GAS LEAKAGE DETECTION AND ALERTING SYSTEM USING IOT FOR HOME AND INDUSTRIAL SAFETY

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Abstract- **LPG gas is one of the household things in daily life. But LPG gas is highly flammable. There have been many accidents due to leakage of LPG gas. The trigger varies from the incorrect installation to the use of defective gas cylinders. This paper aims to provide a solution to this problem by building a device that utilizing sensors connected to Node MCU. The device**

performs area monitoring continuously. The gas sensor provides data to Node MCU, and then the results are displayed as a warning to the user via an Android-based smart-phone device. Other than LPG gas, Air conditioner and refrigerator leaked gases also harmful in home. Using this device, users will be able to prevent accidents that occur due to harmful gas leaks so that accidents can be avoided .

Keywords: LPG-Gas, Node-MCU, Smartphones,,Gas-Sensors

1. INTRODUCTION

In this paper we are using MQ-6 semiconductor sensor to detect combustible gas. This gas sensor is made of Sulphur-Nitroxide. This sensor has lower conductivity in fresh air. Then the output of this sensing element goes low. This low signal is monitored by the microcontroller and it will establish the gas outflow. Currently, the microcontroller turns on LED and Buzzer. Once few milliseconds delay, it conjointly activate fan for throwing gas out and continue send messages as "GAS LEAKAGE" to your mobile no.

2.LITERATURE SURVEY

Author's: Ch. Manohar Raju and N. Sushma Rani.[2]

They proposed prototype depicts a mini mobile robot which is capable to detect gas leakage in hazardous places. Whenever there is an occurrence of gas leakage in a particular place the robot immediately read and sends the data to android

mobile through wireless communication like Bluetooth. They develop an android application for android based smart phones which can receive data from robot directly through Bluetooth.

Author's: Pal-Stefan Murvaya, Ioan Sileaa.[4]

They proposed a wide variety of leak detecting techniques is available for gas pipelines. Some techniques have been improved since their first proposal and some new ones were designed as a result of advances in sensor manufacturing and computing power. However, each detection method comes with its advantages and

disadvantages. Leak detection techniques in each category share some advantages and disadvantages. For example, all external techniques which involve detection done from outside the pipeline by visual

observation or portable detectors are able to detect very small leaks and the leak location, but the detection time is very long.

Author's: Zhao Yang, Mingliang Liu, Min Shao, and Yingjie Ji .[8]

They told about their research on leakage detection and analysis of leakage point in the gas pipeline system. They gave various model which used SCADA I/F Model: The SCADA system has the function of transferring the acquired data from a

pipeline system to Transient Simulation Model every 30 seconds. This module communicates with SCADA. Dynamic parameters are collected every 30 seconds, such as pressure, flow and temperature.

Author's:S Shyamaladevi, V G Rajaramya, P Rajasekar and P Sebastin Ashok[7]

They told about their project ARM7 based automated high performance system for LPG refill booking and leakage detection and methodology to make their project. The paper is designed based on modular approach which is easy to analyze as LPG cylinder booking unit, gas leakage monitoring unit at the consumer end and server system unit at the

distributor side. MQ6 placed in the vicinity of the gas cylinder. In the advent of leakage, the resistance of the sensor decreases increasing its conductivity. Corresponding pulse is

fed to microcontroller and simultaneously switches on the buzzer and exhaust fan.

Author's:Metta-Santiputri,Muhammad Tio.[3]

They propose a device to overcome the probable called the Gas Leak Detection device based on IoT

(Internet of Things). It will monitor the content of flammable gas in the air, the presence of humans, and the presence of fire in the house continuously. With this device, it is expected that the number of future accidents can be reduced and will not cause major losses.

3. EXISTING SYSTEM.

Existing gas leakage detection system has fixed in the wall of the home.

It gives only alarm and LED output.It can't Use the devices like servo motors to turn off the LPG Cylinder. Servo Motor to be Fixed in LPG Cylinder can Turn-Off the Cylinder when the leakage Occurs.It Cannot

identify the Flammable or Inflammable gases

4.PROPOSED SYSTEM.

