

GNSS QUICK START GUIDE

Reference Guide for FieldGenius for Android GNSS Set Up

MicroSurvey
FieldGenius for
Android

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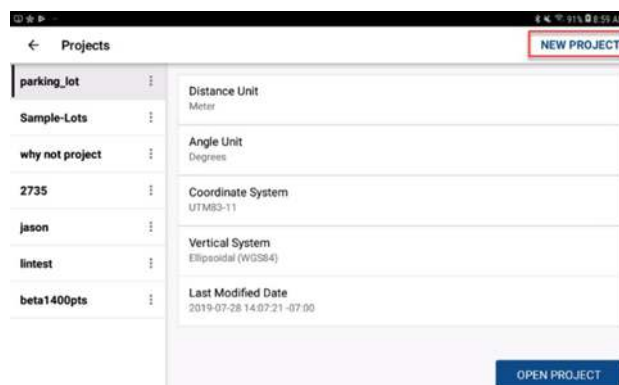
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Part 1 – Create a New Project

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

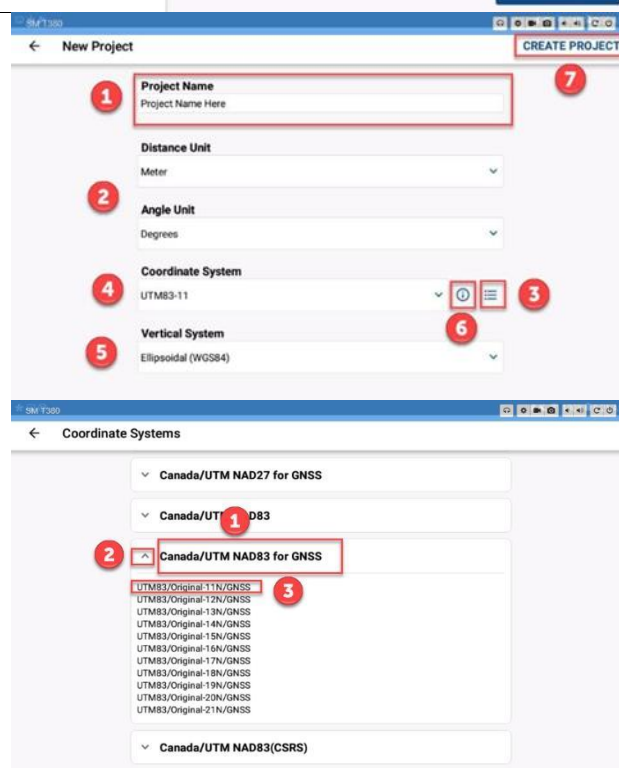
Create a new project.

1. From the “Projects” screen, select the “New Project” button.



Configure and Save a New Project.

1. Enter a name for your project.
Note: No spaces are currently allowed in the project name.
2. Select the Units, Coordinate System and Vertical System.
3. Tap the list button and select the country that the work is being conducted in.
 - 1. Select Country
 - 2. Select arrow to expand list
 - 3. Select Horizontal System
4. Tap the Horizontal System to select
5. Tap the Vertical System to select
6. Tap the “i” button to review.
7. Tap “Create Project” to save your new project to the Project List.
Note: To cancel without setting up a new project, tap the back arrow button.



Project Settings

A FieldGenius for Android project needs to have the Units and Coordinate System defined during the “New Project” configuration. Use the drop-down menus to select the appropriate Units and Coordinate System for your project.

Units and Scale

The Distance Unit 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

Angle Unit

Angular Units are set to Degrees. (Only degrees are supported at this time.)

Coordinate System

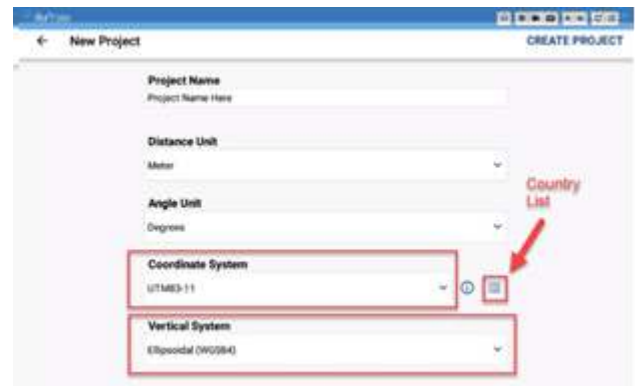
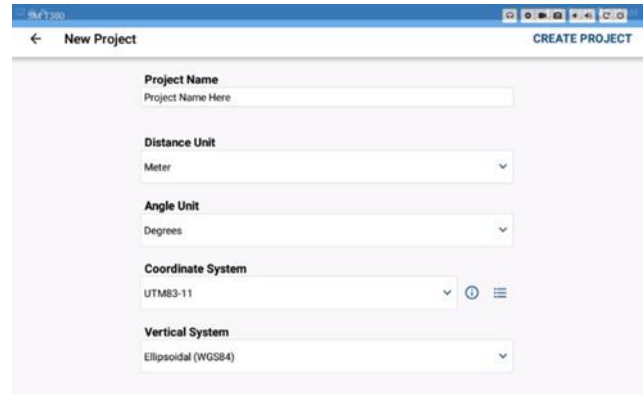
The project Coordinate System is selected during the new project configure and cannot be modified after a project is created. The Horizontal Projected Coordinate System for your project will be listed in the drop-down list of Coordinate Systems. To view a list of previously selected Coordinate Systems, tap on the drop-down list. To select a Coordinate System not shown in the drop-down list, select the Country List to view all available Coordinate Systems. You can tap the (i) button to see more details on the selected Coordinate System.

Country List

If your Coordinate System is not shown in the Coordinate System drop-down list, select the list icon to the right of the Coordinate System drop-down list. You can select the country you are working in from the list and then select the appropriate Coordinate System from the list. If you do not see your Coordinate System, you can [create a User Defined Coordinate system](#) by entering projection parameters and a datum shift equation (if required). *This feature does not support grid file-based datum shifts.*

Gridshift Catalog

Some coordinate systems will require the download of a grid shift file. View the grid shift catalog for a list of gridshifts available for download. If you are not able to locate the gridshift file you require use the Feedback option in the settings menu to contact support so we can develop this gridshift and add it to the catalog.



Vertical System

Select the Vertical Datum for your project from the catalog of available options. The catalog will always contain Ellipsoidal (WGS84) and all available Geoid Models.

See the Appendix for more information about Geoid Models.

Code List

Use the drop-down selector to select the code list library required for the project you are configuring.

