

Assessment on Microcontroller Established Vapor Leak Sensor System

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Abstract

The security has remained main problem in today's scenario. Accidents are on growing day by day. Here, we are talking about person's chances that are actuality happened due to flammable vapors, i.e., LPG, CNG. Frequently we hear eruption in cylinder of domestic and vehicles. Numerous people have remained injured and some got dead. So we are creation this project for security purpose that will notice inflammable gases and alert applicants. Now a day's, LPG Vapor leak sensor's originates in the market with the LPG sensor that only sanities any vapor leak and sends a SMS to the alternative no. delivered to it and alerts the user via audio or visual suggestions while we are on a project in which we are using a stepper motor also in calculation to the normal LPG Vapor leak sensors which assistances in revolving off the switch when there an emergency in our deficiency. In this paper, we are reviewing on the use of LPG Vapor leak sensor along with the stepper motor instead of using other simple Vapor leak sensor. The sensor we are spending here has excellent sensitivity joined with a quick reaction time. The sensor can also sense isobutane, propane, LNG and cigarette smoke. The report contains of a background into the part of 8051 microcontroller and mobile communication, how they are interfaced to each other and AT instructions set used in communication.

Keywords: GSM, microcontroller, MODEM, SIM, LCD, mobile communication, leak sensor, 555 timers

I. INTRODUCTION

With the improvement of world, the technology is improved day by day with the accurate developments and well-organized work. In this project we are using MQ-6 semiconductor sensor to notice flammable gas. This vapor sensor is complete of sno2. This sensor has lower conductivity in new air. When target flammable gases exist, the sensor conductivity is higher along with vapor attentiveness rising. Essentially, conductivity of this sensor depends upon attentiveness of the vapor so it may notice not only inflammable vapor but also smoke, butane, isobutene, liquor. We can conjointly use it as a liquor tester. If the

LPG sensing component senses any outflow from packing then the output of this sensing component goes low.

This low signal is observed by the microcontroller and it will create the vapor outflow. Presently, the microcontroller chances on LED and Buzzer. Once few milliseconds delay, it conjointly stimulate fan for flinging vapor out and endure send messages as "VAPOR LEAK" to your mobile no. consequently the stepper motor opportunities off the switch of the cylinder. In this paper we deliberated finished numerous explores what improvement has been done in VAPOR leak sensors and our planned work concerning the subsequent paper.

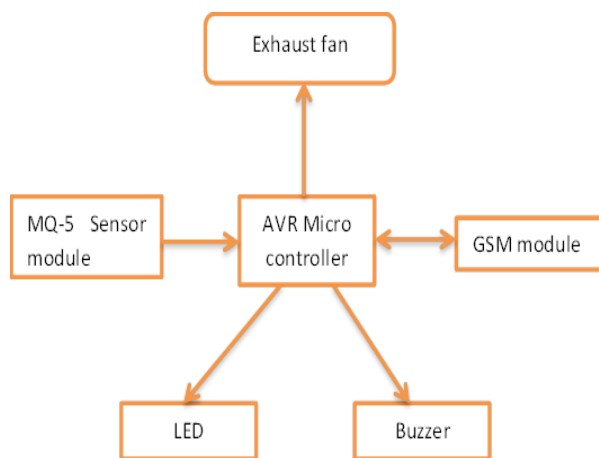


FIG 1 Micro Controller Established Lpg Sensor

A. Microcontroller:

A proficient and smooth occupied controller is desirable to unceasingly sense equally leak and level of the gas. And also fast answer is necessitate when leak found. Along with this the watching system must deliver extra leak information which can be used in extra dispensation. The detection system comprises Arduino Duemilanove microcontroller board which is Arduino companionable with microcontroller chip ATmega328p. The Duemilanove is a microcontroller breakout board featuring ATmega328 recognized on the

popular Arduino Footprint. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB assembly, a power jack, an ICSP header, and a rearranged control.

B. Vapor Sensor

Vapor sensor MQ-6 is extremely sensitive to LPG, isobutene and propane. This sensor is used in vapor leakage identifying apparatus in internal and industrial requests. It is appropriate for LPG detection and significant thing is, it escapes the noise signal of alcohol, cooking vapors and smoke. In clean air it has lower conductivity. If inflammable vapor is perceived, the sensor conductivity intensifications with escalation in vapor attentiveness. Higher compassion to LPG, low cost and long life is the main structures to select this vapor sensor. Voltage difference attained is from 0.5 volts in clean air to 0.9 volts when leakage noticed. Hence 0.7 volts is considered as threshold level suggestion of vapor leakage. If output voltage of 0.7 volts is perceived, vapor leakage system will be operated.

