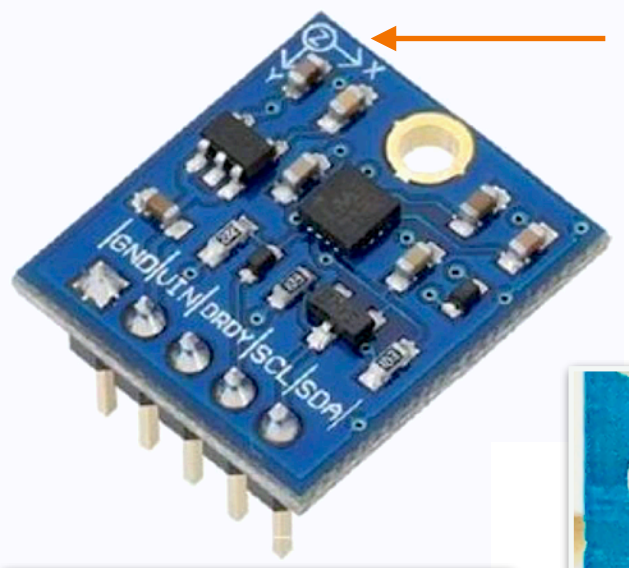
1010 HMC5883L Suplemental Bug Report

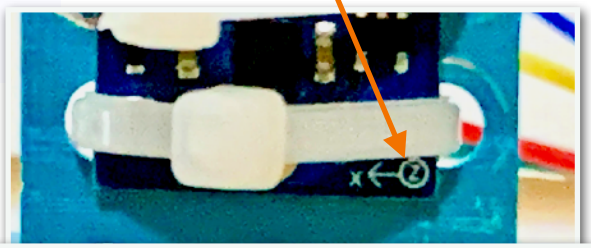
While testing the HMC5883L sensor, I was initially disappointed with the data output not being linear. Although the data was not recorded, the decision was made to design an experiment, to obtain the HMC5883L ***raw data***.

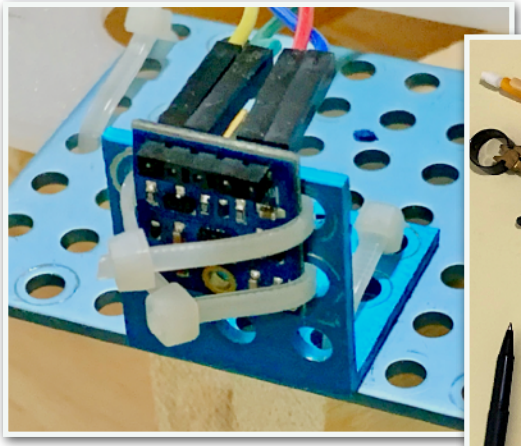
After careful consideration, the experiment simply consisted of rotating the sensor at 8-points 45 degrees apart directing each of the axis x, y and z around a circle to collect the data. Each axis are orthogonally set at 90 degrees apart. The xy-plane lies horizontally in relation on top of the board of the HMC5883L. The z-axis points directly in the up direction of the board of the HMC5883L sensor.

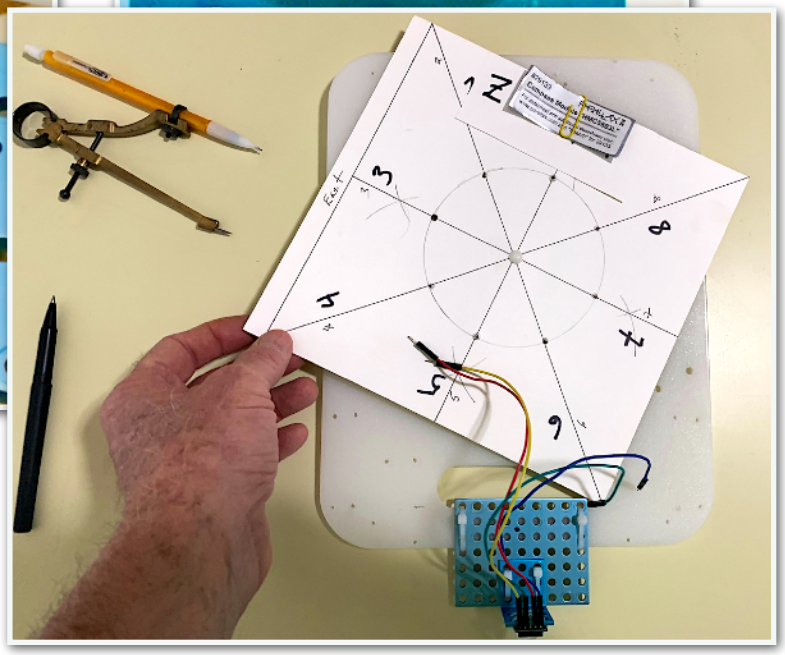


Notice the arrows for x, y and z which form a left-hand configuration. The xy-plane lies horizontally and the z-axis points up.

The board in the image below has the z-axis pointing outward.

