

← Localization

Calculate Mode

Horizontal correction + Elev_correction

Import

Export

← control point

Known Coordinates

Name

North

East

Height

Geodetic Coordinates

Coordinates Type

Geodetic Coordinate

Latitude

Longitude

Altitude

Options

Use Horizontal Control

Use Vertical Control

← Points Database

Point Library

Stakeout point

Input name or code

Name	North	East	Height	
PPK p3	2562922.759	441774.925	28.601	N2
p2	2562922.766	441774.932	30.185	N2
p1	2562921.958	441775.532	26.112	N2
t9	2563061.444	441676.895	18.892	N2
t8	2563064.214	441632.112	18.656	N2
t7	2563148.178	441558.261	19.432	N2
t6	2563154.803	441670.117	19.385	N2
t5	2563103.008	441789.162	19.354	N2
t4	2563014.288	441794.819	18.121	N2
t3	2562917.758	441787.826	17.334	N2
t2	2562936.491	441707.220	16.931	N2
t1	2562960.967	441716.320	17.074	N2

Add

Edit

Delete

Calculate

Figure 3.12-1

Cancel

OK

Figure 3.12-2

IMPORT

ADD

OK

Figure 3.12-3

← Localization

Calculate Mode

Horizontal correction + Elev_correction

No.	1	Name	t1
Horizontal...	0	Vertical...	0
Use Hori...	Use	Use Vert...	Use

No.	2	Name	t2
Horizontal...	0	Vertical...	0
Use Hori...	Use	Use Vert...	Use

No.	3	Name	t3
Horizontal...	0	Vertical...	0
Use Hori...	Use	Use Vert...	Use

Add

Edit

Delete

Calculate

Figure 3.12-4

← Localization Settings

Convert Method

Horizontal correction + Elev_correction

Horizontal correction Model

Horizontal Adjustment

Vertical Control

Automatic Selection

Horizontal Accuracy Limit

0.1

Vertical Accuracy Limit

0.1

Cancel

OK

Figure 3.12-5

← GPS Parameters Report

Ellipsoid Parameter

Ellipsoid Name

CGCS2000

Semimajor axis

6378137

1/f

298.257

Projections Parameter

Projections Mode

Transverse Mercator

Central Meridian

E114°00'00"

False Northing

0

False Easting

500000

Scale Factor

1

Projection Height

0

Latitude of Origin

N0°00'00"

Standard Parallel 1

N0°00'00"

Standard Parallel 2

N0°00'00"

Four-Parameter/Horizontal Adjustment

Translate Northing

15.91112

Translate Easting

-38.007505

Rotation

174°54'03.0964"

Scale

46.08128383656768

Original

Save

Apply

Figure 3.12-6

3.12 Calibrate Point

Click [**Project**]-> [**Calibrate Point**], as shown in Figure 3.13-1. In actual applications, GNSS equipment obtains high-precision positioning by combining differential data from the base station with positioning calculations. Here we know the coordinate position of base station. In fact, the high-precision position output by GNSS equipment is relative to the base station's coordinates. In actual application, in addition to some users using differential data of CORS reference station, there are also quite a few users using differential data of base station transmitted by their own GNSS equipment. When using self-built base stations, a project may involve starting the base station multiple times. When initiating the base station, the starting position and starting coordinates of base station may change, and the starting coordinates may not be correct. Without calibration, the coordinates measured by the rover may be inconsistent—for example, the same point might yield different coordinates when using different base station data. Therefore, when the rover receives new base station differential data for surveying, it needs to perform point calibration so that the coordinates obtained by software match the coordinates obtained by connecting to the last base station. After the starting coordinates or starting position of the base station changes, a known position needs to be used to calibrate the coordinates correctly.

Click [**Base Point Calibration**], as shown in Figure 3.13-2, and click  to select a known point in the coordinate point library (use the coordinates measured by the base station at a certain location last time). Then click [Calculate] and apply.

Click [**Marker Point Calibration**], as shown in Figure 3.13-3, and click  to select a known point in the coordinate point library (use the coordinates measured by the base station at a certain location last time). Then place the GNSS device at the location of the known point. Click  to measure a new positioning point, and calculate the deviation value. Click [Apply], and the coordinates received by the software will match the coordinates measured last time.

When the base station coordinates change, the system will prompt you to perform recalibration. If the coordinates change when receiving differential data from a self-built base station, point calibration for the base station is required.

