How To Calibrate Gill Wind Sensors OS-5000S Compass for PMEL Instruments

The following documents the procedure for calibrating the Ocean Server OS-5000S
compass installed in a PMEL modified Gill Wind sensor housing.

Requirements

NAME	Description	Qty
Wind Sensor	*PMEL Modified Wind Sensor with OS-5000S Compass*	1
Cable	*Compass Test Cable*	1
Power Supply	*Power Supply or Battery (3.3 - 24VDC)*	1
Laptop	*Laptop with Ocean Server Compass Utility Installed	1
RS232 Adapter	USB-to-RS232 Device/Cable	1
Test Jig	Wind Sensor Test Jig with Pitch & Roll Gimbal	1

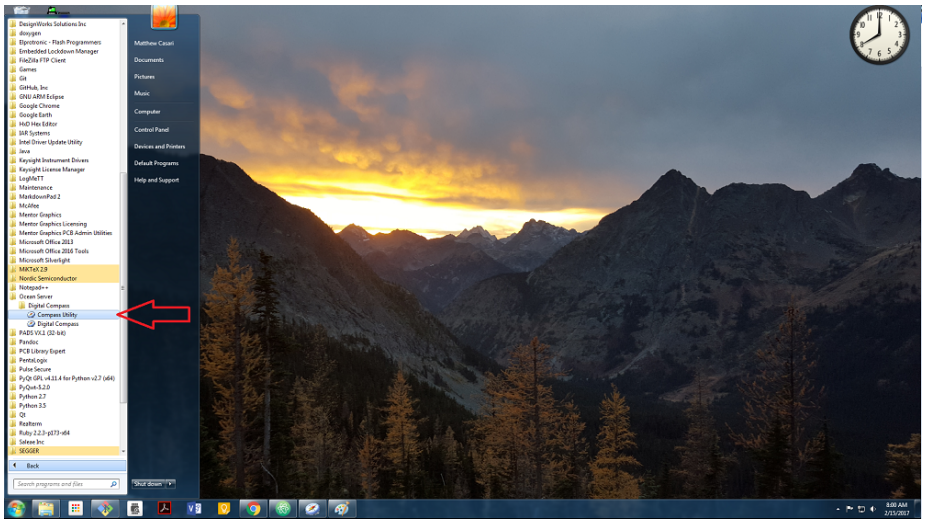
Procedure

Test Setup

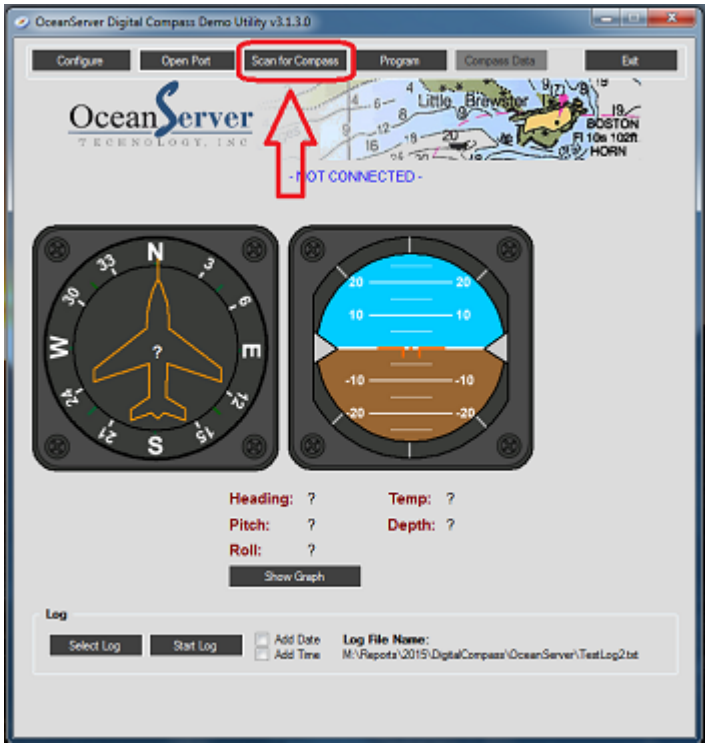
- [ ] Install the Wind Sensor
- [ ] Attach the Cable to the Wind Sensor
- [ ] Mount the Wind Sensor on the Test Jig
- [ ] Align the gimbal so pitch & roll are at 0°
- [ ] Install the jig on the rotary monument with north indicators aligned.
- [ ] Rotate turn-table to 0°
- [ ] Connect the RS232 Adapter to the Laptop
- [ ] Connect the Power Supply to the Test Cable

