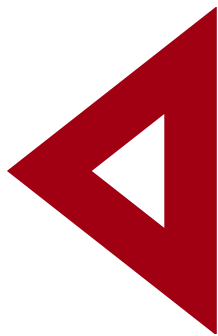


HEALTH AND SAFETY OF WORKERS


Gas Leakage Dtection System



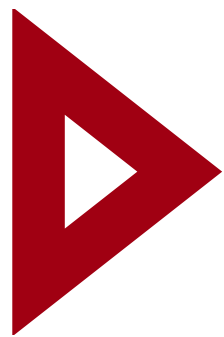




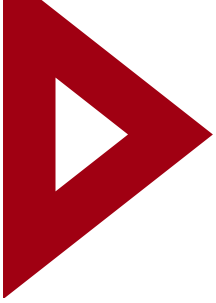
ABSTRACT

Gas leakage is a serious problem and nowadays it is observed in many places like residences, industries, and vehicles like Compressed Natural Gas (CNG), buses, cars, etc. It is noticed that due to gas leakage, dangerous accidents occur. The Liquefied petroleum gas (LPG), or propane, is a flammable mixture of hydrocarbon gases used as fuel in many applications like homes, hostels, industries, automobiles, and vehicles because of its desirable properties which include high calorific value, less smoke, less soot, and meager harm to the environment. Liquid petroleum gas (LPG) is highly inflammable and can burn even at some distance from the source of leakage. This energy source is primarily composed of propane and butane which are highly flammable chemical compounds. These gases can catch fire easily. In homes, LPG is used mainly for cooking purposes. When a leak occurs, the leaked gases may lead to an explosion. Gas leakage leads to various accidents resulting in both material loss and human injuries.

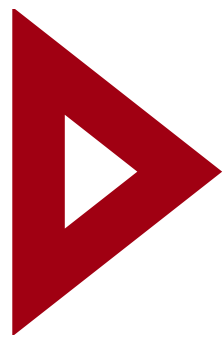



Gas leakage is one of the major issues in polymer industries. The leakage of gas leads to major fire accidents which lead to heavy damage inside the industry as well as the loss of human beings. It is feasible to detect the gas leakage before any disaster happened. So industries need a very efficient gas leakage detection system. The aim of this paper is to propose an industrial safety system for workers working in these types of polymer industries by automatically detect, alert and control gas leakage, fire and smoke using IOT based system.







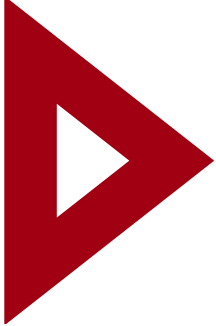
The Internet of Things (IoT) aims to automate the lives of the world by giving the path with or without human interference which will automate the tasks which may be bigger or smaller than we encounter. Because the Internet of Things (IoT) intends to simplify working, It is also practical to use well-being to reinforce present security standards. The essential goal of every project has not gone ignored by IoT. In open or closed situations, gas leakage may be savage. While traditional gas detection systems are noiseless and accurate, they are unaware of a few key aspects in the area of warning people of a leak. As a result, we have built the implementation for both industry and the society which will detect the leakage of gas and also monitor the gas availability. Alerting techniques that include sending messages to the applicable command as well as the ability to analyze sensor reading data. These days, gas leakage and detection are major concerns in our daily lives. LPG gas is very burnable, posing a risk to both people and property. To avoid such accidents, a notable amount of try has gone into developing reliable systems for detecting gas leaks. Our significant objective is to recommend a gas detection that includes gas leakage detecting hardware to households in the area. This can monitor dangerous chemicals in the air at workplaces and it may also be used in households by alerting through an LCD and sending a message to a recorded phone number.