The code lists are stored using a .ctf file format and are stored in the following file path: Internal Storage>FieldGenius>Configurations.

Feature List

The feature list is an optional file that can be configured for your project if you are required to collect GIS attribute information along with your observations.

Utilize the feature manager to create or edit existing feature files.

Project Files

Each FieldGenius for Android project is made up of multiple files and database records saved in a FieldGenius project folder on the device. The project folder is located at: Internal Storage>FieldGenius>Projects>Project Name.

Project File Descriptions

FieldGenius for Android projects are folders containing at least seven files as described below.

ProjectName.sqlite	Project database records
Survey.xml	Point and line description
Project Settings	Project settings and information
InstrumentProfiles.json	GNSS instrument connection profile information
Tracexxx-xx-xx_xx-xx-xx.txt	Troubleshooting trace file
Map3_datum	Coordinate system datums
Map3_ellipsoids	Coordinate system ellipsoids
Map3_Systems	Coordinate systems

Part 2 – First Time Rover Setup

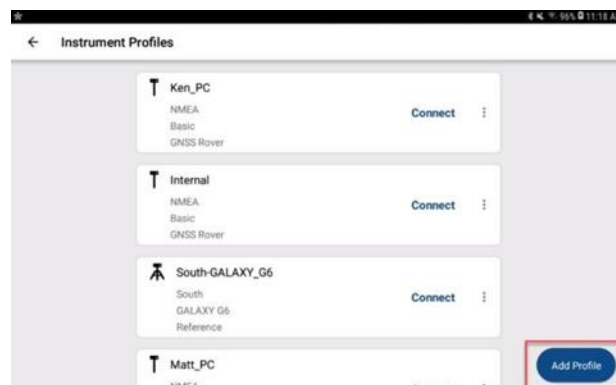
FieldGenius for Android instrument profiles contain settings specific to each instrument. When selecting an instrument profile and connecting to the instrument, all these settings are automatically populated.

Create Instrument Connection Profile

Once you have created and configured your new project, it is time to create your GNSS Rover Profile.

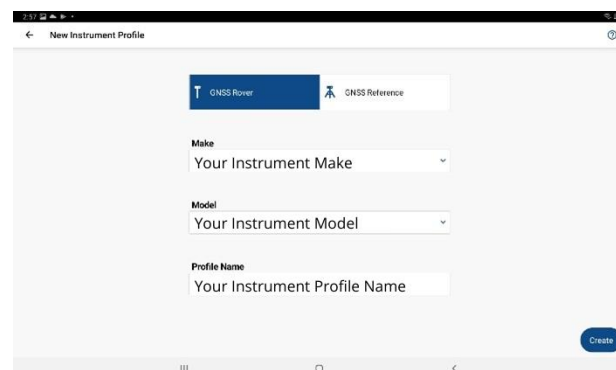
Create a New Profile

1. From the Main Menu, tap “Select Instrument” button.
2. On Instrument Profile page, tap “Add Profile.”



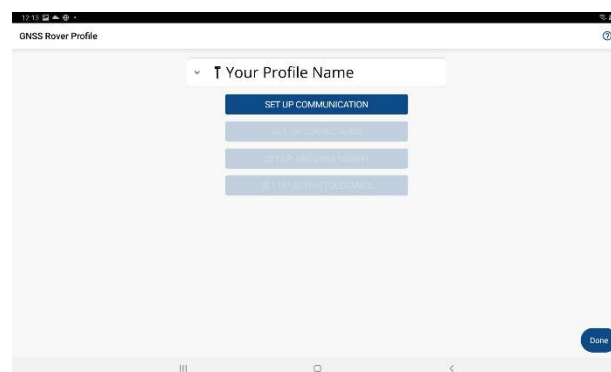
Enter Name and Save

1. Select either GNSS rover or GNSS reference.
2. Select the “Make” of your instrument from the drop-down.
3. Select the “Model” of your instrument from the drop-down.
4. Accept or edit the auto-populated “Profile Name.”
Note: No spaces are allowed in the profile name.
5. Tap “Create”

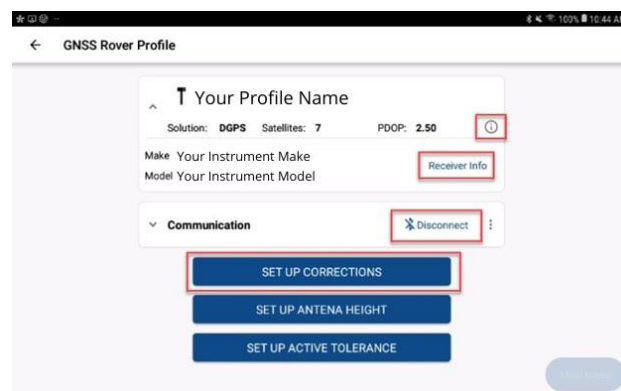
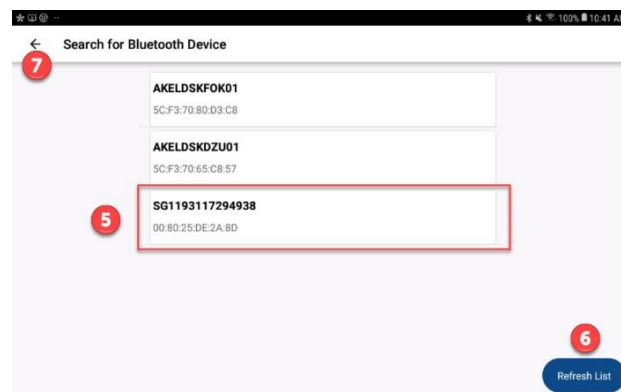


Set Up Communication

1. Tap “SET UP COMMUNICATION.”
2. Connection Type = Bluetooth
3. Tap “Search” to see a list of available Bluetooth devices.
4. A spinning icon will appear while searching for available Bluetooth devices.
5. Select the GNSS receiver as your Bluetooth search for the device.
6. Tap “Refresh List” if the receiver does not appear on the list of devices.
7. Tap the “Connect” button to enable the Bluetooth connection.
 - While connecting, status messages will be shown in the pulsating plumb-bob status pop-up.
 - Once connected you should see the current solution along with satellites and PDOP values.



