LPG GAS DETECTION AND SMS ALERT SYSTEM

Objective :

The gas leakage detector detects inflammable gases like Carbon-dioxide, Butane and LPG and immediately send an alerting message to a specified mobile number for alert mechanism

Abstract :

The gas leakage detector is a domestic device which helps detect inflammable gas leakage in a common household. Detecting the gas leakage by the naked nose is difficult and inaccurate. So, the gas leakage detector helps in this way that, it provides an automated solution for gas detection with utmost accuracy and precision.

The device performs the following:

(i) Detects Gas Leakage (like LPG leak, Butane leak, Methane leak) or any such petroleum based gaseous substance that can be detected using MQ9 Sensor.

(ii) Sets up an SMS based Alert Mechanism and sends an alert messages to the specified mobile number (input inside the arduino program).

Software requirements :

- Arduino IDE

Hardware components Requirements :

- Arduino Uno
- GSM sim 900A Module
- MQ-9 Sensor
- Connecting Wires
- 12V power supply adapter
- A sim card (3G / GSM)

Budget : Procured from Matrix project solutions, Ritchie St.,

Arduino Uno - Rs : 350

GSM 900A sim module - Rs : 870

MQ-9 Sensor - Rs : 170

Connecting wires – Rs : 30

Total – Rs : 1420

Steps and Connection Specification :

The main connection specification lies on MQ-9 sensor and Arduino Uno in order to analyze and gather the real time gas value emitted from various gas emitting devices. The other connection is between the GSM 900A module and Arduino Uno which is the used to send SMS alert to specified Mobile number mentioned. Male to female wires are used to connect between Mq-9 sensor, GSM 900a module and the Arduino Uno which is further connected to Arduino IDE

GSM 900A SIM MODULE :

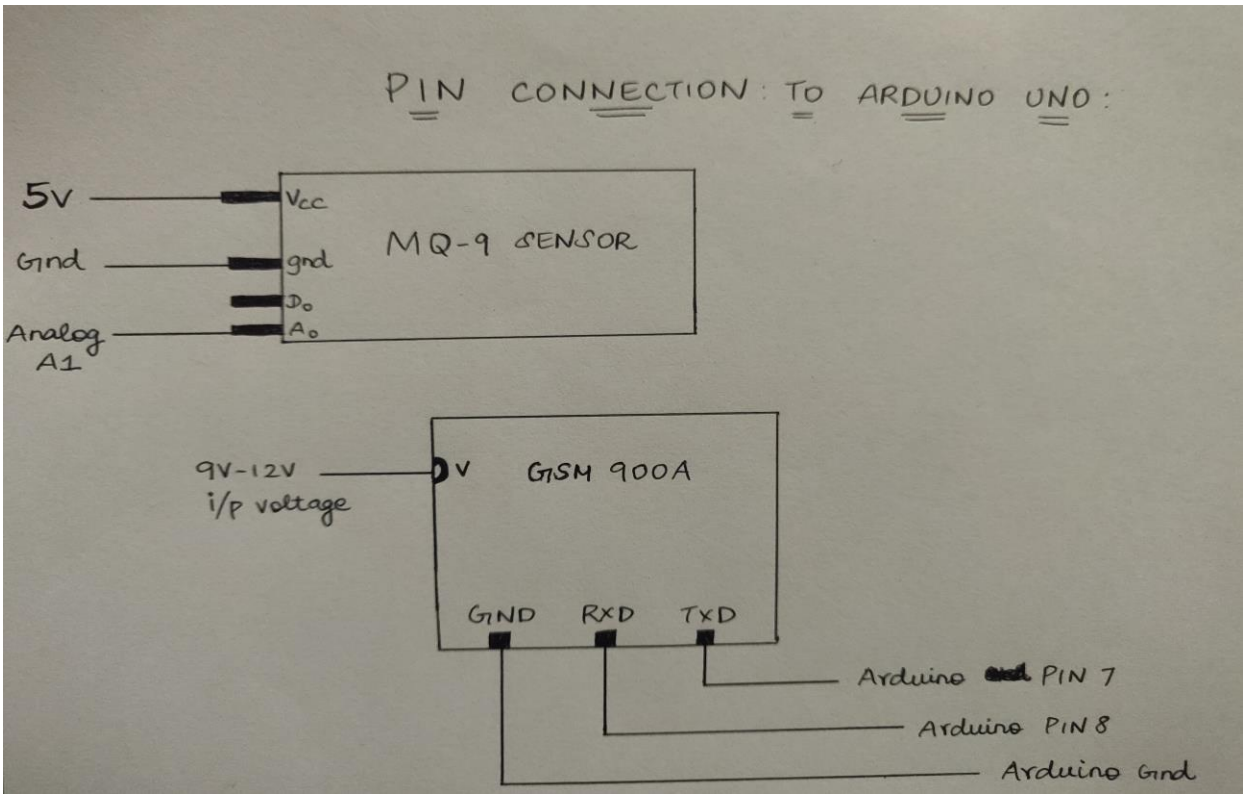
GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/ 1800 MHz. The Modem is coming with RS232 interface, which allows you connect PC as well as microcontroller with RS232 Chip(MAX232). The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer application in M2M interface.

