ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 10, pp.60140-60142, October, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

LPG GAS DETECTOR AND PREVENTION

***Sureshkumar Natarajan, Parth Deshpande, Pranali Gole and Poonam Bhosale**

Department Electronics and Telecommunication, Vishwaniketan's Institute of Management Entrepreneurship and Engineering Technology, India

ARTICLE INFO

Article History:
Received 29th July, 2017
Received in revised form
20th August, 2017
Accepted 08th September, 2017
Published online 31st October, 2017

Key words:
MQ6 Gas Sensor,
Arduino Uno, GSM900.

ABSTRACT

A major problem in industries and homes is the leakage of gas. One of the preventive methods to stop accident associated with the gas leakage is to install a gas leakage detection kit at vulnerable places. This project aims to automatically detect, alert and alert gas leakage. Particularly, a gas sensor having a high sensitivity to gases like propane and butane is used (Ramya and Palaniappan, 2012). This system consists a GSM Module which is able to send an SMS to alert the user (Padmapriya and Kamini, 2013).

Citation: Sureshkumar Natarajan, Parth Deshpande, Pranali Gole and Poonam Bhosale, 2017. "LPG gas detector and prevention", *International Journal of Current Research*, 9, (10), 60140-60142.

INTRODUCTION

LPG gas is a mixture of gases like propane and butane. These gases possess a dangerous property of catching fire easily (Padmapriya, 2013). LPG is used as propellant, fuel and as a refrigerant. When a leakage occurs, the leaked gases may tend to a dangerous explosion. Recently, the number of deaths occurring due to explosion of gas cylinders has increased. Hence, the control of leakage is important from the point of view of safety. Bhopal gas tragedy is a good example of accidents due to gas leakage. Not only is the detection of leakage, but controlling it also equally important. LPG is generally used in houses and industries. In homes, it is used mainly for cooking purpose. Though rarely, gas leaks can happen inside a home, commercial premises or even in gas powered vehicles. Leakage of gas can be quite dangerous as it enhances the risk of explosion. For this purpose, an odorant such as ethanol is added to LPG, so that a leakage can be detected by anyone. However, some people cannot rely on this safety mechanism as they may have a reduced sense of smell. In these cases, our project, a leakage detector can be of help. A number of research papers have been already published on gas leakage detection techniques.

Problem Statement

LPG gas cylinders are used in our homes for various purposes. Cooking and heating water are a major part of the same. Hence it would not be wrong to say that it is an integral part of our life. However, there have been cases in the past about accidents due to gas leakage. The basic objective of the project is to provide a security system to prevent and avoid accidents caused due to the leakage of gas (Meenakshi Vidya, 2014). This can be achieved by creating a ready-to-use product and a standalone system of the same.

Project Objective

The gas may leak from various places like the top of the cylinder where the pipe carrying the gas to the application is present, or the pipe may get cracked leading to leakages. Hence accidents occur when a spark occurs in a place where this leaked gas is present. Same scenario can be seen in household activities. Our project basically aims on reducing such accidents by detecting the leakage of gas and then alerting the required authorities for the same. This will be implemented by using Arduino Uno. When the ratio of the specified gases in the air around the sensor goes above a preset level, it gives a signal to the Arduino which in turn sends a control to make the alarm go off and with the help of the GSM module, a message gets sent to the user. Hence a fore coming accident may get avoided.

Literature Survey

Meenakshi Vidya proposed the gas leakage detection and real-time gas monitoring system. In this system, the gas leakage is detected and controlled by means of exhaust fan (Meenakshi

Corresponding author:* **Sureshkumar Natarajan,
Department Electronics and Telecommunication, Vishwaniketan's Institute of Management Entrepreneurship and Engineering Technology, India.

Vidya, 2014). The level of LPG in cylinder is also continuously monitored. Ashish Shrivastava proposed a project in which two types of gases namely LPG and CNG are detected, which is used for home safety as well for vehicles (Ashish Shrivastava, 2013). R. Padmapriya proposed the system which uses ARM7 processor and simulates using "Keil" software to alert the user by sending SMS (Padmapriya, 2013) V.Ramya proposed the project that uses two different sensors for detecting the leakage and requires resetting manually after every situation (Ramya, 2012).

