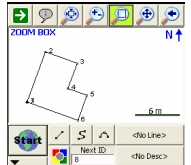# GPS Local Transformation Using FieldGenius
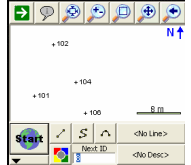
Note: You do not need to be connected to the instrument to perform this operation.
Note: This procedure is for the circumstance described below. It is usually more efficient to use the process described in the helpdesk article: Quick Reference: Multi Point GPS Transformation in the Field.

Please use this article as a guide to performing a GPS transformation in FieldGenius when:

1. You have a range of points downloaded into FieldGenius that are in an assumed coordinate system:

2. You have collected GPS observations on some of the corresponding locations in the field. These observations are in a UTM or State Planes coordinate system. You need to compute transformation parameters so you can continue to work at this site using your assumed coordinate system with GPS equipment.

It is best to have four or five reliable observations to choose from that are distributed widely around the job site.

Important Terms:

Local Coordinates in this case, are the points that you have measured in the field using GPS observations.

Control Coordinates are typically defined by an assumed or published coordinate system. These points will not be transformed by the transformation parameters.

Here we can see the map view of the job before the transformation. I have zoomed to extents. The cluster of points at the top of the screen represents the **Local**, or GPS observed points. The cluster at the bottom represents the **Control** points, which are in the assumed coordinate system you will want to continue working in.
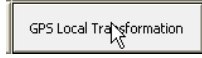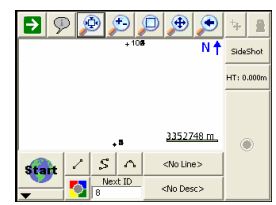
Use the "GPS Local Transformation" utility found in Survey Tools or Settings.

Currently the Transformation Parameters are at their default values. Any GPS measurement taken at this stage will be stored with no transformation applied. Pick "Edit Control" to start the process of calculating the parameters:
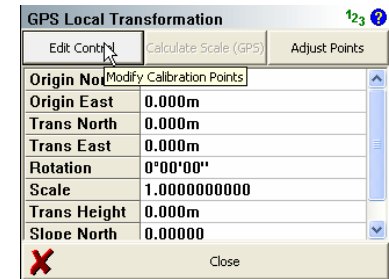
Pick on "Add Control" to start the process of matching **Control** to **Local** points.

See p. 341 in the FieldGenius 2007 manual for an explanation of the two checkboxes. Settings shown are typical.
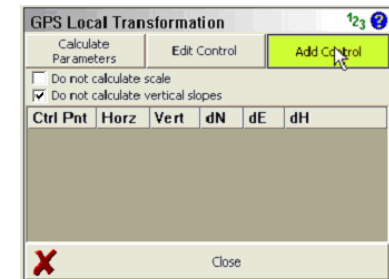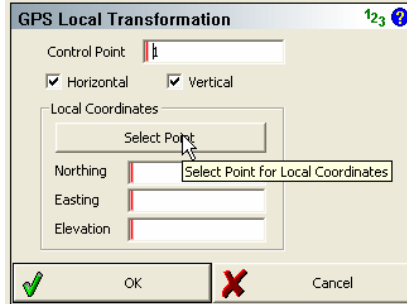
Enter a point number or double click and select the **Control** Point from the map view:

You can select whether to use this point for horizontal or vertical control while you are in this dialogue.
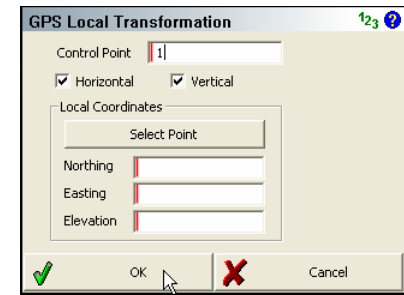
Pick on "Select Point" to select the Corresponding **Local** Point from the Map View:1

Click on "OK" and "Add Control" repeatedly until all necessary points are "paired up."


As you add points you will see a list of **Control** points. The dN and dE values express the difference between the **Control** and corresponding **Local** Northing and Easting.

*Pick on "Calculate Parameters" to view the residual measurements:*
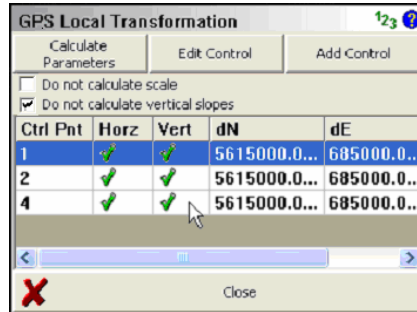
After you pick "Calculate Parameters" the new residuals will be displayed. The listed residuals indicate the amount of error that will be introduced at each **Control** Point if the transformation is applied now. You have the option of Highlighting a point and picking "Edit Control" to check or uncheck points to be used to compute the transformation. Note that point 2 will be used as the benchmark in this case. You can pick "Add Control" to add more pairs of **local** and **control** points.
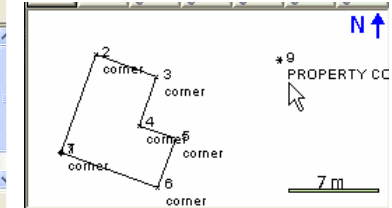
Pick on "Close" to display transformation parameters:
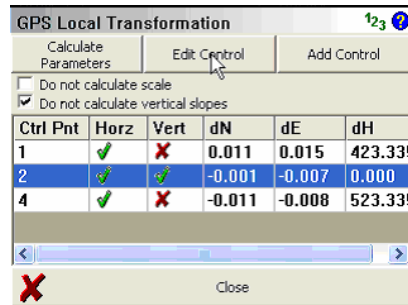
These are the transformation parameters:
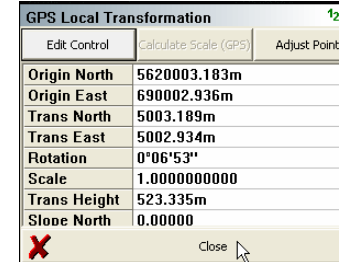
Any further GPS measurements will now be transformed so that they appear in the same neighborhood as the **control** points in the map view.

OPTIONAL:

If you wish your **Local** points to appear in their transformed locations, you can pick on "Adjust Points." FieldGenius will go through the raw file and apply the transformation parameters to every point that was measured using GPS. In the end, zoom extents should show only the neighborhood of your **control** points with the corresponding **local** points very near.