

HARDIRON COMPASS CALIBRATION SOFTWARE

USER INSTRUCTIONS

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Note: Do refer to the content in the Help menu of Hardiron Compass Calibration Software as this document supersedes that content

Introduction

The Falmouth Scientific Compass Hardiron Calibration application allows the user to remove the effects of local magnetic fields from the accuracy of the instrument's compass.

This application can be used on the OSTAR Compass, 2DACM, 3DACM and 3DWAVE products. The best results are attained by running the calibration application after the instrument has been installed in the target environment, whether a vehicle or mooring cage, and after removing any extraneous magnetic field generating equipment from the area of the vehicle.

The vehicle containing the instrument to be calibrated must be able to rotate level through 360 degrees, ideally around the center point of the compass. Off-center calibration will induce a small error into the calibration values.

In order to use this application the instrument's firmware must support hardiron calibration. If the "unsupported" message appears, contact your FSI representative for a firmware upgrade. To check if your instrument supports hardiron calibration, issue the NRML command in OPEN mode. If this command produces a "BAD COMMAND" message, hardiron calibration is NOT supported.

Checking Compass Calibration

The first step in calibration is to see if the compass needs to be calibrated. The instrument should be installed in the target vehicle or mooring cage and all extraneous magnetic field generating equipment should be removed from the area. This obviously precludes the hardiron calibration from being performed on the deck of a ship. In addition, the vehicle containing the instrument with the compass to be calibrated needs to be rotated LEVEL through 360 degrees. This precludes the calibration from being performed in all but the calmest ocean. FSI recommends that the check/calibration be performed on a dock or in a building with few metal objects close to the instrument that will not be deployed with the instrument.

Example: If the vehicle is large and requires a fork truck to lift and rotate to perform the calibration, the fork truck should be backed away from the vehicle after each lift (unless the fork truck is being deployed with the instrument).

Process

To check the compass calibration, slowly rotate the instrument level through 360 degrees. Any tilt induced by the rotation will affect the accuracy of the check. This rotation should also occur around the center point of the compass on the instrument. The center point of the compass may or may not be the same as the center point of the instrument's case.

What To Look For

A perfectly calibrated compass will draw a perfect circle around the center of the axis in the Check View. Off-center circles indicate that the magnetic fields in the vehicle are affecting the accuracy of the compass and the compass will need to be calibrated. Egg-shaped checks indicate that the rotation is not around the center point of the compass. Spikes in the circle are usually the result of a tilt during the check. Try to perform the check step by rotating the vehicle with the instrument's compass as level as possible.

