

Controlling of LPG leakage automatically using IoT

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ABSTRACT

LPG leakage is one of the biggest problems in the industrial sector, the residential environment and the gas-powered vehicles such as buses, cars, etc. LPG consists of mixture of propane and butane which is highly flammable chemical. LPG leak can happen, though rarely, inside a home, commercial premises or in gas powered vehicles. Leakage of this gas is dangerous as it enhances the risk of explosion. So the proper construction to monitor and control the leakage of LPG must be taken. The proposed systems use MQ-2 sensor, for detecting the concentration of Leaked gas, (as it is precise and have high accuracy). Raspberry Pi as controlling boards. Using solenoid valve the cylinder nob will be turn on and off. Relay (12v) is used to control the motor. The updates of cylinder nob's status shall be monitor on web page. As huge data is to be transmitted and processed fast Raspberry Pi3 is preferred as controlling board.

In the IoT, things are expected to become active participants where they are able to interact and communicate among themselves by exchanging data and information sensed about the environment. For that they react autonomously to the real world events and provide services with or without direct human intervention. Using IOT we control the LPG leakage from any part of the world.

Keywords— *Internet of Things, LPG leakage, Raspberry –pi*

I. INTRODUCTION

There are approximately 30 crore LPG users in the country in which mostly 40% of the population. Liquefied petroleum gas (LPG) is currently the most used gas in our home for cooking purposes. LPG gas is a flammable gas, if leaked it can cause major damage to life and property. Therefore it should be used in safe handling manner and additional care has to be taken in order to prevent any leakage possible. The main features of LPG is that being heavier than air, it do not disperse easily and may lead to suffocation when inhaled. The leaked gases when ignited may lead to explosion. We can detect the presence of dangerous LPG leakage in the cars, industrial sectors and residential premises using an Ideal Gas Sensor. We can easily integrate the LPG gas leakage detector unit into a unit that can sound an alarm or give a visual suggestion of the LPG concentration. We can detect the presence of dangerous LPG leakage in the cars, industrial sectors and residential premises using an Ideal Gas Sensor. We can easily integrate the LPG gas leakage detector unit into a unit that can sound an alarm. This paper provides a cost effective and highly accurate system, which not only detect gas leakage but also alert by buzzer and control the leakage and turn off A.C. mains supply and also open the window to thrown out

hazardous gas . In order to provide high accuracy gas sensor MQ-2 has been used.IoT makes this system very flexible and safe as we can monitor and control the leakage as well as prevent the leakage from any part of the world.

II. RELATED WORK

K. Keshamoni et al. have research Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT. The gas booking/order is being done with the help IoT and that the continuous weight measurement is done using a load cell which is interfaced with a Microcontroller [1] R. Pandey et al. have research as Internet of Things (IoT) Based Gas Leakage Monitoring and Alerting System with MQ-2 Sensor the main objective of the work is designing microcontroller based toxic gas detecting and alerting system. The hazardous gases like LPG and propane were sensed and displayed and notify each and every second in the LCD display. [3] Shruti G et al. have developed a Raspberry Pi based Interactive Smart Home Automation System through E-mail using Sensors. They design the system to automate all the devices i.e. home appliances through E-mail using Raspberry Pi, as well as we can have the security for the system by using sensors like PIR, LPG, temperature sensors [5]. V. Kameshwaran et al. have survey on a real time gas monitoring system. The main aim of this paper is to survey the different kinds of gas monitoring systems implemented in various applications to prevent from dangers [7].Digambar S et al. have made research on Smart Gas Booking System & Leakage detection system detects the leakage of the LPG and sounds the alarm to alerts the consumer also it send the SMS about the gas leakage. It can also turn off the main power supply [8]. Vishwajeet H. has made a Survey on the Smart Homes using Internet of Things. He provide fully smart environment condition monitoring by various sensors (Temperature, Humidity, Light and Level) for providing necessary data to automatically adjust the comfort level in homes by optimize use of energy. We also use prediction here for automatically detection and resolution of any problem in the devices. For that we are using Naïve Bayes Classifier algorithm for data mining. It will send email or SMS to required technician for service and it will also notify the owner [9]. T. Soundarya et al. has research on Control and Monitoring system for Liquefied Petroleum Gas detection and prevention they deals with the detection, monitoring and control system of LPG leakage. Using relay DC motor the stove knob is automatically controlled. Along with safety measures the system has additional advantage of automatic rebooking of cylinder when the level of gas goes below the normal weight of cylinder [10].