Note: A CORS reference station is a long-term fixed station whose position and coordinates remain constant. Although received coordinates may vary slightly, they are still accurate and do not require translation calibration.

← Calibrate Point	
Base Point Calibration	>
Marker Point Calibration	>
dX	0
dY	0
dH	0

Figure 3.13-1

← Calibrate Point	
Known Point Coordinates	
North	2562960.967
East	441716.32
Height	17.074
Current Base Coordinates	
Latitude	23°09'54.484426\
Longitude	113°25'51.930324\
Altitude	56.624
Antenna Parameters	0m, Height to phase center >
Result	
Shift dX	21.646
Shift dY	-28.374
Shift dZ	-39.55

Figure 3.13-2

← Calibrate Point	
Known Point Coordinates	
North	2562960.967
East	441716.32
Height	17.074
Current WGS84 Coordinates	
Latitude	23°09'53.953632\
Longitude	113°25'52.998492\
Altitude	28.409
Result	
Shift dX	37.975
Shift dY	-58.757
Shift dZ	-11.335

Figure 3.13-3

Clear	OK	Base Information	Calculate	Apply	Cancel	Apply
-------	----	------------------	-----------	-------	--------	-------

3.13 Coordinate Point Library

Click [**Project**]-> [**Points Database**], as shown in Figure 3.14- 1. Here you can view and manage the point data in the project, including adding, editing, deleting, and importing.

Click the upper right corner , as shown in Figure 3.14-2, to switch the display style of point information.

Click [Add], as shown in Figure 3.14-3, to manually enter the point name, code and corresponding coordinates.

Click [Import], as shown in Figure 3.14-4, select the file format of the point data to be imported, and then select the data file to complete the data import.

Select the coordinate point and click [Edit], as shown in Figure 3.14-5, you can edit and modify the name and code of the coordinate point.

Click the upper right corner , as shown in Figure 3.14-6, to filter the point type.

Click the upper right corner  and an operation pop-up will appear, as shown in Figure 3.14-1. You can perform batch deletion, data statistics, sorting and other functions as needed.

Points Database

Point Library Stake

Input name or code

Name	North	East	Height	Code
PPK p3	2562922.759	441774.92		
p2	2562922.766	441774.93		
p1	2562921.958	441775.53		
t9	2563061.444	441676.895	18.892	N2
t8	2563064.214	441632.112	18.656	N2
t7	2563148.178	441558.261	19.432	N2
t6	2563154.803	441670.117	19.385	N2
t5	2563103.008	441789.162	19.354	N2
t4	2563014.288	441794.819	18.121	N2
t3	2562917.758	441787.826	17.334	N2
t2	2562936.491	441707.220	16.931	N2
t1	2562960.967	441716.320	17.074	N2

Batch Operation Deleted points

Statistics

Time Sort (Ascending)

Name Sort (Ascending)

Default Sort

IMPORT EXPORT ADD

Figure 3.14-1

Points Database

Point Library Stakeout point

Input name or code

p3 PPK Point

N: 2562922.759 code: 2023-11-14 19:20:09

E: 441774.925

High: 28.601

p2 Control point

N: 2562922.766 code: 2023-11-09 19:02:20

E: 441774.932

High: 30.185

p1 Survey point

N: 2562921.958 code: 2023-11-09 11:10:59

E: 441775.532

High: 26.112

t9 Input point

N: 2563061.444 code: 2023-11-08 18:02:08

E: 441676.895

High: 18.892

t8 Input point

N: 2563064.214 code: 2023-11-08 18:02:08

E: 441632.112

High: 18.656

IMPORT EXPORT ADD

Figure 3.14-2

New point

Name p4

Property type Input point

Coordinates Type Local Coordinate

North

East

Height

Code

Photo And Sketch

Cancel OK

Figure 3.14-3

Import File

File Format Local Coordinate(.csv|.dat|.txt)

[Name],[North],[East],[Height],[Code]

