SOUTH
Target your success

N1 & NAVI STATION

Total Station

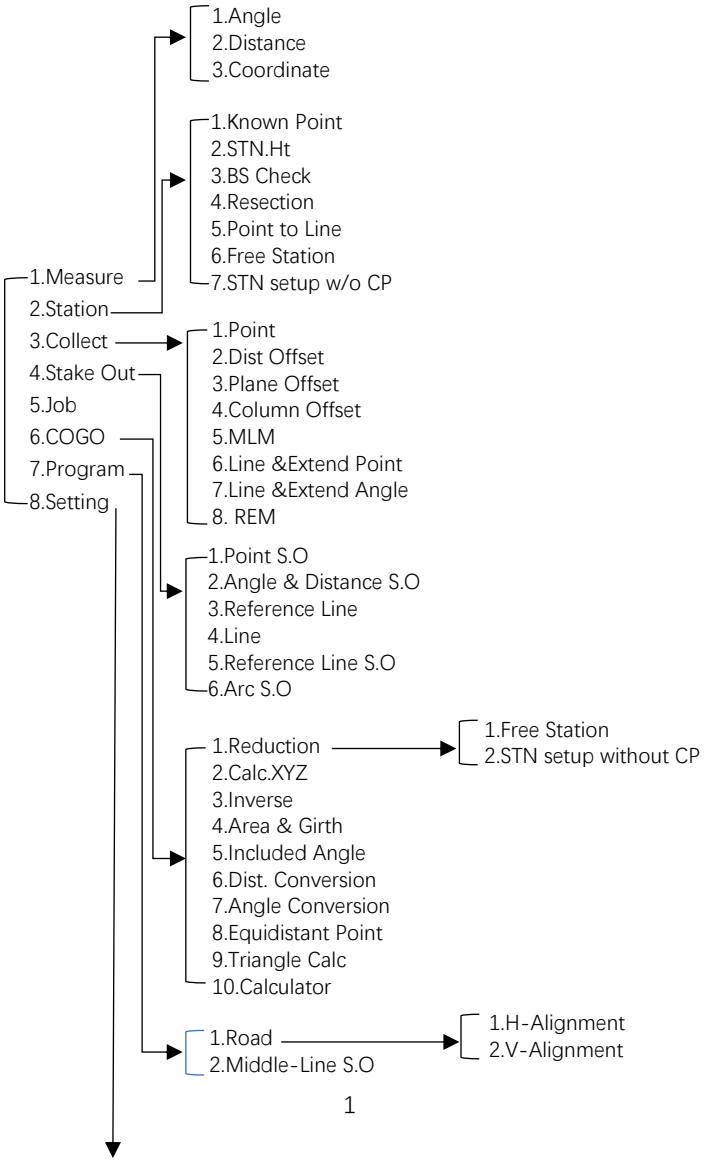
QUICK MANUAL

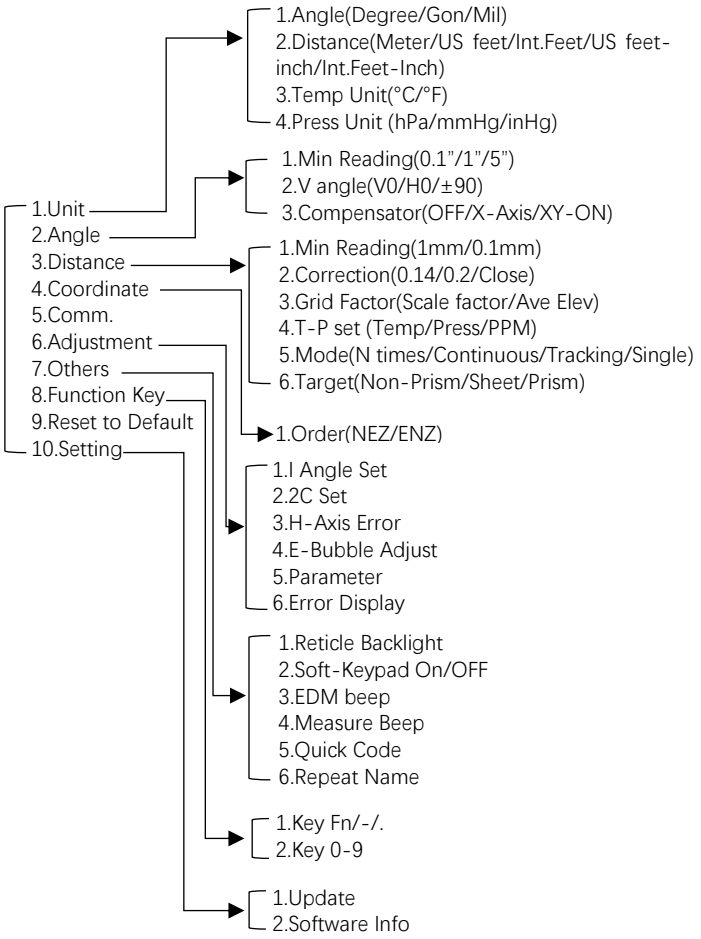
N1 & NAVI STATION

Quick Guide

1. Menu

1.1 Menu Explore View





1.2 Icon info

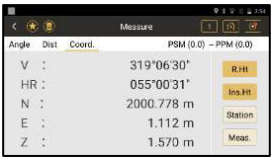
Icon	Meaning
	Photo
	TServer
	Star Key for Quick set
	Data center
	Measure mode
	Target mode (Non-Prism/Prism/Sheet)
	Tilt sensor

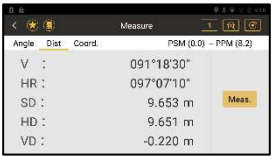
2. Measure

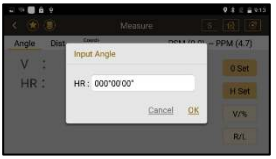
In Measure sub menu. There are 3 basic survey method. Angle, Distant and Coordinate. Please note it is not saved any measure data under this sub menu.

In Angle, you can 0 Set or input a certain value for Horizontal angle setting. Also, it allows switch vertical angle in regular or slope percentage, right or left of Horizontal.

In Coordinate, it allows temporary set reflector height and instrument height, setup STN and BS for measurement.







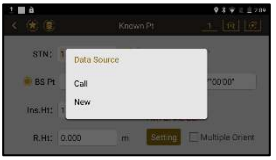
3. Station

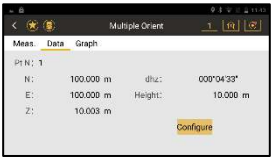
3.1 Known point.

There are 3 methods, by 2 two known point, by angle and multiple orient. Known point can be call from existing job file or manual input.

By Angle, select Azimuth and input angle value.

In Multiple Orient, select it and click Setting, Click Meas 1 Pt, then add another point, press COGO to check result. If accept it , press Configure





3.2 Station Height

Set Station height by measure a point with known height.
Input or Call a known point height and measure it. it will calculate new height for station, press setting .

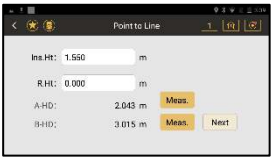
3.3 Back Sight Check

Check current back sight point to shows delta value for angle or for coordinate. Press Reset to renew the backsight.

3.4 Resection

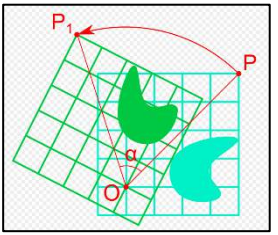
Resection is used for determined the station in new position from measure known points.
Select a geometrical graphic with good structure is important.
After measure achieve condition requirement, press COGO to get calculate result.
It will show measure result and standard deviation. If accept the result, press STN Setup to save it as new station point.

3.5 Point to Line



This function calculates the unknown occupied point from measure two points to define a coordinate system. Can be setup a new occupied point and measure other points base on this AB coordinate system.

