Gas Sensor Module/ Device
(Technical Note)

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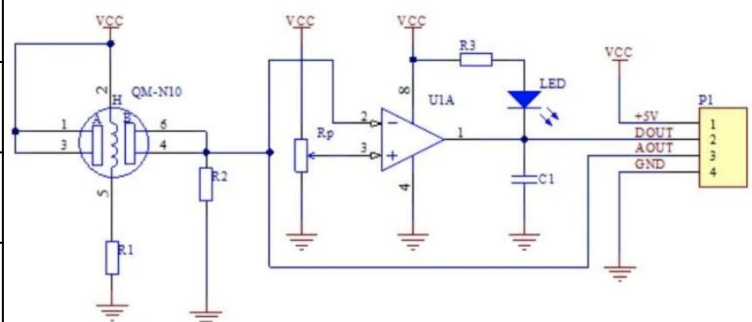
What is a Smoke Sensor Module?

MQ Series of sensor modules are designed to to detect smoke and different gases using the principle of chemiresistors. These sensors have a sensing chamber, where depending on the concentration of smoke/gases, movement of ions are affected thus changing the resistance. It can detect 200-10000 ppm change in concentration of gases.

The sensor module carries the MQ sensor device with a circuit for analog voltage output from the sensor device and a digital output that triggers if the gas level reaches a threshold that is set through the potentiometer. This module also has an on-board LED that turns on when the threshold level is exceeded.

Applications

Smoke detectors in household
Gas sensor
Alcohol breathalyzer
Carbon Monoxide detector
Mine safety appliances
LPG leak detector
Air quality meter

Pinout of typical sensor module

MQ Gas Sensor Series

Z2M Part No	Description
EMS-00010-A	MQ-2 Household or factory gas leakage monitoring device, for liquefied gas, butane, propane, methane, alcohol, hydrogen, smoke
EMS-00010-B	MQ-3 Alcohol Detector Ethanol Gas Detection Sensor
EMS-00010-C	MQ-4 Methane and Natural Gas (CNG) Analog Sensor
EMS-00010-D	MQ-5 Natural Gas and LPG Analog Sensor
EMS-00010-E	MQ-6 LPG Natural Gas Propane Methane Butane Sensor
EMS-00010-F	MQ-7 Carbon Monoxide (CO) Gas Sensor -
EMS-00010-G	MQ-135 Ammonia and Nitrous Oxide Analog Sensor

Typical schematic for the series

Reference:

1. https://lastminuteengineers.com/mq2-gas-senser-arduino-tutorial/
2. http://www.theorycircuit.com/gas-sensor-arduino-hookup-code

Gas Sensor Module/ Device (Application Note)

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Project

To build a model to check if the surrounding smoke or gas level level goes beyond a certain threshold using smoke sensor
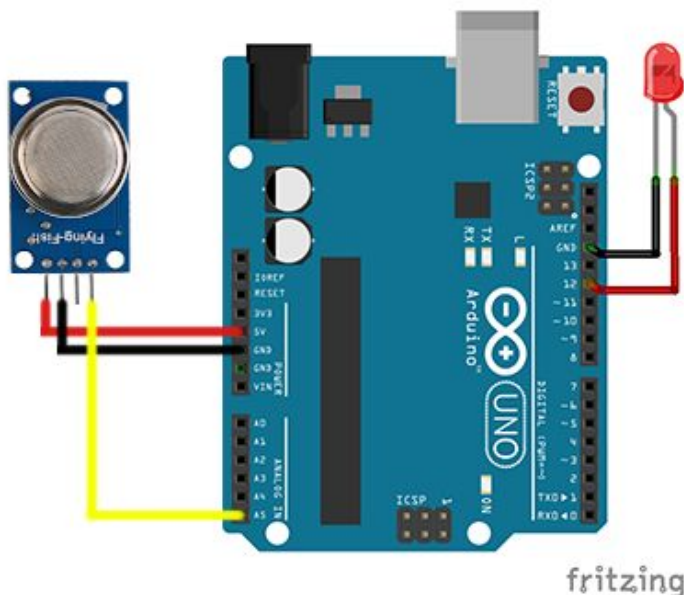
Procedure

Smoke Sensor:
- Connect **1st(Vcc)** pin of sensor to **5V** of Arduino.
- Connect **2nd(GND)** pin of sensor to a **GND** of Arduino
- Connect **4th(OUT)** pin of sensor to **A5** of Arduino

LED:
- Connect **Cathode (shorter leg)** to **GND** of Arduino
- Connect **Anode (longer leg)** to pin **12** of Arduino.

Schematic

Challenge

1. Design a system for mine workers that can warn them for any hazardous gas leakage.
2. Design a model that can open all outlets of a room in case of fire.

Components Required

Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
Gas Sensor Module/ Device	EMS-00010-A to G EDT-00001-A to G	1
LED	EDD-00002-A	1

Code

```
#define led 12/*Connect led to pin 12 of
Arduino*/
#define smoke A5/*Connect sensor to A5 of
Arduino*/
int threshold = 400;/*Setting threshold
limit for situations: Smoke/Smoke-free*/
void setup() {
  pinMode(led, OUTPUT);/*Setting LED for
OUTPUT*/
  pinMode(smoke, INPUT);/*Setting Smoke for
INPUT*/
  Serial.begin(9600);/*Setting the baud
rate of communication at 9600*/
}
void loop() {
  int value = analogRead(smoke);
/*Reading sensor input*/
  Serial.println(value);/*print the value*/
  if (value > threshold)/* Checking for
threshold*/
  {
    digitalWrite(led, HIGH);/*if the
detected value is greater than threshold,
turns ON the led*/
  }
  else
  {
    digitalWrite(led, LOW);/*if detected
value is less than the threshold, turns OFF
the led*/
  }
  delay(1000);
}
```