

# Real Time Gas Leakage Detection System Using Cloud

Kavinilavu.N<sup>1</sup>, Kaviya.D<sup>2</sup>, Logalakshmi.A<sup>3</sup>, Priyanka.R<sup>4</sup>, Dr.Sumathi.S<sup>5</sup>

UG Scholar, Department of ECE, Adhiyamaan College of Engineering, Hosur, TN, India<sup>1,2,3,4</sup>

Head of The Department, Department of ECE, Adhiyamaan College of Engineering, Hosur, TN, India<sup>5</sup>

**ABSTRACT:** The main aim of this project is to detect gas leakage like LPG leak, Butane Leak, Methane Leak or such petroleum based gaseous substance that can be detected using MQ-6 sensor. When the system detects the LPG concentration in the air exceeds the certain level then it immediately alert the consumer by sending SMS to the specified mobile phone and alert the people by activating the alarm which includes the LED, buzzer simultaneously and display the message on LCD display to take the necessary action.

**KEYWORDS:** Liquefied Petroleum Gas(LPG), GSM, Sensors.

## I. INTRODUCTION

Leakage detection and location is one of the paramount concerns of home owner all over the world. A timely evaluation and response to a leakage, allows proper management of the consequences and an effective risk minimization. With the continuing growth of the forces of social production and the gradual awakening of the people's consciousness of the importance of home safety, a series of measures have been put forth to ensure person's safety. In home, small negligence may cause heavy economic losses and serious environmental pollution. Therefore, many large companies, including PetroChina and Sinopec, pumping large amounts of funds to upgrade existing equipment in order to remove the hidden danger. However, there are still some shortcomings on real-time monitoring and on data transmission and accurate location of a leakage point when an accident happens. Mainly because most of the current equipment's are based on wired networks, it is backward in technology and hard to be deployed; the technology of data acquisition in accidents is also backward and so it is hard to locate the leakage point. These problems can be solved with the help of Wireless Sensor Networks.

## II. GAS LEAKAGE DETECTION AND AUTO ON-OFF GAS SYSTEM

In this system, mq-6 sensor and temperature sensor is used for gas leakage detection. Here mq-6 sensor works on basics combustion process, and output is given in variable voltage form, so when LPG gas is leakage voltage at the output pin of mq-6 is increased and they used ic2 as a comparator for compare the LPG leakage with respect to normal condition. Output is comparator is fed to microcontroller and corresponding coding LCD is displayed gas leakage and give another instruction to stepper motor driver to turn 90 degree to turn off the regulator of gas tank. Temperature sensor is continuously communicated with microcontroller and displayed temperature at LCD. If temperature is more than 50 degree then fire alarm is activated and displayed fire on LCD.

## III. GSM BASED GAS LEAKAGE DETECTION SYSTEM

GSM based gas leakage detection System. In this project, gas leakage is detected by the gas sensor MQ-6. This detects the gas leakage and gives the signal to the microcontroller with the help of ADC. After that microcontroller receive the signal, send by gas sensor. It sends activation signal to other external devices attached to it Such as two stepper motor IC, buzzer, LCD (Liquid Crystal Display), GSM module and RF link. When signal is received by the external devices it performs some tasks such as buzzer activates, message display

on liquid crystal display screen and GSM module activated, which send warning sms to the user. Stepper motor IC to drives the stepper motor attached it, as a result main power and gas supply turn off.

### EMBEDDED C

As assembly language programs are specific to a processor, assembly language didn't offer portability across systems. To overcome this disadvantage, several high level languages, including C. Some other languages like PLM, Modula-2, Pascal, etc. also came but couldn't find wide acceptance. Amongst those, C got wide acceptance for not only embedded systems, but also for desktop applications. Even though C might have lost its sheen as mainstream language for general purpose applications, it still is having a strong-hold in embedded programming. Due to the wide acceptance of C in the embedded systems, various kinds of support tools like compilers & cross- compilers, ICE, etc. came up and all this facilitated development of embedded systems using C.

### GAS SENSOR

The electrical properties of the sensor would change with variations in gas concentration. Sensitive material of MQ-6 gas sensor is SnO<sub>2</sub>, which with lower conductivity in clean air compared to MQ-3 and MQ-7. When the target combustible gas exist, the sensor's conductivity is higher along with the gas concentration rising. MQ-6 gas sensor has high sensitivity to Propane, Butane and LPG, also response to Natural gas while other sensors are less sensitive to LPG.

### GSM

GSM sends the details of this node to the receiver, the receiver will send to the laptop or computer to update the details. It acts as transducer. It is used to send and receive the messages from the user and to the user.

### ARDUINO

8051 is just a single microcontroller while Arduino is a development board which comes with various series of microcontrollers, mostly AVR'S. 8051 is a CISC microcontroller with limited features even on board ADC and DAC is not available so for even simple programme take lot of efforts. Arduino have ATMEGA328 microcontroller with RISC architecture and the board supports various features that lead easy usage. In case of burning the code over microcontroller Arduino supersede the 8051 as there is no need of separate programmer instead of that the USB provided will directly connect your PC with board and reduce time to create and burn HEX file.