Software Setup

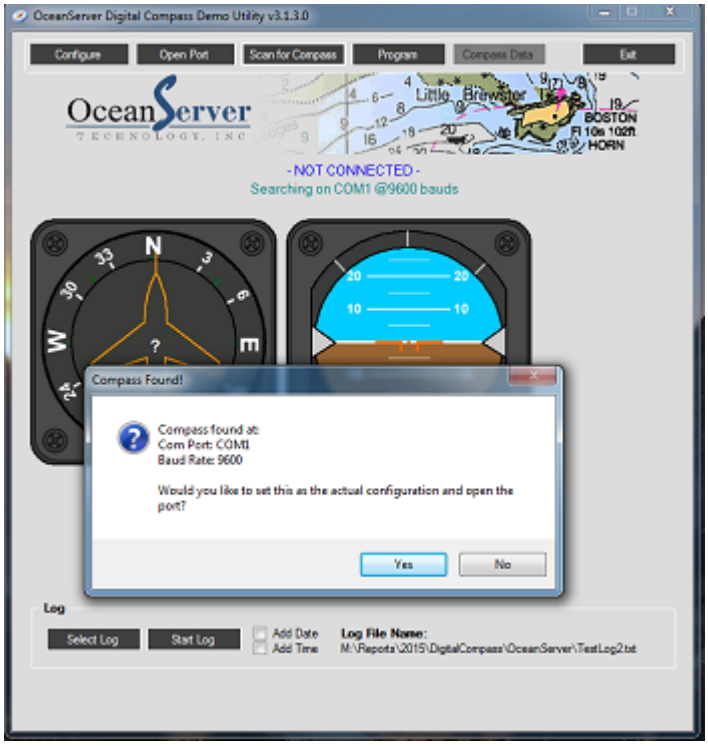
- [ ] Load the Ocean-Server Compass Utility Program



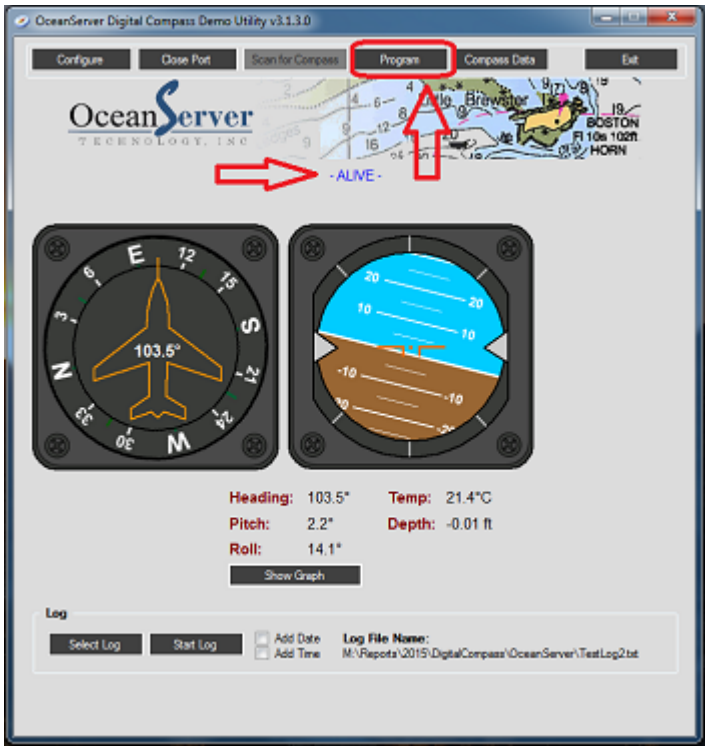
- [ ] Select “Scan for Compass” from the top menu



- You should see the following result. If not, verify that the serial and power are connected and restart the test.

