SGO USER MANUAL

Contents

Chapter 1 Installation and Uninstallation

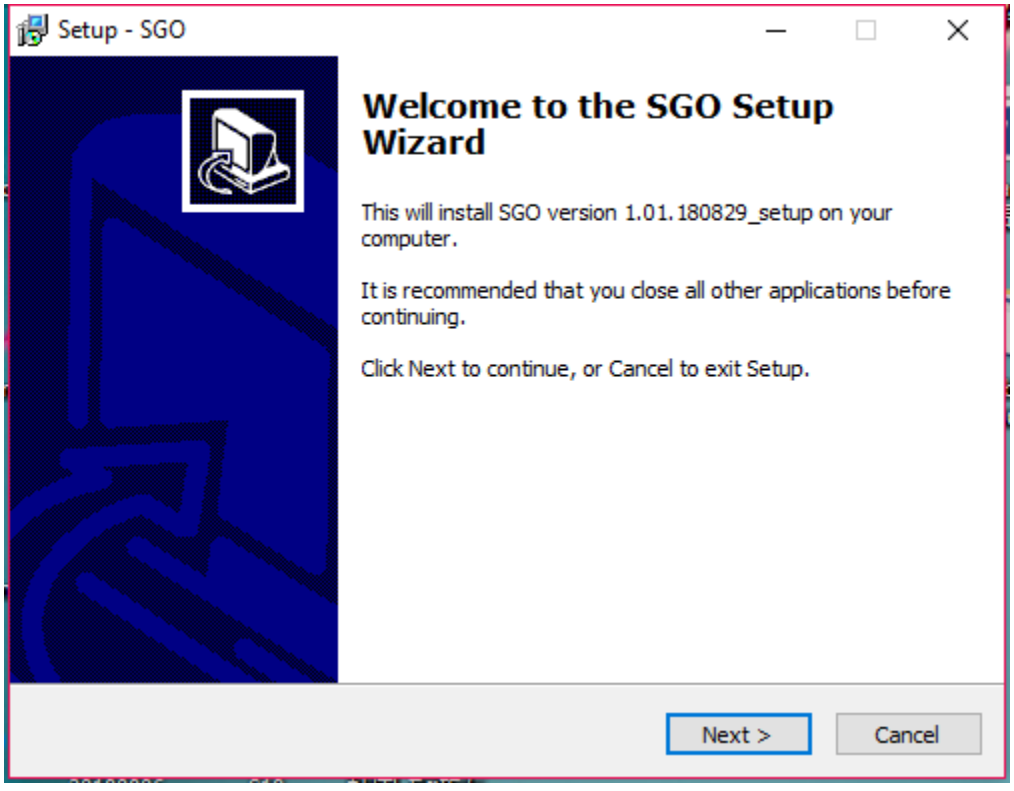
1.1 Installation

1.1.1 SGO Recommending Installation Environment

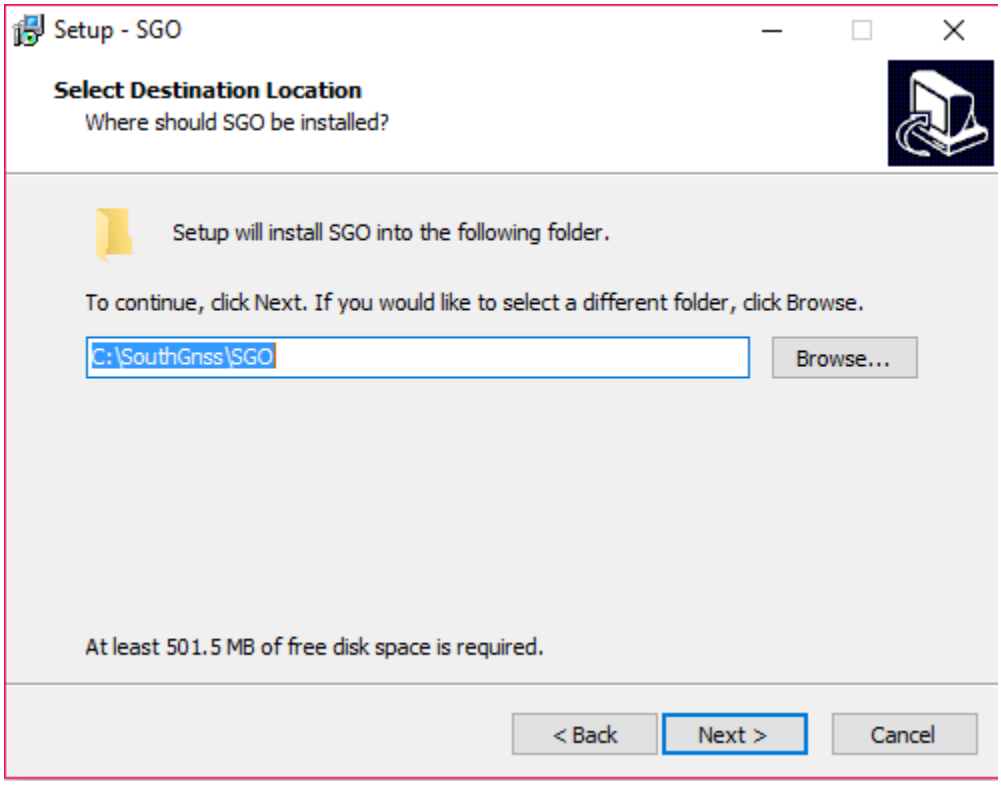
SGO software can be installed directly from the CD or the hard disk. It needs at least Windows XP OS and 1G internal storage.

1.1.2 Installation steps

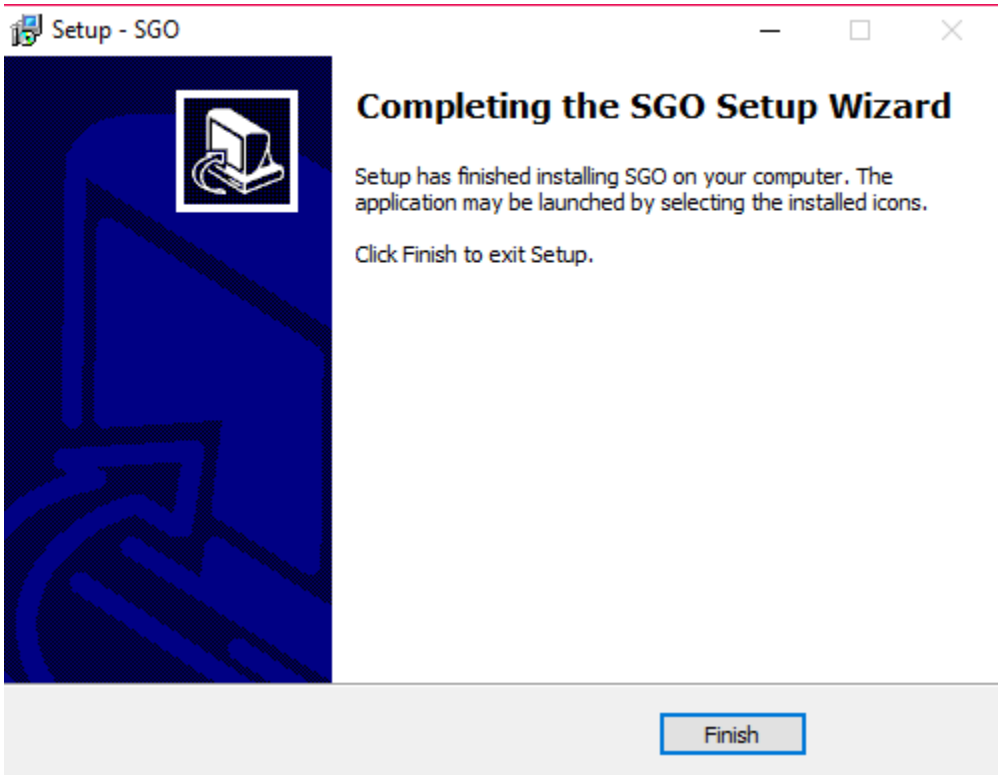
Double click on the SGO.exe installation program and then choose installing language from the appearing dialog. After that the install shield wizard will detect the installation component automatically, then appears the interface as shown following. Click on “Next” button to continue.



Then select the installation location, then the program will start to install. The installation process will take several minutes, please wait patiently until the installation finish.



Click on "Finish" button and return to your computer desk, the SGO shortcut is automatically generated there. Then you can double click on this shortcut to start it,



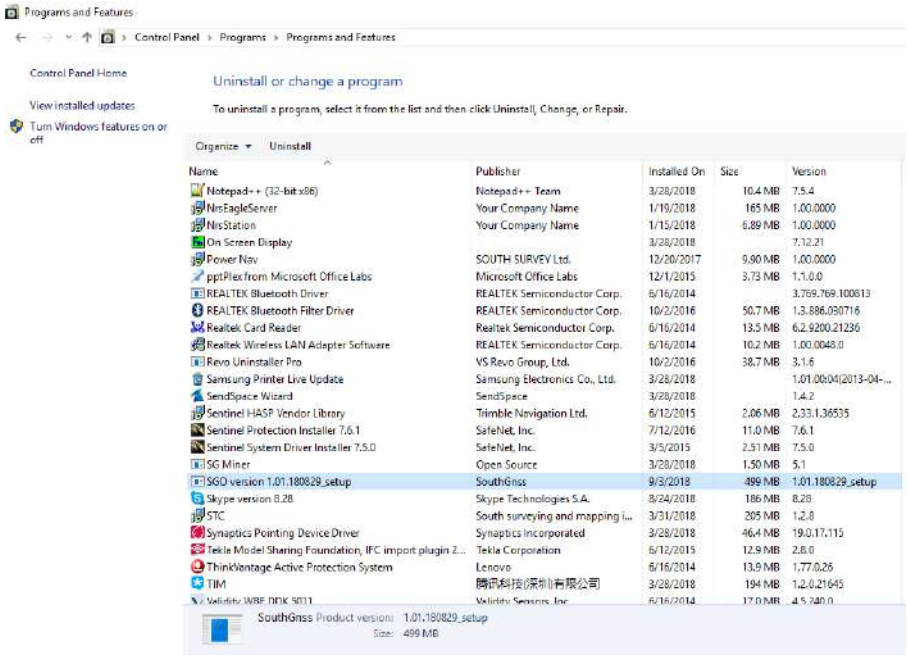
1.2 Uninstallation

In this section, you will get the steps how to uninstall SGO program from your computer. This section provides two methods to uninstall the program.

1, You can find the uninstalling program from Start—All Programs—SouthGNSS, then tap on "SGO Uninstall" option to start your operation.

2. Go to "Control Panel—Uninstall a program" interface on PC server, find SGO option in "Programs and Features" interface, then right click on this option and choose "Uninstall" option to perform program uninstallation.

Before uninstalling the program, please make sure if the software has been turned off and save all useful data and parameters already.


Programs and Features
Control Panel › Programs › Programs and Features
Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Uninstall
Name
Publisher
Installed On
Size
Version
Notepad++ (32-bit x86)
Notepad++ Team
3/28/2018
10.4 MB
7.5.4
NrsEagleServer
Your Company Name
1/19/2018
165 MB
1.00.0000
NrsStation
Your Company Name
1/15/2018
6.89 MB
1.00.0000
On Screen Display
3/28/2018
7.12.21
Power Nav
SOUTH SURVEY Ltd.
12/20/2017
9.90 MB
1.00.0000
pptPlex from Microsoft Office Labs
Microsoft Office Labs
12/1/2015
3.73 MB
1.1.0.0
REALTEK Bluetooth Driver
REALTEK Semiconductor Corp.
6/16/2014
3.769.769.100813
REALTEK Bluetooth Filter Driver
REALTEK Semiconductor Corp.
10/2/2016
50.7 MB
1.3.886.090716
Realtek Card Reader
Realtek Semiconductor Corp.
6/16/2014
13.5 MB
6.2.9200.21236
Realtek Wireless LAN Adapter Software
REALTEK Semiconductor Corp.
6/16/2014
10.2 MB
1.00.0048.0
Revo Uninstaller Pro
VS Revo Group, Ltd.
10/2/2016
38.7 MB
3.1.6
Samsung Printer Live Update
Samsung Electronics Co., Ltd.
3/28/2018
1.01.00:04(2013-04-...
SendSpace Wizard
SendSpace
3/28/2018
1.4.2
Sentinel HASP Vendor Library
Trimble Navigation Ltd.
6/12/2015
2.06 MB
2.33.1.36535
Sentinel Protection Installer 7.6.1
SafeNet, Inc.
7/12/2016
11.0 MB
7.6.1
Sentinel System Driver Installer 7.5.0
SafeNet, Inc.
3/5/2015
2.51 MB
7.5.0
SG Miner
Open Source
3/28/2018
1.50 MB
5.1
SGO version 1.01.180829_setup
SouthGnss
9/3/2018
499 MB
1.01.180829_setup
Skype version 8.28
Skype Technologies S.A.
8/24/2018
186 MB
8.28
STC
South surveying and mapping i...
3/31/2018
205 MB
1.2.8
Synaptics Pointing Device Driver
Synaptics Incorporated
3/28/2018
46.4 MB
19.0.17.115
Tekla Model Sharing Foundation, IFC import plugin 2...
Tekla Corporation
6/12/2015
12.9 MB
2.8.0
ThinkVantage Active Protection System
Lenovo
6/16/2014
13.9 MB
1.77.0.26
TIM
腾讯科技(深圳)有限公司
3/28/2018
194 MB
1.2.0.21645
SouthGnss Product version: 1.01.180829_setup
Size: 499 MB

Chapter 2 Quick Start Guide

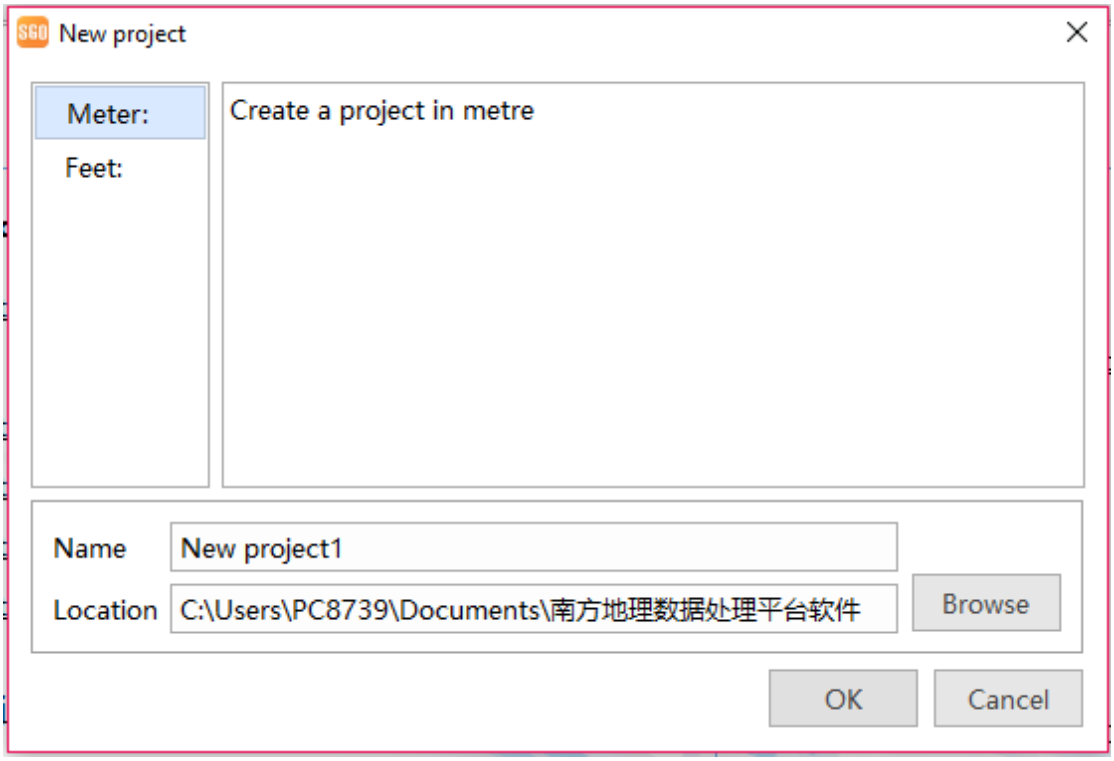
In this chapter, we will explain the general procedure via SGO software to resolve the data of static, dynamic. You can find details or advance usage in the following chapters. This chapter helps you to complete data processing rapidly.

2.1 Static data processing

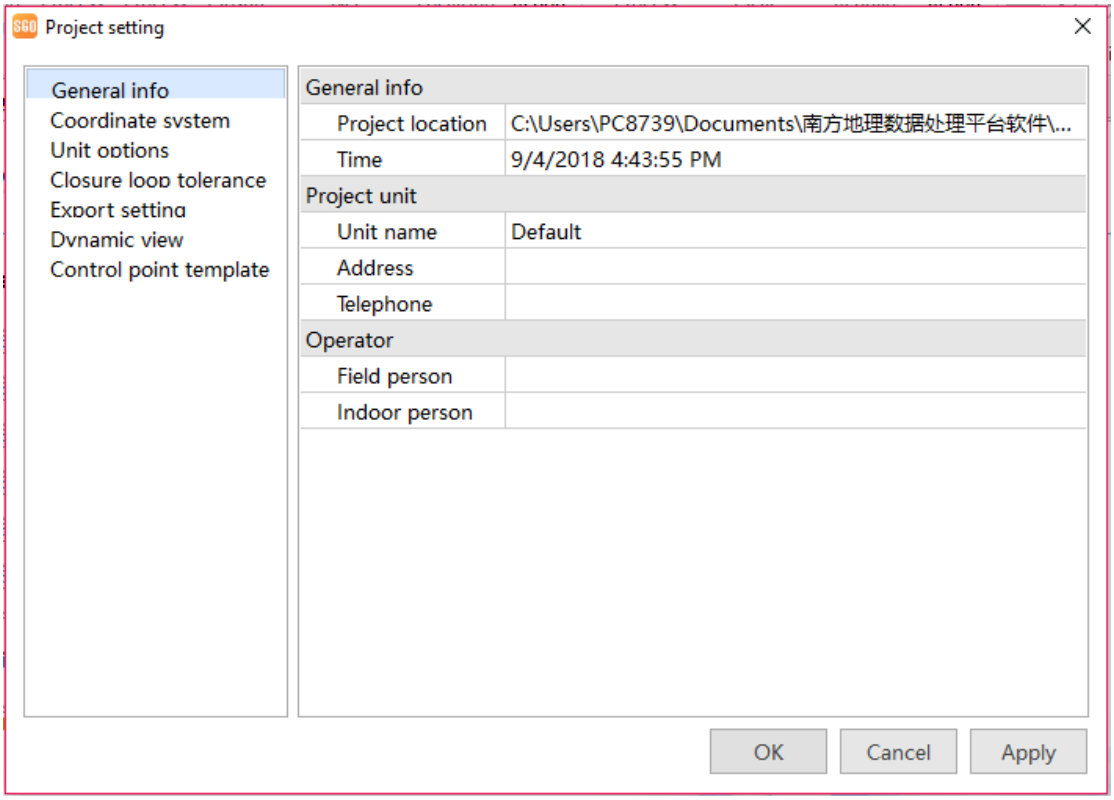
SGO software can process static data in STH, Rinex format, with straightforward and simple operations giving you bran-new experience on your work. We will demo a process below for one static job surveyed in the field to show general operational procedures on SGO.

2.1.1 Create a new project

From the main menu of SGO, select **File→New Project**, or tap on the shortcut  located in toolbar to create a new project.



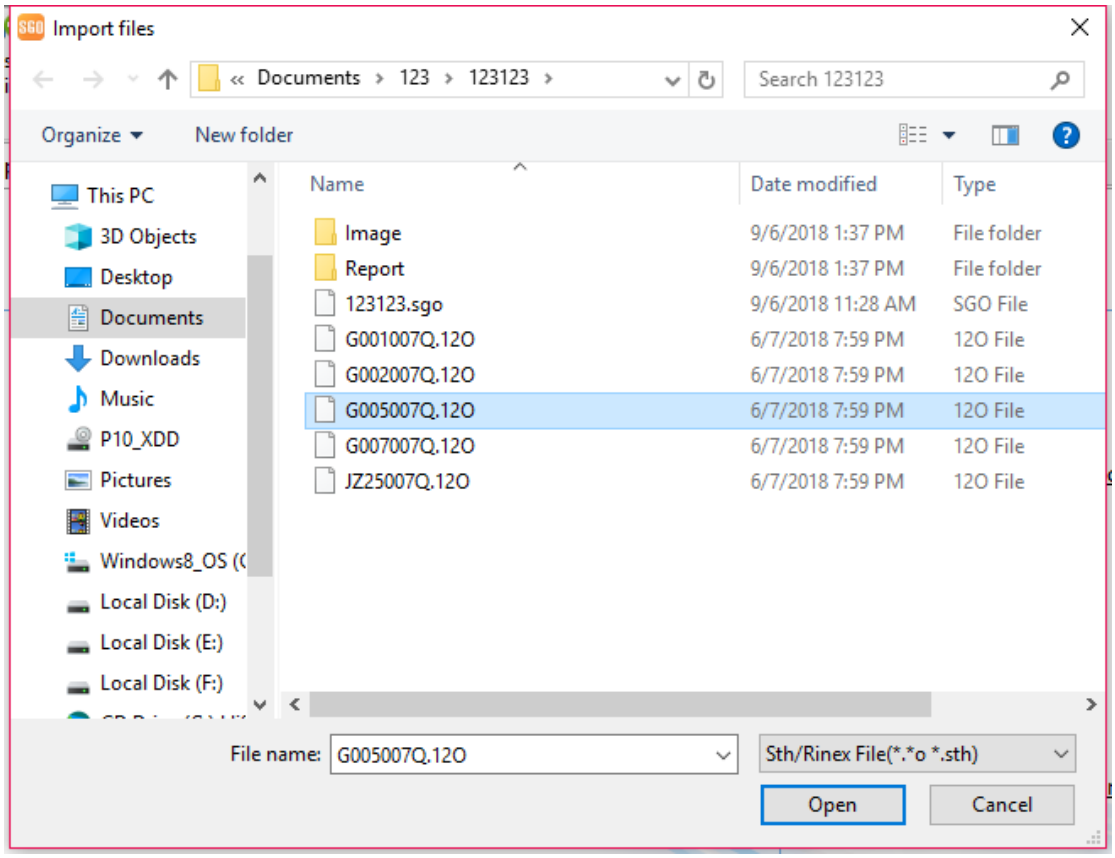
Here you can define project **Name** and storage **Location**, and choose either Metric or English unit for your project. Click **OK** to enter Project Setup window, then set up the parameters for your current project, such as company information, coordinate system, angle and coordinate display format, limitation value for processing quality and so on.
For more detail information of Project setup, please move your step to chapterⅥ Project.



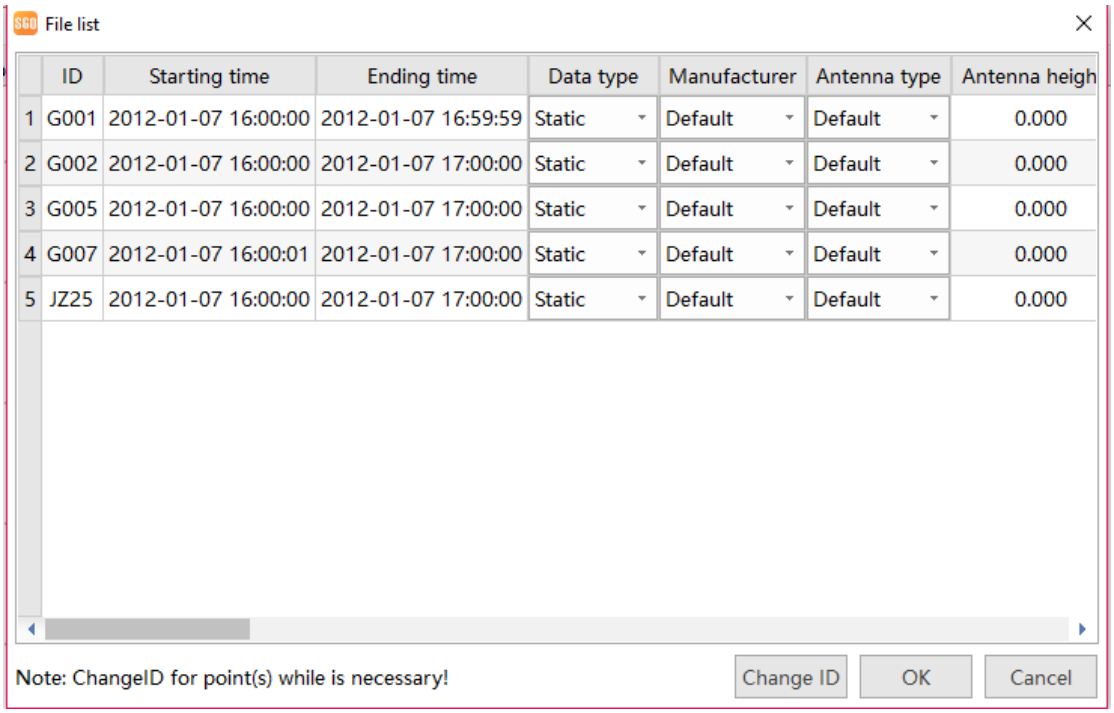
Click **Apply** to confirm all settings and click **OK** to finish creating new project.
During processing, you can click **Common operations→Project setting** to review and modify all settings above.

2.1.2 Import raw data

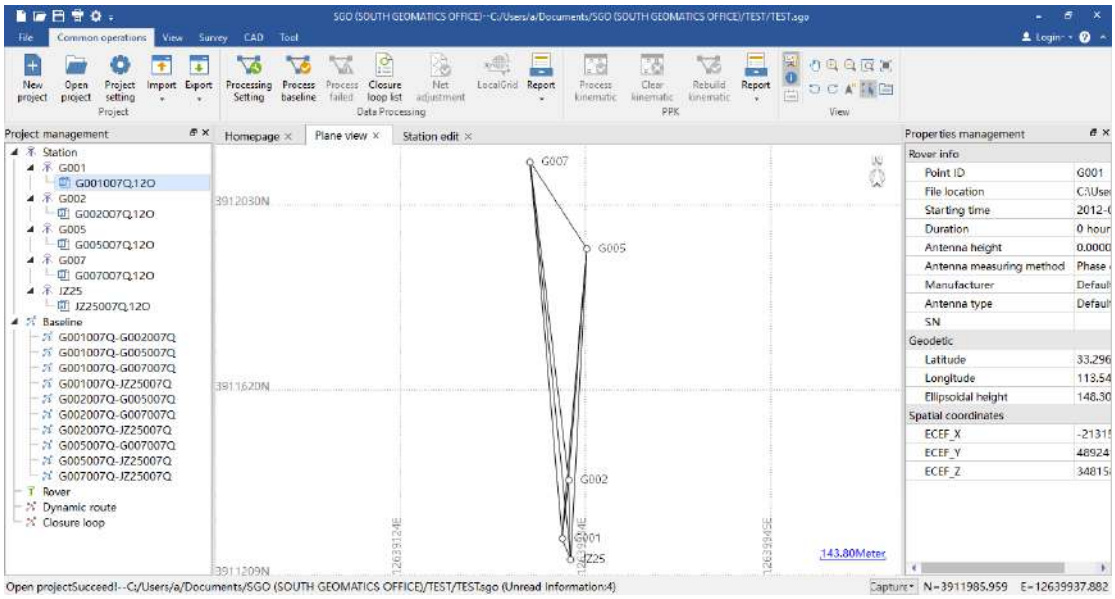
Select **Import→Import observation file** to import all static files you want to process. SGO supports importing of STH files downloaded from SOUTH GPS receiver directly, or commonly-used Rinex format. Click **Open** to start importing



After SGO gets all files imported, it will prompt a window to show *Observation period*, *Data Type*, *Manufacturer*, *Antenna Type*, *Antenna Height*, *Serial Number* of the receiver observed the file, *File storage path*. Importantly, we can modify antenna height in this window for our observation if we didn't set it a correct value in this field.



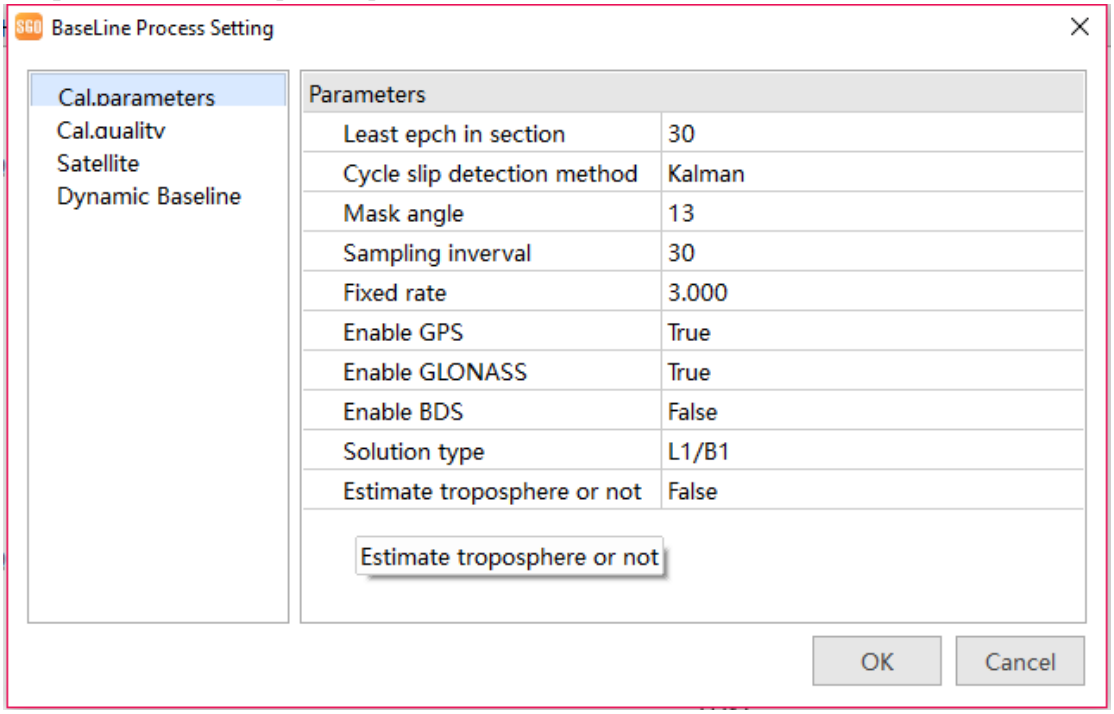
Click **OK** and the graph of static network will appear.



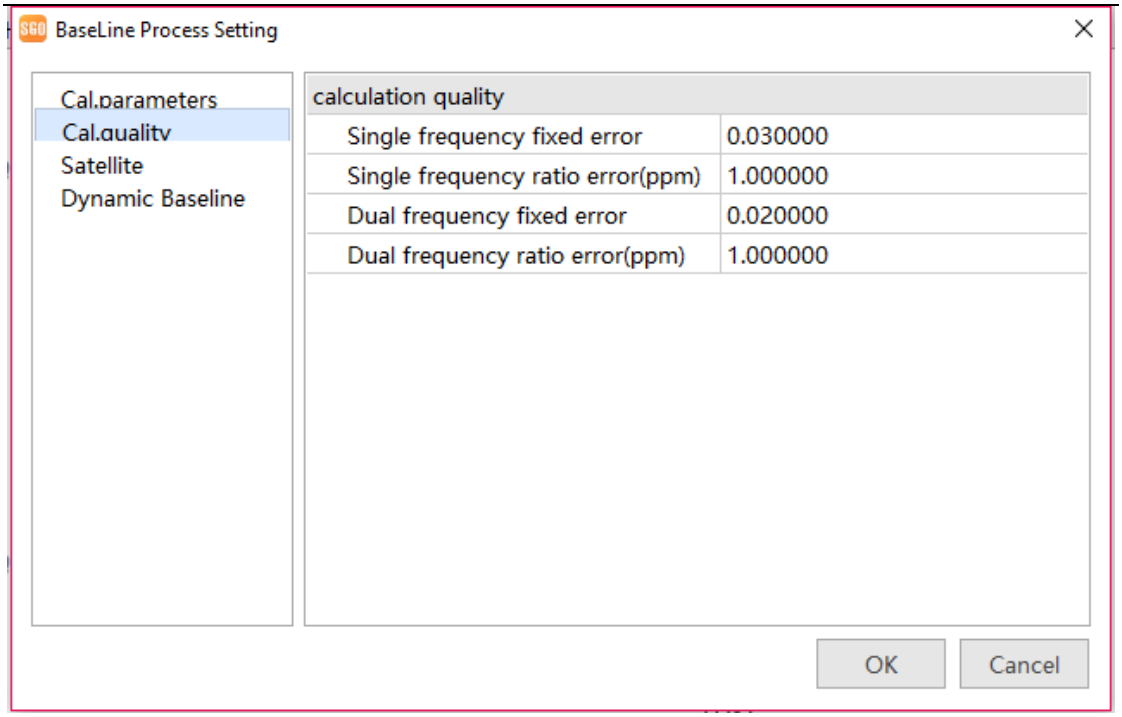
2.1.3 Baselines processing

At the beginning of baseline process, we need to set processing parameters matching with our pre-planned specifications for static project. Select **Survey→Processing setting.**

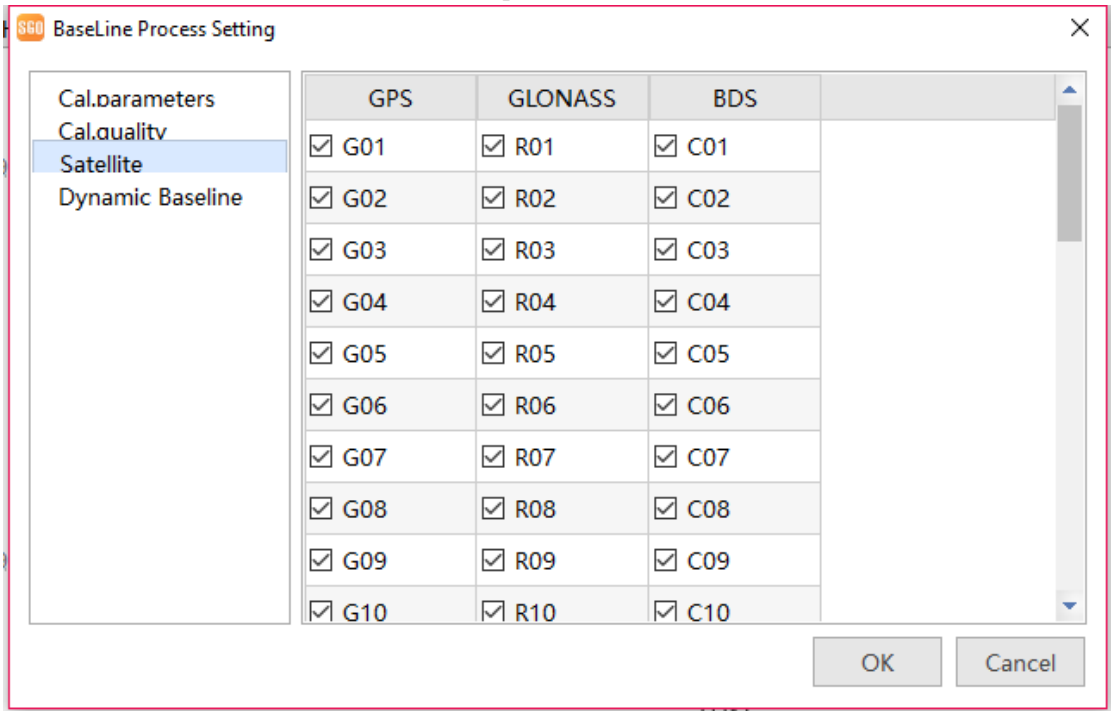
Cal.paremeters: To set process parameters for static observation data.



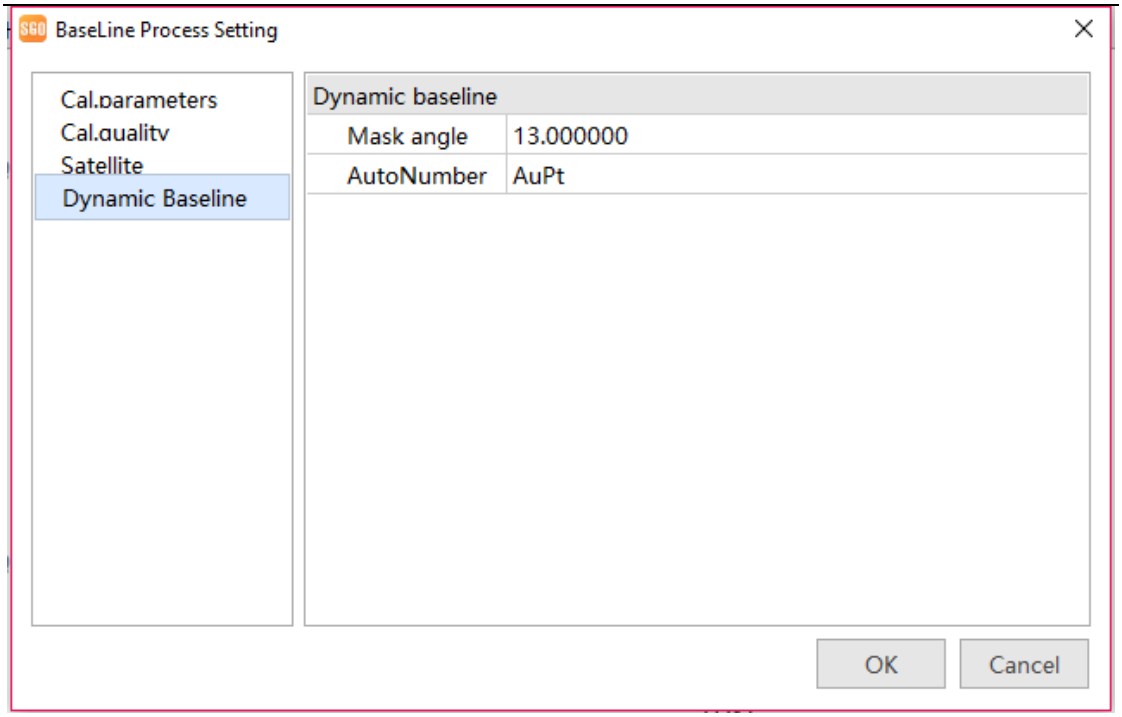
Cal.quality: To set tolerance for static processing. Setting listed errors smaller value means higher process accuracy requested for current project.



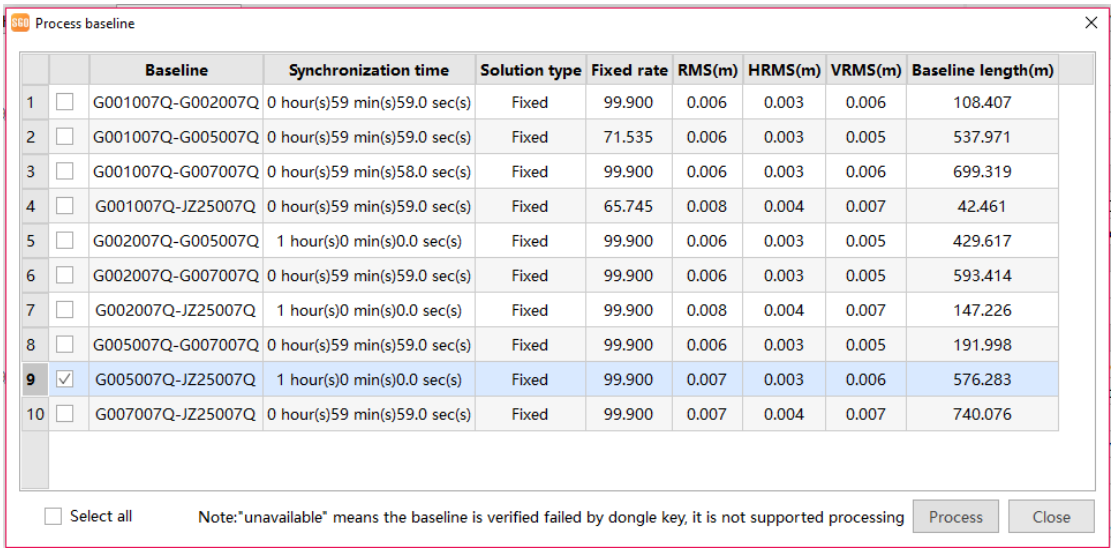
Satellite: Tospecify data from which satellites available for static processing, supported satellites constellations are GPS, GLONASS and Compass.



Dynamic Baseline: The settings for kinematic processing.

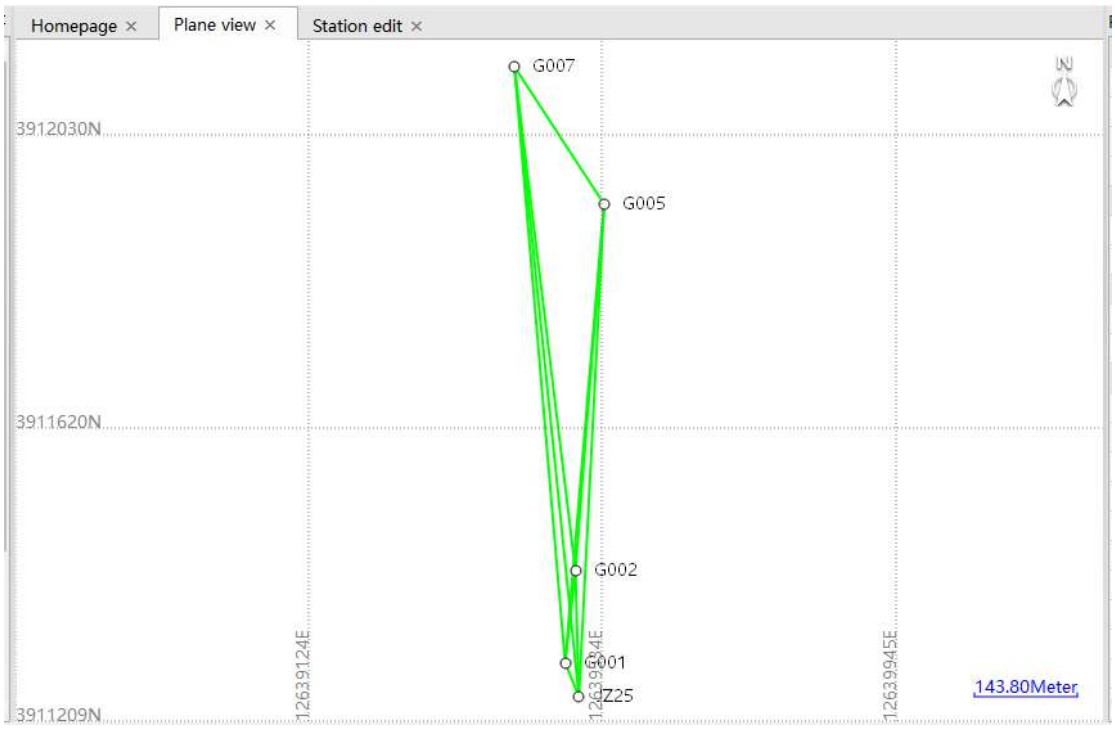


Click **OK** to finish processing settings. Then click **Survey→Process baseline**, click **Process**, SGO will start to process all baselines in this project.

