

LPG Leakage Detection System with SMS Alert Using IoT

Prajakta Vidhate¹, Pooja Bhosale¹, Gauri Veer¹, Ashwini Ghavate¹, Vinayak Kulkarni²

B.E. Student, Department of Computer Science Engineering, JSPM's Bhagwant Institute of Technology, Barshi, India¹

Professor Department of Computer Science Engineering, JSPM's Bhagwant Institute of Technology, Barshi, India²

ABSTRACT: Gas leakages results a serious problem in household and other areas where household gas is used, therefore the proposed gas leakage detection and monitoring system is developed. There are many methods available for booking a Gas Refill, methods include online booking, telephonic booking etc. It will be difficult situation for the one who uses LPG gas for cooking regularly. The aim of this paper is to present a new system automatically books a cylinder when the gas is about to empty is by sending a notification to the gas agency using wifi using Internet of Things approach. In addition to that sensor is used to detect gas leakage at home. If the gas leakage is sensed automatically it will send SMS to the user. wifi is one of the most used networks across the world. Hence, load cell has been used to monitor the weight of the LPG gas regularly. The values are next fed to the microcontroller. If the gas in the cylinder indicates a value where the remaining percentage level is crossed below the threshold level set for gas to be indicated as getting emptied, then a notification will be delivered to gas enterprise automatically to book the new cylinder. Subsequently, reply notification will be sent to the customer about the booking status. At the same time, application software is developed in the gas enterprise to inform and record the booking. This, work this helps the society to specifically indicate gas leakage and also helps both customers and the agency to get the gas booking made automatically using the IOT technique.

KEYWORDS: LPG leakage detection, SMS alerting, Exhaust fan, Weight sensor.

I. INTRODUCTION

There are several existing systems which can discover leakage using completely different gas sensors. Developed systems have used Arduino mega, MQ-2 gas device, and some alternative parts. Systems developed until date has either a gas detection module or automatic cylinder booking module. We've got developed a paradigm that has both the options that are of leakage detection and gas booking. The system detects the escape of the LPG using MQ-2 gas sensor and alerts the consumer regarding the gas escape by sending SMS.

Once the system identifies that LPG concentration within the air reaches the specified level then it alert the consumer by sending SMS to registered mobile phone and blinks the light.

It should additionally enable the service supplier to look at all such requests and to notify the users once their requests are met. the system should be cheap enough so it may be easily scaled and deployed at varied places. users don't need to enter any info manually as all the desired.

II. RELATED WORK

The sensors microcontrollers ,relays ,lcd display and buzzer which is being motorized by power supply .This power supply sector is involved to convert from alternative current to direct current and to decrease the amplitude signal mq 5 sensor it is constructed by micro al203 ceramic pipe and contains sno2 (tin dioxide) layer, capable of measuring electrode and heater covered by plastic and stainless steel [9]

arduino : arduino is a microcontroller, whose main aim is to make electronic to be as easy as possible. it uses different microcontrollers, containing several input and output pins[7]. several methods are available in order to flash the memory and ram in the arduino .it provides integrated development environment (ide). arduino contains several numbers of parts and integrated interfaces in a particular circuit board.

Relay: a relay is an electrical switch which is used to control all other electronic devices by using electromagnetic mechanical toggle lcd display lcd (liquid crystal display) contains two interfaces on upper and lower side of the module. the 16x2 lcd display has the height and width size of 80.0 x 36.0 mm and containing va size of 66.0 x 16.0 mm and thickness is 13.2 mm. its operating power supply ranges from +5.0 v or +3.0 v. **load cell:** load cell is a transducer

which is used to transform force into electronic output [6]. basically, it is used to detect the weight of the cylinder in this proposed system [12] and is organized to interface with microcontroller. wifi modem wifi network can easily establish a connection through a serving wifi adapter. it is easily accessible by any microcontroller due to its simple connection through uart (universal asynchronous receiver/transmitter) interface.

Buzzer: a buzzer is an audio signaling `device which is capable of controlling microcontrollers io directly, with the working voltage of 5v.

