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Model Development of WSN based LPG Measure & LPG Leakage System Detection by Using GSM

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Abstract: *The purpose of this paper, LPG is used in many needs such as domestic, industries and commercial area. So the main purpose of this paper to provide safety from gas leakage causes. The system detects the leakage of LPG using gas sensor and send SMS alerts to consumer about the gas leakage. The system give indicator to turns on the alarm and. The system will continuously measure the weight of the cylinder and as soon as it reaches the minimum threshold it will automatically send an SMS alert to the user. And all this information about gas leak, weight of cylinder can be displayed on the LCD. Our system provides safety from the gas leakage, it detects leakage and takes control action over it. It will be helpful for those aged people who live alone and are dependent on others, by making them independent and secure them from any kitchen as well as industries hazardous.*

Keywords: *LPG gas leakage detector, LPG gas monitoring, wireless sensor network gas sensor GSM module.*

I. Introduction

Our daily routine 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.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.LPG consists of mixture of gases like propane and butane. These gases can catch fire easily. LPG is used as propellant, fuel and as a refrigerant. When a leak occurs, the leaked gases may lead to explosion. The number of deaths occurring due to explosion of gas cylinders has increased. So the leakage should be controlled to protect people from danger. 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. Bhopal gas tragedy is an example for accidents due to gas leakage. Gas leakage detection is not only important but controlling the leakage is also important.

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 , gas leakage detection with monitoring system, and wireless gas sensor network. Liquid petroleum gas is generally used in houses and industries. In homes, LPG is used mainly for cooking purpose. This energy source is primarily composed of propane and butane which are highly flammable chemical compounds.LPG leaks can happen, though rarely, inside a home, commercial premises or in gas powered vehicles. Leakage of this gas can be dangerous as it enhances the risk of explosion. An odorant such as ethanethiol is added to LPG, so that leaks can be detected easily by most people. However, some people who have a reduced sense of smell may not be able to rely upon this inherent safety mechanism. In such cases, a gas leakage detector becomes vital and helps to protect people from the dangers of gas leakage. A number of research papers have been published on gas leakage detection techniques. In this project, advanced gas leakage detection technology is used.This paper presents the design and development of a wireless gas leakage monitoring system by using Arduino and Zigbee.

In this project, the monitoring system is developed by using LabVIEW GUI. It is used to display the level of gas concentration in a place through another remote PC, and via internet server. Hence, it provides benefit to monitor the condition of a room in a safe distance.

Traditionally, the gas pipeline leakage monitoring system is realized by communication cable system, therefore the cost of installation and maintenance are very expensive and difficult as mentioned by J.Ding. In order to overcome these restrictions, wireless sensor network is chosen as the best choice in the situation above. Some papers proposed different types of wireless sensor network such as radio frequency (RF) transceiver,

router and coordinator, general packet radio service (GPRS) network and Zigbee. Nowadays, Zigbee is widely used in the gas leakage monitoring application field for the real-time monitoring of the potential risk areas.

For the autonomous control system is as a preventive way to stop the situation becoming worst by shutting down the process automatically. A. Shrivastava has proposed the system by using stepper motor to turn off the main power and the gas supply. Whereas in this model, the relay switch is used to turn off the main power, and the electronic gas valve is used to turn off the gas supply. At the end, when the gas leakage is successfully stopped then the whole system will return to initial stage with the help of reset button.

II. Literature Survey

MeenakshiVidya et.al..[1] proposedtheleakage detection and real time gas monitoring system. In this system, the gas leakage is detected and controlled by means of exhaust fan.The level of LPG in cylinder is also continuously monitored.

Mr. Sameer Jagtap, Prajkta Bhosale2, Priyanka Zanzane3, JyotiGhogare Assistant Professor, Graduate student , E&TC Department PES's, COE, Phaltan, Shivaji University, Kolhapur Maharashtra, India-415523. " LPG Gas Weight and Leakage Detection System Using GSM."an LPG Gas Weight and Leakage Detection System Using GSM .This is useful in various applications in homes and hotels. Many times it happens that because of the rush or due to the shortage of cylinder, there is a delay in providing the gas cylinder. Main reason behind this is delay in informing to the gas provider or we inform the gas provider at the last moment when the gas cylinder is empty. So the use of first low priority SMS is the user gets intimation about the weight of the gas. So the user can book a new gas cylinder. It avoids the problematic situation caused due to unavailability of gas cylinder. Sometimes the leakage of the LPG gas is not detected by person due to low séance of smell so in this project we use the gas sensor for leakage detection. In this project whenever there is LPG gas leakage is occurred then buzzer

