

Total Station Quick Start

Reference Guide for FieldGenius Total Station Setup and Workflows.

MicroSurvey
FieldGenius 11

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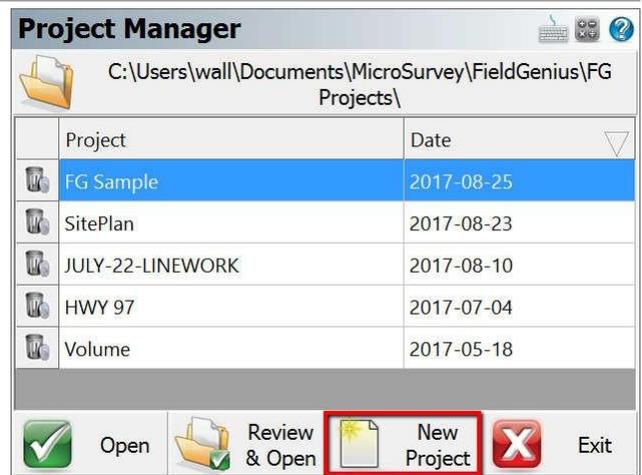
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Part 1 - Create a New Project

The Project Manager in FieldGenius is used to open, create, and delete projects.

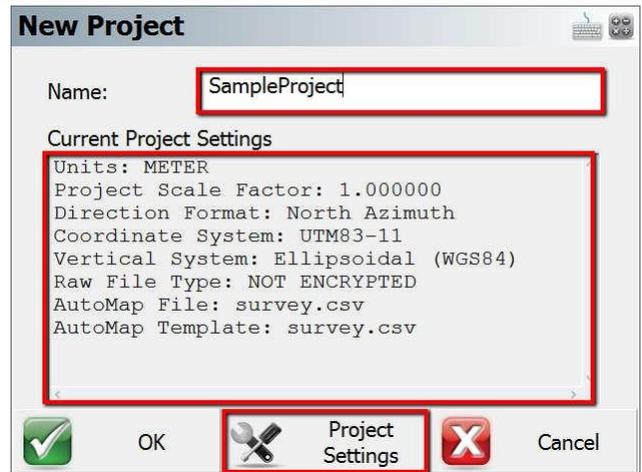
Create a New Project

1. From the Project Manager choose “New Project”



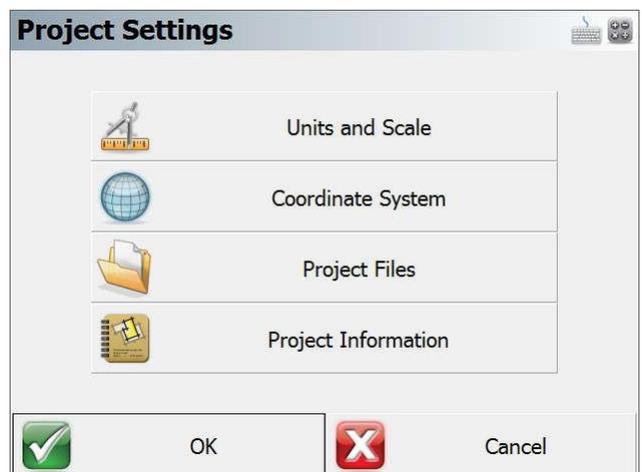
Configure New Project

2. Enter a name for your project
3. Review the Project Settings
4. Modify the Project Settings if required



Project Settings

A FieldGenius project is created with some default settings. It is important to set the defaults to suit your most frequent requirements. These defaults typically will only need to be configured once. For more details on Project settings please see page 40.



Part 2 – First Time Total Station Setup

Note: This chapter is for FieldGenius installed on external devices (data collectors, tablets etc.) only. It is not needed for total station onboard installations.

FieldGenius instrument profiles contain settings specific to each instrument. When selecting an instrument profile and connecting to the instrument, all these settings are automatically inherited.

Create Instrument Connection Profile (Total Station)

To create a new total station profile:

Add a New Profile

- From the Instrument Selection dialog pick the GNSS Rover instrument type
- Pick “Add” to create a new profile



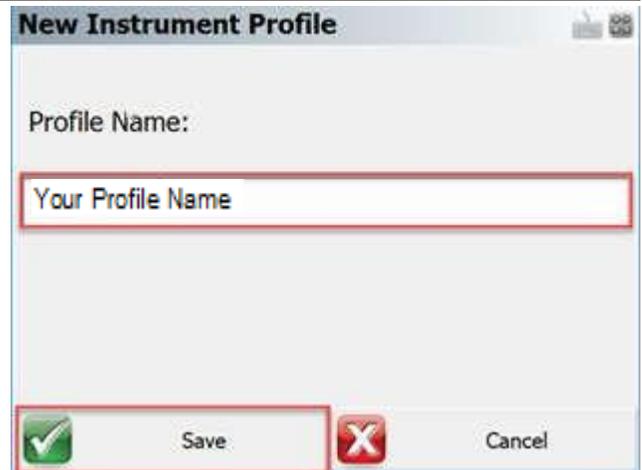
Add a New Profile

- From the Instrument Selection dialog pick the Total Station instrument type
- Pick “Add” to create a new profile



Enter Name and Save

- Enter a name for your profile
- Pick “Save”



Edit Profile

- With the new instrument profile selected, pick “Edit” to edit the profile



Profile Setup

1. Choose the profile component to configure



Model and Communication

The main component of the instrument profile is the instrument driver itself, which is specified by picking the make and model of the device.

Model and Communication

1. Pick the Make from the list
2. Pick the Model from the list
3. Choose the connection Port
4. Open the Bluetooth Device List

Model and Communication

Make: Your Make Model: Your Model **2**

Status: **Not Connected**

Port: Bluetooth **3**

Device: []

Bluetooth Device List 4

Connect Radio Settings **X** Close

Bluetooth Device List

1. Pick Search

Bluetooth Device List

Name	Bluetooth ID	PIN

Search Edit Delete

X Close

Select Bluetooth Device

1. Select desired Bluetooth device
(serial number of the instrument)
2. Note: if device not listed pick Refresh List

Select Bluetooth Device

RH_1625194
(0012F31C105E)

TS1625194 1
(0013430AF6C9)

Refresh List **2** **X** Cancel

New Bluetooth Device

2. Pick OK

New Bluetooth Device

Name:

Bluetooth ID:

PIN Code:

Leave PIN Code blank if not required

OK Cancel

Bluetooth Device List

3. Pick Close

Bluetooth Device List

Name	Bluetooth ID	PIN
TS1625194	TS1625194	

Search Edit Delete

Close

Model and Communication

4. Pick Connect

Model and Communication

Make: Model:

Status: **Not Connected**

Port:

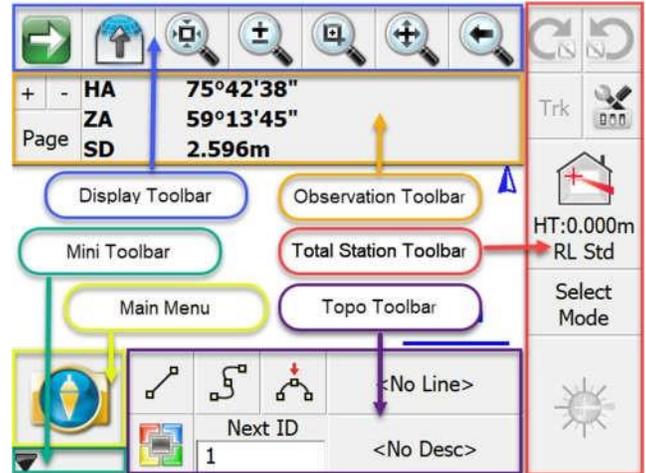
Device:

Connect Radio Settings Close

Part 3 – Program Options and Interface

Toolbars

The FieldGenius interface consists of multiple toolbars that display important information, in some cases the toolbars are also context sensitive.



Display Toolbar

Display Toolbar functions (1st page)

1. Next (go to 2nd page of display toolbar),
2. (open) Observation toolbar,
3. Zoom Extents,
4. Dynamic Zoom,
5. Zoom Window,
6. Dynamic Pan,
7. Zoom Previous



Display Toolbar functions (2nd page)

1. Previous (go to 1st page of display toolbar),
2. World Button (hide unrelated data during stakeout),
3. 3D View,
4. Layers Manager,
5. Surface Manager,
6. Options (Map View configuration)
7. Help



Note: For more information visit our help web page <http://s3.microsurvey.com/fieldgenius/Help/Default.htm>
Search: "Display Toolbar"

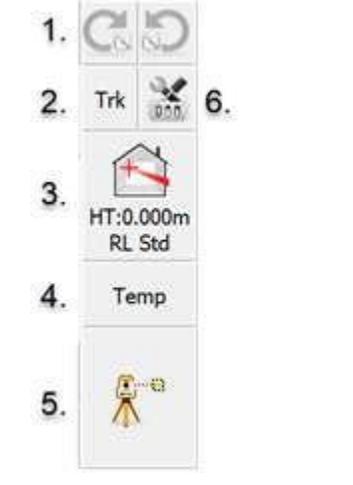
Observation Toolbar

The observation toolbar shows information about last measured point.

<ul style="list-style-type: none"> + , - buttons modifies font size in Observation Toolbar 	
<ul style="list-style-type: none"> Page button cycles through multiple pages of information (1st page: HA, ZA, SD; 2nd page: HA, HD, VD; 3rd page: N, E, H) 	

Total Station Toolbar

This toolbar allows you to control your instrument settings, target types and target heights, measure modes, as well as initiating a measurement.

Total Station Toolbar	ROBOTIC INSTR.	NON-ROBOTIC
<ol style="list-style-type: none"> Prism LOCK Mode for robotic total stations Cursor Tracking (when enabled, EDM tracking on) Target Manager Button (showing your current prism type and height of target) Current Measure Mode – select this button to switch between measure modes Measure Button – select this button to trigger the measurement Instrument Settings Map Auto-center ON /OFF (robotic instruments access this function via Instrument Settings (6)) 		

Prism LOCK Mode:

LOCK mode - not following a prism

Single Tap - Begin PowerSearch to search for prism. The left button starts a clockwise search, the right button starts a counterclockwise search.



Searching - this button indicates that a target search is in progress.



LOCK mode - these buttons indicate that the instrument is in LOCK mode and following a prism.

Single Tap – will break Prism Lock
 Double Tap – will start search for next Prism.
Note: Same action on both buttons.



Cursor Tracking:

When enabled, the instrument makes continuous measurements, and the current position of the target will be displayed on the screen in real time.



Auto-Center:

This toggles the map auto-center feature on or off. If turned on, the map screen will always re-center on the measured point.
 Located in Instrument Toolbar for Non-robotic instruments, Robotic instruments access this toggle via Instrument Toolbar | Instrument Settings (wrench key) | Map auto-center ON / OFF

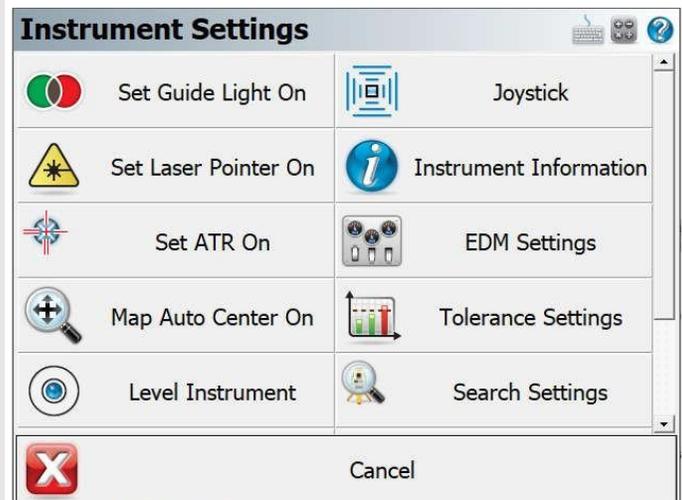


Instrument Settings:

Opens the Instrument Settings screen, where you can control specific settings for your total station.



