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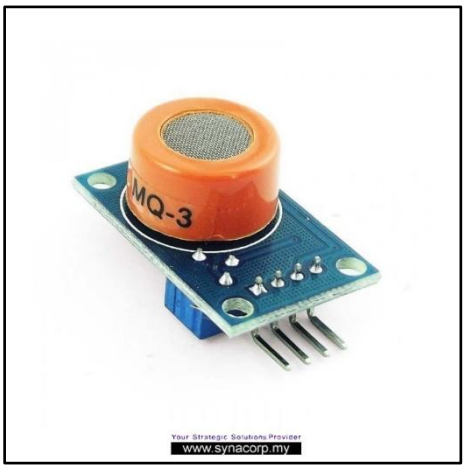
MQ3 MQ-3 Alcohol Gas Sensor Module Detector



Introduction

This module is made using Alcohol Gas Sensor MQ3. It is a low cost semiconductor sensor which can detect the presence of alcohol gases at concentrations from 0.05 mg/L to 10 mg/L. The sensitive material used for this sensor is SnO2, whose conductivity is lower in clean air. It's conductivity increases as the concentration of alcohol gases increases. It has high sensitivity to alcohol and has a good resistance to disturbances due to smoke, vapor and gasoline. This module provides both digital and analog outputs. MQ3 alcohol sensor module can be easily interfaced with Microcontrollers, Arduino Boards, Raspberry Pi etc.

This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple; all it needs is one resistor. A simple interface could be a 0-3.3V ADC.

Features

- Sensor Type - Semiconductor
- Easy SIP header interface
- Compatible with most of the microcontrollers
- Low-power standby mode
- Requires heater voltage
- Good sensitivity to alcohol gas
- Fast response and High sensitivity
- Long life and low cost
- Requires simple Drive circuit

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Specification

- Power requirements: 5 VDC @ ~165 mA (heater on) / ~60 mA (heater off)
- Current Consumption: 150mA
- DO output: TTL digital 0 and 1 (0.1 and 5V)
- AO output: 0.1- 0.3 V (relative to pollution), the maximum concentration of a voltage of about 4V
- Detecting Concentration: 0.05-10mg/L Alcohol
- Interface: 1 TTL compatible input (HSW), 1 TTL compatible output (ALR)
- Heater consumption: less than 750mW
- Operating temperature: 14 to 122 °F (-10 to 50°C)
- Load resistance: 200kΩ
- Sensitivity S: Rs(in air)/Rs(0.4mg/L Alcohol)≥5
- Sensing Resistance Rs: 2KΩ-20KΩ(in 0.4mg/l alcohol)
- Dimensions: 32 x 22 x 16 mm

Components

- Arduino Uno
- MQ-3 alcohol sensor
- LED
- Jumper wires

Objectives:

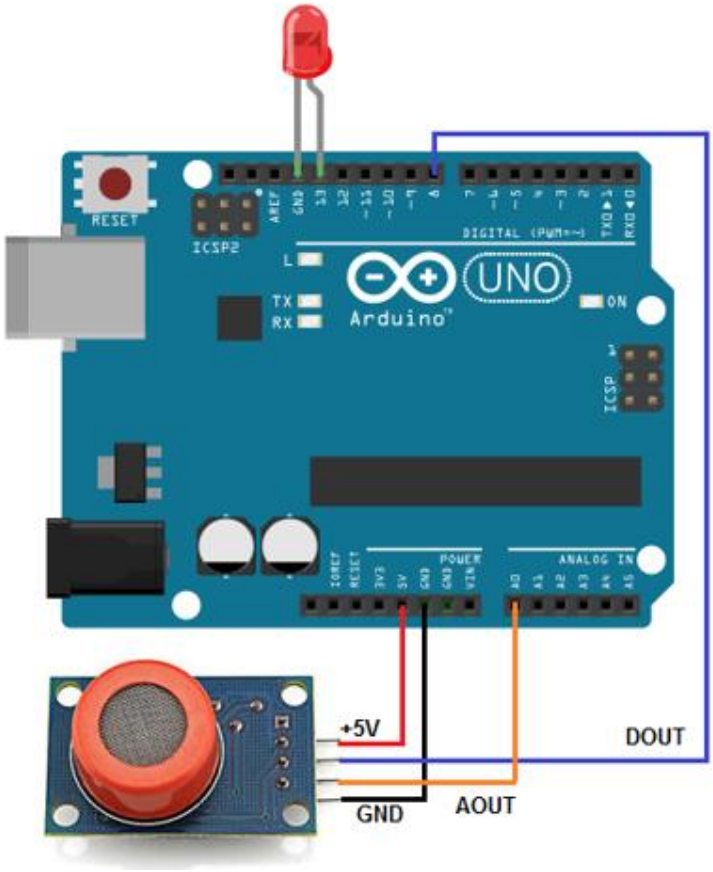
In this experiment, we will build an alcohol sensor with an Arduino as an alcometer to get an estimate of a person's blood alcohol level.