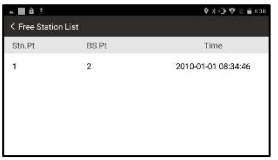
3.6 Free Station



An unknown point is used for orientation. Point data collected at this station need to be reduction to the following calculation to obtain the real coordinates.
As the figure shows, STN locate in O point, P is unknown point for orientation, P1 is real back sight, after reduction, all points collect in blue gird will turn to real coordinates shows at green gird. we need to get the P1 real coordinate before process reduction.

Operation Process:

A. Select Free station, Input STN name, it can be manual input or call from file.
B. Aim the backsight and press setting
C. Then start data collect in data collect.
D. COGO-Reduction-Free Station, Select the BS point No. Input or Call the real BS coordinate you aim as temporary before.
E. Press Reduction to finish process. All real coordinate will be shown in data center.

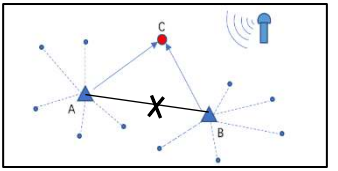


3.7 STN setup without CP

Station setup without control point is using two free station coordinate system, separate data collect first in each coordinate system, then using one public point in 2 system to reduction all points in correctly.

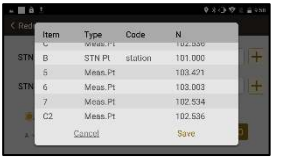
Application condition.

1. A. B is known points. But it is not sighting STN.
2. Two temporary system has public point C.



Operation Process

A. Station-STN setup without CP. Input or Call STN.
B. To do data collect. During data collect, it needs to collect public point C.
C. Move station to next STN B, Redo above process to do data collect. it also needs to collect public points C
D. COGO-Reduction-STN setup without CP. Input STN A, B, and public point C. select C location and press COGO. Then press SAVE.



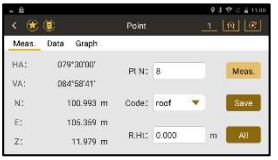
Note: C location need to be select on AB left side or right side. Wrong choose will cause coordinate wrong.

4. Collect

There are 8 method to do data collect.

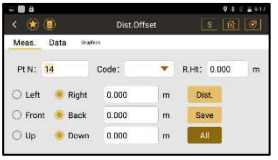
4.1 by Points

Input Pt Name, Code, and reflector height first, aim target and press Meas & Save, or directly press Save. Press Data to check all measure result and press Graph to view location.



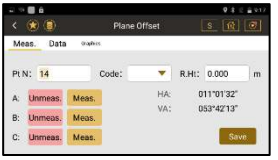
4.2 Distance Offset

Input the offset value as figure shows, then measure offset point, to get the final correct coordinate. *Note: All directions are correspondent to the visual side of operator. It can input first, also can be measure first.*



4.3 Plane Offset

Measure 3 points to define a plane. Then aim on target point. It will calculate the coordinate automatically. Press Data to view and press Save.

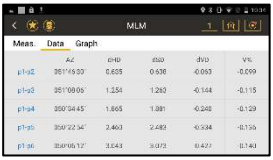


4.4 Column Offset

Aim column left and right edge to measure angle. Then aim column center to measure distance to get result, press DATA to view and press Save.

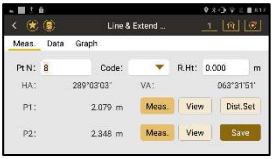
4.5 MLM

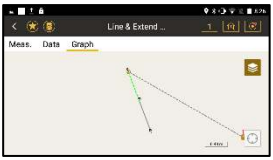
MLM function is mainly used to compute the HD/VD/SD/Azimuth between two points.
Turn on LOCK, result will be calculated by P1-P2, P1-P3.
Turn off LOCK, result will be calculated by P1-P2, P2-P3.
Aim Point, Press Meas, Ang.&Dist. Save. When measurement finish, press COGO to check result.



4.6 Line & Extend Point

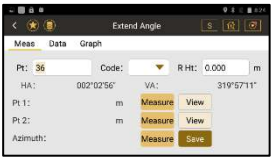
The extension function computes extend point from the base line, calculate the unknown coordinate from two measure points and the extend distance to get the coordinate.
Measure P1 then measure P2 to define line P1-P2, Press Dist Set to input extend distance. + and – is define the forward. + is P1>P2, - is P2>P1 forward.
Press Data to view coordinate and press SAVE.