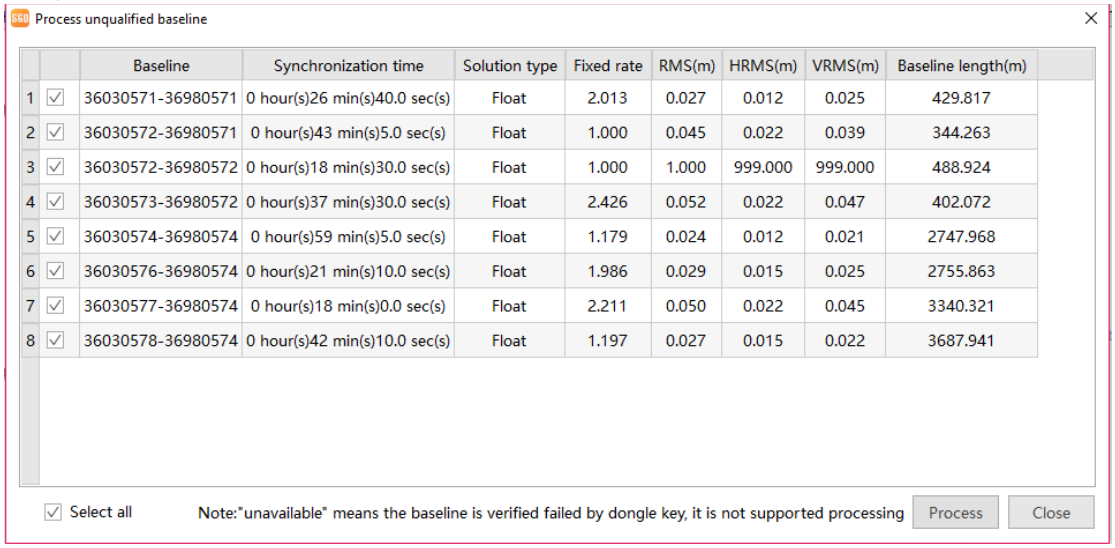


		Baseline	Synchronization time	Solution type	Fixed rate	RMS(m)	HRMS(m)	VRMS(m)	Baseline length(m)
1	☐	G001007Q-G002007Q	0 hour(s)59 min(s)59.0 sec(s)	Fixed	99.900	0.006	0.003	0.006	108.407
2	☐	G001007Q-G005007Q	0 hour(s)59 min(s)59.0 sec(s)	Fixed	71.535	0.006	0.003	0.005	537.971
3	☐	G001007Q-G007007Q	0 hour(s)59 min(s)58.0 sec(s)	Fixed	99.900	0.006	0.003	0.006	699.319
4	☐	G001007Q-JZ25007Q	0 hour(s)59 min(s)59.0 sec(s)	Fixed	65.745	0.008	0.004	0.007	42.461
5	☐	G002007Q-G005007Q	1 hour(s)0 min(s)0.0 sec(s)	Fixed	99.900	0.006	0.003	0.005	429.617
6	☐	G002007Q-G007007Q	0 hour(s)59 min(s)59.0 sec(s)	Fixed	99.900	0.006	0.003	0.005	593.414
7	☐	G002007Q-JZ25007Q	1 hour(s)0 min(s)0.0 sec(s)	Fixed	99.900	0.008	0.004	0.007	147.226
8	☐	G005007Q-G007007Q	0 hour(s)59 min(s)59.0 sec(s)	Fixed	99.900	0.006	0.003	0.005	191.998
9	☑	G005007Q-JZ25007Q	1 hour(s)0 min(s)0.0 sec(s)	Fixed	99.900	0.007	0.003	0.006	576.283
10	☐	G007007Q-JZ25007Q	0 hour(s)59 min(s)59.0 sec(s)	Fixed	99.900	0.007	0.004	0.007	740.076

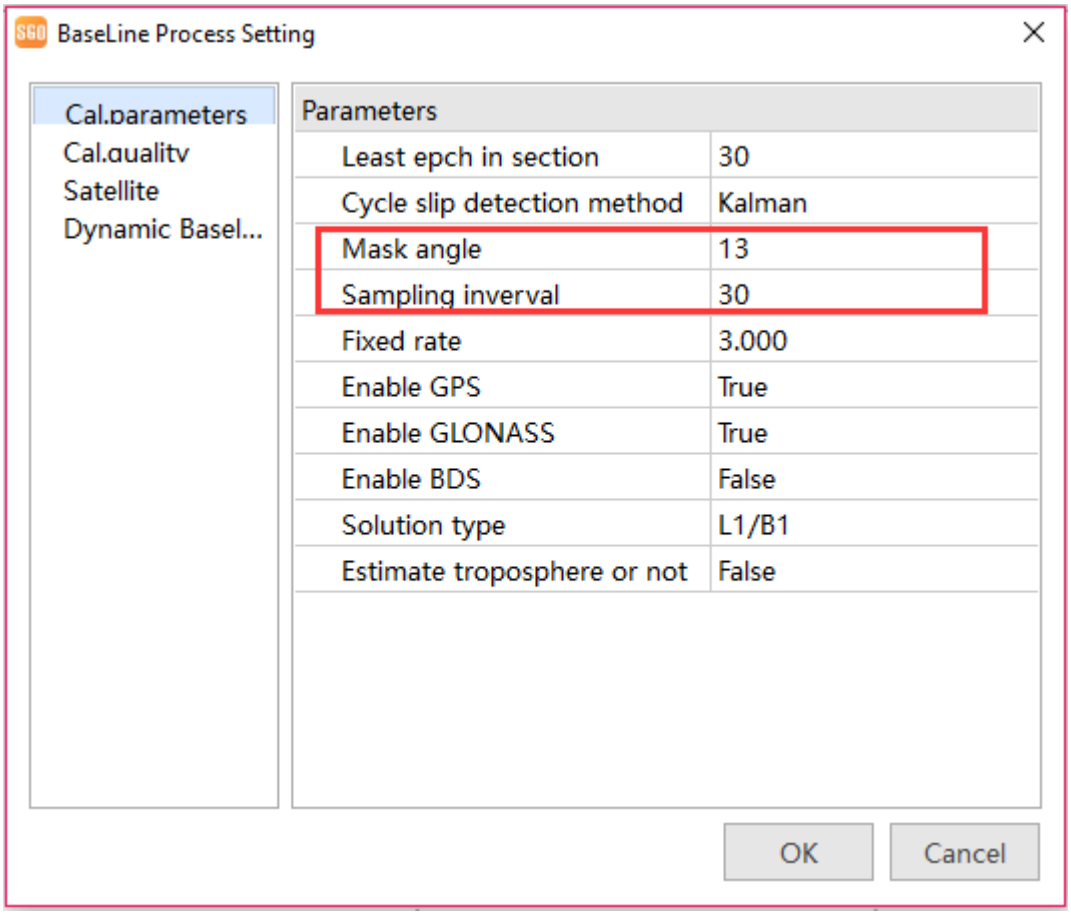
If **Solution type** of each baseline turns to be **fixed** after processing, it means that all baselines are qualified and we can continue with network adjustment. Fixed baselines will be displayed on survey graph in green color.



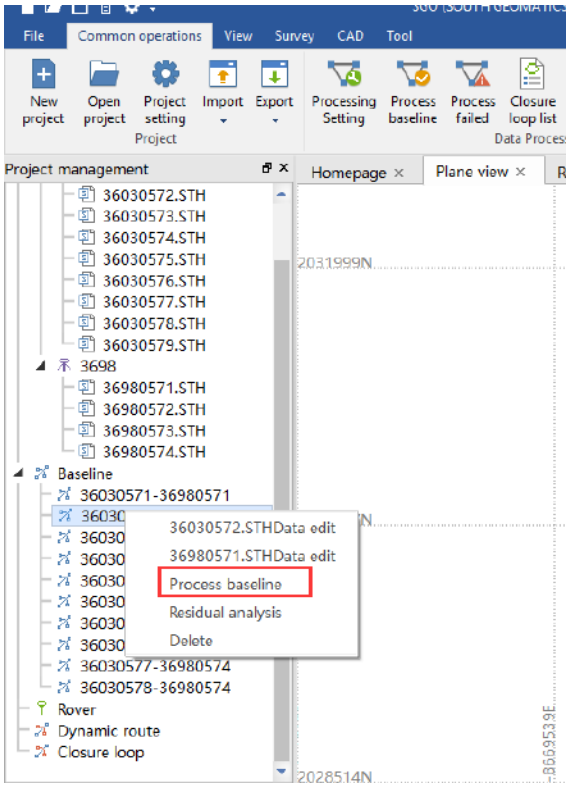
Otherwise if some baselines did not turn fixed, we have to select unfixed baseline listed in the left display frame, and try different groups of **Cutoff angle** and **Interval** to process this baseline again and get fixed solution.



		Baseline	Synchronization time	Solution type	Fixed rate	RMS(m)	HRMS(m)	VRMS(m)	Baseline length(m)
1	☑	36030571-36980571	0 hour(s)26 min(s)40.0 sec(s)	Float	2.013	0.027	0.012	0.025	429.817
2	☑	36030572-36980571	0 hour(s)43 min(s)5.0 sec(s)	Float	1.000	0.045	0.022	0.039	344.263
3	☑	36030572-36980572	0 hour(s)18 min(s)30.0 sec(s)	Float	1.000	1.000	999.000	999.000	488.924
4	☑	36030573-36980572	0 hour(s)37 min(s)30.0 sec(s)	Float	2.426	0.052	0.022	0.047	402.072
5	☑	36030574-36980574	0 hour(s)59 min(s)5.0 sec(s)	Float	1.179	0.024	0.012	0.021	2747.968
6	☑	36030576-36980574	0 hour(s)21 min(s)10.0 sec(s)	Float	1.986	0.029	0.015	0.025	2755.863
7	☑	36030577-36980574	0 hour(s)18 min(s)0.0 sec(s)	Float	2.211	0.050	0.022	0.045	3340.321
8	☑	36030578-36980574	0 hour(s)42 min(s)10.0 sec(s)	Float	1.197	0.027	0.015	0.022	3687.941



After you change the calculation parameters, you can process each baseline by right click the baseline in the left display frame.

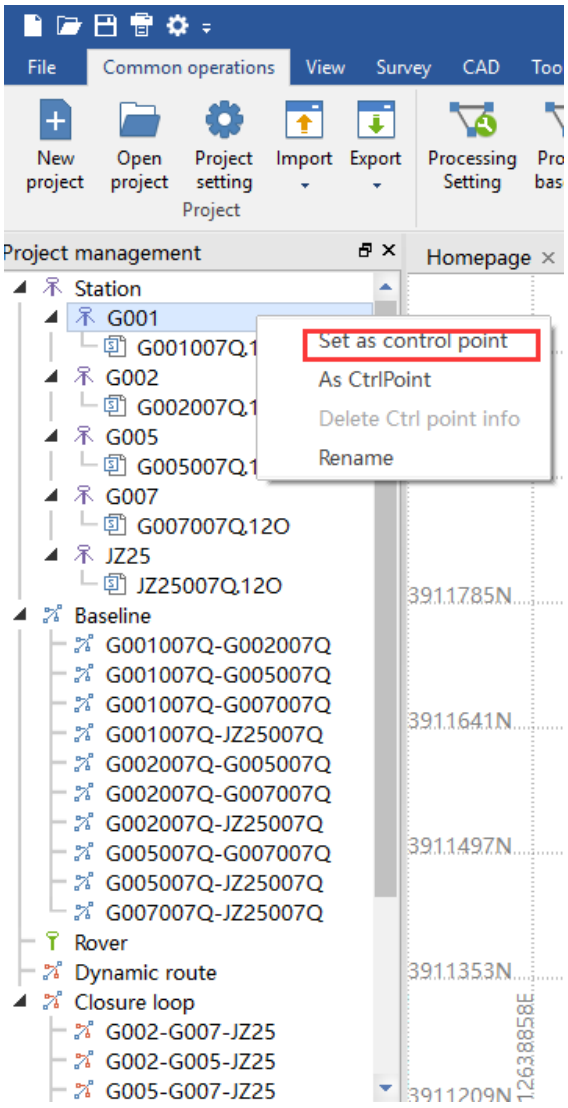


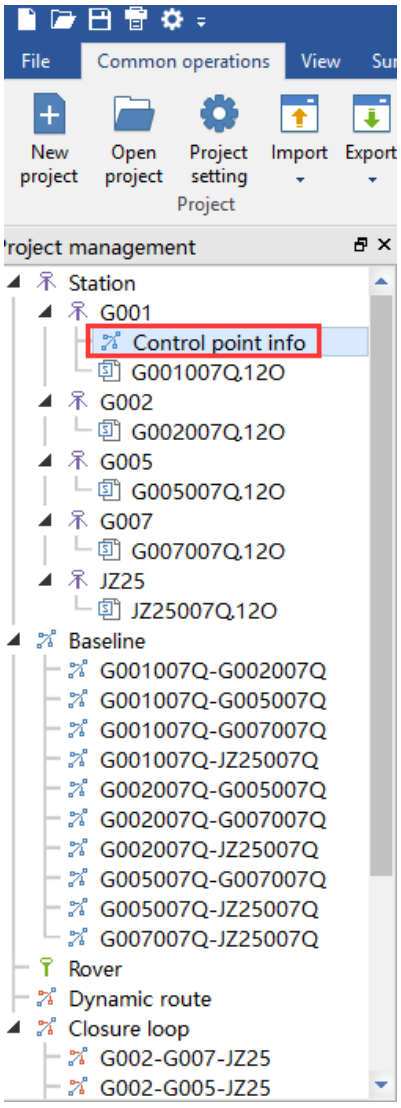
You can also process all failed baseline by tap on the **Process failed** button.

2.1.4 Network adjustment

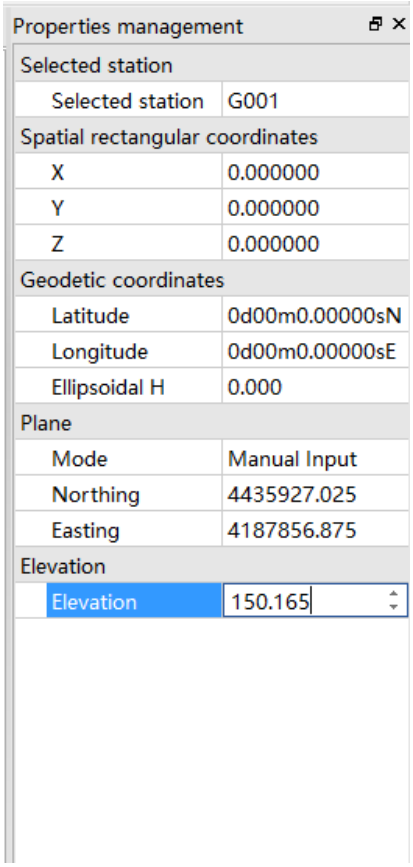
Prior to network adjustment, we need to specify two or more points in static network as control points, and input coordinates (BLH, XYZ or xyh) of them into SGO

In our demo project, we will specify G001 as control points. Right click each point in **Station** item in left display frame and set them **as control point.**

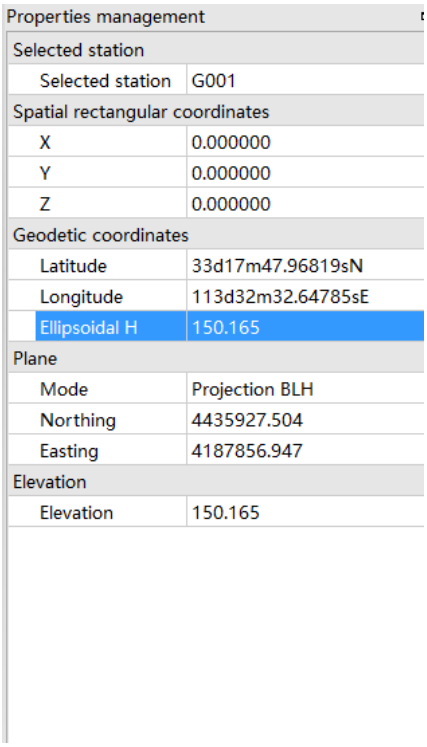




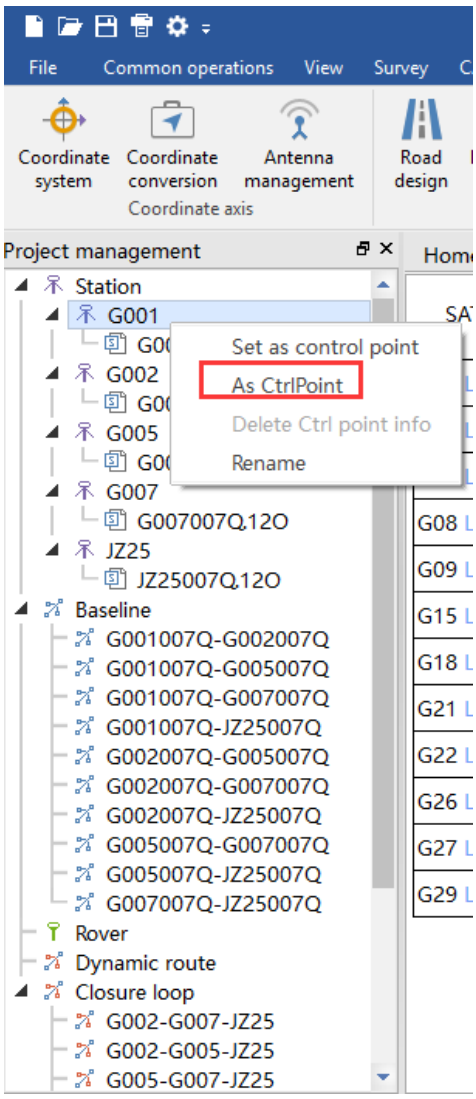
Then in the right display frame select **Manual input** mode, then input the N,E,Elevation.

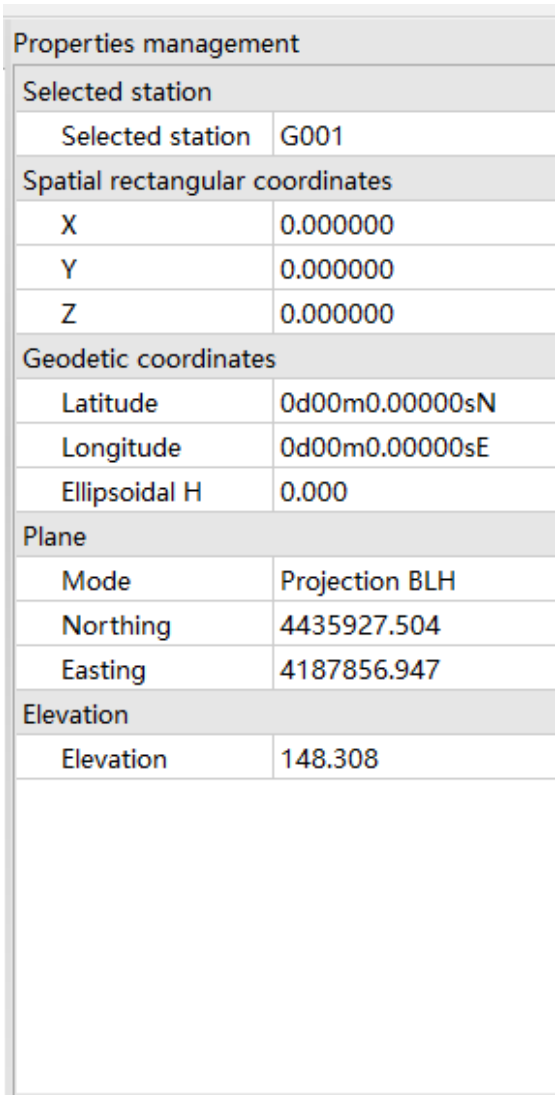


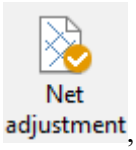
If the control point only has B,L and Ellipsoidal H or XYZ, but you need the software to calculate the plane coordinate Northing, Easting and Elevation, you can select Projection BLH after you input the Geodetic coordinates, then the software will give the projection plane coordinate automatically.



You can also select the As CtrlPoint option to create the control point, the different is the SGO software will give an approximate plane coordinate as control point, so if you do not have any known point, you can use this option.







Click **Net adjustment** button , and SGO will adjust the whole network with known coordinates of control points.

2.2 Kinematic data processing

SGO program is also integrated with the ability of kinematic data processing, in this section you will understand well how to use SGO to perform the stop&go data processing.

This kinematic processing method is divided into two cases, one is to process data files which recorded by single frequency receiver, the other one is to process the data files recorded by dual frequency receiver.

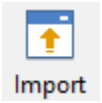
2.2.1 Single frequency data processing

The single frequency data files recorded by south H68 receiver or S750, S760 (dual frequencies actually) handheld which owns the ability of collecting kinematic data file, after finishing field data collection, download the correct raw data files from base and rover to your computer.

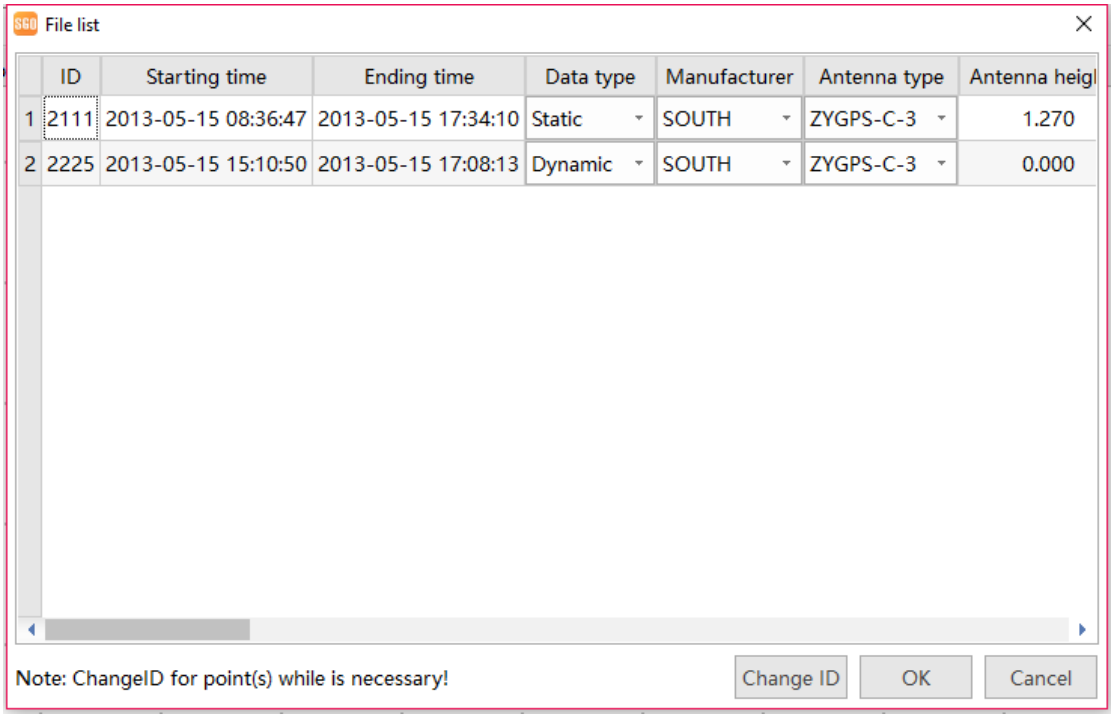
Create a new project

Run SGO program on computer and create a new project as same as static data processing.

Load raw data

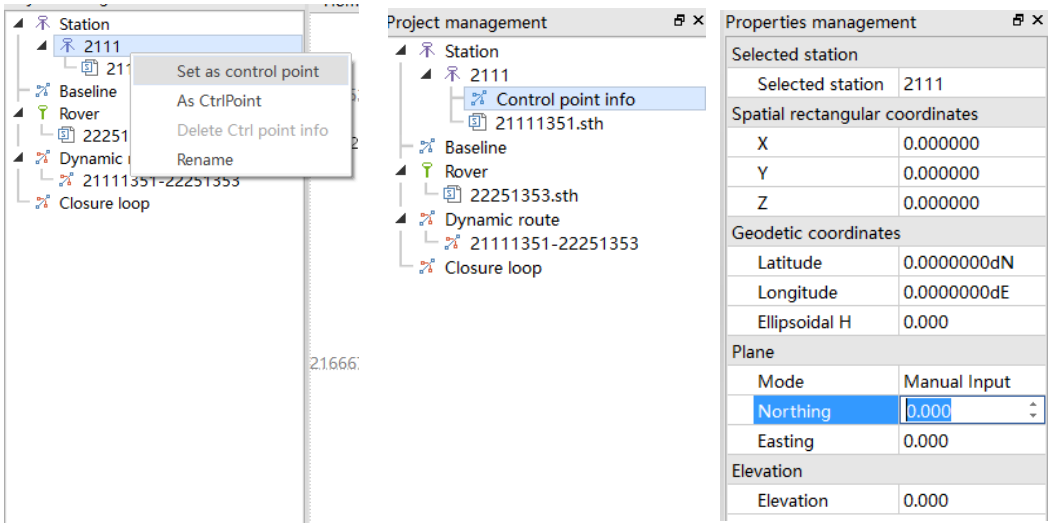
Click import button 

located in toolbar to find the folder where your data files are stored. Select the two kinematic files from base and rover then click ok button to go on, and modify the station name and antenna height in next pop-up dialog.

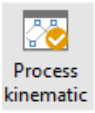


Input control point coordinates

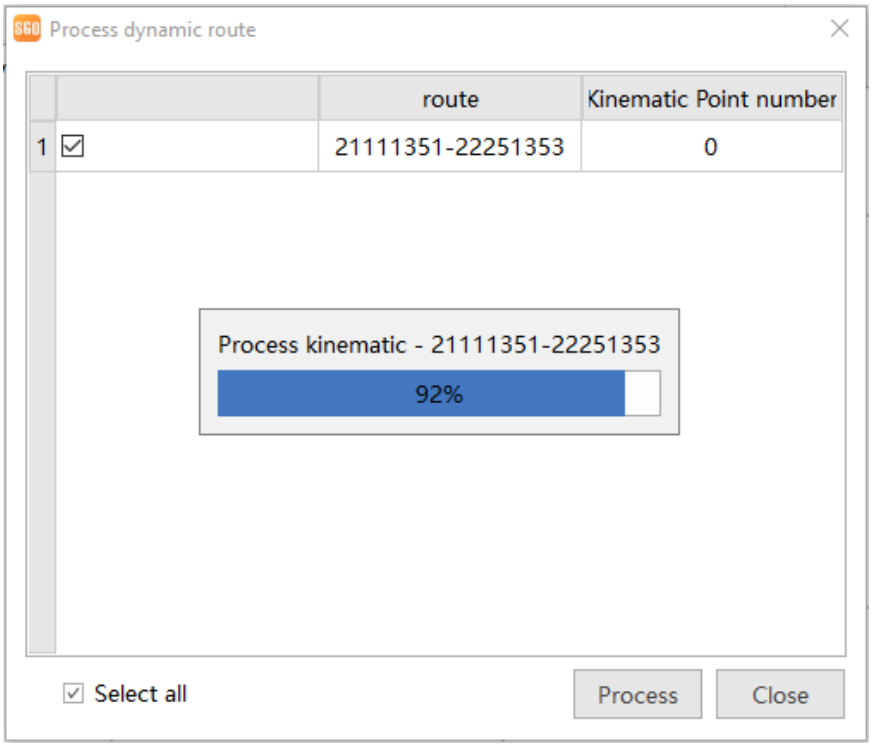
After loading raw data, set the base station as control point. Right click on the base station file and choose “Set as control point” option, then the option of “Control point info” appears under base data file, tap on this option to input coordinates for base station in property window located at the right side.



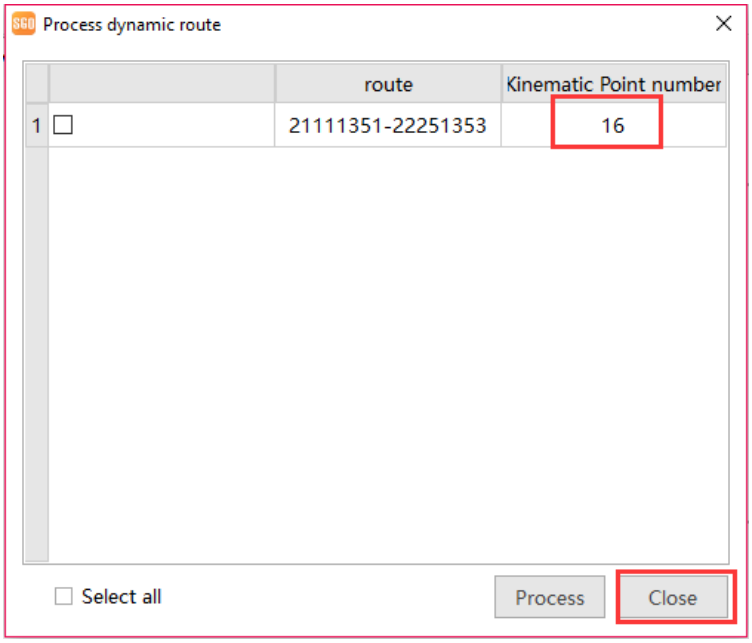
Data processing

Tap on Survey—Process kinematic button 

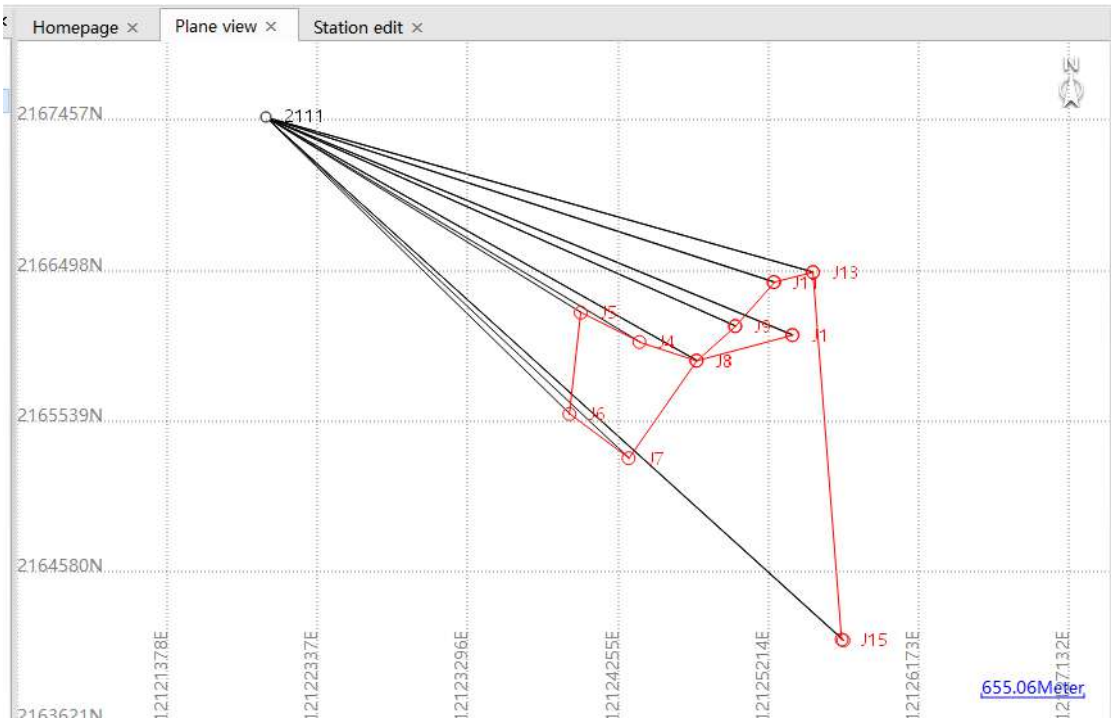
located in toolbar, click "Process" button to start kinematic data processing.



Then tap on Close button after it finish the processing.



In the Plane view all points are displayed with baselines connect to base station, if the baselines displays in red, that means the quality of processing is RTD, in the Station list (View→Station list) view you will see the details result.



Homepage × Plane view × Station edit × Station list ×

	Station name	Coordinate quality	North(m)	East(m)	h(m)
1	2111	Control Point Control P...	1000.000	1000.000	12.000
2	J1-21111351-22251353	DGNSS	-408.925	4151.631	4.588
3	J2-21111351-22251353	DGNSS	-409.856	4148.421	8.162
4	J3-21111351-22251353	DGNSS	-546.708	3565.704	16.016
5	J4-21111351-22251353	DGNSS	-424.027	3223.482	7.947
6	J5-21111351-22251353	DGNSS	-236.420	2873.561	12.452
7	J6-21111351-22251353	DGNSS	-846.930	2787.116	12.138
8	J7-21111351-22251353	DGNSS	-1124.476	3137.132	19.890
9	J8-21111351-22251353	DGNSS	-546.994	3565.354	16.482
10	J9-21111351-22251353	DGNSS	-345.148	3805.925	4.113
11	J10-21111351-22251...	DGNSS	-344.896	3805.305	1.994
12	J11-21111351-22251...	DGNSS	-85.618	4049.789	1.605
13	J12-21111351-22251...	DGNSS	-86.343	4044.637	1.025
14	J13-21111351-22251...	DGNSS	-33.398	4285.190	4.392
15	J14-21111351-22251...	DGNSS	-33.203	4285.745	5.518
16	J15-21111351-22251...	DGNSS	-2257.777	4394.390	62.842
17	J16-21111351-22251...	DGNSS	-2263.378	4405.121	64.916

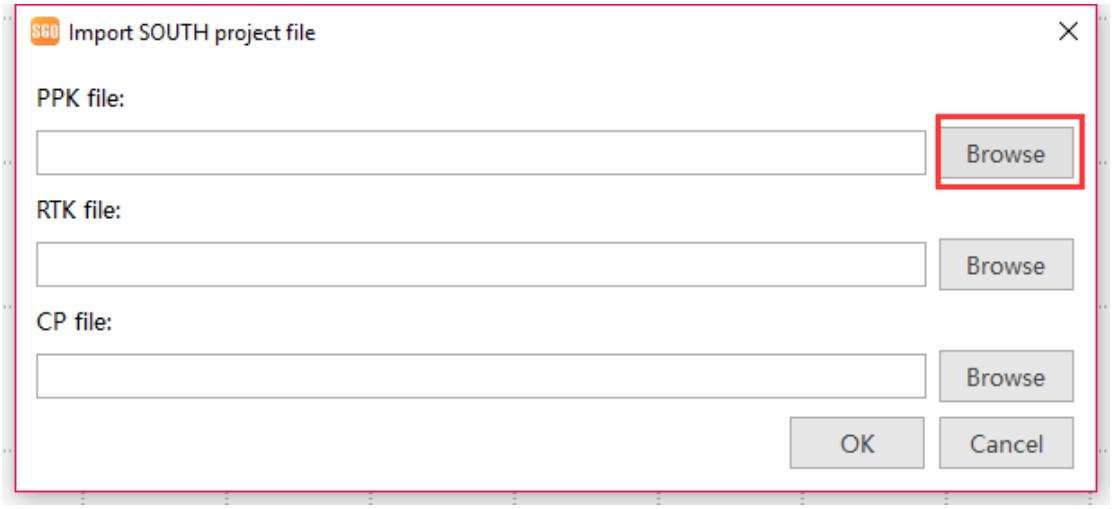
2.2.2 Dual frequency data processing

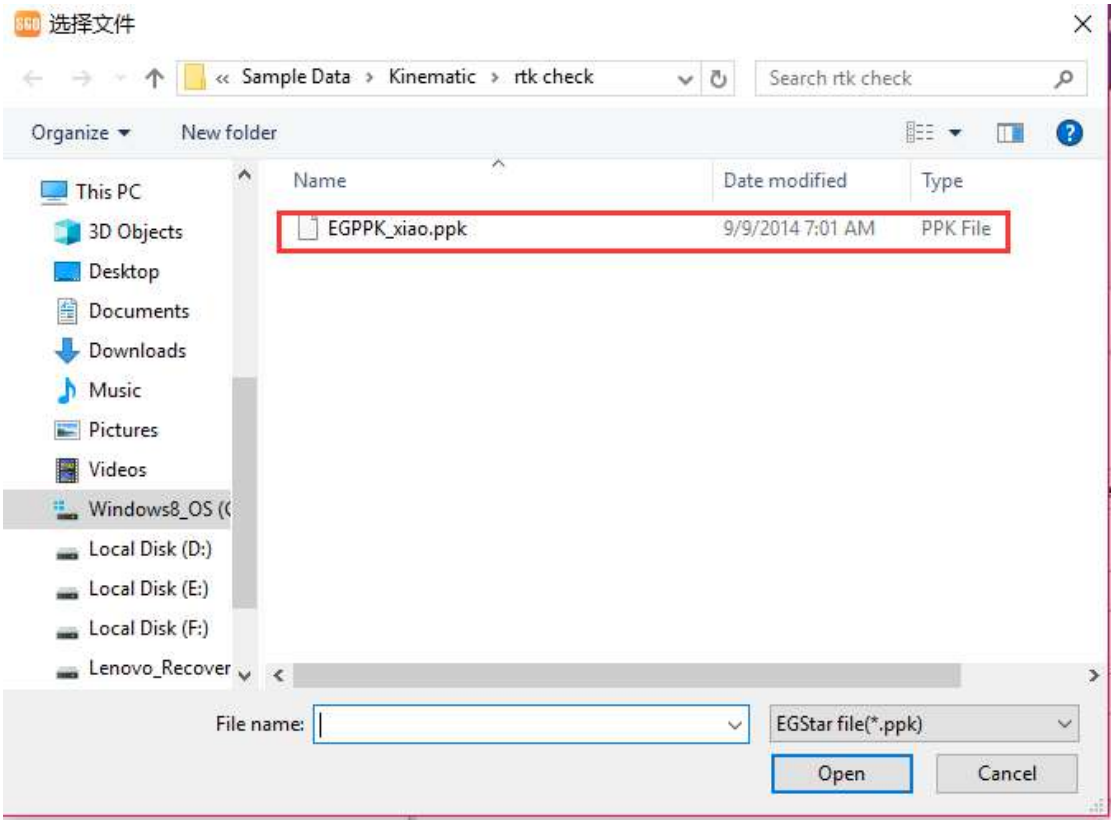
The difference between Single frequency and dual frequency data processing is to mark point ID into dual frequency data file with RW5 file from SurvCE or ppk file from EGStar. We will use ppk files from EGStar as an example.

At the first, all the procedures are same as to single frequency data processing, create new project, load raw data files.

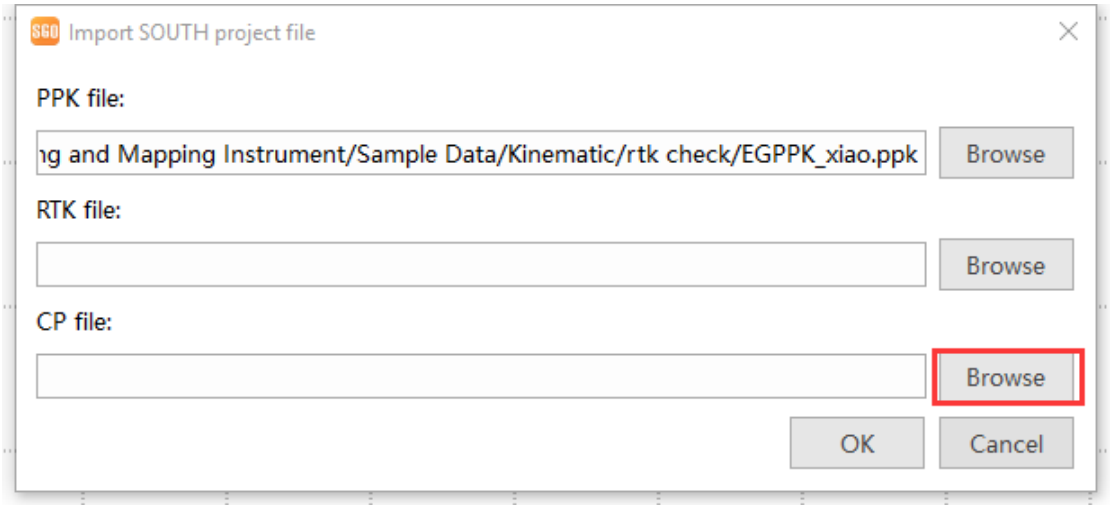
PPK file loading

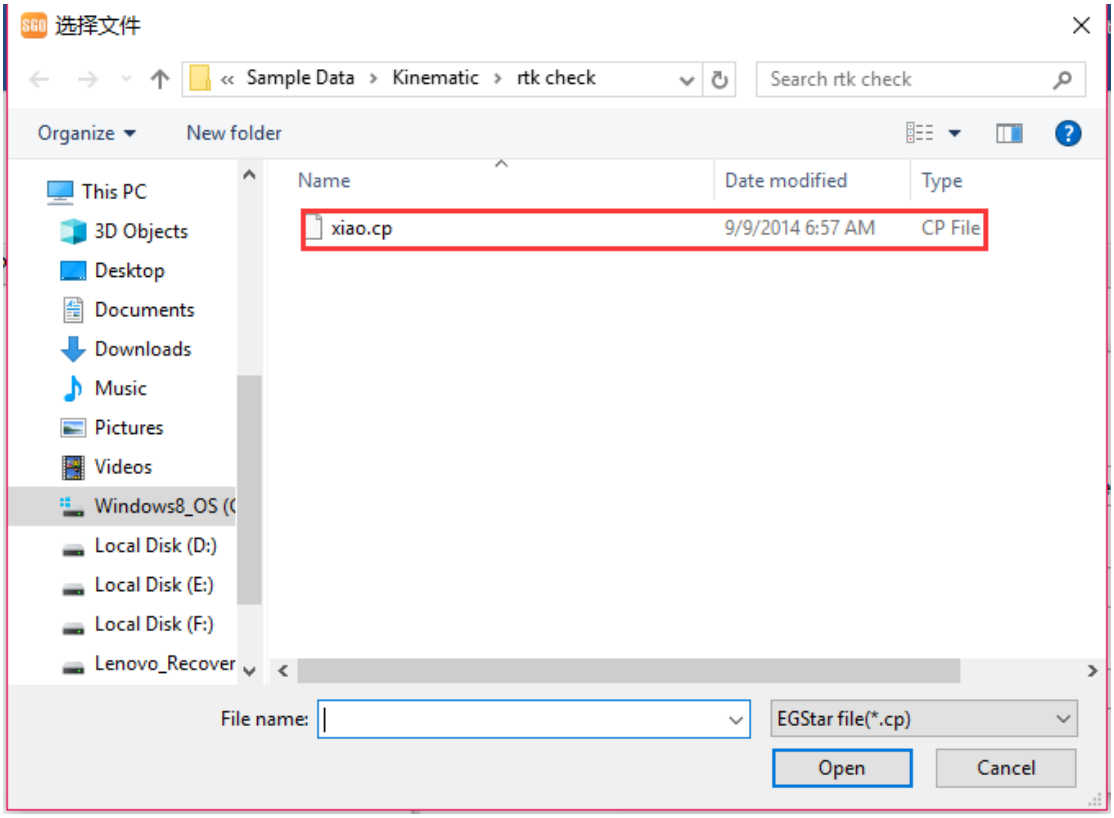
After raw observation data files are loaded, go to "Import—Import SOUTH project" and find where ppk file under directory of your EGStar job folder (you should copy the whole folder of your job onto your computer first).



