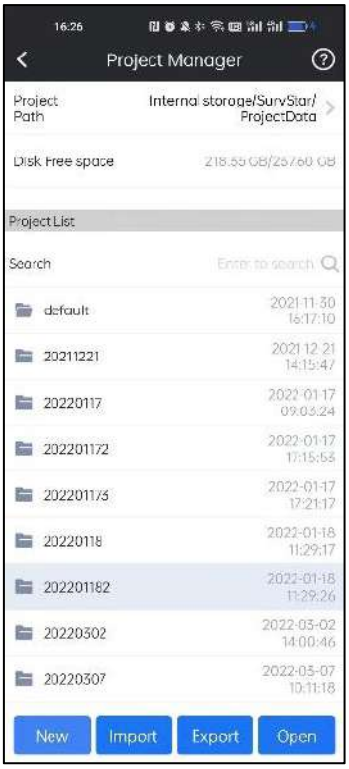
Search Project:

In Project Manager-Project List, we can search projects we created before.



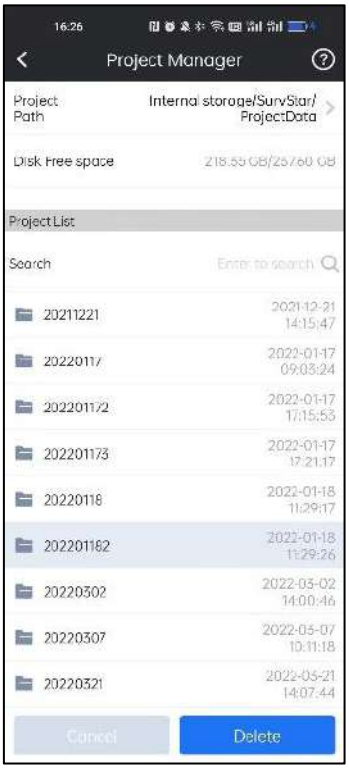
Open Project:

Choose the project, Click Open, then the project selected will be opened.



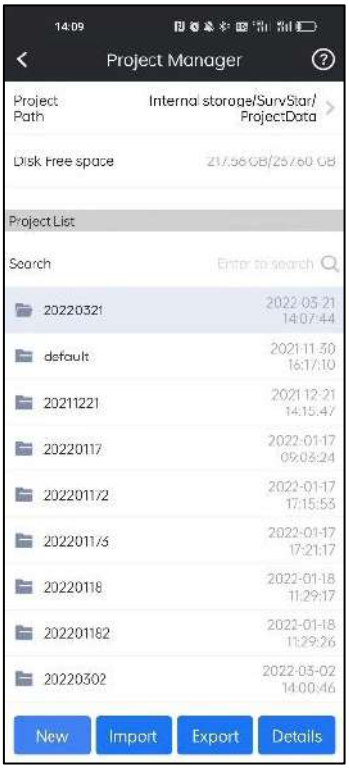
Delete project:

Long press for 1 second, the toolbar below will display delete button, click Delete, and this project will be deleted.



Create new project:

When we run SurvStar, we need to create a project and define basic information such as project name, operator and coordinate system type.



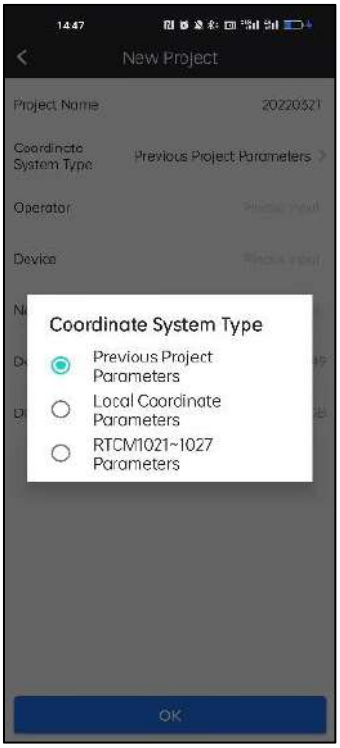
New Project:

1.Click New to create a new project.

2.Input the Project Name. If we input nothing, it will show the tip.

3.Choose coordinate system type. There are three types we can choose: Previous

Project Parameters, Local Coordinate Parameters and RTCM1021~1027 Parameters.

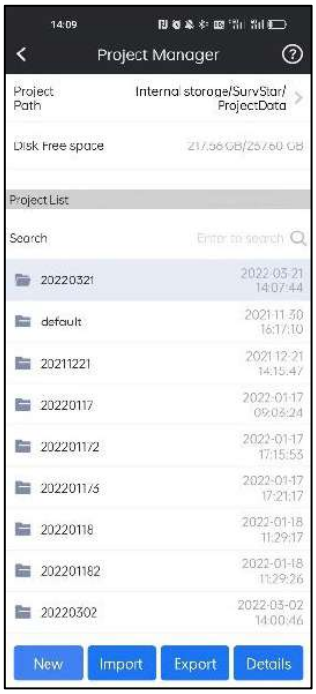


4.Complete other information of the project.

Import Project:

If projects from other controllers are copied into survStar/ProjectData, we can open them directly; if they are copied into other directory, we can import them by loading their project file (*.configure).

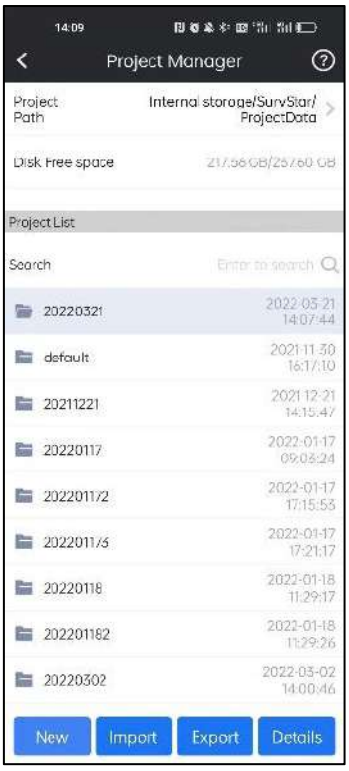
1.Click Import in Project Manager.



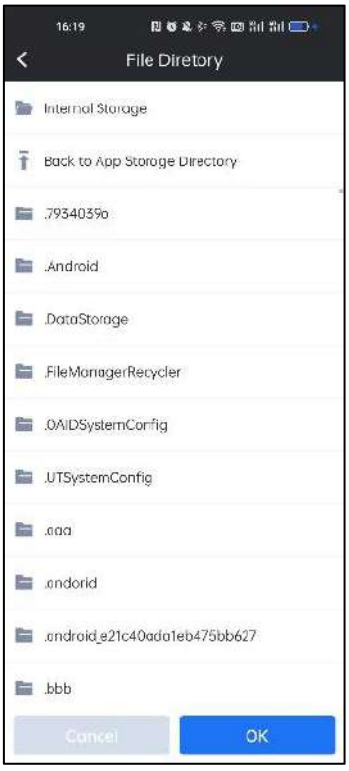
2.Find the target project folder, choose the project file (*.configure) saved before, and click OK. Then the project will be opened.

Export Project:

1.Click Export in Project Manager.

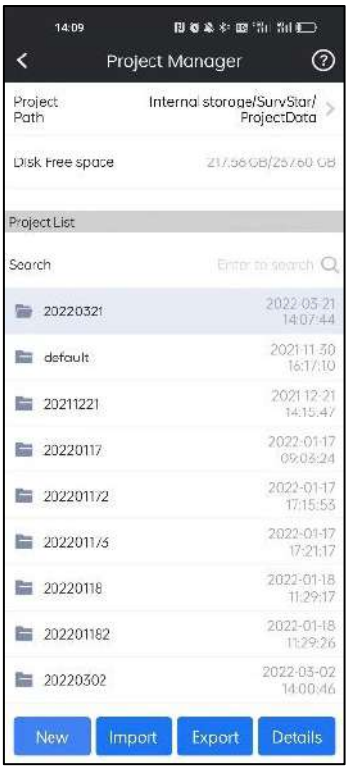


2.Choose the directory we want to save the project. Click OK. Then the project will be saved.



Project Details:

1.Choose the target project, and Click Details.



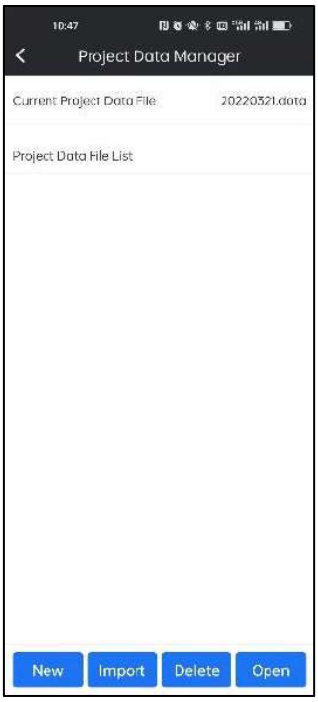
2.We can find relevant project information, such as Project Name, Coordinate System type and so on.

3-2 Project Data Manager

With that function we can manage the surveyed data. We can create, import, delete and change the surveyed data.

New Project Data:

1.Click New.



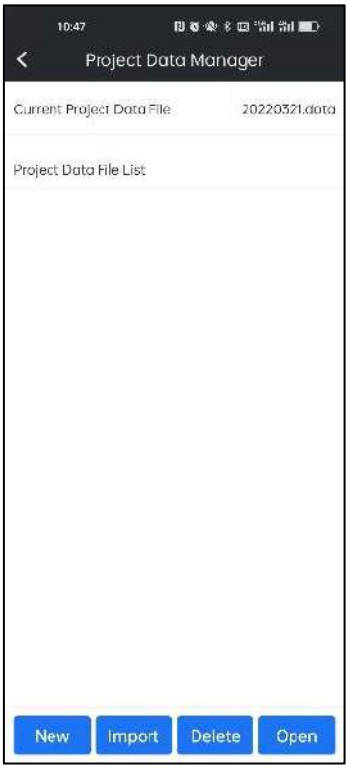
2.Input the name of the new project data and click OK.

3.The new project data created successfully.

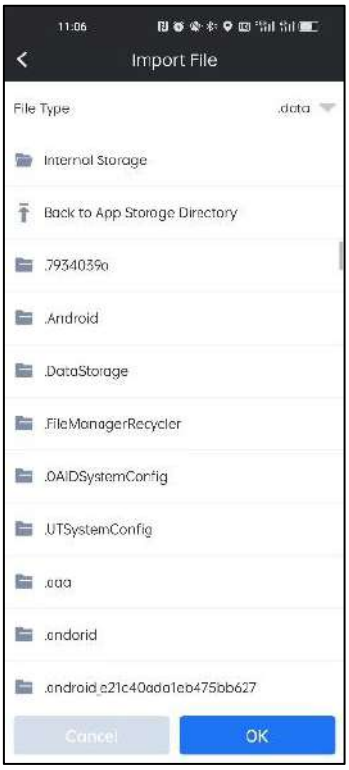
Import Project Data:

We can import the project data from the file (*. data).

1.Click Import.

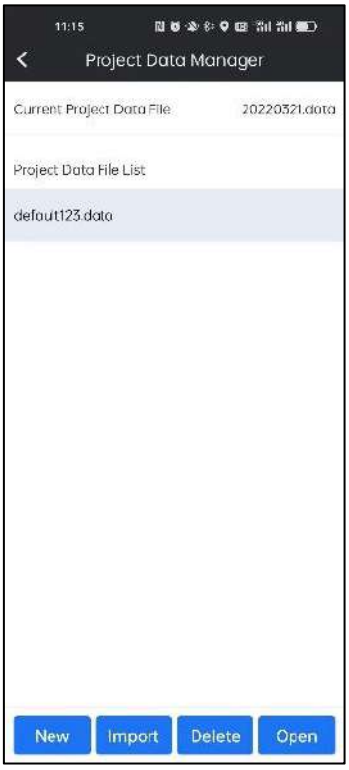


2.Find the correct location of the project data file and choose that file we wanted. Click OK.



Delete Project Data:

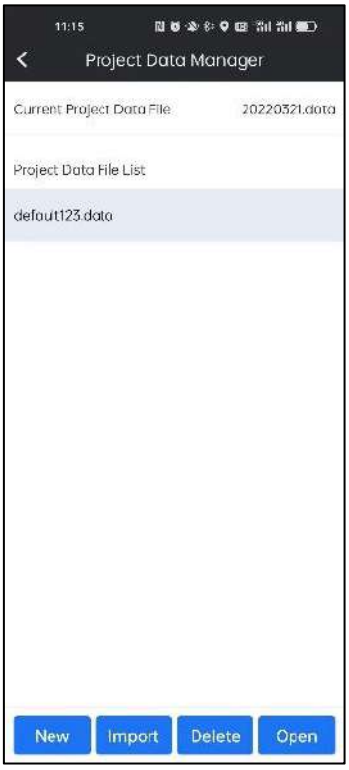
1.Choose the project data we wanted to delete. Then click Delete.



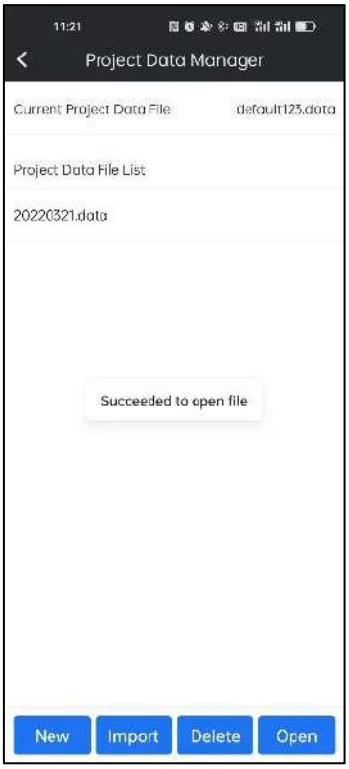
2.Click OK. The project data file will be deleted.

Open Project Data:

1.Choose the project data we wanted to open. Then click Open.

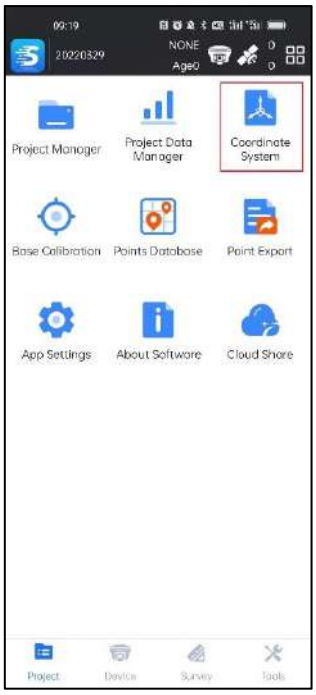


2.Then the chosen project data is opened.

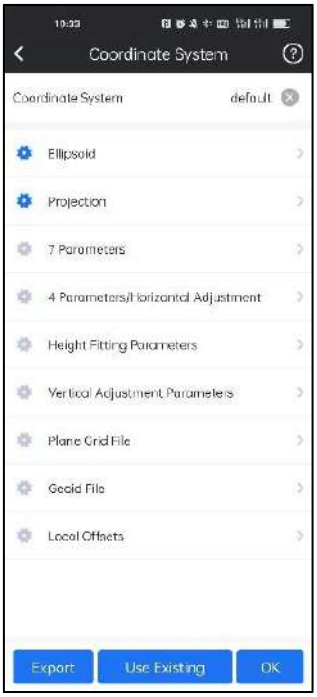


3-3 Coordinate System

Click this icon to enter this function.

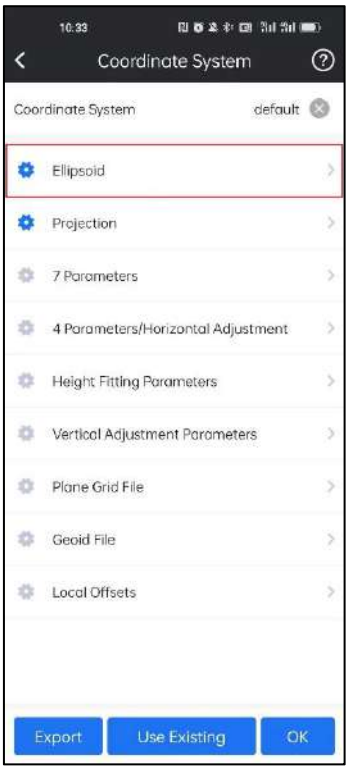


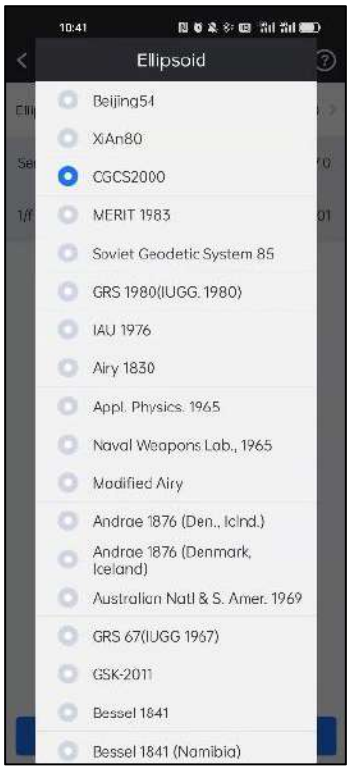
In coordinate system, we can create new coordinate system by defining the name, ellipsoid, projection, 7 parameters, 4 parameters, height fitting parameters, vertical adjustment parameters, plane grid file, geoid file and local offsets.



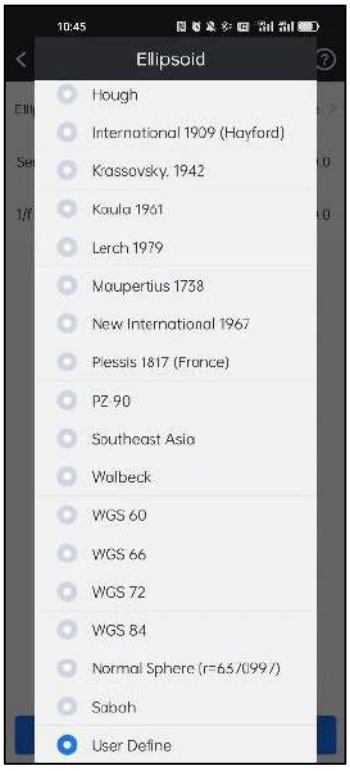
Ellipsoid:

1. In Ellipsoid, we can define the existing Ellipsoid for current project.



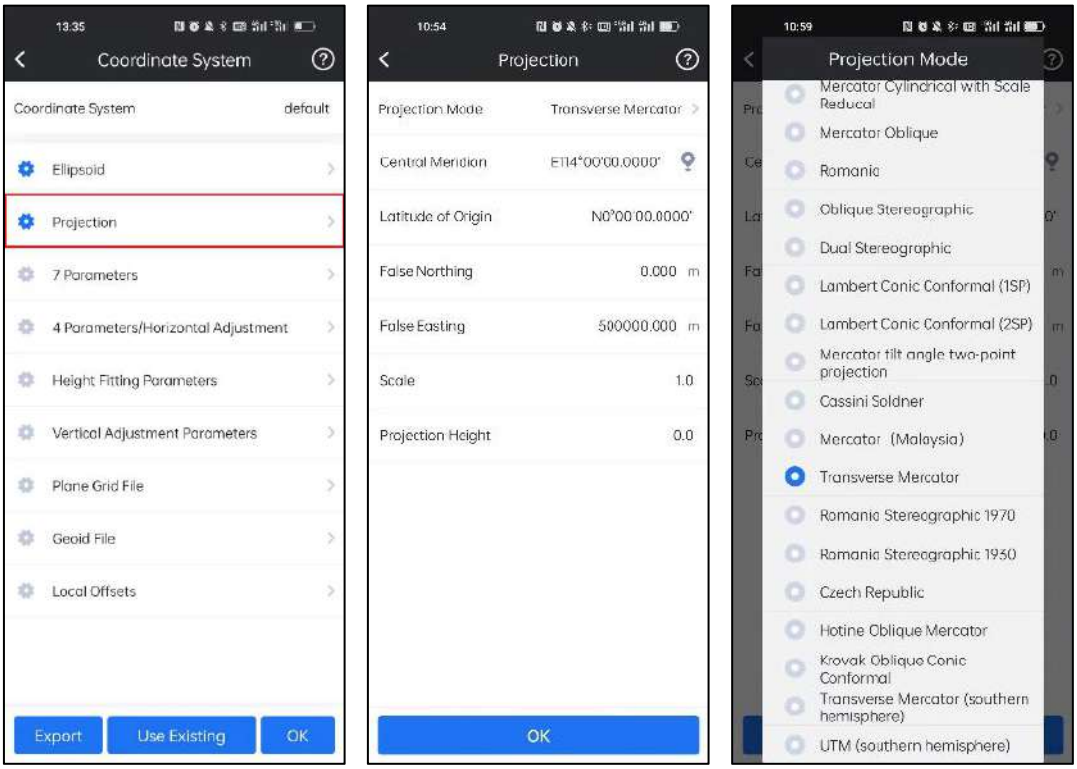


2. Also in User Define, we can define the ellipsoid by inputting Semimajor Axis and 1/f parameters.



Projection:

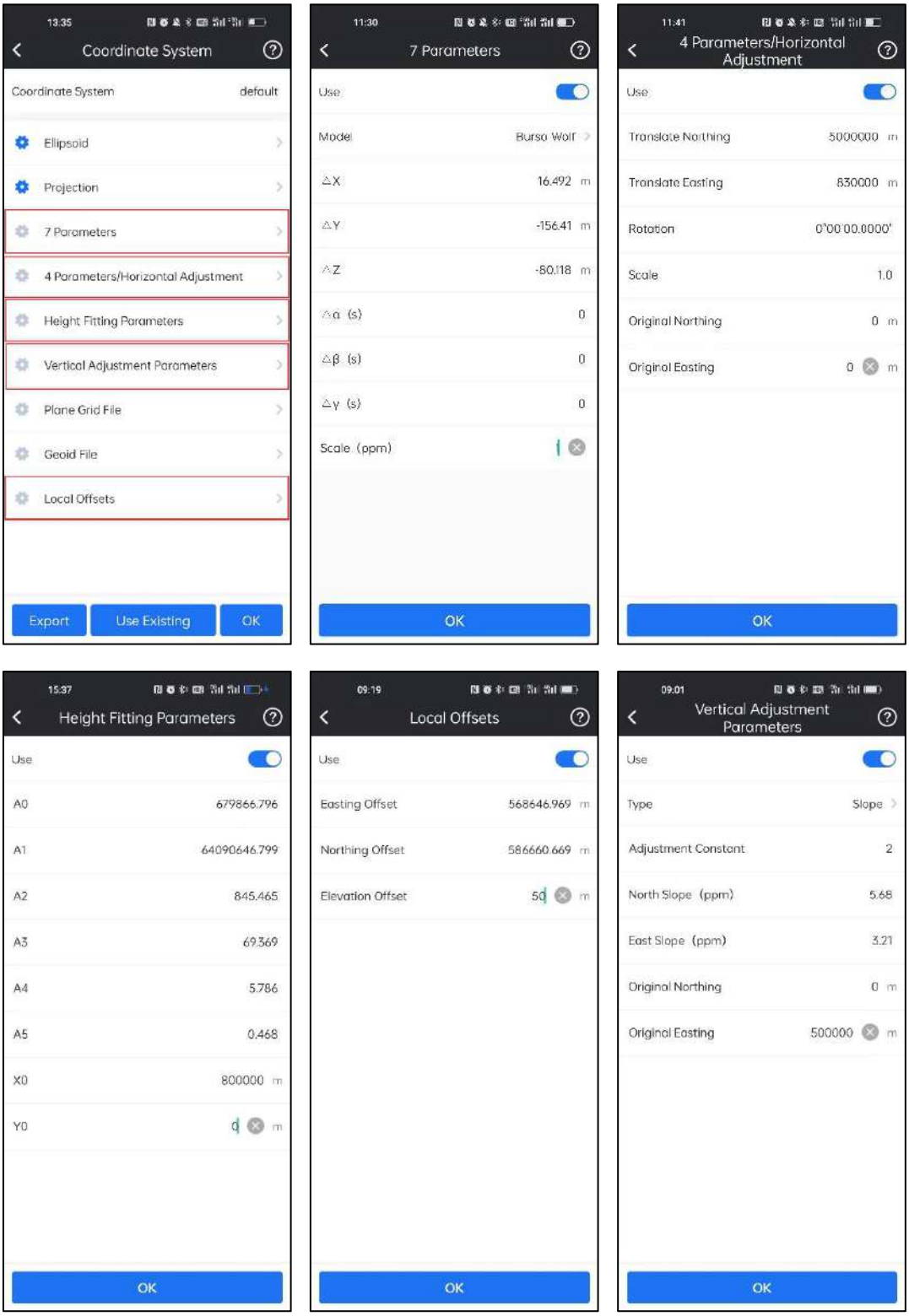
In Projection, we can define relevant projection parameters such as Projection Mode, Central Meridian, Latitude of Origin and so on.



Note: We can acquire Central Meridian of current position by clicking  .

Coordinate Parameters:

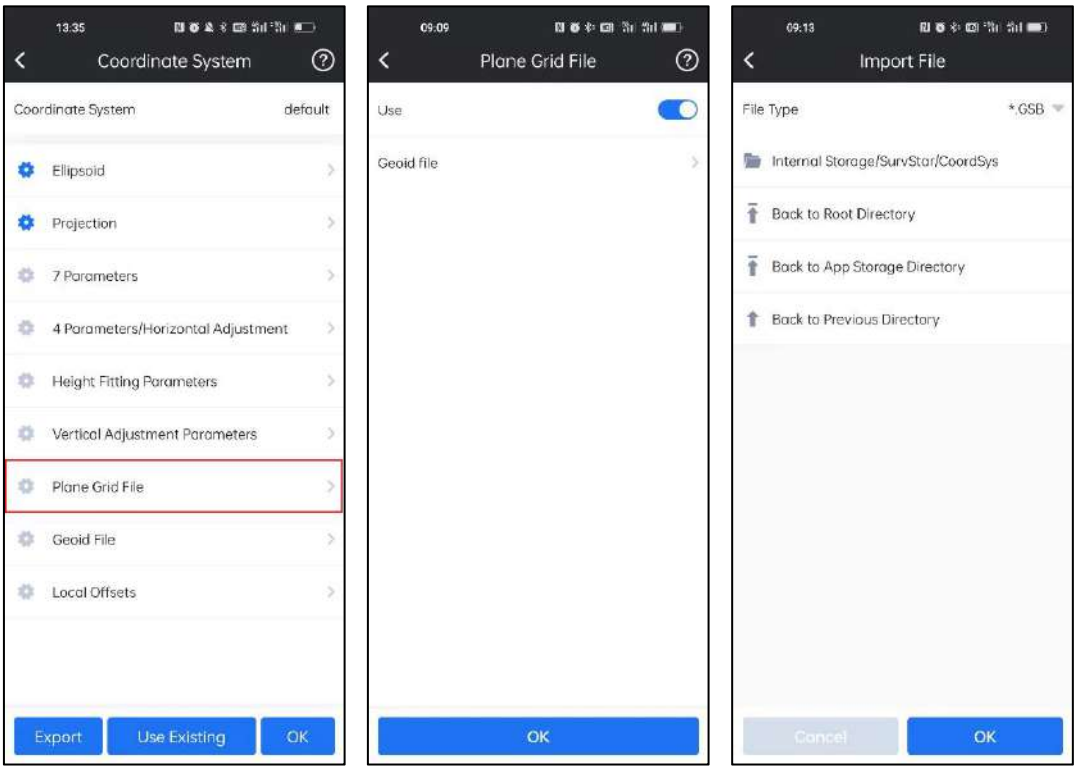
Also we can define 7 Parameters, 4 Parameters, Height Fitting Parameters, Vertical Adjustment Parameters and Local Offsets.



If the function is enabled, the icon in front of it will turn to .

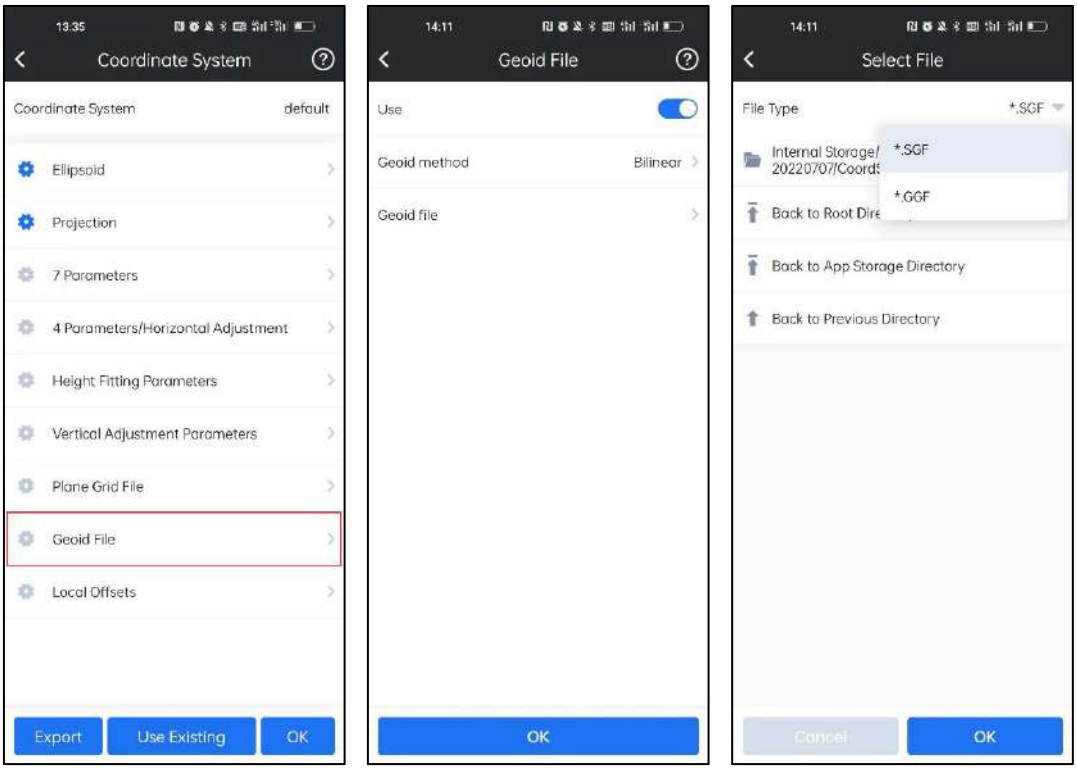
Plane Grid File:

In Plane Grid File, we can add *.GSB format file to adjust plane coordinates.



Geoid File:

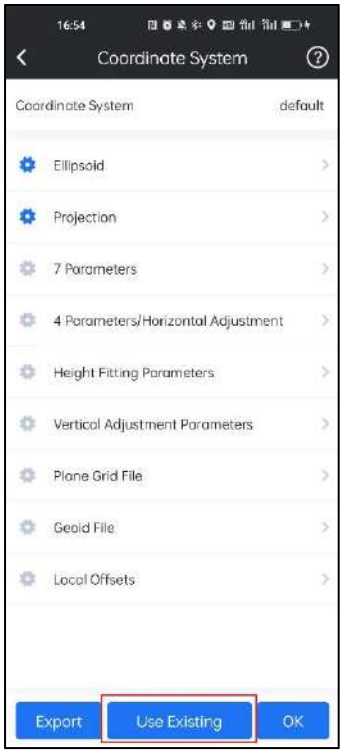
In Geoid File, we can add *.SGF or *.GGF format file to adjust elevation coordinates.



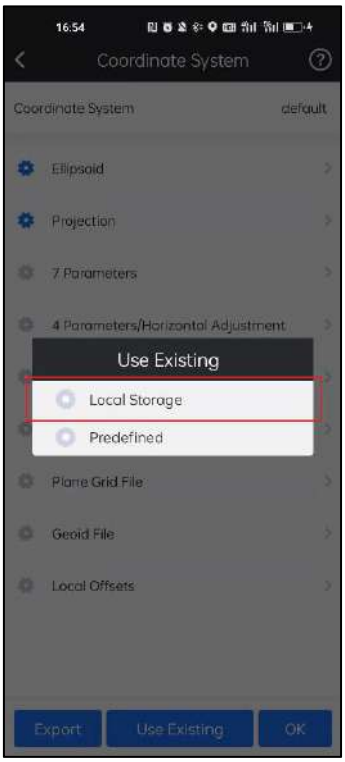
Use Existing File:

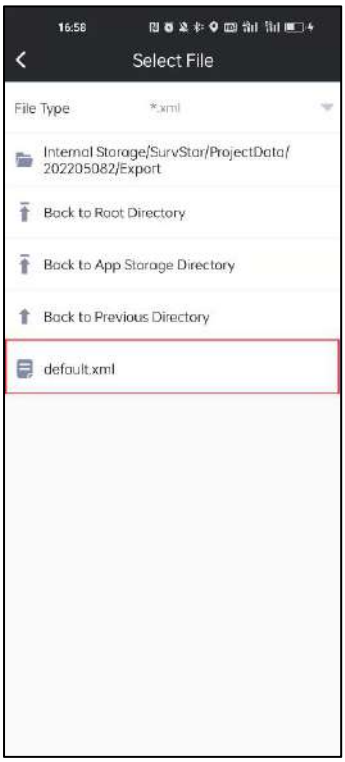
We can click Use Existing to select and apply the existing predefined coordinate

system or use the coordinate system file (*.xml).



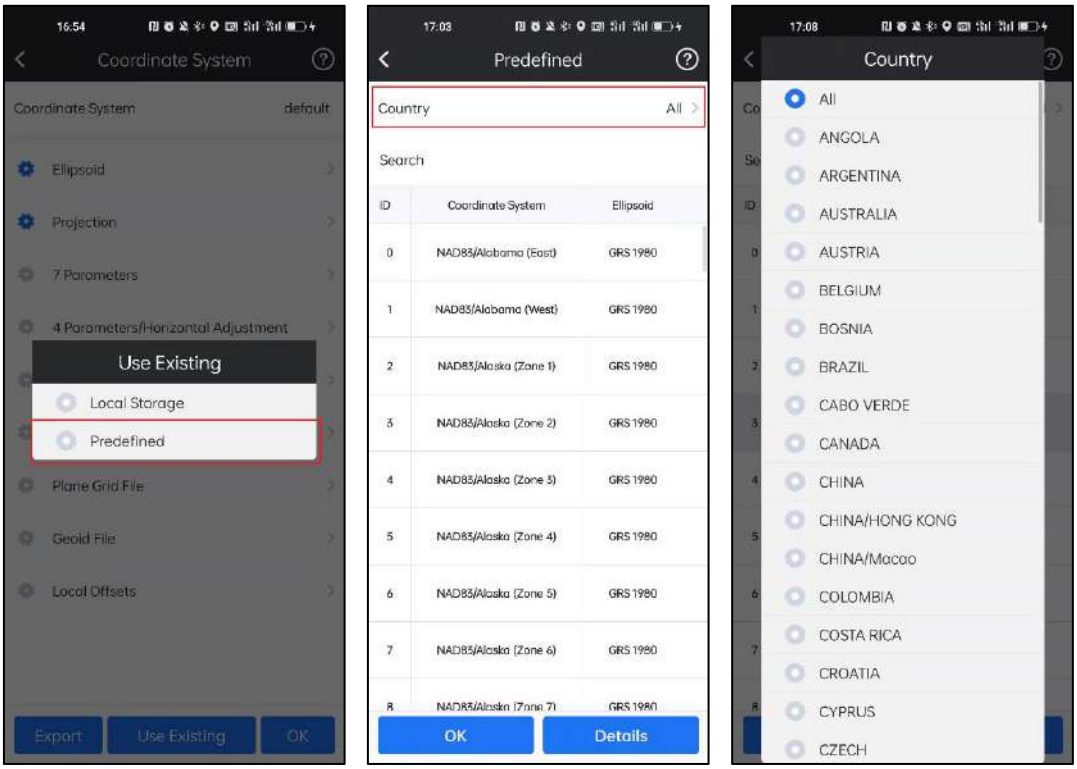
Click Local Storage, find the coordinate system file (*.xml) and click it, the coordinate system will be applied.



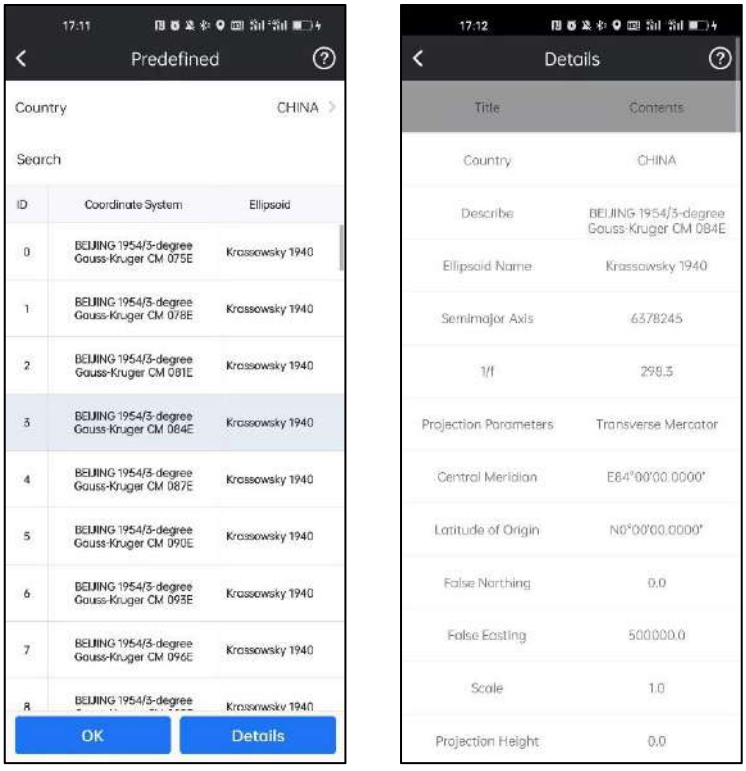


Click Predefined, then click Country and select the country or region (Alphabetical)

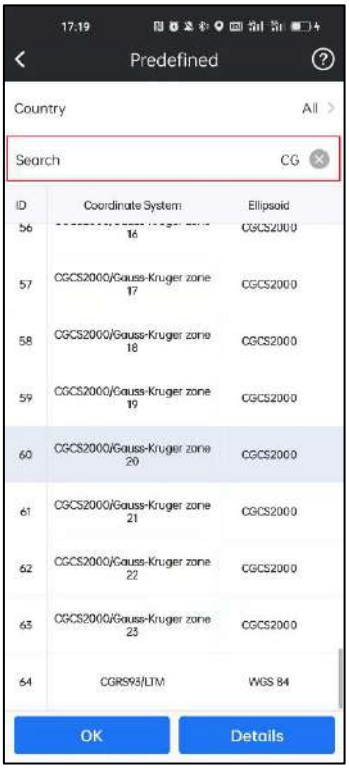
where the needed coordinate system is located.



Then select the needed coordinate system and click OK to apply it, we can click Details to check its information.

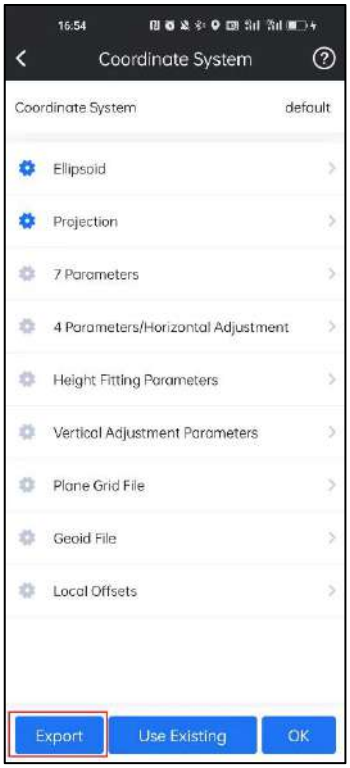


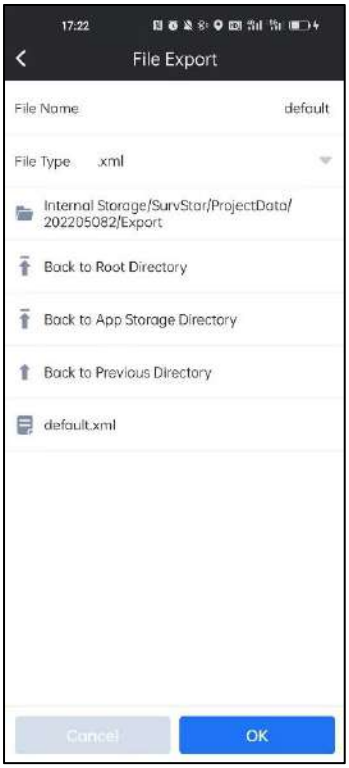
We can also search coordinate system with keywords in Search bar.



Export:

If we need to save the coordinate system in file, we can click Export, input File Name, select the path to save it and click OK, the coordinate system file will be exported.





3-4 Base Calibration

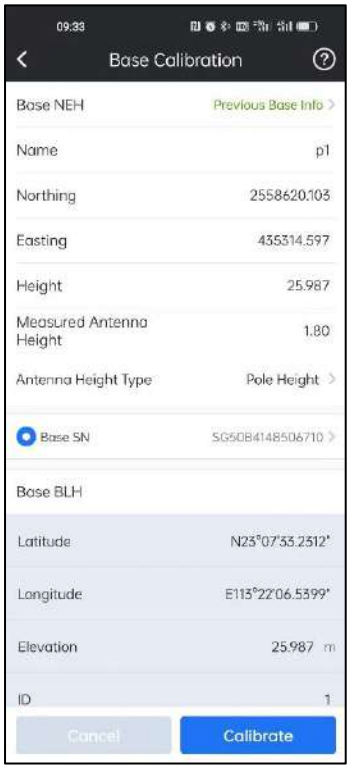
We can calibrate the base coordinate using this function.

