

SOKKIA Link

User's Guide

- Read the Software Usage License Agreement contained at the back of this manual before using this software.
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- The content of this manual is subject to change without notice.
- Some of the diagrams and screen displays shown in this manual are simplified for easier understanding.
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1. Overview

1.1 Introduction

SOKKIA Link is basic data-link software. It can handle SOKKIA SDR files in various ways according to your purpose. In addition to basic functions, such as import, editing and export, special features are also prepared.

You can confirm survey data graphically and convert them to many kinds of formats including DXF. Connecting to SOKKIA total stations allows real time measurement (adding a measured coordinate directly to SOKKIA Link).

Read this chapter first. Chapter 2 onwards describes the details of functions in the order of the main menu of this software.

Precaution

Data should be backed up (transferred to an external device etc.) on a regular basis to prevent data loss.

- The user of this product is expected to follow all operating instructions and make periodic checks (hardware only) of the product's performance.
- The manufacturer, or its representatives, assumes no responsibility for results of faulty or intentional usage or misuse including any direct, indirect, consequential damage, or loss of profits.
- The manufacturer, or its representatives, assumes no responsibility for consequential damage, or loss of profits due to any natural disaster, (earthquake, storms, floods etc.), fire, accident, or an act of a third party and/or usage under unusual conditions.
- The manufacturer, or its representatives, assumes no responsibility for any damage (change of data, loss of data, loss of profits, an interruption of business etc.) caused by use of the product or an unusable product.
- The manufacturer, or its representatives, assumes no responsibility for any damage, and loss of profits caused by usage different to that explained in the operator's manual.
- The manufacturer, or its representatives, assumes no responsibility for damage caused by incorrect operation, or action resulting from connecting to other products.

1.2 Requirements

Hardware Requirements

Minimum Requirements	
Computer/ Processor	166 MHz or higher Pentium-compatible CPU.
Memory	At least 128 MB RAM (more memory generally improves response time.)
Hard Disk	2 GB with 650 MB free space.
Drive	CD-ROM or DVD drive.
Display	VGA or higher resolution.
Ports	One Serial port or USB.

Software Requirements

- Operating System : Windows XP®, Windows Vista®
- Display Resolution : 1024 x 768 or higher

CAD Requirements

- Format : DXF
- DXF Version : Release 12 is recommended

Interface Cable Requirements

When connecting the Total Station to a PC, a separate interface cable is required.

- WinCE total stations (SRX, SET X): DOC129 (PC D-sub 9 pins, male)
- Other total stations : DOC27 (PC D-sub 9 pins, male)

1.3 Installing SOKKIA Link

 You must use the SETUP program to correctly install SOKKIA Link. Simply copying files from your original CD will not properly configure the program. SETUP will copy only the appropriate files to your hard disk and optimize all programs for your system.



Procedure

1. Insert the SOKKIA Link CD into the appropriate drive.



2. Click [**Next**].



3. Read the license agreement. Select

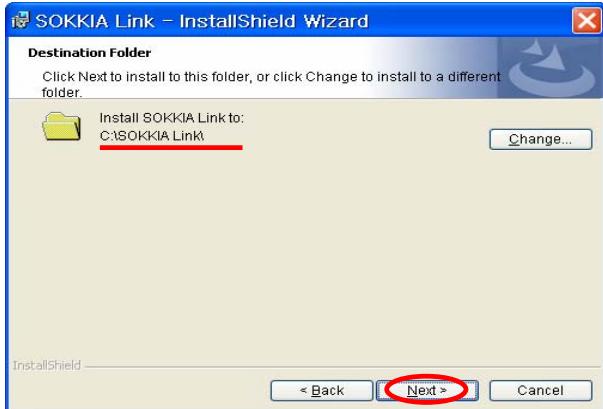
"I accept the agreement" and click [**Next**].



4. Read Information. Click [**Next**].



5. Select Destination Location. Click [Next].



6. Click [Install] to Start installation.



Note

Do not change the default location and start menu folder settings shown above when using Windows Vista.

7. Installing.



8. Click [Finish].



Note

Select [start] - [programs] - [SOKKIA Link] - [Uninstall SOKKIA Link] to uninstall.

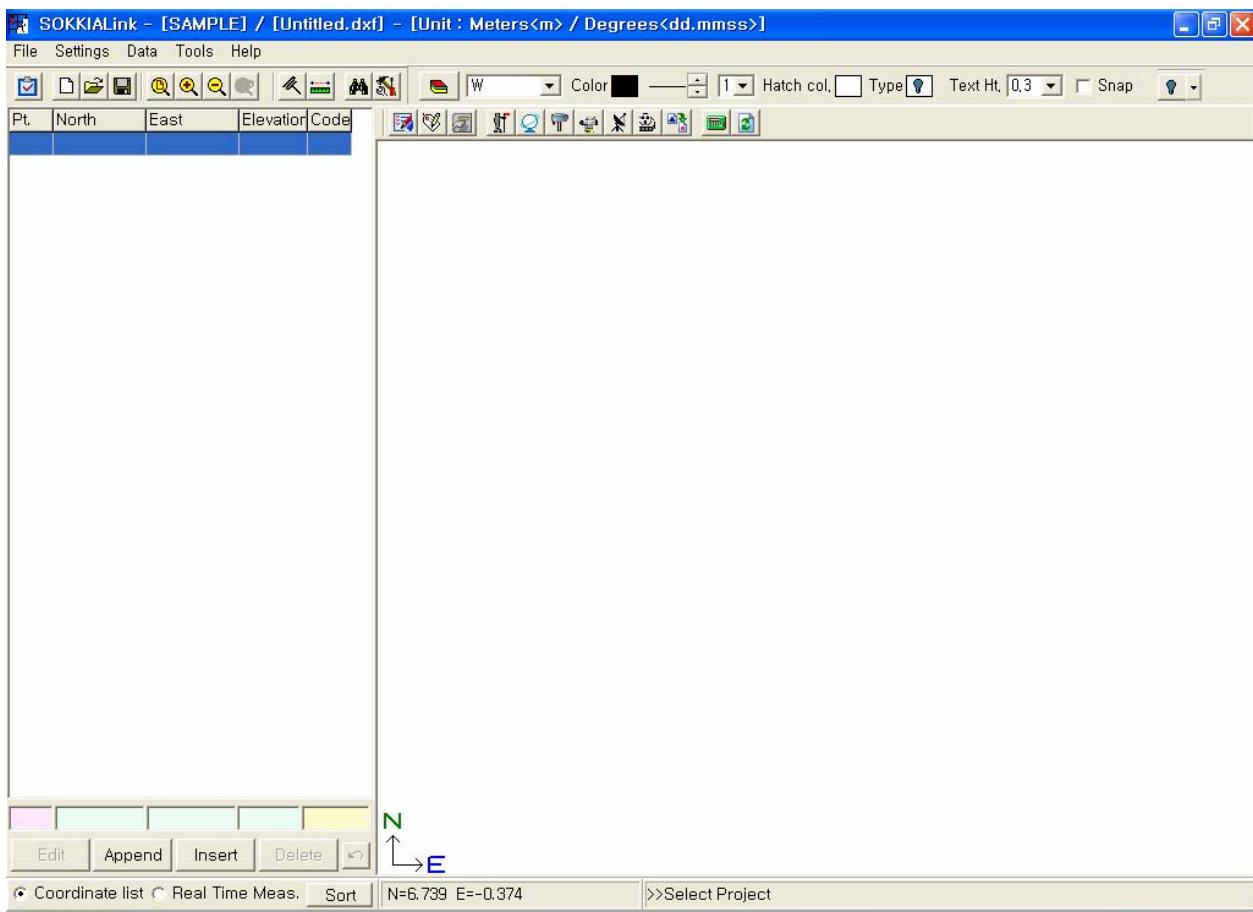
1.4 Starting SOKKIA Link



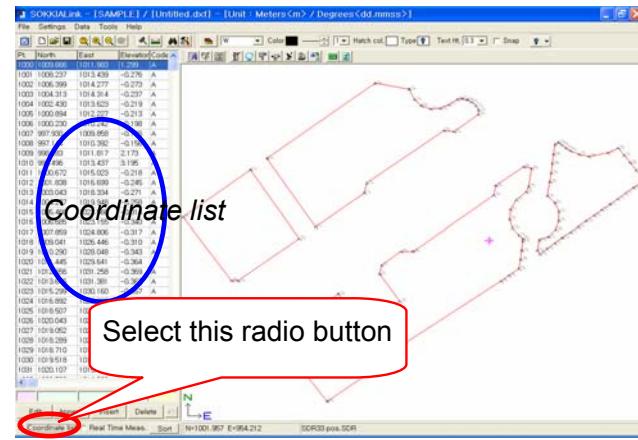
Click the **SOKKIA Link** icon on the desktop or select [start] - [programs] - [SOKKIA Link]

- **[SOKKIA Link]** to start SOKKIA Link.

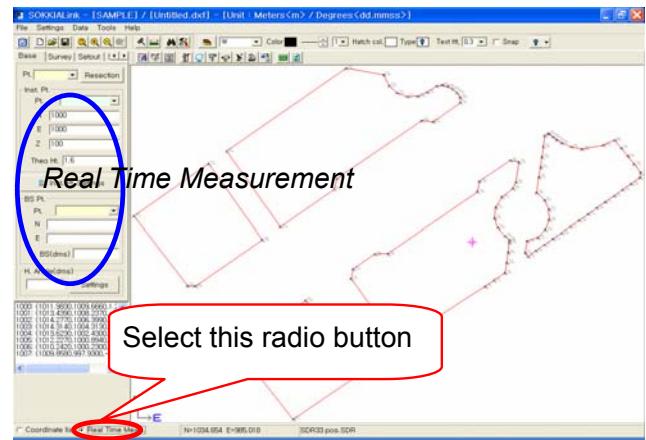
SOKKIA Link main screen



Coordinate list window



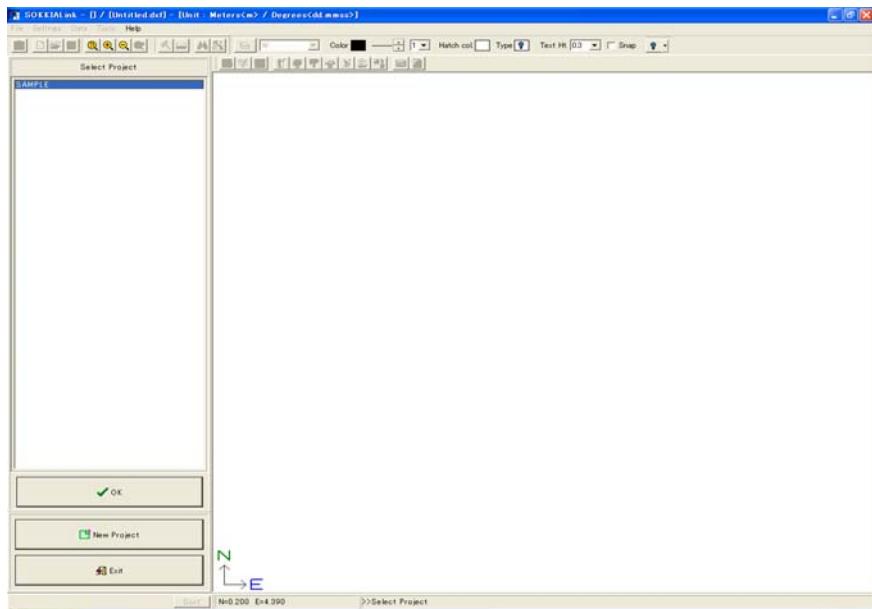
Tabs for Real Time Measurement window



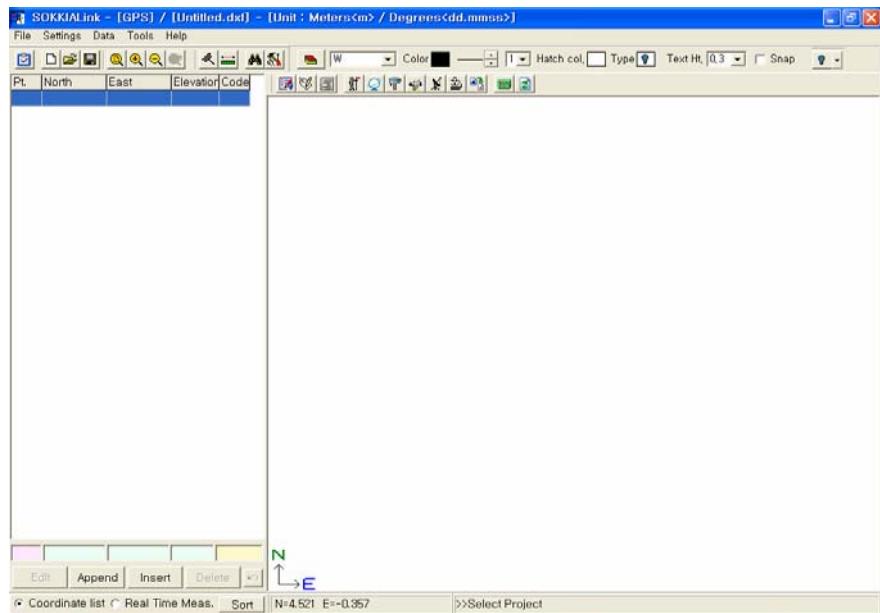


Note

To start SOKKIA Link, you have to select a project. Please refer to the "2-3 Selecting a Project".



Once a project has been selected, press **[OK]**. The main screen changes to that shown below.



Note

Select **[File] – [Exit]** to quit SOKKIA Link.

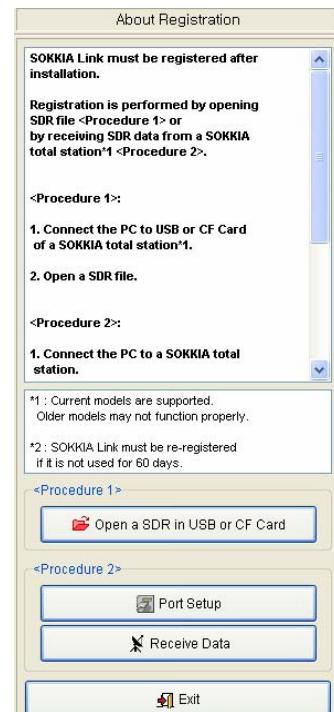
1.5 Registering SOKKIA Link

 SOKKIA Link must be registered after installation. A SOKKIA Instrument is required when registering SOKKIA Link. If SOKKIA Link has not been used for 60 days, it must be re-registered.



Procedure 1

1. Connect the PC to a USB device or CF Card for a SOKKIA instrument.
2. Open an SDR file.



Procedure 2:

1. Connect the PC to a SOKKIA instrument.
2. Click [**Port Setup**] and set parameters to match the instrument's settings. (Refer to "3.4 Port Setup")
3. Click [**Receive Data**] (Refer to "4.5 Receive Data")
4. Click [**Connection**] and send SDR data from the instrument.
5. Save the received data by clicking [**SDR Save File**] to complete registration.



Note

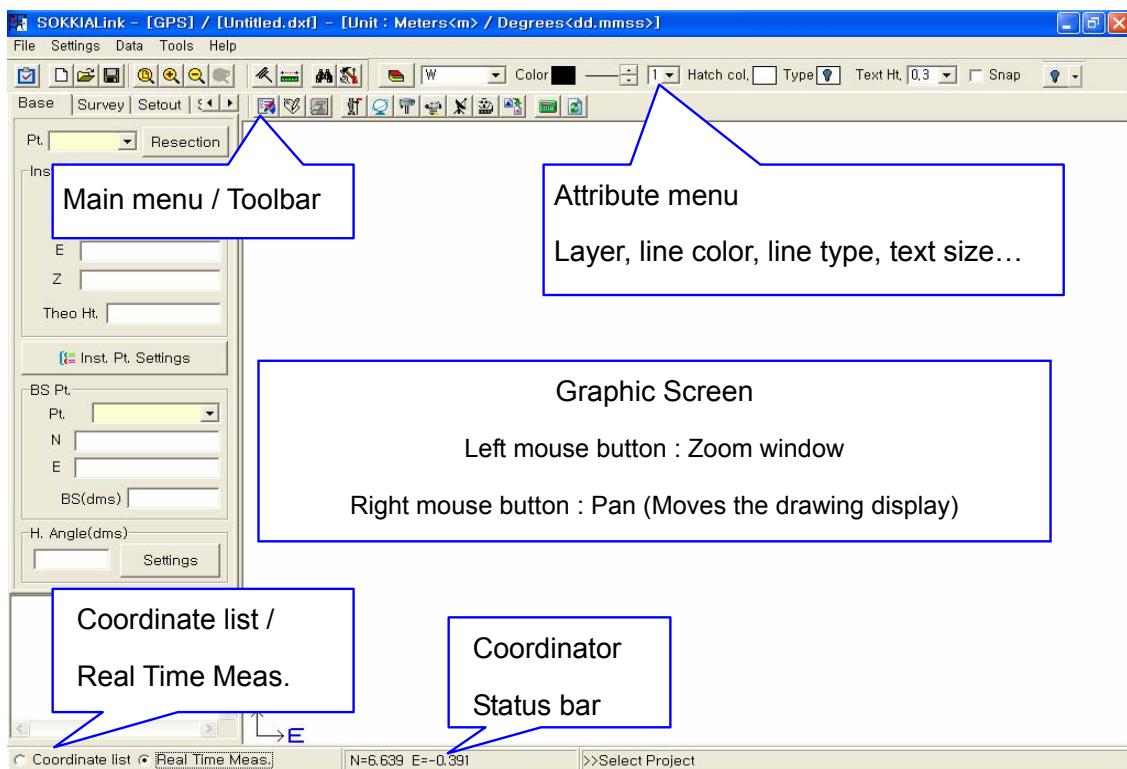
Error message when removable disk not selected.

- Windows OS message : I/O error 21.
- SOKKIA Link message : Please select "Removable Disk".

1.6 The Main Screen



The main screen consists of five sections.



► Using the Attribute menu ◀



Manage drawing layers. Click to open Layer Manager (create or delete layers, turn layers on or off).

Turn all layers on

Turn all layers off

Current layer selection: Select layer from drop-down list.

Current layer color. Double-click to change color.

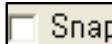
Current line (continuous, hidden, dot, center, phantom). Select using arrows.

Current layer line thickness (1 – 5). Select thickness from drop-down list.

Hatch col. Type Hatch on/off setting and color (only displayed with closed-polyline)

Text Ht **0.3**

Font size



Snap Snap on/off (Right click to specify snap spacing)



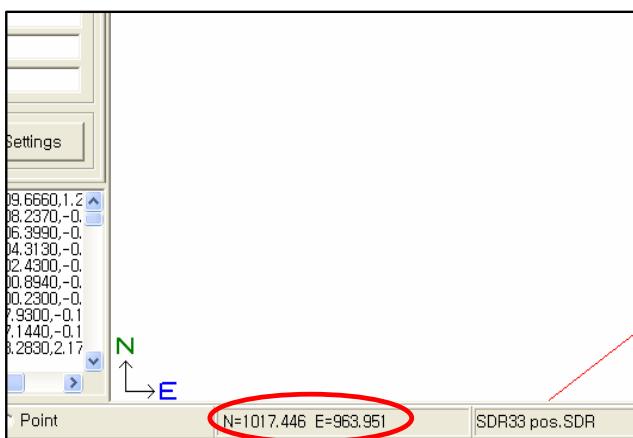
Set running object snap mode on (Near point, End point)/off (guide function for line drawing)



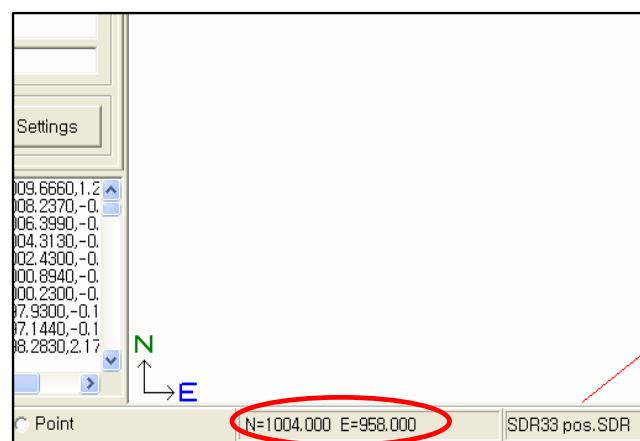
Note

Snap is a tool used to accurately locate points and create objects. E.g. set snap to 1m to draw a line in units of 1m.

Snap OFF



Snap ON

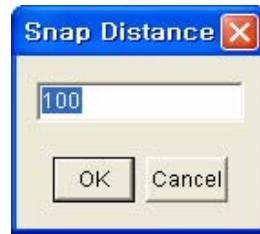


A point is located by the Snap interval when snap is on.

Setting Snap distance



Right Click on the toolbar [Snap] icon to display the Snap Distance dialog box.



Snap distance can be set between 1 and 100.

► Using the Main menu/toolbar ◀



--- Select Project : displays a list of projects from which the user makes a selection.



--- New DXF : initializes and clears the graphic window.



--- Open DXF : open a DXF file that is created on CAD or other program.



--- Save as DXF.



--- Zoom extend : Zooms out to display the entire drawing in the current view.



--- Zoom In.



--- Zoom Out.



--- Zoom Previous. Undoes the previous zoom action.



--- Draw slope symbol.



--- Calculate distance/area (in the case of area, using with Shift + Right mouse button).



--- Query mode : Query the attributes of objects on graphic window.



--- Edit Code List attributes.



--- Options.



--- Port Setup.



--- View Field Book and Reduced Coordinates by reading a Total Station SDR file.



--- View Field Book by reading an RTK-GPS SDR file.



--- View RTK Report file.



--- View Field Book by reading a Digital Level SDR file.



--- Receive SDR files from instrument and save SDF file.



--- Send SDR file to instrument.



--- Shift and transform points.



--- Calculate coordinates of point.



--- Regenerate point mark (Geo ht, No, Code, NE) in the graphic window.



--- Modify Mode.

Modify mode toolbar (press [ESC] to cancel toolbar selection)



--- Select one object.



--- Selects all objects completely inside a rectangle defined by two points.



--- Move : Displaces objects a specified distance in a specified direction.



--- Copy :Duplicates the objects you select.



--- Undo the most recent action.



--- Text.



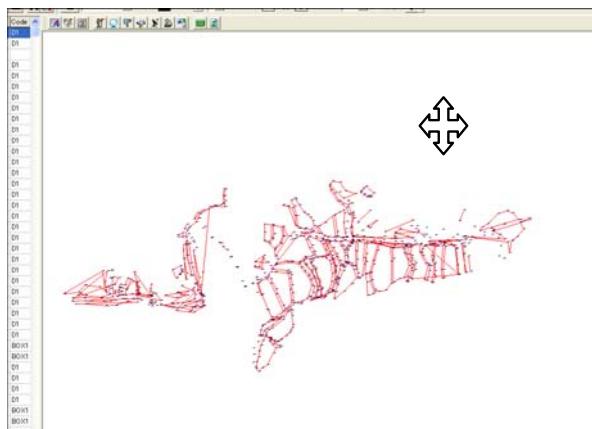
- Draw polyline.
- Draw rectangle
- Draw circle.
- Draw line.

► Navigating the graphic screen ◀

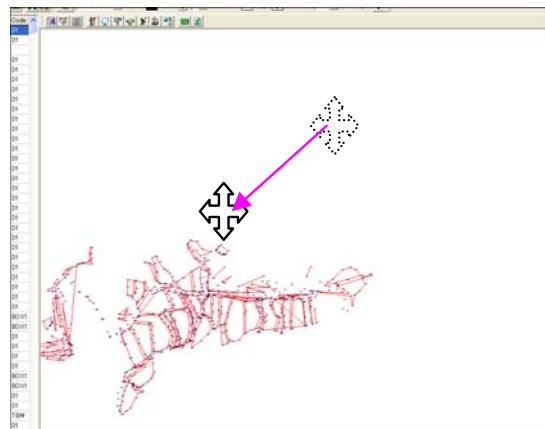
Moving the screen:

Click and hold the right mouse button and drag in the desired direction to move the graphic screen.

Initial click position



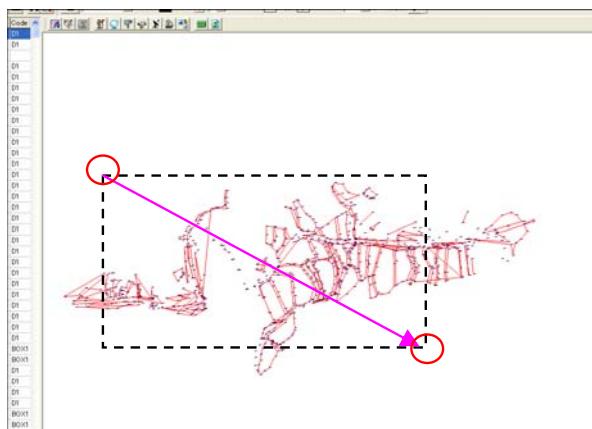
After graphic screen moved



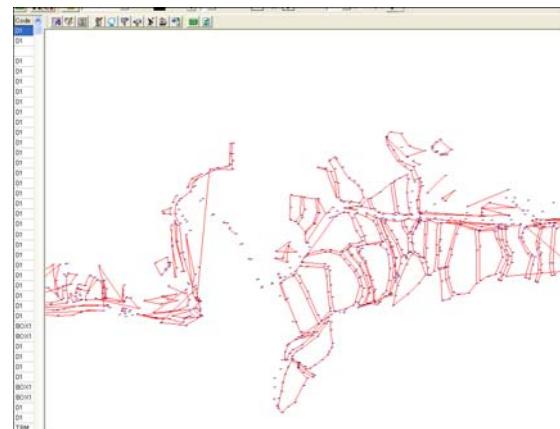
Enlarging a section of the screen:

Click and hold the left mouse button and drag to create a box around the desired area. Release the mouse button to zoom in.

Drawing the box



After graphic screen enlarged



2. File

2.1 Creating a New Project

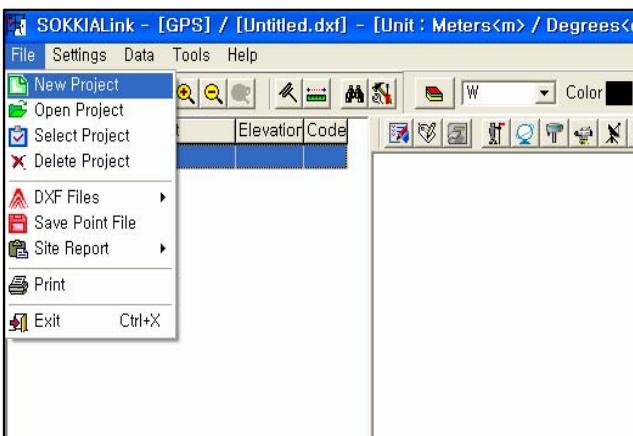


Create a new project by selecting [File] - [New Project] or . Once created, the project name is displayed in the SOKKIA Link title bar.



Procedure

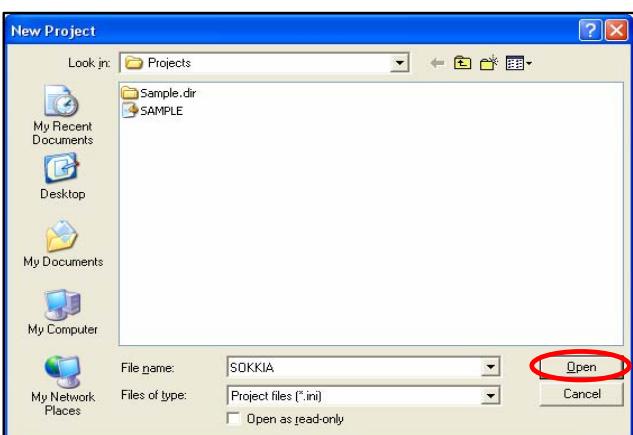
1. Select [File] - [New Project].



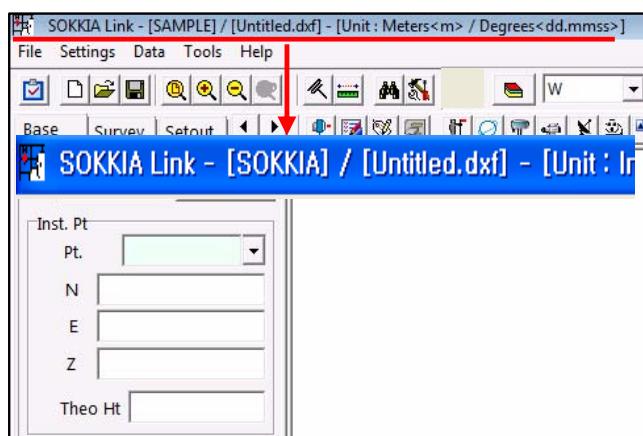
2. Enter a project name.



3. Click [Open].



4. The project name is displayed in the title bar.





Note:

Project Files/Directory

A project is comprised of two components.

- Project file (Project1.ini) : used to open the project.
- Project directory (Project1.dir) : containing project-related settings, such as the state of the project, the applied coordinate system and unit settings.

Both components must exist in the same directory and have the same base name to reopen the file at a later time. SOKKIA Link automatically places the components in the same directory when a project is created.

2.2 Opening an Existing Project



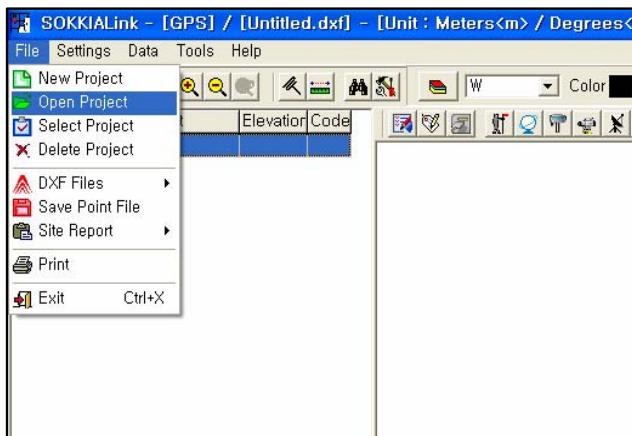
Select [File] - [Open Project] or

Please refer to 2.3 for [Select Project].

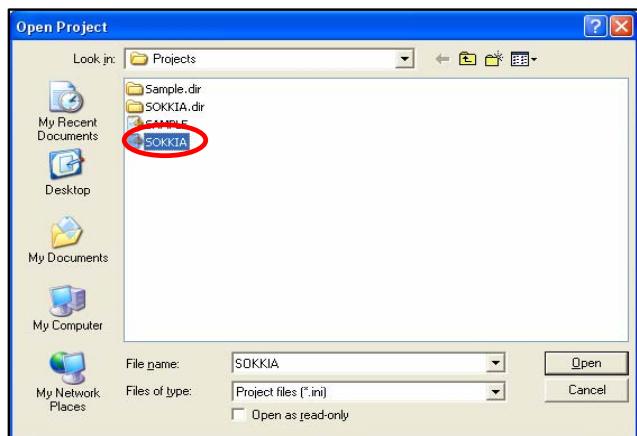


Procedure

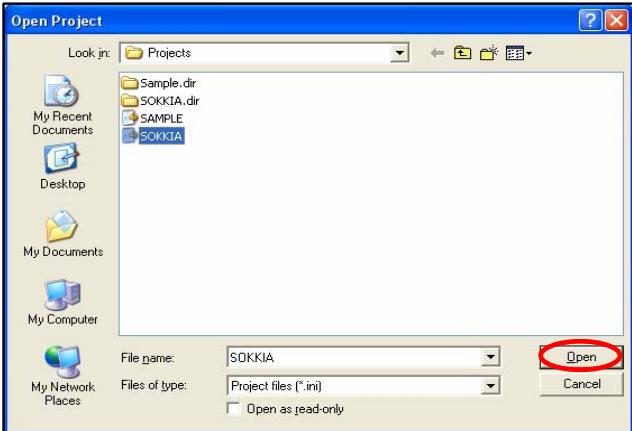
1. Select [File] - [Open Project].



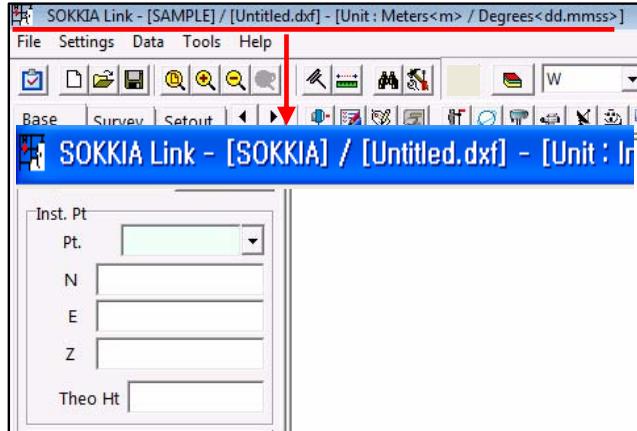
2. Click SOKKIA.INI.



3. Click [Open].



4. The project name is displayed in the title bar.



2.3 Select Project



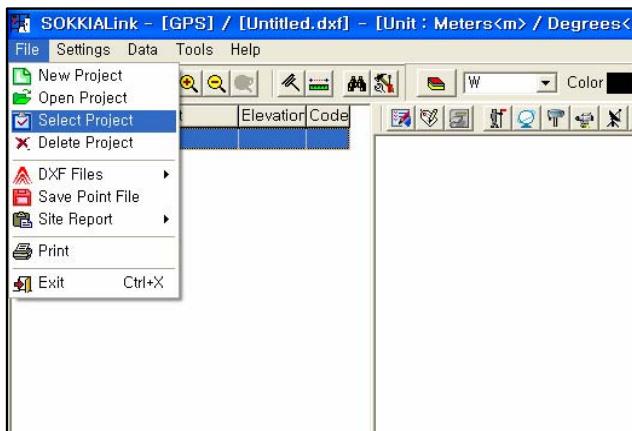
Select [File] - [Select Project] or to open a file from a list of existing files.

The **[Select Project]** option provides a list of the projects accessed and allows you to select one of the projects from this list.

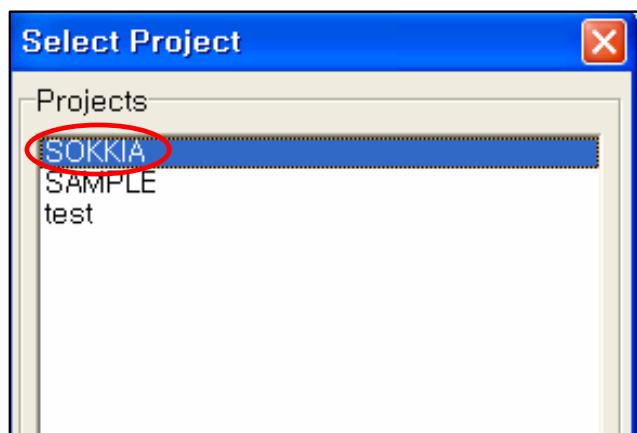


Procedure

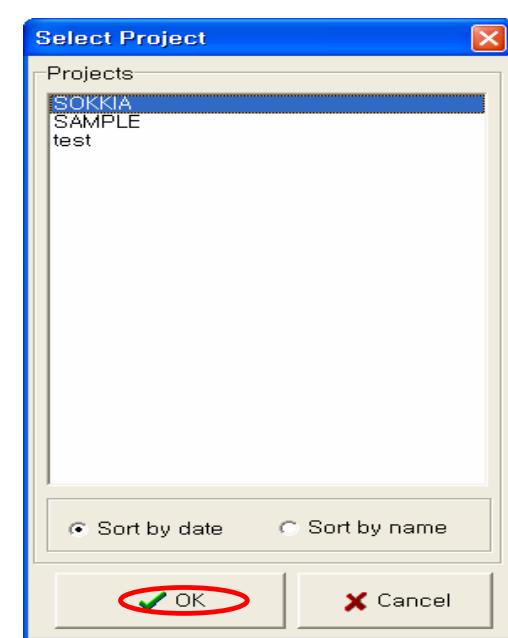
1. Click [File] - [Select Project].



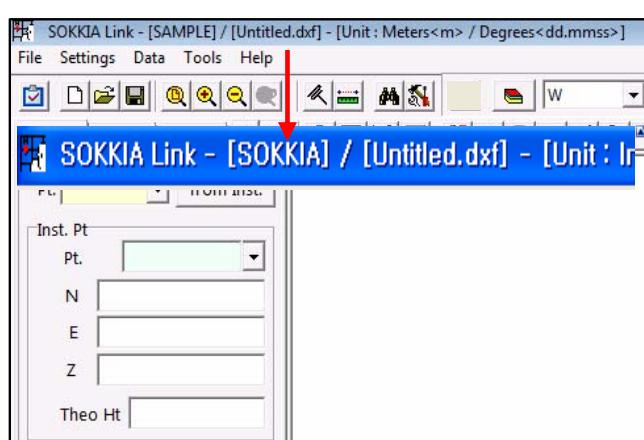
2. Select project.



