

SOKKIA Link

User's Guide

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1. Overview

1.1 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 : Can read all versions. (Recommended Release: Ver. 12)

Interface Cable Requirements

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

- SOKKIA Total Station : DOC27 Interface Cable. (PC D-sub 9pins,male)
- SOKKIA SRX Total Station : DOC129 Interface Cable. (PC D-sub 9pins,male)

1.2 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.

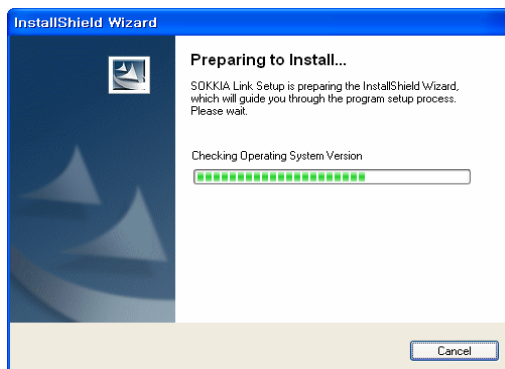
Steps to run the SETUP program :

1. Insert the **SOKKIA Link CD** in the appropriate drive.
2. The InstallShield Wizard should automatically appear.
3. Click **[Next]**.
4. Read the license agreement and select "I accept the terms in the license agreement" and click **[Next]**.
5. Click **[Next]**.
6. Click **[Next]**.
7. Click **[Install]** to begin installation.
8. Click **[Finish]**.

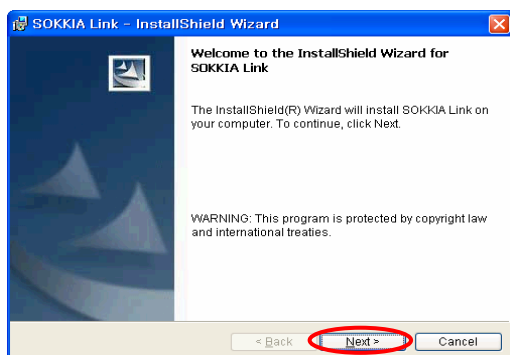


Run

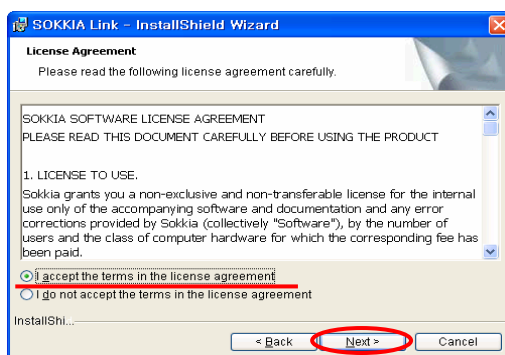
1. Insert the SOKKIA Link CD in the appropriate drive.
2. The InstallShield Wizard should automatically appear.



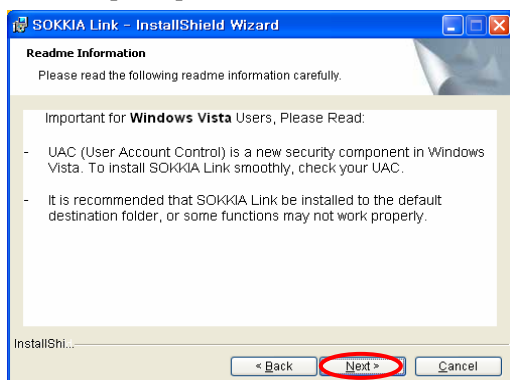
3. Click **[Next]**.



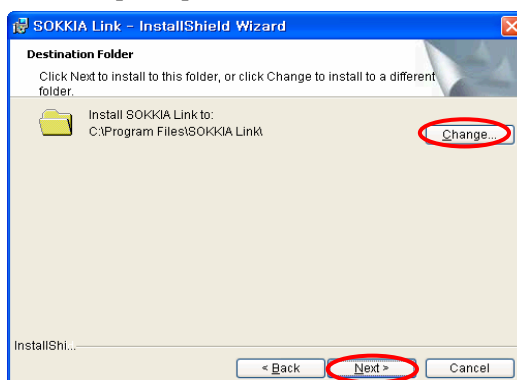
4. Read the license agreement and select "I accept the terms in the license agreement" and click **[Next]**.



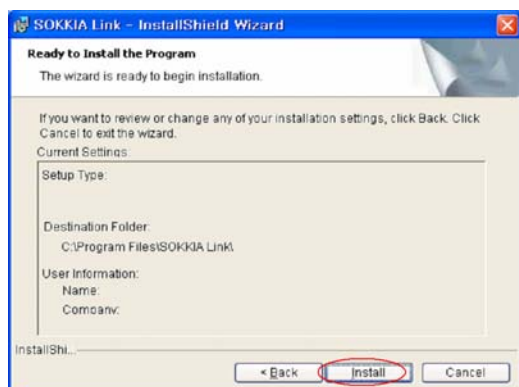
5. Click **[Next]**.



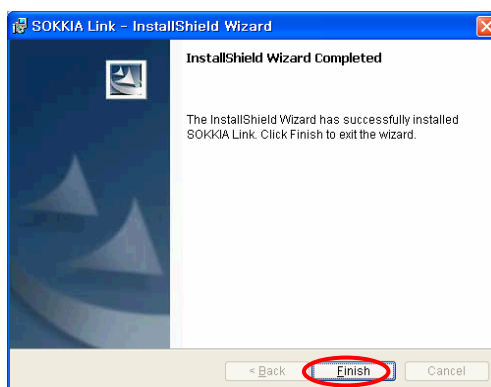
6. Click **[Next]**.



7. Click **[Install]** to begin installation.




8. Click **[Finish]**.

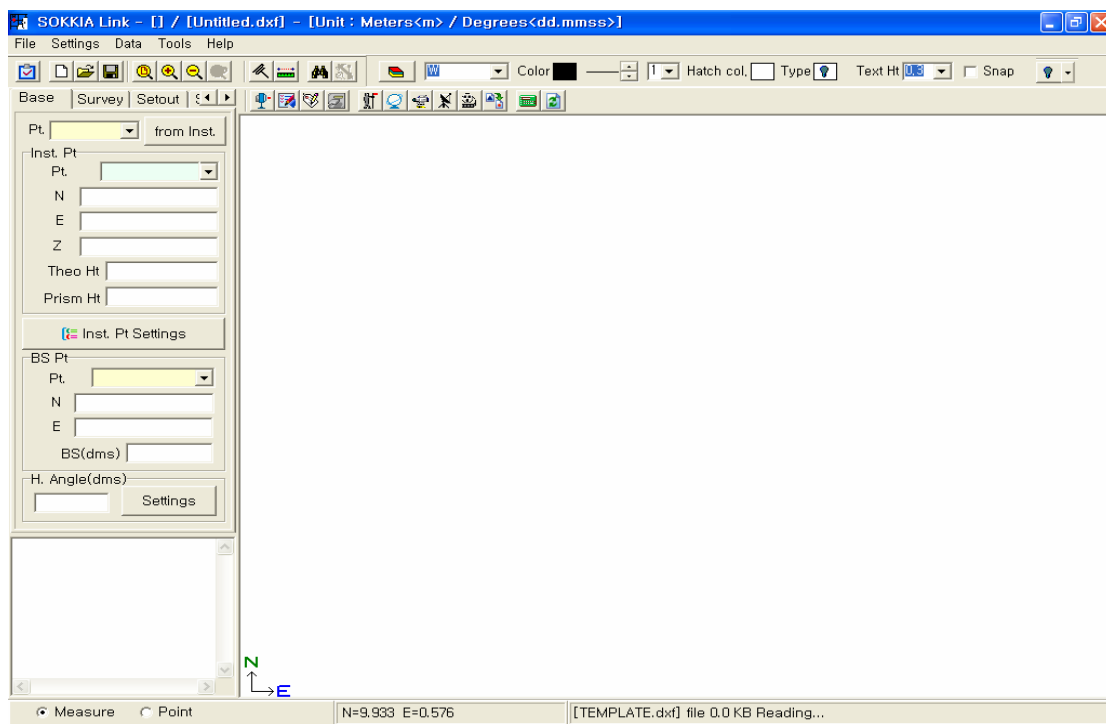


1.3 Start SOKKIA Link

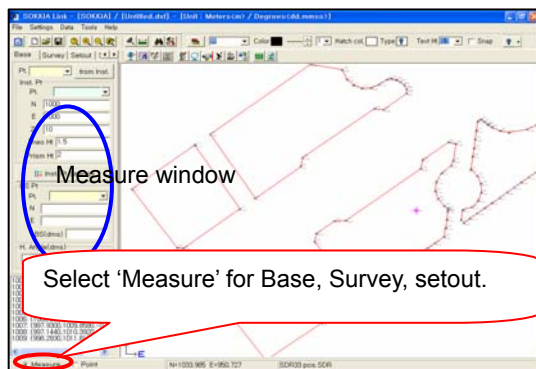


Start SOKKIA Link by clicking the icon  on the desktop.

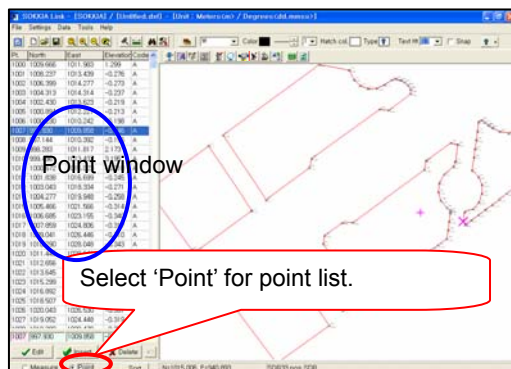
SOKKIA Link main screen



Measure window (survey, setout etc.)



Point window



1.4 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.

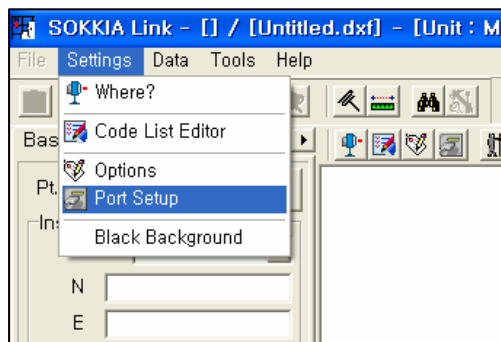
Perform the following procedure to register SOKKIA Link.

1. Connect a SOKKIA instrument to the PC.
2. From the **[Settings]** menu, click **[Port Setup]** (Refer to page 34 for more detail).
 - 2-1. Set **Port** and **BaudRate**.
3. From the **[Data]** menu, click **[Receive Data]** (Refer to page 56 for more detail).
 - 3-1. Click **[Connection]**.
 - 3-2. On the instrument, select **[Comms out]**.
 - 3-3. Click **[SDR Save File]**.
 - 3-4. File menus are now enabled.

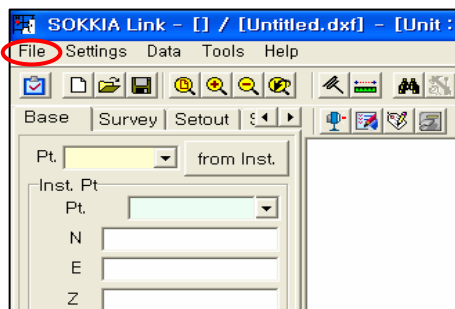


Run

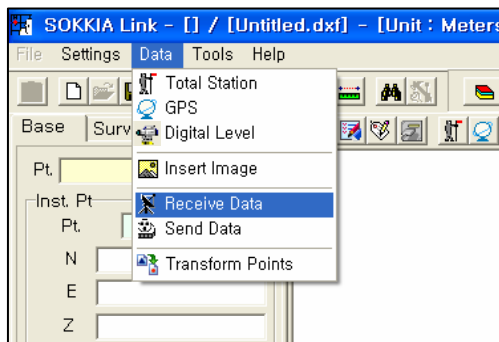
Port Setup (Refer to Page 34)



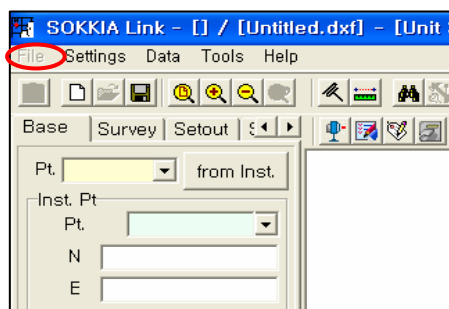
Disabled functions



Receive Data (Refer to Page 56)



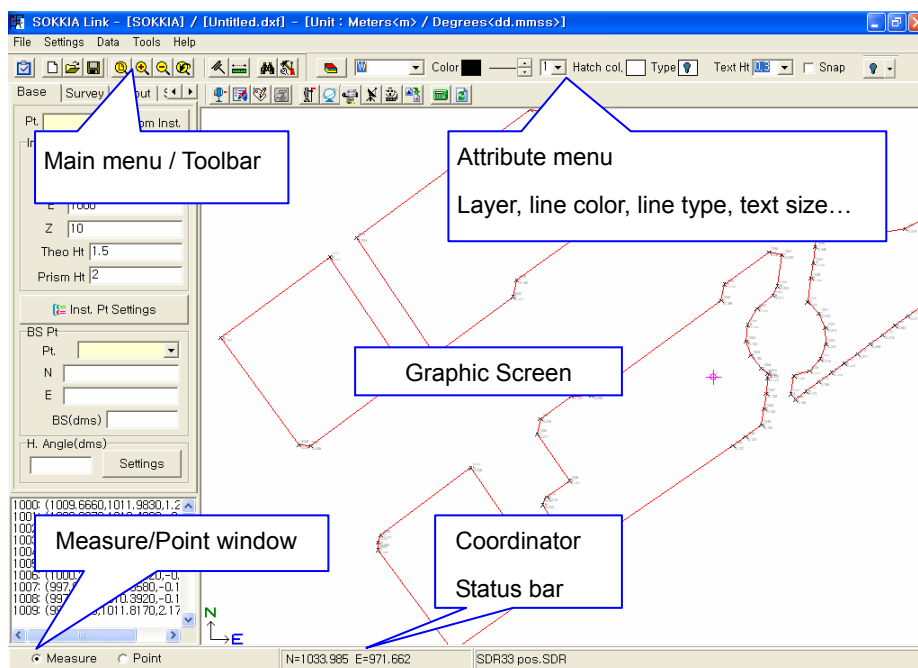
Enabled functions



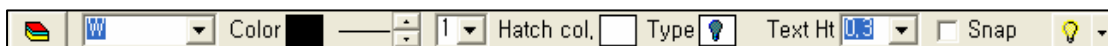
1.5 Learning the main screen



The main screen consists of five parts.



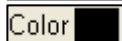
► Using the settings toolbar ◀



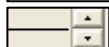
Manage drawing layers (create or delete layers, layer on or off).



Current layer settings



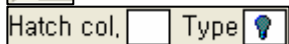
Current layer color



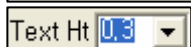
Current layer line (continuous, hidden, dot, center, phantom)



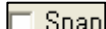
Current layer line width (1 – 5)



Hatch color and on/off (displayed only with closed-polyline)



Text height



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



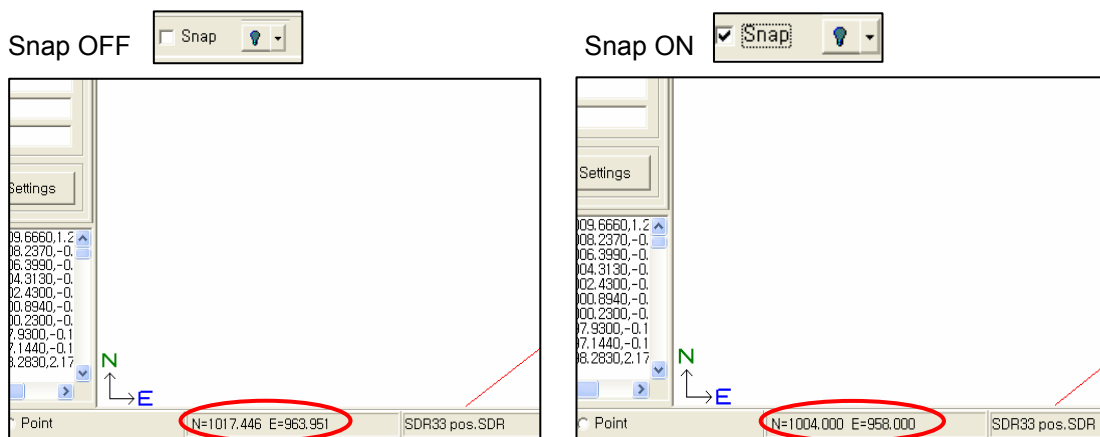
Set running object snap mode and on/off (Near point, End point)

*** The toolbar has the same basic functionality as AutoCAD.**



Note

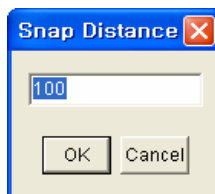
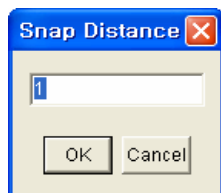
Snap is a tool used to accurately locate points and create objects.



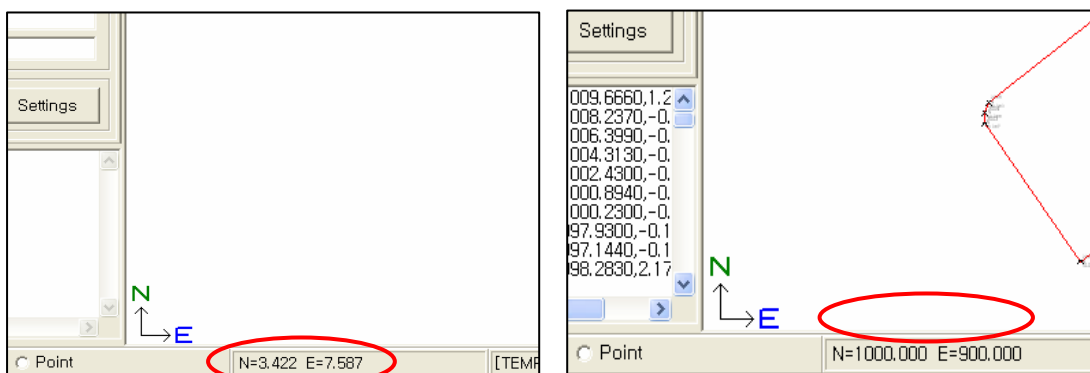
A point is located by the **[Snap]** interval when snap is on.

Setting Snap distance

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

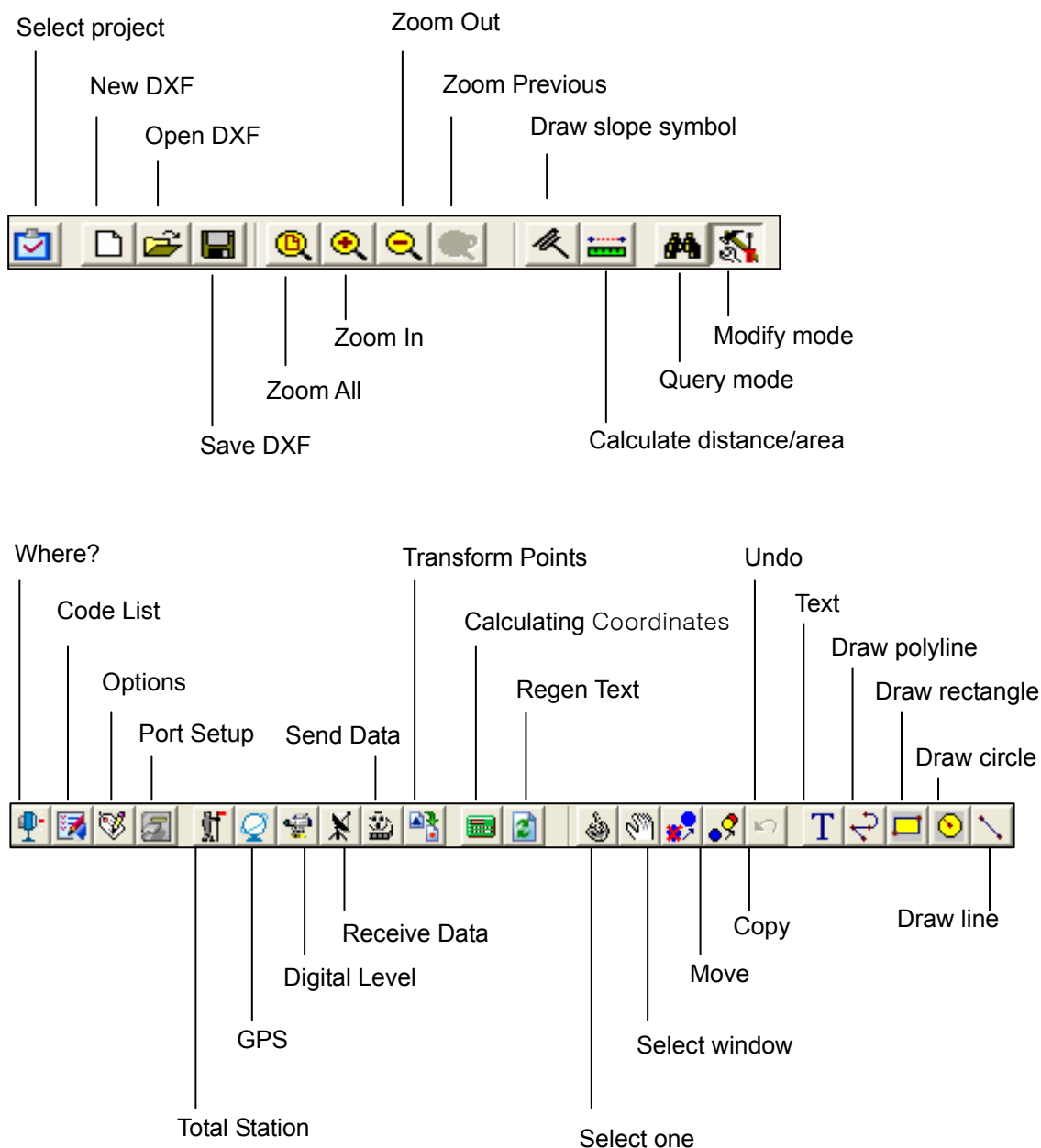


Snap distance can be set between 1 and 100, as shown in the figure below.





































► Using the toolbar ◀

The icons on the toolbar represent commands that will initiate an immediate action.



Toolbar icon buttons

-  --- Select Project : select one of the projects.
-  --- New DXF : initialize and clear graphic window.
-  --- Open DXF : open DXF file that is made out AutoCAD or another thing program.
-  --- Save DXF.
-  --- Zoom All.
-  --- Zoom In.
-  --- Zoom Out.
-  --- Zoom Previous.
-  --- Draw slope symbol.
-  --- Calculate distance/area (in the case of area, using with Shift + Right button).
-  --- Query mode : Query the attribute of objects on graphic window.
-  --- Search instrument point by measuring 2 or 3 points.
-  --- Edit Code List attributes.
-  --- Options.
-  --- Setup Port.
-  --- View Field Book and Reduced Coordinates by reading a Total Station SDR file.
-  --- View Field Book by reading a GPS, SDR 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. → 
-  --- Select one object.
-  --- Select objects by 2 point.
-  --- Move objects.
-  --- Copy objects.
-  --- Undo objects modified.
-  --- Draw text.
-  --- Draw polyline.
-  --- Draw circle.
-  --- Draw line.