C. Demonstration

It is essential necessity to put a demonstration about system observing and controlling performance, which demonstrations the numerous messages such as leak of vapor sensing, booking of cylinder in case of replenishing of cylinder. Moreover the system also, exhibitions the actions approved out in the microcontroller. For the work of exposing the alert messages Liquid crystal presentation of 16*2 characters operating on +5 volt supply and functioned 4-bit mode is implemented.

D. GSM

The GSM modem is highly flexible plug and play modem recognized on tri-band sim300. Sim300 can fit practically all the space necessities in much real-time submission. This global system for movable communication expertise manufacture it very easy to send and obtain the communications sustenance the AT directions. These instructions can be executed by interfacing to the receiver and transmitter pins of microcontroller. MQ6 vapor sensor detects the leakage of gas, weight sensor provides the level in cylinder, and microcontroller will take the protective and necessary action. All these notable information and status happening has to be conveyed to the user. Stores the mobile number of users and distributors Operation of Monitoring and Detection system.

II. LITERATURE SURVEY

A amount of evaluations on the subject of vapor leakage detection methods were done in the past moreover as part of exploration papers/technical reports on a certain leak detection technique and other vapor connected focuses.

Ch. Manohar Raju and N. Sushma Rani, 2008; they present an android established automatic vapor recognition and suggestion robot. They proposed prototype describes a mini peripatetic robot which is proficient to notice vapor leakage in dangerous places. Whenever there is an incidence of vapor leakage in a specific place the robot directly read and directs the data to android mobile finished wireless communication like Bluetooth. We improve an android request for android recognized smart phones which can obtain data from robot straight finished Bluetooth. The request warns with an suggestion whenever there is an incidence of vapor leakage and we can also control the robot actions via Bluetooth by using text instructions as well as voice commands. The preceding mobile robots are recognized on heterogeneous technologies like GSM, GPS, internet recognized etc., but the main disadvantage of those prototypes were the absence of announcement in particular areas. So, with the rapid increases and tremendous changes in technology we have lots of techniques to eliminate preceding difficulties. Wireless communication protocols play a vital role in current trends. Bluetooth, WI-Fi, Zigbee etc., we use one of the best feature of smart phone, i.e., the Bluetooth technology to control and monitor strictures driven by a robot.

They present a robot and mobile application for In the meantime, the system prototype has impressively established its use and competence in concentrated series of tests. The determination unit, the steering system and, therefore, the corresponding sensor systems achieved superbly through the tests. The robot enables dependent vapor detection and leak localization in sites that are otherwise troublesome to access. Furthermore, it helps to escape exploitation of human assessors in perhaps hazardous surroundings. However, before preparing in industrial settings, extra improvement is wanted (e.g., in explosion protection, package development, etc.), and in fact authorized problems must be managed before preparing in business settings. Still, it is assured that an independent, mobile vapor detection and leak localization robot is conceivable today and can meaningfully improve protection.

Pal-Stefan Murvaya, Ioan Sileaa, 2008; they told in their survey on vapor leak detection and localization procedures various ways to detect the vapor

leakage. They familiarize some old or new method to perceive the gas. The proposed techniques in this paper are nontechnical methods; hardware recognized methods which include acoustic approaches, optical approaches and active methods.

In their review they told an extensive variation of leak detecting methods is available for vapor pipelines. Some techniques have been developed since their first suggestion and some new ones were calculated as a consequence of advances in sensor developed and computing power. However, each recognition technique comes with its compensations and disadvantages. Leak recognition techniques in each classification share some benefits and difficulties. For instance, all exterior techniques which involve recognition done from outside the pipeline by visual comment or portable sensors are able to notice very small leaks and the leak location, but the detection time is very long. Approaches recognized on the mathematical model of the pipe have good results at high flow rates while at low flow rates a mass balance recognized detection system would be more appropriate. This disadvantage is prone to evaporate for some of these methods due to approaching technological progressions.

In proposed paper, they work on the organization of leak detection knowledges. Most detection methods rely on the amount of a certain physical quantity or the appearance of a certain physical occurrence. This can be used as a rule for Organization as we have numerous shared used physical limitations and phenomena: acoustics, flow rate, pressure, vapor sampling, optics and occasionally a mix of these. An instance is available in relation to the optical discovery methods. Since of the great diversity of these recognition clarifications, leak finding technologies are sometimes classified into visual and non-visual methods.

III. OPERATION OF SYSTEM

A. Leakage Detection systems

In the detection system the MQ6 vapor sensor is used which is practical to LPG, isobutene and propane gases. This sensor sends a signal (digital pulse) to the microcontroller when vapor is existence leaked. An alert dispatch is sent finished the GSM to the user and a buzzer alarm is stimulated in the room. This alarm products huge sound which drops down the attention of user and neighbors in current leak/fire chances. This alert message will be displayed on LCD Concurrently; LPG regulator fitted to the cylinder is repeatedly turned off using a relayed DC motor to avoid

more leakage from cylinder. 6.2 Replenishing of cylinder: The LPG cylinder refilling unit includes mostly the weight sensor, which is attached with to the ATmega328p microcontroller. When the weight of the cylinder influences the below the prearranged value the GSM modem interfaced to the microcontroller sends appointment application to the distributor.