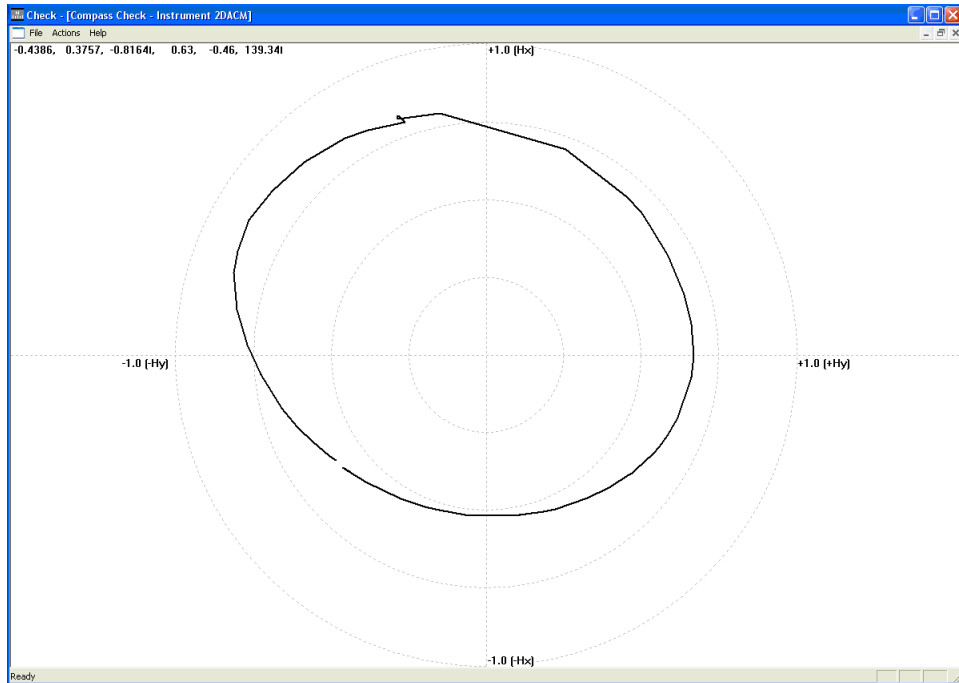


Figure 1 A slightly egg-shaped and off-centered pattern

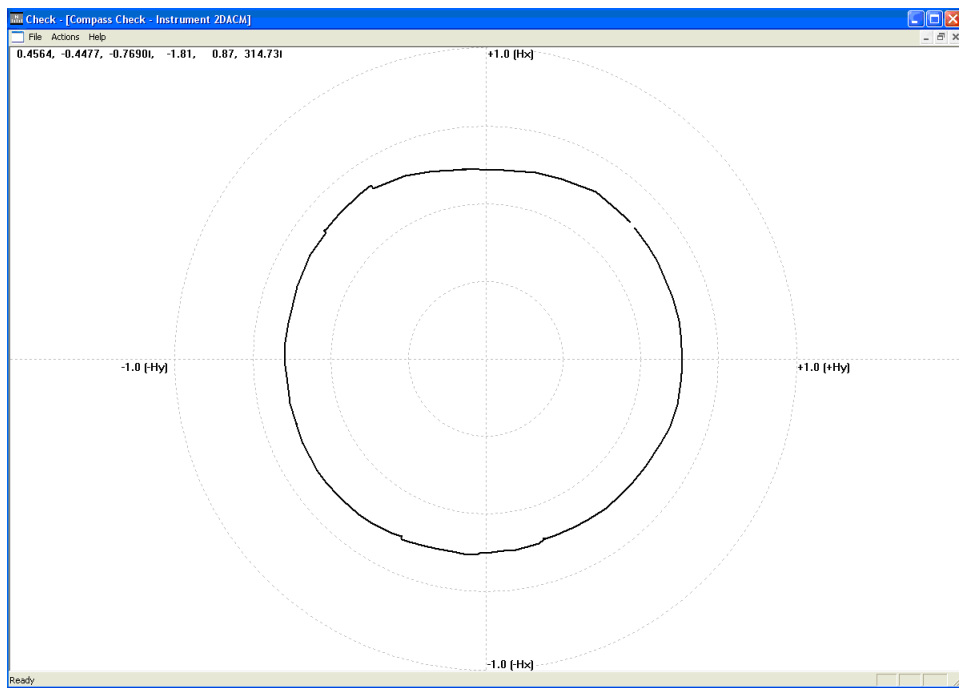
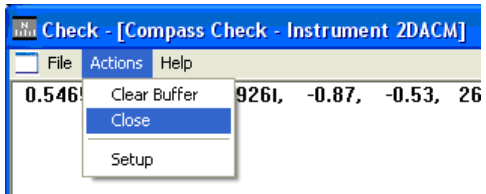