2. File

2.1 Creating a New Project

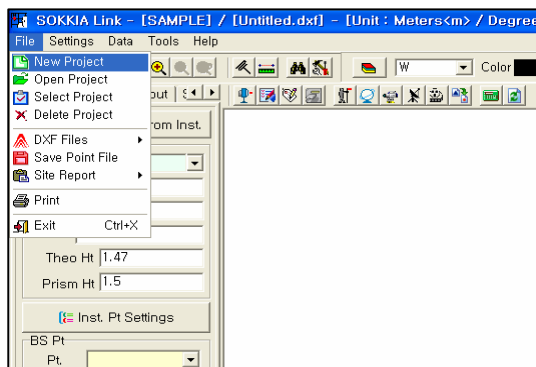


Create a new project by selecting **[File]**, **[New Project]** from the menu bar, or corresponding button on the toolbar. Once created, the project name is displayed in the SOKKIA Link title bar.

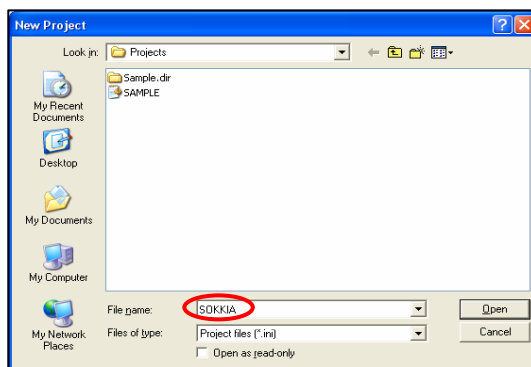


Run

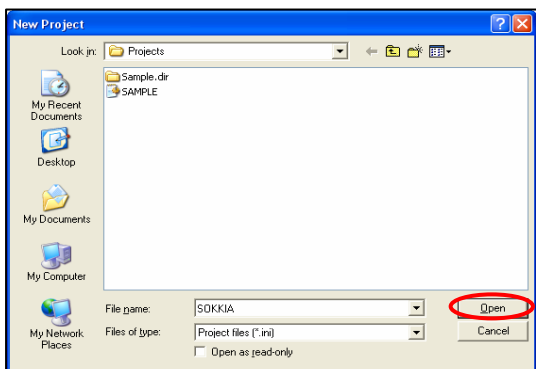
1. Click **[New Project]**.



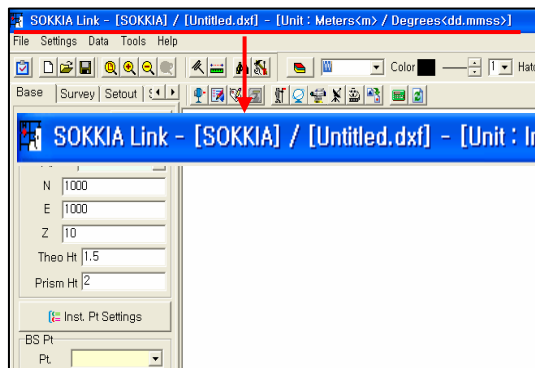
2. Enter a project name in the dialog.



3. Click **[Open]**.



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





Note

Project Files/Directory

A project is comprised of two components as seen in the appropriate directory containing the project.

- 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

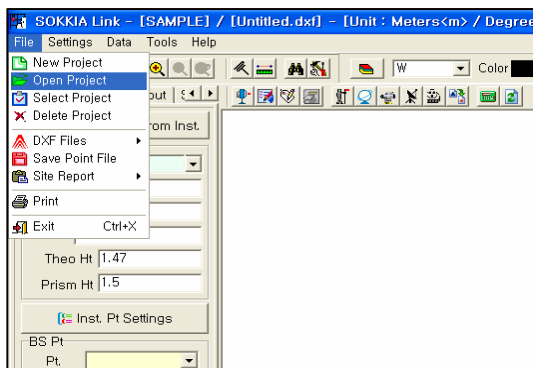


Select **[File]**, **[Open Project]** from the menu bar to open an existing file. You can also open an existing project by selecting **[Select Project]** from the **[File]** menu.

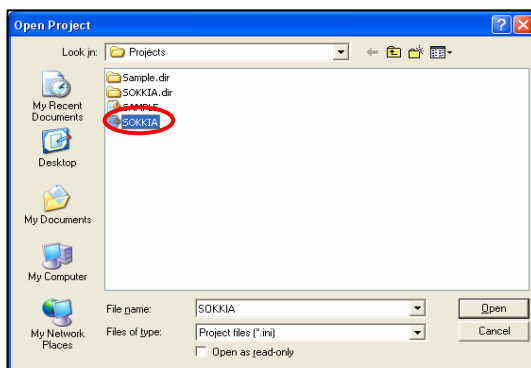


Run

1. Click **[Open Project]**.



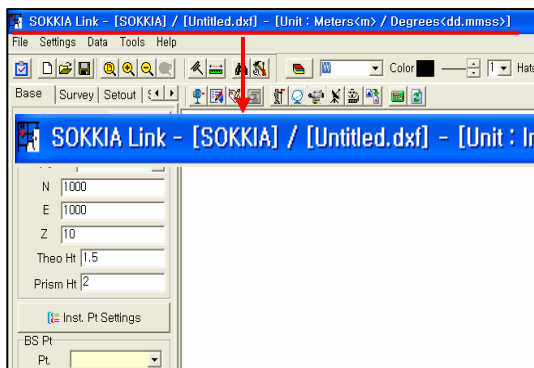
2. Click SOKKIA.INI.



3. Click **[Open]**.



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



2.3 Select Project



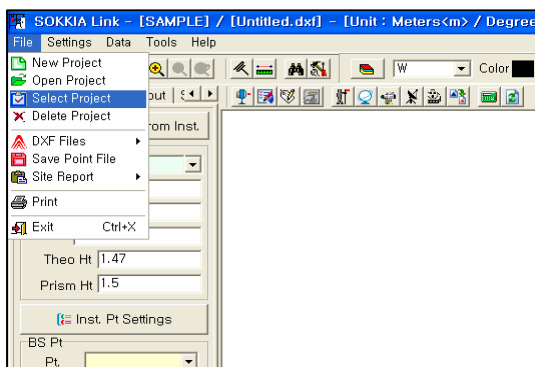
Projects are opened from the **[Select Project]** option of the **[File]** menu or from the **[Select]** button on the toolbar.

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

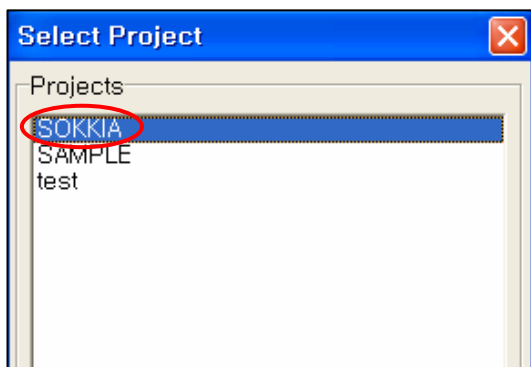


Run

1. Click **[Select Project]**.



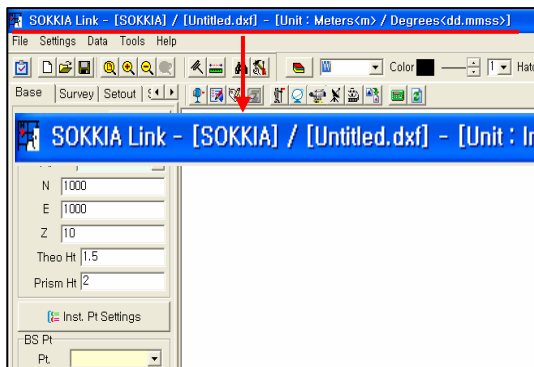
2. Choose **[Project name]**.



3. Click **[OK]**.



4. Displays new project name on title bar.





Note

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

Steps to rename or move a project.

Open the SOKKIA Link\Projects folder.

Rename the Project1.ini file and Project1.dir folder.



Note

Sort option

1. Sort by date.
2. Sort by name.

2.4 Deleting a Project

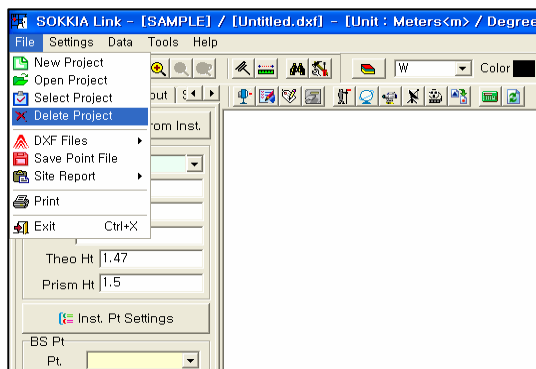


Select **[File]**, **[Delete Project]** to delete a project. An open project cannot be deleted.

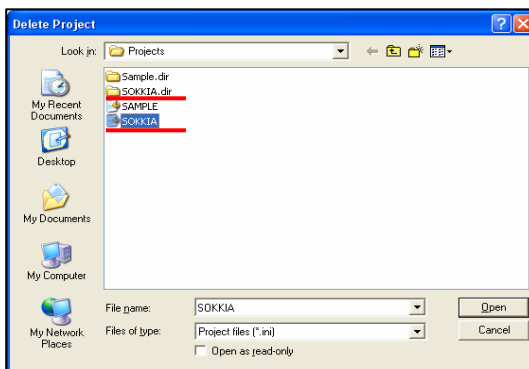


Run

1. Click **[Delete Project]**.



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

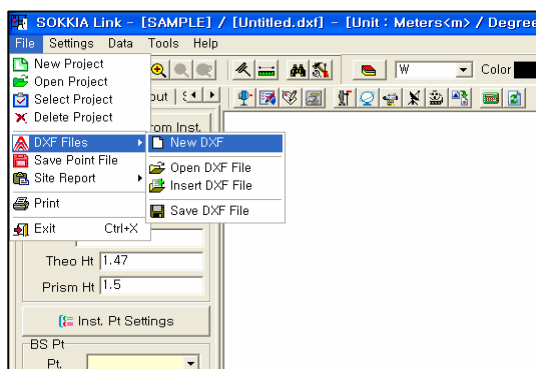


2.5 Create a New DXF

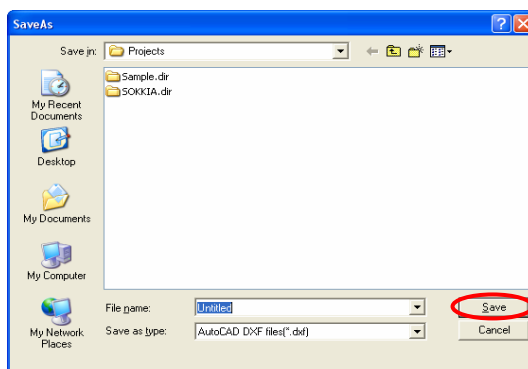


Run

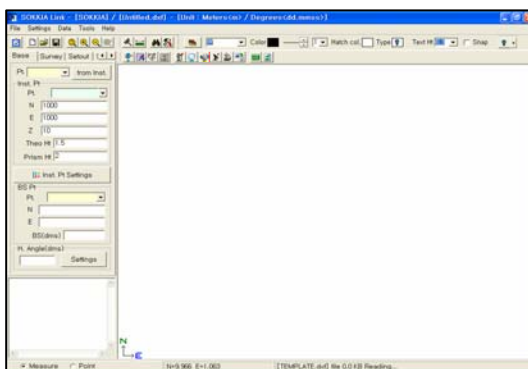
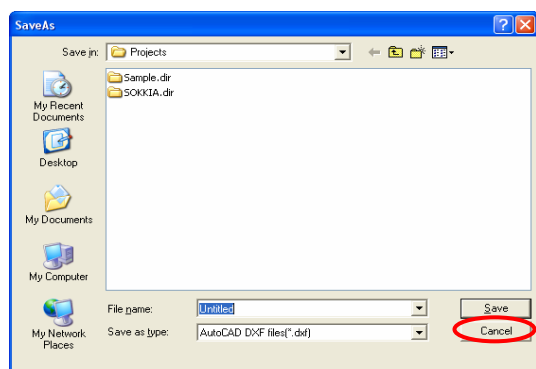
1. Click **[DXF Files]**.



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



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



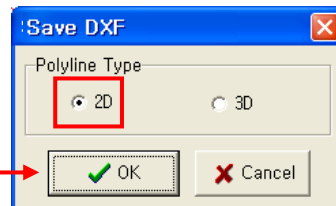
Note

Save DXF Option

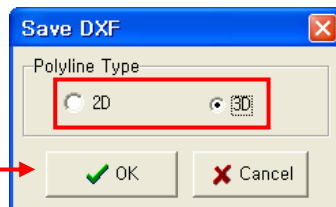
This option is necessary due to the difficulty in modifying a 3D polyline in AutoCAD.

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

2D SAVE



3D SAVE



2.6 Open an Existing DXF File

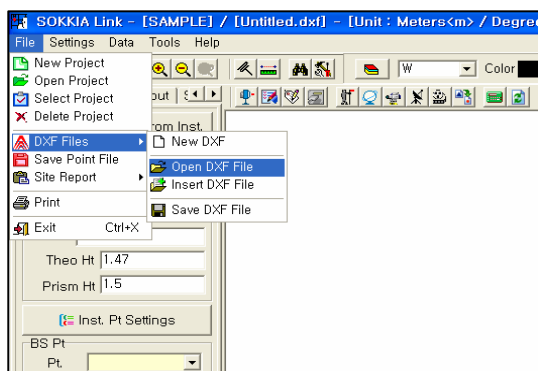


An existing DXF file that has been made using AutoCAD or similar program can be opened using SOKKIA Link.

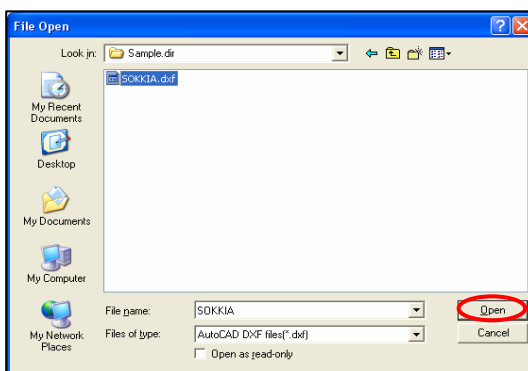


Run

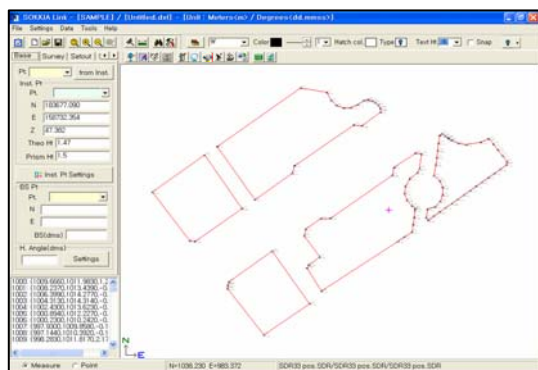
1. Click **[Open DXF Files]**.



2. Select DXF file and click **[Open]**.



3. The DXF file is opened.



Note

DXF Compatibility

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

Before opening a DXF :

- Explodes these entities on AutoCAD.
- Changes style of font into Window's font if text is broken.

2.7 Inserting a DXF File

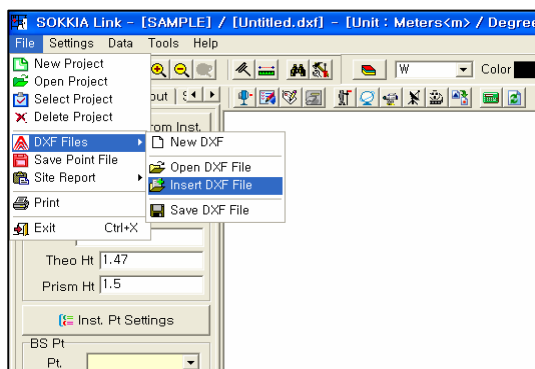


This places an additional DXF file into the current drawing.

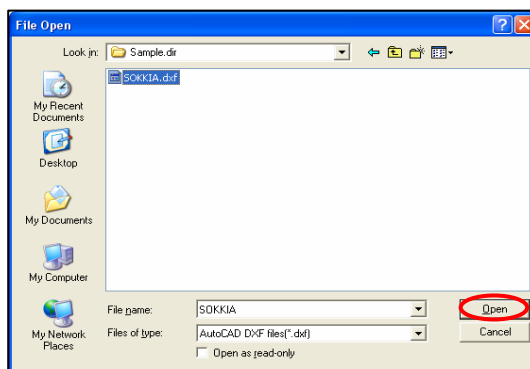


Run

1. Click **[Insert DXF Files]**.

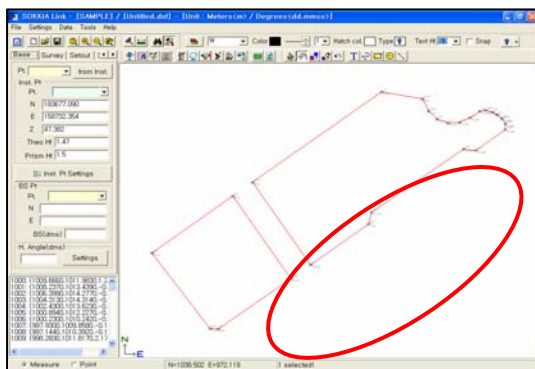


2. Select DXF file and click **[Open]**.

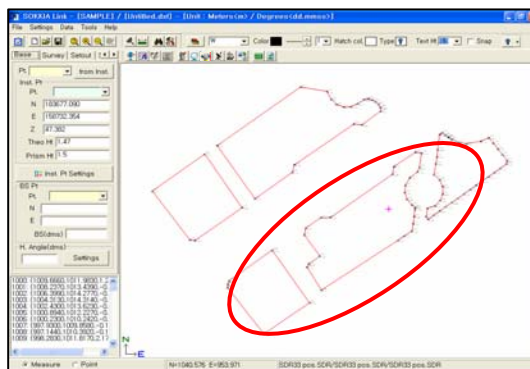


Note

Old drawing



Inserted file



2.8 Saving a DXF File

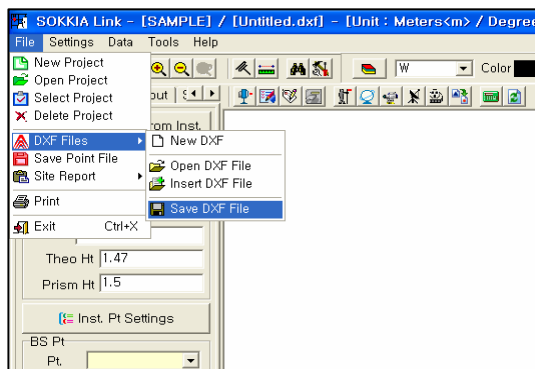


This function has been designed to export data in DXF format, a common format for CAD systems.

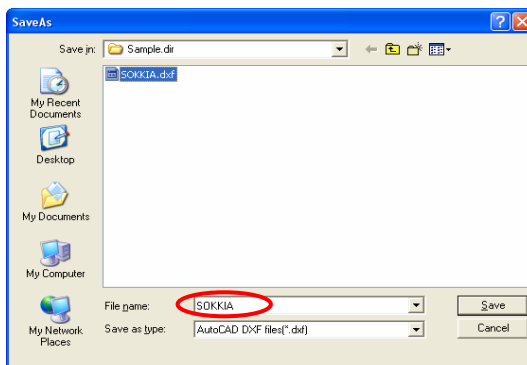


Run

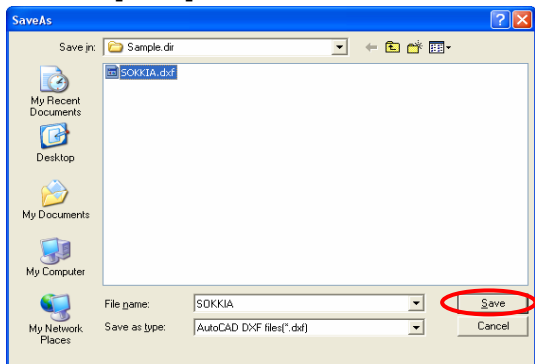
1. Click **[Save DXF Files]**.



2. Input file name.



3. Click **[Save]**.



2.9 Saving Point File



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

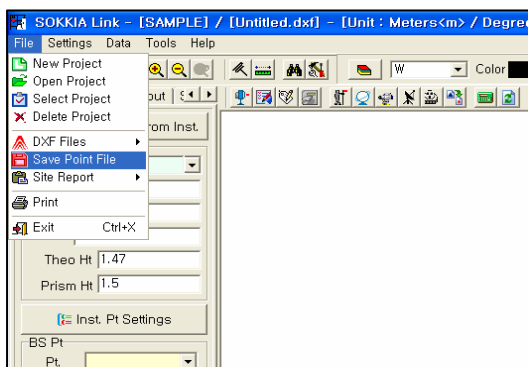
Steps to save a Point File

1. To export data from the current SOKKIA Link project, select **[Save Point File]** from the **[File]** menu.
2. Select data type and enter a name for the saved file.
3. Press **[OK]**.

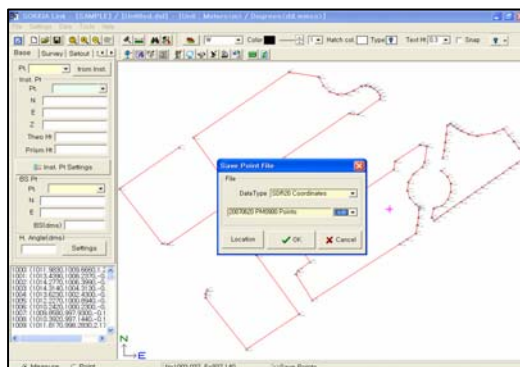


Run

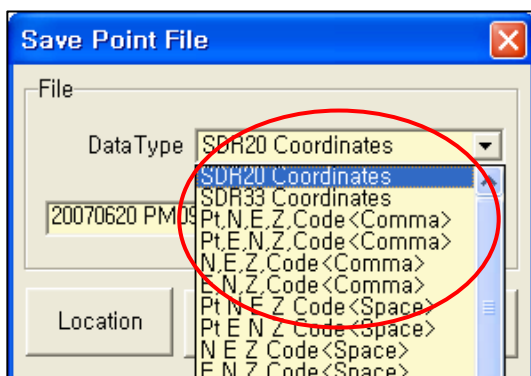
1. Click **[OK]**.



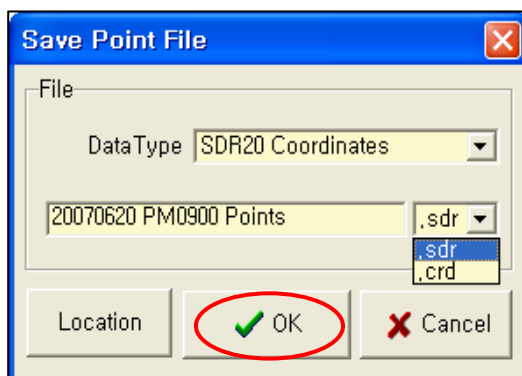
2. Enter a file name to save.