3. Click **[OK]**.



4. The project name is displayed in the title bar.



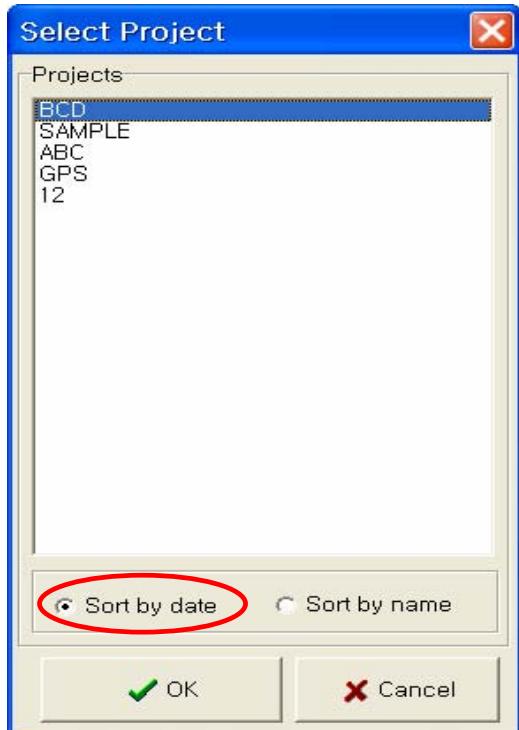


Note:

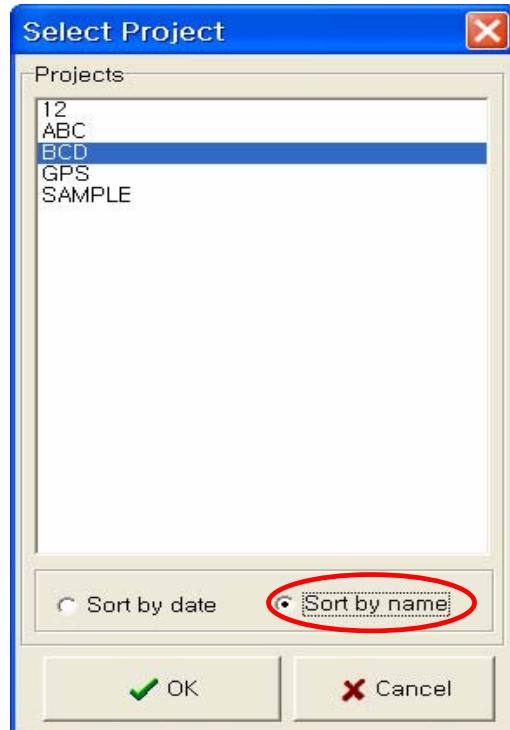
Sort option

Projects can be sorted by date or by name.

Sort by date.



Sort by name



Note:

The current project can be assigned a new name or moved to a new folder.

To rename or move a project, open the SOKKIA Link/Projects folder and rename the Project1.ini file and Project1.dir folder.

2.4 Deleting a Project

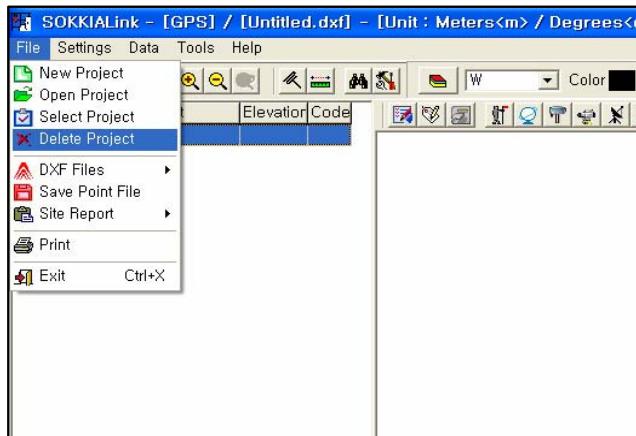


Select [File] - [Delete Project] to delete a project. An open project cannot be deleted.

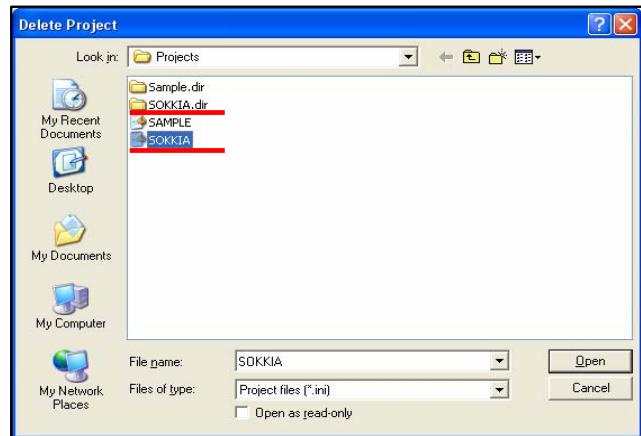


Procedure

1. Select [File] - [Delete Project].



2. Select a project file (*.ini) to delete.



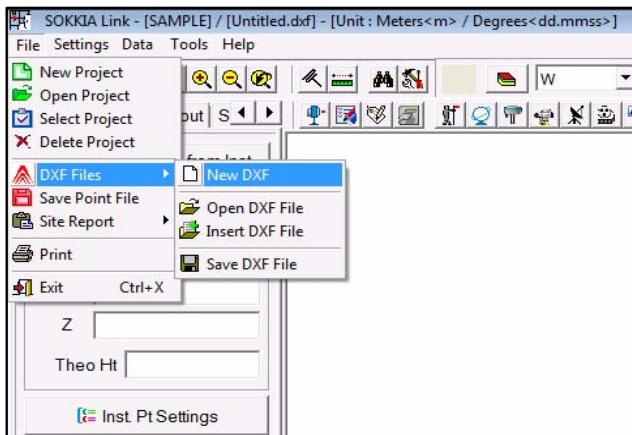
2.5 DXF Files

2.5.1 Creating a New DXF

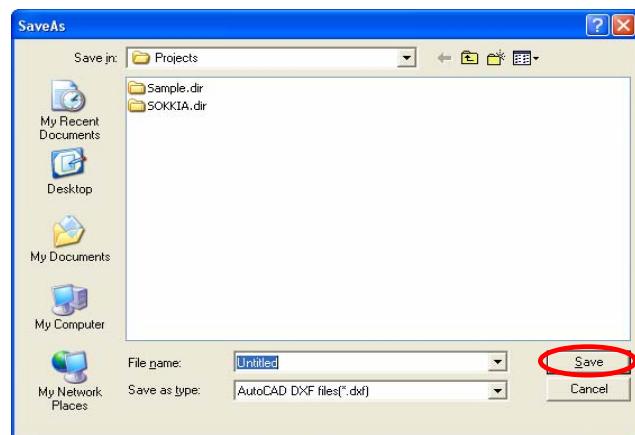


Procedure

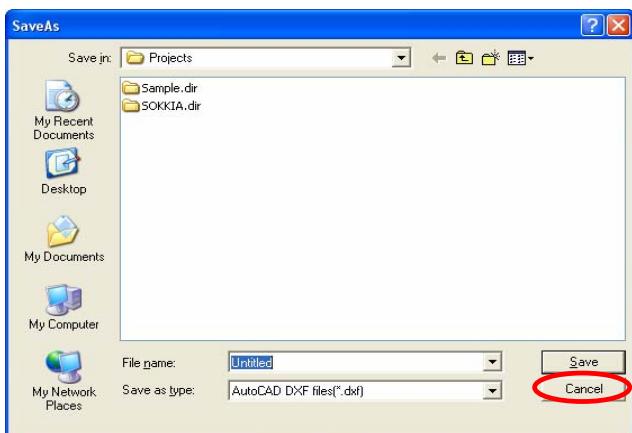
1. Select [File] - [DXF Files] - [New DXF].



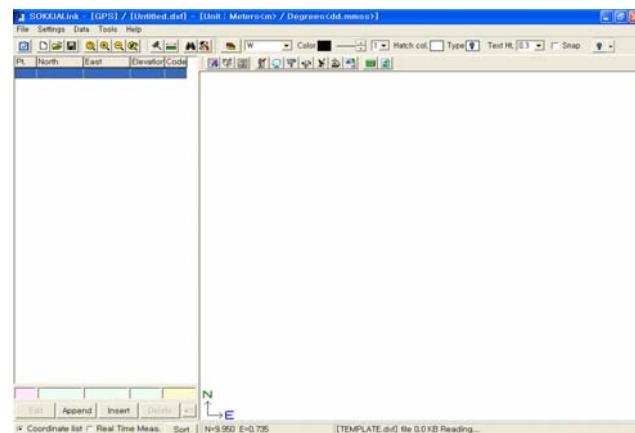
2. Save the existing drawing before creating a new dxf.



3. If you don't wish to save it, select [Cancel].



4. The screen is cleared.

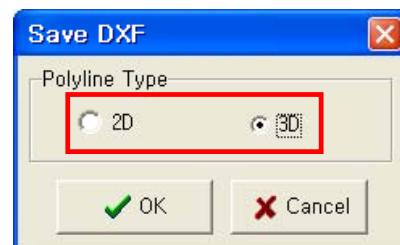


Note:

Save DXF Option

This option is necessary due to the difficulty in modifying a 3D polyline in CAD.

For 2D drawings, the Z value (elevation) is zero.



2.5.2 Opening an Existing DXF File

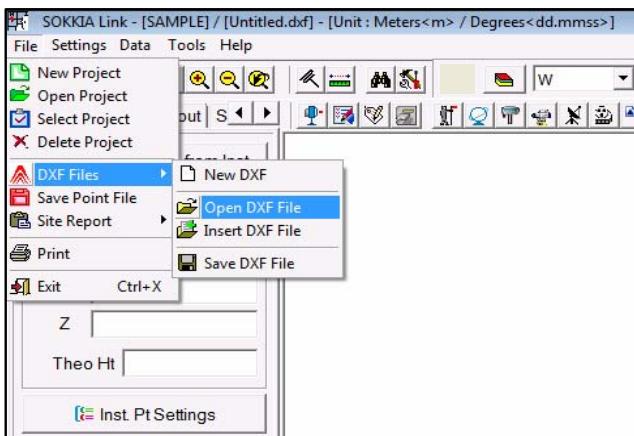


An existing DXF file that has been made using CAD or similar program can be opened using SOKKIA Link.

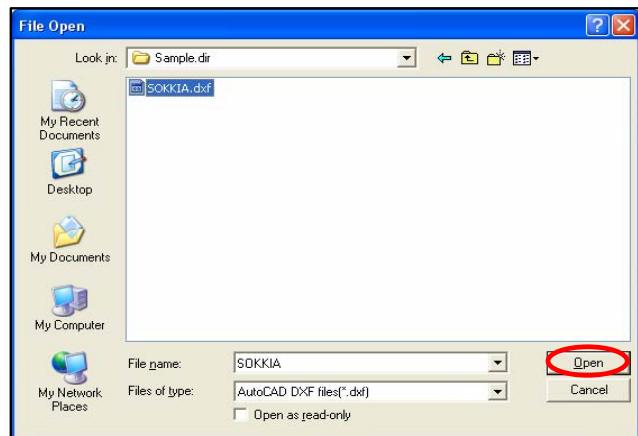


Procedure

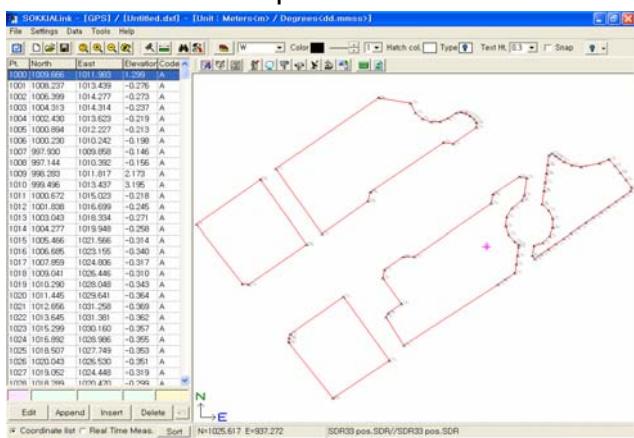
1. Select [File] - [DXF File] - [Open DXF File].



2. Select DXF file and click [Open].



3. The DXF file is opened.



Note:

DXF Compatibility

3DSOLID, HATCH, DIMENSION, and LEADER are not compatible.

2.5.3 Inserting a DXF File

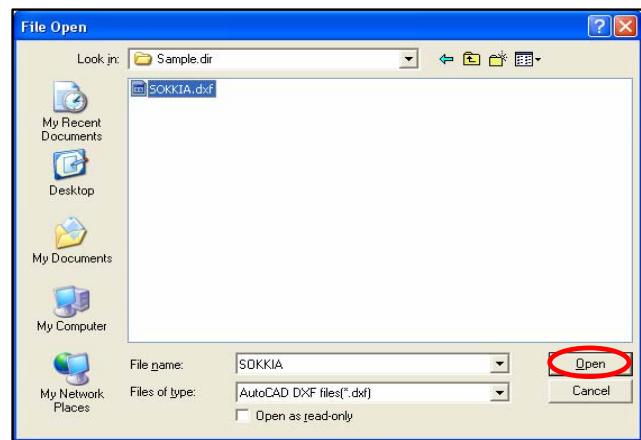


This places an additional DXF file into the current drawing.

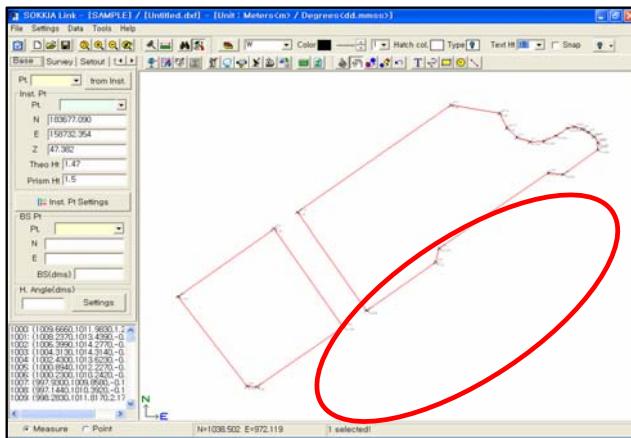


Procedure

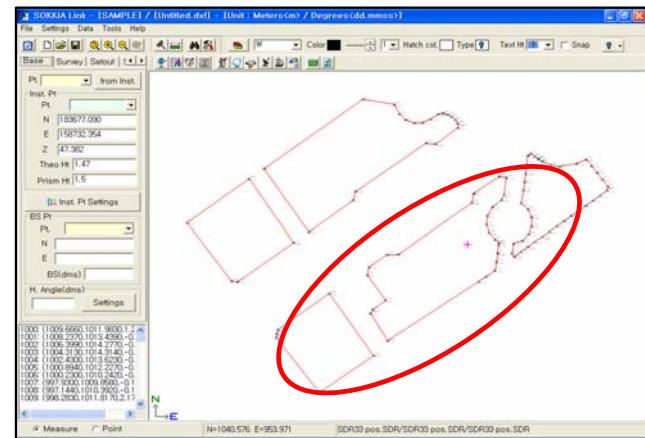
1. Select [File] - [DXF Files] - [Insert DXF File]. 2. Select DXF file and click [Open].



Drawing prior to insertion



Drawing with inserted file



2.5.4 Saving a DXF File

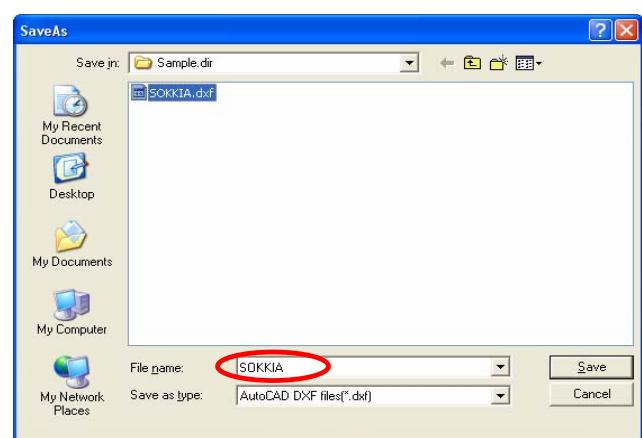
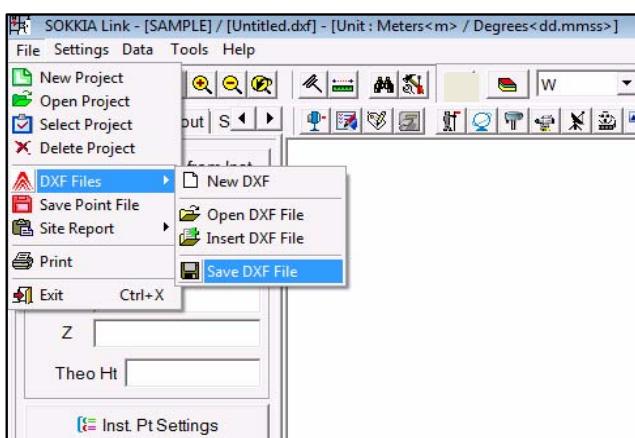


This function has been designed to allow exporting of data in DXF format.

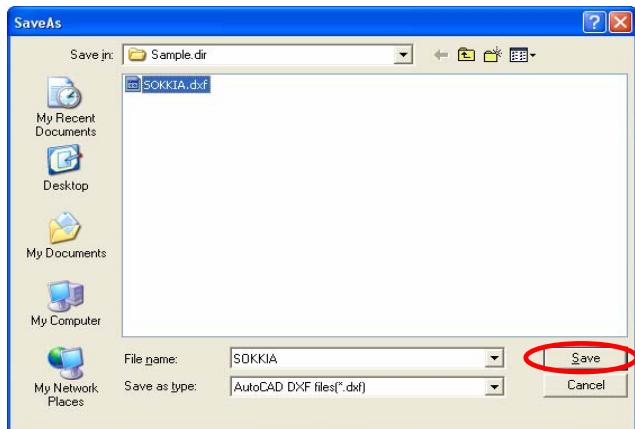


Procedure

1. Select [File] - [DXF Files] - [Save DXF File]. 2. Input file name.



3. Click [Save].

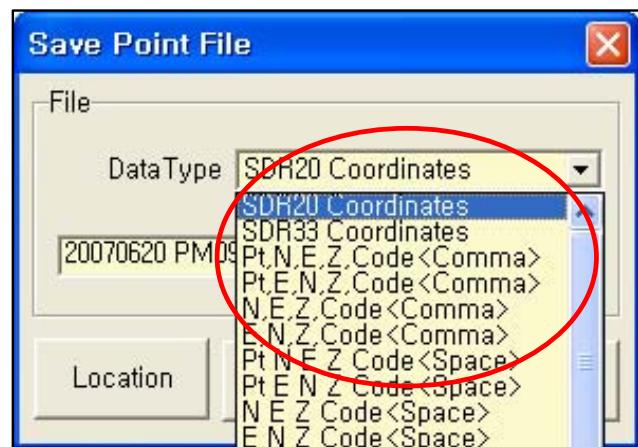
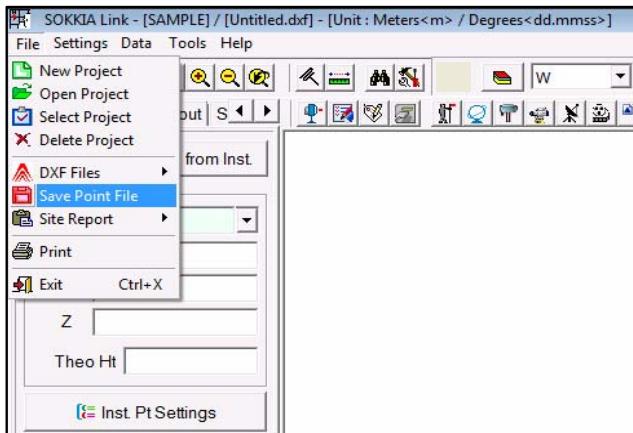


2.6 Saving Point File

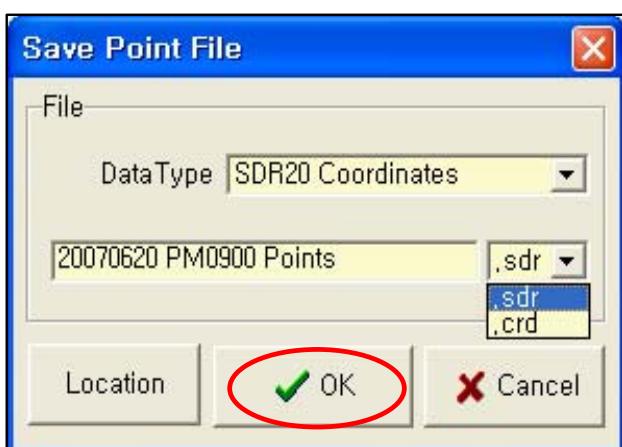
 SOKKIA Link will save points in various file formats. It exports point data from the graphic screen.



1. Click [File] - [Save Point File].
2. Select data type and enter a name for the saved file.



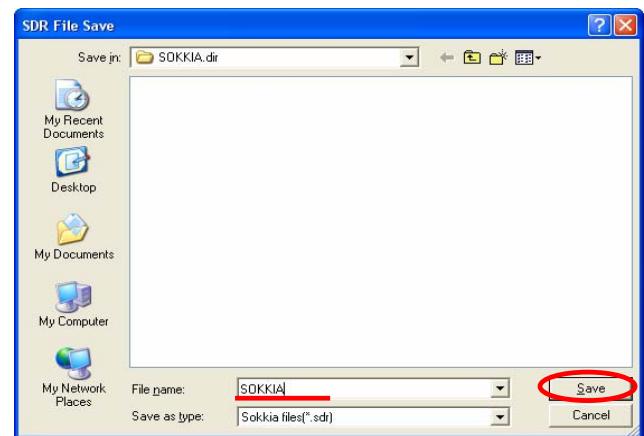
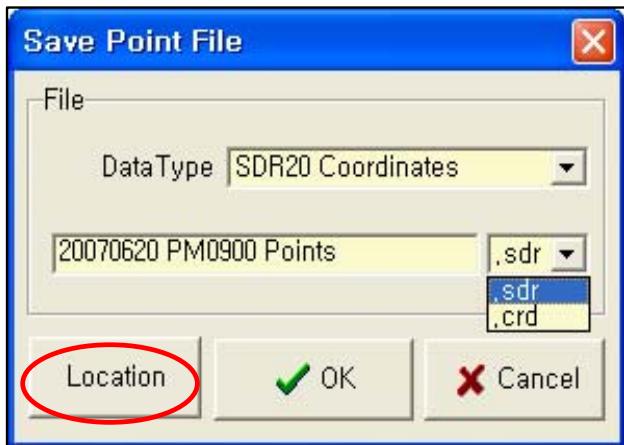
3. Click [OK].





Note:

Click [Location] to open the File save location dialog box.



2.7 Site Report (Text File / Excel File)



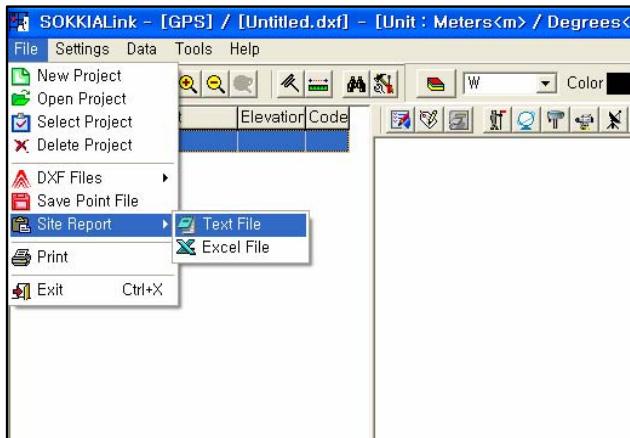
Export points in present drawing to Excel or Notepad.

2.7.1 Text File (Notepad)

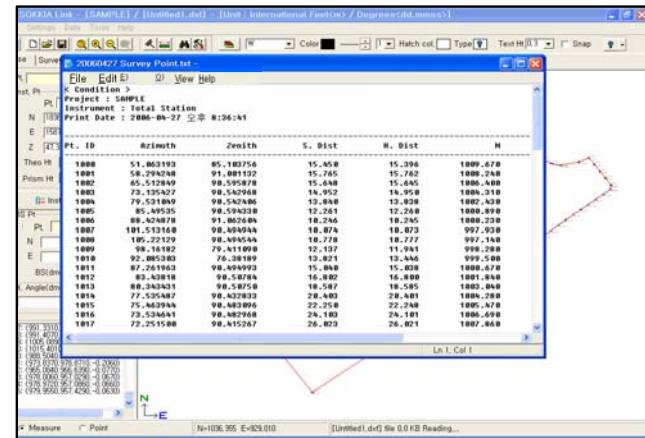


Procedure

1. Select [File] - [Site Report] - [Text File].



2. Save or print file.

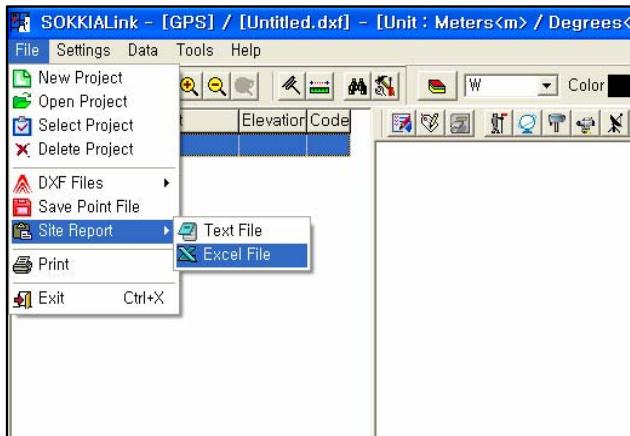


2.7.2 Excel File

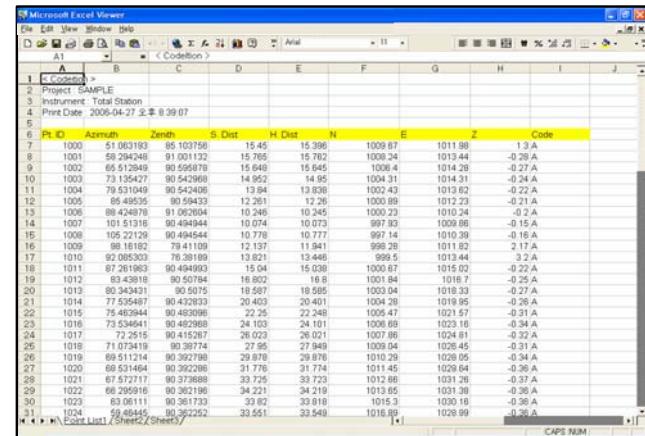


Procedure

1. Select [File] - [Site Report] - [Excel File].



2. Save or print file.



2.8 Printing



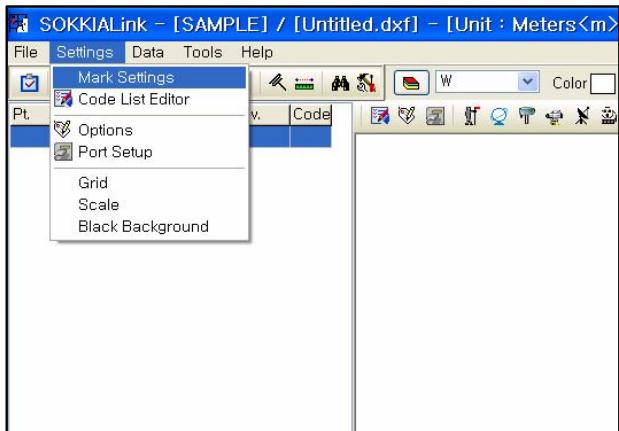
The graphic screen can be printed.

1. Select [File] – [Print].
2. Set printing options.
3. Click [Print].

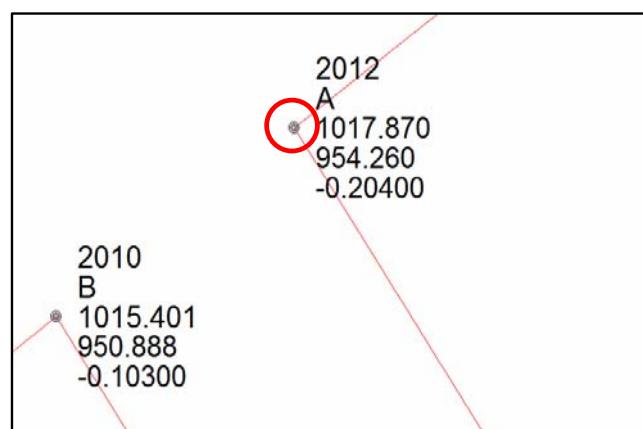
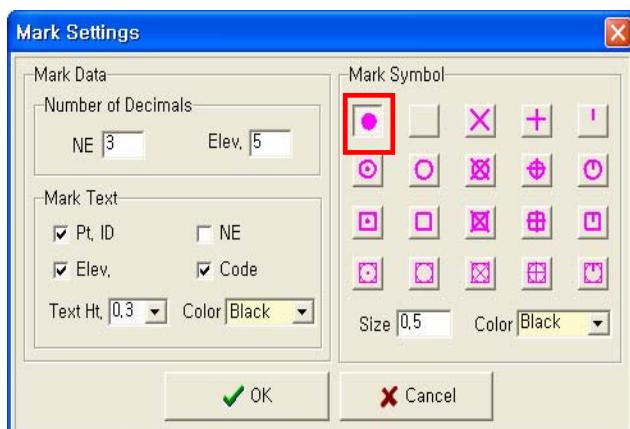
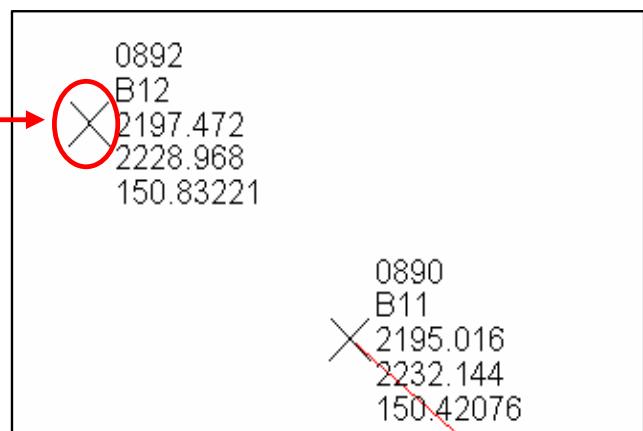
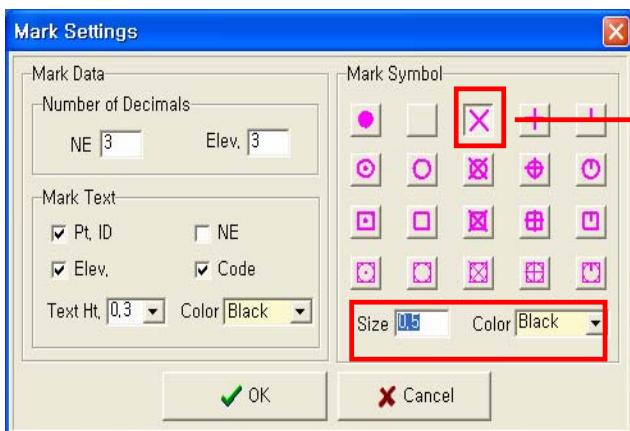
3. Settings

3.1 Mark Settings

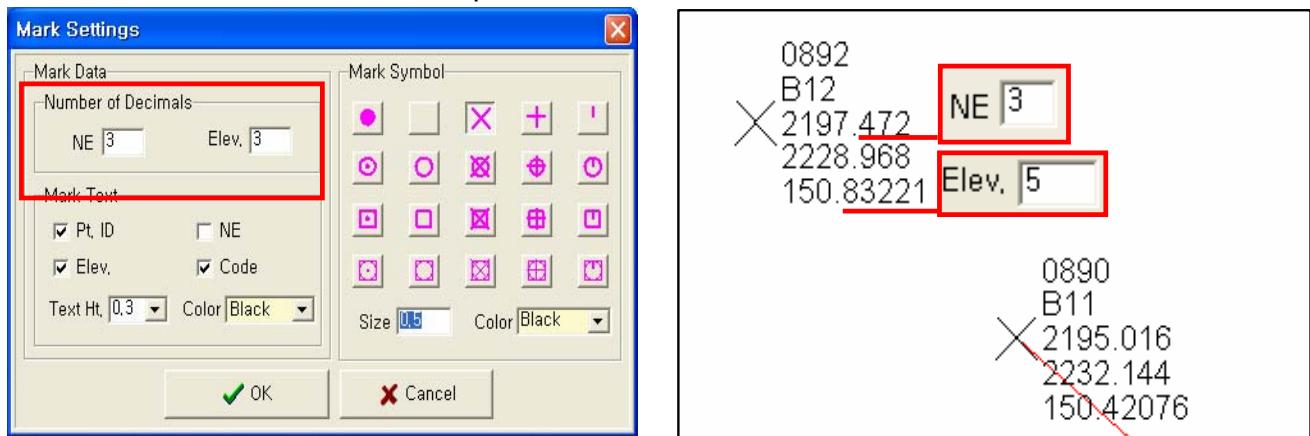
1. Select [Settings] - [Mark Settings].



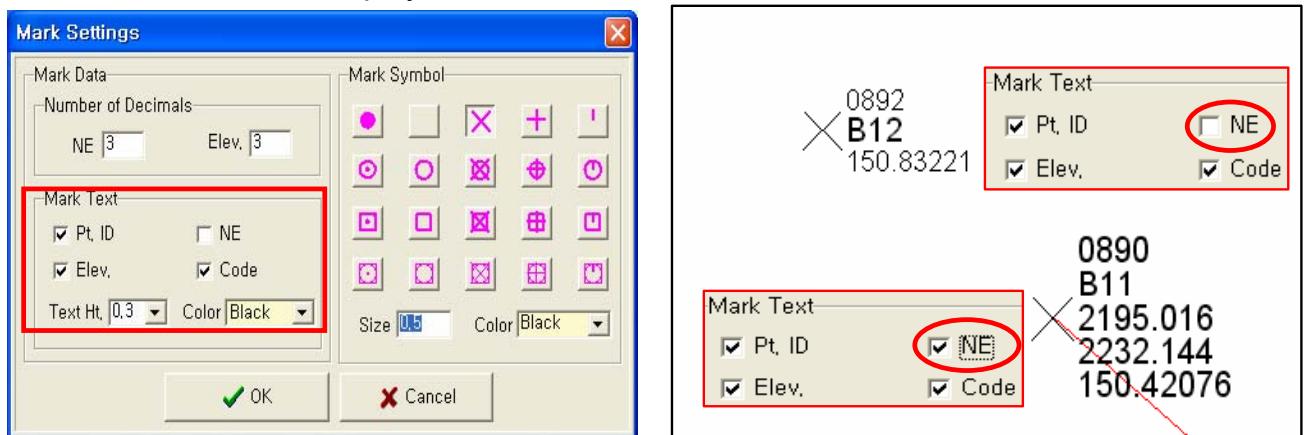
2. Set **mark Symbol**, **size**, and **color**.



3. Set the number of decimal places for NE and elevation values.



4. Set text items to display with each mark. Font size and color can also be set.



3.2 Code List Editor



The Code List Editor is a powerful tool that serves as a starting point for defining the code. It allows you to assign the definition to a point that you draw. From the Code List Editor you can define symbols and line attributes.

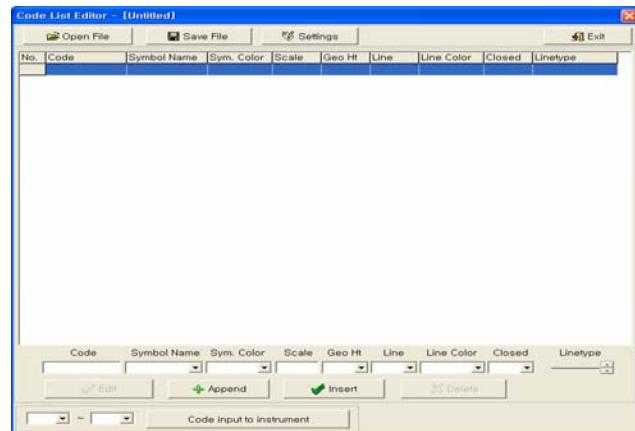
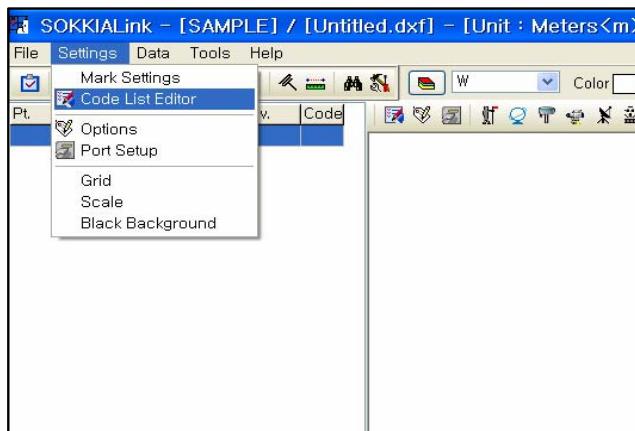


Procedure

1. Select [Settings] - [Code List Editor] or

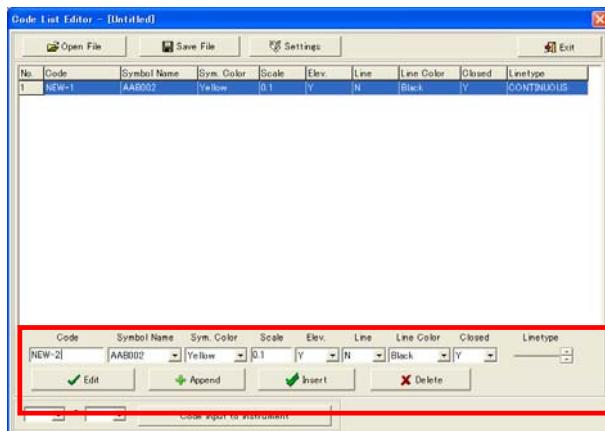


2. The Code List Editor main screen is displayed.



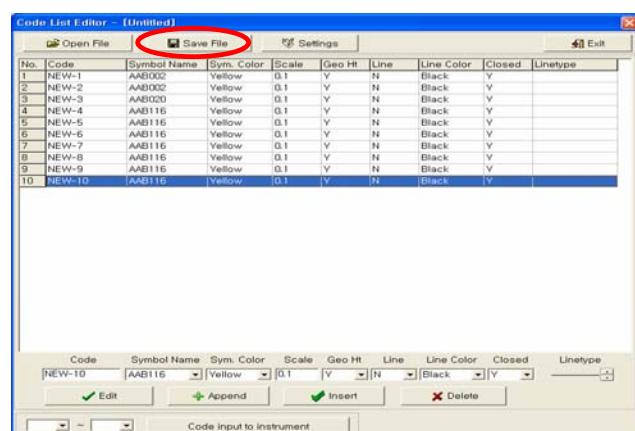
3. Create new code.

