IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 15-17

Tulsiramji Gaikwad Patil College of Engineering & Technology (441108) Raspberry Pi Based LPG Gas Leakage Detector And Prevention

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Abstract: *In this paper, The aim of this project is to design and construct a LPG gas leak detector &prevention system that will remotely switch off gas valve in household industrial gas appliance connected to it, using a microprocessor sensor. We are surrounding with Trillions of machineries. For working of these machineries we firstly used coal & wood. But now-a-days, we are using Natural gases like APG CBM CNG HCNG LNG NGC SNG Bio-SNG. In future we are suppose to used Solar Energy or Wind Energy But now the use of this is Expensive. Classifying leak detection technologies For the purpose of this survey we first look at classifying the available leak detection techniques. Sever criteria are considered for classification, some of which are: the amount of human intervention needed, the physical quantity measured and the technical nature of the methods. we distinguish three categories Automated detection - complete monitoring systems that, can report the detection of a gas leak without the need of a human operator, once they are installed (e.g. optic or cable sensors) Semi-automated detection - solutions that need a certain amount of input or help in performing some tasks (e.g. statistical or digital signal processing methods) Manual detection - systems and devices that can only be directly operated by a person .*

Keywords: *Raspberry pi, GSM Module, Sensor MQ-6, Relay, Exhaust Fan, Solenoidal Valve*

I. Introduction

The aim of this project is to design and construct a LPG gas leak detector & prevention system that will remotely switch off gas valve in household industrial gas appliance connected to it, using a microprocessor sensor. Home Fires have taken a growing toll in lives and property in recent years. LPG is exceptionally inflammable and can consume even at some separation from the wellspring of spillage. Most fire mishaps are caused on account of a low quality elastic tube or when the controller isn't killed. The supply of gas from the controller to the burner is on even after the controller is turned off. Unintentionally, if the handle is turned on brings about the gas spills. This undertaking manages the recognition, checking and control arrangement of LPG spillage.

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 Work

In this system, the methodology is designed to safeguard our lives and our assets from the major fire accidents that are caused by gas leakage and short circuit. The system monitors the level of the gas and detects, when the LPG concentration in the air exceeds than the threshold value. When the exceeded value is detected, it performs two operations: i)the controller in the device automatically switches on the exhaust fan to expel the gas that has already been leaked into the room, ii) It uses a knob which is manipulated with the help of the step up motor to close the gas valve in the cylinder to prevent further leakage. These operations are done to control the accident that may occur. At the same time it immediately alerts the user or the owner by sending a notification via sms, which would help them know the status of their home. When a short circuit is detected, the alert is sent to the user and the power supply is automatically stopped with the help of PLC. The main advantage of this system is that it combines the preventive measures for both gas leakage and short circuit, which makes it cost efficient when compared to the existing systems. It also brings an additional work of cleaning the gas that is already been leaked.Without human intervention, the system detects and prevents the sudden accidents that are caused by gas leakage and short circuiting.

IV. PROPOSED SYSTEM

A.Block Diagram

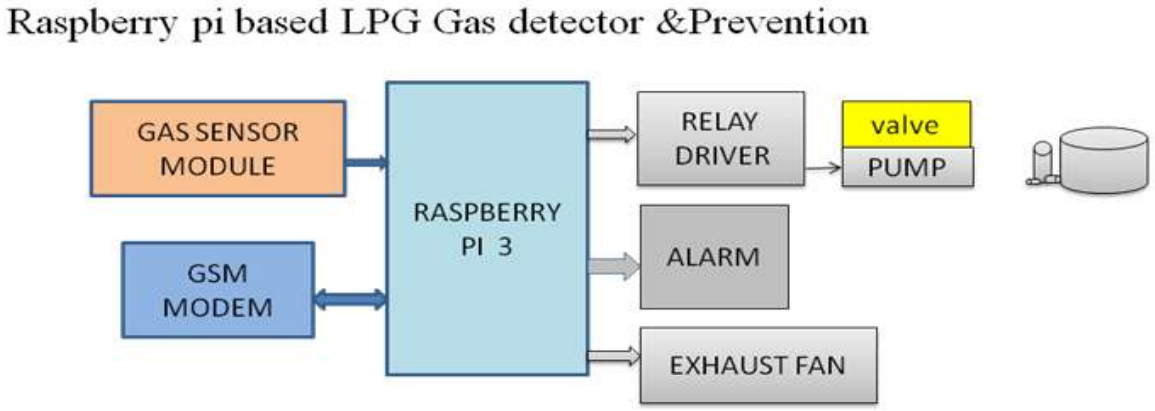

Fig. 1: System Block Diagram

V. Objective

The main objective of this project is

a) Detect the gas leakage using MQ6 sensor send message to user on android application using IoT.
b) Monitor the home temperature and fire, buzzer
will on when temperature exceed above threshold value.
c) Automatically controlling of gas leakage using relay. All such status i.e temperature above threshold value, gas leakage detected is shown on android application of mobile user.

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