Set Guide Light – ON / OFF
Set Laser Pointer – ON / OFF
Set ATR – ON / OFF
Map Auto Center -- ON / OFF
Level Instrument – display instrument level bubble
Joystick – can move motorized instrument to the left, right, up and down by using the joystick touch-screen
Instrument Information – will display model of your instrument, the current battery status etc.
EDM Settings – access to set your EDM and Guide Light intensity
Tolerance Settings – use these settings for averaging the measurements taken in both faces of telescope (multi-set collection). When you store your multi-set point, if the Standard Deviation exceeds this value, you will be notified when you store the point.
Search Settings - When using a robotic total station, you can specify search settings for your instrument



Target Manager:

The Target Manager is a place where you can manage your EDM (electronic distance measurement) targets. You can create, edit, and delete targets.



Leica Geosystems uses a different method for determining prism offsets for Leica prisms as they have a value called a Leica Constant. Leica prism offset differ 34.4 mm from actual prism offset. Please see more details on page 45.

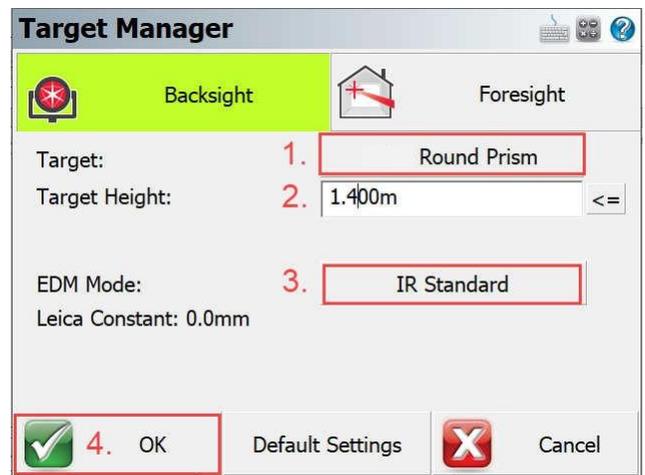
- Select the Current Target icon to enter the Target Manager screen



Target Manager (1st page)

Configure your Backsight and Foresight Targets

1. Select current Target to change the prism type
2. Set Target Height
3. Select EDM Mode
4. Select OK to confirm and return to Map View



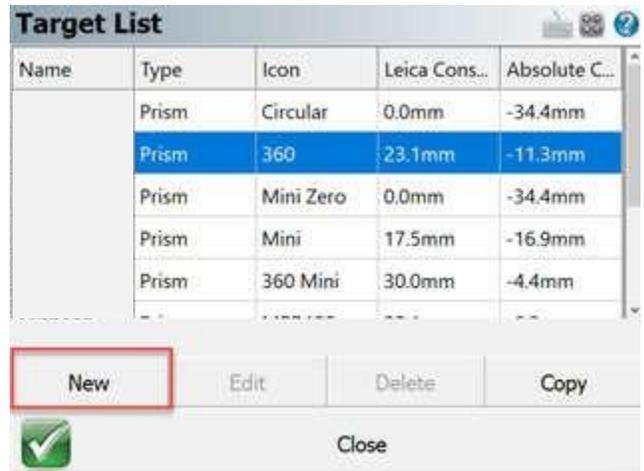
Target Manager (2nd page) - select target as shown on previous figure Round Prism (1).

1. Select one of the predefined targets
or
2. Select Target List to create new target



Create new target in Target List

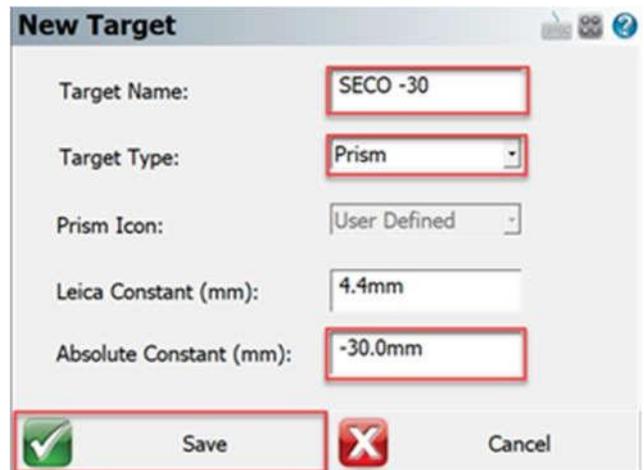
Select New



New Target

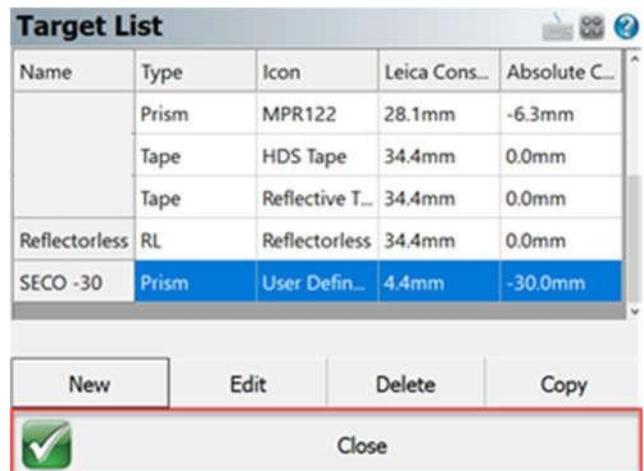
Input the new target name, type, values of prism constant and then select the Save button.

Note: If using Leica prism, input prism constant value to Leica Constant field. If using any other prism make, input value to Absolute Constant field. See more details on page 45.



Target List

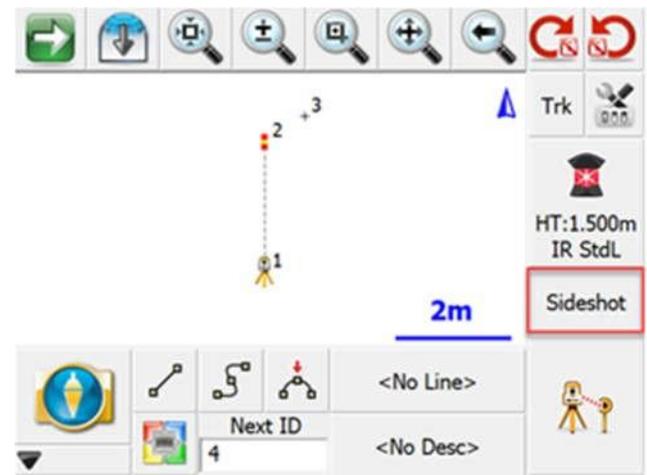
Select Close to close the target list



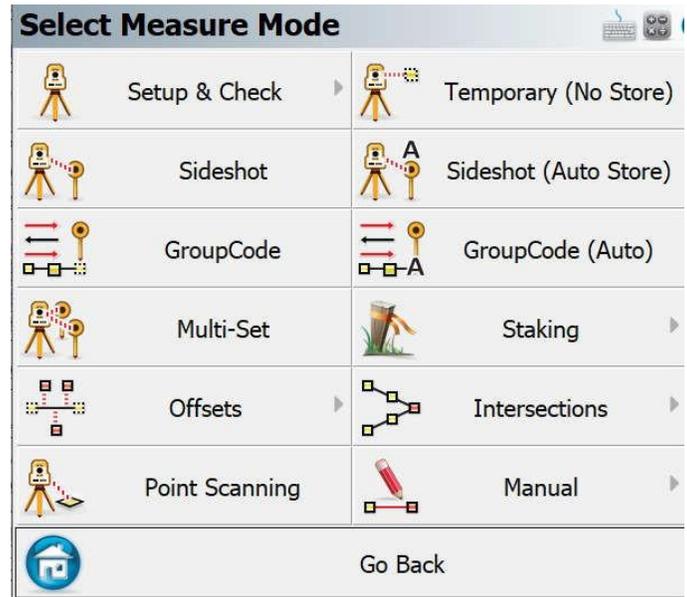
Measure Modes:

Select Measure Mode or Setup instrument

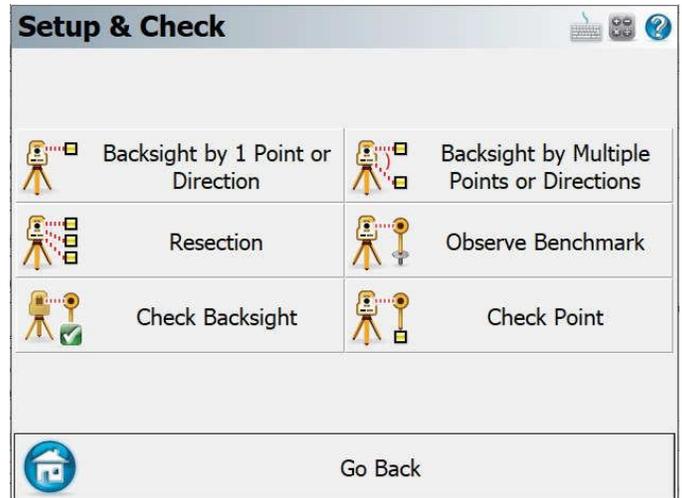
- Select the current Measure mode icon to access the Measure mode options.



1. *Setup & Check* (see page 14 for more details)
2. *Temporary (No Store)* - allow you to take a measurement without storing it
3. *Sideshot* - allows you to measure a point. After the measurement, it will allow you to review your measurement data and allow you to make changes to the point ID and description before it is stored.
4. *Sideshot (Auto Store)* – has no prompt screen before storing point
5. *GroupCode* - this mode allows you to set up a Group of Codes that have a common theme
6. *GroupCode (Auto)* with automatic point storing using the next available Point ID.
7. *Multi-Set* – is to collect repeated observations in both faces of telescope
8. *Staking* – allows you to stake point, line, Elevation, Alignment (See more on page 33)
9. *Offsets* – allows you to create Distance offset, Horizontal Angle, Vertical Angle offset and more
10. *Intersections* – allows you to calculate different type of intersections (two-line intersection, Line –Perpendicular point etc.)
11. *Point Scanning* - use this to activate Point Scanning with your motorized reflectorless instrument.
12. *Manual* - Manual Distance this will record a HA and VA for a shot, but the user can manually enter the distance. Manual Entry - this will allow you to manually enter in a shot including HA, VA and SD.



1. *Backsight by 1 Point or Direction* - use this to define an instrument setup using one backsight point or direction
2. *Backsight by Multiple Points or Directions* - use this to define an instrument setup if you want to use multiple backsight points
3. *Resection* - will start the multiple point resection routine to allow you to determine your current instrument position by measuring to known points.
4. *Observe Benchmark* - use this to check your current setup elevation or compute a new one based on a known elevation.
5. *Check Backsight* - use this to compare your backsight to your previously measured values.
6. *Check Point* - use this to display a check measurement to an existing point in your Project.



