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# IOT BASED HAZARDOUS GAS LEAKAGE PREVENTION SYSTEM

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***Abstract:*** The main objective of our project is to design a microcontroller based combustible and Hazardous gas detecting and alerting system. As it is quite often that we hear about various accidents that are being occurred due to leakage of poisonous toxic and combustible gases, like LPG, LNG, propane, butane, alcohol, Benzene, smoke, CO2, ammonia and other flammable gases. Several people have been injured and some got dead. So we are working on a project in which we are using new technology which is being used to make every existing digital system more smart using internet of things (iot). It provides real time information available on internet for faster accessing with a gas sensor that can detect various other hazardous gases. The advantage of this auto detection and alerting system over the traditionally used manual method is that it offers quickest response time possible and accurate detection of an emergency situation and in turn helps in faster diffusion of the critical situation. The NodeMCU ESP8266 development board comes with the ESP-12E module containing ESP8266 chip havingTensilica Xtensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and operates at 80MHz to 160 MHz adjustable clock frequency. NodeMCU has 128 KB RAM and 4MB of Flash memory to store data and programs. Its high processing power with in-built Wi-Fi / Bluetooth and Deep Sleep Operating features make it ideal for IoT projects. .The MQ-135 Gas sensors are used in air quality control equipment's and are suitable for detecting or measuring of NH3, NOx, Alcohol, Benzene, Smoke, CO2. The MQ-135 sensor module comes with a Digital Pin which makes this sensor to operate even without a microcontroller and that comes in handy when you are only trying to detect one particular gas. If you need to measure the gases in PPM the analog pin need to be used. The analog pin is TTL driven and works on 5V and so can be used with most common microcontrollers. If you are looking for a sensor to detect or measure common air quality gases such as CO2, Smoke, NH3, NOx, Alcohol, Benzene then this sensor might be the right choice for you.

**Index Terms:** Wireless Communication, Wireless Sensor Network, Mq135 Gas Sensor, Sensor Detection & Monitoring, I2C LCD 16X2, Relay Switch, GSM SIM800A,NodeMCU(ESP – 12E).

## 1. INTRODUCTION

Due to leakage of harmful toxic gases from industries many people get affected and some lose their lives and this leakage spreads so quickly that these gases travels very far within few seconds and it's hard to detect and intimate. So we came up with "**IOT BASED HAZARDOUS GAS LEAKAGE PREVENTION SYSTEM**" using our project for every few milliseconds delay, it conjointly sends the information over the internet for throwing gas out and if some hazardous gases are detected messages are send to the mobile numbers of fire service and local police station and the company's owner. Our main objective is to design a microcontroller based combustible and Hazardous gas detecting and alerting system. As it is quite often that we hear about various accidents that are being occurred due to leakage of poisonous toxic and combustible gases, like LPG, LNG, propane, butane, alcohol, Benzene, smoke, CO2, ammonia and other flammable gases. Several people have been injured and some got dead. So we are working on a project in which we are using new technology which is being used to make every existing digital system more smart using internet of things (IoT). It provides real time information available on internet for faster accessing with a gas sensor that can detect various other hazardous gases. The advantage of this auto detection and alerting system over the traditionally used manual method is that it offers quickest response time possible and accurate detection of an emergency situation and in turn helps in faster diffusion of the critical situation.

## 2. Proposed System

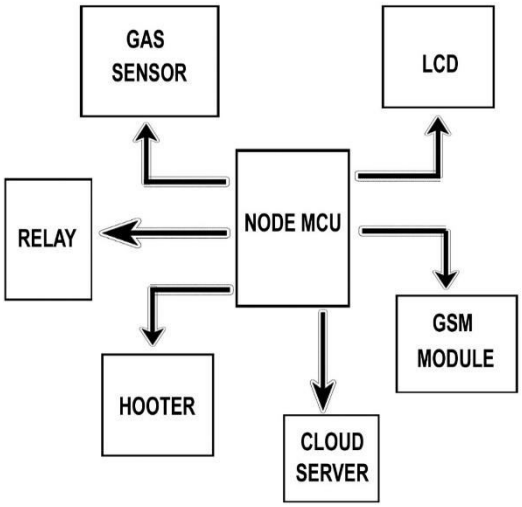


**Figure 1: Block diagram of the Proposed System**

The Figure 1 shows the Block Diagram of wireless **Iot Based Hazardous Gas Leakage Prevention System**. Here the main device is an NODE MCU microcontroller, its acts as a processing unit of the system.MQ-135 Semiconductor Sensor for Combustible Gas detection is a Sensitive Gas sensor. The sensitive material of this MQ-135 gas sensor which works with lower conductivity in clean air. When the target combustible gas exist, the sensors conductivity is higher along with the gas concentration rising. As the conductivity increases the current in the circuit of the sensor increases which results in lower sensor resistance. This change is used to correspond the output signal of gas concentration. MQ-135 gas sensor has high sensitivity to Methane, Propane and Butane and could be used to detect both Methane and Propane. The sensor could be used to detect different combustible gas especially Methane, it is with low cost and suitable for different application. According to the value received if that is above threshold, microcontroller will turn on LED and Buzzer and message is start viewing on the 16x2 LCD display. Once few milliseconds delay, it conjointly sends the information over the internet for throwing gas out and continue send messages as “Gas Leakage Detected” to the mobile numbers of fire service and local police station and the company’s owner . This information that is send over the server created on the internet.

## 3. CONCLUSION

The importance of gas sensing is set to grow with increasing requirements for safety and environmental protection across many industries. The current range of gas sensing technologies has served us well but the future holds many new possibilities. Power and size reductions and an improvement in ruggedness will allow a new generation of body worn devices. And our project will prove to be boom for households and industries. A wide variety of leak detecting techniques is available for gas pipelines. Some techniques have been improved since their first proposal and some new ones were designed as a result of advances in sensor manufacturing and computing power.

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