# \*Cover page\*

# About this Tutorial

In this tutorial, you will learn how to perform a GNSS Site Calibration. We will be using control points, located in Westminster, Colorado (U.S.). You can use this tutorial to follow along with steps; however **you will need to use your own local control points** to accurately perform these steps.

This tutorial will take about 15-30 minutes to complete.

# GNSS Site Calibration

Calibration is the process of adjusting projected (grid) coordinates to fit the local control. A calibration calculates parameters for transforming Global coordinates into local grid coordinates.

Spectra Geospatial recommends using a minimum of four local control points for the calibration calculation; however, you can use a maximum of 200. For best results, local control points should be evenly distributed over the job area as well as extending beyond the perimeter of the site.

# What You Will Need

* **Origin Field Software:** Origin Max or Origin GNSS
* **Device**:
	+ Computer or data collector
	+ GNSS Receiver - this tutorial uses Spectra’s [SP60 GNSS Receiver](https://spectrageospatial.com/sp60-gnss-receiver/)
* **Survey:** You will need to start a GNSS survey to perform a site calibration. Please refer to the tutorials for setting up a new survey, if needed.
* **Data**: Ensure the data used in this tutorial is located on your device. **You should use your own control point data for this tutorial**; however, we have provided the control points used in the **GNSSSiteCalibration** folder you downloaded. You will link the control points to your job.

# Step 1: Create a Project and Job

1. When you start Origin, you need to select or create a new **Project**. Tap **New** in the top left hand corner of the screen.
2. In the **New project** screen, fill in the project details (not all of the details are required).

**Name** the project “*GNSS Site Calibration*”

(Optional) Provide a **Description** *“perform GNSS site calibration”*

(Optional) Include a **Location** *“Westminster, CO”*

1. Tap **Enter** and **Create**
2. In the **New Job: GNSS Survey** screen, tap **Create from template** and set up the job with the properties of your site:

**Name:** *GNSS Site Calibration*

**Template:** *Metric Scale Only*

**Coord. Sys.** and tap **Select from library**. Input the coordinate system you will be using.

**System:** *United States/State Plane 1983*

**Zone:** *Colorado Central 0502*

**Project height**: *1,641m (meters)*

Tap **Enter** and **Store.**

**Units:** *Meters*

**Feature library:** *GlobalFeatures*

**Cogo settings:** *Ground*

1. Tap **Accept**.
2. Once you have opened the project, you are brought to the **Map** screen.
3. To link the data, tap the **Layer manager** icon.
4. Under the **Point files** tab, select **Browse**.

Navigate to the control point file *SiteCalibration\_Controls.job* (or your own control point file)



1. Center the control points to your screen. You will see **four** control points in the map: 100, 101, 102, 103. These will be the points calibrated in this tutorial.



# Step 2: Start a GNSS Survey

1. Set up the survey style you would like to use.
2. If you need assistance, navigate to the Origin Tutorial Page to see:
* Setting up a Radio RTK Survey
* Setting up a VRS Now RTK Survey
1. This survey will be using a Network RTK survey style.

# Step 3: Measure Site Calibration Points

1. Tap .

Tap **Measure** and **Measure points.**

1. Change the **Method** to **Calibration point** and we will first calibrate point 100.
2. Tap **Options** and scroll to **Calibration point name**

Ensure **Method** is set to *add suffix* and **Add** is set to *\_GNSS****.***

Tap **Accept**.

1. In the **Grid point name** box, type *100*. The boxes should auto-fill; however, check to ensure the information is correct:

**GNSS point name** - *100\_GNSS*

**Code** - *NAIL*

**Antenna height** - *2.0m* (adjust to your antenna height).

Measured to - *Bottom of antenna mount* (fix to your method)

1. Position your GNSS receiver on the marked control point.

Tap **Measure** and **Store** once the measurement is taken.

**Note**: For site calibration, Origin defaults to a 3 minute measurement shot to help with accuracy. You can edit this length to longer or shorter, if needed.

1. Once the measurement has been taken, tap **Store**.

You can take a photo of your calibration point, if desired.

1. Walk to the next control point and repeat **Steps 1 - 5** to calibrate each control point on your site.

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# Step 4: Apply Site Calibration and View Results

1. Tap .

Tap **Measure** and **Site calibration**.

1. Tap **Add** and you are brought to the **Calibration point** screen.

For **GNSS point name**, enter *100\_GNSS* (or tap the arrow to the side of the bar, select **List** and you will see a list of points)

The Grid point name and Use will auto-fill.



1. Tap **Accept** and repeat Steps 1 - 2 to add all four points to your Site Calibration.



1. Once all of your points have been added to your site calibration. Tap **Results** where you will see the level of accuracy for your calibration.
2. Tap **Apply** to save your site calibration.

You have completed this tutorial.