Enter the code name symbol attributes and line attributes, then click **[Append]**.



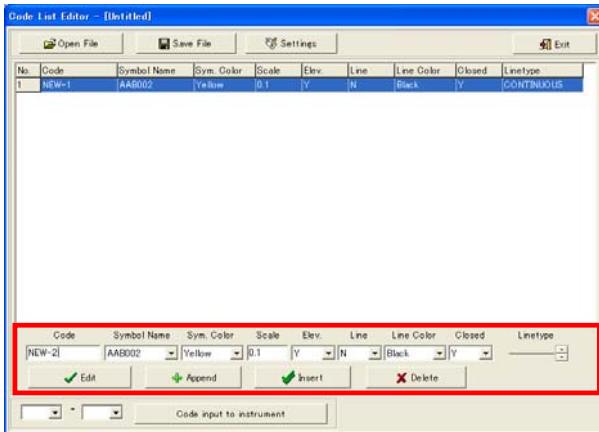
4. Save code list file.

Click **[Save File]** and enter code list file name.



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Code Edit Panel



Code File Panel

The screenshot shows a software window titled "Code List Editor - T:\Program Files\SOOKIA Link\Codes\Sample.lst". The main area displays a table with 24 rows of data:

No.	Code	Symbol Name	Sym. Color	Scale	Geo Ht	Line	Line Color	Closed	Linetype
1	E	AZ0202	Black	0.5	Y	N	Black	N	CONTINUOUS
2		AZ0203	Black	0.5	Y	N	Black	N	CONTINUOUS
3	EM	AZ0212	Black	0.5	Y	N	Black	N	CONTINUOUS
4	TM	AZB015	Black	0.5	Y	N	Black	N	CONTINUOUS
5	VM	AZB014	Black	0.5	Y	N	Black	N	CONTINUOUS
6	GM	AZB010	Black	0.5	Y	N	Black	N	CONTINUOUS
7	UM	AZB013	Black	0.5	Y	N	Black	N	CONTINUOUS
8	H	SPOTX	Black	0.5	Y	N	Black	N	CONTINUOUS
9	PC-H	SPOTX	Black	0.5	Y	N	Black	N	CONTINUOUS
10	PC-H	SPOTX	Black	0.5	Y	N	Black	N	CONTINUOUS
11	N.H	DAA001	Black	0.5	Y	N	Black	N	CONTINUOUS
12	B.H	DAA002	Black	0.5	Y	N	Black	N	CONTINUOUS
13	KSW.H	DAA003	Black	0.5	Y	N	Black	N	CONTINUOUS
14	MG	AB0002	Black	0.5	Y	N	Black	N	CONTINUOUS
15		AE1001	Black	0.5	Y	N	Black	N	CONTINUOUS
16	S	AE142	Black	0.5	Y	N	Black	N	CONTINUOUS
17	SHJ	AZ001	Black	0.5	Y	N	Black	N	CONTINUOUS
18	HD.H	DD0013	Black	0.5	Y	N	Black	N	CONTINUOUS
19	BISUK	AB010	Black	0.5	Y	N	Black	N	CONTINUOUS
20	EJP	AECC002	Black	0.5	Y	N	Black	N	CONTINUOUS
21	AGU	AGU001	Black	0.5	Y	N	Black	N	CONTINUOUS
22	UU	A001	Black	0.5	Y	N	Black	N	CONTINUOUS
23	RA	SPOTX	Black	0.5	Y	Y	Red	N	CONTINUOUS
24	RC	SPOTX	Black	0.5	Y	Y	Red	N	CONTINUOUS

Below the table is a toolbar with buttons for "Edit", "Append", "Insert", and "Delete". A red box highlights the "Settings" button in the top right corner. At the bottom is a "Code input to instrument" text field containing the value "1".

- Code : Code name.
- Symbol Name : Block name for insert.
- Sym. Color : Symbol color
- Scale : Symbol scale (x,y,z).
- Elev. : Mark height on drawing Yes (Y)/No (N).
- Line : Draw line Yes (Y)/No (N).
- Line Color : Set line color.
- Closed : Set to "Y" to link the last point of a certain code to the first point of the same code to close the area.
- Line type : Set line style.
- Edit : Edit the selected row.
- Append : Append the code to the last row.
- Insert : Insert code in the next row to that selected.
- Delete : Delete the selected row.

~ Code input to instrument

The selected code list names are sent to the instrument feature code.
(A maximum of 20 codes can be sent to the instrument at once)

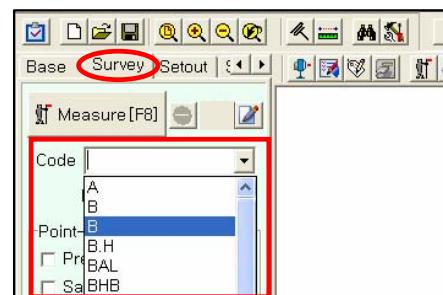
- Open File : Open code List file (*.lst) in folder.
- Save File : Save code List file with a new name.
- Settings : Code settings.



Note:

By clicking [Settings], code items set here are reflected in the Survey tab of Real Time Meas.

Refer to “6.2 Survey Tab”.



3.3 Options

Select [Settings] - [Options] or .

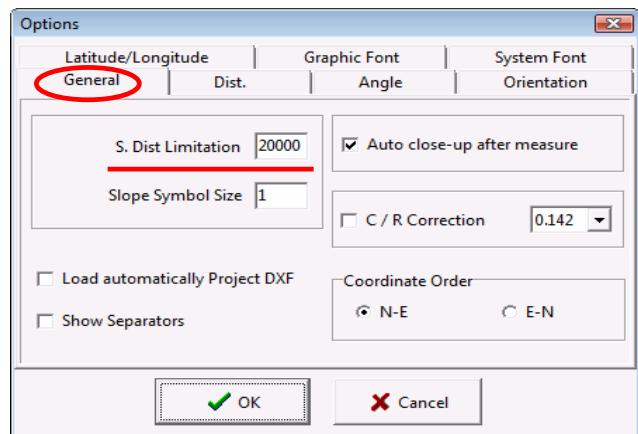
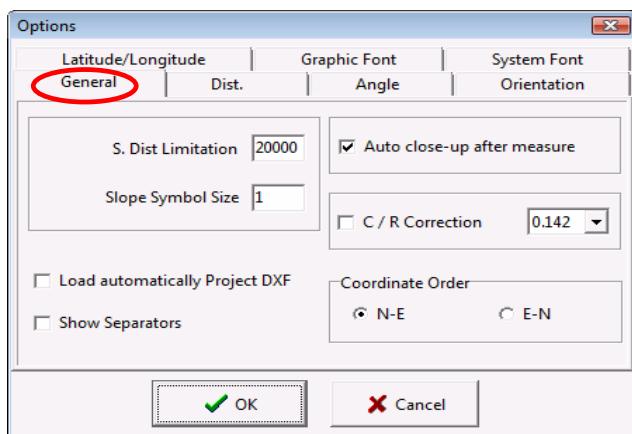


3.3.1 General tab

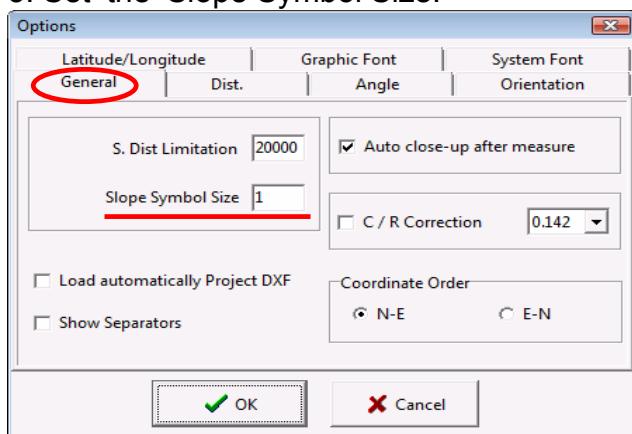
1. Select the General tab.

2. Set the Slope Distance Limitation.

Results for measurement beyond this limit will be void.

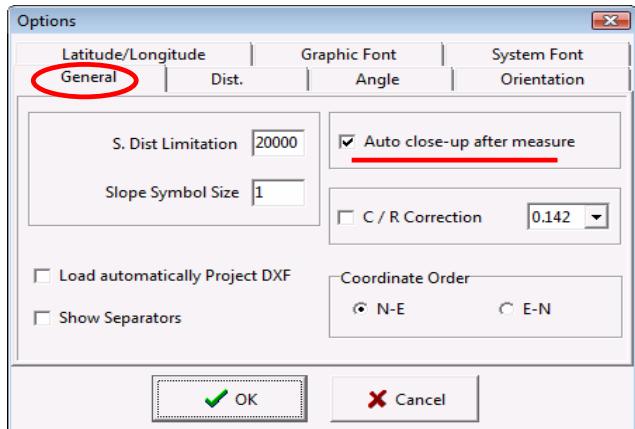


3. Set the Slope Symbol Size.



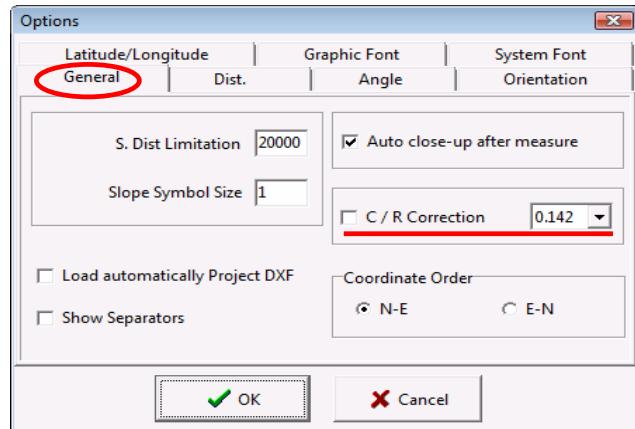
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4. Set the “View close-up automatically after – measure” setting.



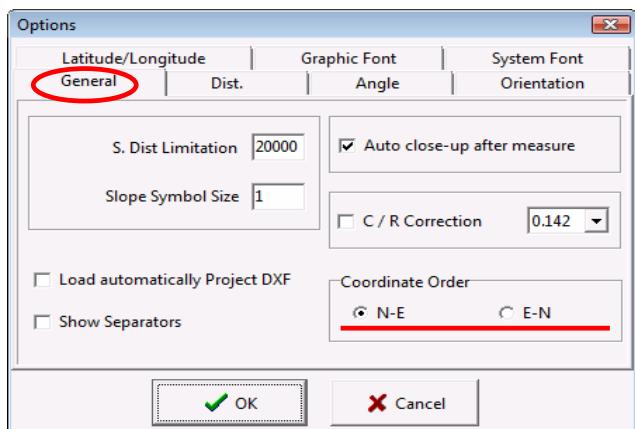
5. Set the C / R Correction setting.

(Curvature & Refraction correction)

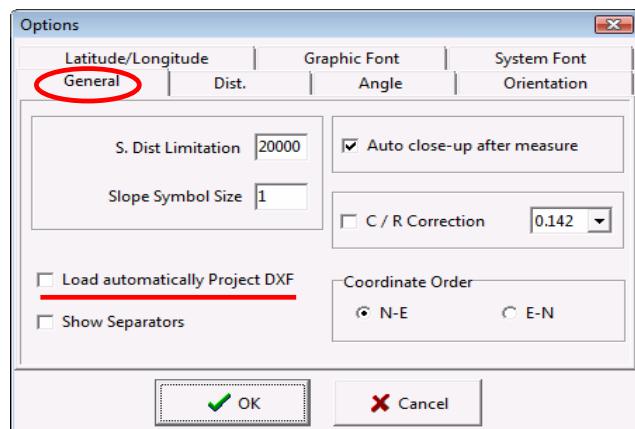


6. Set the Coordinate Order.

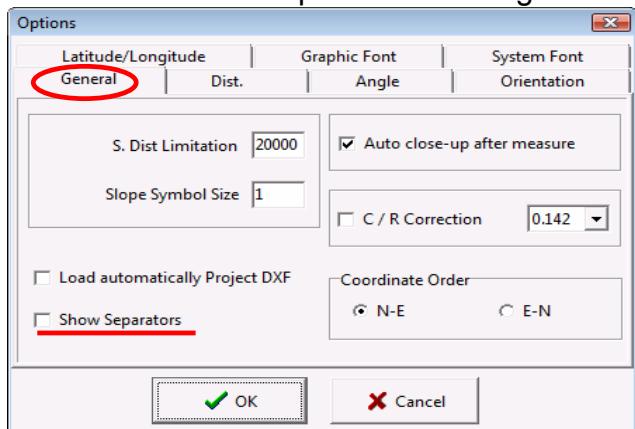
This field sets the display order for coordinates.



7. See the “Load automatically Project DXF” setting. When a project opens, the last graphic data are automatically loaded on the window.



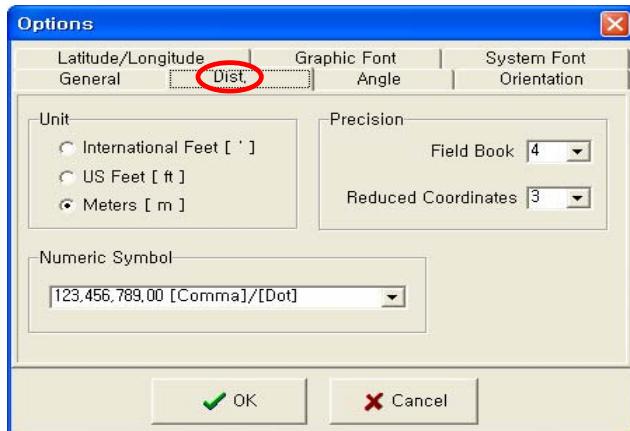
8. Set the “Show separators” setting



Commas are inserted to indicate thousands in displayed numbers.

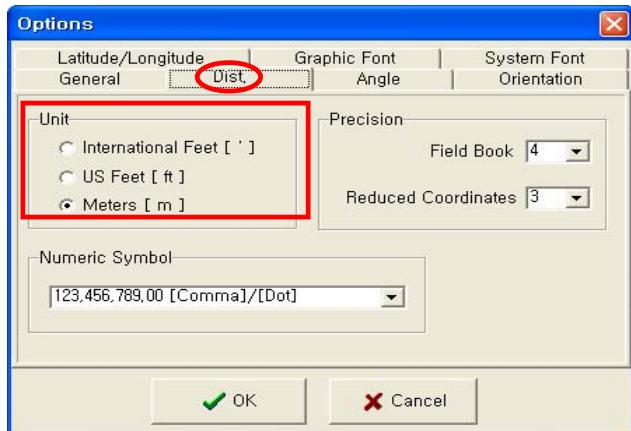
3.3.2 Dist tab

1. Select the Dist. Tab.

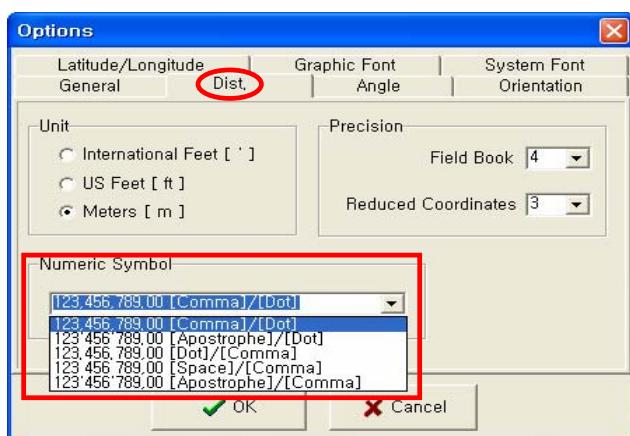


2. Select a distance unit.

The units are set for all other distances.

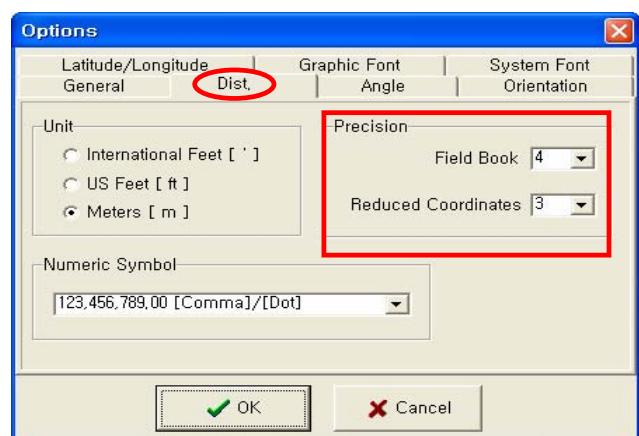


3. Select a numeric symbol.



4. Set "Precision".

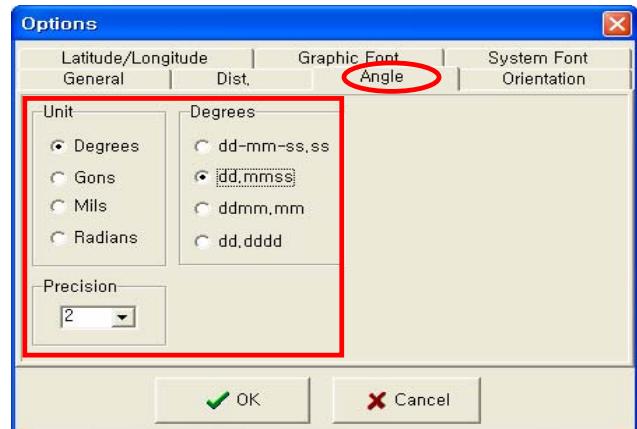
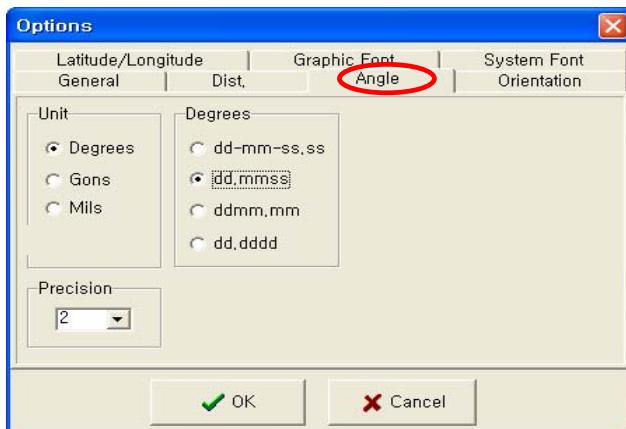
Set the number of decimal places for Field Book and reduced coordinate values.



3.3.3 Angle tab

1. Select the Angle tab.

2. Set angle units and number of decimal place settings.



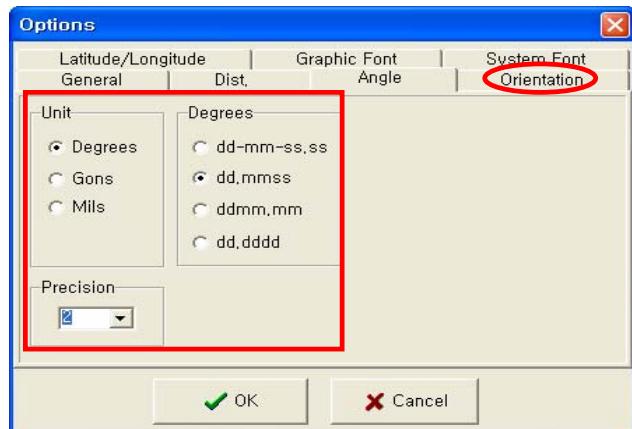
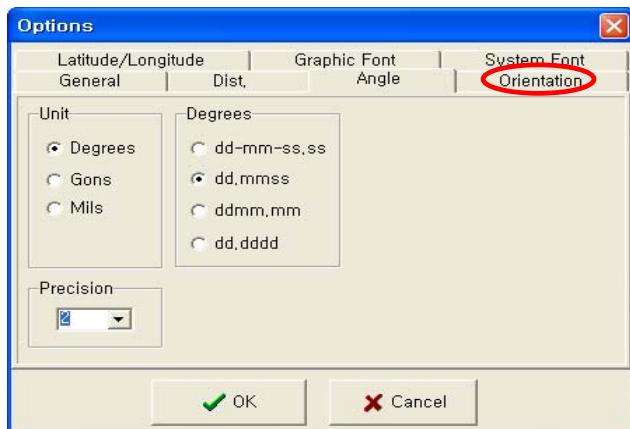
Note:

When Angle-unit (Degrees/Gon/Mil) settings have been changed during Real Time measurement, click **[Inst. Pt. Settings]** in the Base tab to make these changes effective.

3.3.4 Orientation tab

1. Select the Orientation tab.

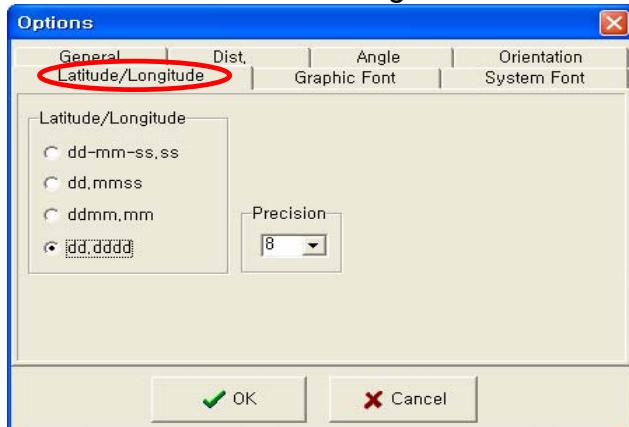
2. Set azimuth angle units and number of decimal place settings.



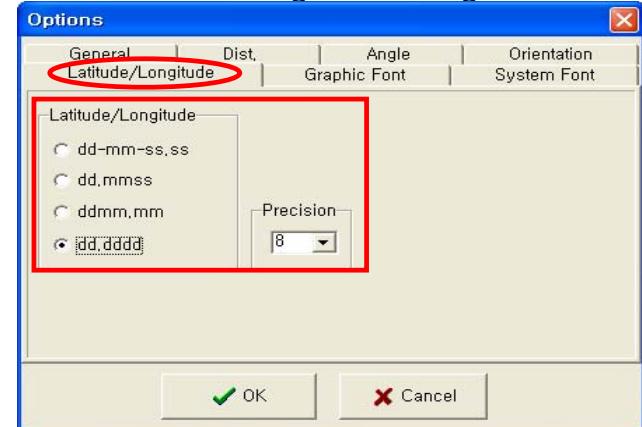
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3.3.5 Latitude/Longitude tab (GPS)

1. Select the Latitude/Longitude tab.



2. Set Latitude/Longitude settings.

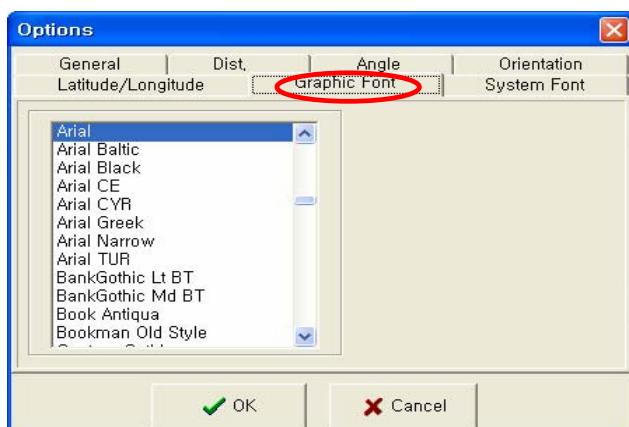


Note:

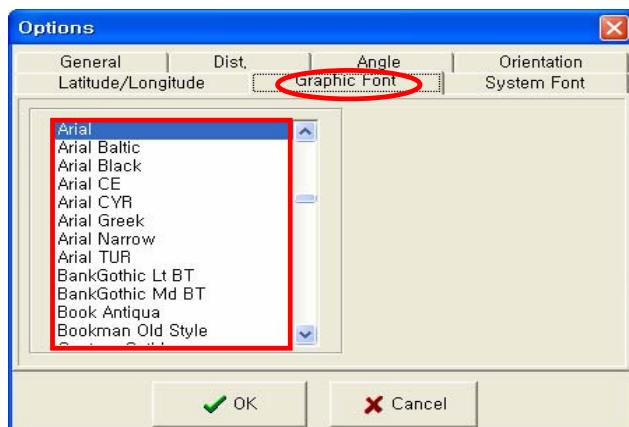
Precision: This field indicates the number of decimal places allowed behind the decimal point.

3.3.6 Graphic Font tab

1. Select the Graphic Font tab.

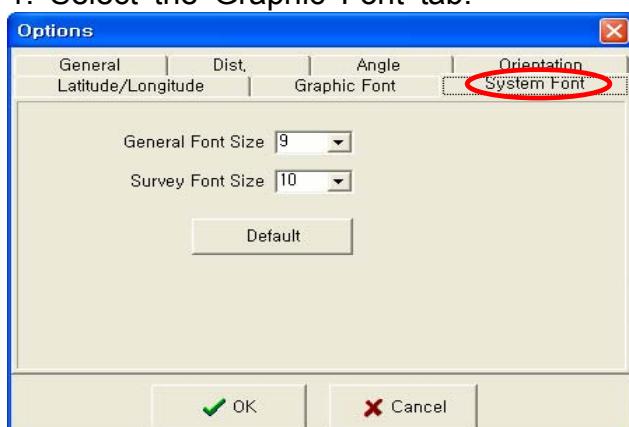


2. Set text font for Graphic window.

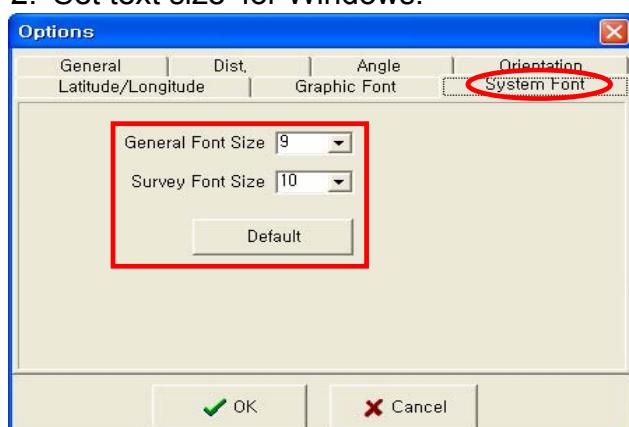


3.3.7 System Font tab

1. Select the System Font tab.



2. Set text size for Windows.



3.4 Port Setup

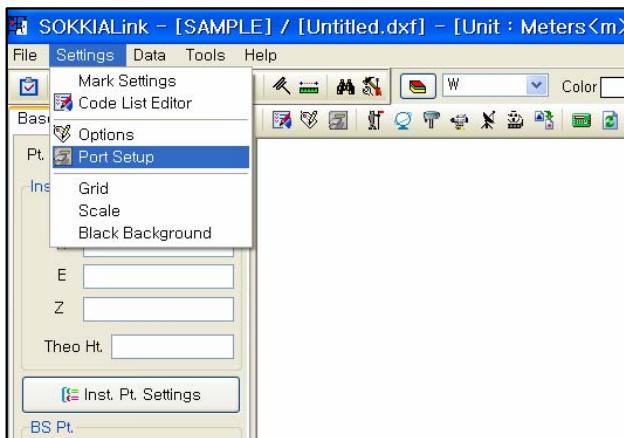


Set **Port** and **BaudRate**

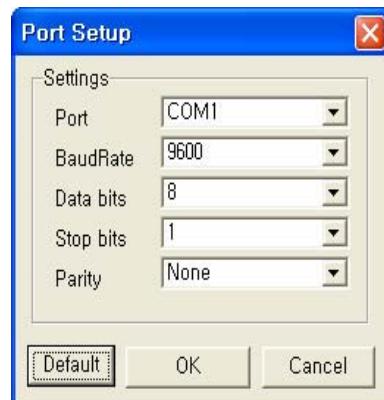


Procedure

1. Select [Settings] - [Port Setup] or



2. Select Port and Baud Rate settings.



Note:

Baud rate setting must be the same as that for the instrument.

The "9600" setting is recommended to prevent data loss during USB connection.



Note:

The POWERSET Series, Series 220 and Series 030R can only operate at 1200.

3.5 Grid



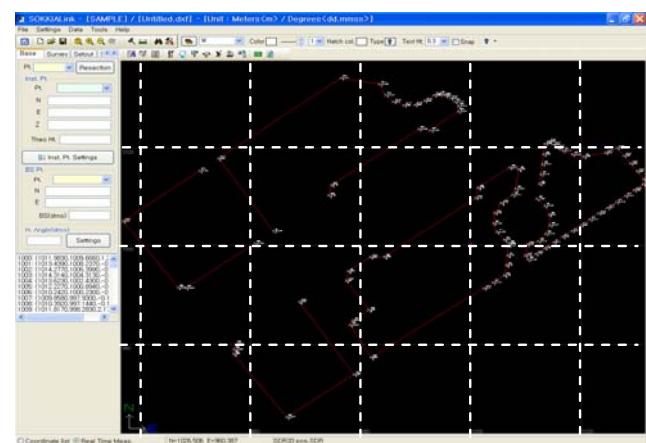
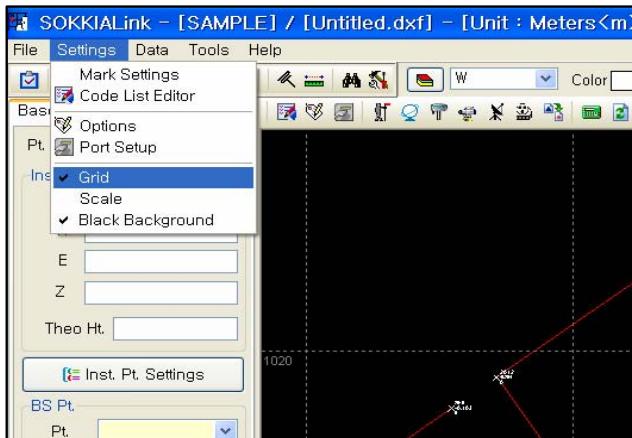
The screen can be set to either *grid on* or *grid off*.



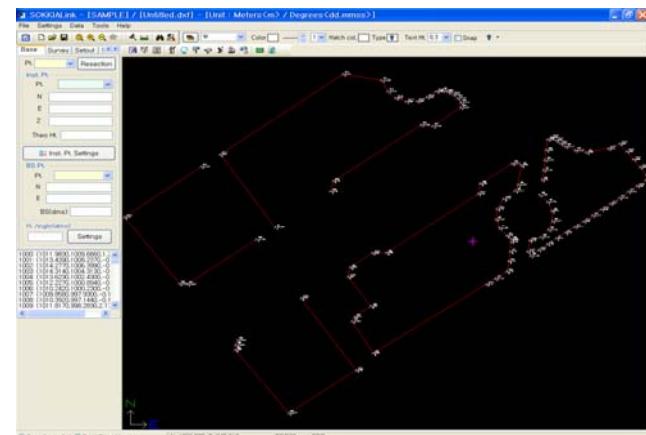
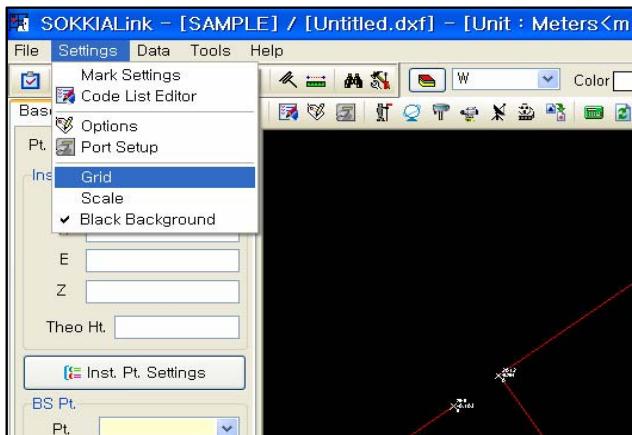
Procedure

1. Check “Grid” in the Settings menu to set the screen to *grid*.

Grid ON



Grid OFF



Note:

1. Distance unit set in “Settings-Options-Dist”
2. Minimum display is “1M”

3.6 Scale



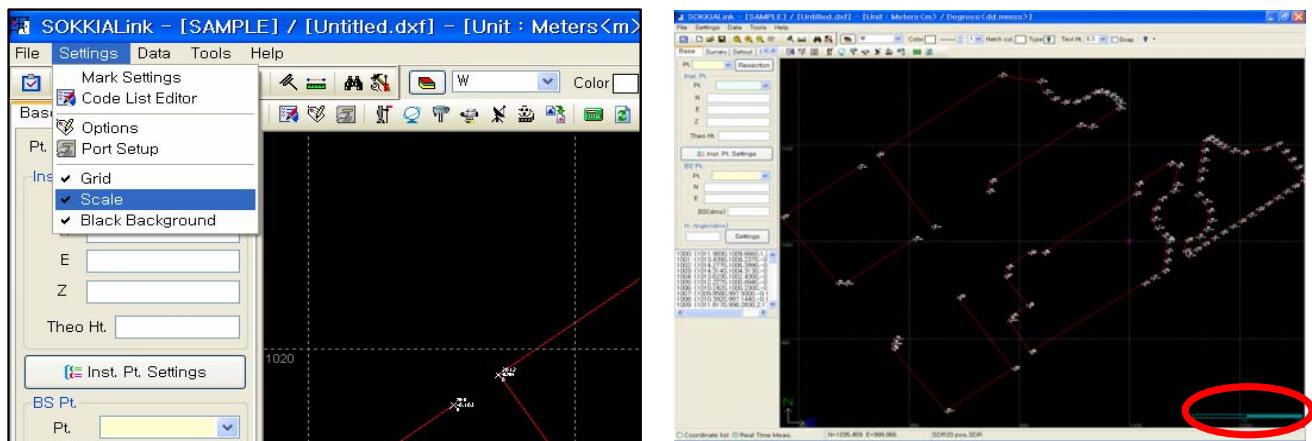
The screen can be set to either *scale bar on* or *scale bar off*.



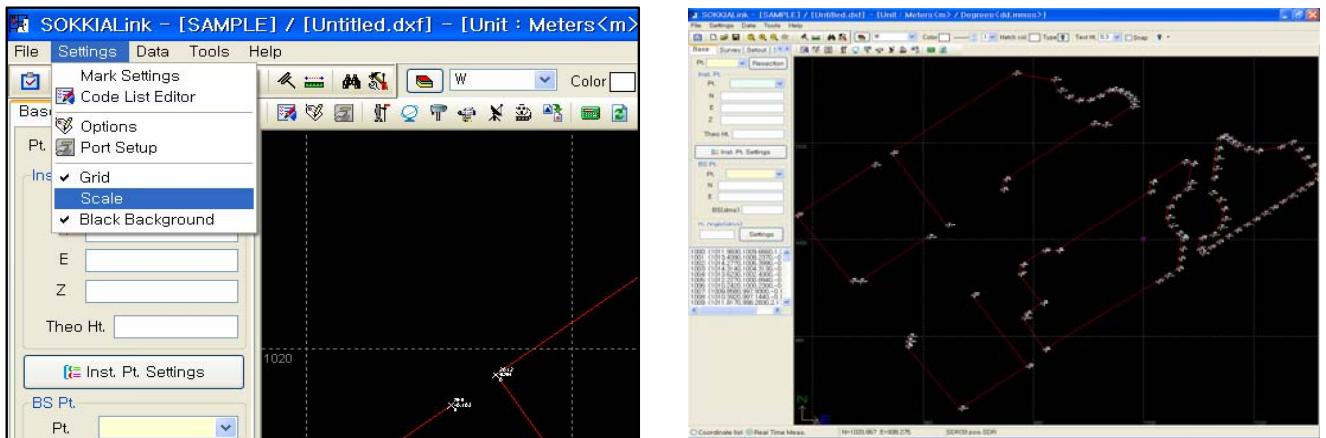
Procedure

1. Check “Scale” in the Settings menu to set the screen to *scale bar*.

Scale ON



Scale OFF



Note:

1. Distance unit set in “Settings-Options-Dist”
2. Minimum display is “1M”

3.7 Set background color



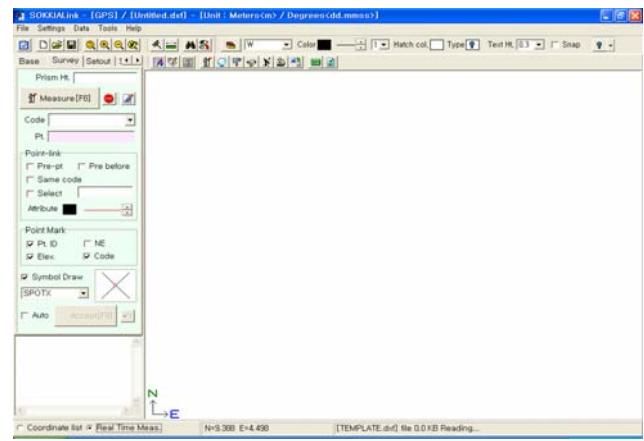
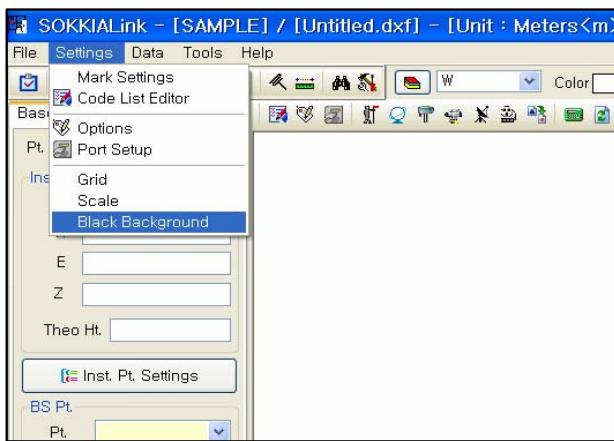
The background can be set to either black or white.