Figure 2 An example of a good calibration

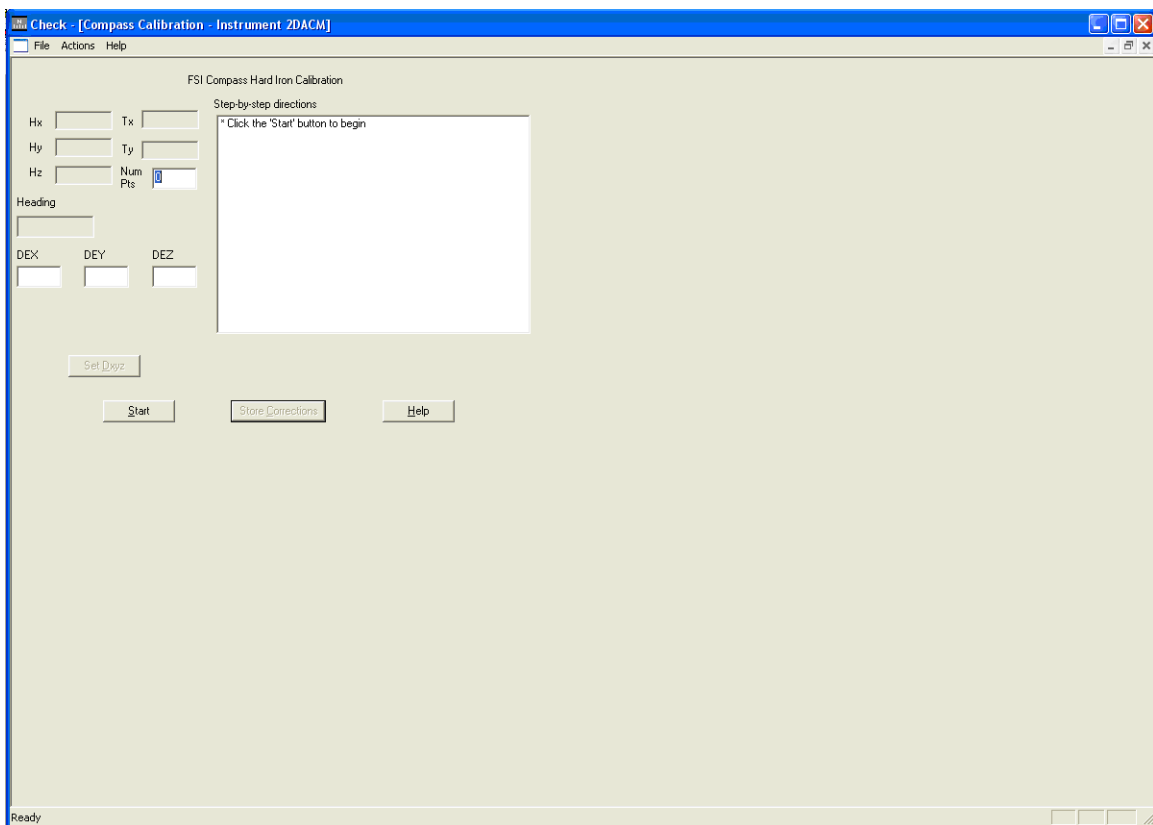
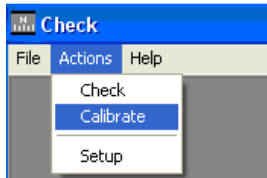
Calibrating the Compass

The following steps guide the user to calibrate the instrument's compass, select Calibrate from the Actions menu. Follow the step-by-step directions displayed.

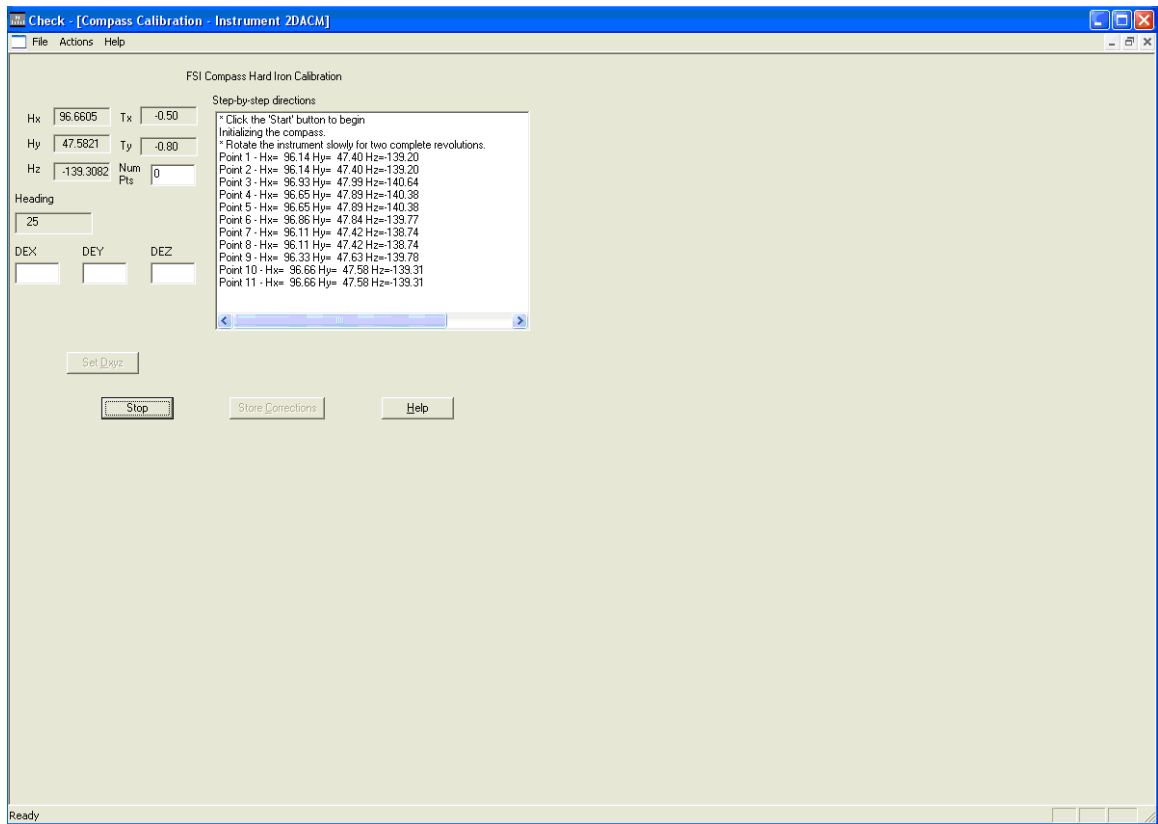
1. Select Actions>close from the menu to stop checking



