

# GAS LEVEL MONITOR ON INTERNET USING ESP8266 & GAS SENSOR

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Abstract: Liquefied Petroleum Gas (LPG) is widely used for cooking fuel in developing countries for economic reasons, for energy-rich fuel source that contains the high calorific value, for clean fuel with LPG cylinder is developed. Usually, the LPG in cylinder is not determined and a cylinder when the gas is about to empty will be a difficult situation for is LPG gas for cooking continuously. The purpose of the research is the detection of gas detection the LPG gas mixed in the atmosphere detection. Now determine gas in the cylinder. LPG cylinder is developed. Usually, the capacity of LPG in cylinder is determined an exact sensor and a cylinder when the gas. Then by detecting the gas leakage with MQ6 gas sensor, this research work indicates for leakage condition and also helps to prevention the LPG gas burst accidents in the home. (Abstract)

*Keywords: Gas leakage, Prevent the gas leakage, Using sensors, Level monitoring, Using sensor detect and analysis automatically and How much of gas mixture in our atmosphere detection. (key words)*

## 1. INTRODUCTION

Gas leakage is the major problem for LPG gas burst accidents and People can't know that the gas is leaking. So, several research works and projects have been implemented for gas leakage detection. The existing research provides a gas leakage accident prevention system with an alert which is mainly meant to detect Gas leakage in the kitchen and was proposed with only on-site alarm.

The main objective of this research is to the continuous measurement of the weight of the cooking gas cylinder but in addition, can store this information over time to the IoT platform and how much amount of gas is spent in a week or a month. When the weight reaches the minimum threshold it will automatically sends an SMS alert to the gas

cylinder for regular cooking. This system also designed to detect and sense for liquid petroleum gas (LPG) leakage and the alarm unit will be activated immediately, if the amount of gas concentration exceeds normal level to prevent accidents in the kitchen environment.

Installed with innovation, these gadgets can convey and connect over the Internet, and they can be remotely observed and controlled [1]. The meaning of the Internet of things has advanced because of union of numerous innovations, ongoing examination, AI, wear sensors, and implanted frameworks. Conventional fields of installed frameworks, remote sensor systems, control frameworks computerization (counting home and building mechanization), and others all add to empowering the Internet of things. A gas spill alludes to a hole of petroleum gas or different vaporous item from a pipeline or other regulation into any territory where the gas ought not be available.

Automated unified trolley system for LPG leakage detection with safety measures and refill booking [2] proposed a system that uses PIC 16F877a for LPG leakage detection and automatic gas booking system.

## 2. DESIGN AND TECHNIQUES

This paper will solve the problem for not only detects any leakage of the LPG gas but removes automatically the leaked gas to prevent from fire accidents and it also alerts the user by creating alarm song and warning signal.

In this guide you'll learn how to use the BME680 sensor module with the ESP8266 NodeMCU board using Arduino IDE.

The core circuit is encapsulated in an anti-static box and the auxiliary circuit (auxiliary board) is placed in an isolation box. The sensor array is a gas-sensitive device in the gas chamber, with a buffer between the core board and the sensor array. The gas neural network is designed to find the optimal solution for accuracy and hardware scale. It focuses on optimization of individual components and system-level improvement, and meets the requirements of stability, ease of use, maintainability, and online monitoring in industrial applications.

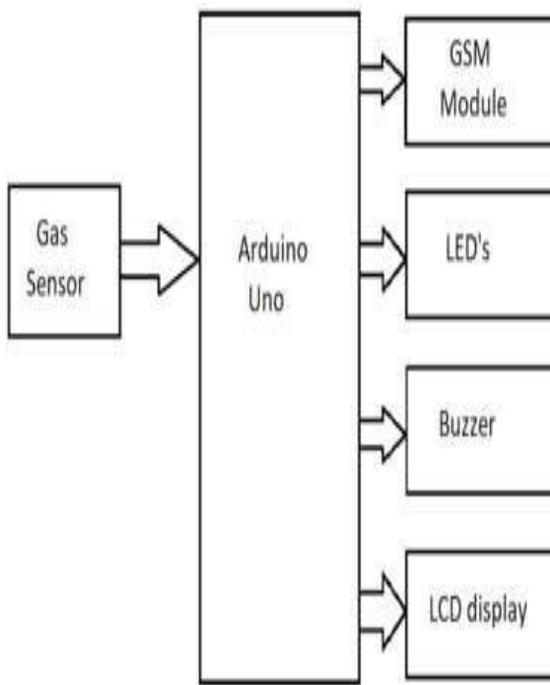


Figure 2.1 Gas level detection process.

