

CALIBRATION PROCESS FOR SENSORS FG-33, FG-33+, FG-43

Version 1.0

Sensors are already factory calibrated, but in some cases recalibration is required (after time, shock, ...)

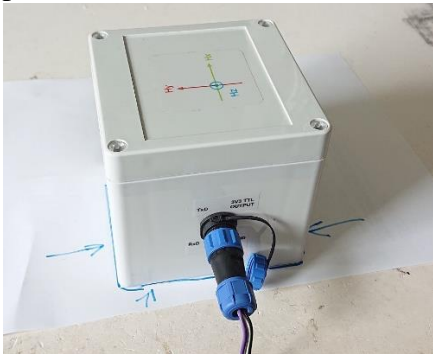
For calibration process of the sensor, you need:

- 12V power supply
- Cable for serial connection (how to, look at manual document)
- Computer with serial terminal program (putty, termite, ...)

Calibration must be done away from any metal and electromagnetic object!

1. Process:

- 1.1. Connect the sensor to the computer and power supply
- 1.2. Run the terminal program and open specified COM port in the terminal program with baud rate 115200bps
- 1.3. Place the sensor away from any metal and electromagnetic device and mark the position. In the case shown in the figure, we will recalibrate “Z” axes.

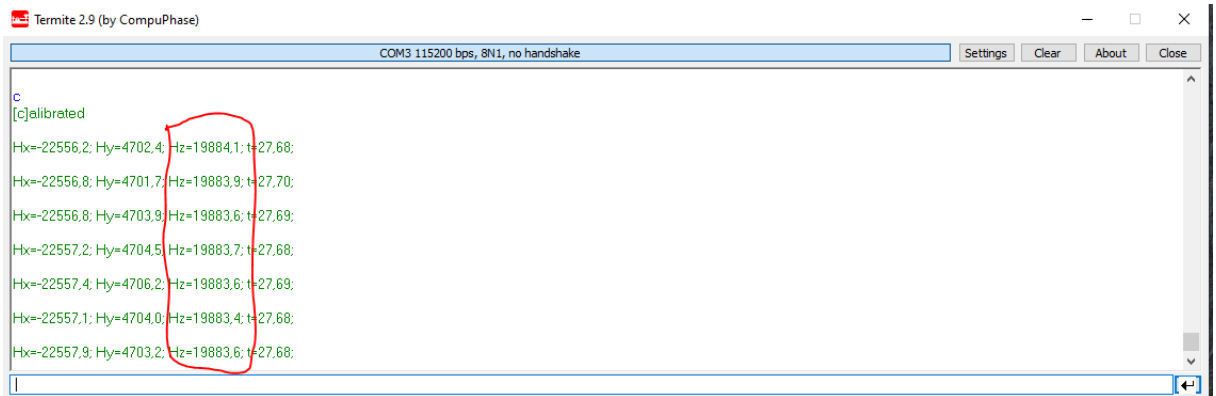


- 1.4. Enter “p” command to receive default settings. Remember the Ax, Ay and Az settings

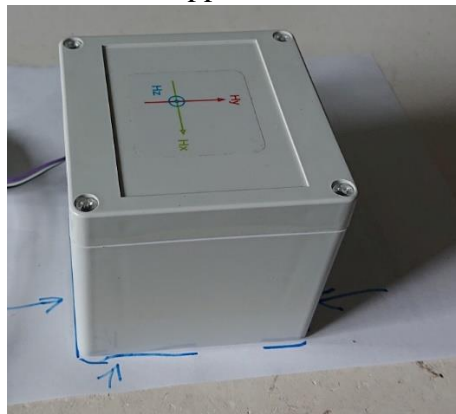
```
Termite 2.9 (by CompuPhase)
COM3 115200 bps, 8N1, no handshake
Settings Clear About Close

Enter a command:
p
[p]rint calibration constants and deviation tangents out
Ax=80054, Bx=219883, Cx=3818277.8, Dx=2.06887
Ay=81924, By=231885, Cy=3499559.0, Dy=2.00153
Az=123236, Bz=208955, Cz=3954634.5, Dz=2.09761
Txy=0.00000, Tzy=0.00000, Tyx=0.00000, Tzx=0.00000
R25=33000 Ohm, beta=4131
int=25 ms
```