Property type Input point

Format Manager OK

Figure 3.14-4

Points Database

Point Library Stakeout point

Input name or code

Name	North	East	Height	Code
PPK p3	2562922.759	441774.925	28.601	N2
p2	2562922.766	441774.932	30.185	N2
p1	2562921.958	441775.532	26.112	N2
t9	2563061.444	441676.895	18.892	N2
t8	2563064.214	441632.112	18.656	N2
t7	2563148.178	441558.261	19.432	N2
t6	2563154.803	441670.117	19.385	N2
t5	2563103.008	441789.162	19.354	N2
t4	2563014.288	441794.819	18.121	N2
t3	2562917.758	441787.826	17.334	N2
t2	2562936.491	441707.220	16.931	N2
t1	2562960.967	441716.320	17.074	N2

Edit

Details

Stakeout

Delete

IMPORT EXPORT ADD

Figure 3.14-5

Points Database

Point Library Stakeout point

Input name or code

Name	North	East	Height	Code
PPK p3	2562922.759	441774.925	28.601	N2
p2	2562922.766	441774.932	30.185	N2
p1	2562921.958	441775.532	26.112	N2
t9	2563061.444	441676.895	18.892	N2

Point Type Filter

☒ Survey point

☒ Control point

☒ Input point

☒ Calculate Point

☒ Base Point

☒ CAD point

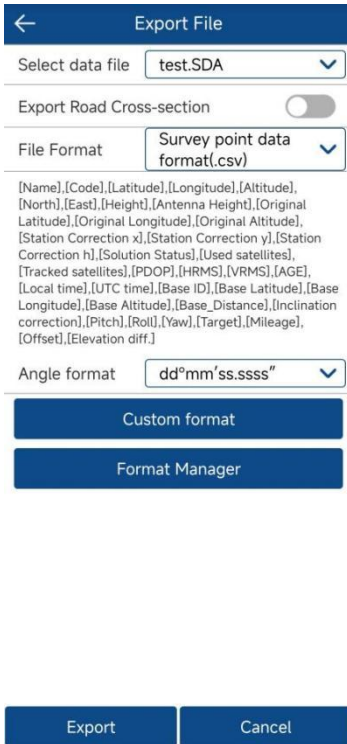
☒ PPK Point

OK

Figure 3.14-6

3.14 Export File

Click [**Project**]-> [**Export File**], as shown in Figure 3.15-1, and select the type, file format, and angle format of the exported data as needed. Click [Format Manager], as shown in Figure 3.15-2, select the file format of the data to be exported, and click [OK]. Click [Use-defined Format], as shown in Figure 3.15-3, to manually create and edit the export data format.



Export File

Select data file: test.SDA

Export Road Cross-section: ☐

File Format: Survey point data format(.csv)

[Name],[Code],[Latitude],[Longitude],[Altitude],[North],[East],[Height],[Antenna Height],[Original Latitude],[Original Longitude],[Original Altitude],[Station Correction x],[Station Correction y],[Station Correction h],[Solution Status],[Used satellites],[Tracked satellites],[PDOP],[HRMS],[VRMS],[AGE],[Local time],[UTC time],[Base ID],[Base Latitude],[Base Longitude],[Base Altitude],[Base Distance],[Inclination correction],[Pitch],[Roll],[Yaw],[Target],[Mileage],[Offset],[Elevation diff.]

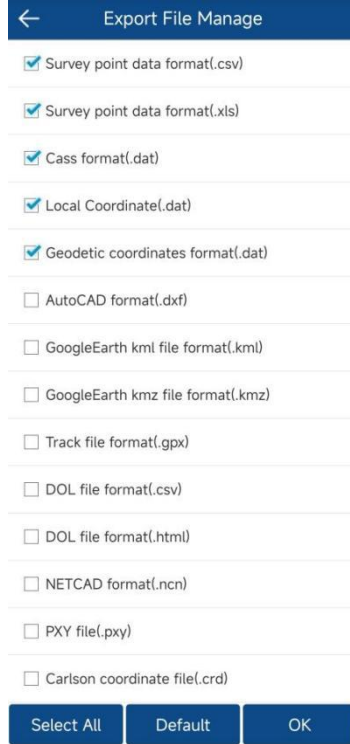
Angle format: dd°mm'ss.ssss"

Custom format

Format Manager

Export Cancel

Figure 3.15-1



Export File Manage

☒ Survey point data format(.csv)

☒ Survey point data format(.xls)

☒ Cass format(.dat)

☒ Local Coordinate(.dat)

☒ Geodetic coordinates format(.dat)

☐ AutoCAD format(.dxf)

☐ GoogleEarth kml file format(.kml)

☐ GoogleEarth kmz file format(.kmz)

☐ Track file format(.gpx)

☐ DOL file format(.csv)

☐ DOL file format(.html)

☐ NETCAD format(.ncn)

☐ PXY file(.pxy)

☐ Carlson coordinate file(.crd)

Select All Default OK

Figure 3.15-2



User-defined format

New Edit Delete

Figure 3.15-3

3.15 Device Information

Click [**Device**]-> [**Device Information**], as shown in Figure 3.16, to view basic information such as the GNSS device's working mode, device serial number, firmware version, battery power, expiry date, satellite system, antenna parameters, etc.

