* **Gas leakage detection and alerting system using Arduino Uno**

**Syeda Bushra Shahewaz and Ch. Rajendra Prasad**

The presence of hazardous LPG gas leakage in a domestic, work place, also, stored gases container gas which exhibits ideal characteristic is use. For that sake, an alarm unit is used to vibrate an alarm which is buzzer. Buzzer gives an audible sign of the presence of LPG volume. The sensors are widely used to detect essence of propane, iso-butane, LPG and even smoke. The sensor has an advantage to combine a sensitivity response time. If the LPG sensor senses gas leak from work place or home, sensor output goes to active low (logic-0) condition. Arduino UNO is used in the project; low signals are overlooked by the Arduino and gas leakage is been noticed by the Arduino. The Arduino UNO turns on the LCD and buzzer. It even turns on the GSM modem after that, it continues to send messages SMS to mobile number specifically mentioned in the program of the source code for alerting danger to the people.

**ADVANTAGES AND APPLICATIONS :**

* Applicable usefully in the industrial and domestic purpose.
* In danger situations we are able to save the life by using this system.
* An alert is indicated by the GSM module.
* A sensor node senses gas like CO2, oxygen, propane.
* The estimated range of transmission and consumption of power is obtained.
* **Development of a Gas Leakage Detection System**

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Liquefied Petroleum Gas (LPG) is a fundamental source of fuel in urban areas as a result of its comparatively higher calorific value and reduced impact on the environment. Due to the flammable nature of the gas, care must be taken in order to guarantee its safe use. In this work, a microcontroller-based gas leakage detection system is developed. The system detects leaked gas using MQ-6 gas sensor whose calibrated outputs are used to trigger an alarm and display gas levels on a liquid crystal display (LCD) for ambient gas concentrations above 100 PPM. Additionally, the system is configured to send an “EMERGENCY ALERT” message to a user’s mobile device in emergency situations.

**APPLICATIONS AND ADVANTAGES:**

* Low Weight Alert
* Local Audio Alarm
* Safety has always been an important criterion.
* **GAS LEAKAGE DETECTION AND SMART ALERTING SYSTEM USING IOT**
* **(Shital Imade, Priyanka Rajmane, Aishwarya Gavali, V. N. Nayakwadi )Computer Dept.,BSCOER, Savitribai Phule Pune University, India**

Internet of Things aim towards making life simpler by automating every small task around us. As much is IoT helping in automating tasks, the benefits of IoT can also be extended for enhancing the existing safety standards. Safety, the elementary concern of any project, has not been left untouched by IoT. Gas Leakages in open or closed areas can prove to be dangerous and lethal. The traditional Gas Leakage Detector Systems though have great precision, fail to acknowledge a few factors in the field of alerting the people about the leakage. Therefore we have used the IoT technology to make a Gas Leakage Detector for society which having Smart Alerting techniques involving sending text message to the concerned authority and an ability performing data analytics on sensor readings. Our main aim is to proposing the gas leakage system for society where each flat have gas leakage detector hardware. This will detect the harmful gases in environment and alerting to the society member through alarm and sending notification

**APPLICATIONS AND ADVANTAGES:**

* Live-Monitoring and Control
* On-Demand Automatic Reordering Facility
* A UAV System for Autonomous Target Detection and Gas Sensing
* IOT technology to make a Gas Leakage Detector for society which having Smart Alerting techniques involving sending text message to the concerned authority and an ability performing data analytics on sensor.
* **Gsm Based Gas Leakage Detection System**
* **(H. Huang, H. Bainand S. Zhu, “A Greenhouse Remote Monitoring System Based on GSM,” in Proc. of IEEE )**

Gas leakage is a major problem with industrial sector, residential premises and gas powered vehicles like CNG (compressed natural gas) buses, cars. One of the preventive methods to stop accident associated with the gas leakage is to install gas leakage detection kit at vulnerable places. The aim of this paper is to present such a design that can automatically detect and stop gas leakage in vulnerable premises. In particular gas sensor has been used which has high sensitivity for propane (C3H8) and butane (C4H10). Gas leakage system consists of GSM (Global System for mobile communications) module, which warns by sending SMS. However, the former gas leakage system cannot react in time. This project provides the design approach on both software and hardware. Gas leakage detection is not only important but stopping leakage is equally essential.