There are two ways to calibrate: one is Base on Known Point Calibration, set up base on a known point, and when rover gets fixed solution, input known point coordinates to calibrate; the other is Base on Unknown Point Calibration, set up base on an unknown point, when rover gets fixed solution, put rover on a known point and known point coordinates to calibrate.

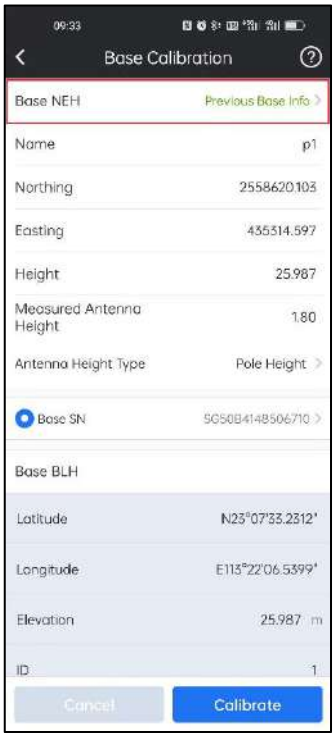
Base on Known Point:

Set up base on a known point, after rover gets fixed solution, we can start do the calibration.

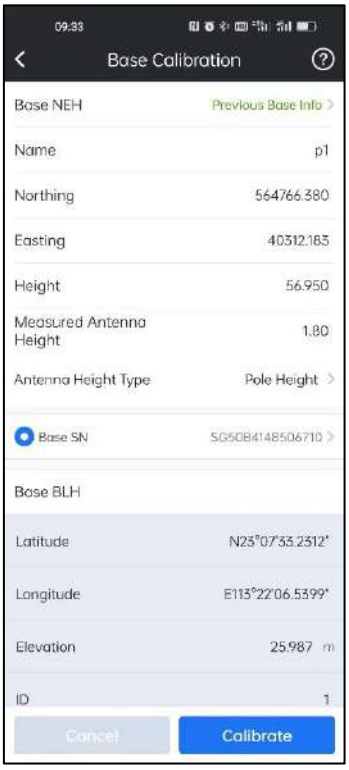
1.Choose Base on Known Point, and click Next.



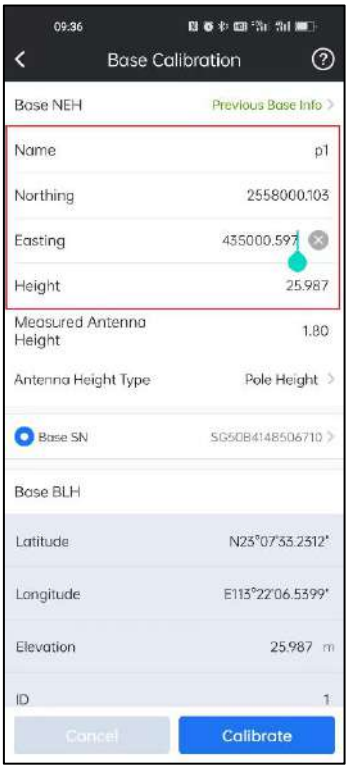
2.In this page, we can click Base NEH to find the historical base station information.



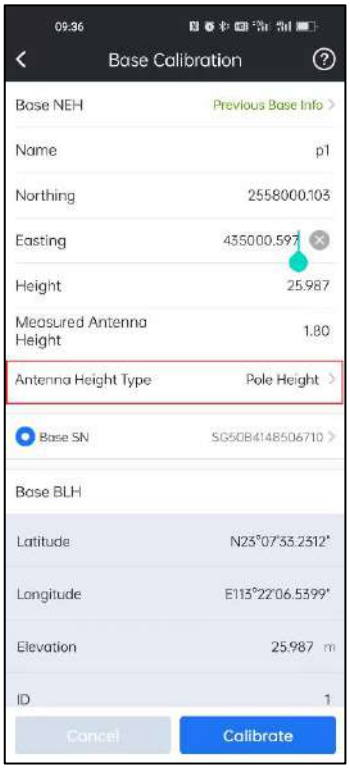
3. Find the right historical base station, and click Choose, then the relevant coordinates information will be applied.

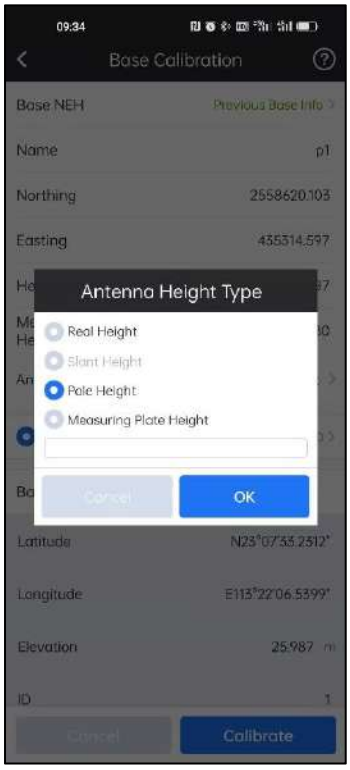


4. Also we can input base information manually.

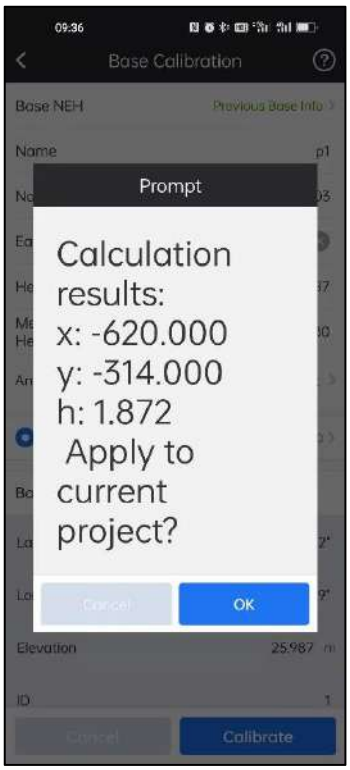


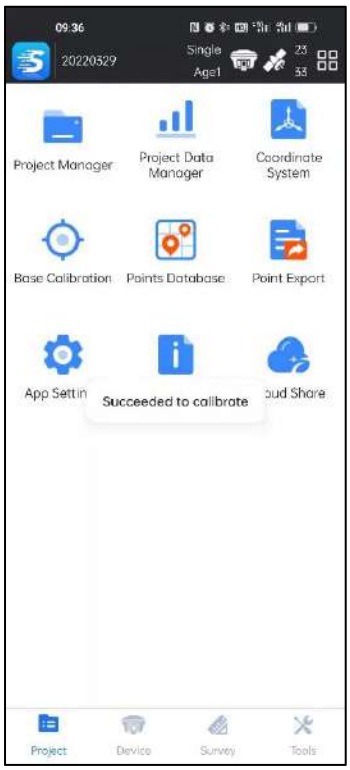
5. Then we can select right antenna type and input relevant antenna height.



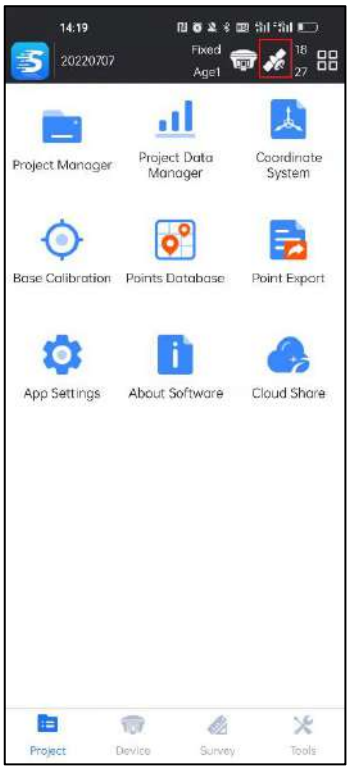


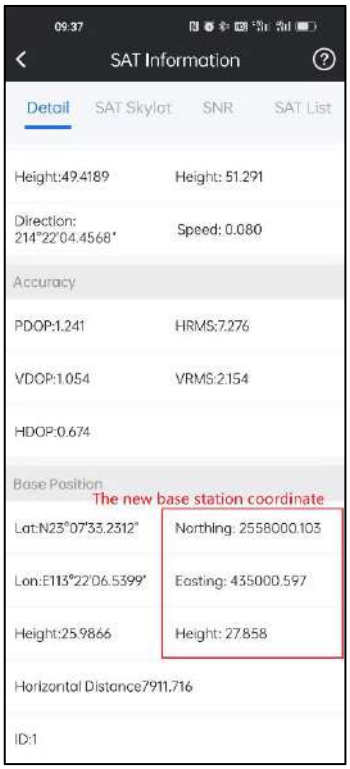
6.Click Calibrate and then there will be a popup to show the calculation results. Click OK then the results will be applied.

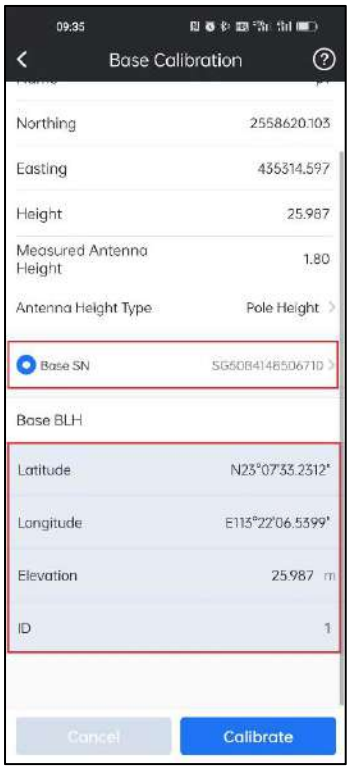




7. And then in SurvStar, we can go to SAT Information, find the base position has been changed.







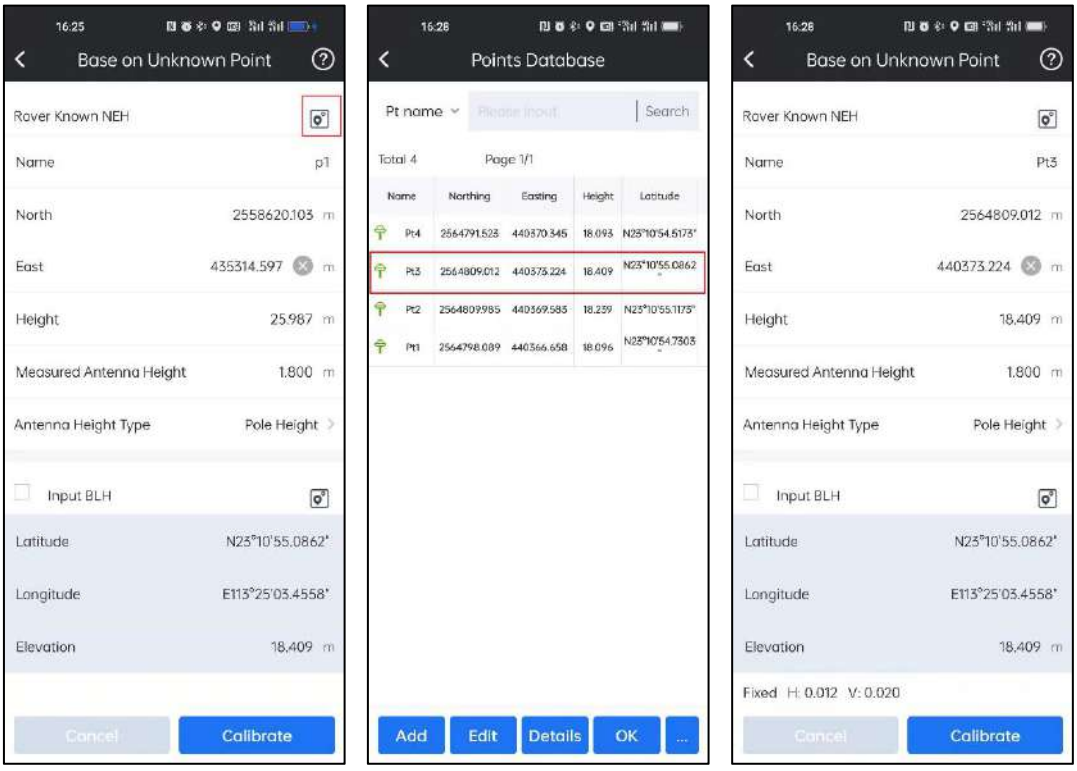
Base on Unknown Point:

Set up base on a unknown point, after rover gets fixed solution, we move rover on a

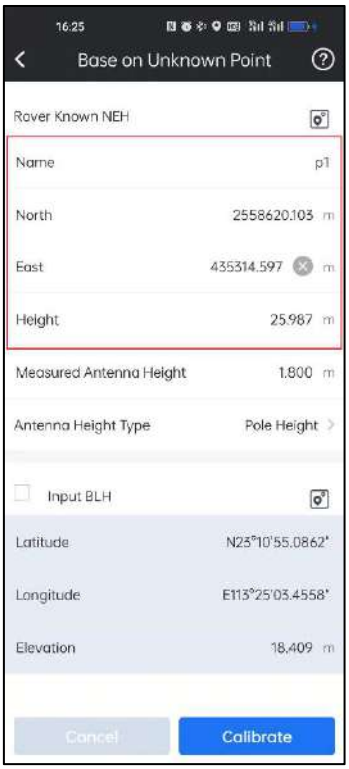
known point and then start calibration.

Choose Base on Unknown Point. And Click Next.

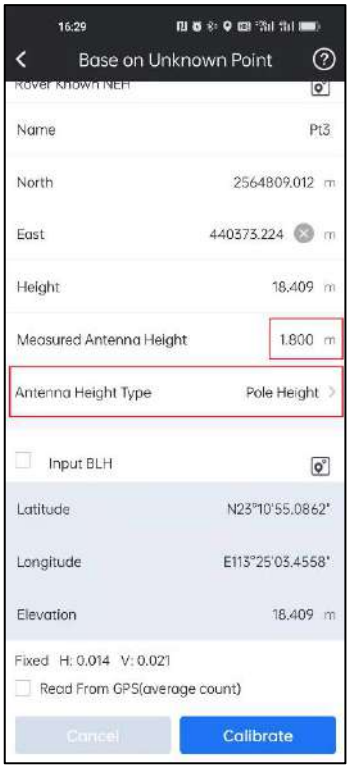
2. We can input the known points coordinates by selecting it from data base (if it is in the Point Data base).

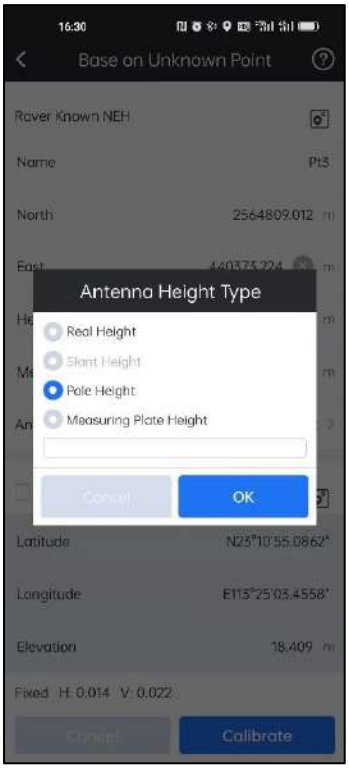


Or we can input NEH information manually.



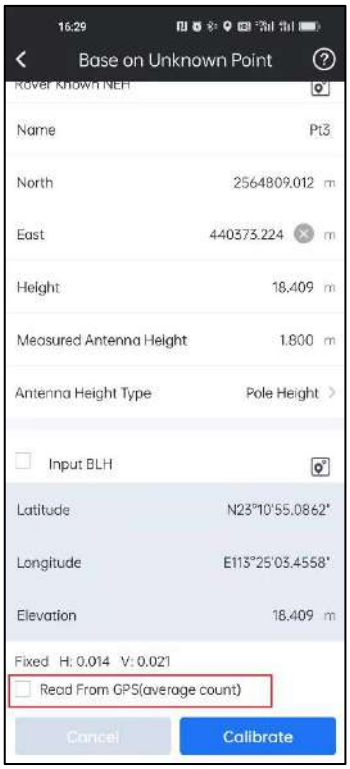
3. Then we can select right antenna type and input relevant antenna height.

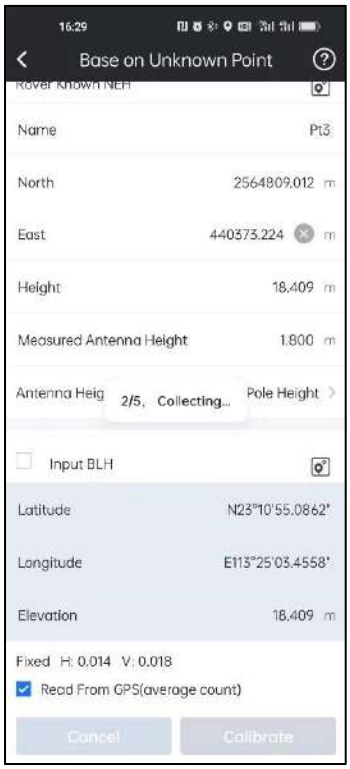




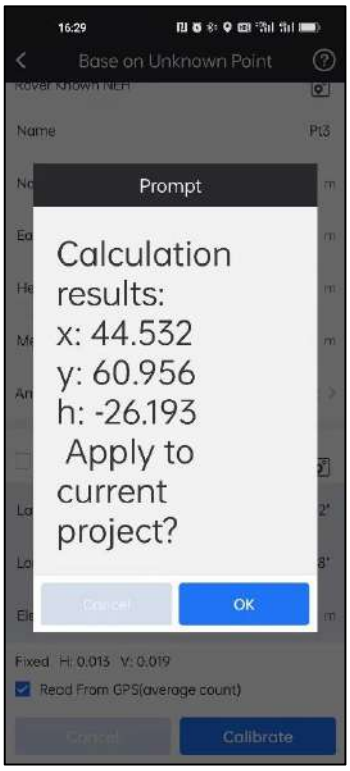
Then click Calibration to calculate the calibration parameters.

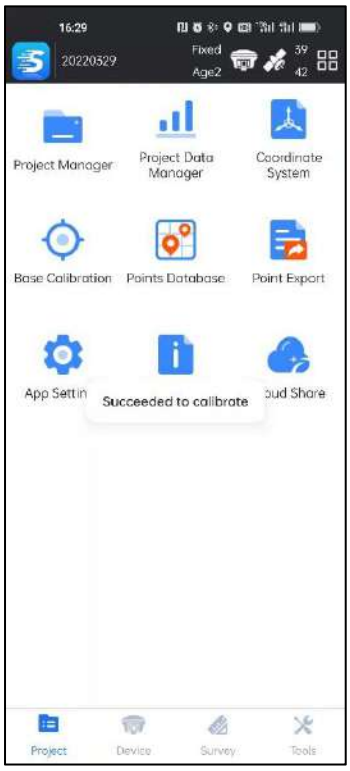
Note: we can acquire current position's BLH automatically here. if ReadFrom GPS(average count) is enabled, then SurvStar will collect current position's BLH for 5 times and take the average value.



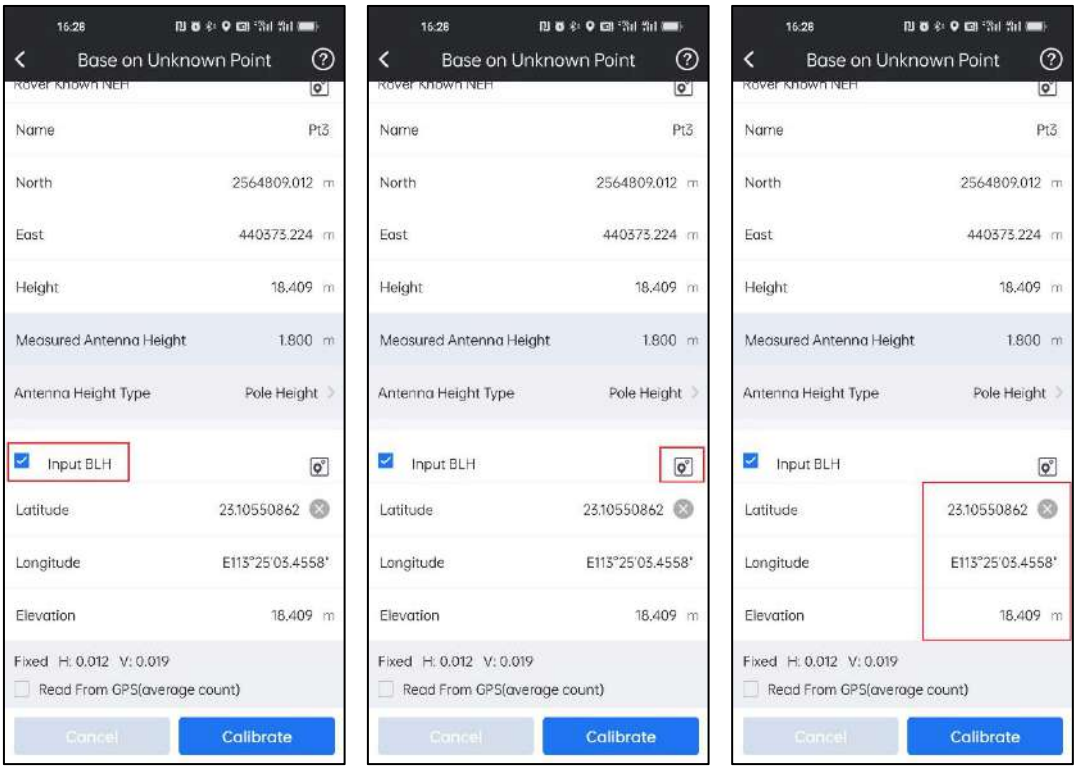


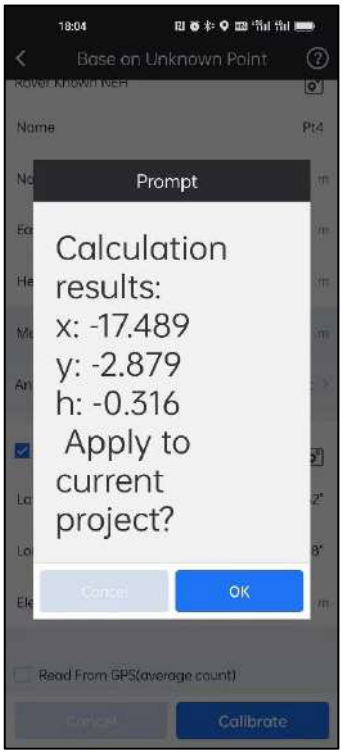
It will show the calculation results, and click OK To apply the result.

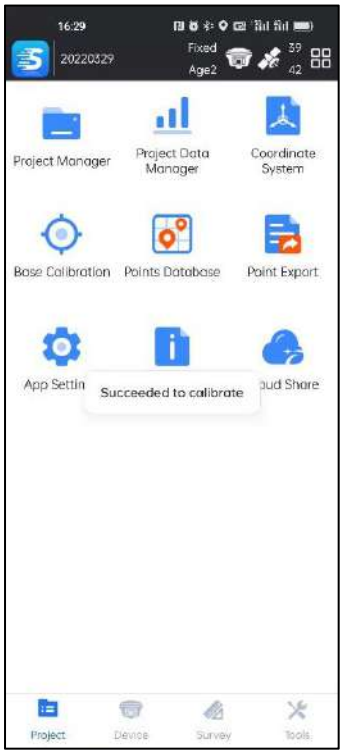




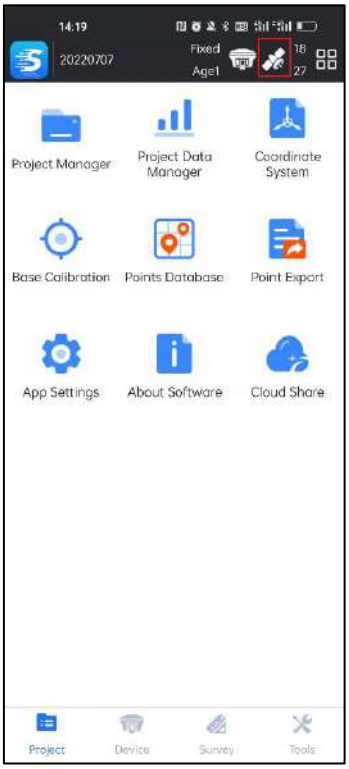
Note: if we enable Input BLH here, we can input current BLH manually or get it from Point Database directly.

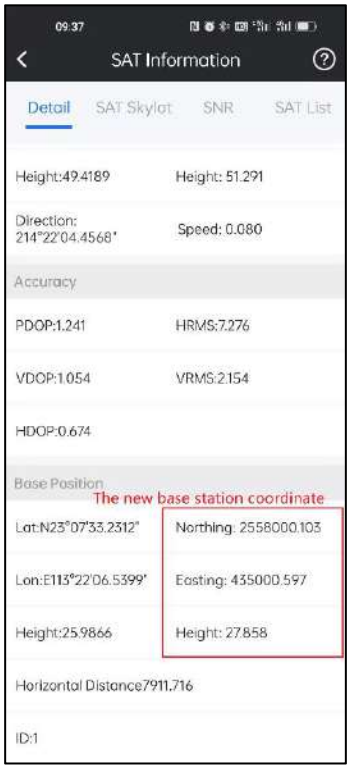






And then in SurvStar, we can go to SAT Information, find the base position has been changed.





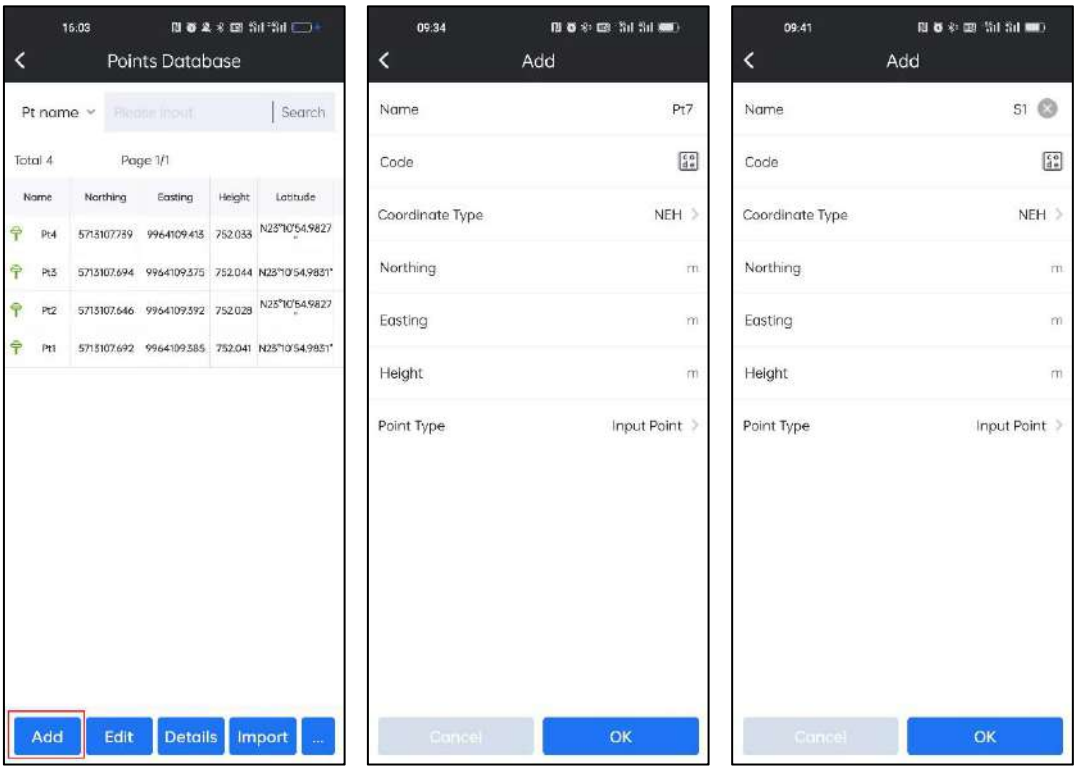
3-5 Points Database

In Points Database, we can manage points by Add, Edit, Check Details, Import and other operations.

Add:

Click Add, we can input points coordinates manually here and add it to the Database.

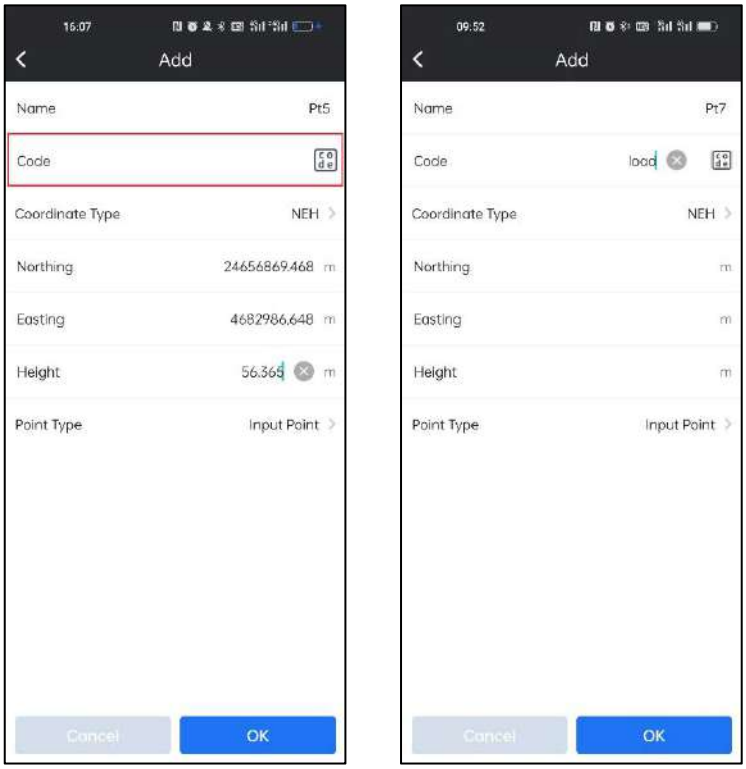
Firstly, we need to define the Point Name.



Then the Code:

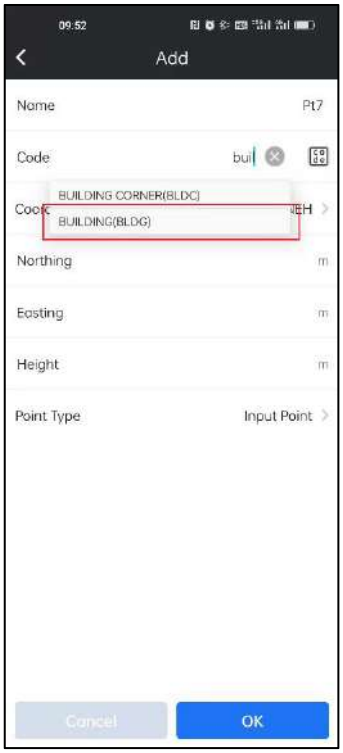
If we don’t need Code property, we can leave it blank.

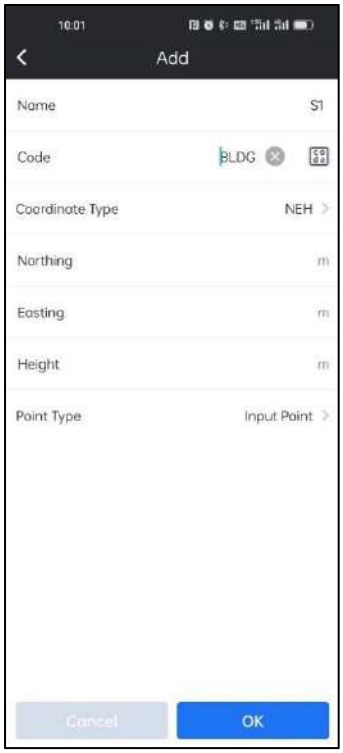
If we plan to attach Code property to the point, we can input code directly.



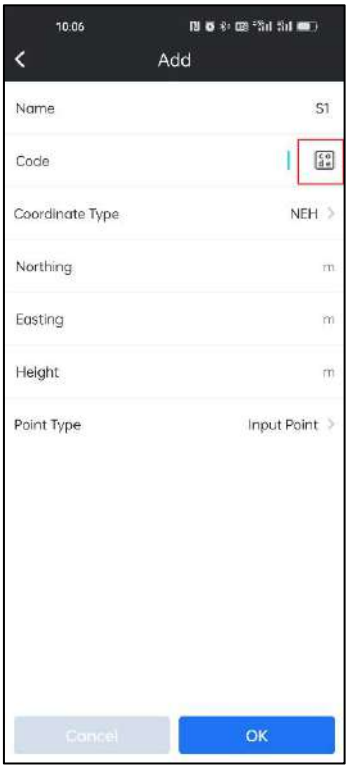
There are predefined codes in the data base, by searching and selecting, we can try

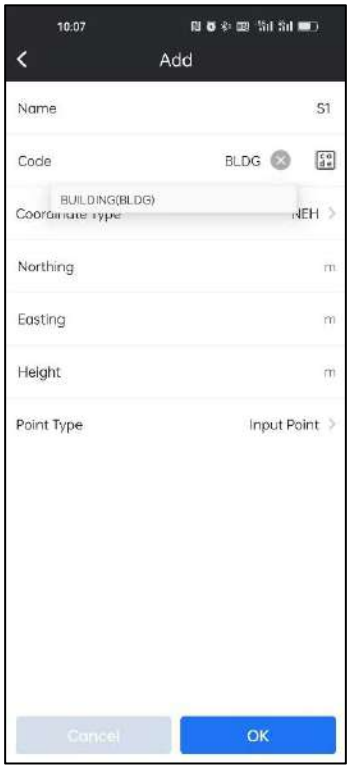
to find the code we need.



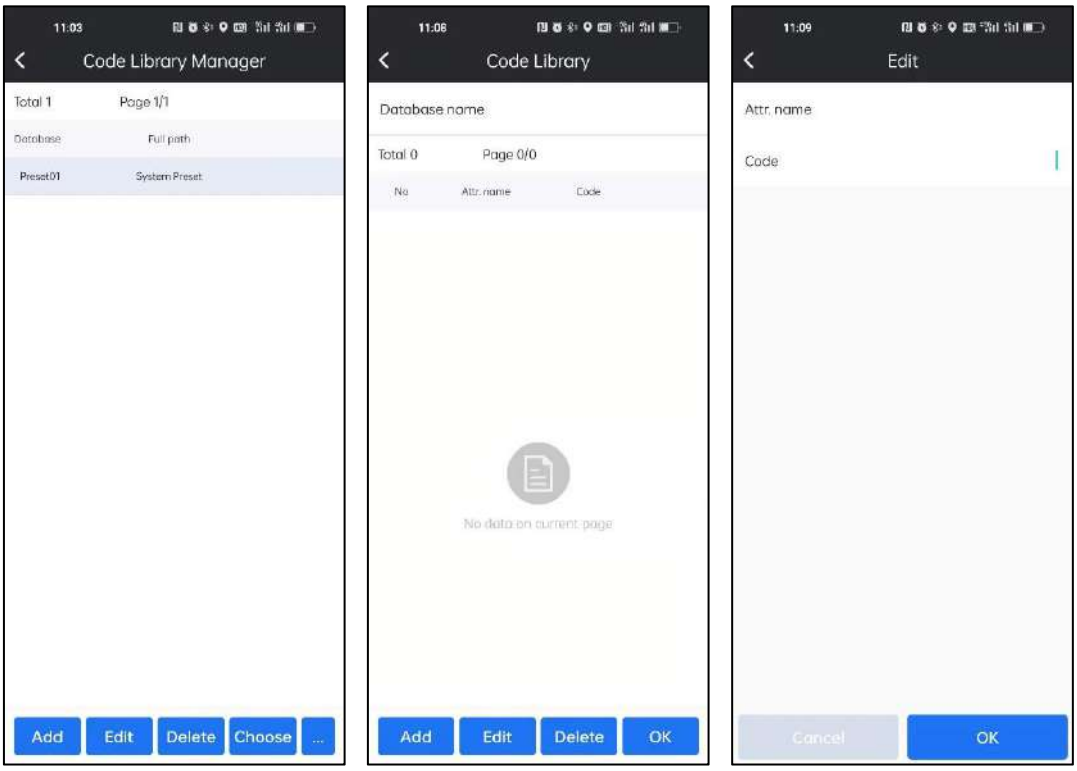


If we want to check the predefined code data base, we can click the icon to access.

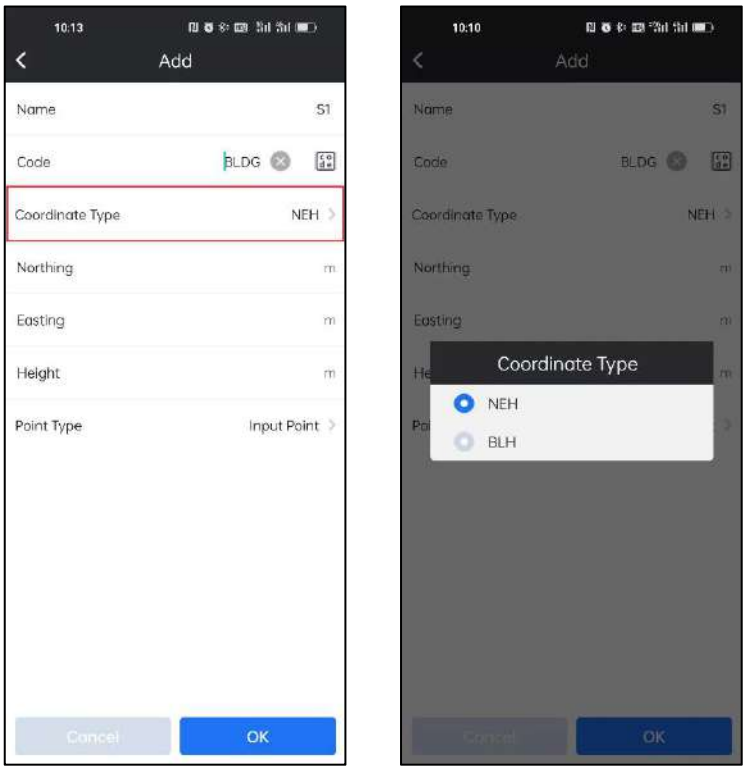




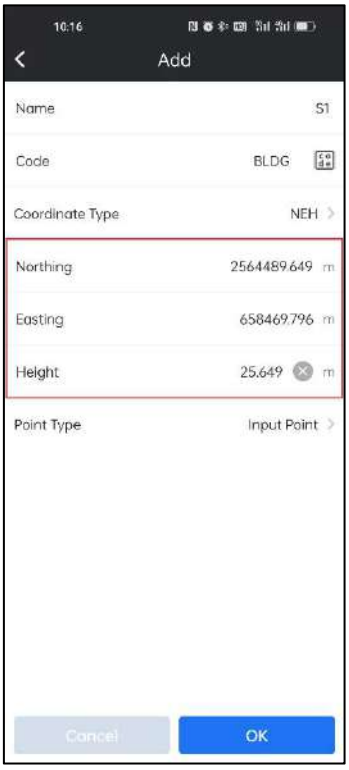
In Manage. We can manage the code database. It includes Add, Edit, Delete, Choose and Import. Click Add to add a code library. We can create the code we need.



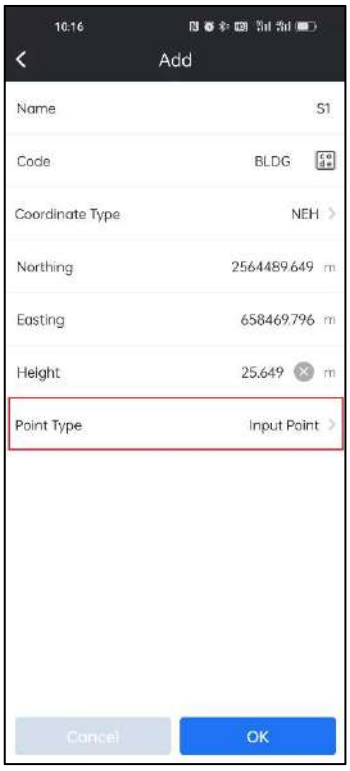
Then we need to choose the Coordinate Type. There are two types: NEH and BLH.

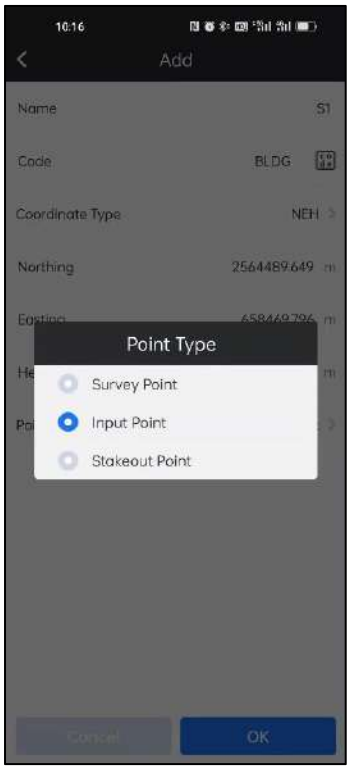


Then we can input the coordinate of the point.



Then choose the point Type. There are three types: Input Point, Survey Point and Stakeout Point.