← Details	
Basic Information ^	
Working Mode	Rover
Device Serial no	W55166861100217
Firmware Version	2.619.2505.2667
Current DataLink	Phone Internet
Battery Power	86%
Expiry date	20250715
IMEI	867652076356237
Region Code	53
Satellites System ^	
GPS	Enable
GLONASS	Enable
BEIDOU	Enable
GALILEO	Enable
SBAS	Enable
QZSS	Enable
IRNSS	Enable
Antenna Parameters ^	
Antenna Type	RTK-K19T19
Radius	130mm
SHMP Offset	0mm
L1 Offset	73.6mm
L2 Offset	73.6mm
OK	

Figure 3.16

4 Device Activation and Software Registration

4.1 Device Activation

Click [**Device**] -> [**Device Activation**], as shown in Figure 4.1, to view the device serial number and expiry date. If the GNSS device has expired, you can obtain the registration code from the dealer and authorize the device here.

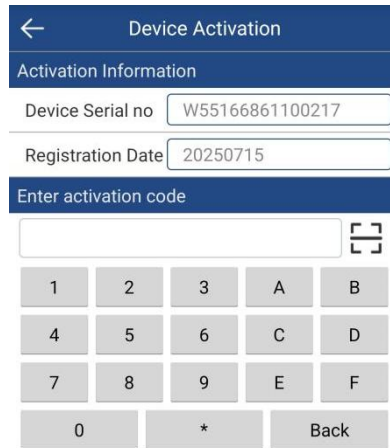



Figure 4.1

4.2 Software Activation

Click [**Project**]->[**About Software**], as shown in Figure 4.2-1 , to view the software version information and registration authorization information.

Click [**Check for new versions**], if there is a new version, the new version update information will pop up, click [Update] to update the software to the latest version. If there is no new version, it will prompt that it is already the latest version.

Click [**Software Registration**] to go to the software registration interface, as shown in Figure 4.2-2, to view the activation ID and expiry date.

When you install the software for the first time, click [Online Activation] to activate it for three months of free trial.

Click [**Manual Code Activation**], as shown in Figure 4.2-3. Enter the authorization code here or scan the QR code of the authorization code to activate the software.

If you need to replace the controller, click [Transfer activation code] on the old controller, then go to the software registration page on the new controller and input the transferred activation code to activate the software.



Figure 4.2-1



Figure 4.2-2



Figure 4.2-3



5 Built-in Radio

The **AR15** is equipped with a 2Watt digital radio that supports integrated transmission and reception. Users can choose from three transmission power levels: low power (1W) and high power (2W).

Note: Each time you set the data link to the built-in radio, you need to install the radio antenna in advance. Please open the UHF radio cover on the bottom of the device and then install the antenna.

Radio Protocol

The device currently supports the following 12 radio protocols, which you can change according to your needs.



5.1 Default Channel Frequency

The device has 16 default channel frequencies, and the frequency of each channel can be customized.

aisle	Frequency/MHz
1	463.125
2	464.125
3	465.125
4	466.125

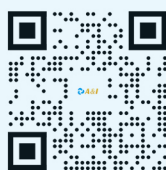
5	463.625
6	464.625
7	465.625
8	466.625
9	463.375
10	464.375
11	465.375
12	466.375
13	463.875
14	464.875
15	465.875
16	466.875



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Federal Communications Commission (FCC) Statement

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

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

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

Warning: Changes or modifications made to this device not expressly approved by **Shanghai Archimedes Innovation Technology Co., Ltd.** may void the FCC authorization to operate this device.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

RF exposure statement:

The transmitter must not be colocated or operated in conjunction with any other antenna or transmitter. This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a Minimum distance of 20cm between the radiator and any part of your body.