### 3. PROPOSED SYSTEM

We design and develop an propose system which include some safety factors. A safety has been a major issue in today's day to day life.

LPG and CNG i.e. petroleum gas and compressed natural gas are most commonly used in residential and commercial places for cooking purpose .

#### 3.1 GAS LEVEL MONITOR

Gas Cylinder Level Sensor is a non-invasive level sensor used to measure the remaining liquid level in a gas cylinder. It can be connected to a mobile phone through Bluetooth to check the remaining level height or volume. The auxiliary circuit (auxiliary board) is placed in an isolation box. The sensor array is a gas-sensitive device in the gas chamber, with a buffer between the core board and the sensor array. The gas neural network is designed to find the optimal solution for accuracy and hardware scale. It focuses on optimization of individual components and system.

#### 3.2 ESP8266

It is capable of either hosting an application or offloading all WiFi networking functions from another application processor. It comes pre-programmed with an AT command set firmware, making it as much WiFi-ability as a WiFi Shield. minimal loading during runtime. It supports APSD for VoIP applications and Bluetooth co-existence interfaces, and has no external RF parts. The auxiliary circuit (auxiliary board) is placed in an isolation box. The sensor array is a gas-sensitive device in the gas chamber, with a buffer between the core board and the sensor array. The gas neural network is designed to find the optimal solution.

#### 3.3 GAS SENSOR

Gas sensors detect the presence of gases in a controlled volume and work to transform adsorption effects into a detectable signal. They detect gases such as methane, butane, propane, hydrogen, and alcohol vapour, as well as ozone, nitrogen dioxide, chlorine, ammonia, and toluene.

### 3.4 ALERTING

This guide provides information on how to detect and prevent natural gas leaks in your home. It explains that natural gas is a relatively safe, efficient, and convenient source of energy, but can be dangerous if installed or maintained. Additionally, it provides important information on the risk of poisonous vapors in the home, such as fumes from improperly ventilated gas generators, gas furnaces, and attached garages. This guide provides valuable insights into how to protect yourself and your children from potential health risks.

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### 3.5 ANALYZE AND ACCURACY

Gas sensors are used to measure the accuracy of gases in a confined space. They work by transforming gas adsorption effects into a detectable signal in terms of its changed electrical, optical, thermal, mechanical, magnetic, and piezoelectric properties. Both gas detectors and gas analysers provide accurate readings of the atmosphere, with a gas detector detecting when the level of a certain gas is too high.

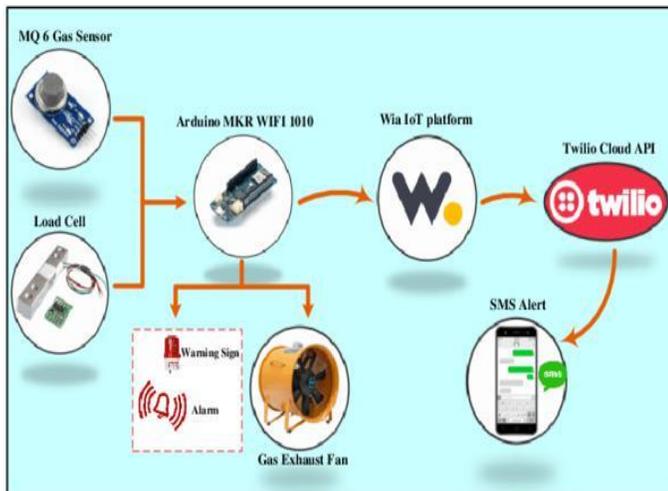


Figure 3.1 Proposed Methodology

### 4.SCOPE AND OBJECTIVES

In this project, we will learn about Gas Level Monitor On Internet Using E P8266 & Gas Sensor Module, i.e MQ135 to the NodeMCU through the A0 pin in NodeMCU. It will give the readings in analog values and whenever it reaches the threshold value which we set like 530ppm it will pass the values and the NodeMCU will premises. The gas sensors help detect the concentration of the gases present in the atmosphere to avoid hazardous consequences like fire breakouts.

This sensor is part of a current balance circuit of the fuel gauge display circuit which typically consists of coils for actuation of the display needle. Gas detection systems are sensor objective.