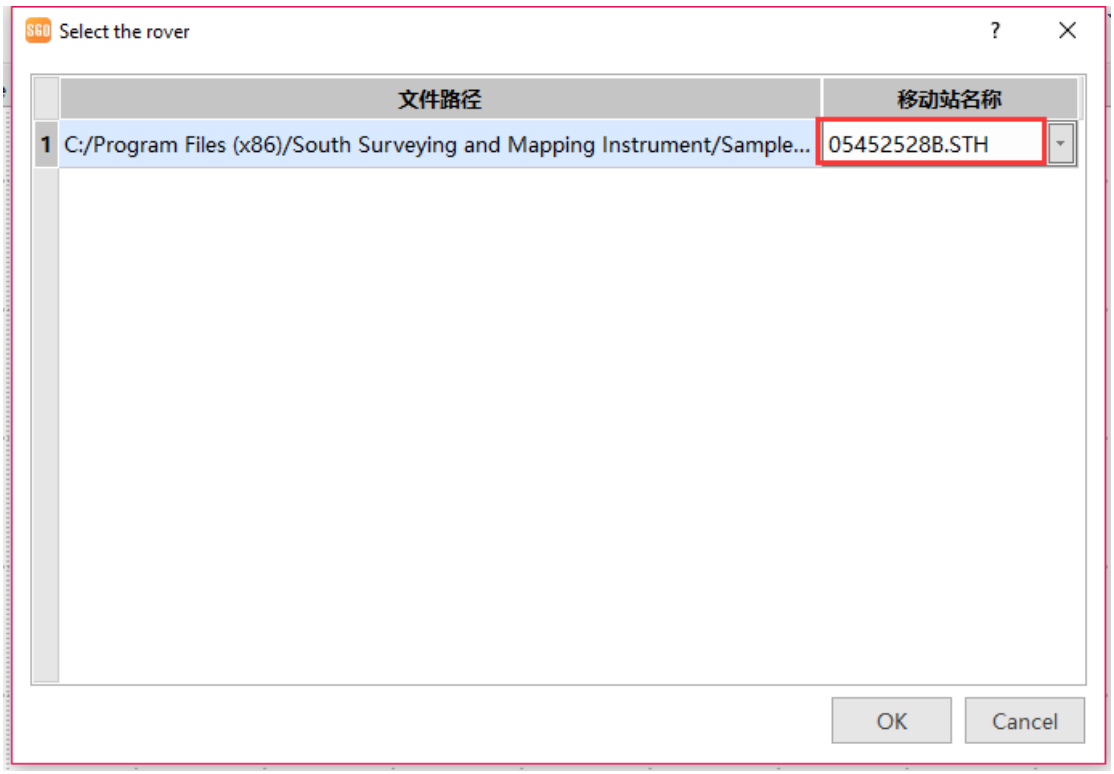


Then you need load the CP file from the EGStar project.





Click OK to confirm. Then you need to select the matched rover STH file. Click OK.



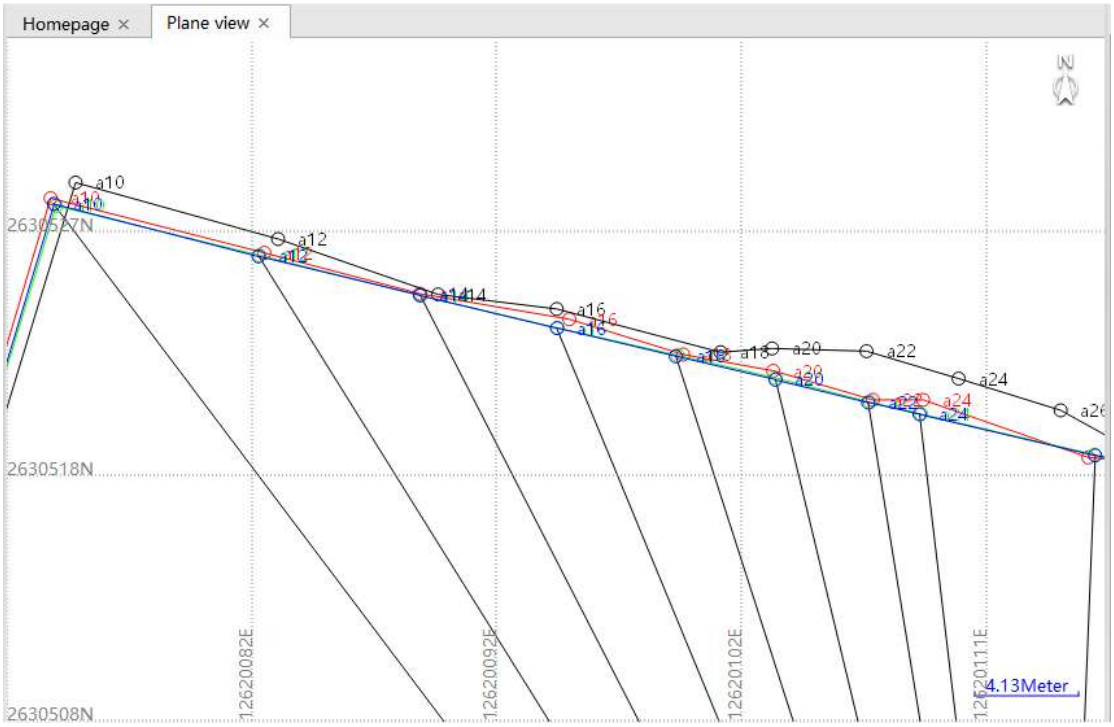
Data processing

Input the coordinates for control point then process all kinematic points (detail steps please refer to single frequency data processing). Then you will see some solutions different from single frequency data processing.

If the baselines display in RED, that means the processing quality is RTD;

If the baselines display in GREEN, that means the processing quality is FLOAT;

If the baselines display in BLUE, that means the processing quality is FIXED.



Homepage × Plane view × Station list ×

	Station name	Coordinate quality	North(m)	East(m)	h(m)
1	0552	Control Point Control P...	10000.000	10000.000	12.000
2	a2-05522528B-05452...	Fixed	9998.846	10004.574	11.778
3	a4-05522528B-05452...	Fixed	10001.939	9992.967	11.763
4	a6-05522528B-05452...	Fixed	10006.096	9977.382	11.794
5	a8-05522528B-05452...	Fixed	10012.832	9952.698	11.760
6	a10-05522528B-0545...	Fixed	10049.397	9964.640	11.548
7	a12-05522528B-0545...	Fixed	10047.286	9972.084	11.370
8	a14-05522528B-0545...	Fixed	10045.712	9977.965	11.708
9	a16-05522528B-0545...	Fixed	10044.385	9982.954	11.371
10	a18-05522528B-0545...	Fixed	10043.245	9987.280	11.377
11	a20-05522528B-0545...	Fixed	10042.294	9990.913	11.380
12	a22-05522528B-0545...	Fixed	10041.374	9994.290	11.381
13	a24-05522528B-0545...	Fixed	10040.898	9996.161	11.388
14	a26-05522528B-0545...	Fixed	10039.227	10002.561	11.370
15	a28-05522528B-0545...	Fixed	10038.633	10004.977	11.533
16	a30-05522528B-0545...	Fixed	10034.737	10007.060	11.374

Processing result report

After finishing data processing, go to "Survey—Report—dynamic route report" to display the processing result. Double click the report it can be opened by your Browser.

Dynamic route calculation report

2018-10-11 10:45:22

Report head

Project name:	C:\Users\a\Documents\SGO (SOUTH GEOMATICS OFFICE)\ppk egstar
The company of project :	Default
Project start time:	2018-10-11 10:32:11
Dynamic route name	05522528B-05452528B

Coordinate system

Central meridian	117.0000000dE
Projection method	Gauss-Kruger(Transverse Mercator)

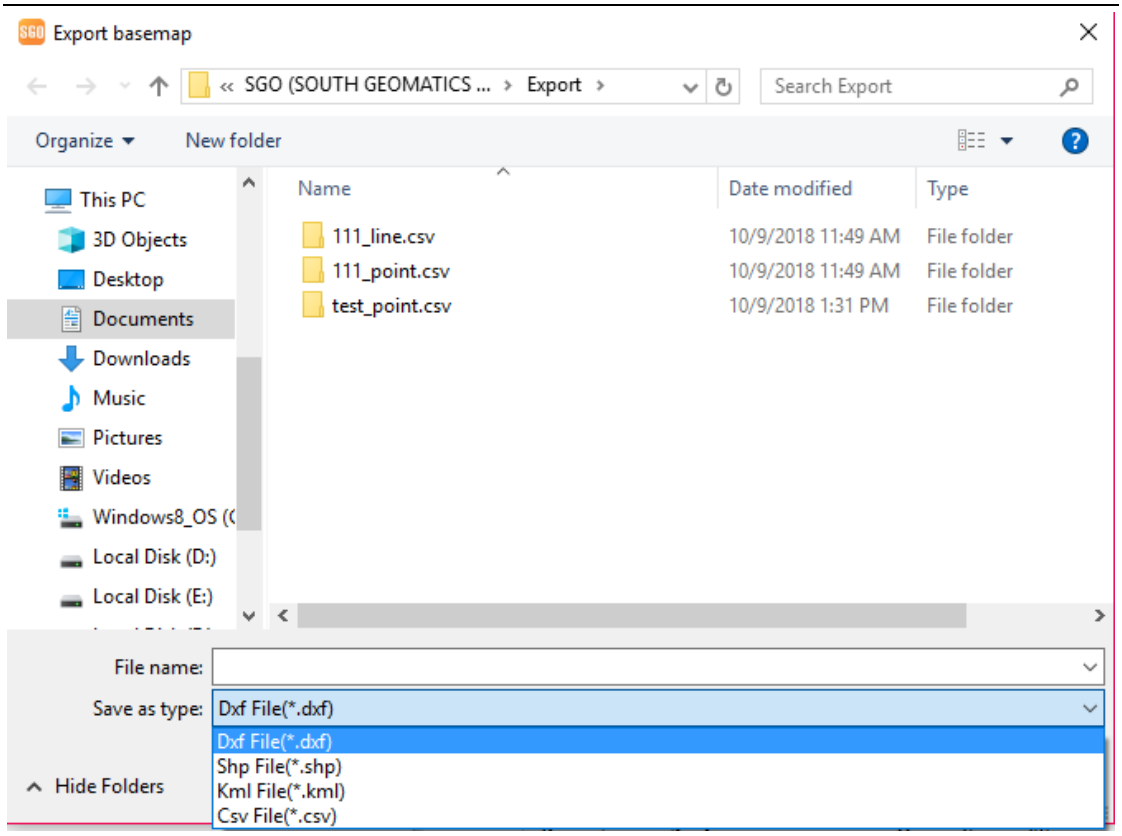
Base information

Point name	North(m)	East(m)	h(m)
0552	10000.000	10000.000	12.000

Dynamic point name

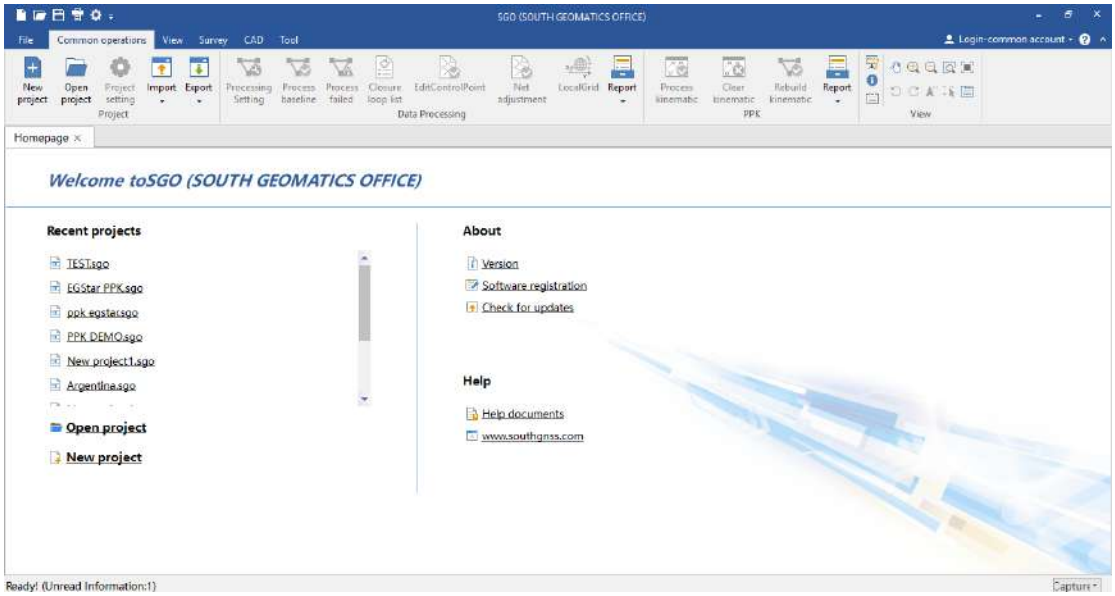
Point name	North(m)	East(m)	h(m)	RMS(m)	HRMS(m)	VRMS(m)	PDOP(m)	Solution type
a2	9999.418	10004.894	27.388	1.161	0.617	0.984	1.340	Autonomous
	9998.795	10004.974	11.443	0.042	0.022	0.036	1.340	DGNSS
	9998.838	10004.610	12.600	0.001	0.001	0.001	1.340	Float
	9998.846	10004.574	11.778	0.001	0.001	0.001	1.340	Fixed
	10002.485	9993.341	27.273	1.171	0.623	0.991	1.340	Autonomous

You can also export other format go to 'Export—Export dynamic map'.

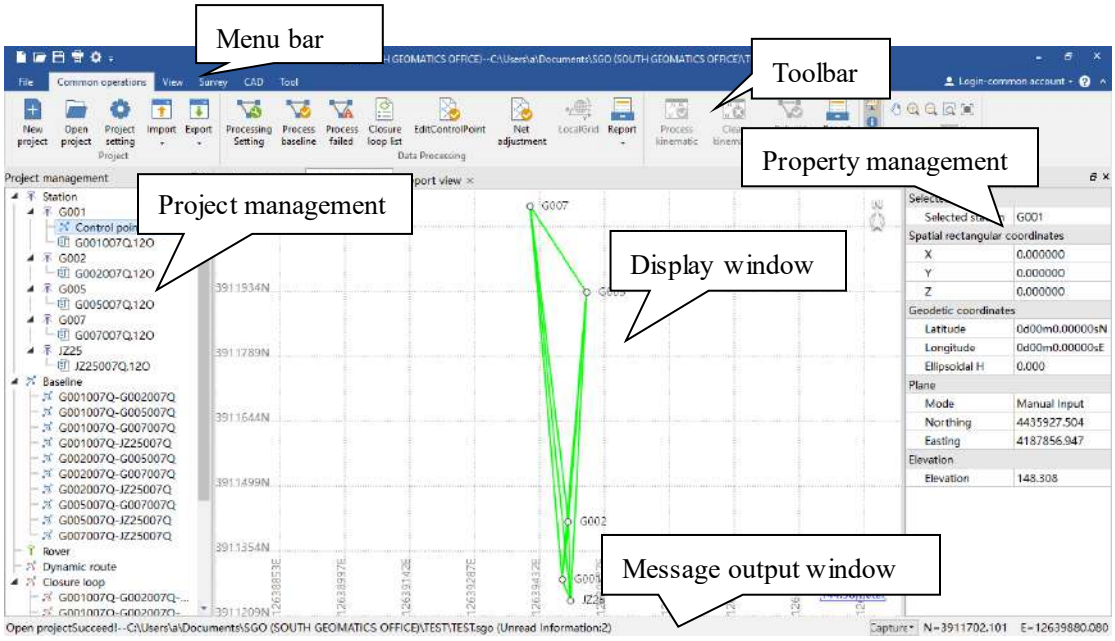

Export basemap
« SGO (SOUTH GEOMATICS ... › Export ›
Search Export
Organize
New folder
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Windows8_OS (
Local Disk (D:)
Local Disk (E:)
Name
Date modified
Type
111_line.csv
10/9/2018 11:49 AM
File folder
111_point.csv
10/9/2018 11:49 AM
File folder
test_point.csv
10/9/2018 1:31 PM
File folder
File name:
Save as type:
Dxf File(*.dxf)
Dxf File(*.dxf)
Shp File(*.shp)
Kml File(*.kml)
Csv File(*.csv)
Hide Folders

Chapter 3 Main Interface

Run SGO Software from the Start menu, or directly double click on Icon, then it enters the main program. As shown in following picture.



Create a new project or open an existing project, you will get the toolbar activated and the entire menu bar, and the other corresponding windows. Please see the following picture, menu bar and toolbar are located at the top of main interface, and the project explorer window is located at left side, on the contrary, there is the property window.



Menu bar: The list menu is an important part of any type window. It supplies many command to

create engineering files, resolve data, and manage data.

Tool bar: It provides majority common shortcuts for fast operation. And the corresponding command can be found in menu.

Display window: It is the user's main working field, generally includes every type views related to project.

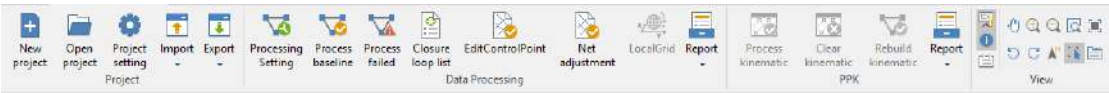
Project Explorer: Users can browse all the observation data and baseline information here.
Message Output window: Output message of processing.

3.1 Menu

The main menu of the program consists of File, Common operations, View, Survey, CAD, Tool, Every menu item has a window shortcut key located in toolbar. The menu items provide the operation to complete most of the data processing work and cover the main processing steps.

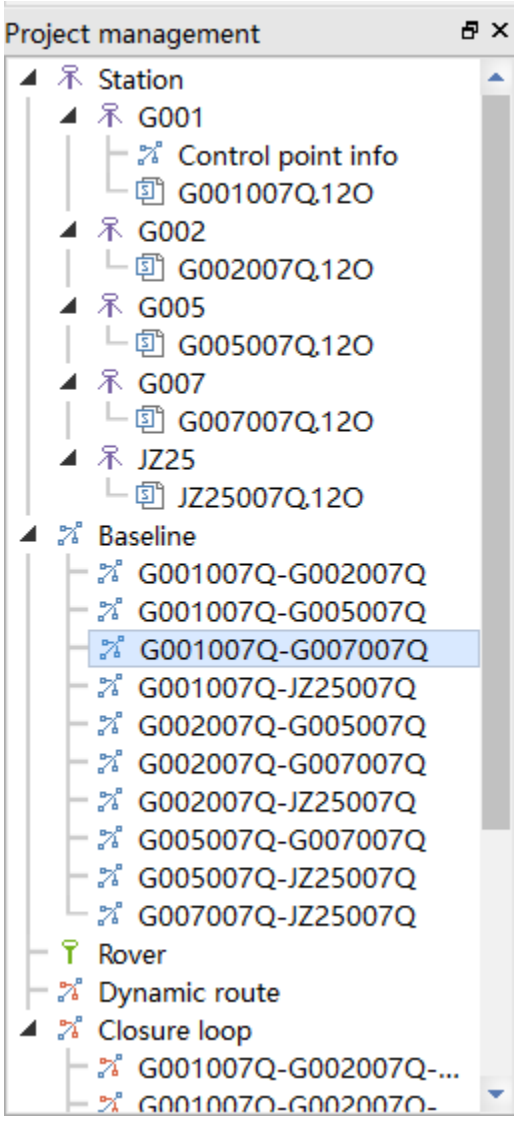
3.2 Toolbar

You can achieve the main operations through the Toolbars in the main program. It includes create new project, open project, project setting, import data, export data, adjust the work field, process the baseline, check report.



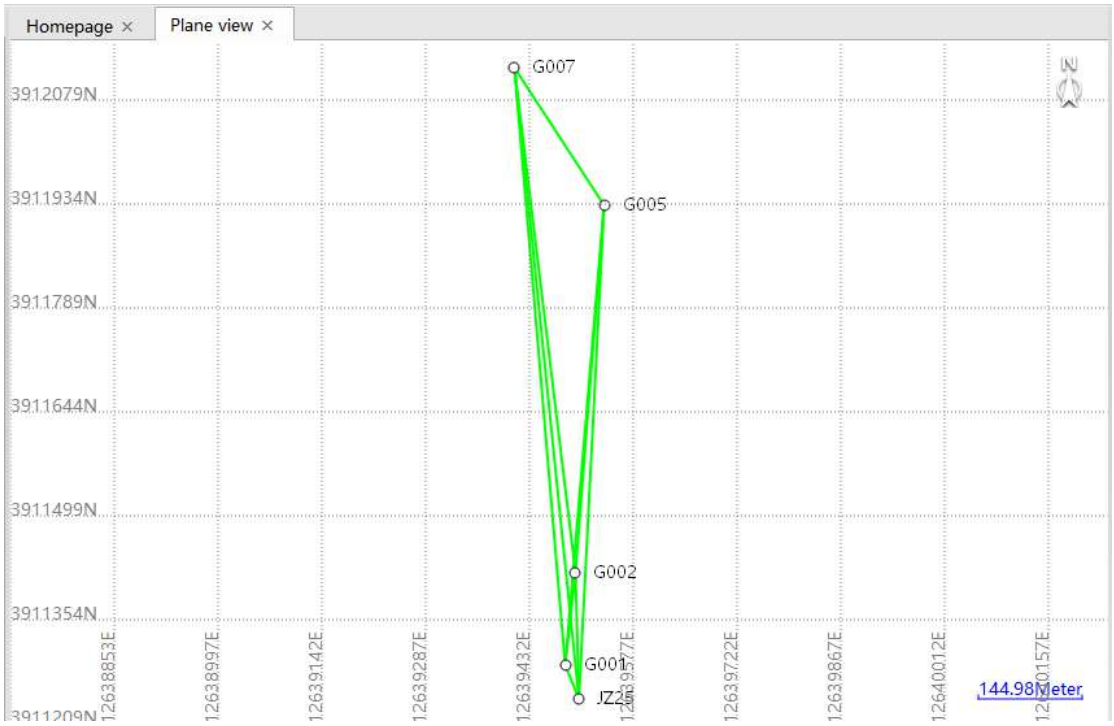
3.3 Project Management

The Project Management window is placed at the left of main interface. It is used to manage all context of the project, including points list, baselines list, and observation files list. Click on "▷" symbol to open the corresponding contents, for example, click on "▷" symbol before the station to view relative data file to the point. Tap on the file, you will have the relative information displayed at property window such as Point info, Geographical latitude and Cartesian coordinate.



3.4 Display window (Plan View)

This is the important working window of main interface which mainly displays the added information such as site list, baseline, scale, and grid etc.



3.5 Property window

The property window will display the different properties according to the selected node in project management, if a point is selected, the corresponding information is displayed in property window, as shown the left in following pictures.

Properties management

Rover info	
Rover info	G001
File location	C:\Users\a\Documents
Starting time	2012-01-07 16:00:00
Duration	0 hour(s)59 min(s)59.0
Antenna height	0.000000
Antenna measuring method	Phase center
Manufacturer	Default
Antenna type	Default
SN	
Geodetic	
Latitude	33d17m47.96819sN
Longitude	113d32m32.64785sE
Ellipsoidal height	148.308
Spatial coordinates	
ECEF_X	-2131588.713
ECEF_Y	4892413.947
ECEF_Z	3481587.031

Station properties

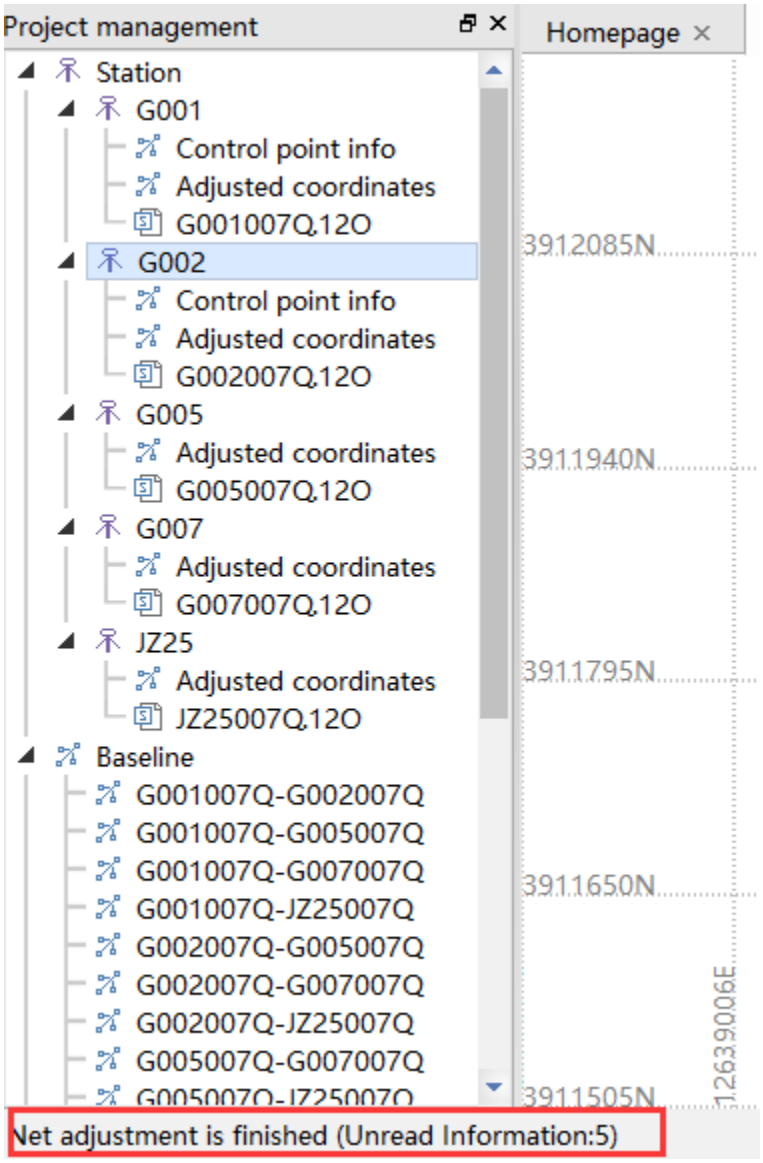
Properties management

General	
Process Status	True
Starting time	1/7/2012 4:00:00 PM
Ending time	1/7/2012 4:59:59 PM
Duration	0 hour(s)59 min(s)59....
Starting point info	
Starting point ID	G001
Start point File location	C:\Users\a\Document...
Ending point info	
Ending point ID	G002
File location	C:\Users\a\Document...
Parameters	
Least epch in section	30
Cycle slip detection method	Kalman
Mask angle	13
Sampling inverval	30
Fixed rate	3.000
Enable GPS	True
Enable GLONASS	False
Enable BDS	False
Solution type	L1/B1
Estimate troposphere or not	True

Baseline properties

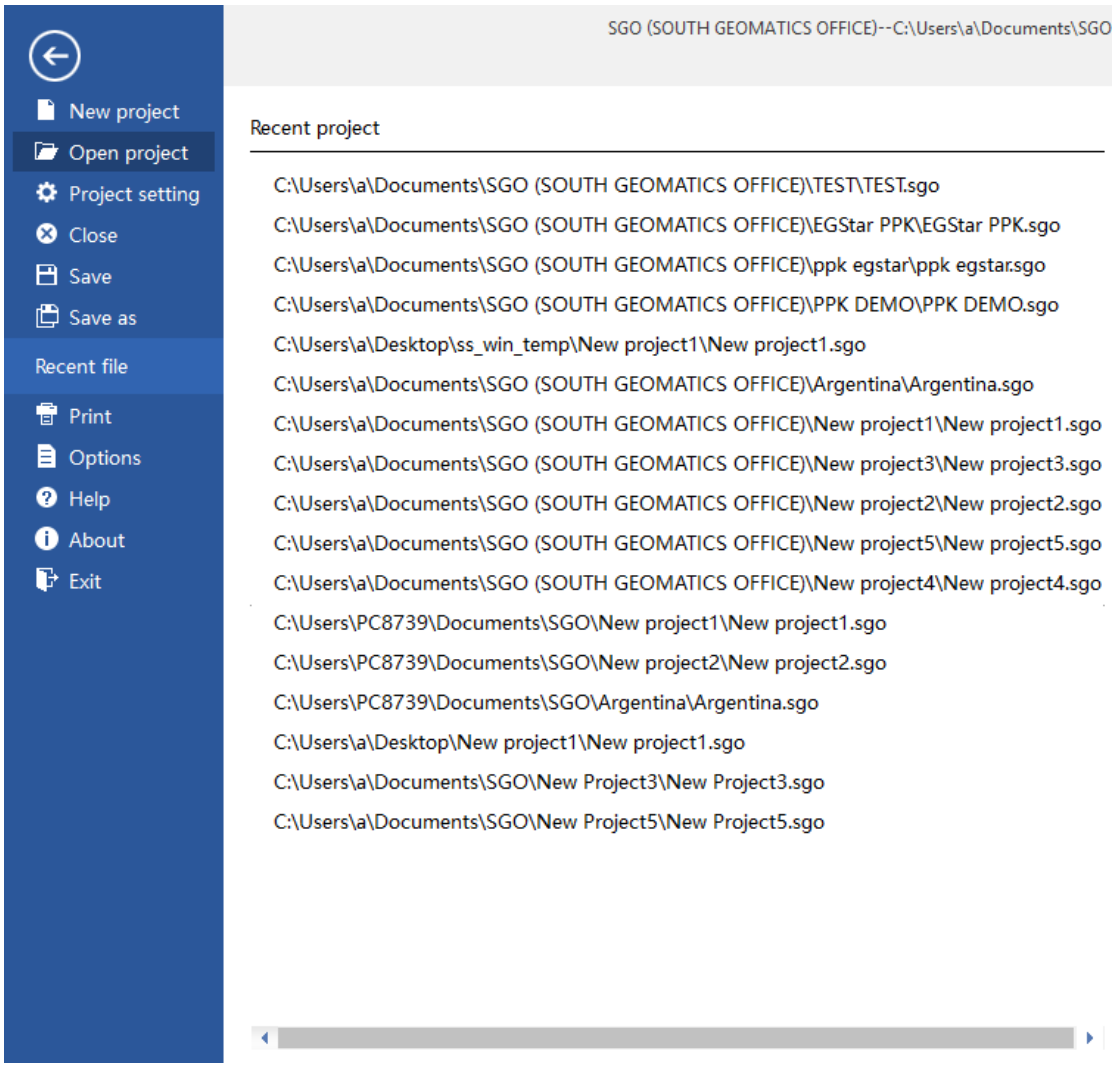
3.6 Output window

This window is mainly used to display the message of your operation, for example, if the kinematic data is processed, it will display as “All kinematic points processed”. If the operation is on static data processing, it will display as “All baselines processed”.



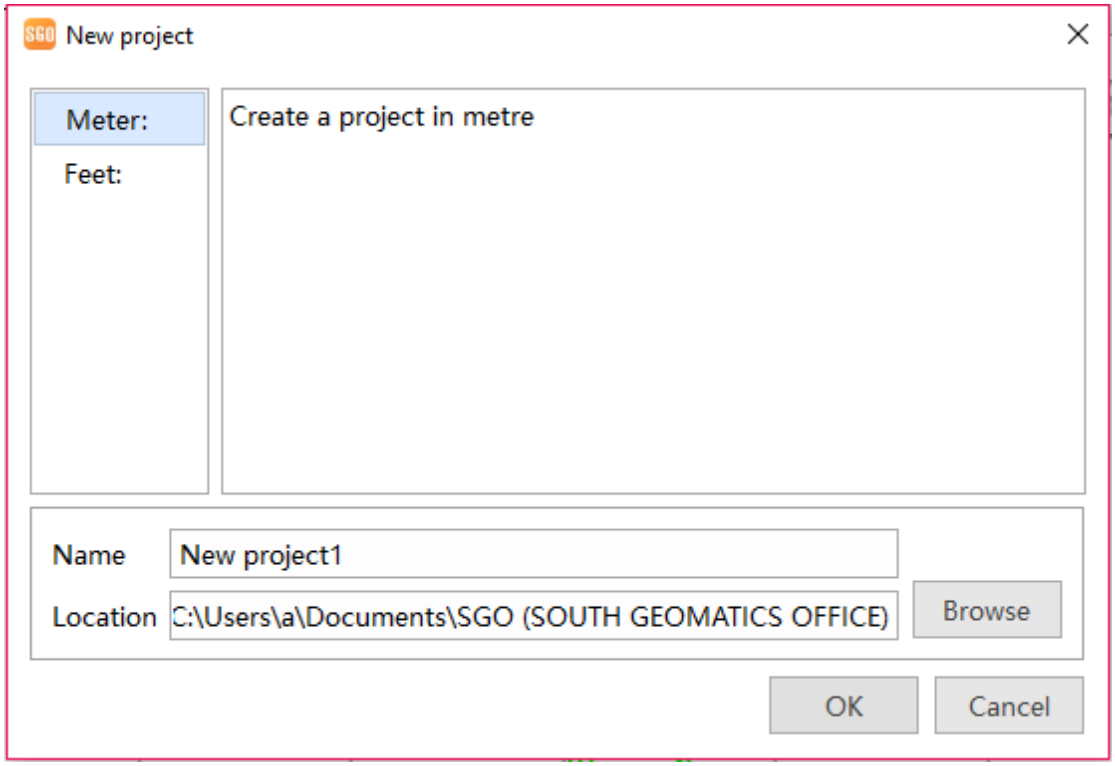
Chapter 4 File

This chapter provides information on using main commands from File menu, including New project, Open project, Project setting.



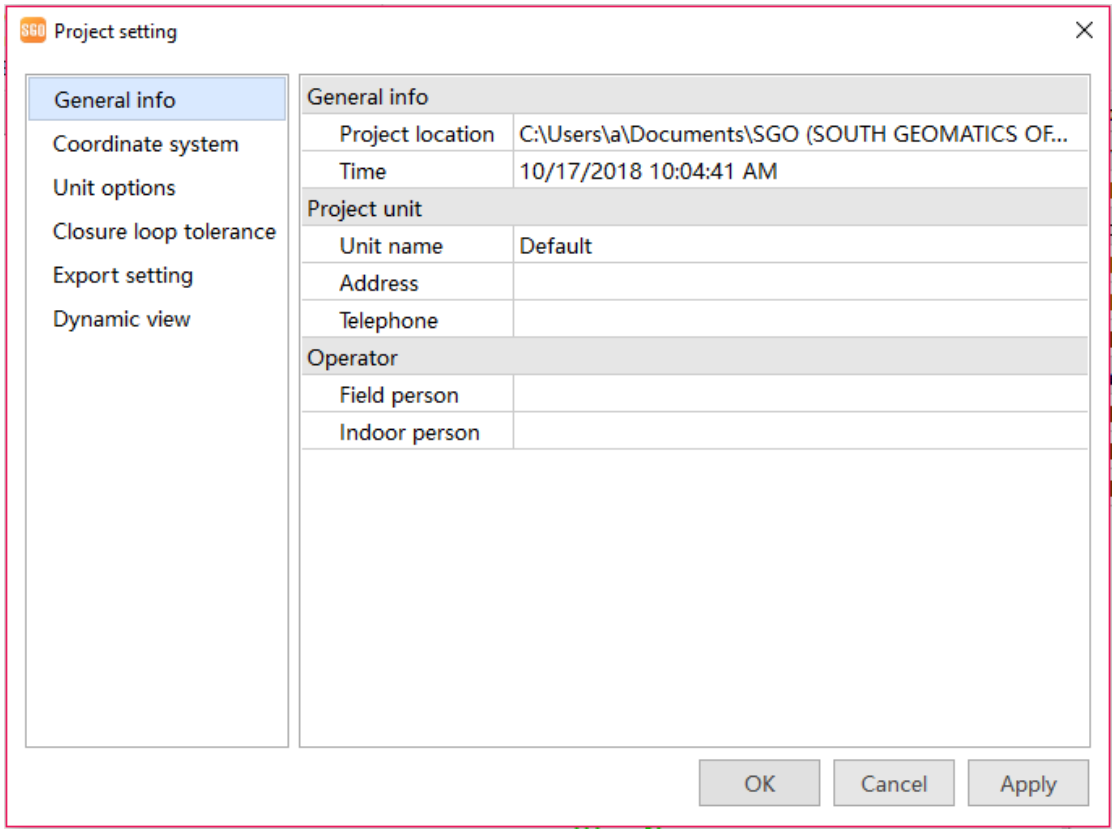
4.1 New project

This command is used to create a new project for data processing at the beginning of starting job. To create a new project, click on this command then the new project window will be pop-up, then requires you to choose the unit, input a project name and set up the project saving path.

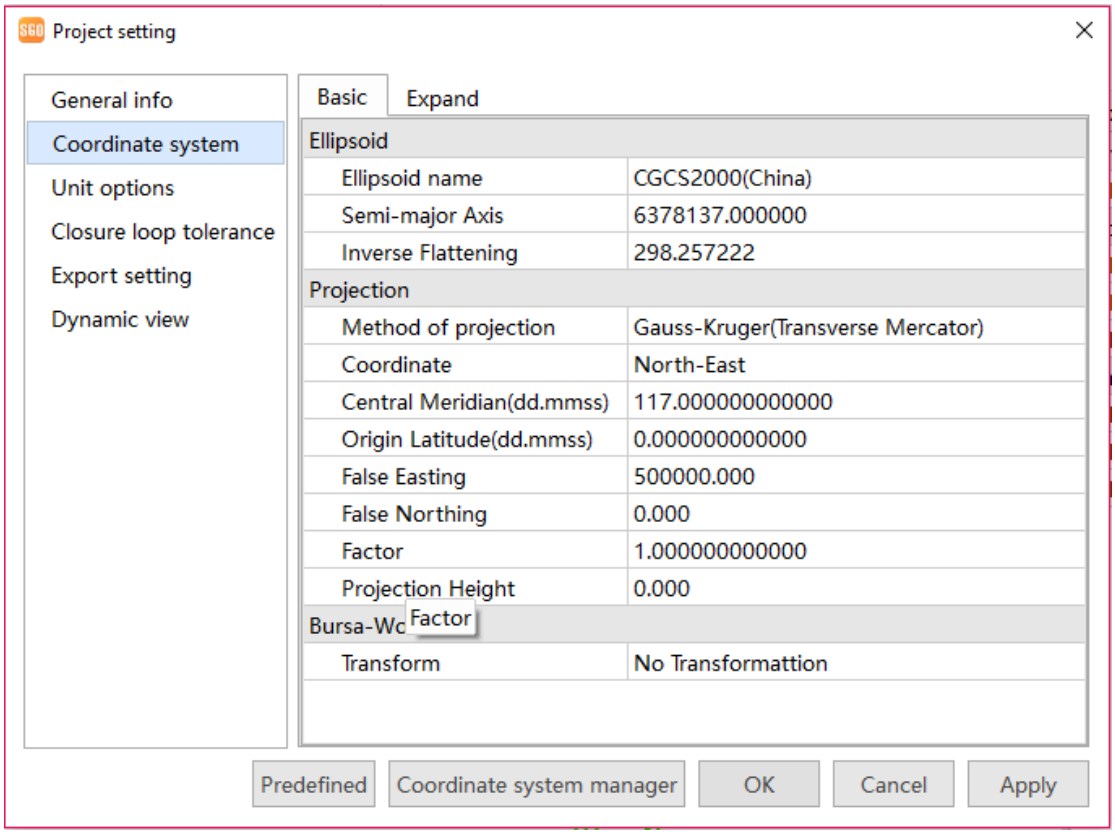


Click "Browse" button to control where the project is saved by browsing to the desired folder where the job is to be created, then select OK button to continue.

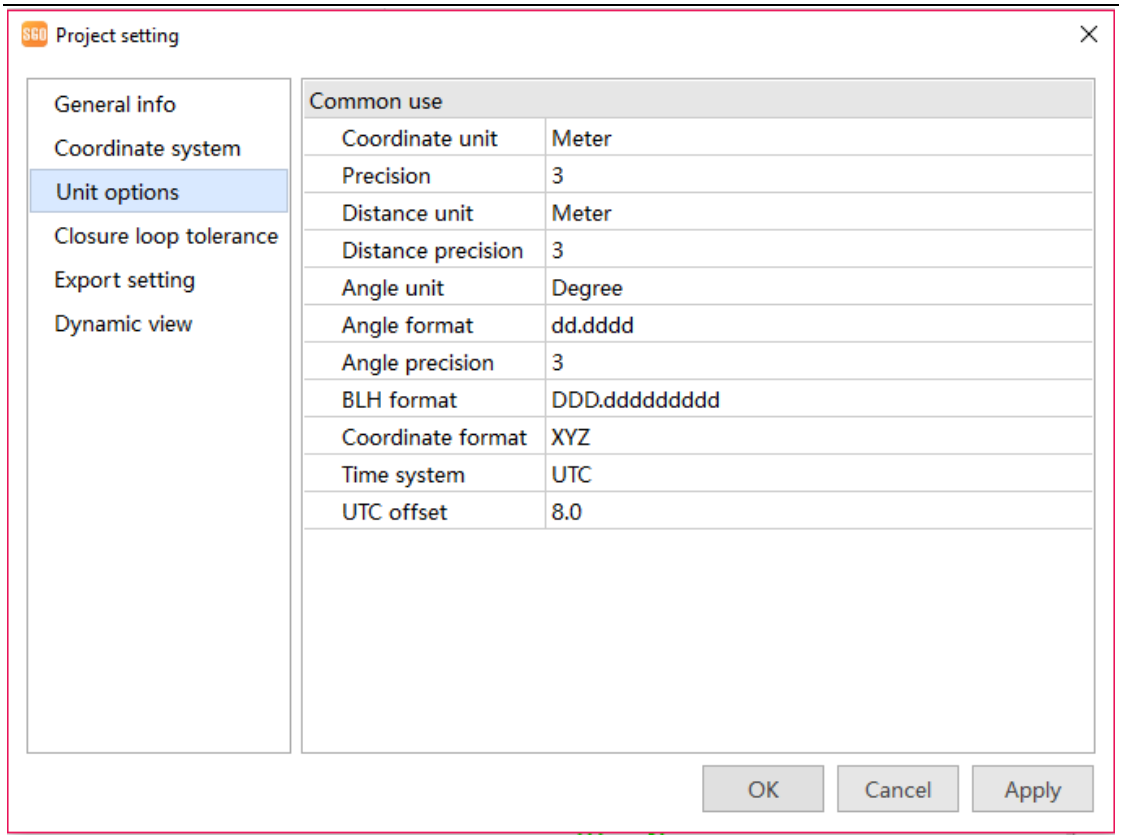
Then set up the parameters for the project in such a following window, input general information including company information and operators.