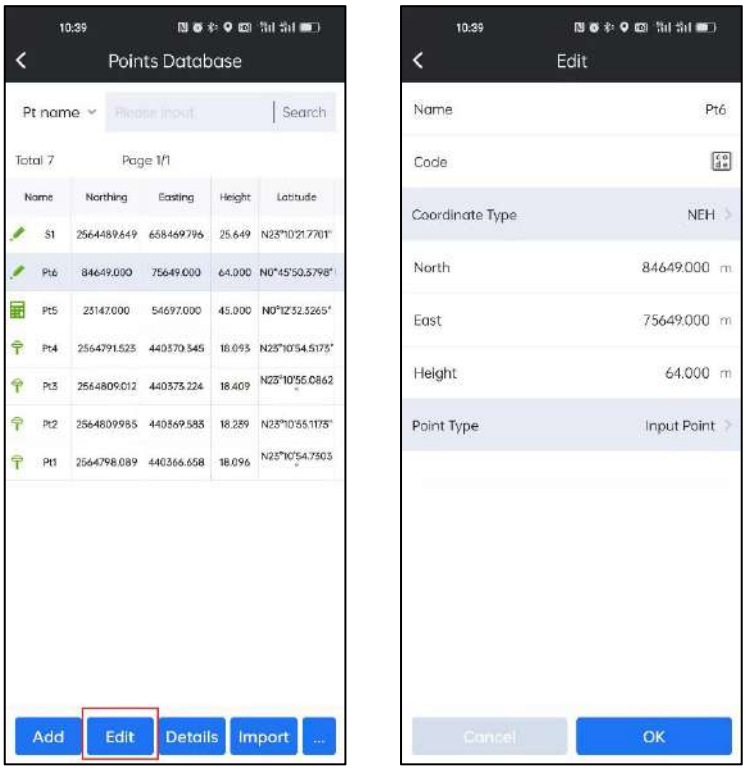




Click OK. The new point is created in point database.

Edit:

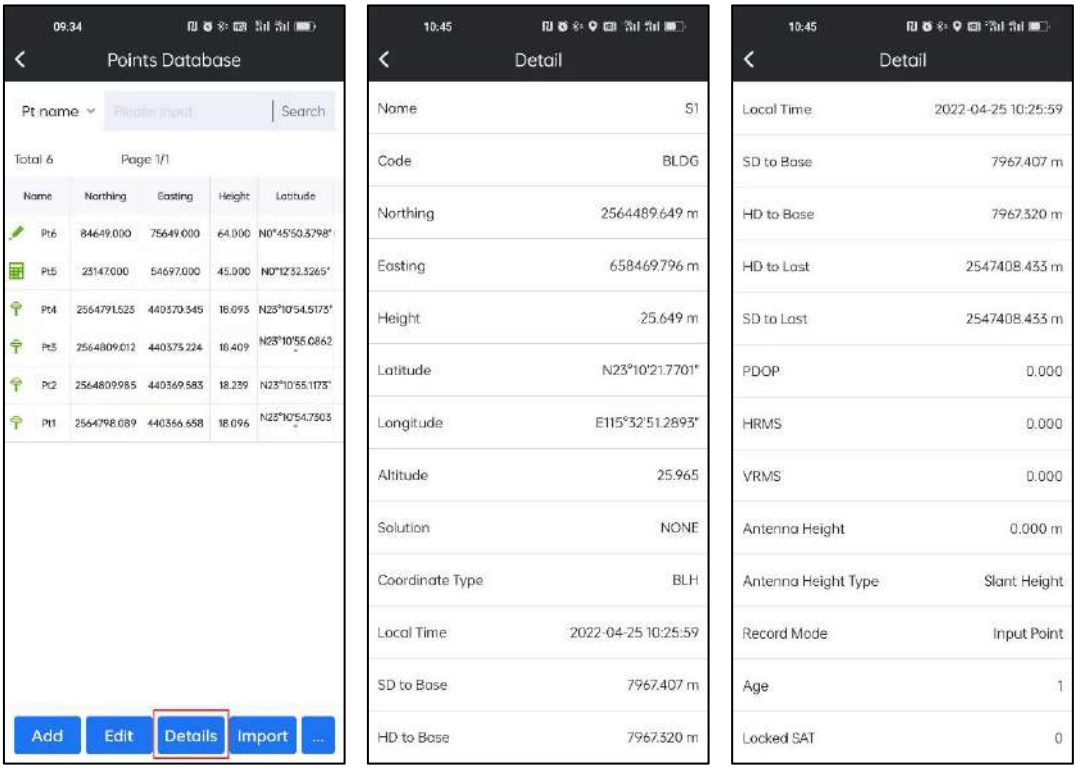
Select the point we want to edit and click Edit. We can edit the coordinate, code and name of the selected point.



Note: for Survey Points and Stakeout Points, we can only edit Point Name and Code.

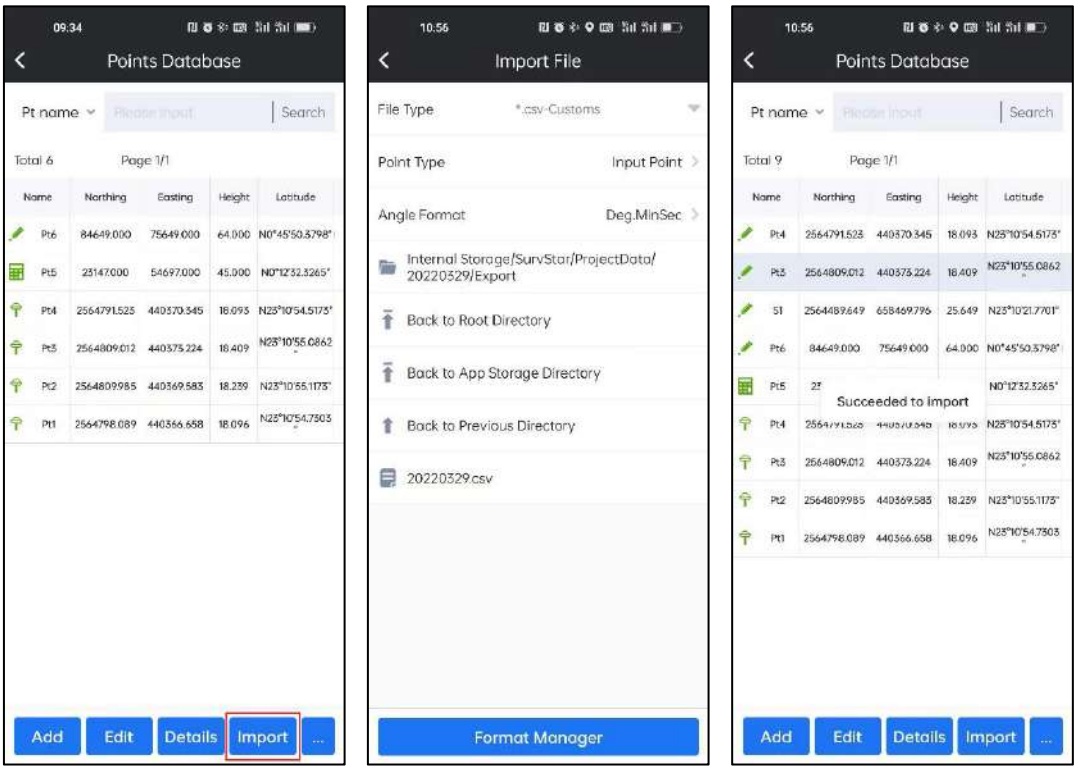
Details:

Select the point we want to check and click Details. We can check the details of the selected point.

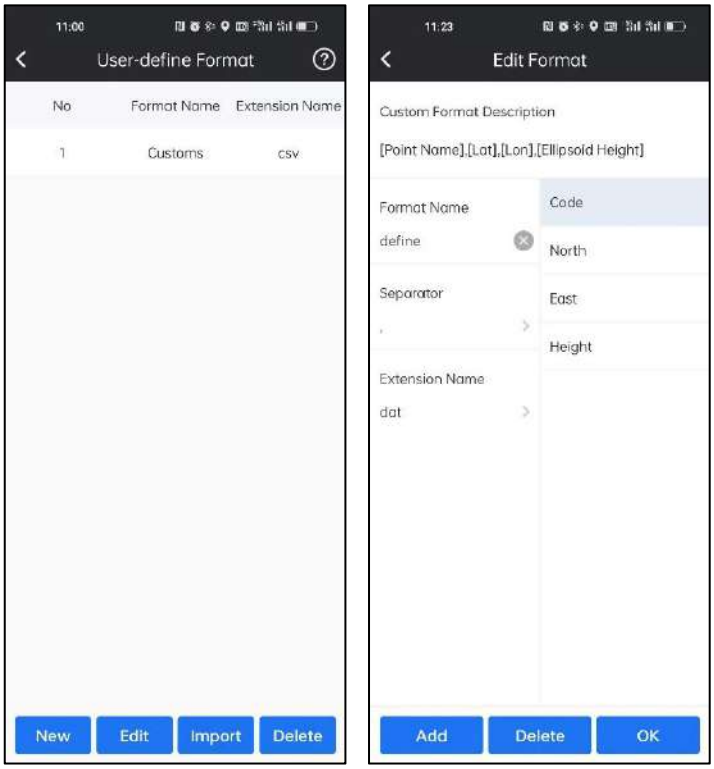


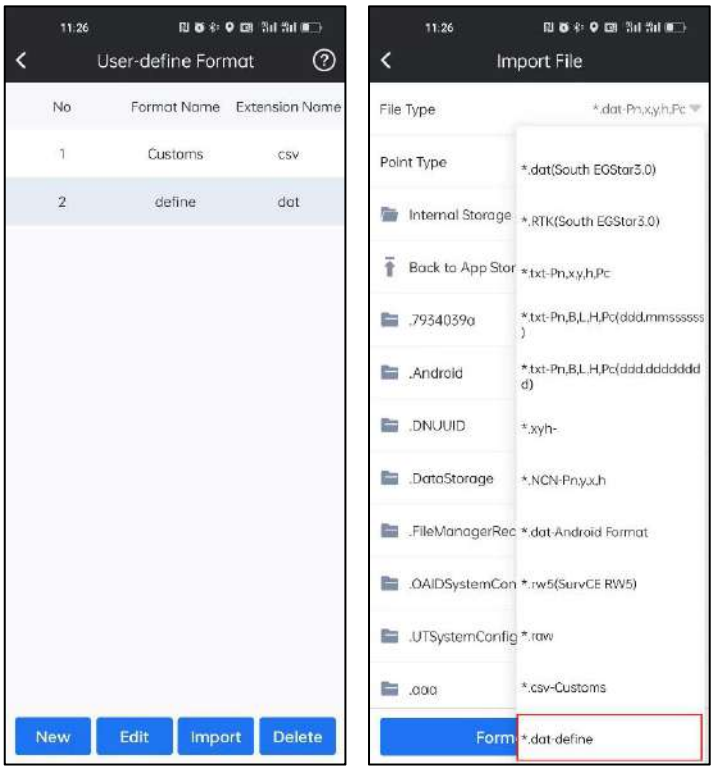
Import:

We can import points to Points Database Directly. When we import file, in Format Manager, we need to select the Import File Format, Point Type and Files Directory, then we can find the target file and load those points to Point Database.



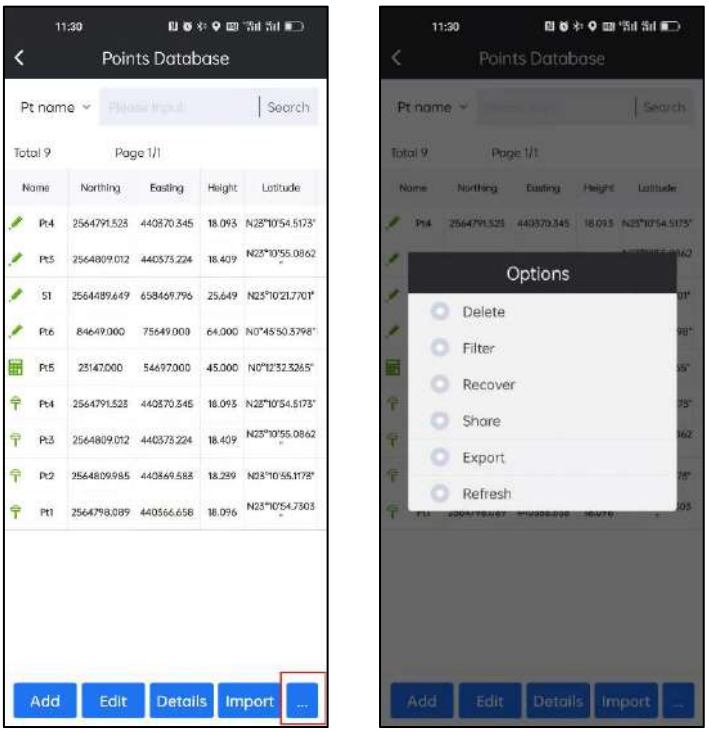
In Format Manager, we can define the imported file's format and contents. Then when we import files to SurvStar, we just need to get the relevant format file, and import it directly.





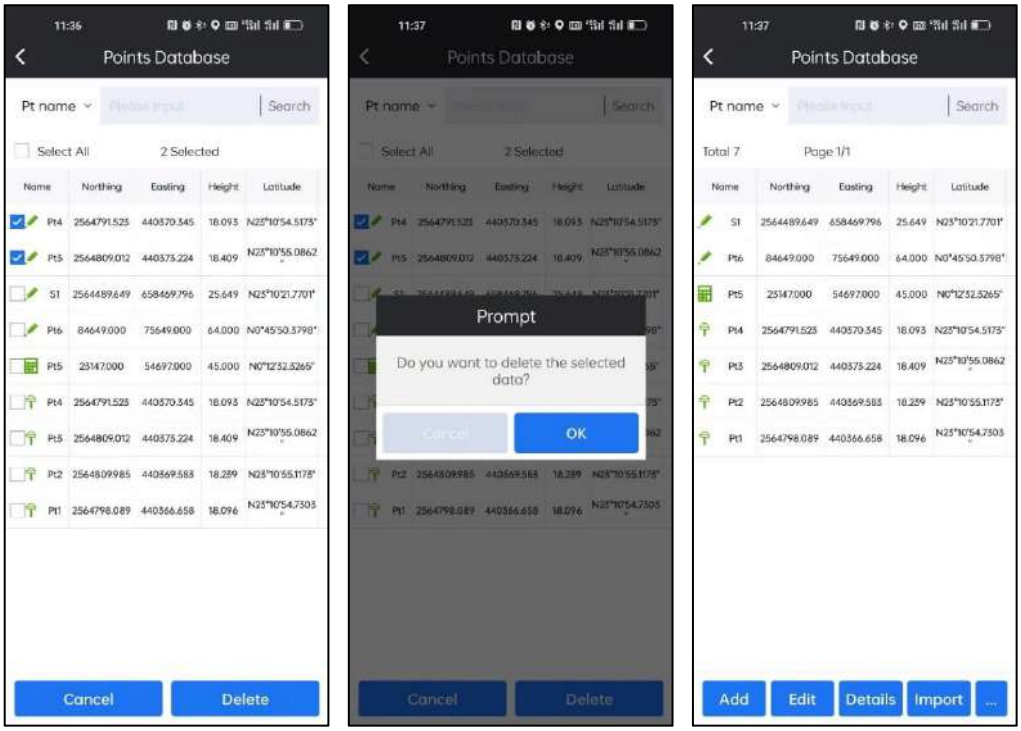
Options:

Besides basic, Add, Edit, Details and Import functions, by Clicking ... in the right of the tool bar. Then we can use the other function as Delete, Filter, Recover, Share, Export and Refresh.



Delete:

We can delete the points selected.



Filter:

We can let Point Database filter and display the points (Survey Point, Input Point or Stake Point) we need automatically.

Recover:

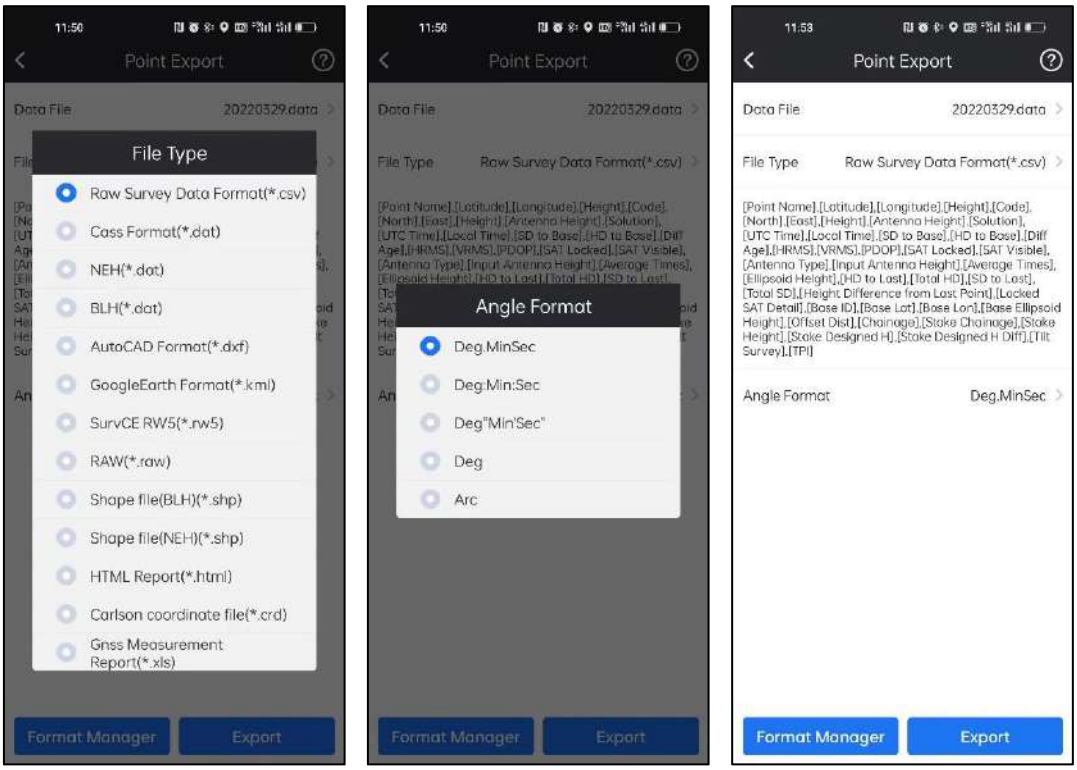
If we delete some points by mistake, we can recover them here.

Share:

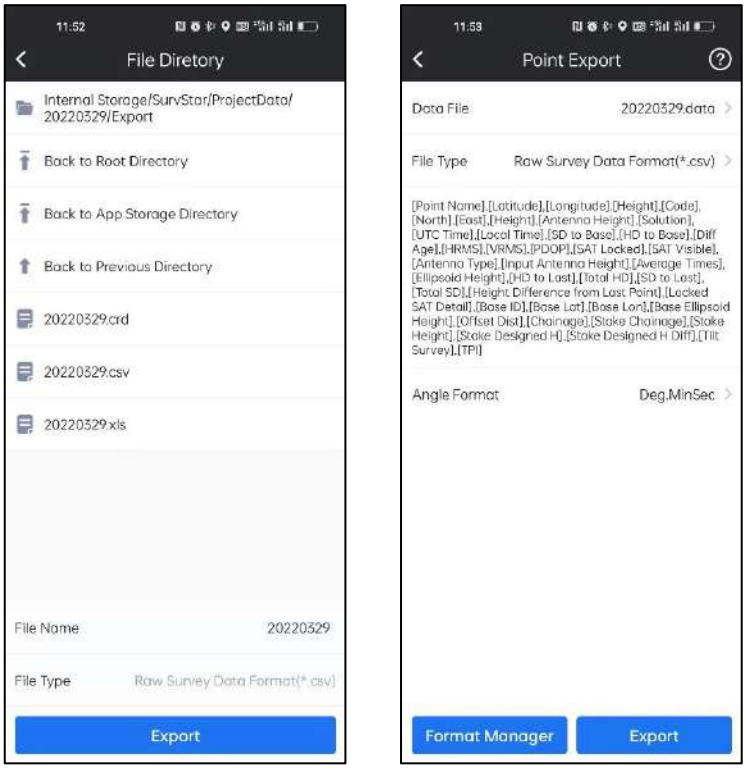
We can share the points to other users by QR code or Text format.

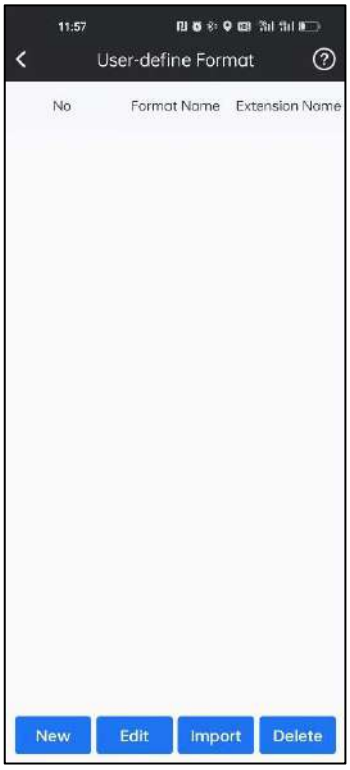
Export:

We can export data file in existing formats or self-define formats.



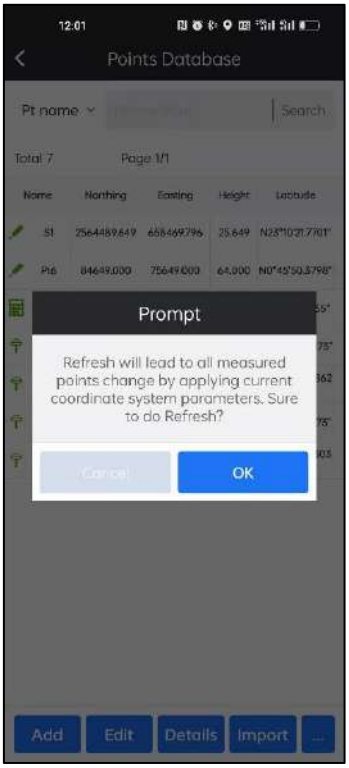
Select the export file path and click Export.





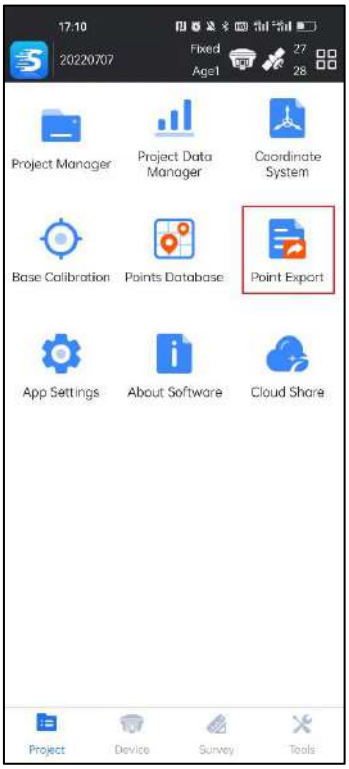
Refresh:

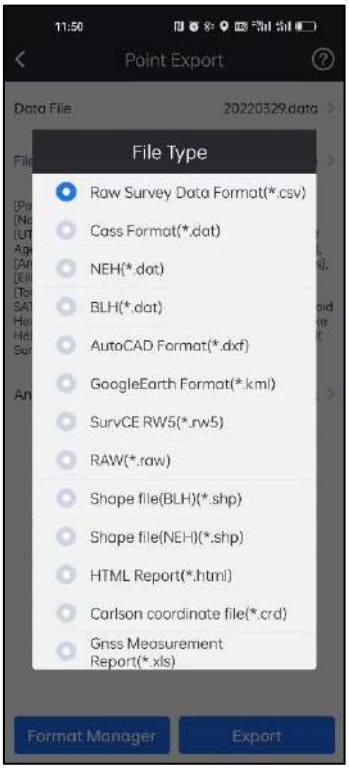
Click Refresh, we can apply the new Coordinate system parameters to the points in database.

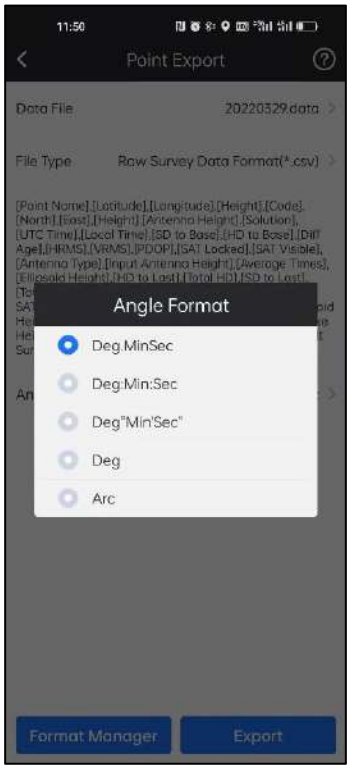


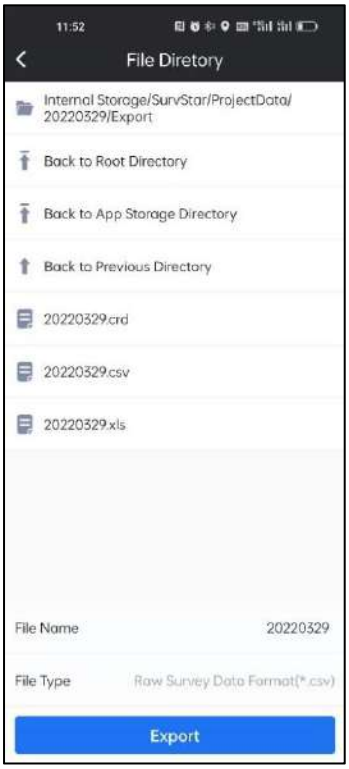
3-6 Point Export

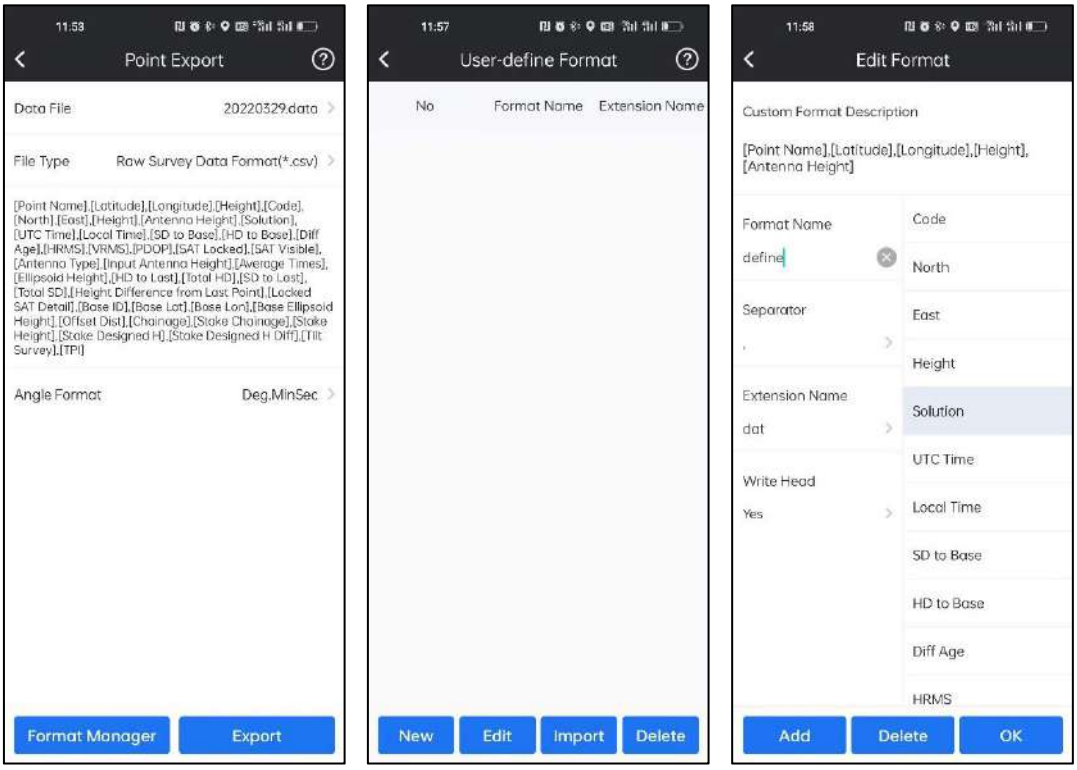
It is the same config as Point Export in Points Database.





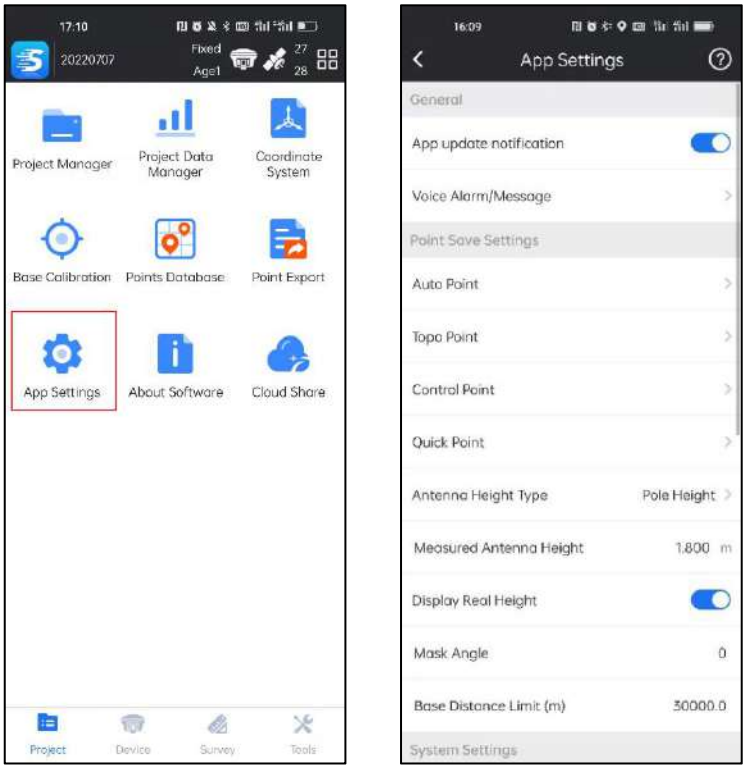




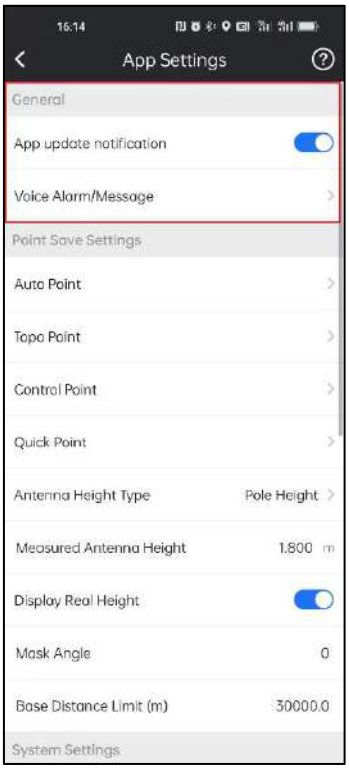


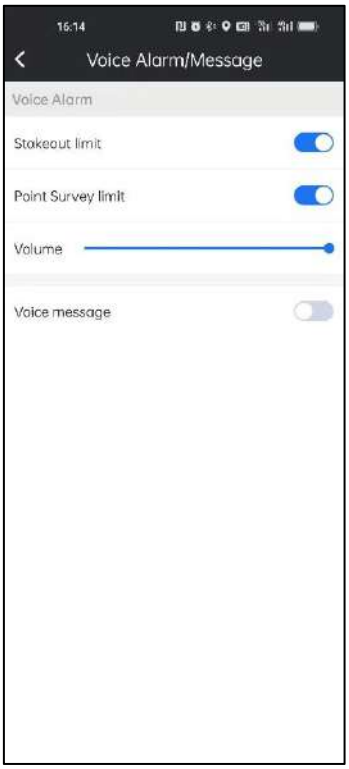
3-7 APP Settings

In APP Settings, we can do basic configurations (such as General config, Point Save Settings, System Settings and Display Settings) for SurvStar.

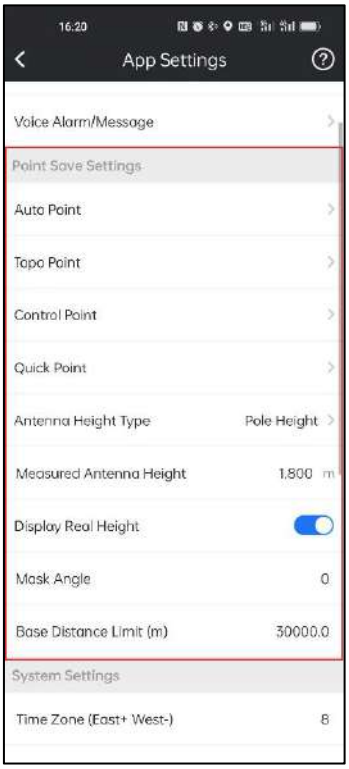


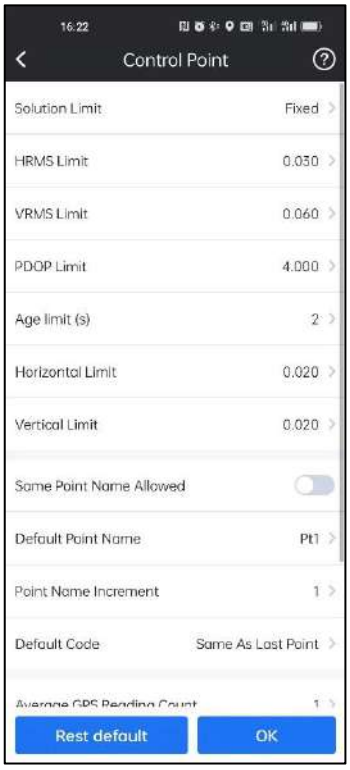
In General Config, we can set App update notification and App Voice Alarm.





In Point Save Settings, we can set Point collection limits and parameters, Antenna Height, mask angle and so on.





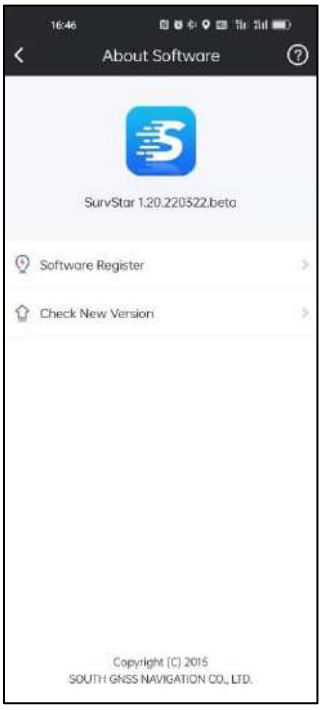
In System Settings, we can set the Time Zone, Length Unit, Angle Format, Angle decimal and Language.

In Display Settings, we can set the Coordinate Order Habit, Point Display Limit, Map Display, Positive Direction. And set Fake Point Detection and link points with same

code on/off.

3-8 About Software

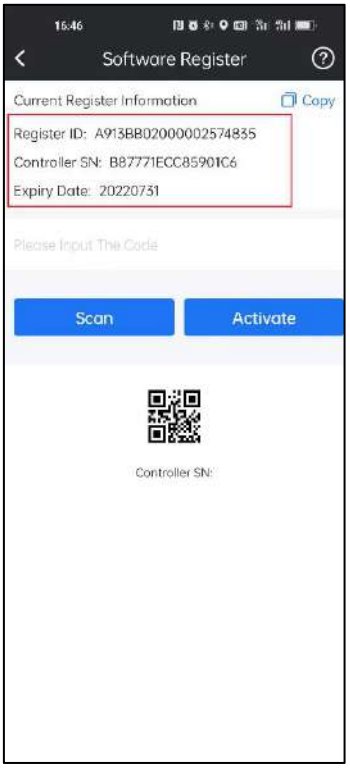
By clicking this, we can check the version of SurvStar, register the SurvStar and check new version manually.



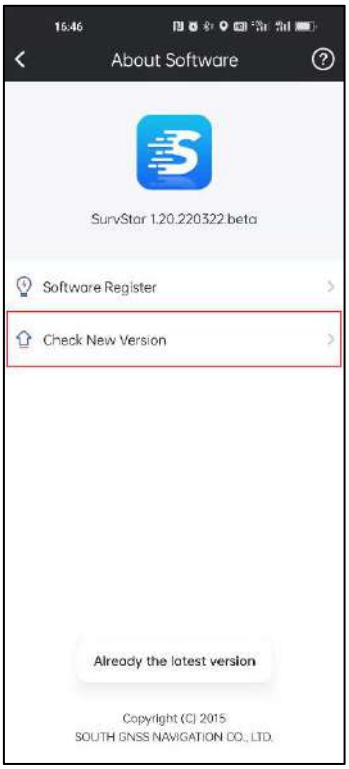
Software Register:

When we get the register code, we can click Software Register, input the code in the bar, and click Activate.

We can also check the information about the Register ID, Controller SN and Expiry Date.



We can click Check New Version to see if there is update or not.

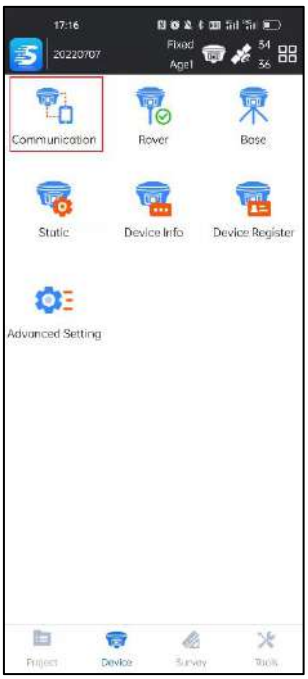


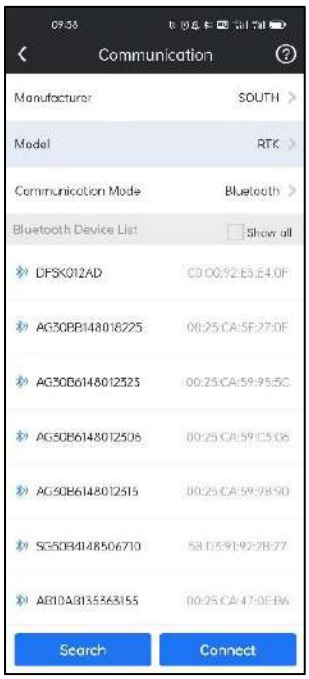
Chapter 4 Device

4-1 Communication

It is used to connect and communicate with receiver.

Click Device->Communication or tap the  icon in the top to enter this interface.

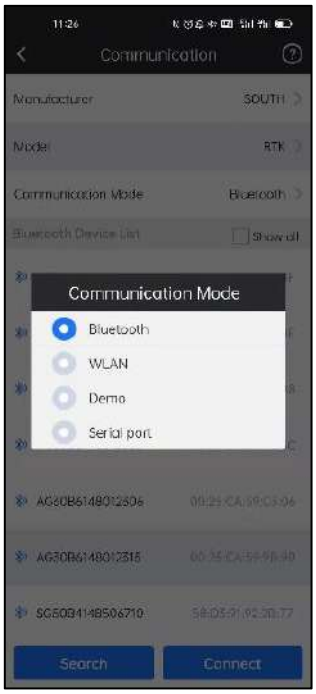




Set the correct Manufacturer.

Select the Communication Mode. There are four kinds of Communication Mode:

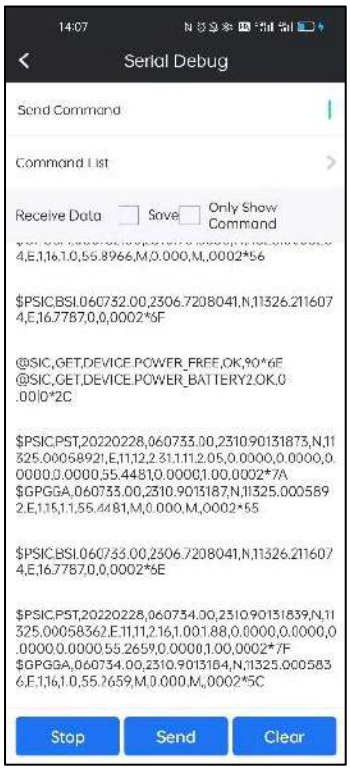
Bluetooth: connect receiver by Bluetooth. It is the most common used way to connect the receiver.



1.Click Search to detect the Bluetooth devices around us

2. Select the receiver's serial number, and click Connect to connect receiver. The chosen device will highlight with blue.

3. In Debug, we can monitor the data stream from the connected receiver.

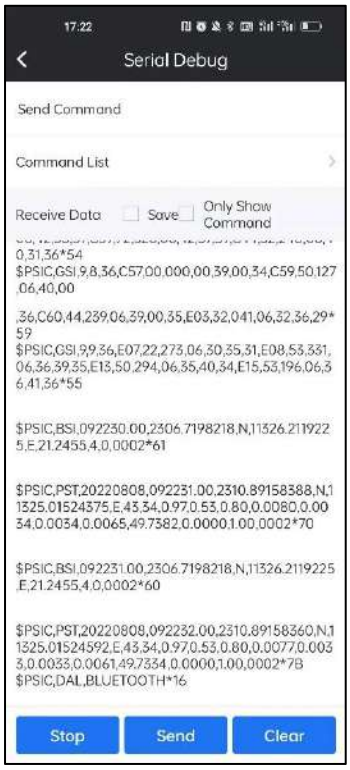


Start\Stop: Start\Stop data stream from the receiver;

Send: send commands to communicate with receiver;

Clear: Clear contents of the page;

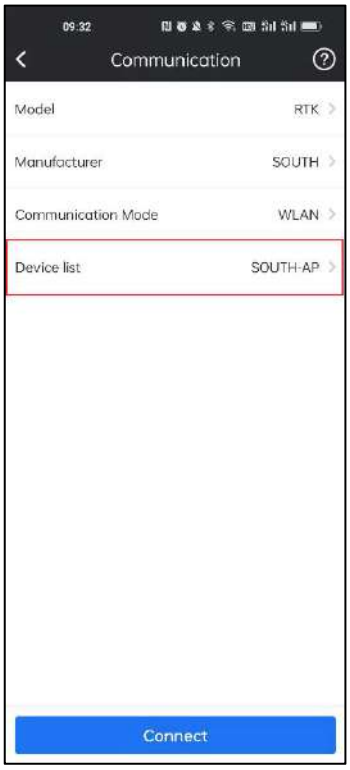
Below are some commonly used commands' list.