In other words, all gas sensors are analog. It is the addition of an on-board analog-to-digital converter that makes a digital gas sensor possible. In other words, all gas sensors are analog. It is the addition of an on-board analog-to-digital converter that makes a digital gas sensor possible. A gas sensor is a device which detects the presence or concentration of gases in the atmosphere. Based on the concentration of the gas the sensor produces a corresponding potential difference by changing the resistance of the material inside the sensor, which can be measured as output voltage. It not only provides a binary indication of the presence of combustible gasses, but also an analog representation of their concentration in air. to the NodeMCU through the A0 pin in NodeMCU. It will give the readings in analog values and whenever it reaches the threshold value which we set like 530ppm it will pass the values and the NodeMCU will. This sensor is part of a current balance circuit of the fuel gauge display circuit which typically consists of coils for actuation of the display needle. Gas detection systems are premises. The gas sensors help detect the concentration of the gases present in the atmosphere to avoid hazardous consequences like fire breakouts.

Gas Cylinder Level Sensor is a non-invasive level sensor used to measure the remaining liquid level in a gas cylinder. It can be connected to a mobile phone through Bluetooth to check the remaining level height or volume. The auxiliary circuit (auxiliary board) is placed in an isolation box. The sensor array is a gas-sensitive device in the gas chamber, with a buffer between the core board and the sensor array. The gas neural network is designed to find the optimal solution for accuracy and hardware scale. It focuses on optimization of individual components and system

The hardware implementation of the project has classified into two parts. Designing of the gas leakage detection and gas level measurement are included. This project is designed for the kitchen that used LPG for cooking. For a gas leakage detection unit, the MQ-6 gas sensor is connected with Arduino MKR WiFi 1010. The alarm unit will activate and also turn on the exhaust fan automatically when LPG concentrations are over 500 ppm in the kitchen.

### 5. ARCHITECTURE

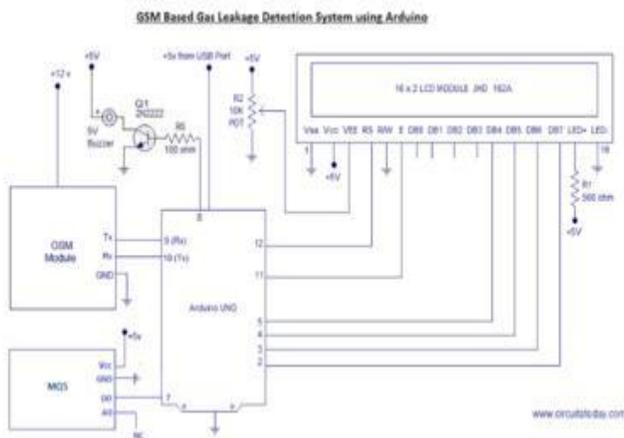


Figure 5.1 Architecture

### 6. IMPLEMENTATION

For gas burst accident prevention system, the gas concentration is decreased by turning on the exhaust fan. In this research, HX711 amplifier module contains 24-bit high-precision analog-to-digital converter chip to interface directly with a load sensor. This chip has two analog input channels and designed for high-precision electronic scale applications. Either Channel A or B differential input can be selected to the low-noise programmable gain amplifier (PGA). Gas Cylinder Level Sensor is a non-invasive level sensor used to measure the remaining liquid level in a gas cylinder. It can be connected to a mobile phone through Bluetooth to check the remaining level height or volume. The auxiliary circuit (auxiliary board) is placed in an isolation box. The sensor array is a gas-sensitive device in the gas chamber, with a buffer between the core board and the sensor array. The gas neural network is designed to find the optimal solution for accuracy and hardware scale. It focuses on optimization of individual components and system

### 7. RESULT AND DISCUSSION

The alarm unit will activate and also turn on the exhaust fan automatically when HX711 amplifier unit is attached with Arduino MKR WiFi 1010. The hardware implementation of the project has classified into two parts. Designing of the gas leakage detection and gas level measurement are included. This project is designed for the kitchen that used LPG for cooking. For gas burst accident prevention system, the gas concentration is decreased by turning on the exhaust fan. In this research, HX711 amplifier module contains 24-bit high-precision analog-to-digital converter chip to interface directly with a load sensor.