### CLOUD

On cloud, analyze and store the data and communicate wirelessly for further analysis is possible. Anyone can access the leakage data from anywhere using any Internet enabled device like PC, tablet or smart phone, and analyze it.

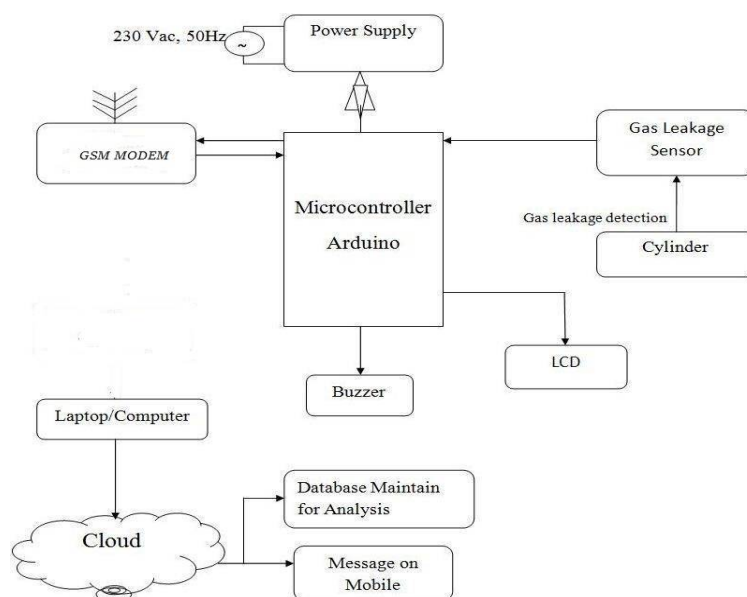


Fig 1: Block Diagram Of Gas Leakage Detection System Using Cloud

- 1) Gas sensor detects the gas leakage and gives the signal to the microcontroller.
- 2) Microcontroller receives the signal, send by gas sensor. It sends activation signal to buzzer, LCD (Liquid Crystal Display), GSM.
- 3) Buzzer [8] gives sound indication.
- 4) Detected gas information is send from sensor to microcontroller.
- 5) When the gas is detected, microcontroller sends the information to the GSM
- 6) GSM sends details of this node to the receiver, the receiver will send to the Laptop/Computer [8] to update the details.
- 7) This information will be fed on cloud through laptop/computer.
- 8) On cloud [7] data is collected, stored and analysed in a form and context based alarm will generate

#### IV. RESULT AND DISCUSSION

STEP 1: For interfacing the Arduino with the computer, the Putty software is used which creates the terminal window in Windows 7 OS. After installing the software, a window appears where we can select the COM port and then select serial communication for interfacing the Arduino. The terminal shows the real time leakage readings read by gas sensor.

STEP 2: Whenever the sensor detects gas beyond a limit the alarm raises to alert neighbours or user that there is leakage in the particular area.

STEP 3: If sensor fails it does not detect any gas then a message is displayed on LCD screen.

STEP 4: The leakage readings are sent to receiver on computer side through GSM on system side. The data is fed on cloud using Wamp server.

STEP 5: After analysis of data on cloud, a text message of leakage is send to owner.

#### V. CONCLUSION

This software approach can develop a real-time detecting and controlling of gas leakage system for highly sensitive industries using GSM, Arduino and Cloud. It comprises ZigBee modules, gas sensor, so it can be easily deployed. This proposed method can overcome the shortcomings of the current systems. With this, the rescue management improves and can save economy and lives very quickly

#### VI. FUTURE SCOPE

Wi-Fi module can be used for large scale areas like industries to monitor leak of gas in each room from the control room. This paper mainly aims to implement gas leakage detection technology with cloud. We can use temperature sensor, Multi Language Display, audio o/p to make it user friendly. However, this application can also be developed in future by integrating more number of equipments to measure various parameters, for instance, a humidity sensor or an optical sensor to determine the humidity.

#### REFERENCES

- [1] AshishShrivastava, Ratnesh Prabhakar, Rajeev Kumar and Rahul Verma "GSM Based Gas Leakage Detection System" International Journal of Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 1, Issue 2(MAY-JUNE 2013), PP.42-45.
- [2] Hina Ruqsar, ChandanaR, NandiniR, Dr.T.P.Surekha "Internet of Things (IoT) Based Real Time Gas Leakage Monitoring and Controlling" Vol 5, Issue 8, August (2014), PP.208-214.M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.
- [3] Rasika S. Ransing, Manita Rajput "Smart Home for Elderly Care Based on Wireless Sensor Network" 2015 International Conference on Nascent Technologies in the Engineering Field (ICNTE-2015).
- [4] Ashish Shrivastava, Ratnesh Prabhakar, Rajeev Kumar and Rahul Verma "GSM Based Gas Leakage Detection System" International Journal of Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 1, Issue 2(MAY-JUNE 2013), PP.42-45.