

# LPG LEAKAGE DETECTION AND PREVENTION SYSTEM WITH GSM ALERT

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**Abstract** – Now a days the home safety detection system play the important role for the security of people. Since all the people from the home goes to work on daily bases, it make impossible to have check on the appliances available at home specially LPG gas cylinder, wired circuits, Etc. whereas in industrial system it also make difficult for the labors to keep the track of every second so to work on this problem, the system is develop which will keep the track on various home appliances such as LPG gas cylinder, wired circuit, etc. this system uses MQ6 gas sensor to detect inflammable gas leakage and LM35 temperature sensor which will sense the sudden rise in temperature than above the room temperature. This makes easy for both the commercial as well as domestic sector to keep the track on problem faced on daily bases. This system effectively track the problems arises in day to day life.

**Key Words:** MQ6 gas sensor, LM35 temperature sensor, Load cell, Arduino, GSM module, relay, etc.

## I. INTRODUCTION

Since last three years there is a tremendous hike in the demands of liquefied petroleum gas (LPG) and natural gas. To meet this access amount of demand for energy and replace oil or coal due to their environmental disadvantage. LPG and natural gas since they are inflammable gases they burn easily, cleanly and does not have any effect on environment. This gases are mostly used on large scale in industry, heating, home appliances and motor fuel. So as to keep the track on the amount of resources available at the user the developed system contains a load cell. This load cell continuously monitor the amount of quantity present at the resource storage. This system also enlighten the concept of wastage of resource at various industrial and domestic places. This wastage on a large scale may lead to unwanted accident. So as to track this leakage gas, the system includes MQ6 gas sensor. This sensor senses the amount of leak gas present in the surrounding atmosphere, if this gas is leak in more amount and if collected at a large quantity in the surrounding than it will trigger the buzzer. This system also enlighten another important concept which is nothing but the fire. This system includes LM35 sensor which monitor the sudden rise in the temperature above the room temperature.

## II. LITRATURE SURVEY

[1] In the year of November 2011 the authors Luay Friwan, Khaldon Lweesy, Aya Bani-Salma, Nour Mani presented a paper titled "A Wireless Home Safety Gas Leakage Detection System". In this paper they used gas leakage, gas detection, gas sensors. In this system the gas sensor checks the changes in gas. If the changes occur then sensor detects a change in gas and then it activates the alarm and sends a signal to the receiver module. The system is checked and it worked properly.

[2] In the year of 2013 the authors Nivedita S, Padmavathy A. presented paper titled "Development of multipurpose gas leakage and fire alarm system". In this paper they used LED, gas sensors, relay, Computer. They used LED to gives the indications of gas or smoke leakage. If the concentration of the gas is increases then gas sensor will detect it and wirelessly relay will we activated. Then relay will gives the command to main supply to turn off. The computer is use to see the analog voltage of gas concentration.

[3] In the year of April-June 2015 the authors Ankit Sood, Babalu Sonkar, Atul Ranjan, Mr. Ameer Faisal presented a paper titled "Microcontroller Based LPG Gas Leakage Detector Using GSM Module". In this paper they used gas sensor, GSM module, microcontroller, if the gas concentration is increases the gas sensors will sense the leakage of the gas and then send to the microcontroller. Then the GSM module is connected to the microcontroller which will gives the command to stop the main supply. The system is highly reliable, tamper-proof and secure. In the long run the maintenance cost is efficient. It is highly accurate.

## III. BLOCK DIAGRAM

This paper consist of following blocks AVR microcontroller Atmega328, LCD, GSM module, gas sensor MQ6, temperature sensor LM35, relay, buzzer and load cell. The heart of the system is Arduino which is consist of Atmega328 IC by using Arduino IDE software we can make a program for our system and implementing it with the help of connecting cable.