4.7 Line & Extend Angle

Computes extend point from azimuth change.
Measure P1 and P2 to define base line. rotate housing to correct azimuth you want, press Save.

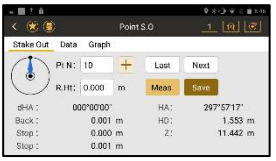


Note, Forward only P1>P2 direction in this method.

5. Stake Out

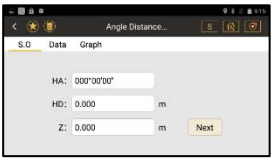
5.1 Point Stake Out

Set a coordinate for stake out, it can be called or inputted.
Follow the guide on screen, move prism far/near, right /left, up /down, till to all values close to 0, then press SAVE



5.2 Angle & Distance Stake Out

Stake out by input value of the HA, HD or Z.
After input value, others operation same as Point S.O.



5.3 Reference Line

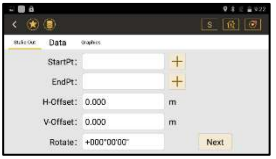
Pt can be called or input.
Input the azimuth, HD, and VD.
Others operation same as Pt, S.O

5.4 Line

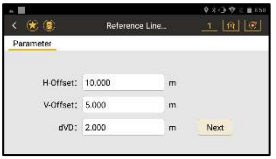
Define a line by call, input or measure the start point and end point. Then input offset distance and stake out.

5.5 Reference Line Stake Out

Define a base Line first by call, input or measure the start point and end point. Then input line offset value and rotate angle.



After defined base line, input stake out point offset value and press NEXT for stake out.



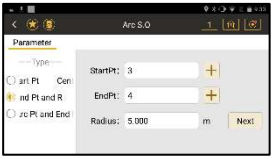
5.6 Arc Stake Out

It needs to define an Arc first. there are 3 method to defined Arc.

By CENTER/Start Point

By Start Pt, End Pt and Radius

By Start Pt, Arc Pt and Ent Pt



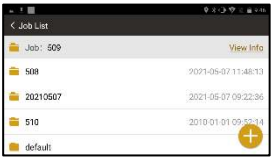
After defined Arc, Select stake out parameter. Stake Out Point/ Arc S.O/ String S.O/ Central Angle S.O, input relate value such as Arc Distance, Radius Distance, Arc Length, String etc. then Press Next to stake out.

6. Job

Press + icon to create a new job.

Press View info to check job attribute.

Long press job name to open, Delete and view job info.



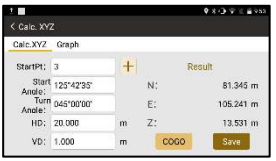
7. COGO

7.1 Reduction

Refer to 3.6 & 3.7

7.2 Calculate XYZ

Calculate with a known point base on direction and distance offset. Press COGO to calculate and Save.

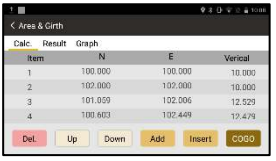


7.3 Inverse

Calculate relationship between two points. Points can be called, input or measure.

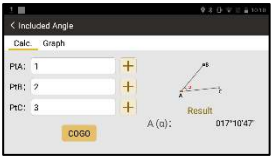
7.4 Area & Girth

Calculate the area and girth by points. Points can be called, Input or measure, also it allows insert, delete point, also allow move up or move down points order. Press COGO to calculate.



7.5 Included Angle

Calculate Angle by 3 points. Points can be called, input and measure, Press COGO to get result.

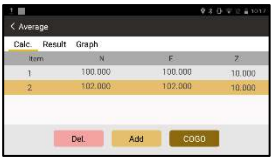


7.6 Distance & Ange Conversion

Convert the unit of distance and Angle.

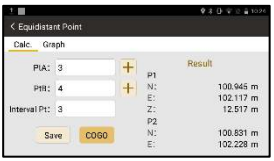
7.7 Average

Calculate the average value of know points. Points can be called, input or measure, press COGO to get result.