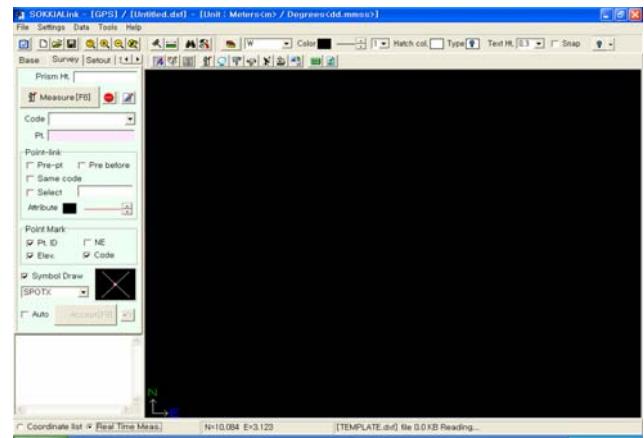
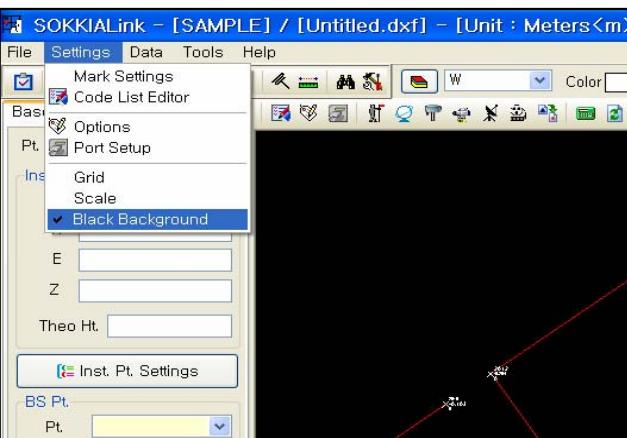
Procedure

1. Check “Black Background” in the Settings menu to set the background to black.

White Graphic Background



Black Graphic Background



4. Data

4.1 Total Station



SOKKIA Link manages survey data including data from Total Station surveys.

The raw data is stored, organized, edited, reduced and analyzed.

The data can be manually input, imported from a wide variety of file formats or received directly from an Electronic Total Station.

Field Book

Field books organize data. **Field books** display the raw data, in unchanged format, in an easy-to-view table layout.

Reduced Coordinates

The results of the reduction process are presented in the **Reduced Coordinates** box and can be immediately exported in a variety of formats. The reduction process creates a coordinate list based on the **Field book** values.



Note:

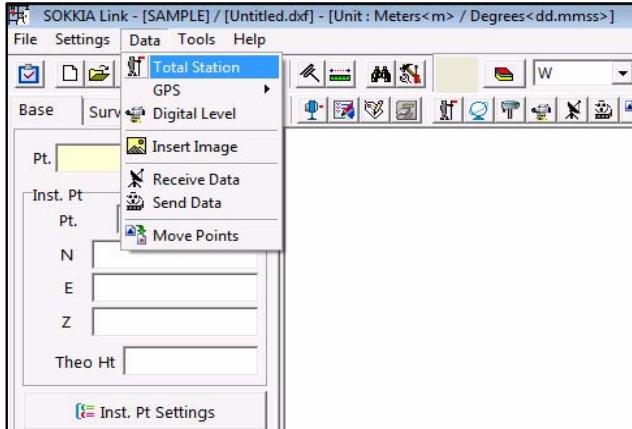
Additional configuration is necessary when reducing RTK-GPS values. Refer to “4.2 GPS”.

4.1.1 Opening Data

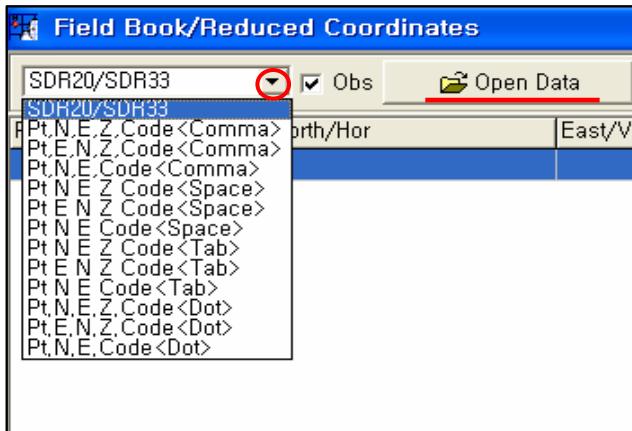


Procedure

1. Select [Data] - [Total Station] or



3. Select **Data type**, and click **[Open Data]**.



Note:

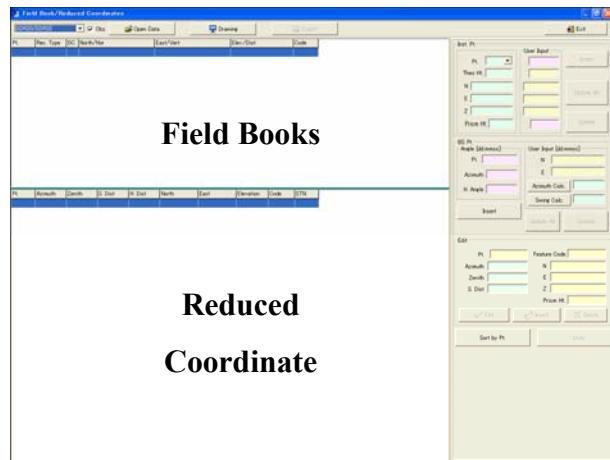
Re-sizing Total Station columns

You can adjust the width of each column to display more information within a single cell, or shorten the width to display more cells.

Field Book and **Coordinates** screens can be modified for easier viewing.

- Using the left mouse button, click and drag the screen to resize it.

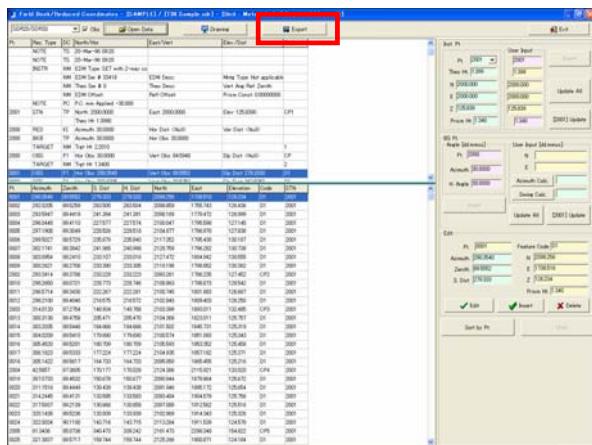
2. The Total Station dialog box is displayed.



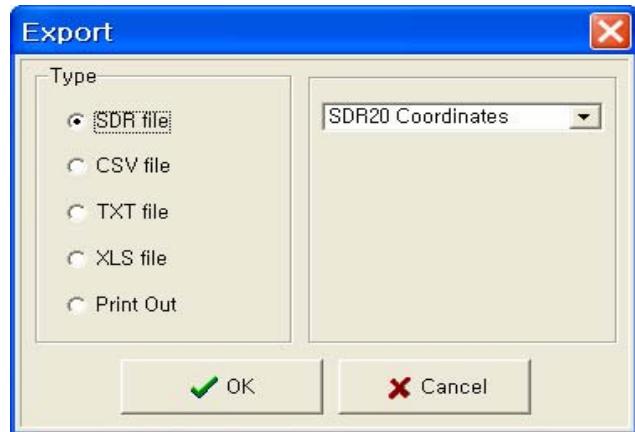
4. Select a file and click **[Open]**.

4.1.2 Exporting Data

1. Click [Export].

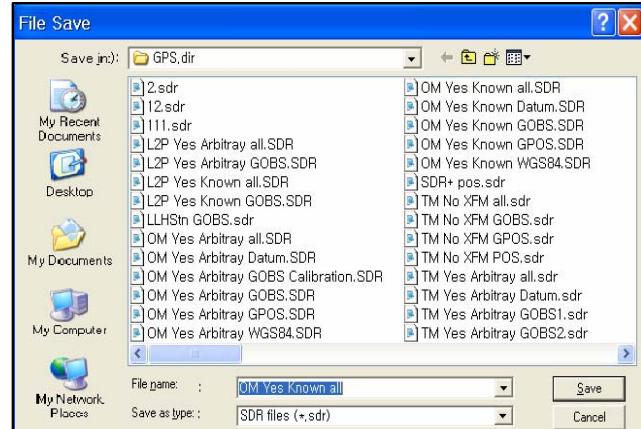
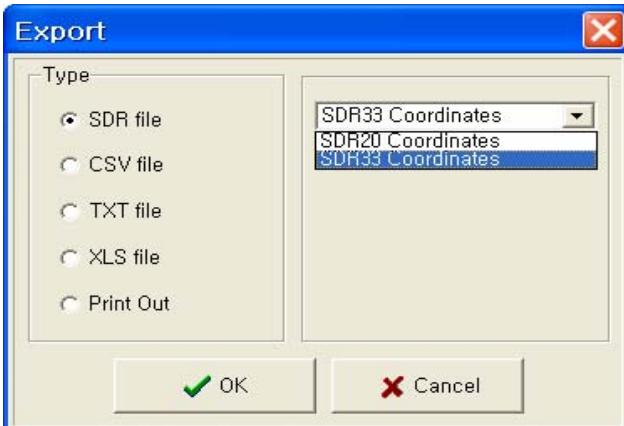


2. Select “SDR file” in Type. For other types see the Note below.



5. Select “SDR20 Field Book”, “SDR33 Field Book”, “SDR20 Coordinates”, or “SDR33

Coordinates” and click [OK].



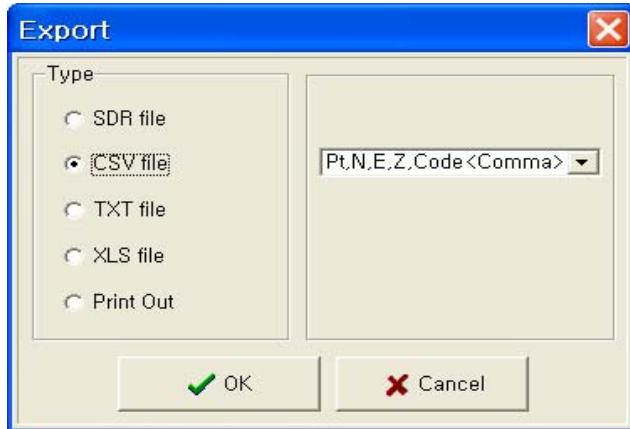
User's Guide



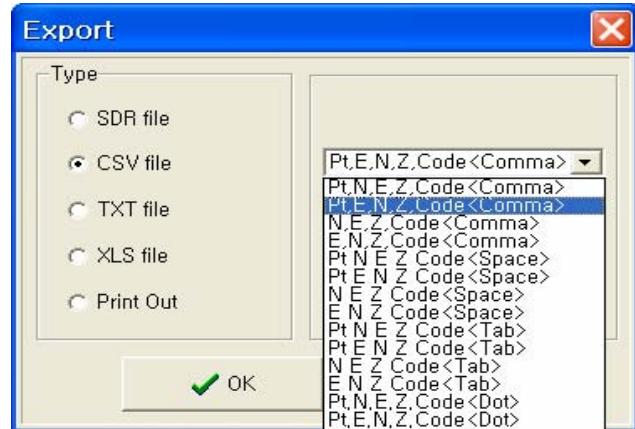
Note:

► Export Type: CSV file

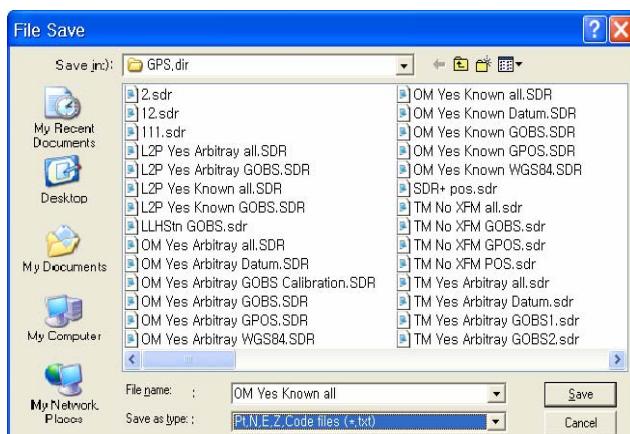
a. Select “CSV file” in Type.



b. Select the data format.

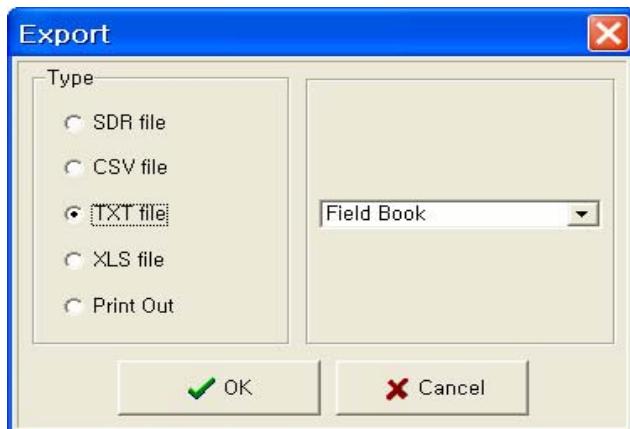


c. Input the file name and save.

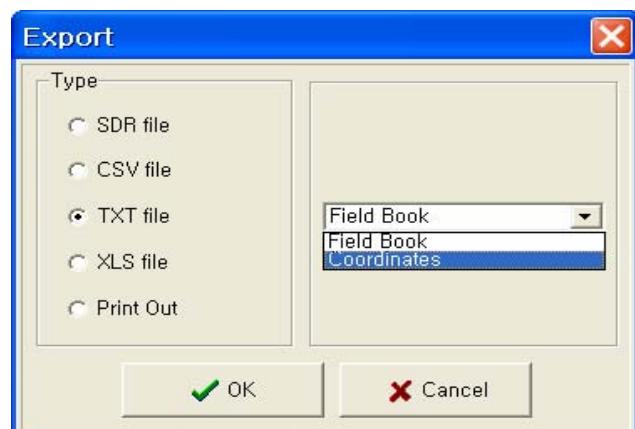


► Export Type: TXT file

a. Select “TXT file” in Type.

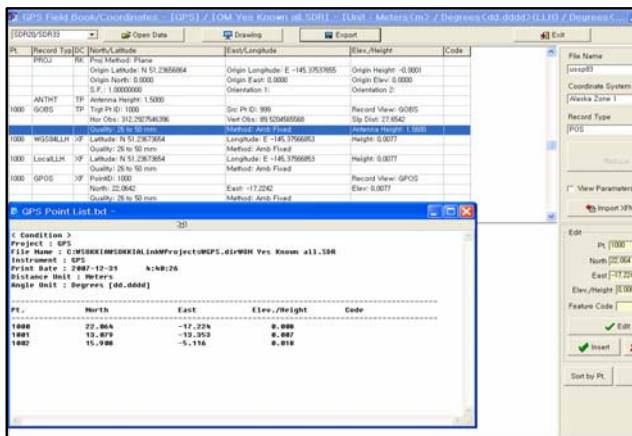


b. Select the data format to export.



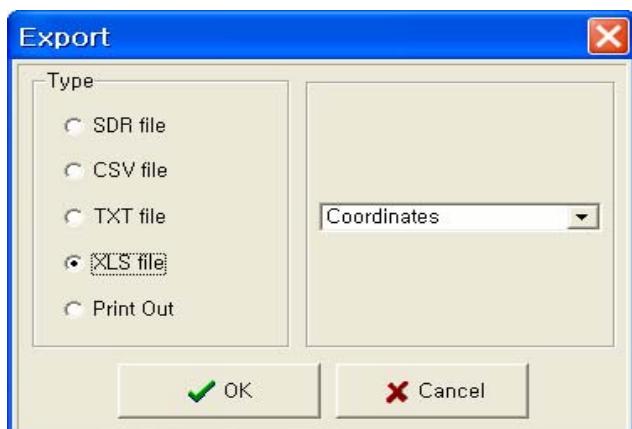
User's Guide

c. Review the exporting data.

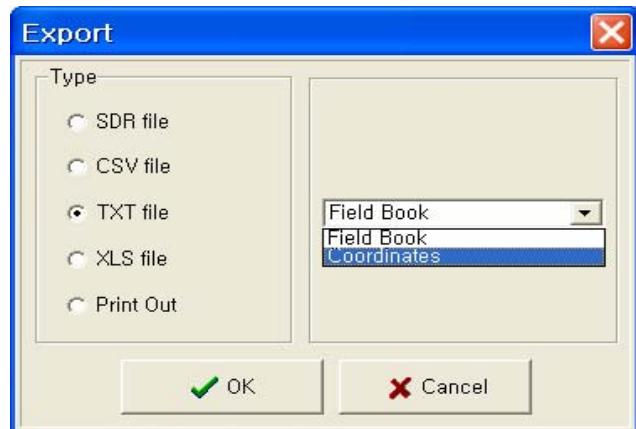


► Export Type: XLS file

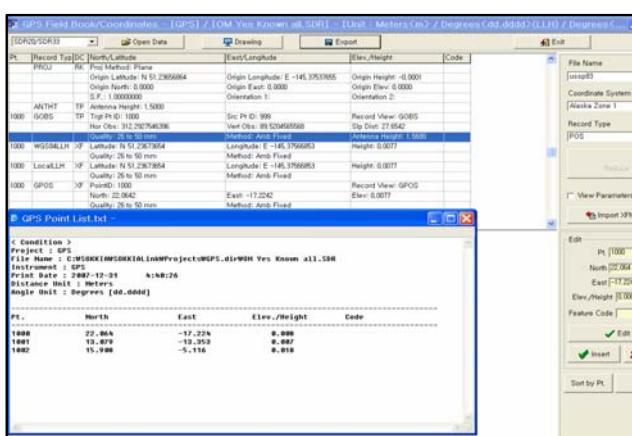
a. Select “XLS file” in Type.



b. Select the data format to export.



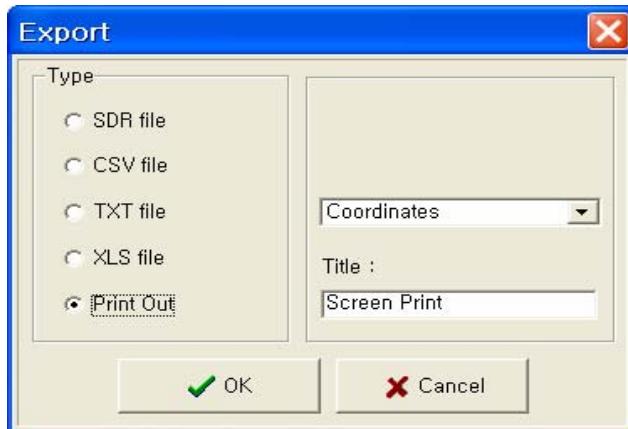
c. Review the exporting data.



► Export Type: Print Out

a. Select “Print Out” in Type.

Input the title and click [OK].



Screen Print				
PL	North	East	Elevation	Code
1000	22.064	-17.204	0.008	
1001	13.079	-13.353	0.007	
1002	15.908	-5.116	0.018	

4.1.3 Drawing



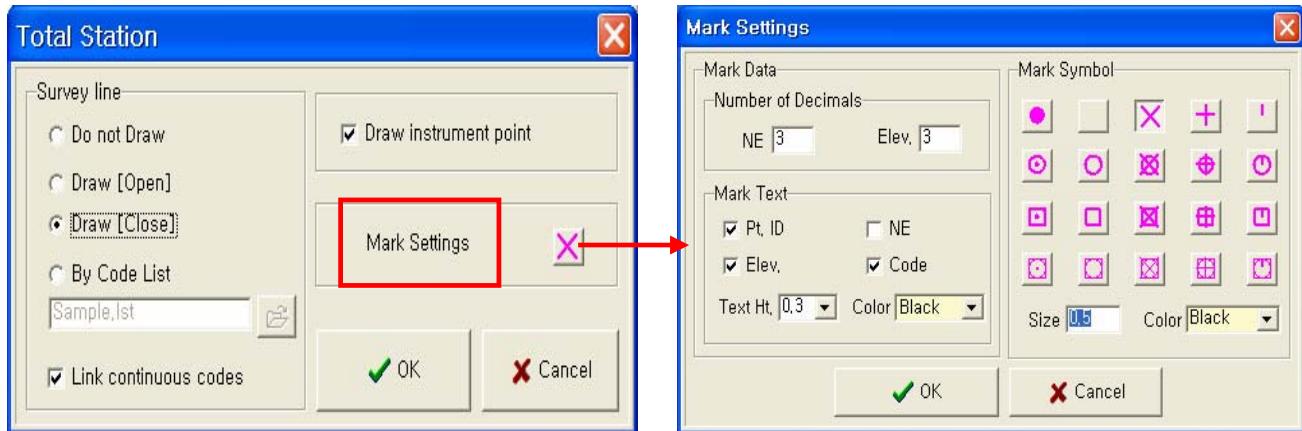
1. Click [Drawing].

The following dialog box is displayed.

PL	Altitude	Depth	Ex	East	North	PL	Altitude	Depth	Ex	East	North	PL	Altitude	Depth	Ex	East	North	PL
1000	22.064	0.008				1001	13.079	0.007				1002	15.908	0.018				
1003	24.000	0.000				1004	24.000	0.000				1005	24.000	0.000				
1006	24.000	0.000				1007	24.000	0.000				1008	24.000	0.000				
1009	24.000	0.000				1010	24.000	0.000				1011	24.000	0.000				
1012	24.000	0.000				1013	24.000	0.000				1014	24.000	0.000				
1015	24.000	0.000				1016	24.000	0.000				1017	24.000	0.000				
1018	24.000	0.000				1019	24.000	0.000				1020	24.000	0.000				
1021	24.000	0.000				1022	24.000	0.000				1023	24.000	0.000				
1024	24.000	0.000				1025	24.000	0.000				1026	24.000	0.000				
1027	24.000	0.000				1028	24.000	0.000				1029	24.000	0.000				
1030	24.000	0.000				1031	24.000	0.000				1032	24.000	0.000				
1033	24.000	0.000				1034	24.000	0.000				1035	24.000	0.000				
1036	24.000	0.000				1037	24.000	0.000				1038	24.000	0.000				
1039	24.000	0.000				1040	24.000	0.000				1041	24.000	0.000				
1042	24.000	0.000				1043	24.000	0.000				1044	24.000	0.000				
1045	24.000	0.000				1046	24.000	0.000				1047	24.000	0.000				
1048	24.000	0.000				1049	24.000	0.000				1050	24.000	0.000				
1051	24.000	0.000				1052	24.000	0.000				1053	24.000	0.000				
1054	24.000	0.000				1055	24.000	0.000				1056	24.000	0.000				
1057	24.000	0.000				1058	24.000	0.000				1059	24.000	0.000				
1060	24.000	0.000				1061	24.000	0.000				1062	24.000	0.000				
1063	24.000	0.000				1064	24.000	0.000				1065	24.000	0.000				
1066	24.000	0.000				1067	24.000	0.000				1068	24.000	0.000				
1069	24.000	0.000				1070	24.000	0.000				1071	24.000	0.000				
1072	24.000	0.000				1073	24.000	0.000				1074	24.000	0.000				
1075	24.000	0.000				1076	24.000	0.000				1077	24.000	0.000				
1078	24.000	0.000				1079	24.000	0.000				1080	24.000	0.000				
1081	24.000	0.000				1082	24.000	0.000				1083	24.000	0.000				
1084	24.000	0.000				1085	24.000	0.000				1086	24.000	0.000				
1087	24.000	0.000				1088	24.000	0.000				1089	24.000	0.000				
1090	24.000	0.000				1091	24.000	0.000				1092	24.000	0.000				
1093	24.000	0.000				1094	24.000	0.000				1095	24.000	0.000				
1096	24.000	0.000				1097	24.000	0.000				1098	24.000	0.000				
1099	24.000	0.000				1100	24.000	0.000				1101	24.000	0.000				
1102	24.000	0.000				1103	24.000	0.000				1104	24.000	0.000				
1105	24.000	0.000				1106	24.000	0.000				1107	24.000	0.000				
1108	24.000	0.000				1109	24.000	0.000				1110	24.000	0.000				
1111	24.000	0.000				1112	24.000	0.000				1113	24.000	0.000				
1114	24.000	0.000				1115	24.000	0.000				1116	24.000	0.000				
1117	24.000	0.000				1118	24.000	0.000				1119	24.000	0.000				
1120	24.000	0.000				1121	24.000	0.000				1122	24.000	0.000				
1123	24.000	0.000				1124	24.000	0.000				1125	24.000	0.000				
1126	24.000	0.000				1127	24.000	0.000				1128	24.000	0.000				
1129	24.000	0.000				1130	24.000	0.000				1131	24.000	0.000				
1132	24.000	0.000				1133	24.000	0.000				1134	24.000	0.000				
1135	24.000	0.000				1136	24.000	0.000				1137	24.000	0.000				
1138	24.000	0.000				1139	24.000	0.000				1140	24.000	0.000				
1141	24.000	0.000				1142	24.000	0.000				1143	24.000	0.000				
1144	24.000	0.000				1145	24.000	0.000				1146	24.000	0.000				
1147	24.000	0.000				1148	24.000	0.000				1149	24.000	0.000				
1150	24.000	0.000				1151	24.000	0.000				1152	24.000	0.000				
1153	24.000	0.000				1154	24.000	0.000				1155	24.000	0.000				
1156	24.000	0.000				1157	24.000	0.000				1158	24.000	0.000				
1159	24.000	0.000				1160	24.000	0.000				1161	24.000	0.000				
1162	24.000	0.000				1163	24.000	0.000				1164	24.000	0.000				
1165	24.000	0.000				1166	24.000	0.000				1167	24.000	0.000				
1168	24.000	0.000				1169	24.000	0.000				1170	24.000	0.000				
1171	24.000	0.000				1172	24.000	0.000				1173	24.000	0.000				
1174	24.000	0.000				1175	24.000	0.000				1176	24.000	0.000				
1177	24.000	0.000				1178	24.000	0.000				1179	24.000	0.000				
1180	24.000	0.000				1181	24.000	0.000				1182	24.000	0.000				
1183	24.000	0.000				1184	24.000	0.000				1185	24.000	0.000				
1186	24.000	0.000				1187	24.000	0.000				1188	24.000	0.000				
1189	24.000	0.000				1190	24.000	0.000				1191	24.000	0.000				
1192	24.000	0.000				1193	24.000	0.000				1194	24.000	0.000				
1195	24.000	0.000				1196	24.000	0.000				1197	24.000	0.000				
1198	24.000	0.000				1199	24.000	0.000				1200	24.000	0.000				
1201	24.000	0.000				1202	24.000	0.000				1203	24.000	0.000				
1204	24.000	0.000				1205	24.000	0.000				1206	24.000	0.000				
1207	24.000	0.000				1208	24.000	0.000				1209	24.000	0.000				
1210	24.000	0.000				1211	24.000	0.000				1212	24.000	0.000				
1213	24.000	0.000				1214	24.000	0.000				1215	24.000	0.000				
1216	24.000	0.000				1217	24.000	0.000				1218	24.000	0.000				
1219																		

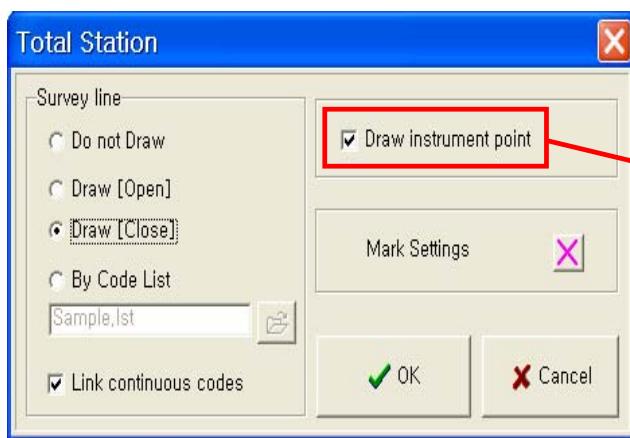
User's Guide

2. Select a mark symbol.

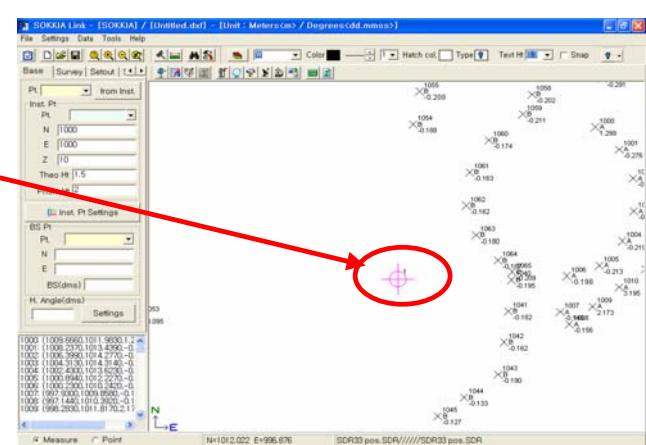


Refer to “3.1 Mark Settings”

3. Select “Draw instrument point” setting.

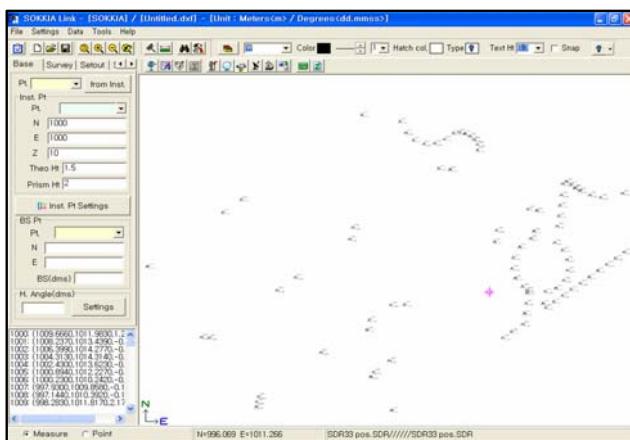


If checked, the instrument point is drawn.



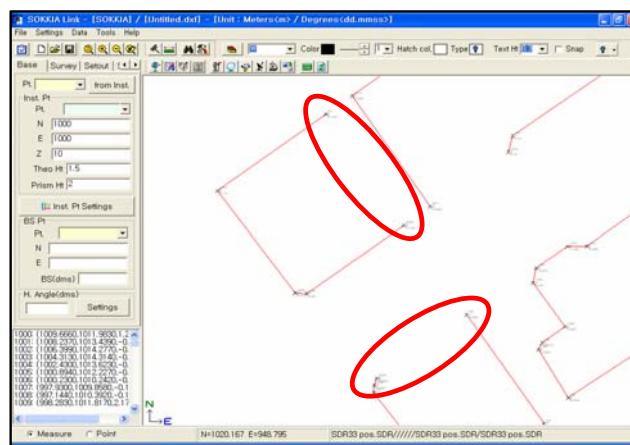
4. Select survey line settings

“Do not Draw”

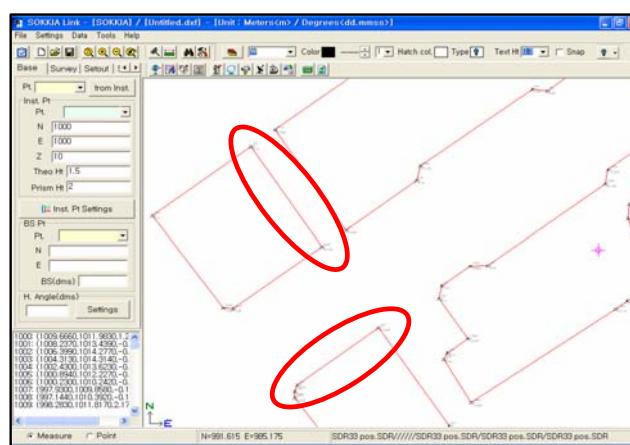


User's Guide

“Draw (Open)”



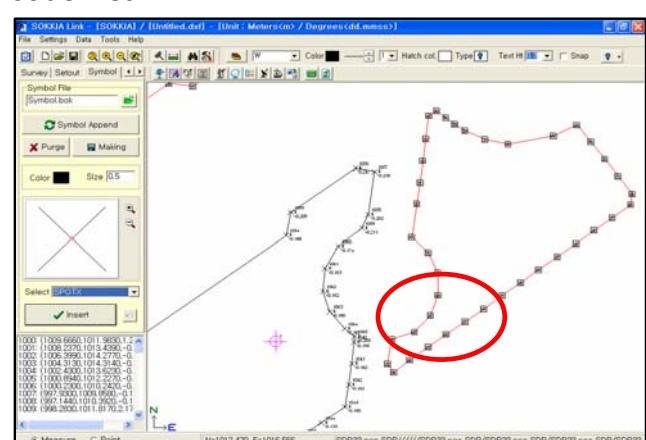
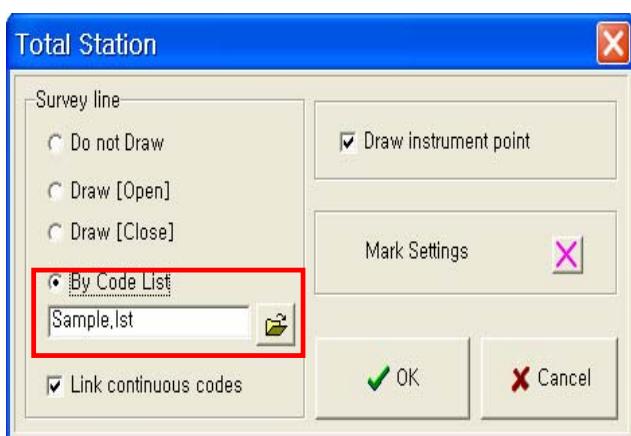
“Draw (Close)”



“By Code List”

Select a code list.

Lines are drawn according to the selected code list.

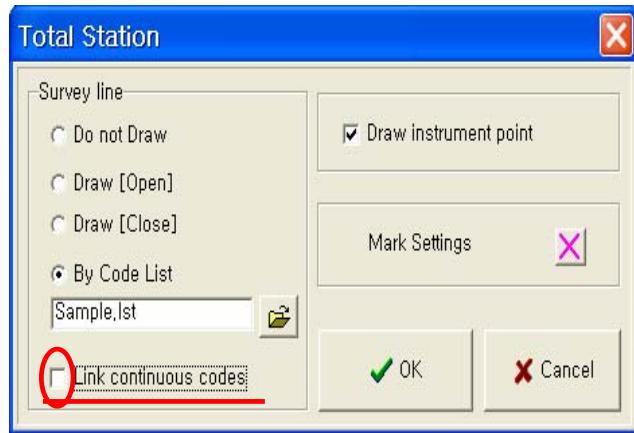


User's Guide



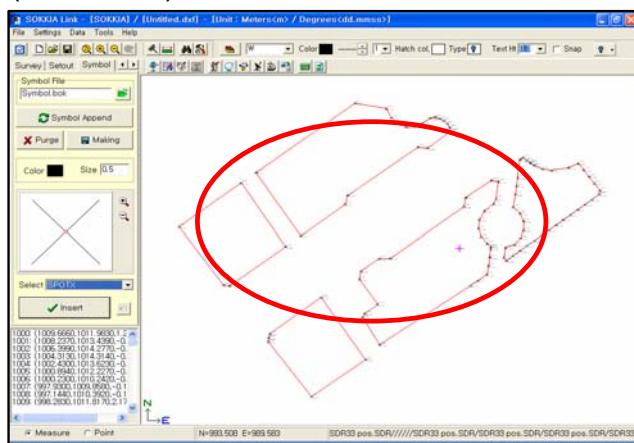
Note:

"Link continuous codes" option

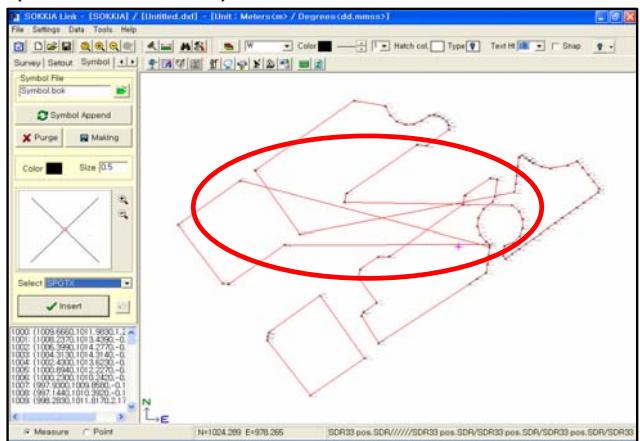


This option links all consecutive points with the same code.