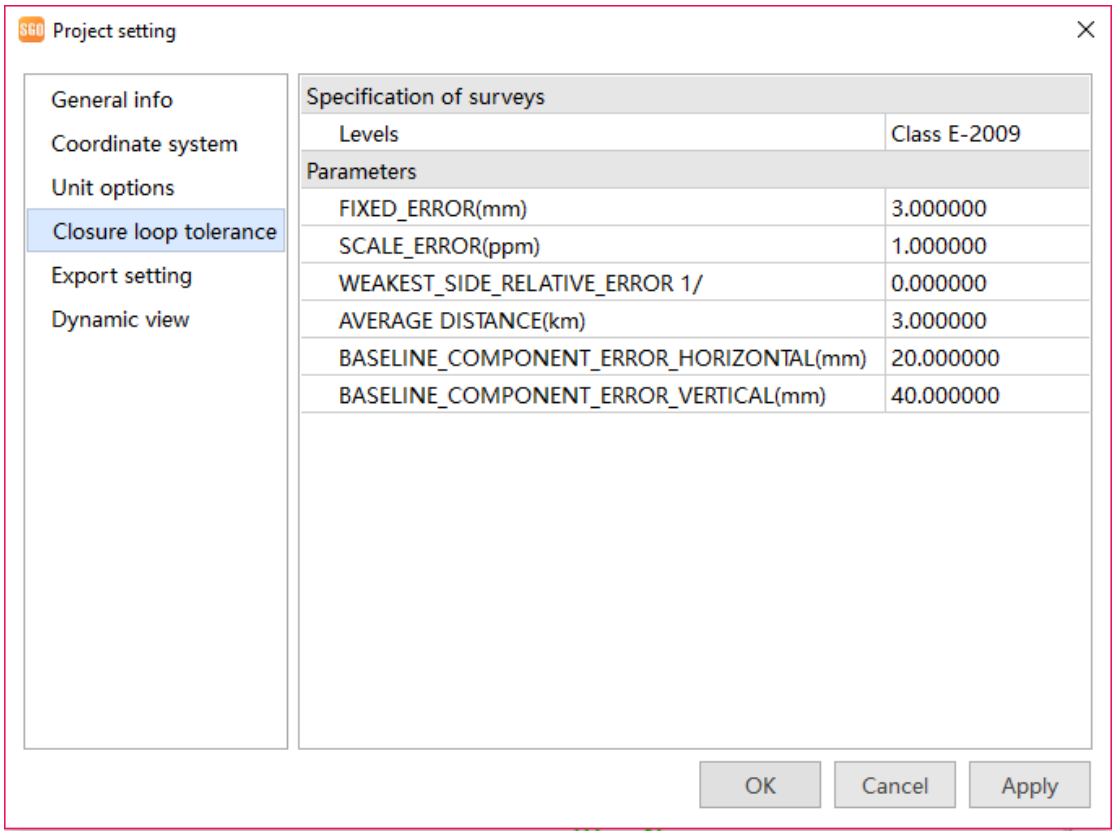
Go to “Coordinate system” tab to set up your local coordinate system and check if the parameters are correct. Click on the Predefined button to choose the country or region from predefined list, then choose the correct coordinate system at the next field at the right side of coordinate system. If your local coordinate system is not listed under predefined list, you are able to click on “Coordinate system manager” button to self-define your local coordinate system at coordinate system manager (please take a reference to Coordinate system manager for more detail information about how to create a coordinate system)



The “Unit options” tab allows you to configure the unit and the precision for general items such as coordinate, distance and angle, as well as the format of coordinate, you can set the coordinate to display as spatial coordinate, geodetic coordinate or plane coordinate.

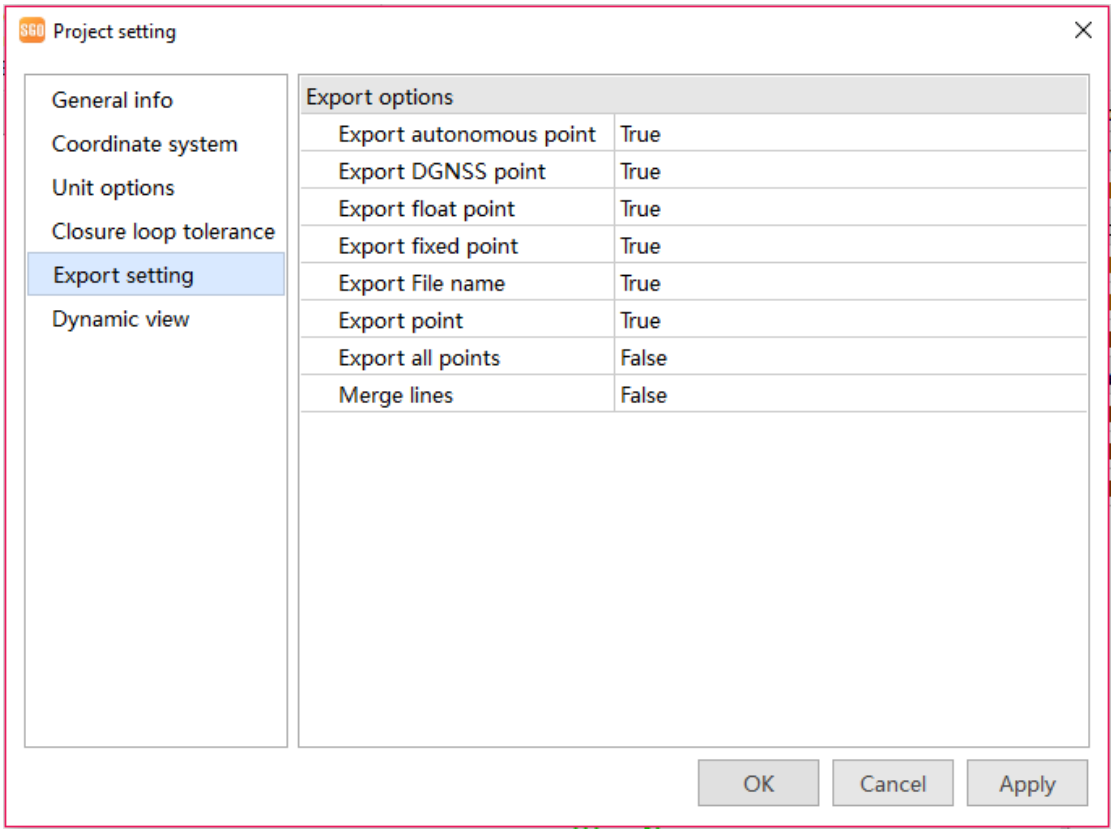


Move to "Closure loop tolerance" tab, this is allowed to control the quality of processing result, choose the predefined standard from the list of specification name, or choose user defined option to re-configure the parameters according to your requirement.

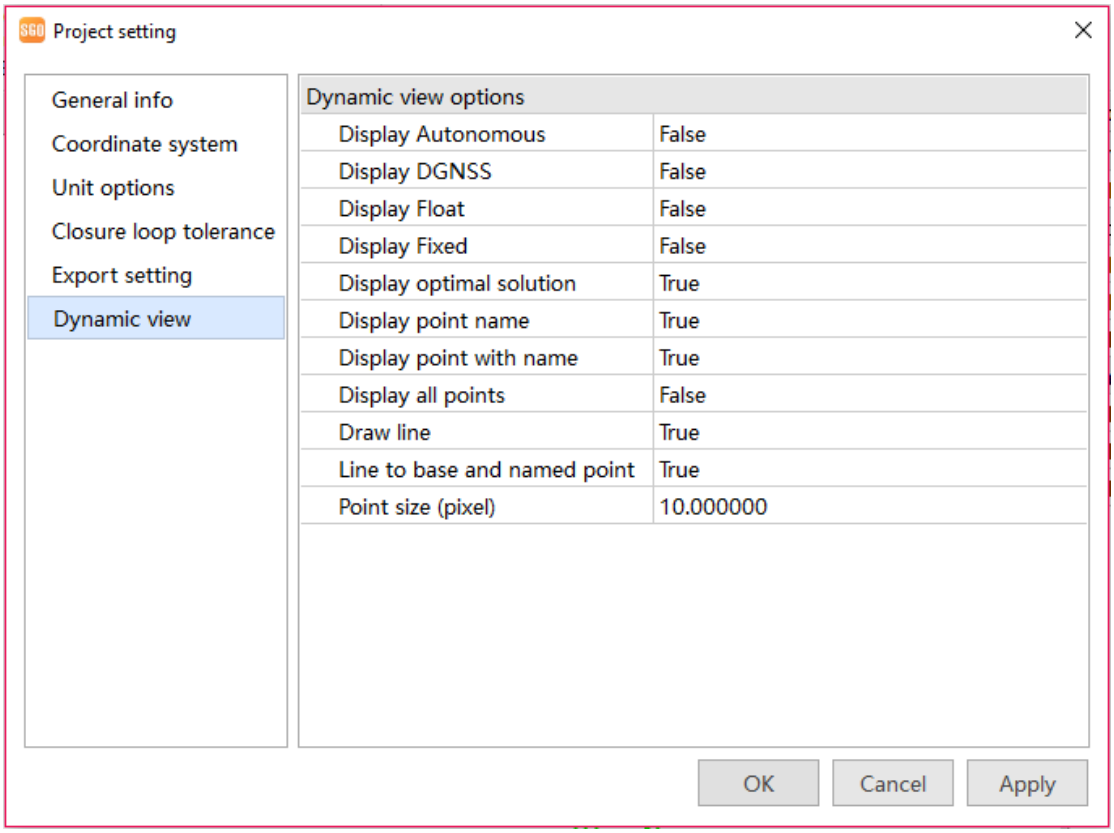


The "Export setting" tab is used to configure what kind of solution result and what kind of fields

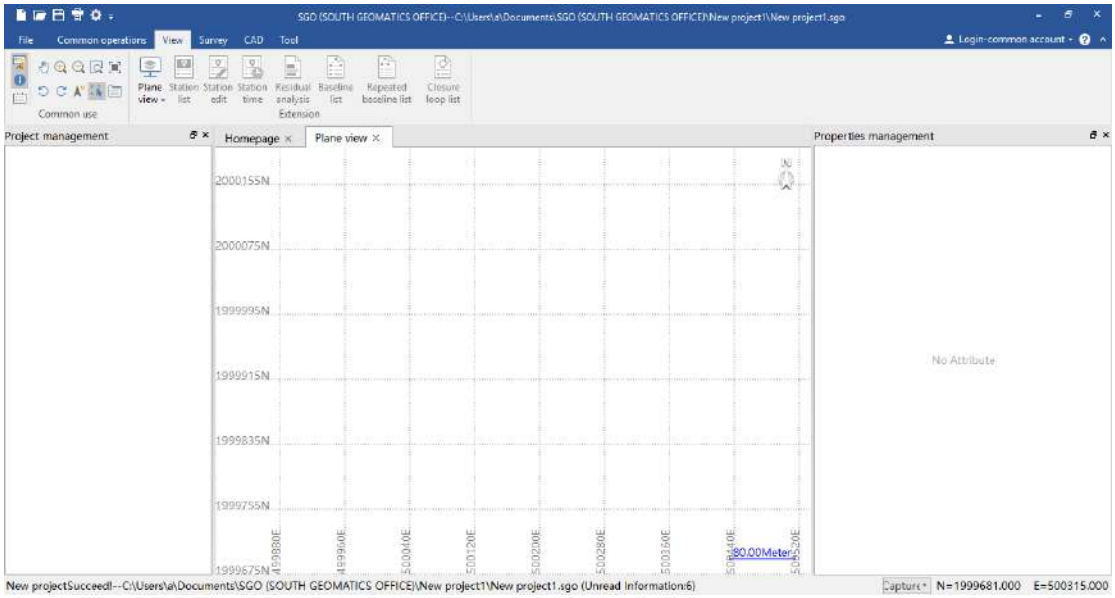
of points to output in reports.



At the last tab of "Dynamic View", this is allowed to enable or disable what kind of dynamic data solution to view, or if enable to view the baselines between points, and whether to display the PPK base station.

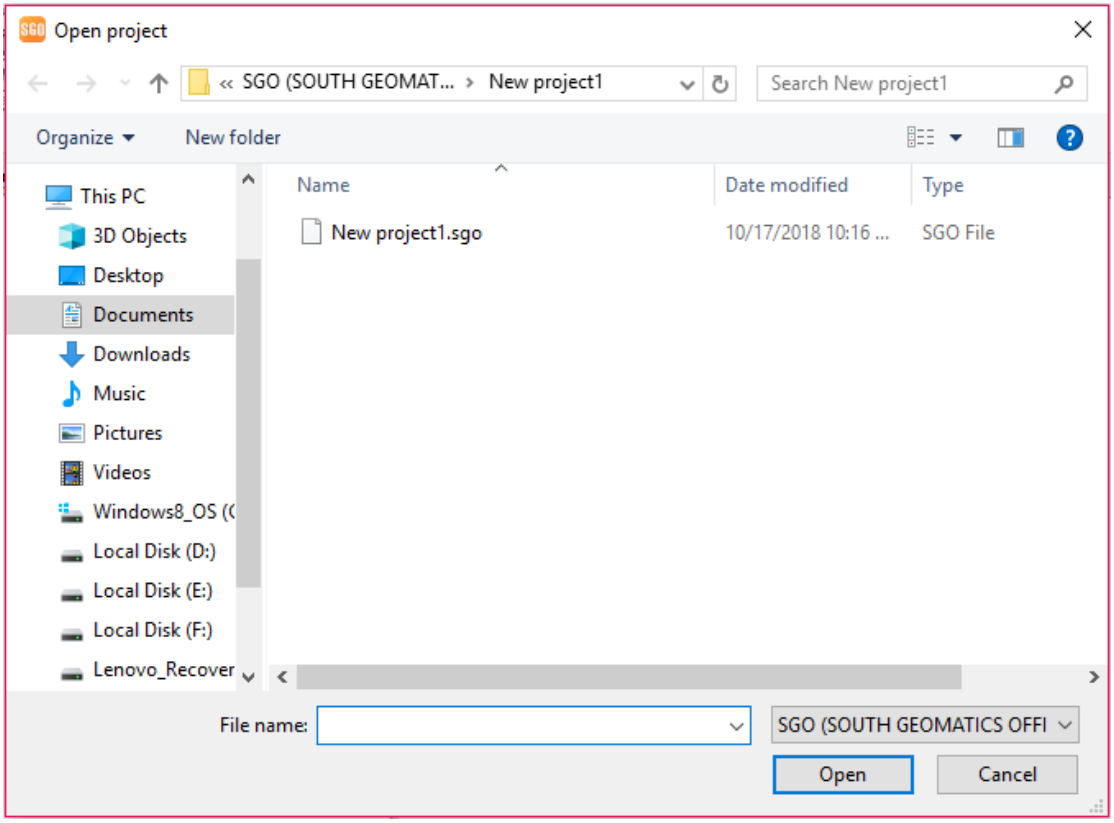


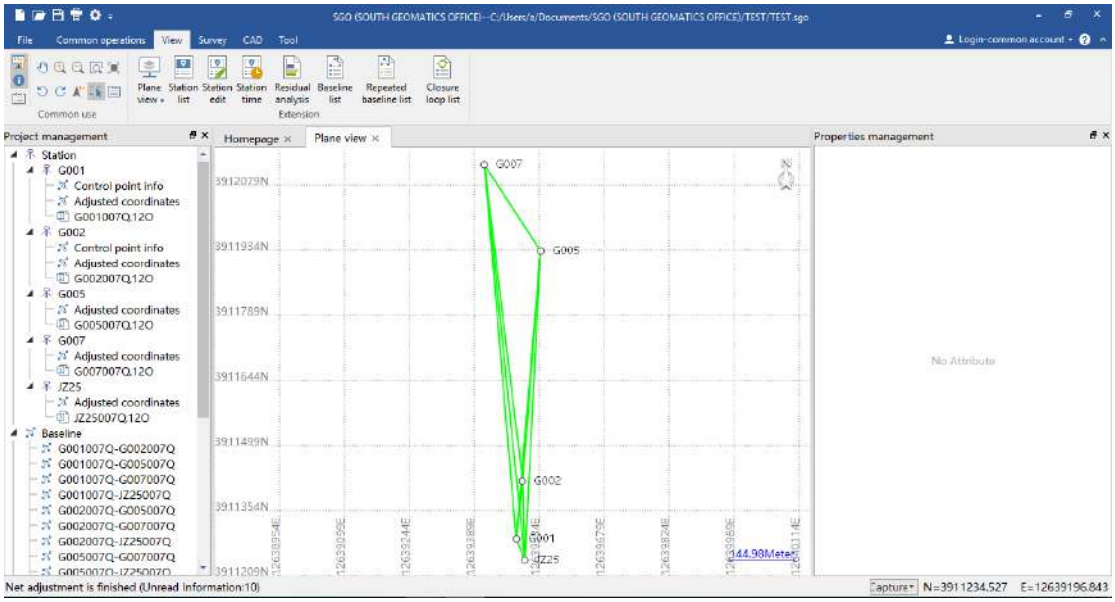
After all the parameters for the project are configured, click OK button to finish creating a new project, then you will enter the main interface of SGO. As shown in following figure.



4.2 Open project

This command is used to open an existing project which is saved for previous job.
Click on this command to browse to the folder where the project file is located, then choose the project file with the .sgo file extension and then click “Open” button to load the data.
(If a project is saved, the .sgo file extension will automatically be appended to the file name)

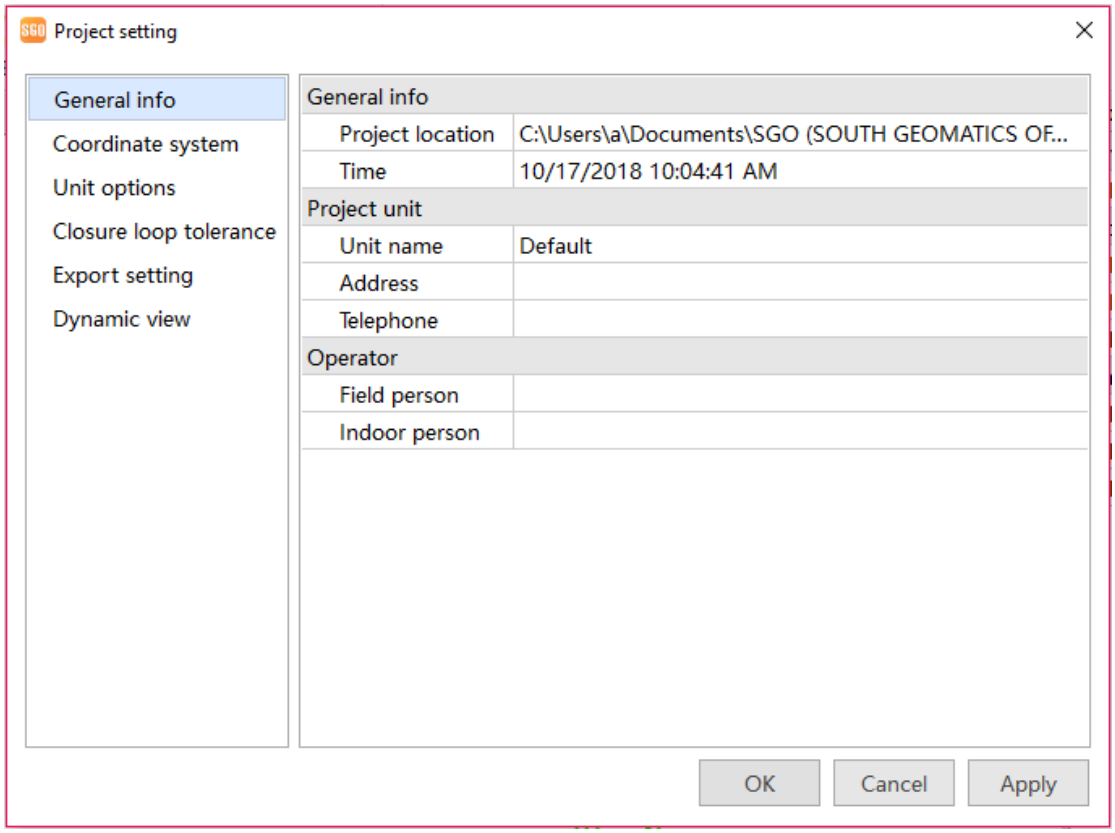




4.3 Project setting

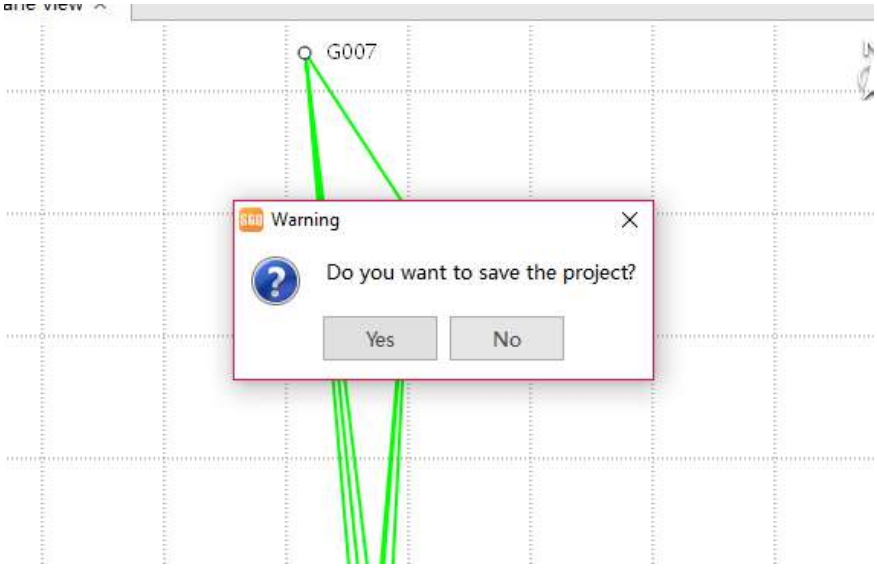
This “Project setting” allows you to set up the parameters or re-configure parameters for your current project.

At the beginning of starting your project, SGO asks you to set up parameters for project first when you create a new project. After that you can check and modify the parameters from project setup.



4.4 Close

To close the current project, tap on Yes to confirm, No to cancel it.

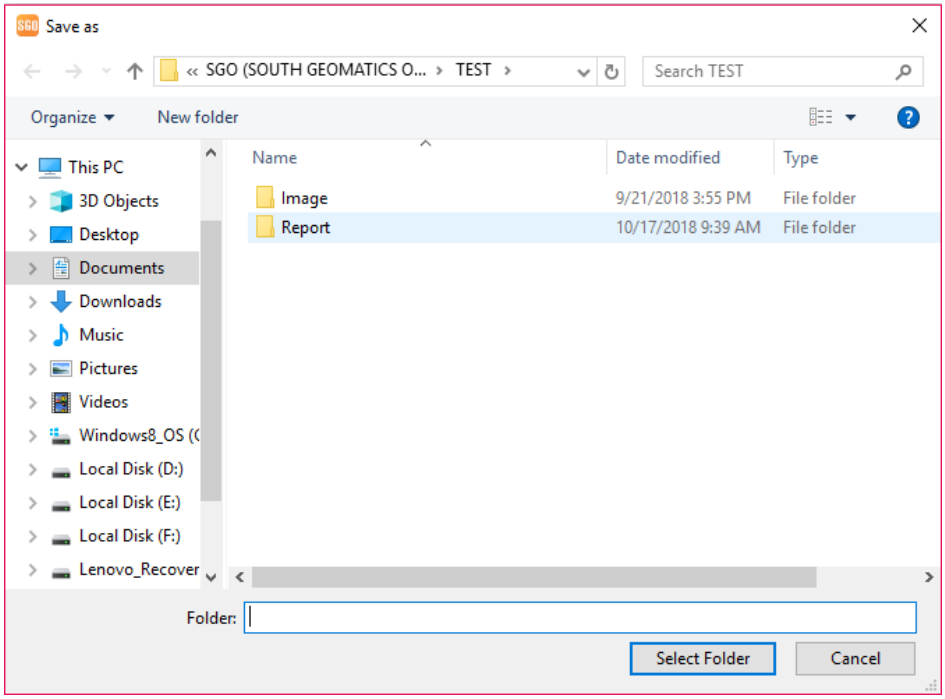


4.5 Save

Save the current project to default path.

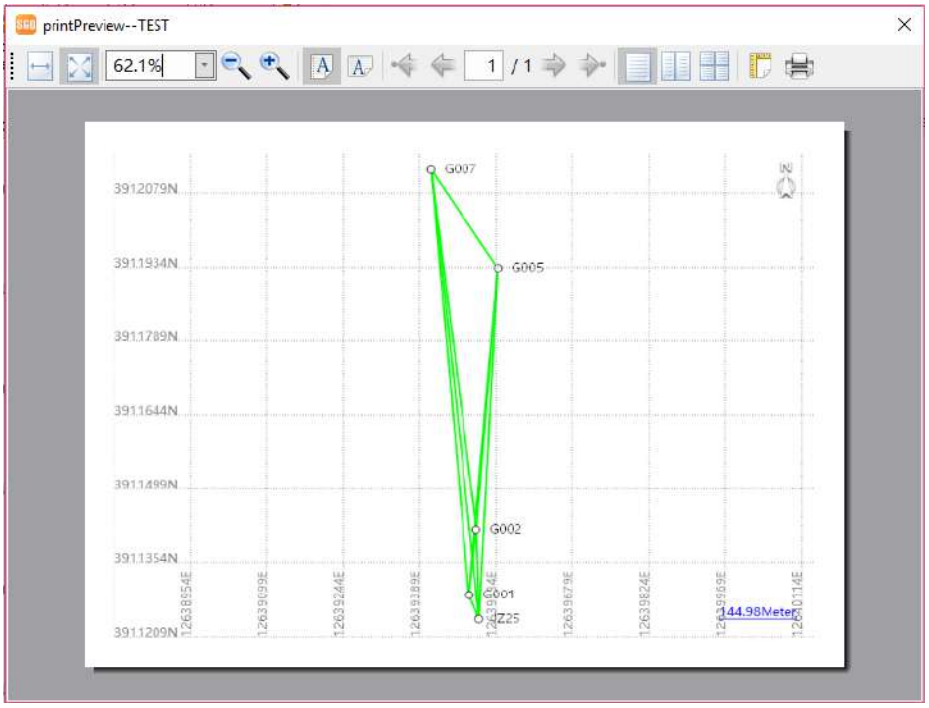
4.6 Save as

Save the current project to user defined Path.



4.7 Print

To print the plane view picture.

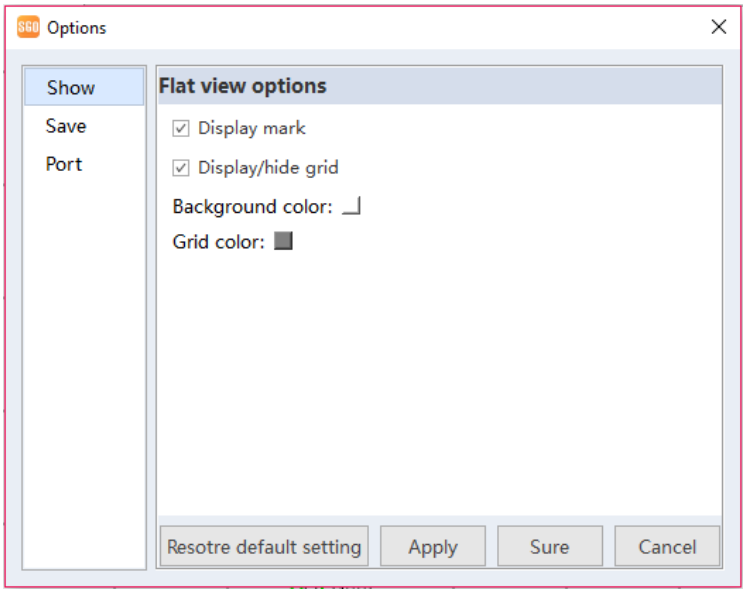


4.8 Options

This button is for changing the project default settings.

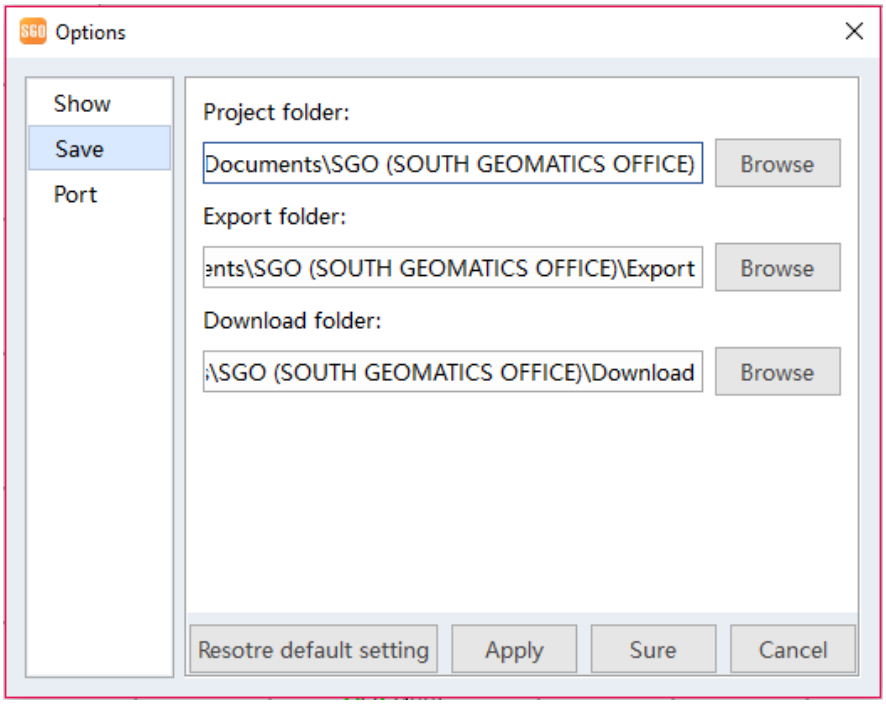
4.8.1 Show

Here you can change the software interface color and if shows the display mark and grid.



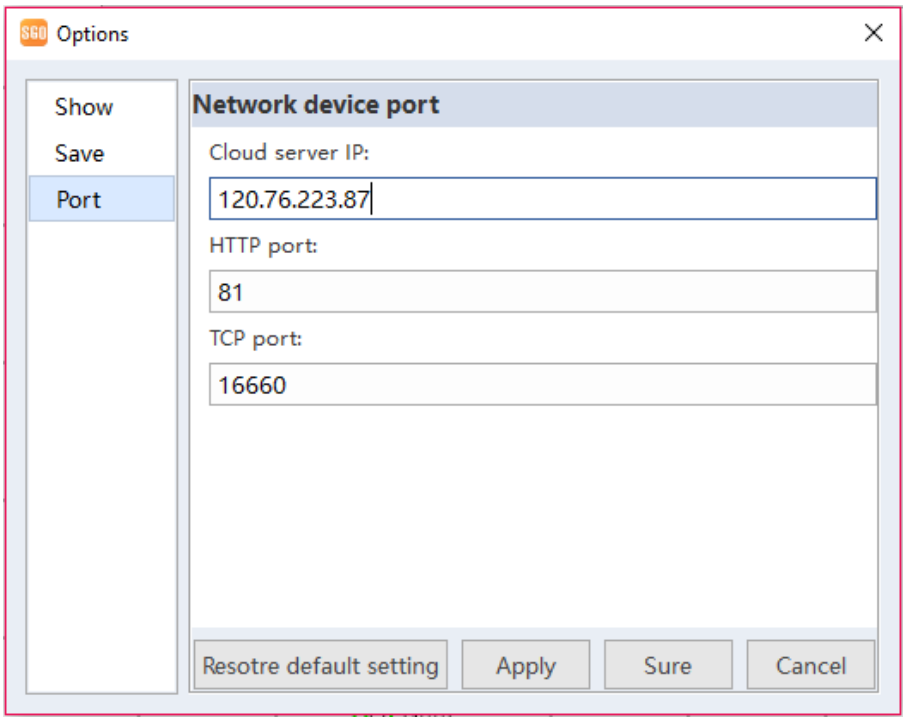
4.8.2 Save

Here you can edit the project default save path. You can tap on the Restore default setting to restore the software default save path, it is under Documents folder in you PC.



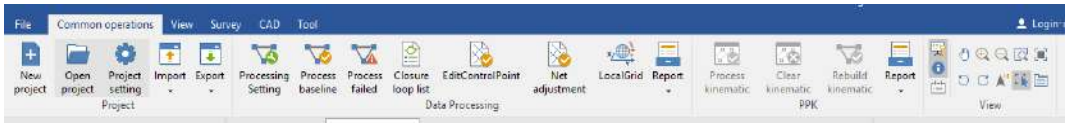
4.8.3 Port

This port is for the Cloud service settings.



Chapter 5 Common operations

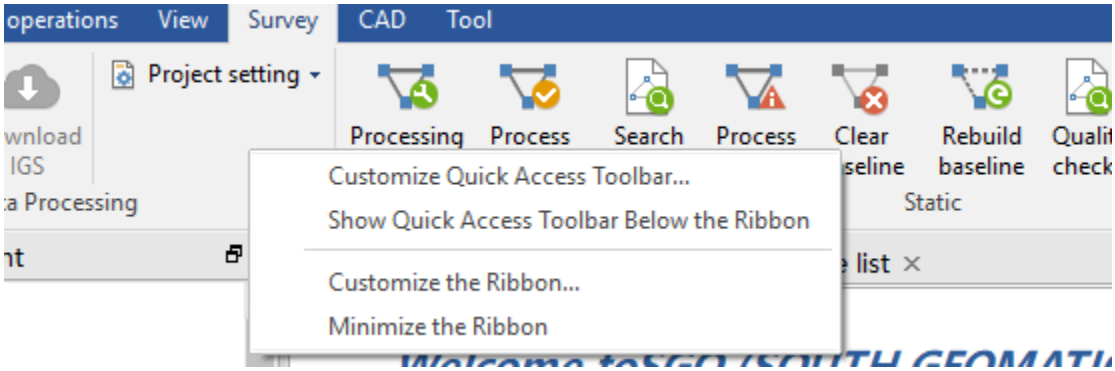
Common operations provide the common used button for Project, Data processing, PPK and view.



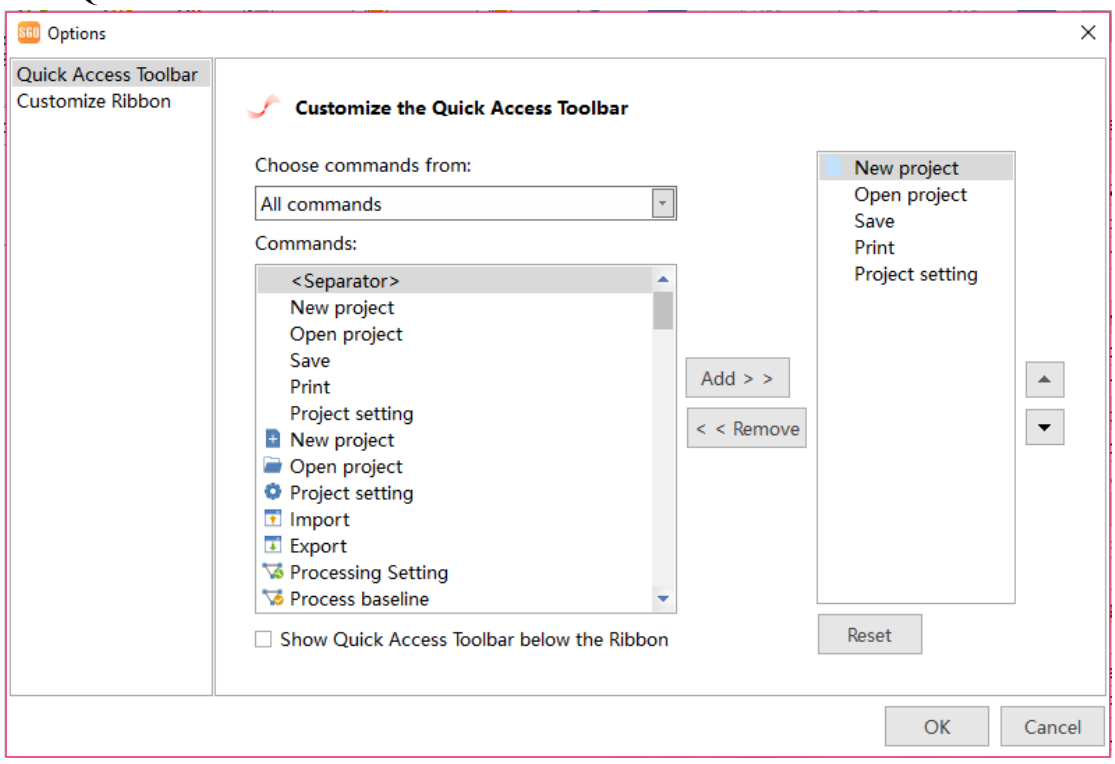
All this function will be shown in other related chapter.

5.1 Toolbar edit

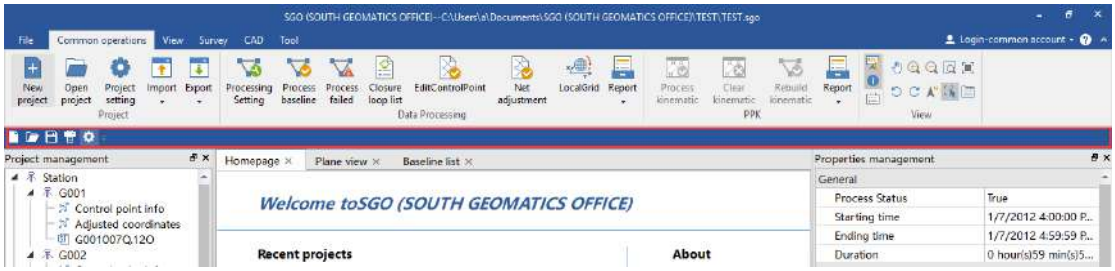
Right click the toolbar, it will appear a window.



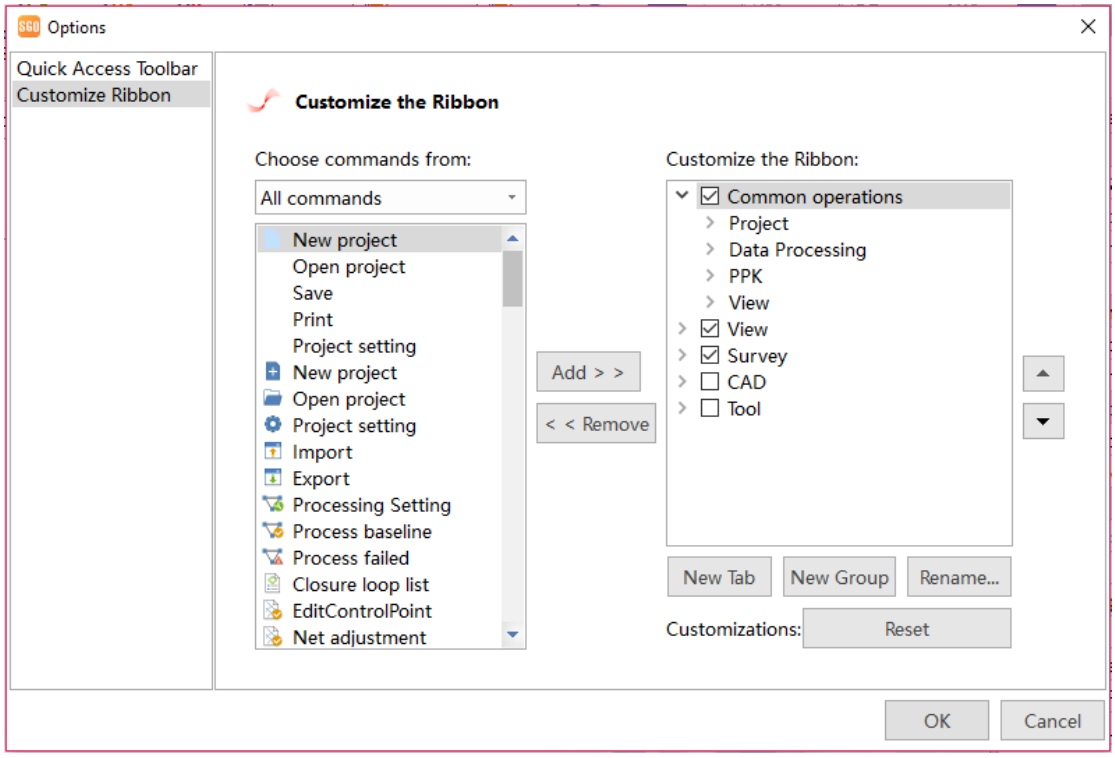
Tap on Customize Quick Access Toolbar.., in this interface you can add or remove the button inside Quick Access Toolbar.