III. METHODOLOGY

In this proposed system, the gas leakage is detected by MQ 5 sensor which is interfaced by arduino [2], when the gas leakage is detected through the MQ 5 sensor the motor gets on and lights gets off with buzzer alarm and displaying alert message in LCD display [11], at the same time the notification will be sent to user through mobile which is connected via WiFi. Further, working of this proposed system is as below

Load cell which is also known as pressure sensor is used to detect the weight of the gas and the result will be displayed through LCD display

If the weight of the cylinder is below the threshold level, the booking confirmation message will be sent to user through mobile

The threshold range will be embedded and usually developed using C Programming

Wifi modem is capable of sending and receiving messages

Message will be sent from user to LPG agency and gets a return notification of when the LPG is delivered. However, as another segment of this system, it also detects leakage of gas in LPG models through sensors. LPG gas sensor will generate the signal to the UC and automatically shut down the main power supply. LCD is used to display the alert message i.e “LPG leakage detected” displayed when the leak is detected by sensor. Figure 1 depicts the architectural block diagram of the proposed gas leakage detection system

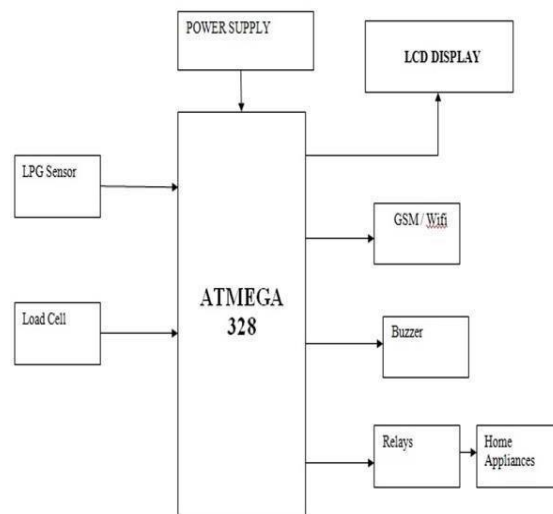


FIGURE 1: ARCHITECTURAL BLOCK DIAGRAM

The prototype of projected system is shown in the figure. This proposed system is developed to detect and monitor the lpg, when a small amount of LPG is brought near the MQ5 sensor, it display the message in LCD i.e“GAS LEAKAGE” at the time of leakage of the gas and the system monitors the lpg level and displays the message[8] i.e, “HIGH or LOW”. As in recent times, the problems that are faced by the lpg gas customer is gas leakages and booking issues, the developed system will be helpful to the customer.It

Helps them to upgrade their safety norms and aids to prevent the major disaster.It also helps in protecting life and property from apparent accidents.The primary aim of this proposed system is therefore to detect the gas leakage which is detected though gas sensor and user should be notified to prevent injure or outburst.The secondary aim is to detect the weight of the gas remaining in the cylinder which can be done through weight sensor. Thus, the proposed system helps the lpg gas customers to lead a pleasant life.

IV. CONCLUSION

We have successfully detects the LPG gas leakage and successfully send the text message to the user. Also weight sensors placed can detect the low quantity of gas and inform to user. We have applied algorithm to work application successfully.

