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Design and Development of Gas detection alert with SMS using Arduino

Pooja Dnyaneshwar Lambatkar
poojalambatkar@gmail.com
Yashoda Technical Campus, Satara, Maharashtra

Kajal Ravikant Chavan
kajalrchavan1996@gmail.com
Yashoda Technical Campus, Satara, Maharashtra

Tejashwini Atmaram Salunkhe
tsalunkhe390@gmail.com
Yashoda Technical Campus, Satara, Maharashtra

Dipali Maruti Pachangane
dipalipachangane61654@gmail.com
Yashoda Technical Campus, Satara, Maharashtra

Vaishnavi Sunil Mohite
mohitevaishnavi45@gmail.com
Yashoda Technical Campus, Satara, Maharashtra

ABSTRACT

The explosion due to gas leakage has become a serious problem in our country's daily activities. It is very life threatening ifyou will not distinguish and modified right away. Now the world is evolving with technology, so it is necessary to use technology if possible in every case. The idea behind our project is to give a solution by power cut the gas provision as soon as a gas leakage is perceived apart from activating the sounding alarm. In addition to this, the authorized person will receive a message informing him about the leakage

Keywords: *Arduino, GSM module, LCD display, Arduino IDE*

1. INTRODUCTION

In our daily life, the environment and its condition is very important for our health as it will impact the quality of life for all of earth's inhabitants. Consequently, the issues from environment and the air quality in industrial area are discussed to increase the alertness and responsibility regarding the environment towards public and workers' health. The dangerous gases such as CH4, and CO will bring harmful effect towards human as they may cause explosions and CO poisoning accident in most industrial areas. Thus, a gas detector is invented to ease human on detecting the presence of those dangerous gases within an area to prevent disaster happen. Nowadays, the gas detector has been innovated into various ways of detection, for example infrared thermal imaging gas leak detection.

This paper presents the design and development of a wireless gas leakage monitoring system by using Arduino and GSM module. The purpose of this project is to detect the presence of GAS leakage as a part of a safety system. Apart from an SMS alert will inform the authorized person and shut down the gas supply to prevent any harmful effects due to gas leakage. Descriptively, we use a gas sensor to monitor the gases. if the gas leak reaches beyond the normal level. This proposed project will trigger the sound alarm. In addition, the authorized person will be informed about the leakage via SMS alert and the gas supply will be automatically shut down. The people can be saved from a potential explosion caused by gas.

Objectives

- To design and develop a Gas leakage monitoring & alert system using Arduino.
- To display the leakage on a display board and send a notification on SMS to any predefine mobile number.

Scope of Study

Due to the increase in fuel costs, we use LPG gas in most petrol/diesel vehicles.

The use of gas in car and home is very risky

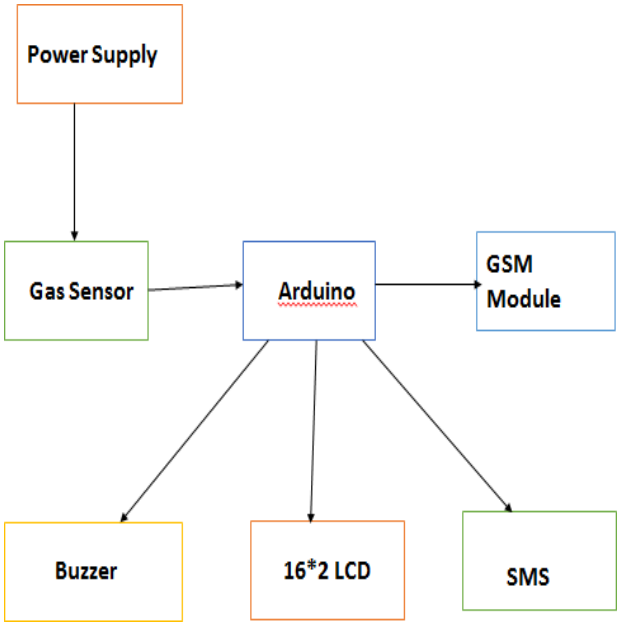
The gas cylinders used at home and elsewhere are the same condition, which is mainly due to gas leakage accidents.

For the protection and security of gas explosion problem, we design the IoT based system to prevent home and vehicle accidents.

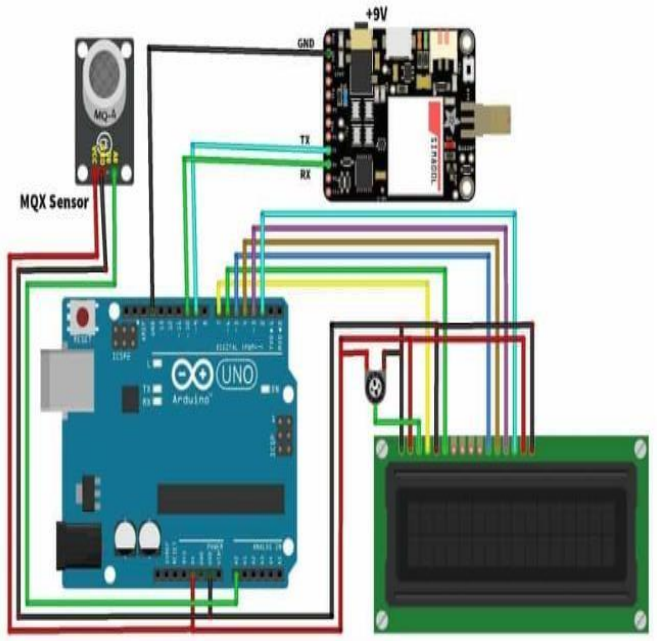
List of Components

- Arduino Uno
- GSM module SIM 900
- Buzzer
- 16*2 LCD Display
- DC Power Supply (12V)
- Gas Sensors
- Connecting wires
- I2C Display module
- A SIM card

2. BLOCK DIAGRAM



3. CIRCUIT DIAGRAM



4. WORKING PRINCIPLE

Arduino will be active with 5 volts‟ power supply. The sensor will detect gas leakage once the system is launched, if there is no gas leakage, it will display "Normal Condition Air Cleaning" on the display.