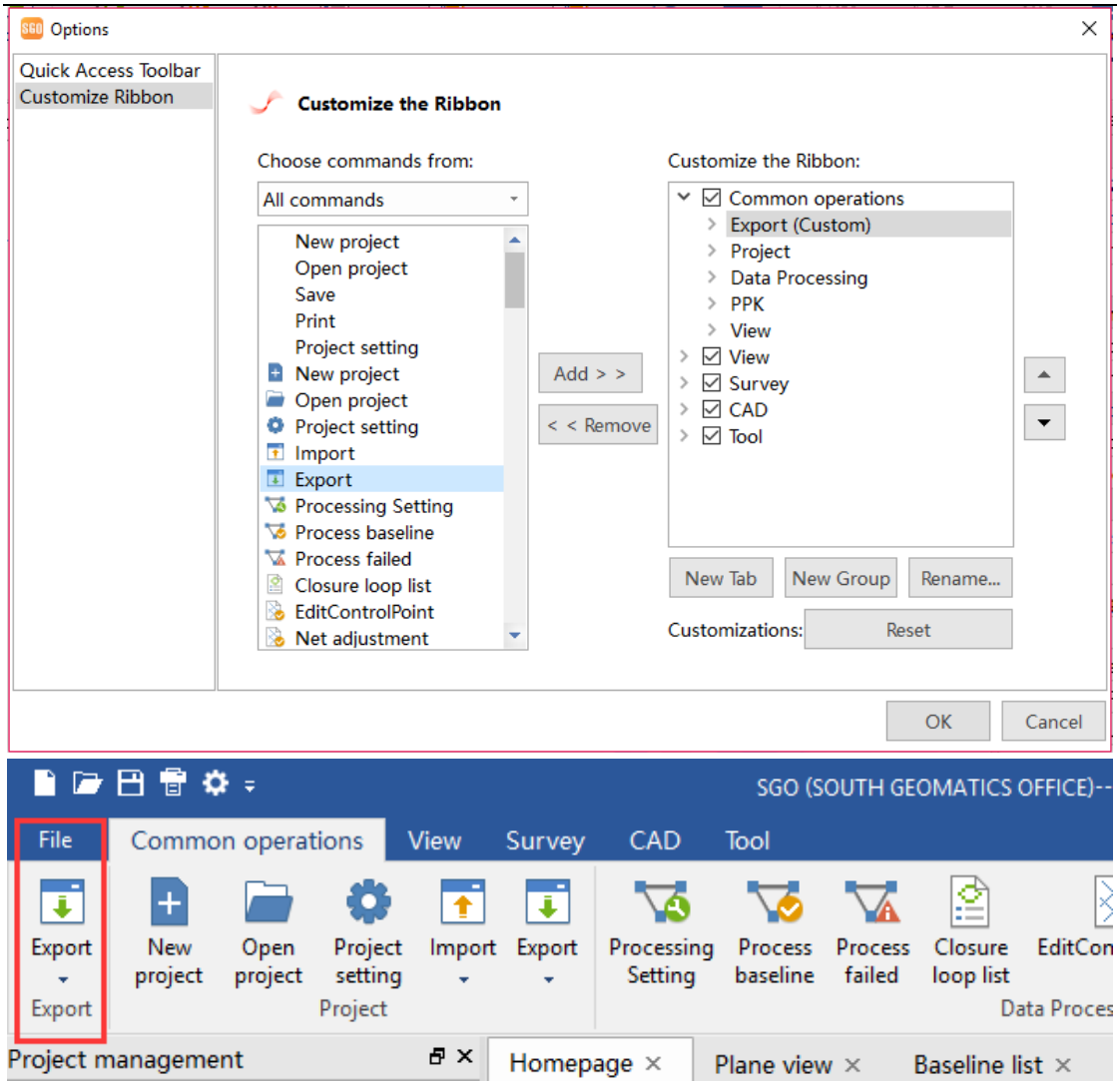
Click Show Quick Access Toolbar Below the Ribbon button, the new toolbar will appear, if you want to close it, just click this option button again.



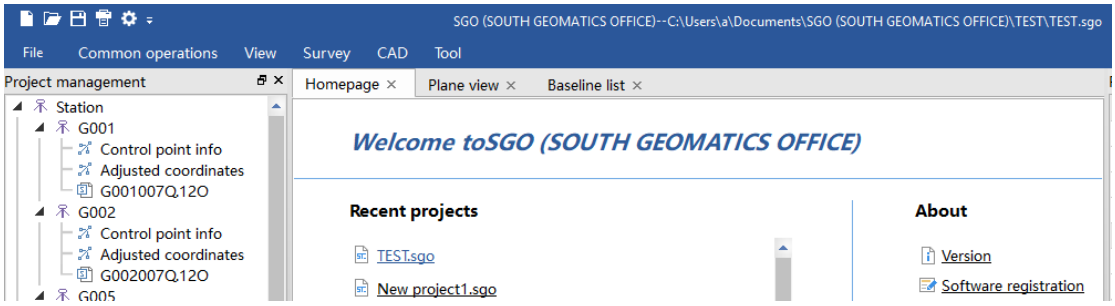
Click Customize the Ribbon…option, in this window, you can edit the options in menu bar and toolbar.



For example, I create a new group under Common operations and named Export, then I add the Export function into this group, Click OK to confirm. Then I can see a new export button under Common operations.

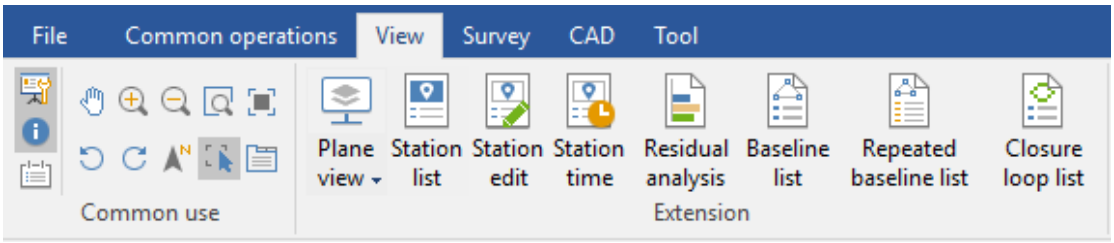


Tap on the Minimize the Ribbon option, the whole toolbar will be hidden.



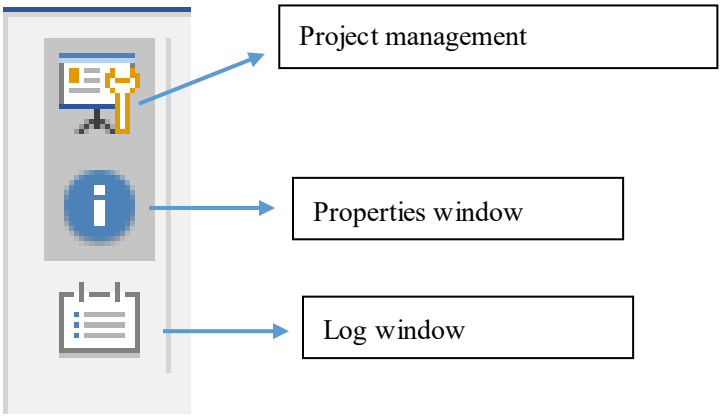
Chapter 6 View

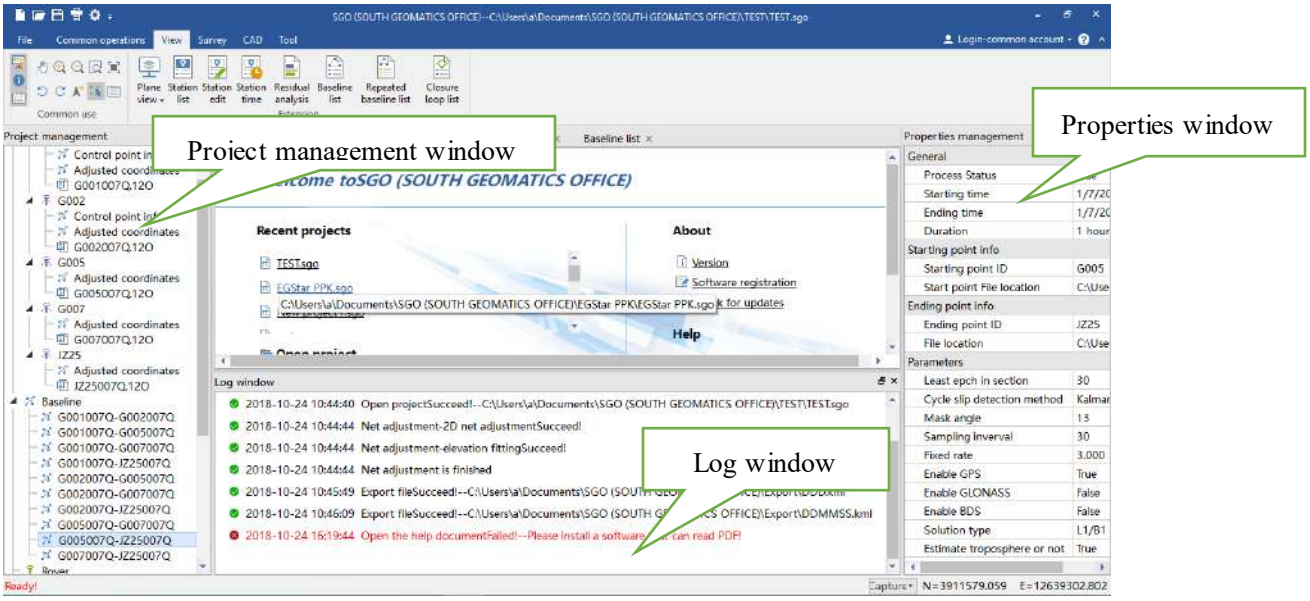
This chapter provides more information on using commands under View menu, in this chapter we emphasis on some important commands including toolbar, station list, station edit, station occupation, residual analysis, baselines list, repeated baselines list, closure loops list.



6.1 Window settings

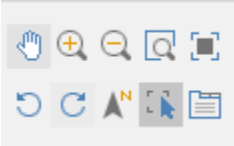
The left three buttons control the project management window, properties window and log window display or not.





6.2 Plane view tools

This tools is for adjusting the plane view window display method.

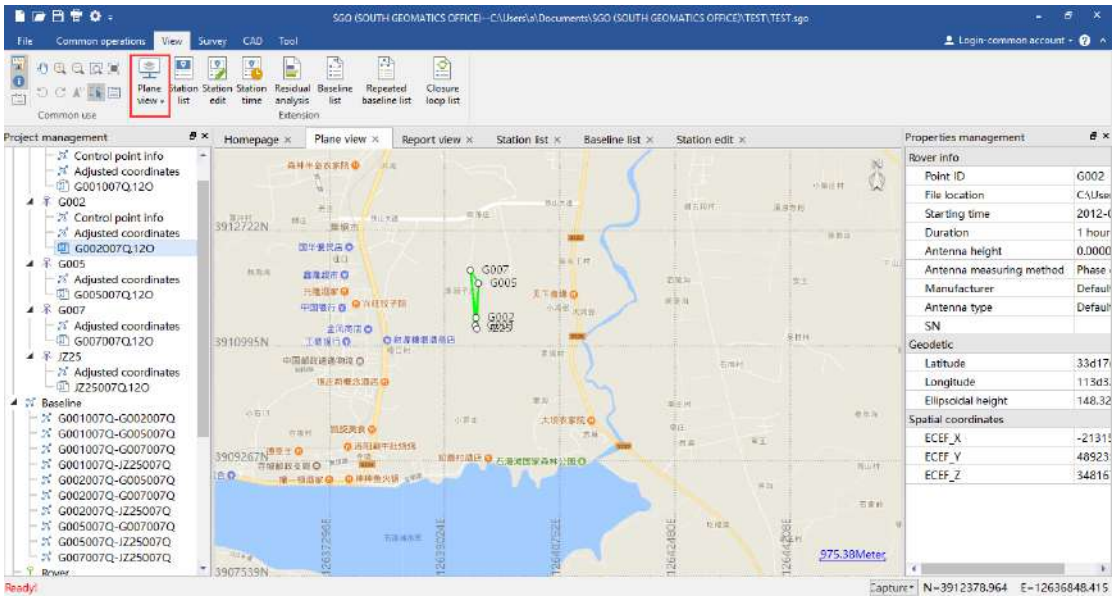


The detail instruction of each shortcut is described in following table:

Items	Function	Description
	Move	Move the map
	Zoom in	Zoom in the view
	Zoom out	Zoom out the view
	Partial enlarge	Zoom in the specific area according to the selection
	Zoom all	Zoom all the view
	Anticlockwise rotate	Rotate the map anticlockwise
	Clockwise rotate	Rotate the map clockwise
	Reset	Restore the default map direction
	Properties	Switch the move function to selection function
	Homepage	Open the homepage window

6.3 Plane view

Here you can enable or disable the online map display or not.



6.4 Station list

This means the station list, after finishing data processing, click on this option, all the stations will be listed in this window accompany with processing quality and coordinates.

Click on each tab to sort stations or values. If you want to change the coordinates display format, please go to "Common operations—Project setting—unit options—Coordinate format", select the format to display as you want.

Homepage × Plane view × Station list ×

	Station name	Coordinate quality	North(m)	East(m)	h(m)
1	0552	Control Point Control P...	10000.000	10000.000	12.000
2	a2-05522528B-05452...	Fixed	9998.846	10004.574	11.778
3	a4-05522528B-05452...	Fixed	10001.939	9992.967	11.763
4	a6-05522528B-05452...	Fixed	10006.096	9977.382	11.794
5	a8-05522528B-05452...	Fixed	10012.832	9952.698	11.760
6	a10-05522528B-0545...	Fixed	10049.397	9964.640	11.548
7	a12-05522528B-0545...	Fixed	10047.286	9972.084	11.370
8	a14-05522528B-0545...	Fixed	10045.712	9977.965	11.708
9	a16-05522528B-0545...	Fixed	10044.385	9982.954	11.371
10	a18-05522528B-0545...	Fixed	10043.245	9987.280	11.377
11	a20-05522528B-0545...	Fixed	10042.294	9990.913	11.380
12	a22-05522528B-0545...	Fixed	10041.374	9994.290	11.381
13	a24-05522528B-0545...	Fixed	10040.898	9996.161	11.388
14	a26-05522528B-0545...	Fixed	10039.227	10002.561	11.370
15	a28-05522528B-0545...	Fixed	10038.633	10004.977	11.533
16	a30-05522528B-0545...	Fixed	10034.737	10007.060	11.374

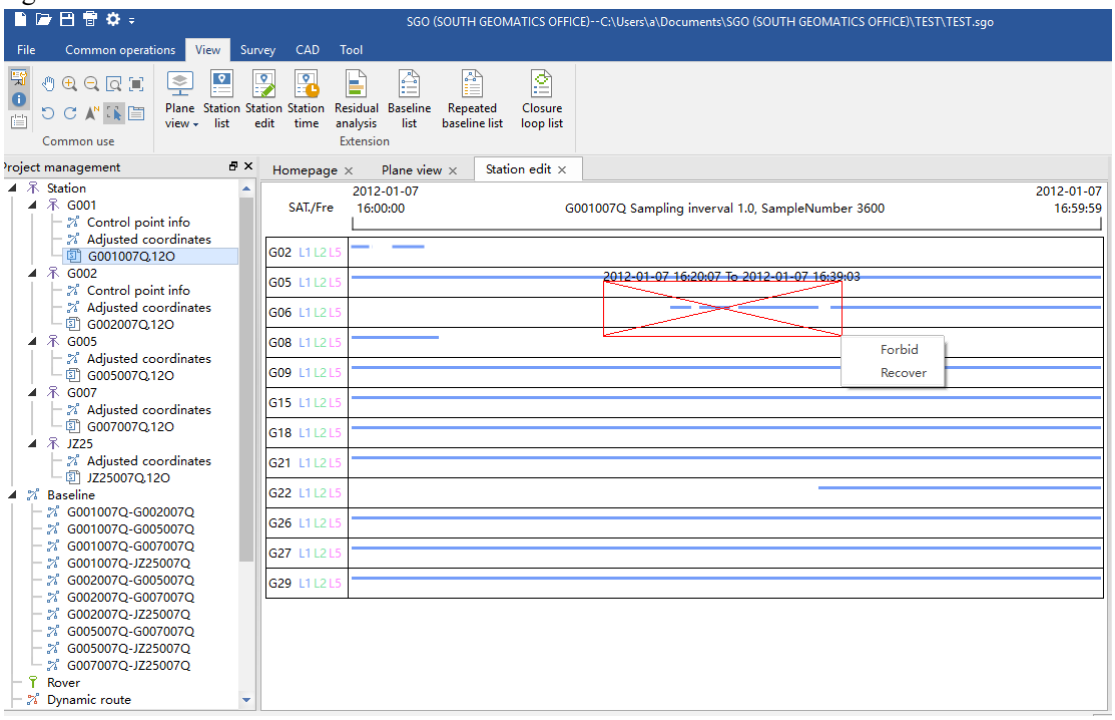
Homepage × Plane view × Report view × Station list × Baseline list × Station edit ×

	Station name	Coordinate quality	Lat	Lon	H(m)
1	G001	Adjusted	33d17m47.96819sN	113d32m32.64785sE	148.308
2	G002	Adjusted	33d17m51.46448sN	113d32m33.11986sE	148.320
3	G005	Adjusted	33d18m5.36698sN	113d32m34.40833sE	147.991
4	G007	Adjusted	33d18m10.58457sN	113d32m30.35006sE	147.914
5	JZ25	Adjusted	33d17m46.68717sN	113d32m33.25265sE	148.978

6.5 Station edit

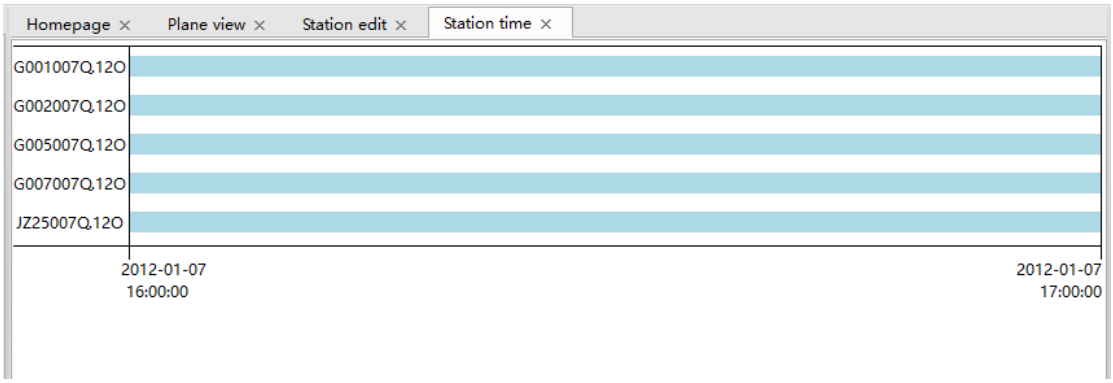
This is the station session that allows you to check quality of satellites' signals. Before processing, you can check the satellites' signals first and edit to erase some bad signals to make sure the quality of data processing.

Draw a frame on bad signal section and choose forbid option in the pop-up dialog to erase this part signal.



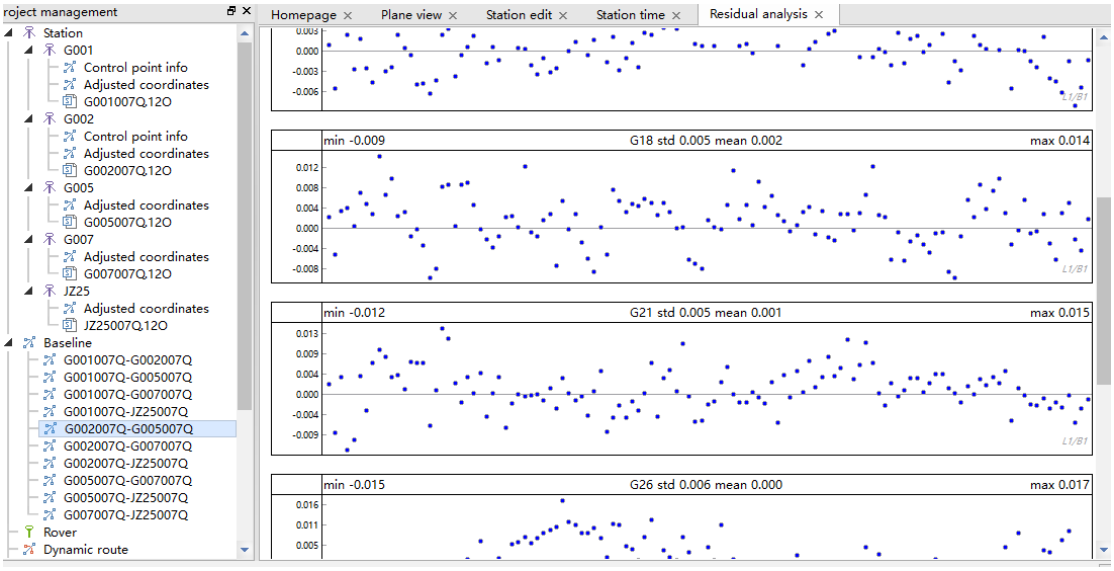
6.6 Station time

Click on this command to check the common observation time of stations.



6.7 Residual analysis

The Residual analysis command allows you to check the residual error of each baseline, there you will get the information of residual error of each satellite including the maximum and minimum error, and the value of standard error and the average error.



6.8 Baselines list

This baselines list is used to display the information of all baselines after finishing baselines processing.

Click on this command, you will then get into the baselines list window and obtain all corresponding information including component for each baseline, fixed ratio, RMS and baseline length.

Homepage × Plane view × Station edit × Station time × Residual analysis × Baseline list ×

	Baseline name	Baseline status	Fixed rate	Standard error of unit weight(mm)	RMS(m)	HRMS(m)	V
1	G001007Q-G002007Q	Fixed	99.9	1.887	0.006	0.003	
2	G001007Q-G005007Q	Fixed	71.535	1.854	0.006	0.003	
3	G001007Q-G007007Q	Fixed	99.9	1.811	0.006	0.003	
4	G001007Q-JZ25007Q	Fixed	65.745	2.093	0.008	0.004	
5	G002007Q-G005007Q	Fixed	99.9	1.869	0.006	0.003	
6	G002007Q-G007007Q	Fixed	99.9	1.656	0.006	0.003	
7	G002007Q-JZ25007Q	Fixed	99.9	2.064	0.008	0.004	
8	G005007Q-G007007Q	Fixed	99.9	1.76	0.006	0.003	
9	G005007Q-JZ25007Q	Fixed	99.9	2.012	0.007	0.003	
10	G007007Q-JZ25007Q	Fixed	99.9	1.848	0.007	0.004	

6.9 Closure loops list

After baseline processing, click on closure loops list option to view all closure loops. In loops page, all the closure loops are listed accompany with their corresponding information, such as loop type, the quality of processing result, closure error of each variable (XYZ and side length), length and relative error.

Tap on the " ▷ " symbol before the closure loop, you will understand this closure loop is composed by which 3 baselines including the result of processing.

Type: this field is to show you what type this closure loop belongs to, generally, the synchronous loop is the most common loop.

Quality: this field will display the processing result for this closure loop and the baselines which form this loop. If the baselines turn out to be fixed, the result of quality of closure loop is shown as pass, that means the closure loop is qualified.

Closure error (DeltaX/ DeltaY/ DeltaZ/ DeltaS): this is the difference value between the observations and due value.

Length: it is the perimeter of closure loop.

Relative error: this error is the ratio between absolute error caused by measurement and the true value of measurement (agreed), in general, the relative error can reflect more the credibility of measurement.

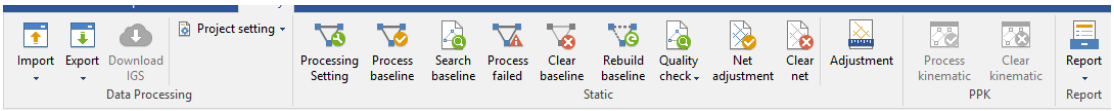
× Station edit × Station time × Residual analysis × Baseline list × Repeated baseline list × Closure loop list ×

ID	Type	Quality	X closure error(mm)	Y closure error(mm)	Z closure erro
◢ G005007Q-G007007Q-JZ25007Q	Synchronous loop	Qualified	0.052	-0.126	-0.008
G007007Q-JZ25007Q		Fixed	-230.654	341.393	-614.786
G005007Q-JZ25007Q		Fixed	-99.122	302.357	-480.476
G005007Q-G007007Q		Fixed	131.532	-39.036	134.309
▷ G002007Q-G007007Q-JZ25007Q	Synchronous loop	Qualified	-0.01	0.122	-0.042
▷ G002007Q-G005007Q-JZ25007Q	Synchronous loop	Qualified	0.009	-0.011	-0.013
▷ G002007Q-G005007Q-G007007Q	Synchronous loop	Qualified	0.033	0.007	-0.037
▷ G001007Q-G007007Q-JZ25007Q	Synchronous loop	Qualified	0.038	-0.112	-0.077
▷ G001007Q-G005007Q-JZ25007Q	Synchronous loop	Qualified	0.186	-0.136	-0.16
▷ G001007Q-G005007Q-G007007Q	Synchronous loop	Qualified	0.199	-0.15	-0.091
▷ G001007Q-G002007Q-JZ25007Q	Synchronous loop	Qualified	0.058	-0.019	-0.097
▷ G001007Q-G002007Q-G007007Q	Synchronous loop	Qualified	0.03	-0.029	0.022
▷ G001007Q-G002007Q-G005007Q	Synchronous loop	Qualified	-0.137	0.128	0.077

Chapter 7 Survey

In this chapter we emphasis on some important commands including baseline process settings, baseline processing, kinematic processing, net adjustment and some hiding commands..

This chapter provides more information on using commands under Report menu, in this chapter you will well know how to make a report for your data processing result.

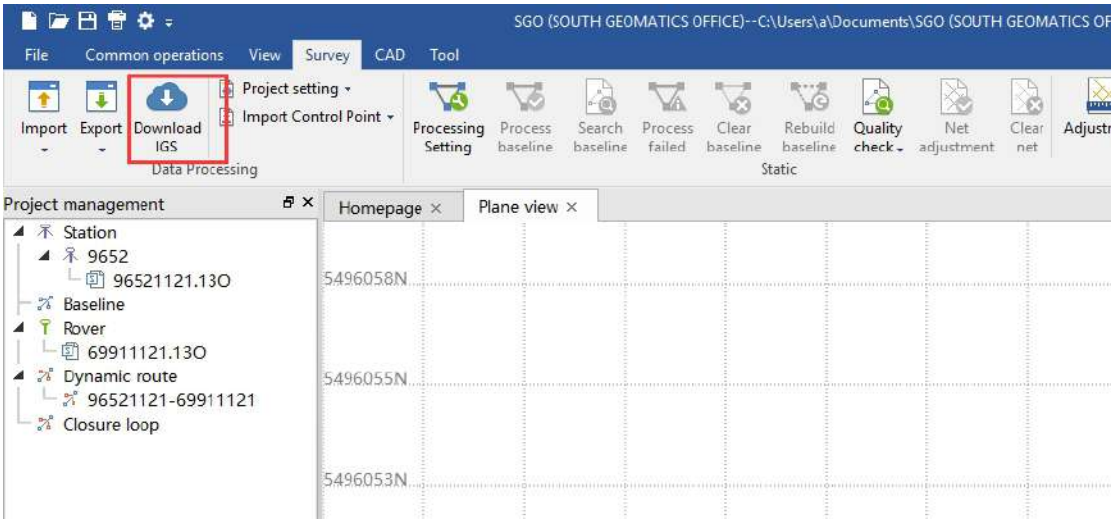


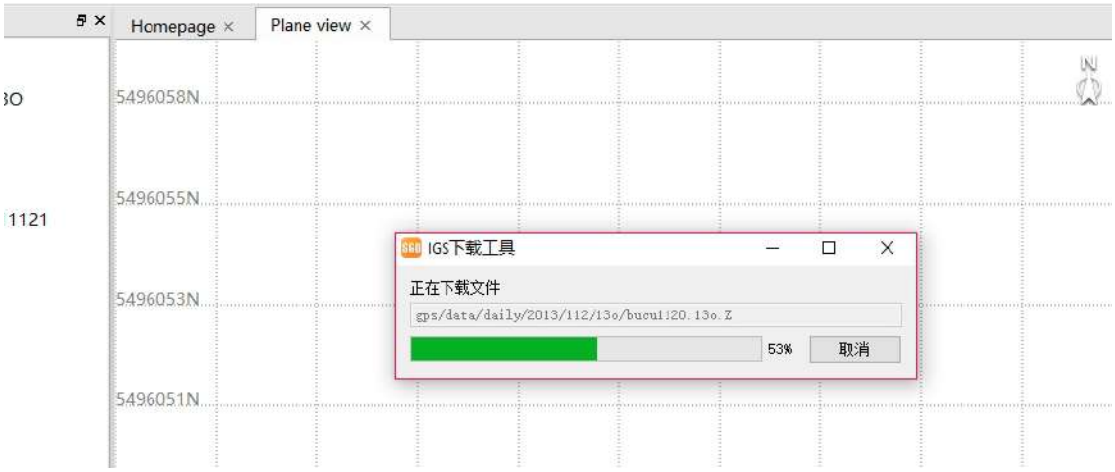
7.1 Import and export

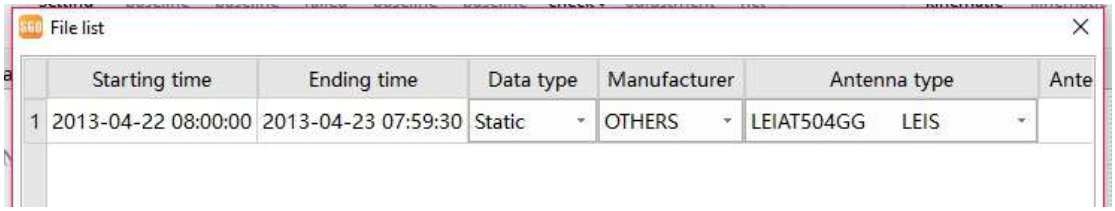
This two buttons are used to load observation raw data for your current project such as Static or Kinematic. Static raw data loading and kinematic data loading are similar to each other, but there is still a little bit difference between each other. Detailed information please refer to Chapter2.

7.2 Download IGS

The Download IGS function only can be used with Kinematic data, after the users import the kinematic data collected, the Download IGS button will be activated, click this button, the SGO will download the nearest IGS station static data for users to process the kinematic data together.





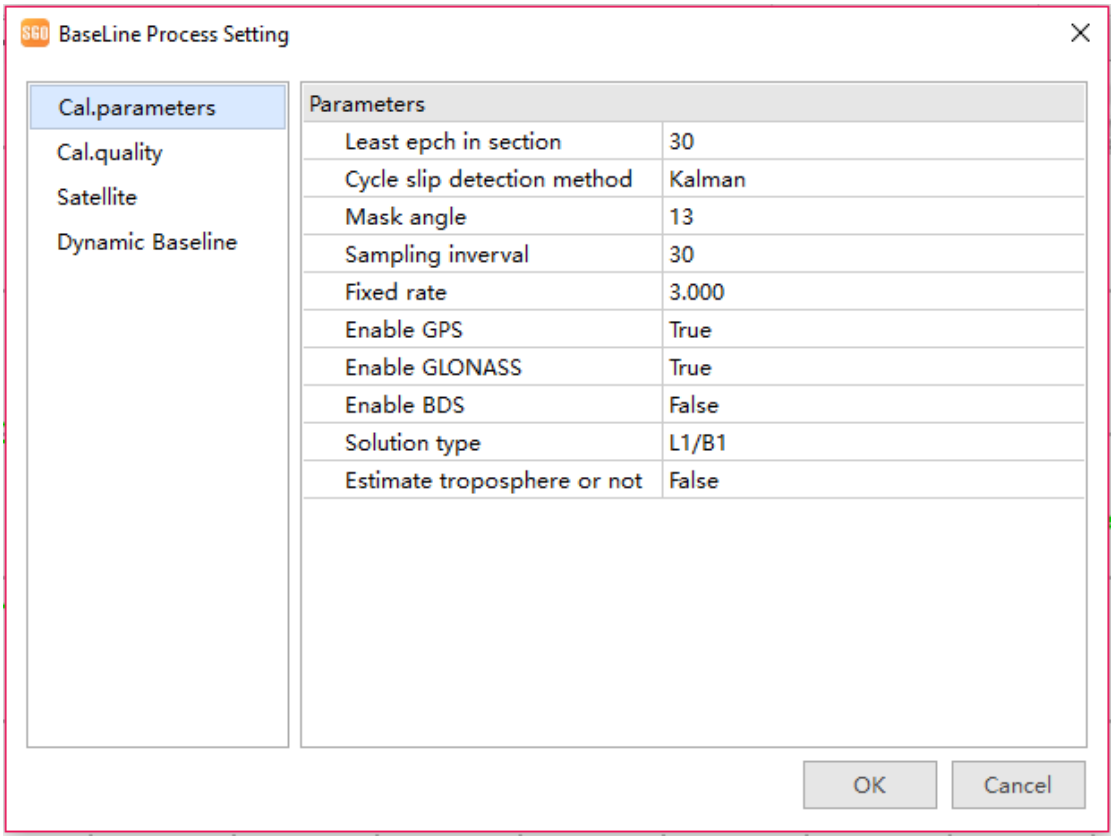


Note: If you already have the base station data for post processing, you do not need to load the IGS data anymore.

7.3 Processing setting

There are four pages in this dialog, including Cal.parameters, Cal.quality, Satellite, Dynamic baseline.

7.3.1 Cal.parameters



Least epoch in section: For static survey, if the observation epoch is less than 30, the observation data can't form baseline.

Circle slip detection method: There are two options for detecting circle slip, TD and Kalman.

Mask angle: Cutoff angle is used to limit the satellite data with relatively lower elevation angle, these data won't be processed when you processed baseline.

Usually the signal quality of satellite with low elevation angle is very bad, so when we process the baseline, we can adjust this parameter to forbid this kind of data.

Sampling Interval: it means epoch interval which is involved to baseline processing, that is to say, if you set sample interval to 5s, the receiver will collect 12 epochs in 1min, but when you set interval to 10s in baseline setup, it means only 6 epochs will be taken to baseline processing in 1min. but notice that, the interval must be bigger than sampling interval, otherwise, the setting will be invalid.

Fixed rate: this parameter refers to baseline qualified condition, usually, the default value is 3.0,after processing, if the result is bigger than 3.0, the baseline is qualified, otherwise ,it's failed.

Enable GPS: True means using GPS data, False means not.

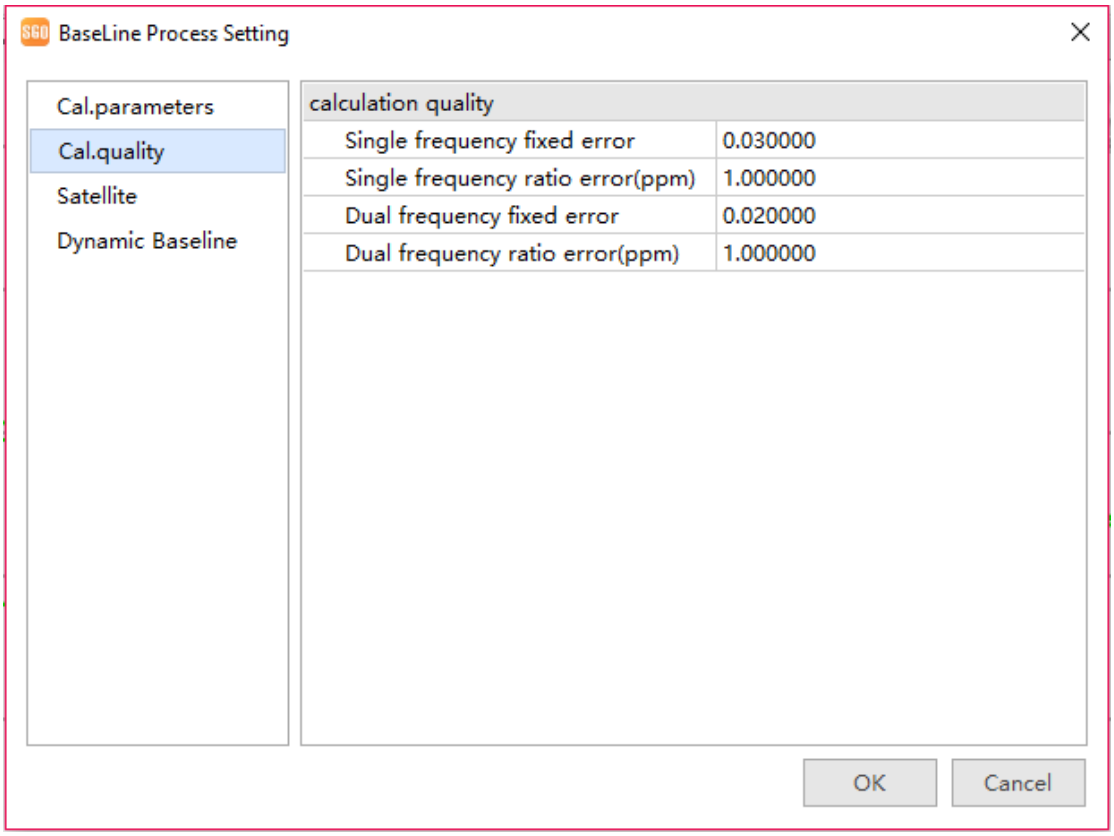
Enable GLONASS: True means using Glonass data, False means not.

Enable BDS: True means using Beidou data, False means not. This function is only available in registration version.

Solution type: there are 4 options,L1/B1,L2/B2,Ionosphere-free combination,L5/B3. For short distance, L1/B1 method is recommended.

Estimate troposphere or not: True means using troposphere error, False means not.

7.3.2 Cal.quality



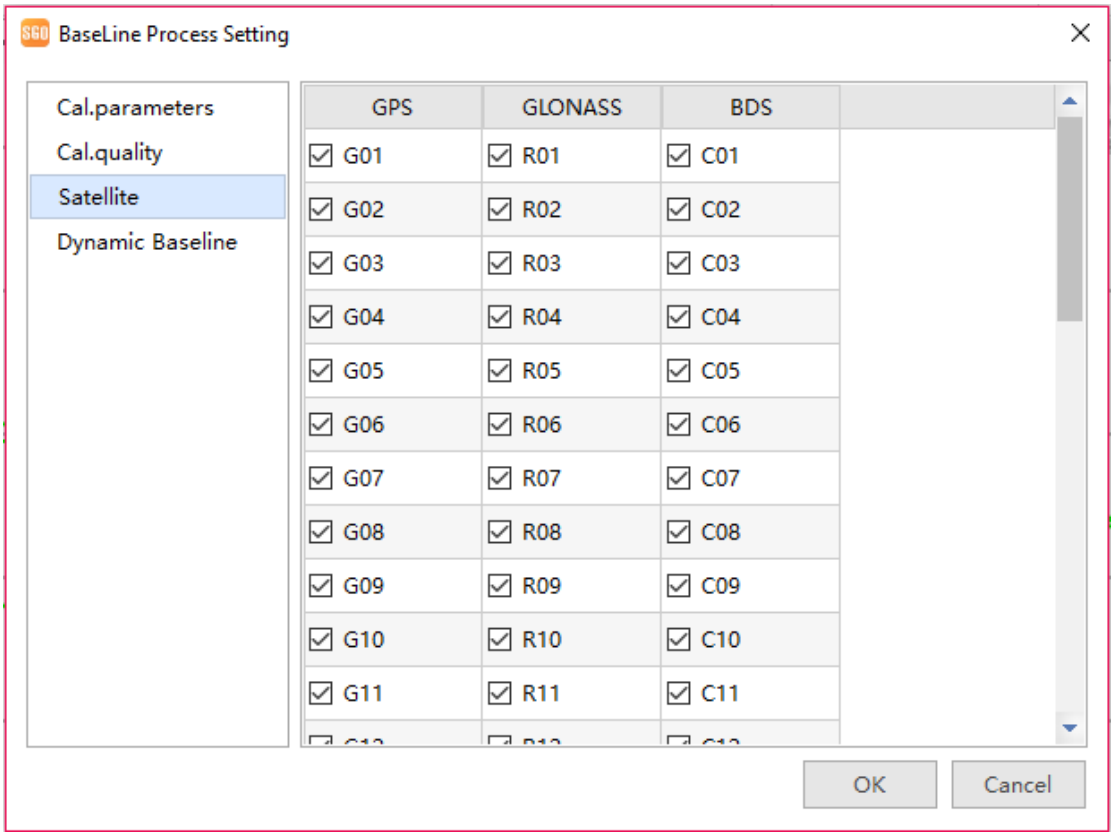
Single frequency fixed error: the default value is 0.03, if the result is less than 0.03, the baseline is qualified, otherwise it's failed. This is suitable for single frequency observation data.

Single frequency ratio error(ppm): the parameter is used to estimate repeated baseline error and closure loop error, the default value is recommended.

Dual-frequency fixed error: the default value is 0.02, if the result is less than 0.02, the baseline is qualified, otherwise it's failed, this is suitable for dual-frequency observation data.

Dual-frequency ratio error(ppm): the parameter is used to estimate repeated baseline error and closure loop error, the default value is recommended.

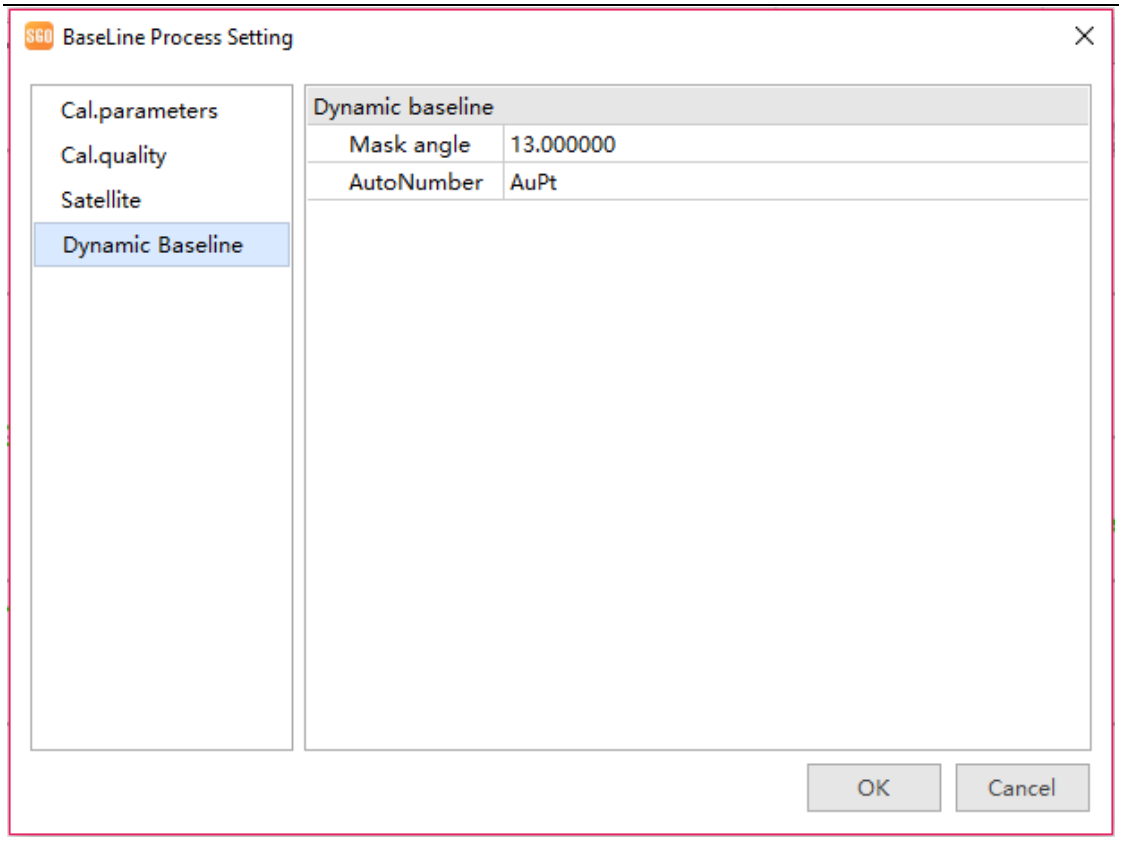
7.3.3 Satellite



This page is used to control the satellite which can involve to baseline processing or cant, user can check or uncheck satellite number to control it. GPS, GLONASS, BDS are available.

