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GSM BASED HOME SAFETY

Hrushikesh Keluskar[1],Pooja Chavan[2], SonaliKudale[3], G .D.Salunke[4], Satish Pawar[5]

UG Students, Department of E&TC,AISSMS'S IOIT Pune, India.
Asst. Prof. Department of E&TC,AISSMS'S IOIT Pune, India.

***Abstract*—Every person wants to enjoy safe life. Accidents may happen due to carelessness at home. Gas leakage and fire are one of the main reasons of accident at home. This paper deals with the safety measures from these accidents. This is one of the best solution to install gas leakage detection system at home as well as vulnerable places. In proposed system Gas sensor is used to detect combustible gases like LPG, CNG etc. These gas sensors have greater sensitivity for Propane (C3H8) and Butane (C4H10). Home safety system consists of GSM (Global System for Mobile communication) module to send message to owner and grabs his attention. However former systems are not able to react in time. This paper provides the design approach on software as well as hardware.**

***Keywords*–GSM (Global System for Mobile communication), XBEE, LPG (Liquefied Petroleum Gas), Gas Sensor, Smoke Sensor, Microcontroller (LPC 2138), DC motor, Buzzer, LCD (Liquid Crystal Display), Exhaust fan, Sprinklers**

I. INTRODUCTION

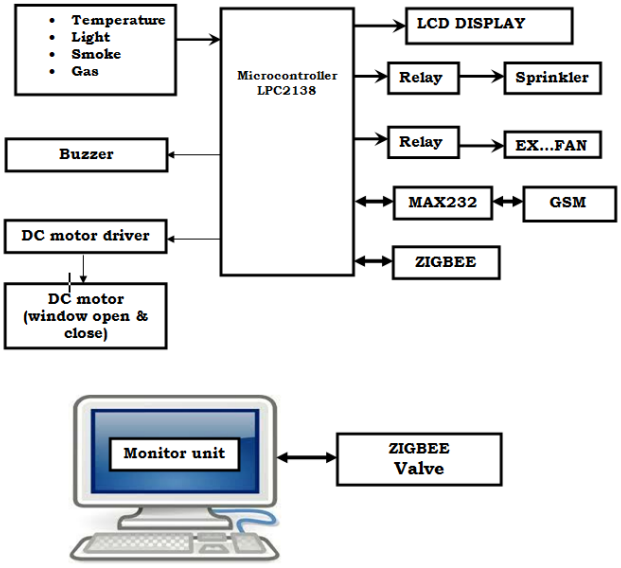
LPG is a mixture of propane and butane which is highly flammable chemical. This mixture is odourless hence gas leakage cannot be detected. To detect this Ethanethoil is added as a powerful odorant. Other international standards can be added as odorants like EN589 and amyl mercaptane. LPG gas is used for domestic as well as industrial purpose.

Some people have low sensitivity or cannot respond to low concentration of Gas leakage. If no one is at home and regulator is ON then accident may happen. In such case home safety system becomes essential to alert and protect from these kinds of accidents. Number of papers have been published on control and monitoring system. Embedded system for Hazardous gas detection and alerting has been proposed in literature where alarm is activated when gas leakage concentration reaches to a certain level.

Bhopal Gas tragedy was an example of industrial gas leakage accident in India. It was a worst accident across globe. Gas leakage and fire detection is not only important but also prevention from further accidents is also important. This paper provides cheaper as well as accurate solution to detect and prevent gas leakage and fire by sending message to owner, activating buzzer. Prevention is also done by opening automatic window and sprinklers. In order to provide high accuracy MQ-7 Gas sensor has been used.

II. PROPOSED SYSTEM

In this project we are going to design a system which can monitor the environment in the house like temperature, light, smoke and gas. If there is increase in above measurement beyond certain limit the owner will be informed with the help of message. For this purpose we are using GSM. In case of society we can build one central monitoring room to keep an eye on conditions in all room. To develop this XBEE is used.



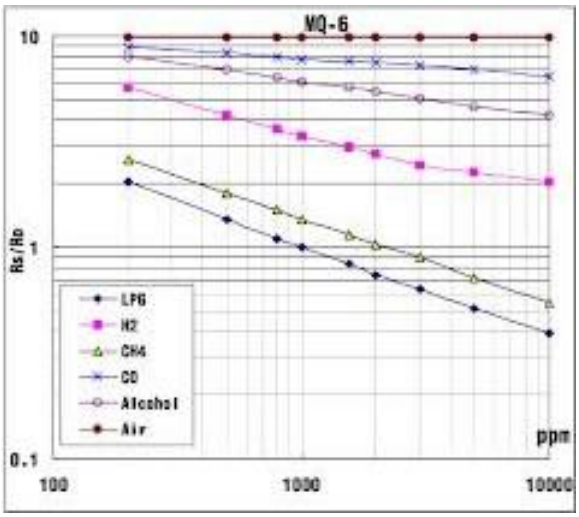
III.PARTS OF THE SYSTEM

A. Main Control Module(LPC2138)

LPC 2138 is the heart of this system. The internal 10 bit ADC available in this microcontroller is useful in this project. The speed of operation is very fast. Due to their tiny size and low power consumption, these microcontrollers are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale.

