TECH HYAKU

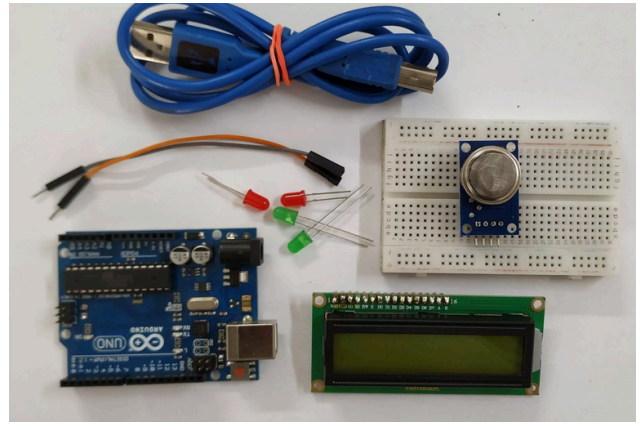
Gas Leakage Detector

Aim:

To develop a gas leakage detection system using Arduino

Hardware Required:

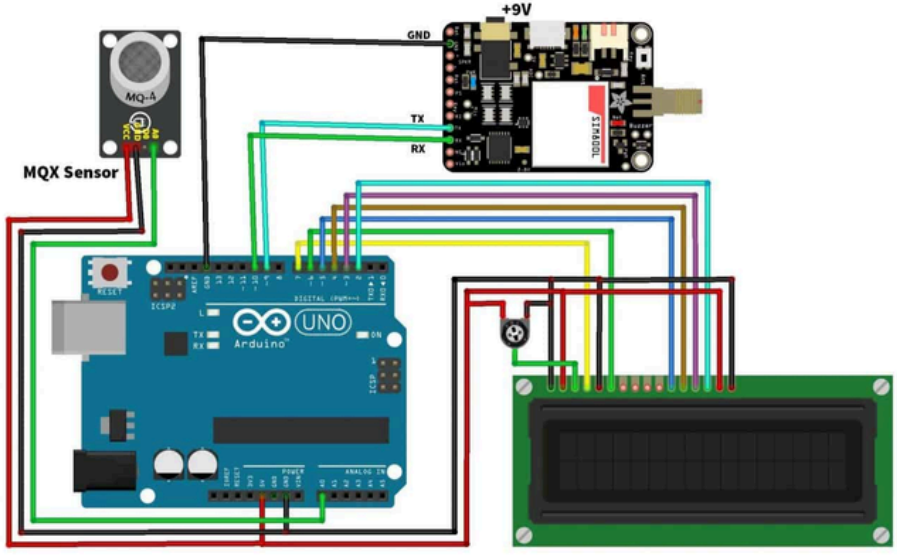
- Arduino Uno/Nano – Main controller
- Gas Sensor (MQ-2, MQ-5, MQ-135) – Detects gas levels
- Buzzer – Alerts users in case of leakage
- LEDs – Visual indication of gas levels
- LCD Display (16x2) – Shows gas concentration (optional)
- Wi-Fi Module (ESP8266/ESP32) – IoT notifications (optional)
- GSM Module (SIM800L) – SMS alerts (optional)
- Relay Module – Controls exhaust fan or valve
- Power Supply – 5V/9V battery or adapter



Software Required

- Arduino IDE

Circuit Diagram:



- Supply MQ135 Sensor with 5V Power Supply. Connect its Analog pin A0 to Analog pin A0 of Arduino.
- Similarly, Connect the GSM Module with 9V/12V external Power Supply. Only the Tx, Rx and GND pin of Sim800 Modem is connected to Arduino. So connect Tx & Rx to Pin No. 9 & 10 of Arduino respectively.
- Connect the LCD to pin no 7,6,5,4,3,2 of Arduino. Supply it with 5V Power Supply. Use a 10K POT to adjust the contrast.

Arduino Code for Gas Detection

```
#define MQ2 A0
#define Buzzer 8
#define LED 7

void setup() {
  pinMode(MQ2, INPUT);
  pinMode(Buzzer, OUTPUT);
  pinMode(LED, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int gasLevel = analogRead(MQ2);
  Serial.print("Gas Level: ");
  Serial.println(gasLevel);

  if (gasLevel > 400) { // Threshold level
    digitalWrite(Buzzer, HIGH);
    digitalWrite(LED, HIGH);
    Serial.println("Gas Leakage Detected!");
  } else {
    digitalWrite(Buzzer, LOW);
    digitalWrite(LED, LOW);
  }

  delay(1000);
}
```

IoT Integration (Optional)

- Wi-Fi Alerts (ESP8266 + Firebase/MQTT)
- SMS Alerts (SIM800L GSM Module)
- Mobile App (Blynk for remote monitoring)

Future Enhancements

- Automated Ventilation using a relay-controlled fan.
- Mobile App Notifications for remote monitoring.
- AI-Based Gas Pattern Analysis for predictive safety.

——————Thank you——————