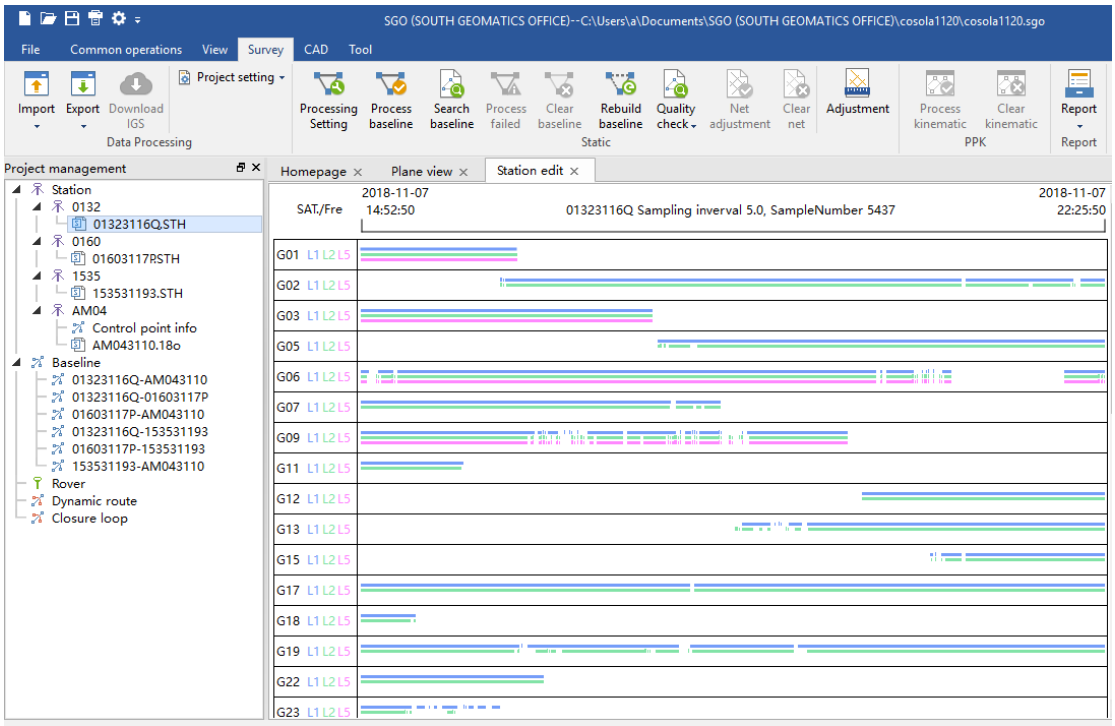
7.3.4 Dynamic Baseline

This is configured some settings for kinematic processing.

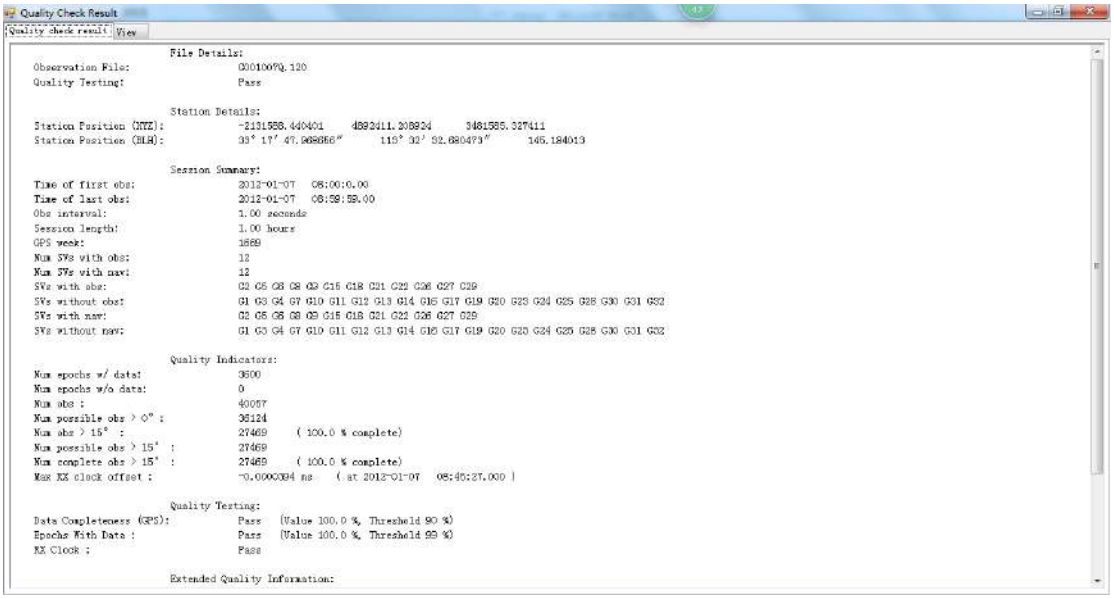


7.4 Process baseline

Before baseline processing, we can check observation point data quality. From the project management, click observation file you will see the station edit interface.



Right click observation file, select quality check, it will pop-up a new dialog, **quality check result**.



There are two pages in the dialog, quality check result, view.

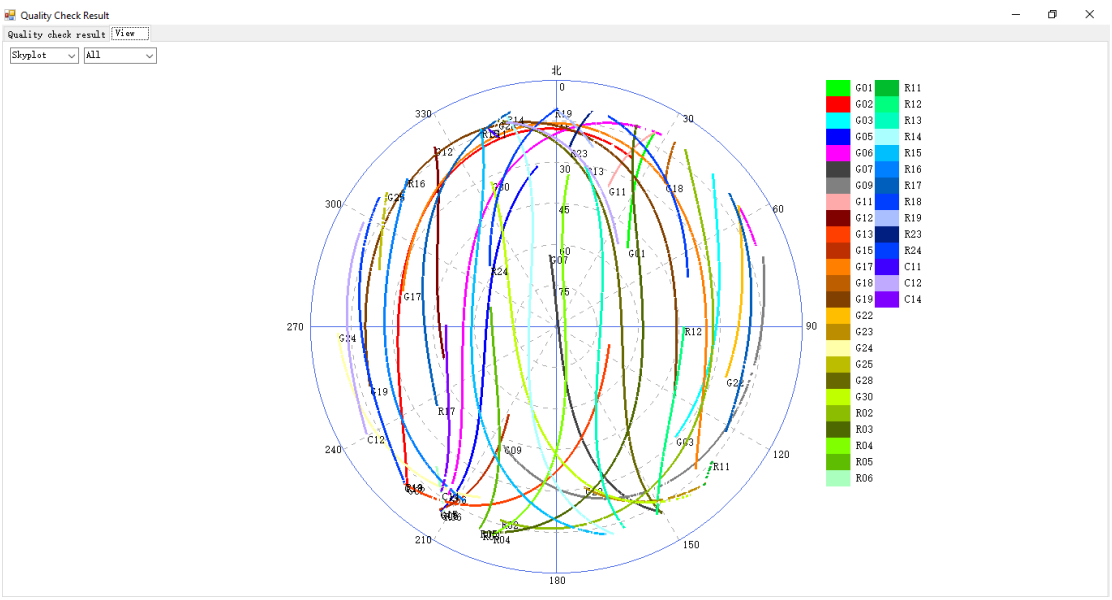
7.4.1 Quality check result

This is a detailed report about observation data quality. If the data quality is too bad, the result will show Failed, if it's qualified, the result is Pass. The report also includes observation satellite number, observation epoch, data completeness and so on. According these information, we can basically judge the data quality condition.

7.4.2 View

There are five options in this page, skyplot, Nsat, multipath, elevation,azimuth,SNR.

Skyplot

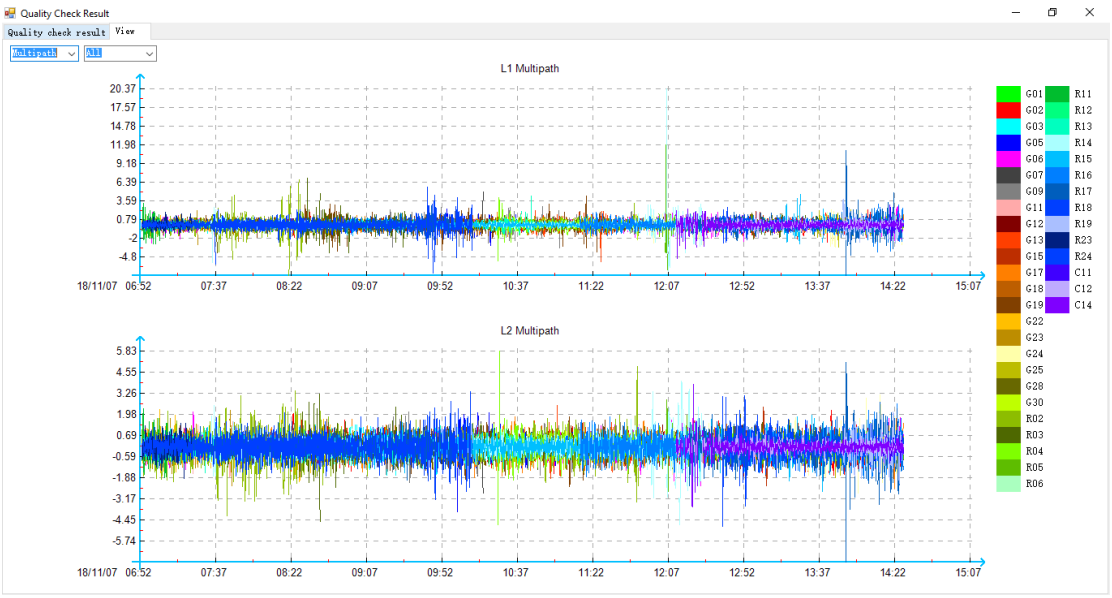


It shows every captured satellite running orbit during observation time.

Nsat

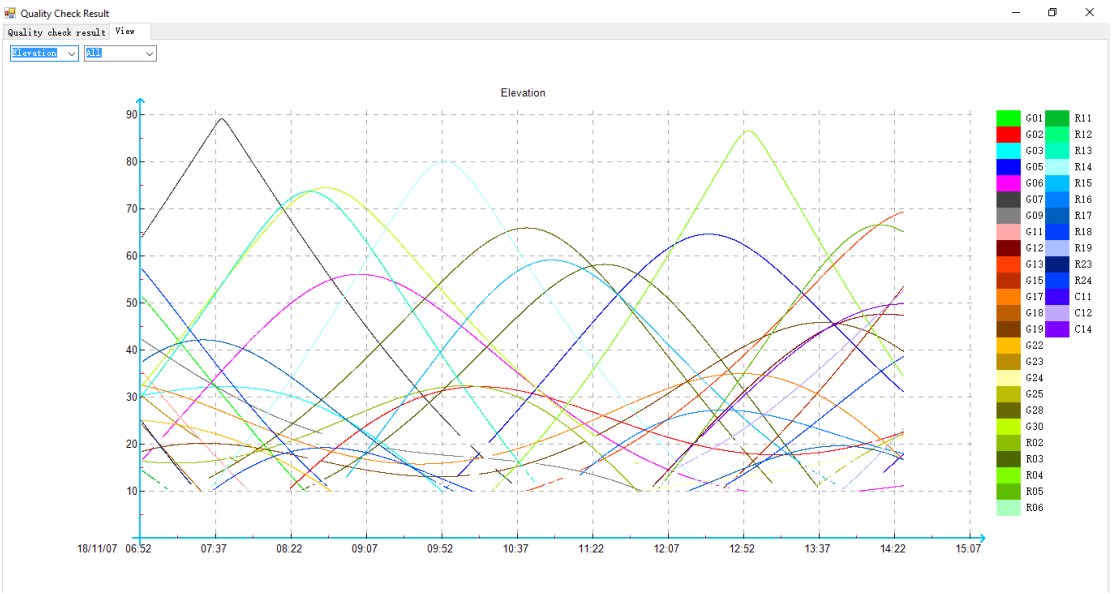
It shows captured satellite number during every time span.

Multipath



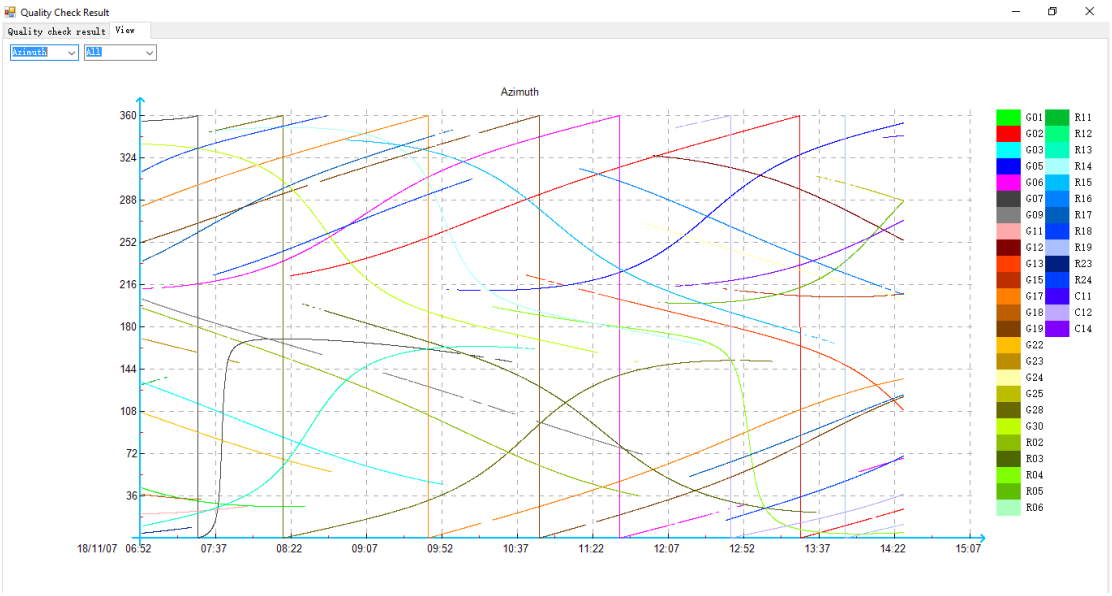
This page shows multipath effect, includes L1 and L2 multipath.

Elevation



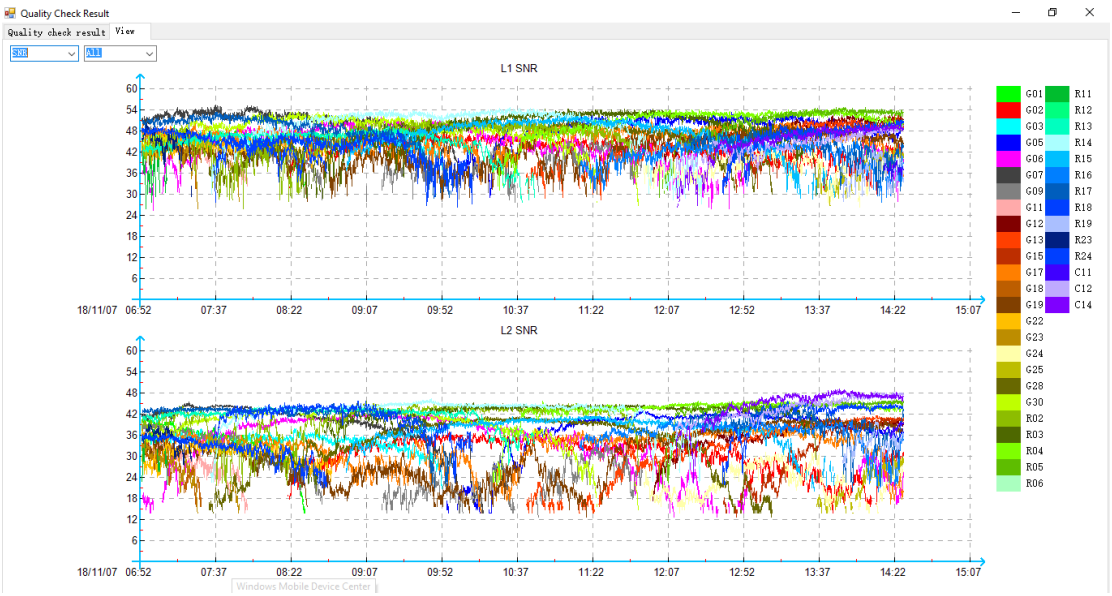
This page shows all captured satellites' elevation orbit.

Azimuth



This page shows all captured satellites' azimuth of orbit.

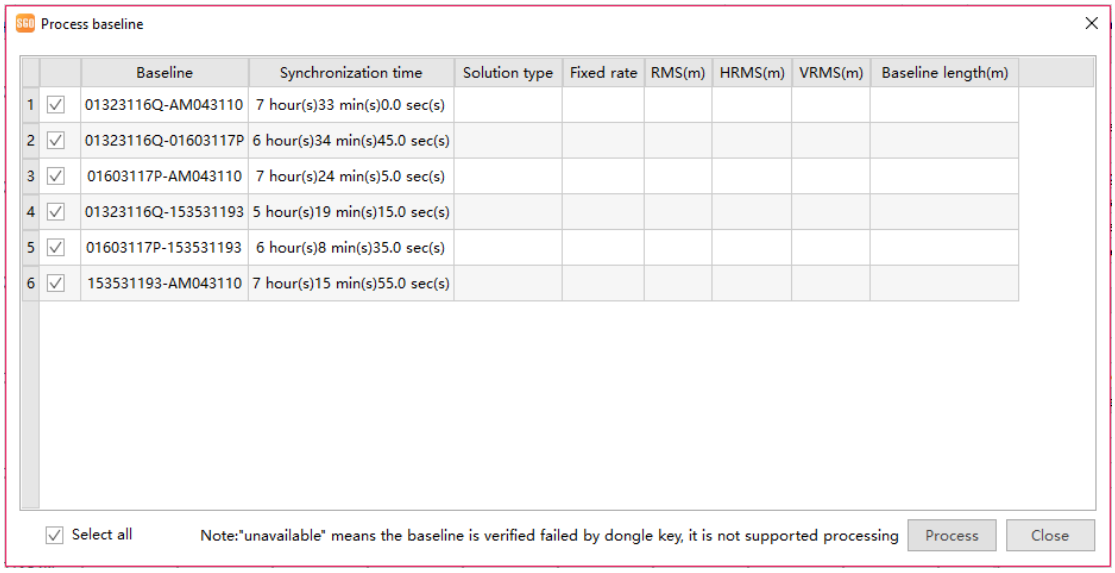
SNR



SNR means signal to noise ratio, it's an index to estimate satellite quality. This page shows all captured satellites SNR condition change as time goes on.

After making above checking and setting, we can click 

button on the toolbar. Then you will see the following figure,



If you want to process specified baseline, you can just select the baseline you want to process. Or you can directly press **Process** button to process all baseline.

After processing procedure finished, if the baseline is qualified, the solution type will be fixed, ratio will be bigger than 3.0, and RMS will be smaller than 0.02.

Ratio

The RATIO is the rate of the less least RMS and the Least RMS after the integer ambiguity analysis, that is:

$$RATIO = \frac{RMS_{sec}}{RMS_{min}}$$

It reflects the reliability of the integer ambiguity parameter, which is determined by a few factors. It has the relation to the observation quality and the observation term. The RATIO is the key to reflect the quality of the baseline, generally, the RATIO is required to bigger than 3.

RMS

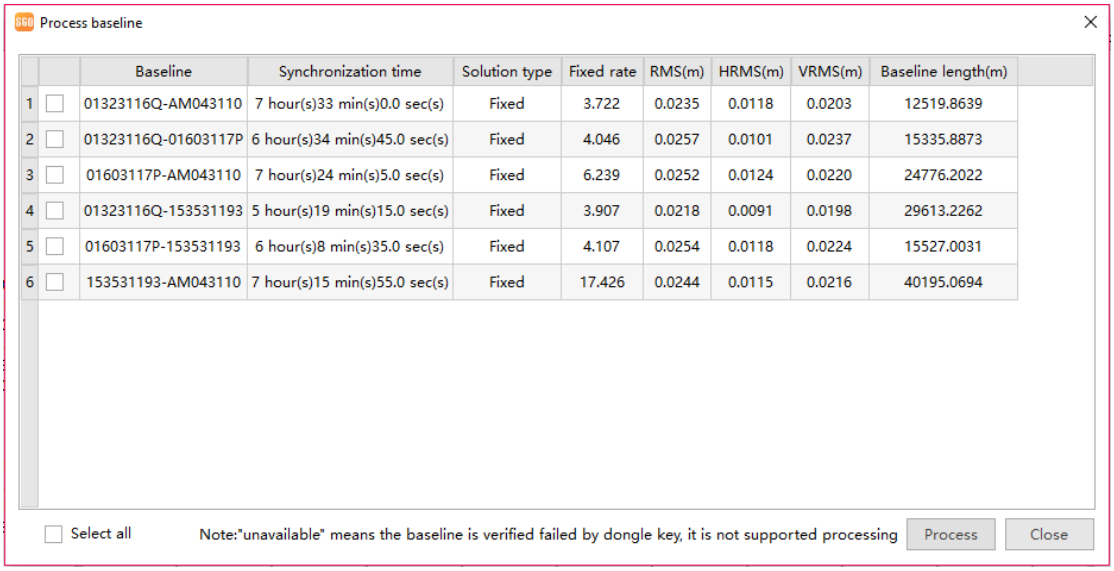
RMS is the Root Mean Square, that is:

$$RMS = \sqrt{\frac{V^T PV}{n-f}}$$

V is the residual of the observations.

P is the weight of the observations.

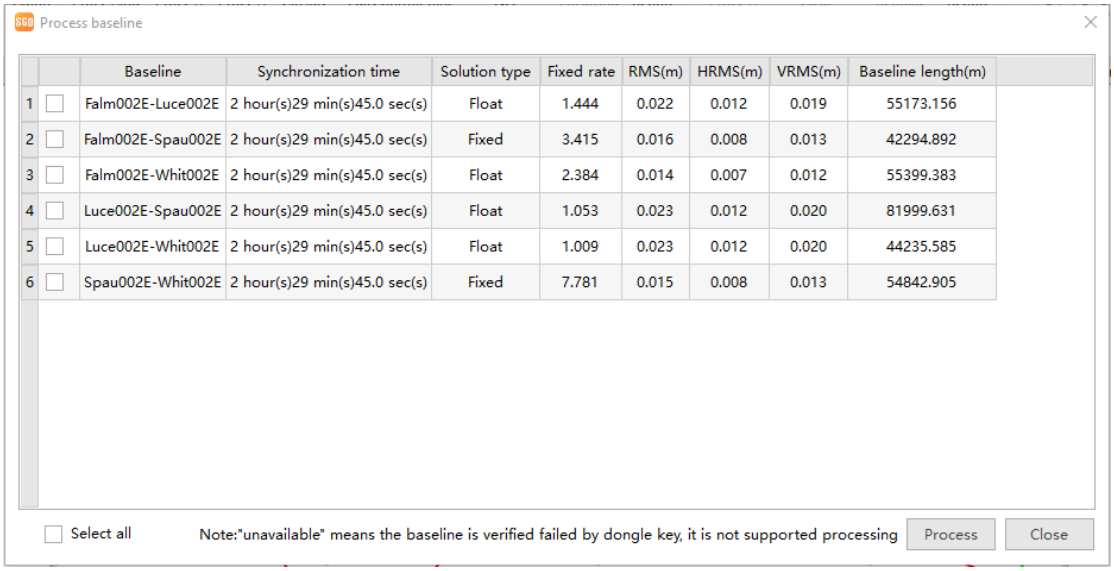
n-f is that the total numbers of observations subtracts to the number of known number. RMS means the quality of the observations. The smaller the value of RMS is, the better the quality will be. Otherwise the worse the quality will be. The RMS is not effected by the observation terms. According to the theory of Symbolic Statistics Mathematical Statistics, the rate of the observation error within the 1.96 times of RMS is 95%.



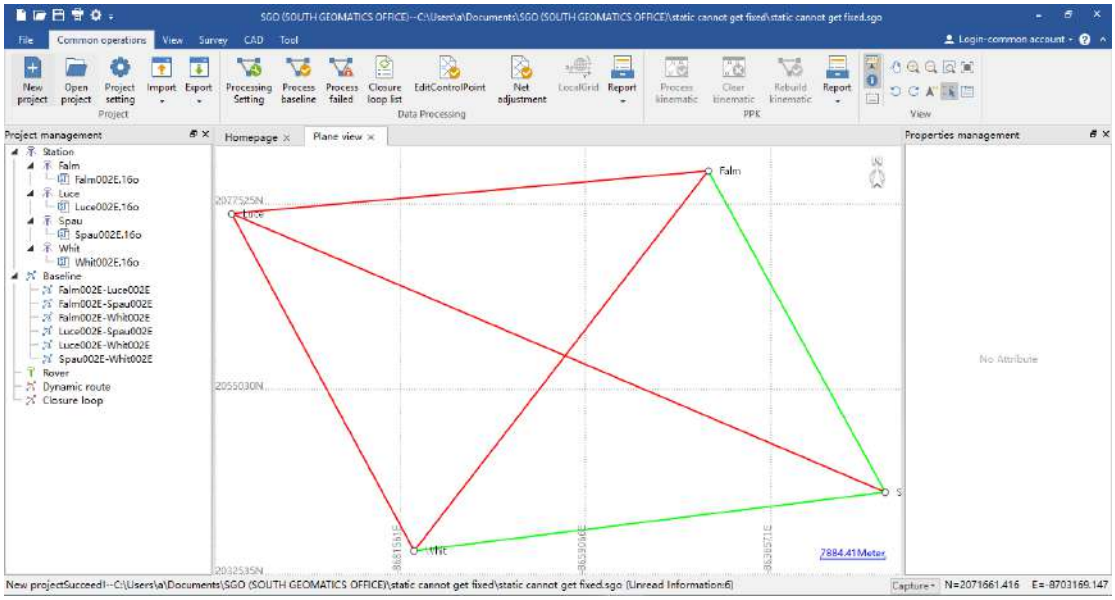
If all the baselines get fixed solution, you can press **Close** button to Save the processing result and exit.

7.5 Adjust failed baseline

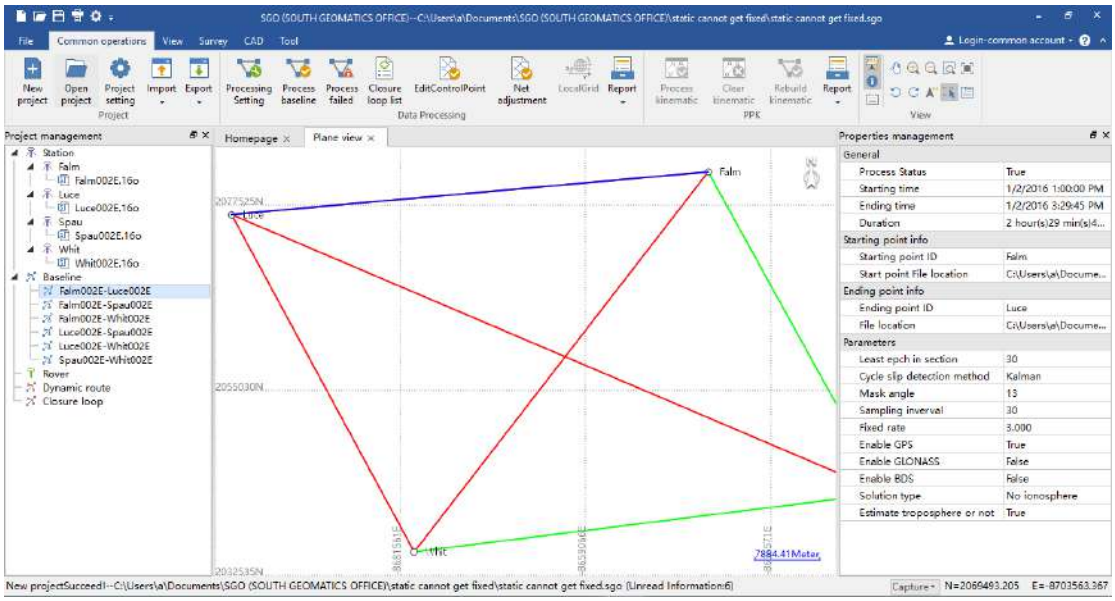
But in reality, it's impossible to make all baselines to get fixed solution at the first time, some baselines may get float, dgps or none result. In that case, we should adjust parameters to reprocess the baseline again, sometimes, the operation will repeat again and again. See the below example,



Firstly, we should save the result, then the baselines with fixed solution will be saved, we just need to reprocess unqualified baseline.

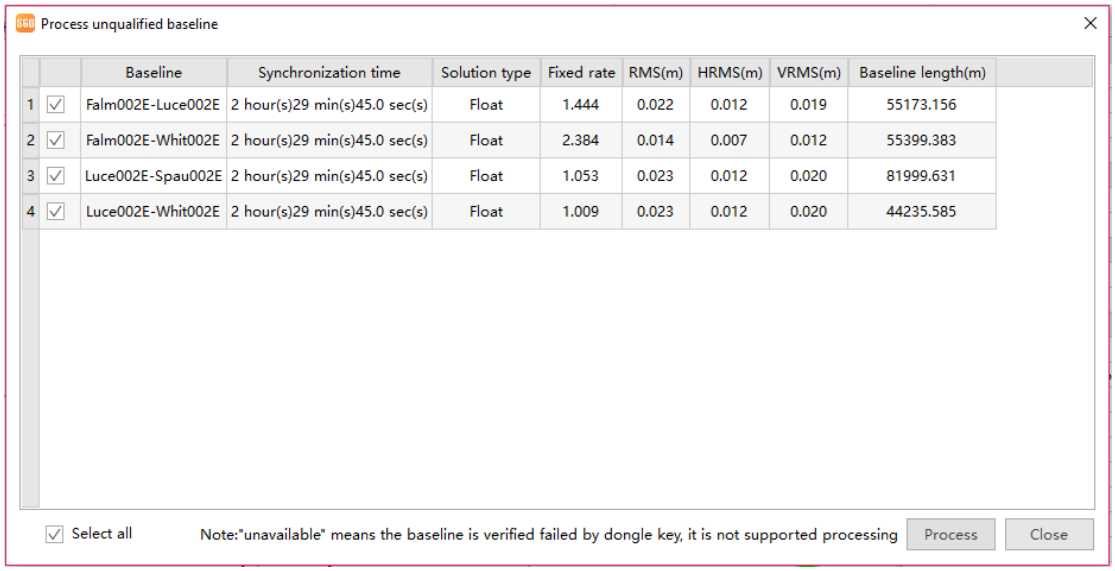


The qualified baseline will become green, unqualified baseline will become red. Then we can select unqualified baseline one by one by clicking the red baselines in plane view workspace, the selected baseline will become blue. The right workspace will show baseline information.

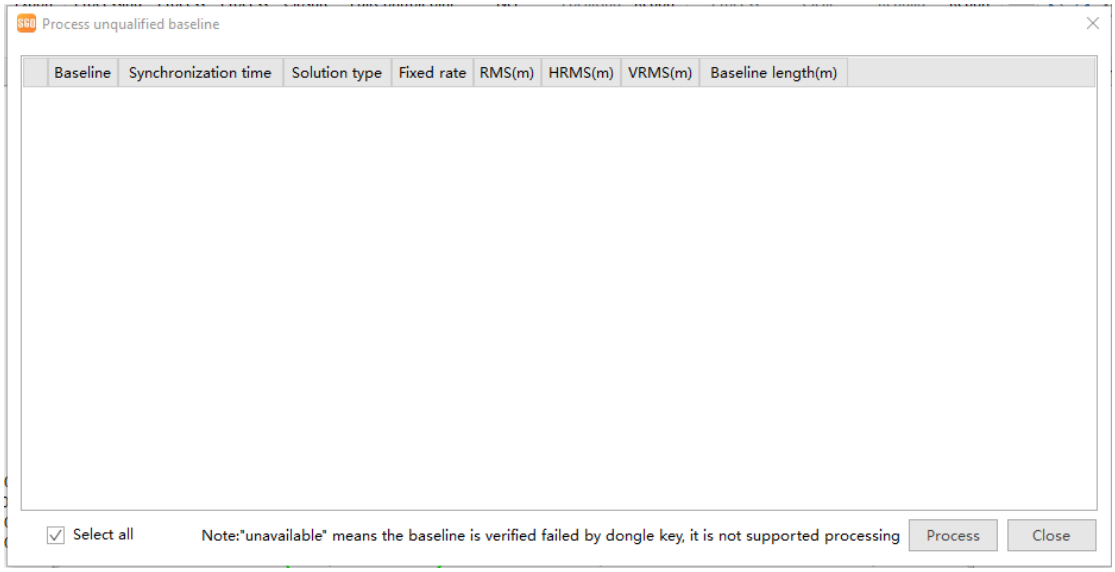


The right bottom corner shows current process parameters, we can adjust the following parameters to reprocess it.

1. After checking the observation data, we can see the sampling interval is 5s, but the default processing interval is 30s, so we can adjust processing interval to 5s, so the involved epoch will become more. After change to 5s, we can click the Process failed button to reprocess the failed baseline,

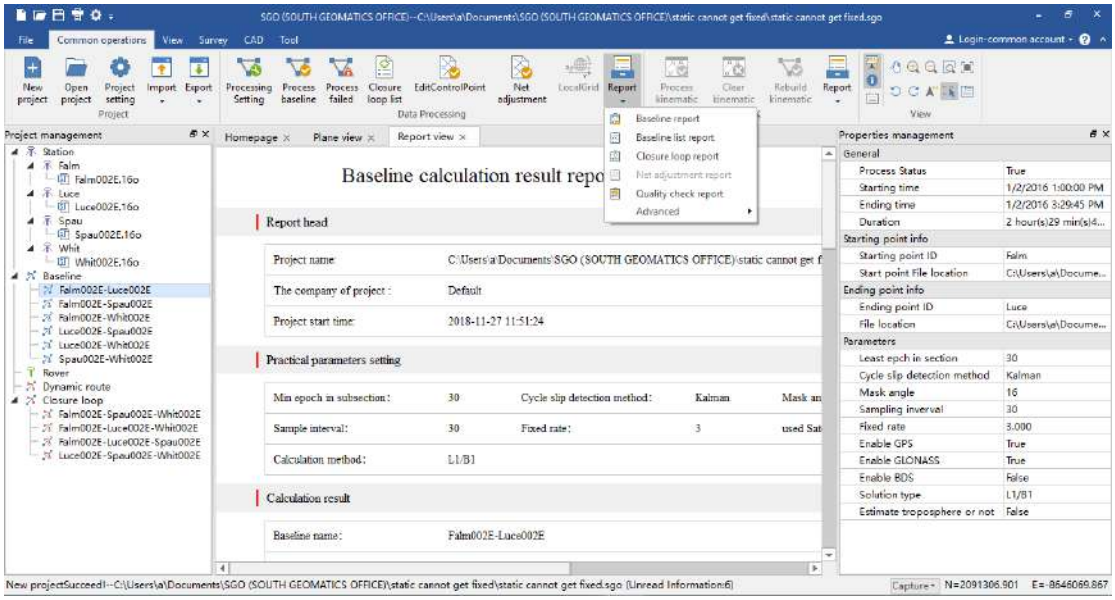


Before reprocessing

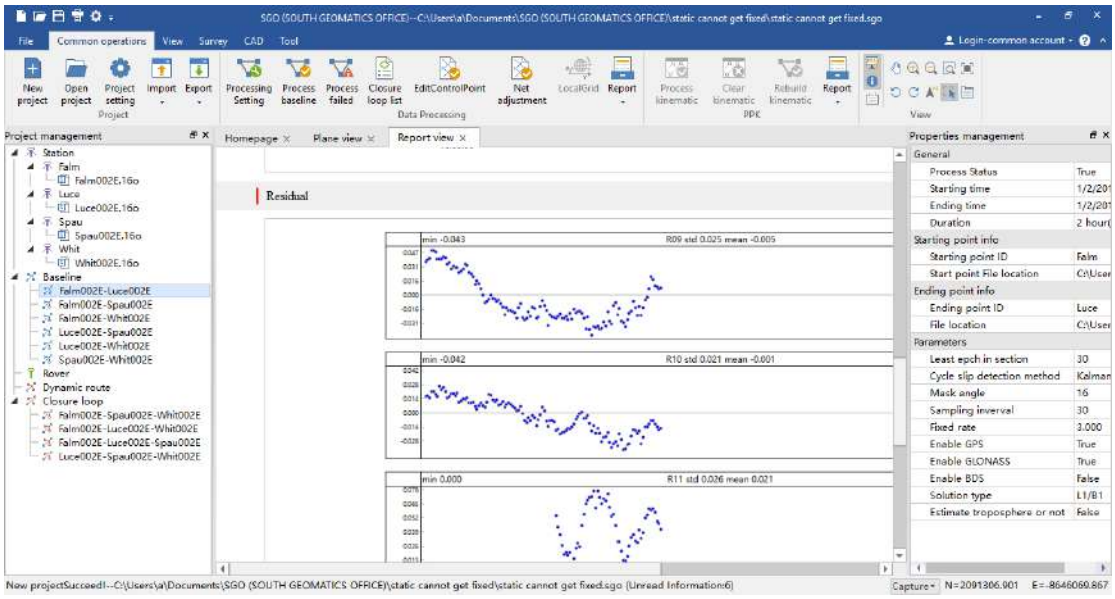


After reprocessing

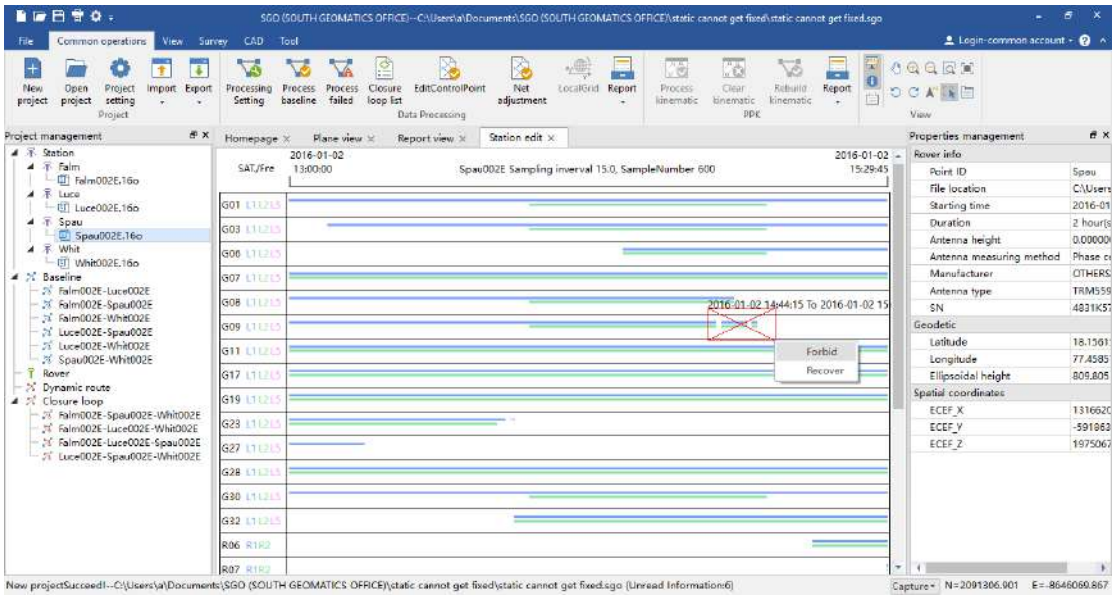
2. Also you can adjust cutoff angle, using GLONASS, and select different solution type to try to reprocess the unqualified baselines.
3. If above methods still can't get satisfied result, we can check the baseline residual condition, For example, after above processing, there is only left one baseline which is unqualified.



We can check the baseline report by clicking report→Baseline report button, select baseline in the left Project management window. Then it will pop up a new dialog,



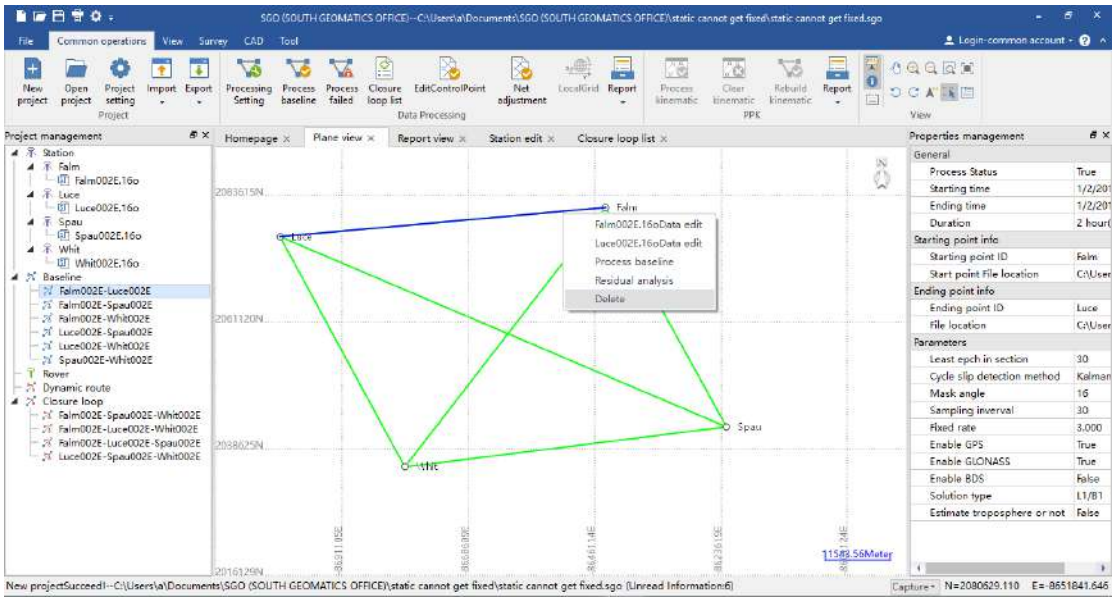
From the chart, we can check the residual, usually the normal residual error is only 20-40mm grade. If any satellites qulity is not good, we can try to forbid the satellite observation.



Finally, if you still cannot get the qualified solution, you should prevent this baseline from the network adjustment or delete this baseline. If the baseline is necessary in the control network, you should resurvey this baseline.