Components Used

The components which are used in the LPG gas detector and prevention are mentioned with their quantity below:

- Arduino Uno-1
- MQ6(Gas Sensor)-1
- GSM Module-1
- Buzzer-1
- LED-2

Flowchart

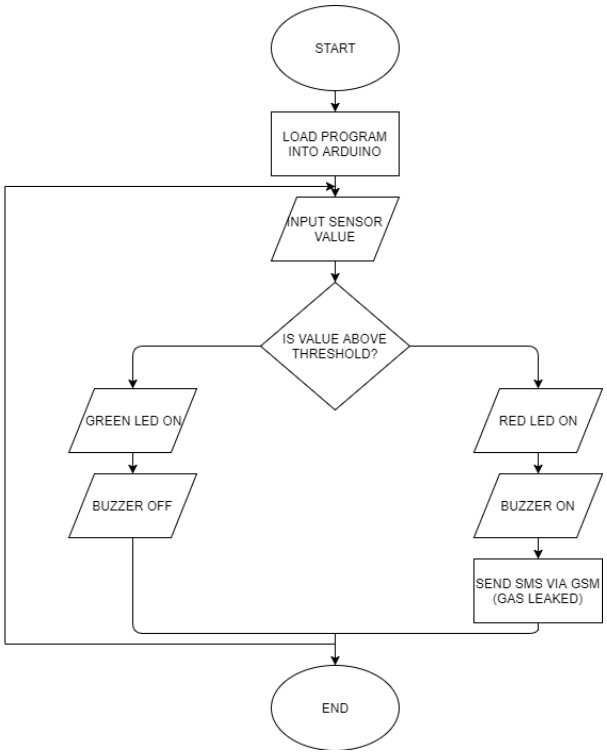

Fig. 1. Flow Chart

Working

By seeing the block diagram shown in Fig.1. we come to know the flow of project.

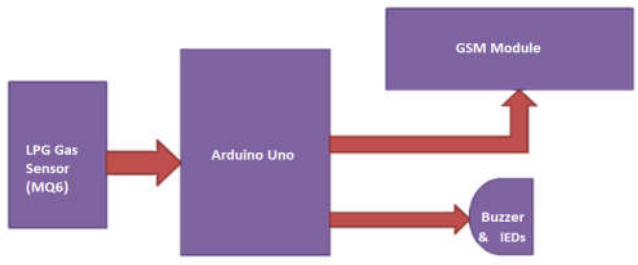

Fig.2. Block Diagram

The working of any advanced system mainly depends on the microcontroller which controls the entire functioning of the device. In this case the Arduino Uno is working like a conditional switch. It performs two sets of action depending upon the condition which is present. It will trigger the buzzer and the Red LED will glow to give the signal "Gas Leak" when the leakage of the gas will be detected by the sensor. The Green Led will be used to indicate "No Gas Leak" when the leakage of the gas is not detected. If the sensor detects the presence of the gas in the vicinity, then GSM module will send "Gas Leak" message to the relevant contacts [3]. If no gas is detected by the sensor in the surrounding, then GSM module will not send any message. The GSM module is included in this device to make the concerned aware about the leakage of gas taking place at the house in their absence so that necessary actions can be implemented immediately to prevent an accident. What actually happens, as indicated in the Fig.2. is as soon as MQ6 senses the leakage, it sends an analog signal to the microcontroller, which then gets converted into a digital value. A particular threshold value of gas is already set while programming in the microcontroller. A comparison between the value received by the sensor and the threshold value is done by the controller, as shown in circuit diagram shown in Fig.2.