MERITS


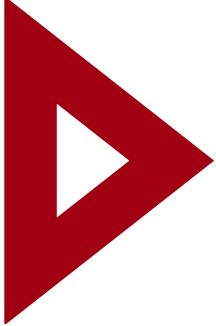


1. Low cost
 2. Low power consumption
 3. High accuracy
 4. The sensor has excellent sensitivity combined with a quick response time
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MATERIALS REQUIRED



- NodeMCU (ESP8266 MOD)
 - MQ-6 sensor
 - Breadboard
 - Jumper wires
 - Blynk App installed on a device with Wi-Fi connection
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MQ-6 – Introduction

There is a variety of sensors which are like MQ-X. X represents various numbers. Each sensor is for various purposes,

you can view its datasheet for more information. It gives only single output, i.e., digital output. The pin will be pulled to high or 5v whenever the MQ6 sensor detects LPG gas. Else it will give 0(zero)V output.

The module is very easily available in the market also many alternatives are available. You can visit its Arduino tutorial for more information.

Working

The working of this sensor is very simple. Actually,

- it measures the resistance between two probes.*
- There is a heater that heats up the sensor a little and then checks resistance.*
- When the sensor come in contact with LPG gas, its resistance changes between the two probes of the sensor and hence gives 5V on the output pin.*
- this IoT project comes under the security project for homes.*

First, we initialize some important libraries which are required like ESP8266WiFi, BlynkSimpleEsp8266, SimpleTimer. Along with this, we also initialize a serial object and save our Wi-Fi details along with the Auth-Code in a char datatype variable. Then we define Pin for MQ-6 Sensor.

In setup section, we start communication with serial and Blynk App interfaces. In loop section we run main loops i.e., timer.run() & Blynk.run().

```
void setup()
{
  Serial.begin(115200);
  Blynk.begin(auth, ssid, pass);
  timer.setInterval(1000L, getSendData);
}
```

```
void loop()
{
  timer.run(); // Initiates SimpleTimer
  Blynk.run();
}
```

Then we create a custom function getSendData(), in which we read a value from MQ-6 sensor and send it to the Blynk App for remote notification of LPG detection.

```
void getSendData()
{
  data = analogRead(mq6);
  Blynk.virtualWrite(V2, data); // Blynk
  INPUT Connect V2 Pin

  if (data > 700 )
  {
    Blynk.notify("LPG Detected!");
  }
}
```




BUSINESS VALUE OF IDEA

The global gas detection equipment market size was valued at USD 4.06 billion in 2020. It is expected to expand at a compound annual growth rate (CAGR) of 9.7% from 2021 to 2028. The increasing need for gas detection equipment in the oil and gas sector for applications such as emergency response, fracking, and leak detection is driving the market growth. Moreover, the need for protecting workers from hazardous gases is creating a demand for gas detection equipment across various industries. Government regulations such as the American Society of Heating Refrigeration & Air Conditioning Engineers and Occupational Safety & Health Administration have mandated the installation of gas detection equipment for safety and security purposes, which is also contributing to the market growth.



REFERENCE

- 1.Upasnasagar¹ , komal² , MsTaslima Ahmed³ FIRE AND GAS ACCIDENT AVOIDER SYSTEM international Journal of Scientific Research and Review ISSN No.: 2279-543X Volume 07, Issue 04, April 2019
 - 2.Victor Olugbemiga Matthews,A.I. Adekitan A microcontroller based gas leakage detection and evacuation System, September 2018.
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CONCLUSION

This system provides a fast and cost-effective solution to avert the gas leak effect by reducing the risk to human life. The statistics of the application of gas clam on to the application can be useful to own the faulty valves and regulators prior and do the necessary replacement. Apart from detecting the leakage, a two-level prevention apparatus makes the system more valid. The cost involved in developing the system is crucially low. In recent brood, the use of LPG is taking a big giant. From the use of cylinders up to the use of petroleum lines. The biggest warning in using this technology is security. our project will prove to be resonance for households and industries.

This monitoring system can be further increased by using Bluetooth in place of GSM to send the alert messages to the user, which abetment another real-time application. For the industrial sector, the data collected by the mobile application is beneficiary and used for data analytics. The combination of other sensors like temperature, pressure sensors, etc. makes the system a home computerization project. IoT turns drones into gas observation sensors. Another very interesting and extraordinary improvement would be to board reoccurring receiver MODEMS at different positions in the geographical area carrying duplicate SIM cards. The display can be another added variant in the project. Audio output can be settle to make it user-friendly..