Halavva Patil1, ShreedharNirad, Jyoti D.T, Seema J.S, Shweta D.G, Assistant Professor S.G. Balekundri Institute of Technology Belagavi, India Student of Computer Science Engineering Belagavi ,India.Now a day's safety and time are major issue. And home fires have taken a growing toll in lives and property in recent year. LPG is highly inflammable and can burn even at some distance from the source of leakage. Most fire accidents are caused because leakage of gas. In this project we are dealing with detection, monitoring and control system of LPG gas leakage. Using relay DC motor the stove knob is automatically controlled. Along with this safety measures the system has additional advantage of automatic rebooking of cylinder when the level of gas goes below the normal weight of cylinder.

III. Methodology

Hardware:

There are two Arduino boards will be used as shown in Fig. 2. This microcontroller consists of built-in analogue-digital converter (ADC), which able to read the analogue signal from the combustible gas sensor MQ-9.

Threshold value:

Meanwhile, Arduino (2) will receive the data and compare to the threshold value of the gas concentration based on the standard value from Occupational Safety and Health Administration (OSHA) organization [2]. Table I shows the threshold value for gas concentration of CO and CH4 in parts per million (ppm). Whereas for Table II, represents the measured threshold value for the MQ-9 using Liquefied Petroleum Gas (LPG)

Microcontroller:

Arduino Uno R3 is a device that acts similarly to a microcontroller unit. In this project, Arduino is the perfect microcontroller due to its high performance and special features. The Arduino is an open-source electronic prototyping platform based on flexible, easy-to-use hardware and software. It has 14 digital input or output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The focus of the project is on the programming of Arduino. It is the open source software used to create the language programming in order to run the system. Therefore, make this microcontroller suitable for industrial control as compare to other microcontroller.

GSM module:

The term GSM stands for Global System for Mobile. It is mainly used for communication purpose. In this project, the GSM system is used to communicate with the user. When the gas leakage occurs, the microcontroller stops the leakage and alerts the surroundings. Then, the information about the leakage has to be informed to the user. For this purpose, GSM is used. Using GSM, a warning SMS is sent to the user. The type of GSM module used in this project is GSM module SIM300. The method of communication is asynchronous serial communication. The corresponding code has to be loaded into the microcontroller, to which GSM is connected.

Buzzer:

It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time haslapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound.

IV. Conclusion

The gas leakage detection and monitoring is successfullydesigned and works. There are various types of structure and design developed by different software and hardware but it is made by GSM module because it is easy to use as an handicap, senior citizen or small kids who will handle this design or project and they can see resultsand it will detect within fraction of second and give notification to GSM module and LCD display

Bibliography

[1]. V. Ramya and B. Palaniappan, "Embedded system for Hazardous gas detection and Alerting," in Proc. of International Journal of Distribted and parallel system(IJDPS), vol. 3, no. 3, May 2012.

[2]. H. Huang, H. Bainand S. Zhu, "A Greenhouse Remote Monitoring System Based on GSM," in Proc. of IEEE International Conference on information management, pp. 357-360, 2011.

[3]. Fraiwan, L.; Lweesy, K.; Bani-Salma, A. Mani, N, "A wireless home safety gas leakage detection system", Proc. of 1st Middle East, Conference on Biomedical Engineering, pp.11-14, 2011.

[4]. Sheikh RafikManihar, Komal Prasad Dewagan, JayantRajpurohit Multiple Gas journal Analyzer International Journal of Modern Engineering Research (IJMER) Vol.2, Issue.4, July-Aug. 2012 pp-2753-2755

[5]. Pal-Stefan Murvay, IoanSilea, "A Survey on gas leak detection and localization techniques," Journal of Loss Prevention in the Process Industries, vol. 25, no. 6, pp. 966-973, Nov. 2012.

[6]. K. Padmapriya, Surekha, Preethi, "Smart Gas Cylinder Using Embedded System", published in 2014.

[7]. P. MeenakshiVidya, S. Abinaya, G. GeethaRajeswari, N. Guna ,"Automatic LPG detection and hazard controlling " published in April 2014.