REFERENCES

- [1] Abhishek, P. Bharath, "Automatin of lpg cylinr booking and leakge monitoring system," *International Journal of Combined Research and Development (IJCRD)*, pp. 693–695, 2016.
- [2] Patel, Z., Senjaliya, N., & Tejani, A. (2019). AI-enhanced optimization of heat pump sizing and design for specific applications. *International Journal of Mechanical Engineering and Technology (IJMET)*, 10(11), 447-460.
- [3] D. H. Priya and L. Babu, "Gas leakages system," *International Journal of Scientific and Research Publications*, p. 653, 2014.
- [4] R. Sugumar, C. Jayakumar, A. Rengarajan, "An Efficient Blocking Algorithm for Privacy Preserving Data Mining", *International Journal of Computing, USA*, Vol. 3, Issue. 8, pp. 73-77, August 2011.
- [5] P. M. Vidya, S. Abinaya, G. G. Rajeswari, and N. Guna, "Automatic lpg leakage detection and hazard prevention for home security," in *Proceeding of 5th National Conference on VLSI, Embedded and Communication & Networks on April*, vol. 7, 2014.
- [6] **B. Murugeshwari**, R. Sujatha, Preservation of privacy for Multiparty Computation System with homomorphic encryption system, **International Journal of Emerging Technology and Advanced Engineering**, Vol No 04 Issue 03, 530-535 Pages, 2014 ISSN : 2250-2459
- [7] S. S. S. S. K. K. Pankaj C. Warule and Shivam Upadhyay, "Lpg detection, metering and control system using microcontroller," *International Journal of Advance Research and Innovative Ideas in Education*, 2016.
- [8] Technical data mq-5 gas sensor. [Online]. Available: <https://www.sparkfun.com/datasheets/Sensors/Biometric/MQ-6.pdf>.
- [9] R. Sugumar, A. Rengarajan, C. Jayakumar "Enhancement of K-Anonymity To Privacy Preserving Data Mining Using Association Rule Hiding Algorithm", *International Journal of Applied Engineering Research*, Vol. 9, No. 24, pp. 26351-26364, November 2014.
- [10] N. S. G. B. D. Jolhe and P. A. Potdukhe, "Automatic lpg booking, leakage detection and real time gas measurement monitoring system," *International Journal of Engineering Research & Technology (IJERT)*, vol. 2, April- 2013.
- [11] Pic16f87x datasheet. [Online]. Available: <http://ww1.microchip.com/downloads/en/DeviceDoc/39582b.pdf>.
- [12] M. R. H. Davda and M. N. Mohammed, "Text detection, removal and region filling using image inpainting," *International Journal of Futuristic Science Engineering and Technology*, vol. 1, no. 2.
- [13] L. Shaw, S. Bagha, A. G. Mahapatra and N. Nayak, "Kernel Approach on Detection of Ethanol Connection using ZnO Gas Sensor," *International Journal of Machine Learning and Computing*, vol. 2, no. 1, Feb. 2012.
- [14] J. Sasidevi, R. Sugumar, Fuzzy C-means Clustering and Elliptic Curve Cryptography using privacy preserving in cloud, *International Journal of Business Intelligence and Data Mining*, Volume 15, Issue 3, pp. 273-287, July 2019.
- [15] [10] V. Ramya and B. Palaniappan, "Embedded system For Hazardous gas detection and Alerting," in *Proc. of International Journal of Distributed and Parallel System (IJDPDS)*, vol. 3, no. 3, May 2012. H. G. Rodney Tan, C. H. Lee and V. H. Mok,
- [16] **B. Murugeshwari**, C. Jayakumar, K. Sarukesi, Preservation of the Privacy for Multiple Custodian Systems with Rule Sharing, **Journal of Computer Science**, Vol No 09 Issue 09, 1086-1091 Pages, 2013 ISSN : 1549-3636
- [17] "Automatic Power Meter Reading System Using GSM Network," in *Proc. of the 8th International Conference (IPEC 2007)*, pp. 465-469, 2007.
- [18] Senjaliya, N., & Tejani, A. (2020). Artificial intelligence-powered autonomous energy management system for hybrid heat pump and solar thermal integration in residential buildings. *International Journal of Advanced Research in Engineering and Technology (IJARET)*, 11(7), 1025-1037.
- [19] S. Jagadeesh, R. Sugumar, "Optimal Knowledge Extraction System Based on GSA and AANN", *International Journal of Control Theory and Applications*, Vol. 10, Issue 12, pp. 153-162, December 2017.
- [20] Mahesh S. R. Pooja R. Preethi K. Mane Kumuda S. Shivalingesh B. M., Ramesh C. LPG detection, measurement and booking system. *IJRSI*, 1(6), November 2014.