3. Click **Data Type**.

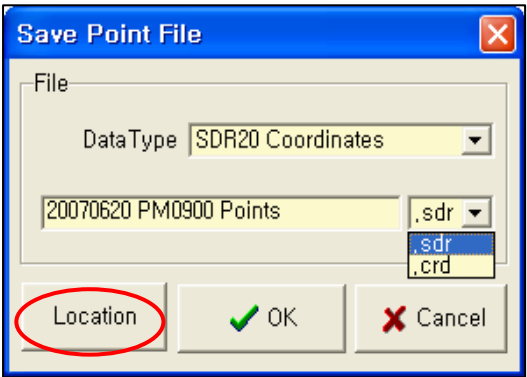


4. Click **[OK]**.

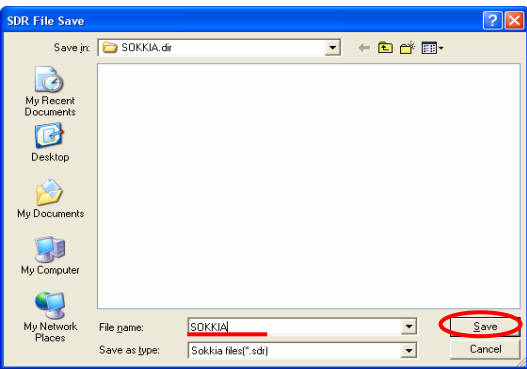




SDR Location Option



File save location



2.10 Site Report (Text File / Excel File)

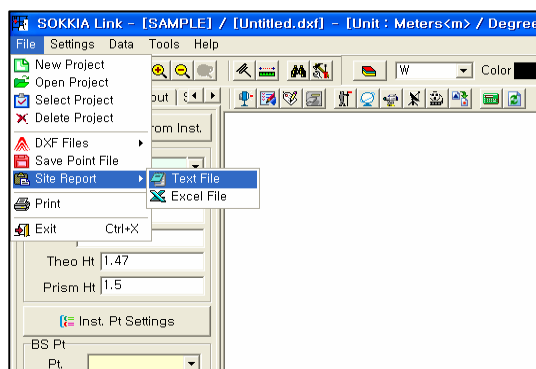


Export points in present drawing to Notepad, Excel.

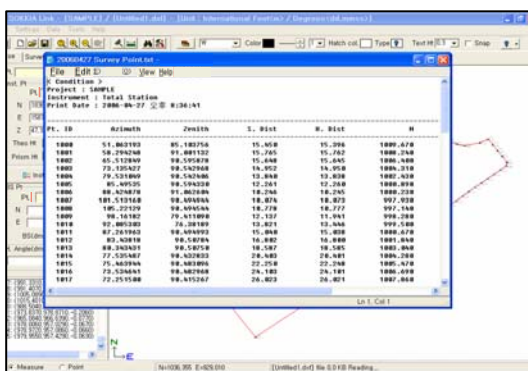


Run

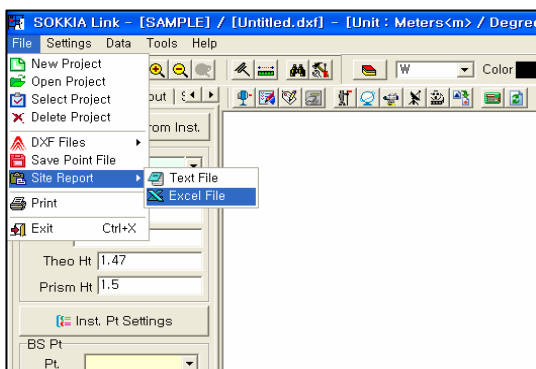
1. Click **[Text File]**.



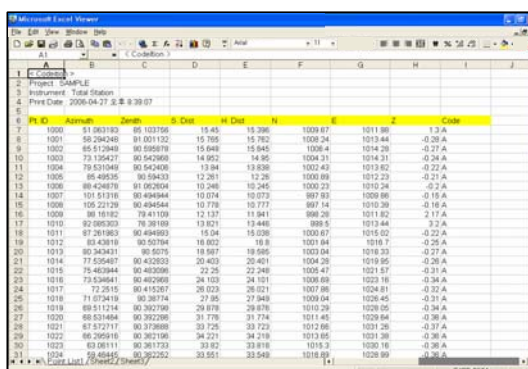
2. Notepad Save/ Printer.



3. Click **[Excel File]**.



4. Excel Save/ Printer.



Note

Excel allows several worksheets to be used in a single file. If this function is used with an existing Excel file, new data will be stored in a new worksheet in the same file when possible.

3. Settings

3.1 Where?



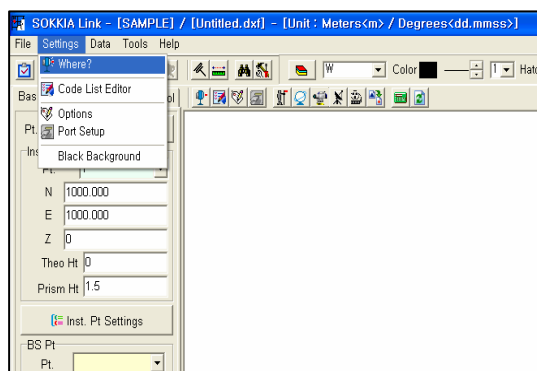
This function locates an unknown instrument point using known points.

Steps to transform drawing

1. Select **[Where?]** from the **[Settings]** menu.
2. Click **[Point Select]** or select **[Pt.]** to find the coordinates.
3. Click **[Measure]**.
4. Click **[Calc.]**.
5. Confirm **Diff. value**.
6. Click **[Settings]** to set Instrument point and H. angle.



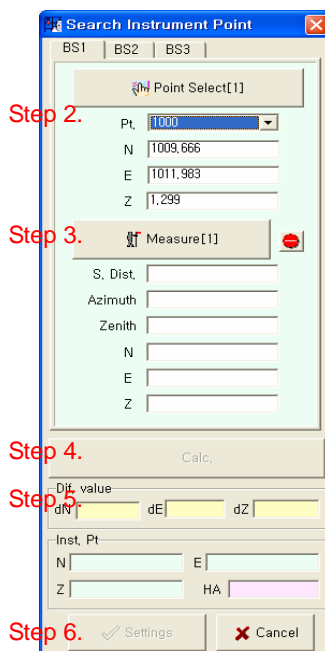
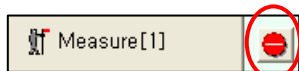
Run



Note

More than two points are required to find the instrument point.

Stop **[Measure]** button (Fine meas repeat).



3.2 Code List Editor

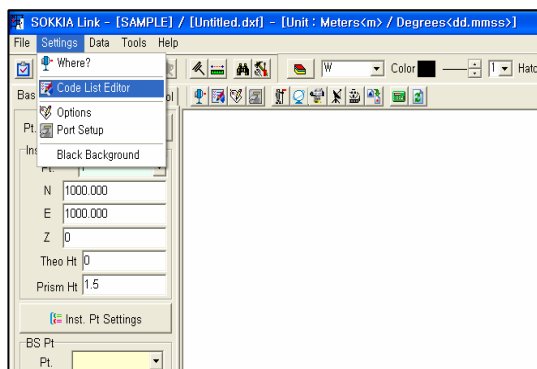


The Code List Editor is a powerful tool that serves as a starting point for defining the code. It allows you to assign the definition to a point that you draw. From the Code List Editor you can also define records, including symbols and line attributes. After the records are defined, the Editor also allows you to link records for drawing.

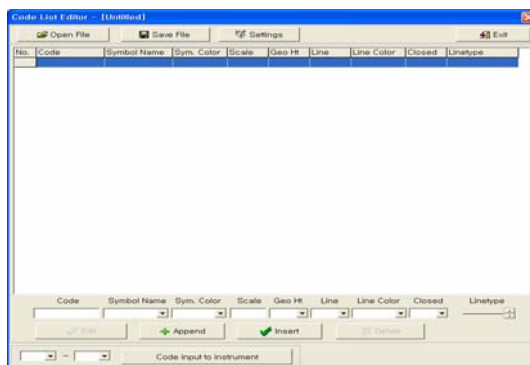


Run

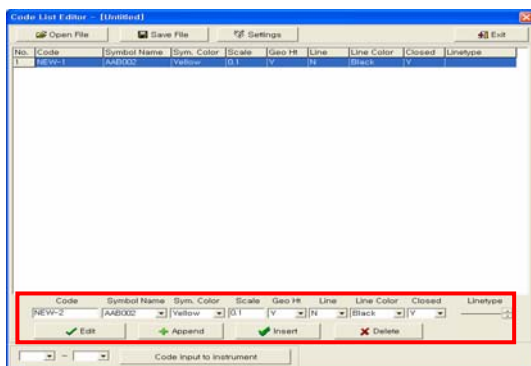
1. Click [Code List Editor].



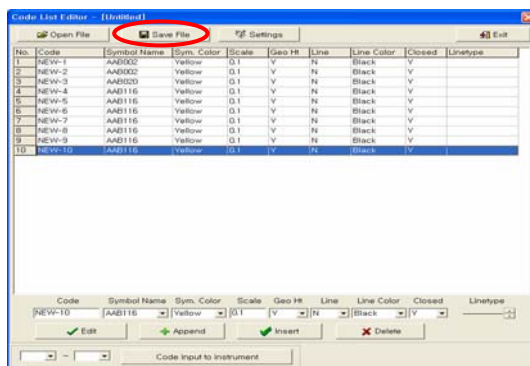
Code List Editor main screen.



2. Create new code.



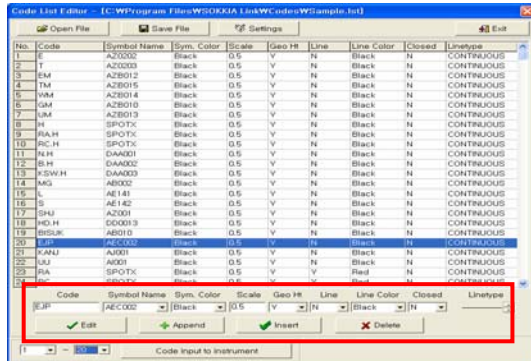
3. Save code list file.



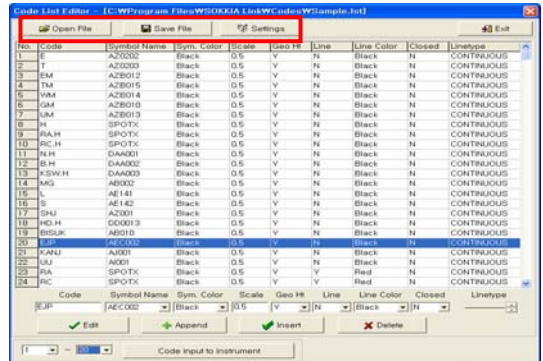
Enter the code name symbol attributes and line attributes, then click **[Append]**.

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

Code Edit Panel



Code File Panel



Code : Code name.

Symbol Name : Block name for insert (the same as AutoCAD).

Sym. Color : Symbol color / Scale : Symbol scale (x,y,z).

Geo Ht : Mark height on drawing, Yes or No.

Line : Draw line, Yes or No / Line Color : Set line color.

Closed : If Yes, Point link with point of first same code.

Linetype : Set line style.

Edit : Edit a row selected.

Append : Append the code in the last row.

Insert : Insert code in the next row.

Delete : Delete the selected row.

1 ~ 20 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)

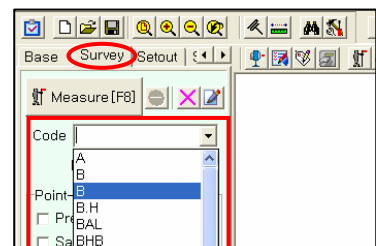
Open File : Open code List file (*.lst) in folder.

Save File : Save code List file with a new name.

Settings : Code settings.

Note

By clicking the **[Settings]** button, code item in Survey are changed to new code contents in the sheet.



3.3 Options

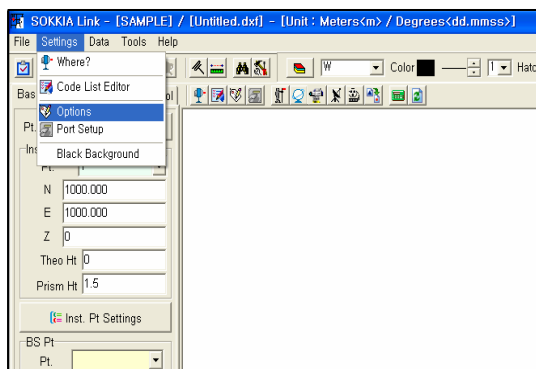


Select **[Options]** from the **[Settings]** menu or use the select button on the toolbar.



Run

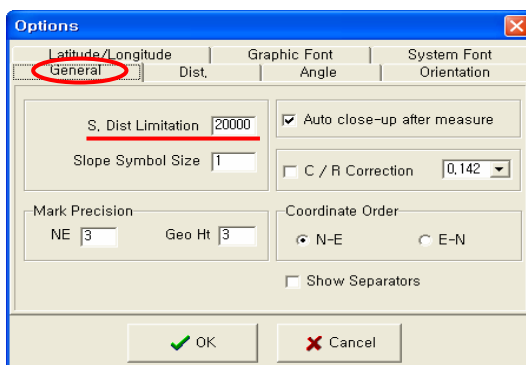
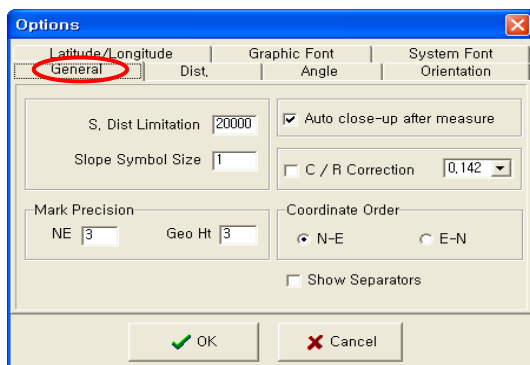
1. Click **[Options]**.



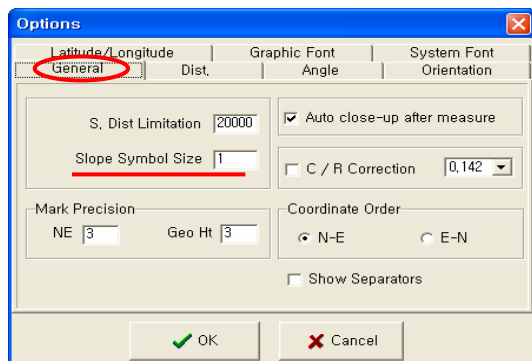
► General Options Settings

2. **[General]** / Options.

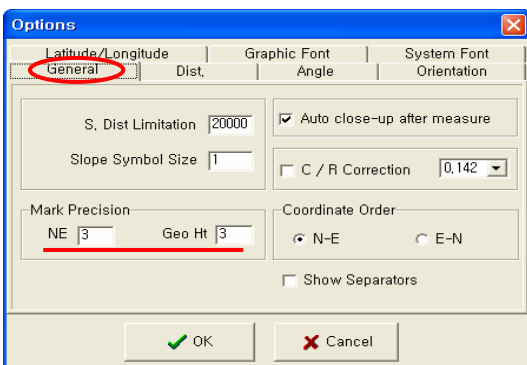
2-1. **Slope Dist Limitation.**



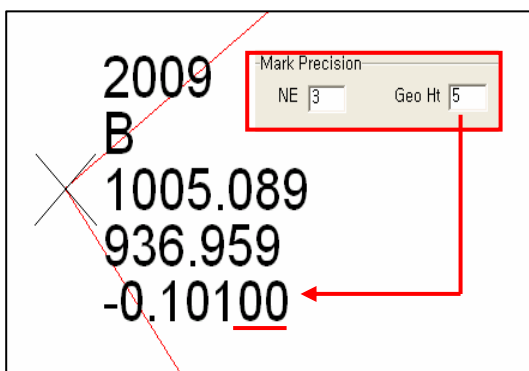
2-2. Slope Symbol Size.



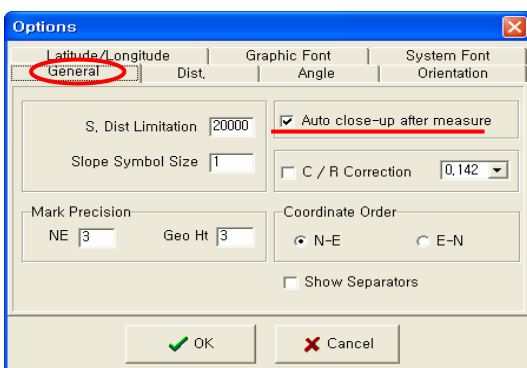
2-3. Mark Precision setting.



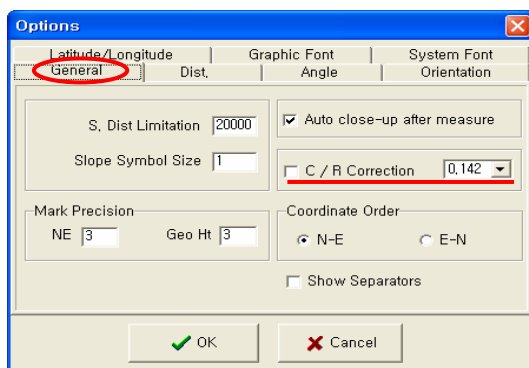
Run



2-4. Auto close-up after measure.



2-5. C / R Correction setting.



Curvature & Refraction correction.

2-6. Coordinate Order.

Options dialog box, Latitude/Longitude tab, General sub-tab. The 'Coordinate Order' section shows 'N-E' selected with a red underline. The 'Show Separators' checkbox is unchecked.

This field sets the coordinate display order.

2-7. Show separators.

Options dialog box, Latitude/Longitude tab, General sub-tab. The 'Show Separators' checkbox is checked with a red underline.

Numbers are shown with a thousand separator.

3. [Dist] Setting.

Options dialog box, Latitude/Longitude tab, Dist. sub-tab. The 'Unit' section shows 'Meters [m]' selected. The 'Precision' section shows 'Field Book' set to 4 and 'Reduced Coordinates' set to 3.

3.1 Distance *Unit*.

Options dialog box, Latitude/Longitude tab, Dist. sub-tab. The 'Unit' section shows 'Meters [m]' selected with a red box around it.

Select the distance unit.

3.2 Numeric Symbol.

Options dialog box, Latitude/Longitude tab, Dist. sub-tab. The 'Numeric Symbol' dropdown menu is open, showing a list of symbols with a red box around it.

3.3 Precision.

Options dialog box, Latitude/Longitude tab, Dist. sub-tab. The 'Precision' section shows 'Field Book' set to 4 and 'Reduced Coordinates' set to 3, both with red boxes around them.

4. [Angle] Settings.

The 'Options' dialog box has four tabs: 'Latitude/Longitude General', 'Dist.', 'Angle', and 'System Font Orientation'. The 'Angle' tab is active. Under 'Unit', 'Degrees' is selected. Under 'Degrees', 'dd-mm-ss.ss' is selected. The 'Precision' dropdown is set to '2'.

4.1 [Angle] unit, *Precision* setting.

This screenshot is identical to the previous one, showing the 'Angle' settings with 'Degrees' as the unit and a precision of 2.



Note

If you change the settings of Angle-unit (Degrees/Gons/Mils) during Realtime measurement, click the **[Inst. Pt. settings]** in base tap to make the changes effective.

5. [Orientation] Setting.

The 'Options' dialog box has the 'Orientation' tab active. The 'Unit' section shows 'Degrees' selected. The 'Precision' dropdown is set to '2'.

5.1 Azimuth Angle *Unit*, *Precision* settings.

This screenshot is identical to the previous one, showing the 'Orientation' settings with 'Degrees' as the unit and a precision of 2.

6. [Latitude/Longitude] Setting (GPS).

The 'Options' dialog box has the 'Latitude/Longitude' tab active. Under 'Unit', 'Degrees' is selected. Under 'Degrees', 'dd-mm-ss.ss' is selected. The 'Precision' dropdown is set to '8'.

6.1 *Latitude/Longitude* settings.

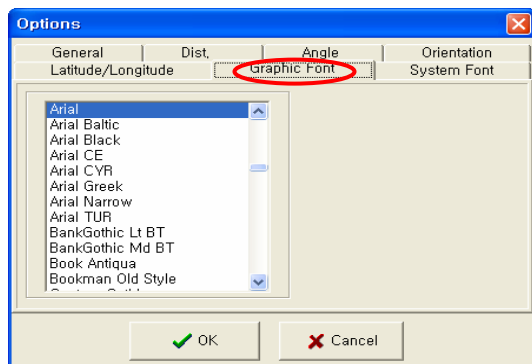
This screenshot is identical to the previous one, showing the 'Latitude/Longitude' settings with 'Degrees' as the unit and a precision of 8.



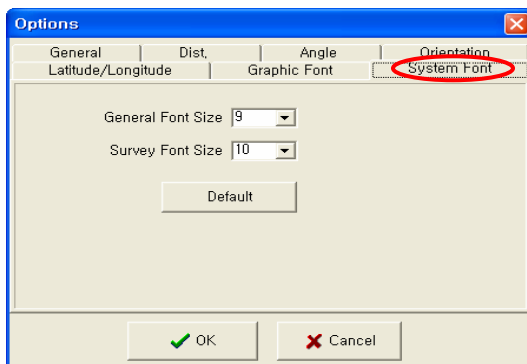
Note

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

7. [Graphic Font]

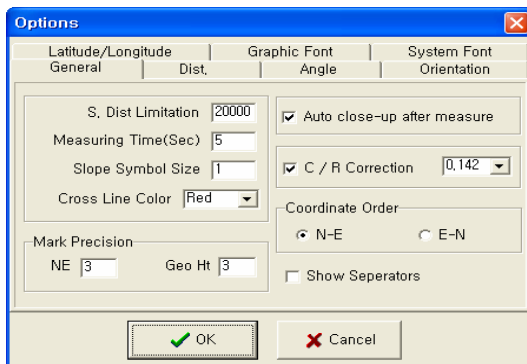
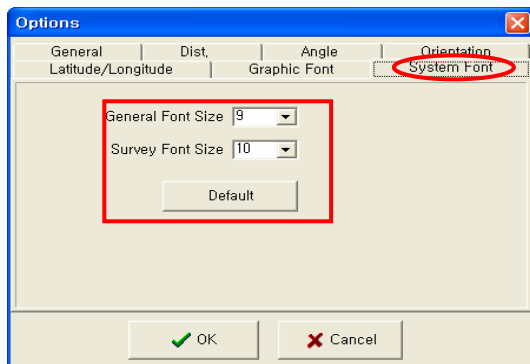


8. [System Font]

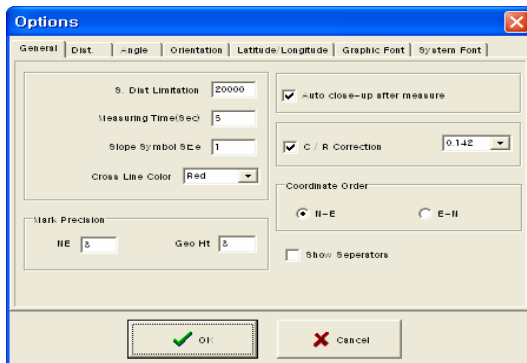
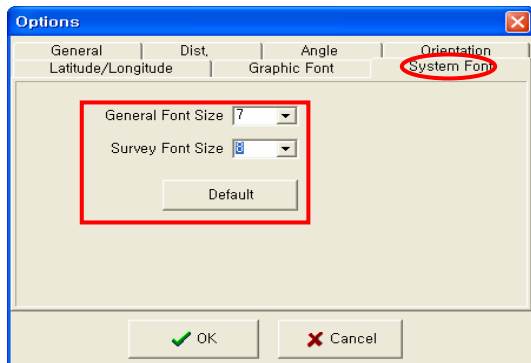


Note

System Font Size 9 / 10



System Font Size 7 / 8



3.4 Port Setup

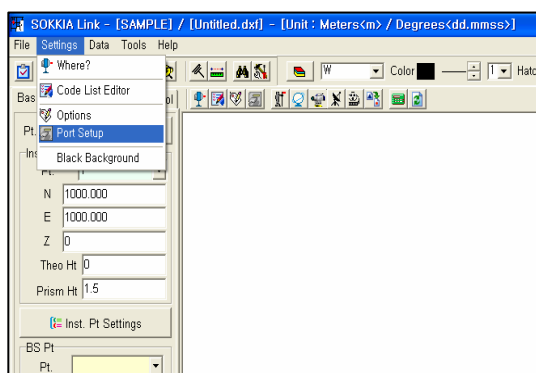


Select **Port** and **BaudRate**

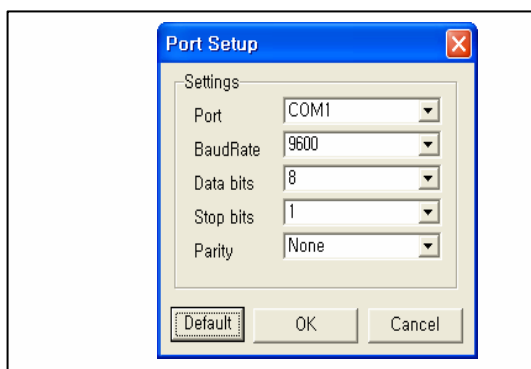


Run

1. Click **[Port Setup]**.



2. Select **Port** and **BaudRate** setting.



Note

BaudRate must be the same as the instrument.