Topo Toolbar

The Topo Toolbar features figure toggles to draw linework, displays the active figure name, the active description, the Next Point ID and features a user-definable button which by default is mapped to the Point Coordinate Database.

Draw Lines Button

This is used to toggle on and off the draw lines function. When turned on, points will be connected with a line as you measure them.



Draw Splines Button

This is used to toggle on and off the draw curvy lines button. This function will draw a best-fit curve through your points as you shoot them



Draw 3-Point Arc Button

Measure an arc. Start (or continue) regular line. Toggle 3-Point Arc Button ON when measuring mid (2nd) point of arc. After the shot the program automatically switches back to line mode to before taking the end shot of arc.



Active Line List Button

Once the first point for the new line has been measured, the Active Lines list will set and display the new line as current. Select Current line to access all active lines to modify them.



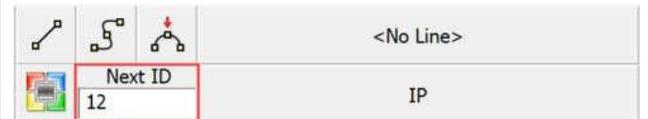
Description Selection Button

Use this button to set the current point description. Select the Description button to access AutoMap Library (predefined code list).



Next ID Field

This field displays the point number that will be assigned to your next shot. You can change it at any time prior to recording your shot



User Defined Button

This button can be customized to start any command. By default, it opens the Coordinate Database, but this can be changed in the Keyboard Shortcuts settings (Main Menu | Settings | Keyboard Shortcuts).



Mini Toolbar

The Mini Toolbar can be used to maximize the map screen size by hiding any/all unwanted toolbars



This is Mini Toolbar in collapsed version. By default, Observation Toolbar (**Controls**) and Total Station Tollbar (**Instrument**) is ON. Toggle OFF these buttons to maximize Map screen.



Main Menu Toolbar

This button takes you into the Main Menu.



Project Manager - to create, open or delete project

Settings – access features such as FieldGenius Options, Unit & Scale, Coordinate System, Keyboard Shortcuts, Language, Code List Options, Project Information, Info about FieldGenius

Measure Modes - access all available measuring methods

Survey Tools – access features such as manually creating new points, deleting/undoing the previously measured point, or viewing the raw file.

Calculations – access manual calculation options such as COGO, inversing or transformation.

Staking - access staking functions. Please see the Staking topic for more information (page 33).

Disconnect – use this button to safely end your work with FieldGenius (only when using external devices such as tablets or data collectors).

Import/Export - to import or export ASCII files, and to export DXF, XML, and other files.

Data Manager - manage points, DXF files, and surfaces.

Roads Manager - execute tools that will help you create or edit alignments, templates, and profiles.

Map View - close the main menu and take you back to the map view.

Exit - close FieldGenius application



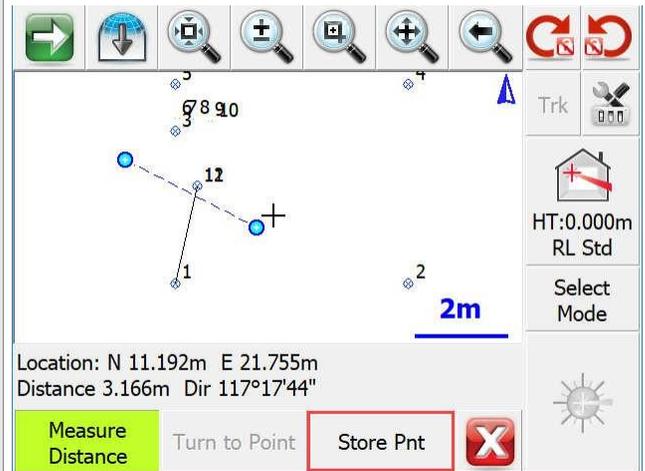
Map Select Toolbar

Following Toolbars appear when you pick an object (point, line, or alignment) on screen.

The Map Select Toolbar is a context-sensitive toolbar that can be used to Store a Point at a picked position on the map or measure a distance on the map between two picked positions.

Note:

To allow this option, go to MAIN MENU – Settings – Options – Map Configurations – ✓ check Map Position Select



Point Toolbar

The Point Toolbar is displayed when a point is selected on the map screen.

Shortcuts on the top row of this toolbar are:

Points List, Inverse Tool, Store New Point, Edit Point, Delete Point, Offset Tool, Drawing Tool

Shortcuts on the second row are:

Zoom to Point, Stake Point, Previous Point ID, Point ID, Close Point Toolbar



Line Toolbar

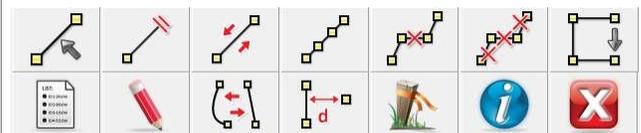
The Line Toolbar is displayed when a line or arc figure is selected on the map screen.

Shortcuts on the top row of this toolbar are:

Set Figure Current, End Figure, Reverse Direction, Partition Figure, Delete Segment, Delete Figure, Close Figure

Shortcuts on the second row are:

Open Figure List, Drawing Tool, Convert Line to Spline, Offset Tool, Stake Figure, Figure Information, Close Line Toolbar



Alignment Toolbar

The Alignment Toolbar is displayed when an Alignment figure is selected on the map screen.

1. Opens Roads Manager
2. Current Stake Alignment screen
3. Arrows navigate between the alignments.
4. Create or inquire point by offset.
5. Options Settings for Alignment (Roads)
6. Close Alignment Toolbar



Note: For more information visit our help web page <http://s3.microsurvey.com/fieldgenius/Help/Default.htm>
Search: "Alignment Staking"

Configuring Program Options

Program options are designed to help the user get the most out of FieldGenius. You can configure Interface, User Input, Point Attributes, Map Configuration, Default Units, Total Station, GNSS, Staking, Program Options are accessed through:

MAIN MENU – Settings – Options

Interface Options

Map Colour - set the background of the map screen to white or black.

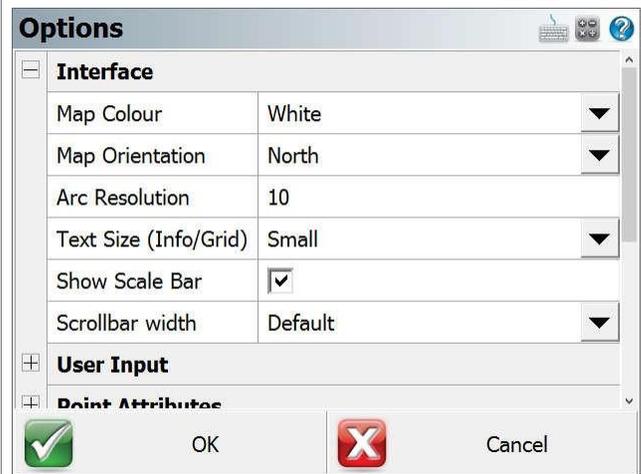
Map Orientation - set map orientation North or South.

Arc Resolution - set the number of segments for drawing arcs on the map.

Text Size (Info/Grid) - set the size of text displayed on information screens.

Show Scale Bar - toggle Scale Bar display on the map screen.

Scrollbar Width - to change the width of scrollbars to improve touch experience.



User Input Options

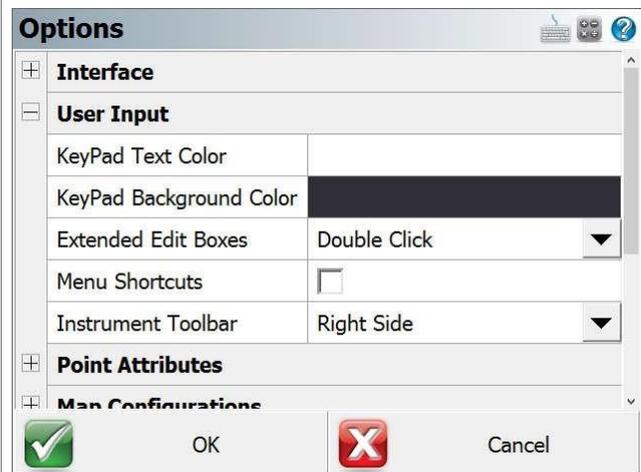
Keypad Text Colour - set the colour of the text on the virtual keypad.

KeyPad Background Colour - set the colour of the background on the virtual keypad.

Extended Edit Boxes - set behavior of the virtual keypad popping up. Recommended settings are Single Click for devices without a keyboard, Double Click for devices with a keyboard.

Menu Shortcuts - toggle display of menu shortcuts for faster navigation with a keyboard.

Instrument Toolbar - toggle which side of the screen the instrument toolbar will be displayed on. Left-handed users may prefer the left side of the screen.



Point Attributes Options

Coordinate Order - select the coordinate order for display and ASCII Import/Export

Alphanumeric IDs - to allow Alphanumeric Point IDs

Alphanumeric Case Sensitive - check if Point ID is unique while storing a point. When enabled a1 and A1 are handled as different values. This setting does not apply to coordinate imports.

Point ID Range – Minimum - enter a minimum value for a Point ID. Can be used to ensure Points are stored within a specific range.

Point ID Range – Maximum - enter a maximum value for a Point ID. A blank value will allow any maximum.

Point ID Intervals - auto-increment Point IDs by this interval.

LandXML Export – Prefix IDs - prefix Point ID with description during LandXML Export.

New Description Prompt - toggle whether to prompt to create a new Automap entry when using a point description that is not in the project's Automap library.

Time Stamp Saved Points - toggle to write a time stamp in the raw file when points are stored.

Write Notes to Raw Files - toggle to write text notes in the raw file if entered for a point.

Options	
Point Attributes	
Coordinate Order	N, E, H
Alphanumeric IDs	<input checked="" type="checkbox"/>
Alphanumeric Case Sensitive	<input checked="" type="checkbox"/>
Point ID Range - Minimum	1
Point ID Range - Maximum	999999
Point ID Interval	1
LXML Export - Prefix IDs	<input type="checkbox"/>
New Description Prompt	<input checked="" type="checkbox"/>

Map Configurations Options

Show ID / Description / Elevation - select the Point attributes to display on the map screen.

Level of Detail - toggle smart filter of Point information based on zoom level.

Text Size (Map View) - text size of Point information on the map screen.

Map Position Select - toggle ability to tap on the screen to store a point or other options from the Map Select Toolbar.

Map Point / Line / DXF Select - select which types of objects can be selected on the map screen.

