



Calibrating the LaserCraft Contour XLRic Compass

What is Compass Calibration?

All compasses can perform well in a controlled environment, where the magnetic field consists solely of the earth's field. In most practicable applications, however an electronic compass module will be mounted in a host system such as a vehicle that can contain large sources of magnetic fields.

When you perform the user calibration procedure, the Contour XLRic takes a series of magnetic field measurements. This identifies the components that are created by the earth's field, which is the desired signal, from which those components that are generated by the local environment which we wish to subtract out.

The Contour XLRic uses an advanced compass sensor. It has the ability to compensate for all ambient magnetic field generated internally by the Contour's electronics, as well as many fields, which are the result of the mount rigidly fixed to the Contour. This allows accurate bearing measurements by the Contour at up to 40-degree tilts in pitch and roll.

A limitation inherent to all magnetic compasses is the nearby magnetic fields, which are not present and fixed with respect to the system during calibration, may cause errors during subsequent use. Knowing this, bear the following ideas in mind when calibrating the compass:

1. During calibration mode the Contour XLRic is trying to sample as many different data points as possible in 3-D space to determine the magnetism caused by the Contour XLRic.
2. The Contour XLRic cannot totally compensate for magnetism outside of the Contour XLRic unless the sources are rigidly fixed to the Contour XLRic during calibration and subsequent use.
3. When calibrating and using the compass, try to locate the system as far as possible from any sources of magnetic fields. These include power lines, automobiles, steel buildings, steel tripods, etc. These will all serve to put errors into the system.
4. Turn the Contour XLRic around twice or more spanning a period of between one and two minutes. Spend about sixty seconds on each revolution. Additionally change the pitch of the Contour XLRic during this time you can exceed the 40-degree range of the inclinometer.

It is recommended to perform the compass calibration when:

- When significant changes in location occur such as traveling to a new city
- When changing battery packs or power cord packs

Note: Calibrate the unit with a newly charged battery. Battery voltage below 9.6V may result in error.

To begin the calibration routine:

1. Insert the battery pack or cord pack that you will be using
2. Stand outside in an area clear of magnetic disturbances (at least 25 feet from vehicles).
3. Press the Menu button on the laser.
4. Select Comp.
5. Select CAL.
6. The following messages will appear on the LCD.

Initializing Please Wait!

Rotate Unit for Calibration

7. When the second message is displayed, the unit is ready to calibrate.
8. Pull and hold the trigger in the fire position. The following message is displayed:

Data Point Count – 0

9. Slowly rotate yourself and the Contour through approximately two revolutions. Take 1 or 2 minutes per revolution.
10. While rotating, slowly pitch and roll the unit up and down and side to side from horizontal (+/- 40 degrees is OK).
11. As the unit is rotated you will see the data point count increase. When the count reached 275, the calibration is complete.
12. Release the trigger.
13. The rear panel will indicate “calibration complete” and the unit will return to its previous operating mode.
14. Try to rotate the unit such a rate that you complete between one but no more than two rotations in the given time frame (i.e., a count of 275).
15. Rotating too fast does not allow the sensor readings to settle.
16. Repeat the CAL procedure if 275 is not reached before the end of the second rotation.