9600 BaudRate is recommended to prevent data loss during USB connection.

3.5 Set background color

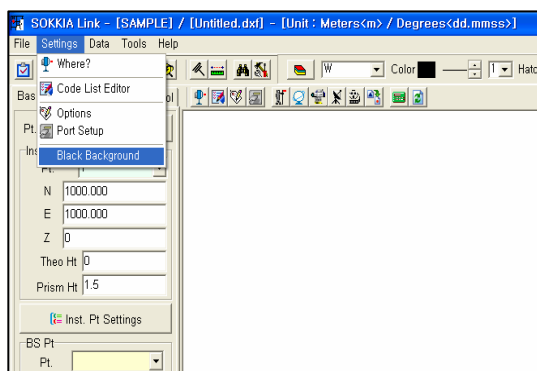


Select between a white or black background color.

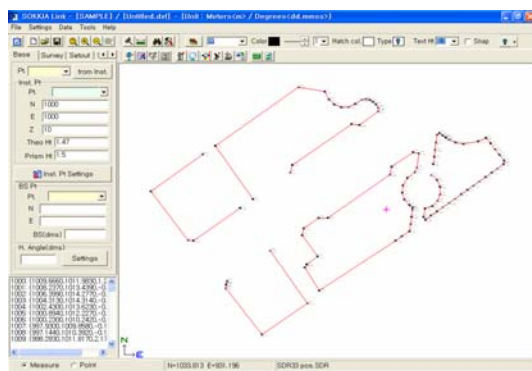


Run

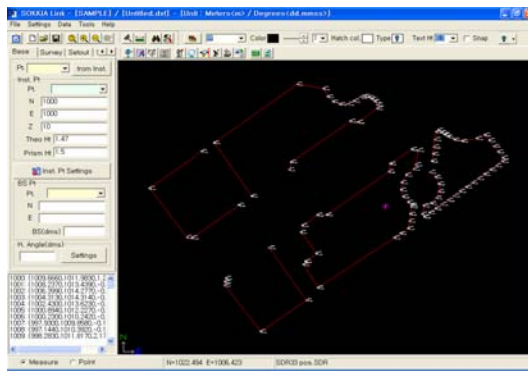
1. Click **[Black Background]**.



White background



Black background



4. Data

This section presents the formulas and constants used by SOKKIA Link. In addition to this information, it is also important to understand the principles described in Applying SDR Search Rules, because these principles can affect the outcome of coordinate calculations.

Types of data

SOKKIA Link can manage two types of collected data: Total station, GPS/RTK and Digital LEVEL. The data is corrected in a variety of ways, depending on the original type of data and the calculations needed to reduce the data to coordinates.

Total Station Data

The total station data can be represented in several 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.

For **GPS/RTK data**, GOBS has the least importance and POS has the most importance.

- GOBS** The observation includes the azimuth, vertical angle and slope distance from the base antenna to the rover antenna.
- GRED** The observation is calculated as the horizontal distance and the vertical distance from the base to the rover.
- GPOS** The observation is reduced to the coordinates at the rover.
- POS** The observation is reduced to the rover's coordinates with the transformation determined from the most recent calibration applied, if available.

Understanding the search rules

When reducing a *field book* to a list of coordinates, SOKKIA Link uses the following rules.

Rule 1: Observations in POS view are treated as a POS record.

For search purposes, any GOBS, OBS, MC, GRED, RED or GPOS record in POS view is treated the same as a true POS record.

A POS view record is, most typically, an observation (GOBS/OBS) in position (POS) view. However, MC, RED, GROB and GPOS records can also be stored in POS view. These four types of POS view records (GOBS/OBS in POS view, MC in POS view, GRED/RED in POS view and GPOS in POS view) are equal in precedence to true POS (or STN) records in the coordinate search rules.

Rule 2: SOKKIA Link uses POS, GSTN, STN, GPOS and POS view records before using GOBS/OBS records even if the GOBS/OBS record is more recent.

SOKKIA Link will look for any POS records, GPOS, GSTN or STN records, or POS view records, starting at the end of the field book (most recent records), and going backward in time. The first POS, GSTN, GPOS or POS view record found per point ID is used to determine the coordinates of that associated point.

If SOKKIA Link finds a POS, GSTN or STN record, the coordinates are immediately available from that record.

If SOKKIA Link finds a record in POS view, it will reduce that record to coordinates.

Rule 3: If there are no applicable POS, GSTN, STN or POS view records, SOKKIA Link will use the most recent GOBS, OBS, GPOS, MC, GRED or RED record. The record's view is no longer significant.

SOKKIA Link will look for any GOBS, OBS, GPOS, MC, GRED or RED records, starting at the end of the current job and going backwards in chronological order. If SOKKIA Link finds an GOBS, OBS, MC, GRED or RED record in its search with an associated point ID that has not yet been determined, it will reduce it to coordinates (see Reviewing Record Types).

Rule 4: If no such record can be found, the search fails.

If SOKKIA Link cannot find any POS, GSTN, GPOS, STN, POS view, OBS, GPOS, MC, GRED or RED records for a point, it simply does not appear in the **reduced coordinate** results.

Rule 5: Coordinate searching is iterative.

Finding the coordinates of the point may necessitate finding the coordinates of several other points. This process will continue until a fixed position for some point (a POS, GPOS, GSTN or STN record, not a POS view record) is found.

4.1 Total Station



SOKKIA Link manages survey data. SOKKIA Link contends with data from Total Station surveys. The raw data gathered on a variety of devices 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 or from a data collector such as the SDR.

Field Book

Field books organize data. Multiple **field books** can be used to separate data, allowing you to apply specific reduction parameters to individual survey jobs and to output the data contained in **field books** separately - or together.

Reduced Coordinates

The results of the reduction process are presented in the **Reduced Coordinates** and can be immediately exported to a variety of formats. The **Reduced Coordinates**, and subsequent output, can be made to reflect the current, all or a specific combination of field books. In this view, you control the results and subsequent output by excluding individual points. Displaying the coordinates in an organized list, the **Reduced Coordinates** makes managing data for export easy.

SOKKIA Link performs several corrections when it reduces raw data to coordinate data. These reduction calculations can be grouped into three general categories:

Instrument, environmental and job-related corrections - Instruments corrections include equipment configuration, Face1/Face2 observations, collimation and prism constant. Environmental corrections include pressure and temperature corrections. Job-related corrections include orientation, instrument height reduction and target height reduction.

Geometric reductions - Geometric corrections include such things as curvature and refraction, slope reduction, sea level and projection.

Coordinate calculations - Coordinate calculations involve adding an observation vector to the coordinates of its respective station coordinates to determine the target point coordinates.

SOKKIA Link always applies corrections in a specific sequence as it converts a raw observation to coordinates. The instrument, environmental and job-related corrections are applied first, followed by the geometric corrections. This sequence is shown in the following figure.

OBS SOKKIA Link assumes the prism constant and atmospheric parts per million (PPM) corrections have been applied to the slope distance before it is displayed in the field book. This slope distance can be from the instrument or it could be manually input from the keyboard. Adjustments to the slope distance of OBS records for prism constant and PPM can be applied by using **Field Book** Settings.

OBS -> MC SOKKIA Link applies six different corrections when it converts an OBS record to a measured and corrected (MC) record. The order is face one/face two, instrument and target height, collimation, orientation, Earth curvature and refraction. With manually entered OBS MC values, SOKKIA Link will assume these corrections have been applied.

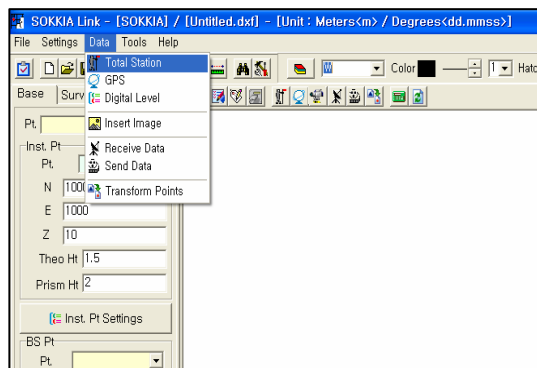
OBS -> MC RED SOKKIA Link corrects for sea level, projection and scale when converting an MC record to a reduced (RED) record.

RED -> POS The final step in arriving at coordinates (POS record) is a mathematical coordinate calculation.

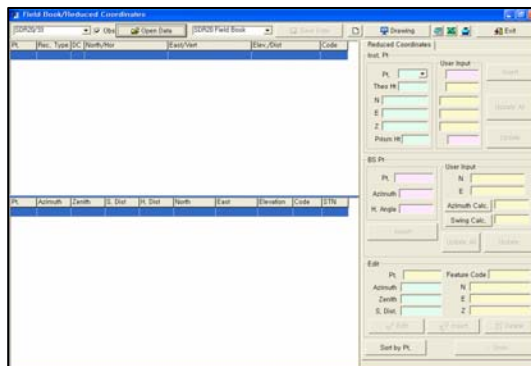
User's Guide



1. Click **[Total Station]**.

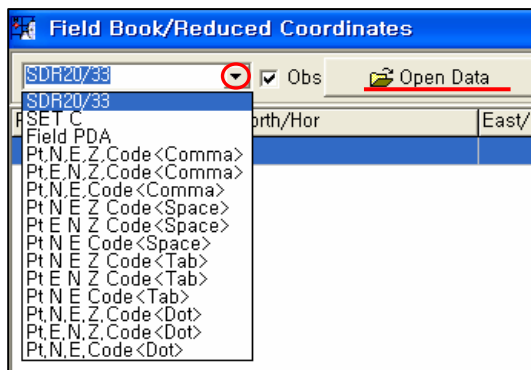
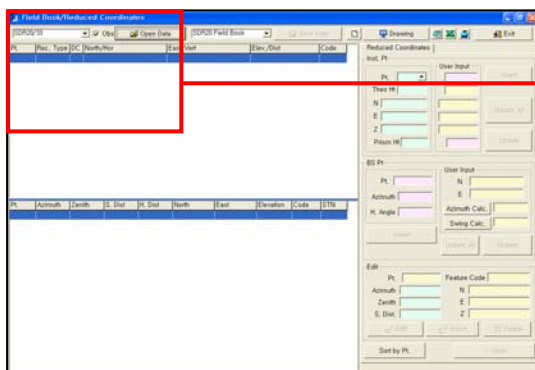


2. The Total Station screen is displayed.



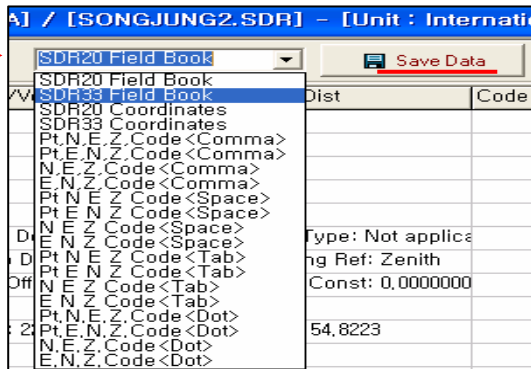
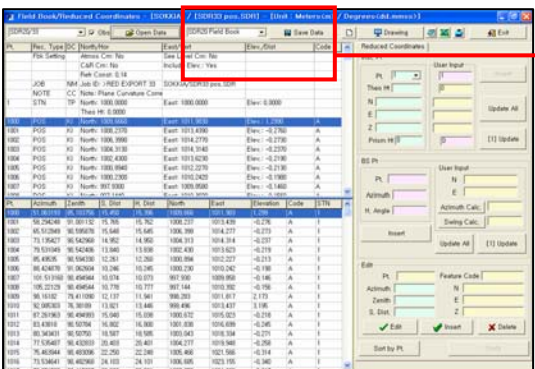
2-1. **[Open Data]**

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



2-2. **[Save Data]**




Select **Data type**, click **[Save Data]**.



Field Book/Reduced Coordinates - [

Total Station

Mark Type

Mark   

Size | 0.5 | Color | Black |

Mark Precision and Color

NE | 3 | Geo Ht | 3 | Black |

Text Ht | 0.3 |

Mark Text

☒ Geo Ht ☒ Pt. (No.)

☒ Code ☐ NE

Survey line


☒ Draw instrument point

☐ Not Draw


☐ Draw [Open]


☒ Draw [Close]

☐ By Code List

Sample, 1st 

☒ Link continuous codes

 OK

 Cancel

0892
B12
2197.472
2228.968
150.83221

0890
B11
2195.016
2232.144
150.42076

3. **Test 1** (100%)

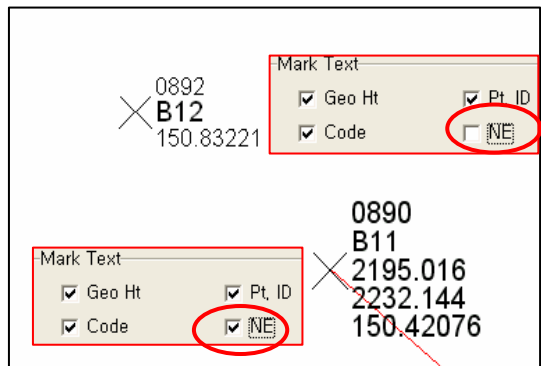
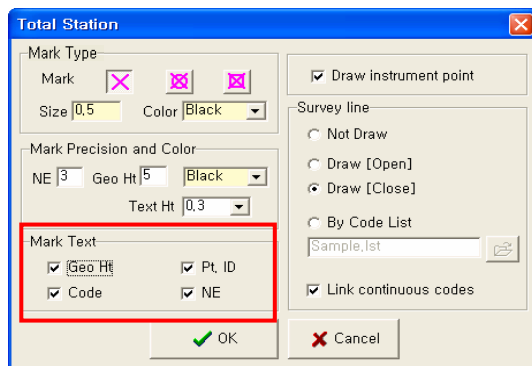
0892
B12
2197.472
2228.968
150.83221

NE 3

Geo Ht 5

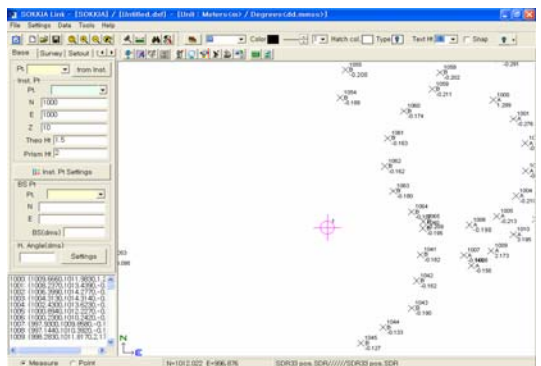
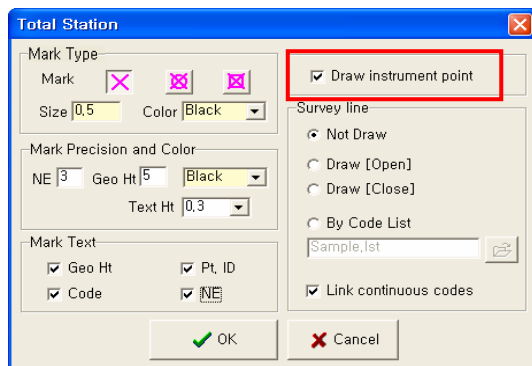
0890
B11
2195.016
2232.144
150.42076

2-3-3. Mark Text

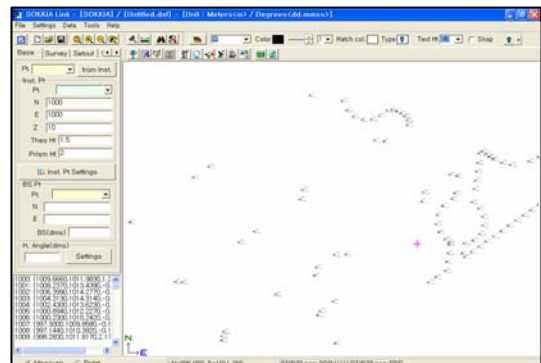
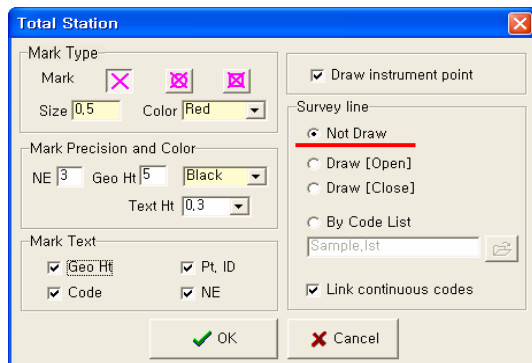


2-3-4. Draw instrument point.

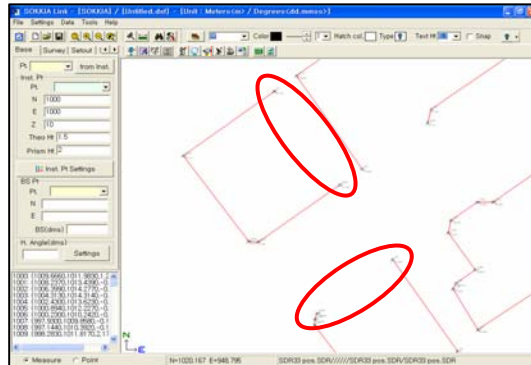
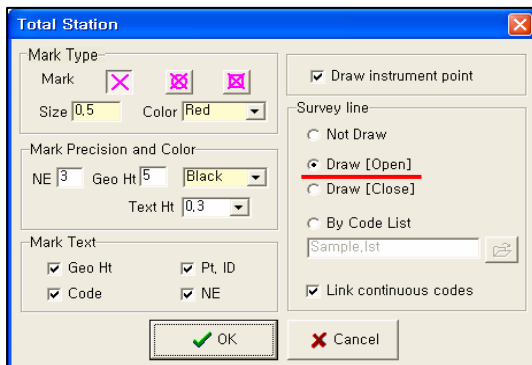
If checked, the instrument point is drawing.



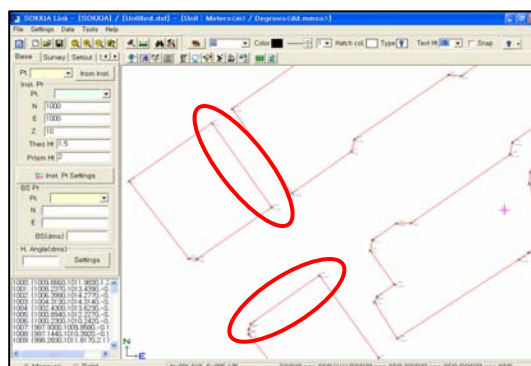
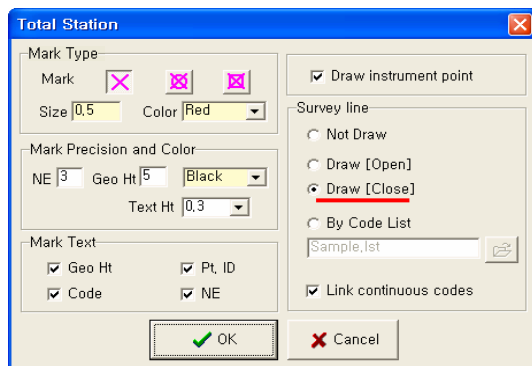
2-3-5. Survey Line [Not Draw]



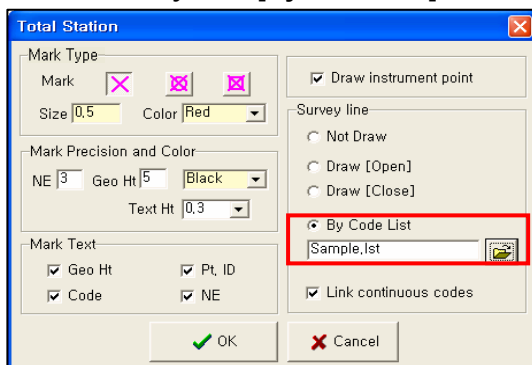
2-3-6. Survey Line [Draw(Open)]



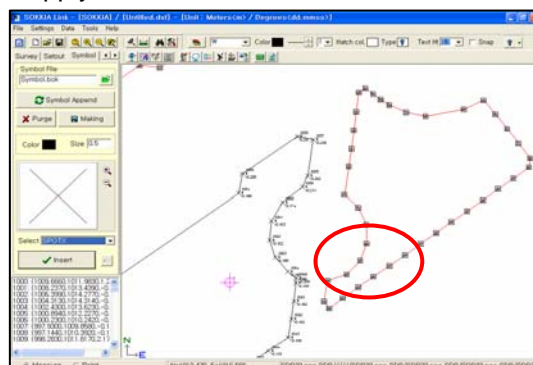
2-3-7. Survey Line [Draw(Close)]



2-3-8. Survey Line [By Code List]



Apply Code List.

