

3 Analog Sensors

1. Ultrasonic rangefinder

Requires 5V, and a 1k resistor should be plenty to help keep it from getting damaged and filter out any noise. It has 4 pins: Ground, Supply, trigger input and trigger output. It works by send a small high-frequency sound burst from the emitter: solid objects within the expected range (in this case 400cm) bounce the sound wave back into the expecting receiver, and the time it took between the signal sent and received is used to determine distance. With the speed of sound being near-constant in livable conditions, the time multiplied by the speed of sound divided by two allows us to solve for the distance from the emitter and the object it bounced its sound off. No special libraries are required, but careful thought must be put into the timer and units you are measuring so that your data makes sense. While not specifically an analog sensor, it can be argued that after running its calculation and outputting different answers over time it fits the bill.

2. Light sensor

5V is fine for powering it, and a 200ohm resistor works perfectly well with it. The photo-resistor or “light sensor” changes its resistance based on present light levels. Despite being rather inaccurate to the precise levels of light present, it can somewhat clearly track light levels changing. This occurs as photons charged within the semiconductor “jump” the band when certain frequencies are attained, allowing for more or less to “jump” depending on the light levels. When attached directly to an analog pin on the Arduino the Arduino simply reads the resistance change as the sensor is exposed to light, whereas if an analog pin “listens” to a circuit including the sensor it will measure the voltage change.

3. Alcohol sensor

The MQ-3 breathalyzer is a sensor that is sensitive to the amount of alcohol (ethanol) in a person’s breath. The user needs to breathe into the sensor and the levels will be measured. The sensor works by giving an analog voltage output depending on the amount of alcohol it detects. When it reaches a certain threshold, the output will be “HIGH”. The potentiometer can be adjusted to raise or lower the threshold. This sensor has 4 pins; a 5V power, ground, analog

output, and digital output. The amount of alcohol on a person's breath is proportional to the amount in their blood, therefore this sensor is fairly accurate in estimating the blood alcohol level.

SOURCES:

<http://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/>

<https://en.wikipedia.org/wiki/Photoresistor>

<http://www.learningaboutelectronics.com/Articles/MQ-3-alcohol-sensor-circuit-with-arduino.php>