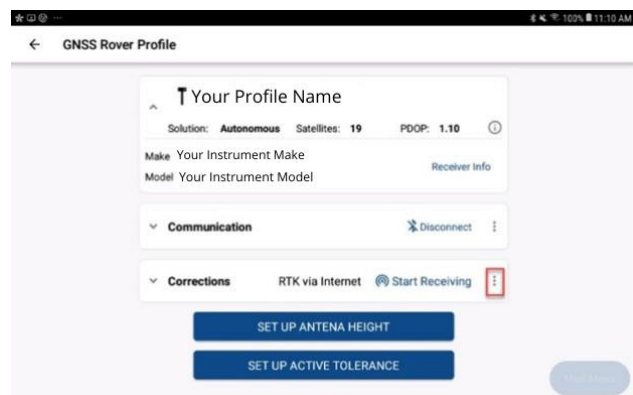
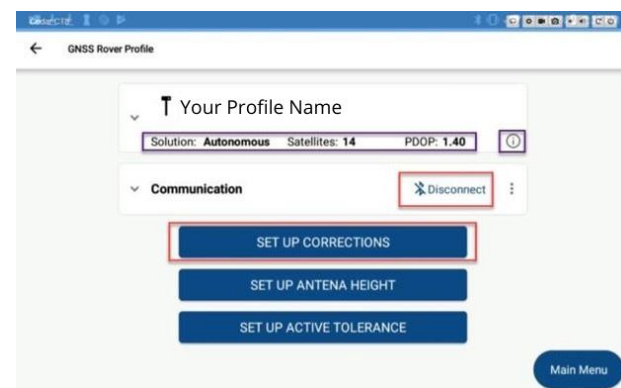
- For current position information, tap on the “i” button.
- Select on the 3-dot menu to access receive information and additional instrument settings.



Setting up Corrections

You should now be connected to the instrument; the next step is to set up your receiver to receive RTK Corrections. Tap the “SET UP CORRECTIONS” button.

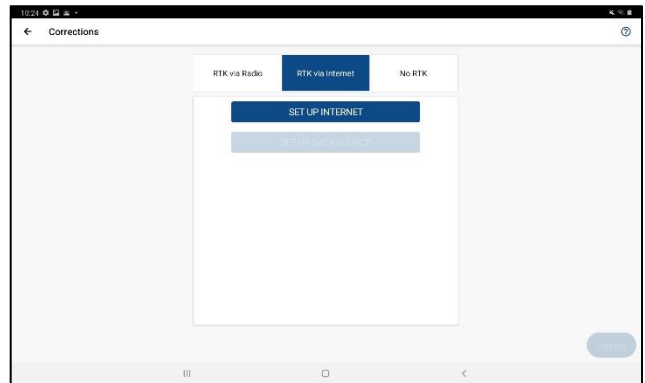
Then choose the method for how you intend on receiving RTK corrections.



Configure Correction Link

When connecting to a GNSS Rover Device, the “Corrections” page will be displayed. Select the method type for how you intend to obtain RTK corrections:

- RTK via Radio: select to obtain corrections from a UHF reference base station.
- RTK via Internet: select to obtain corrections from caster over an internet connection.
- No RTK: select to receive autonomous position locations with no corrections.

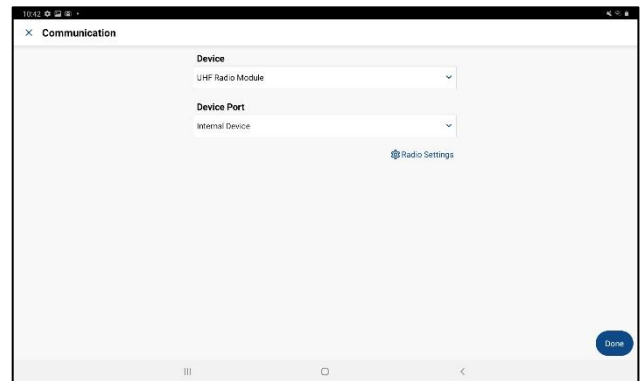


Radio

Tap the “SETUP COMMUNICATIONS” button.

Device Settings

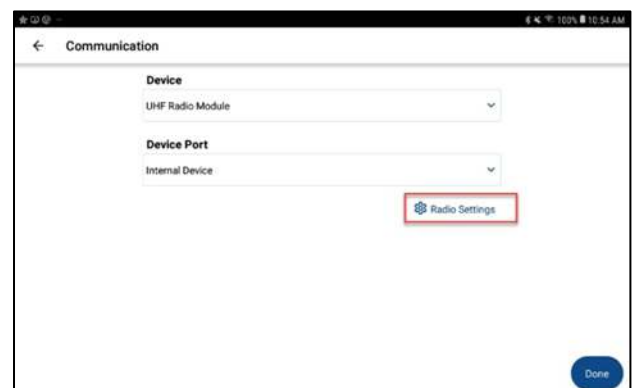
Select the appropriate type of radio from the drop-down list.



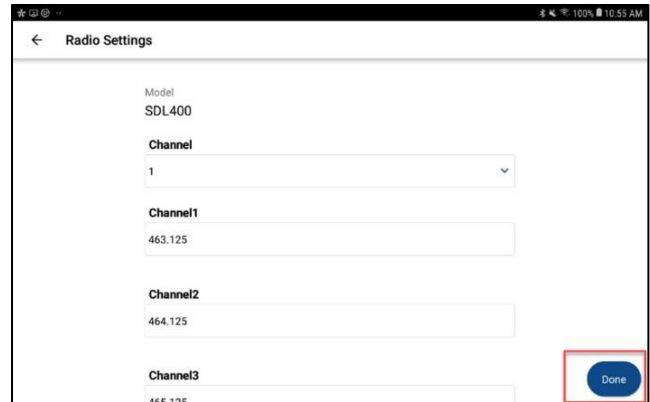
Radio Settings

For radio corrections, choose the appropriate Device and Port from the drop-down menu options. Select “Radio Settings” to review or change the current radio configuration settings. Refer to the Radio Manufacturer for the appropriate settings. Choose the Make and Model from the drop-down menus and set the channel or frequency. On some models, the radio will be automatically programmed by FieldGenius for Android to the correct channel or frequency selected. Configure the radio settings as necessary following manufacturer’s recommendations.

- Configure the radio settings.
- Channel.



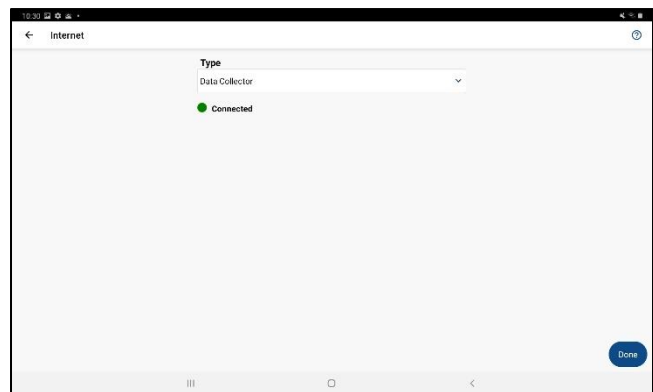
- Channel Spacing,
- Protocol.
- FEC.
- Transmission Power.
- Device Port: select the appropriate port when there are multiple options.