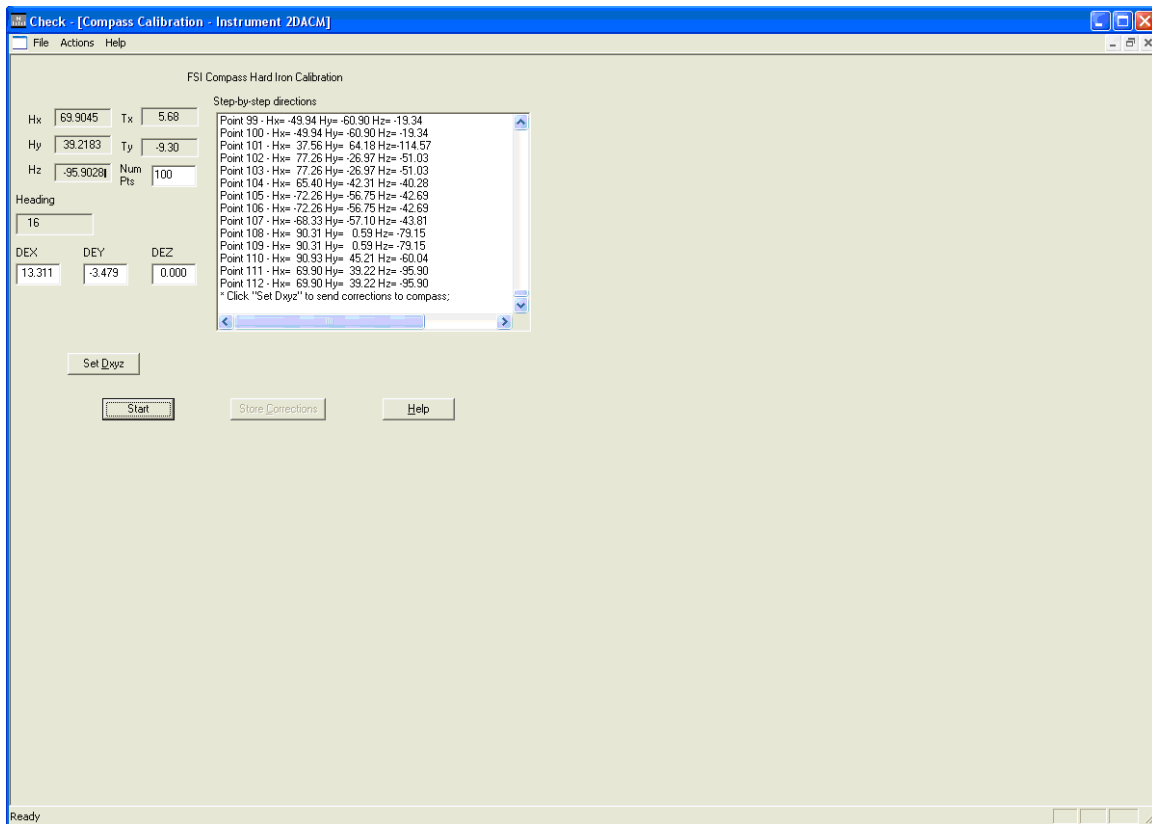
2. Select Actions>Calibrate form the menu to open the Calibration tool