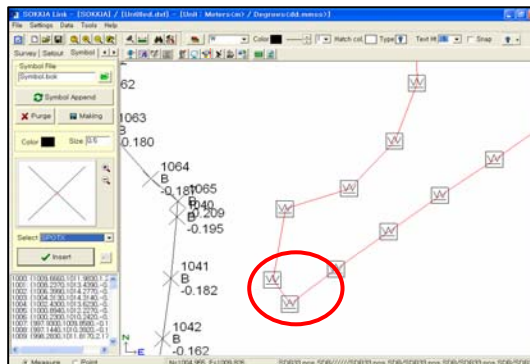




Note

Code List (sewer manhole setting)

Code	Symbol Name	Sym. Color	Scale	Geo Ht	Line	Line Color	Closed	Linetype
DMTB	SPOTX	Black	0.5	V	V	Black	N	CONTINUOUS
HCIG	SPOTX	Black	0.5	V	V	Black	N	CONTINUOUS
N	SPOTX	Black	0.5	V	V	Cyan	V	CONTINUOUS
B	SPOTX	Black	0.5	V	V	Black	V	CONTINUOUS
INTO	SPOTX	Black	0.5	V	V	Black	N	CONTINUOUS
NBO	SPOTX	Black	0.5	V	V	Black	N	CONTINUOUS
J	SPOTX	Black	0.5	V	V	Green	V	CONTINUOUS
LHH	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
KSW	SPOTX	Black	0.5	V	V	Black	N	CONTINUOUS
CP	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
SPLH	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
OM	SPOTX	Black	0.5	V	N	Red	N	CONTINUOUS
TBS	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
EPS	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
GAS	SPOTX	Black	0.5	V	N	Red	N	CONTINUOUS
BOL	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
OIL	SPOTX	Magenta	0.5	N	N	Black	N	CONTINUOUS
VBBS	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
JSB	SPOTX	Black	0.5	V	N	Blue	N	DOT
PSB	SPOTX	Black	0.5	V	V	Green	V	CONTINUOUS
BAL	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS
B	ACTB3	Black	0.5	V	V	Red	V	CONTINUOUS
A	AND33	Black	0.2	V	V	Red	V	CONTINUOUS
TEM	SPOTX	Black	0.5	V	N	Black	N	CONTINUOUS



2-3-9. [Link continuous codes] option (Selected)

Total Station

Mark Type
 Mark ☒ ☒ ☒
 Size 0.5 Color Red

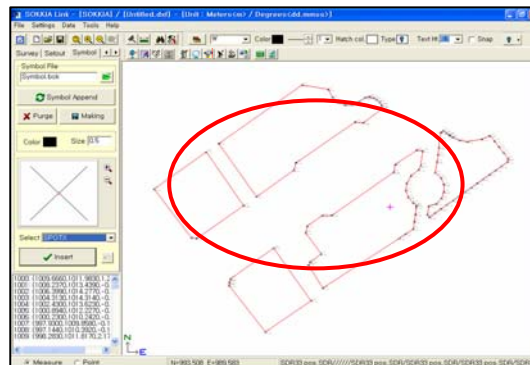
Mark Precision and Color
 NE 3 Geo Ht 5 Black
 Text Ht 0.3

Mark Text
☒ Geo Ht ☒ Pt. ID
☒ Code ☐ NE

☒ Draw instrument point

Survey line
☐ Not Draw
☐ Draw [Open]
☒ Draw [Close]
☐ By Code List
☒ Link continuous codes

OK Cancel



2-3-10. [Link continuous codes] option (Not selected)

Total Station

Mark Type
 Mark ☒ ☒ ☒
 Size 0.5 Color Red

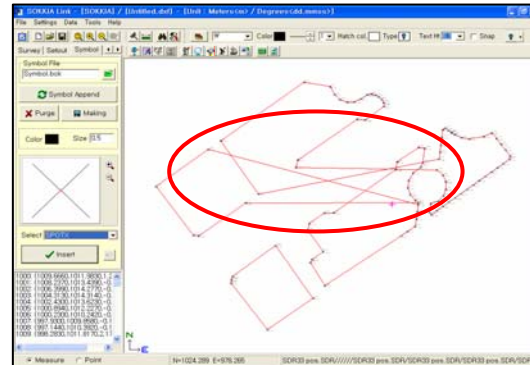
Mark Precision and Color
 NE 3 Geo Ht 5 Black
 Text Ht 0.3

Mark Text
☒ Geo Ht ☒ Pt. ID
☒ Code ☐ NE

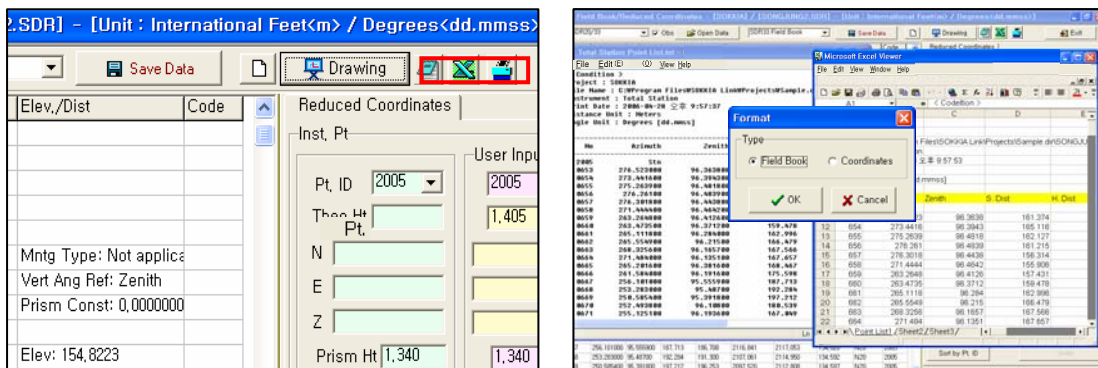
☒ Draw instrument point

Survey line
☐ Not Draw
☐ Draw [Open]
☒ Draw [Close]
☐ By Code List
☐ Link continuous codes

OK Cancel



2-4. Export data to various file formats (Notepad, Excel).



How to select **Field Book** or **Reduced Coordinates**.

Right click on the Notepad, Excel or Print screen icon to open the **Format** selection dialog.

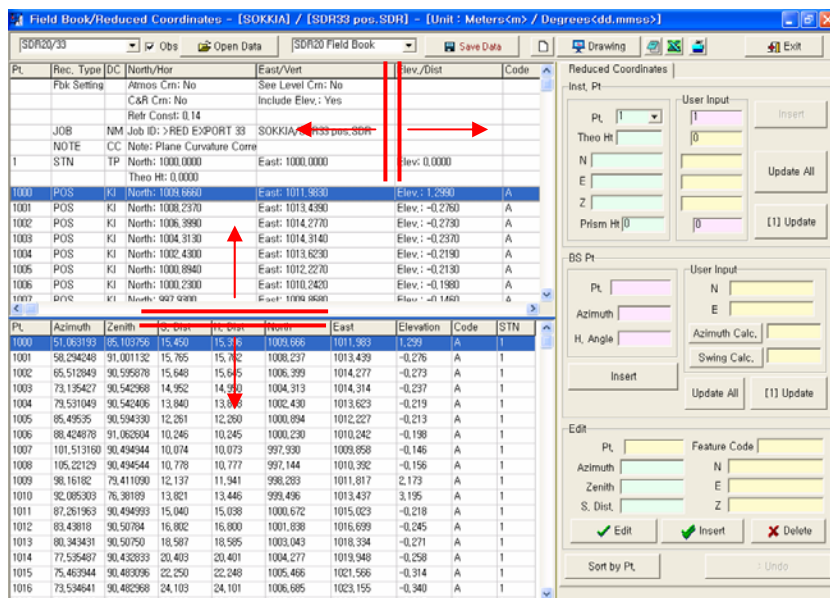


Note

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 **Coordinate** screens can be modified for easier viewing.



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

3. [Insert] and [Update] Instrument Point.

3-1. Enter instrument data in **User Input** and click **[Insert]**.

Reduced Coordinates

Inst. Pt

Pt.

Theo Ht

N

E

Z

Prism Ht

User Input

Insert

Update All

[-1] Update

Reduced Coordinates

Inst. Pt

Pt.

Theo Ht

N

E

Z

Prism Ht

User Input

Insert

Update All

[-1] Update

Before inserting instrument point

(Field book is created)

Pt.	Rec. Type	DC	North/Hor	East/Vert	Elev./Dist	Code			
NOTE CC Note: Plane Curvature Corr									
1000	POS	KJ	North: 1.005,660	East: 1.011,980	Elev.: 1.299	A			
1001	POS	KJ	North: 1.008,237	East: 1.013,439	Elev.: -0.270	A			
1002	POS	KJ	North: 1.006,399	East: 1.014,270	Elev.: -0.270	A			
1003	POS	KJ	North: 1.004,313	East: 1.014,314	Elev.: -0.270	A			
1004	POS	KJ	North: 1.002,430	East: 1.013,623	Elev.: -0.219	A			
1005	POS	KJ	North: 1.000,894	East: 1.012,227	Elev.: -0.219	A			
1006	POS	KJ	North: 1.000,230	East: 1.010,242	Elev.: -0.198	A			
Pt.	Azimuth	Zenith	S. Dist	H. Dist	North	East	Elevation	Code	STN
1000	0	0	0	0	1.009,666	1.011,983	1.299	A	-1
1001	45.085074	90.003982	1.429,546	1.429,546	1.008,237	1.013,439	-0.276	A	-1
1002	45.132416	90.003941	1.428,845	1.428,845	1.006,399	1.014,277	-0.273	A	-1
1003	45.17190	90.003425	1.427,402	1.427,402	1.004,313	1.014,314	-0.237	A	-1
1004	45.19516	90.003169	1.425,587	1.425,587	1.002,430	1.013,623	-0.219	A	-1
1005	45.192117	90.003086	1.423,514	1.423,514	1.000,894	1.012,227	-0.213	A	-1
1006	45.17717	90.002873	1.421,636	1.421,636	1.000,230	1.010,242	-0.198	A	-1
1007	45.202538	90.002121	1.419,746	1.419,746	997,930	1.009,858	-0.146	A	-1
1008	45.224115	90.002267	1.419,573	1.419,573	997,144	1.010,392	-0.156	A	-1
1009	45.23876	89.544467	1.421,389	1.421,388	998,283	1.011,817	2.173	A	-1
1010	45.234851	89.521701	1.423,396	1.423,393	999,496	1.013,437	3.195	A	-1
1011	45.242850	90.003155	1.425,348	1.425,348	1.000,672	1.015,023	-0.218	A	-1
1012	45.251855	90.003540	1.427,360	1.427,360	1.001,838	1.016,699	-0.245	A	-1
1013	45.2629	90.003911	1.429,370	1.429,370	1.003,043	1.018,334	-0.271	A	-1

After inserting instrument point

Pt.	Rec. Type	DC	North/Hor	East/Vert	Elev./Dist	Code			
	NOTE	CC	Note: Plane Curvature Corr						
1	STN	TP	North: 0.0000 Theo Ht: 0.0000	East: 0.0000	Elev.: 0.0000				
1001	POS	KJ	North: 1,008,2390	East: 1,013,4390	Elev.: -0.2760	A			
1002	POS	KJ	North: 1,006,3990	East: 1,014,2770	Elev.: -0.2730	A			
1003	POS	KJ	North: 1,004,3130	East: 1,014,3140	Elev.: -0.2730	A			
1004	POS	KJ	North: 1,002,4300	East: 1,013,6230	Elev.: -0.2190	A			
PL	Azimuth	Zenith	S. Dist	H. Dist	North	East	Elevation	Code	STN
1000	0	0	0	0	1,009,666	1,011,983	1,299	A	1
1001	45.085074	90.003982	1,429,546	1,429,546	1,008,237	1,013,439	-0.276	A	1
1002	45.132416	90.003941	1,428,845	1,428,845	1,006,399	1,014,277	-0.273	A	1
1003	45.171900	90.003425	1,427,402	1,427,402	1,004,313	1,014,314	-0.237	A	1
1004	45.19516	90.003169	1,425,587	1,425,587	1,002,430	1,013,623	-0.219	A	1
1005	45.192117	90.003086	1,423,514	1,423,514	1,000,894	1,012,227	-0.213	A	1
1006	45.17717	90.002873	1,421,636	1,421,636	1,000,230	1,010,242	-0.198	A	1
1007	45.202538	90.002121	1,419,746	1,419,746	997,930	1,009,858	-0.146	A	1
1008	45.224115	90.002267	1,419,573	1,419,573	997,144	1,010,392	-0.156	A	1
1009	45.23876	89.544467	1,421,389	1,421,388	998,283	1,011,817	2.173	A	1
1010	45.234851	89.521701	1,423,396	1,423,393	999,496	1,013,437	3.195	A	1
1011	45.242850	90.003155	1,425,348	1,425,348	1,000,672	1,015,023	-0.218	A	1
1012	45.251855	90.003540	1,427,360	1,427,360	1,001,838	1,016,699	-0.245	A	1
1013	45.2629	90.003911	1,429,370	1,429,370	1,003,043	1,018,334	-0.271	A	1

3-2. [Update All]



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

(*Theo Ht* and *Prism Ht* are not changed)

Inst. Pt

Pt, 1

Theo Ht 0

N 1000,000

E 1000,000

Z 1,000

Prism Ht 0

User Input

1

1000,000

1000,000

1,000

Insert

Update All

[1] Update

1000	51.063193	94.492244	15.450	15.396	1009.666	1011.983	-0.299	A ST
1001	58.294248	94.374119	15.814	15.762	1008.237	1013.439	-0.276	A
1002	65.512849	94.39596	15.697	15.645	1006.399	1014.277	-0.273	A
1003	73.135427	94.434845	15.001	14.950	1004.313	1014.314	-0.237	A
1004	79.531049	95.02321	13.892	13.838	1002.430	1013.623	-0.219	A
1005	85.49535	95.39216	12.320	12.260	1000.894	1012.227	-0.213	A
1006	88.424878	96.401152	10.314	10.245	1000.230	1010.242	-0.198	A
1007	101.513160	96.292620	10.138	10.073	997.930	1009.858	-0.146	A
1008	105.22129	96.072019	10.839	10.777	997.144	1010.392	-0.156	A
1009	98.16182	95.363706	11.999	11.941	998.283	1011.817	-0.173	A
1010	92.085303	95.044294	13.499	13.446	999.496	1013.437	-0.195	A
1011	87.261963	94.374997	15.087	15.038	1000.672	1015.023	-0.218	A
1012	83.43818	94.141794	16.846	16.800	1001.836	1016.699	-0.245	A
1013	80.343431	93.544435	18.628	18.595	1003.043	1018.334	-0.271	A
1014	77.535487	93.314273	20.440	20.401	1004.277	1019.948	-0.258	A
1015	75.463944	93.224822	22.287	22.248	1005.466	1021.566	-0.314	A
1016	73.534641	93.105654	24.138	24.101	1006.688	1023.155	-0.340	A

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

2000,000

2000,000

2,000

Insert

Update All

[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	10.314	10.245	2000.230	2010.242	0.802	A
1007	101.513160	96.292620	10.138	10.073	1997.930	2009.858	0.854	A
1008	105.22129	96.072019	10.839	10.777	1997.144	2010.392	0.844	A
1009	98.16182	95.363706	11.999	11.941	1998.283	2011.817	0.827	A
1010	92.085303	95.044294	13.499	13.446	1999.496	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	2001.836	2016.699	0.755	A
1013	80.343431	93.544435	18.628	18.595	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

3-3. [Update]



Instrument and measurement points are shifted according to user input.

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

Inst. Pt

Pt, 1027

Theo Ht 10001

N 4320

E 2257

Z 4,633

Prism Ht 1058

User Input

1027

0

432105,830

225779,263

4,633

0

Insert

Update All

[1027] Update

4. BS [Update All]



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.

4-1. BS [Update All]

User Input N, E, click [Azimuth Calc].

BS Pt		User Input	
Pt.	1001	N	
Azimuth	265,6954	E	
H, Angle	284,2000	Azimuth Calc.	
Insert		Swing Calc.	
		Update All	[1027] Update

BS Pt		User Input	
Pt.	1001	N	1000
Azimuth	265,6954	E	1200
H, Angle	284,2000	Azimuth Calc.	207,5092
Insert		Swing Calc.	
		Update All	[1027] Update

Click **[Swing Calc.]**.

Click **[Update All]**.

BS Pt		User Input	
Pt.	1001	N	1000
Azimuth	265,6954	E	1200
H, Angle	284,2000	Azimuth Calc.	207,5092
Insert		Swing Calc.	-58,1862
		Update All	[1027] Update

BS Pt		User Input	
Pt.	1001	N	1000
Azimuth	265,6954	E	1200
H, Angle	284,2000	Azimuth Calc.	207,5092
Insert		Swing Calc.	-58,1862
		Update All	[1027] Update

4-2. [Update]



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

5. [Edit] / [Insert] / [Delete]

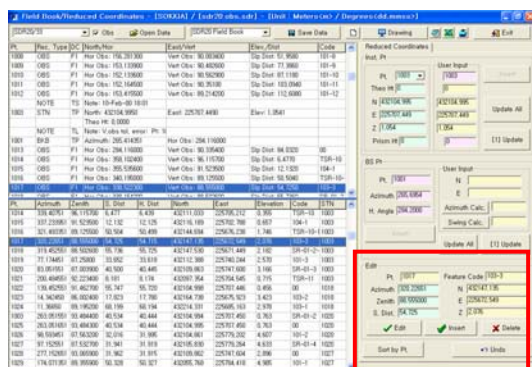


It is possible to modify only the raw point data.

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



Run



Pt

1017

Feature Code

103-3

Azimuth

320,22741

N

432147,135

Zenith

88,555000

E

225672,549

S. Dist

54,725

Z

2,076

✓ Edit

✓ Insert

✗ Delete

Sort by Pt

Undo

5-1. Before editing data.

Pt

1023

Feature Code

103-2

Azimuth

14,342628

N

432164,738

Zenith

86,002430

E

225675,923

S. Dist

17,823

Z

3,423

✓ Edit

✓ Insert

✗ Delete

Sort by Pt

Undo

1018	STN	TP	North: 432147,5300	East: 225671,4490	Elev: 2,1819			
			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: 432164,7380	East: 225675,9230	Elev.: 3,4231			
1024	POS	TP	North: 432214,3310	East: 225685,1630	Elev.: 2,9781			
	NOTE	AJ	Note: Vert Recip Calc Refi					
Pt	Azimuth	Zenith	S. Dist	H. Dist	North	East	Elevation	Code
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	14,342628	86,002430	17,823	17,780	432164,738	225675,923	3,423	103-2
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
1026	98,593284	87,563198	32,016	31,995	432104,961	225779,202	4,607	101-2
1027	97,152537	87,532684	31,940	31,919	432105,830	225779,263	4,633	SR-01-4
1028	277,152864	93,065900	31,962	31,915	432109,062	225747,604	2,896	00
1029	174,071095	89,355900	50,328	50,327	432055,768	225784,419	4,985	101-1

5-2. After editing data.

Pt

1023

Feature Code

SOKKIA

Azimuth

200,432876

N

100000,000

Zenith

89,595952

E

100000,000

S. Dist

355127,153

Z

3,000

✓ Edit

✓ Insert

✗ Delete

Sort by Pt

Undo

			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 Refi					
1020	STN	TP	North: 432109.0620	East: 225747.6000		Elev: 3.4576		
			Theo Ht: 0.0000					
	NOTE	TL	Note: V:obs tol, error: Pt: 10					
Pt	Azimuth	Zenith	S. Dist	H. Dist	North	East	Elevation	Code
1020	83.051851	87.003900	40.500	40.445	432109.062	225747.600	3.166	SR-01-
1021	200.485794	92.223335	8.182	8.175	43207.354	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

6. Sort Points

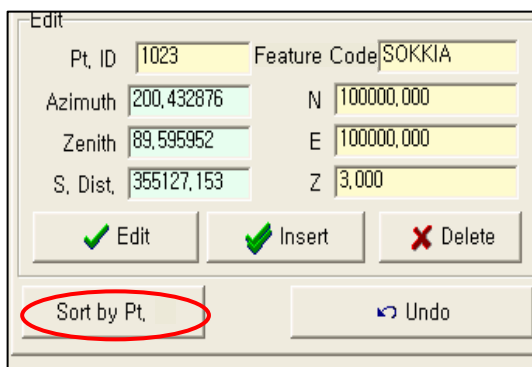
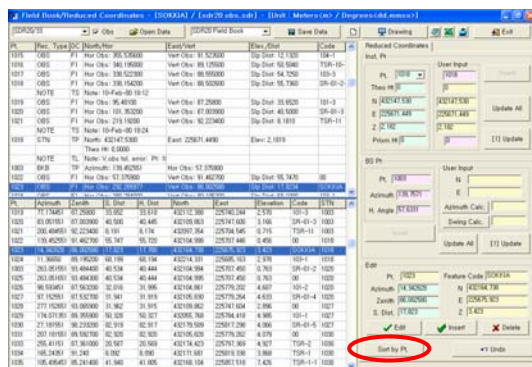


Points are sorted by Pt field. This function sorts only the **Reduced Coordinate** View.



Run

Click [Sort by Pt.].



Note

Columns can be edited according to color.

Yellow : Can be edited.

Blue : Unable to edit.

Pink : Can be edited.

4.2 GPS



SOKKIA Link manages survey data. SOKKIA Link contends with data from GPS/RTK surveys. The raw data gathered on a variety of devices 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 or from a data collector such as the SDR.

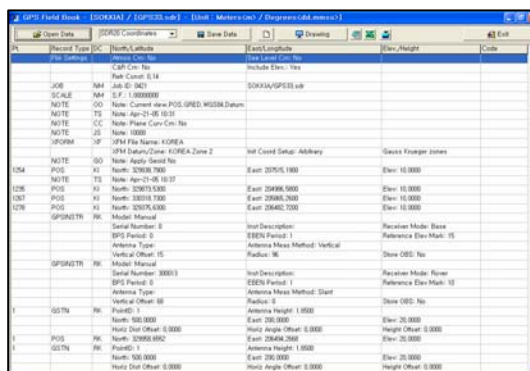
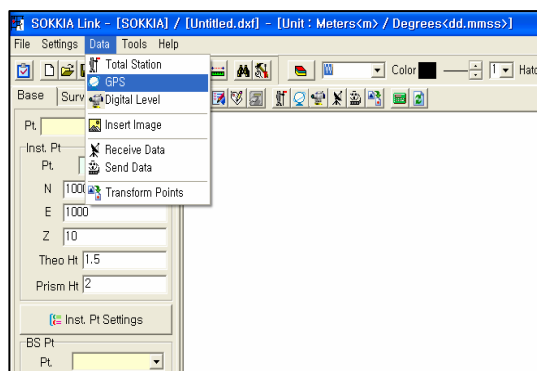
Reduced Coordinates

The results of the reduction process are presented in the **Reduced Coordinates** and can be immediately exported to a variety of formats. The **Reduced Coordinates**, and subsequent output, can be made to reflect the current, all or a specific combination of **field books**. In this view, you control the results and subsequent output by excluding individual points. Displaying the coordinates in an organized list, the **Reduced Coordinates** makes managing data for export easy.



Run

1. Click **[GPS]**.



4.3 Digital Level



SOKKIA Link manages survey data. SOKKIA Link contends with data from LEVEL surveys. The raw data gathered on a variety of devices 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 or from a data collector such as the SDR.

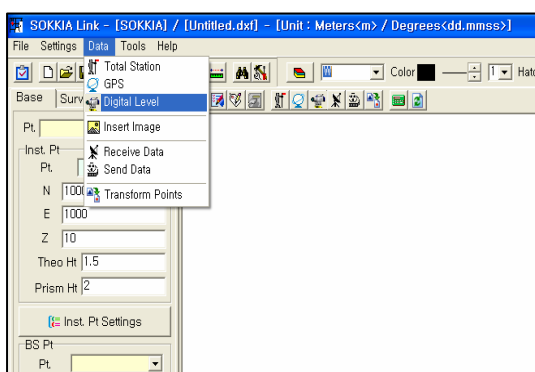
Reduced Coordinates

The results of the reduction process are presented in the **Reduced Coordinates** and can be immediately exported to a variety of formats. The **Reduced Coordinates**, and subsequent output, can be made to reflect the current, all or a specific combination of **field books**. In this view, you control the results and subsequent output by excluding individual points. Displaying the coordinates in an organized list, the **Reduced Coordinates** makes managing data for export easy.

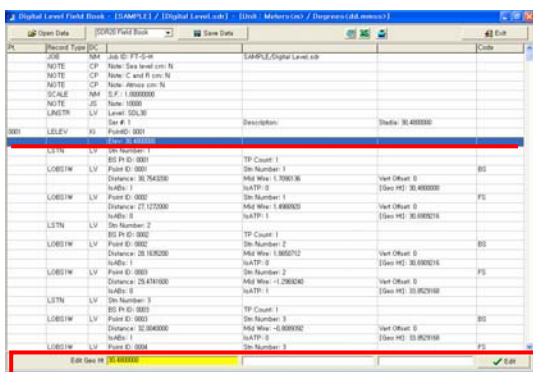


Run

1. Click **[Digital Level]**.



Edit.



Note

For more information on specific functions, refer to page 49, **[Total Station]**.



Note

Edit Level Elev.

Select [Elev].

LELEV	KI	PointID: 0001		
		ISlev: 0.400000		
LSTN	LV	Stn Number: 1	TP Count: 1	
		BS Pt ID: 0001	Stn Number: 1	
LOBSTW	LV	Distance: 30.754300	Mid Wire: 1.7090136	
		IsAtP: 0	IsATP: 0	
LOBSTW	LV	Point ID: 0002	Stn Number: 1	
		Distance: 27.127000	Mid Wire: 1.699000	
		IsAtB: 0	IsATP: 1	
LSTN	LV	Stn Number: 2	TP Count: 1	
		BS Pt ID: 0002	Stn Number: 2	
LOBSTW	LV	Distance: 28.169200	Mid Wire: 1.860712	
		IsAtB: 1	IsATP: 0	
LOBSTW	LV	Point ID: 0003	Stn Number: 2	
		Distance: 25.474100	Mid Wire: -1.295040	
		IsAtB: 0	IsATP: 1	
LSTN	LV	Stn Number: 3	TP Count: 1	
		BS Pt ID: 0003	Stn Number: 3	
LOBSTW	LV	Distance: 32.004000	Mid Wire: -0.809992	
		IsAtB: 1	IsATP: 0	
LOBSTW	LV	Point ID: 0004	Stn Number: 3	
Edit Geo Ht: 30.400000				

Edit [Edit Geo Ht].