Options	
Map Configurations	
Show ID	<input checked="" type="checkbox"/>
Show Description	<input type="checkbox"/>
Show Elevation	<input type="checkbox"/>
Level of Detail	<input checked="" type="checkbox"/>
Text Size (Map View)	7
Map Position Select	<input type="checkbox"/>
Map Point Select	<input checked="" type="checkbox"/>
Map Line Select	<input checked="" type="checkbox"/>

Total Station Options

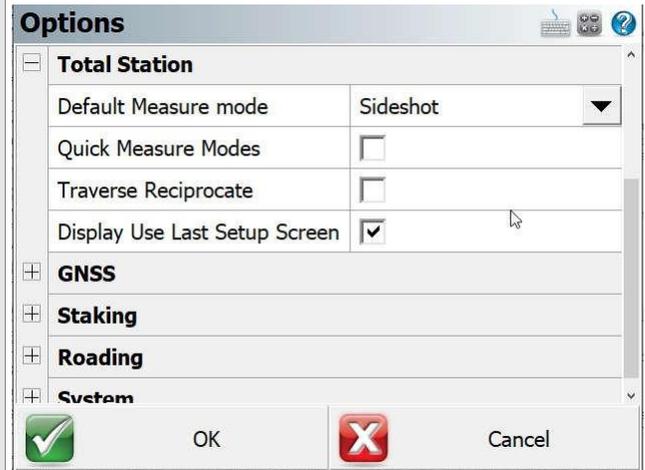
Default Measure Mode - specify your Default Measure Mode, either Sideshot or Sideshot (Auto).

Quick Measure Modes - when enabled, it will force the instrument to take a measurement instantly (it will skip the measure screen).

Traverse Reciprocate - when enabled, you will be able to use the Reciprocate Traverse option on the Backsight Summary screen.

Display Use Last Setup Screen - when enabled, you will be offered to the choice to use the last instrument occupied point when for an existing Project is opened.

Use Assistant on Open - the Total Station Assistant suggests workflow shortcuts when opening a Project.



Staking Options

Tolerance - the distance tolerance where staking residuals will be shown as green text versus red text.

Orientation – GNSS - choose the Staking direction orientation.

Compass Switch Threshold - the distance from a point where the Compass will automatically switch to a grid display.

Attached User ID - value to add to Point ID when storing Staked Points.

Line Mode - method to use for calculating navigation distances.

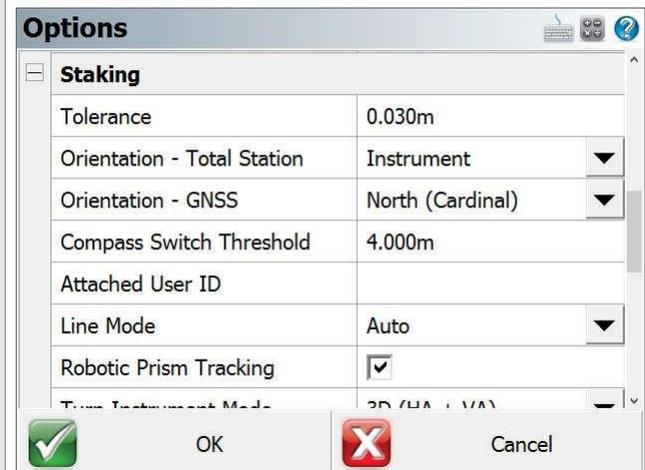
Cut and Fill Slope (X:1) - slopes to use for Slope Staking.

DTM Staking - surface name for Surface Staking.

Fade Staked-Out Points - option to display staked points differently on the screen.

Display Point Staking Screen - toggle to show the Point Staking Screen when choosing the Point to stake.

Display Stake Results Screen - toggle to show the results of the Point Stake. This screen will always display if the results are outside of tolerance settings.



Store Stake Point - prompt to store Staked Point.

Show Staked-Stored Points - option to show Staked-Stored Points on the map screen.

Use Stake List - toggle to use a staking list to stake a predetermined list of points.

Find Next Nearest - toggle to automatically let FieldGenius search for the next nearest point to stake and suggest the Point for the next position to stake.

Part 4 - Measure Modes

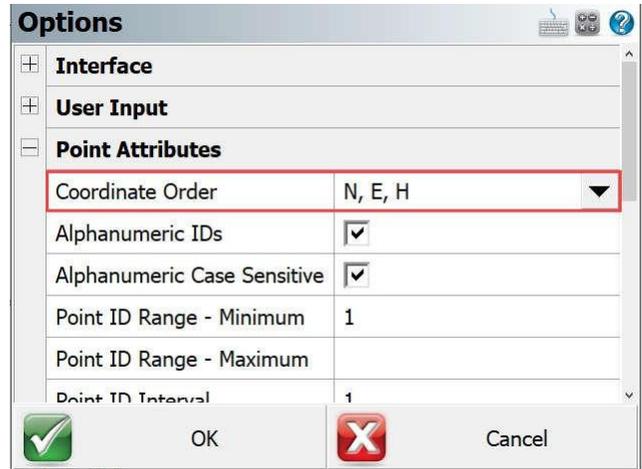
Workflows

Coordinates upload, Total Station Setup (Bucksight point, Resection), Sideshot, Multiset, Offset Measurement and Staking workflows will be summarized.

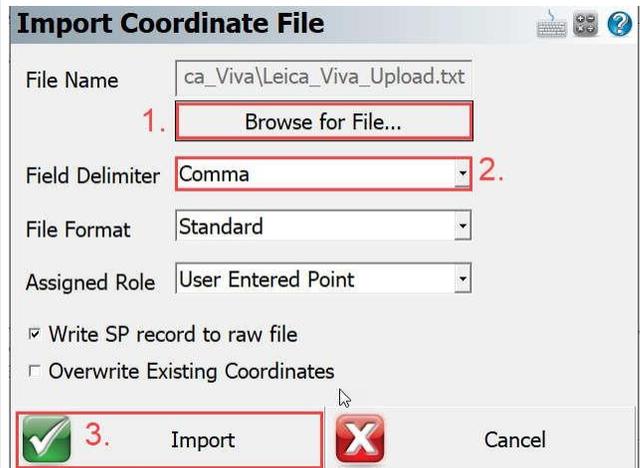
Coordinates Upload

Main Menu | Import / Export | Points / Observations | ASCII Coordinate Import

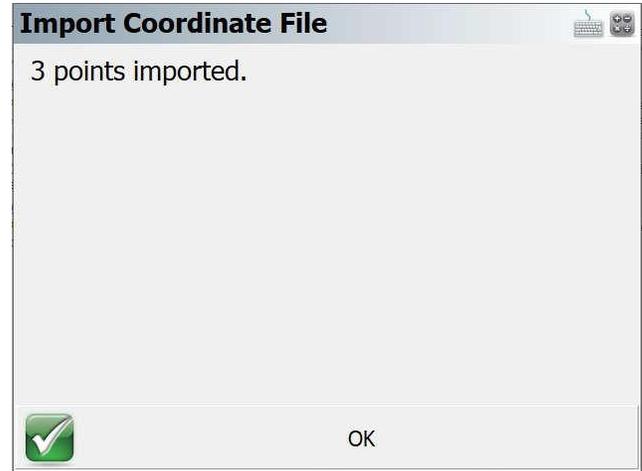
- Make sure that coordinates in your upload file is in same order as it is set in FieldGenius.
- To check or change this setting go to:
Main Menu | Settings | Options | Point Attributes



1. Select you upload file.
(N, E, H, Description – *.txt)
2. Select file delimiter.
3. Import the file



4. Import status



To check if the coordinates have been imported correctly open point database.

- by selecting Users define button in the Map View
- Main Menu | Data Manager | Point Database



The screenshot shows a window titled "Point Database" with a table containing three rows of data. The table has five columns: "Point ID", "Northing", "Easting", "Elevation", and "De". Below the table is a toolbar with buttons for "Edit", "Delete", "Add", "Find", and a red "X" button.

Point ID	Northing	Easting	Elevation	De
1	10.000m	20.000m	5.000m	IP
2	14.004m	20.000m	5.200m	
3	15.254m	18.759m	6.027m	

Total Station Setup

Backsight by 1 point or Direction

Use this command to specify the instrument location and orientation. You will be asked to specify the point your instrument is occupying, an instrument height and if you will be assuming a backsight direction or sighting an existing point. After you have established your setup and backsight, FieldGenius will graphically show you your setup points.

To access the function: → MAIN MENU | Measure Modes | Setup & Check | Backsight by 1 point or Direction
 or
 → Current Measure Mode | Measure Modes | Setup & Check | Backsight by 1 point or Direction

Use this command to specify the instrument location and orientation.

1. Specify the point number your instrument is occupying
2. Specify instrument height
3. Specify the Backsight point number
4. Specify the Backsight Height of Target
5. Open Target Manager Dialog to specify you Backsight Target (See more details on page 11)
6. Select OK

Observe Backsight

- Check your Target settings in Total Station Toolbar (Currently used Leica Circle Prism, Height of target 20 cm, EDM mode: IR Standard)
- Toggle Measure Button from Total Station Toolbar to trigger the measurement.

Note: If the instrument is currently locked  to the wrong target, you can double click the green arrows and the instrument will search for next available target. If you want to manually aim the target, single click on green arrows will break the lock to the current target.

Orientation Result

1. Review your Backsight Observation such as Horizontal Angle, Zenit Angle, Slope Distance, Horizontal Distance, Height of Instrument, Height of Target)
2. Check Backsight Errors
3. Set the Instrument plate reading (Set to Direction, Set to Zero, Do Not Modify)
4. Accept (or Observe Again if needed)

Total Station setup completed. Instrument is ready for sideshots surveying (page 28).

Resection

Instrument is set on unknown point. Measure at least 2 known points to determine the instrument location.

To access the function: → MAIN MENU | Measure Modes | Setup & Check | Resection

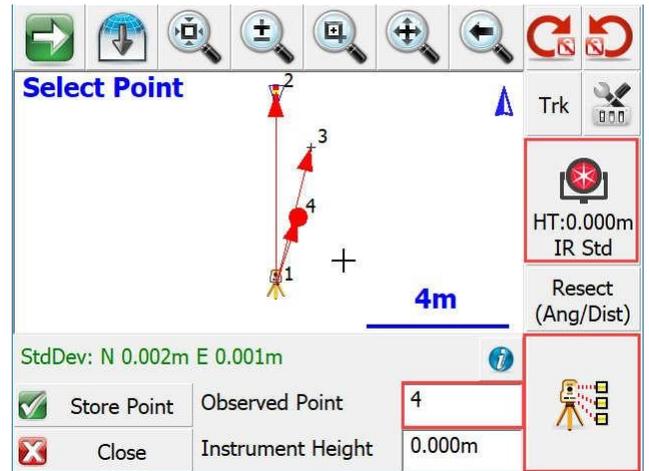
or

→ Current Measure Mode | Measure Modes | Setup & Check | Resection

Resection - Point observations

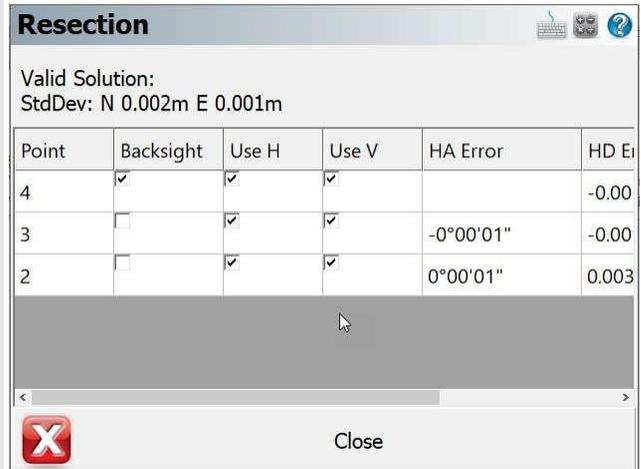
1. Open Target Manager - set Foresight target type and height
2. Enter Observed point number
3. Trigger measurement

Repeat to all points you want to include in resection.



