**Introduction**

MQ gas sensors are a family of sensors which are used to detect a wide variety of gases like alcohol, smoke, methane, LPG, hydrogen, NH3, Benzene, Propane etc. These sensors are made up of electrode which is coated with a sensing material, and it is heated to make it more reactive and sensitive. When the gas reacts with these electrodes, its resistance changes, more the gas, less is the resistance and vice-versa.
Here is a list of the different sensors that we have provided and the gases they detect:

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Gases detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>MQ 3</td>
<td>Alcohol</td>
</tr>
<tr>
<td>MQ 7</td>
<td>CO</td>
</tr>
<tr>
<td>MQ 4</td>
<td>Methane, Natural Gas</td>
</tr>
<tr>
<td>MQ135</td>
<td>Air Quality Control</td>
</tr>
<tr>
<td>MQ6</td>
<td>LPG, Propane</td>
</tr>
<tr>
<td>MQ 8</td>
<td>Hydrogen</td>
</tr>
<tr>
<td>MQ 2</td>
<td>General combustible gas</td>
</tr>
<tr>
<td>MQ 5</td>
<td>LPG, Natural gas, Coal gas</td>
</tr>
</tbody>
</table>

**Objective:**

During this activity, you will help students to achieve following objectives:

- Understanding principle and operations of MQ Gas sensor.
- Design algorithm and flowchart to sense moisture of soil using MQ Gas sensor.
- Programming MQ Gas sensor using Arduino API for Intel Genuino.
- Interfacing MQ Gas sensor with Intel Genuino using analog pin A0.
Algorithm

**Step 1** Assign analog pin A0 to MQ GAS Sensor

**Step 2** Define and initialize Setup Function for GAS sensor

**Step 3** Read GAS Sensor Value

**Step 4** If GAS sensor value is Greater than Threshold value than Print High

**Step 5** If GAS sensor value is Less than Threshold value than Print Low
Flowchart

Start

Assign Analog A0 to GAS sensor

Define and Initialize Threshold value

Read Analog Input

Analog read > threshold

Print High

Print Low
int input = A0; int output = 7; int thr=500; // Set threshold level. void setup()
{
    Serial.begin(9600);
    pinMode(output,OUTPUT);
    digitalWrite(output,LOW);
}

void loop()
{
    Serial.println(analogRead(input));
    if(analogRead(input)>thr)
    {
        digitalWrite(output,HIGH);
    }
    else
    {
        digitalWrite(output,LOW);
        delay(500);
    }
}
Hardware

Instructions:

- Connect GND pin of Gas sensor to GND on the Genuino board
- Connect Out pin of Gas Moisture sensor to A0 on the Genuino board
- Connect VCC pin of Gas Moisture sensor to 5V on the Genuino board
- Connect power supply to the Genuino and USB to USB Client Port on the Genuino
- Open Arduino IDE under Tools → Board select Intel® Genuino
- Under Tools → Serial Port select the Com # where the Genuino is connected to
- Write the above code on Arduino IDE
- Upload to the Genuino by clicking the upload button
- Monitor the value of the gas sensor in the Serial Monitor

Hardware Connection

<table>
<thead>
<tr>
<th>Genuino pin</th>
<th>MQ Gas Sensor Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>5V</td>
<td>VCC</td>
</tr>
<tr>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>Analog pin 0</td>
<td>Signal</td>
</tr>
</tbody>
</table>
Circuit Diagram: