International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 05 | May - 2023 Impact Factor: 8.176 ISSN: 2582-3930

CNG/LPG GAS LEAKAGE DETECTION USING ARDUINO

Pranay Tijare[1], Rajat Khobragade[2], Sagar Jagne[3], Nehal Kalambe[4]

Information Technology Department, Tusiramji Gaikwad Patil College Of Engineering And Technology Mohgaon, Maharashtra India

---

Abstract - Gas leakage is a serious problem in the industrial sector, residential structures, and gas-powered vehicles. Installing gas leakage detecting systems is one of the preventive measures to avoid accidents carried by gas leakage. The purpose of this study is to provide a tool that can identify gas leaks and notify owners to avoid problems caused by gas leaks. The system runs on a microcontroller and includes a buzzer, an LCD display, a GSM module, and a gas sensor. The system uses an Arduino microcontroller, a buzzer, and a MQ2 gas sensor to monitor gas leaks and send SMS notifications as needed. The circuit includes an LCD display, GSM module, buzzer, and Microcontroller MQ2 gas sensor. There are several solutions for fireplace accidents that authorities frequently support. Examples of these devices include smoke detectors, fire alarms, fire extinguishers, and showers. It should be noted that while these devices can warn you of a fire or stop it from spreading, they cannot protect you from fire injuries, which is already a significant drawback. This investigation explains the special properties of LPG fuel and how to avoid it from causing injuries. A tool that helps people's disregard for their surroundings while stopping the start of a firestorm is desired. The gadget additionally has a shut-off mechanism that acts as the first line of defence in the coincidence's prevention.

1.INTRODUCTION

The usage gas brings great problems in the domestic working places. The inflammable gas such Liquidized petroleum gas, which is excessively used the house and work places. The leakage of the gas causes destructible impact lives the heritage of the people. So, by keeping it in the concept of project we have develop a examining system which finds the leak of LPG gas and protects the work places correct precaution at correct time. This system provides the information such the when gas leakage noticed, sensors of the project used the notice the gas leakage immediately turns ON the buzzer for the danger indication. Buzzer is the clear indication of the gas leakage. By the detection of hazardous gas alerting message reached the person who has control over from the GSM. Detection the gas leakage is important halting leakage is important equally. The main objective that it is extremely accurate with cost, this project system is best to detect gas leakage warn people around buzzer sound SMS is send the responsible person for the preparatory safety calculations.

2. Literature Survey

Ch. Manohar Raju and N. Sushma Rani, 2008;

They introduce the android based automatic gas detection. They proposed prototype depicts mobile robot which are capable to detect gas leakage hazardous places. Whenever there is an occurrence a gas leakage in the particular place machine read and sends data the android mobile through wireless communication. We develop an android application for the android based smart phones which can receive data to robot directly through Bluetooth. The application warns indication whenever the occurrence of gas leakage and we can also control the machine movements via Bluetooth using text commands voice commands. The previous mobile robots are based the heterogeneous technologies like GSM. The disadvantage of the prototypes were the absence of communication in particular areas.

Pal-Stefan Murvaya, Ioan Sileaa, 2008;

They told in their survey on gas leak detection and the localization techniques various ways detect the gas leakage.They introduce some old or new technique detect the gas. The proposed techniques the paper are nontechnical methods, hardware based methods Research Article Volume 10 Issue No.6 IJESC, June 2020.

26131 http:// ijesc.org/ include the acoustic , optical and active methods.

3. OBJECTIVE

Specifically, the LPG/CNG Leakage Detector by Using Arduino and getting SMS Alert and Call Alarm project. The design and getting of a project to detect gas leaks, such as methane, butane, and lpg leaks, as well as any other petroleum-based gaseous substance, using a MQ5 device, and to set up an SMS-based alert system to send SMS alerts while limiting the entry of mobile numbers into an Arduino programme. (3) to design and purchase a project that will create an audible alert during gas outflow and turn it off after gas outflow is controlled. (4) to display status on an LCD using a 162 LCD component and to turn off the gas supply using a solenoid controller.