RTK Internet

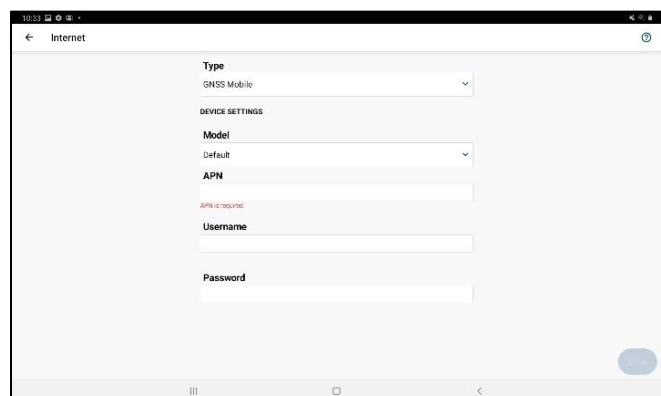
Select the appropriate correction link device type option: Data Collector or GSM Modem.

Data Collector = connects the data collector to the internet using the device manufacturer instructions. The status of the connection, (connected/not connected) will be displayed below the “Type” selection field.



GSM Modem = allows you to set up corrections from a cellular network. You will require the following information before you can configure receiving corrections via GSM.

- Model
- APN
- Username
- Password



Setup the Data Source

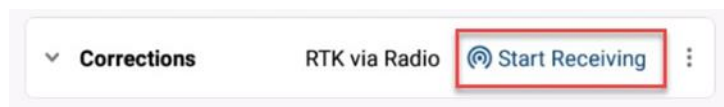
Fill in the correction source fields shown to set the receiver up to receive RTK corrections.

The required NTRIP information:

- Internet address.
- Port.
- Username.
- Password.

Start/Stop Receiving Corrections

Once the corrections are configured, select the “Start Receiving” button to implement processing and the application of corrections to the GNSS position. To terminate applying the corrections, select the “Stop Receiving” button.



Antenna Height

The Antenna Height dialogue allows the user to change the measured height of the antenna and also define a user defined antenna with changed offsets if required.

Model

The preconfigured offsets information of the receiver is stored under the Offsets section.

Select “User Defined” from the model pulldown to manually enter an offset value to change the antenna setting.

Measure Point

Available options vary between receivers.

Tolerance Settings Concepts

FieldGenius for Android can be configured using three tolerance settings that can determine the minimum requirements that must be met for storing a position when the tolerance setting is active. The user can change the active tolerance setting to suit the project requirements.

Default Tolerance settings:

- Autonomous
- RTK Float
- FTK Fixed

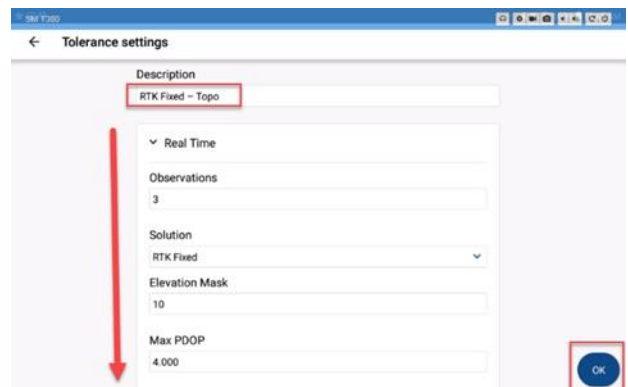
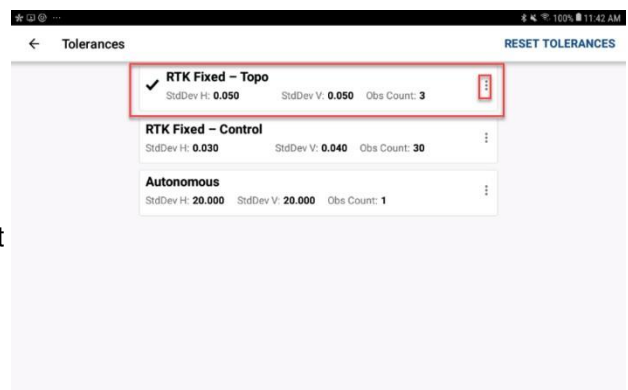
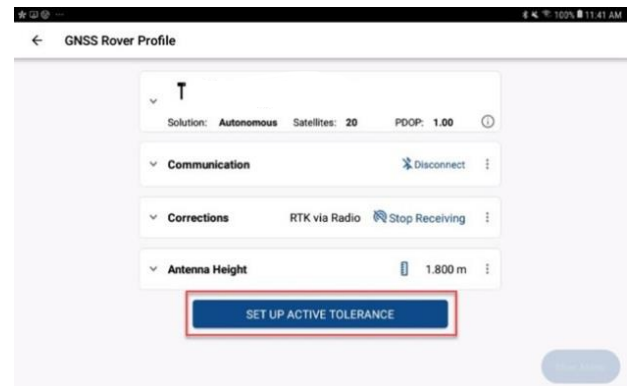
The three tolerance settings each have a default description and various options configured for specific conditions. The available options may vary between GNSS receivers. Tap the desired tolerance panel to select it as the active tolerance to be used by the software. The active tolerance will have a checkmark next to the name.

Active Tolerance

The Active Tolerance is used when measuring points to determine if minimum specifications are met based off the actions taking place. It is a method of ensuring quality of data. If a measured point is out of tolerance, a warning icon will be displayed on the point review screen. The user has the option to re-measure the point or to save the point even though it does not meet tolerance.

Tap the “three-dot” icon to edit the tolerance setting to set custom tolerance values. There is no option to create a new tolerance, only to edit the existing ones to meet your required specifications. You can use the “Description” field to name the tolerance setting. Tap “OK” to save the tolerance values.

Once you are in the Map View, the Observation Toolbar will have a view that displays the current GNSS solution horizontal standard deviation (SD H), vertical standard deviation (SD V) and PDOP values. The icon beside each value indicates if the current solution is within or out of tolerance. By using this view on the Observation Toolbar, the user can preview if tolerances are met before taking a measurement.



Part 3 – Program Options and Interface

Settings

FieldGenius for Android application settings are accessed from the Main Menu by tapping the “Settings” button. Some commonly used settings that you may need to customise are outlined below.