(If checked)



(If not checked)



4.1.4 Inserting an Instrument Point



1. Enter instrument data in User Input and click [Insert].

2. The input point is inserted into the Field book.

Pt.	Rec.	Type	Inc.	North/Hor.	East/Vor.	Elev./Dist.	Code		
1	NOTE	CC	Note: Plane Curvature Corre						
	STN	TP	North: 0.0000	East: 0.0000	Elev: 0.0000				
			Theo Ht: 0.0000						
1000	POS	KI	North: 1.009,6660	East: 1,011,9830	Elev.: 1,2990	A	I		
1001	POS	KI	North: 1,008,2370	East: 1,013,4390	Elev.: -0,2760	A	I		
1002	POS	KI	North: 1,006,3990	East: 1,014,2770	Elev.: -0,2730	A	I		
1003	POS	KI	North: 1,004,3130	East: 1,014,3140	Elev.: -0,2370	A	I		
1004	POS	KI	North: 1,002,4300	East: 1,013,6230	Elev.: -0,2190	A	I		
Pt.	Azimuth	Zenith	S. Dist	H. Dist	North	East	Elevation	Code	STN
1000	0	0	0	1,009,666	1,011,983	1,299	A	I	
1001	45,086074	90,003982	1,429,546	1,429,546	1,008,237	1,013,439	-0,276	A	I
1002	45,132416	90,003941	1,428,845	1,428,845	1,006,399	1,014,277	-0,273	A	I
1003	45,17190	90,003425	1,427,402	1,427,402	1,004,313	1,014,314	-0,237	A	I
1004	45,19516	90,003169	1,425,587	1,425,587	1,002,430	1,013,623	-0,219	A	I
1005	45,192117	90,003086	1,423,514	1,423,514	1,000,894	1,012,227	-0,213	A	I
1006	45,17717	90,002873	1,421,636	1,421,636	1,000,230	1,010,242	-0,198	A	I
1007	45,202538	90,002121	1,419,746	1,419,746	997,936	1,009,858	-0,146	A	I
1008	45,224115	90,002267	1,419,573	1,419,573	997,144	1,010,392	-0,156	A	I
1009	45,23876	89,544467	1,421,389	1,421,388	998,283	1,011,817	2,173	A	I
1010	45,234851	89,521701	1,423,396	1,423,393	999,496	1,013,437	3,195	A	I
1011	45,242850	90,003155	1,425,348	1,425,348	1,000,672	1,015,023	-0,218	A	I
1012	45,251855	90,003540	1,427,360	1,427,360	1,001,838	1,016,699	-0,245	A	I
1013	45,2629	90,003911	1,429,370	1,429,370	1,003,043	1,018,334	-0,271	A	I

4.1.5 Updating All Points



Instrument and measurement points are shifted from the selected instrument point.



Procedure

- Enter new coordinates in User Input and click [Update All].

Inst, Pt

Pt.	1
Theo Ht	0
N	1000,000
E	1000,000
Z	1,000
Prism Ht	0

User Input

1	Insert
0	
1000,000	
1000,000	
1,000	
0	[1] Update

1000	51,063193	94,492244	15,450	15,396	2009,666	2011,983	-0,299	A ST
1001	58,294248	94,374119	15,814	15,762	2008,237	2013,439	-0,276	A
1002	65,512849	94,39596	15,697	15,645	2006,399	2014,277	-0,273	A
1003	73,135427	94,434845	15,001	14,950	2004,313	2014,314	-0,237	A
1004	79,531049	95,02321	13,892	13,838	2002,430	2013,623	-0,219	A
1005	85,49535	95,39216	12,320	12,260	2000,894	2012,227	-0,213	A
1006	88,424878	96,401152	10,914	10,245	1000,230	2010,242	-0,198	A
1007	101,513160	96,292620	10,138	10,073	997,930	2009,858	-0,146	A
1008	105,22129	96,072019	10,839	10,777	997,144	2010,392	-0,156	A
1009	98,16182	95,363706	11,999	11,941	998,283	2011,817	-0,173	A
1010	92,085303	95,044294	13,499	13,446	999,496	2013,437	-0,195	A
1011	87,261963	94,374997	15,087	15,038	2000,672	2015,023	-0,218	A
1012	83,43818	94,141794	16,846	16,800	2001,838	2016,699	-0,245	A
1013	80,344341	93,544435	18,628	18,585	2003,043	2018,334	-0,271	A
1014	77,535487	93,314273	20,440	20,401	2004,277	2019,948	-0,258	A
1015	75,463944	93,224822	22,287	22,248	2005,466	2021,566	-0,314	A
1016	73,534641	93,105654	24,138	24,101	2006,685	2023,155	-0,340	A

Inst, Pt

Pt.	1
Theo Ht	0
N	1000,000
E	1000,000
Z	1,000
Prism Ht	0

User Input

1	Insert
0	
2000,000	
2000,000	
2,000	
0	[1] Update

1000	51,063193	94,492244	15,450	15,396	2009,666	2011,983	0,701	A ST
1001	58,294248	94,374119	15,814	15,762	2008,237	2013,439	0,724	A
1002	65,512849	94,39596	15,697	15,645	2006,399	2014,277	0,727	A
1003	73,135427	94,434845	15,001	14,950	2004,313	2014,314	0,763	A
1004	79,531049	95,02321	13,892	13,838	2002,430	2013,623	0,781	A
1005	85,49535	95,39216	12,320	12,260	2000,894	2012,227	0,787	A
1006	88,424878	96,401152	10,914	10,245	1000,230	2010,242	0,802	A
1007	101,513160	96,292620	10,138	10,073	997,930	2009,858	0,854	A
1008	105,22129	96,072019	10,839	10,777	997,144	2010,392	0,844	A
1009	98,16182	95,363706	11,999	11,941	998,283	2011,817	0,827	A
1010	92,085303	95,044294	13,499	13,446	999,496	2013,437	0,805	A
1011	87,261963	94,374997	15,087	15,038	2000,672	2015,023	0,782	A
1012	83,43818	94,141794	16,846	16,800	2001,838	2016,699	0,755	A
1013	80,344341	93,544435	18,628	18,585	2003,043	2018,334	0,729	A
1014	77,535487	93,314273	20,440	20,401	2004,277	2019,948	0,742	A
1015	75,463944	93,224822	22,287	22,248	2005,466	2021,566	0,686	A

4.1.6 Updating



Instrument and related measurement points are shifted according to user input.

(**Theo Ht** and **Prism Ht** are updated)



Procedure

1. Enter new data in User Input and click **[Update]**.

Pt.	1027
Theo Ht	0001 1001 1003
N	432105,830
E	225779,263
Z	4,633
Prism Ht	1020 1027 1030 1039 1042 1054 1058 1062 1066

User Input:
Pt. 1027
N 432105,830
E 225779,263
Z 4,633
[1027] Update

4.1.7 Updating All Points after BS Change



Click **[Update All]** after the first BS has been changed to rotate instrument and measurement points. Remaining points are rotated according to the updated instrument point.



Procedure

1. Enter new NE values in User Input and click **[Azimuth Calc]**.

The azimuth angle for the new BS is calculated.

2. Click **[Swing Calc]**.

The angle by which related points will be rotated when using the new BS is Calculated.

Pt.	1001
Azimuth	265,6954
H, Angle	284,2000

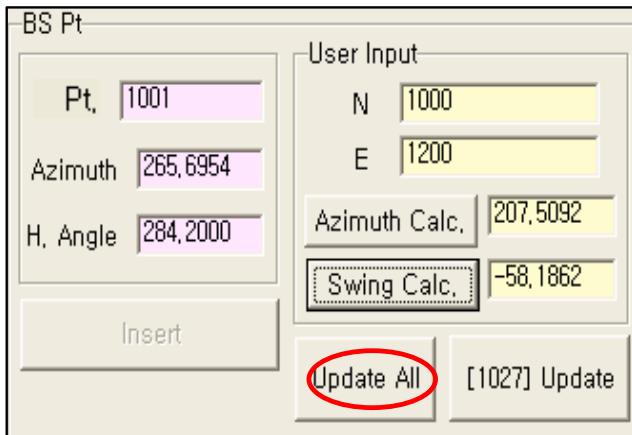
User Input:
Pt. 1001
N 1000
E 1200
[Azimuth Calc.] 207,5092
[Swing Calc.]

Pt.	1001
Azimuth	265,6954
H, Angle	284,2000

User Input:
Pt. 1001
N 1000
E 1200
[Azimuth Calc.] 207,5092
[Swing Calc.] -58,1862
[Update All] [1027] Update

User's Guide

3. Click [Update All].



Updating after BS Change



[1027] Back Sight is changed, then hierarchical measuring points are rotated.

4.1.8 [Edit] / [Insert] / [Delete]

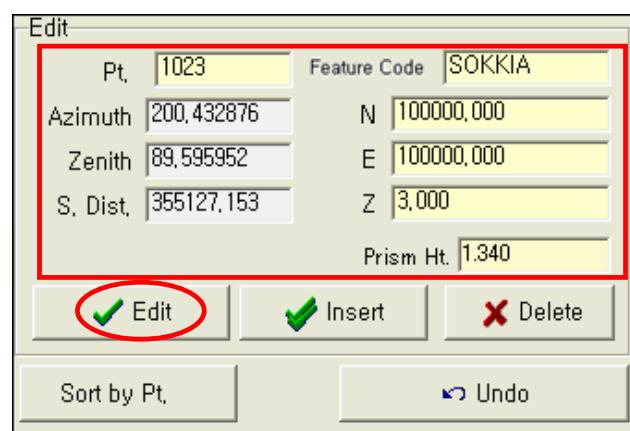
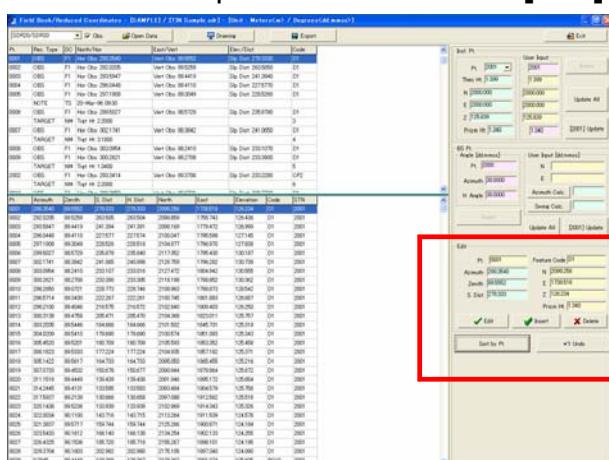


When the Reduced coordinates for points are modified, the information is automatically updated in the Field Book.



Procedure

1. Enter new point data and click [Edit].



User's Guide

2. The new data is reflected in the Field Book and Reduced coordinates.

Theo Ht: 0,0000								
NOTE	TL	Note: V,obs tol, error: Pt: 10						
1003	BKB	TP Azimuth: 139,452551	Hor Obs: 57,375900					
1022	POS	TP North: 432104,9980	East: 225707,4460	Elev.: 0,4560				
1023	POS	TP North: 100000,0000	East: 100000,0000	Elev.: 3,0000				
1024	POS	TP North: 432214,3310	East: 225685,1630	Elev.: 2,9781				
NOTE	AJ	Note: Vert Recip Calc Refr						
1020	STN	TP North: 432109,8620	East: 225747,6000	Elev: 3,4576				
Theo Ht: 0,0000								
NOTE TL Note: V,obs tol, error: Pt: 10								
Pt. ID	Azimuth	Zenith	S. Dist	H. Dist	North	East	Elevation	Code
1020	83,051851	87,003900	40,500	40,445	432109,862	225747,600	3,166	SR-01-3
1021	200,485794	92,223335	8,182	8,175	432097,354	225704,544	0,715	TSR-11
1022	139,452542	91,462699	55,747	55,720	432104,998	225707,446	0,456	00
1023	200,432876	89,595952	355127,153	355127,153	100000,000	100000,000	3,000	SOKKIA
1024	11,36511	89,195199	68,199	68,194	432214,331	225685,163	2,978	103-1
1025	263,051851	93,484280	40,535	40,445	432104,995	225707,449	0,763	00



Note:

Enter new point data and click **[Insert]** to add as a new record above the currently selected row.

Click **[Delete]** to delete the selected row.

4.1.9 Sorting Points



Points are sorted by Pt field. This function sorts only the Reduced Coordinate View.



Procedure

1. Click **[Sort by Pt.]**.

Edit

Pt.

Feature Code

Azimuth

N

Zenith

E

S. Dist.

Z

Prism Ht.

55

4.2 GPS

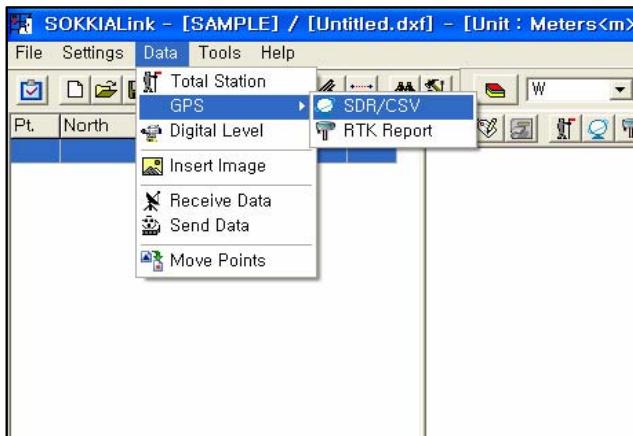
4.2.1 Opening GPS/CSV file

 SOKKIA Link can manage GPS/RTK data. You can import, edit and export them in various ways. Furthermore, SDR data can be transformed with region-specific coordinate transformation systems.



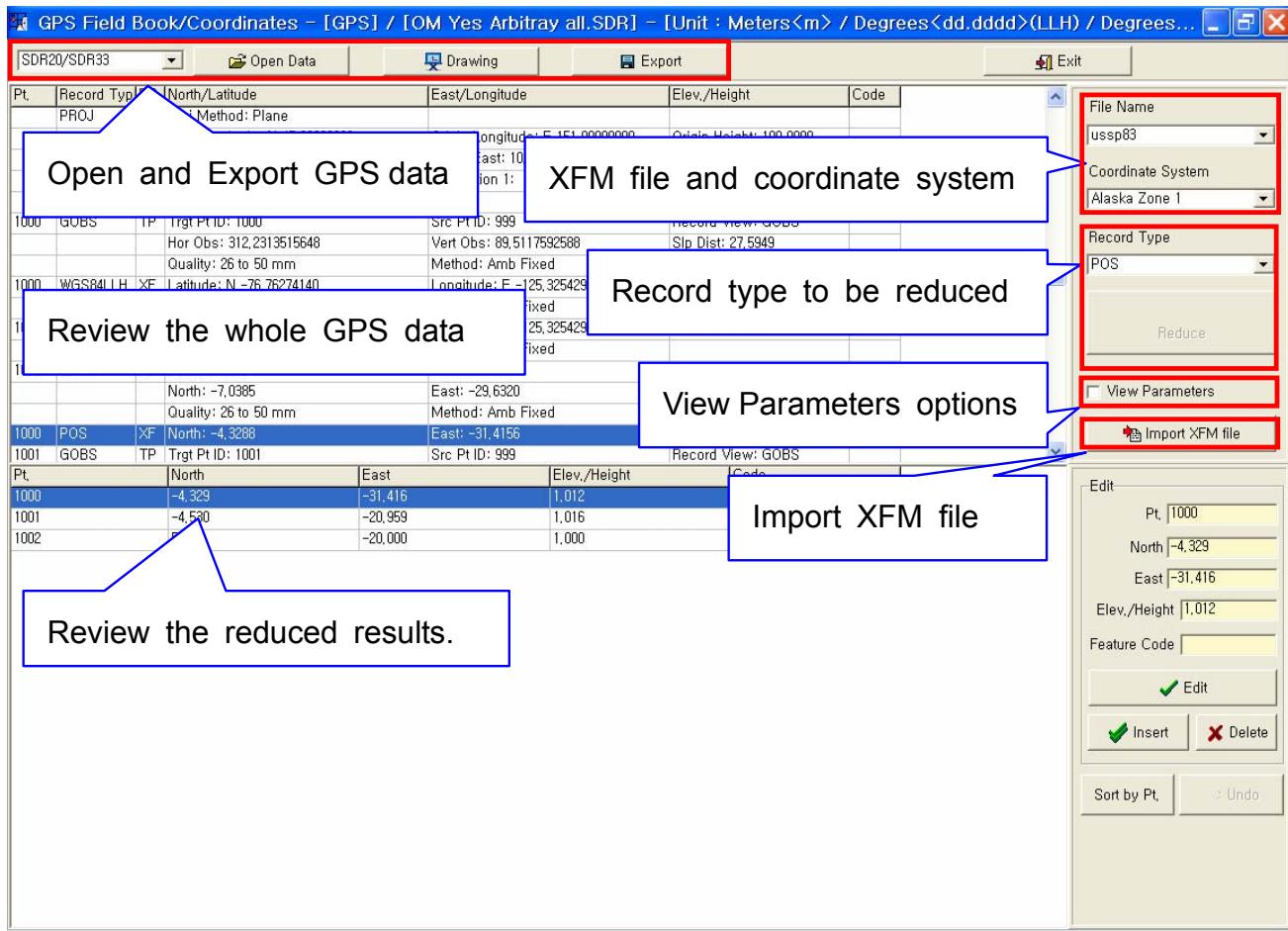
Procedure

1. Select [Data] – [GPS] – [SDR/CSV] or .



User's Guide

2. The GPS-SDR/CSV Main screen is displayed.



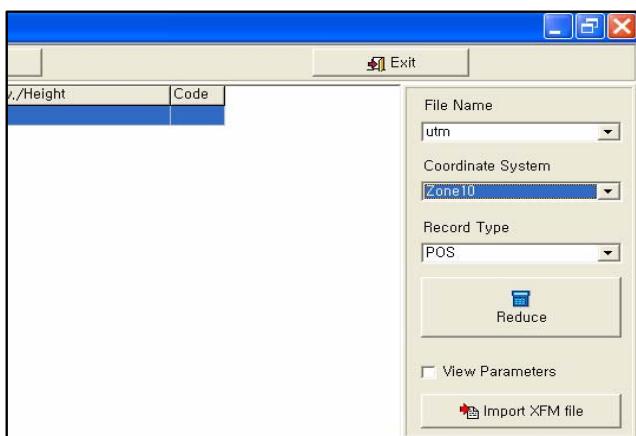
4.2.2 Importing XFM (GPS/CSV file)

Clicking [Import XFM] imports (copies) the user-specified XFM into SOKKIA Link.

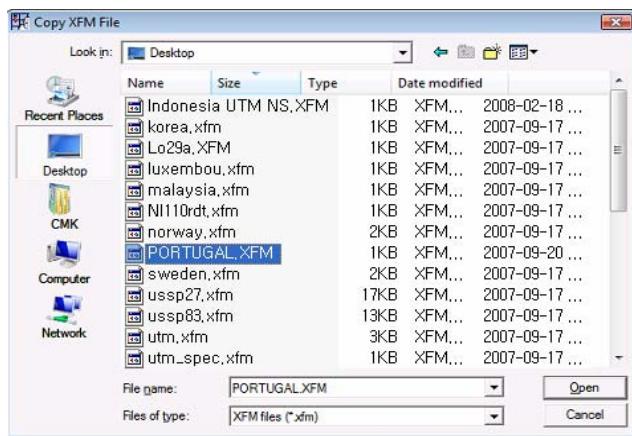


Procedure

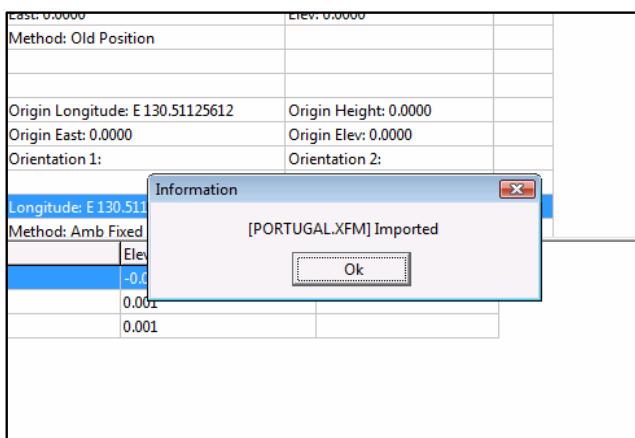
1. Click [Import XFM].



2. Select a file and click [Open].

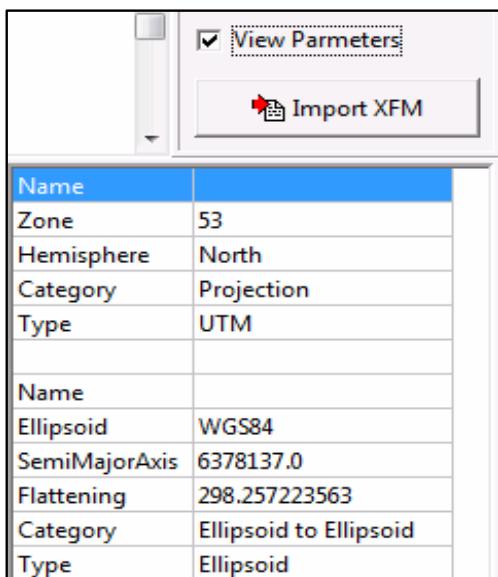


3. Click [Ok].



Note:

Check the View Parameters options by checking the “View Parameters” box.



Note:

Changing the content of an XFM file may lead to inaccuracy in calculation results.



Note:

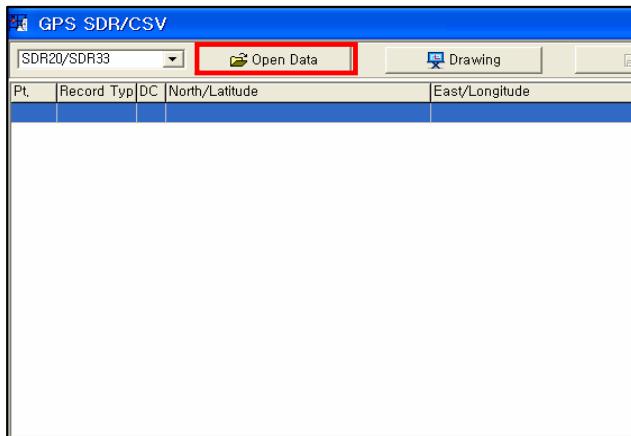
XFM files are an original Sokkia format containing information necessary for RTK-GPS data transformation.

4.2.3 Opening Data

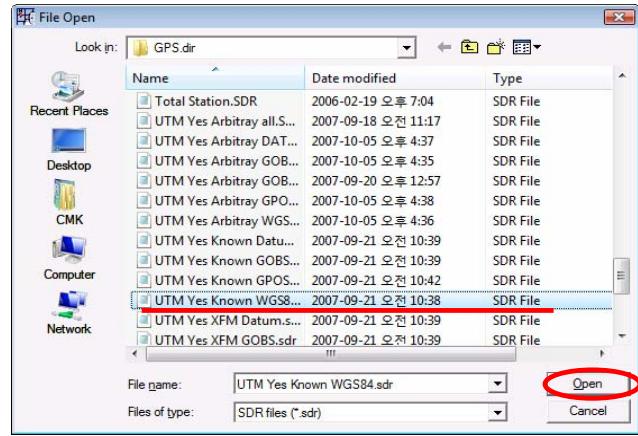


Procedure

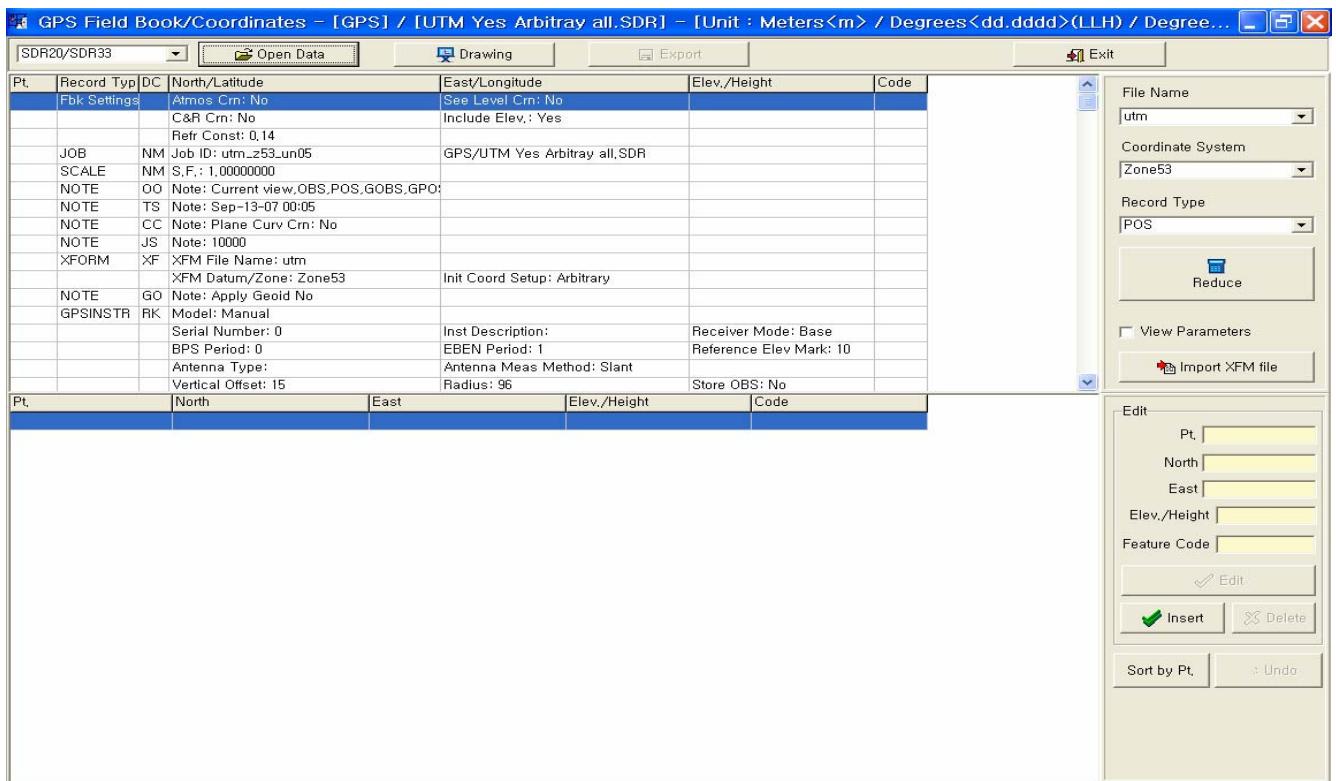
1. Click [Open Data].



2. Select a file and Click [Open].

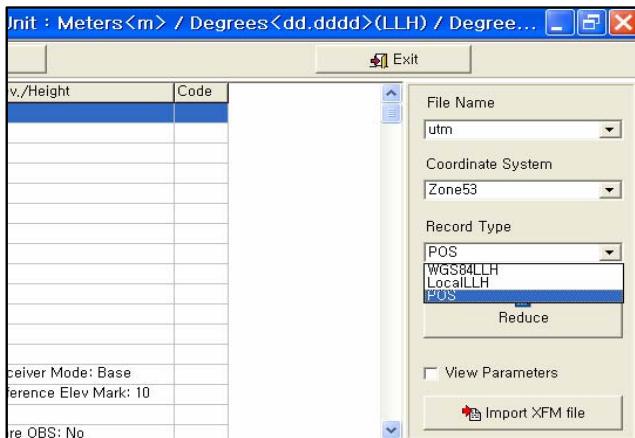


Data is displayed as shown below.

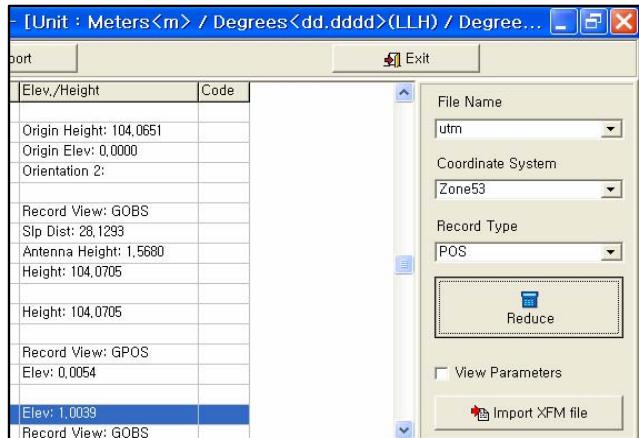


User's Guide

3. Select “POS” in Record Type.



4. Click [Reduce].



Data is reduced to POS values.

999	GPOS	RK	PointID: 999 North: 0.0000 Quality: 0 to 25 mm Method: Old Position
NOTE	TS		Note: Sep-13-07 01:26
PROJ	RK	Proj Method: Plane Origin Latitude: N 0.00000000 Origin North: 0.0000 S.F.: 1.00000000 Orientation 1:	Origin Longitude: E 130.51107316
ANTHT	TP		Antenna Height: 1.5000
1000	WGS84LLH	XF	Latitude: N 0.00017056 Longitude: E 130.51107316 Quality: 0 to 25 mm Method: Amb Fixed
Pt.		North	East
1000		18.910	-20.421
1001		10.674	-15.396
1002		14.786	-7.814
			Elevation
			-0.045
			0.001
			0.001



Note:

You can apply the above processes to other data formats such as WGS84LLH and Local LLH, in the same way.

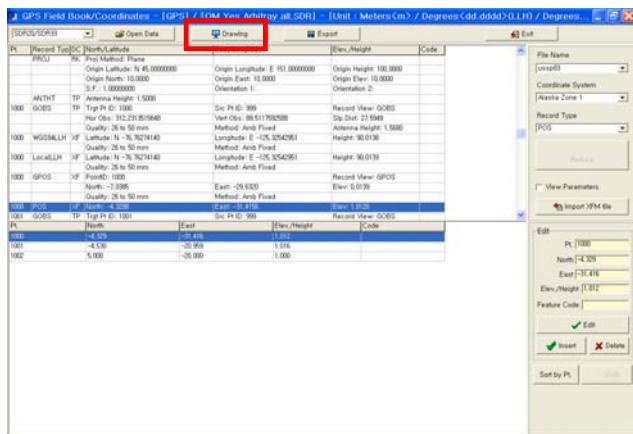
4.2.4 Drawing



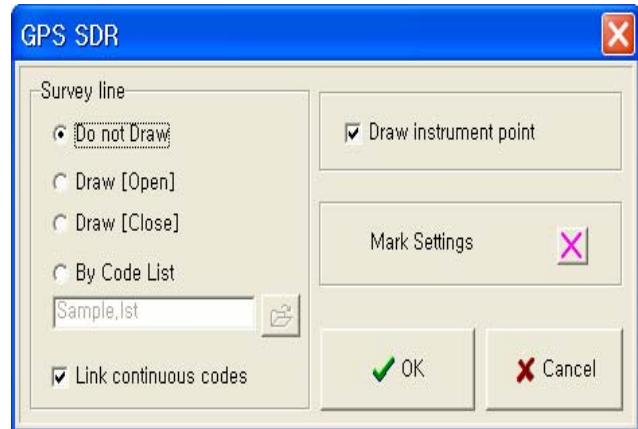
Procedure

User's Guide

1. Click [Drawing].



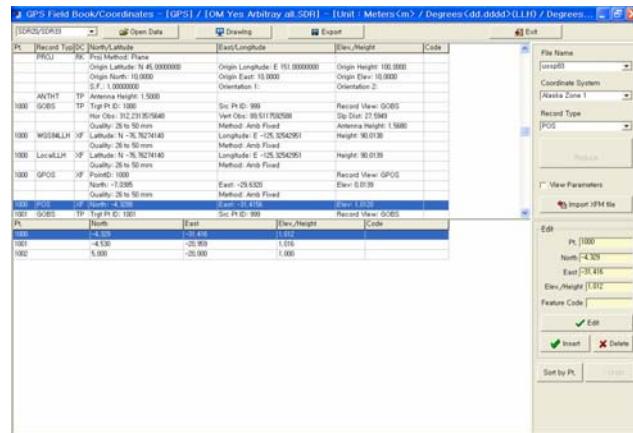
2. The following dialog box is displayed.



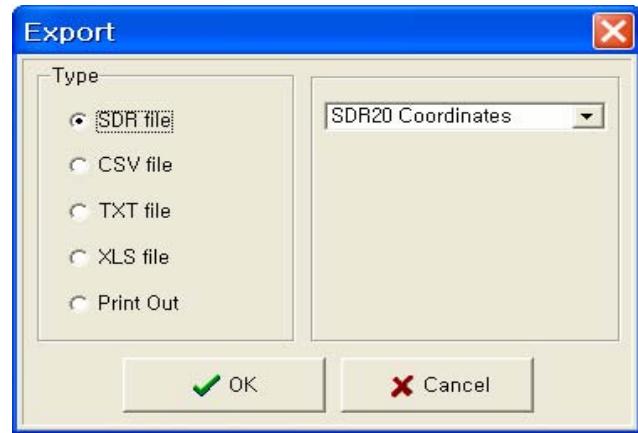
Refer to “4.1 Total Station”

4.2.5 Exporting

1. Click [Export].



2. The following dialog box is displayed.



Refer to “4.1 Total Station”



Note:

Available projection transformation

The types of projections supported by SOKKIA Link are :

Projection	Type
Lambert 2 Parallel	conformal
Transverse Mercator (or TM)	conformal
Universal Transverse Mercator (or UTM)	conformal
Oblique Mercator	conformal
Stereographic Double	conformal

User's Guide

4.2.6 RTK Report.



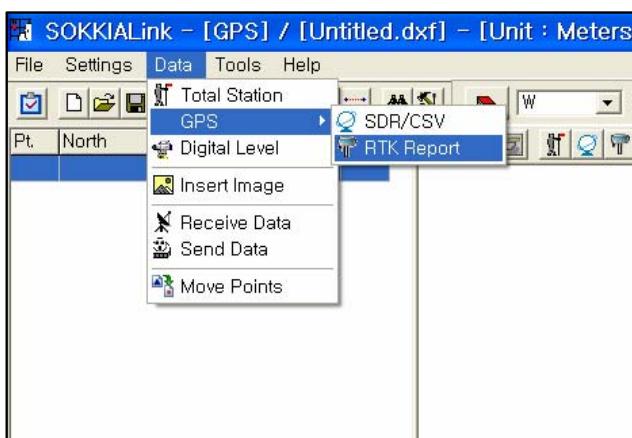
SOKKIA Link can manage RTK report format. This function helps you easily view the raw data, and export it in various ways.



Procedure



1. Select [Data] – [GPS] - [RTK Report] or



2. The RTK Report Main screen is displayed.

The screenshot shows the RTK Report main screen with the following sections highlighted:

- Job Information:** Job name (Job01), Project (RTK report export), Location (Olathe,Kansas), Comments (Jeff & Scott).
- Receiver Information:** Profile (Sokkia GSR2700 IS), Brand (Sokkia), Model (GSR), Serial Number (NZH), Firmware (2,313:1,000).
- Session Information:** Time (5/9/2007 1:50:26 AM), Base ID (1001), Correction format (RTC), Broadcast ID (ANY), True antenna height (m) (2,743), WGS84 Latitude (38°54' 58.580"), WGS84 Longitude (-94°46' 50.180"), WGS84 Height (m) (287.424).
- Reduced Coordinates:** A table showing points (Pt.) 1001 through 5019 with their North, East, Elevation, and Code values. The point labeled "Reduced" is highlighted.
- RTK Vector Observations:** A table showing time, point (Pt.), used status, measured height (Meas.Ht.), antenna height (Ant.Ht.), ECEF dx, ECEF dy, ECEF dz, geo azimuth (Geo.Az), geo distance (Geo.Dist), mode, fix/fit, horizontal RMS (H.RMS), vertical RMS (V.RMS), PDOP, and SVs for each observation. The "RTK Vector" section is highlighted.

4.3 Digital Level

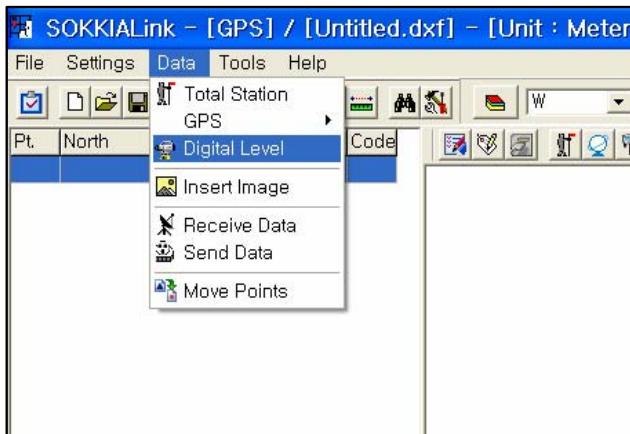


SOKKIA Link manages Digital Level data. The raw data gathered can be imported, edited and exported in various ways.



Procedure

1. Select [Data] - [Digital Level] or 



2. The Digital Level Main screen is displayed.



Note:

Editing Level Elev.

- a. Select “Elev” values.

LELEV	KI	PointID: 0001	
LSTN	LV	Elev: 30.400000	
LOBSIW	LV	Stn Number: 1 BS Pt ID: 0001 TP Count: 1 Point ID: 0001 Stn Number: 1 Distance: 30.754300 Mid Wire: 1.7090136 IsABs: 1 IsATP: 0	Vert Offset: 0 [Geo Ht]: 30.400000
LOBSIW	LV	Point ID: 0002 Stn Number: 1 Distance: 27.127200 Mid Wire: 1.4980930 IsABs: 0 IsATP: 1	Vert Offset: 0 [Geo Ht]: 30.6909216
LSTN	LV	Stn Number: 2 BS Pt ID: 0002 TP Count: 1 Point ID: 0002 Stn Number: 2 Distance: 28.169500 Mid Wire: 1.8650712 IsABs: 1 IsATP: 0	Vert Offset: 0 [Geo Ht]: 30.8909216
LOBSIW	LV	Point ID: 0003 Stn Number: 2 Distance: 32.004000 Mid Wire: -0.0009392 IsABs: 1 IsATP: 0	Vert Offset: 0 [Geo Ht]: 33.0029168
LOBSIW	LV	Point ID: 0004 Stn Number: 3 BS Pt ID: 0003 TP Count: 1 Point ID: 0003 Stn Number: 3 Distance: 29.4741600 Mid Wire: -1.2969240 IsABs: 0 IsATP: 1	Vert Offset: 0 [Geo Ht]: 33.8529168
Edit Geo Ht [30.400000]			

- b. Edit “Edit Geo Ht” value.