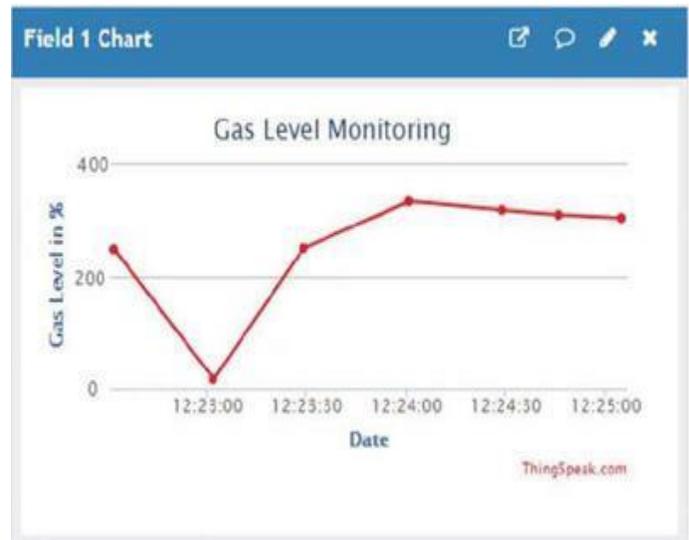


Figure 7.1 Gas level monitor

Gas leakage is the major problem for LPG gas burst accidents and People can't know that the gas is leaking. So, several research works and projects have been implemented for gas leakage detection. The existing research provides a gas leakage accident prevention system with an alert which is mainly meant to detect Gas leakage in the kitchen and was proposed with only on-site alarm.

The main objective of this research is to the continuous measurement of the weight of the cooking gas cylinder but in addition, can store this information over time to the IoT platform and how much amount of gas is spent in a week or a month. When the weight reaches the minimum threshold it driver via the indicating system. Simply put, a gas monitor is a type of device used to detect the presence of harmful gases.

### GAS LEVEL RATIO

The sensor-enabled solution helps prevent the high risk of gas explosions and affecting any casualties within and outside the premises. The LPG gas sensor is connected to the NodeMCU through the A0 pin in NodeMCU. It will give the readings in analog values and whenever it reaches the threshold value which we set like 530ppm it will pass the values.

$$R(s)=RaRg$$

The sensor-enabled solution helps prevent the high risk of gas explosions and affecting any casualties within and outside the premises. The LPG gas sensor is connected to the NodeMCU through the A0 pin in NodeMCU. It will give the readings in analog values and whenever it reaches the threshold value which we set like 530ppm it will pass the values and the NodeMCU will get triggered when the Gas sensor readings gets crosses the threshold value. They work through sensing electrodes in the air, sending an electric current to sound the alarm. The sensor response is defined as where Ra and Rg denote the sensor resistance in air and gas environment, respectively. By definition the sensitivity of a sensor. This relation ship is mostly linear. That is  $y= S x$ , with S the sensitivity.

### 8. CONCLUSION

This paper is focused on the gas leakage detection system for home safety and will update regularly about LPG consumed daily. The developed system is affordable cost as components used here are cheap when compared to gas detectors commercially available in the market. LPG leakage is alerted by activating the alarm and using an exhaust fan it removes the leaked gas from the area. LPG consumption is observed and can be booked. Detect Gas leakage in the kitchen and was proposed with only on-site alarm.

The main objective of this research is to the continuous measurement of the weight of the cooking gas cylinder but in addition, can store this information over time to the IoT platform and how much amount of gas is spent in a week or a month. When the weight reaches the minimum threshold it will automatically .

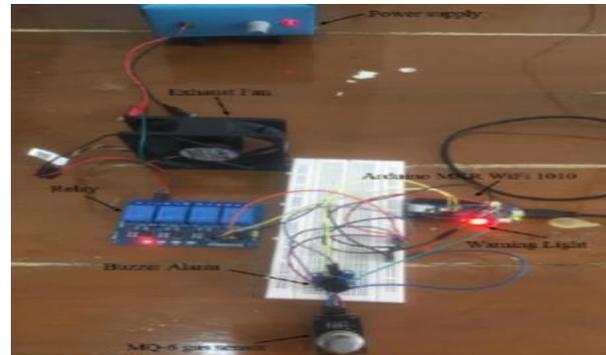


Figure 8.1 Gas leakage detection

and Alert system testing

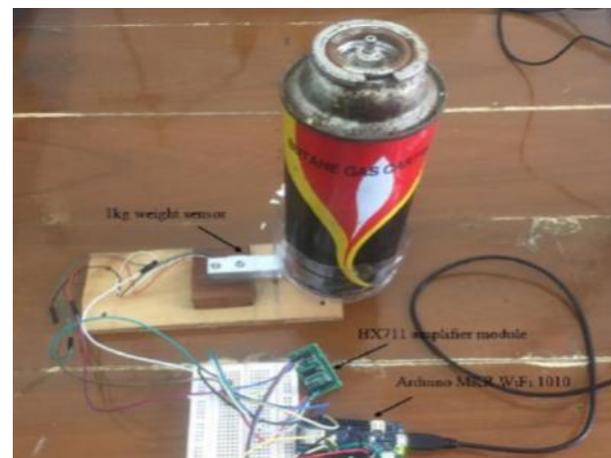


Figure 8.2 s level

measurement system testing



Figure 8.3 Prototype of LPG Gas Level Detection & Gas Leakage Accident Prevention with Alert System

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