7.PROPOSED WORK

Here the gas produced is from cigarette lighter. When the gas is detected by MQ-2 gas sensor, the output of the sensor becomes logic LOW when the gas content reaches the value calibrated within the sensor. The Micro Controller UNO is the connected to gas sensor output the respective at the commands sent the GSM module the accordance to Micro-controller coding. The GSM module sends the message warning to the members the household. Gas leakage is the major problem with the industrial sector, residential premises and gas powered vehicles compressed natural gas buses. The system detects the leakage the liquefied petroleum gas using the gas sensor and uses of GSM to alert person about the gas leakage using SMS and call. The LPG concentration the air exceeds the certain level. It is detected the microcontroller and the LED and buzzer are turned ON simultaneously. The system alerts the customer by sending an SMS to specified mobile-phone. A solution is provided the further enhanced by displaying amount of gas is leaked. We incorporate the location detection feature for the gas leakage area to which SIM900 is purposely used as comes with added feature of web interfacing by using some extra codes in the microcontroller programming. MQ-2 Semiconductor Sensor for Combustible Gas Sensitive material the MQ-2 gas sensor SnO2, with the lower conductivity in the fresh air. The sensors conductivity higher gas concentration rising. We use simple electro-circuit, convert change the conductivity to correspond gas concentration. Propane and Butane and could be used to the detect both Methane and Propane. The sensor is used to detect different flammable gas especially Methane, with low cost and suitable for different application.

9. BLOCK DIAGRAM

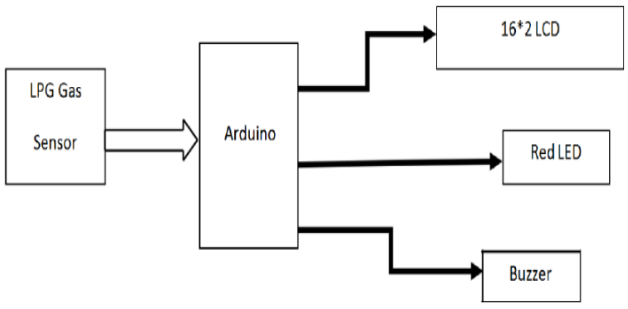

Figure 1. Block diagram of gas leakage detection and alert system.

10. CONCLUSIONS

We may draw the conclusion from the performance of the project that system detection of LPG/CNG gas leakage is great. Useful for both industrial and home purposes. We can use this technology to save lives when they are in danger. The GSM module signals a warning. Gases as CO2, oxygen, and propane are detected by a sensor node. The predicted gearbox range and power consumption are obtained. The sensor was built using easy steps and an Arduino UNO Micro controller.

ACKNOWLEDGEMENT

We are grateful to our guide Prof.Jayant Rohankar, Associate Professor for this continuous support and guidance. Through their guidance, we were able to successfully complete our project. Sincere thanks to Prof. Abhay Rewatkar, Head of the department of Information Technology at TGPCET, for his support and time.

REFERENCES

[1] Shrivastava, A., Prabhaker, R., Kumar, R., & Verma, R. GSM based gas leakage detection system. International Journal of Emerging Trends in Electrical and Electronics (IJETEE-ISSN: 2320-9569), 2013; 3(2):42-45.

[2] Hema, L. K., Murugan, D., & Chitra, M. WSN based Smart system for detection of LPG and Combustible gases. In National Conf. on Architecture, Software systems and Green computing-2013.

[3] Ramya, V., & Palaniappan, B. Embedded system for Hazardous Gas detection and Alerting. International Journal of Distributed and Parallel Systems (IJDPS), 2012; 3(3):287-300.

[4] Priya, P. D., & Rao, C. T. Hazardous Gas Pipeline Leakage Detection Based on Wireless Technology. International Journal of Professional Engineering Studies, India, 2014; 2(1).

[5] Jero, S. E., & Ganesh, A. B. 2011, March. PIC18LF4620 based customizable wireless sensor node to detect hazardous gas pipeline leakage. In 2011 International Conference on Emerging Trends in Electrical and Computer Technology (pp. 563-566). IEEE.

[6] Anusha, O., & Rajendra prasad, C. H. Experimental investigation on road safety system at crossings. International Journal of Engineering and Advanced Technology, 2019; 8(2):214–218. Alerting system. International Journal of Innovative Technology and Exploring Engineering, 2019; 8(8):2242–2245.