**APPLICATIONS AND ADVANTAGES:**

* Fire/Safety detection system
* Gas leak alarm
* Gas leak detection system
* Gas detector (LPG, Natural gas)
* **Gas Leakage Monitoring with Mobile Wireless Sensor Networks**
* **(Saeed H, Ali S, Rashid S, et al. Reliable monitoring of oil and gas pipelines using wireless sensor network (WSN)—REMONG[C]//System of Systems Engineering (SOSE), 2014 9th International Conference on. IEEE, 2014: 230-235.)**

In this paper, a real-time and early warning gas leakage monitoring system has been developed for large-scale region based on Mobile Wireless Sensor Networks (MWSNs). The system consists two parts: sensor terminal and center server. A sensor terminal includes TDLAS gas sensor which has remarkably high accuracy and reasonable size, microcontroller, Global Position System (GPS) receiver module, General Packet Radio Service (GPRS) module and power module. The center server is developed to receive, process and store the data. A real-time monitoring cloud platform is developed to display real-time data. A mobile wireless sensors networks, which consists of mobile sensor terminals and stationary sensor terminals, enable a large-region leakage monitoring. Experiments are carried out to valid the system. Theresults show that thereal-time and early warning gas leakage monitoring system developed in this paper is reliable and practice.

**APPLICATIONS AND ADVANTAGES:**

* Harmful Gas Detection
* Fire Hazard Prevention
* Real-time updates about leakages
* **Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT**
* **(Prof. S. K. Nanda B. B. Didpaye. Automated uni\_ed system for lpg using microcontroller and gsm module a review)**

This journal explains about the most common problem experienced in our day- to- day lives that is regarding GAS container going empty. We bring this paper to create awareness about the reducing weight of the gas in the container, and to place a gas order using IOT. The gas booking/order is being done with the help IOT and that the continuous weight measurement is done using a load cell which is interfaced with a Microcontroller (to compare with an ideal value). For ease it is even has a been added with an RF TX & Rx modules which will give the same information. When it comes it to security of the kit as well as gas container we have an MQ-2(gas sensor), LM 35(temperature sensor), which will detect the surrounding environment for any chance of error. When ever any change is subjected in any of the sensors (load cell, LM35, Mq-2) a siren (60db) is triggered.

**APPLICATIONS AND ADVANTAGES:**

* Oxygen Level Measurement
* Data analytics for improved decisions
* Get real-time alerts about the gaseous presence in the atmosphere
* Get immediate gas leak alerts.
* **IoT Based LPG Gas Level Detection & Gas Leakage Accident Prevention with Alert System**

**(Zaw Lin Oo, Theint Win Lai and Aung Moe)**

Liquefied Petroleum Gas (LPG) is widely used for cooking fuel in developing countries for economic reasons, for energy-rich fuel source that contains the higher calorific value,for clean fuel with low carbon emission and for a portable that is available in even the far away areas. Therefore the proposed gas leakage detection and monitoring system for the gasoline content present in household LPG cylinders is developed. Usually,the capacity of LPG in cylinder is not determined in an exact manner and a cylinder when the gas is about to empty will be a difficult situation for the one who uses LPG gas for cooking continuously. By using IoT, the information of the near to the empty level of LPG gas in the cylinder will send to the user and the gas refill method by using telephonic ordering can be conducted. The purpose of this research is the detection of gas leakage and monitoring the LPG gas cylinder weight regularly to know the remaining value of gas in the cylinder. When the gas leakage is sensed, the warning signal and alarm sound will be active and also switch on the exhaust fan automatically to decrease the gas concentration. The weight of LPG is measured using the load sensor (SEN-10245) and the output of the sensor is connected with Arduino MKR Wifi 1010 microcontroller. The user can know the validity of LPG usage daily because the the amount of LPG gas will be published as events and watch them come through in real-time using the Wia IoT cloud platform. Consequently, the user is alerted by giving SMS notification to their mobile phone when the LPG level is critically low (below 20%) by using the integration function of the Wia IoT platform call Twilio, using its web service APIs. Then by detecting the gas leakage with MQ6 gas sensor, this research work indicates gas leakage condition and also helps to prevent the LPG gas burst accidents in the home.

**APPLICATIONS AND ADVANTAGES :**

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 for a new LPG cylinder by the customer when the gas level is near empty.

