Accurate orthometric heights from Leica Zeno Smart Antennas in ArcGIS Field Maps
Step by step guide.

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1 Introduction

Leica Zeno solutions strengths rely on the ability to create your own solution. A very good example of this is using Esri´s ArcGIS Field Maps with Leica Zeno Connect and a Zeno receiver, such as the FLX100 plus and the GG04 plus smart antennas. This setup brings high accuracy to the Field Maps user in a streamlined manner.

In this document, we introduce the steps to record orthometric heights in ArcGIS Field Maps with the help of Zeno Connect, from setting up layers for orthometric height collection to configuring Zeno Connect correctly.

Esri released documentation, which can be found here (see point 5), explaining the required expressions to accomplish this task. This document provides a more comprehensive view, including preparation of layers and setup of the software.

2 Field Maps Designer

To prepare feature layers, use the Field Maps Designer tool. This is an online tool developed by Esri which allows easy creation of web maps, feature layers, forms, geofences and more.

☞ **Important**: Any layers created need to support z-values. Not enabling z-values implies not being able to store the orthometric height in the geometry or the attribute value.

1. To start, open Field Maps Designer and sign in.
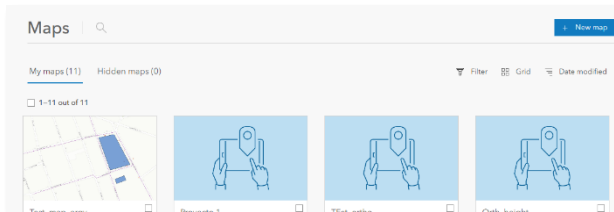
2. Once signed in, either select an existing web map to which you would like to add the orthometric height expression or start a new map with the ⊞ New map button.
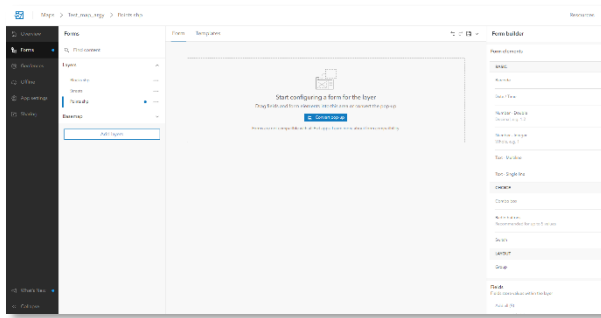
3. After creating the new map and layers or opening the desired web map, you will be presented with a page in which you can create new forms.

   Note: When creating layers, you will be given the option to enable z-values.


Will 3D spaces be modeled or analyzed?
If enabled, z-values will be collected
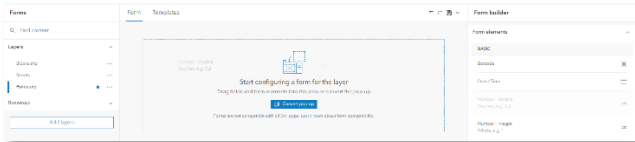
4. In the Forms section, select the layer of interest on the left-hand panel and, from the right-hand panel, drag-and-drop the "Number – Double" form element onto the middle section.
This will trigger the creation of a new number form element.
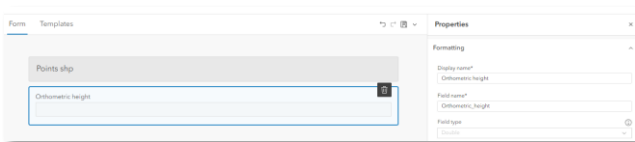
5. Give the correct formatting for this new item. Enter a Display name and click on the 🖫 icon.
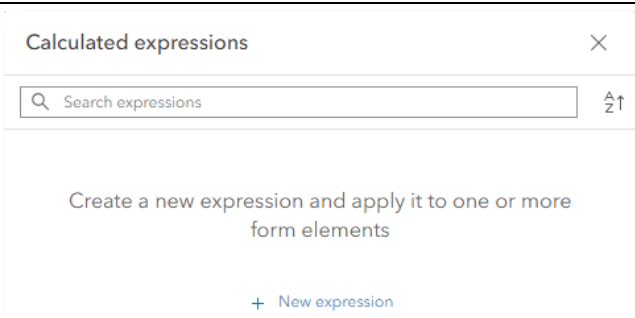
6. Once saved, go to the bottom of the right-hand panel and click on the ⚙ icon next to "Calculated expression". Then, select "New expression".

7. Field Maps stores the orthometric height in the z-value of the geometry. Copy this expression to store the orthometric height value as an attribute for newly created or updated point features:

var geom = Geometry($feature)
if (IsEmpty(geom)) {
   return null
} **else** {
   return geom.Z
}

Note: You can enter a title for this expression to save it. It will be then suggested to you in step 6 when doing this process again.

8. Save again by using the 🖫 icon.
The layer is now ready to collect and

store orthometric heights in the field when using ArcGIS Field Maps with [Zeno Connect](#) and the Zeno [FLX100 plus](#) and [GG04 plus](#) smart antenna.

3 Leica Zeno Connect

Before jumping to Field Maps, it is important that you set up Zeno Connect correctly. Especially the geoid, as this will influence the resulting z-value.

Zeno Connect can be downloaded from the App Store and Play Store for free.
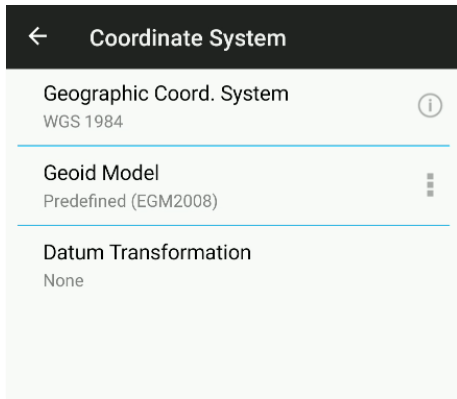
1. Open Zeno Connect and select the "Coordinate System" in the main menu.
By default, WGS 1984 geographic coordinate system and the EGM2008 geoid are selected.

2. Select the coordinate system you would like to work on and then go to the "Geoid Model" page.
To add more geoid models, tap on the ⊕ icon on the top-right. This will open the online repository of geoids. Internet connection is required to access and download geoids but is not required once the geoid is stored locally in your device.

Note: If your geoid is not part of the repository, you can also import a geoid file (.gem) via TRFSET.dat format. This file can be created in Leica Infinity.
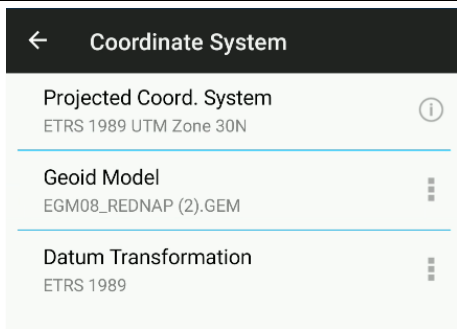
3. Once selected, you´re good to go.
Connect to your smart antenna and move on to ArcGIS Field Maps to start working.

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4 ArcGIS Field Maps

You can now launch ArcGIS Field Maps on your mobile device.
Make sure it is prepared for high-accuracy data collection.
Then, you´re ready to start recording orthometric heights!

1. Open the same web map in ArcGIS Field Maps

2. Capture a feature in the layer we've configured to store orthometric heights.
   The value will be displayed.

   This value will also be stored in the attribute table of the feature layer, not only displayed.