Experiment 003 Rotation Sensor

I made this!

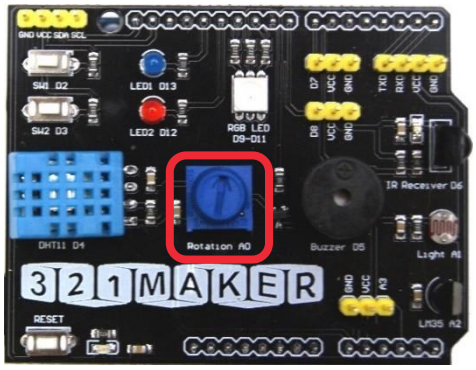
OVERVIEW

In this experiment you will control how to read an analog value from the rotation sensor and display it on the computer's serial monitor window.

OUTCOMES

By the end of this assignment the student will be able to:

- Read an analog value
- Send data from an Arduino to the computer's Serial monitor.



REQUIREMENTS

- Arduino-Compatible board
- 321Maker Things Shield
- USB Cable
- Arduino Software

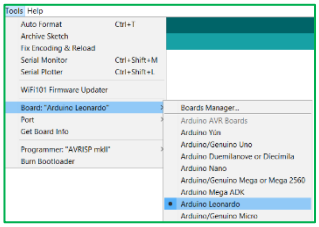
PREREQUISITES

- Getting Started Tutorial: http://321maker.com/start

VIDEO TUTORIAL

http://youtube.com/indevelopment

BACKGROUND



Rotation Dial

The rotation dial on the 321Maker shield is a variable resistor (potimeter) that is connected to analog pin A0. As the dial is turned it will vary the voltage between 0-5V. As the dial list rotated clockwise the voltage increases, the Arduino can read this voltage through the use of an internal analog to digital converter (ADC). The ADC maps of value of the voltage from zero to 1023.

Serial Connection

The Arduino is able to communicate with the computer by sending data through the USB port on the Arduino this is then read by the Arduino software and displayed in the serial monitor window. The default data baud rate is 9600 bps. By using the serial connection programmers can send data to a computer via the USB port. This provides a simple way for developers to debug and troubleshoot code.

The **serial. Begin()** command establish is the serial connection back to the computer this command accepts one argument what is the data rate of the connection.

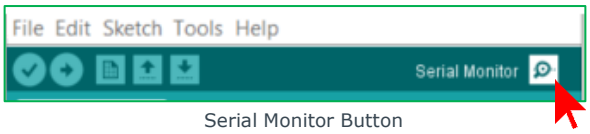
The **serial. Write()** function is used to send data to the USB port of the computer.

Experiment 003 Rotation Sensor

LEVEL 1 PROCEDURE

- [ ] Connect your Arduino to your computer using the USB port. Open the Arduino software.
- [ ] Download the **Rotation Sensor** program code from here: https://git.io/viQqs
- [ ] Copy and paste the program code into the Arduino software editor.
- [ ] Make sure you have the correct Arduino Board and Communications port setup.
- [ ] Click the upload button in the upper left corner to compile and upload the code to the Arduino device. If you see an Orange error in the bottom of your screen, then something went wrong.

- [ ] From the Arduino program click the magnifying glass in the upper right of the screen to open the serial monitor.



Serial Monitor Button

- [ ] As you rotate the dial, you should notice the values changing in the serial monitor.

- [ ] Congratulations, you are now reading data from the rotation sensor. .

LEVEL 2 PROGRAM MODIFICATION

- [ ] Modify line 19 of the program to show "Volume =" instead of "Rotation Value="
- [ ] Modify the program code to read the sensor once every 5 seconds.
- [ ] Modify the program code to display the value of the rotation dial divided by 4.

LEVEL 3 ADVANCED APPLICATION

- [ ] Write a program that cycles displays the following color sequence on the RGB LED (D9-D11) red, green, blue. The speed at which the color changes is controlled by Rotation dial A0 on the board.

LEVEL 4 PROJECT CHALLENEGE

- [ ] **Thermostat Challenge-** Write a program that will read the rotation sensor and it will control the such that if the value the value of the dial is below 512 the blue LED (D13) will turn on, or else if the value is 512 or greater the red Led (D13) will turn on.

- [ ] **Light Show Challenge–** Write a program that will vary the brightness of the RGB led (D9-D11), based on the value of the rotation sensor.

- [ ] **Tone generator Challenge-** Write a program that will output a sound using the buzzer (D5). The sound of the buzzer should vary with the value of the rotation dial.