

GAS LEAKAGE DETECTION AND ACCIDENT PREVENTION IN DOMESTI SECTOR USING IoT

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Abstract:

Gas leakage detection and accident prevention in domestic sector using IOT has applications in Home, Hotels, restaurants, as well as in Industries. This project is used to monitor the weight of the gas cylinder and in the case of fire accident and fire sensor is used. In our home we observe whenever the Gas cylinder is empty, we give a request for the new cylinder at the office of the gas cylinder provider. 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. The main reason behind this is a delay in informing the gas provider or we inform the gas provider at the last moment when the gas is empty. One more example in hotels or sometimes in the industry also the gas is also used. In-home or in hotels the main purpose of gas is for cooking. But in the industry sometimes, gas or some other combustible gas is used for some other purposes like welding or cutting or for some other use. In these places, if the gas inside a gas cylinder is finished at that time request for a new gas cylinder is sent to the storage department but if there is a shortage in stock then there is a delay in providing a new gas cylinder.

Keywords — —LPG gas, sensors, NodeMCU, Android

I. INTRODUCTION

This Gas leakage poses great danger in this modern era where the use of gas has become an important source of energy for industries, homes and vehicles alike. The leakage of Liquefied Petroleum Gas (LPG) is known to cause serious accidents which have resulted in loss of lives and properties worth billions of dollars across the globe. The catastrophic explosions at Nyaniba Health Assistants Training School in Tema, Valco estate, UDS in Wa, Ashaiman, Axim and KwahuFoda in the Eastern Region (Owusu, 2014) are but a few cases that have occurred over the last two years in Ghana. LPG is one of the most commonly used fuels in Ghana and as such precautions have to be taken in order to safe guard against accidents such as explosions and suffocation that are associated with its usage.

LPG is made up of mixtures of propane and butane which are inflammable chemicals. Due to the odorless nature of these chemicals, Ethyl Mercaptan is added as odorant in order to make the gas detectable by smell. However, some people have poor sense of smell especially at low concentrations and so a more effective and reliable means of detecting the gas has to be adopted in homes, industries and vehicles that rely on the use of gas. One of the preventive methods of stopping accident associated with gas leakage is to install gas leakage detection devices.

Even though there have been great strides in developing effective gasleakages detection and response systems over the past years, there are still improvements that can be made to previous designs. Most systems developed focus on the detection of the leakage and sounding of an alarm in response to the detection. Other systems detect the gas and use a microcontroller to activate an alarm and also send SMS to the appropriate personnel.

II. LITERATURE SURVEY

A. Kumar, M. Kumar, B. Singh, "Designing and implementaion of smart LPG trolley with home safety", 2nd International Conference on Next Generation Computing Technologies (NGCT) 2016, pp. 185-190, 2016.

LPG cylinders have become an integral part of every home. Our kitchens are occupied with LPG cylinders which help us make delicious food. But it can be dangerous and life threatening. Therefore, it requires constant vigilance to reduce the danger. The aim of this paper is to design a safety oriented system which will alert the user about any threat in the kitchen through mobile and also capable of performing required action immediately. This system will detect leakage of LPG and send an alert message to the user, at the same time it will switch off the mains power supply and a mechanical design attached with it, can switch off regulator too. In the present time, everyone is busy in their daily life and it is difficult to know the status of the gas cylinder. Further, it will register your booking through GSM technology by sending SMS to the distributor company and also send an alert to user at the same time. 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 hazardous.

A. Bachchan, K. Bhasharkar, M. Z. Gundagi, V. Bhan, "Design of Smart LPG Regulator using Internet-ofThings", International Journal of Engineering Technology Management and Applied Sciences, vol. 4, no. 2, 2016.

Our kitchens are filled with these cylinders which help us make delicious food, but can also be dangerous and life threatening. Constant vigilance is required in helping us reduce the dangers of this

device. This paper aims at designing a basic home automation system using the internet which can be monitored and accessed from anywhere in the world. The technology incorporates Raspberry Pi and Android App Development. The Raspberry Pi is used to monitor the cylinder and the readings are passed down to the server. The conclusions will be analysed and informed to the user via the app and then further action could be taken. A stepper motor will be fixed to the regulator which will be able to control the regulator. The user will be able to control the regulator using an Android app through which he can detect the status and switch off the regulator if necessary.

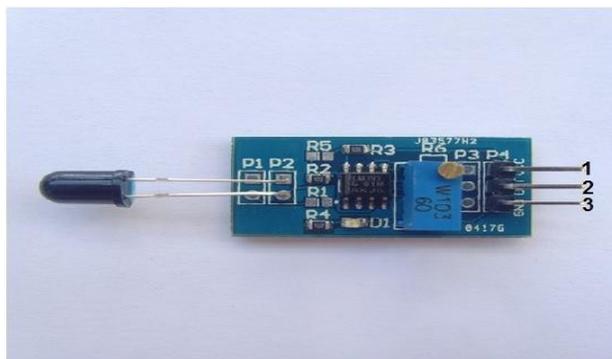
Flame sensor is the most sensitive to ordinary light that is why its reaction is generally used as flame alarm purposes. This module can detect flame or wavelength in 760 nm to 1100 nm range of light source. Small plate output interface can and single-chip can be directly connected to the microcomputer IO port. The sensor and flame should keep a certain distance to avoid high temperature damage to the sensor. The shortest test distance is 80 cm, if the flame is bigger, test it with farther distance. The detection angle is 60 degrees so the flame spectrum is especially sensitive. device for protection against.