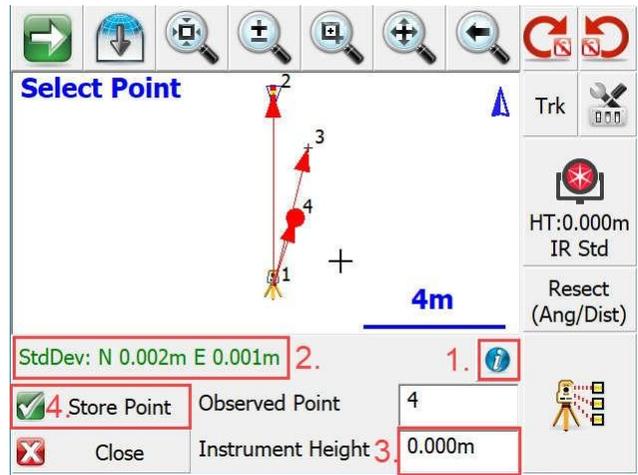
Resection – Review solution

- Select Information Button  to review resection solution values.
- Use check boxes what measurements you want to include or exclude from calculation.
- Select what point will become your backside (it is the first measured point by default)



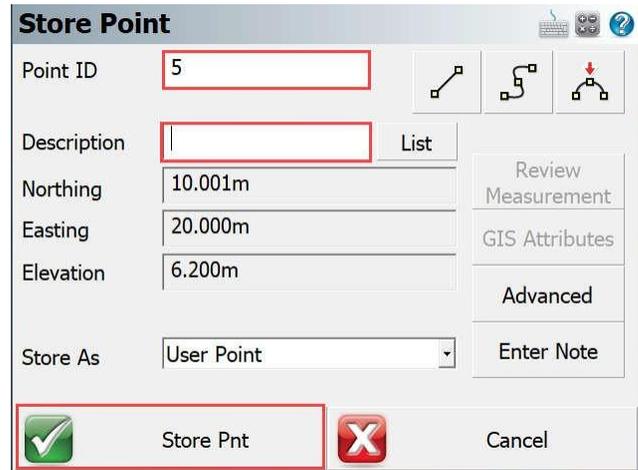
Resection – Accepting Solution

1. Information Button (location of Info button described in previous step)
2. Standard deviation in horizontal position of new calculated point (your instrument position)
3. Enter instrument height
4. Store the point



Resection – Storing Point

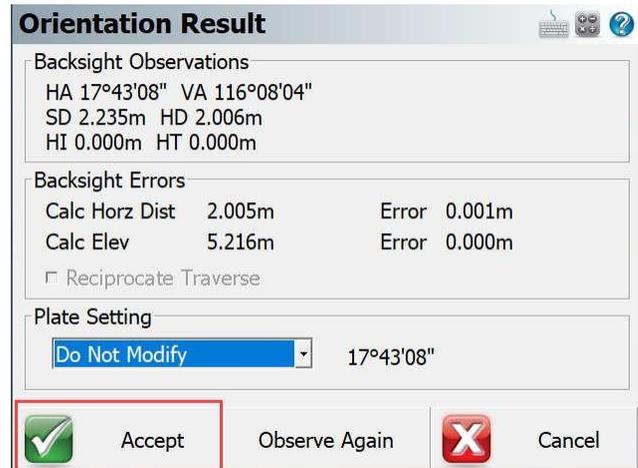
1. Enter point number or use next available.
2. Enter point description or list the point description from the Library.
3. Store the point.



Resection – Orientation Result

1. Review your Backsight Observation to the point number you selected while reviewing Resection solution (point 4 in this example)
2. Check Backsight Errors
3. Set the Instrument plate reading. (Set to Direction, Set to Zero, Do Not Modify)
4. Accept

Total Station setup completed. Instrument is ready for sideshots surveying (page 28).



Sideshot

This mode allows you to measure points in three different modes (Sideshot, Sideshot (Auto Store, Temporary (No Store))).

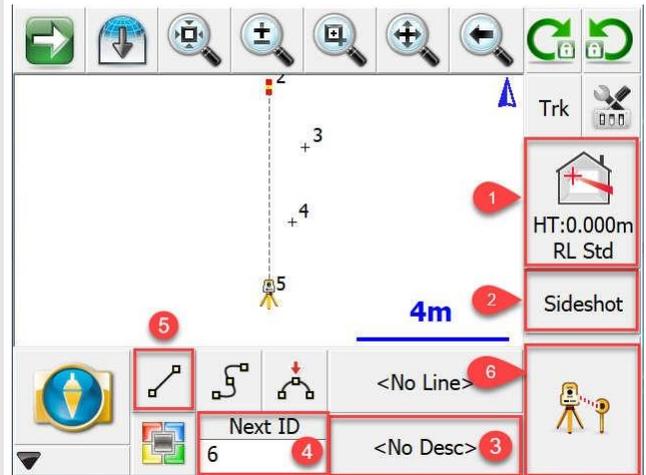
To access the functions: → MAIN MENU | Measure Modes | Sideshot, Sideshot (AS), Temporary (NS)

or

→ Current Measure Mode | Measure Modes | Sideshot, Sideshot (AS), Temporary (NS)

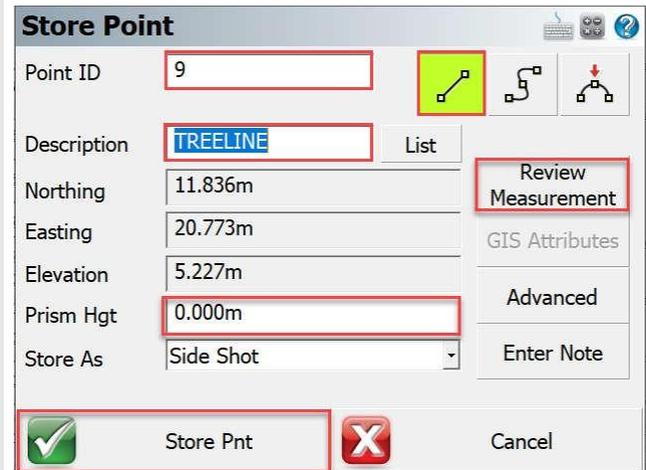
1) Sideshot (prompt before storing point)

1. Open Target Manager to set Foresight Target type and Target Height
2. Select Measure Mode
3. Select Point Description
4. Select desired point ID
5. Start Line work (if needed)
6. Trigger the measurement



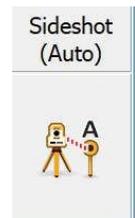
Sideshot – Store Point

1. Option to modify Point ID
2. Option to include/exclude point to/from line work
3. Option to modify point Description
4. Option to modify Target Height
5. Option to Review Measurements (HA, VA, SD, HD, VD, N, E, H)
6. Store Point to the Point Database



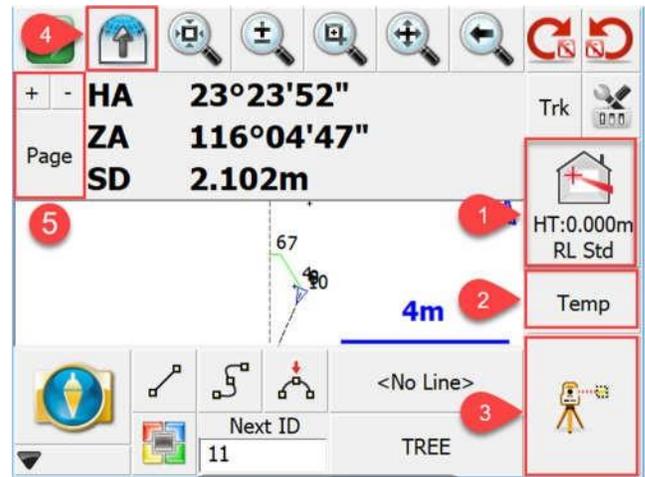
2) Sideshot (Auto Store)

- Follow the same steps as taking regular Sideshot
- After measurement is taken, there is no prompt screen to modify your point afterwards



3) Temporary (No Store)

1. Open Target Manager to set Foresight Target type and Target Height
2. Select Measure Mode
3. Trigger measurement
4. Expand Observation Toolbar
5. Page between observations and calculated values
 1st page HA, ZA, SD; 2nd page HA, HD, VD; 3rd page N, E, H
 Use +, - to customize text size



Multi-Set

Multi-Set routine allows you collect Backsight and Foresight data in both faces of telescope to increase the measurement accuracy.

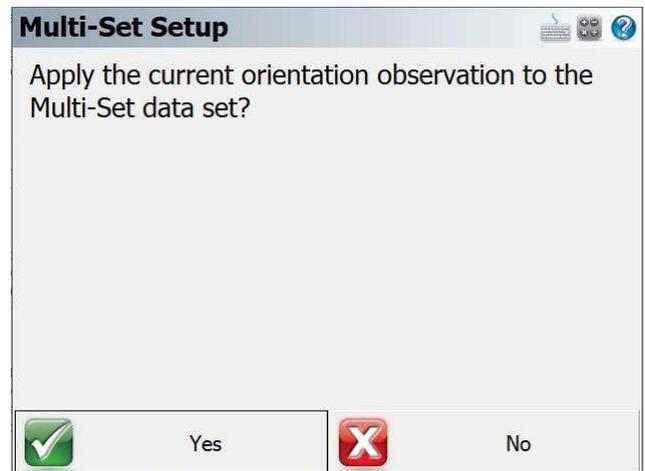
The Multiset routine in FieldGenius allows you to record angular sets in any order you want. You can also review your measurement's computed average and standard deviation.

To access the function: → MAIN MENU | Measure Modes | Multi-Set
 or
 → Current Measure Mode | Measure Modes | Multi-Set

Multi-Set – Setup

Apply the current orientation observation to the Multi-Set data set?

- If YES – previous set up will be applied to Multi-Set routine (not recommended)
- If NO – there will be Orientation Setup prompt screen



Multi-Set – Orientation Setup

Option NO (not to apply Orientation Setup) was selected.

1. Specify the point number your instrument is occupying.
2. Specify Instrument height
3. Specify the Backsight point number.
4. Specify the Backsight height of Target.
5. Select Continue Multi-Set

Multi-Set – Point List

Add Foresight point(s) to the point list.

1. Next button - gives next available point ID
2. Add button – add point(s) to the point list
3. ✓ Check Auto Turn (robotic instruments only) to automatically rotate between faces
4. Select (highlight) the point row to you want to measure first
5. Notice that there are no observations recorded (F1 – Face I, F2 – Face II)
6. Select Measure to go to Measure Screen

Pnt	Type	Obs F1	Obs F2	Saved
2	BS	0	0	N/A
3	FS	0	0	

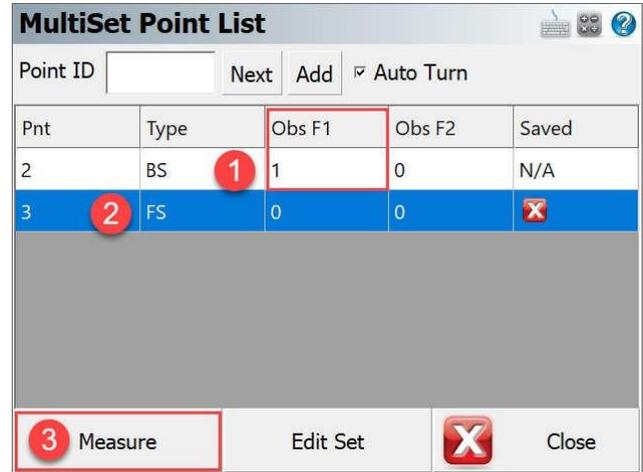
Multi-Set – Backsight Observation

1. Check Map screen for point ID before taking shot
2. Option to use PowerSearch to find the target
3. Set your prism type and target height
4. Trigger the measurement

After the shot is taken, FieldGenius will automatically open MultiSet Point List Screen.