Units

Angular Format

Set the Angular Format for display in DEGREES MINUTES SECONDS or DECIMAL DEGREES

Angular Precision

Set the number of integers to display after the decimal point for angular values.

Linear Precision

Set the number of integers to display after the decimal point for linear values.

Language

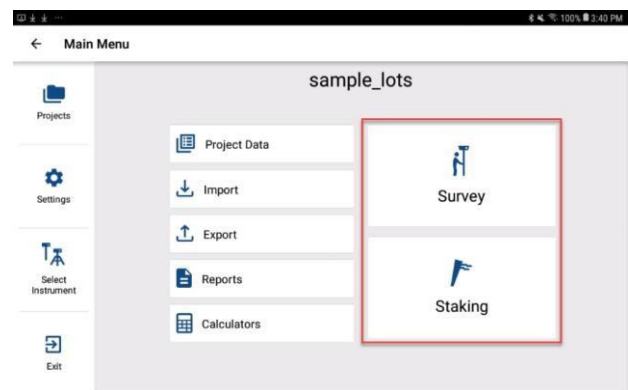
When you change the language, you will need to restart the application before the new language is displayed.

Interface

Switch map display modes between High Contrast and Dark Mode

Toolbars

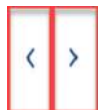
On the Survey and Staking map view screens, the FieldGenius for Android interface consists of multiple toolbars and data panels that display all the information the surveyor needs to conduct fieldwork on one screen. The goal of the toolbar and data panels is to provide necessary information with the minimal number of taps to navigate within the map screen. Within FieldGenius for Android, the workflows are split between surveying points and staking points. The different map views allow for the display of more tools aligned to the specific work activity. On the Main Menu, select either “Survey” or “Staking” to navigate to the appropriate map view.

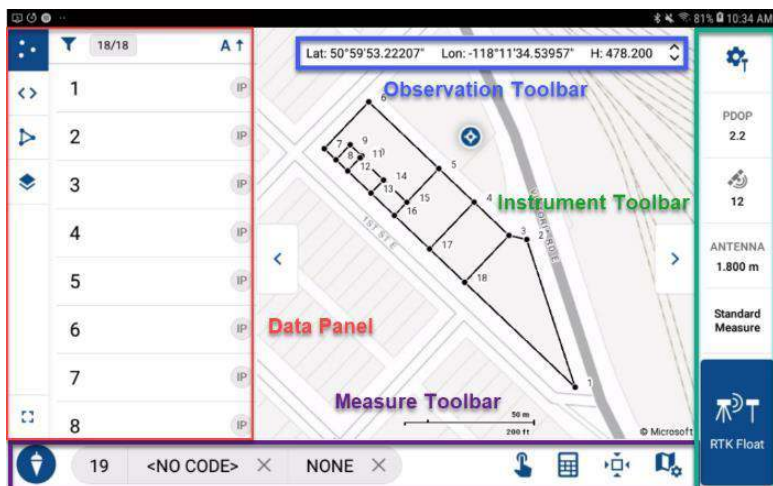


Survey Map View

Survey Toolbars and Data Panels

The Instrument Toolbar and the Data Panel can be opened or collapsed to show more of the map view when needed by tapping the Open and Close tabs beside each.





GNSS Instrument Toolbar

	Instrument Settings Button	Opens the GNSS Rover Profile screen which provides access to change instrument-specific settings.
PDOP 2.2	PDOP Button	Displays the position DOP values. Tap to cycle through PDOP, HDOP VDOP, and position Standard Deviation values.
	Satellite Plot Button	Displays the number of satellites used for the current position solution. Tap to open the sky plot or to access the satellite list.
ANTENNA 1.800 m	Antenna Height Button	Displays the current antenna height set and provides access to the Antenna Height dialogue.
Standard Measure	Measure Mode Button	Displays the current measurement mode and provides access to the Measure Modes screen to select a measure mode.
	Measure Button	Displays the current solution type and is used to begin a position measurement.

Observation Toolbar

The Observation Toolbar shows information about the current position. The Observation Toolbar is linked to the Instrument Toolbar and will only display when the Instrument Toolbar is open and you are connected to an instrument. Tap the Observation Toolbar to cycle through the different display modes:

- Latitude, Longitude, Height.
- Northing, Easting, Height.
- Horizontal SD, Vertical SD, PDOP.
- SOG, COG, Time, (GPS).

Lat: 49°50'17.54594" Lon: -119°36'35.60802" H: 395.858
 N: 5,523,909.480 E: 312,340.609 H: 395.818
 SD H: 1.045 m SD V: 1.707 m PDOP: 2.1
 SOG: 0.003 m/s COG: 274°39'51" Time: 21:50:01 (GPS)


Measure Toolbar





The Measure Toolbar provides information on the point and line settings plus a quick access to highly used features and map view options.



The Plumb-bob icon provides navigation to the Main Menu Screen.

The numbers and code provided next to the plumb-bob is information about the next point to be measured.

- The number of the next point measured.
- The Point Code of the next point measured. Tap the <NO CODE> area to open the code list and select a code for the next point to be measured. If the code has a line symbol  both the point code and line segment will be set for the next point measured. If the line segment icon is missing on the code list name, then only the Code will be set to the selected name.

	Manual Measure Button	Brings up the Manual Measure Page that allows users to navigate a target to a location and save a point as a manual measurement in the points database.
	COGO Button	Displays the list of available COGO options and allows the user to tap on an option and open the COGO data panel
	Zoom Extents Button	Resizes the Map View to include all project points, lines and current GNSS position.
	Map Options Button	Opens the Map Options panel that allows users to customize the display of points, lines background maps and map center features.


Survey Data Panel

Use the arrow tabs to open and collapse the data panel on the Survey Map View.

The left data panel type selection bar allows the user to switch between different data panels. Tap the icons to switch between the following data panels:

- Points List.
- Code List
- Line Segment List
- Xref – External References List
- Media – List of existing photos taken that are associated with the project
- GIS – List of existing GIS Point/Line attributes that been collected

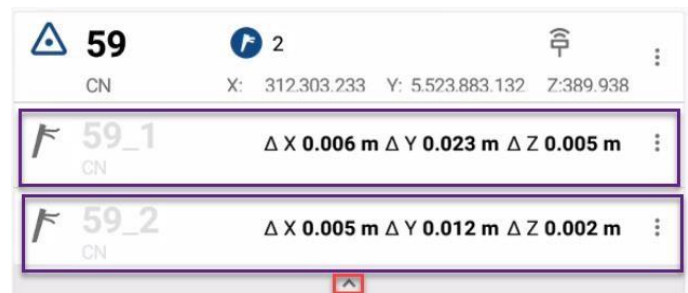
The data panel provides key lists of items that users may want to select or change quickly when taking measurements in the field.

