

Smart Platform For Gas Level Monitoring, Auto Booking and Leakage Detection

M.Deepthi, M.Tamil Elackiya, B.Jeevitha, S.Susikala, S.Mercy Deepika

Department of ECE, Angel college of engineering and technology, Tirupur, India

ABSTRACT: This paper presents the hardware implementation of LPG detection and observance system using Arduino. The common drawback faced in our daily lives is relating to GAS instrumentality going empty and discharge of GAS. We have a tendency to bring this paper to observe the GAS amount in the container by using load cell, and to intimate as well as to place a refill within the several branch office(GAS Agency) via a message by using GSM module. The GAS container parameters are detected by using Temperature sensor, Gas sensor and Buzzer.

KEYWORDS: LPG, Arduino, Sensor, Load cell, GSM, Buzzer.

I. INTRODUCTION

There are approximately 30 crore LPG users in our country. Each currently then, we tend to see incidents of explosions and fires in homes furthermore as in laboratories. Most of the days these accidents are due to leakage of LPG. So, to ensure human safety, we need a system that can constantly monitor the LPG levels. In the proposed system, we designed a system to monitor the gas level by using gas sensor. Once a gas leakage is perceived by the sensing element, it will send a high pulse to the micro controller, the buzzer is triggered. Temperature of the environment is monitored by temperature sensor. If any fireplace is to be happened, then the temperature sensing element will sense a high modification in temperature and can send a pulse to the micro controller, it will trigger the buzzer. The most important drawback long-faced by LPG cylinder users is “They don’t apprehend the standing of LPG gas completion”, that makes delay in booking the cylinder. To avoid this, the gas container is placed on load cell, it measures the weight and sends an electrical pulse to the micro controller which is able to compare the pulse with a perfect worth. If the compared weight is high it does not place an order, however if the compared weight is low a refill order is placed by using GSM module.

II. RELATED WORK.

Paper [1] In this paper a portable system is designed for monitoring the gas leakage in the air by using LabVIEW Programming. This system detects the gas leakage and provides immediate alarm to the user. The monitoring of the gas sensor node is done by G-code created in LabVIEW.

Paper [2] This paper presents the hardware implementation of Liquefied Petroleum Gas detection and monitoring system using micro controller. This system monitors the level of gas in a room and transmits the data through 2.4 GHz ZigBee based Bluetooth module. The MQ-6 gas sensor is used for monitoring the LPG level , and it transfers the data to AT mega 16 micro controller.

Paper [3] This paper presents a gas leakage alert system to detect the gas leakage and to alarm the people onboard. To detect the LPG, MQ-6 gas sensor is used. If the leakage is detected, this system triggers LED and buzzer to alert the people.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 2, February 2019

III. EXISTING METHOD.

In India, gas distributor uses IVRS and ONLINE BOOKING for LPG booking.

A. IVRS

It was introduced due to the user's complaints regarding the landline phones of the distributors. Because they are not giving response to the users call or call liners busy and also in the IVRS User required to follow the instructions according to the automatic voice which includes selecting options.

B. ONLINE BOOKING

This are the little time consuming process and it require some knowledge about the messaging and internet. All these task are difficult to the uneducated peoples and time consuming for busy scheduled peoples. Mostly users are not able to know the level of LPG gas in cylinder.

IV. PROPOSED METHOD

The existing methods such as IVRS and ONLINE BOOKING are time consuming methods in fast running life. We discover uneducated individuals aren't ready to do these task and busy schedule individuals haven't spare time to try to do all the activities. Additionally safety plays the necessary role. Peoples grasp that several happens thanks to gas leak. We tend to designed a project by considering a security problems and additionally offer straightforward approach for LPG booking.

A. GAS LEAKAGE DETECTION

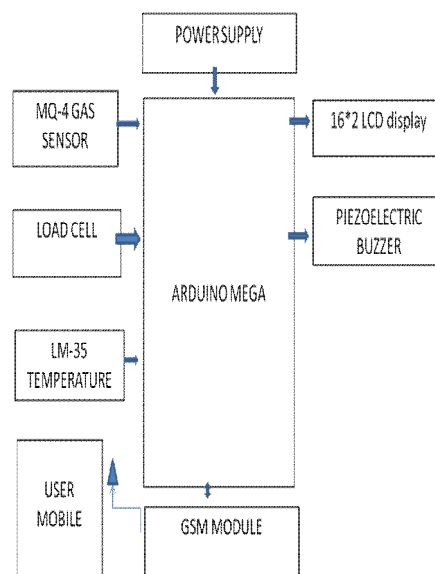
The leakage is detected by gas sensing element that is interfaced with micro controller. When the gas is detected it inform the user concerning the gas leakage by causing the SMS, turning on the buzzer and additionally message displayed on the LCD.