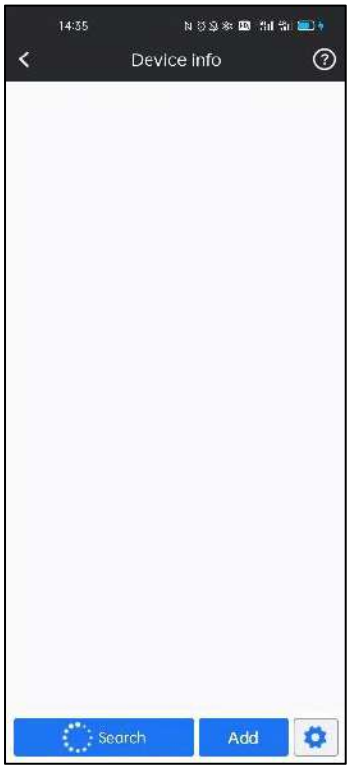


4. If we want to break communication with receiver, we can click Disconnect.

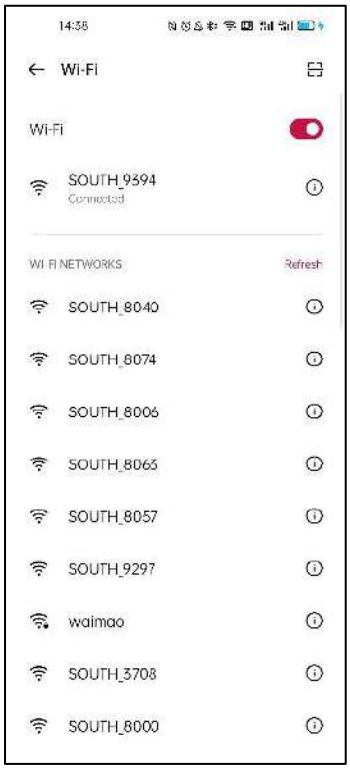
WLAN: Connect receiver by WIFI (It only supports the receiver with WIFI and WEB UI; and while connecting the receiver by WIFI, the android controller won't have access to the internet.)

1.Click the Device list bar to enter this page.



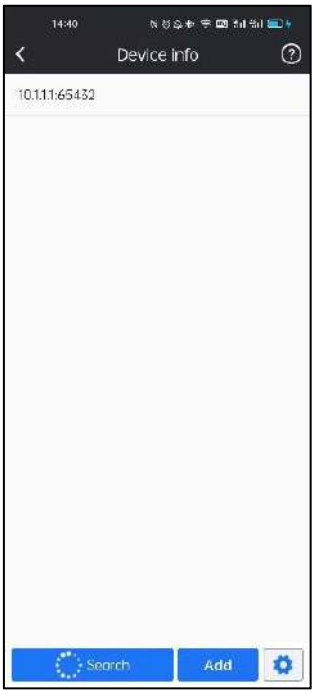


2.Click the settings icon to connect the WLAN of the receiver.

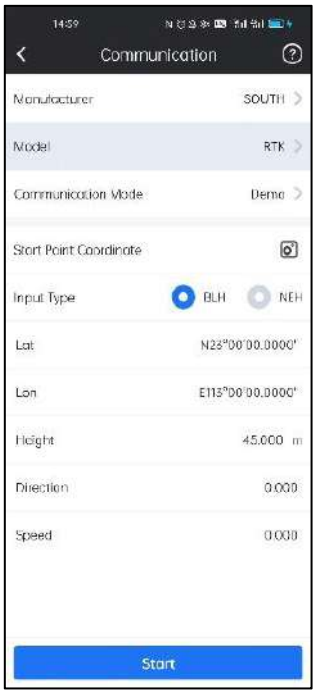


3.Click Add to input the IP:10.1.1.1 and port: 65432.

4.Click this IP information and click Connect. It will connect the receiver.



Demo: It is a mode used monitoring position to use SurvStar (usually for tuition and test purpose) without connecting real receiver. In this mode, we can define the starting point's coordinates, receiver moving direction and speed.

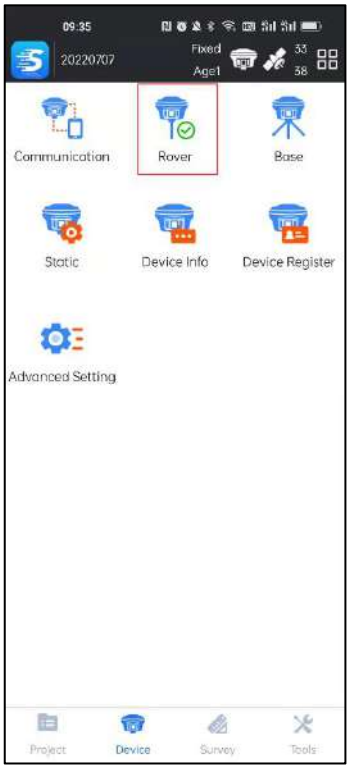


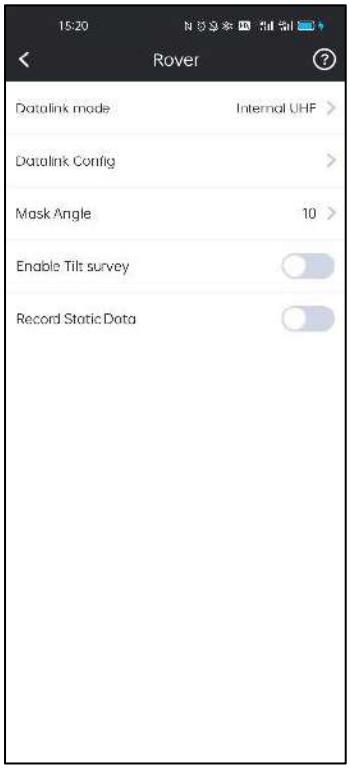
Serial port: Connect the receiver by cable (Not used so often)

4-2 Rover Mode

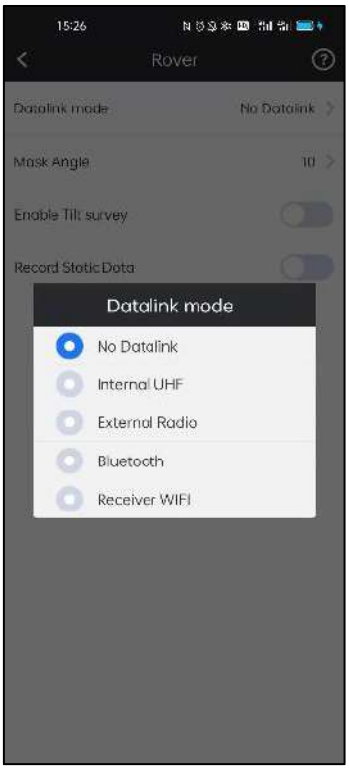
In Rover Mode, we can set receiver to rover mode and do some configurations

Click Device->Rover to enter the interface of Rover Mode.

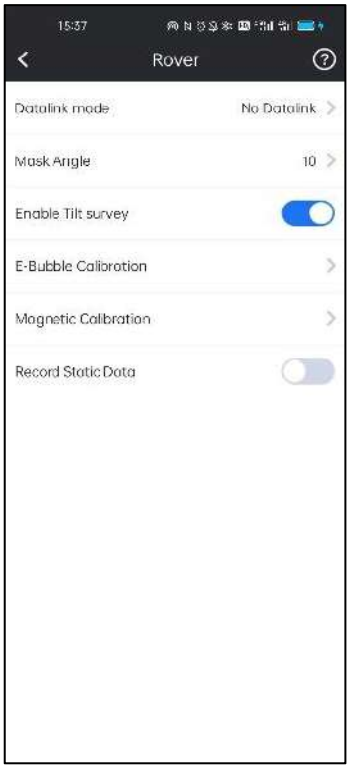


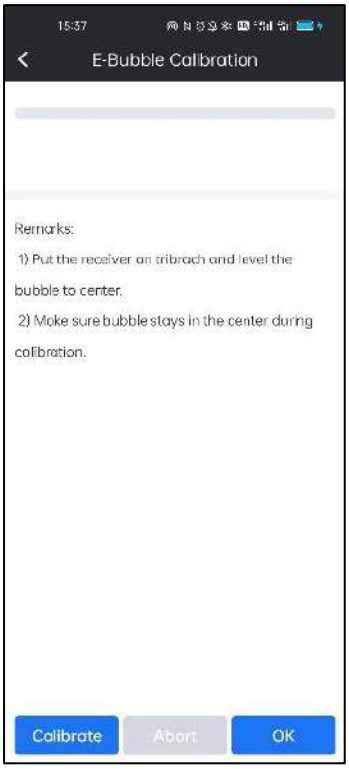


Datalink Mode: set datalink for rover.

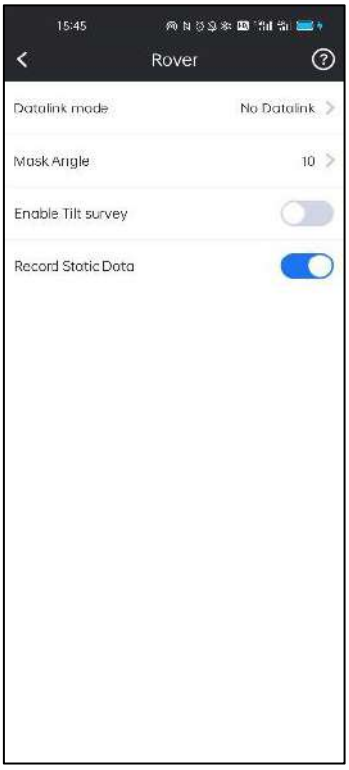


Enable Tilt Survey: by enabling it, we can do E-Bubble calibration for IMU sensor.



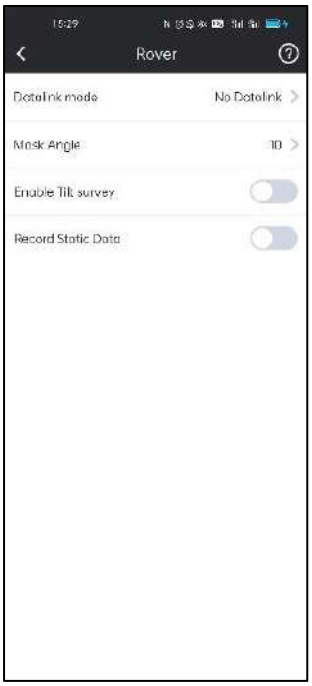


Record Static Data: Enable receiver to record raw data automatically (usually used in PPK mode).



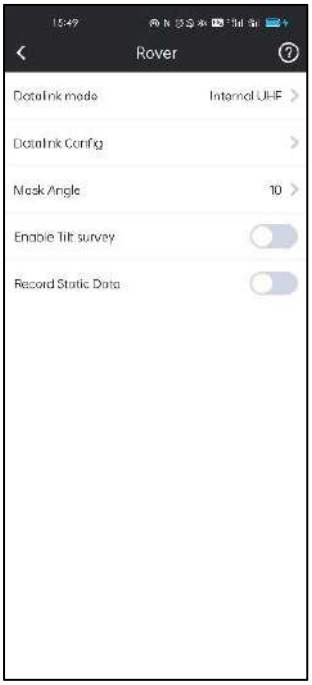
4-2-1 Rover-No Datalink

In No Datalink mode, rover’s data link is empty, and cannot receive corrections from base.

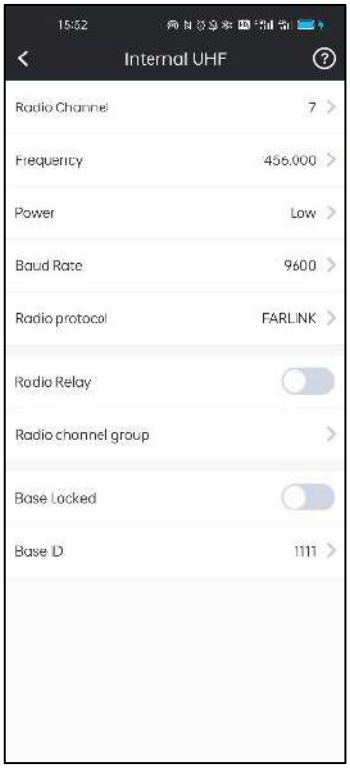


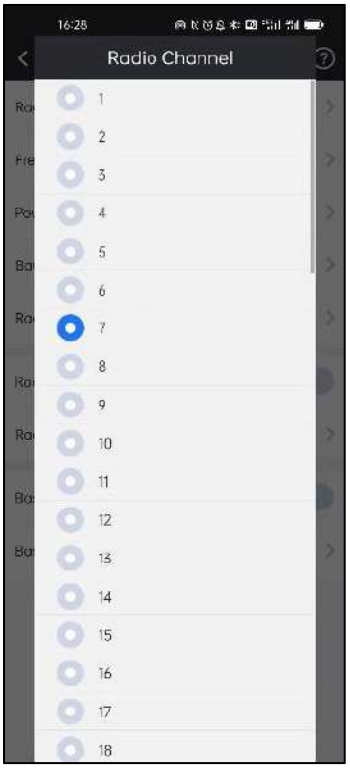
4-2-2 Rover-Internal UHF

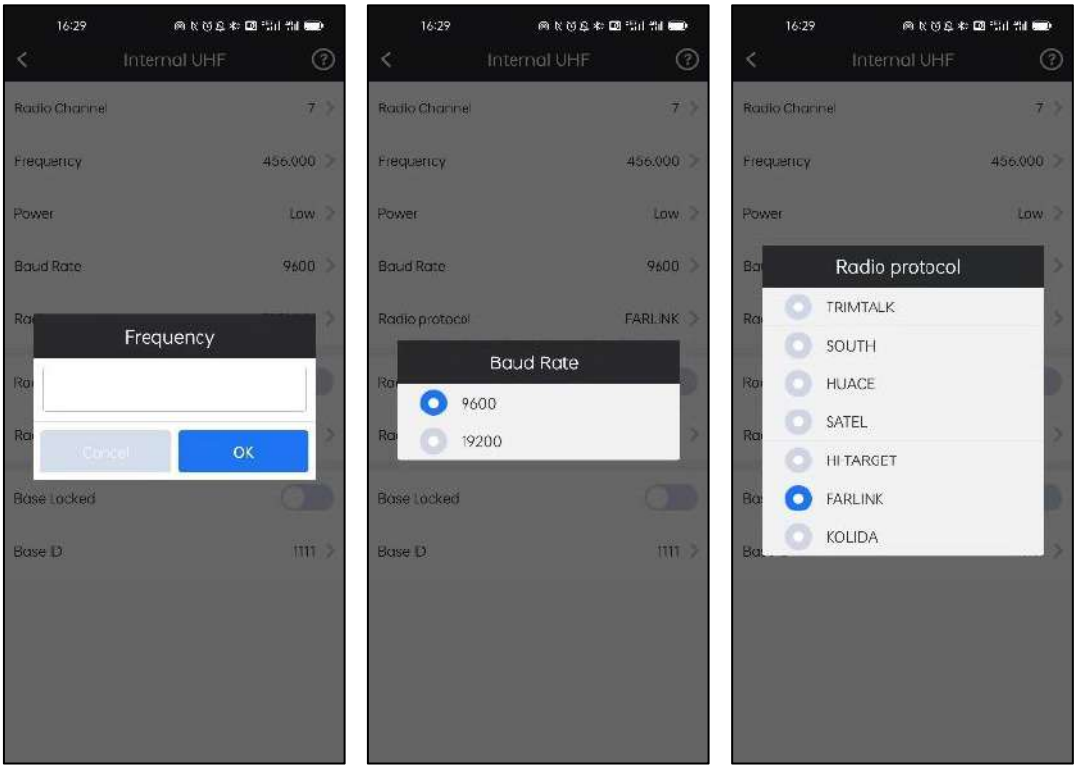
In UHF mode, rover is able to receive corrections from base by internal radio.



In UHF data link, we can set Channel, Frequency, Power, Baud Rate and Radio Protocol for rover.







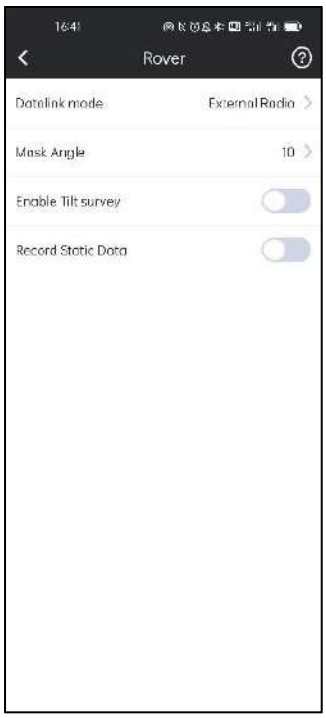
After those parameters above are set the same as base, rover can receive corrections from base and get base information.

4-2-3 Rover-External Radio

In External Radio datalink, Rover can use external radio to receive radio signal from base.

1. Connect the receiver to external radio.

2. Click the Datalink mode bar, set the receiver to Rover- External mode.



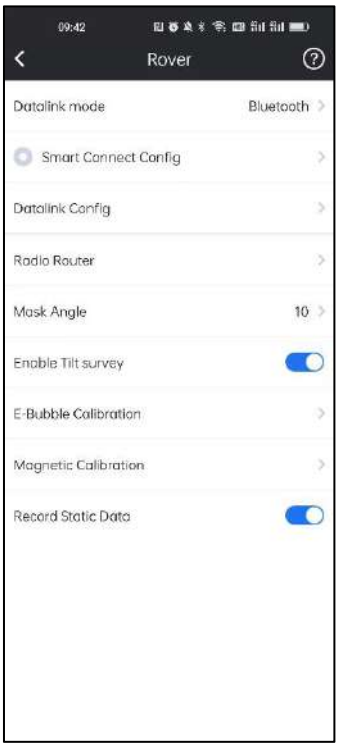
3. Config the external radio the same as base UHF.

note: Configurations on external radio must be done on external radio itself.

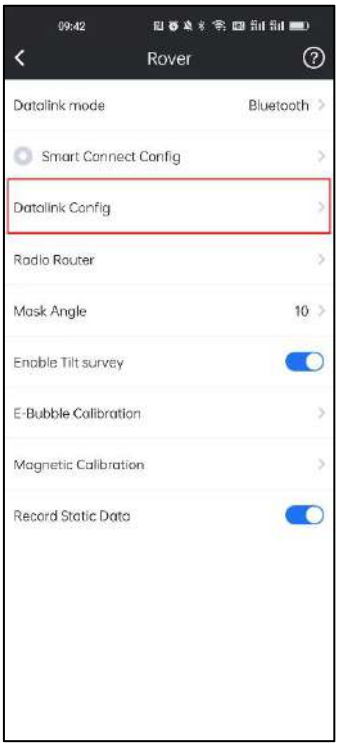
4-2-4 Rover-Bluetooth Data Link

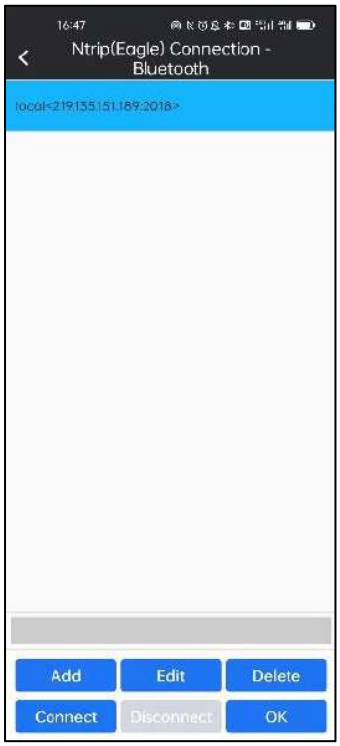
In Bluetooth datalink, we can use controller's internet to access CORS server and download corrections. (Note: the controller must have access to the internet).

1.Click the Datalink mode bar, set the receiver to Bluetooth mode.

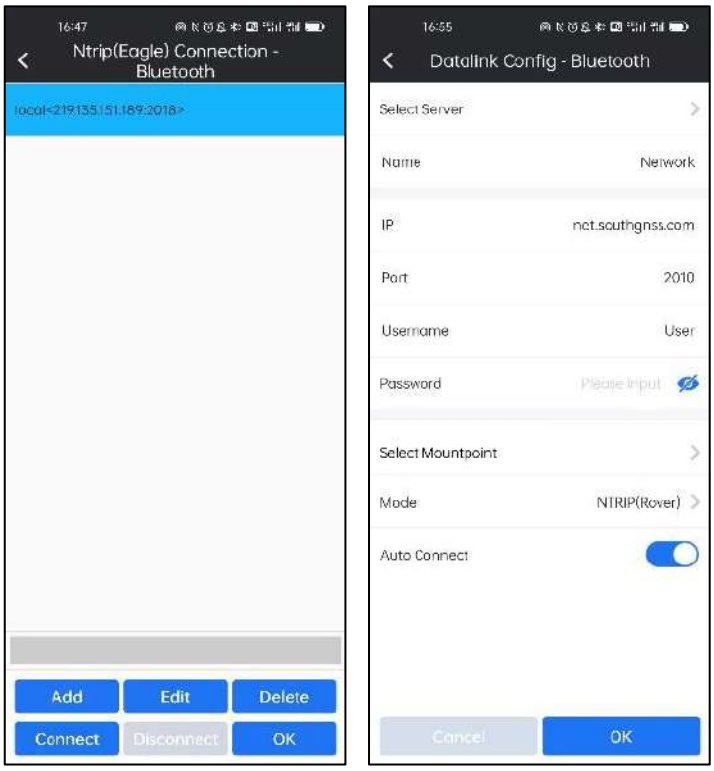


2.Click the Datalink Config bar to enter the Ntrip(Eagle) Connection-Bluetooth page.

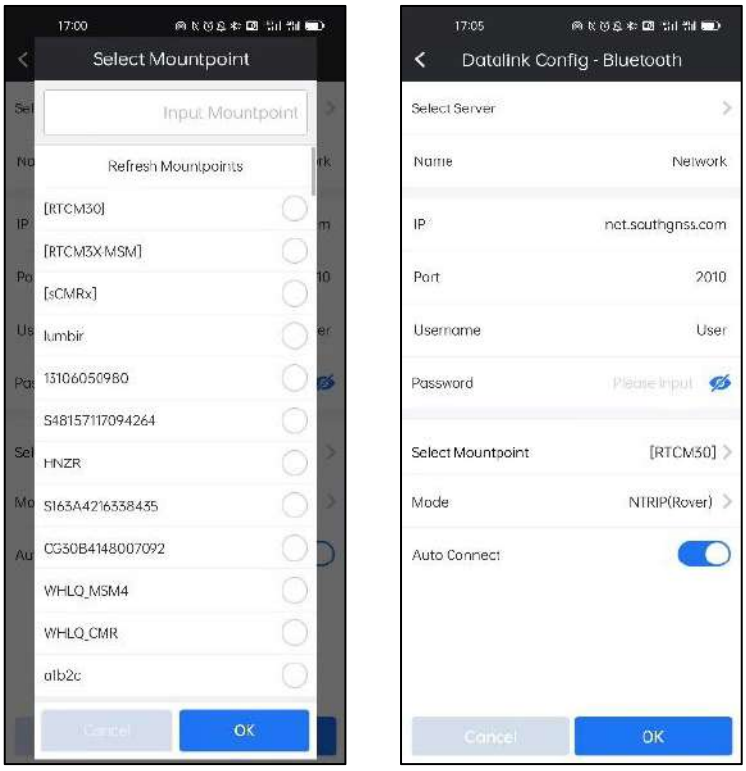




3.Click Add. In this interface, we can define a network config by inputting IP, Port, Username and mountpoint.

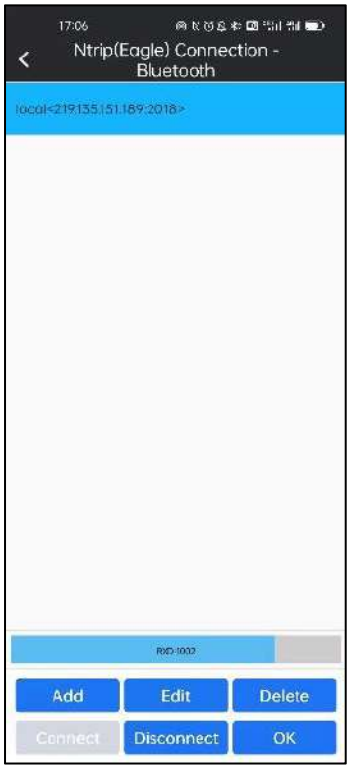


4. In Select Mountpoint, by Refreshing Mountpoints, we can get all the mountpoints available, select the one needed to finish Network config.



4. Click Connect, and differential corrections from base will be downloaded from the server.


17:06
Ntrip(Eagle) Connection - Bluetooth
local<219.135.151.189:2018>
Succeeded to login
RXD:1002
Add
Edit
Delete
Connect
Disconnect
OK

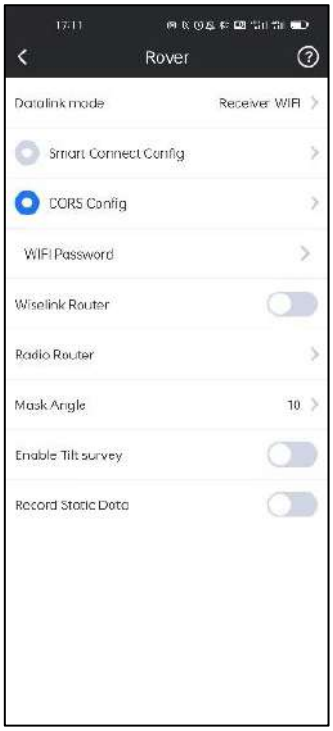

17:06
Ntrip(Eagle) Connection - Bluetooth
local<219.135.151.189:2018>
RXD:1002
Add
Edit
Delete
Connect
Disconnect
OK

4-2-5 Rover-Receiver Network

In Receiver Network mode, we must ensure receiver itself has access to the internet, usually there are 2 ways: by receiver's WIFI or by receiver's network module.

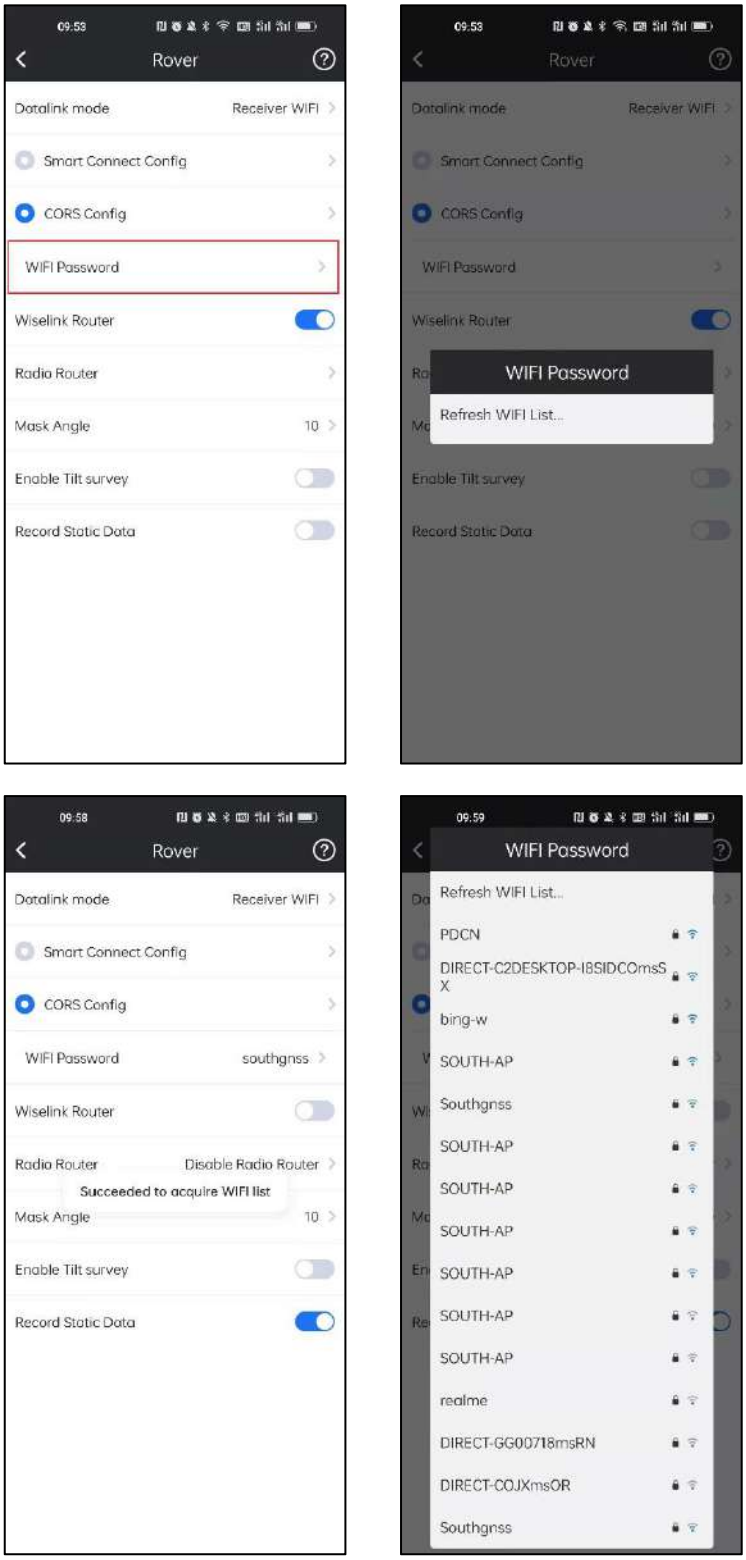
By WIFI:

1.Click the Datalink mode bar, set the receiver to the Receiver WIFI mode.

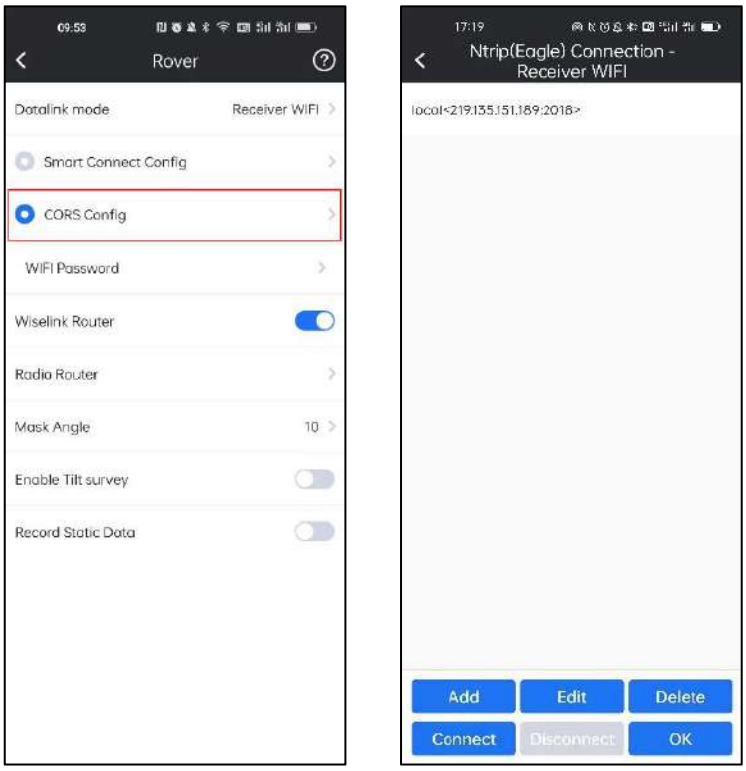


2. Receiver must be able to switch to WIFI client mode and connect to a WIFI hot spot.

Click WIFI Password bar, and click Refresh WIFI List... to search for WIFI nearby. Then click WIFI Password bar again to connect WIFI network.



3.Click the CORS Config bar to enter the Ntrip(Eagle) Connection-Receiver WIFI page.

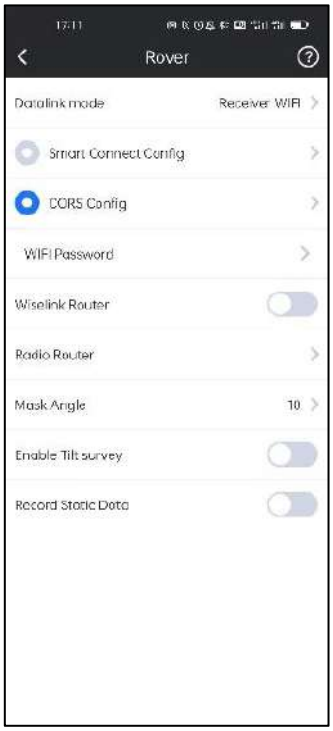


3. Build Network Config and connect (Operation is the same as we do when config Rover-Bluetooth data link).

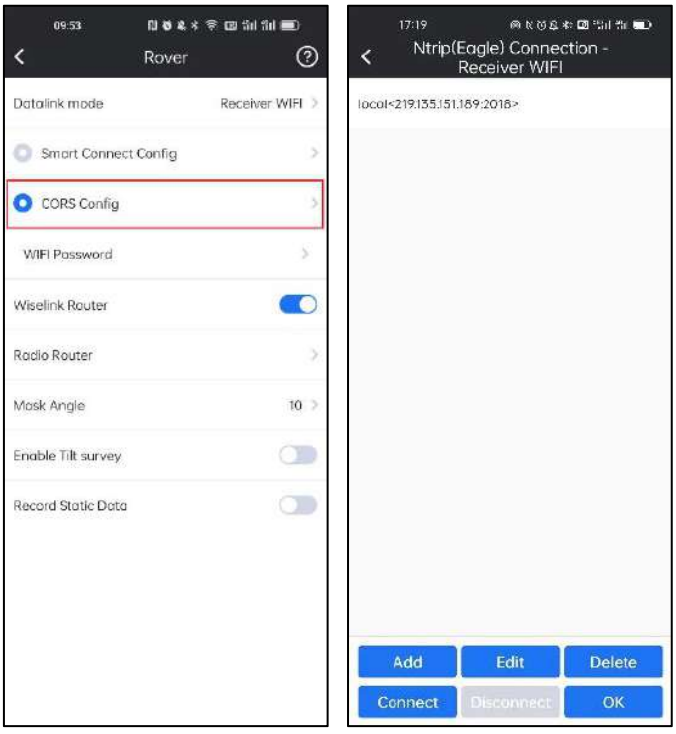
By Network:

Receiver must have the network module and make sure the SIM card has been inserted into the device correctly.

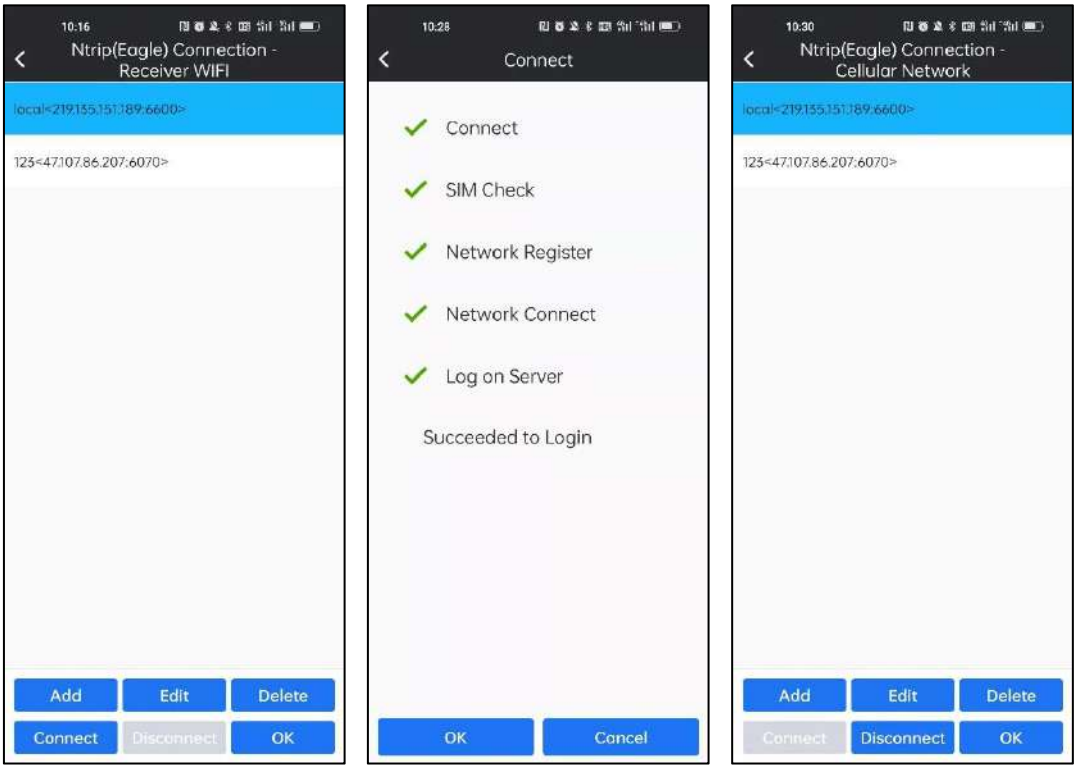
1.Click the Datalink mode bar, set the receiver to the Receiver WIFI mode.



2.Click the CORS Config bar to enter the Ntrip(Eagle) Connection-Receiver WIFI page.

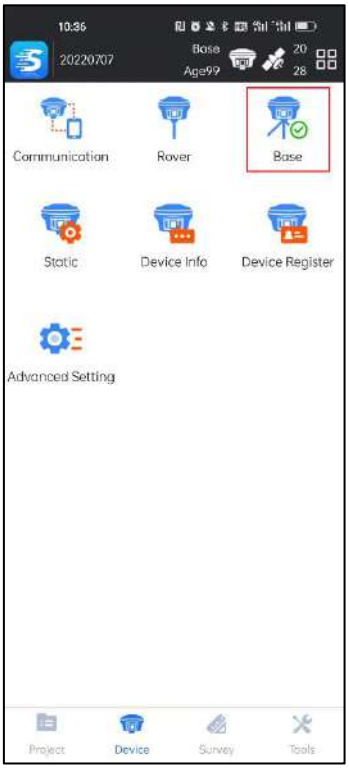


3. Build Network Config and connect (Operation is the same as we do when config Rover-Bluetooth data link).

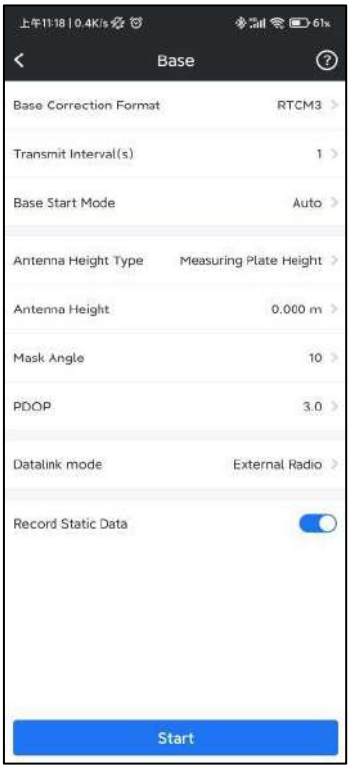


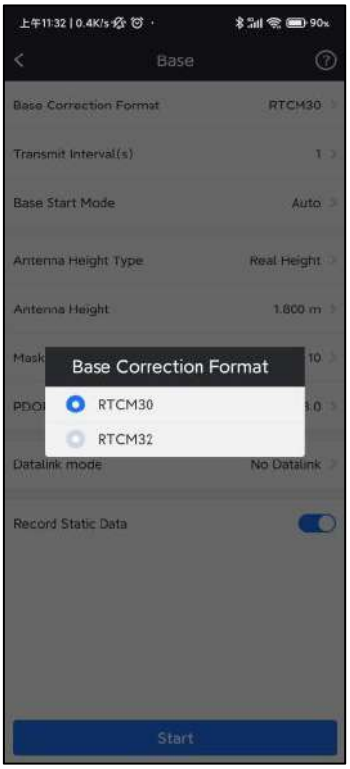
4-3 Base Mode

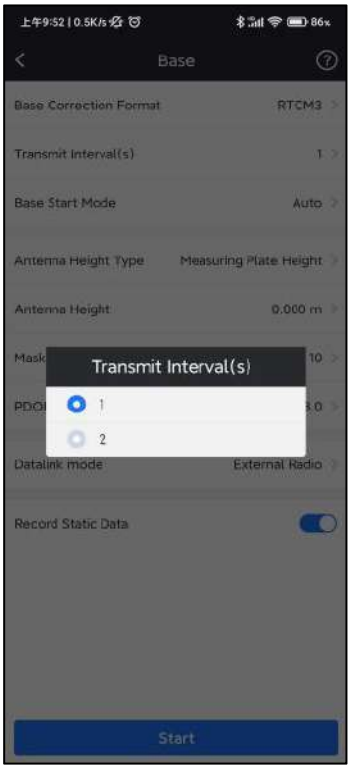
Base Mode is used to start base and transmit differential corrections in UHF, Network, and External Radio.