The distributor will confirm the validity of customer in the database and consequently an acknowledgement message is directed complete GSM modem to the user repeatedly.

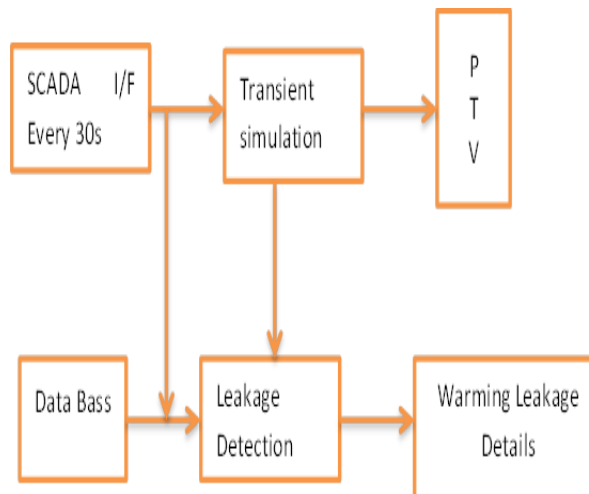


FIG 2 Leakage Detection systems

B. Application

This arrangement can be used in dissimilar parking area like

1. House hold determination
2. Vapor activity
3. Chemical factory
4. Businesses
5. Hospitals

IV. PROPOSED SYSTEM

We have decided from these existing and above deliberated technology. We shall use a new technology IOT (Internet of Things) to get fastest announcement of vapor leakage. We shall use a stepper motor to OFF the knob of cylinder controller to avoid the unintentional cases due to vapor leakage. We will also use a website or application under the IOT technology to get fastest answer from the component. The other component and things which are used in this development is GSM module, microcontroller, deplete fan, LED for suggestion, a buzzer to inform local individuals and MQ 5 or MQ 6 vapor sensor component to sense the vapor leakage. In this proposed model we want to realize five aspects:

A. To Design an Embedded System

In this we use the AVR microcontroller that control all the component and things.

B. GSM Module

GSM component is used to direct the message of vapor leakage.

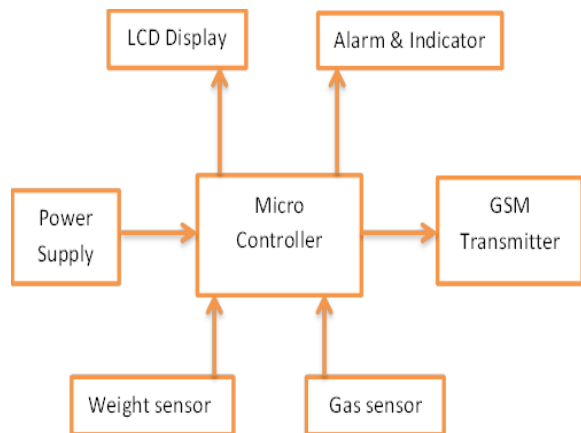


Fig 2 Structure of block diagram

C. Accident Avoiding Feature

In this we use the exhaust fan to reduce the vapor from the place, a stepper motor that OFF the cylinder knob and for notify the local people automatically weeping the buzzer.

D. IOT Module

This module is use for app notification.

E. Sensor Module

This module is use to sense the vapor leakage. In this module we use a sensor MQ 5 or MQ 6 to perform the leakage detection operation.

V. CONCLUSION

Lastly, we accomplish in new households, the use of LPG is captivating a big troll. From the use of cylinder up to the use of petroleum pipelines. The main danger in using this knowledge is security. And our development will prove to be boom for households and productions. A wide variety of leak noticing methods is obtainable for vapor pipelines. Some techniques have been developed since their first suggestion and some new ones were intended as a result of progresses in sensor industrial and computing power. Though, respectively detection method originates with its advantages and disadvantages. Leak detection methods in each grouping part some advantages and disadvantages. For example, all peripheral techniques which include recognition done from external the pipeline by visual reflection or movable sensors are

able to notification very small leaks and the leak position, but the detection period is actual long.

Approaches recognized on the mathematical model of the pipe have respectable consequences at great movement rates though at low flow rates a mass balance recognized detection system would be more appropriate. Hybrid systems promoting from the real-time detection competence of software recognized technique and the high localization correctness of a hardware recognized technique, along with other specific recompenses of both methods, appear to be the forthcoming trend in vapor leak detection. Choosing from the wide variety of profitable solutions obtainable is eventually an action that has to be taken subsequently assessing the essentials of the system in which vapor leak detection is needed.

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