



LPG Leakage Detection and Prevention System

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ABSTRACT

For lives security and satisfaction of social obligations, and keeping in centre the dangerous examples of impacts and wounds because of spillage of gas in enterprises, vehicles and houses, a gas spillage framework has been structured whereby utilization of installed frameworks and association of Internet of things (IoT) in it, a framework is gotten that empowers us not exclusively to advise the concerned individual yet additionally hold onto any spillage of gas. In the paper, a framework has been proposed which diminish the odds of accidents and guarantee security by the virtue of existing electronics and technology.

Keywords: Arduino Uno, NodeMCU, 16*2 LCD Display, MQ-6 Gas Sensor, Buzzer, DC motor(9V), Relay.

1. INTRODUCTION

The significance of safety measures when utilizing Liquefied Petroleum Gas (LPG) in India is paramount due to the potential risks associated with gas leaks. LPG, a widely used cooking fuel, is not only affordable and readily available but also flammable. Gas leaks, often stemming from worn-out gas tubes or old pipes, can lead to hazardous situations. The proposed solution involves a computer-designed software system equipped with an LPG gas detector. This system detects gas leaks swiftly and triggers a set of safety responses, including activating hazard

lights, sounding an alarm, displaying information on an LCD, and sending email notifications.

The proactive nature of this system ensures a rapid and efficient response to potential hazards, enhancing

safety in environments such as hotels and high-tech homes.

2. LITERATURE REVIEW

The LPG leakage detection and prevention kit is designed to address the potential hazards of gas leaks associated with LPG usage. Built on NodeMCU and Arduino UNO boards, it employs an MQ6 gas sensor to detect LPG gas leakage. Upon detection, the NodeMCU triggers the Arduino UNO, resulting in the transmission of a "LPG gas leakage detected" notification to a mobile device, offering real-time alerts to users.

In addition to the mobile notification feature, the kit includes various safety responses such as activating a bell, illuminating LEDs, and engaging a DC motor fan for gas expulsion when gas levels exceed the predefined

threshold of 530ppm. This comprehensive system not only enhances safety and security but also ensures timely and accessible alerts to users through mobile notifications, enabling swift response to potential hazards.

on the display, and it will be turned off. The major apparatus required for this project are

1. **Arduino UNO**
2. **LPG Gas sensor Module (MQ-6)**
3. **Buzzer**
4. **NodeMCU**
5. **16x2 LCD**
6. **Bread board**
7. **9V DC Motor**

BLOCK DIAGRAM

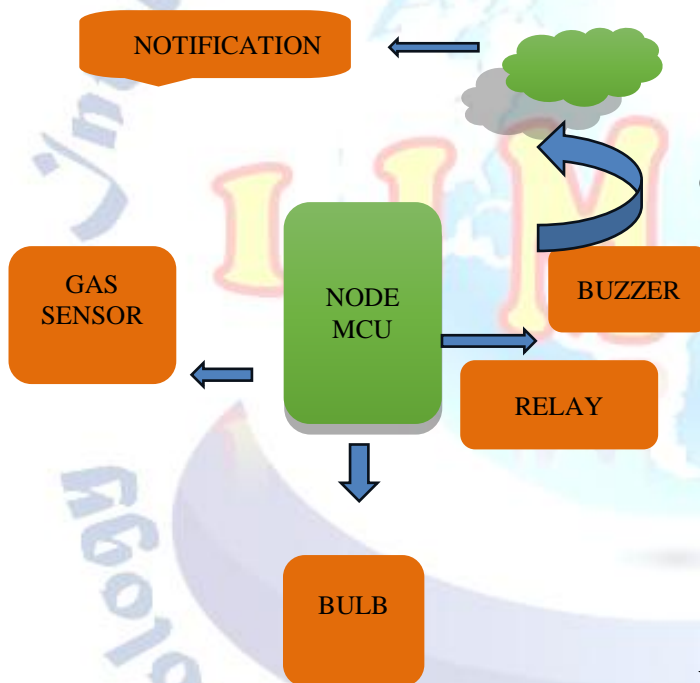


Fig:BlockDiagram

3.COMPONENTS:

FUNCTIONS OF COMPONENTS

Arduino UNO:

The Arduino UNO is a kind of open - source microcontroller which is depend upon the Microchip ATmega328P micro controller and it was created by Arduino.cc. This board is equipped with multiple sets of computerized and even simple information that may be used for different applications and with different circuits.

A. NodeMCU:

NodeMCU is also an open - source IoT board. It is integrated with firmware which will run using the ESP8266 Wi-Fi SoC, and the apparatus which is depended on the ESP-12 module. The expression of "NodeMCU" as a matter of course that refers to the firmware that has opposed to the improvement of units. This firmware will be using the Lua scripting language.

B. LPG Gas Sensor:

The MQ6 is an LPG gas detecting sensor that will be used for detection of gases within less time of leakage. So, it was used mostly for detecting the spillage of gases from the gas cylinders or other gas sources. It will be used for many industrial purposes and this sensor can detect the gases like iso-butane, LPG, propane, LNG [1].

C. Power Supply:

Every electronic system needs power from any principle supply by any methods for a greater stage down transformer up to change over 230V AC essential into a 0-12V or 500mA support. So, a full - wave connect rectifier which is pursued by many capacitor channels will be used to provide the voltage of 5V to the electronic boards whose yield will be used as power supply requirements of micro controller circuits.

D. Buzzer:

A buzzer is an electromechanical device designed to produce a buzzing or beeping sound when an electric current passes through it. It is commonly used for various applications to provide audible alerts, notifications, or alarms. Buzzer construction typically includes a coil of wire, a diaphragm or a piezoelectric element, and a housing to amplify and project the sound. A buzzer is a versatile and widely used component in electronics, offering an audible signaling mechanism that is valuable for safety, communication, and various other applications.

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