* **LPG Gas Leakage Detection and Alert System**
* **E. Jebamalar Leavline1 , D. Asir Antony Gnana Singh2 , B. Abinaya H. Deepika**

Home fires have been taking place frequently and the threat to human lives and properties is growing in recent years. Liquid petroleum gas (LPG) is highly inflammable and can burn even at some distance from the source of leakage. Most fire accidents are caused because of a poor-quality rubber tube or the regulator is not turned off when not in use. Therefore,

developing the gas leakage alert system is very essential. Hence, this paper presents a gas leakage alert system to detect the gas leakage and to alarm the people onboard.

Keywords: Liquid petroleum gas, Gas sensor, Leakage

**ADVANTAGES AND APPLICATIONS**

Gas leakage leads to severe accidents resulting in material losses and human injuries.

Gas leakage occurs mainly due to poor maintenance of equipments and inadequate

awareness of the people. Hence, LPG leakage detection is essential to prevent

accidents and to save human lives. This paper presented LPG leakage detection and

alert system. This system triggers LED and buzzer to alert people when LPG leakage

is detected. This system is very simple yet reliable.

* **LP GAS LEAKAGE ALARM**
* **(M. G.. D. D. Wickramasinghe , N. Abhayasinghe)**

One of the most common types of energy source used domestically is propane in which liquefied gas contains. Though the safety issues are considered by the company, leakage of gas has become a very common accident which can cause damage to human lives and property. This paper presents a low cost, power efficient centralized LP gal leakage alarm system. The system has two main devices: the gas detector and the centralized alarm unit. The gas detector that is located close to the gas usage point (gas cylinder) is a battery operated device that is designed to operate up to 6 months with two AA size alkaline batteries. There can be more than one detector in the systems, which can be separately identified in the system. The centralized alarm unit detects the alerts sent by the detectors and releases the alarm. It has an indication of which detector has released the alert. The alarm unit is ac mains powered and has a battery backup to cater power failures. The components of the device have been chosen considering the power consumption and the time intervals have been calculated concerning the current consumption of each component.

**ADVANTAGES AND APPLCATIONS :**

The paper presented the design, development and implementation of low power, accurate LP gas detector. The 6 month duration of the gas detector is proved theoretically and practically. These product features can be extended with the wider range of requirements. When dealing with more than one unit, handshaking is really important. It assures that two devices are in alert mode. Since these devices are dealing with hazardous gas, safety becomes the major requirement. So handshaking in every 30 minutes assures the two devices are

in alert mode.

* **LPG GAS LEAKAGE DETECTION USING IOT**
* **(Dr. Chetana Tukkoji and Mr. Sanjeev Kumar A. N Assistant Professor, Dept. of CSE Assistant Professor, GITAM School of Technology, Bengaluru)**

This paper provides a brand new approach to discover LPG discharge supported microcontroller based Arduino. To alert on Liquefied rock oil Gas (LPG) leakage and preventing any unwanted incident, we need to apply some cautions to discover the discharge. It can be developed associate degree Arduino based LPG gas detector alarm, if gas leakage happens. The LPG detector MQ6 is associate degree correct LPG sensing device that acquires the signal intensity. Associate degree economical Arduino based signal process mechanism is followed that effectively quantizes the non-inheritable electrical signal. The intensity of the LPG leakage is classed into 3 categories, such as LOW, MEDIUM and HIGH based on square measure. This paper conjointly shows the ratio and temperature over the alphanumeric display. The importance and connection of the paper is very beneficiary for man as a result of it's a vital cautions for our domestic life.

* **ADVANTAGES AND APPLICATIONS**

Safety plays a serious role in today's world and it's necessary that smart safety systems are to be enforced in places of education and work. The LPG or gas that is combustible mixture of organic compound gases utilized in use as fuel in abundant application like homes, hostels, industries, automobiles' vehicles attributable to its fascinating properties that embrace high hot price, that manufacture the less smoke, produces less soot and doesn't cause abundant hurt to the setting. Each cases burns to provide clean energy, but there's a significant drawback concerning their outpouring within the air. The gases being heavier than air don't disperse simply could and should and will cause suffocation once indrawn conjointly once gas outpouring into the air may cause explosion' thanks to the explosion of LPG gas the no of deaths has been inflated in recent years. Thus this device is often used to avoid these issues by sleuthing and conjointly preventing outpouring of LPG.