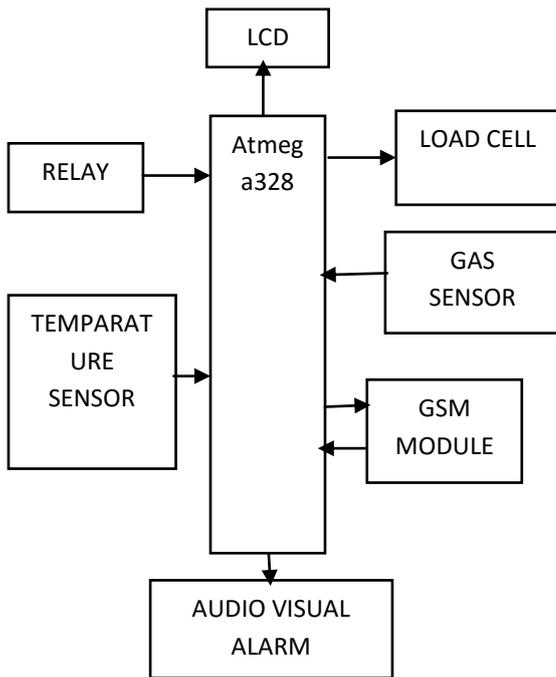


Fig. 1: BLOCK DIAGRAM OF LPG LEAKAGE DETECTION AND PREVENTION SYSTEM WITH GSM ALERT

In various home appliances like gas leakage detection, temperature detection the system will be used. The gas sensor and temperature sensor sense the gas concentration and temperature detection respectively and if any changes in the gas and temperature then it will show on LCD and buzzer will be buzz then by using the GSM system the command will be gives to the system and then it will work normally.

#### IV. FUNCTIONS OF COMPONENTS

[1] ARDUINO: It is an open source computer hardware & software & software company project & user community that designs & manufactures single-board microcontrollers & microcontroller kit. Hardware means arduino circuit & software means where we can type our program or command the arduino. So basically it has two sides like programing to control the project & hardware means arduino device.



Fig. 2: ARDUINO UNO

It is tool for control the project or give the instruction to the circuit or project. Arduino UNO is very easy to use & it is cost efficient & easily available in the market. The simple c programing language is used & very easy to implement the program like just connect the arduino to computer using connector cable & implement the program.

[2] GSM MODULE: GSM is a mobile communication modem it stands for Global System for Mobile communication. A GSM modem is a specialized type of modem which accepts a SIM card & operates just like a mobile phone. From the mobile operator perspective a GSM modem looks just like a mobile phones. When a GSM modem is connected to a computer this allows the computer to use the GSM modem to communicate over mobile network.



Fig. 3: GSM modem

While this GSM modems are most frequently used to provide mobile internet, internet connectivity many of them can also be used for sending & receiving SMS. It is used for transmitting mobile voice & data service operate at the 850 MHz , 900 MHz, 1800 MHz & 1900 MHz frequency bands.

[3] LCD: Most common LCD's connected to the microcontroller are 16 x 2 & 20 x 2. This means 16 character per line by 2 line & 20 character per line by 2 line respectively.



Fig. 4: LCD

An LCD or Liquid Crystal Display, is a type of screen that is used in many computers, TV's, digital cameras, tablets & cell phones.

[4] RELAY: It is electrically operated switch. Relay are used where it is a necessary to control a circuit by a low power signal or where several circuit must be control by one signal.



Arduino set limit of weight of the cylinder after crossing weight the load cell will give the message to the consumer with the help of GSM module. Now the 2<sup>nd</sup> process in this same procedure will be done for the temperature. For temperature the LM35 sensor will be used. In Arduino the certain limit of the room temperature will be set at 35 degree after crossing this limit the LM35 sense it with the help of relay buzzer will be on off the solenoid valve and with the help of GSM module it will send the message to the consumer that his/her home will be safe from fire or not.

## VI. CONCLUSION

At the end of this project we conclude that the gas leakages in households and industries cause risk to life and property. So our project will provide a solution to prevent such accidents by not only monitoring the system but by also switching off the main power and gas supplies in case of a leakage. Using MQ6 gas leakage will be protected and with the help of LM35 the temperature of the device or room will be maintained in control. So basically it is a useful project.

## VII. REFERENCES

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