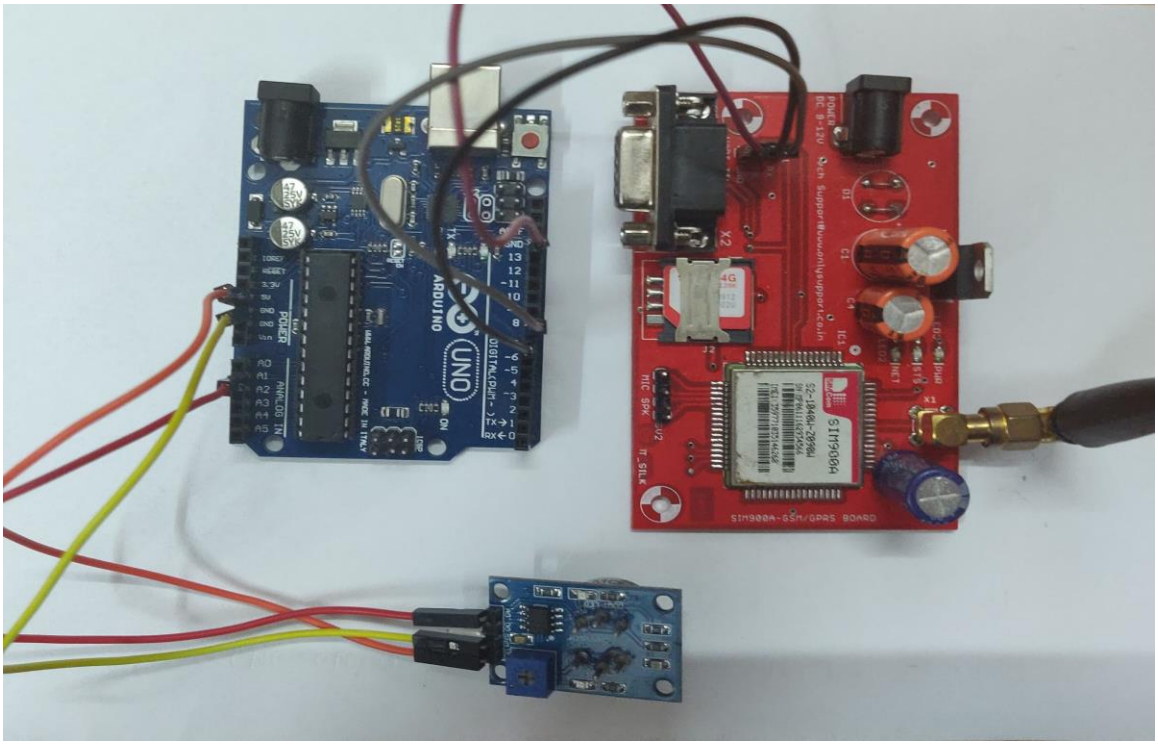
The onboard Regulated Power supply allows you to connect wide range unregulated power supply. Using this modem, you can make audio calls, SMS, Read SMS, attend the incoming calls and internet ect through simple AT commands

MQ-9 SENSOR :

The Grove - Gas Sensor(MQ9) module is useful for gas leakage detection (in home and industry). It is suitable for detecting gases like **LPG , CO , CH4**. Due to its high sensitivity and fast response time, measurements can be taken as soon as possible.

CONNECTION DIAGRAM :





CODE :

```
#include <SoftwareSerial.h>
SoftwareSerial SIM900(7, 8);
String textForSMS;
int smokeS = A1;
int data = 0;
void setup()
{
 randomSeed(analogRead(0));
 Serial.begin(9600);
 SIM900.begin(9600);
  pinMode(smokeS, INPUT);
}
void loop()
{
  data = analogRead(smokeS);
  Serial.print("Smoke: ");
  Serial.println(data);
  if ( data >290)
  {
textForSMS =  "Attention Required Gas Detected";
sendSMS(textForSMS);
```

```
Serial.println(textForSMS);
Serial.println("message sent.");
delay(3000);
while(1)
  {
  }
 }
}
```

void sendSMS(String message)

```
{
 SIM900.print("AT+CMGF=1\r");
 delay(1000);
SIM900.println("AT + CMGS = \"+917010784978\"");
delay(1000);
SIM900.println(message);
delay(1000);
SIM900.println((char)26);
delay(1000);
SIM900.println();
 delay(100);
}
```