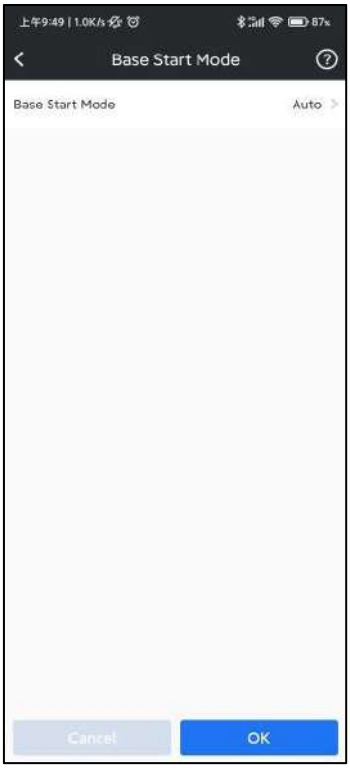


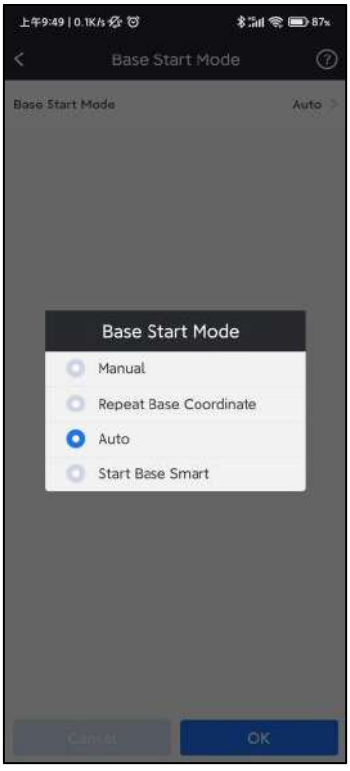
In Base Parameter config, we can set Base Correction Format, Transmit Interval, different Base Start Mode, Antenna Type and Height, Mask Angle, PDOP limit and transmit Data Link.

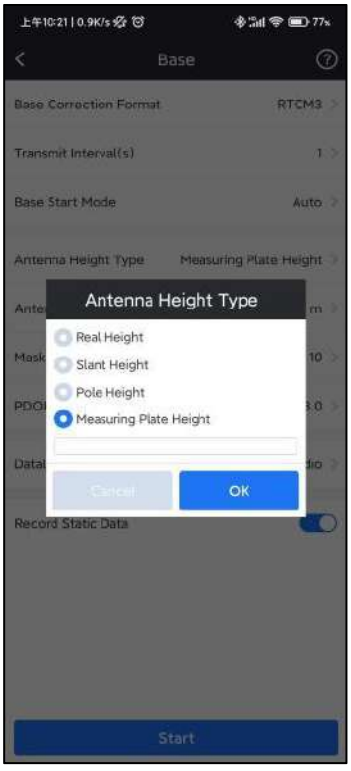


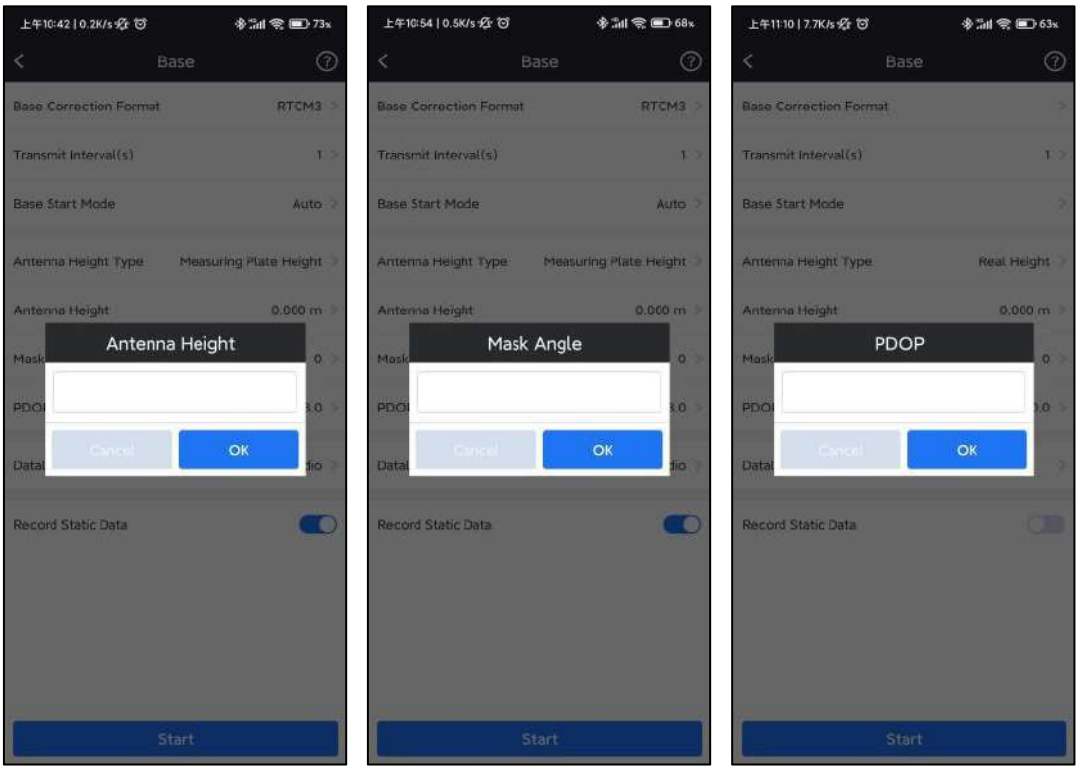






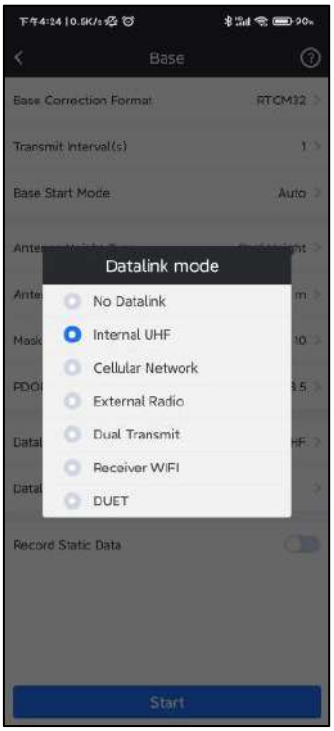




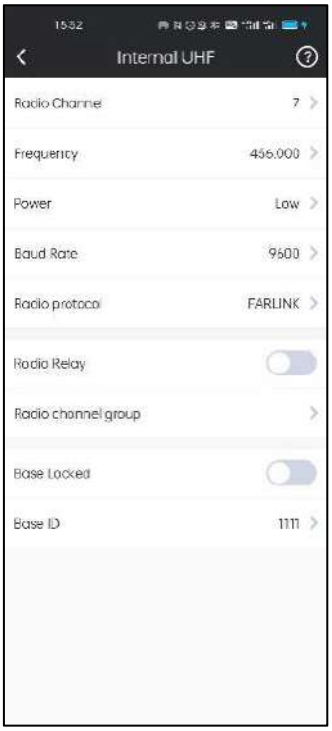


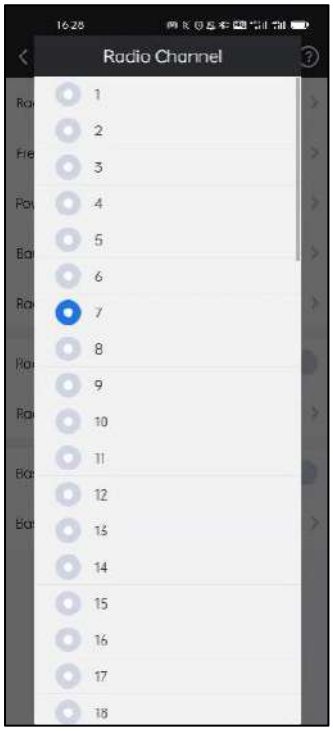
4-3-1 Base-Internal UHF

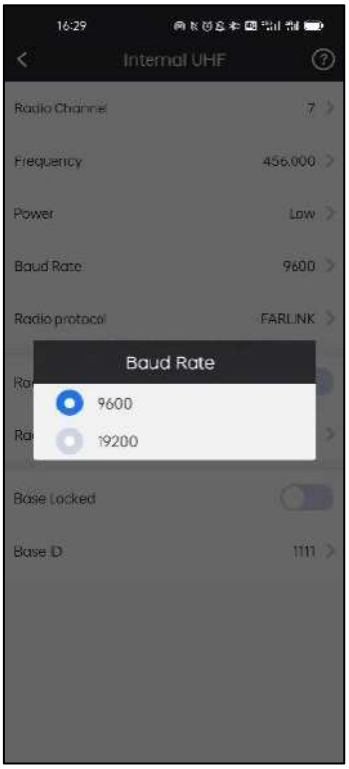
In this mode, Base is using its Internal UHF module to transmit differential corrections.



In UHF data link, we can set Channel, Frequency, Power, Baud Rate and Radio Protocol for base.

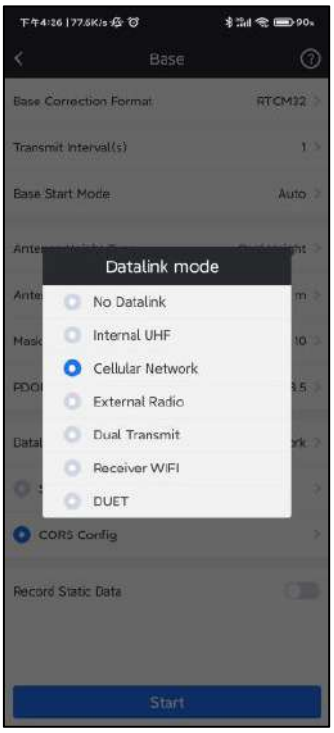




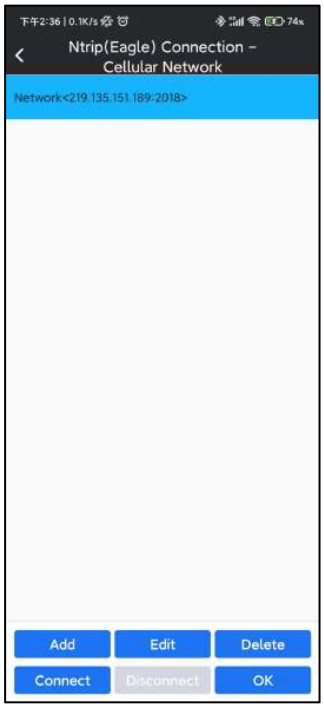


4-3-2 Base-Cellular Network

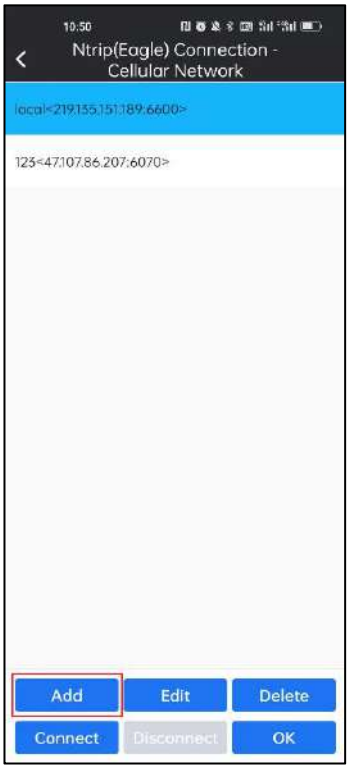
In this mode, Base is uploading its differential corrections to CORS server by Network. Then rover can download the corrections and get fixed solution.



2.Click the Datalink Config bar to enter the Ntrip(Eagle) Connection-Cellular Network page.



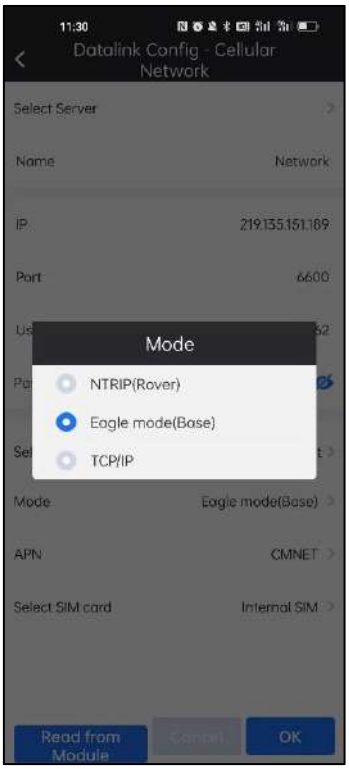
3. Click Add. In this interface, we can define a network config by inputting IP, Port, Username and Password. If set before, we can click Read from Module to get them.



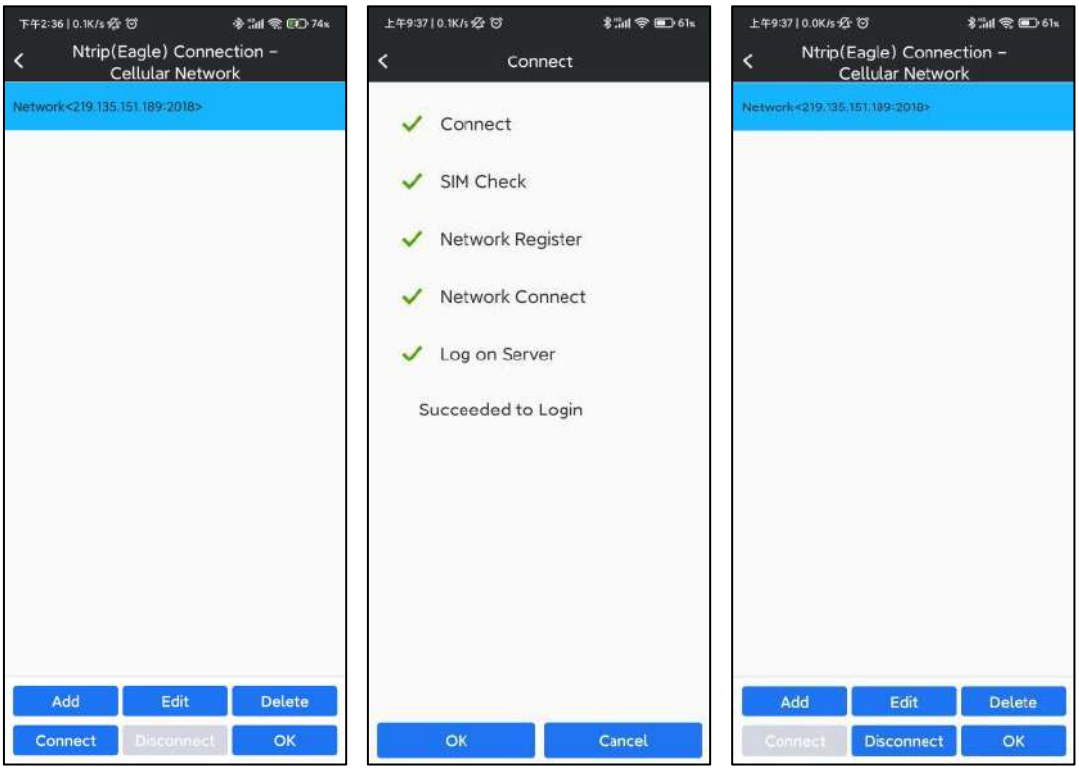
4.Click Select Mountpoint bar to set the uploading differential corrections' access

points, which cannot be set already exist in CORS.

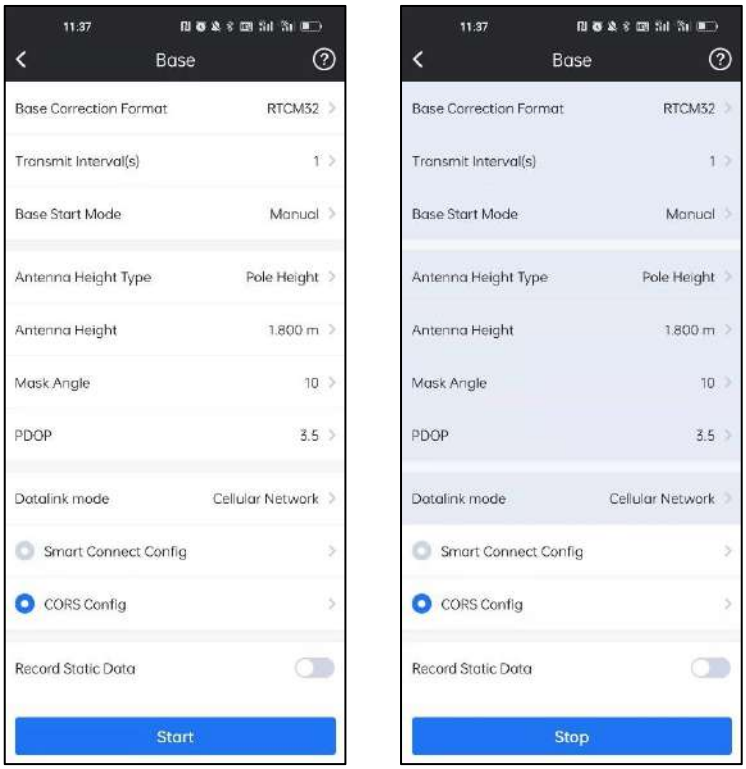
5.Set the Mode as Eagle mode (Base), and set the APN settings.



5. Click Connect bar to connect CORS server.

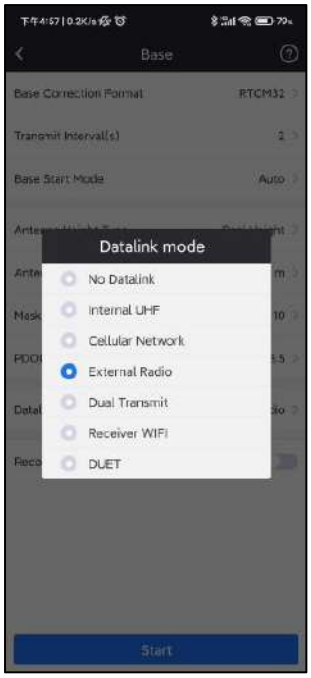


6. Once set, click Start to upload differential corrections.



4-3-3 Base-External Radio

In this mode, Base is using External Radio to transmit differential corrections.



4-4 Static Mode

When we need to use receiver to do static work, we can go to SurvStar-Device, set receiver into Static Mode.

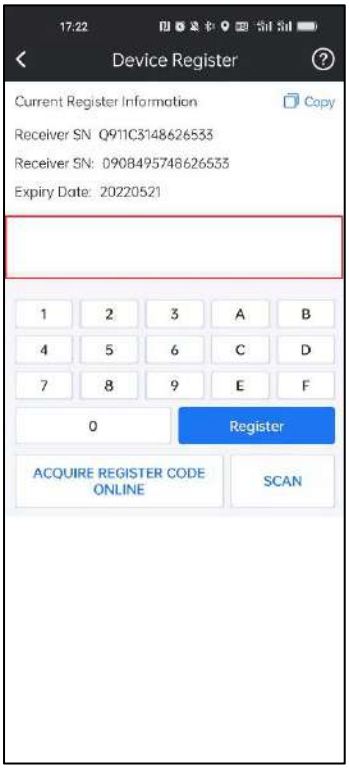
In Static Mode, we need config Static File Name, Recording Interval, Antenna Height and Type, Mask Angle, PDOP limit and Auto\Manual Record.

4-5 Device Info

In this sector, we can check the information of the device. It includes Receiver Model, Receiver SN, Work Mode, Datalink, L1 Offset, Antenna Radius, Temperature of the device, Battery Status, Memory, Receiver Firmware Version, Expiry Data, OEM Board SN, OEM Board Firmware Version, UHF Module SN and UHF Module Firmware Version.

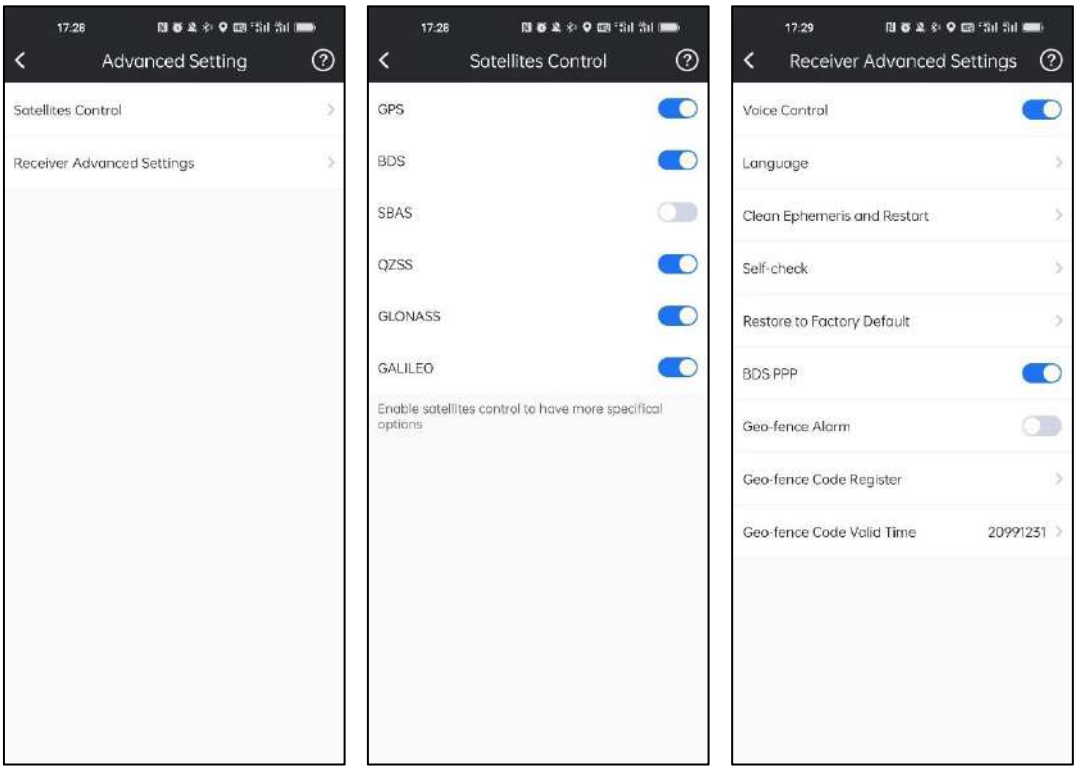
4-6 Device Register

In this page, we can check the device registration information and register device. Click Copy will copy the receiver SN. Input the registration code in the bar, and click Register, then the device will be registered. We can also click SCAN to scan the QR code to register.



4-7 Advanced Setting

In this page, we can control weather track one satellite system and set the settings of the receiver. We can set the Voice of the device, Language of the device, Clean Ephemeris, Self-check, Restore to Factory Default and so on.

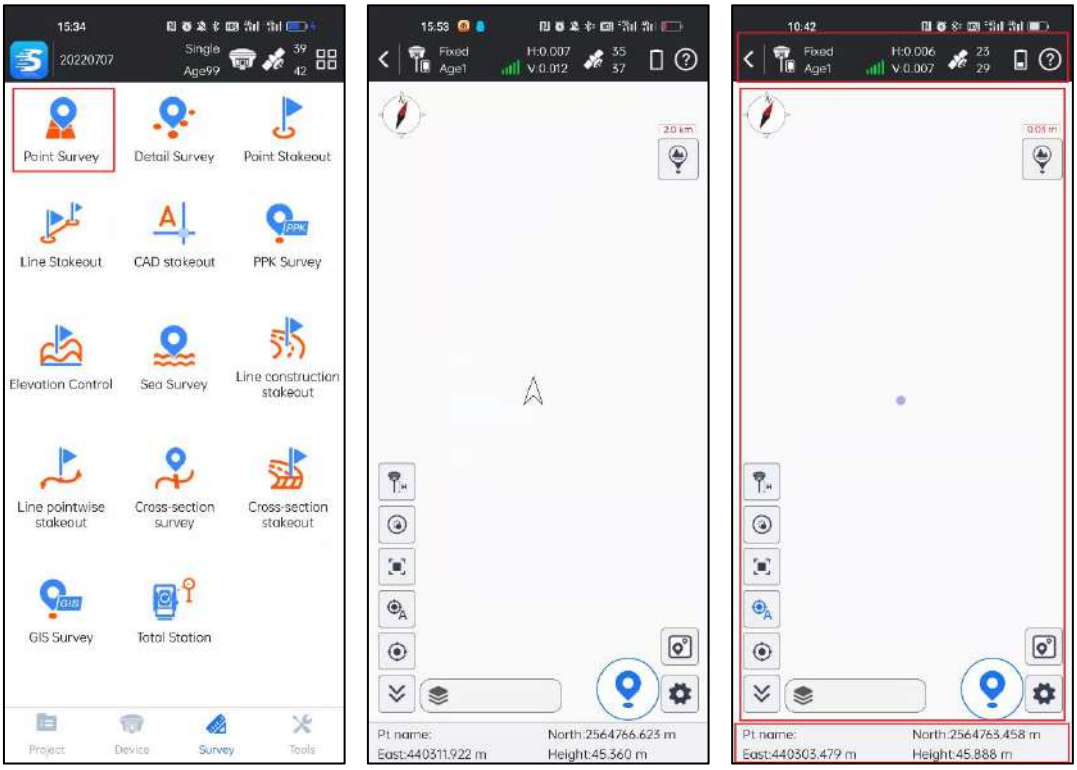


Chapter 5 Survey

5-1 Point Survey

By clicking this, we can enter to the point survey page.

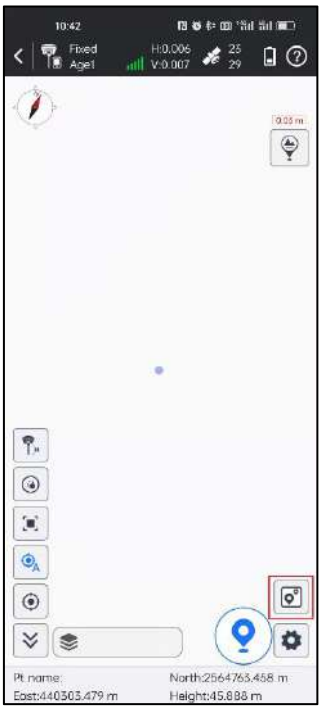
It can be divided into 3 parts: the top status bar, the middle acquisition interface (the left can be edited and added, and the right can be different acquisition point schemes, settings and layers), and the bottom coordinate information display.



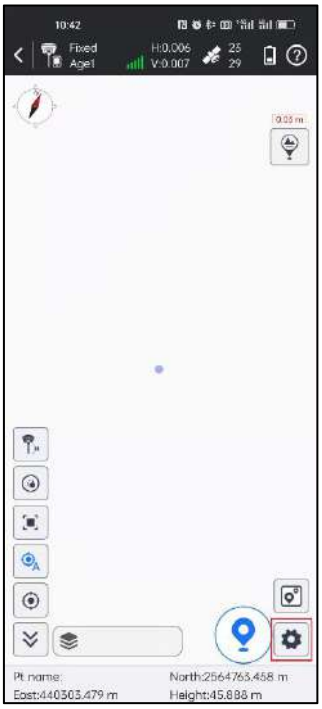
In this page,  is the Point Collect icon; when IMU is enabled, it will turn to  , and after IMU initialization and it will turn to  .

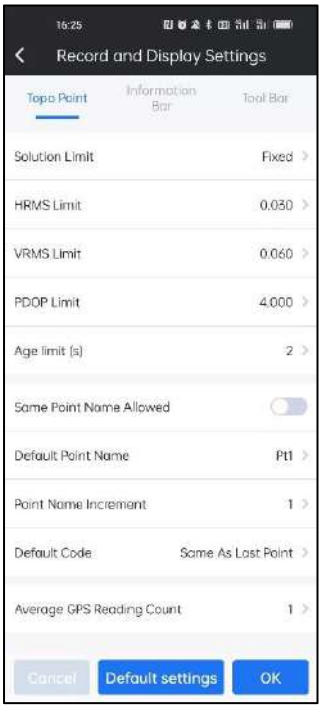
 is the Point Type icon, which decides the points collected will be which type (Topo Point, Control Point, Quick Point and Auto Point).

 is coordinate point database. Points collected by SurvStar are stored in coordinate point database.

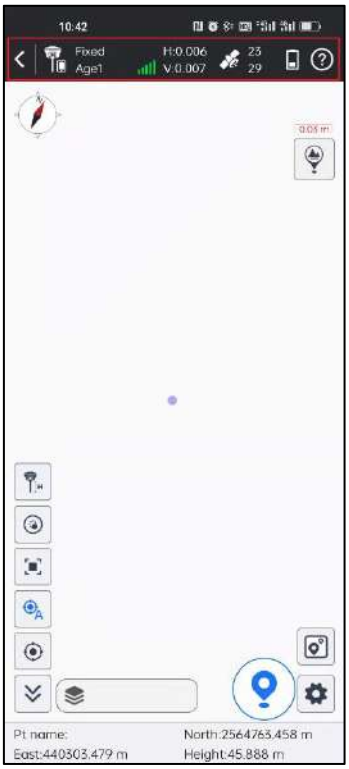


 is Record and Display Settings, which can set the collection point type, the limit conditions for the collection accuracy of the point position, the replacement of display of the bottom information and the toolbar. There are 3 sections: Point Collect, Information Bar and Tool Bar.





The Top Status Bar



In this page, the top status bar icons describe as follows:

 : Close/exit Point Survey page.

 : Receiver operation mode, pressing to jump to Base/Rover/Static setting page.

 : Receiver signal.

 : Receiver positioning information, pressing to jump to satellite positioning information page.

 : Receiver battery power.

Solution status: includes single, float, differential and fixed.

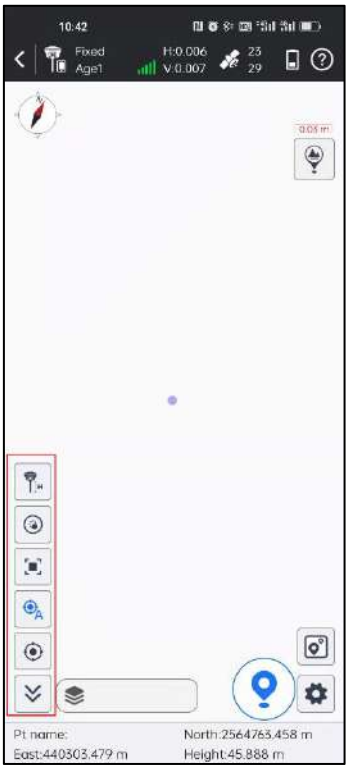
Age1: current differential delay is 1. *e.g., Single, 0: current solution is single, and differential delay is 0. Fixed, 1: current solution is fixed, and differential delay is 1.*

H: HRMS, the value represents the horizontal accuracy of current point.

V: VRMS, the value represents the vertical accuracy of current point.

35/37: current number of satellites which used to solution, and the total tracked satellites number.

The Left Toolbar



Click  to enter to this page. In Tool Bar, we can decide which function quick launch to be displayed in left of main interface.

The icons in left toolbar describe as follows:

 Go Map Center

 Auto Map Center

 Full Map

 Tilt Survey

 Antenna Parameter

 Auto Zoom

 Screen Survey

 Map Display

 Coordinate Converter

 Perimeter and Area

 Static Record

 Coordinate Inverse

 Offset Distance/angle

 Slope Distance

 Angle Calculation

 Intersection

 Resection

 Forward Intersection

 Coordinate Traverse

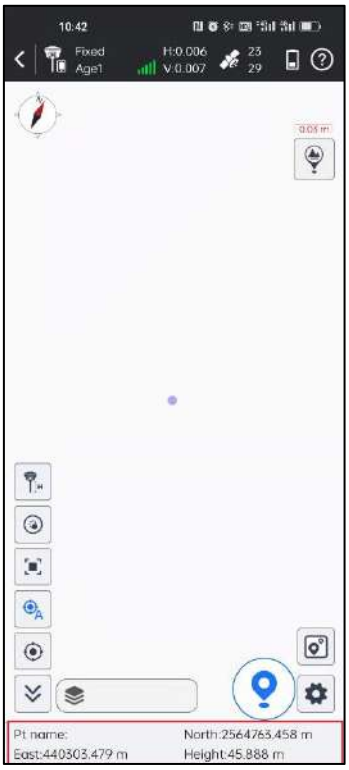
 Offset Point

 Divide Line Equally

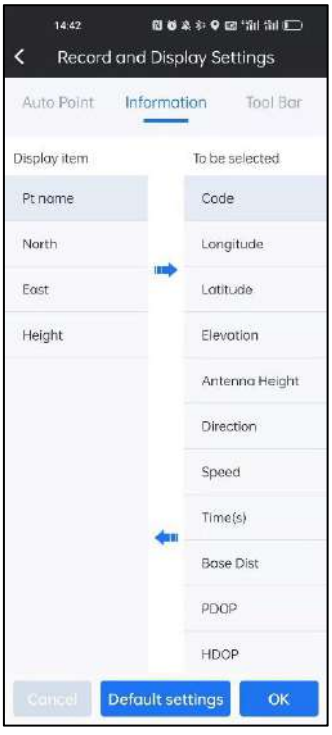
 Compass

 Pt, Code, H Display

The Bottom Information Display



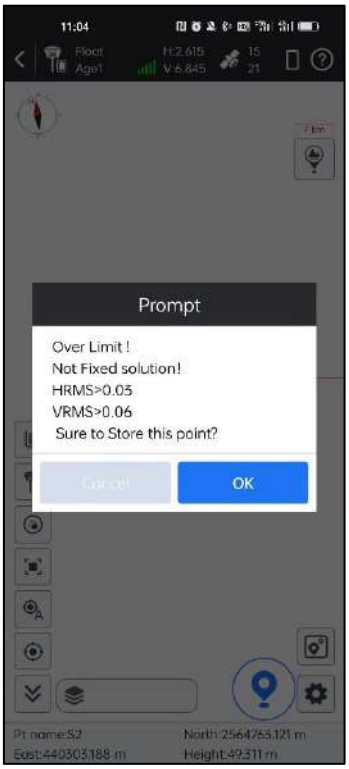
Click  to enter to this page. In Information Bar, we can config which information to be displayed at the bottom of main interface.



Click  to enter to this page. In Point Collect, we can set Limit while doing Topo Point\Control Point\Quick Point\Auto Point collection.

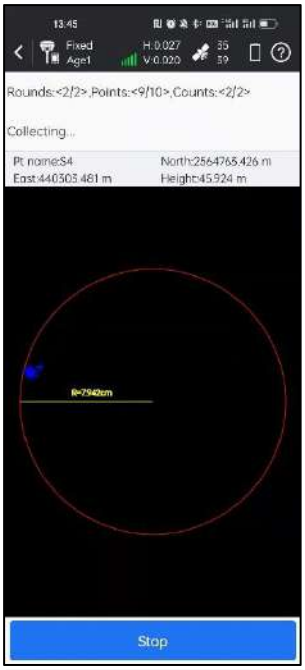
Topo points: 

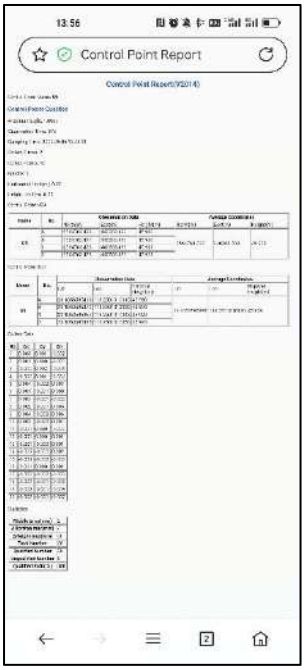
Topo Point collection: this method is the most used way to collect points, after setting the record limit and average times, SurvStar will collect Topo Point by clicking the button  .



Control point: 

Control Point collection: this method is used to collect Control Points, so the key points are high accuracy collect and control points report. To get high accuracy results, we need to collect one position as many as possible and get the average coordinates. In this config, the total data collected for one control point will be 20 times (1 (Average GPS Recording Count)*10 (Survey Point Count per Round)*2 (Survey Round)), and each data will only be recorded after 20 seconds fixed solution. And after collection, SurvStar will generate a Control Point report in Html format.



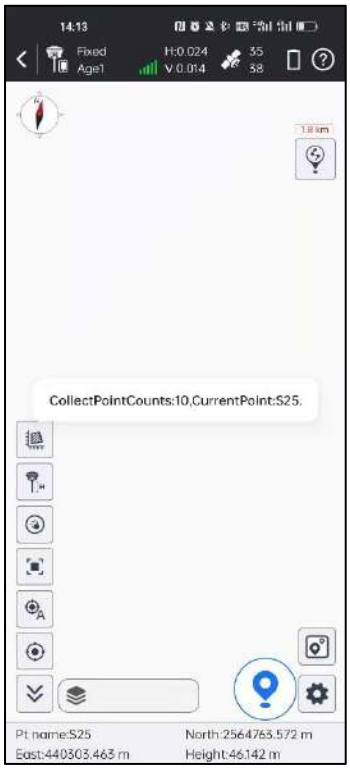


Quick point: 

Quick Point collection: this method is used for quick collect. Just click collect button, and points will be recorded without any tips.

Auto point: 

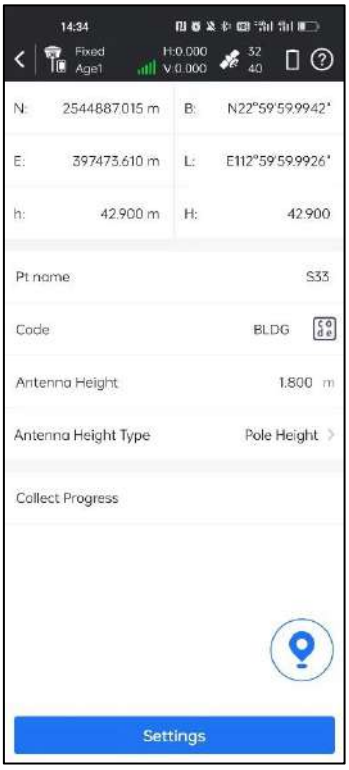
Auto Point collection: sometimes when we need to collect points by time or distance, we can use this method.



5-2 Detail Survey

Detail Survey is a simplified Point Survey mode, which is for rapid and continuous coordinates collection.

When we do Detail Survey, SurvStar will keep in this interface showing detailed collect points information. And by clicking Settings, we can config the limit of recording.



5-3 Point Stakeout

In Point Stakeout, we can select target point and do the stake out.

Below are icons' descriptions of Stake out interface:

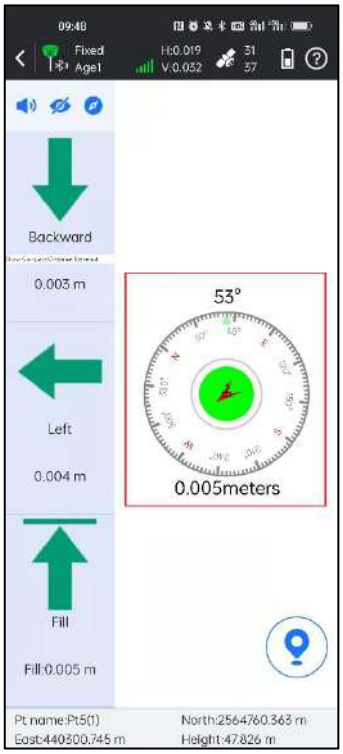


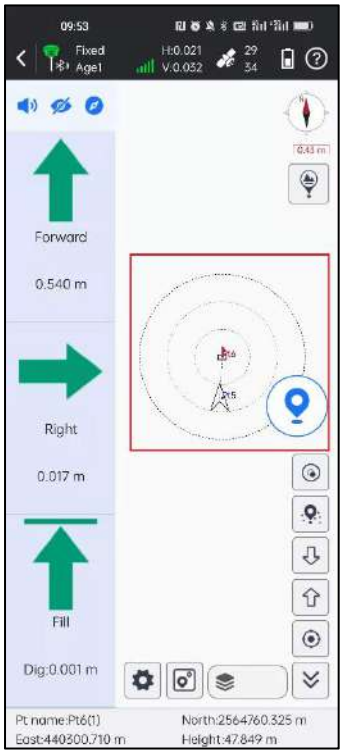
: Enable\Disable Voice Prompt;



: Display\Hide Stakeout Direction;

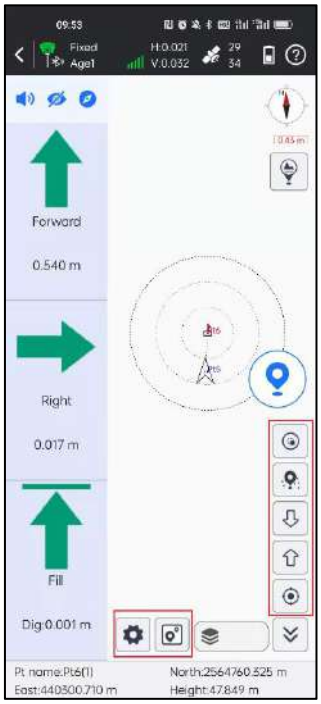

: Show Compass\Distance Stakeout.





In Compass mode, when receiver is far from target point, receiver position will be displayed as an arrow; when it is near to the target point (2 times of prompt range), receiver position will be displayed as blue dot; when it almost reaches target point (1 time of prompt range), the blue dot will turn to green.

In Distance Mode, icons are as follows:



: Points database.