2.GAS SENSOR

III. HARDWARE DESCRIPTION

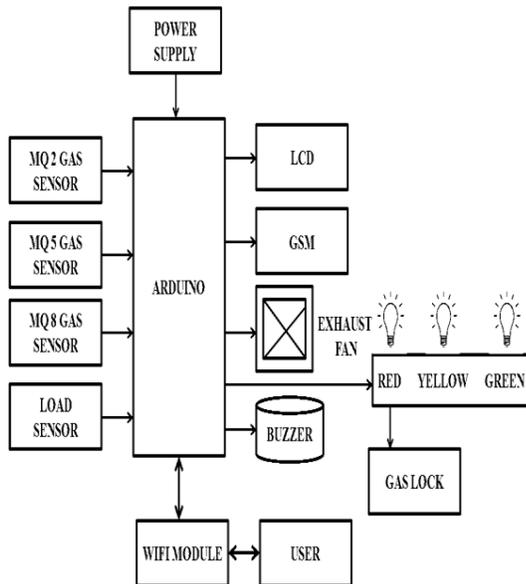
1.FLAME SENSOR

A **sensor** which is most sensitive to a normal light is known as a **flame sensor**. That's why this **sensor** module is used in **flame** alarms. This **sensor** detects **flame** otherwise wavelength within the range of 760 nm – 1100 nm from the light source. ... These **sensors** are used in fire fighting robots like as a **flame** alarm.



A **gas sensor** is a device which detects the presence or concentration of **gases** in the atmosphere. Based on the concentration of the **gas** the **sensor** produces a corresponding potential difference by changing the resistance of the material inside the **sensor**, which can be measured as output voltage

IV.EXISTING SYSTEM



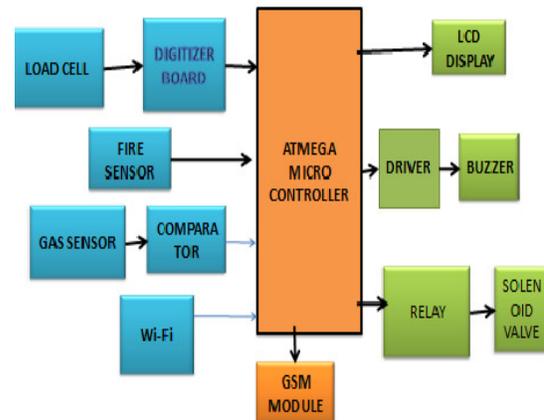
The purpose of this project is to gas level of this cylinderGSM is used to send alert signal or its send message.

Load sensor is used to detect the lpg level in this cylinder.The aim of this project is to monitor and to provide gas security system.Wifi module is added which is used to send notification to the user.

User notification

V.PROPOSED SYSTEM

The system that monitors gas leakage in an enclosed area (home, car or industry); that alarms the user of leakage; and that shuts down gas supply during leakage. To send message to the user using GSM To store the monitoring data in the remote server using Wi-Fi.



IV.SYSTEM DESCRIPTION

The notification generated by the Gas Leak Detection Device is categorized into four types as follows: 1) Android bar notification This notification will be shown as a message in an Android device, without any vibration or sound. This message is shown as a regular notification usually shown in an Android device. 2) Alarm notification This notification will be shown as a regular alarm notification in an Android device. It will produce vibration and sound. 3) Notification on the gas leak detection device This notification will produce a “beep” sound. It can only be received when the user is in close proximity with the device. 4) Message notification This notification is sent to the users registered on the receiver list in the Android device.

V.IMPLEMENTATIONAND EVALUATION

The fire sensor, gas sensor, Load cell are connected to the microcontroller using port A0,

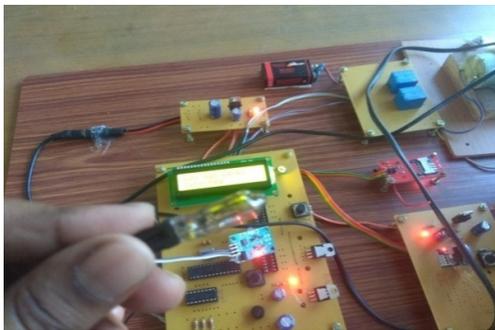
A1, and A2, of the microcontroller. The sensors are used for detecting the fire and smoke and the load cell is used for getting the weight of the gas cylinder.

The MAX232 is used for connected the GSM and Wi-Fi with the microcontroller using port T2 IN and R2OUT of the MAX232 and the Do/and D1 of the microcontroller

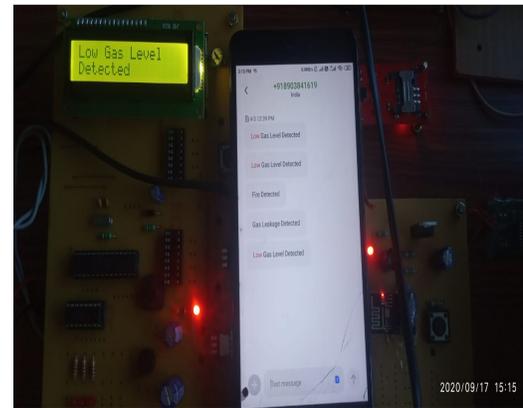
i)when the weight module is less than 1 kg,low gas leakage level is detected



ii)When fire sensor detects flame.



iii)when weight of the cylinder is low and cylinder books automatically.



VI.CONCLUSION

LPG gas is preferable as fuel in man households and to support the effort to shift from support the effort to shift from the limited resources from fossil energy to the more abundant natural resources.however it is high flammable.

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