LELEV	KI	PointID: 0001	Description:	Stadia: 30.400000
		ISlev: 0.400000		
LSTN	LV	Stn Number: 1	TP Count: 1	
		BS Pt ID: 0001	Stn Number: 1	
LOBSTW	LV	Distance: 30.754300	Mid Wire: 1.7090136	BS
		IsAtP: 0	IsATP: 0	
LOBSTW	LV	Point ID: 0002	Stn Number: 1	FS
		Distance: 27.127000	Mid Wire: 1.699000	
		IsAtB: 0	IsATP: 1	
LSTN	LV	Stn Number: 2	TP Count: 1	
		BS Pt ID: 0002	Stn Number: 2	
LOBSTW	LV	Distance: 28.169200	Mid Wire: 1.860712	BS
		IsAtB: 1	IsATP: 0	
LOBSTW	LV	Point ID: 0003	Stn Number: 2	FS
		Distance: 25.474100	Mid Wire: -1.295040	
		IsAtB: 0	IsATP: 1	
LSTN	LV	Stn Number: 3	TP Count: 1	
		BS Pt ID: 0003	Stn Number: 3	
LOBSTW	LV	Distance: 32.004000	Mid Wire: -0.809992	BS
		IsAtB: 1	IsATP: 0	
LOBSTW	LV	Point ID: 0004	Stn Number: 3	FS
Edit Geo Ht: 30.400000				

Before editing data.

LELEV	KI	PointID: 0001	Description:	Stadia: 30.400000
		ISlev: 0.400000		
LSTN	LV	Stn Number: 1	TP Count: 1	
		BS Pt ID: 0001	Stn Number: 1	
LOBSTW	LV	Distance: 30.754300	Mid Wire: 1.7090136	BS
		IsAtP: 0	IsATP: 0	
LOBSTW	LV	Point ID: 0002	Stn Number: 1	FS
		Distance: 27.127000	Mid Wire: 1.699000	
		IsAtB: 0	IsATP: 1	
LSTN	LV	Stn Number: 2	TP Count: 1	
		BS Pt ID: 0002	Stn Number: 2	
LOBSTW	LV	Distance: 28.169200	Mid Wire: 1.860712	BS
		IsAtB: 1	IsATP: 0	
LOBSTW	LV	Point ID: 0003	Stn Number: 2	FS
		Distance: 25.474100	Mid Wire: -1.295040	
		IsAtB: 0	IsATP: 1	
LSTN	LV	Stn Number: 3	TP Count: 1	
		BS Pt ID: 0003	Stn Number: 3	
LOBSTW	LV	Distance: 32.004000	Mid Wire: -0.809992	BS
		IsAtB: 1	IsATP: 0	
LOBSTW	LV	Point ID: 0004	Stn Number: 3	FS
Edit Geo Ht: 30.400000				

4.4 Inserting an Image

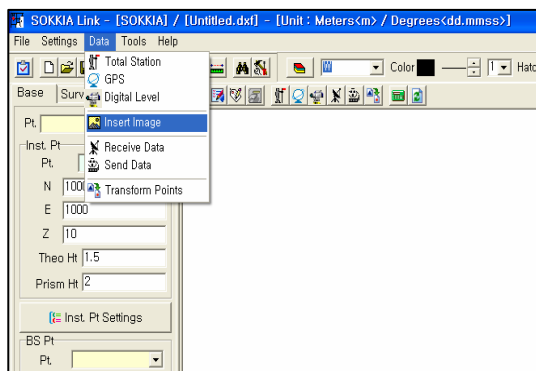


Insert an image file (Cadastral map or GIS file).



Run

1. Click **[Insert Image]**.



Select the image file that you want to insert.

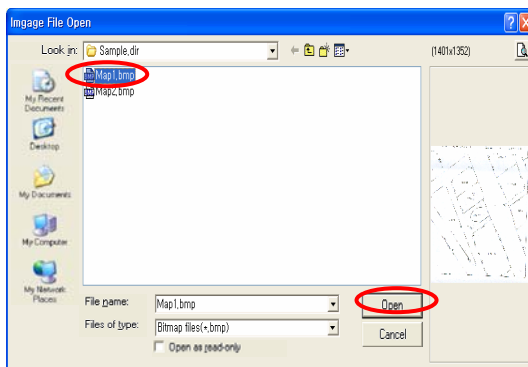
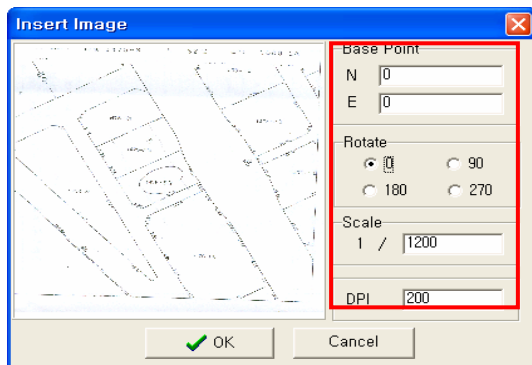
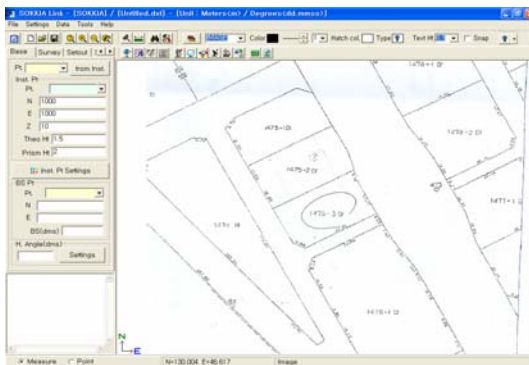


Image Option



Click **[OK]**.



Base Point : Input Base point "N ,E".

Rotate : Select Rotate "0 , 90 , 180 ,270".

Scale : Input scale of image.

DPI : Enter the same DPI as the scanner.



Note

Only BMP files can be inserted.

4.5 Receive Data (SOKKIA device to PC)

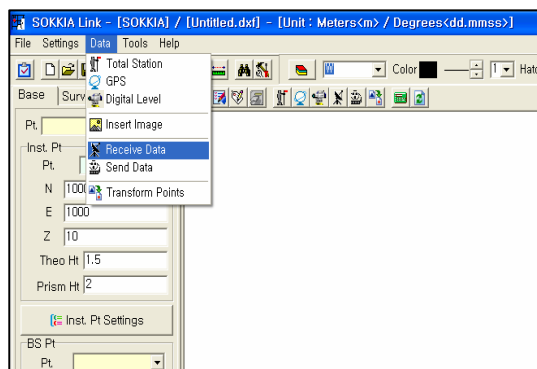


SOKKIA Link communicates with the entire line of SOKKIA devices.



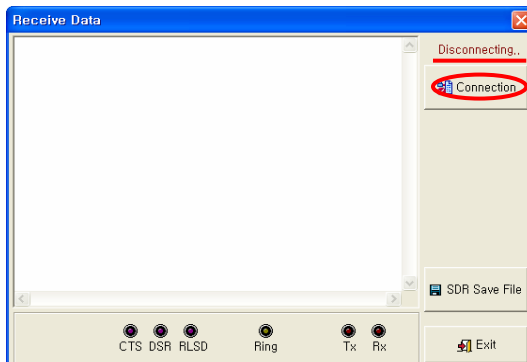
Run

1. Click **[Receive Data]**.

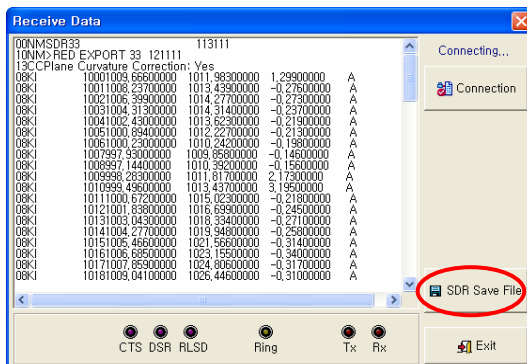
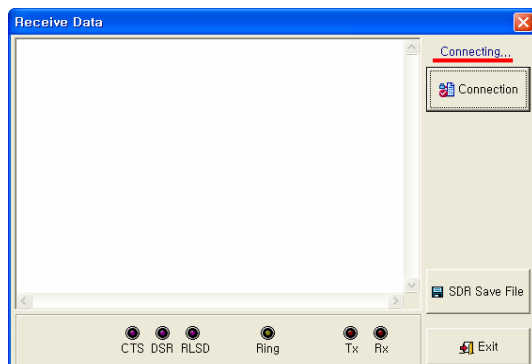


1-2. Select **[Comms out]** on the Instrument.

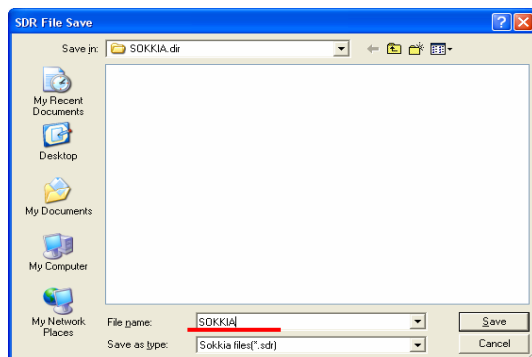
1-1. Click **[Connection]**.



1-3. After confirming data click **[SDR Save File]**



1-4. Enter the file name



Note

BaudRate must be the same as the instrument.

The POWERSET Series, Series220 and Series030R can only operate at 1200.

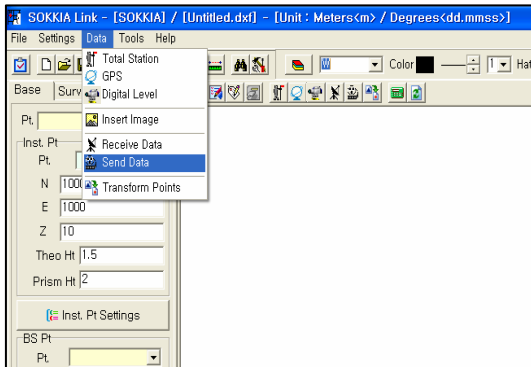
4.6 Send Data (PC to SOKKIA device)



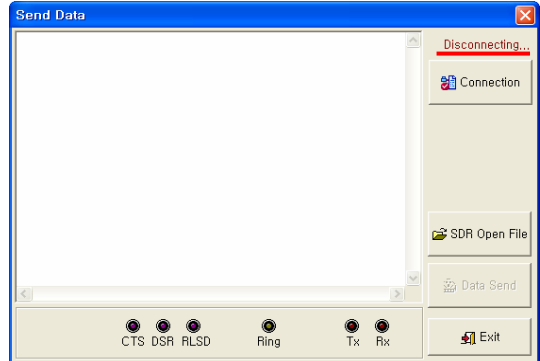
SOKKIA Link can **[Send Data]** files to a **GPS** receiver or **Total station**.

Run

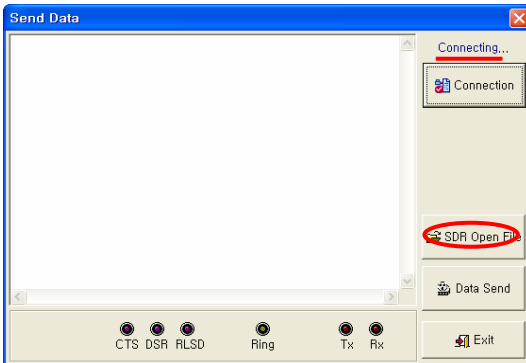
1. Click **[Send Data]**.



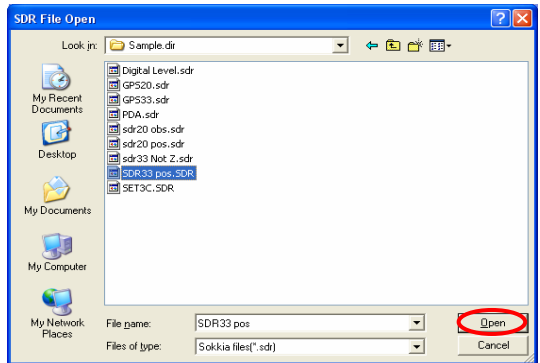
1-1. Click **[Connection]**.



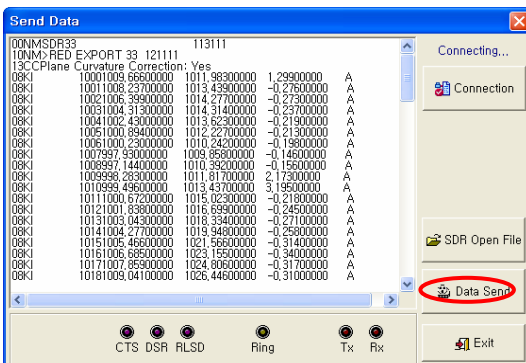
1-2. Click **[SDR Open File]**.



1-3. Click **[Open]**.



1-4. Click **[Data Send]**.



Note

BaudRate must be set to the same as the instrument before sending.

The POWERSET Series, Series220 and Series030R can only operate at 1200

4.7 Transform 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

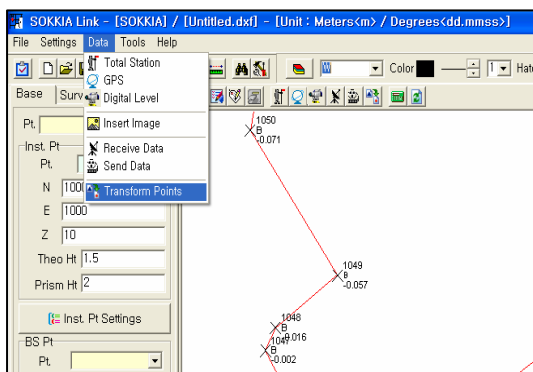
Steps to transform a drawing

1. Select **[Transform Points]** from the **[Data]** menu.
2. Select **[Pt.]** or Enter N, E, Z of **[Pre]** to set the coordinates before transformation.
3. Enter N, E, Z of **[Post]** to set the transformation coordinates.
4. Press **[Calc.]**.
5. Select radio button of **[Diff. value]** that is the smallest.
6. Press **[OK]**.



Run

1. Click **[Transform Points]**.



Transform Points

Pre[1] Pt. **Step 2.** N E Z

Pre[2] Pt. N E Z

Pre[3] Pt. N E Z

Post[1] N **Step 3.** E

Post[2] N E

Post[3] N E

Step 4. **Calc.**

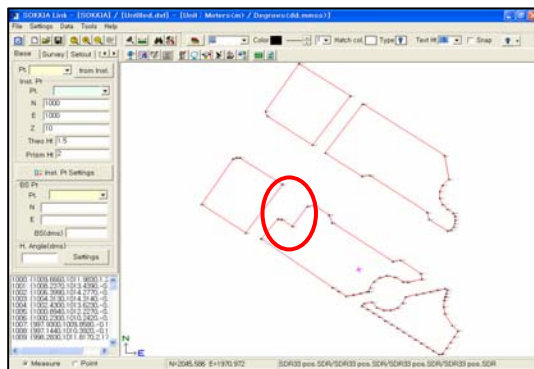
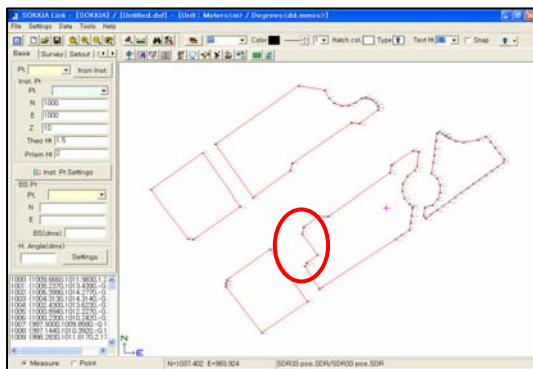
[1] ~ [2] Dif. value
Tn Te Rotate
☐ Select Dif. value

Step 5. [2] ~ [3] Dif. value
Tn Te Rotate
☐ Select Dif. value

[3] ~ [1] Dif. value
Tn Te Rotate
☐ Select Dif. value

Step 6. **OK** **Cancel**

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



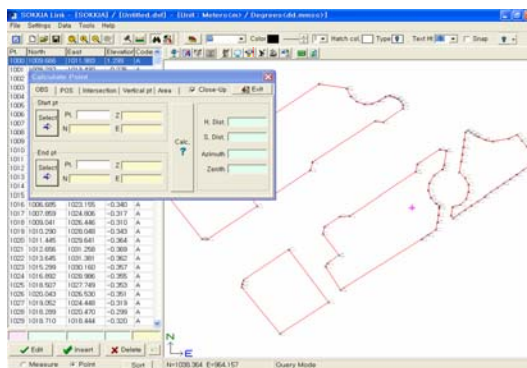
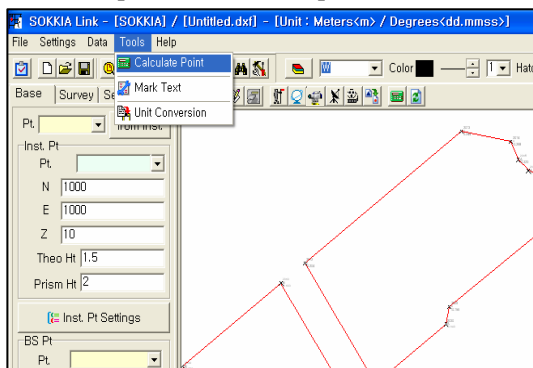
5. Tools

5.1 Calculating a Point

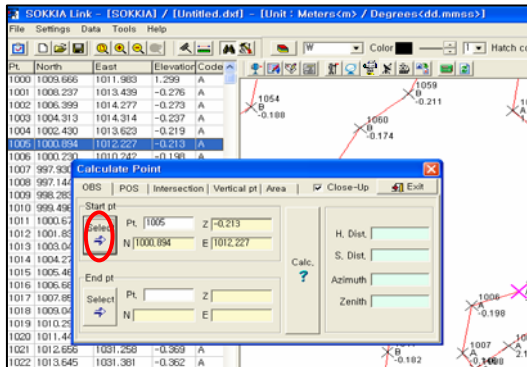
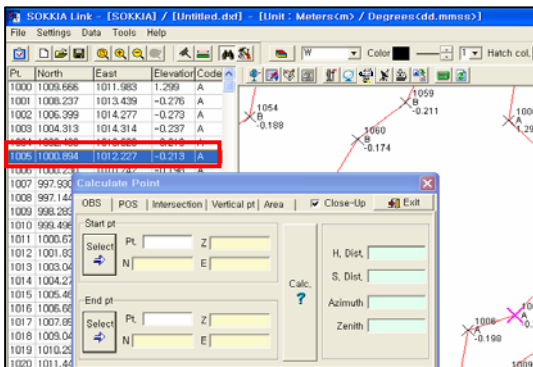


Run

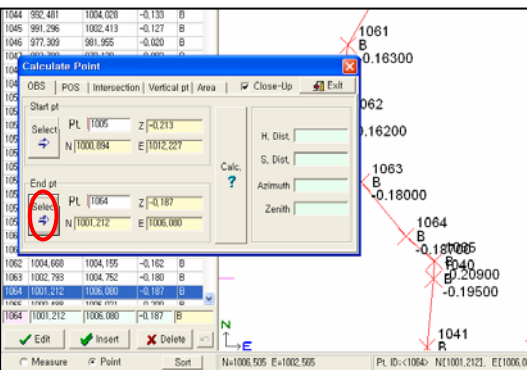
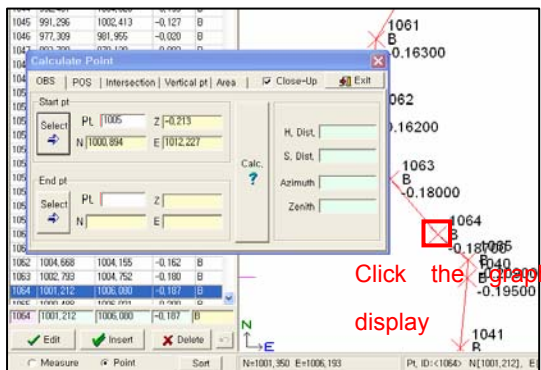
1. Click [Calculate Point].



Method 1: Select a point from the list.



Method 2: Select a point graphically.



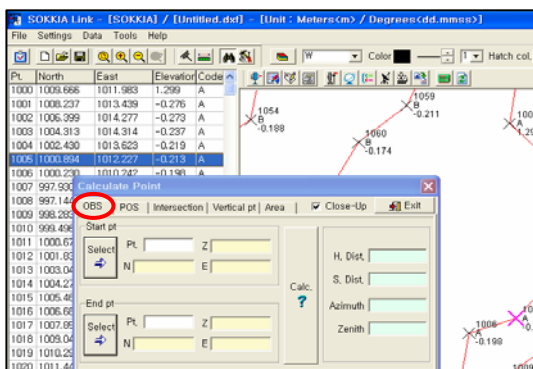
2. POS (coordinate) → OBS (angle)



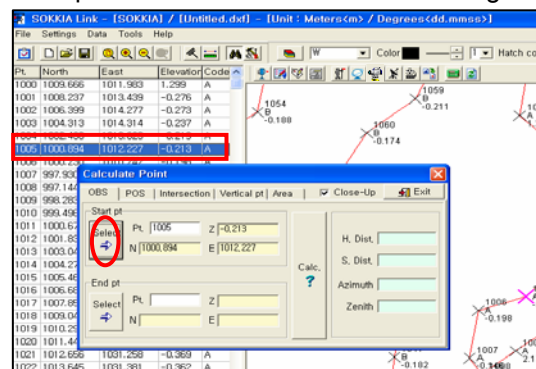
Calculate the observation angle using two sets of coordinates.

From the [Tools] menu, select [Calculate Point].

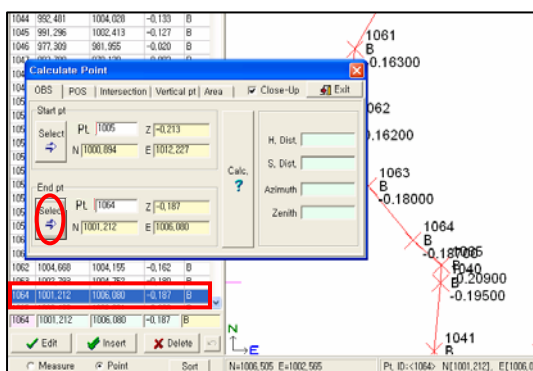
2-1. Select the [OBS].



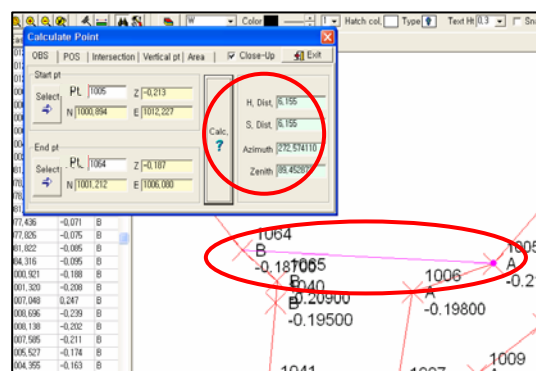
2-2. Select the first point from the observation window and click [Select] in the Start pt box of the **Calculate Point** dialog.



2-3. Select the second point from the observation window and click [Select] in the **End pt** box of the **Calculate Point** dialog.



2-4. Click [Calc] to calculate the **H.Dist**, **S.Dist**, **Azimuth**, and **Zenith**.



3. OBS (angle) → POS (coordinate)



Calculate coordinates using the observation angle and distance.