Multi-Set – Point List

1. Notice first observation in the first face of telescope to the Backsight has been taken
2. Select point 3 (row will highlight blue)
3. Select Measure to go to Measure Screen

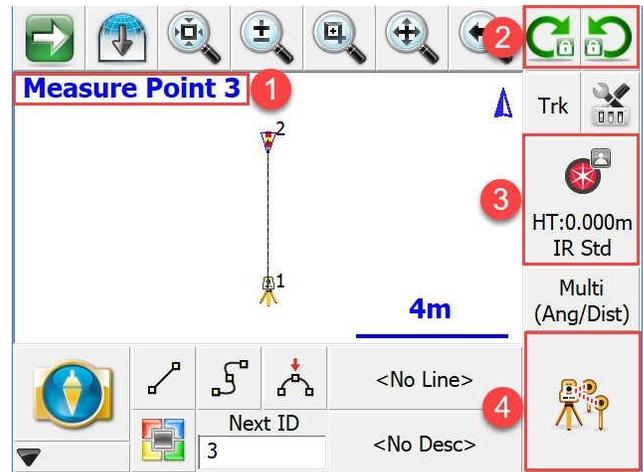


Multi-Set – Foresight Observation

1. Check Maps screen for point ID before taking shot
2. If the instrument is lock to the Backsight target you can use double-click to search for the next target
3. Set your Foresight prism type and target height
4. Trigger the measurement

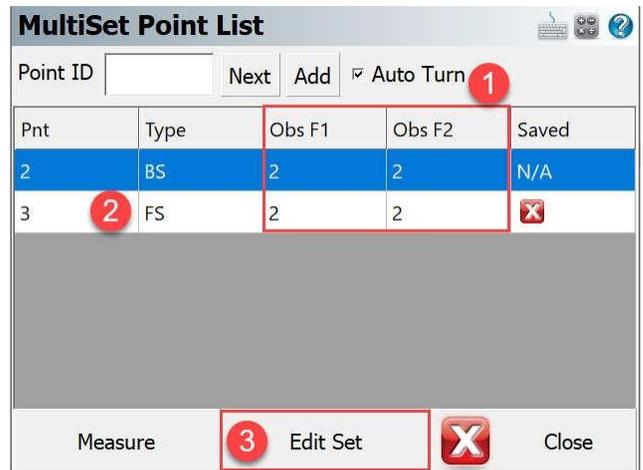
After the shot is taken, FieldGenius will automatically open MultiSet Point List Screen.

Repeat the process of taking shots until all desired measurement are taken. Robotic instruments will automatically rotate between the points.



Multi-Set – Point List

1. Two sets of two points have been completed. 4 observations to each point (2x Face I, 2x Face II)
2. Highlight point 3 row
3. Select Edit set to review observations and to store the foresight point



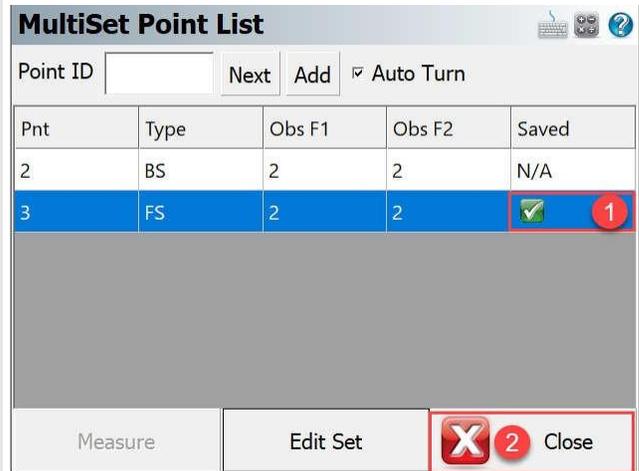
Multi-Set – MultiSet Observations

1. Use Check boxes to include/exclude the measurements from calculation
2. Is showing how many F1 (Face I) and F2 (Face II) observations have been used for calculation of point 3
3. Standard deviation of all used measurements to point 3
4. Averaged measured values calculated based on 2 sets of measurement
5. Angle calculated between Backsight (pt2) and Foresight (pt3)
6. Store Point to Point Database



Multi-Set – MultiSet Observations

1. Make sure the point has been stored (Green check mark)
2. Close the Multi-Set Application to return to the Map View



Offset Measurement

FieldGenius allows you to perform a variety types of offsets. The most common such as Distance offset and Horizontal Angle offset will be described.

Distance Offset

A distance offset allows you to specify an offset forward or backward along the line of sight, left or right, and vertically up or down from instrument or prism view

To access the function: → MAIN MENU | Measure Modes | Offsets | Distance Offset
or

→ Current Measure Mode | Measure Modes | Offsets | Distance Offset

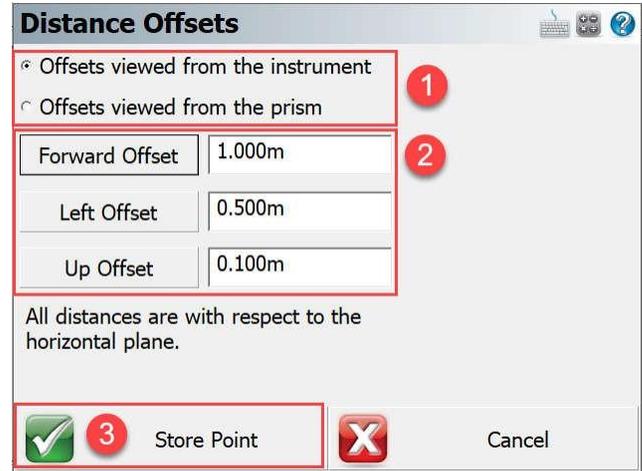
Distance Offsets button

Trigger the measurement to the offset



Distance Offsets

1. Select one of the following options
2. Define desired offsets
Use toggle buttons to switch between the directions
3. Store the offset point to the point database



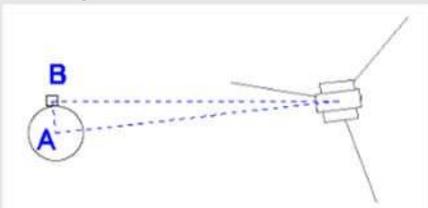
Horizontal Angle Offset

FieldGenius includes a flexible angle offset routine. It allows you to shoot the angle and distance to a point that cannot be occupied by the rod. An example of where you would use this is if you wanted to record the center of a large object, such as a tree.

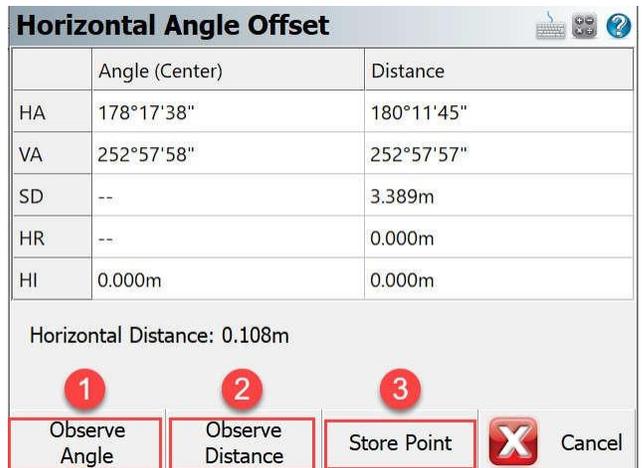
When you choose the Horizontal Angle Offset Measure Mode you will see the following screen. To access the function: → MAIN MENU | Measure Modes | Offsets | Horizontal Angle Offset

or
→ Current Measure Mode | Measure Modes | Offsets | Horizontal Angle Offset

Horizontal Angle Offset



1. Observe Angle (A) - aim center of the object without target
2. Observe Distance (B) - place prism perpendicular to the measured object
3. Store point



Staking

Point Staking

Use this to stake points from a list or from a screen selection.

- To access the Function:
- 1) Main Menu | Staking | Stake Point
 - 2) Current Measure Mode | Staking | Stake Point
 - 3) Select point to stake in Map View → Point Toolbar | Stake

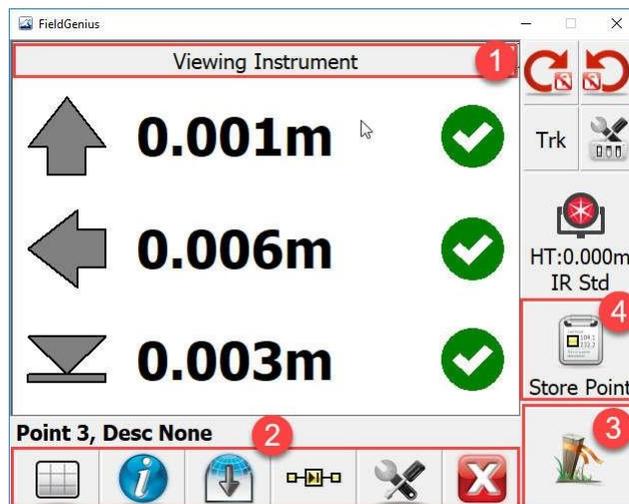
Staking – Point Staking

1. The Point ID of the point to be staked
2. Navigate between points to stake and option to create the Stake List (more information about Stake List on page 35)
3. This will calculate offset from your design point. Keep zero value for no offset.
NOTE: The Multi-Offset Mode allows the user to compute and stake multiple offsets from a single point without having the Point ID automatically increment.
4. Stake the Point when ready.



Staking – Point Staking Screen

1. Pick this button to select the View Direction.
2. The Staking Toolbar provides access to:
Staking Method – Toggle between Grid, Compass, or Map View.
Staking Information – Displays direction to the point
Observation Toolbar – Toggles the display of the observation toolbar if Map View is selected
Next Point – Select the Next Point to stake, from a variety of options
Staking Options – to configure Staking function
Close – Close the Staking Interface.
3. Measure Button starts a measurement
4. After finding desired position select Store Point

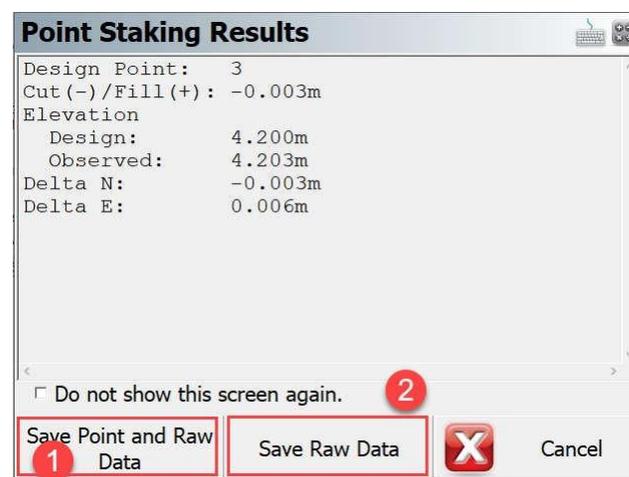


Staking – Point Staking Results

Select one of the following options (1 or 2) to Save the data.

or

select Cancel to return to the Point Staking screen



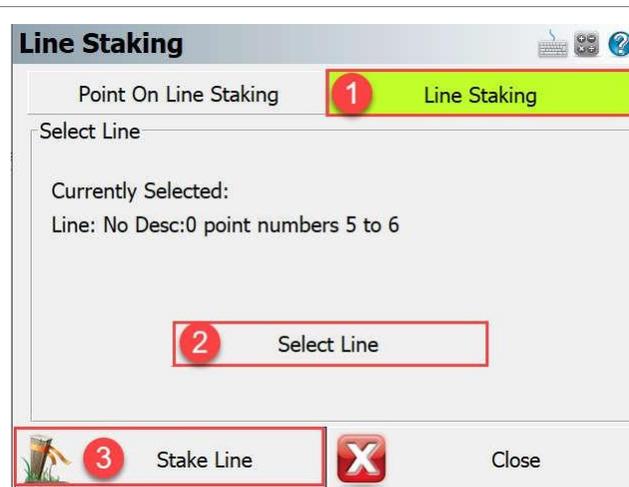
Line Staking

Use this function to stake lines and arcs, or points on line in desired interval and offset.