7.6 Delete baseline and rebuild baseline

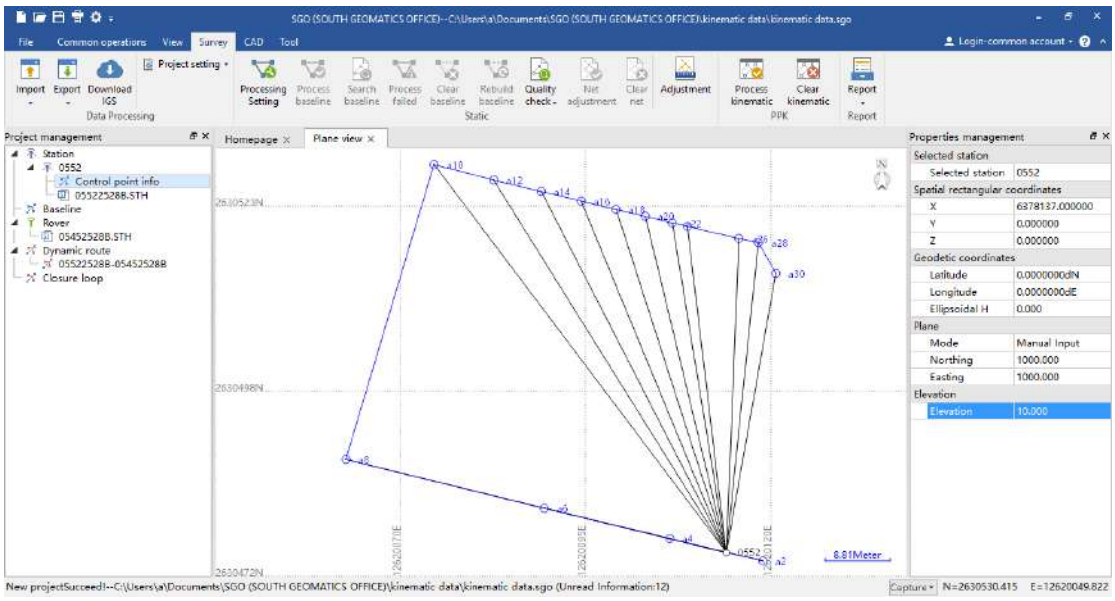
If you want to delete specified baseline, you can tap it in the plan view workspace, then right-click mouse, and select the **Delete** item.



If you delete by mistake, you can click **Rebuild baseline** button to regenerate it again, this function is for regenerating all delete baseline, then you need to process the rebuild baseline again.

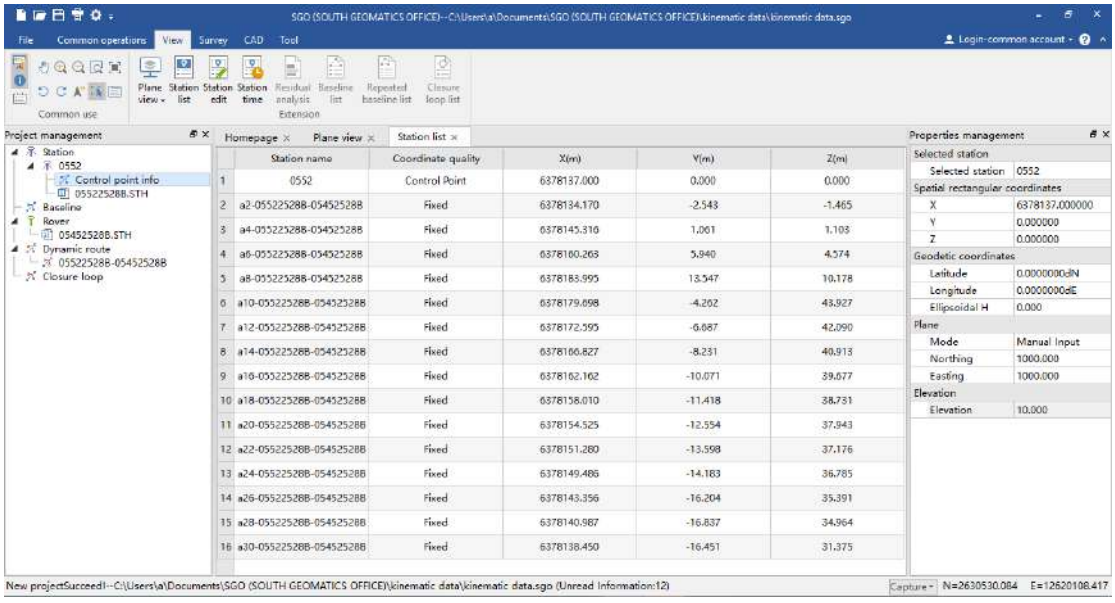
7.7 Kinematic processing

Kinematic processing is used for kinematic survey, stop& go survey. The progress is very simple, we can view previous quick guide.



The baseline color means different result, blue means fixed, green means float, red means dgps, grey means single.

After processed, you can click **View->Station list** to check kinematic points result.

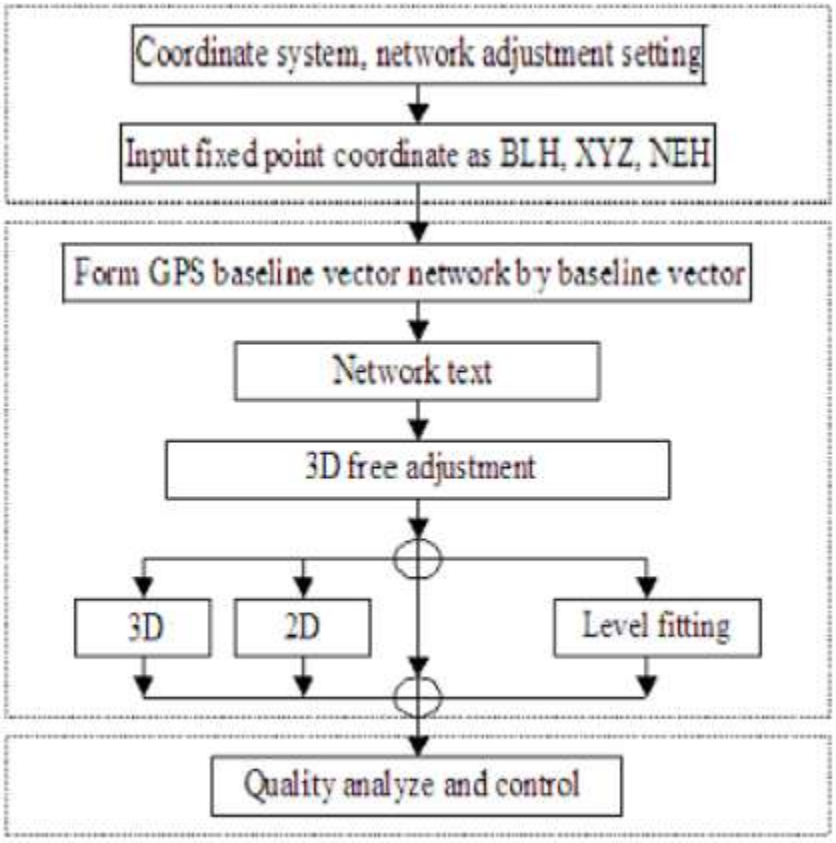


	Station name	Coordinate quality	X(m)	Y(m)	Z(m)
1	0552	Control Point	6378137.000	0.000	0.000
2	a2-05522528B-05452528B	Fixed	6378134.170	-2.548	-1.465
3	a4-05522528B-05452528B	Fixed	6378145.316	1.061	1.103
4	a6-05522528B-05452528B	Fixed	6378160.263	5.940	4.574
5	a8-05522528B-05452528B	Fixed	6378188.995	13.547	10.178
6	a10-05522528B-05452528B	Fixed	6378179.698	-4.202	43.927
7	a12-05522528B-05452528B	Fixed	6378172.595	-6.687	42.090
8	a14-05522528B-05452528B	Fixed	6378166.827	-8.231	40.913
9	a16-05522528B-05452528B	Fixed	6378162.162	-10.071	39.077
10	a18-05522528B-05452528B	Fixed	6378158.010	-11.418	38.731
11	a20-05522528B-05452528B	Fixed	6378154.525	-12.554	37.943
12	a22-05522528B-05452528B	Fixed	6378151.280	-13.598	37.176
13	a24-05522528B-05452528B	Fixed	6378149.486	-14.183	36.785
14	a26-05522528B-05452528B	Fixed	6378143.356	-16.204	35.391
15	a28-05522528B-05452528B	Fixed	6378140.987	-16.837	34.964
16	a30-05522528B-05452528B	Fixed	6378138.450	-16.451	31.375

7.8 Network adjustment

7.8.1 Network adjustment type

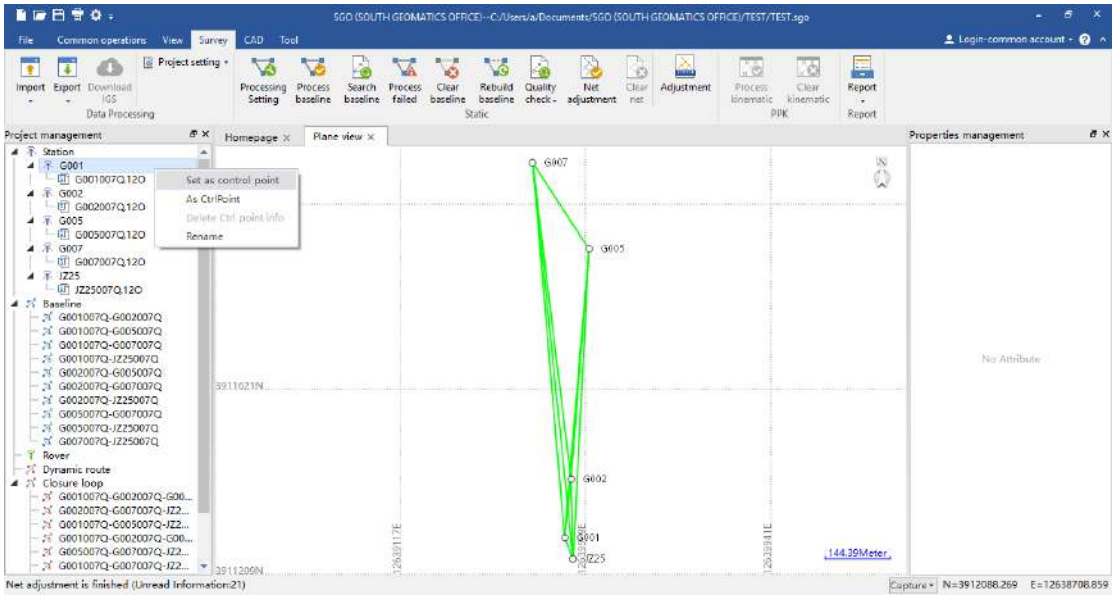
There are 4 kinds of network adjustment, 3D free network adjustment, 3D restricted network adjustment, 2D network adjustment, and level fitting.



In SGO software, if you don't input known BLH coordinate as control point's coordinate, the software will automatically select the first point as control point, if you want to make whole network adjustment, you should input one NEH coordinate at least.

7.8.2 Step of network adjustment

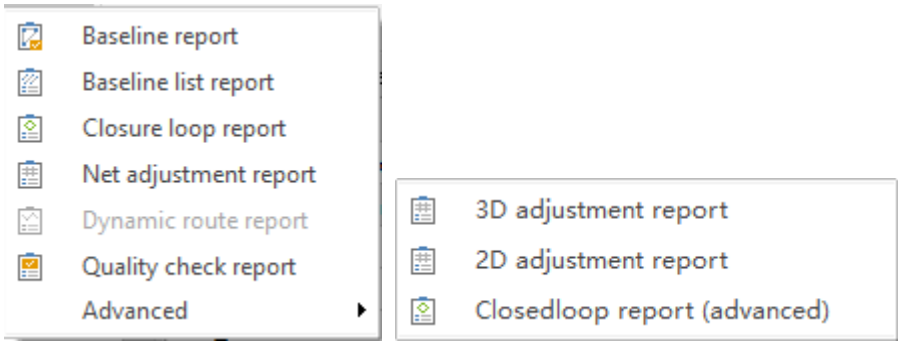
In SGO software, network adjustment step is very simple,



1. Just select the control points in project explorer workspace, right-click the point name, select **Set as control point** option.
2. Click Control point info item. The right workspace will pop up coordinate information field. If your known point coordinate format is space coordinate, you can input it to XYZ field, if you known point coordinate format is BLH, you can input to BLH field. The last filed is suitable for NEH coordinate.
3. Then click Net adjustment to make network adjustment.

7.9 Report

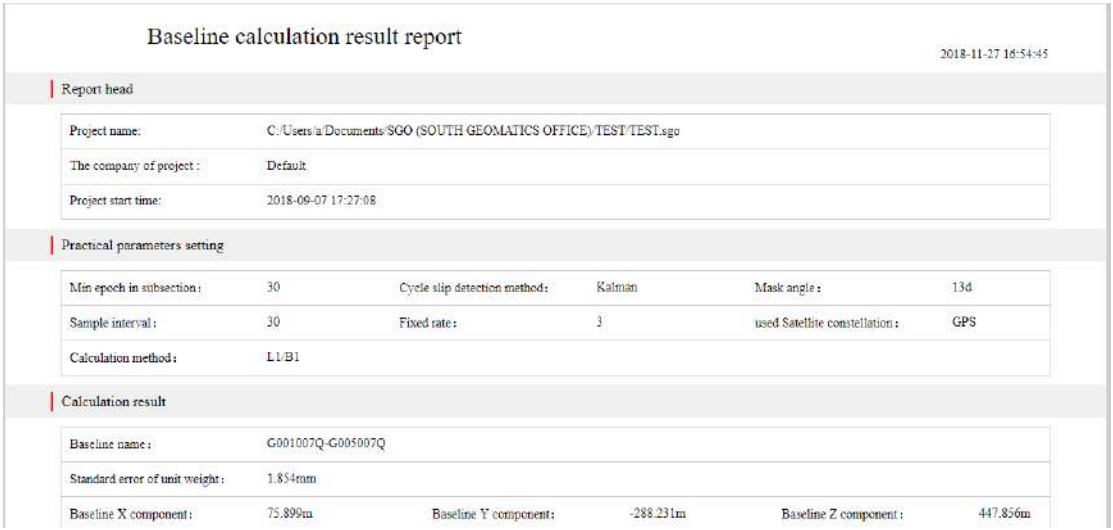
Report button contains Baseline report, Baseline list report, Closure loop report, Net adjustment report, Dynamic route report, Quality check report, 3D adjustment report, 2D adjustment report and closedloop report.



7.9.1 Baseline report

It show single baseline quality report, includes common satellites condition and residual error

information, before press the menu, you should select specified baseline in project management workspace.



Baseline calculation result report

2018-11-27 16:54:45

Report head

Project name:	C:/Users/a/Documents/SGO (SOUTH GEOMATICS OFFICE)/TEST/TEST.sgo
The company of project :	Default
Project start time:	2018-09-07 17:27:08

Practical parameters setting

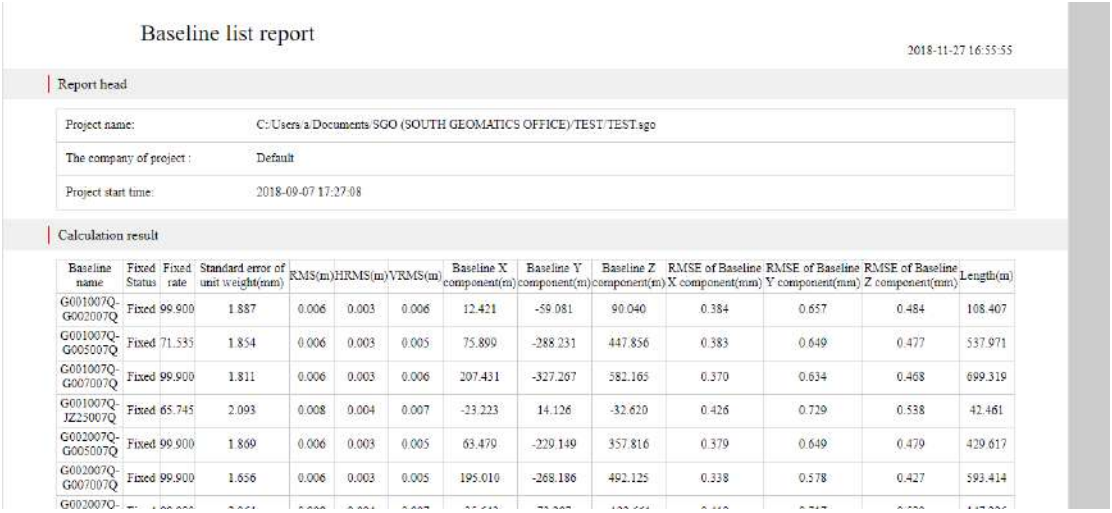
Min epoch in subsection :	30	Cycle slip detection method:	Kalman	Mask angle :	13d
Sample interval :	30	Fixed rate :	3	used Satellite constellation :	GPS
Calculation method:	L1/B1				

Calculation result

Baseline name :	G001007Q-G005007Q			
Standard error of unit weight :	1.854mm			
Baseline X component :	75.899m	Baseline Y component:	-288.231m	Baseline Z component :	447.856m

7.9.2 Baseline list report

It shows all baselines solution type, RMS conditions.



Baseline list report

2018-11-27 16:55:55

Report head

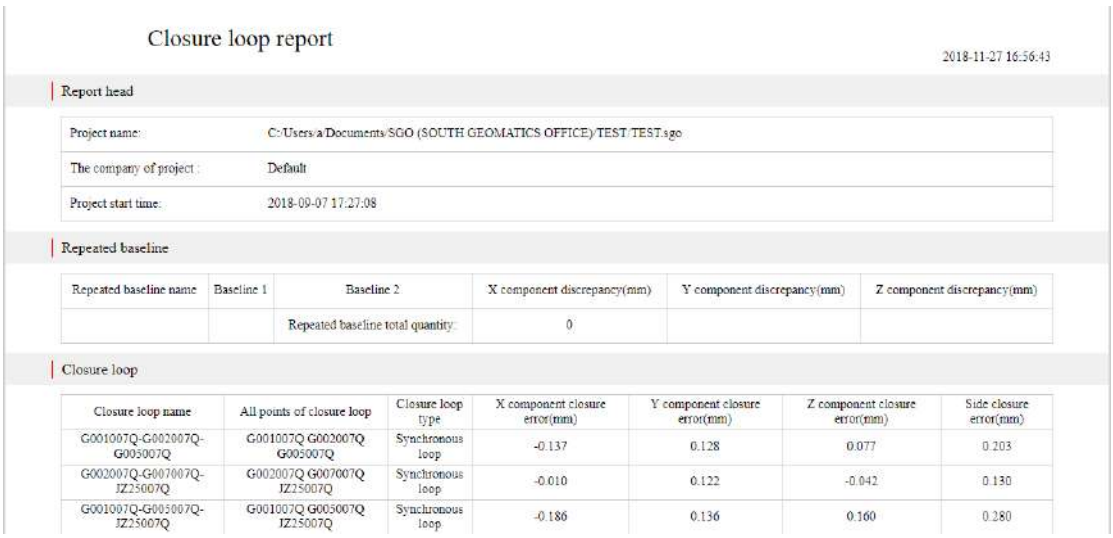
Project name:	C:/Users/a/Documents/SGO (SOUTH GEOMATICS OFFICE)/TEST/TEST.sgo
The company of project :	Default
Project start time:	2018-09-07 17:27:08

Calculation result

Baseline name	Fixed Status	Fixed rate	Standard error of unit weight(mm)	RMS(m)	HRMS(m)	VRMS(m)	Baseline X component(m)	Baseline Y component(m)	Baseline Z component(m)	RMSE of Baseline X component(mm)	RMSE of Baseline Y component(mm)	RMSE of Baseline Z component(mm)	Length(m)
G001007Q-G002007Q	Fixed	99.900	1.887	0.006	0.003	0.006	12.421	-59.081	90.040	0.384	0.657	0.484	108.407
G001007Q-G005007Q	Fixed	71.535	1.854	0.006	0.003	0.005	75.899	-288.231	447.856	0.383	0.649	0.477	537.971
G001007Q-G007007Q	Fixed	99.900	1.811	0.006	0.003	0.006	207.431	-327.267	582.165	0.370	0.634	0.468	699.319
G001007Q-JZ25007Q	Fixed	65.745	2.093	0.008	0.004	0.007	-23.223	14.126	-32.620	0.426	0.729	0.538	42.461
G002007Q-G005007Q	Fixed	99.900	1.869	0.006	0.003	0.005	63.479	-220.149	357.816	0.379	0.649	0.479	429.617
G002007Q-G007007Q	Fixed	99.900	1.656	0.006	0.003	0.005	195.010	-268.186	492.125	0.338	0.578	0.427	593.414
G002007Q-													

7.9.2 Closure loop report

It shows the closure loop X, Y, Z component closure error and side closure error.



Closure loop report

2018-11-27 16:56:43

Report head

Project name:	C:/Users/a/Documents/SGO (SOUTH GEOMATICS OFFICE)/TEST/TEST.sgo
The company of project :	Default
Project start time:	2018-09-07 17:27:08

Repeated baseline

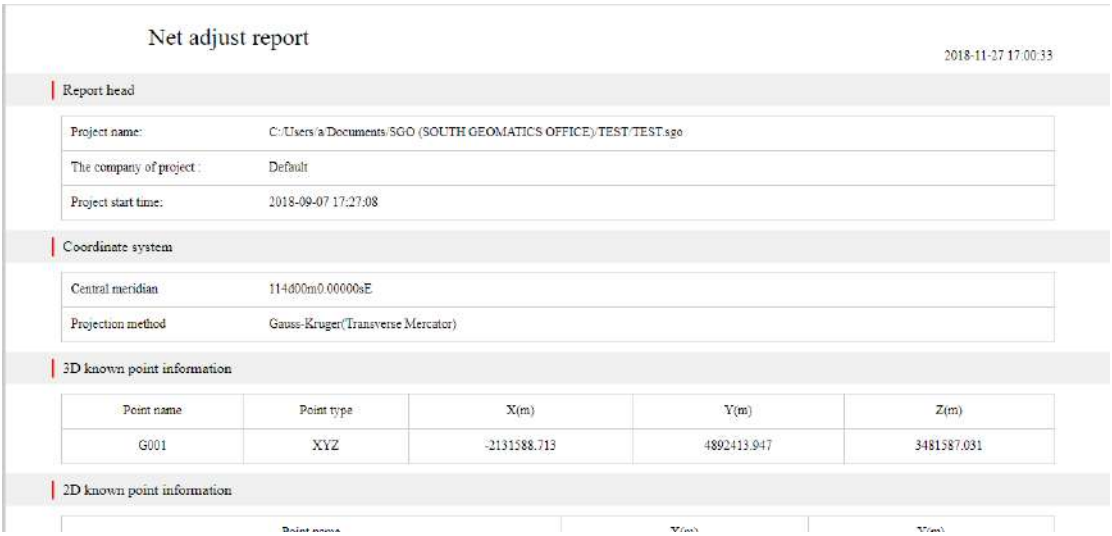
Repeated baseline name	Baseline 1	Baseline 2	X component discrepancy(mm)	Y component discrepancy(mm)	Z component discrepancy(mm)
		Repeated baseline total quantity:	0		

Closure loop

Closure loop name	All points of closure loop	Closure loop type	X component closure error(mm)	Y component closure error(mm)	Z component closure error(mm)	Side closure error(mm)
G001007Q-G002007Q-G005007Q	G001007Q G002007Q G005007Q	Synchronous loop	-0.137	0.128	0.077	0.203
G002007Q-G007007Q-JZ25007Q	G002007Q G007007Q JZ25007Q	Synchronous loop	-0.010	0.122	-0.042	0.130
G001007Q-G005007Q-JZ25007Q	G001007Q G005007Q JZ25007Q	Synchronous loop	-0.186	0.136	0.160	0.280

7.9.3 Net adjust report

It's used to show network adjustment result.



Net adjust report

2018-11-27 17:00:33

Report head

Project name:	C:/Users/a/Documents/SGO (SOUTH GEOMATICS OFFICE)/TEST/TEST.sgo
The company of project :	Default
Project start time:	2018-09-07 17:27:08

Coordinate system

Central meridian	114d00m0.00000sE
Projection method	Gauss-Kruger(Transverse Mercator)

3D known point information

Point name	Point type	X(m)	Y(m)	Z(m)
G001	XYZ	-2131588.713	4892413.947	3481587.031

2D known point information

7.9.4 Dynamic route report

This report is used to show kinematic point result, includes point coordinate and solution type.

Dynamic route calculation report

2018-10-11 10:45:22

Report head

Project name:	C:\Users\a\Documents\SGO (SOUTH GEOMATICS OFFICE)\ppk egstar
The company of project :	Default
Project start time:	2018-10-11 10:32:11
Dynamic route name	05522528B-05452528B

Coordinate system

Central meridian	117.0000000dE
Projection method	Gauss-Kruger(Transverse Mercator)

Base information

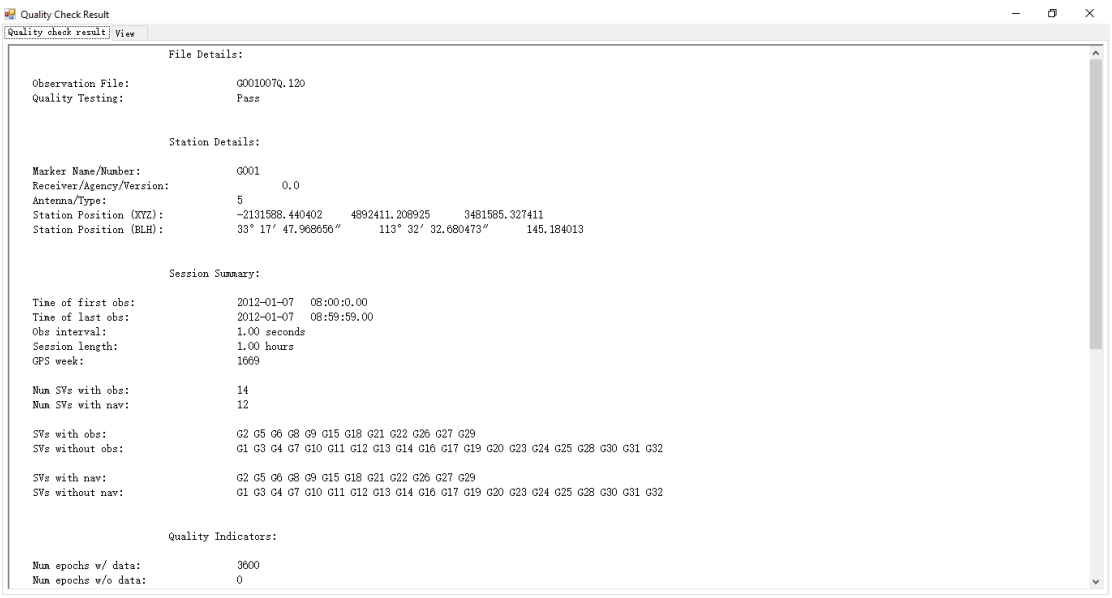
Point name	North(m)	East(m)	h(m)
0552	10000.000	10000.000	12.000

Dynamic point name

Point name	North(m)	East(m)	h(m)	RMS(m)	HRMS(m)	VRMS(m)	PDOP(m)	Solution type
a2	9999.418	10004.894	27.388	1.161	0.617	0.984	1.340	Autonomous
	9998.795	10004.974	11.443	0.042	0.022	0.036	1.340	DGNSS
	9998.838	10004.610	12.600	0.001	0.001	0.001	1.340	Float
	9998.846	10004.574	11.778	0.001	0.001	0.001	1.340	Fixed
	10002.485	9993.341	27.273	1.171	0.623	0.991	1.340	Autonomous

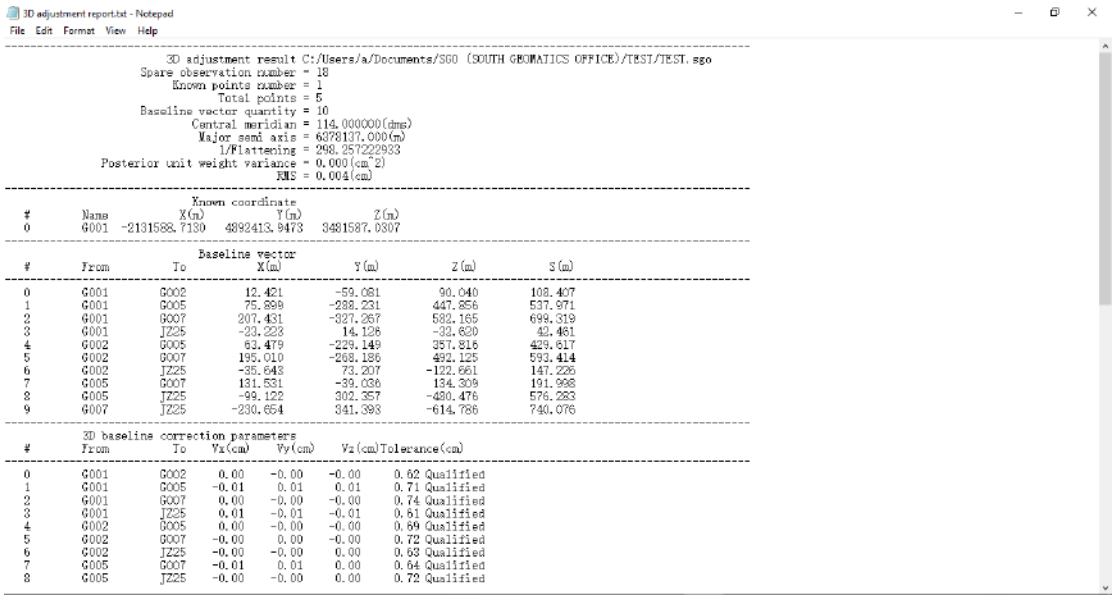
7.9.5 Quality check report

It is used to show all repeated baseline and closure loop condition.



7.9.6 3D adjustment report

It shows the 3D adjustment result.



3D adjustment report.txt - Notepad

File Edit Format View Help

3D adjustment result C:/Users/a/Documents/SGO (SOUTH GEOMATICS OFFICE)/TEST/TEST.sgo
Spare observation number = 18
Known points number = 1
Total points = 5
Baseline vector quantity = 10
Central meridian = 114.000000(dms)
Major semi axis = 6378137.000(m)
1/Flattening = 298.257222933
Posterior unit weight variance = 0.000(cm^2)
RMS = 0.004(cm)

Known coordinate

#	Name	X(m)	Y(m)	Z(m)
0	G001	-2131588.7130	4892413.9473	3491587.0307

Baseline vector

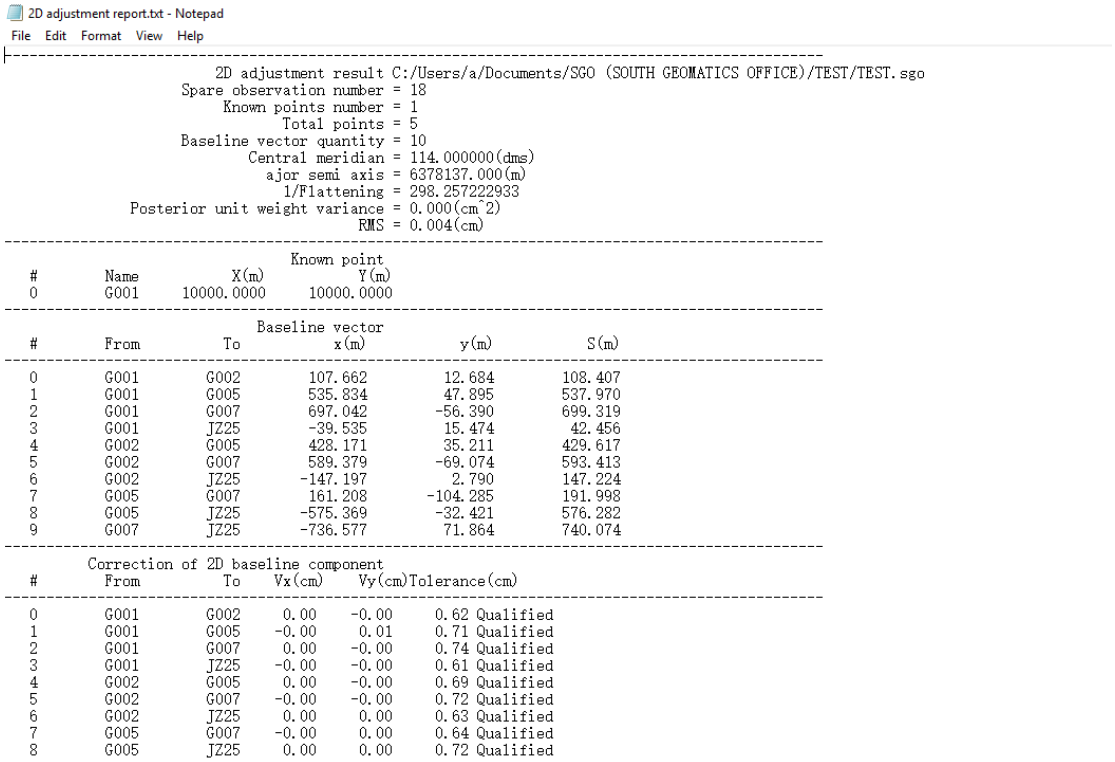
#	From	To	X(m)	Y(m)	Z(m)	S(m)
0	G001	G002	12.421	-59.081	90.040	108.407
1	G001	G005	75.898	-288.231	447.856	537.971
2	G001	G007	207.431	-327.267	582.165	699.319
3	G001	JZ25	-23.223	14.126	-32.620	42.461
4	G002	G005	63.479	-229.149	357.816	429.617
5	G002	G007	195.010	-268.186	492.125	593.414
6	G002	JZ25	-35.643	73.207	-122.661	147.226
7	G005	G007	131.531	-39.036	134.309	191.998
8	G005	JZ25	-99.122	302.357	-480.476	576.283
9	G007	JZ25	-230.654	341.393	-614.786	740.076

3D baseline correction parameters

#	From	To	Vx(cm)	Vy(cm)	Vz(cm)	Tolerance(cm)	
0	G001	G002	0.00	-0.00	-0.00	0.62	Qualified
1	G001	G005	-0.01	0.01	0.01	0.71	Qualified
2	G001	G007	0.00	-0.00	-0.00	0.74	Qualified
3	G001	JZ25	0.01	-0.01	-0.01	0.61	Qualified
4	G002	G005	0.00	-0.00	-0.00	0.69	Qualified
5	G002	G007	-0.00	0.00	-0.00	0.72	Qualified
6	G002	JZ25	-0.00	-0.00	0.00	0.63	Qualified
7	G005	G007	-0.01	0.01	0.00	0.64	Qualified
8	G005	JZ25	-0.00	-0.00	0.00	0.72	Qualified

7.9.7 2D adjustment report

It shows the 2D adjustment result.



2D adjustment report.txt - Notepad

File Edit Format View Help

2D adjustment result C:/Users/a/Documents/SGO (SOUTH GEOMATICS OFFICE)/TEST/TEST.sgo
Spare observation number = 18
Known points number = 1
Total points = 5
Baseline vector quantity = 10
Central meridian = 114.000000(dms)
ajor semi axis = 6378137.000(m)
1/Flattening = 298.257222933
Posterior unit weight variance = 0.000(cm^2)
RMS = 0.004(cm)

Known point

#	Name	X(m)	Y(m)
0	G001	10000.0000	10000.0000

Baseline vector

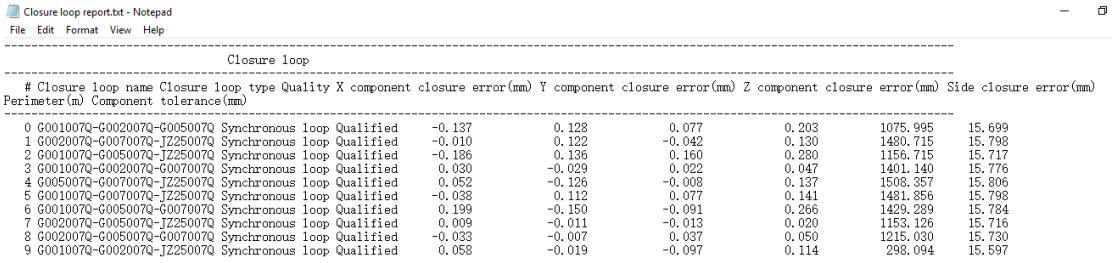
#	From	To	x(m)	y(m)	S(m)
0	G001	G002	107.662	12.684	108.407
1	G001	G005	535.834	47.895	537.970
2	G001	G007	697.042	-56.390	699.319
3	G001	JZ25	-39.535	15.474	42.456
4	G002	G005	428.171	35.211	429.617
5	G002	G007	589.379	-69.074	593.413
6	G002	JZ25	-147.197	2.790	147.224
7	G005	G007	161.208	-104.285	191.998
8	G005	JZ25	-575.369	-32.421	576.282
9	G007	JZ25	-736.577	71.864	740.074

Correction of 2D baseline component

#	From	To	Vx(cm)	Vy(cm)	Tolerance(cm)	
0	G001	G002	0.00	-0.00	0.62	Qualified
1	G001	G005	-0.00	0.01	0.71	Qualified
2	G001	G007	0.00	-0.00	0.74	Qualified
3	G001	JZ25	-0.00	-0.00	0.61	Qualified
4	G002	G005	0.00	-0.00	0.69	Qualified
5	G002	G007	-0.00	-0.00	0.72	Qualified
6	G002	JZ25	0.00	0.00	0.63	Qualified
7	G005	G007	-0.00	0.00	0.64	Qualified
8	G005	JZ25	0.00	0.00	0.72	Qualified

7.9.8 closedloop report

It shows the closure loop result in txt file.



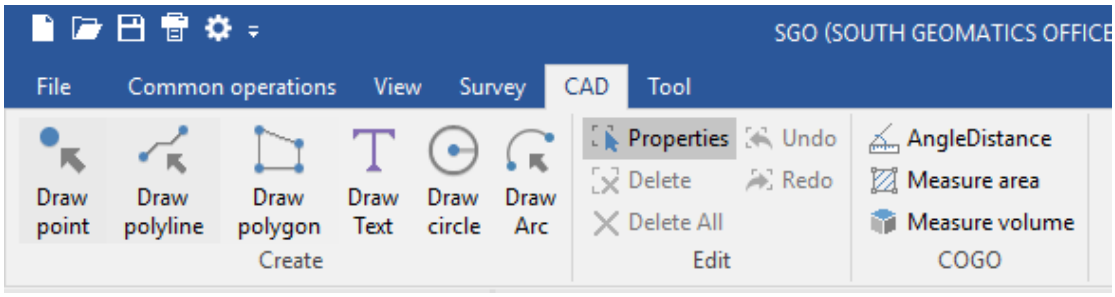
Closure loop report.txt - Notepad

File Edit Format View Help

Closure loop

#	Closure loop name	Closure loop type	Quality	X component closure error(mm)	Y component closure error(mm)	Z component closure error(mm)	Side closure error(mm)	Perimeter(m)	Component tolerance(mm)
0	G001007Q-G002007Q-G005007Q	Synchronous loop	Qualified	-0.137	0.128	0.077	0.203	1075.995	15.699
1	G002007Q-G007007Q-JZ25007Q	Synchronous loop	Qualified	-0.010	0.122	-0.042	0.130	1480.715	15.798
2	G001007Q-G005007Q-JZ25007Q	Synchronous loop	Qualified	-0.186	0.136	0.160	0.280	1156.715	15.717
3	G001007Q-G002007Q-G007007Q	Synchronous loop	Qualified	0.030	-0.029	0.022	0.047	1401.140	15.776
4	G005007Q-G007007Q-JZ25007Q	Synchronous loop	Qualified	0.052	-0.126	-0.008	0.137	1508.357	15.806
5	G001007Q-G007007Q-JZ25007Q	Synchronous loop	Qualified	-0.038	0.112	0.077	0.141	1481.856	15.798
6	G001007Q-G005007Q-G007007Q	Synchronous loop	Qualified	0.199	-0.150	-0.091	0.266	1429.289	15.784
7	G002007Q-G005007Q-JZ25007Q	Synchronous loop	Qualified	0.009	-0.011	-0.013	0.020	1153.126	15.716
8	G002007Q-G005007Q-G007007Q	Synchronous loop	Qualified	-0.033	-0.007	0.037	0.050	1215.030	15.730
9	G001007Q-G002007Q-JZ25007Q	Synchronous loop	Qualified	0.058	-0.019	-0.097	0.114	298.094	15.597

Chapter 8 CAD

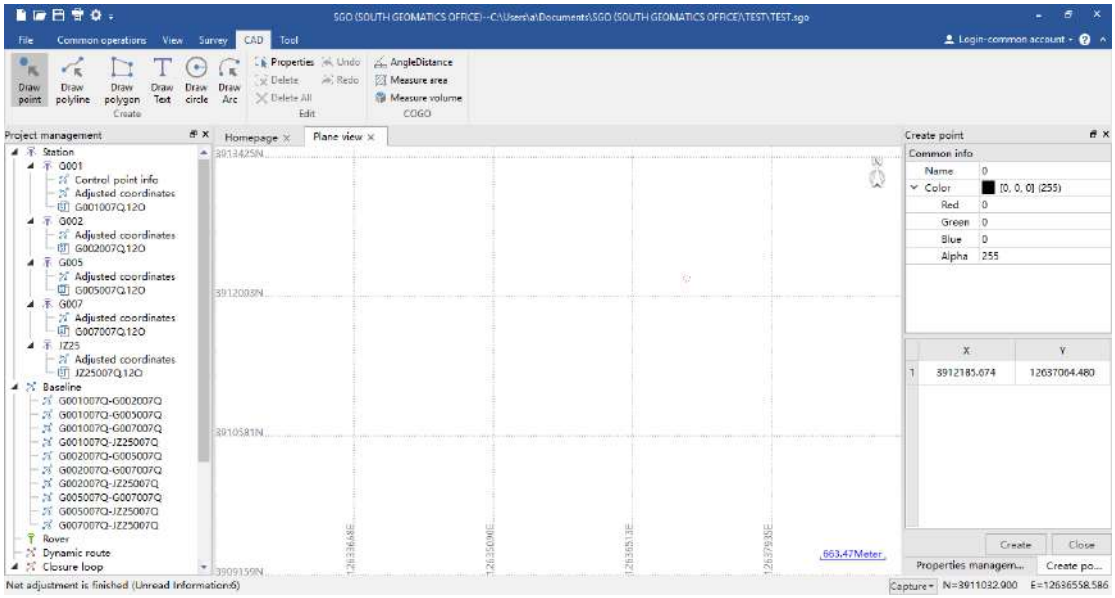


This chapter will introduce the CAD function in SGO, it is a useful function to help draw simple map base on the collected points. It also provide other function like angle and distance measurement, are and volume measurement.