LELEV	KI	PointID: 0001	Description:	StaId: 30.400000
LSTN	LV	Elev: 30.400000		
LOBSIW	LV	Stn Number: 1 BS Pt ID: 0001 TP Count: 1 Point ID: 0001 Stn Number: 1 Distance: 30.754300 Mid Wire: 1.7090136 IsABs: 1 IsATP: 0	Vert Offset: 0 [Geo Ht]: 30.400000	BS
LOBSIW	LV	Point ID: 0002 Stn Number: 1 Distance: 27.127200 Mid Wire: 1.4980930 IsABs: 0 IsATP: 1	Vert Offset: 0 [Geo Ht]: 30.6909216	PS
LSTN	LV	Stn Number: 2 BS Pt ID: 0002 TP Count: 1 Point ID: 0002 Stn Number: 2 Distance: 28.169500 Mid Wire: 1.8650712 IsABs: 1 IsATP: 0	Vert Offset: 0 [Geo Ht]: 30.8909216	PS
LOBSIW	LV	Point ID: 0003 Stn Number: 2 Distance: 32.004000 Mid Wire: -0.0009392 IsABs: 1 IsATP: 0	Vert Offset: 0 [Geo Ht]: 33.0029168	BS
LOBSIW	LV	Point ID: 0004 Stn Number: 3 BS Pt ID: 0003 TP Count: 1 Point ID: 0003 Stn Number: 3 Distance: 29.4741600 Mid Wire: -1.2969240 IsABs: 0 IsATP: 1	Vert Offset: 0 [Geo Ht]: 33.8529168	PS
Edit Geo Ht [30.400000]				✓ Edit

- c. Click [Edit] to confirm edited value.

4.4 Inserting an Image



Insert an image file.

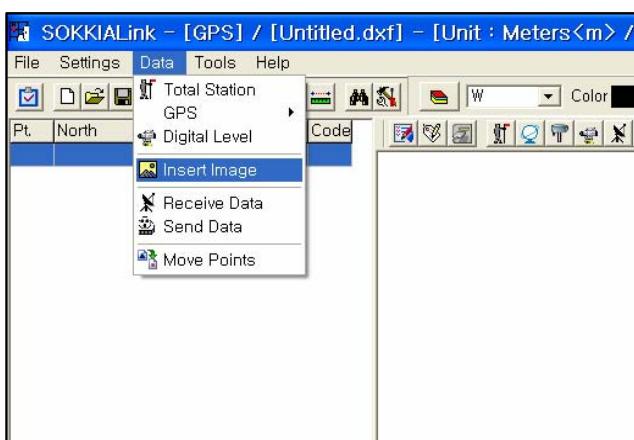


Procedure

1. Select [Data] - [Insert Image]

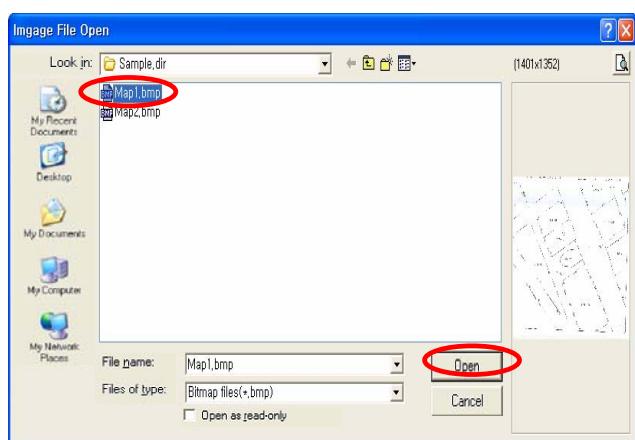


or

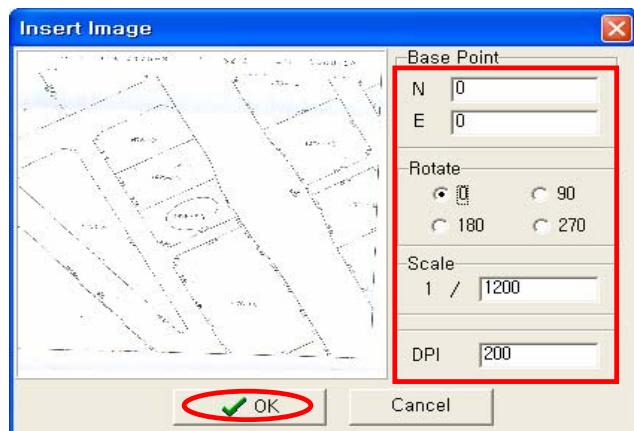


2. Select the image file that you want to

insert and click [Open].



3. Set settings and click [OK].



Base Point: Input N and E values for Base point.

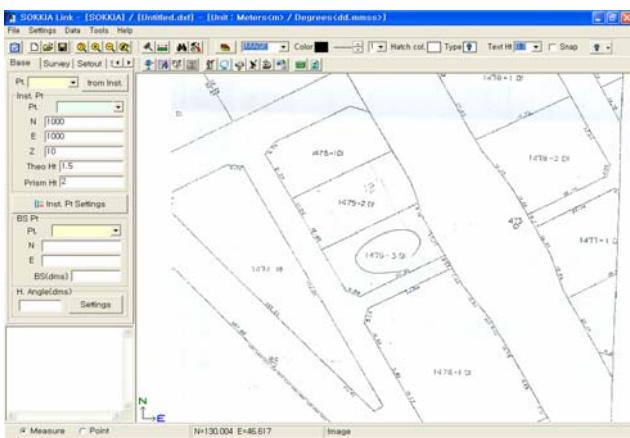
Rotate: Select rotation angle from "0", "90", "180", "270".

Scale: Input scale of image.

DPI: Enter the same DPI as the scanner.

User's Guide

The image file is inserted.



Note :

Only BMP files can be inserted.

4.5 Receiving Data (SOKKIA device to PC)



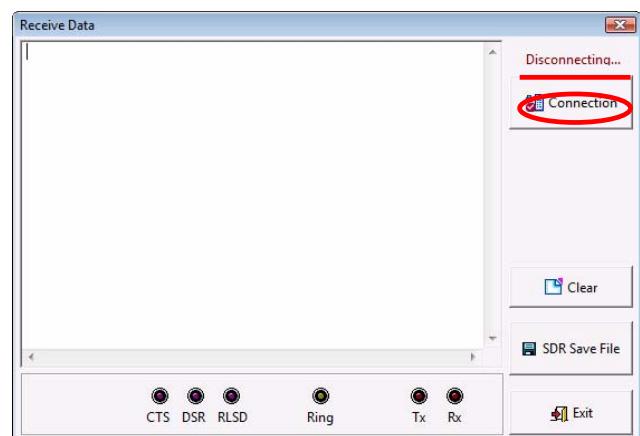
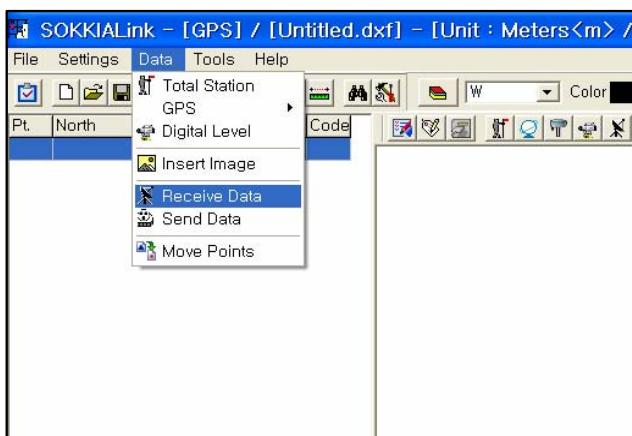
SOKKIA Link can be linked to the current range of SOKKIA total stations.



Procedure

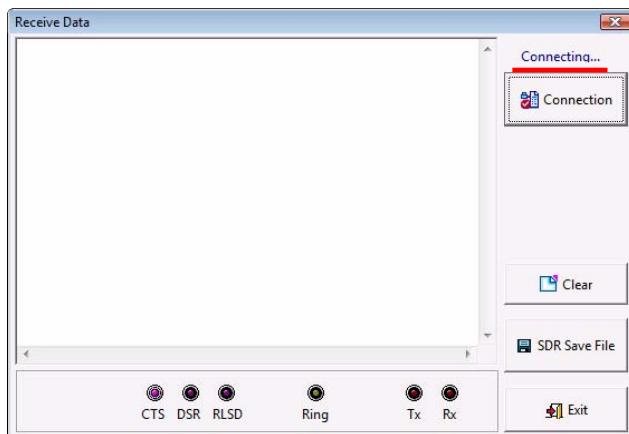
1. Select [Data] - [Receive Data] or

2. Click [Connection].

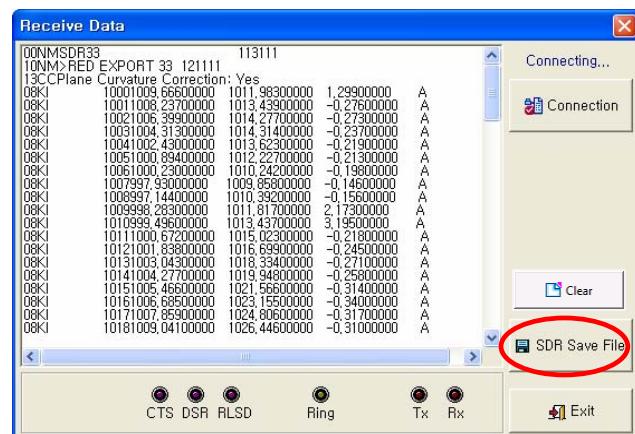


User's Guide

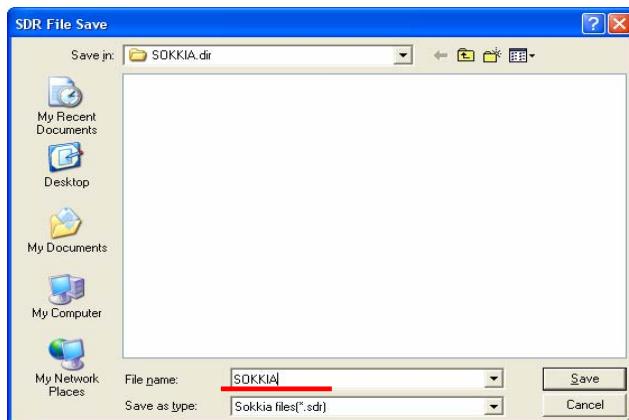
3. On the total station, press button used for initiating external communication. Refer to the operator's manual for your Total station.



4. After confirming data click [SDR Save File]



5. Enter the file name



Note:
Baud rate setting must be the same as that for the instrument.

The POWERSET Series, Series 220 and Series 030R can only operate at 1200.

4.6 Sending Data (PC to SOKKIA device)

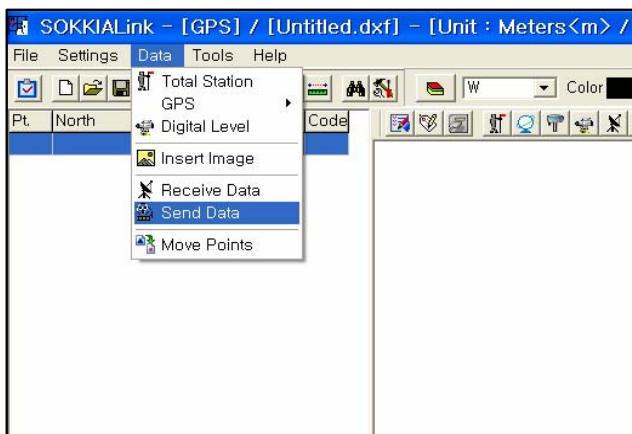


SOKKIA Link can send files to a GPS receiver or Total station.

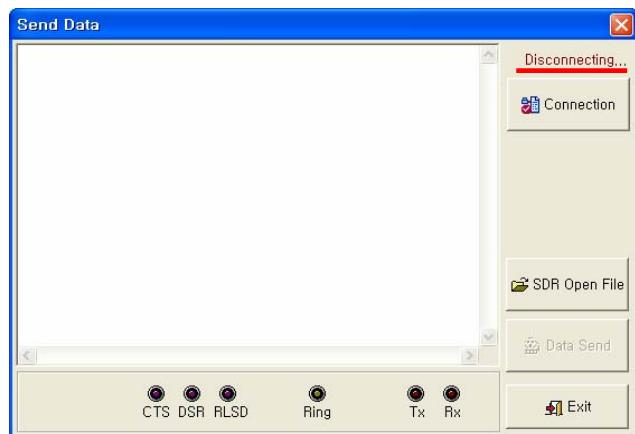


Procedure

1. Select [Data] - [Send Data] or 



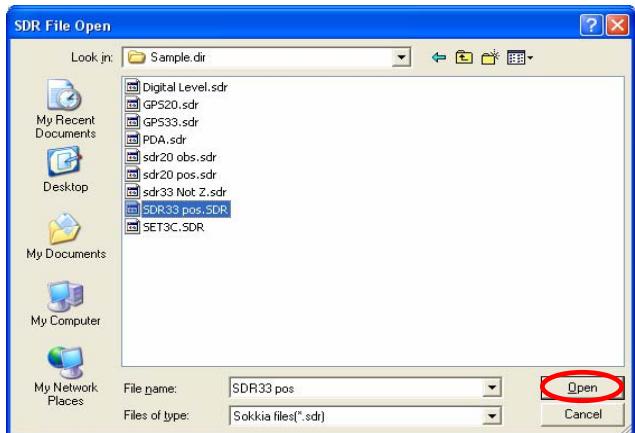
2. Click [Connection].



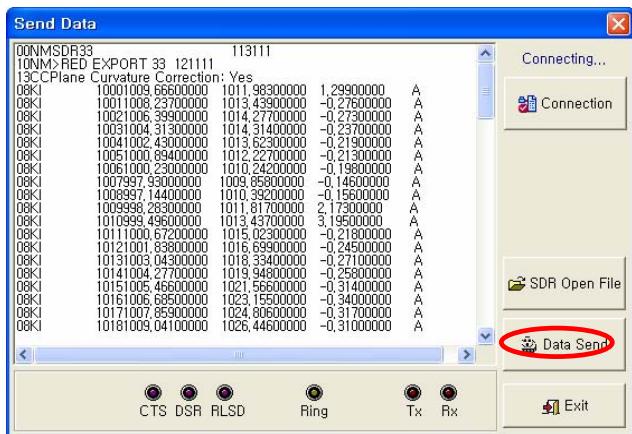
3. Click [SDR Open File].



4. Select a file and click [Open].



5. Click [Data Send].



Note:

Baud rate setting must be the same as that for the instrument.

The POWERSET Series, Series 220 and Series 030R can only operate at 1200.

4.7 Moving Points



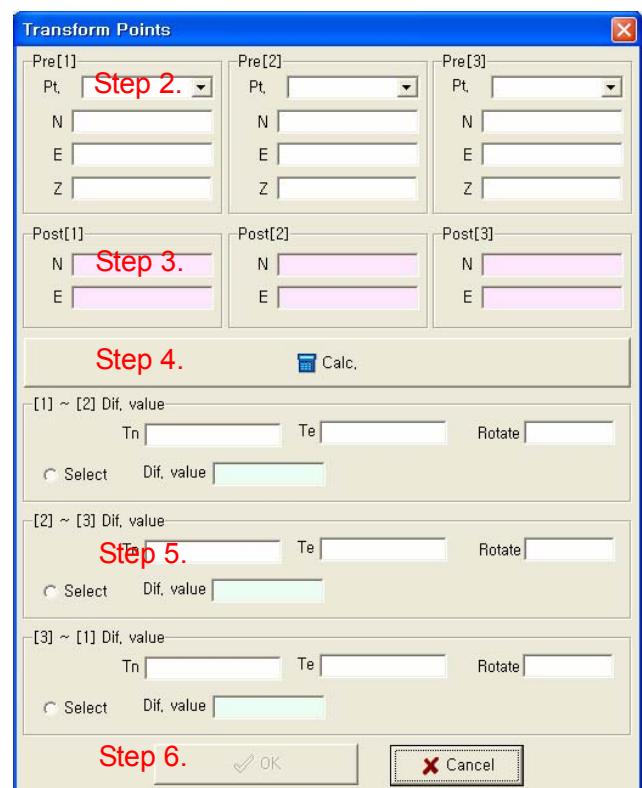
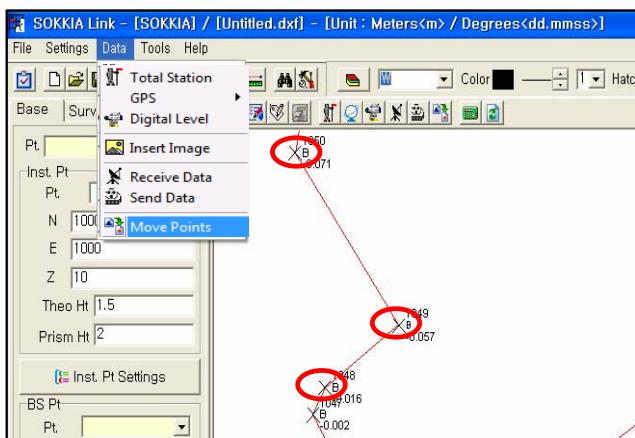
Use this function to transform drawing coordinates.

If one point is transformed the drawing is shifted. If more than two points are transformed, the drawing is shifted and rotated



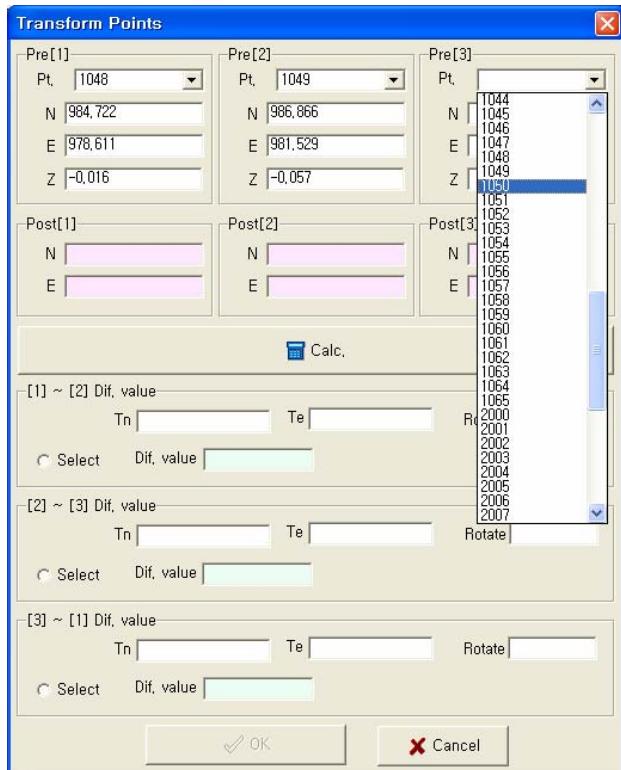
Procedure

1. Select [Data] - [Move Points] or

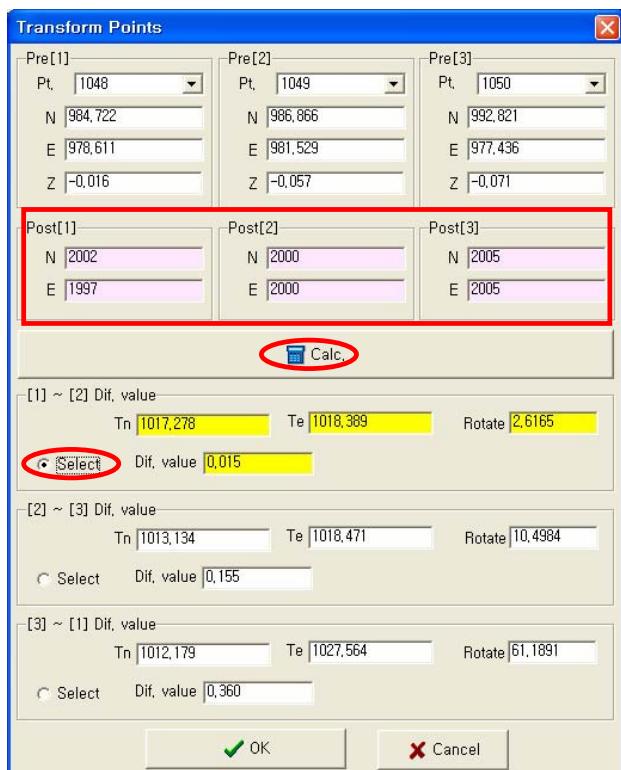


User's Guide

2. Select [Pt.] or Enter N, E, Z of [Pre] to set the pre-transformation coordinates.



3. Enter N, E, Z of [Post] to set the transformation coordinates.



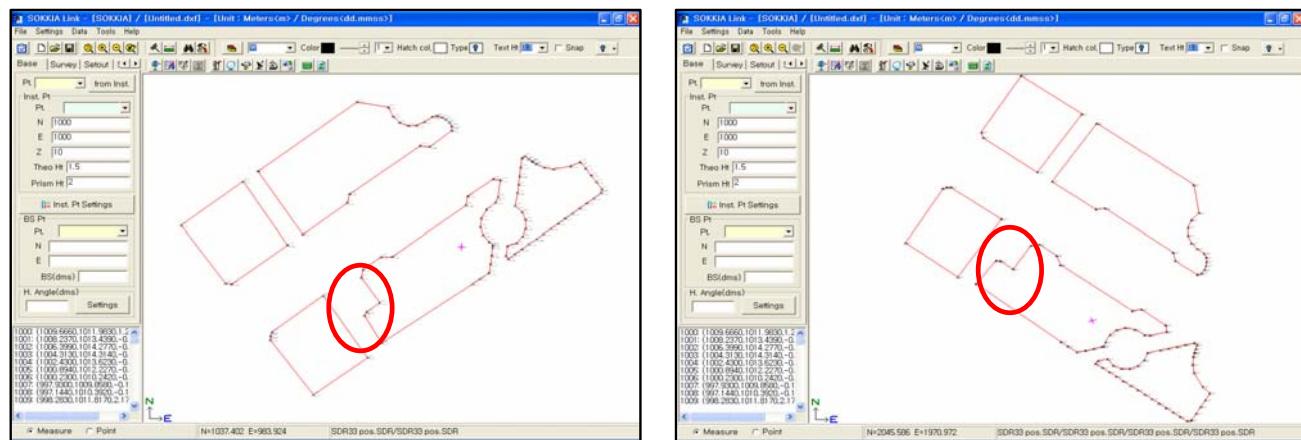
User's Guide

4. Press [**Calc.**].
5. Select “Diff. value” radio button.
6. Press [**OK**].



Note:

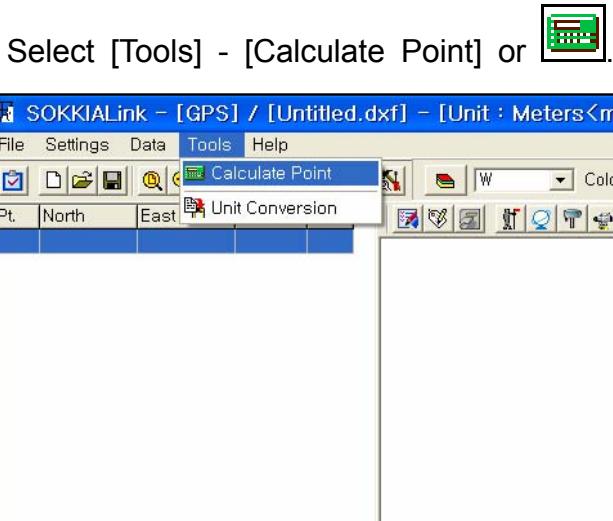
The following example illustrates a drawing that has been rotated for easier viewing.



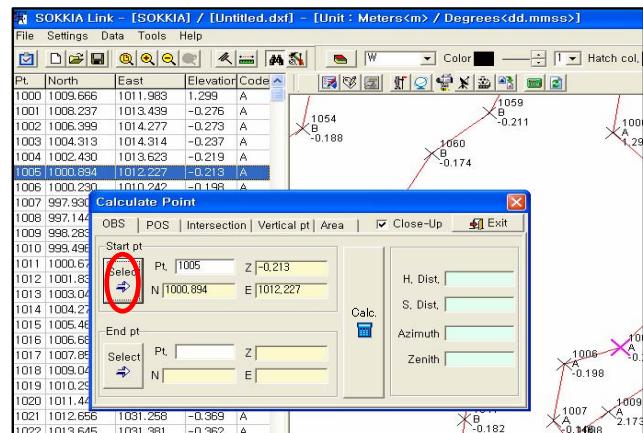
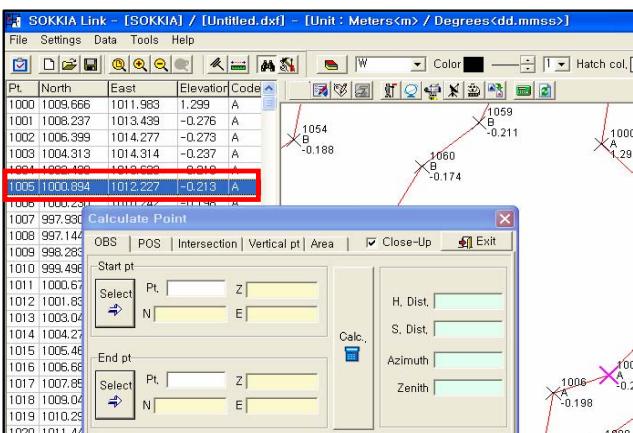
5. Tools

5.1 Calculating a Point

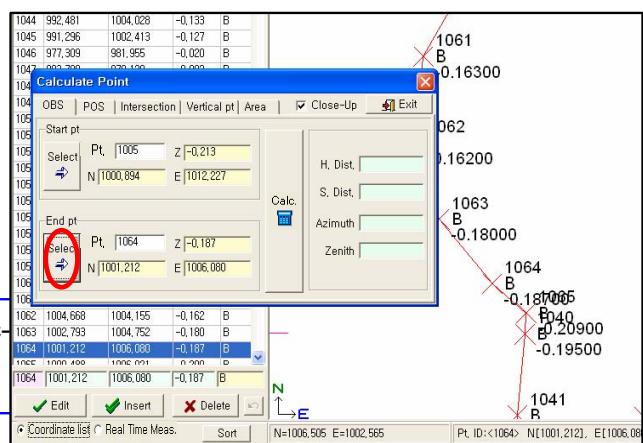
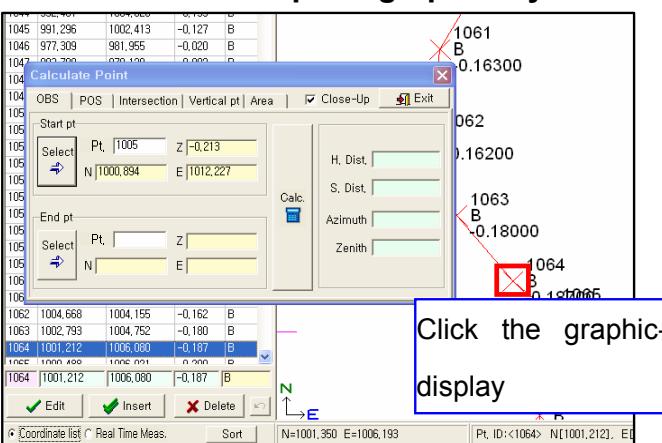
There are 2 methods for selecting points for calculation.



Method 1: Select a point from the list.



Method 2: Select a point graphically.



5.1.1 POS (coordinate) → OBS (angle)

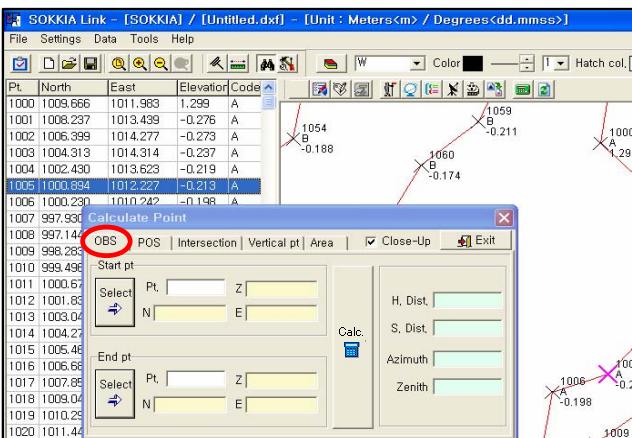


Calculate the observation angle using two sets of coordinates.

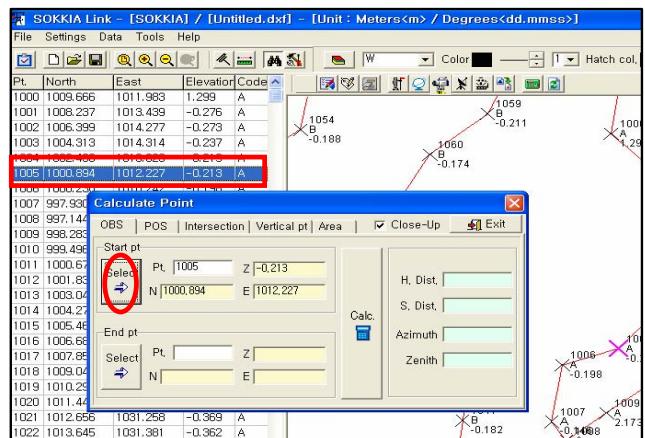


Procedure

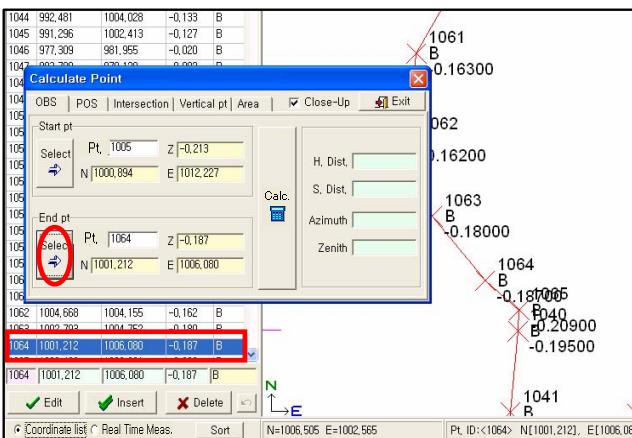
1. Select OBS tab.



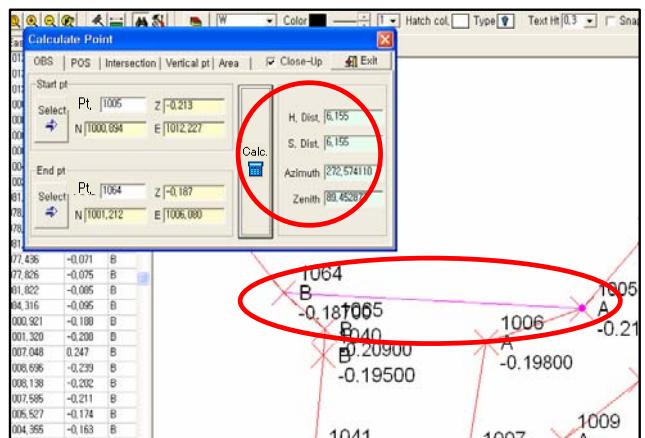
2. Select the first point and click [Select] in the Start pt box of the Calculate Point dialog box.



3. Select the second point and click [Select] in the End pt box of the Calculate Point dialog box.



4. Click [Calc] to calculate the H.Dist, S.Dist, Azimuth, and Zenith.



5.1.2 OBS (angle) → POS (coordinate)

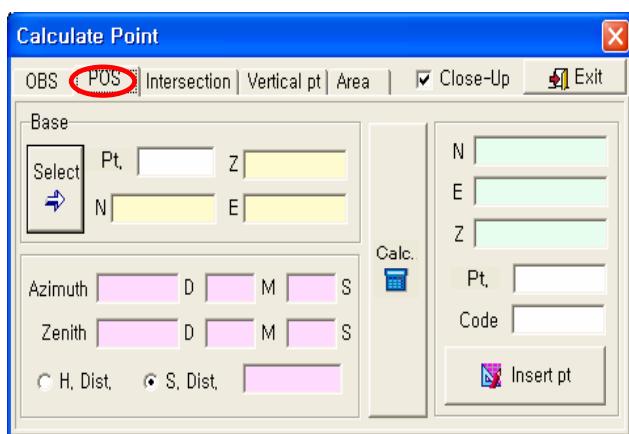


Calculate coordinates using the observation angle and distance.



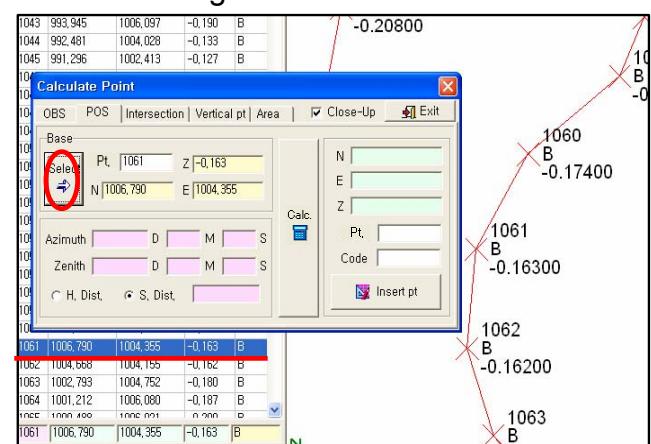
Procedure

1. Select POS tab.

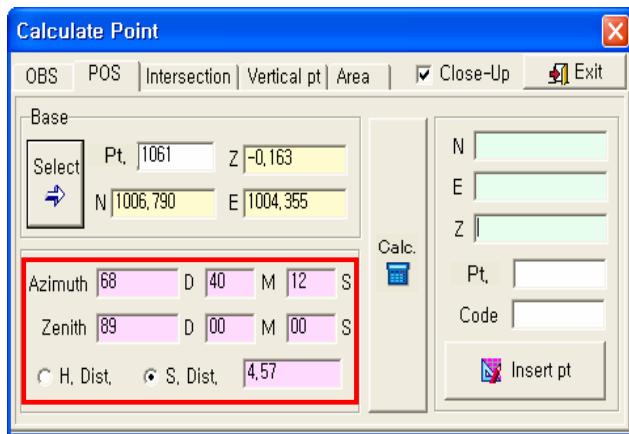


2. Select the first point window and click

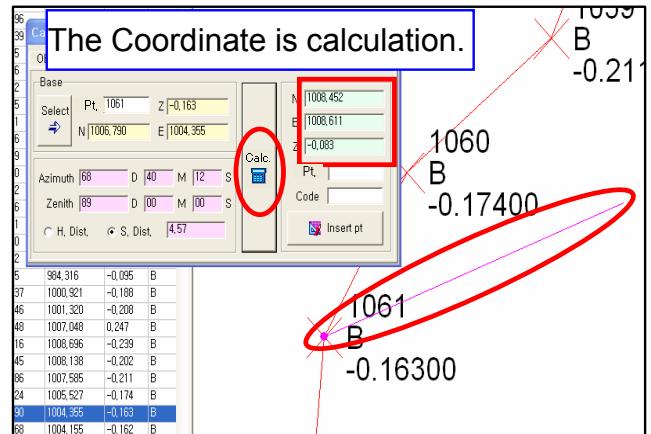
[Select] in the Base box of the Calculate Point dialog box.



3. Enter the Azimuth, Zenith, and Dist.

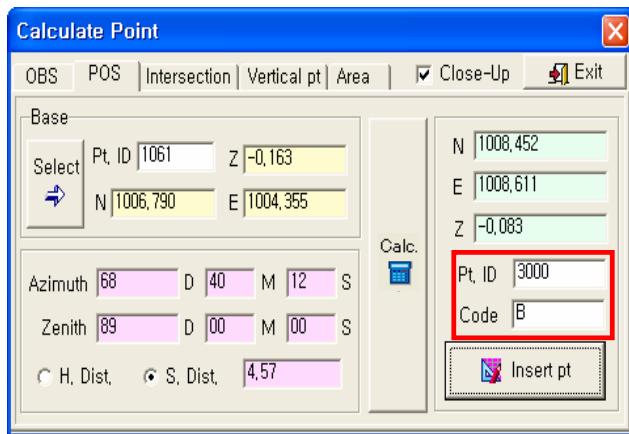


4. Click **[Calc]** to calculate the coordinates of this point.

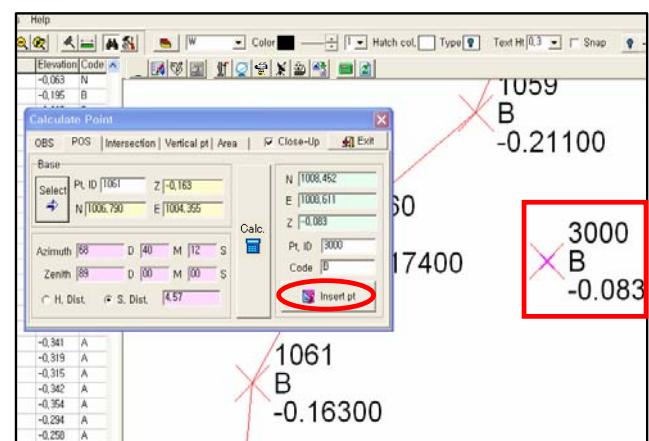


User's Guide

5. Enter Pt ID, Code for drawing.



6. Click [**Insert pt**] to add this point to the list.



5.1.3 Intersection

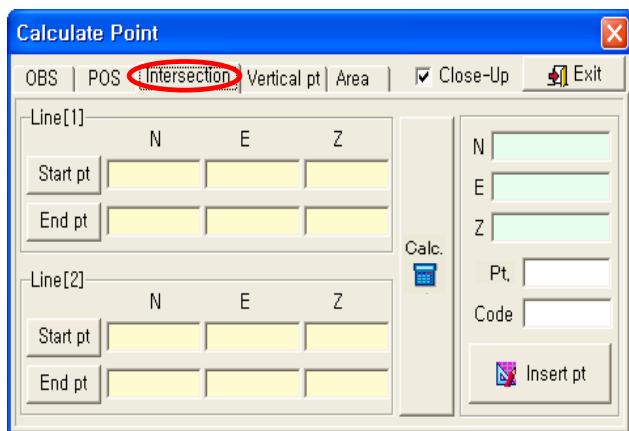


Calculate the intersection of two lines using 4 points.