- To access the Function:
- 1) Main Menu | Staking | Stake Line
 - 2) Current Measure Mode | Staking | Stake Line
 - 3) Select line to stake in Map View → Point Toolbar | Stake

1) Staking – Line Staking – Line Staking

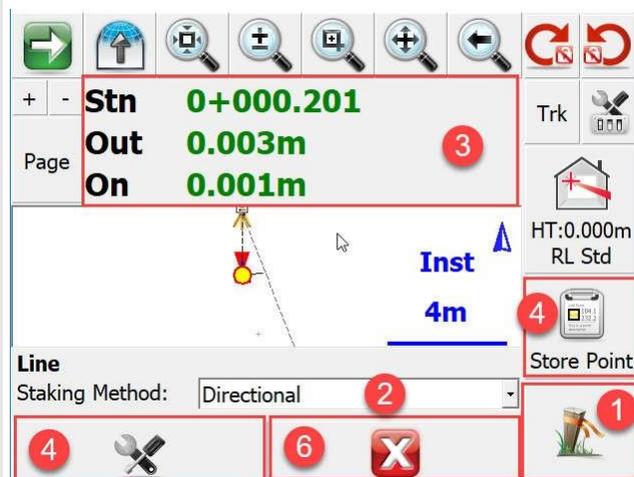
1. Select Line Staking Option
2. Select line to stake out
3. Select button Stake Line



Staking – Line Staking Screen

1. Select Measure Button to take a measurement
2. Select method how the values in Observation Toolbar will be displayed
 - **Directional** – displays offset values based on Orientation settings of your instrument (eq. Instrument, Prism, Cardinal etc. – to change this setting press the wrench key button (4))
 - **Stationing – Absolute** – displays offset values where target (rod) is located from the line (Offset R 0.200m*)
 - **Stationing – Relative** - displays offset values to move the target (rod) to get on the line (Left 0.200m*)

**Note: Both values represent the same offset*
3. Review observations values
4. Store point (the same dialog follows as for Point Staking)
5. Staking Options – to configure Staking Function
6. Close – Close the Staking Interface

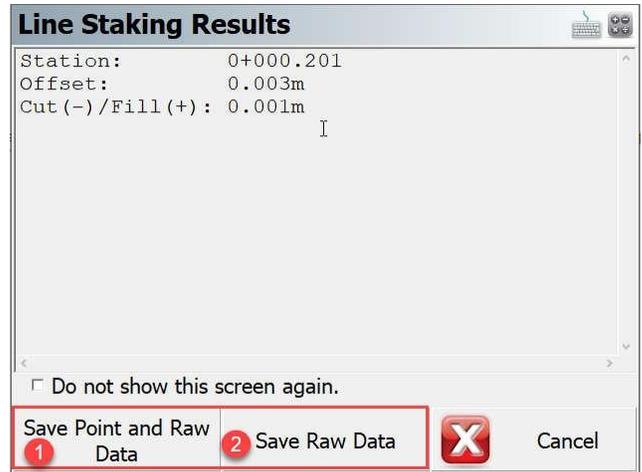


Staking – Line Staking Results

Select one of the following options (1 or 2) to Save the data

or

select Cancel to return to the Point Staking screen



2) Staking – Line Staking – Point on Line Staking

1. Select Point on Line Staking Option
2. Set interval in which points on line needs to be staked
3. Use Prev and Next buttons to navigate between the points along the line
4. Define line offset if needed
5. Specify direction of the offset
6. Select Stake Point to go to Line Staking Screen



Staking – Point on Line Staking Screen

1. Check stationing and offset of the point to stake out
2. Select Measure Button to take a measurement
3. Select method how the values in Observation Toolbar will be displayed
 → **Directional** – displays offset values based on Orientation settings of your instrument (eq. Instrument, Prism, Cardinal etc. – to change this

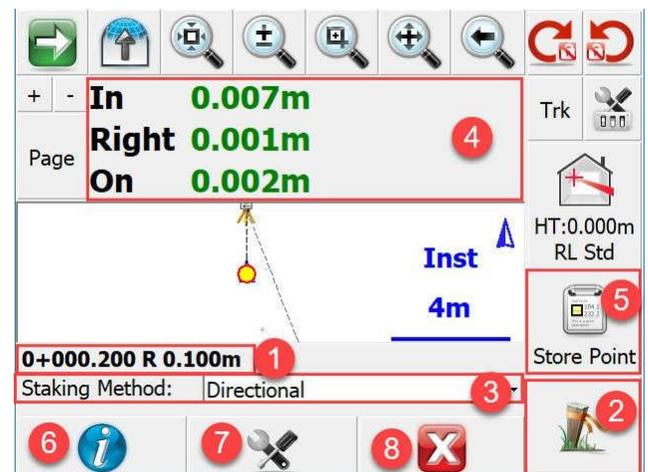
setting press the wrench key button (4))

→ **Stationing – Absolute** – displays offset values where target (rod) is located from the line (Offset R 0.200m*)

→ **Stationing – Relative** - displays offset values to move the target (rod) to get on the line (Left 0.200m*)

**Note: Both values represent the same offset*

4. Review observations values



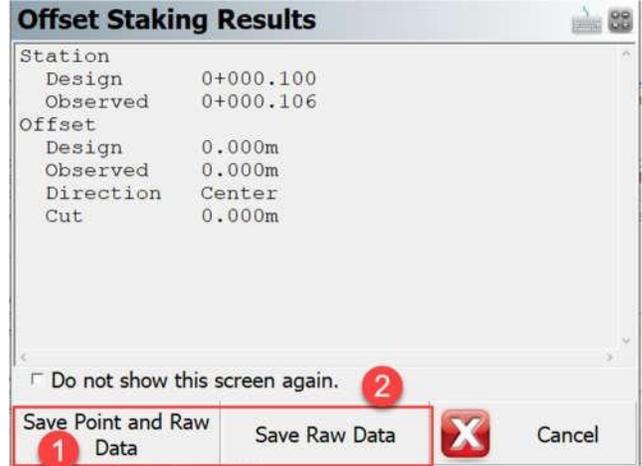
5. Store point (the same dialog follows as for Point Staking)
6. Staking Information
7. Staking Options – to configure Staking Function
8. Close – Close the Staking Interface

Staking – Line Staking Results

Select one of the following options (1 or 2) to Save the data

or

select Cancel to return to the Point Staking screen



Staking List

Use a staking list to designate a subset of points from your database for staking. This function helps keep data well organized. The staking list allows you to sort the points by point ID or by shortest path.

- To access the Function:
- 1) Main Menu | Staking | Stake Point | Staking List
 - 2) Current Measure Mode | Staking | Stake Point | Staking List
 - 3) Select point to stake in Map View → Point Toolbar | Stake | Staking List

Staking – Point Staking – Staking list

1. Choose one of the following options to add points to the Staking List (**Find Points** – options to select multiple points (see more details on page 38) or **Select Point** for individual point selection)
2. Select how the points in stake list will be sorted **By Point ID** or **By Shortest Path**
3. Option to sort the points manually
4. Option to remove points individually or clear the Staking List
5. Select point to stake out and press Stake Pnt button
6. Check status of your points

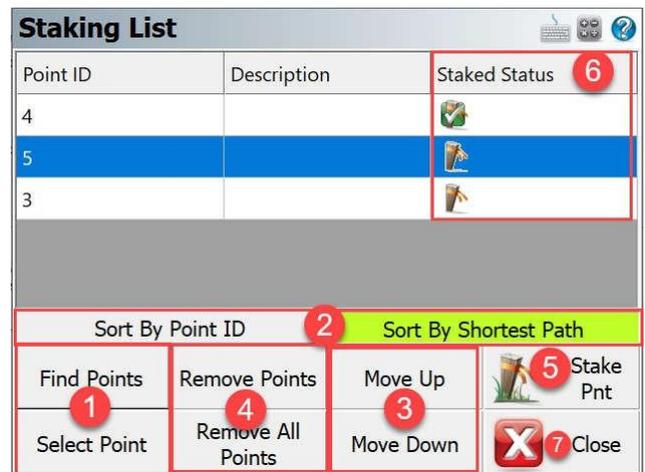


point to be staked out



point already staked out

7. To Close the Staking List



Staking list – Find Points – Point ID

Find points button opens the dialog to find points based on the Point ID which includes three options how to select points

1. Select an Area - based on a window crossing in the map view screen,
2. by point ID range
3. By a single point and radius

Staking list – Find Points – Coordinate

Find points button opens the dialog to find the points based on the Point ID, you can toggle between find points by specific **Coordinate** option or search for specific Description.

Staking list – Find Points – Description

Find points button opens the dialog to find the points based on the Point ID, you can toggle between find points by specific Coordinate option or search for specific **Description**.

Appendix

Additional Resources for FieldGenius.

Online Manual

A version of the complete FieldGenius manual is available online at:

<http://s3.microsurvey.com/fieldgenius/Help/Default.htm>

Movies

A selection of instructional videos for FieldGenius are available online at:

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/149>

Helpdesk

Contact MicroSurvey Support through the MicroSurvey Helpdesk at:

<http://helpdesk.microsurvey.com/>

Automap Libraries

The Automap system is used in MicroSurvey field and office software:

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/1306>

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/1350>

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/1543>

Project Settings

A FieldGenius project is created with some default settings. It is important to set the defaults to suit your most frequent requirements. These defaults typically will only need to be configured once.

Units and Scale

The Distance and Angle Unit must be set when a project is created and cannot be modified once created.

Distance Unit

Choose from Meters, International Feet, or US Survey Feet.

Distance Format

Choose from Decimal or Fractional format if the distance unit is set to International Feet or US Survey Feet. Meters are always decimal.

Distance Precision

Choose distance precision for decimal format.

Angle Unit

Choose from Degrees, Gons, or Radians.

Angle Format

Choose from DDD°MM'SS", DDD°MM.m' or DDD.d° format if the angle unit is set to Degrees. Gons and Radians are always decimal.

Angle Precision

Choose angle display precision.