8.1 CAD tools

8.1.1 Draw point

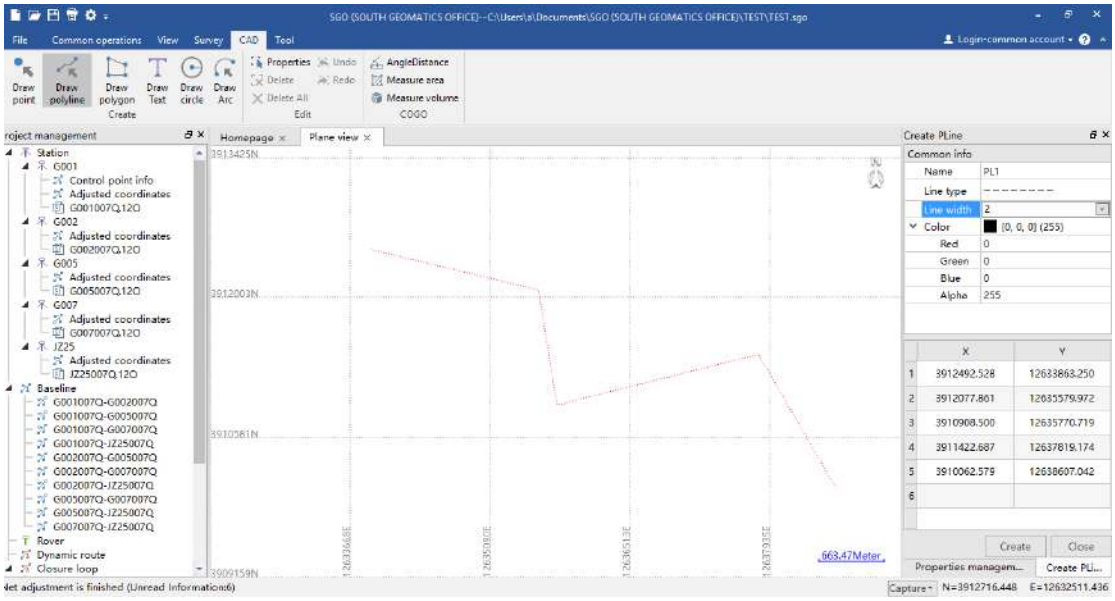
With this tool, users can draw a point on the map, click the position you want to draw it, in the right work space you can input the point name and point color, after check the point coordinates in the bottom, click Create button to confirm drawing or Close button to cancel it.



8.1.2 Draw polyline

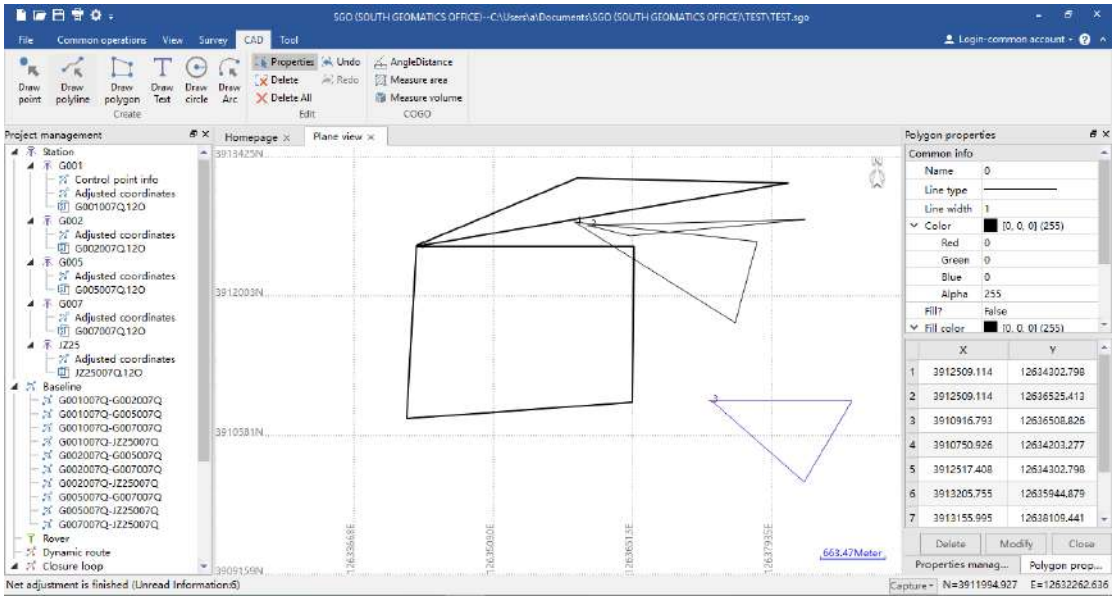
With this tool, you can draw polyline on the map, left click the mouse to select the trace of the polyline, right click the mouse to finish the drawing. Then you can input the polyline name and set

the line style, width and color in the right work space, after check the point coordinates of the polyline, click Create button to confirm drawing or Close button to cancel it.



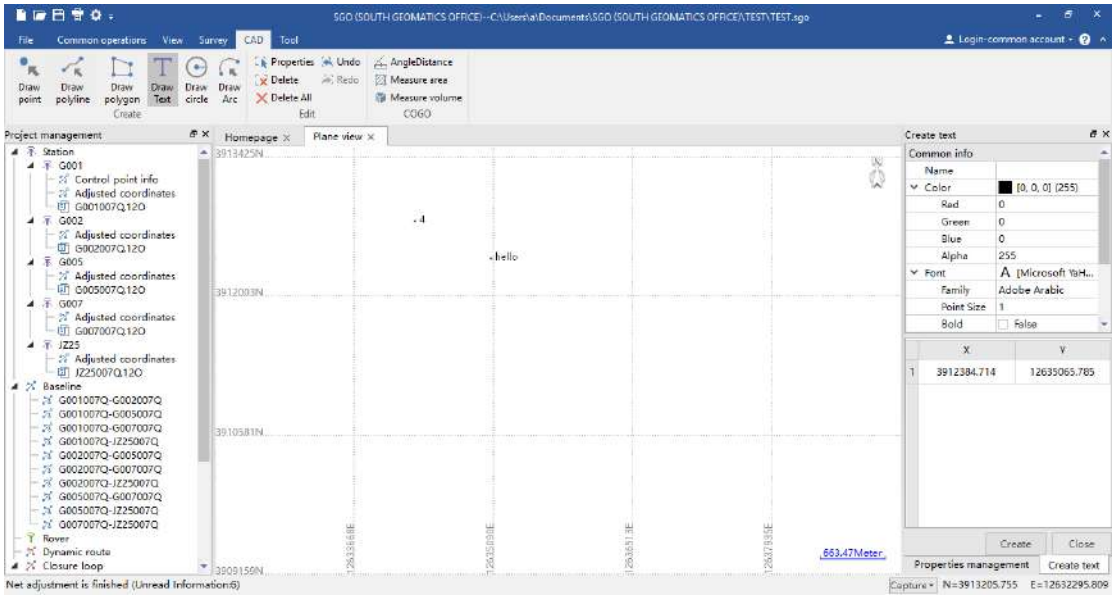
8.1.3 Draw polygon

With this tool, you can draw a polygon, left click the mouse to select the trace of the polygon, right click the mouse to finish the drawing. Then you can input the polygon name and set the line style, width and color in the right work space, after check the point coordinates of the polygon, click Create button to confirm drawing or Close button to cancel it.



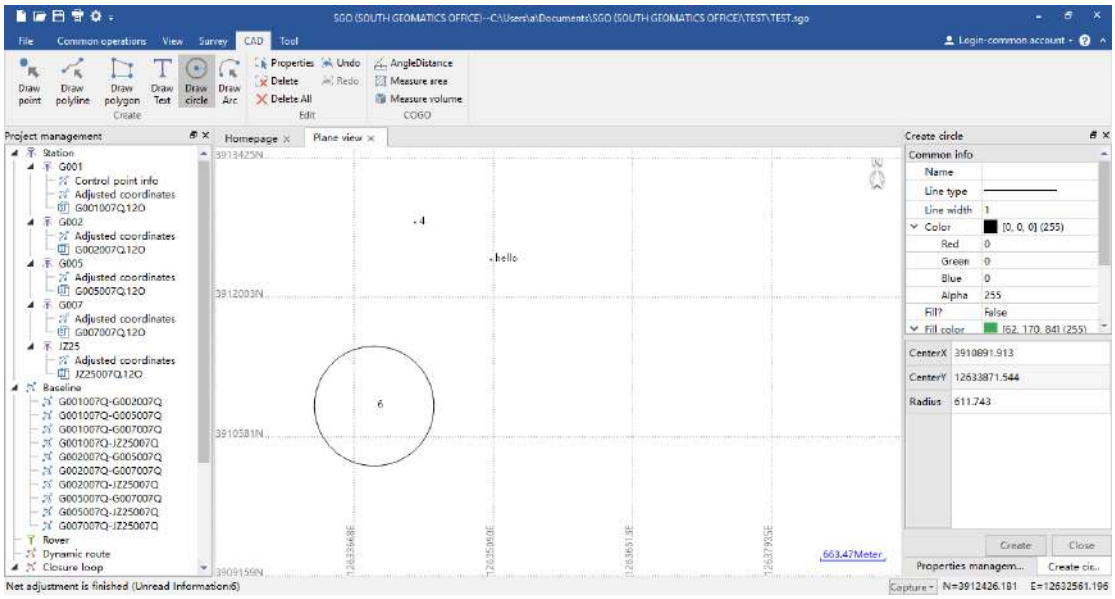
8.1.4 Draw text

With this tool, you can input text on the map, left click the mouse to select the position of the text. Then you can input the text name and set the text color and font in the right work space, after check the point coordinates of the text, click Create button to confirm drawing or Close button to cancel it.



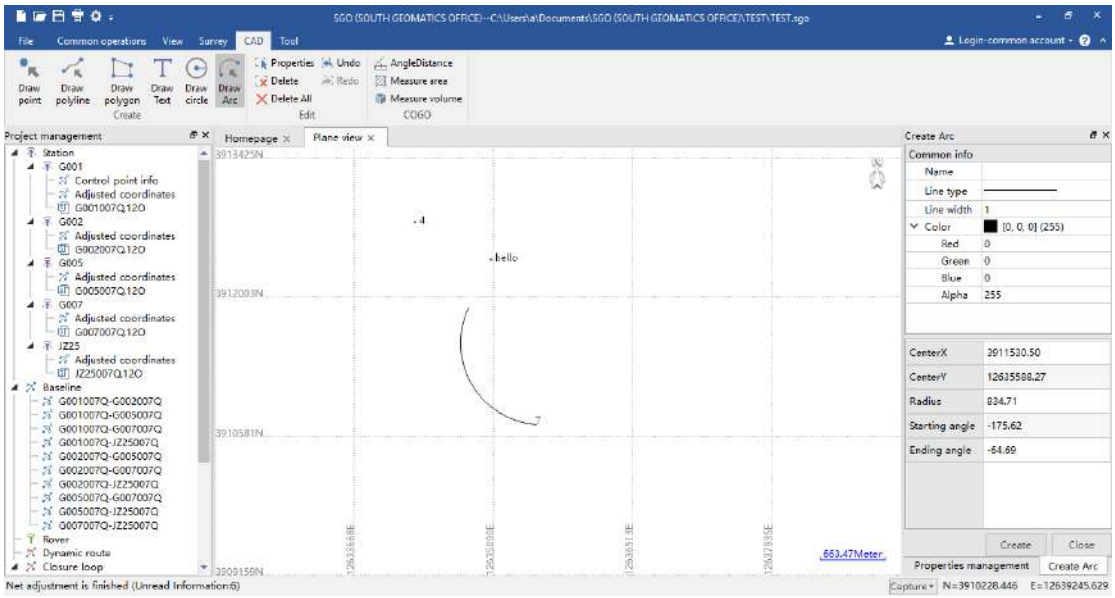
8.1.5 Draw circle

With this tool, you can draw a circle, left click the mouse to select the center of the circle, move the mouse to set the radius, click the mouse to finish the drawing. Then you can input the circle name and set the line style, width and color in the right work space, after check the point coordinates of the circle, click Create button to confirm drawing or Close button to cancel it.

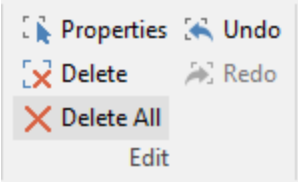


8.1.6 Draw arc

With this tool, you can draw a arc, left click the mouse to select the center of the arc, move the mouse to set the radius, click the mouse to set the start point of the arc. Then click the mouser again to set the end point of the arc. Then you can input the arc name and set the line style, width and color in the right work space, after check the point coordinates of the arc, click Create button to confirm drawing or Close button to cancel it.

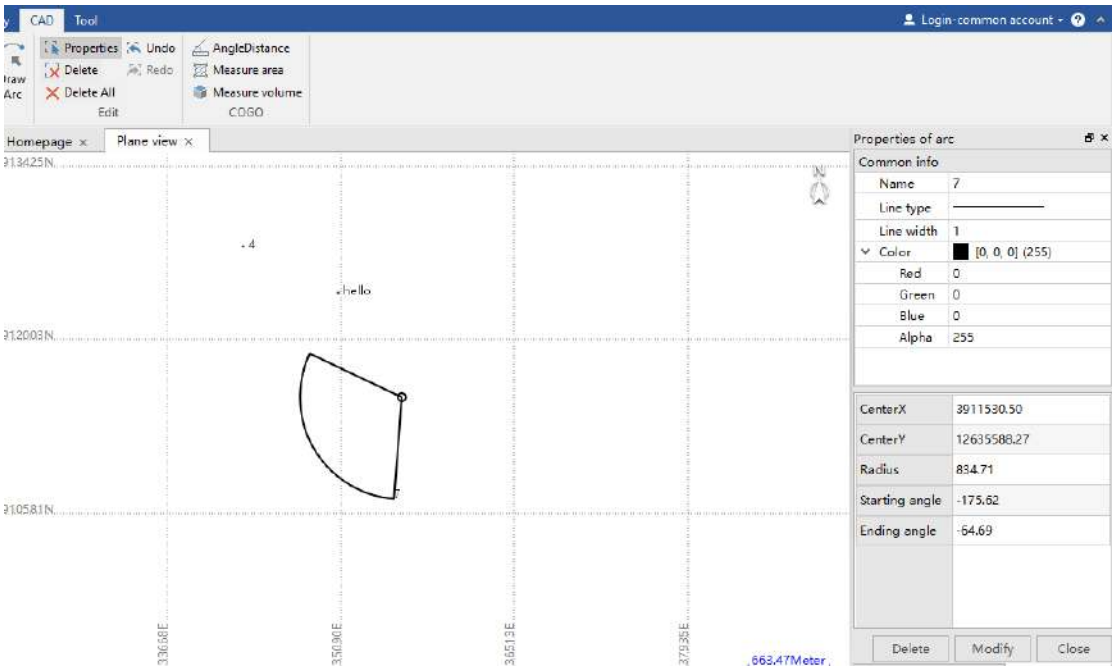


8.1.7 CAD edit



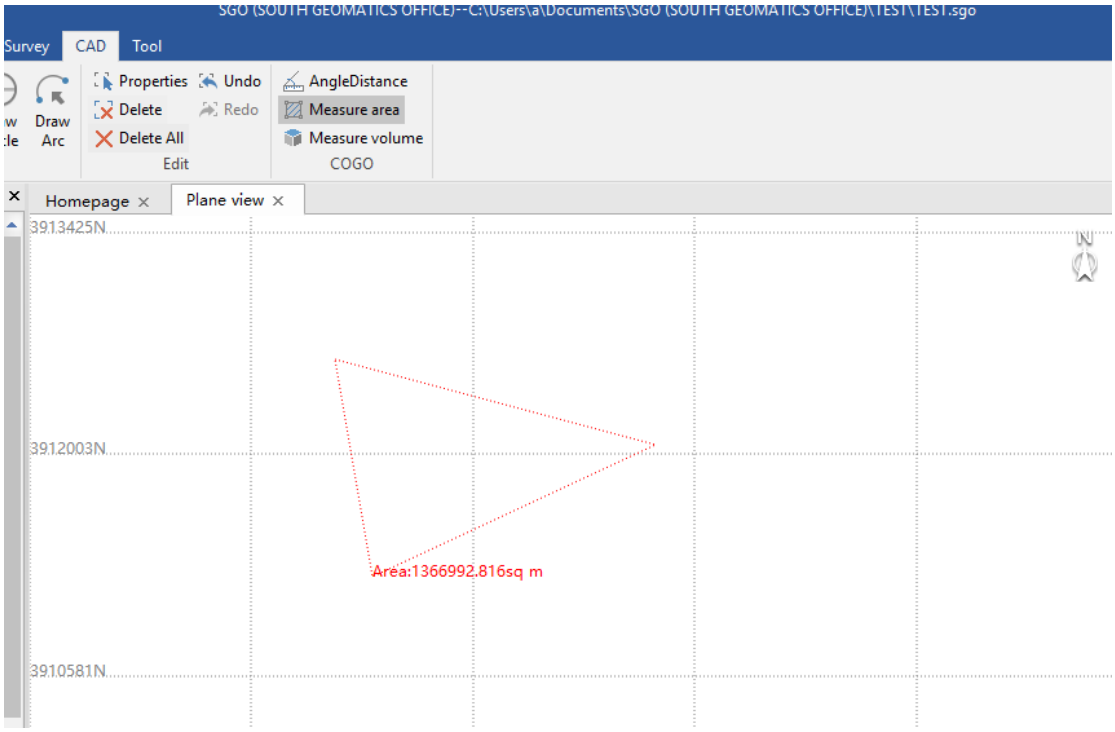
The SGO also provide CAD edit function like properties check, delete, delete all, undo and redo function.

After click Properties button, you can select the CAD shape in the map. Then you can edit it with other edit tools.



8.1.8 COGO

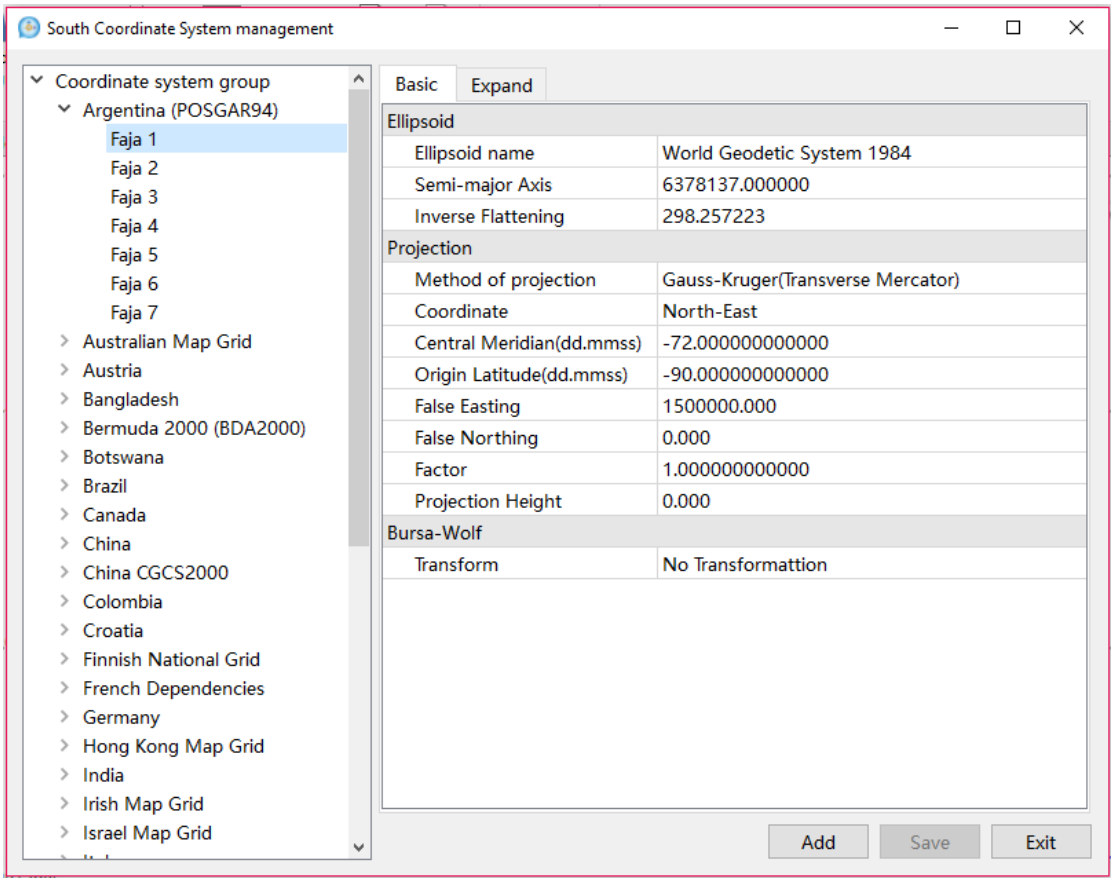
COGO provide tools to measure the Angle, Distance, Area and Volume.


SGO (SOUTH GEOMATICS OFFICE)--C:\Users\a\Documents\SGO (SOUTH GEOMATICS OFFICE)\TEST\TEST.sgo
Survey
CAD
Tool
Draw Arc
Properties
Undo
Delete
Redo
Delete All
Edit
AngleDistance
Measure area
Measure volume
COGO
Homepage
Plane view
3913425N
3912003N
3910581N
N
Area:1366992.816sq m

Chapter 9 Tool

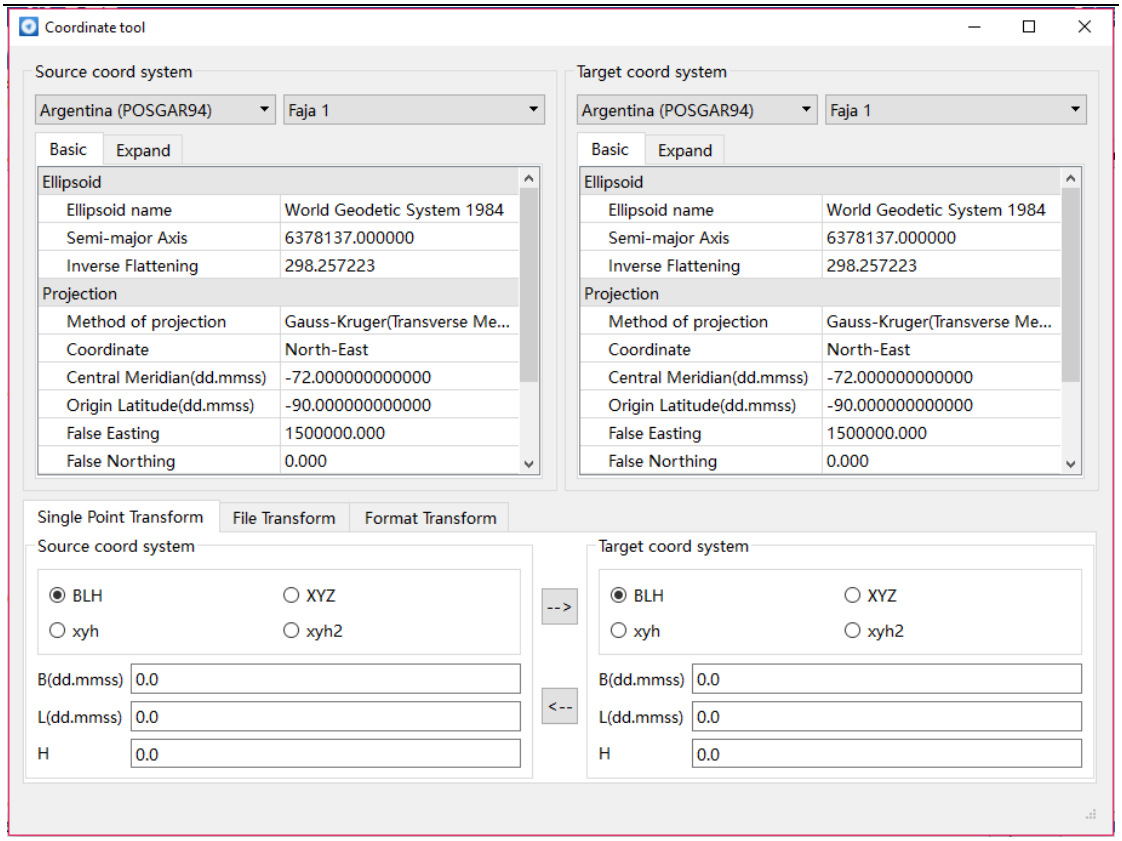
9.1 Coordinate system

Coordinate system management contains the majority of countries' and area's common used coordinate system, you can click on this command to check, edit, create new coordinate system.



9.2 Coordinate conversion

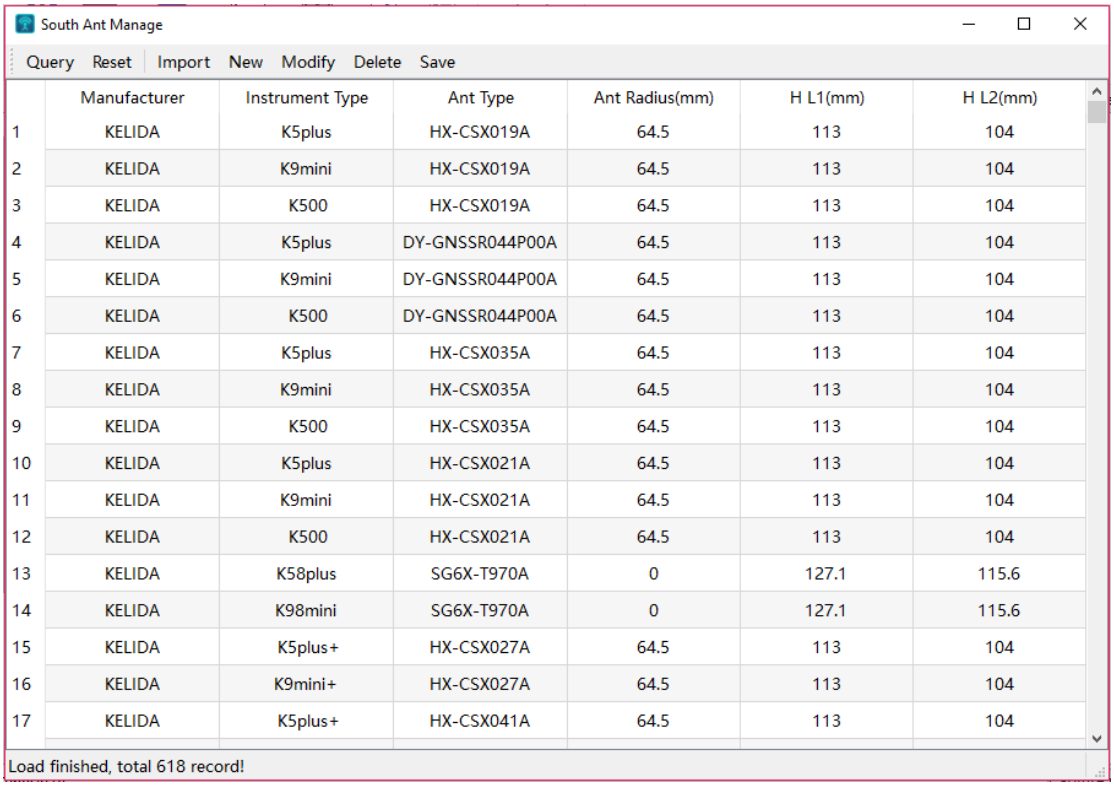
With Coordinate conversion tool, you can convert original coordinates no matter geodetic coordinates, Cartesian coordinates or plane coordinates to destination coordinates under same or different coordinates system.



9.3 Antenna management

Antenna management is designed for updating and editing the receiver parameter file. When you used an unknown receiver type but you have the geometric parameter of the receiver and the phase center height parameters, you can use this tool to add the receiver you as need.

Click Antenna management button, there will be pop-up the antenna manager window, you can set up some commonly used parameters here, such as the radius, the phase center height



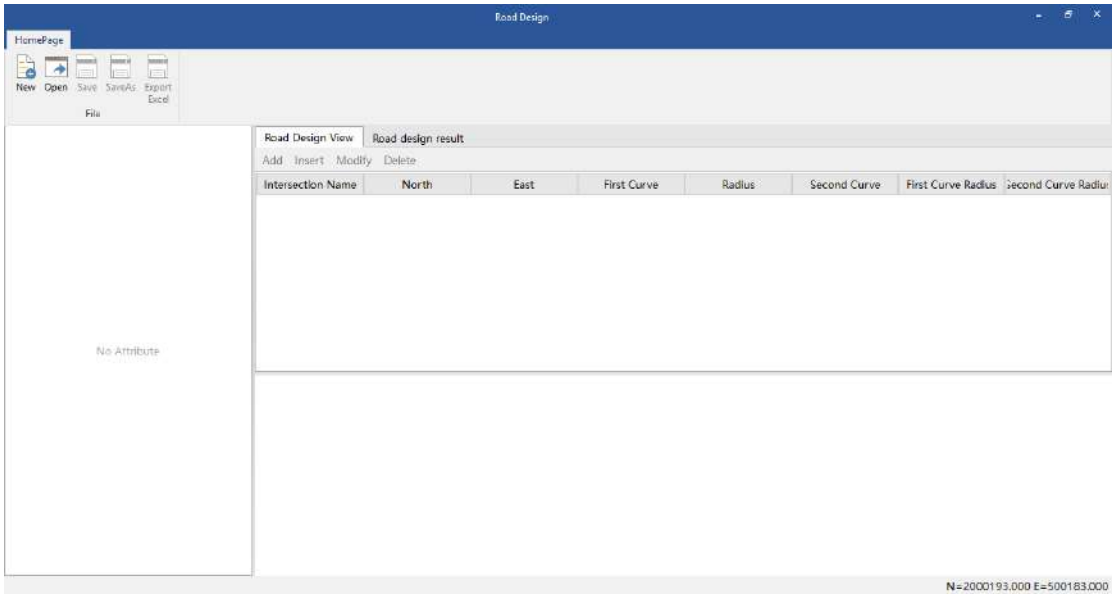
	Manufacturer	Instrument Type	Ant Type	Ant Radius(mm)	H L1(mm)	H L2(mm)
1	KELIDA	K5plus	HX-CSX019A	64.5	113	104
2	KELIDA	K9mini	HX-CSX019A	64.5	113	104
3	KELIDA	K500	HX-CSX019A	64.5	113	104
4	KELIDA	K5plus	DY-GNSSR044P00A	64.5	113	104
5	KELIDA	K9mini	DY-GNSSR044P00A	64.5	113	104
6	KELIDA	K500	DY-GNSSR044P00A	64.5	113	104
7	KELIDA	K5plus	HX-CSX035A	64.5	113	104
8	KELIDA	K9mini	HX-CSX035A	64.5	113	104
9	KELIDA	K500	HX-CSX035A	64.5	113	104
10	KELIDA	K5plus	HX-CSX021A	64.5	113	104
11	KELIDA	K9mini	HX-CSX021A	64.5	113	104
12	KELIDA	K500	HX-CSX021A	64.5	113	104
13	KELIDA	K58plus	SG6X-T970A	0	127.1	115.6
14	KELIDA	K98mini	SG6X-T970A	0	127.1	115.6
15	KELIDA	K5plus+	HX-CSX027A	64.5	113	104
16	KELIDA	K9mini+	HX-CSX027A	64.5	113	104
17	KELIDA	K5plus+	HX-CSX041A	64.5	113	104

In the list window, double click the name of the antenna, you can change the corresponding parameters directly.

You can create a new antenna parameters by tapping on **New** button, you can also import the .atx antenna file from NGS website directly by **Import** button.

9.4 Road design

Road design tool is used to design a road file for field road stakeout.



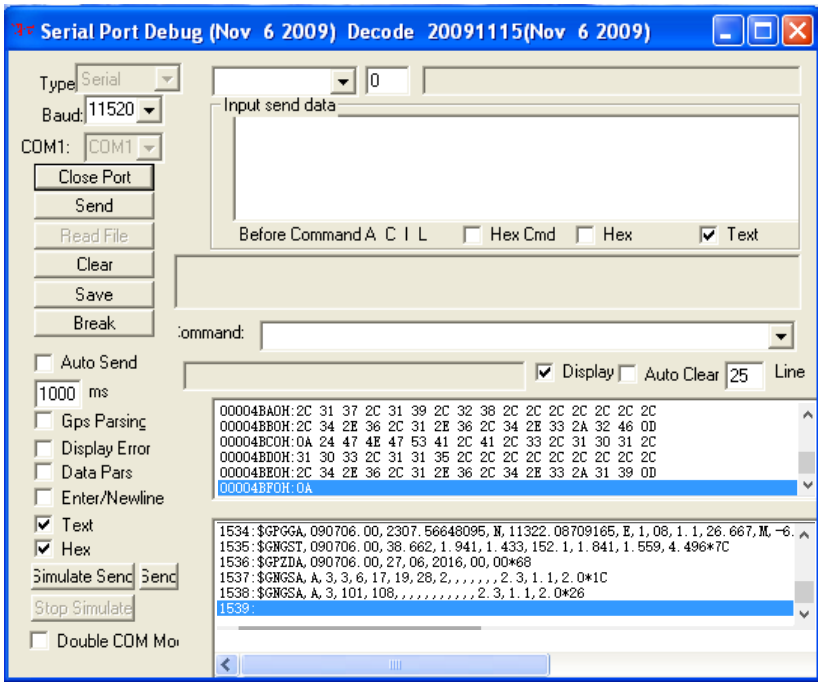
9.5 Instar

InStar is a multi-functional setting tool, which can perform data transfer, firmware upgrades, parameter settings, radio settings, network settings, mainframe register. This tool is simple and easy. Install InStar to the computer

- Perform “Data Output” and “Parameter settings” via USB port;
- Via serial port, the function options are “Radio Settings, Network Settings, Receiver Register. Both can do firmware upgrades;

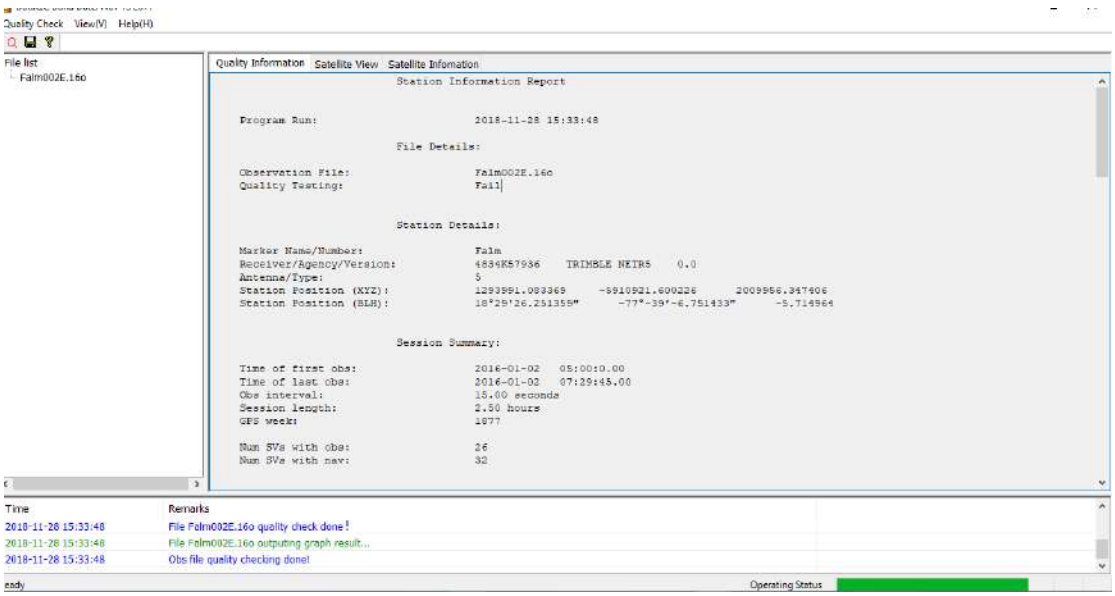
9.6 GPSdecoder

GPSDecoder software is used to debug the receiver module, you need to connect the receiver to PC by RS232 port. Select the correct port and baud rate, then you can receive the output message from the receiver and you can also send command to the receiver module.



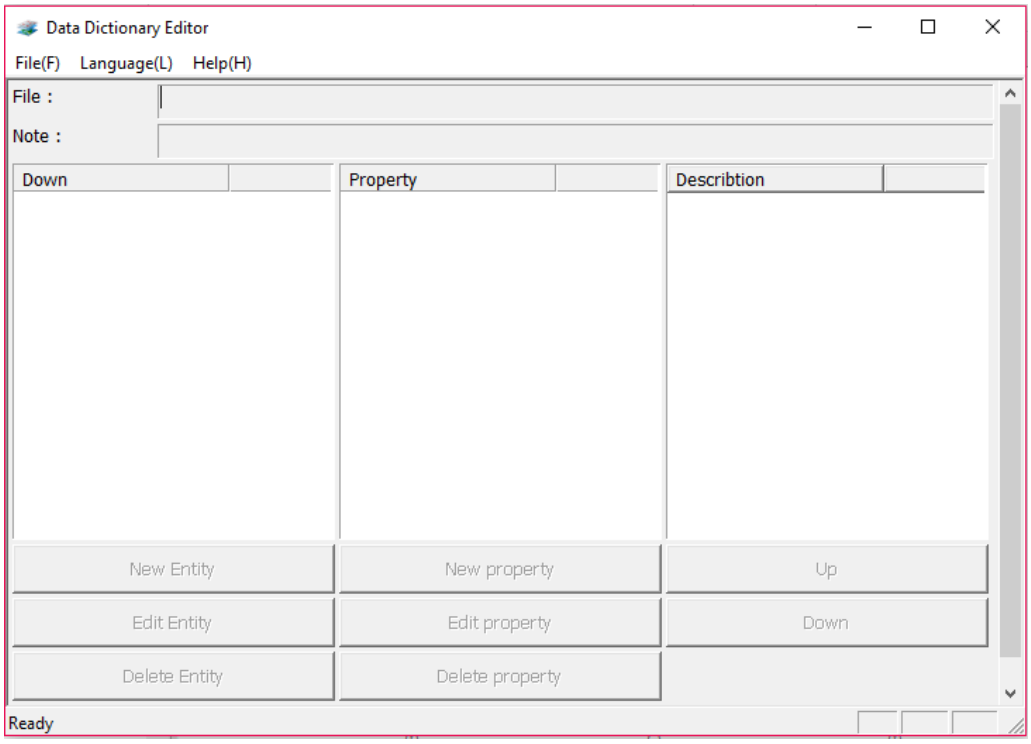
9.7 Quality check

This tool is used to check the single static data quality, we often use this tool to analyze the collected data from where should be a reasonable position for CORS station.



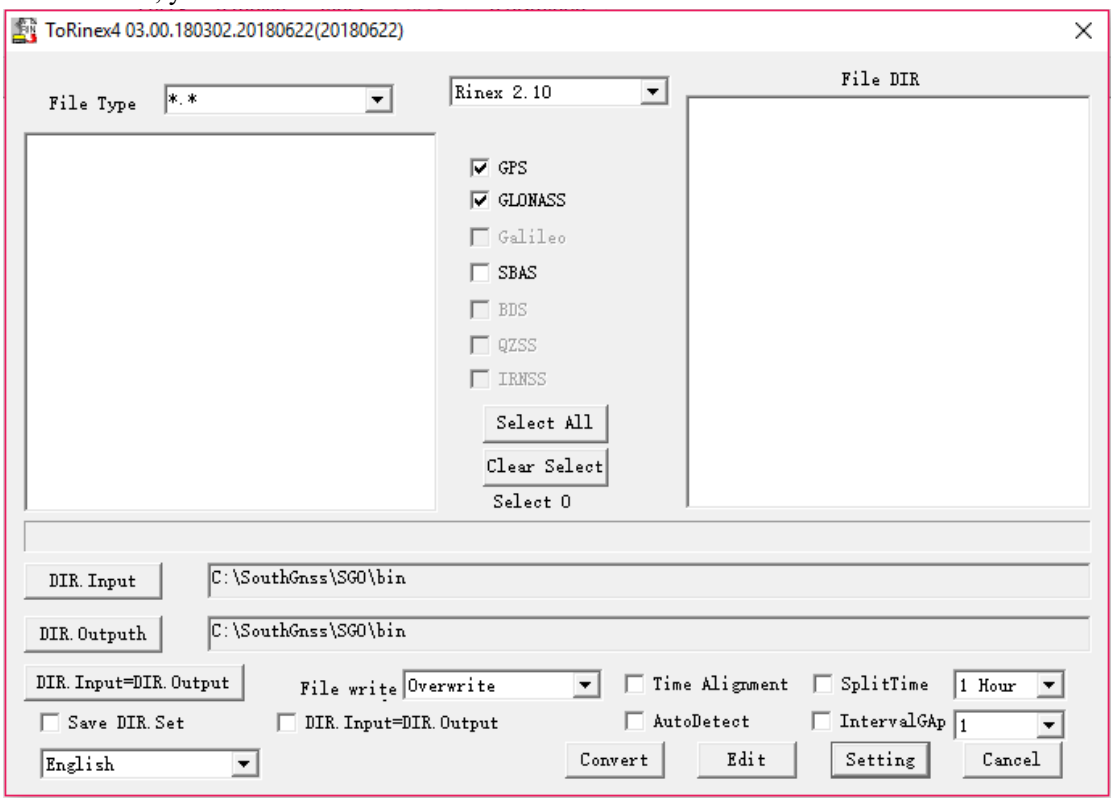
9.8 Data template

This is a tool to create GIS collection data dictionary which can be imported to SOUTH GIS data collector software GIStar. More information please refer to the GIStar manual.



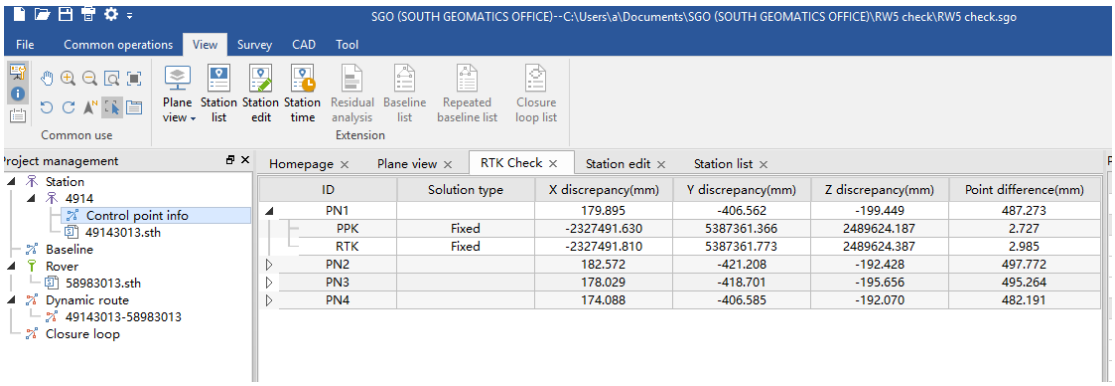
9.9 Export Rinex

With this tool, you can convert the different format static data into different version Rinex data.



9.10 RTK check

This function is allowed to compare the result between your RTK points and the kinematic points. At the meantime of your RTK job, you can save the kinematic raw data and process it in office, then check the difference of RTK points and kinematic points.



9.11 Software registration

Click software registration button, it will appear a new window then click Upgrade Account button appear another window which shows the serial number of the SGO in the local PC. Users need to send back the serial number to the provider and ask for a registration code. The advanced functions are just supported in registered version SGO.