From the [Tools] menu, select [Calculate Point].

3-1. Select the [POS].

3-2. Select the first point from the observation window and click [Select] in the Base box of the **Calculate Point** dialog.

3-3. Enter the **Azimuth**, **Zenith**, and **Dist.**

3-4. Click [Calc].

3-5. Enter **Pt ID**, **Code** for drawing.

3-6. Click [Insert pt].

4. Intersection

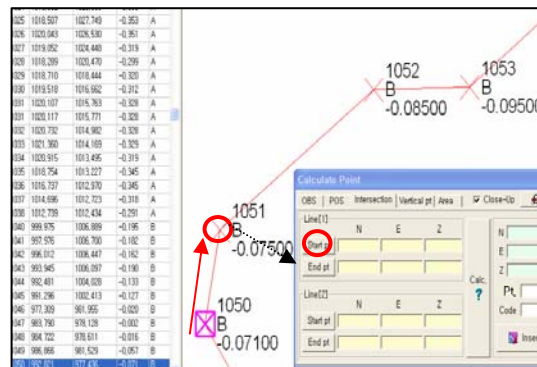
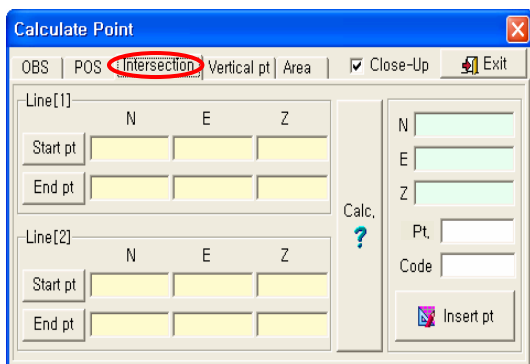


Calculate the intersection of two lines using 4 points.

From the [Tools] menu, select [Calculate Point].

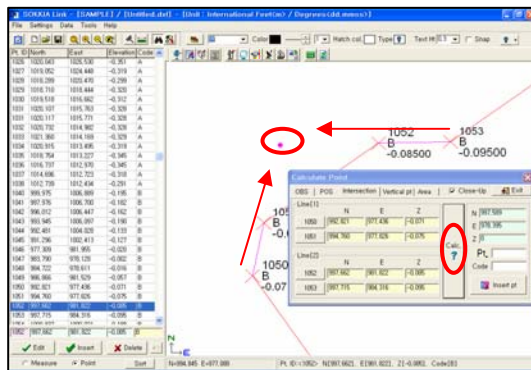
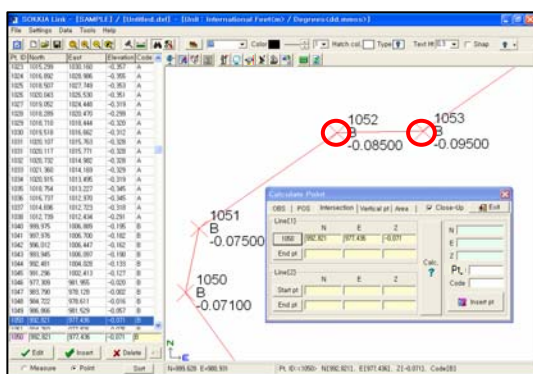
4-1. Select the [Intersection].

4-2. Select the first point from the observation window and click [Start pt], [End pt] in the **Line[1]** box of the **Calculate Point** dialog.



4-3. Repeat the previous two steps for the **Line[2]** start and end points.

4-4. Click [Calc].



Note

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

5. Vertical pt



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

From the [Tools] menu, select [Calculate Point].

5-1. Select the [Vertical pt].

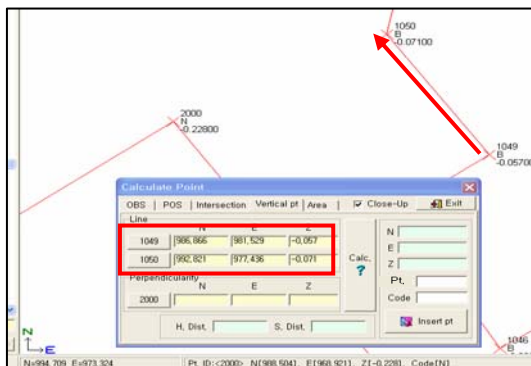
5-2. Select the start point of the line from the observation window and click [Start pt], [End pt] in the **Line** box of the **Calculate Point** dialog.

Line			
	N	E	Z
1049	986,866	981,529	-0,057
1050	992,821	977,436	-0,071

Perpendicularity			
	N	E	Z
2000	988,504	968,921	-0,228

H. Dist. S. Dist.

Insert pt



5-3. Select the [Point] for **perpendicularity**.

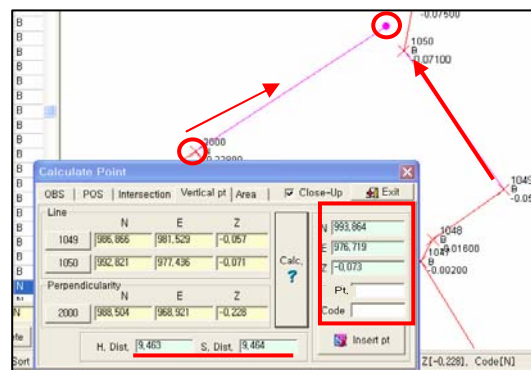
5-4. Click [Calc].

Line			
	N	E	Z
1049	986,866	981,529	-0,057
1050	992,821	977,436	-0,071

Perpendicularity			
	N	E	Z
2000	988,504	968,921	-0,228

H. Dist. S. Dist.

Insert pt



Note

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

6. Area



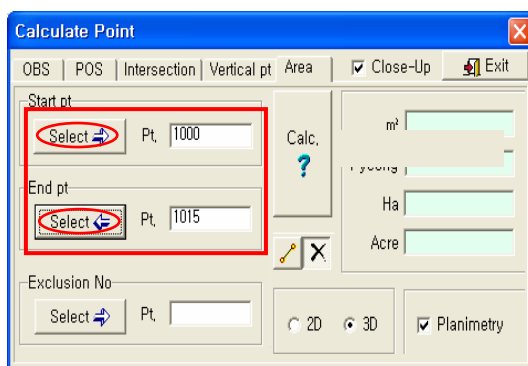
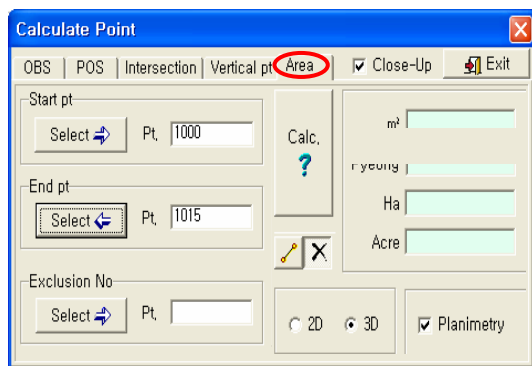
Calculate the area of a polygon defined by start and end points.

From the [Tools] menu, select [Calculate Point].

6-1. Select the [Area].

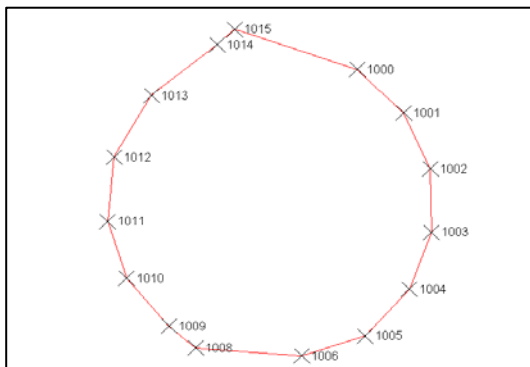
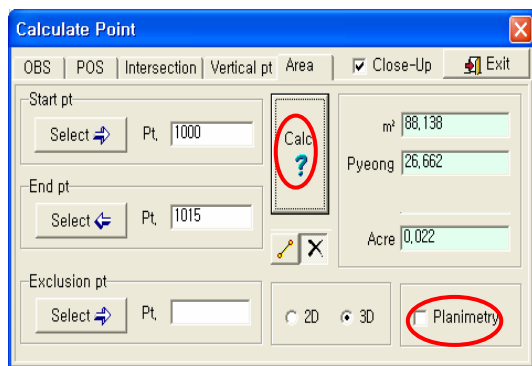
6-2. Select the start point of the polygon from the observation window and click [Select] in the

Start pt, End pt box of the **Calculate Point** dialog.

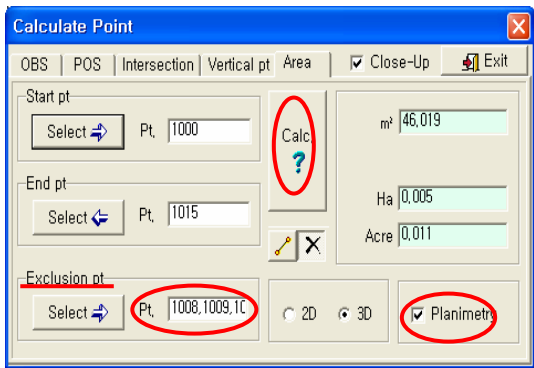


6-3. Click [Calc].

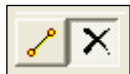
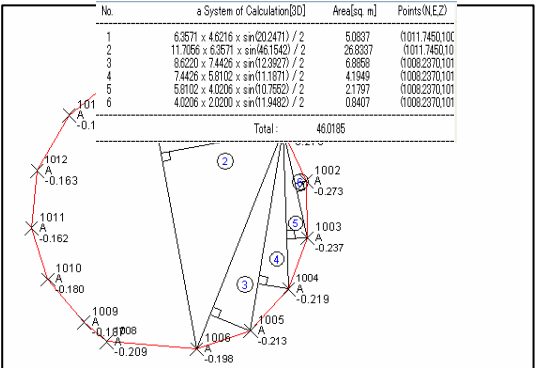
Example: Calculating the polygon from Pt.1000 to Pt.1015.



6-4. Select points to be excluded after calculation using **Exclusion Pt.**



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



Select polyline drawing to calculate the area of the polygon.

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

6. Real Time Measurement

SOKKIA Link functions can be divided into two categories: Calculation and 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 setout in real time.

6.1 Base Tab

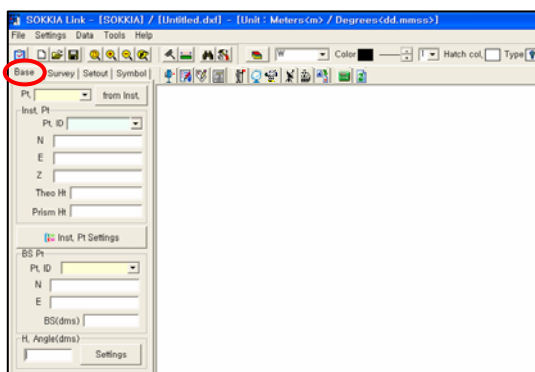
Steps to set the STN point and BS angle

1. Enter Instrument point **[Pt, N, E, Z]** or select **[Pt.]**.
2. Enter **[Theo Ht, Prism Ht]**.
3. Click **[Inst. Pt Settings]** to set Instrument point.
4. Enter BS point **[Pt., N, E]** or select **[Pt.]**.
5. Confirm **[H. angle (dms)]**.
6. Click **[Settings]** to set H. angle (dms).

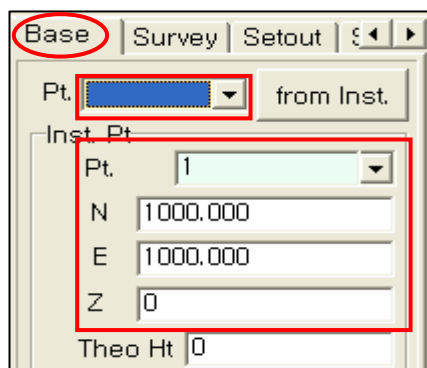


Run

1. Click the **[Base]**.



- 1-1. Enter Instrument point or select **[Pt.]**.



[from Inst.] : Use the instrument point from the Total station.

1-2. Enter **[Theo Ht, Prism Ht]**.

Base | Survey | Setout | Symbol

Pt. from Inst.

Inst. Pt

Pt. ID

N

E

Z

Theo Ht

Prism Ht

Inst. Pt Settings

1-3. Press **[Inst. Pt Settings]**.

Base | Survey | Setout | Symbol

Pt. from Inst.

Inst. Pt

Pt. ID

N

E

Z

Theo Ht

Prism Ht

Inst. Pt Settings

1-4. Enter BS point **[Pt., N, E]**.

BS Pt

Pt.

N

E

BS(dms)

H. Angle(dms)

1-5. Press **[Settings]**.

BS Pt

Pt.

N

E

BS(dms)

H. Angle(dms)



Enter BS point **[Pt.]**, **[N]**, **[E]** or select **[Pt.]**.



The Limit of **[from Inst.]** function

This function is not available in 2-Way mode (POWERSET Series, Series 220, and Series 030R).



Note

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

6.2 Survey Tab



This function measures surveys in real time.

Steps to measuring a Survey

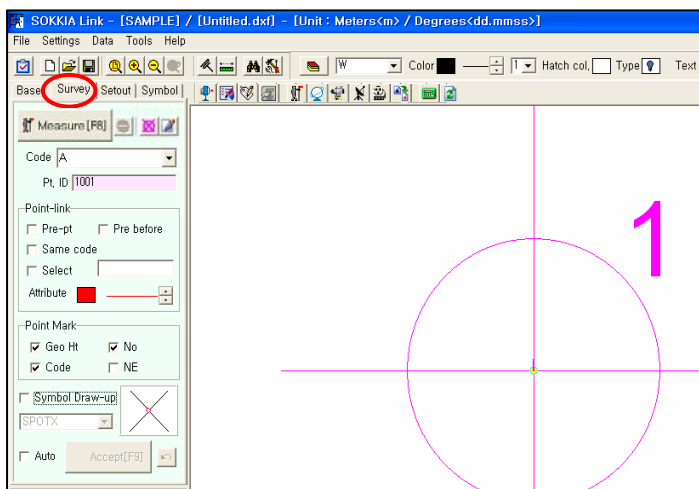
The following procedure can be performed after STN point and BS angle have been set.

1. Select **[Code]**.
2. Enter **[Pt.]** ----- Start point.
3. Select **[Point-link]**.
4. Select **[Point-Mark]**.
5. Click on button **[Measure [F8]]** or press **[F8]** on the keyboard.
6. Check the status.
7. Click **[Accept [F8]]** or press **[F9]** on the keyboard.



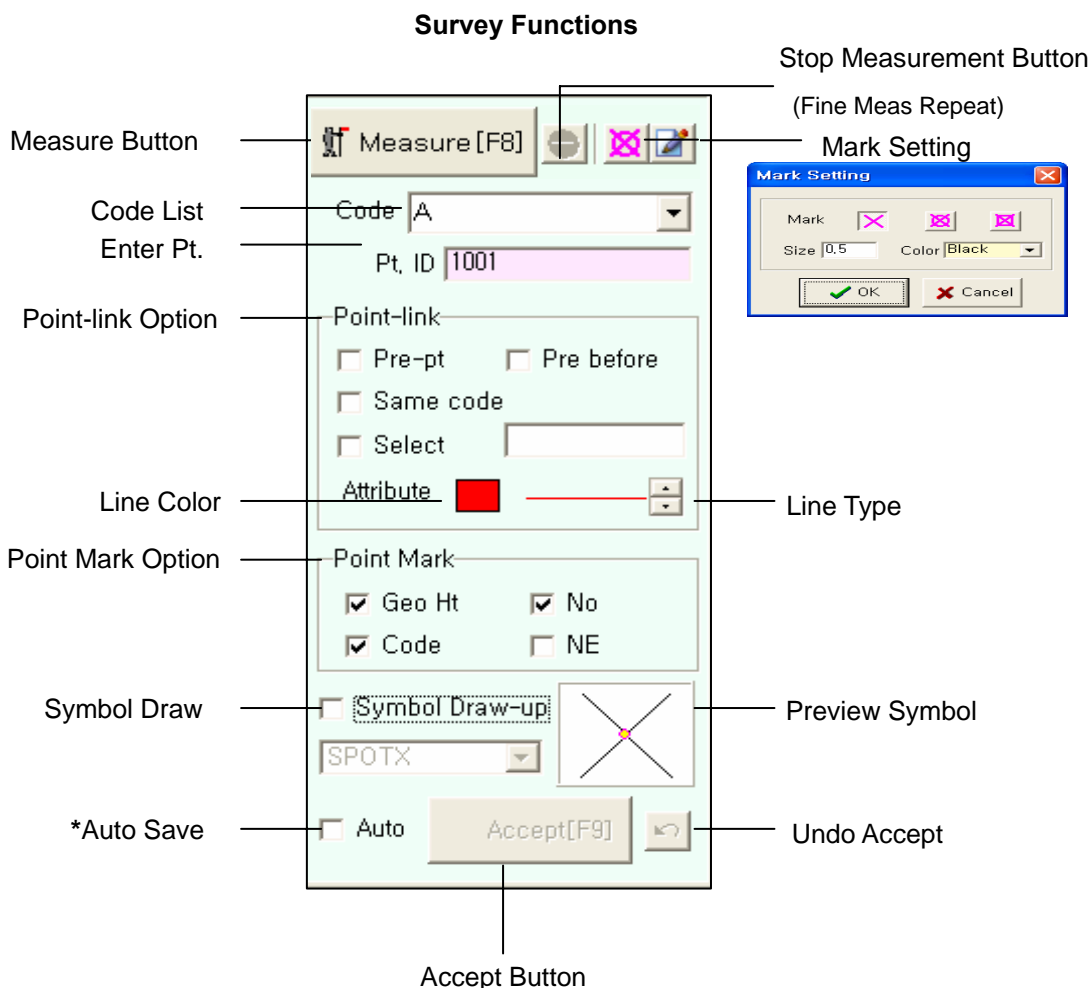
Run

1. Click **[Survey]**.



Note

If you change the settings of Angle unit (Degrees/ Gons/ Mils) during Real time measurement, click the **[Inst. Pt. settings]** in base tap to make the changes effective.



Auto Save

The following operations can be performed using the Auto Save function.

1. When the total station EDM is in Single mode.

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

Sequential point numbers are automatically assigned.

2. When the total station EDM is in Repeat mode and Tracking mode.

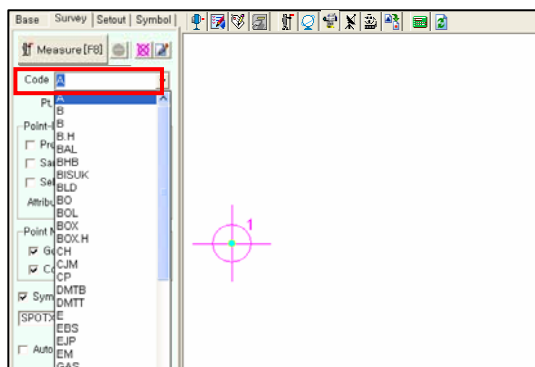
Data is saved each time it is received from the Total Station.

Data is continually saved until the stop button is pressed.

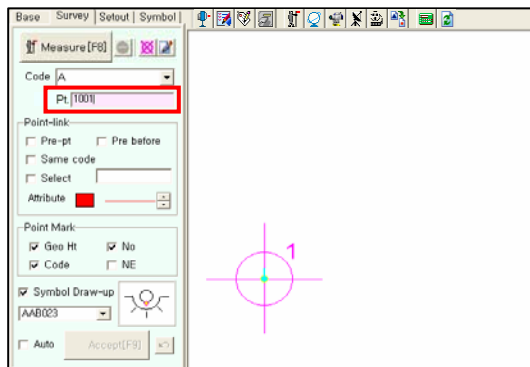
Sequential point numbers are automatically assigned.

This function can record moving target trajectory coordinates and perform target scanning.

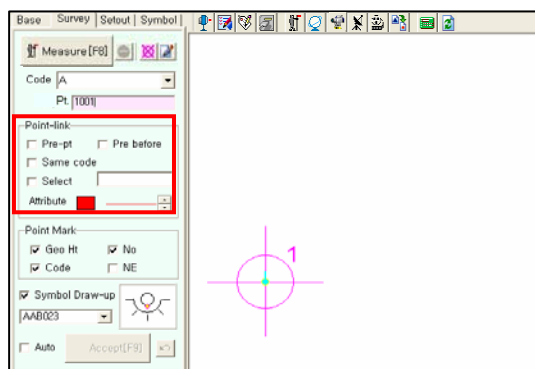
1-1. Select [Code].



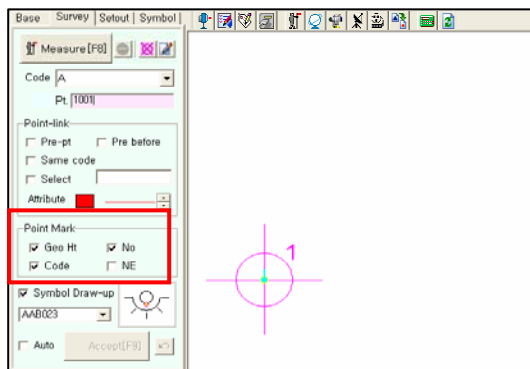
1-2. Enter [Pt.] ----- Start point



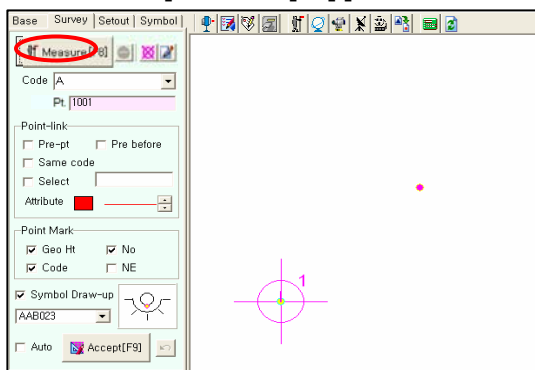
1-3. Select [Point-link].



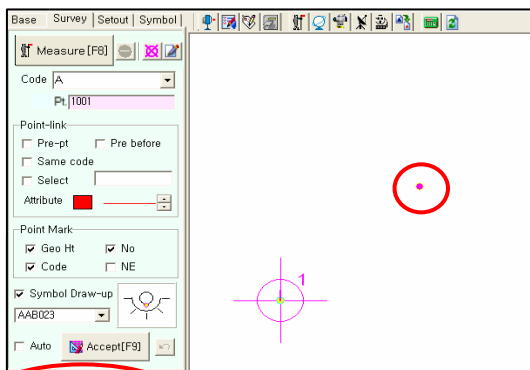
1-4. Select [Point-Mark].



1-5. Click on [Measure [F8]].



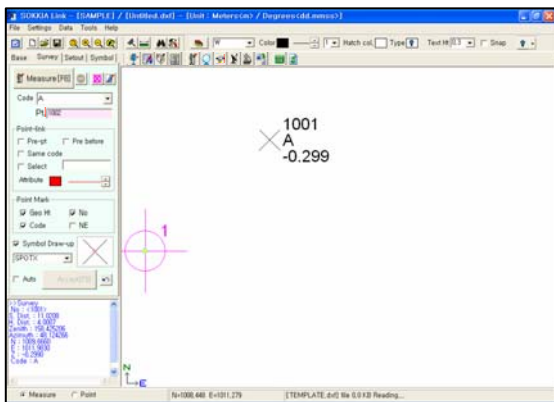
1-6. Confirm condition.



>>>Survey Measure
S. Dist : 3.1040
Zenith : 81.0127
Azimuth : 234.0750

S.Distance / Zenith / Azimuth

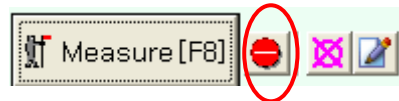
1-7. Click **[Accept F9]** or press **[F9]** on the keyboard.