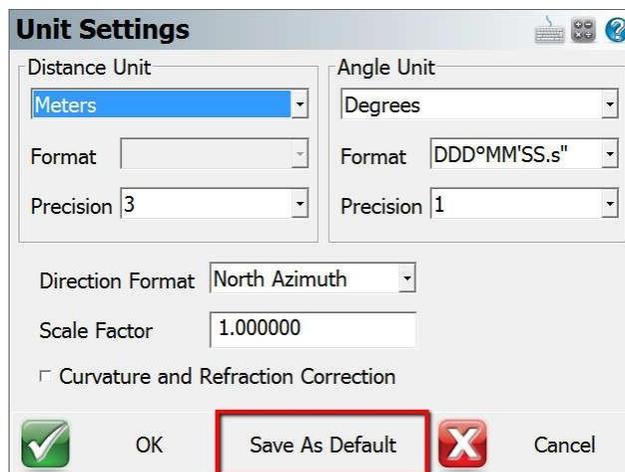
Direction Format

Choose from North Azimuth, South Azimuth or Bearing for direction input/output format.

Scale Factor

The Scale Factor value is applied to:

- Distances measured with a Total Station to compute scaled coordinates. Raw values are not affected.
- Distances entered for COGO calculations.
- Distances computed from COGO calculations, the inverse of the scale factor is applied.



*Use the **Save As Default** option to permanently set the current settings as default values for future projects.*

Coordinate System

Coordinate system settings can be modified after a project is created, however setting the most suitable default eliminates the need to change it for each project.

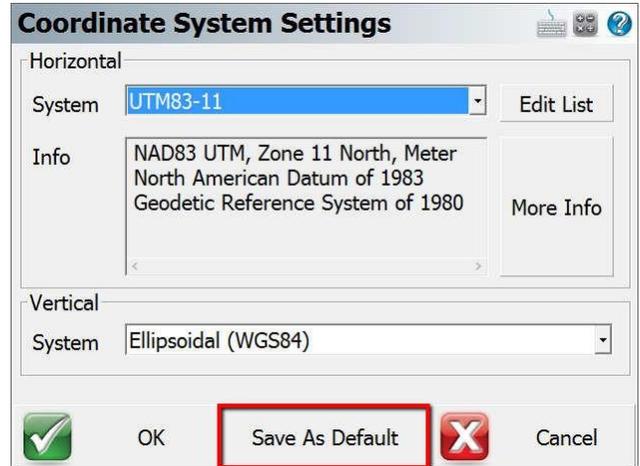
Horizontal System

Choose the horizontal projected coordinate system for your project from a list of coordinate systems.

Use the **Edit List** option to add or remove coordinate systems from the list of favourites. Use the steps outlined below to add a coordinate system to the list.

Vertical System

Choose the vertical datum for your project from a list of available options. The list will always contain Ellipsoidal (WGS84) and all available geoid models. See the [Appendix](#) for more information about Geoid Models.



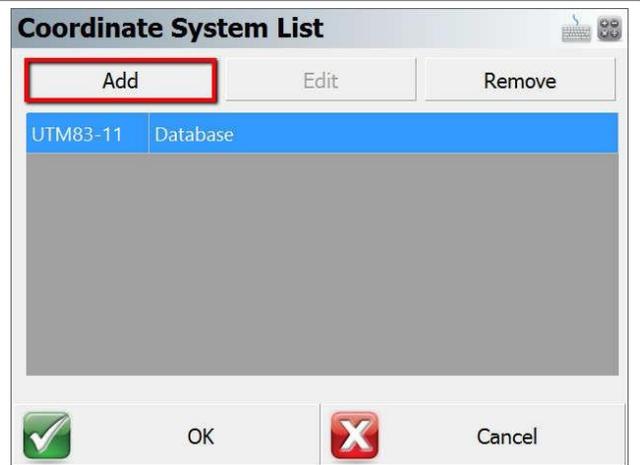
*Use the **Save As Default** option to permanently set the current settings as default values for future projects.*

Add Coordinate System to List

Pick **Edit List** to edit the Coordinate System list, then:

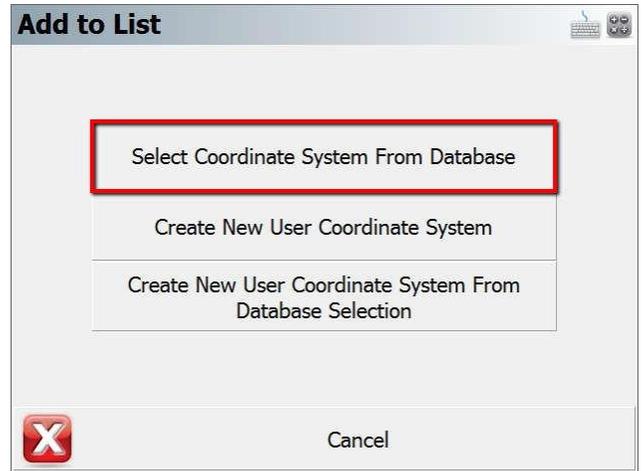
Add New Coordinate System

- From the Coordinate System List choose "Add"



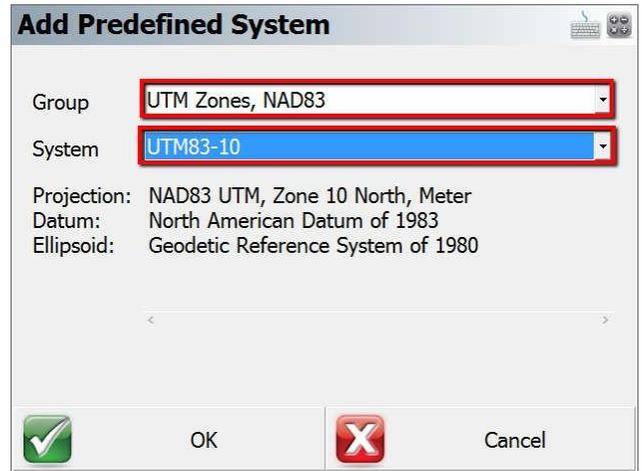
Select Method

- Choose “Select Coordinate System From Database” to add a predefined coordinate system



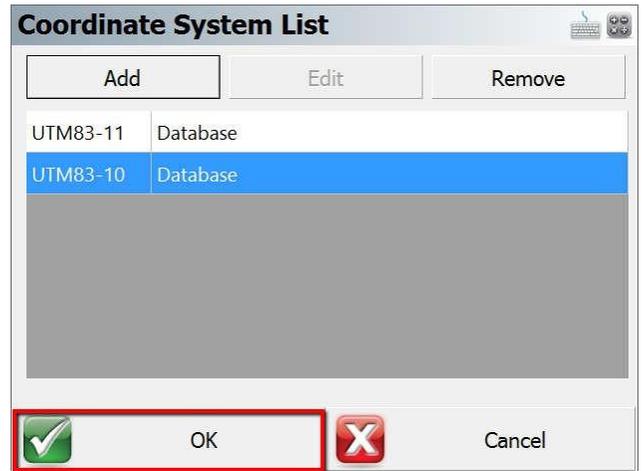
Select System

- Choose the appropriate group that applies to the coordinate system
- Choose the coordinate system from the group



Add to List

- Pick “OK” to add the coordinate system



Project Files

Each FieldGenius project is made up of multiple files, some of which can be copied from templates and/or another project. For many users, it may not be necessary to change any of these options when creating a new project.

Active Raw File

The active raw file is used to write all measured observation values in real time. It is possible to have many raw files associated with a project, for example a new file for each day on a site. The **Generate New Name** button can be used to append the date and time string to the project name.

The raw file can be **Encrypted** so only MicroSurvey desktop software can read the files. The encryption toggle is retained until manually changed.

An existing raw file can be copied from another project and optionally point coordinates generated from that raw file.

Project Automap

Automap libraries contain predefined point descriptions with associated point symbols, colour, layer, linework and DTM properties. FieldGenius includes a sample Automap file to demonstrate the system (survey.csv). It is suggested to create a template that can be used for all projects, or a few templates for different categories of projects. See the [Appendix](#) for more information about Automap libraries.

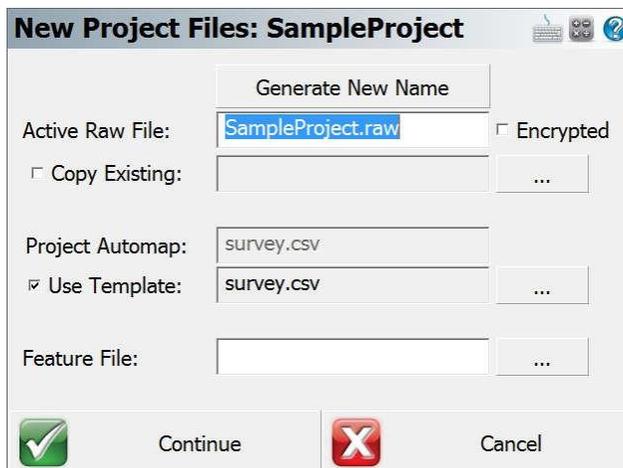
Feature File

Adding a feature file to a project allows GIS feature and attribute collection for points and figures. See the [Appendix](#) for more information about feature files.

Project Files Descriptions

FieldGenius projects are folders containing at least 7 files as described below.

ProjectName.cdx	Index file of coordinate database
ProjectName.dbf	Coordinate database
ProjectName.ini	Project Settings and Information
ProjectName.raw or ProjectName.rae	Raw measurement observations, encrypted raw files have a rae extension. Note: Projects can have multiple raw files.
ProjectName _figures.cdx	Index file for the figures database
ProjectName _figures.dbf	Figures database
ProjectName _automap.csv	Automap Library for the project



Project Information

The Project Information dialog is used to record information relevant to the project. This information is simply for record keeping.

Project Information

Crew Members

Instrument

Serial Number

Temperature

Pressure

PPM

Note 1

Note 2

OK Cancel

Leica Prism Constant Offset vs. Actual Prism Constant Offset

1. If you are using Leica Total station with Non-Leica prism, you need to use:
Leica Offset = Absolute Offset + 34.4 mm
2. If you are using non-Leica Total Station with Leica prism, you need to use:
Absolute Offset = Leica Offset - 34.4 mm

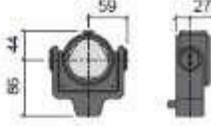
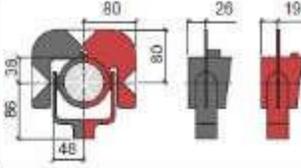
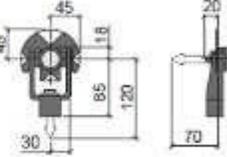
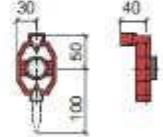
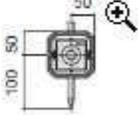
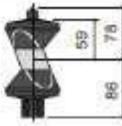
Prism Model	Leica Offset	Actual Offset	
GPH1P	0.0	-34.4	
GPR121 GPR111	0.0	-34.4	
GMP101	+17.5	-16.9	
GMP111 GMP111-0	+17.5 0.00	-16.9 -34.4	
Reflective Tape	+34.4	0.0	
CPR 105	+34.4	0.0	
GRZ4	+23.1	-11.3	
GRZ122	+23.1	-11.3	
GRZ101	+30.0	-4.4	

Photo Credit: <https://www.lasersurveyingequipment.com.au/latest-news/42/leica-prism-constant-explained.html>