If the gas is leaked otherwise, the following three steps will follow :-

Step 1: A signal from the microcontroller will go to the display andshow gas leakage message there.

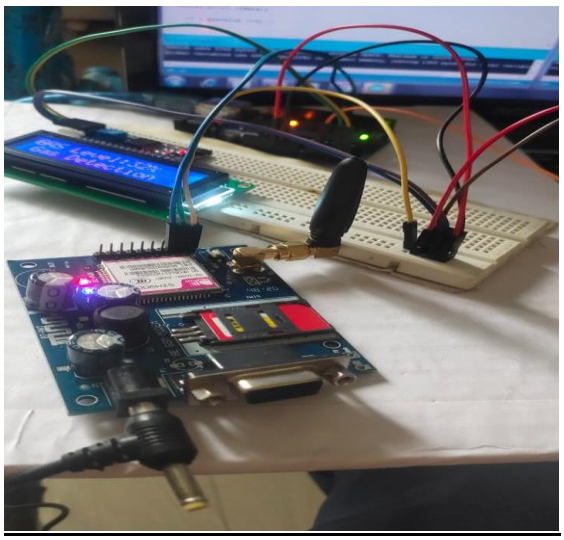
Step 2: The signal from Buzzer will signal when the first step iscompleted.

Step 3: Lastly, through GSM, there will be a signal message that thegas has been leaked to a specific number or multiple.

5. ADVANTAGES

- Detection and prevention of any sort of gas leakage.
- Cost is efficient.
- Less complex circuit.
- No environmental effect or no effect of physical condition
- Low power consumption and reliable.

6. RESULTS AND DISCUSSION



The result of this project is that the leakage is detected and SMS sent to the given mobile number, after the leakage starts. This system can detect even small value of leakage.

7. APPLICATIONS

- Protection from any gas leakage in cars.
- For safety from gas leakage in heating gas fired appliences like boilers, domestic water heaters.
- Large industries which uses gas as their production.
- For safety from gas leakage in cooking gas fired appliences like ovens, stoves, etc.

8. DISADVANTAGES

- It works only when 5volt power supply is given.
- Its sensitivity is depends on humidity and temperature

9. CONCLUSION

As a conclusion, this gas leakage monitoring system by using Arduino and GSM was successfully developed and works well. Its ability to warn its stakeholders about the leakage of the gas. The future aspects of this detector include the GSM module and a tripper circuit which increases the efficiency of the system and provides more safety to the users. This detector is implement successfully and is easy to use and also a low cost product. Another advantage of this device is that even though if no one is there in the house and then gas leaks occurs, GSM module is there to send immediate messages to the stakeholders regarding the gas leak and thus it lowers the intensity of accidents.

10. REFERENCES

[1] Infrared thermal imaging gas leak detection, Retrieved from:http://www.applied-infrared.com.au/?page_id=1562.

[2] Zulaika, “Wireless Gas Monitoring System of Gas Detector”, Degree dissertation, Faculty of Electrical Engineering (Medical Electronics), Universiti Teknologi Malaysia, Skudai, 2012.

[3] M.F. Jan, Q. Habib, M. Irfan, M.Murad, K.M. Yahya, and G.M. Hassan, “Carbon Monoxide Detection and Autonomous Countermeasure System for a Steel Mill using Wireless Sensor and Actuator Network”, IEEE 6thInternational Conference on Emerging Technologies,2010.

[4] J.Ding, J.Wang, N.Yuan, and Q.Pan, “The Monitoring System ofLeakage Accidents in Crude Oil Pipeline based on Zigbee Technology”, IEEE Changzhou University,

2011.
[5] Rakesh, M., Dagadi, S., "Implementation of Wireless GasLeakage Detection System", Proceedings of the International Conference on Sensing Technology, ICST, art. no. 6461747 , pp. 583-588.2012
[6] H.Yang, Y.Qin, G.Feng, and H.Ci, "Online Monitoring of GeologicalCO2 Storage and Leakage Based on Wireless Sensor Networks.", IEEE BEE Sensors Journal, 2013.
[7] G.A.A. Kumar, K.Rajasekhar, B.V.V.Satyanarayana, and K.S.Murthy, "Implementation of Real time Detection of Gas leakage in Industries using ARM7 and Zigbee", IEEE International Journal of Engineering Research & Technology, 2012.
[8] V.Boonsawat, J.Ekchamanonta, K.Bumrungkhet and S.Kittipiyakul, "XBee Wireless Sensor Networks for Temperature Monitoring", School of Information, Computer, and Communication Technology, 2010.