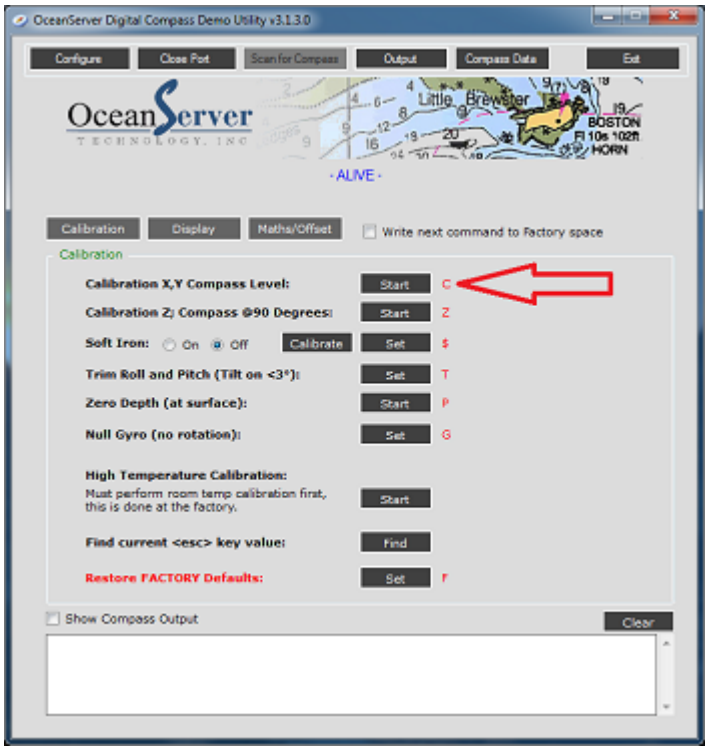


- [ ] With the compass “Alive”, select the “Program” button from the top menu.



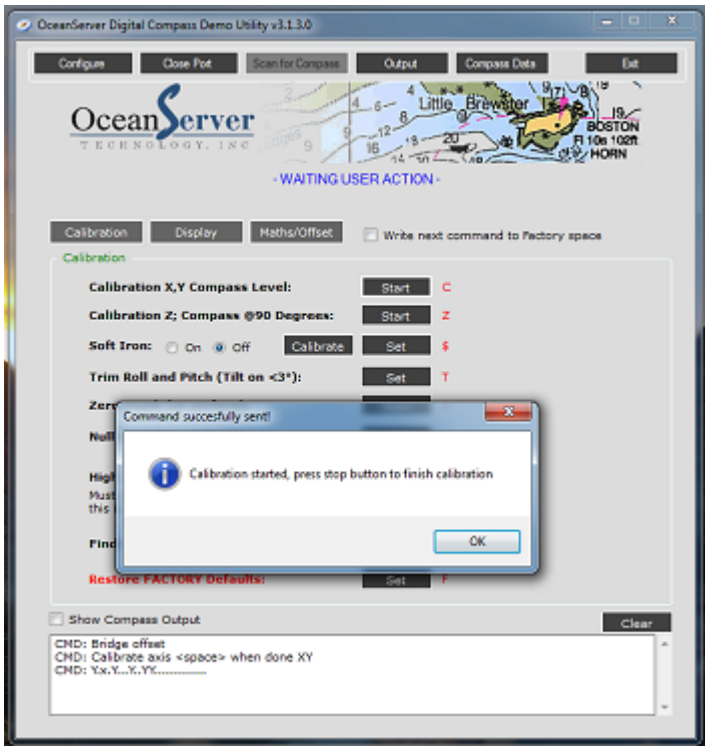
X,Y Calibration

- [ ] Select ***"Calibration X,Y Compass Level: Start"*** from the menu (press button).
- Press **Enter** to exit the pop-up window
- When started, rotate the turntable clockwise so that it performs one revolution in 20+ seconds.
- Press the **Spacebar** when complete