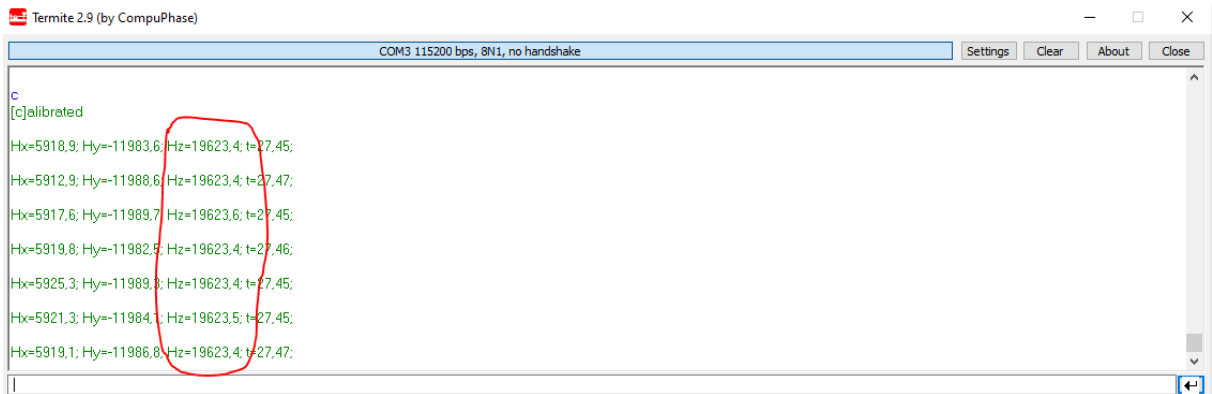
1.5. Enter “c” command to capture data and record in this case Hz (without decimal)
=19884



1.6. Turn the sensor in the opposite direction and enter “c” command again. Now Hz



=19623

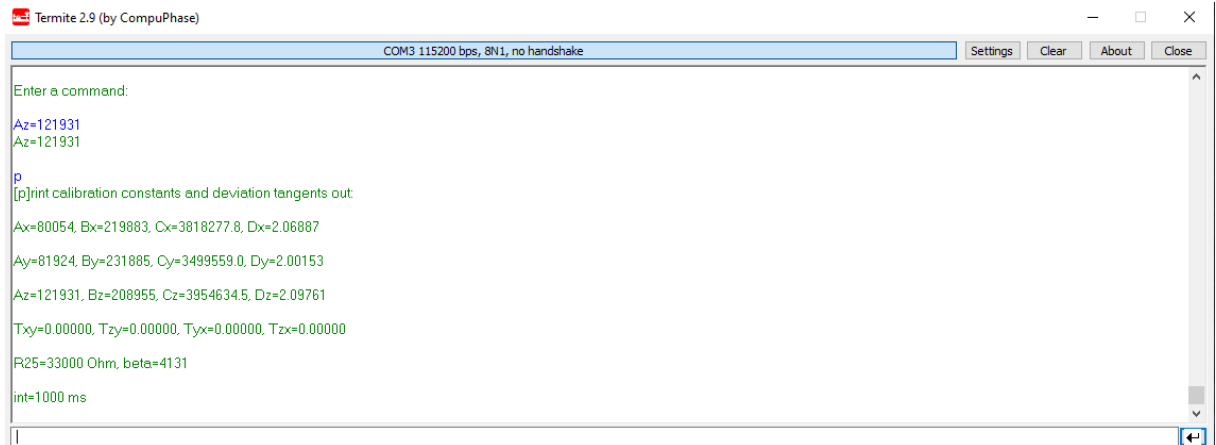


1.7. We noticed the difference of 261nT (19884 – 19623) is too big. Now we need to calculate a new constant value. This must be done with a simple formula.