Full Screen View – Tap the Full-Page  Icon at the bottom to open the full-page details for a selected data panel.

Points List – Lists the project points. To filter the list by point code, tap the “funnel” icon. A filtered list will display the number of points listed of the total points in the project. To sort the points, tap the “sort” icon and select the sort option.

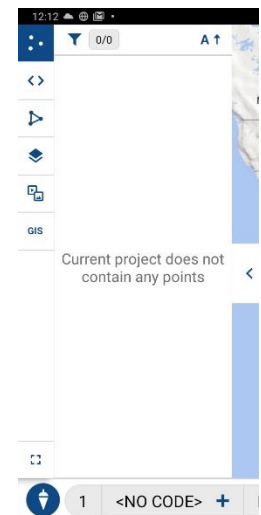
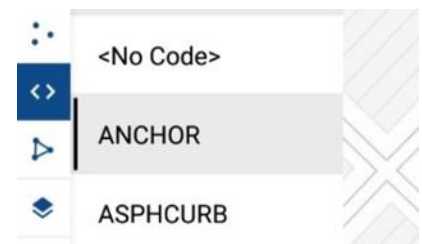


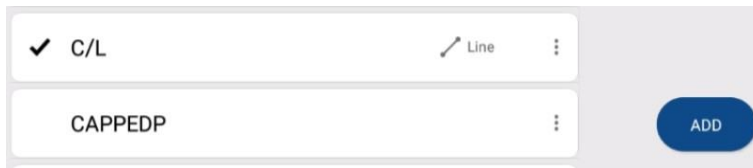
The full screen mode will display all the information about a specific point. To edit or delete a point, you need to open the Full-Screen Mode and select the “three-dot” icon. The icon on the left indicates whether the point is a Control Point or a Staked out point. If the point is staked out, the staking icon will be shown with the number of times the point has been staked. Use the expand arrow to show a summary of the staked points.



Code List – Lists the codes that can be assigned to a point when it is measured. Tap a code to select it. The code will then be shown in the Next Code field on the Measure Toolbar.

The full screen mode will allow users to add new codes. Users can tap the Full-Screen Icon and then the “Add” button. A code can be assigned as a point code or both a point code and a line type code.





Line Codes – Shows a list of line segment codes that can be selected and then edited or set to active. If set to active, the code is listed in the “Next Line” field and the next measurement taken will be appended to the line segment. If the user selects “edit,” the data panel will display the list of point vertices that are included in the line segment. The user has the option to add or delete vertices to the line segment. To delete a vertex, tap the ‘X’ next to the point number in the data panel. To add a point to the end of the line segment, tap the Map and select a point. Tap the “Done” button to exit the edit mode.

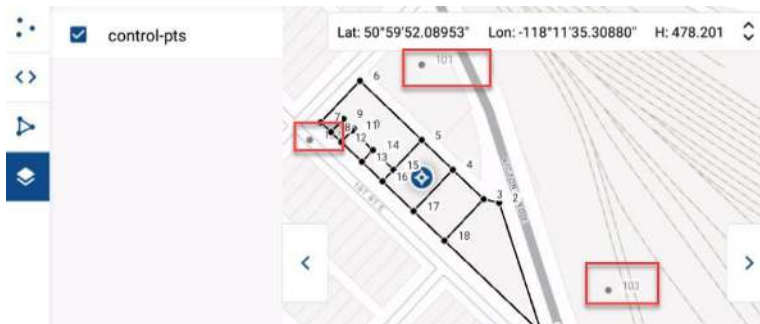


The full screen view allows user to add a new line type. On the full screen, tap the Line Type and then on the right side, tap the “+” button to create a new line segment. Each line segment shows the number of point vertices that are included in the line segment. Tap a line segment to select it and have the option to make it active or edit it.



Xref Layers – The list of external references allows a user to select a different project on their Android tablet and import the project points as a background layer on the current project. The Xref points have an opacity of 60% of the project points so the user can differentiate between the current and background points.

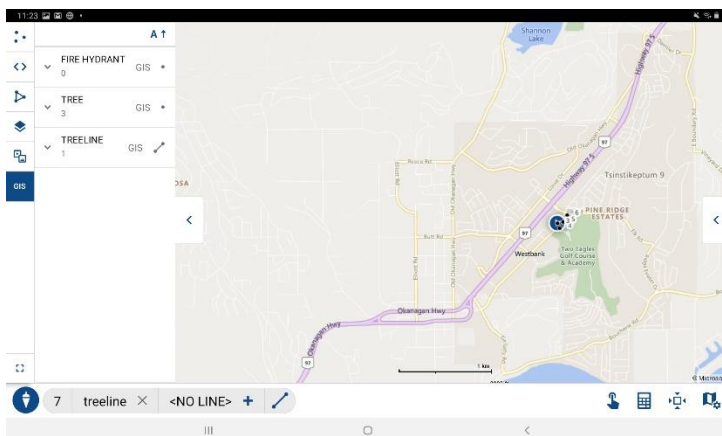
In the full screen view, users can see a list of all the available Xref files available on their data collector. Select the check box to have the Xref file displayed as a layer on the current project.



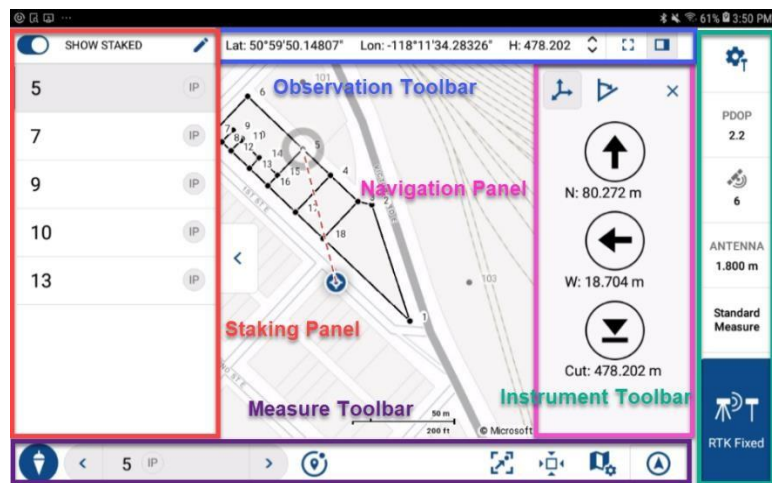
Media – The media data panel allows you to view images that are tied to specific points in the project. You can use the 3-dot menu to icon to access options to work with project media to reassign links or delete if required.