Z Calibration

- [ ] Adjust the pitch axis of the gibal so that compass is 90° to normal.
- [ ] Align sensor North with 0° on the monument
- [ ] Press ***"Calibrate Z; Compass @90 Degrees: Start"***
- Press **Enter** to exit the pop-up window
- Rotate the turntable through 360° over 20+ seconds
- Press the **Spacebar**



Soft Iron Calibration

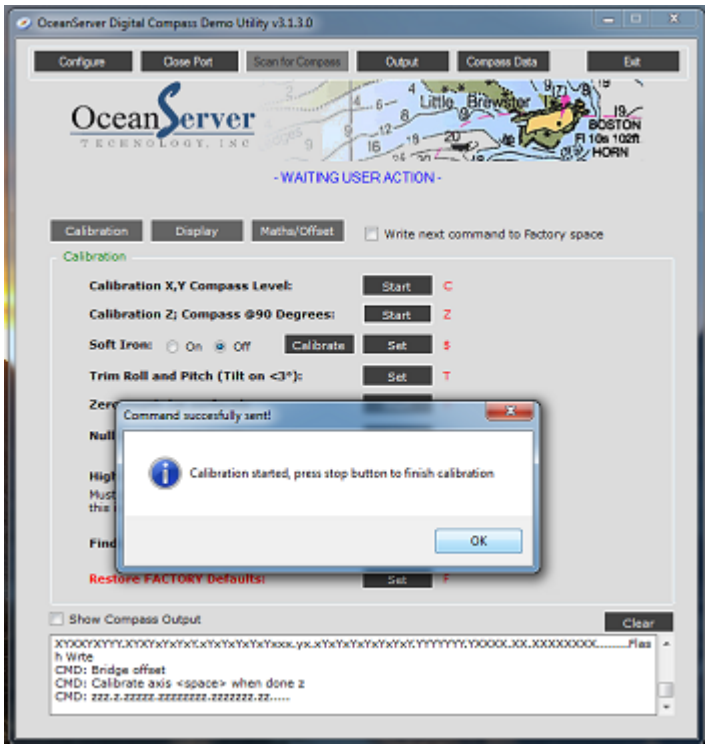
- [ ] Adjust the pitch axis of the gibal so that compass is 0° to normal.
- [ ] Align sensor North with 0° on the monument
- [ ] Select ***"Soft Iron: On"*** Radio Button
- [ ] Press ***"Soft Iron: Calibrate"***
- Press **Enter** to exit the pop-up window
- Press the **Spacebar**

- [ ] Rotate the turntable to 90°
- Press **Enter** to exit the pop-up window
- Press the **Spacebar**