B. AUTO GAS BOOKING

We endlessly live the burden of gas gift within the cylinder. Once gas level goes below the perfect worth then message are going to be sent to the Gas Agency through GSM. Therefore , user gets cylinder with in time .

V. BLOCK DIAGRAM

The block diagram consists of Arduino, Load cell, GSM Module, Temperature sensor, Gas sensor, LCD display.



International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 2, February 2019

1.Methane gas sensor:

MQ-4 is a semiconductor type gas sensing element that detects the gas leakage. The sensitive material of MQ-4 is tin oxide (SnO₂). It has terribly low conduction in clean air. This gas sensing element not solely has sensitivity to propane and butane but also sensitive to other natural gases. Additionally this sensing element is used for detection of alternative flammable gases.

2.LM 35 Temperature sensor:

LM 35 is associate microcircuit sensing element that may be used to measure the temperature with an electrical output proportional to the temperature. LM 35 generates a high output voltage than thermocouples and may not require that the output voltage be amplified. It consumes approximately 60 micro amps from its supply which is very low and possesses a low self-heating capacity.

3.Load Cell:

The continuous measure is done using the load cell which intern works on the principle of Piezo electric sensor. Here we measure the weight of the cylinder by placing the cylinder on load cell arrangement. Strain gauge type of load cells are generally used. The weight of the cylinder is measured by placing it in a load cell arrangement. Load cell contains four strain gauges in Wheatstone configuration. Among the four strain gauges, two of them are in tension and remaining are in compression. The force being detected by the mechanical arrangement deforms a strain gauge then strain gage measures the deformation as an electrical signal.

4.Piezoelectric Buzzer:

Buzzer is an audio signaling device. Buzzers are generally used in alarms and timers. In the project, piezoelectric type of buzzer is used. Piezoelectric buzzer is more advantageous because of its light weight, simple construction and low price. Piezoelectric buzzer is based on the inverse principle of Piezo electricity discovered by Jacques and Pierre Curie. When an alternating electric field subjected to the material stretch or compress with the frequency of the signal thereby producing sound.

5. GSM MODULE:

Global System for Mobile Communication is term known for worldwide digital cellular communication. GSM network operates in different frequencies as 900 MHz, 1800 MHz and 1900 MHz . The architecture of all the three frequencies are identical but they differ in radio frequencies. The key feature of GSM is Subscriber Identity Module [SIM]. It is a detachable Smart Card which contains user's subscription information. GSM is suitable for SMS and Data transfer application in mobile to mobile interface. The GSM can be interfaced with micro controller using Universal Synchronous Asynchronous Receiver and Transmitter USART feature.

6 .ARDUINO UNO:

In the proposed system, Arduino Uno is used as a controller .Arduino UNO is a microcontroller board. It uses ATmega328P micro controller, it is developed by Arduino.cc. Arduino is Inexpensive, cross-platform with simple programming environment. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE .It can be operated in 5 volts and accepts input voltages between 7 and 20 volts. For beginners Arduino software is easy to use and flexible enough for advanced users.

VI. CONCLUSION

By considering the problems faced by LPG users, we come up with some solutions to avoid the difficulties of the users. We made a system to detect the LPG leakage and to place the refill order automatically. By this system we help people to save their time and to ensure the safety norms. It is useful for domestic purposes as well as for industrial purposes. When any leakage occurs, the system alerts the user by triggering the buzzer and sending messages. Also when the quantity of the gas is lower than the ideal value, the system place the refill order automatically by using GSM.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 2, February 2019

VII. FUTURE SCOPE

This observance system are often any increased by mistreatment Bluetooth in place of GSM to send the alert messages to user, that supports the another period of time application. For industrial functions mobile automation are often developed for defective work multiple gas concentrations. Addition of load cell co jointly be used as pressure sensor that detects the quantity of gas within the cylinder and also detects high air mass in cylinder pipe, displaying the alert messages via SMS and LCD displays.

REFERENCES

- [1]L.P.DESHMUKH ,J.AKHTAR& N.N.MALDAR, "A LabVIEW based LPG gas leakage detection" ,2016 International Syposium on Electronics and Smart Devices
- [2] RAHUL KURZEKAR & HARDIK ARORA, "Gas detection and Monitoring in android mobile platform",2017 IEEE International symposium on nanoelectronics and information system.
- [3]E.JEBAMALAR LEAVLINE & H.DEEPIKA, "LPG gas leakage detection and alert system",2017 International Journal of Electronics engineering research.
- [4]MAHALINGAM, R.T.NAYAGI & N.E.MASTORAKIS, "Design and implementation of an economic gas leakage detector",2017.
- [5]ATTIA,HUSSAIN.A & HALAH Y.ALI, "Electronic design of LPG leakage monitoring, alarm and protection system based on discrete components",2016 International journal of applied engineering research.