: Tilt Survey

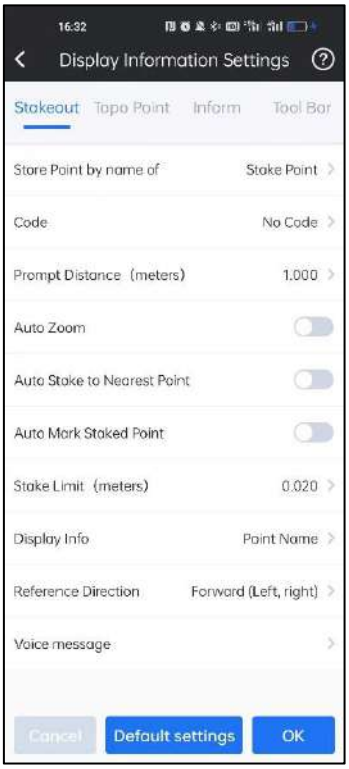
: Nearest Point.

: Next Point.

: Last Point.

: Point stakeout settings.

Note: In Point Stakeout settings ( ), we can set stakeout settings, including Prompt Distance, Stake Limit, Display Information (Not Display, Point Name, Code), and Reference Direction (Forward, North); settings for Topo Point, Inform and Tool Bar are the same as that of Point Survey. Click Default settings and it can restore the changed settings.



Prompt Distance: If we set Prompt Distance as 1 meter, and then in Stakeout

Interface, SurvStar will draw 3 circles using target point as center, and 1\2\3 meters as radius.

Point stakeout steps:

1. Select a point to stakeout in the points database, then click OK to enter points stakeout page. Red flag is target stake point. Circle is current position of receiver. Arrow is direction indicator, indicating the direction of current receiver. When the arrow direction is same with the direction to the target point, please move in this direction, then you can reach the target point.

2. According to left status bar, move from the current point to the stakeout point, and excavate or fill the soil according to the height difference of the elevation.

3. When current point is within prompt range, there will be three concentric circles, which indicate it accesses to precise stakeout.

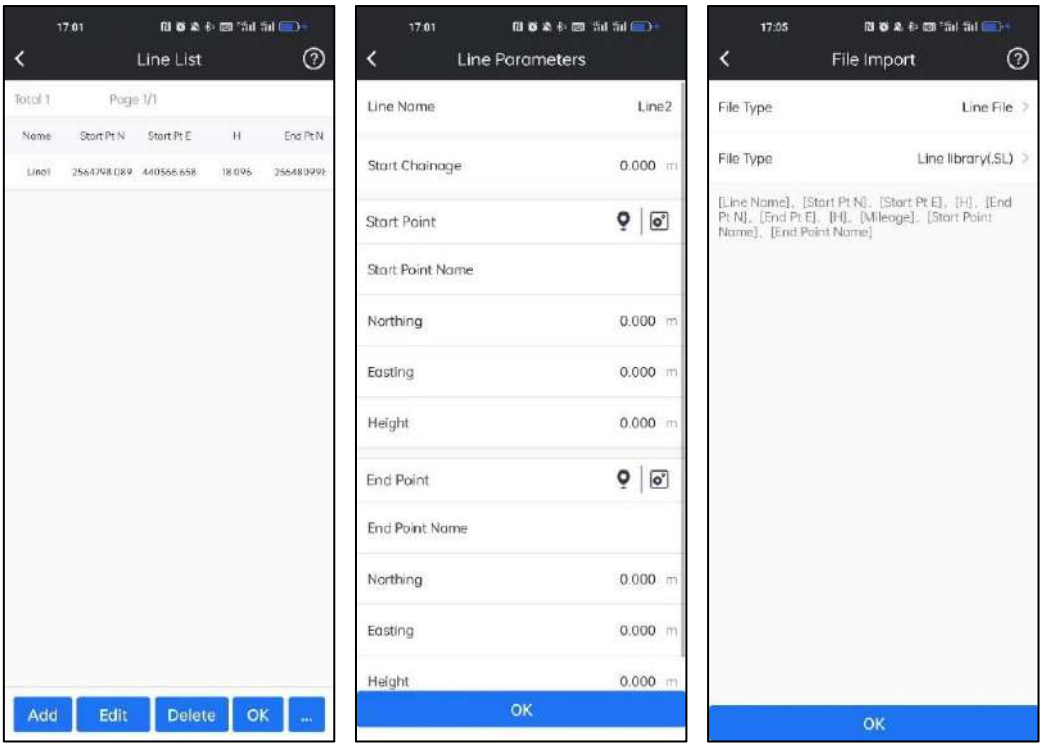
4. After you reach the stakeout point, please stake it.

5-4 Line Stakeout

Line stakeout is the stakeout of designed line.

By clicking this, we will enter to Line List.

Click Add, we can add the designed line with Line Name, the Start Point, End Point and Start Chainage. We can also import line file(*.SL).



Select target line, and click OK. And then we need to set stake parameters, which includes Chain Pile Stake On/Off, Auto Stake Nearest Point On/Off, Mileage, Range, Calculating Method and Stake interval.

Then we will access to the line stakeout page.

The icons in side toolbar are describe as follows:

 : Line List.

 : Next Point.

 : Last Point.

 : Next Line.

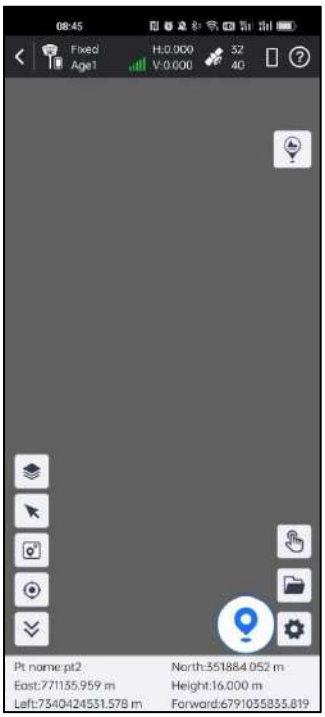
 : Last Line.

 : Line Stakeout Settings.

In Line Stakeout Settings, we can set Prompt Distance, Reference Direction (Forward, North); As for Topo Point, Information and Tool Bar settings, it is the same as Point Survey. If we click Default Settings, and it can restore the changed settings.

5-5 CAD

CAD function is mainly used to stake out CAD elements (Points, Line) of imported CAD file.



The icons in side toolbar describe as follows:

 : Import CAD file(*.dxf/*.dwg).

 **: CAD Layer.**

We can manage and check the CAD layers by clicking this icon.

: Layer switches, controlling layer display.

: Layer freeze, cannot edit or modify after freezing.

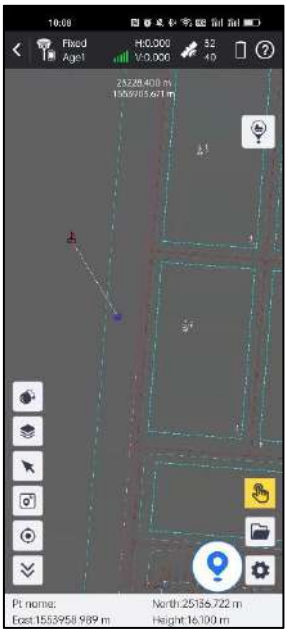
: Layer locking, cannot select after locking.

: Select Point Mode.

By clicking it, an arrow will come out. With the help of the arrow, we can move to any position on the map, get coordinates, and do Point stakeout.

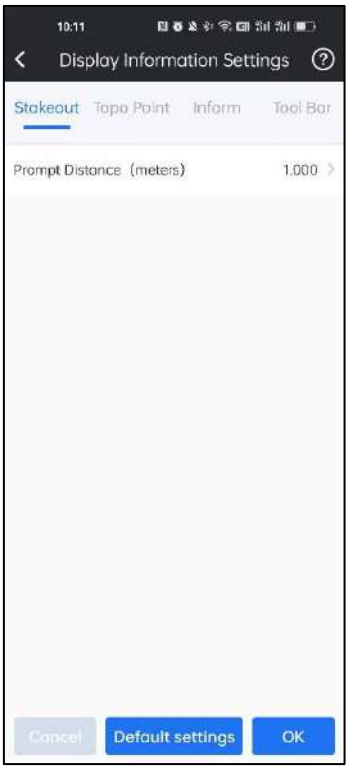
: Select CAD Element Mode.

By clicking this, We can select Point, Line, Surface elements of loaded CAD file and do a stakeout.



 : CAD stakeout settings.

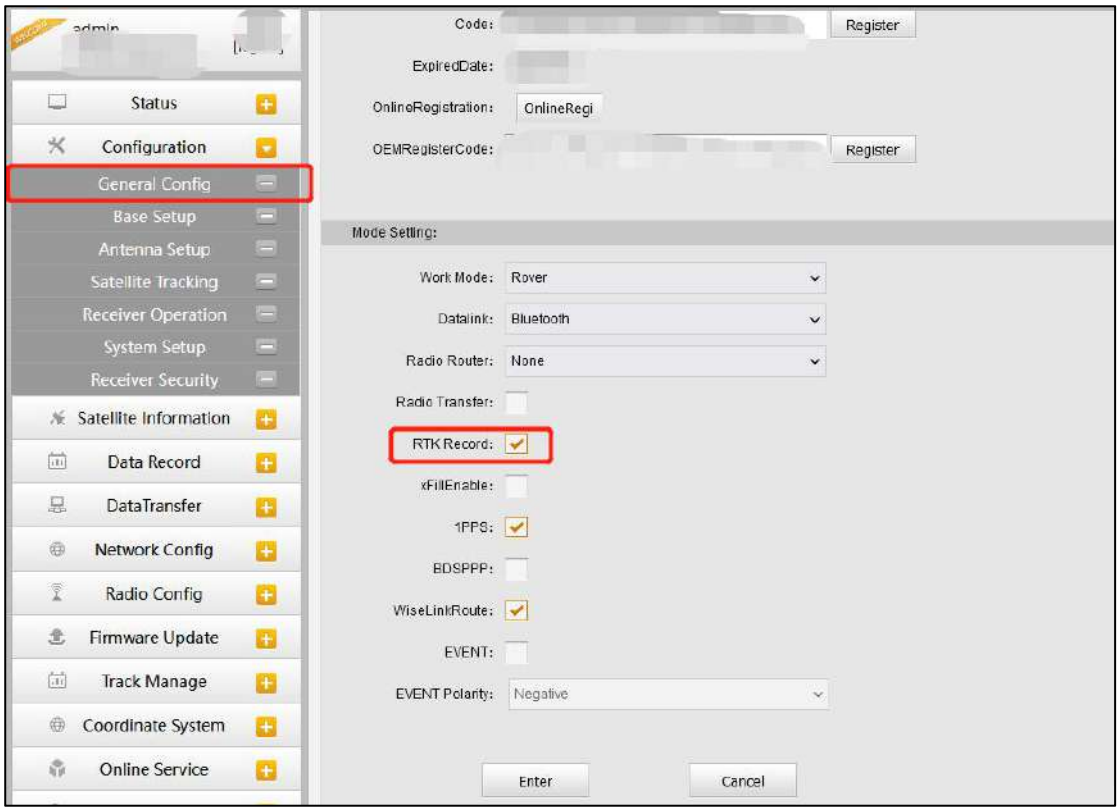
In CAD Stakeout Settings, we can set Prompt Distance; settings for Topo Point, Inform and Tool Bar are the same as that of Point Survey.



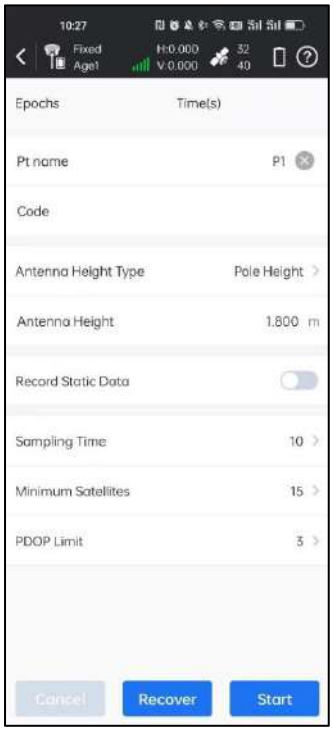
5-6 PPK Survey

PPK (Post Processed Kinematic) is a post-processing differential technology to obtain centimeter level positioning accuracy information. Compared to RTK (Real Time Kinematic) positioning, PPK doesn't need direct communication between base station and rover station. It is also called Stop & Go.

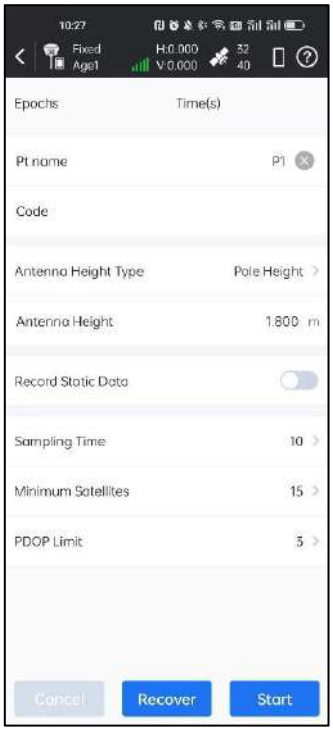
1. We need to enable Raw data record in WEB UI for both base and rover.



2.After connecting rover in SurvStar, go to Survey-Point Survey-PPK, we can access to the PPK collect interface.



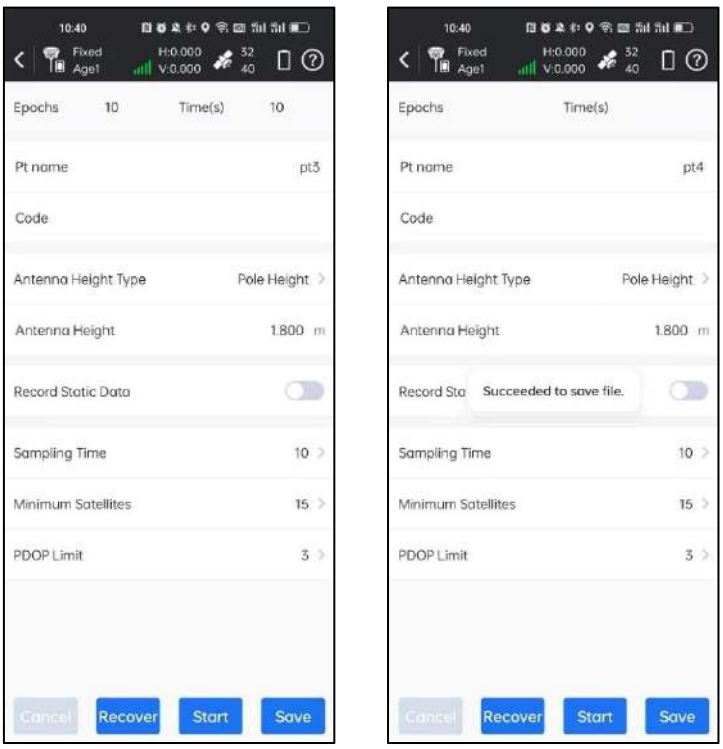
3.In PPK collection, we can set the Pt name, Code, Antenna Height Type, Antenna Height, Record Static Data On/Off (make sure Record Static Data choice is on), Sampling Time, Minimum Satellites and PDOP Limit. For the Sampling Time setting, 30 seconds or more is recommended to achieve better accuracy.



4. And then we go to the first target point, click start and SurvStar will collect the point's PPK information. After previous set Sampling Time ends, PPK collection will

stop.

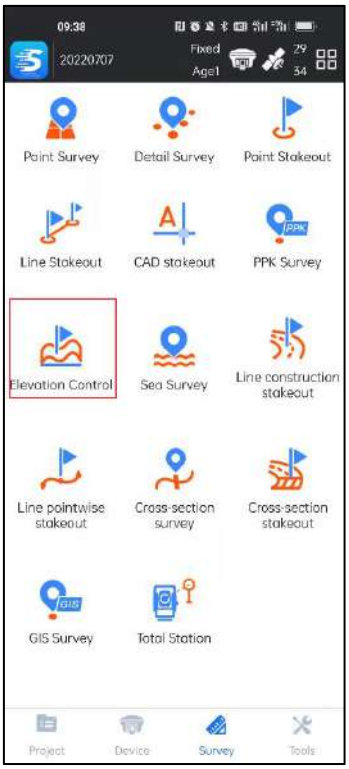
5. After collecting the point, we can click Save to save the point and then go to the next point.



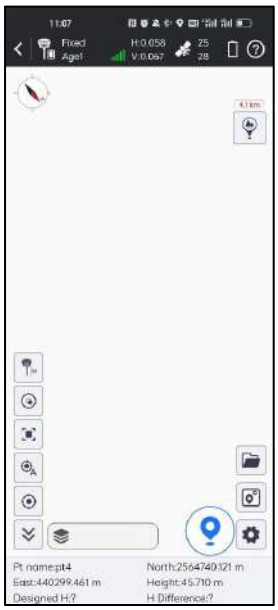
5. Repeat these steps until the project done. And then copy relevant files into post processing software to do PPK processing.

5-7 Elevation Control

Elevation Control is using known points to calculate designed Height surface, or loading designed Height surface directly, and we can compare current position's Height with designed Height surface to do site leveling and earthwork calculation work.



1.Click  to open Surface manage page.

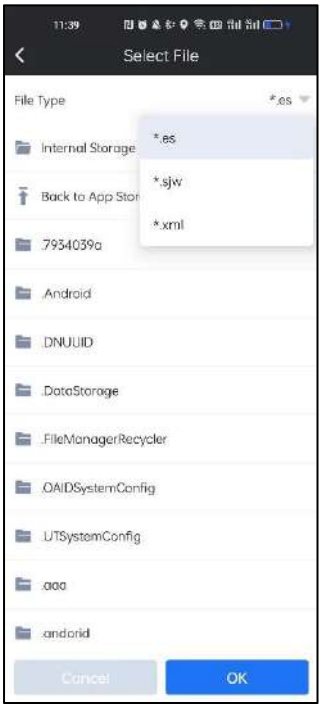


2.Add/Import Surface.

There are two ways to add/import surface.

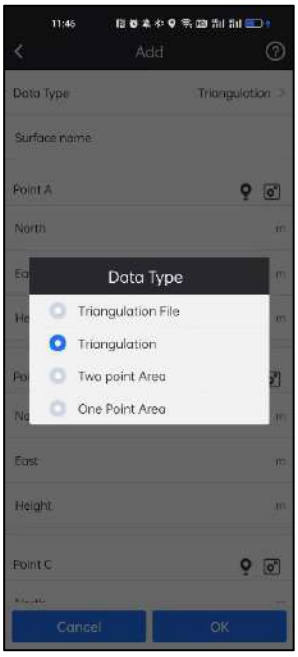
Import:

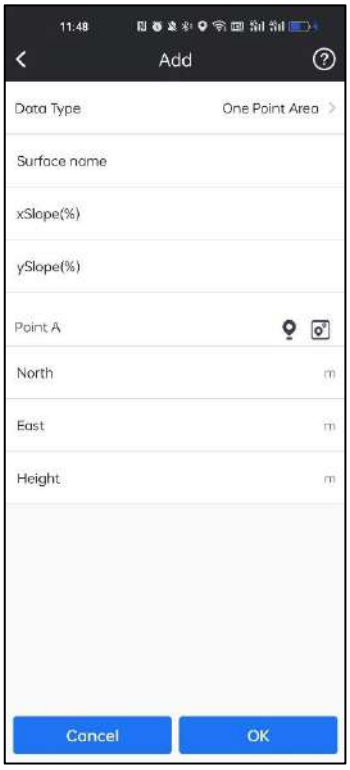
Click ... and click Import, select the surface file (*.es/*.sjw/*.xml) and click OK.



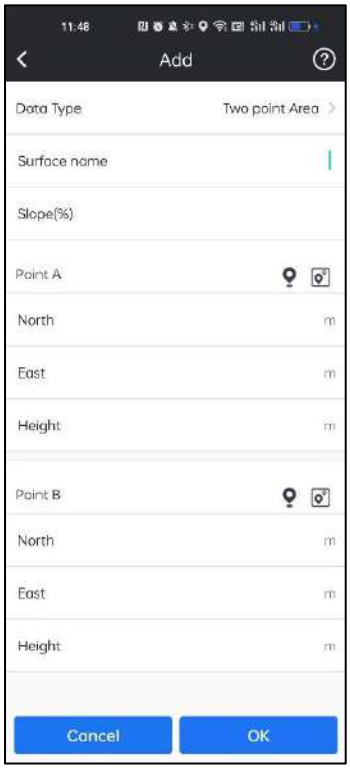
Add:

Click Add, select the Data Type to build elevation plane. We can use three ways to build it: one point with two slope, two points with one slope and Triangulation.

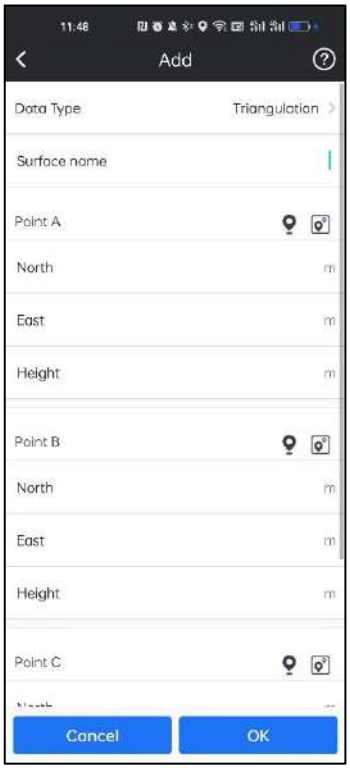




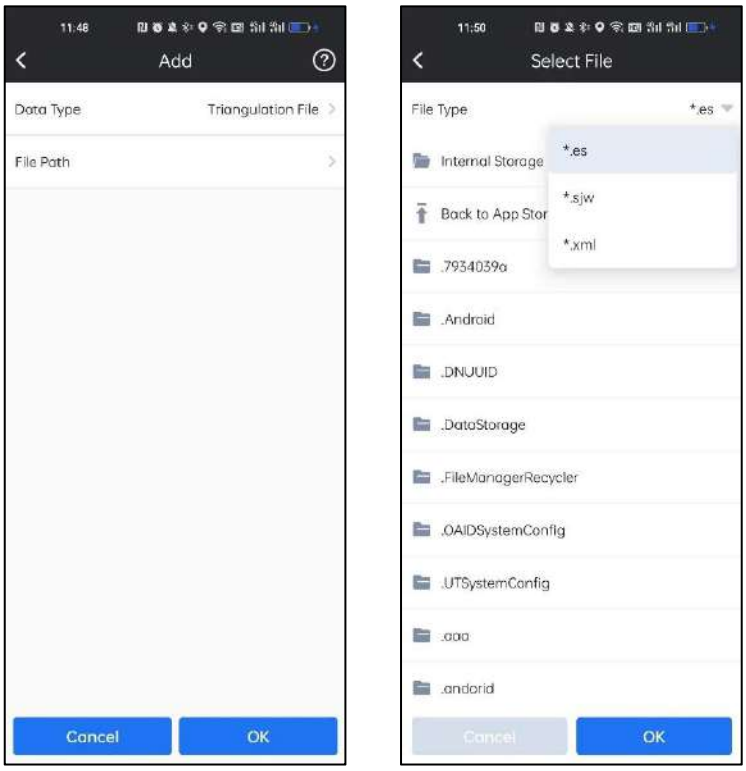
One point



Two points

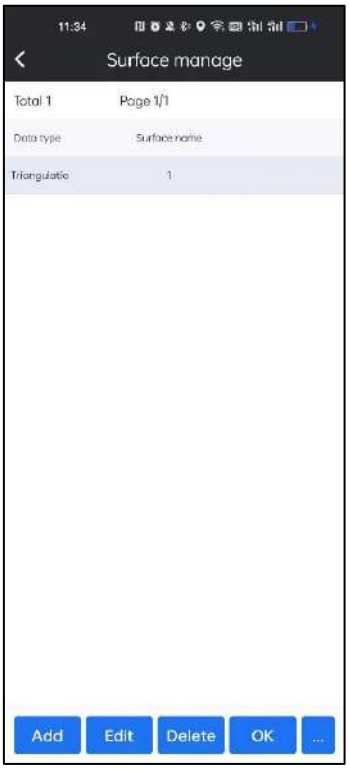


Three points



Triangulation file

3.Then we can select the surface and click OK to do the elevation control.



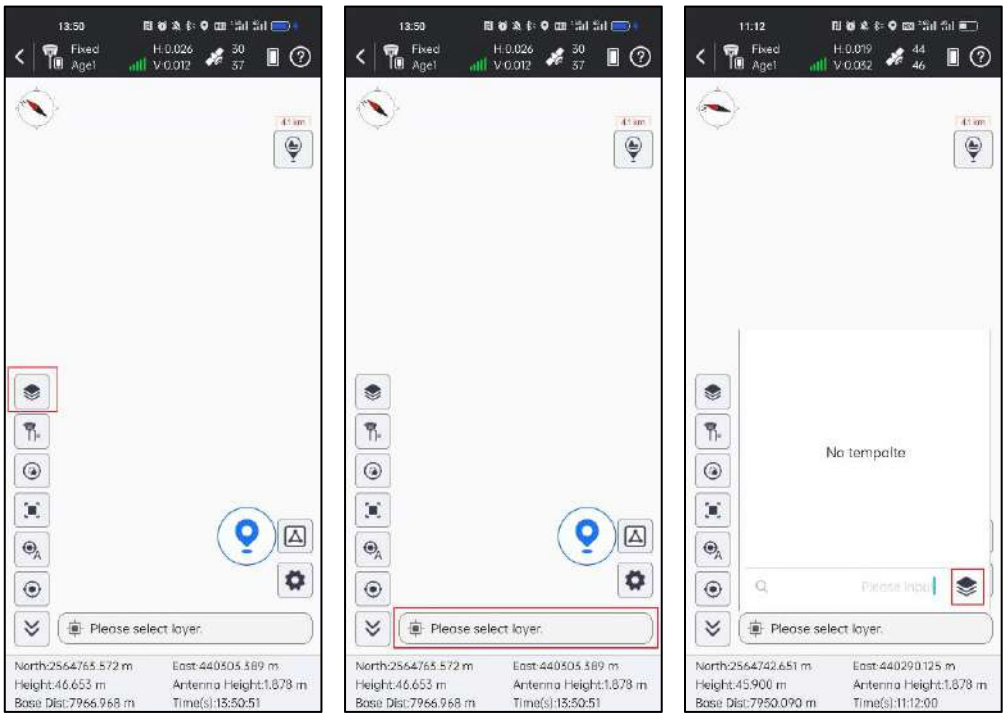
4.If the device is in the surface, there will be designed height and H difference shown in the below bar. If it is outside, there will be '?'.

We can control the elevation with the designed surface. And know the any point H difference in the range of the surface.

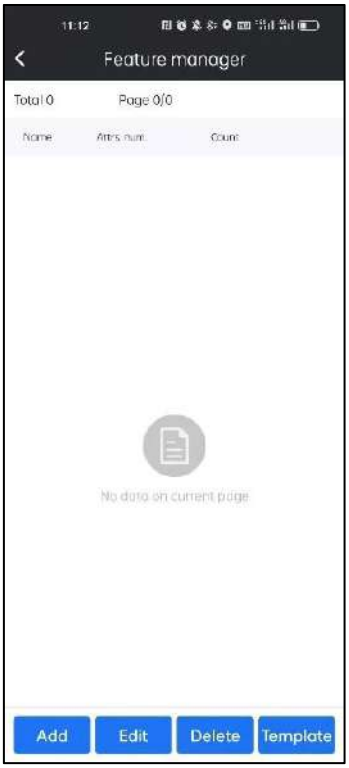
5-8 GIS Survey

In GIS survey, we can define GIS template and collect GIS entities.

1.For a new project, we need to import predefined GIS template or make GIS entities' features for current project in SurvStar. Click  and enter to feature manager page. We can also click the layer bar to enter to it.

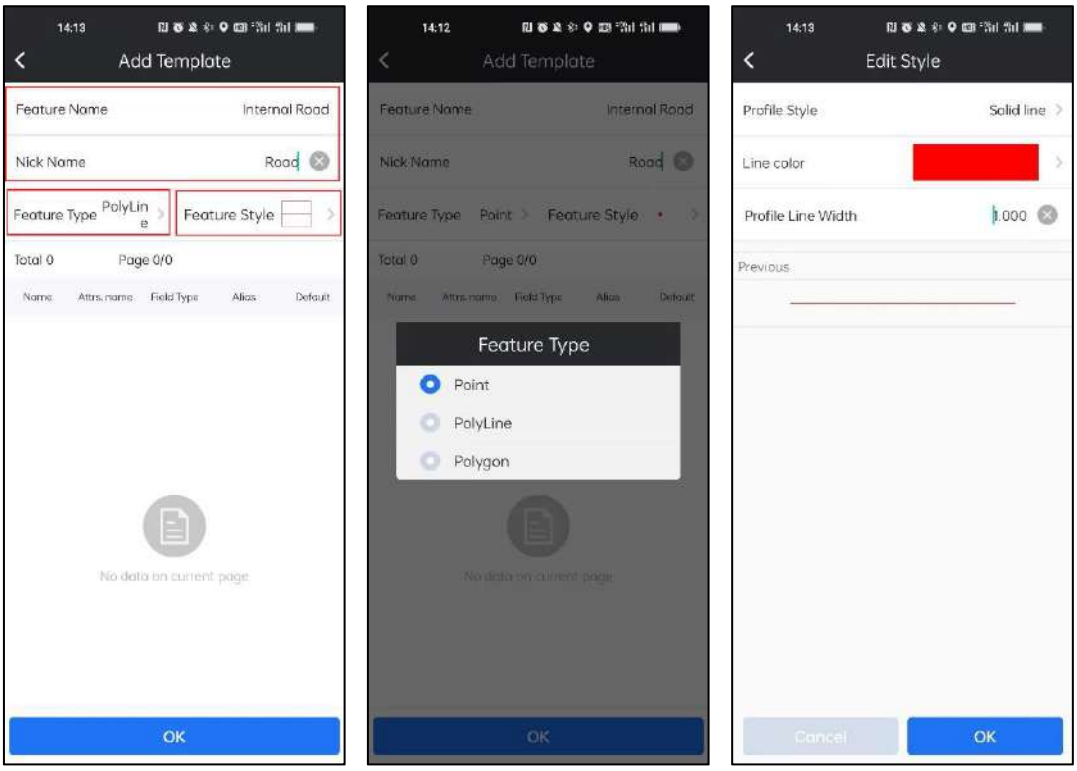


2.In feature manager, we can add, edit, delete, import and export the features.

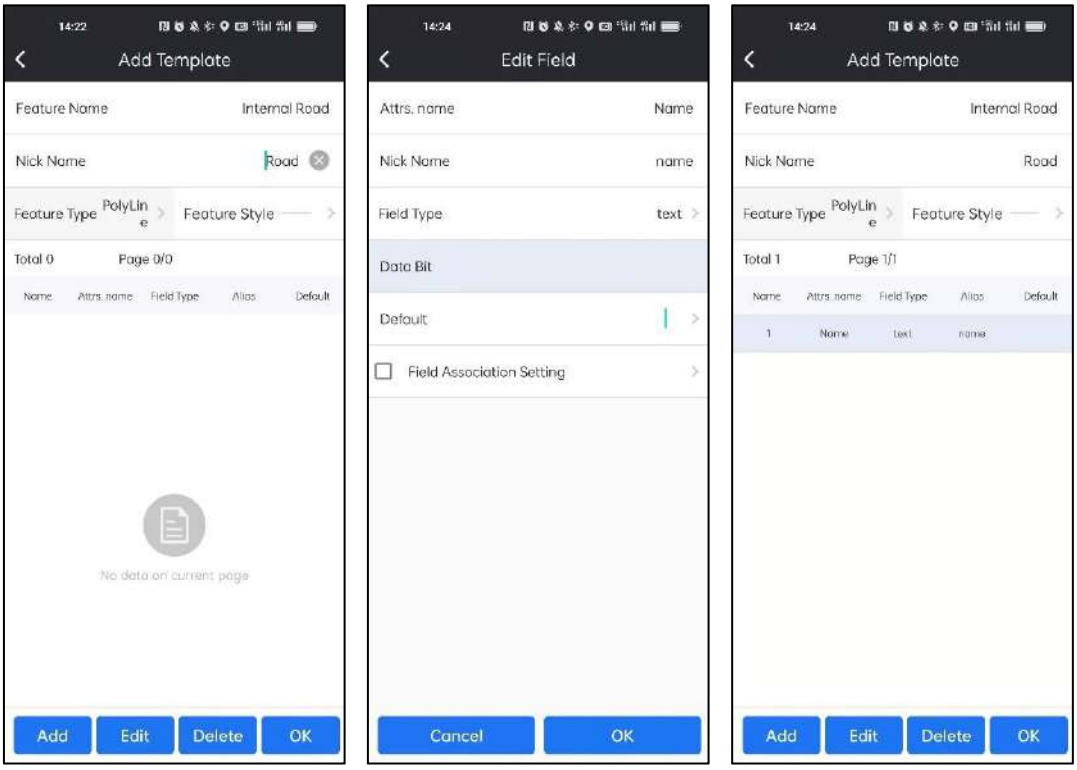


Add:

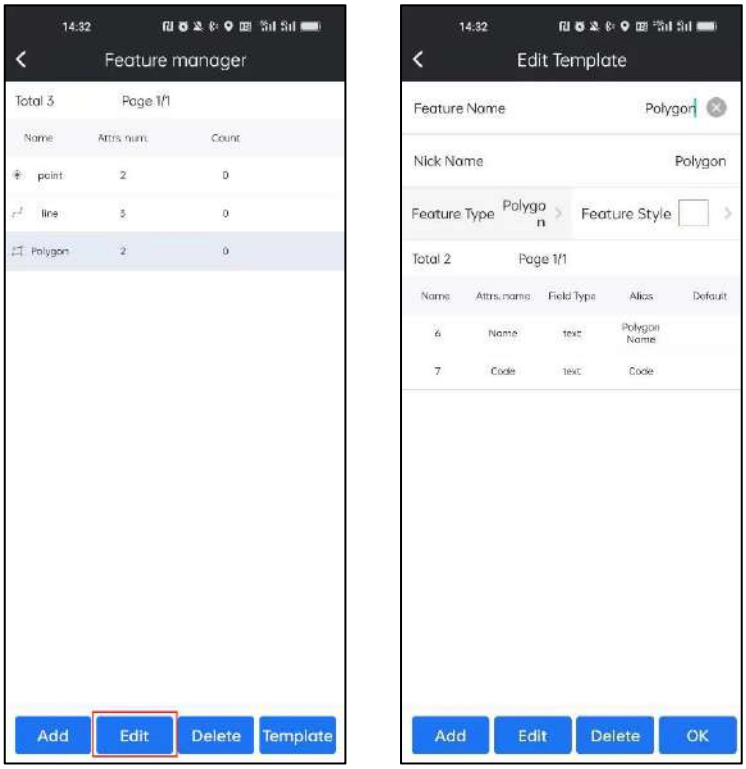
Click Add, input the feature name and nick name, choose the feature type (Point/PolyLine/Polygon) and set the feature style, then click OK.



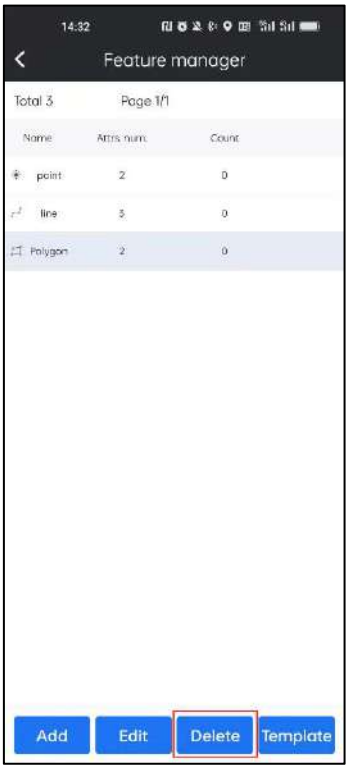
Then we need to add the attribute of it, click Add. Input the Attributes Name, Nick name, Field Type and click OK. If the input of the attributes finished, click OK.



Edit: Select any feature, click Edit, then we can edit it.



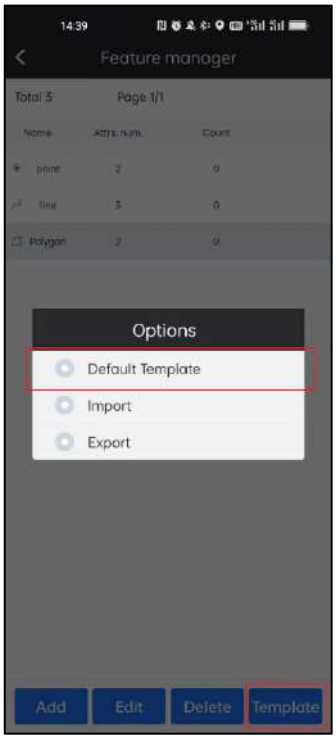
Delete: Select any feature, click Delete, then we can delete it.

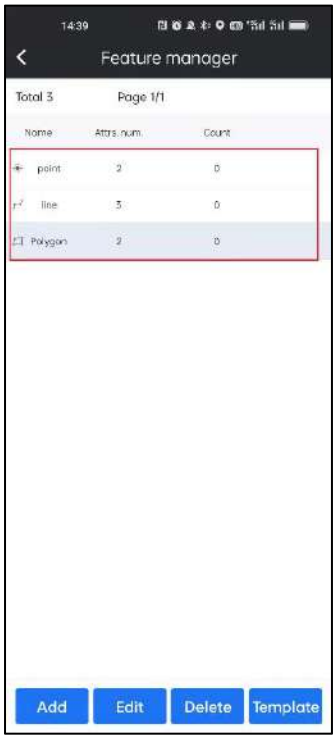


Default Template:

Click Template and click Default Template, there will load the default template to it.

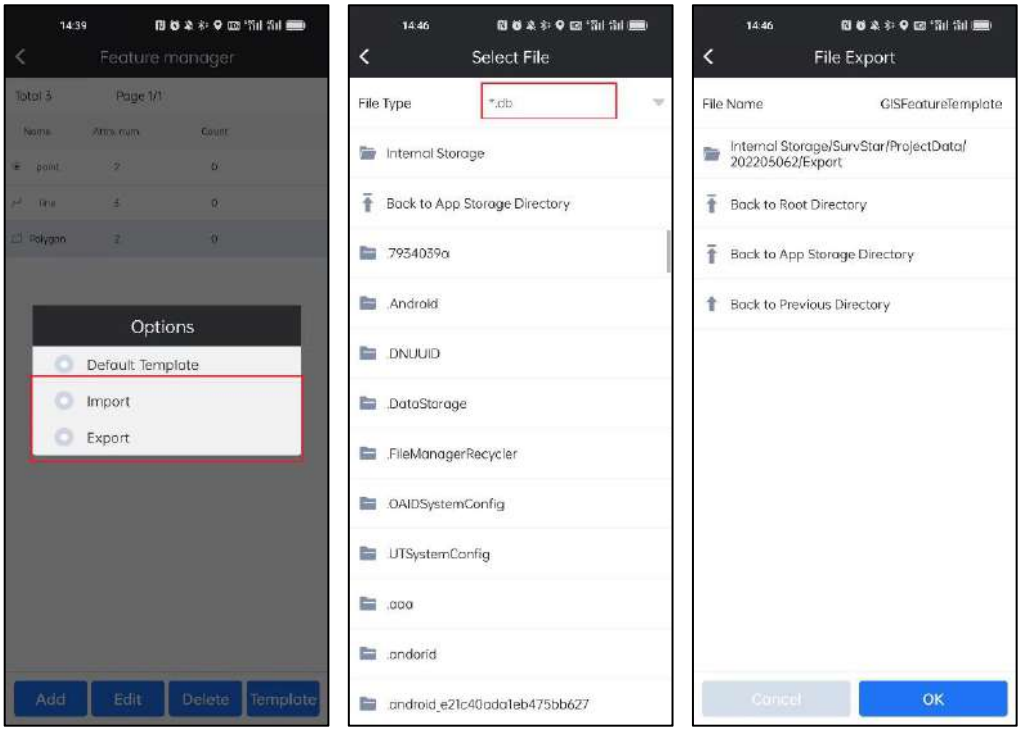
It has three features: Point, Line and Polygon.



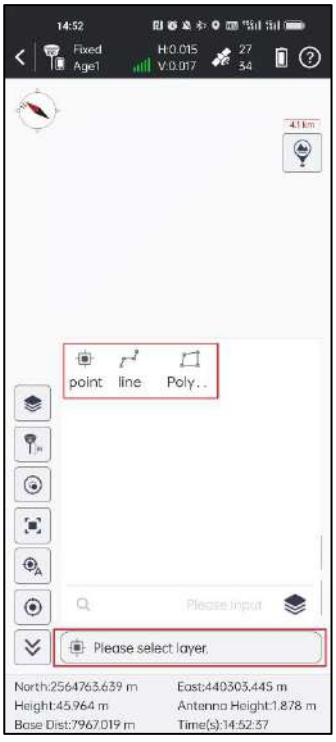


Import/Export Template:

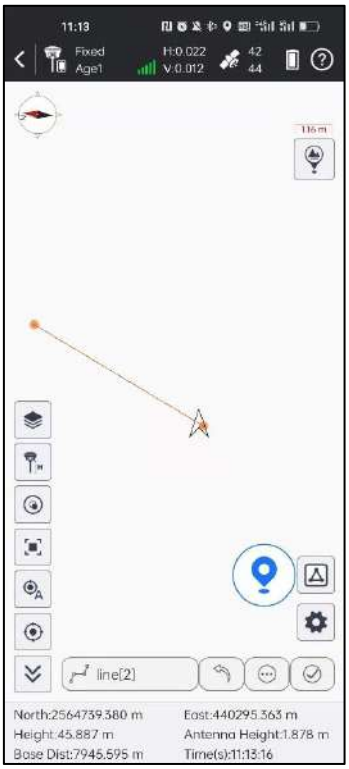
Click Template and click Import/Export, select the template file(*.db)/select the export path and click OK. The template file will be imported or exported.