- [ ] Rotate the turntable to180°
- Press **Enter** to exit the pop-up window

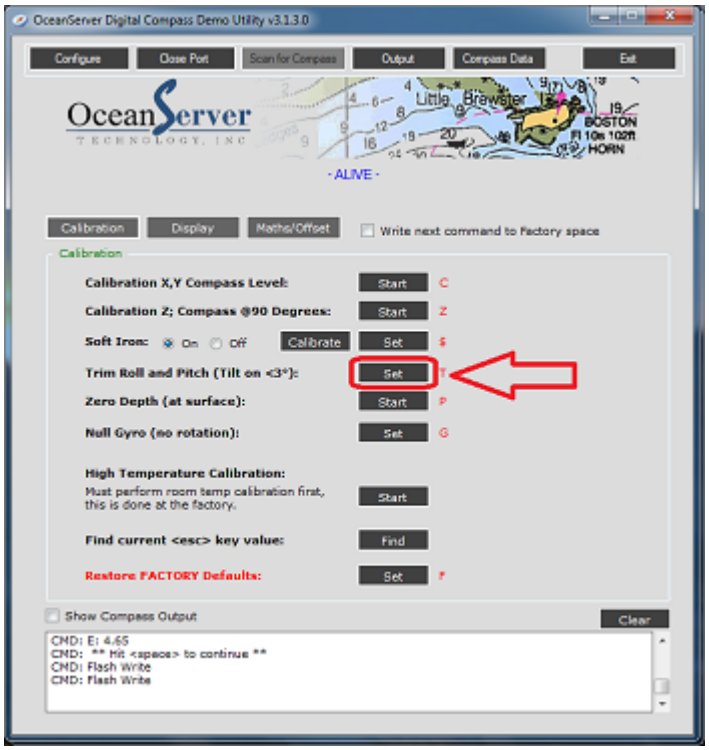
- Press the **Spacebar**

- [ ] Rotate the turntable to 270°
- Press **Enter** to exit the pop-up window
- Press the **Spacebar**



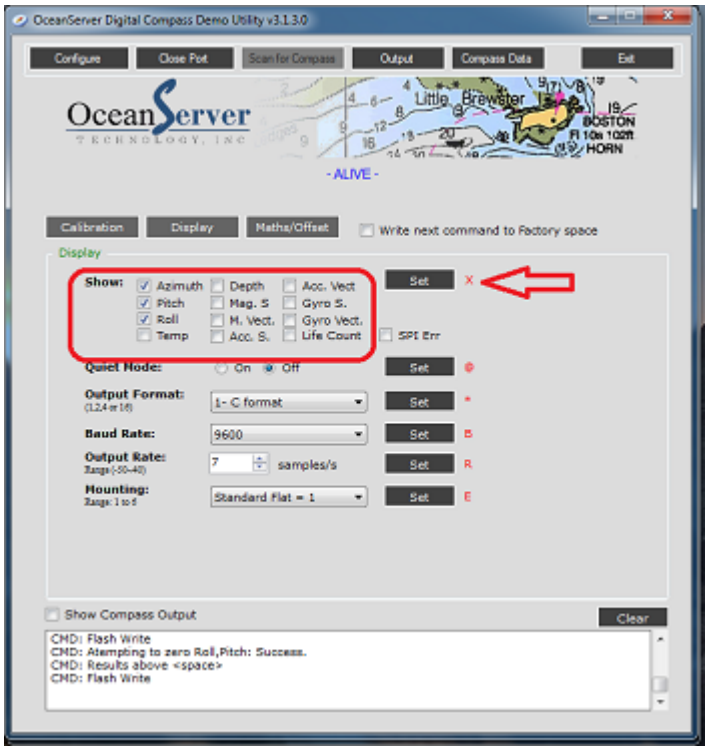
Trim Roll & Pitch

- [ ] Ensure the Pitch & Roll axis of the gibal so that compass is 0° to normal.
- [ ] Select ***"Trim Roll and Pitch (Tilt on <3°): Set"***