GIS – The GIS data panel allows you to view codes available to use for GIS points and lines collection and displays the number of points and lines collected for each attribute code.



Staking Map View



Staking Toolbars and Data Panels

The Instrument Toolbar and Data Panel can be opened or collapsed by tapping the Open and Close tabs beside each to show more of the Map View When needed.



GNSS Instrument Toolbar

The Instrument Toolbar displays position information and provides access to settings and measure modes. The Instrument Toolbar has the same features and functionality as the Survey Instrument Toolbar. (See Instrument Toolbar description in the Survey Map View section.

Staking Toolbar

The Staking Toolbar provides information on the next point to be staked with quick navigation buttons.



The Plumb-bob icon provides navigation to the Main Menu screen.

Next stake point features:

- Tap the < icon to go to the previous point on the Stake List.
- The Stake Number Filed displays the next point the be staked and the point code.
- Tap the > icon to go to the next point on the stake list.
- Tap the icon to find the closest point on the stake list to your current position.
- Tap the icon to zoom the screen to include your current position and the next stake point.
- Tap the center icon to center the map on your current position.
- Tap the icon to display the map control panel.

Staking Data Panel

The Staking data panel provides a list of the points on the Staking List.



Turn ON the toggle if you want to see the points on the Staking List that have already been staked. If the toggle is OFF, then only the points remaining to be staked will be shown.

Tap the “pencil” icon to open the full screen view which allows users to add and remove points from the staking list.

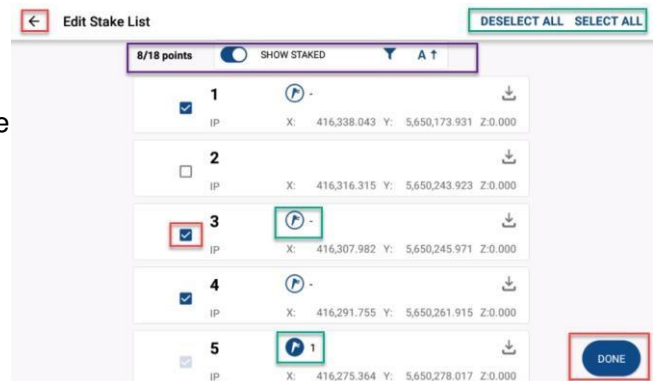
On the full screen view of the Staking List, the user can select points or remove them from the Staking List by tapping the checkbox next to the point number.

To assist in selecting points to be added to the Staking List, the user can filter or sort the list. If the points list has been filtered, the number of total points is displayed. To open the filter option, tap the funnel icon and select the codes you want to add to the filtered list. Select “APPLY” when done.

To sort the points list, tap the “sort”  icon.

The points selected on the Staking List are indicated by the checkmark and the status of the staked points on the list are shown by the icons “to be staked”  and “already staked” . If a point has already been staked, the number of times is indicated next to the icon.

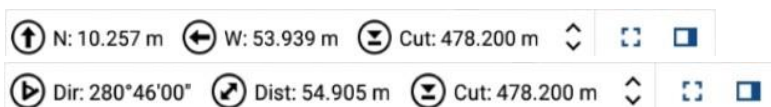
Once you have added or removed all the points you wanted from the Staking List, tap “DONE” to update the list and return to the Staking Map View. If you want to return to the map view without updating the list, select the back icon.



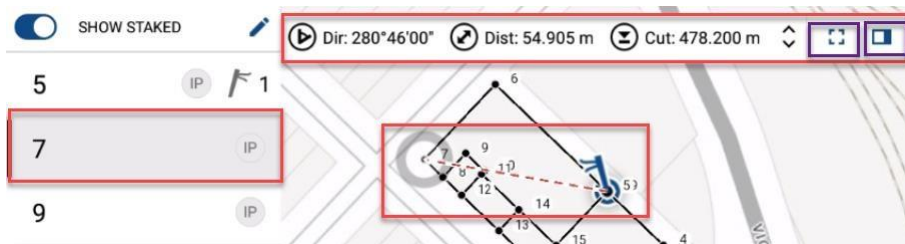
Navigation to Stake Point

The staking screen provides several different features and views to help the user navigate to the next point to be staked. If the Staking data panel is open, the next point to be staked is highlighted on the list.

The Observation Toolbar has two view options to show the Cartesian Northing, Easting and Cut/Fill distances from the current position or Direction, Distance, and Cut/Fill to the selected stake point.



On the Map View, the current location of the GNSS receiver is shown and the next point to be staked is also shown with a red dashed rubber band line connecting the two. As the user moves the GNSS receiver, the rubber band line and Observation Toolbar values are updated in real time on the screen.



If the user wants, they can open a partial or full screen data panel to display the navigation information by tapping the data panel icon or full-page icon in the Observation Toolbar.

On the data panel while in Full-Page View, the user can toggle between Cartesian and Direction views by tapping the appropriate icon. To close the data panel or full screen view and return to the map view, tap the “X” button.



