

SUPPORT NOTE

5 NOVEMBER 2013

GEO 7X HANDHELD: ORIENTATION SENSOR CALIBRATION

TYPES OF CALIBRATION

The Geo 7X handheld is equipped with a field calibration utility to make calibrating the system sensors in the field simple and easy. The calibration utility recommends when you should perform the different calibration workflows, but in general the following rules apply:

FULL CALIBRATION

Full calibration recalibrates all orientation sensors on the handheld to the local environment and device state, taking into account your location and the temperature of the device.

Full calibration should be performed:

- the first time the device is used
- if the device temperature or environment temperature has changed dramatically
- whenever the calibration utility recommends Full Calibration
- if after performing a fast calibration, sensor measurement still appear to be erroneous

FAST CALIBRATION

Fast calibration calibrates for local magnetic and environmental magnetic conditions.

Fast calibration should be performed:

- when you are about to begin data collection at a different job site
- after swapping the battery
- if you have dropped the handheld, or it is exposed to severe shock
- if field applications are consistently reporting compass disturbance
- if it appears that sensor outputs are erroneous

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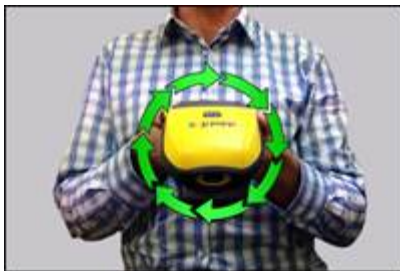


HOW TO PERFORM A FULL CALIBRATION

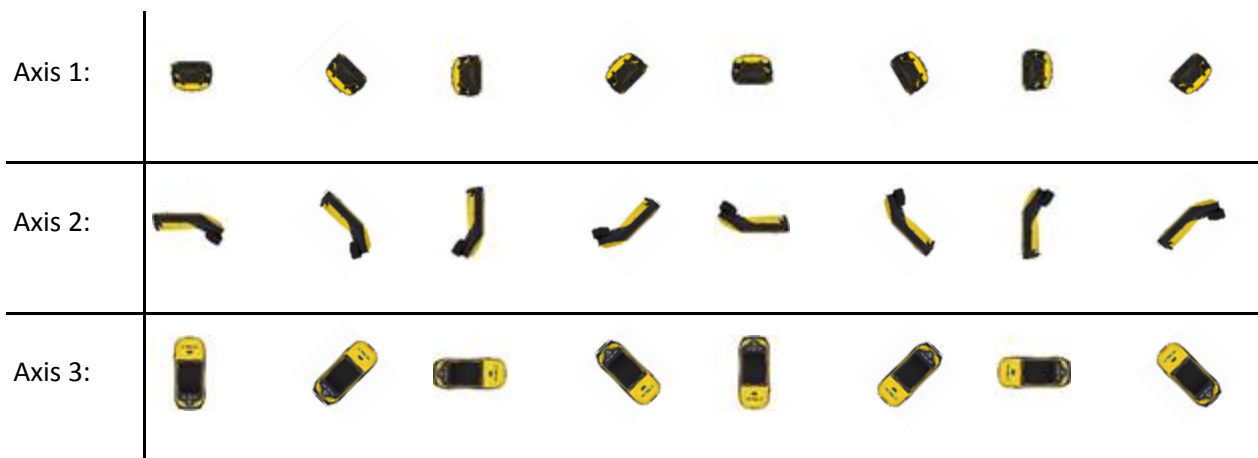
[Click here](#) to watch a video illustrating the Full Calibration process.

Full calibration involves recording 24 points across three axes of rotation. Each point needs to be collected with the device held still. The Full Calibration wizard guides you through the process. Stand still when calibrating, and try to calibrate somewhere you can avoid metallic objects or magnetic interference sources. The three axes can be described as follows:

- **Axis 1:** Rotating the device while keeping the handheld's battery door facing you.
- **Axis 2:** Rotating the device while keeping the handheld's SD door facing you.
- **Axis 3:** Rotating the device while keeping the handheld's display facing you.



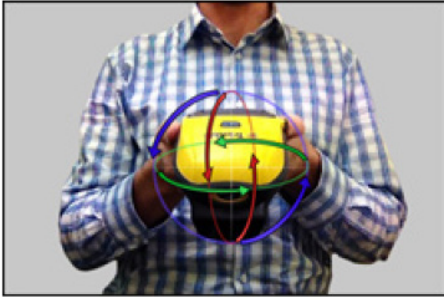
The image sequence below indicates the 24 orientations that need to be collected during full calibration. These images show the handheld from your point of view.



HOW TO PERFORM A FAST CALIBRATION

Fast calibration involves capturing a sequence of points to represent a full sphere of rotation of the handheld. Fast calibration simply involves rotating and spinning the handheld in all axes until enough points have been collected to represent the local environment's magnetic field. It typically takes less than 20 seconds.

Stand still when calibrating, and try to calibrate somewhere you can avoid metallic objects or magnetic interference sources.



CALIBRATION ENVIRONMENT

Sensor calibration should always be performed outdoors in areas unaffected by magnetic disturbance.

Where possible, avoid calibrating in environments with large metallic objects nearby, and be aware of objects in the surrounding area that may influence the magnetic fields near your device.

When choosing a calibration environment, consider the following objects that can potentially influence the magnetic environment around your handheld:

	Distance to your device			
	Within 6 inches	Within 6 feet	Within 15 feet	Within 30 feet
Potential sources of magnetic interference	Car keys Metal framed glasses Cellphones Watches Jewelry Metallic pens Batteries Other computers Survey nails Metal clipboards	Hydrants Valves Manhole covers Poles	Power lines Vehicles	Large machinery Metallic buildings or structures

Sometimes it is impossible to work in an environment that is metal-free. Do your best to avoid these types of objects, and if in doubt, recalibrate.