$$\text{new_constant_value} = \text{old_constant_value} - 10 \times (\text{H_value_one_side} - \text{H_value_opposite_side}) / 2$$

$$\text{new_constant_value} = 123236 - 10 \times (19884 - 19623) / 2 = 121931$$

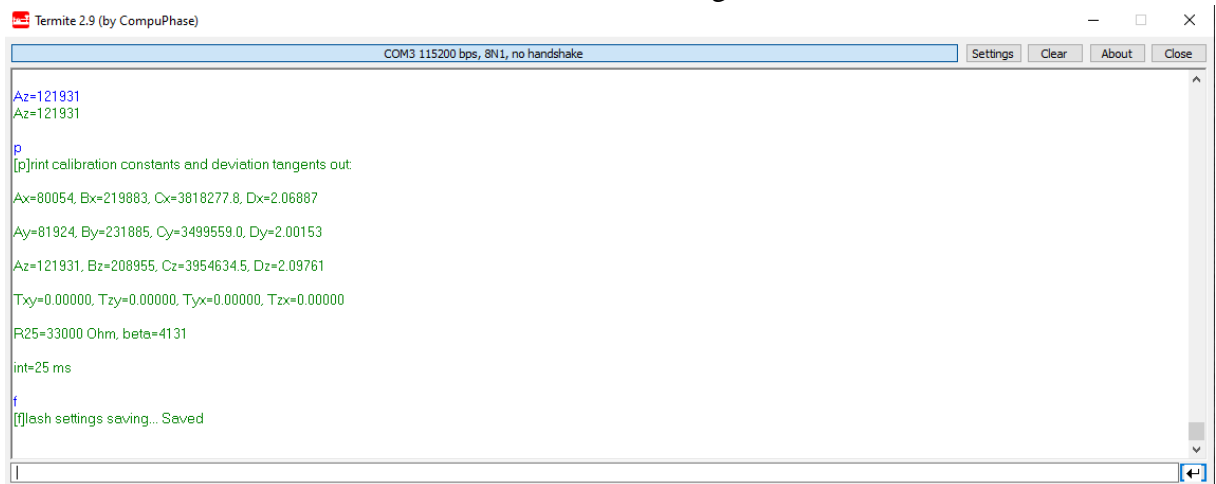
1.8. Enter a new constant value in sensor with “Az=121931”



```
Termite 2.9 (by CompuPhase)
COM3 115200 bps, 8N1, no handshake
Enter a command:
Az=121931
Az=121931
p
[p]rint calibration constants and deviation tangents out
Ax=80054, Bx=219883, Cx=3818277.8, Dx=2.06887
Ay=81924, By=231885, Cy=3499559.0, Dy=2.00153
Az=121931, Bz=208955, Cz=3954634.5, Dz=2.09761
Txy=0.00000, Tzy=0.00000, Tyx=0.00000, Tzx=0.00000
R25=33000 Ohm, beta=4131
int=1000 ms
```

1.9. Repeat the procedure from 1.5 to 1.8 also for “X” and “Y” axes if needed.

1.10. At the end use “f” command to save these settings to flash.



```
Termite 2.9 (by CompuPhase)
COM3 115200 bps, 8N1, no handshake
Az=121931
Az=121931
p
[p]rint calibration constants and deviation tangents out
Ax=80054, Bx=219883, Cx=3818277.8, Dx=2.06887
Ay=81924, By=231885, Cy=3499559.0, Dy=2.00153
Az=121931, Bz=208955, Cz=3954634.5, Dz=2.09761
Txy=0.00000, Tzy=0.00000, Tyx=0.00000, Tzx=0.00000
R25=33000 Ohm, beta=4131
int=25 ms
f
[f]lash settings saving... Saved
```

If something goes wrong, use “def” command to return the default settings. Just do not forget to save those settings with the “f” command!