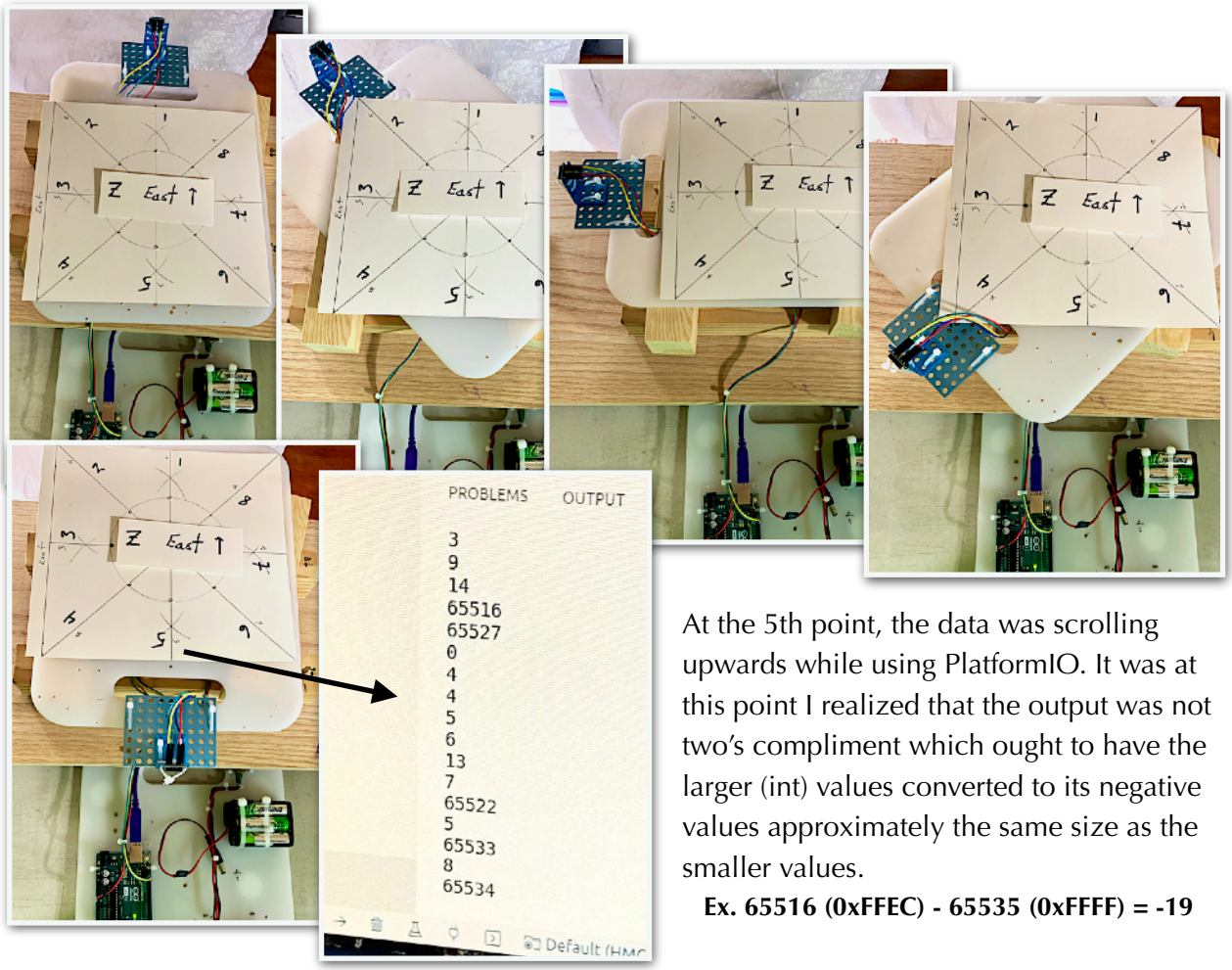






In the experiment, the board was positioned where one of the axis was pointing outward from the center of the circle. In the image above in this test, the z-axis is pointing outwards. This was also setup by positioning the x-axis and the y-axis so that they would point outwards. There were no iron metal placed near the compass while collecting the data at each of the 8 points numbered 1 through 8. The compass was placed away from the center of the circle to reduce the errors…

The method used to orient the compass around the circle while collecting data is demonstrated with the images below…



At the 5th point, the data was scrolling upwards while using PlatformIO. It was at this point I realized that the output was not two's compliment which ought to have the larger (int) values converted to its negative values approximately the same size as the smaller values.

Ex. 65516 (0xFFEC) - 65535 (0xFFFF) = -19

The Parallax HMC5883L compass was functioning as it should. ~~**The problem was the Arduino software in the Wire library.**~~ See the Bug Report for further information and other data obtained.

New test: The Pololu LSM303D setup seems to be working correctly with the **Arduino's Wire.h**, so for now the issue will be focused on both compass sensors thinking now that more needs to be programmed (and investigated) to get both sensors functioning correctly…

—Jesse Carpenter *edited 20230227*