3.After the feature manager completed, we can use it by clicking the below layer bar. Select the feature and then we can start GIS survey.



4.For example, select a line feature template. And start to do GIS survey.

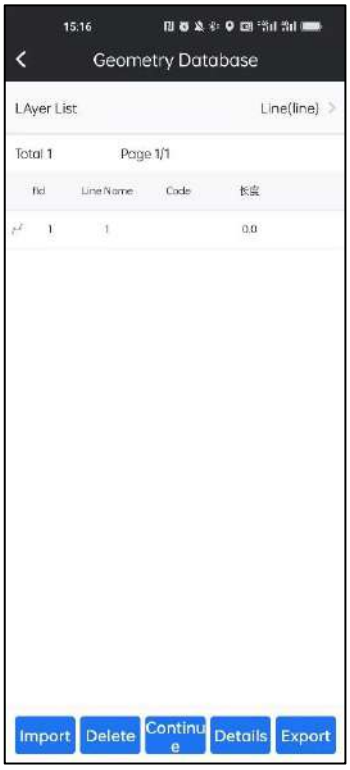


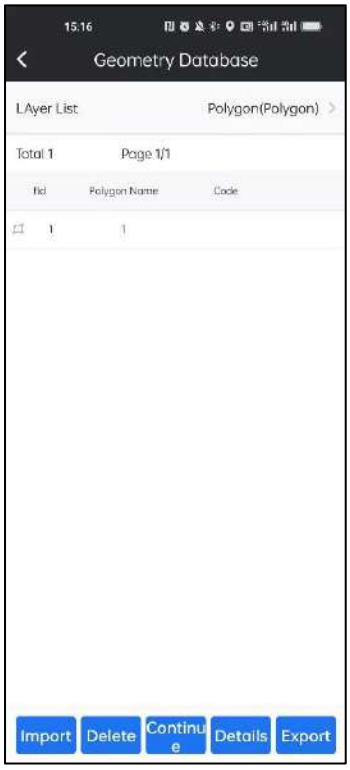
 : Click this, it will go back to the previous operation

 : Click this, we can edit the attributes of current feature.

 : Click this, we can finish surveying this feature.

5.We can check and manage the shape in Geometry Database. Click  and enter to Geometry Database. In Geometry Database, it can import/export shape file(*.shp), delete and continue to survey the feature.



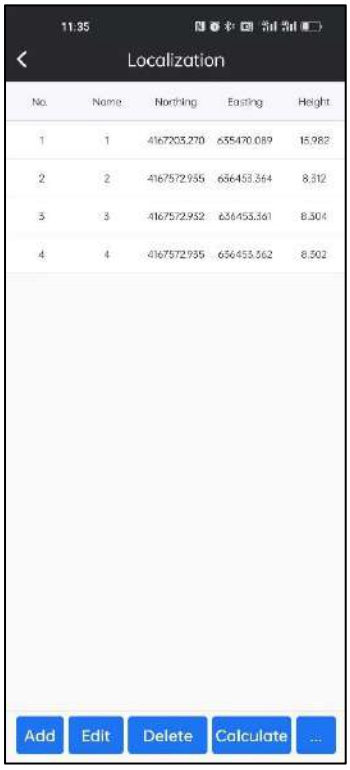


Chapter 6 Tools

6-1 Localization

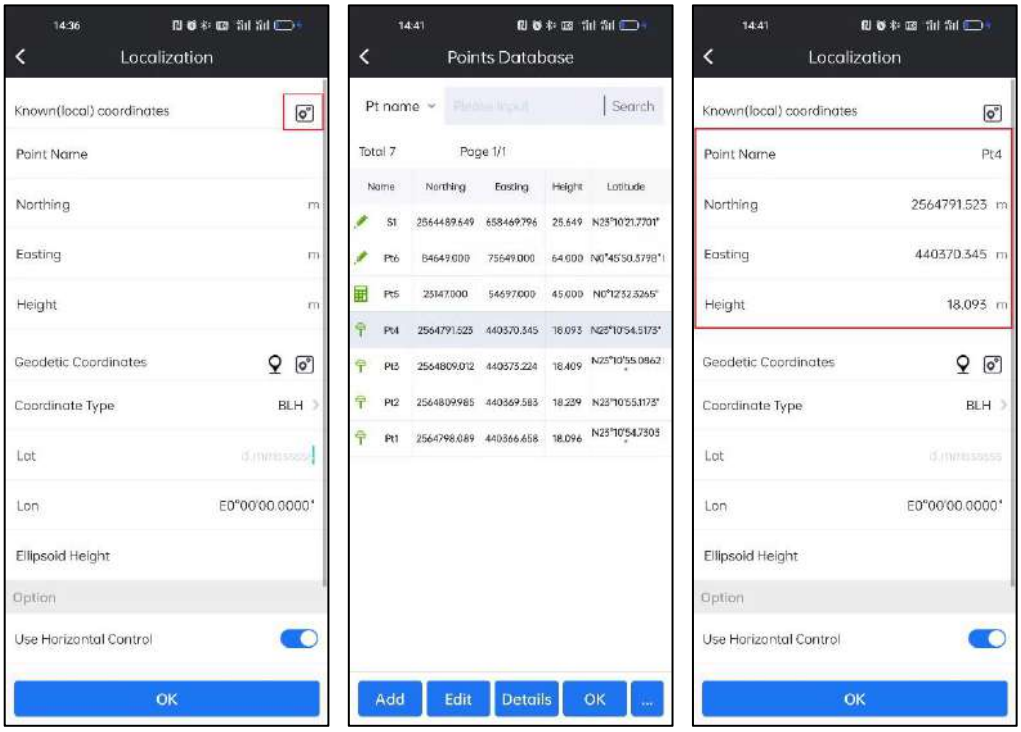
Sometimes we don’t know target coordinate system parameters except for a few known points, in this case, we need to do Localization to convert current coordinate system to target coordinate system.

When we go to Localization tool, we can do the Add, Edit, Delete, Calculate, Import, Export and Settings operation.

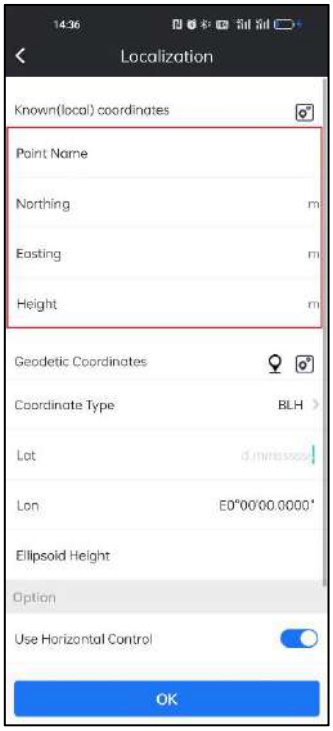


Add:

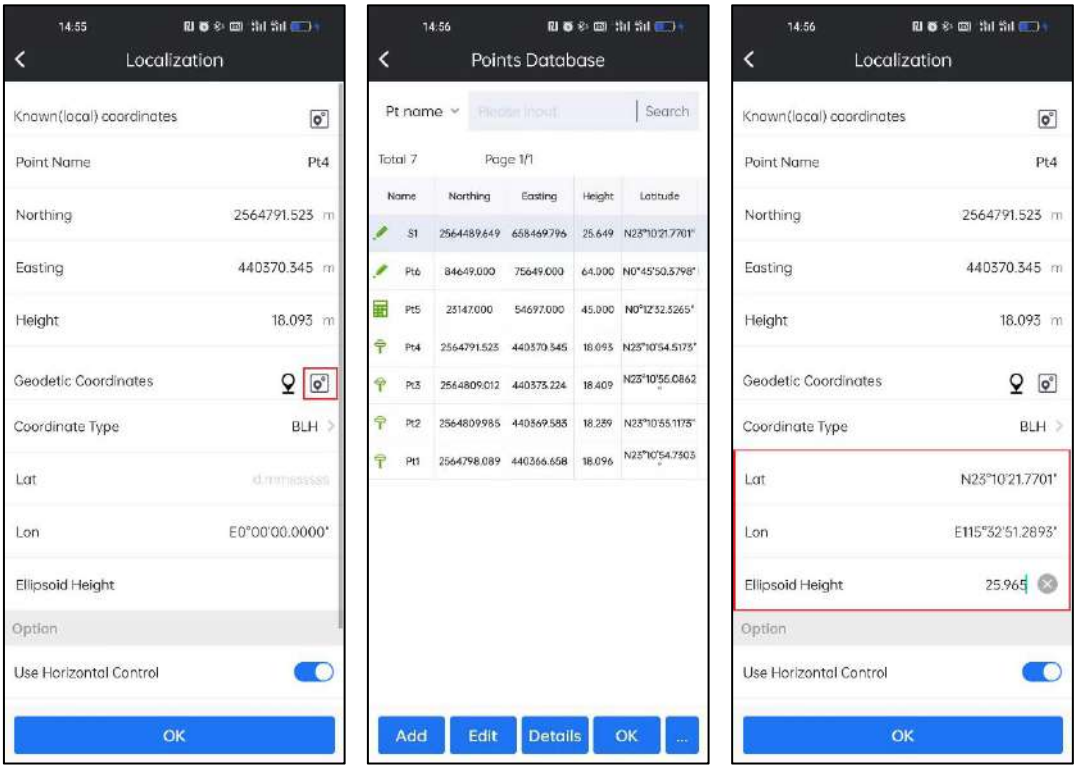
Click Add, we can add Coordinates of the same point under target coordinate system (known point) and current coordinate system. If we have input known points NEH in database before, we can click the icon in the right of the Known(local) coordinates bar. And select it directly.



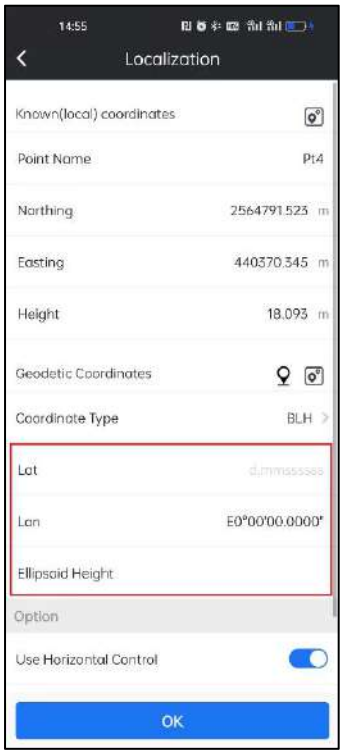
Or we can input the coordinate directly.



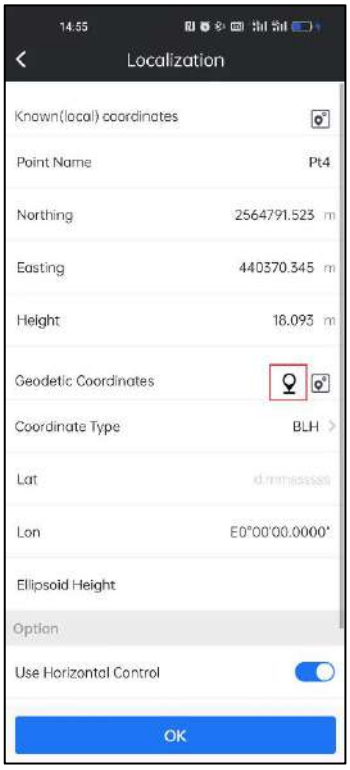
And then we need to input the same point's Coordinates under current coordinate system. If we collected it before, we can click the icon in the right of the Geodetic Coordinates bar and select it directly.

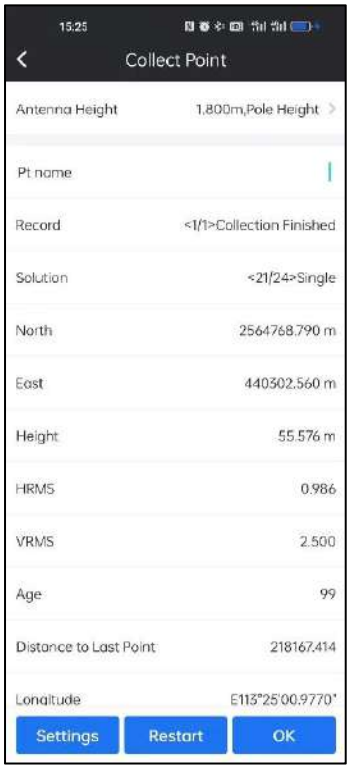


We can also input BLH directly.

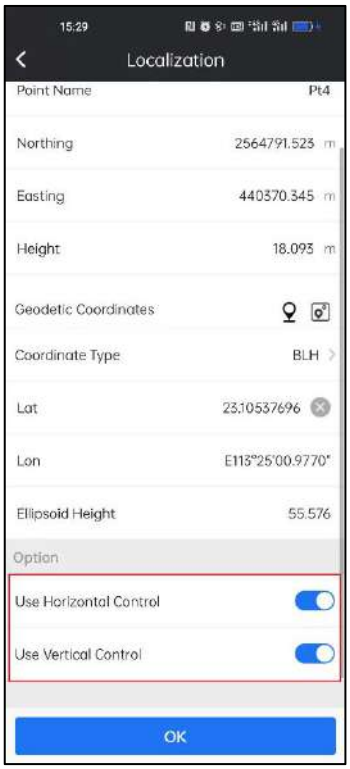


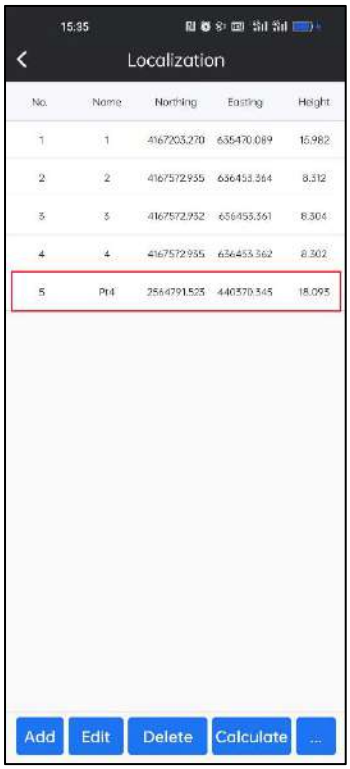
We can also put the device on the point and collect coordinates in site. Click the icon in the right of the Geodetic Coordinates bar. And click OK to collect it.





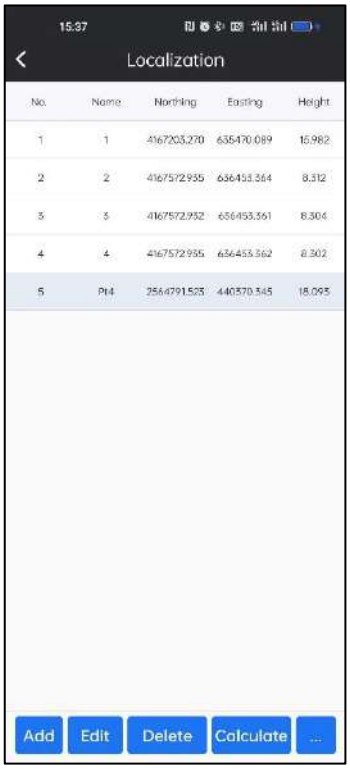
Then we need to select whether to use the point with horizontal control or vertical control. And Click OK. This point will participate in calculation.

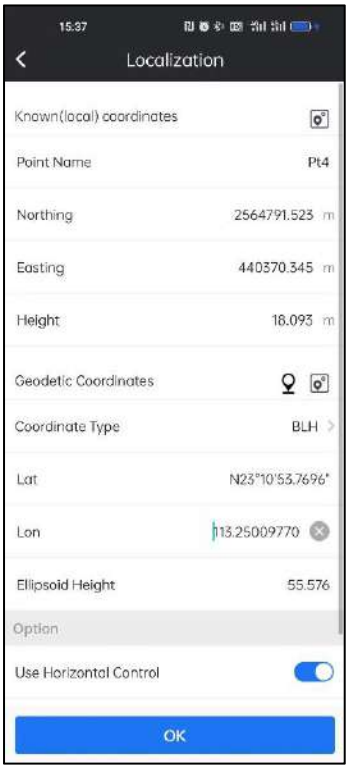




Edit:

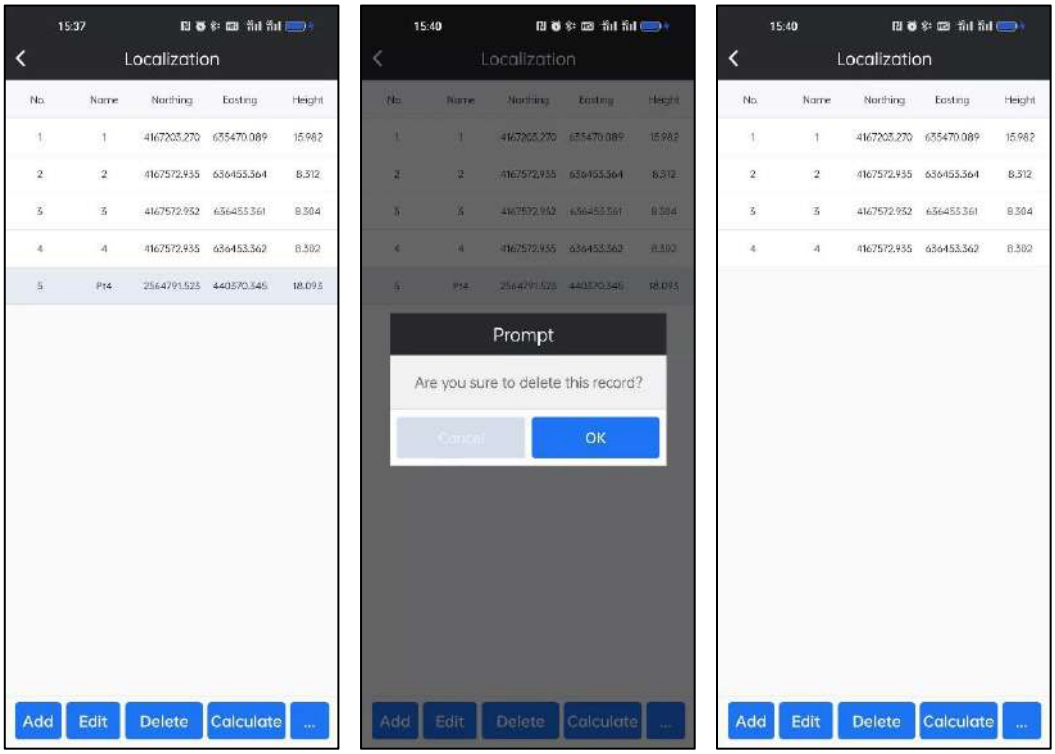
Select any point and click Edit. We can edit the coordinate of the selected point and select whether to use the point with horizontal control or vertical control.





Delete:

Select any point and click Delete. We can delete the selected point.

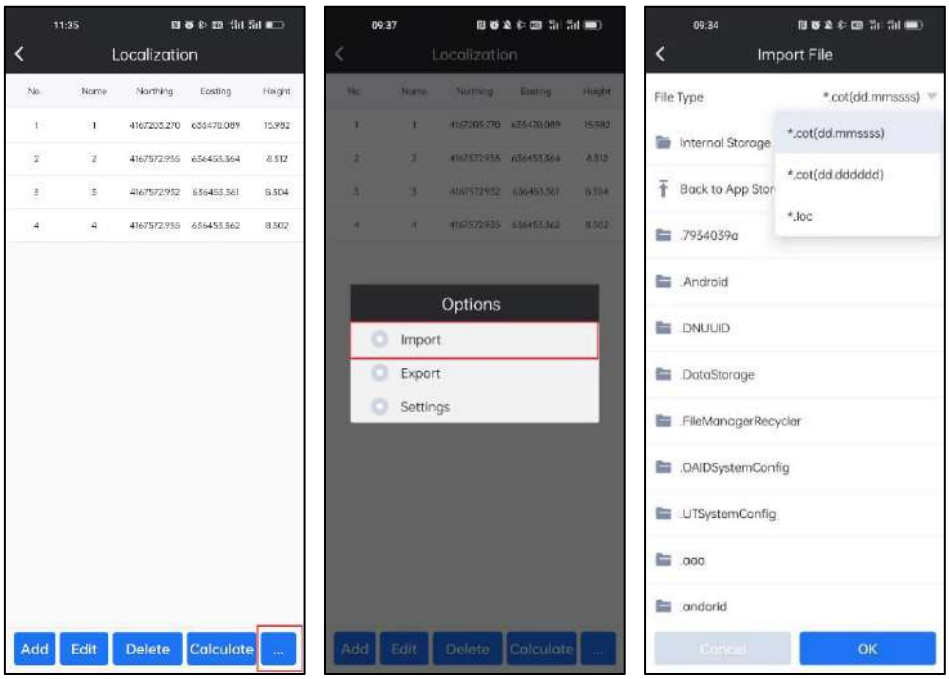


Calculate:

After finishing inputting localization points' information, we can click Calculate. Then there will show a coordinates System report with converting parameters. We can save the converting parameters by clicking Save. And click Apply, the parameters will apply to the current project.

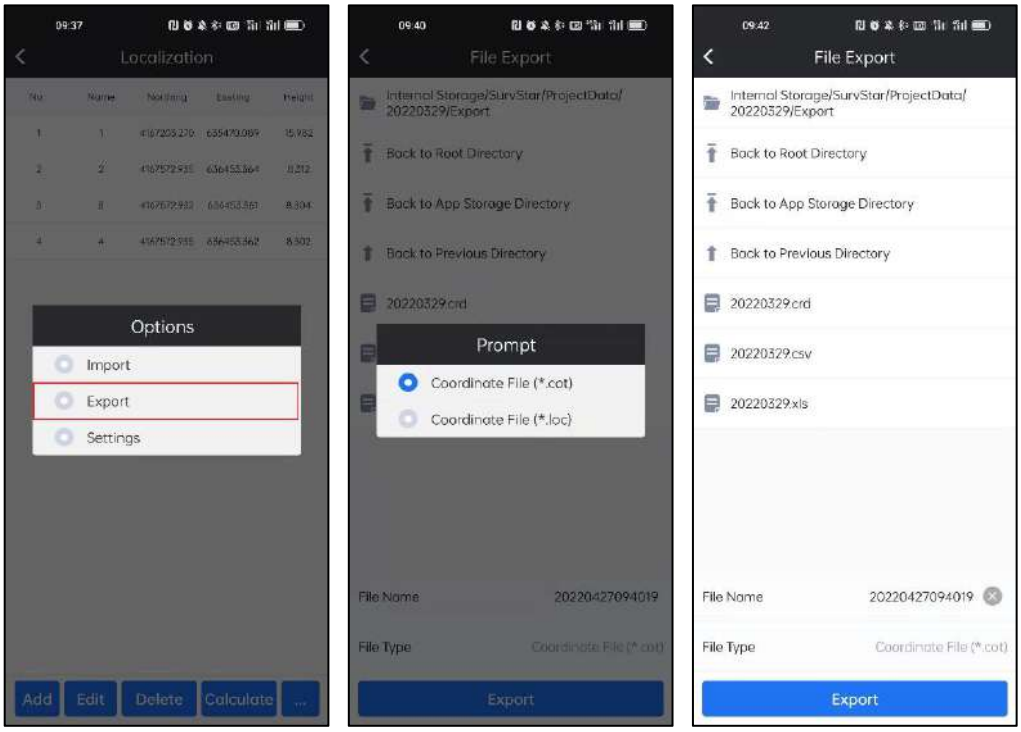
Import:

Click ... and Click Import. Select the file type: *.cot(dd.mmssss), *.cot(dd.dddddd) and *.loc. Select file path and click the file. Click OK.



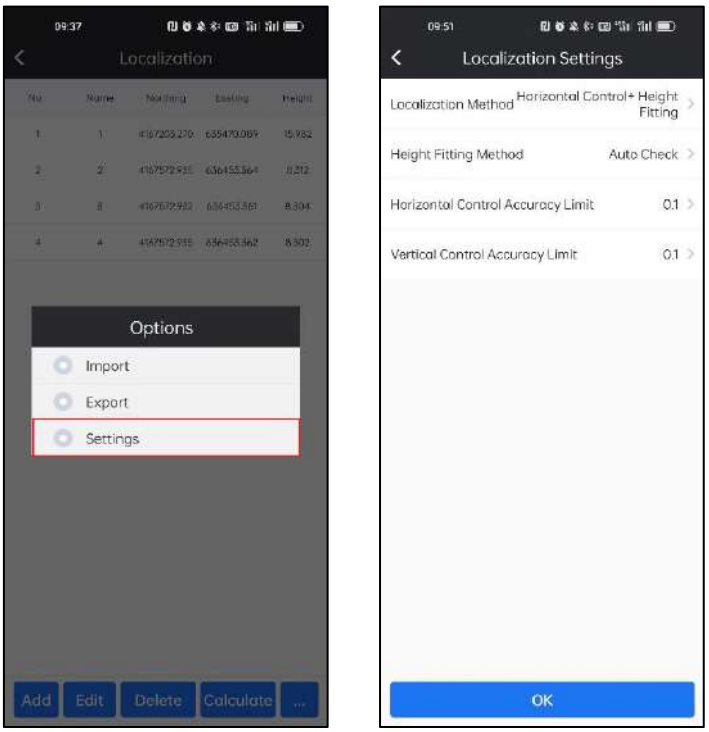
Export:

Click ... and Click Export. Select the file type: *.cot(dd.mmssss) or *.loc. Select file path and click the file. Click Export.



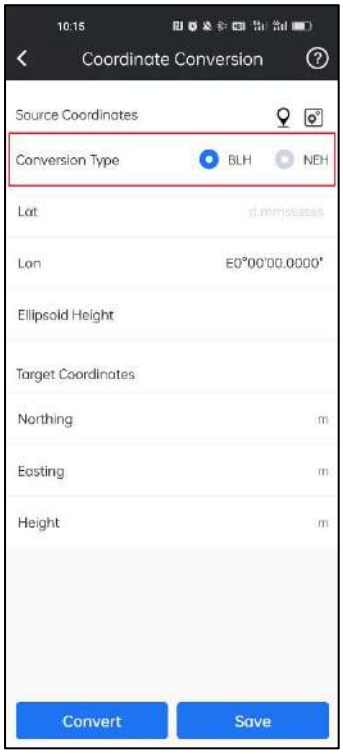
Settings:

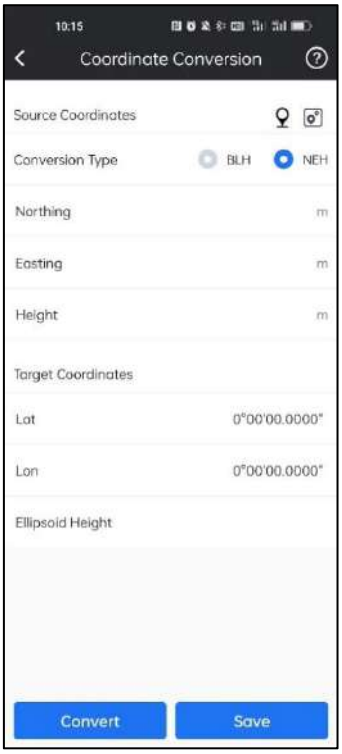
Click ... and Click Settings. We can set localization method, height fitting method, horizontal control accuracy limit and vertical control accuracy limit.



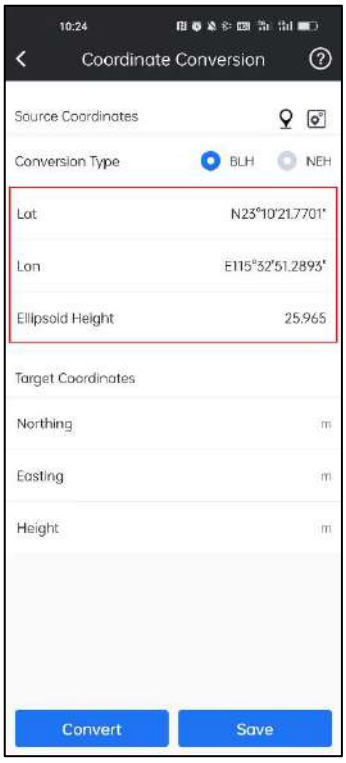
6-2 Coordinate Converter

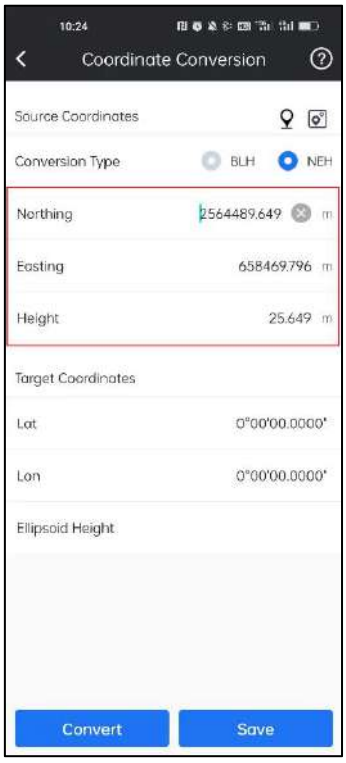
In Coordinate Converter, we can convert coordinate from BLH to NEH or from NEH to BLH in the current project parameters. We need to select the Conversion Type firstly.



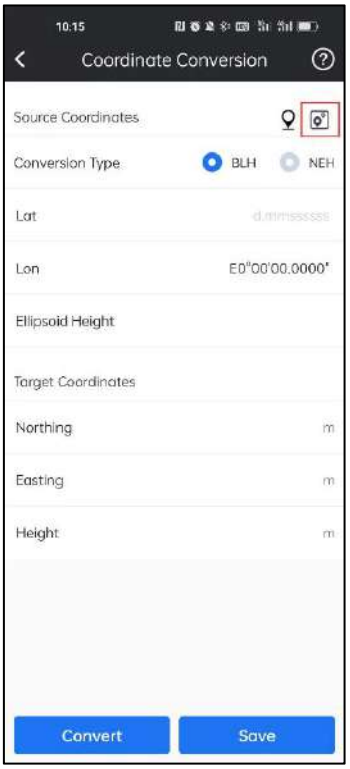


We can input coordinate directly.

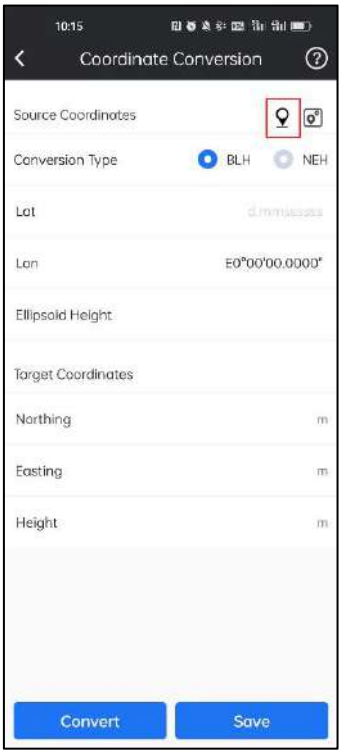




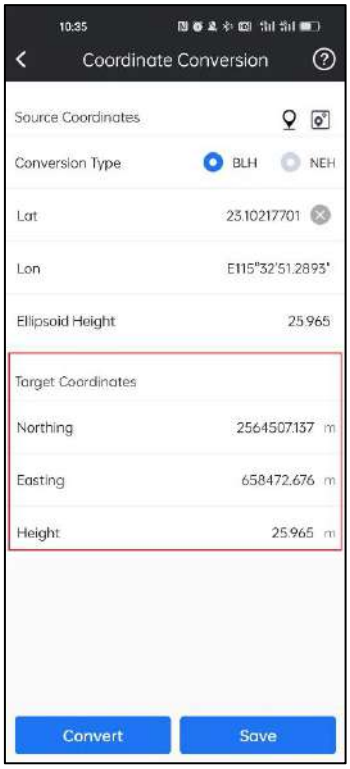
If we have the surveyed point in database, we can click the icon in the right of the Source Coordinates bar. And select a point. Click OK. Then the BLH or NEH will input automatically.

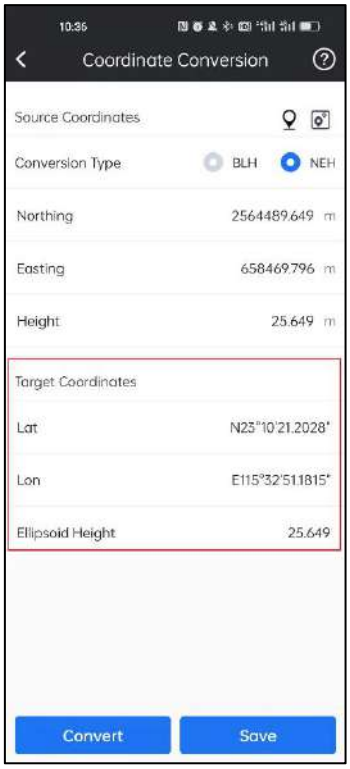


We can also put the device in the point and collect the coordinate in site. Click the icon in the right of the Source Coordinates bar. And click OK to collect it.



Click Convert and the target coordinates will be calculated and shown in the below bars.

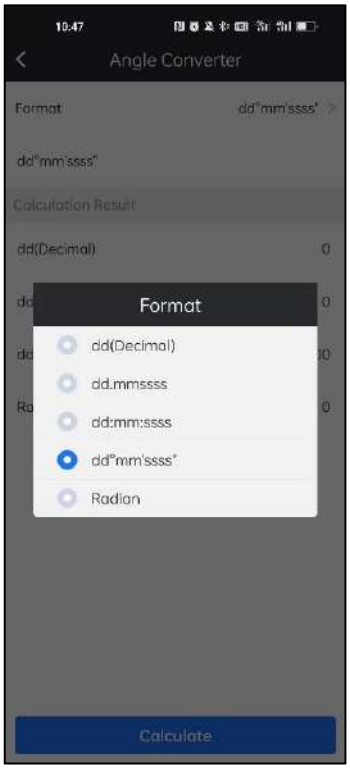




We can click Save to add the calculated coordinate to the point database.

6-3 Angle Converter

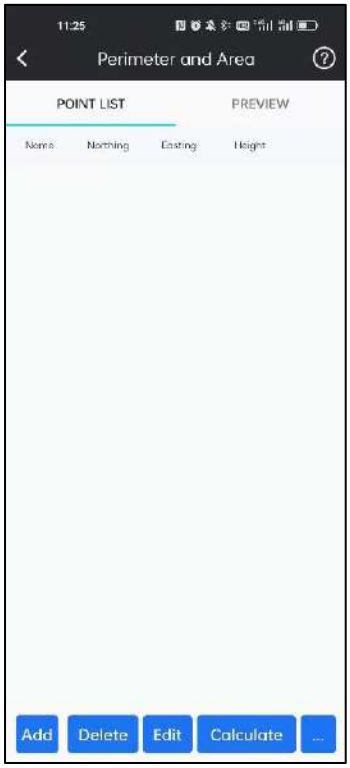
We can convert the angle format in this function. Set the format and input the angle.

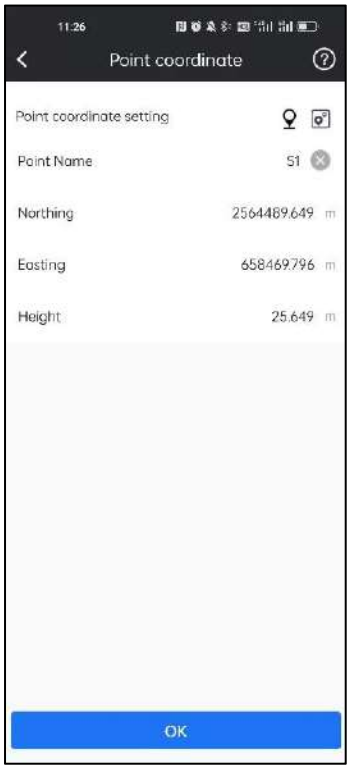


Click Calculate. Then the angle value input will be converted to other formats.

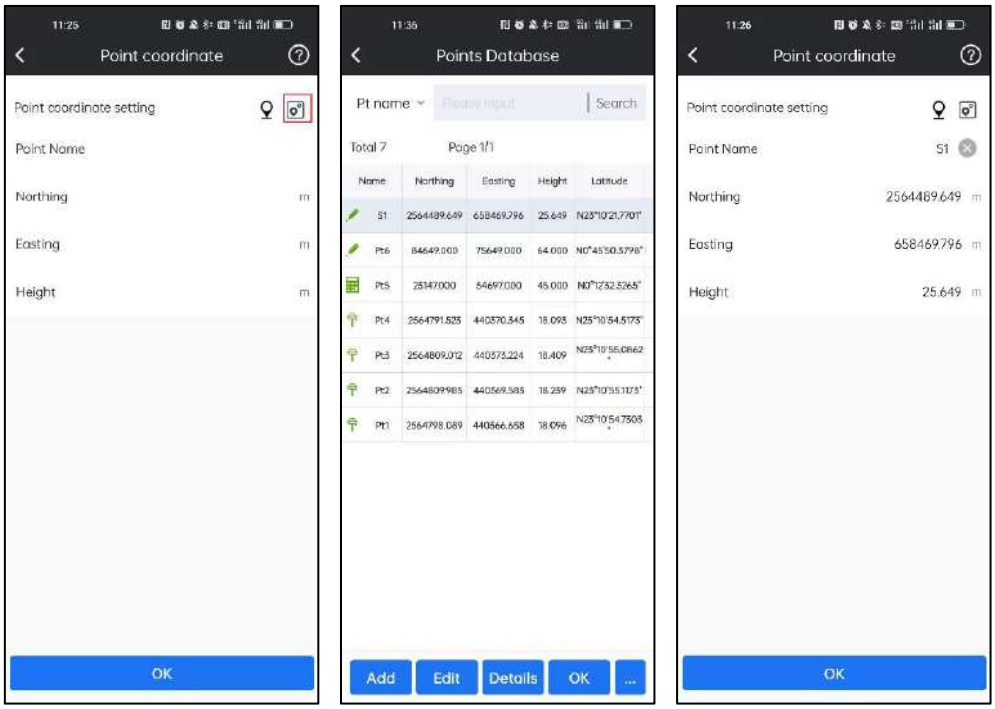
6-4 Perimeter and Area

In Perimeter and Area, we can use the coordinate of the points to calculate the perimeter and area. Click Add. We can input the point directly.

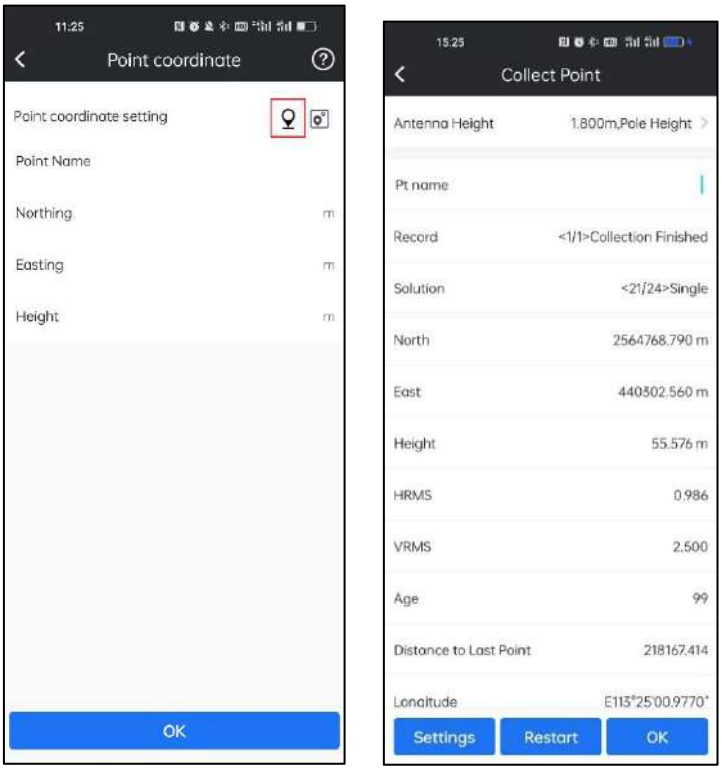




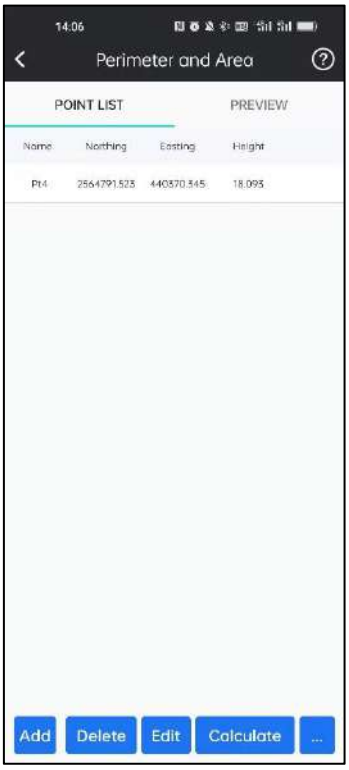
If we have the surveyed point in database, we can click the icon in the right of the Point coordinate setting bar. And select a point. Click OK. Then the NEH will input automatically.



We can also put the device in the point and collect the coordinate in site. Click the icon in the right of the Point coordinate setting bar. And click OK to collect it.