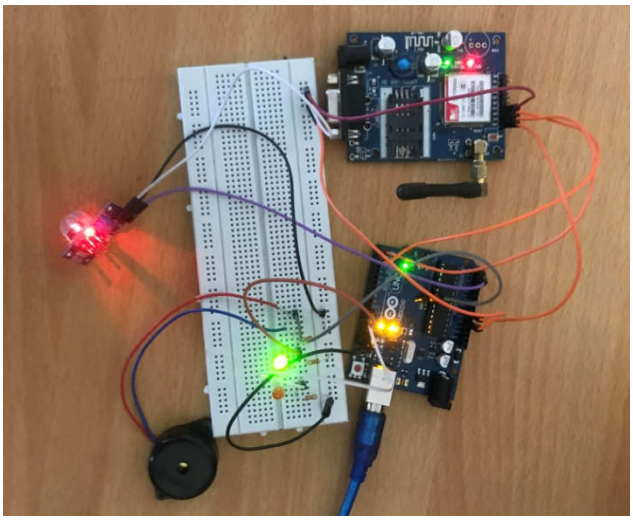

Fig. 3. No Gas Leakage Condition

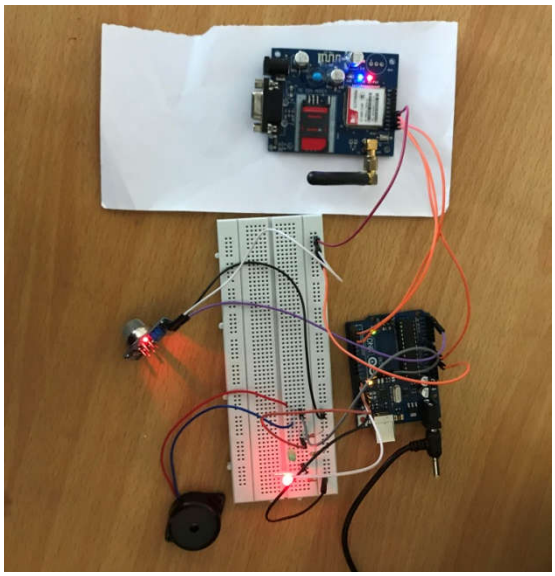

Fig. 4. Gas Leaked Condition

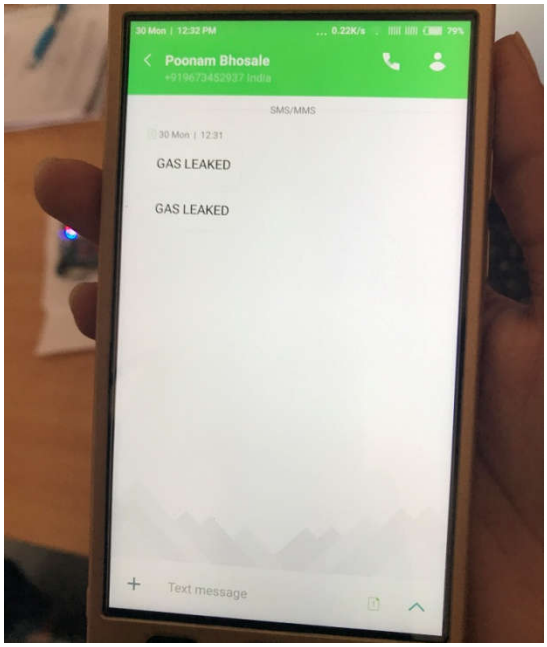

Fig. 5. Alert message sent due to Leaked Gas

There will be two cases mentioned as follows

- If the digital value received by the sensor is less than that of the Threshold value, the Green led keeps on glowing, indicating that there is "no gas leakage" in vicinity.
- If the received digital value exceeds the threshold value, the green Led turns to red indicating that there is "gas leakage" in vicinity. Also, a buzzer is triggered and an emergency text is sent to the user.

RESULTS

This system has been tested by taking a small amount of LPG gas near to the sensor. MQ-6 gas sensor detects the LPG gas and sends a signal to the Arduino. After that Arduino send an active signal to other externally connected devices. As a result, a buzzer rings, simultaneously message has been sent to the owner.

Future Scope

- In the future the system can be expanded to many applications. The sensor used to detect the gas leakage can also be used to detect if a person has consumed alcohol and/or is smoking in or near the petrol filling stations. If anyone is detected, they could be immediately sent out from the place and along with the fire prevention, public safety can be maintained.
- This system also helps in industries e.g. in chemical and gas industries where the LPG or all other gases are used for manufacturing the products.
- In future the security of home mainly in rural areas it is must because many accidents happen due to LPG leakage.

Conclusion

The proposed approach to monitor and detect the leakage of LPG gas is simulated and developed which detects the leakage of gas in the air and if it exceeds safety level then it activates the buzzer and sends the SMS to the specified numbers by using GSM. Using this, the user gets alerted in the hazardous and abnormal condition to take the necessary action. We can avoid the accidents caused by gas leakage with the help of this system.

REFERENCES

Meenakshi Vidya, P., Abinaya, S., Geetha Rajeswari, G., Guna, N. 2014. "Automatic LPG detection and hazard controlling " published in April.

Ashish Shrivastava, Ratnesh Prabhaker, Rajeev Kumar and Rahul Verma," GSM Based Gas Leakage Detection System", published in 2013.

Padmapriya, R., Kamini, E. 2013. "Automatic LPG Booking, Leakage Detection and a Real Time LPG Measurement Monitoring System", published in 2013.

Ramya, V., Palaniappan, B. 2012. "Embedded system for Hazardous Gas detection and Alerting", published in 2012.

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