Procedures:

Step 1: Build the circuit connection as shown in table below. The connection between the MQ-3 alcohol sensor and the Arduino Uno board:

MQ-3 alcohol	Arduino Uno
GND	**GND**
VCC	**5V**
DOUT	**Pin 8**
AOUT	**A0**

please make sure the wiring is same as the picture given

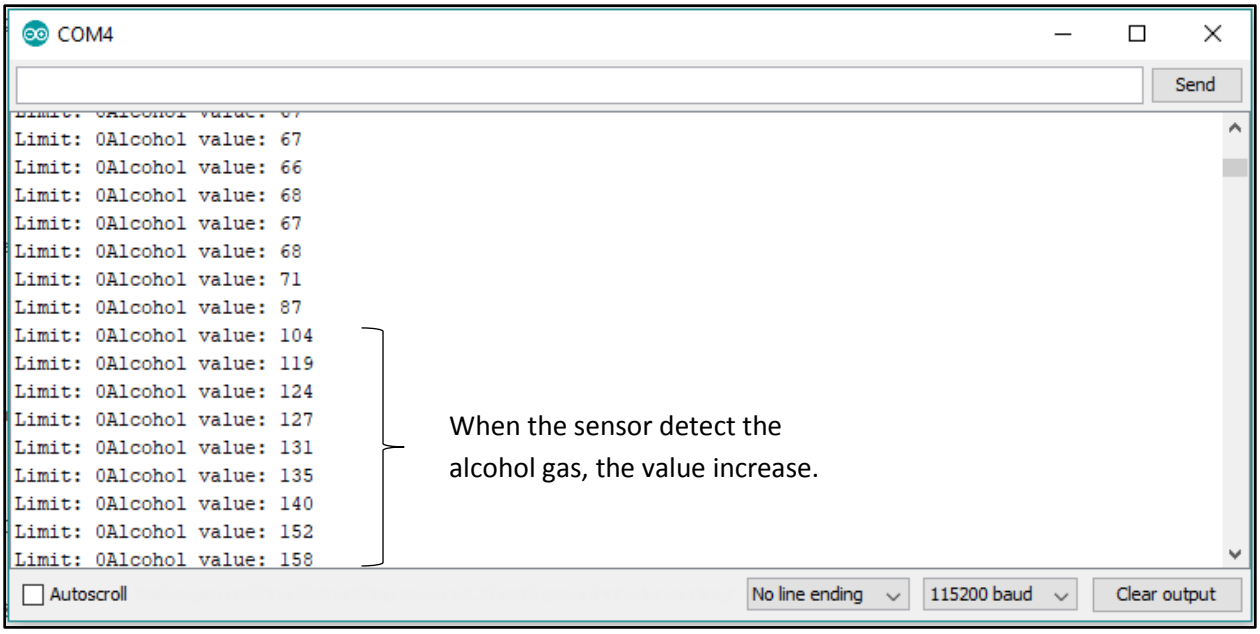


Step 2: Insert the sample programming provided below by copy and paste it into Arduino IDE.

```
/* MQ-3 Alcohol Sensor Circuit with Arduino */

const int AOUTpin=0;//the AOUT pin of the alcohol sensor goes into analog pin A0 of the arduino
const int DOUTpin=8;//the DOUT pin of the alcohol sensor goes into digital pin D8 of the arduino
const int ledPin=13;//the anode of the LED connects to digital pin D13 of the arduino

int limit;
int value;

void setup() {
Serial.begin(115200);//sets the baud rate
pinMode(DOUTpin, INPUT);//sets the pin as an input to the arduino
pinMode(ledPin, OUTPUT);//sets the pin as an output of the arduino
}

void loop()
{
value= analogRead(AOUTpin);//reads the analaog value from the alcohol sensor's AOUT pin
limit= digitalRead(DOUTpin);//reads the digital value from the alcohol sensor's DOUT pin
Serial.print("Alcohol value: ");
Serial.println(value);//prints the alcohol value
Serial.print("Limit: ");
Serial.print(limit);//prints the limit reached as either LOW or HIGH (above or underneath)
delay(100);
if (limit == HIGH){
digitalWrite(ledPin, HIGH);//if limit has been reached, LED turns on as status indicator
}
else{
digitalWrite(ledPin, LOW);//if threshold not reached, LED remains off
}
}
```

Step 3: Upload the sketch to the Arduino Uno board

Step 4: Open the serial monitor to observe the result as shown below.



Applications

- Gas level over-limit alarm
- Breathalyzer
- Portable alcohol detector
- Stand-alone/background sensing device
- Environmental monitoring equipment