Your Strategic Solutions Provider

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MQ-9 Carbon Monoxide Combustible Gas Sensor

Introduction:

The Analog CO/Combustible Gas Sensor (MQ9) module is useful for gas leakage detecting; it used the sensitive material SnO2, which with lower conductivity in clean air. It make detection by method of cycle high and low temperature, and detect CO when low temperature (heated by 1.5V). The sensors conductivity is higher along with the gas concentration rising. When high temperature (heated by 5.0V), it detects Methane, Propane etc combustible gas and cleans the other gases adsorbed under low temperature. MQ-9 gas sensor has high sensitivity to Carbon Monoxide, Methane and LPG. The sensor could be used to detect different gases contains CO and combustible gases, it is with low cost and suitable for different application.

Connecting five volts across the heating (H) pins keeps the sensor hot enough to function correctly. Connecting five volts at either the A or B pins causes the sensor to emit an analogue voltage on the other pins. A resistive load between the output pins and ground sets the sensitivity of the detector. Please note that the picture in the datasheet for the top configuration is wrong. Both configurations have the same pinout consistent with the bottom configuration. The resistive load should be calibrated for your particular application using the equations in the datasheet, but a good starting value for the resistor is 20kΩ.

Components:

- MQ-9 Carbon Monoxide Combustible Gas Sensor
- Arduino Uno
- USB Cable
- Several Jump Wires

Objectives:

For gas leakage detecting, it used the sensitive material SnO2, which with lower conductivity in clean air.

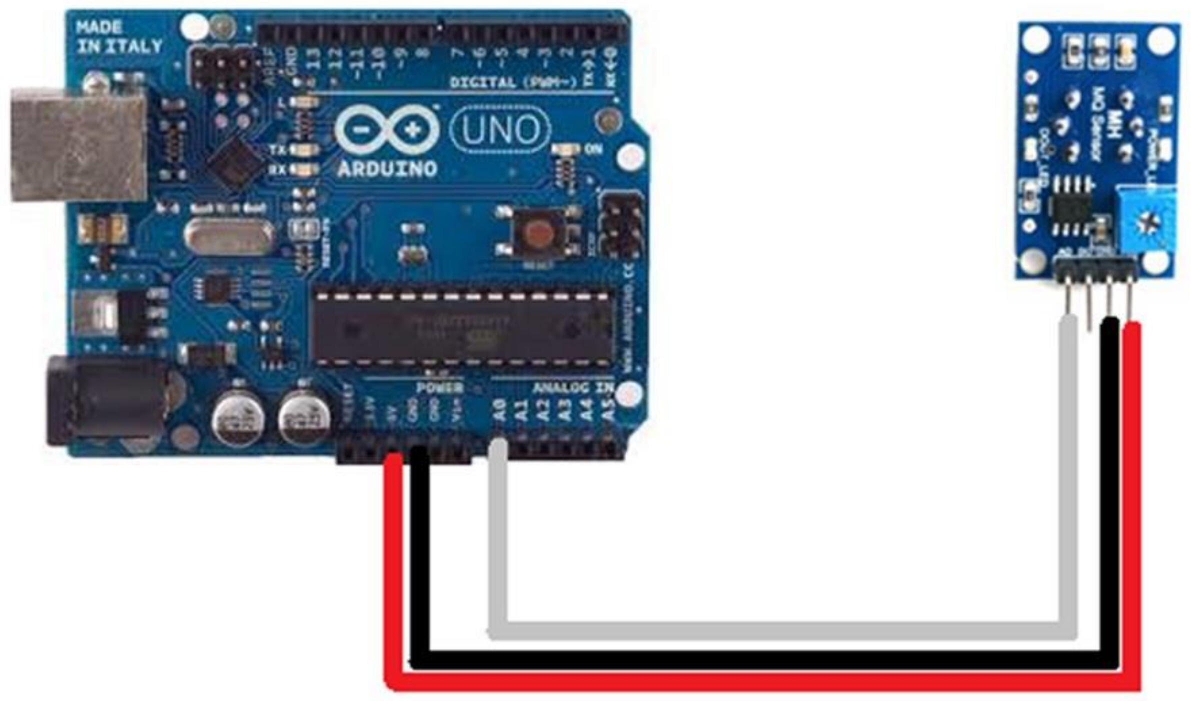
Procedures:

Step 1: Build the circuit.

The connection between the MQ-9 Carbon Monoxide Combustible Gas Sensor

and the Arduino Uno Board:

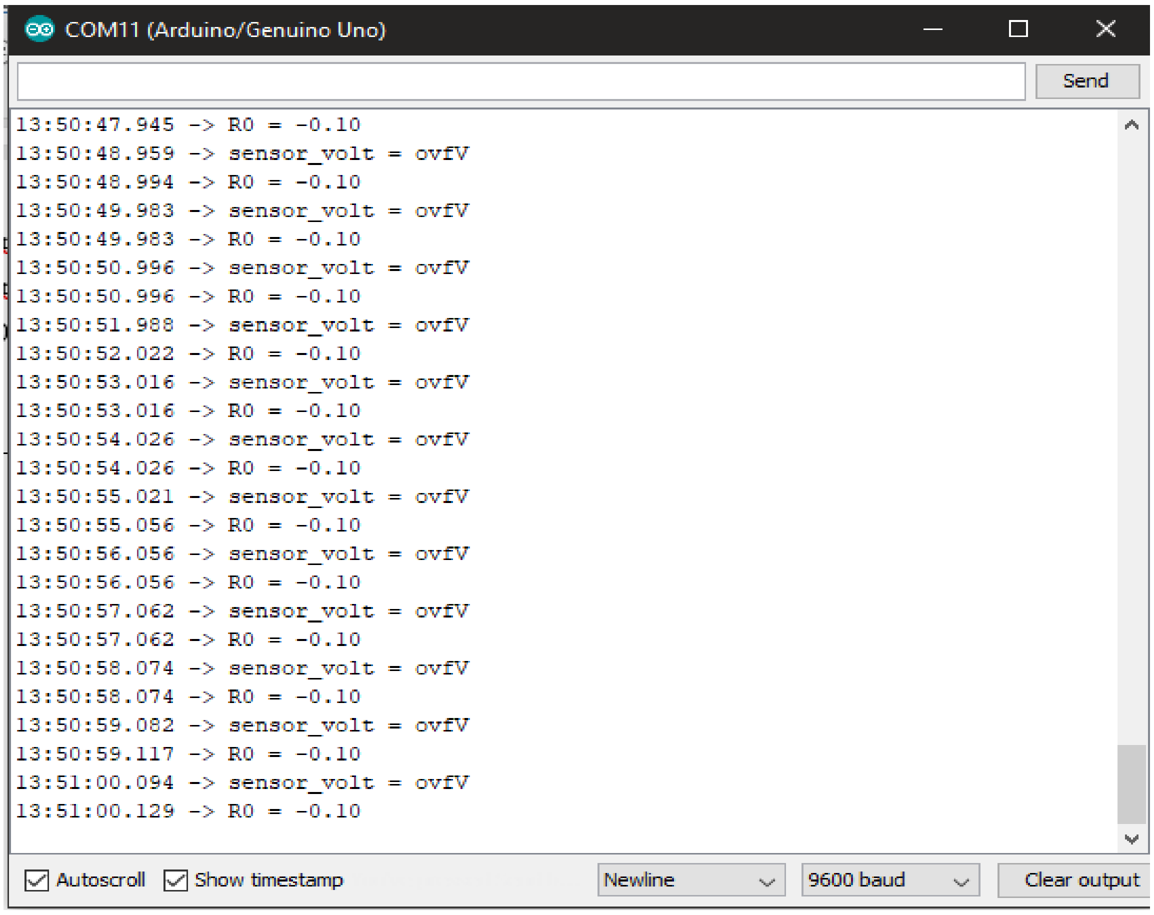
MQ-8 Hydrogen Gas Sensor	Arduino Uno
VCC	5V
GND	GND
A0	A0



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

```
void setup() {
  Serial.begin(9600);
}


void loop() {
  float sensor_volt;
  float RS_air; //  Get the value of RS via in a clear air
  float R0;  // Get the value of R0 via in LPG
  float sensorValue;


/*--- Get a average data by testing 100 times ---*/
    for(int x = 0 ; x < 100 ; x++)
  {
    sensorValue = sensorValue + analogRead(A0);
  }
  sensorValue = sensorValue/100.0;
/*-----------------------------------------------*/

  sensor_volt = sensorValue/1024*5.0;
  RS_air = (5.0-sensor_volt)/sensor_volt; // omit *RL
  R0 = RS_air/9.9; // The ratio of RS/R0 is 9.9 in LPG gas

  Serial.print("sensor_volt = ");
  Serial.print(sensor_volt);
  Serial.println("V");

  Serial.print("R0 = ");
  Serial.println(R0);
  delay(1000);

}
```

Step 3: Open the serial monitor to observe the result as shown below.



```
13:50:47.945 -> R0 = -0.10
13:50:48.959 -> sensor_volt = ovfV
13:50:48.994 -> R0 = -0.10
13:50:49.983 -> sensor_volt = ovfV
13:50:49.983 -> R0 = -0.10
13:50:50.996 -> sensor_volt = ovfV
13:50:50.996 -> R0 = -0.10
13:50:51.988 -> sensor_volt = ovfV
13:50:52.022 -> R0 = -0.10
13:50:53.016 -> sensor_volt = ovfV
13:50:53.016 -> R0 = -0.10
13:50:54.026 -> sensor_volt = ovfV
13:50:54.026 -> R0 = -0.10
13:50:55.021 -> sensor_volt = ovfV
13:50:55.056 -> R0 = -0.10
13:50:56.056 -> sensor_volt = ovfV
13:50:56.056 -> R0 = -0.10
13:50:57.062 -> sensor_volt = ovfV
13:50:57.062 -> R0 = -0.10
13:50:58.074 -> sensor_volt = ovfV
13:50:58.074 -> R0 = -0.10
13:50:59.082 -> sensor_volt = ovfV
13:50:59.117 -> R0 = -0.10
13:51:00.094 -> sensor_volt = ovfV
13:51:00.129 -> R0 = -0.10
```