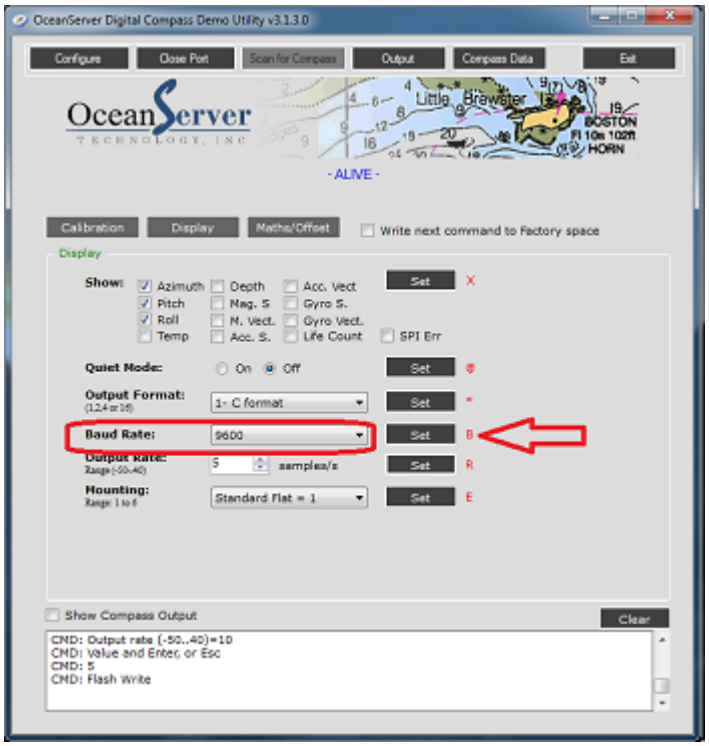


Set Baud Rate and Data Format

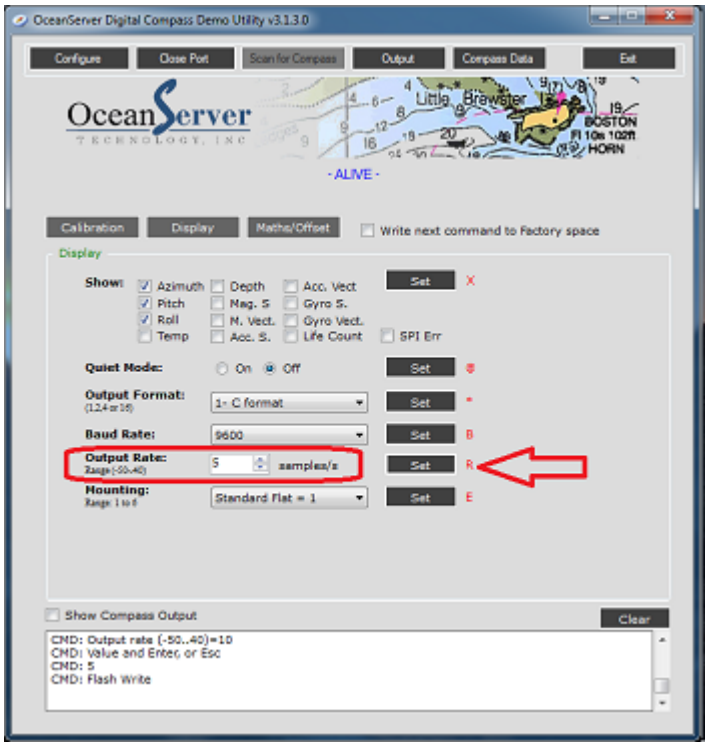
- [ ] Select ***"Display"*** from the menu
- [ ] Select ***"Azimuth", "Pitch", "Roll"*** from check boxes. Deselect all others
- [ ] Select ***"Set"*** To the right of check boxes



- [ ] Select ***"Baud Rate: 9600"*** from pull-down menu.
- [ ] Select ***"Set"***



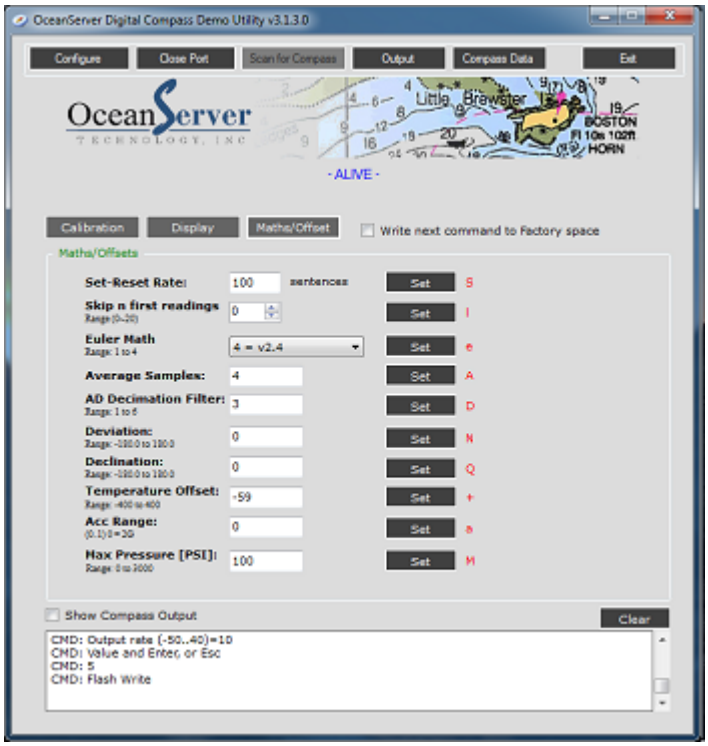
- [ ] Select ***"Output Rate: 5 samples/sec"*** from menu.
- [ ] Select ***"Set"***



- [ ] Select ***"Maths/Offsets"*** from the menu
- [ ] Ensure the following settings are correct. If they are not, apply change and press corresponding ***"Set"***

Variable	Value
Set-Reset Rate	100 sentences
Skip n first readings	0
Euler Math	4=v2.4
Average Samples	4
AD Decimation Filter	3
Deviation	**Enter Deviation if Required**
Declination	**Enter Declination if Required**
Temperature Offset	**DO NOT CHANGE**
Acc Range	0
Max Pressure [PSI]	N/A

- [ ] Select ***"Set"***

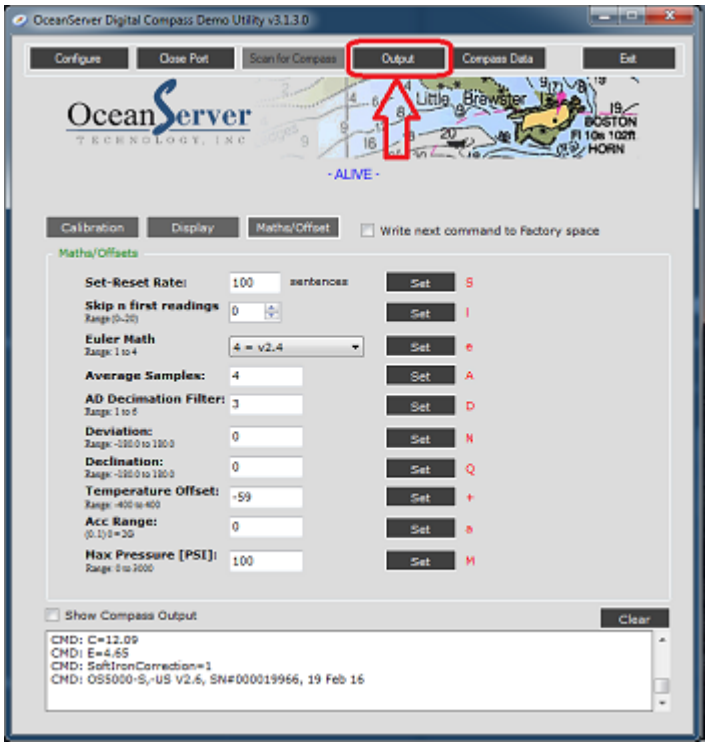


Grab Compass Calibration Data

- [ ] Select ***"Compass Data"*** from top menu
- [ ] Copy, paste and save data in text document

Validate Compass Calibration

- [ ] Rotate the Turntable to 0°
- [ ] Select ***"Output"*** from top menu



- [ ] Rotate the turntable to the following points and record the output.

Turntable Heading	Recorded Value	Error (expected - actual)
0°	°	°
15°	°	°
30°	°	°
45°	°	°
60°	°	°
75°	°	°
90°	°	°
15°	°	°
120°	°	°
135°	°	°
150°	°	°
165°	°	°
1800°	°	°
195°	°	°
210°	°	°
225°	°	°
240°	°	°
255°	°	°

Turntable Heading	Recorded Value	Error (expected - actual)
270°	°	°
285°	°	°
300°	°	°
315°	°	°
330°	°	°
345°	°	°

Calibration Complete