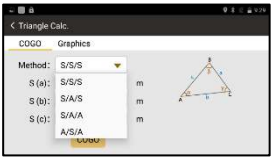
7.8 Equidistance Point

Defined a line by 2 points and input interval point, all interval points will be calculated and save.



7.8 Triangle Calculate

Calculate triangle base on input Angle or length.

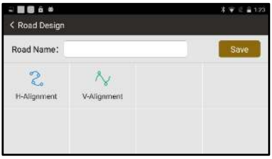


8. Program

It includes Road design and Middle line stake out.

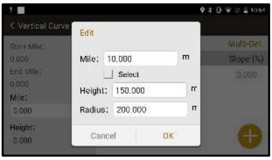
8.1 Road Design

It can be manual input H-Alignment and V-Alignment. also, it supports import road elements by different file type. Such as excel.



for H-Alignment, it needs to input elements such as intersection point NE. 1ST Trans Curve, 2nd Trans Curve, Radius of Curve. Start radius of 1st trans curve and end radius of 2nd trans curve.

For V-Alignment, it needs to input elements such as Mile, Height and Radius



Import from file

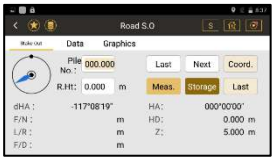
Support file format: *.rd-EG Star, *.ip-EG Star, *.xlsx-Road Elements Form, *.rod-EG Star, *.pm and *.jd.

Example by xlsx format:

交点号 Intersection Point No.	交点坐标 Pt. Coordinate N (X)	E (Y)	交点桩号 Intersection Pile No.	转角值 Turn Value	半径 Radius	缓和曲线长度 Transition Curve	缓和曲线参数 Transition Curve Parameter	切线长度 Tangent Length	曲线长度 Curve Length	外距 Outer Distance	校正值 Verify Value
1	2	3	4	5	6	7	8	9	10	11	12
QD	3151084.959	501427.6078	K21+046.637								
JD1	3151901.799	501122.9571	K21+422.395	17° 06′ 05.7″ (Y)	2500			375.918	746.2454	28.105	5.591
JD2	3159837.[illegible]	499179.397	K24+615.368	93° 46′ 14″ (Y)	9000			910.628	1786.222	195.16	51.093

8.2 Middle Line Stake Out

Finish road design first, then open a road file, input Start Mile, interval and offset value. Start to Stake out ,



9. Setting

Unit	Angle	Degree/Gon/Mil/DDM MSS
	Distance	Meter/US ft/Int ft/US ft-inch / Int.ft-inch
	Temperature	°C / F °
	Press Unit	hPa/mmHg/inHg
Angle	Min reading	0.1”/1”/5”
	V0	V0/H0/±90°
	Compensator	OFF/X-axis/Y-Axis
Distance	Min Reading	0.1mm/1mm
	Correction	Close/0.14/0.2
	Scale factor	Input value
	Average Elev.	Input value
	Grid Factor	Auto calculate base on Scale factor and average elevation
	Temperature	Input value
	Press	Input value
	PPM	Auto calculate base on temperature and press
	Mode	N times/Continuous/ Tracking/ Single
	Target	Non-prism/sheet/Prism
Coordinate	Order	NEZ/ENZ

Adjustment	I angle Set
	2C Set
	H-Axis Error
	E-Bubble
	Parameter-Constant set
	Error Display
Others	Reticle backlight ON/OFF
	Soft keypad ON/OFF
	EDM beep ON/OFF
	Measure Beep ON/OFF
	Quick code ON/OFF
	Repeat Name ON/OFF
Function Key	Define keys function
Reset to default	YES/NO
Setting	Update
	Software Info

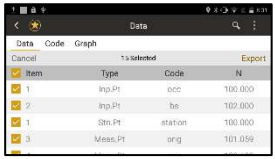
Star Key

Press Star key for quick set.