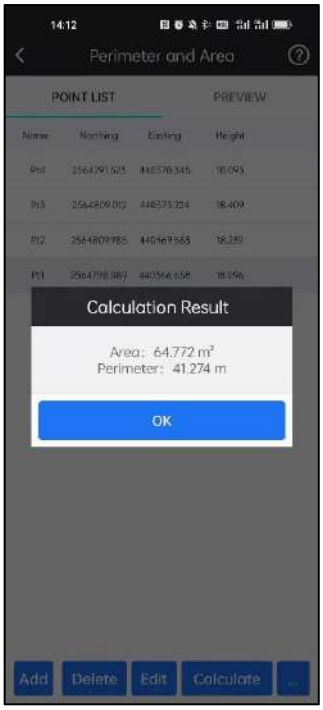


Click OK. And the point will add to point list.

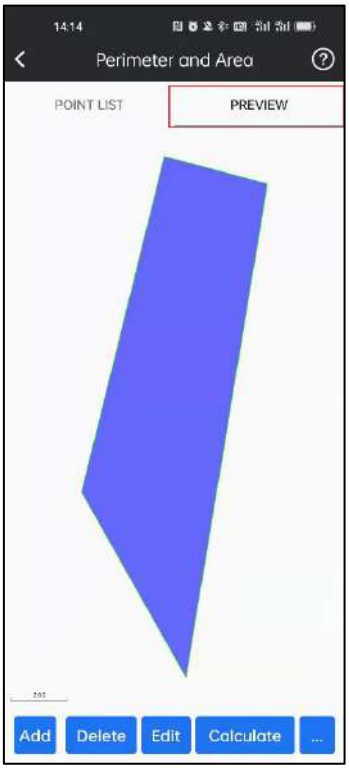


We can delete or edit a point after selecting it and then click Delete or Edit.

When we finish inputting points, then we click Calculate and there will show the result of perimeter and area.

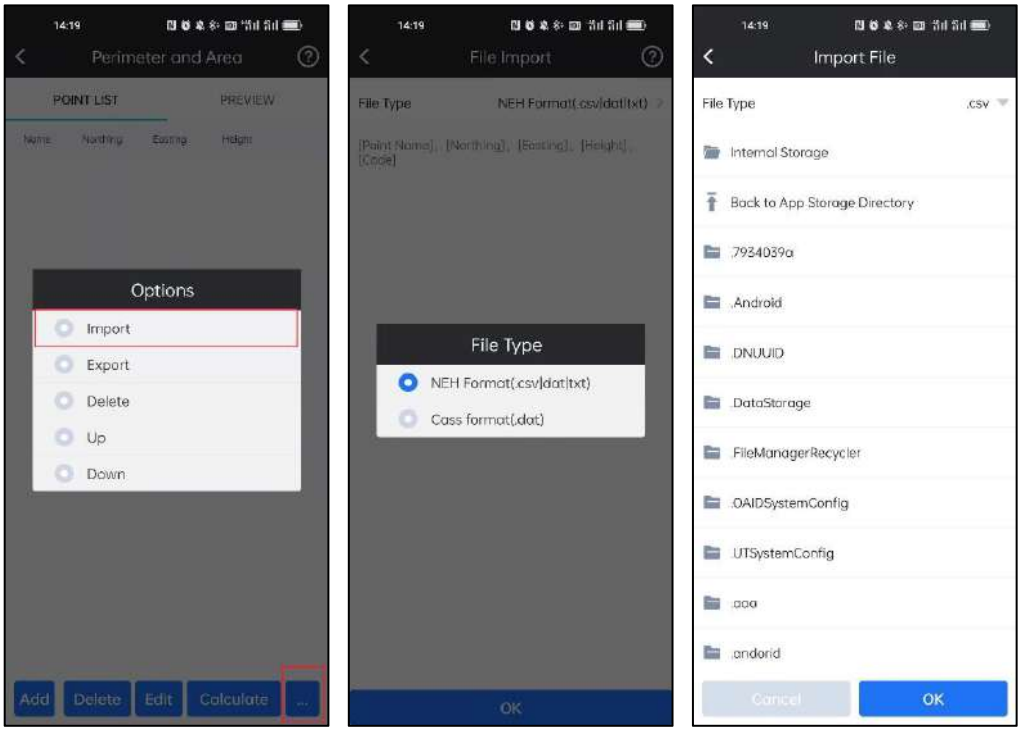


We can check the shape of the polygon by click the PREVIEW.



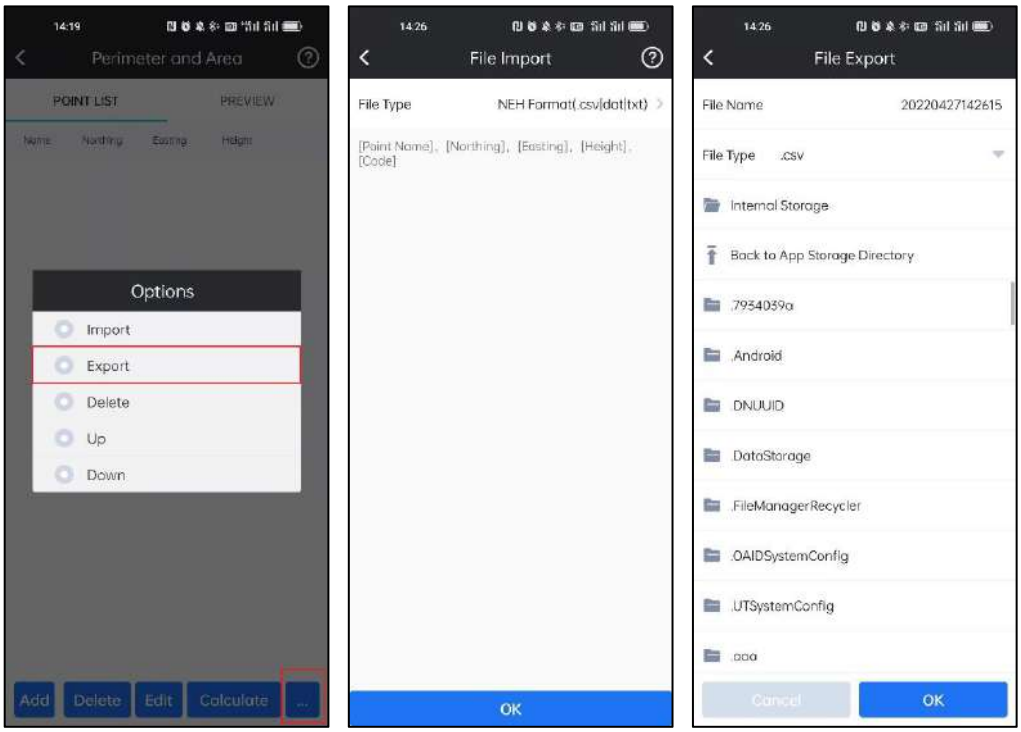
Import:

Click ... and Click Import. Select the file type: NEH Format(*.csv|dat|txt) or Cass Format(*.dat). Click OK. Select file path and click the file. Click OK and then points will be loaded into Point List for calculation.



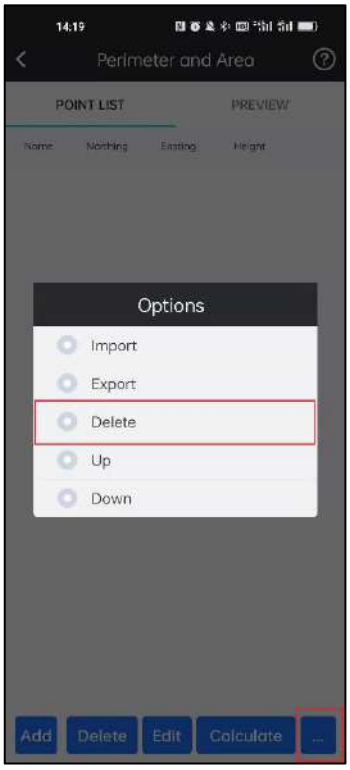
Export:

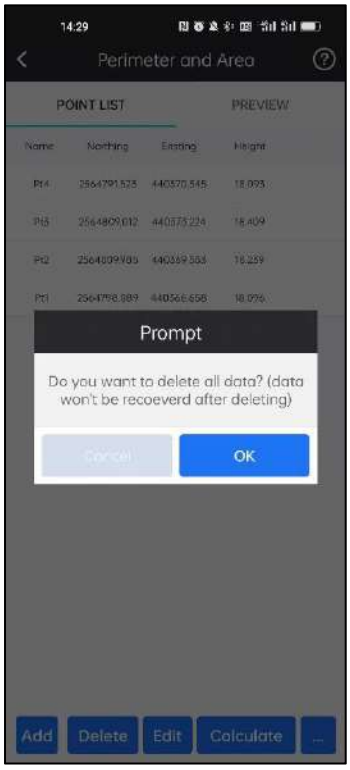
Click ... and Click Export. Select the file type: NEH Format(*.csv|dat|txt) or Cass Format(*.dat). Click OK. Select file path. Click OK to export points in Point List.



Delete all data:

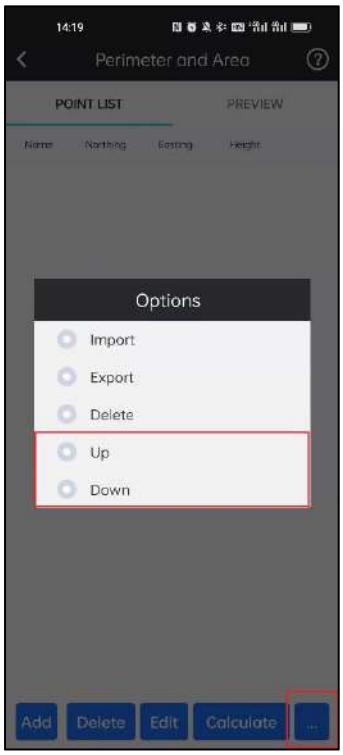
Click ... and Click Delete. Click OK to delete all points in Point List.

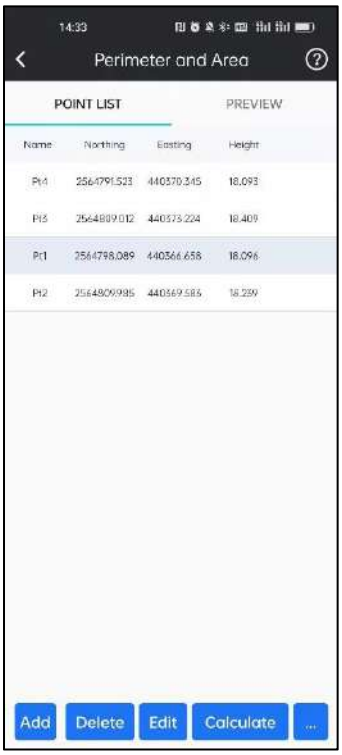




Up/Down Point:

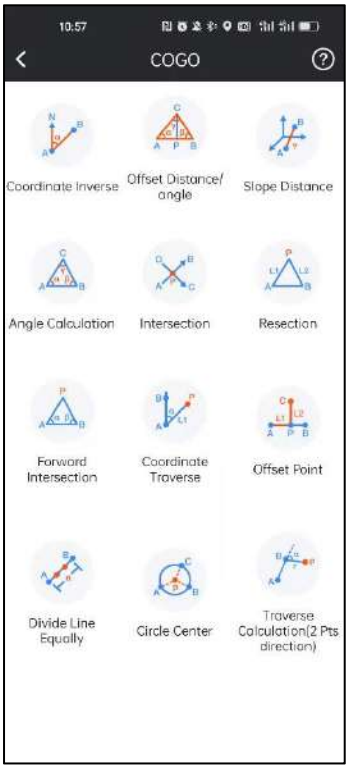
Select a point, click ... and Click Up/Down. Then the selected point will move up/down.





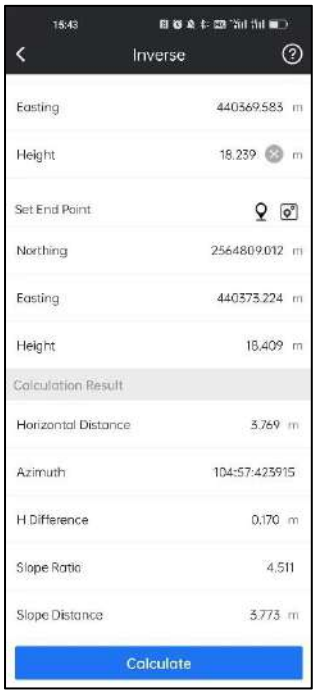
6-5 COGO

In COGO, we can do some calculation to get coordinates, distance, intersection points and so on. And those calculations including Coordinate Inverse, Offset Distance/angle, Slope Distance, Angle Calculation, Intersection, Resection, Forward Intersection, Coordinate Traverse, Offset Point, Divide Line, Circle Center and Traverse Calculation



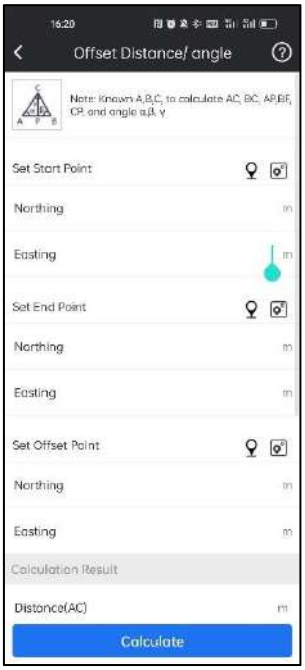
6-5-1 Coordinate Inverse

Set Start Point A and End Point B, and click Calculate to calculate the Horizontal Distance, Azimuth, H Difference, Slope Ratio and Slope Distance.



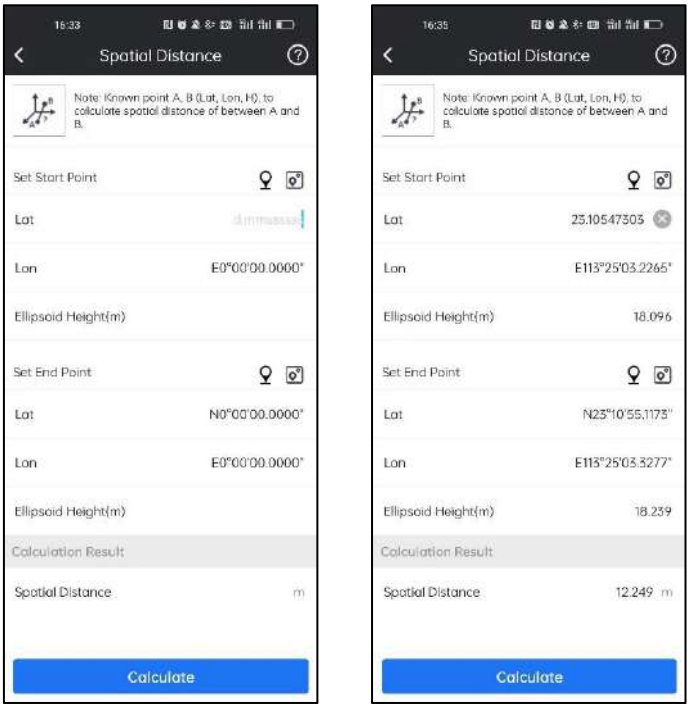
6-5-2 Offset Distance/Angle

Set Start Point A, End Point B and Offset Point C, and then click Calculate to calculate the Distance(AC), Distance(BC), Distance(AP), Distance(BP), Offset Distance(CP), Offset Angle and Corner Angle.



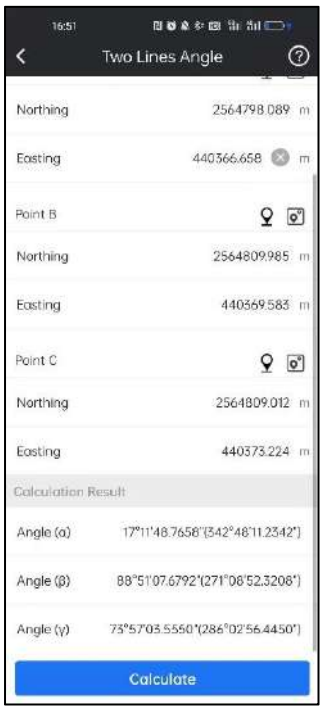
6-5-3 Slope Distance

Set Start Point A and End Point B, and then click Calculate to calculate the Spatial Distance.



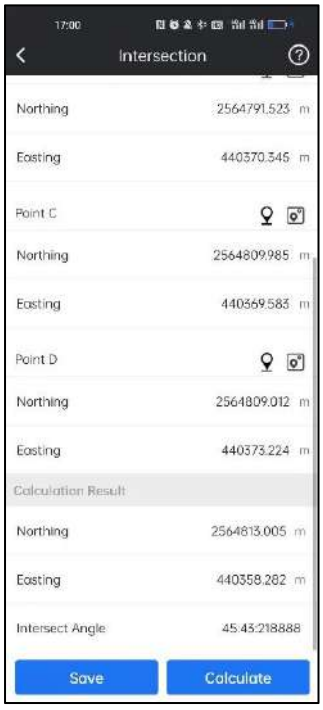
6-5-4 Angle Calculation

Set Point A, Point B and Point C, and then click Calculate to calculate the Angle ABC, BAC and ACB.



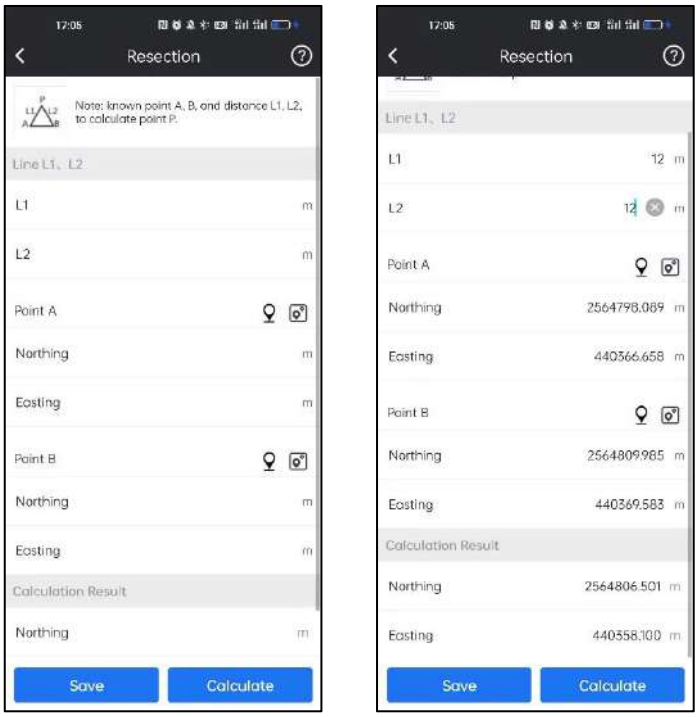
6-5-5 Intersection

Set Point A, Point B, Point C and Point D, and then press Calculate to calculate the intersection coordinates and intersect angle.



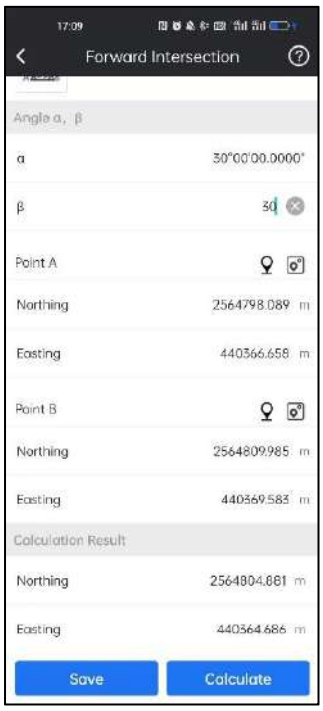
6-5-6 Resection

Set Line L1, L2, Point A and Point B, and then click Calculate to calculate the resection point coordinates.



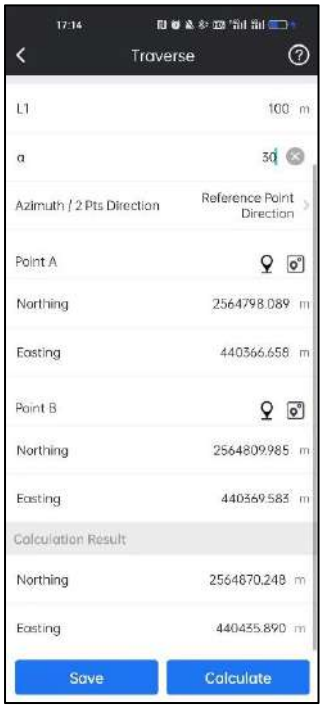
6-5-7 Forward Intersection

Set Angle α, β, Point A and Point B, and then click Calculate to calculate the intersection point coordinates.



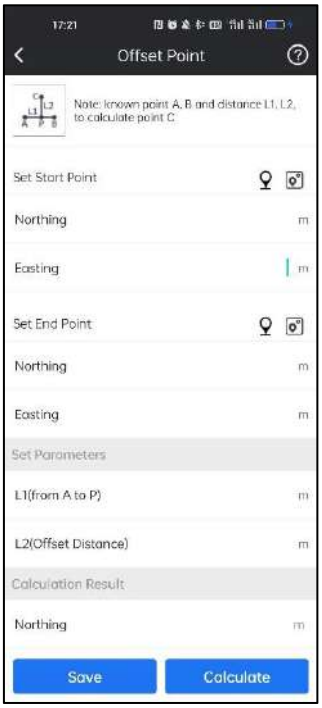
6-5-8 Coordinate Traverse

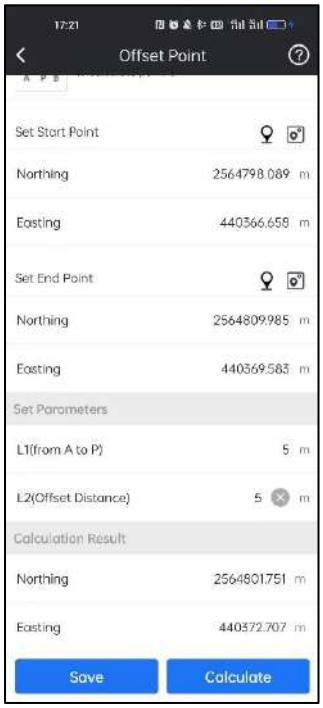
Set Line L1, Angle α, Point A and Point B, and then click Calculate to calculate the traverse point coordinates.



6-5-9 Offset Point

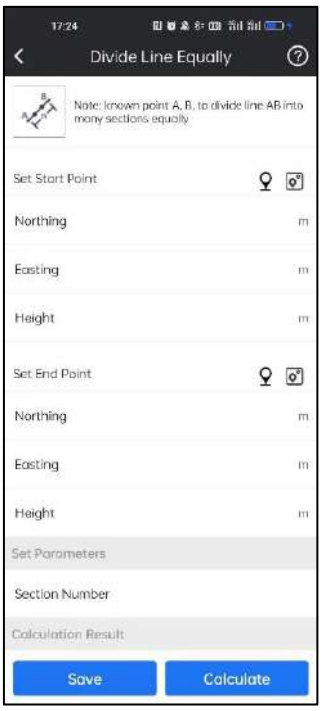
Set Start Point A, End Points B, Line L1(from A to P), Line L2(Offset Distance), and then click Calculate to calculate the offset point coordinates.

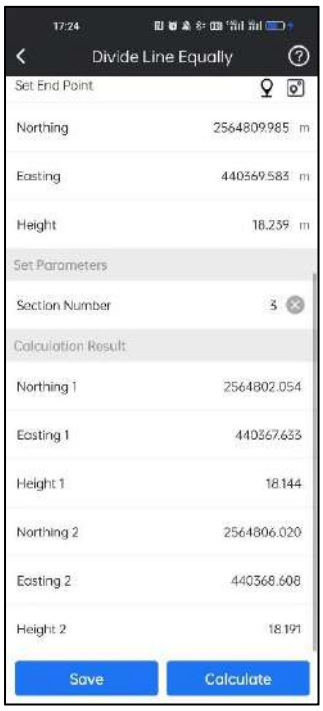




6-5-10 Divide Line Equally

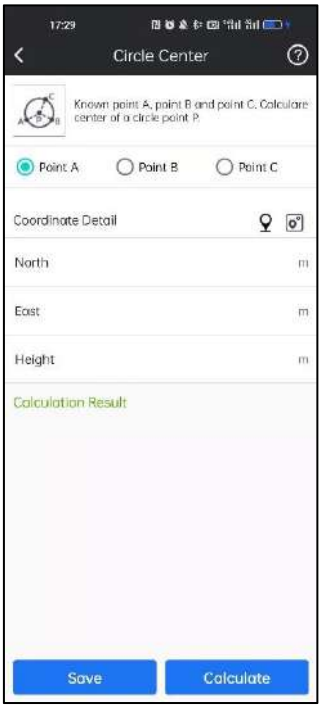
Set Start Point A, End Point B, and Section Number, and then click Calculation to calculate equally divided points' coordinates.

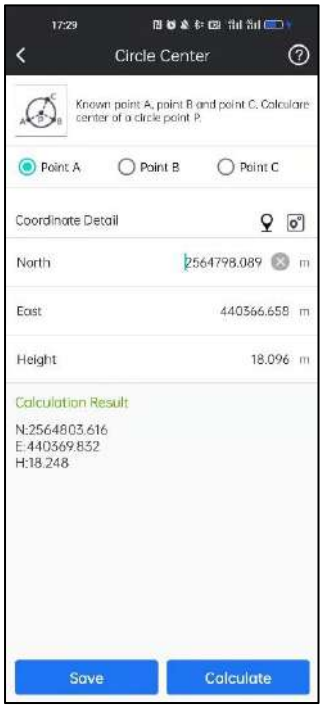




6-5-11 Circle Center

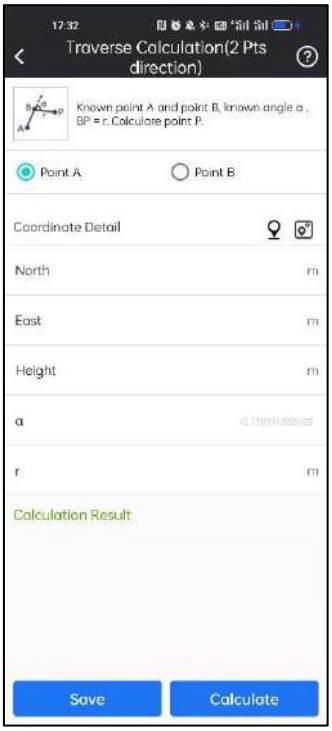
Set Point A, Point B, and Point C, and then click Calculation to calculate Coordinates of the circle center.

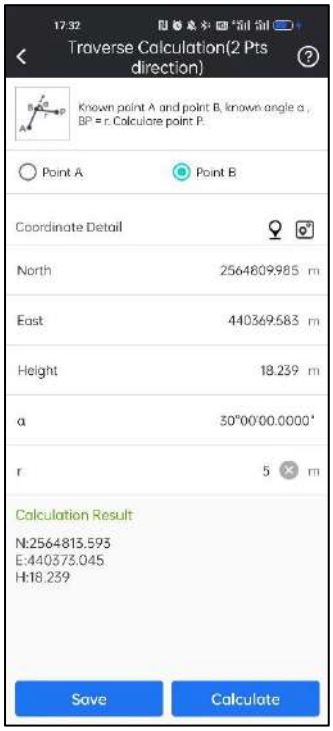




6-5-12 Traverse Calculation(2 Pts direction)

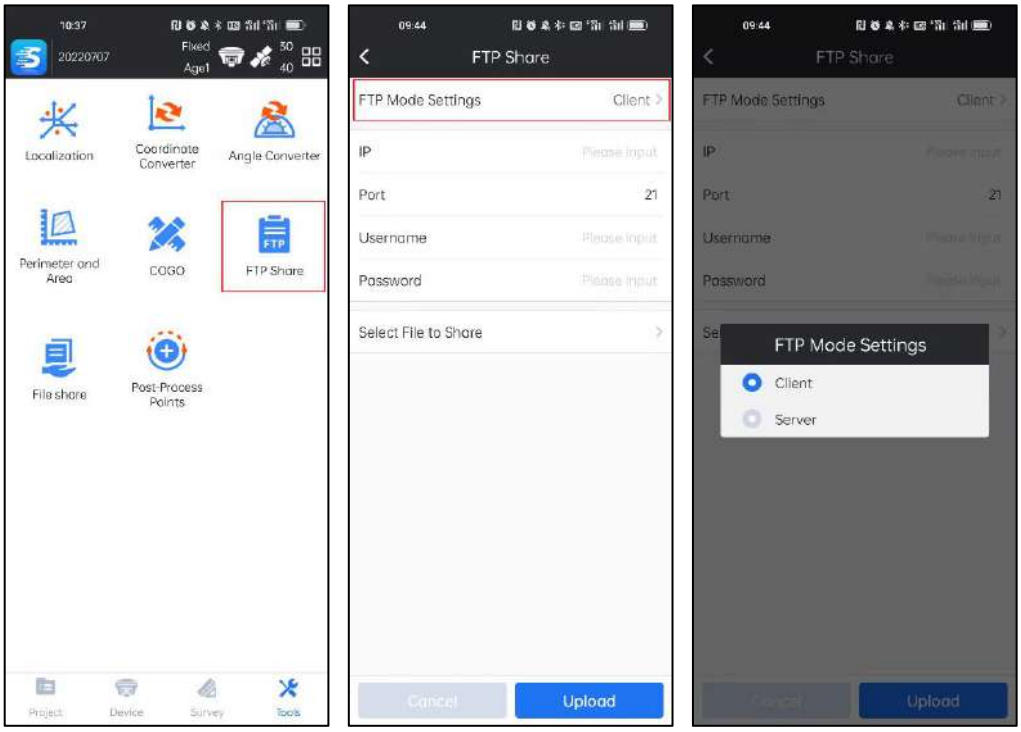
Set Point A, Point B, Angle α and Line r, and then click Calculation to calculate the point coordinates.





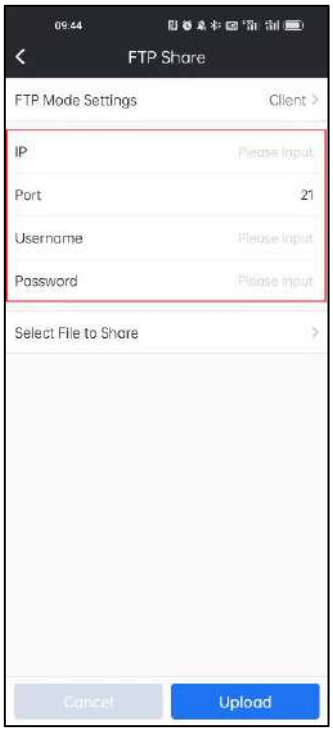
6-6 FTP Share

In FTP Share, we can share files using FTP. And there are two FTP modes, by Client and by Server.

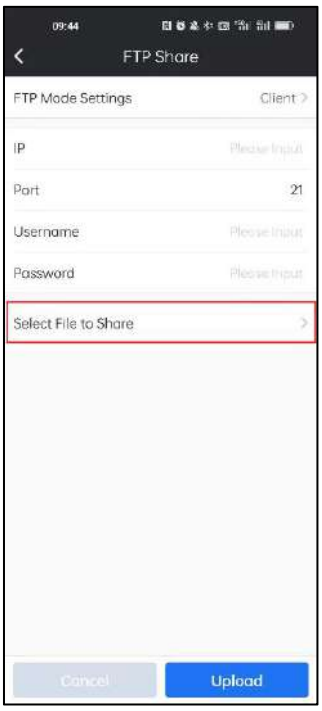


Client Mode: Upload files to FTP server.

We need to have a FTP server, and input IP, Username and Password to access the server.

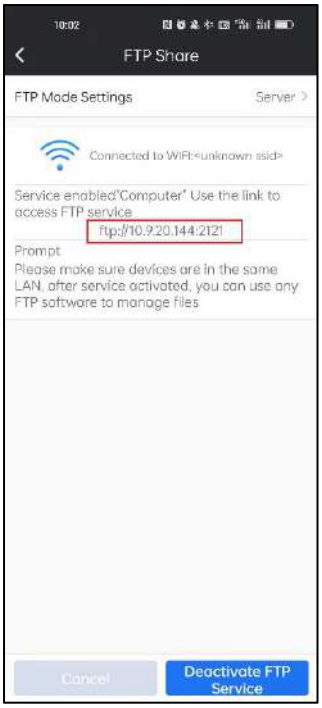


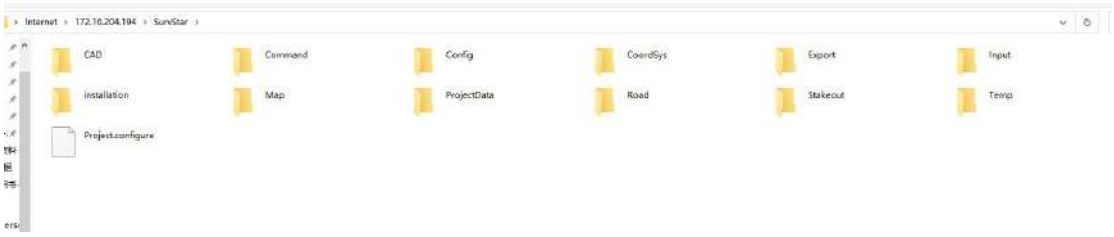
And then we can Select File to Share to upload files to the FTP server.



Server Mode: Make android device as FTP server

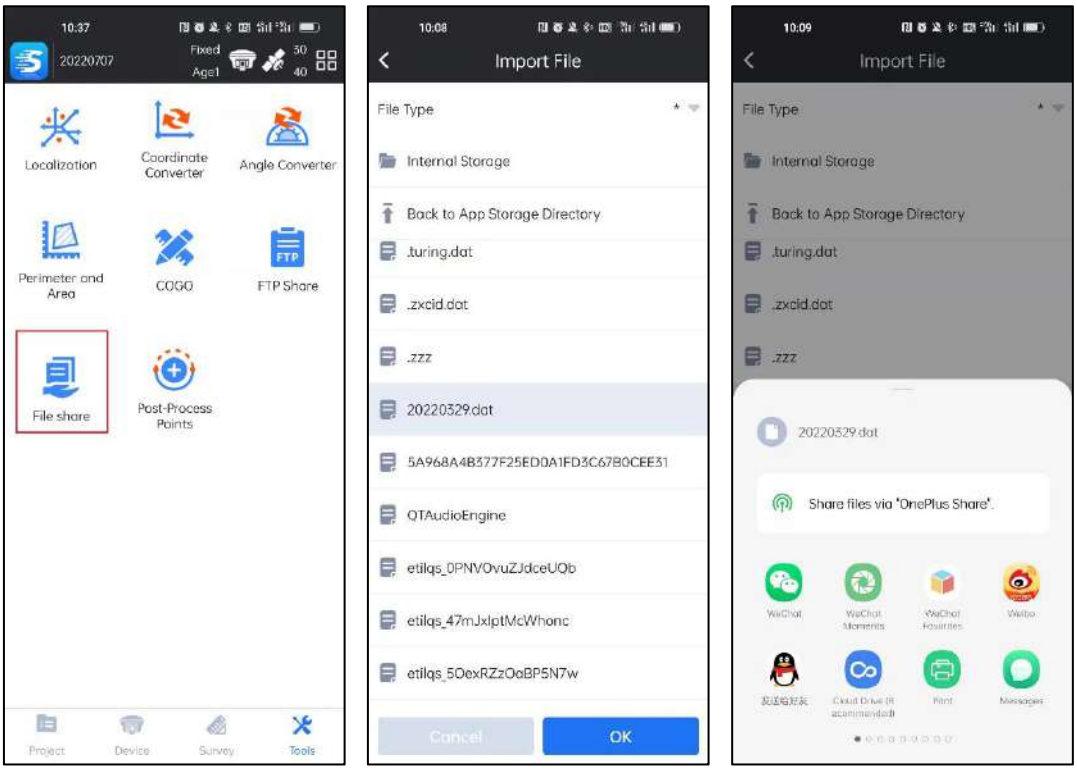
Another device must be in the same LAN of android device install SurvStar. By activating this mode, we can access to the android phone internal memory by FTP:// android device LAN IP:2121.





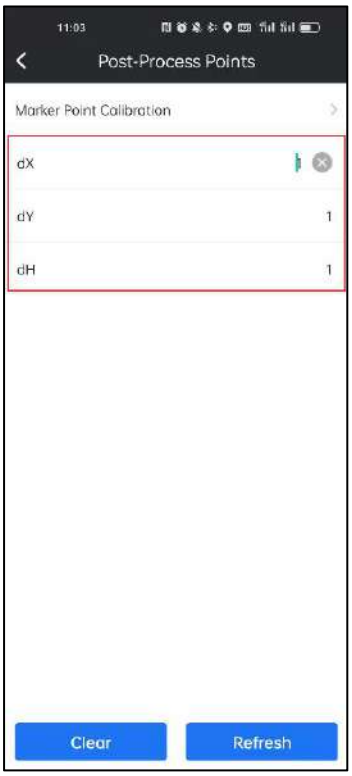
6-7 File Share

By clicking this, we can share the data file to the other app or the other device. Select the shared file and click OK, then we can share the selected file.

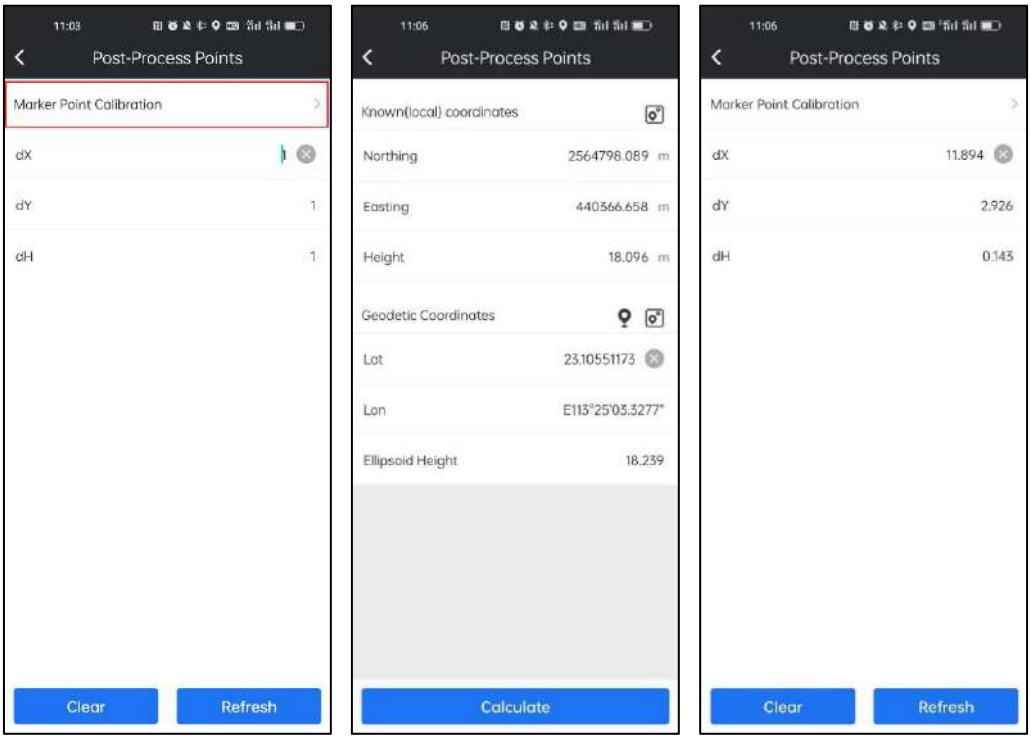


6-8 Post-Process Points

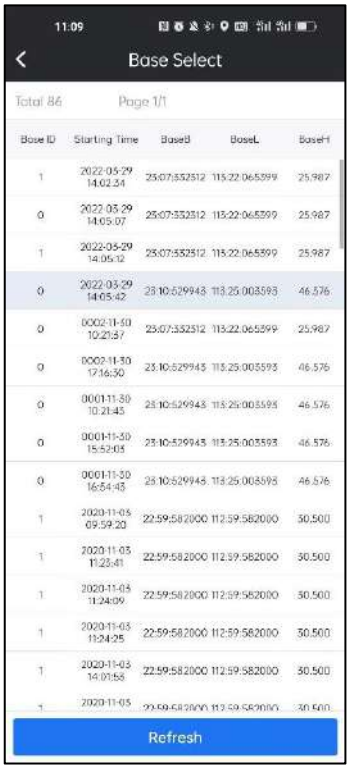
In this section, we can make single point calibration for all collected points. If we know offsets in X, Y and H, we can input offset values directly.



We can also click Marker Point Calibration to calculate the offset parameters.



Then click Refresh, select the base to be calibrated, click Refresh. Then select the Starting Time and the Ended Time, then the surveyed point in that period will be calibrated.


11:09
Base Select
Total 86
Page 1/1
Base ID
Starting Time
BaseB
BaseL
BaseH
1
2022-05-29 14:02:34
25:07:552512
115:22:065599
25.987
0
2022-05-29 14:05:07
25:07:552512
115:22:065599
25.987
1
2022-05-29 14:05:12
25:07:552512
115:22:065599
25.987
0
2022-05-29 14:05:42
25:10:529943
113:25:003593
46.576
0
0002-11-30 10:21:37
25:07:552512
115:22:065599
25.987
0
0002-11-30 17:16:30
25:10:529943
113:25:003593
46.576
0
0001-11-30 10:21:45
25:10:529943
113:25:003593
46.576
0
0001-11-30 15:52:05
25:10:529943
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0001-11-30 16:54:43
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30.500
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112:59:582000
30.500
1
2020-11-03 14:01:58
22:59:582000
112:59:582000
30.500
Refresh


11:11
Post-Process Points
Refresh Date
2022-5-29
Starting Time
14:05:42
Ended Time
10:21:37
log
dx=11.894 dy=2.926 dh=0.143
Refresh