

Log

February 2022

1 Week 1

1.1 Introduction

This week we were introduced to the course and the upcoming project we would be assigned to do.

1.2 Groups

We were told to make groups of three for next week. Since the other class was not here, we could not continue any further and class was dismissed...

2 Week 2

2.1 Introduction to Arduino

This week we were introduced to programming on an Arduino. We used the Arduino IDE to write the code which would be deployed on an Arduino which was fixed to circuits system on a Breadboard.

2.2 Sensors

Today we added an ultra-sonic sensor to the circuits system to measure distance to an obstacle. The goal was to make the built-in LED blink for 1/10 of a second when an obstacle was less than 30 cm away but more than 25 cm away, 3/10 of a second when an obstacle was less than 25 cm away

and more than 20 cm away and if the distance between the obstacle and the sensor was less than 20 cm away the LED should turn on constantly.

2.3 Errors

According to the datasheet¹ the sensor outputs an analog voltage of 9.8 mV/in from a 5V voltage supply. We succeeded at getting readings, but these were not the exact distance between the sensor and an obstacle. We made use of the data we received from the sensor which got printed as an output on the Arduino IDE screen. We assumed that our voltage input was the same as the distance to implement the see-think-act cycle. Even though this was not exactly the correct way to do this, it gave us an idea on how the Arduino worked with the sensors.

2.4 Remember for next week

We have not successfully come to a conclusion with the scaling factor.

3 Week 3

3.1 Fault in Arduino

Our Arduino's yellow LED did not work, so we got another Arduino, but this Arduino would not connect to our computer, so we could not push our updated code to the new Arduino. So we went back to using the Arduino from before and implemented an external LED for sensor nr. 2.

3.2 Goal for today

The goal was to make multiple range sensors work so we could measure distance from more than one direction. We did so by connecting the external LED to sensor nr. 2 and connecting the built-in LED from the Arduino to sensor nr. 1.

¹https://www.maxbotix.com/documents/LV-MaxSonar-EZ_Datasheet.pdf

3.3 Using multiple connections in a single system

To connect the two sensors we made a chain connection on the circuit system so the sensors would not interfere with each other. We did this by looking at the datasheet which showed us the following:

The next method is AN Output Constantly Looping. The first sensor will range, then trigger the next sensor to range and so on for all the sensor in the array. Once the last sensor has ranged, it will trigger the first sensor in the array to range again and will continue this loop indefinitely. Below is a diagram on how to set this up.

To start the continuous loop, bring the RX pin high for a time greater than 20 μ s but less than 48ms and return to ground or a high impedance state. This will start the sensor chain. To stop the chain, remove power from the sensors.

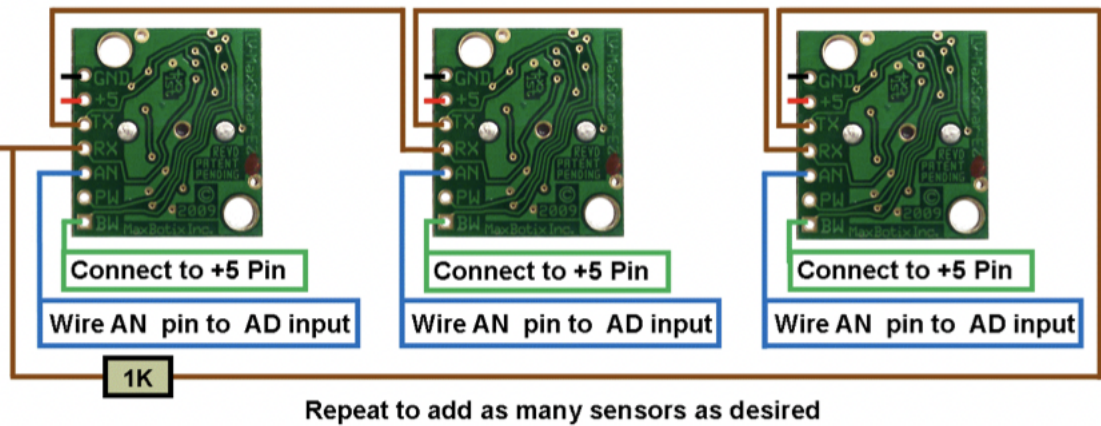


Figure 1: chain connection implemented on circuit system