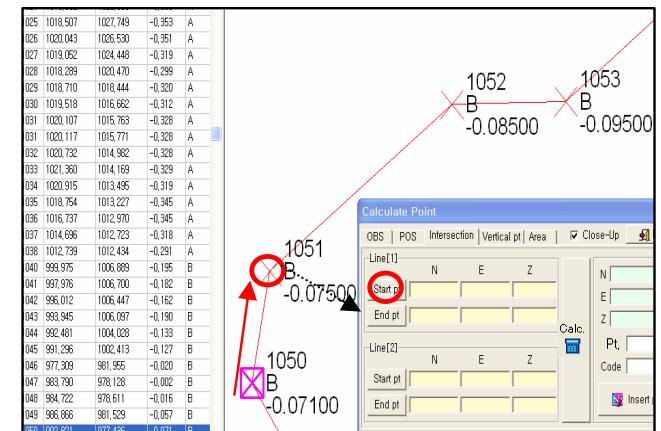


Procedure

1. Select Intersection tab.

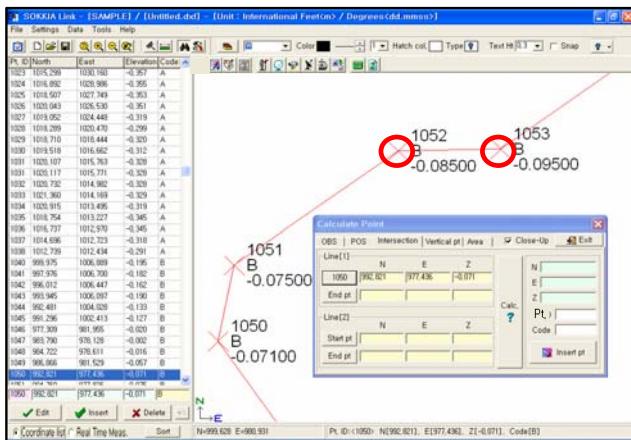


2. Select the start and end point for the first line and click [**Start pt**], [**End pt**] in the "Line[1]" box of the "Calculate Point" dialog box.

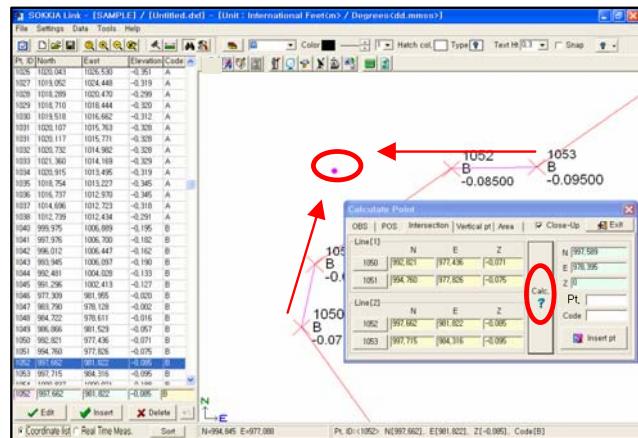


User's Guide

3. Repeat the previous two steps for the “Line[2]” start and end points.



4. Click [Calc].



Note:

To draw the intersection, enter the Pt. and Code and click [Insert pt].

5.1.4 Vertical pt

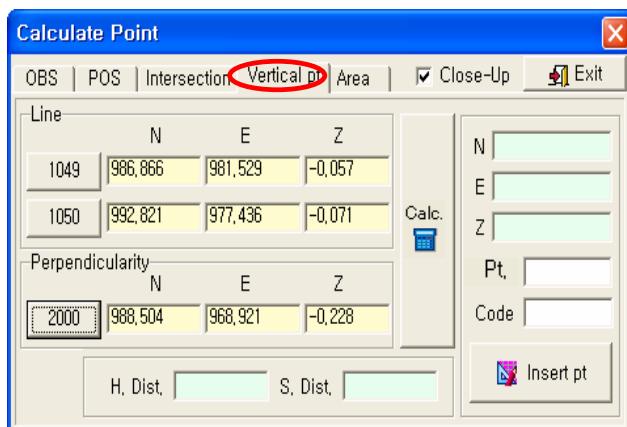


Calculate the distance from a point perpendicular to a line connecting a second and third point.

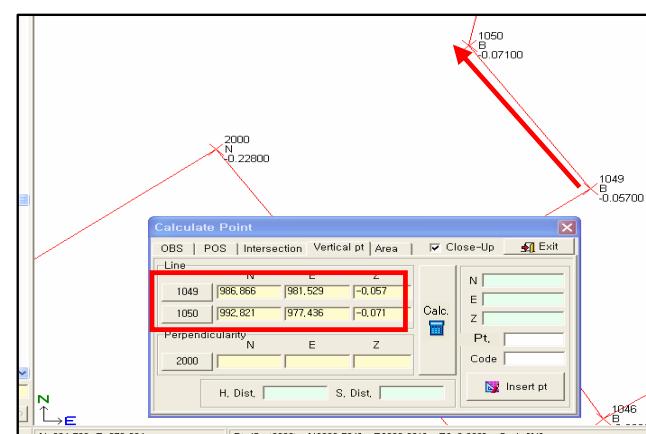


Procedure

1. Select “Vertical pt” tab.

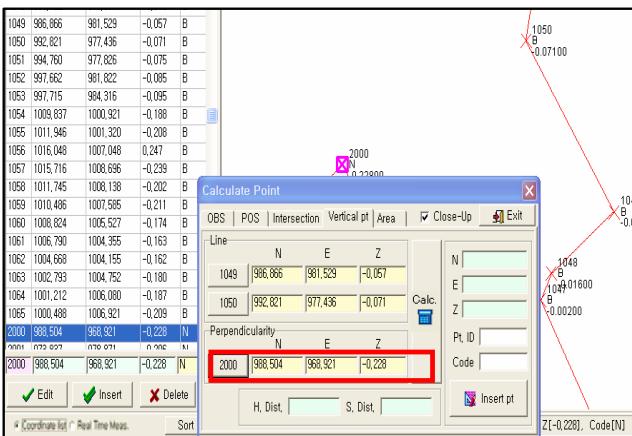


2. Select the start and end points of the line and click [Start pt], [End pt] in the Line box of the Calculate Point dialog box.

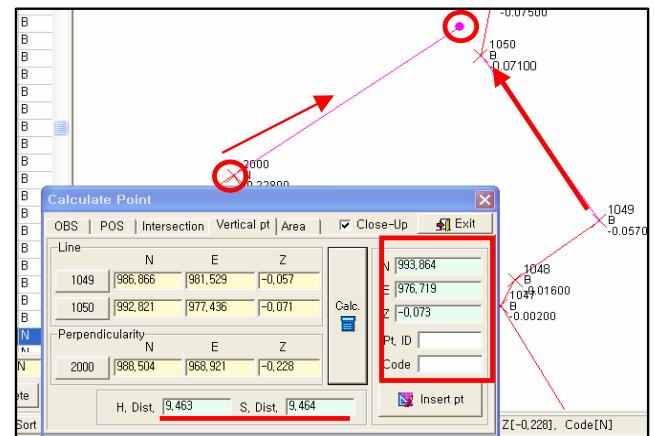


User's Guide

3. Select the Point for perpendicularity.



4. Click [Calc].



Note:

To draw the resulting point, enter the Pt. and Code and click [Insert pt].

5.1.5 Area

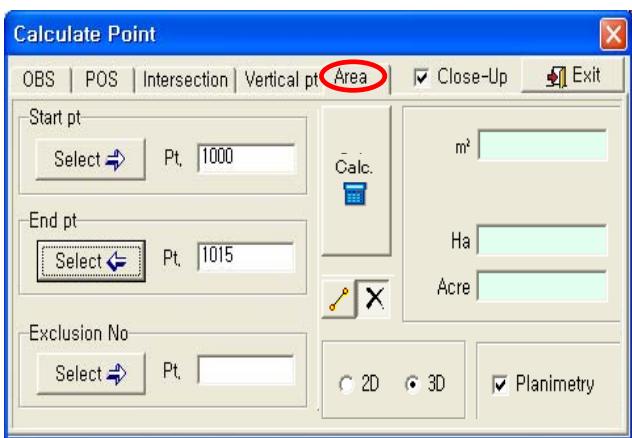


Calculate the area of a polygon defined by start and end points.

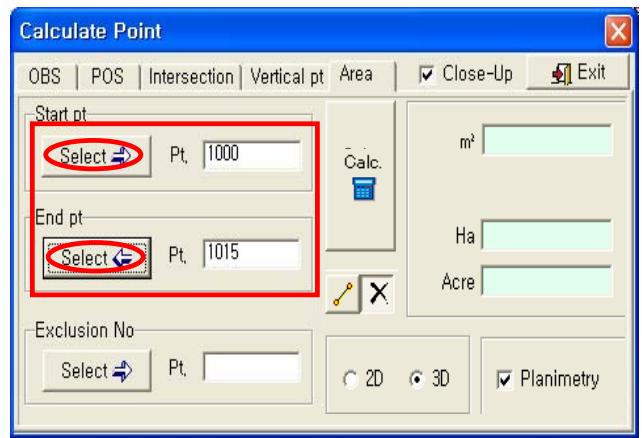


Procedure

1. Select “Area” Tab.

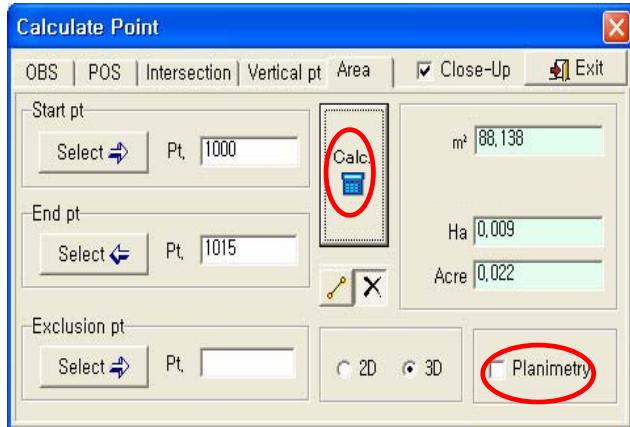


2. Select the start point and end points of the polygon and click [Select] in the Start pt, End pt box of the Calculate Point dialog box.

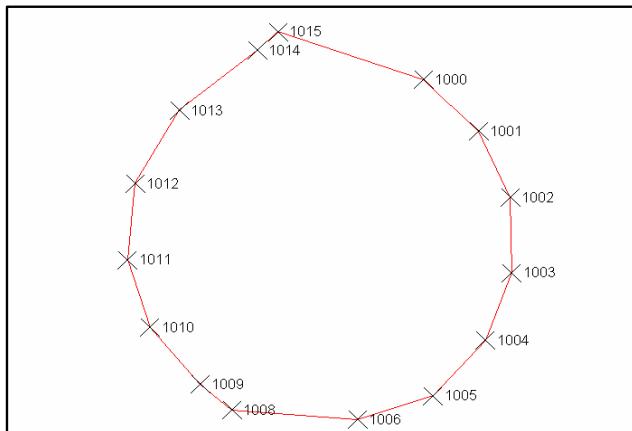


User's Guide

3. Click [Calc].

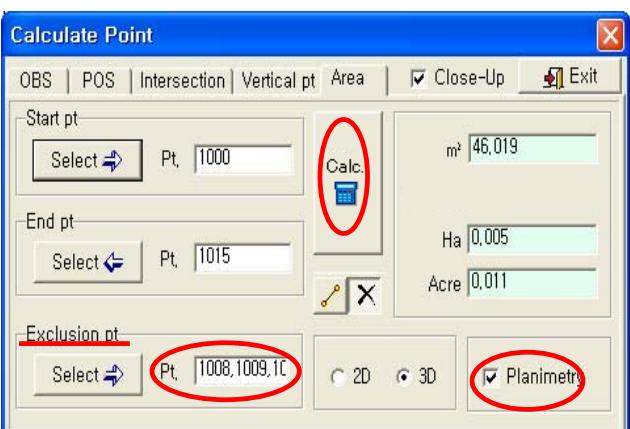


Example: Calculating the polygon from Pt.1000 to Pt.1015.

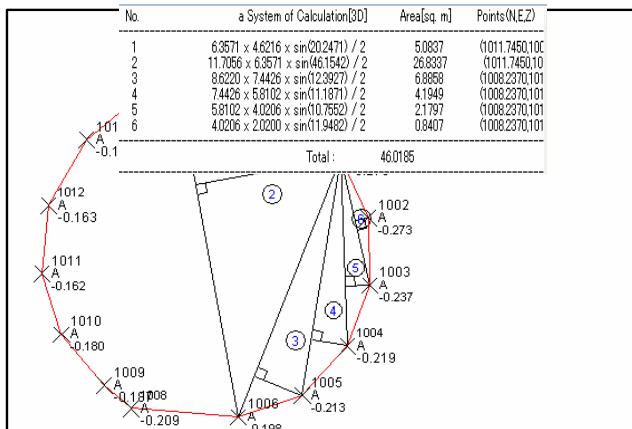


Note:

Select points to be excluded from calculation using Exclusion Pt.



Example: Polygon calculated excluding Pt.1008, 1009, 1010, 1011.



Note:



When the icon at left is selected, the area of a polygon can be calculated simply by selecting one side of the desired polygon.

This function is only available for closed-line or linked-line polygons.

Selecting the icon at right cancels this function.

User's Guide



Note:

"Planimetry": Check this box to display results in a quadrature chart.

"2D"/"3D": Select 3D to calculate slope area.

5.1.6 Divide

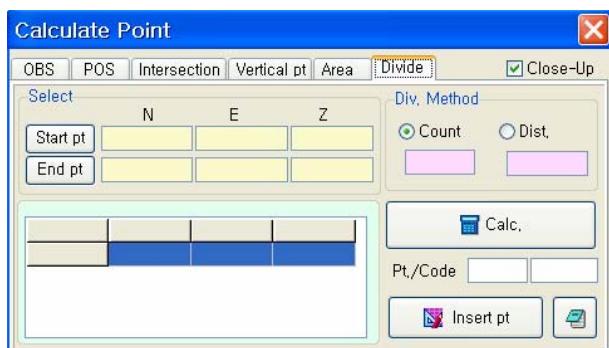


This function allows division along a line composed between two specified points. There are 2 methods of division: equal division into the number of sections specified in "Count"; or, division at a point along the line composed between two specified points at a distance from the start point specified in "Dist.".

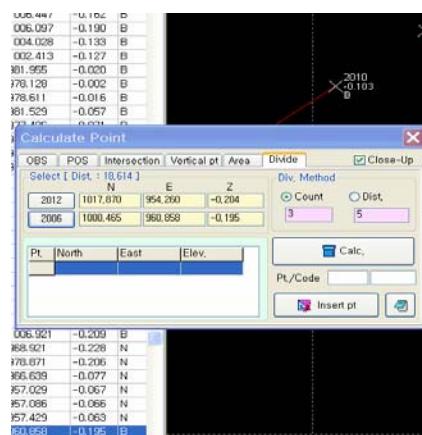


Procedure

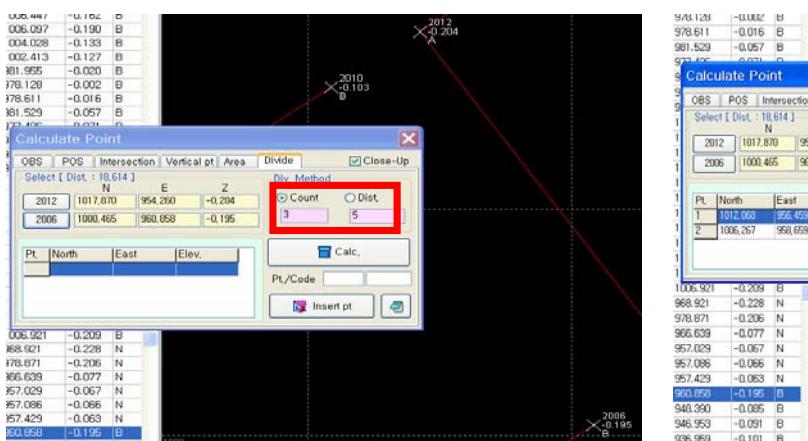
1. Select "Divide" tab.



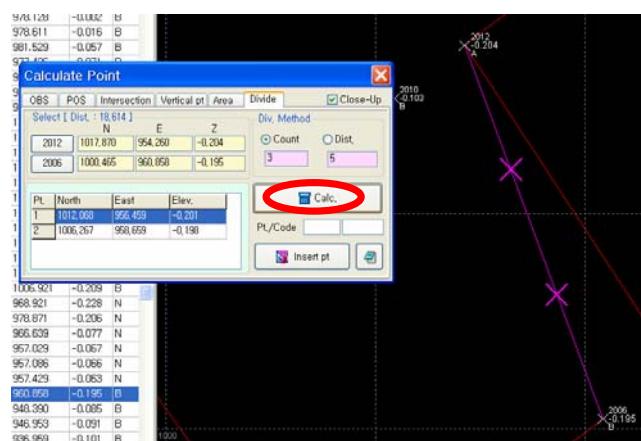
2. Click [Start pt], [End pt] in the Select box of the Calculate Point dialog box.



3. Input "Count or Dist".

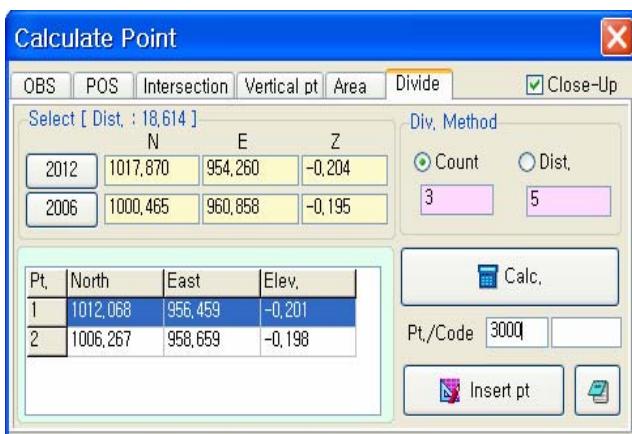


4. Click [Calc].

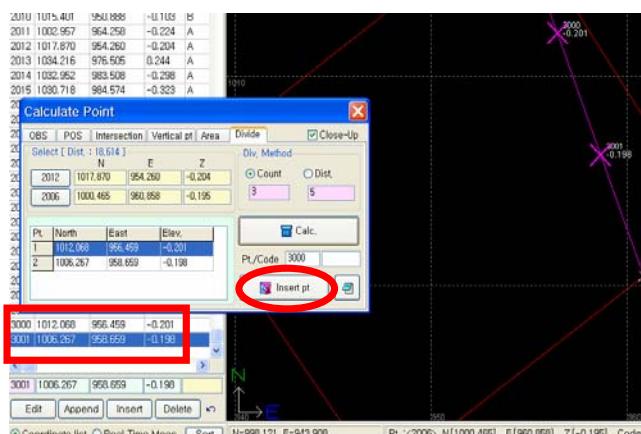


User's Guide

5. Input Pt./Code .



6. Click [Insert pt].



Note:

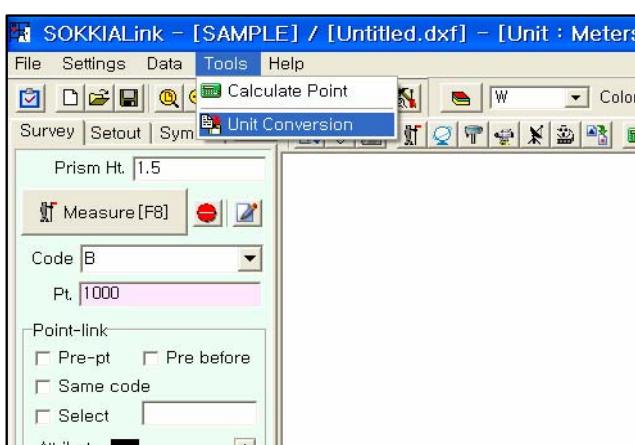
1. To draw the resulting point, enter the Pt. and Code and click [**Insert pt**].
2. Distance unit set in "Settings-Options-Dist"

5.2 Unit Conversion



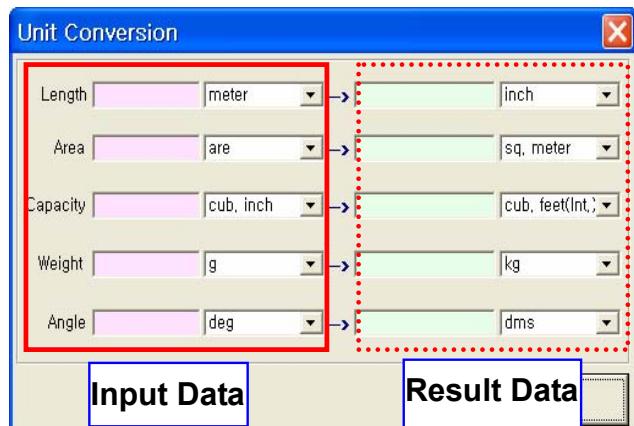
Procedure

1. Select [Tools] - [Unit Conversion] or



2. The Unit Conversion Dialog box is

displayed.



User's Guide

3. Input values in the pink column and select 4. Select destination-unit.
source-unit.

Unit Conversion

Length	100	meter	→	3937,007874	inch
Area		cm	→		
Capacity		meter	→		sq. meter
Weight		inch	→		feet(Int.)
		feet(US)	→		yard
		yard	→		mile
		mile	→		

Exit

Unit Conversion

Length	100	meter	→	3937,007874	inch
Area		are	→		cm
Capacity		cub. inch	→		meter
Weight		g	→		inch
		kg	→		feet(Int.)
			→		feet(US)
			→		yard
			→		mile

Exit

Results are displayed in the blue column.

Unit Conversion

Length	100	meter	→	328,083333	feet(US)
Area		are	→		sq. meter
Capacity		cub. inch	→		cub. feet(Int.)
Weight		g	→		kg
Angle		deg	→		dms

Exit

6. Real Time Measurement



This focus of this chapter is Real Time Measurement.

Real Time Measurement is performed using a notebook or tablet PC.

Using this function, you can perform measurement and setting out on the SOKKIA Link screen in real time.

6.1 Base Tab

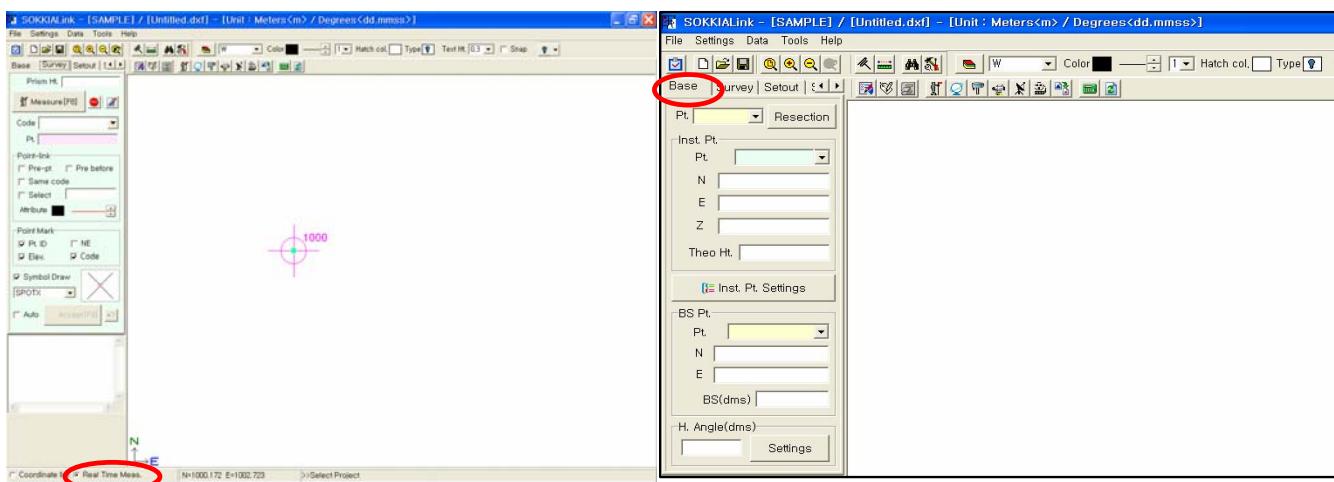
6.1.1 Inputting Instrument and Backsight Point



Procedure

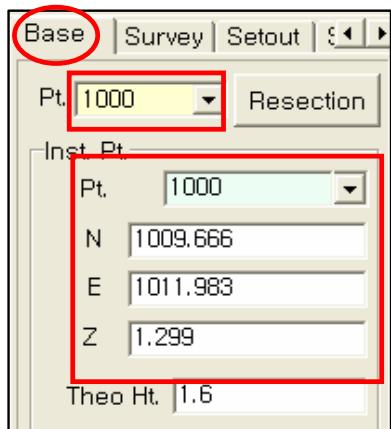
1. Select the Real Time Meas. radio button.

2. Select the Base tab.

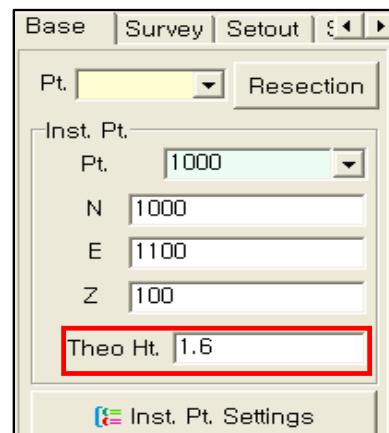


User's Guide

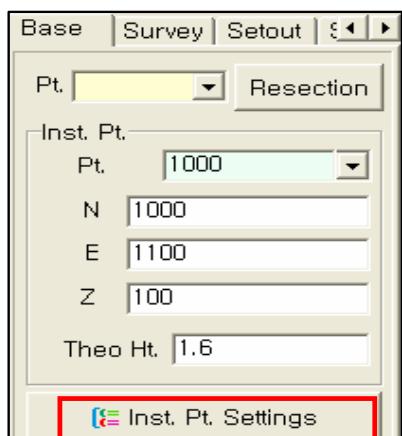
3. Enter Pt. name, N, E, Z values for instrument point or select from the drop-down list.



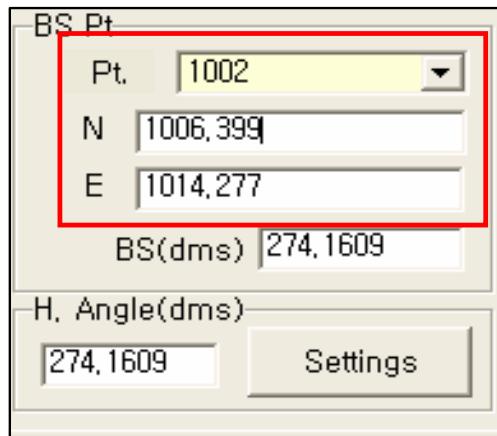
4. Input the theodolite height in "Theo. Ht."



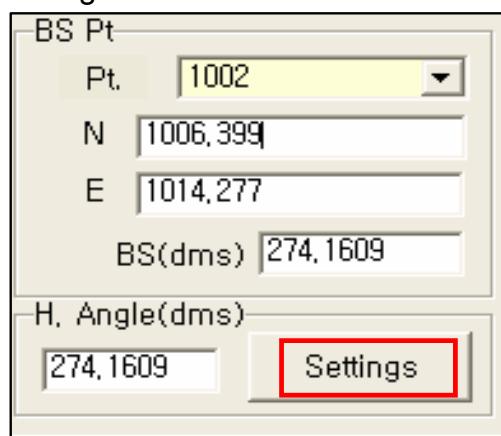
5. Click [Inst. Pt Settings].



6. Input Pt. name and N, E values for BS point.



7. Click [Settings] to confirm the horizontal angle.



6.1.2 Resection function

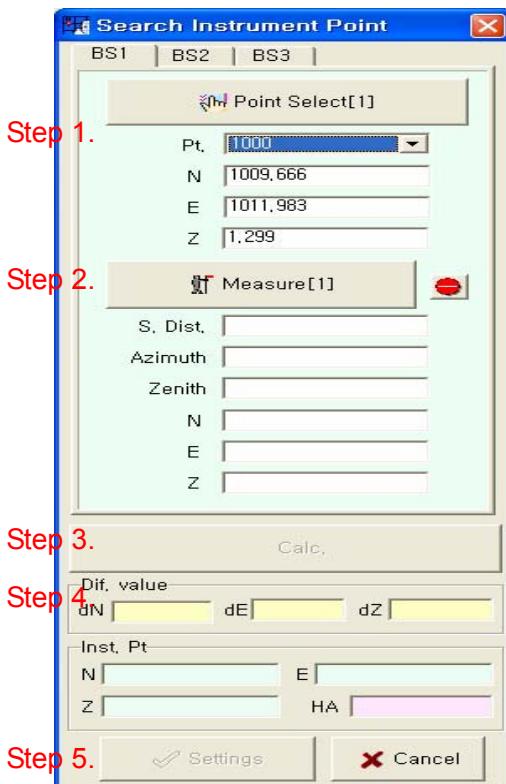
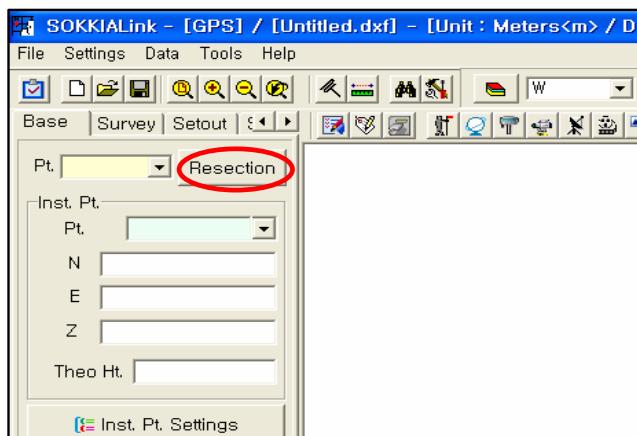


The Resection function calculates the coordinates of an unknown station by observing a number of known positions from the unknown point.



Procedure

1. Select a point in "Pt." or click [Point Select] and select a point from the graphic screen. Coordinates for that point are displayed.
2. Perform observations to two or three known points by clicking [**Measure**].
3. After you are finished with observations, click [**Calc.**].
4. Confirm data (Differential value and Instrument Point).
5. Click [**Settings**] to set Instrument point and horizontal angle.



6.2 Survey Tab



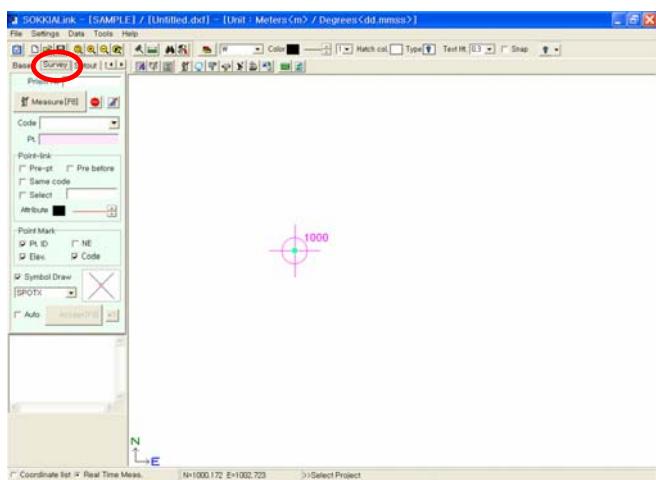
This function performs surveys in real time.

The following procedure can be performed after STN point and BS angle have been set.



Procedure

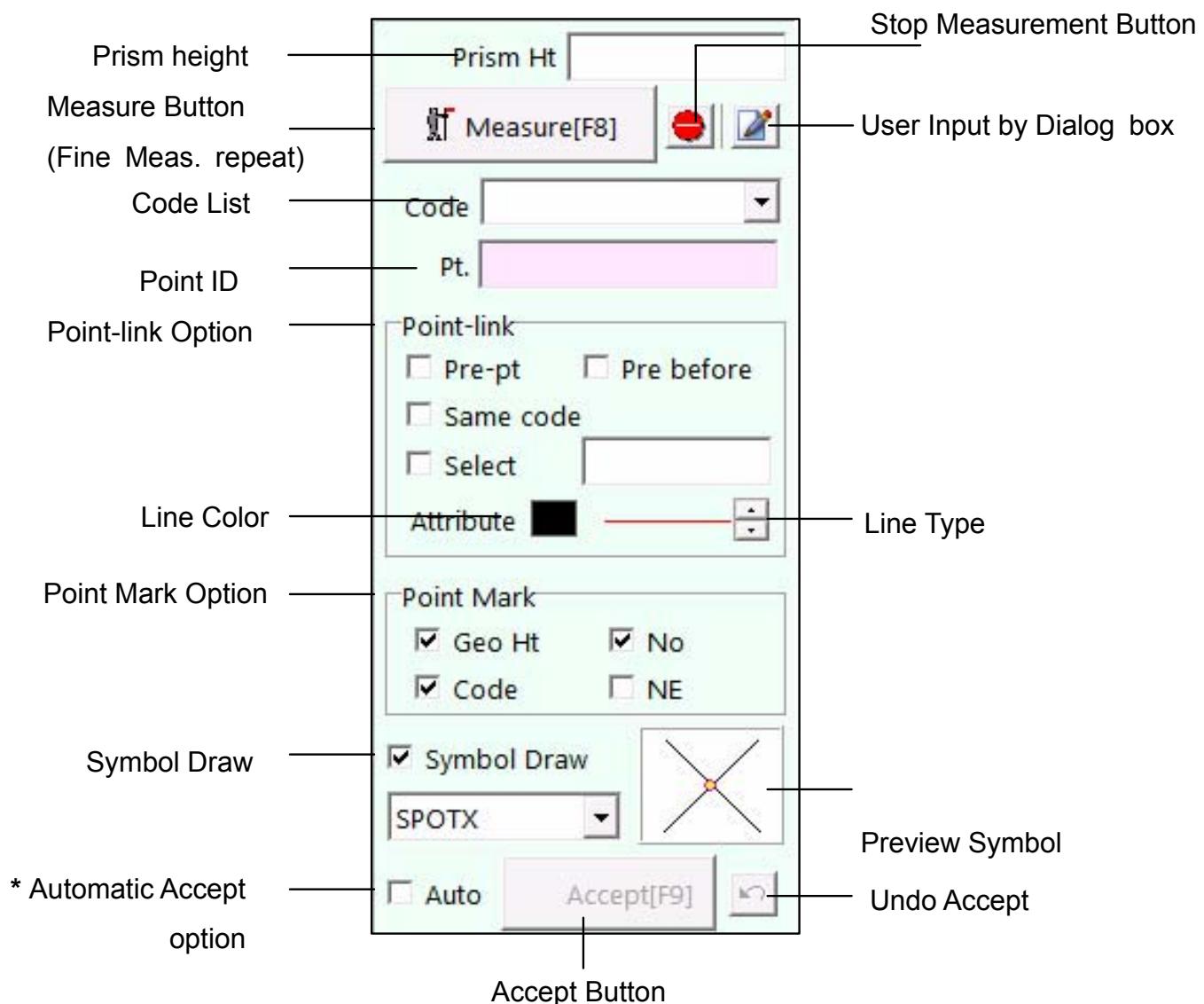
1. Select “Survey” Tab.



Note:

If you wish to change Angle unit settings (Degrees/Gons/Mils) during Real time measurement, click **[Inst. Pt. settings]** in the “Base” tab to make the changes effective.

Survey Functions



Note:

Automatic Accept:

- When the total station EDM is in Single mode.

Data is automatically saved and added to the Coordinate List when distance measurement has finished.

Sequential point numbers are automatically assigned.

- When the total station EDM is in Repeat or Tracking mode.

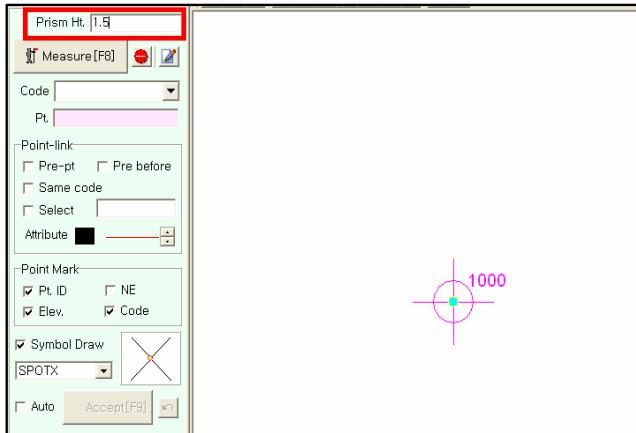
Data is saved each time it is received from the Total Station.

Data is continually saved until measurement is stopped.