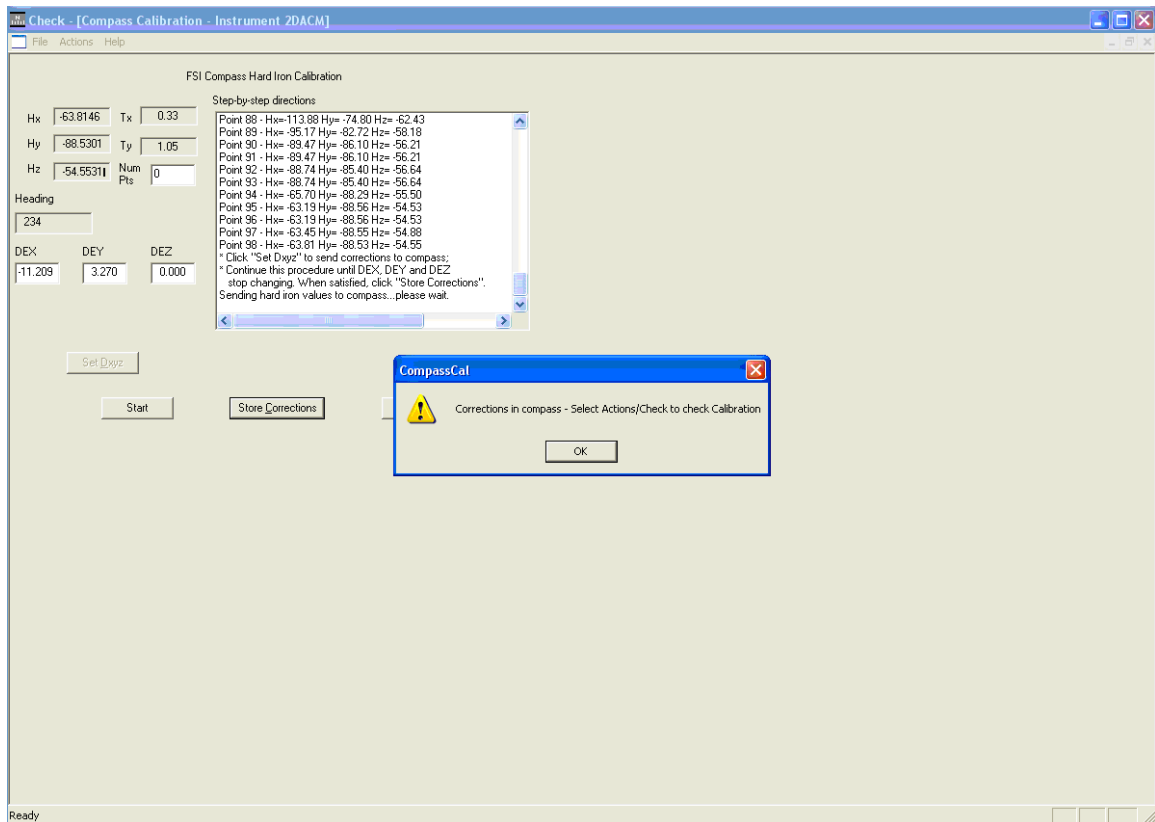
3. Click the Start button. This sends the proper commands to the instrument to generate the compass data needed for calibration. Once data begins to flow, rotate system two times - try not to introduce pitch or roll while rotating.



4. After the second rotation click the stop button.



5. Click Set Dxyz to send the hardiron calibration values (DEX,DEY,DEZ) to the instrument. These values will alter the data output from the compass, but will not be permanently stored until the next step is followed.
6. Click Store Corrections to permanently store the hardiron calibration values in the instrument.



7. Select Actions>Close from the menu
8. Check the calibration by selecting Actions>check from the menu. (see **Checking Compass Calibration** above for more details).