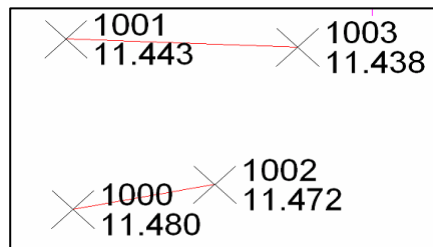
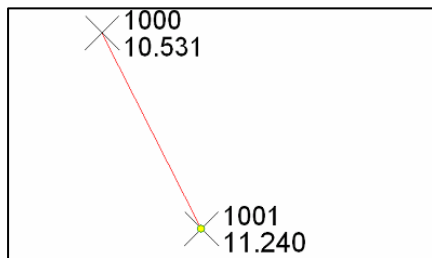
Note

Stop Measurement Button

(Fine Meas Repeat)



► Point-link Option.



Point-link

☐ Pre-pt ☐ Pre before

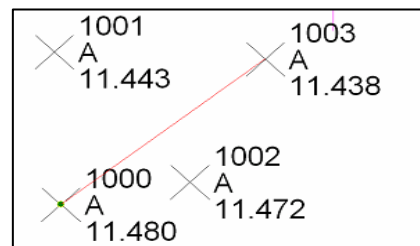
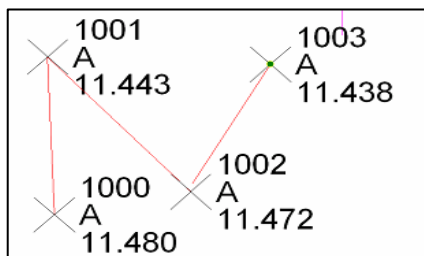
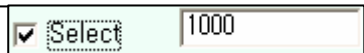
☐ Same code

☐ Select

Attribute



Link to the point recorded two measurements ago.



6.3 Setout Tab

Steps to Setout

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

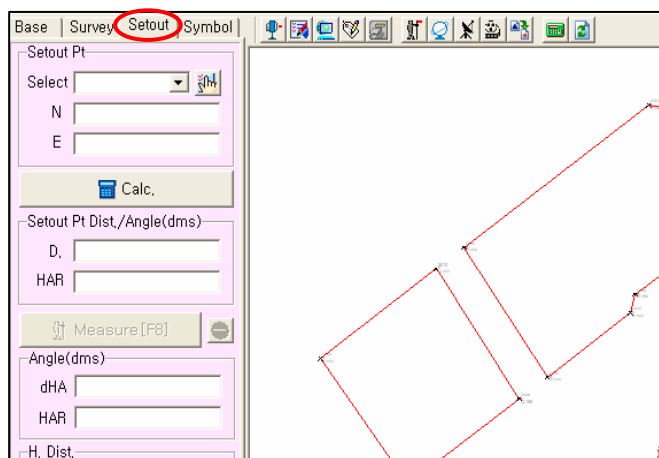
1. Select **[Pt.]** or enter the N-E value directly or select a point on the graphic screen.
2. Click **[Calc.]**.
3. Sight the target.
4. Click **[Measure [F8]]** or press **[F8]** on the keyboard.
5. Confirm **D.Angle / H.Dist**
To draw the point graphically.
6. Enter **[Pt.]**.
7. Click **[Accept [F9]]** or press **[F9]** on the keyboard.

To draw point on graphic



Run

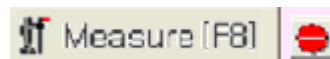
1. Click **[Setout]**.



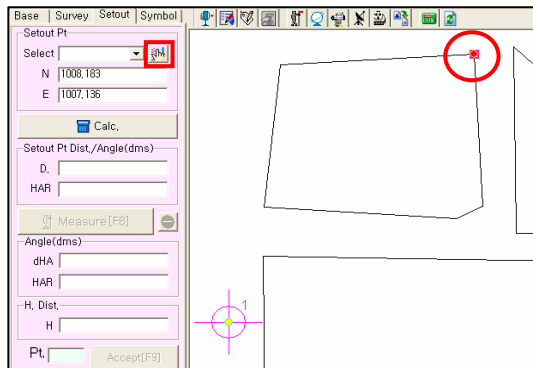
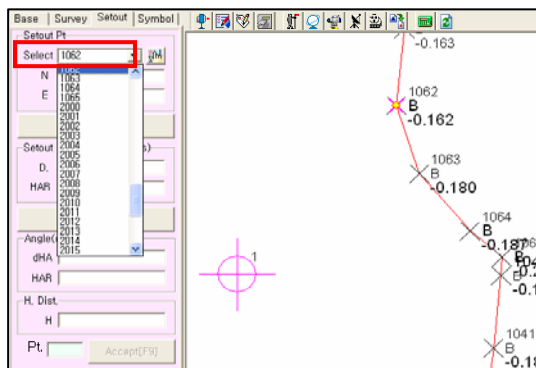
Note

Stop Measure Button

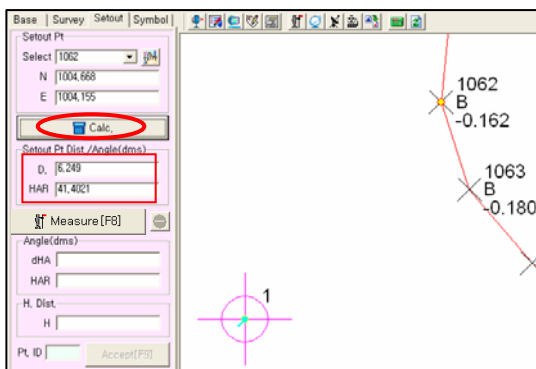
(Fine meas. Repeat)



1-1. Select **[Pt.]** or enter the N-E value directly or select a point on the graphic screen.

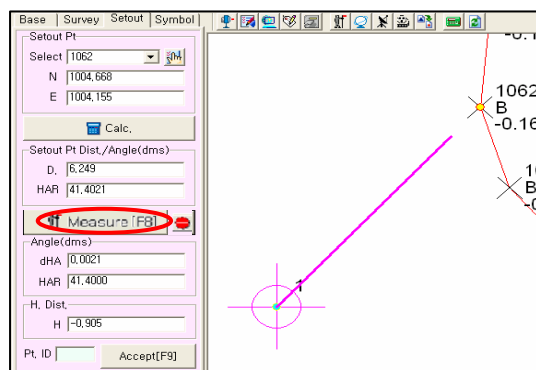


1-2. Press **[Calc]** .

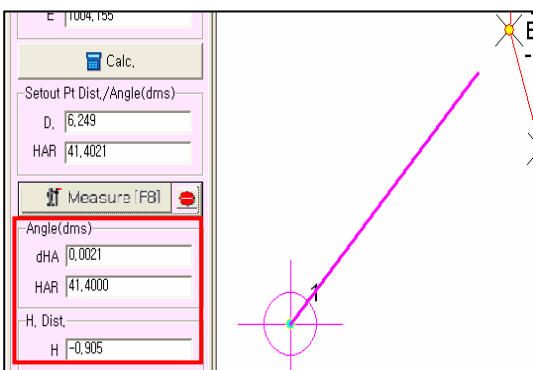


1-3. Sight the target.

1-4. Click **[Measure [F8]]** on press **[F8]** on the keyboard.

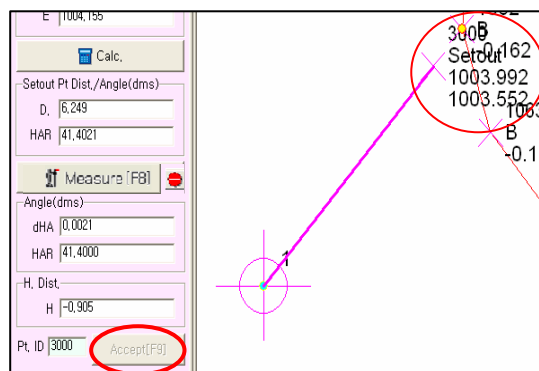
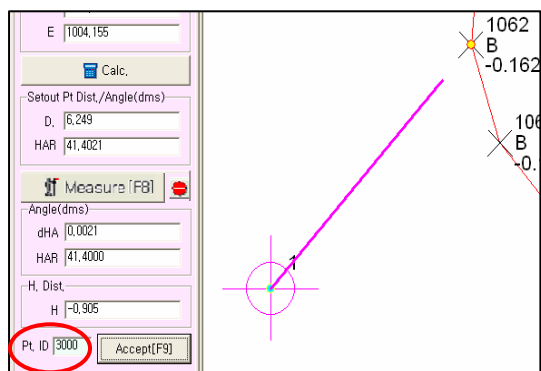


1-5. Confirm **D.Angle / H.Distance** .



1-6. Enter **[Pt.]**.

1-7. Click **[Accept [F9]]** or press **[F9]** on the keyboard.



6.4 Symbol Tab



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

Steps to inserting a symbol

1. Select symbol name.
2. Click **[Insert]**.
3. Right click on the position you want to place the symbol on the graphic screen.

How to create symbol on AutoCAD

1. Make blocks on AutoCAD.
2. Save the file in DXF format (if possible, save the file as an early version – i.e. AutoCAD Release 2000, 14, or 12).
Refer to the sample in folder DOC/SYM.

How to make symbol file

1. Select **[Open DXF]** file from the **[File]** menu.
2. Click **[Making]** to save BOK file.

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

How to load a symbol file

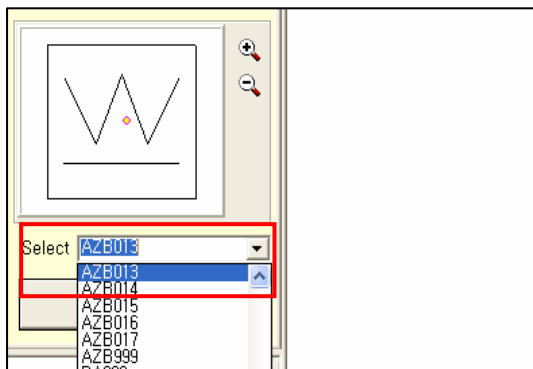
1. Click **[Open Symbol File]**.
2. Identify the symbol file to be loaded in the **Open Project** dialog.
3. Click **[Symbol Append]**.



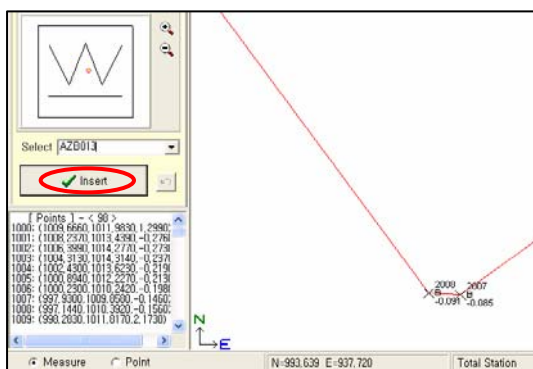
Run

► How to Insert Symbol

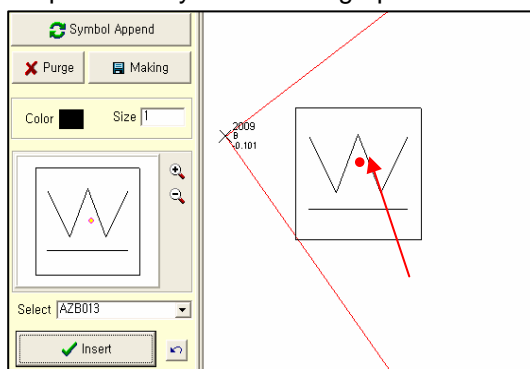
1. Select **[symbol name]**.



2. Click **[Insert]**.

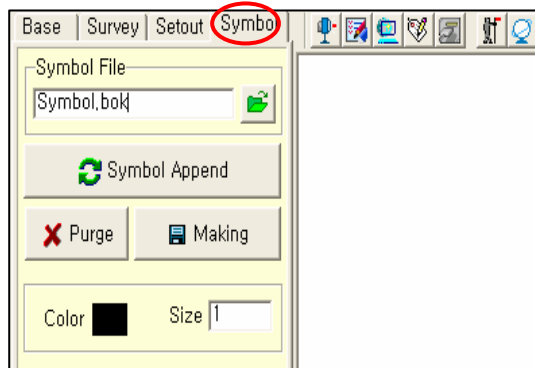


3. Right click on the position you want to place the symbol on the graphic screen.

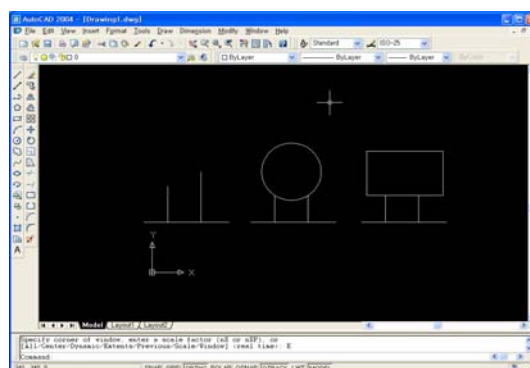


► How to create symbol on AutoCAD

1. Click **[Symbol]**.

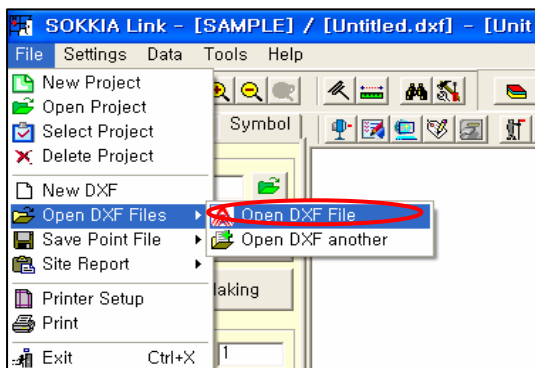


2. Make blocks using AutoCAD.

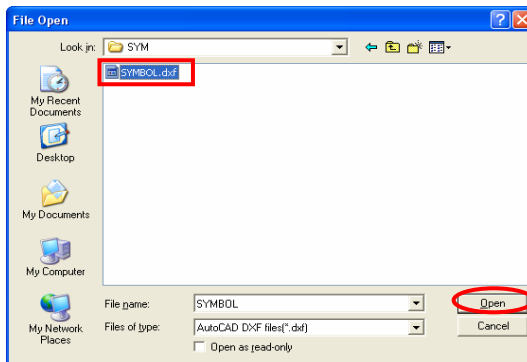


► How to make symbol file

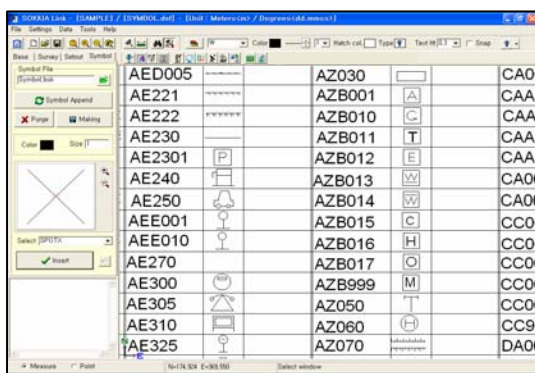
1. [Open DXF File].



2. Select [Symbol.dxf].



3. Block (Symbol)

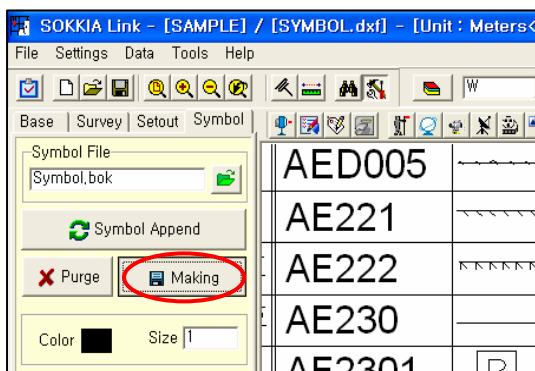


Note

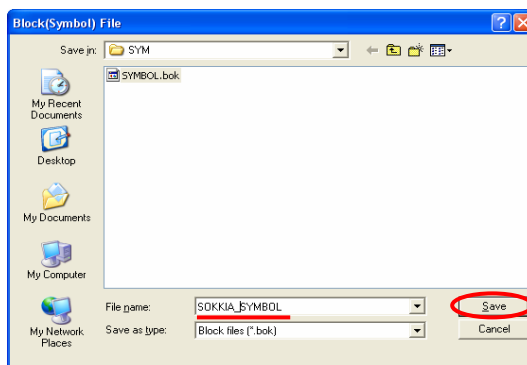
This function can be used to confirm which symbols have been opened.



4. Press [Making].

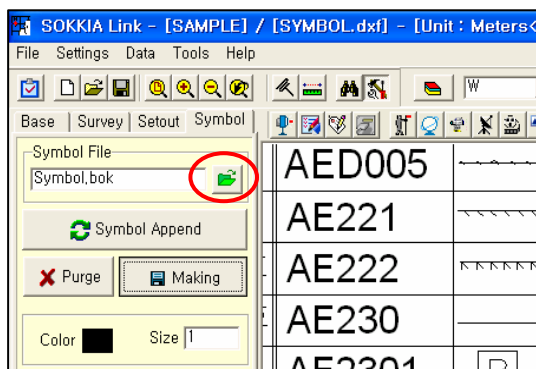


5. Enter [symbol file name].

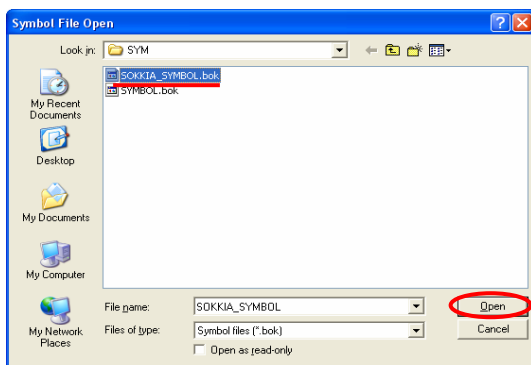


► How to load symbol file

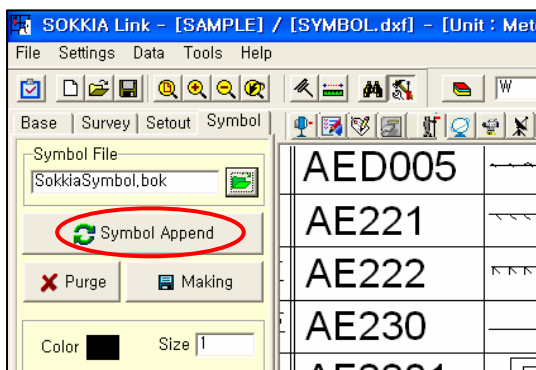
1. Click **[Open Symbol File]**.



2. Identify the symbol file to be loaded.



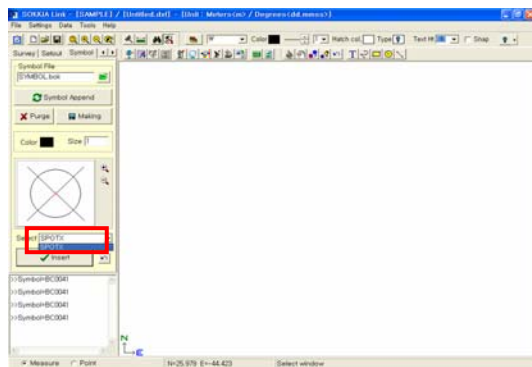
3. Click **[Symbol Append]**.



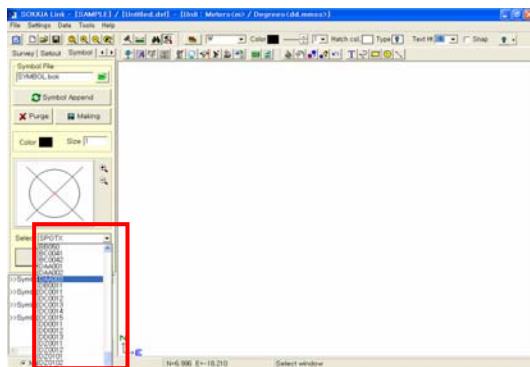
Note

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

Before appending (loading) the symbol

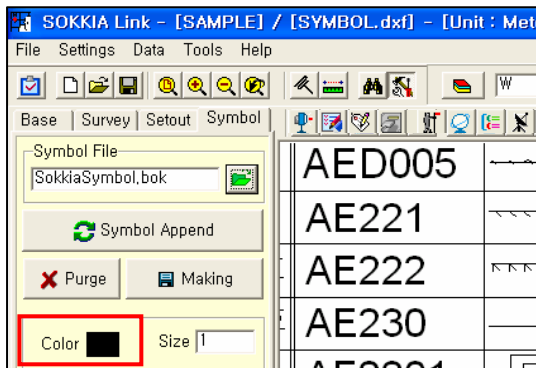


After appending (loading) the symbol



If a project is selected, the symbol library is automatically loaded.

4. Symbol color

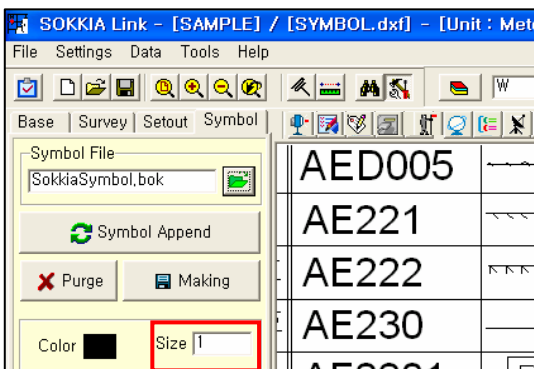


Note

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

Symbols with the same name are the same color.

5. Size of symbol

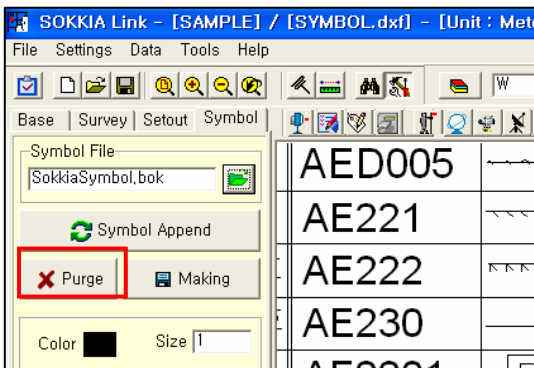


Note

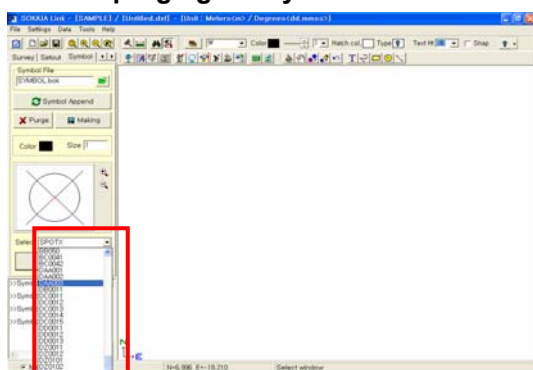
SOKKIA Link symbol sizes are the same as AutoCAD.

Symbols created using CAD have a block size of 1.

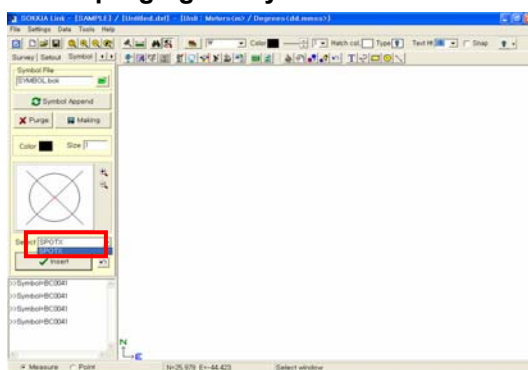
6. Click [Purge].



Before purging the symbol



After purging the symbol



Only the point mark remains.