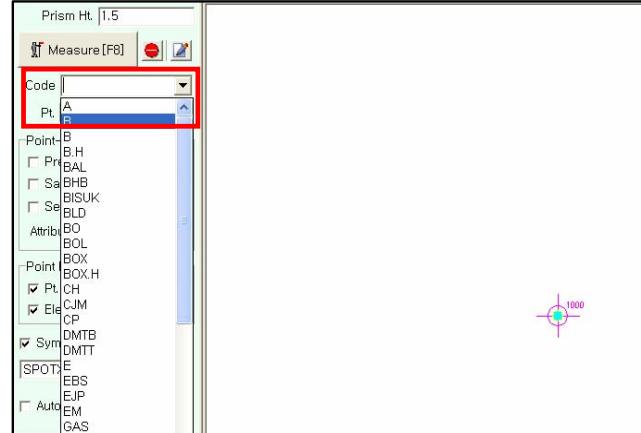
Sequential point numbers are automatically assigned.

User's Guide

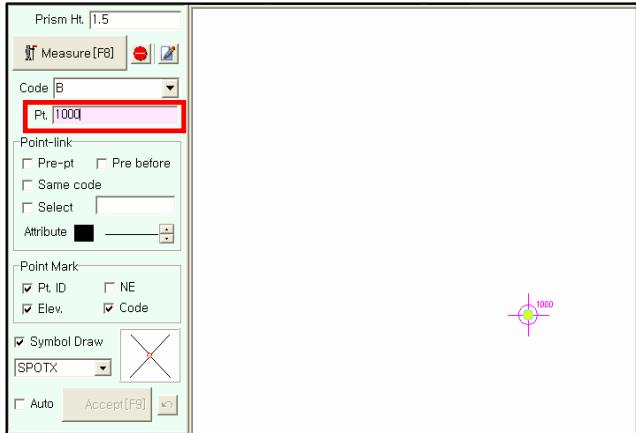
2. Input prism height in "Prism Ht".



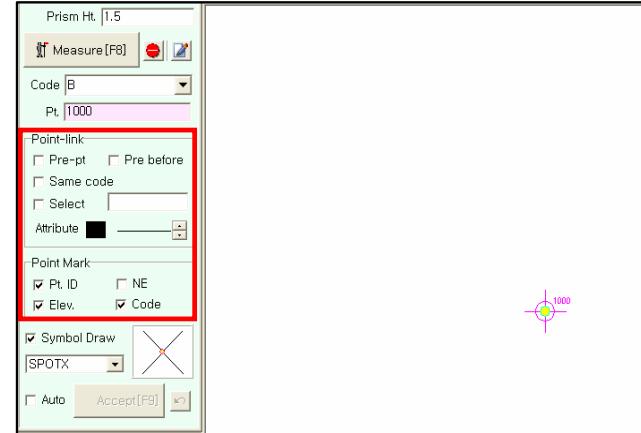
3. Select a code in "Code".



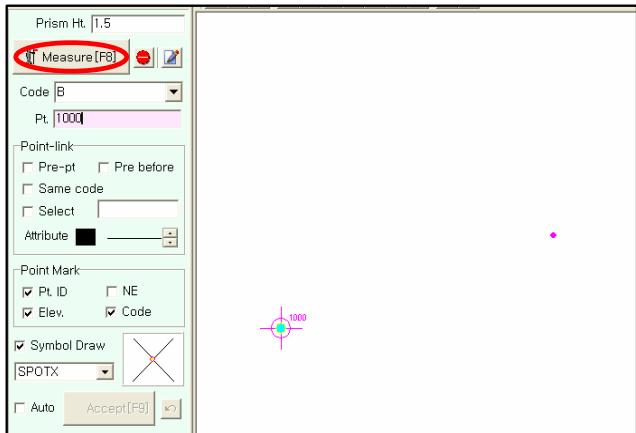
4. Input Start point in "Pt".



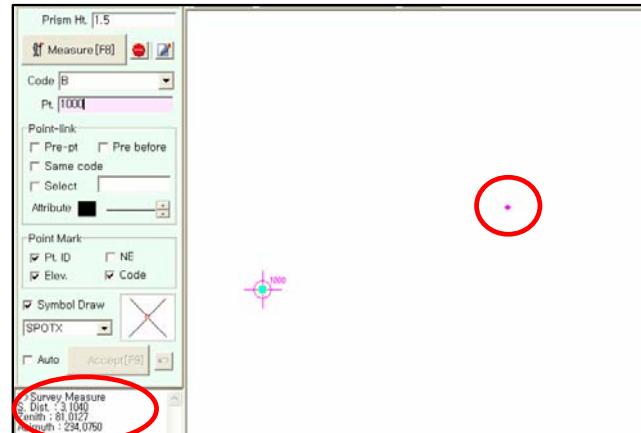
5. Select "Point-link" and "Point-Mark" options.



6. Click [Measure [F8]].

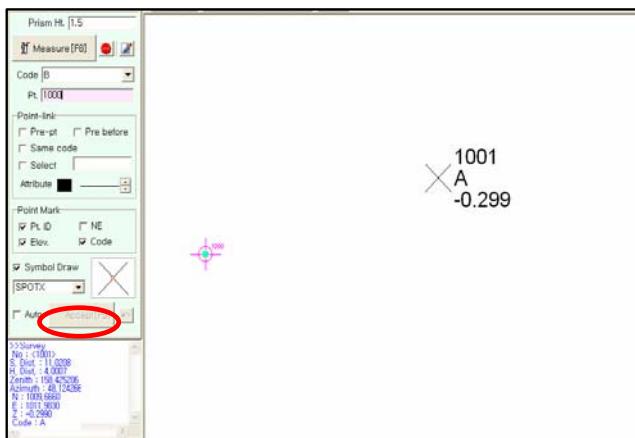


7. Confirm condition.



S.Dist /Zenith /Azimuth

8. Click [Accept F9] or press [F9] on the keyboard.

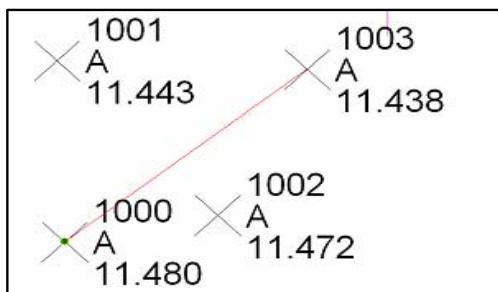
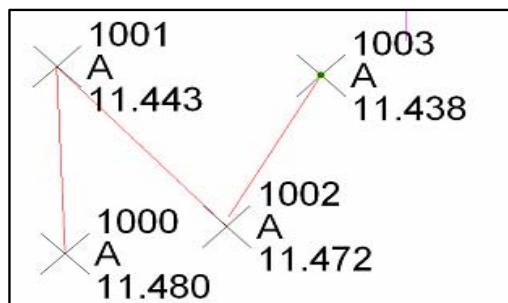
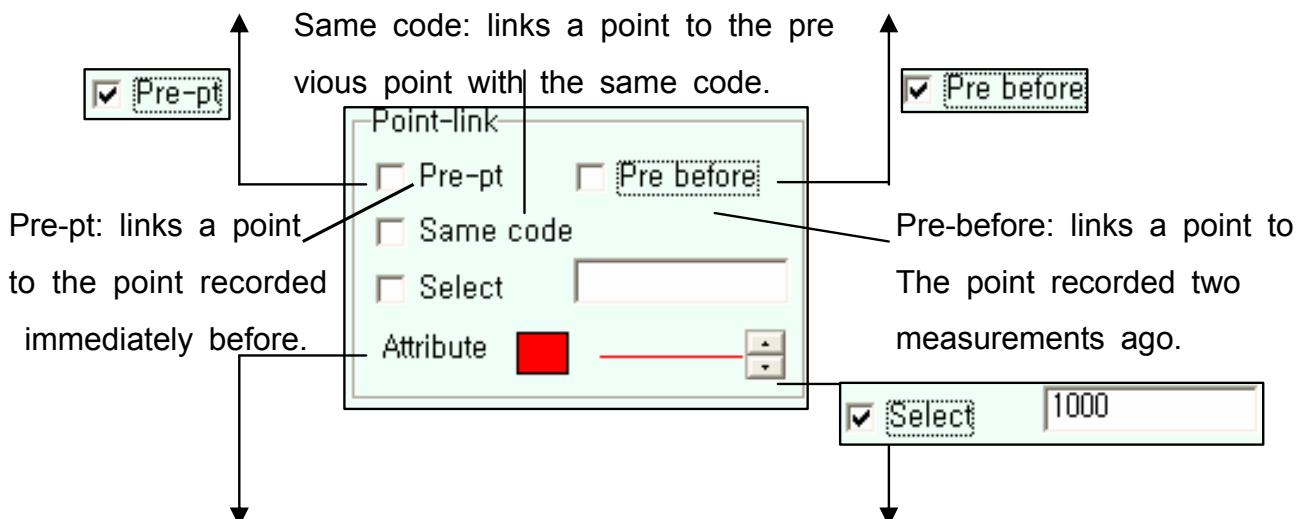
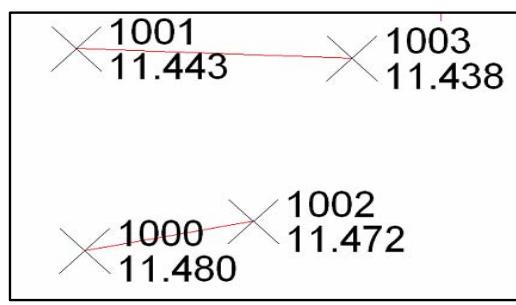
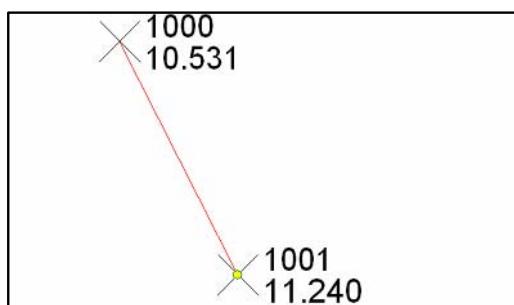


Stop Measurement Button



Note:

Point-link Option.



6.3 Setout Tab

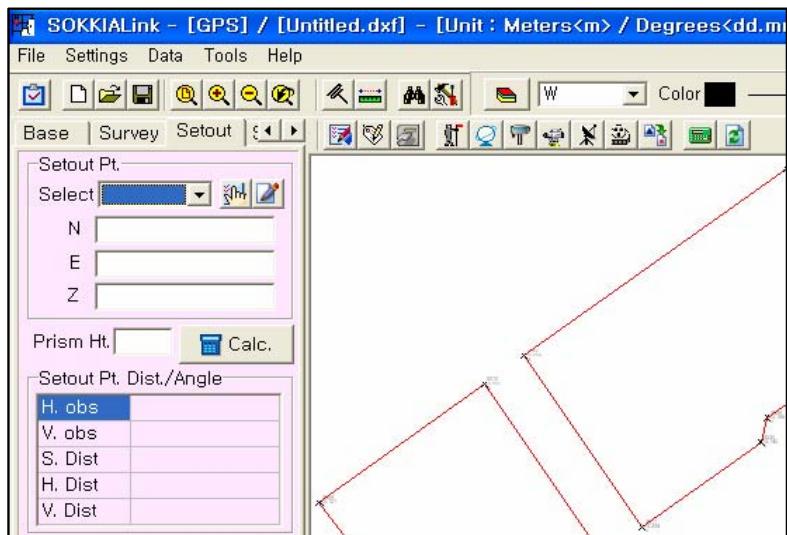


This function enables setting-out after STN point and BS angle have been set.

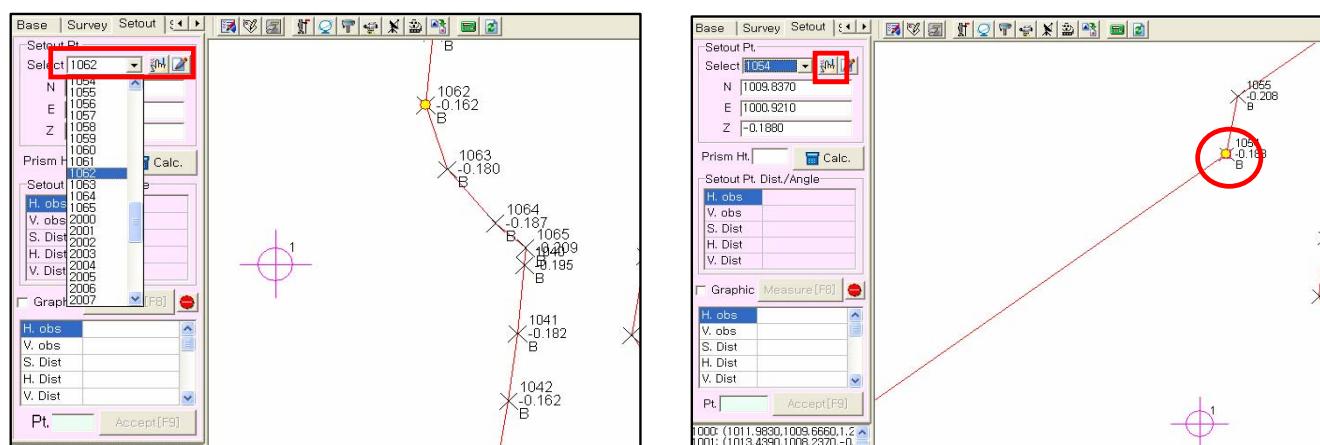


Procedure

1. Select “Setout” tab.



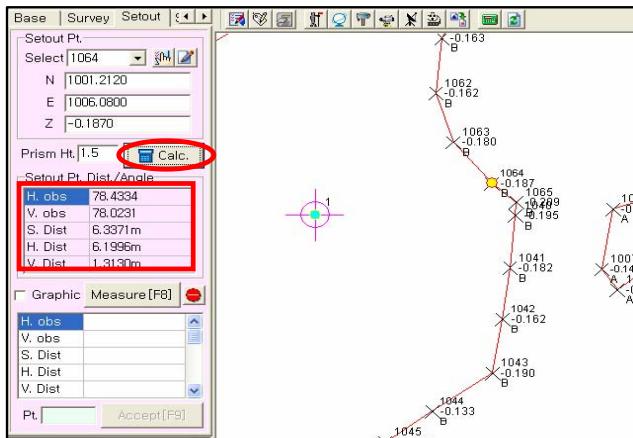
2. Select a point from the drop-down menu, from the graphic screen, or enter N, E, Z values directly.



User's Guide

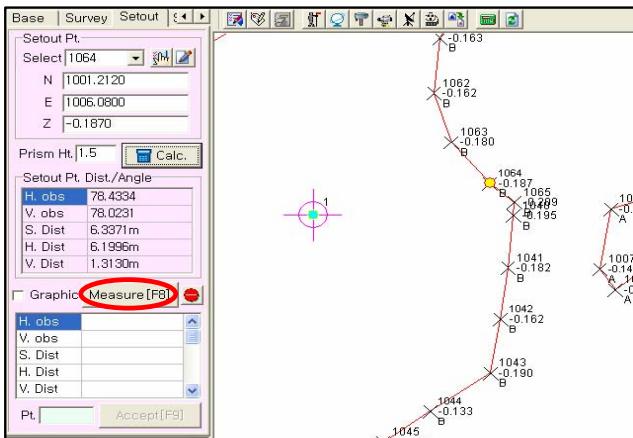
3. Click [Calc.]

Calculated values are displayed in the table below.

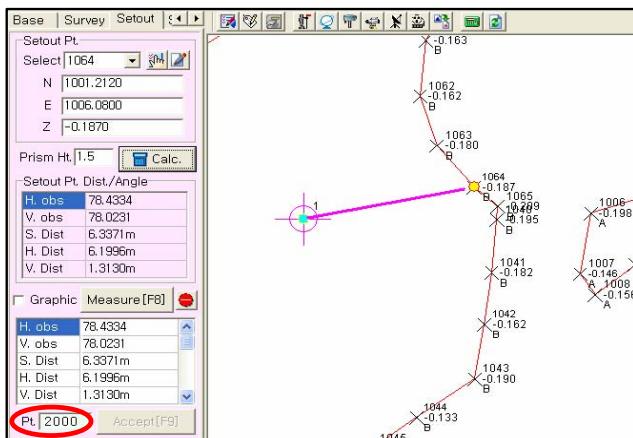


5. Click [Measure [F8]] or press [F8]

on the keyboard.

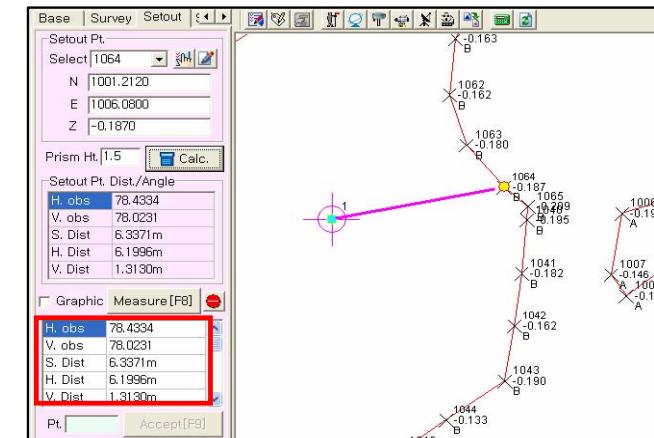


7. Enter “Point ID”.

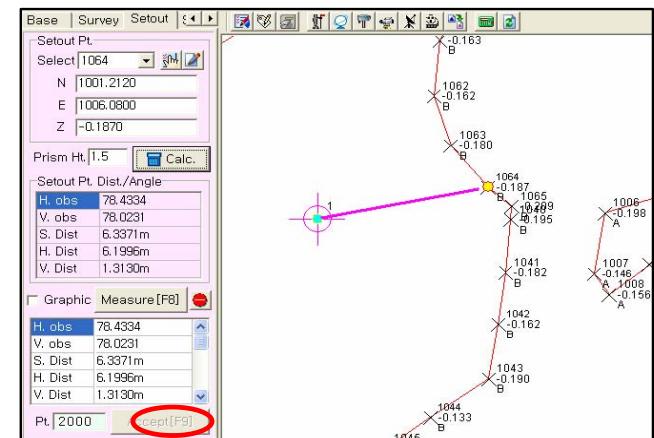


4. Sight the target.

6. Confirm data.



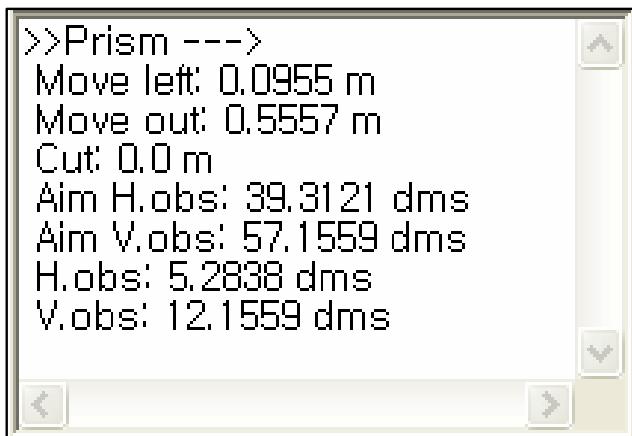
8. Click [Accept [F9]] or press [F9] to save.



9. Results are displayed

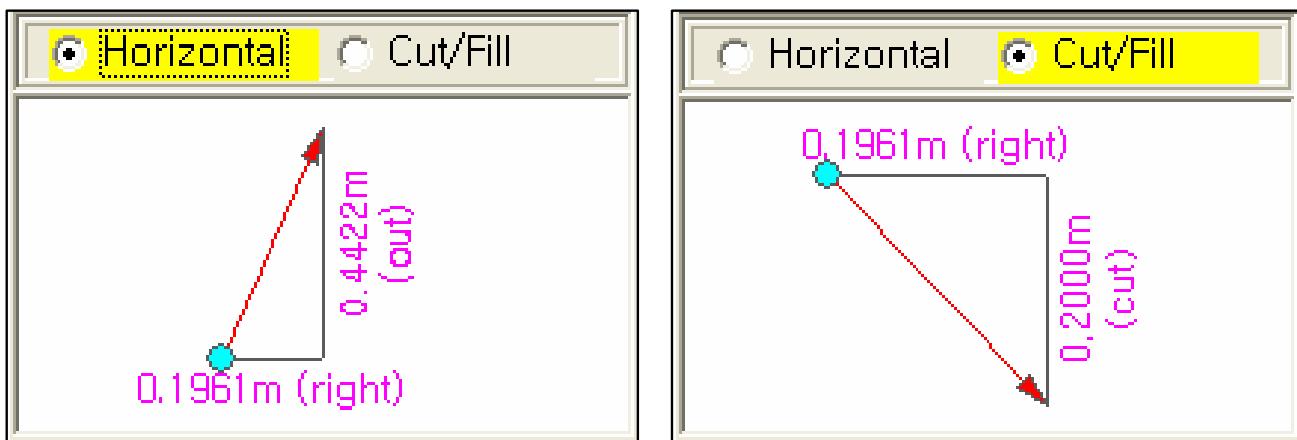
Information for setting out the plan position of the point is shown in the following screen:

- Text Option (“Graphic” check box unchecked)



- Graphic Option (“Graphic” check box checked)

The setting out distance can be displayed graphically in either the horizontal or Cut/Fill view.



Note:

Right/Left : Distance to move in the left or right direction to reach the setout point.

The direction is from the instrument operator's point of view.

In/Out : Distance to move either in (toward the instrument) or out (away from the instrument) to get the prism on to the target point.

Cut/Fill : Amount of cut or fill that the currently observed position represents relative to the setout point.

H.obs : Horizontal observation angle

V.obs : Vertical observation angle

6.4 Symbol Tab



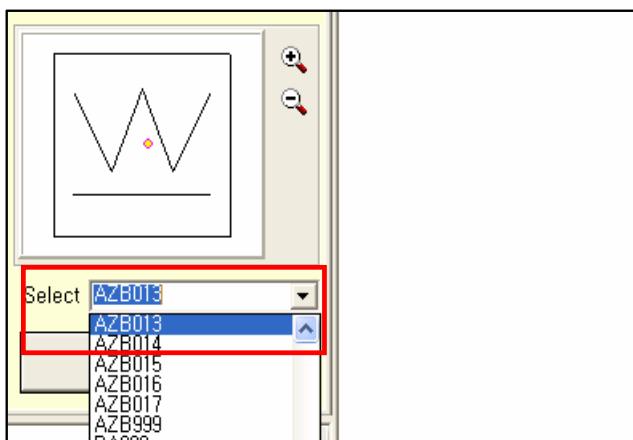
This function places a named symbol (similar to block on CAD) into the current drawing.

6.4.1 Insert Symbol



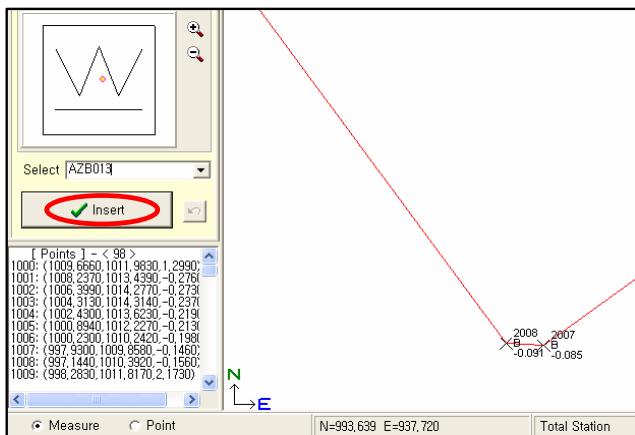
Procedure

1. Select “Symbol” tab.
2. Select symbol name in “Select”.

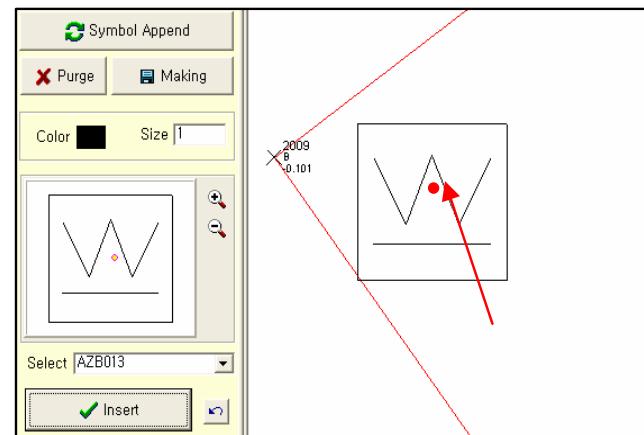


User's Guide

2. Click [Insert].



3. Right click where you want to place the symbol on the graphic screen.



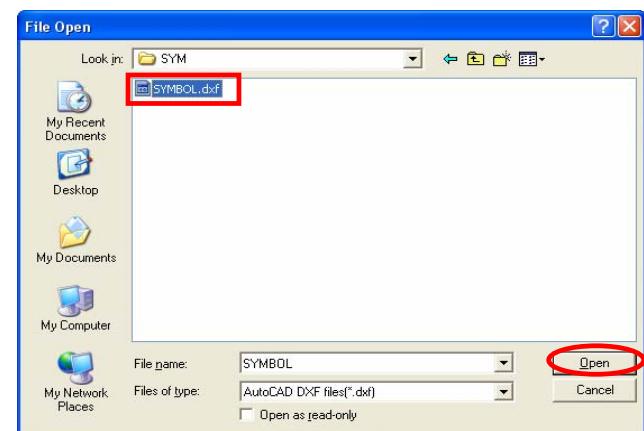
6.4.2 Converting a symbol file to .bok format



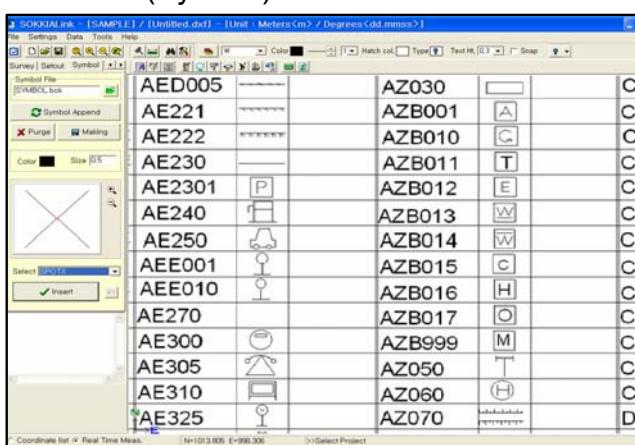
Procedure

1. Select [File] – [DXF File] - [Open DXF File].

2. Select “Symbol.dxf”.



3. Block (Symbol)

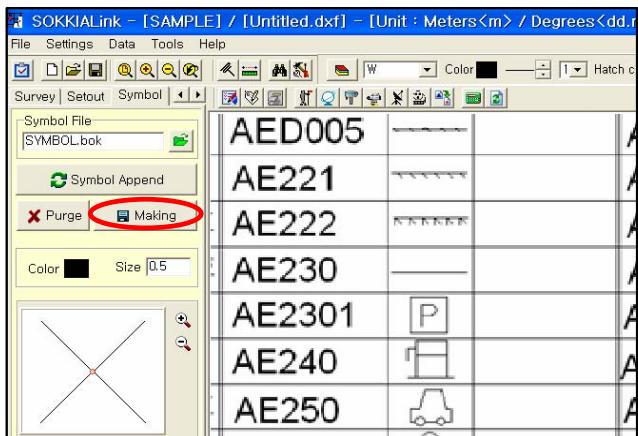


Note:

This function can be used to confirm which symbols have been opened.



4. Click [Making].



5. Enter symbol file name and click [Save].

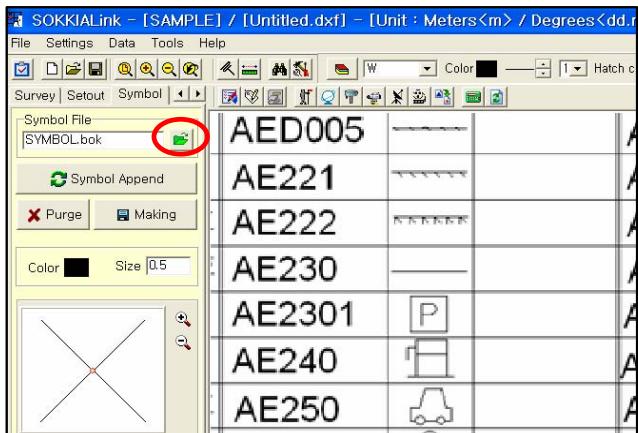


6.4.3 Loading symbol file

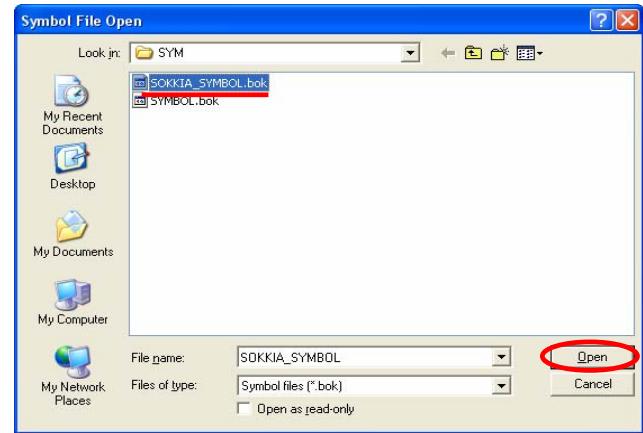


Procedure

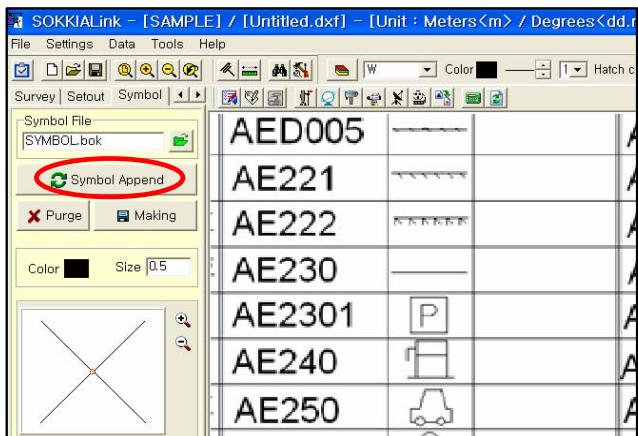
1. Click .



2. Select the symbol file to be loaded.



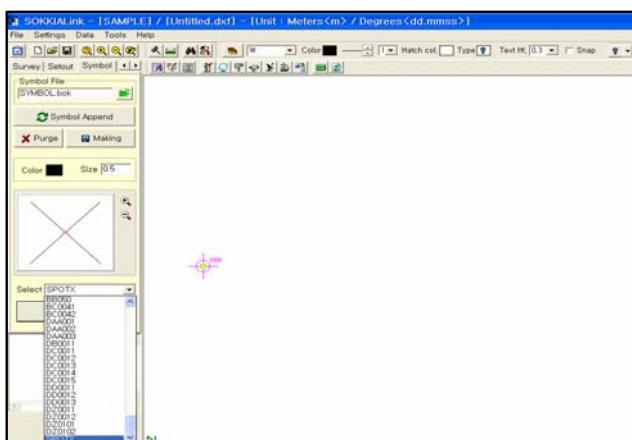
3. Click **[Symbol Append]**. All symbols in that .bok file can now be selected from the pull-down menu.



Note:

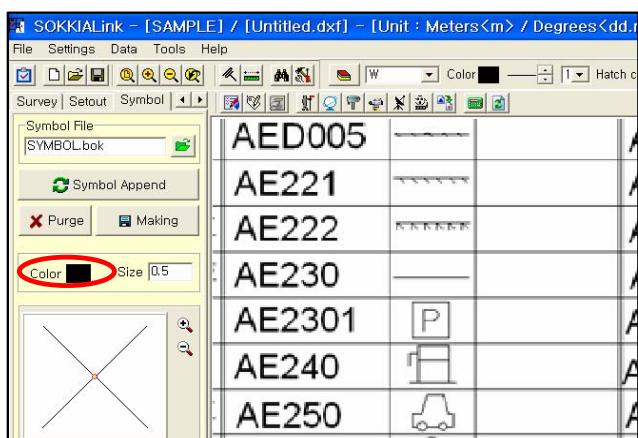
The file extension “BOK” is used for the SOKKIA Link symbol library.

Loaded symbols are displayed in the “Select” drop-down list.



The symbol library is automatically loaded when a project is selected.

4. Select symbol color

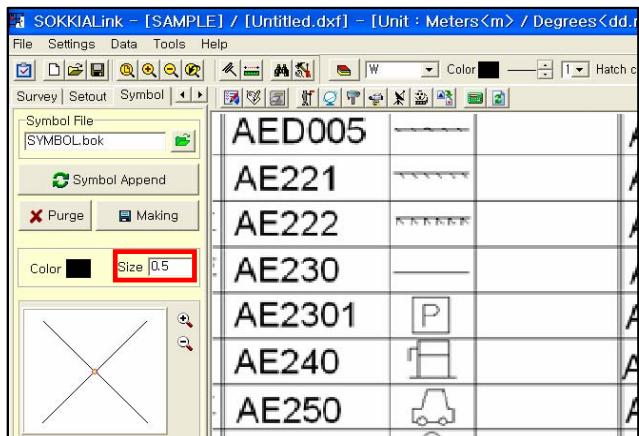


Note:

A new layer is created for a symbol with a new name.

Symbols with the same name are the same color.

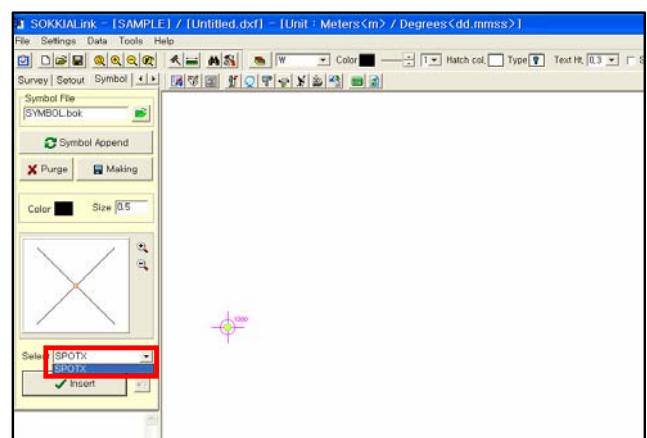
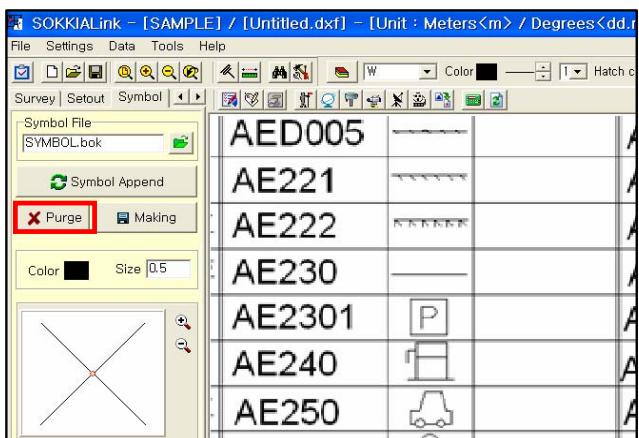
5. Select symbol size



Note:

Symbols created using CAD have a block size of 1. This "Size" setting shows the scale of the displayed symbol compared to the CAD original.

6. Click [Purge] to remove all symbols from the drop-down list that are not used in the graphic.



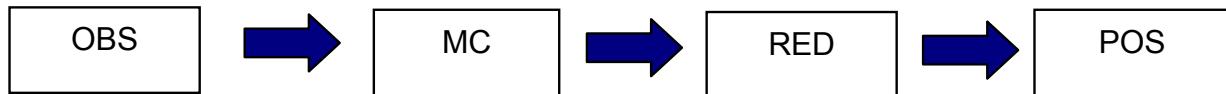
Purge symbols can be restored to the drop-down list by loading the symbol file again.

The X symbol shown above cannot be purged.

Appendix

In SDR format, measured data can be represented in the following ways which also correspond to stages of the reduction process.

- OBS** The observation includes the horizontal angle, vertical angle and slope distance from the instrument to the target prism.
- MC** The ground vector includes the azimuth, vertical angle and slope distance from the Instrument ground point to the target ground point.
- RED** The horizontal and vertical components from the instrument ground point to the target ground point.
- POS** The coordinates of the target ground point



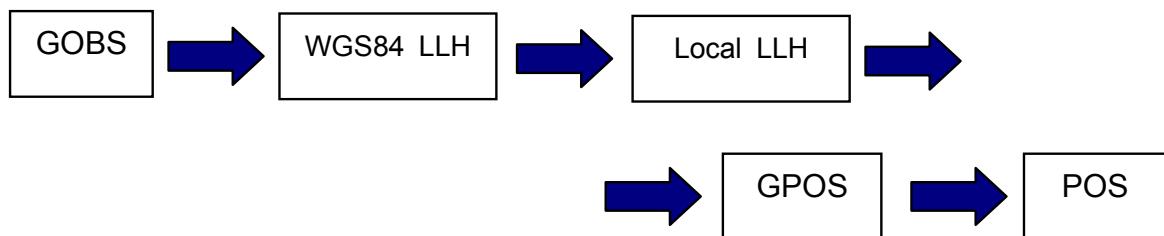
GOBS (GPS observation) The GOBS record shows the observation from the base receiver antenna to the rover receiver antenna.

WGS84 LLH This record shows the original GOBS coordinates converted to WGS84 ellipsoidal coordinates, latitude, longitude, and height.

Local LLH This record displays the GOBS as local datum latitude, longitude, and height.

GPOS (GPS position) The GPOS record shows you the observation reduced to coordinates relative to the GSTN from which it was calculated. This observation includes the un-calibrated coordinates of the rover ground point.

POS (position) The POS record shows the observation relative to the station from which it was calculated. If the record is a GPS observation, the transformation determined from the most recent calibration will be applied, if available.



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