Part 4 – Measure Modes and Workflows

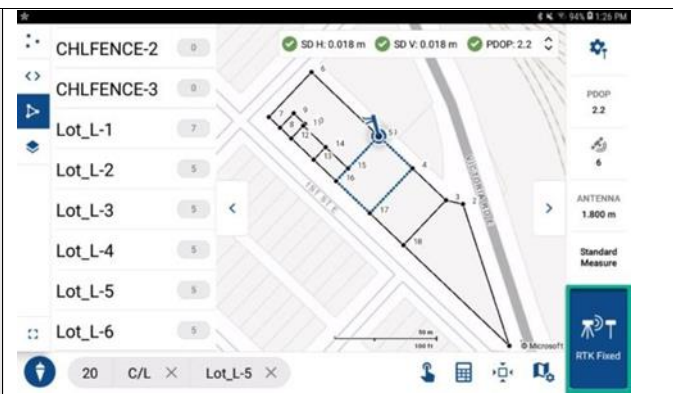
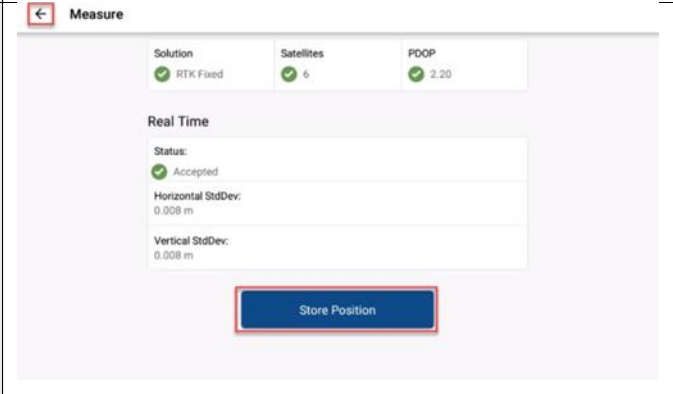
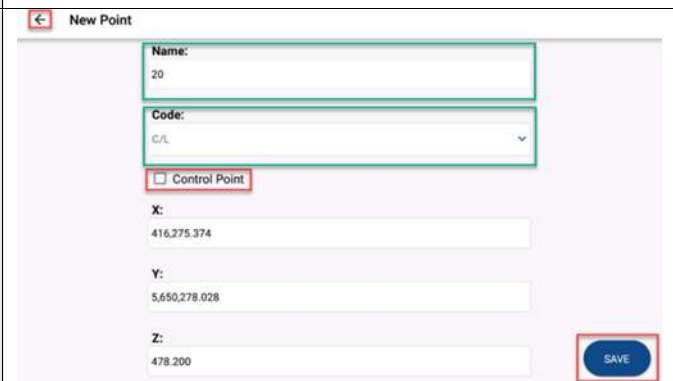
FieldGenius for Android has separate Survey and Staking workflows and Map View Screens that are accessed from the Main Menu.

Survey Map View

On the Survey Map View, select the Measure Button to store a position. The Measure Button will display the receiver's current GNSS Solution.

Standard Measurement

General Procedure is as shown in the table below.

<p>Start Measurement</p> <ol style="list-style-type: none"> 1. With "Standard Measure" Mode set, select the Measure Button to start measuring the current position. 2. The Measure Button will display the receiver's current GNSS solution. 3. The Observation Toolbar can show if the current solution is within the applied horizontal and vertical tolerances. 	
<p>Confirm Measurement</p> <ol style="list-style-type: none"> 4. The number of observations is determined by what Tolerance Mode is set as active. 5. RMS values are shown. 6. "Store Position" button is available once tolerance criteria are met. 7. Use the "Tolerance Override" option if you want to store out of tolerance observations. <p><i>Note: Out of tolerance observations are shown with a warning icon in the Observations Table.</i></p>	
<p>Store Position</p> <ol style="list-style-type: none"> 8. Accept or change the point name. 9. Accept or change the point code. 10. Check the Control Point box if the point is a control point. 11. Review the Cartesian Coordinates. 12. Tap "SAVE" to store the point and add it to the points database. 13. Tap the "Back Arrow" to return to the previous screen without storing the point. 	

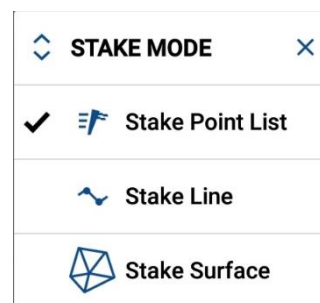
Staking Map View

Select Staking from the Main Menu.

Users can choose between Point, Line or Surface Staking modes.

Point Staking

General Procedure is shown in the table below.



Add Points to the Staking List

1. Select "edit" from the Staking List Panel
2. On the "Edit Stake List" screen, Add Point to the Staking List.
3. Select "Done."

Select Next Point to be Staked.

4. Select the Point on the Staking List or tap the point on the Map Screen.
Note: the point needs to be on the Staking List to be selected from the map screen.
5. Use the Measure Toolbar to select Previous, Next, or Closest point to be staked.

Stake Point When Ready

6. Select the Point on the Staking List or tap the point on the Map Screen.
7. Navigate to the Stake Point.
8. The Staking Map View provides several different views and tools to assist you in locating the stake point:
 - a. Map View with rubber band dotted line between the current position and stake point.
 - b. Observation Toolbar with Cartesian or Direction Navigation distances.
 - c. Navigation Panel with Cartesian and Directional distances.
 - d. Full-Screen view of Cartesian and Directional distances.
9. When at the stake point, tap the Measure button to start a measurement.



Store Staked Point

10. Review the staked point information.
11. Select "Save" to add the point to the Points Database.
12. Select the Back Arrow to return to the previous page without saving the point.
Note: To stake a point more than once, turn on "Show Staked Points" toggle on the Staking Data Panel. Then, tap on the staked point and take another measurement. The new staked point will contain the number of times it has been staked in its name. (e.g., 5_1 to 5_2 etc.)


Note: You can open the Stake List Full-Page view from the Staking Data Panel at any time during staking.

	Design Coordinates	Accepted Coordinates	Deltas
N	5,650,278.017 m	5,650,278.028 m	Δ N 0.011 m
E	416,275.364 m	416,275.374 m	Δ E 0.010 m
H	0.000 m	478.200 m	Δ H -478.200 m Cut

Configuring Program Options

Program Options are designed to help the user get the most out of FieldGenius for Android. Options relevant to GNSS workflows and map view display options are summarized below.

Map View Options

The Map View Options are accessed from the bottom toolbar map setting icon  on the map view screen.

- The user can pan the map by using one finger to move the image on the main screen.
- The user can zoom in on the map by using two fingers to pinch or expand the map zoom level.

Map Interface Options

Point Names

To display Point Names on the map view, switch the toggle ON.

Lines

To display the Lines on the map view, switch the toggle to ON.

Scale Bar

To display the Map Scale Bar on the map view, switch the toggle to ON.

Background Map Type


When the Android device is connected to the internet, the user can select a background map to display on the Map View screen. There are four map type view settings available:

- Street View
- Satellite Image
- Terrain
- No Background Map

Map Opacity

The background map opacity can be adjusted using the + and – buttons on the opacity control so the user can make the map image lighter to better see the project points and lines dependant on different lighting conditions.

Center to Current Location

Tap the center icon  to move the map view so that when you are connected to a GNSS receiver, the current location is always centered on the map. Turn the center toggle ON to update the map view so that your current location is always centered on the map when you move.

Appendix

Additional Resources for FieldGenius for Android.

Online Manual

A version of the complete FieldGenius for Android Manual is available online at:

[Online Help Manual](#)

Movies

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

[FieldGenius for Android How-to Videos](#)

Helpdesk

Contact MicroSurvey Support through the MicroSurvey Helpdesk at:

[MicroSurvey Helpdesk](#)

Grid Shift Files

MicroSurvey provides a collection of Grid Shift files for FieldGenius for Android, files and instructions are available at:

[Grid Shift Files](#)