1. Laser Pointer ON/OFF, long press can be set auto off time 30sec/1min On/5min On/always On.
2. Reticle Backlight ON/OFF, long press can be set level from 1 to 4.
3. Laser Plummet ON/OFF, long press can be set level from 1 to 4.
4. Temp& Press. Manual input to reading from sensor.

10. Data

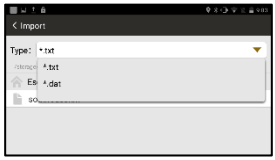
Press  to data center, it can manual input, edit or delete data. Press  to export or import data.



10.1 Data export

Click “Export”, select data type and format.
Coordinate: support TXT,DXF,DAT and CSV format. For coordinate order, click gear icon on right top corner to define it.
Raw data and SA data only support export TXT format.
Select the destination folder path. Then press OK.
Export code file, Click CODE, then same as data operation.

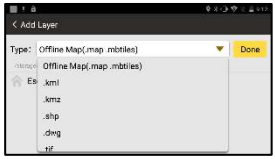
10.2 Data Import



only support 2 format for coordinate, TXT and DAT. The default file folder is /Storage/ emulated/0/com_southgnss/ surveystarExpand/input. Select the correct folder and click file you want to import. It will ask defined import coordinate order.

Code import only support TXT file and same folder as coordinate data.

Graph Import.
N1 and NAVI STATION support loading graph as background.
In Data center, Graph, Click layer icon, press + to load graph file.



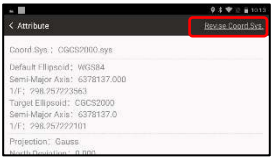
It support MAP, MBTILES, KML, KMZ,SHP,DWG,TIF,TIFF,DXF format. The graph file should be locatein /Storage/emulated/0 /Com_Southgnss_surveystarExpand/Map folder.

11．GNSS Collect

For Navi Station, it allows collect data by GNSS for station setup and data collect. It will ask OPEN GNSS or not when enter relate menu.

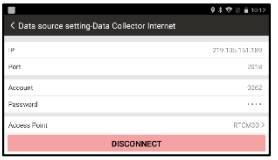
for GNSS data collect, it needs to setup GNSS parameter first. Press Setting.

Setup Coordinate system, Press Revise Coord.Sys to define local system



Select datalink source. From external mode (by CORS) or UHF

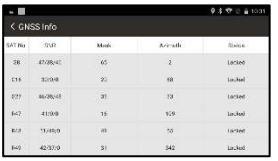
For connect CORS setting, input IP, Port, Account, password and access points, click CONNECT.



For UHF setting. Input match channel, baud rate and protocol.

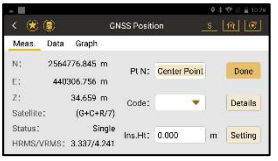
Press for view satellite status, slide right side window to check base info, point info and accuracy factor.

In GNSS info page, press right top corner to check satellite list



In GNSS info page, press right top corner, press data to get the debug data send out from COM. .

after GNSS setting, back to data collect or station setup menu. Check the status on right side, when the status in FIXED, Press ALL or DONE to save it.

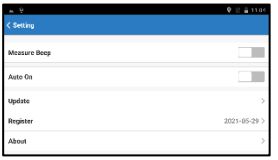


12．Tserver

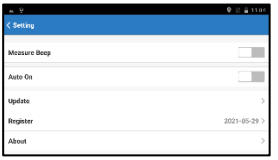
TServer is an individual application, which function is a data dispatch platform. It read all data from hardware platform and distribute to data collect software such as SurveyStar or others 3rd party software.

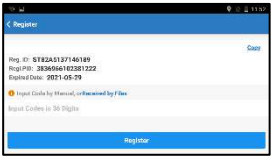
Model: South TS Series
Connect Type: Serial Port
Device List: ttyMT3:115200
Click CONNET.

In Tserver, all setting change will relate to Survey Star.



when connect to internet, Tserver can be download update file to update.
Register: Tserver need to register so that the data collect software can read data. If it is expired , no hardware data send to data collect software.
Click Register and input 36 Digits register code to register.





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Add: South Geo-information Industrial Park, No.39 Si Cheng Rd, Guangzhou, China

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