Vasudev Yadav et al. have made a review on IoT based hazardous gas leakage detection & controlling system using microcontroller & gsm module [11]. Viraj Mali et al. developed a system as Home Automation and Security using Arduino Microcontroller. Develop a low-cost means of homeSecurity system using sensors like motion sensor,PIR sensor etc.[12]. Pradeep Rajan S et al. developed a system as embedded based home automation as the method to make every home appliances such as like lights, air conditioners, fans, washing machines to work through the android application in our smart phone [13]. Pooja Dahiya et al. has made research on IoT based Home Alert System using Wi-Fi and Cloud Technologies as survey the current work on security system and applications. We examine the existing work, which is held by using different sensors and

contributes to better understanding of the challenges in existing work on security systems and further research direction. In this paper we take an overview on how to protect our home from fire, theft and safety issues [15]

III. PROPOSED SYSTEM

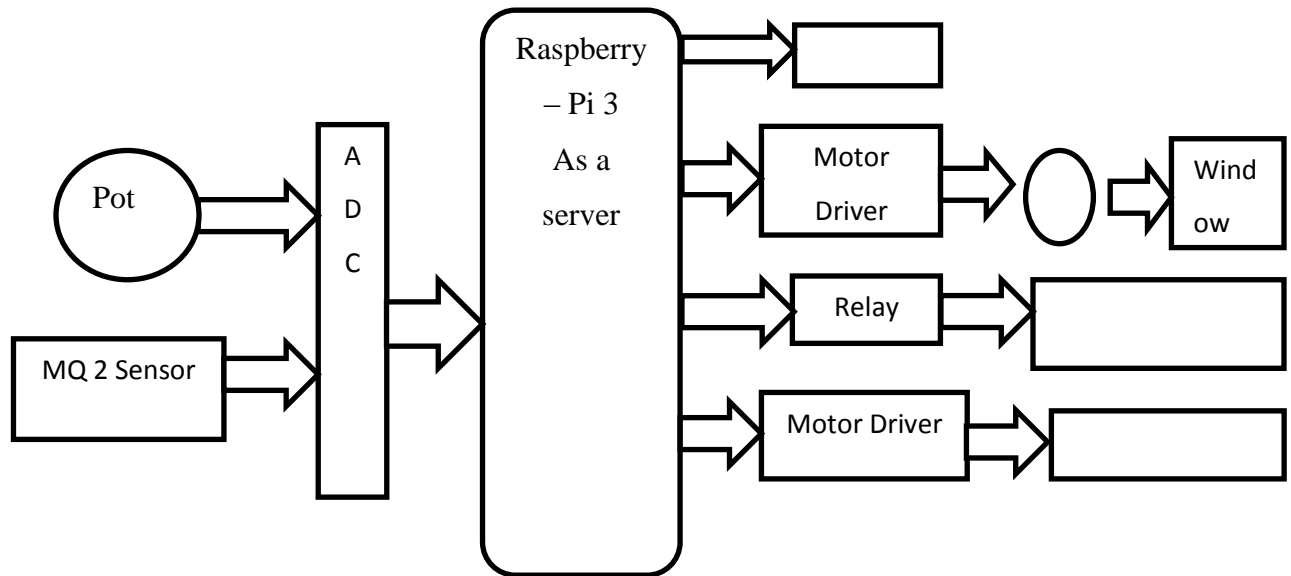


Fig 1. Block Diagram of the Proposed System

The proposed method is designed to overcome the drawbacks of previous system and to improve security and flexibility efficiency takes an automatic control action upon detection of gas.

GAS sensor MQ2 and POT (Timer) are connected to the Raspberry Pi. The R-Pi collects the data and stores in MySQL Database, if the Gas values exceed the critical value appropriate measures are taken by the raspberry pi. Gas is detected by the Raspberry Pi using gas sensor and which update on webpage & buzzer are turned ON. Pot is used as timer. We can set timer to off the gas if any leakage. The gas values along with time and date can be viewed on a webpage. Ac Mains supply turn off as gas leakage is detected for safety. As well as the window also open automatically with help of relay and the hazardous gas thrown out from home.

IV. CONCLUSION

The principle of operation of IOT based gas leakage and monitoring system was shown by operating the Raspberry pi model attached with embedded system with required input and output gas level with the help of gas sensors. This results in a more efficient in operation because it is connected to a common web page specially built to notify or email the responsible authority automatically to reduce the stress of constant monitoring. The choice of using a real time gas leakage monitoring and controlling the output levels of gas will be clearly observed by the help of this system. Turn OFF the Gas Regulator automatically to Controlling leakage. Automatically turn OFF the AC Mains Supply. Open the window automatically when leakage is

detected.ON/OFF the gas regulator as per timer set by pot.We can turn on/off the cylinder nob from any part of the world using IoT.

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