

SenseBox calibration to turbidity (NTU)

Materials needed for calibration

- An expensive turbidity sensor (we used the Analite NEP-5000-Link from Observer)
- Soy milk - instead of Formazin (the standard calibration liquid since it is carcinogenic) and instead of cow's milk (we found that it wasn't as "stable" in NTU compared to soy milk)
- A large vase/glass to hold the soy sample
- Your sensor to calibrate
- A room that can be almost entirely dark once the lights are off

Procedure

1. Obtain your first NTU-bit datapoint as in Figure X below:
 - a. Pour the soy milk into a the large glass. Pour it in a way so there are almost no bubbles. Use enough milk so that you can fully submerge the expensive sensor. After a few minutes, record the NTU value read by the expensive sensor.
 - b. Now remove the expensive sensor and place your senseBox-turbidity sensor into the same soy milk sample (without creating bubbles). Record the number of bits read by the ADC (the ADC is the Adafruit ADS1115).
 - c. This NTU and bit is your first datapoint
2. Repeat the above procedure for different dilutions of the soy milk:
 - a. For example, next dilute 3 parts soy milk to 1 part water (e.g. mix 30mL and 10mL water)
 - b. You want to make sure you have enough data points to cover your entire expected measurement range. So if you have a clear river, you want to obtain datapoints around 0-50 NTU. If you have a very turbid river, you want to obtain datapoints up to 4000NTU.
3. Once you have enough datapoints, fit a curve to your data and obtain the curve's equation. Use this equation in your Arduino code to convert the bits read by the ADC to NTU. **(Please do not use the equation currently in the turbidityCalibrated_sensebox.ino code because that is just a placeholder equation and won't work.)**