B. MQ-6 Gas Sensor

MQ6 gas sensor has the greater conductivity for propane and butane gas which is highly combustible. The sensitive material in it is tin dioxide (SnO2). It has very low conductivity in clean air.



The concentration of gas is measured in ppm. Hence the concentration range of MQ-6 gas sensor is 300-1000 ppm and it uses 6 pins out of which 4 pins are to fetch signals and 2 are used to provide heating current.

C. GSM modem

GSM is a Global Mobile system for Mobile communication. It is used to send the information to other people. When gas or fire is detected by the microcontroller it send this information by sending text information to owner. Multiple SMS can be send to fire station, police station

D. XBEE

XBEE is used to form a control room in building. With the help of XBEE we can transmit data from sensor to computer. It uses free radio frequency. It works like Bluetooth but the advantage of XBEE is its distance coverage

IV. SYSTEM DESIGN AND ITS OPERATION

The first step is to detect the gas if there is leakage at home. The gas sensor MQ-6 is used to detect the gas. The inbuilt ADC in microcontroller sends this information to the microcontroller. Similarly it sense the fire if smoke is present or the temperature inside home increases above threshold level then also ADC will send information to microcontroller.

In second step microcontroller activates secondary devices such as GSM, LCD, Buzzer, Motor etc. connected to it with the help of information from ADC.

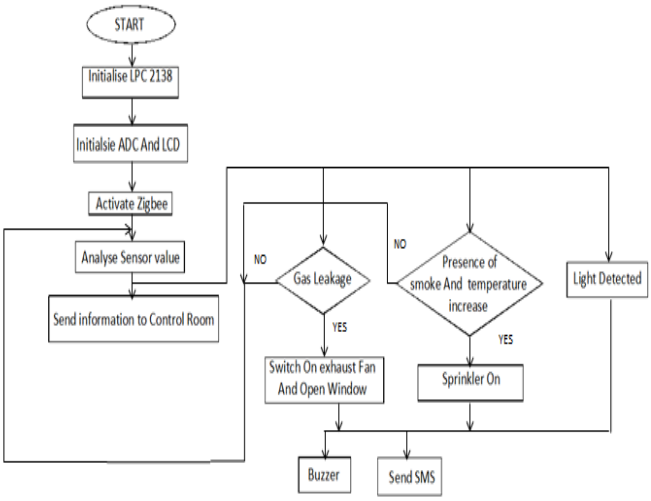
In the last step many processes takes place simultaneously. Activation of GSM and sending of message to the house owner, message display on Liquid Crystal Display, buzzer activation and motor driver to open window etc. Motor is also useful to cut off the supply of gas from gas cylinder. At the end when the whole gas is expelled out from room the system can be reset with the help of reset button.

V. SOFTWARE SPECIFICATION

In this project we are using KEIL software for the purpose of programming. The full system is developed in embedded C

language. Proteus and dip-trace softwares were used for circuit designing and PCB layout.To burn the hex file Flash Magic software is used.

VI. FLOWCHART



VII. CONCLUSION

In this paper, a low-cost Gas leakage and fire detection and safety system is presented. Hence a simple system to decrease these kind of accidents is made. This system is also useful for prevention if any fault occurs at home. This system can be made more compact.

REFERENCES

[1] Sunithaa.J, Sushmitha.D, "Embedded control system for LPG leakage detection and prevention" International Conference on Computing and Control Engineering (ICCCE 2012), 12 & 13 April, 2012.
[2] V.Ramya, B. Palaniappan,"Embedded system for hazardous gas detection and alerting" International Journal of Distributed and Parallel Systems (IJDPS) Vol.3, No.3, May 2012.
[3] Mr.SagarShinde,Mr.S.B.Patil,Dr.A.J.Patil,"Development of movable gas tanker leakage detection using wireless sensor network based on embedded system",International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com Vol. 2, Issue 6, November- December 2012, pp.1180-1183
[4] Mahalingam, R. T. Naayagi, N. E. Mastorakis, "Design and Implementation of an Economic Gas Leakage Detector", Recent Researches in Applications of Electrical and Computer Engineering.
[5] Huang, H., S. Xiao, X. Meng and Y .Xiong , 2010. A remote home security system based on wireless sensor network and GSM technology. Proceeding of the 2nd international conference on Wuhan, Hubei, pp: 535-538.
[6] Li, S. and Y. Cai,2010. Development of data communication system applied to electrical instruments based on USB interface. Proceeding of the international conference on the computer design and application, volume 4, june 25-27,2010,qinhuangdaopp,pp:v4-424-v4-428.
[7] Ramamuthy , B.,S. Bhargavi and R.S.kumar,2010.develoment of low cost GSM SMS-based humidity remote monitoring and control system for industrial application. Int .J. Adv. Comput. sci.Appl.,1:020-026.