This paper aims to provide a solution to this problem by building a device that utilizing sensors connected to Node MCU. The device performs area monitoring continuously. The gas sensor provides data to Node MCU, and then the results are displayed as a warning to the user via an Android-based smart-phone device. Other than LPG gas, Air conditioner and refrigerator leaked gases also harmful in home. Using this device, users will be able to prevent accidents that occur due to harmful gas leaks so that accidents can be avoided .
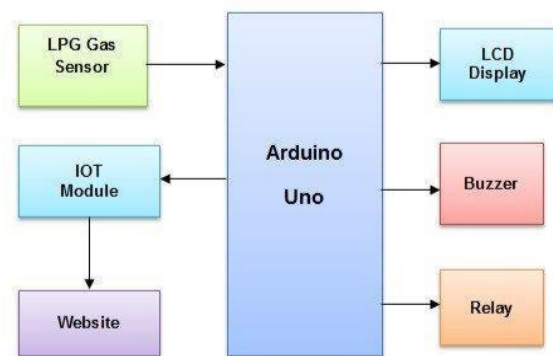
5.BLOCK DIAGRAM
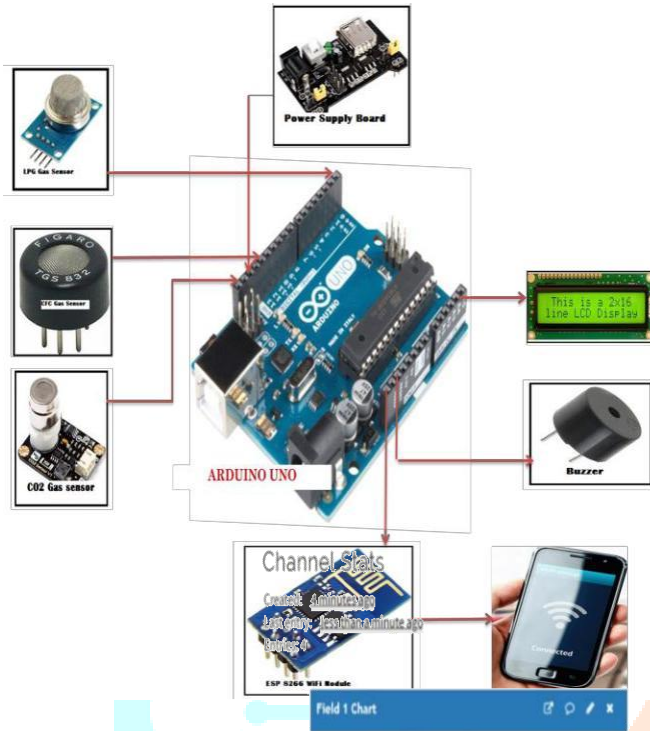
Fig 1 Block Diagram
6.PROPOSED DIAGRAM

**Fig 2 Proposed Design.**

7.IMPLEMENTATION

Internet of Things (IoT) is the networking of 'things' by which physical things can communicate with the help of sensors, electronics, software, and connectivity. These systems do not require any human interaction and same is the case with iot based gas detection system, it does not require human attention.IOT and Arduino based LPG leakage detection system senses the LPG gas with the help of an LPG gas sensor. LPG gas sensor interfacing with Arduino is implemented in

this project. The Signal from this sensor is sent to the

Arduino microcontroller. The microcontroller is connected to an LCD, Buzzer and IOT module (ESP8266). IOT LPG leakage detector project is implemented using an ESP8266 chip. This is a Wi-Fi module which is used for connecting micro-controllers to Wi-Fi network and make TCP/IP connections and send data. Data, which is sensed by these sensors, is then sent to the IOT. The IOT module then sends the data over to a website. Once the gas leakage is detected, the buzzer is turned ON and a 'Leakage detected' message is displayed on the LCD. The Pre-requisite for this LPG gas leakage detection and the smart alerting project is that the Wi-Fi module should be connected to a Wi-Fi zone or a hotspot. This project is also implemented without the IOT module. In place of the IOT module, we have

used a GSM module, by which an SMS is triggered.

8.RESULTS AND DISCUSSION
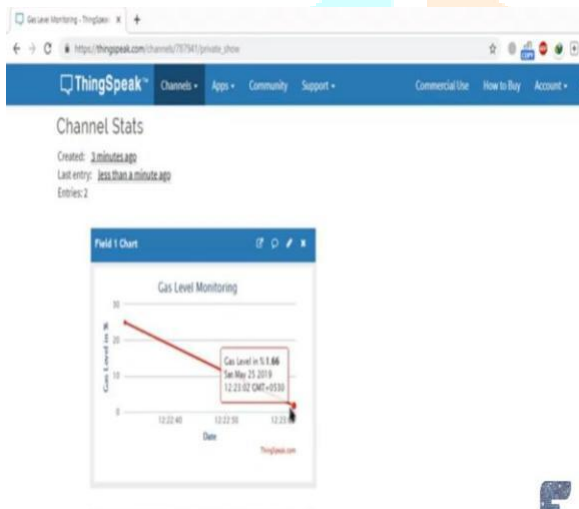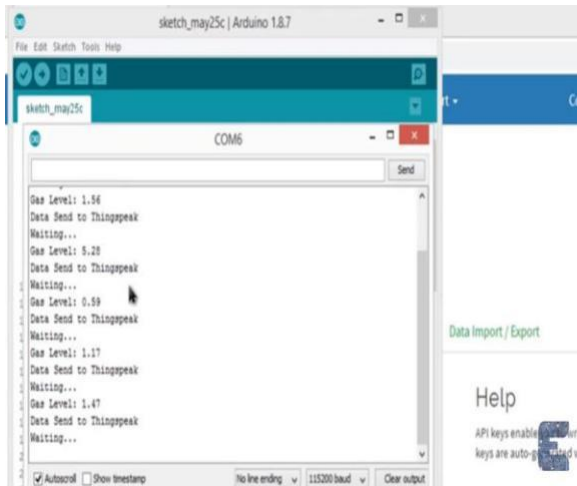
The proposed approach can be implemented in IOT basics and stored in thinkspeaks.com. The graph representation provides the field chart for gas leakage and monitoring levels. We can monitor the sensors anywhere and anytime using cloud framework. The chart represents for gas sensor levels to identify the gas leakage. The ThinkSpeak is a Cloud in which it can receive the sensors data via Wi-Fi Module and it can represent the data as a field graph in the various parameters.The ThinkSpeak

can generate the api key.The Api key can be given in source code.By Giving SSID and Password we can connect the wi-fi module with the thinkspeak

services.

9.CONCLUSION AND FUTURE ENHANCEMENTS

Most commonly used sensors are Passive InfraRed (PIR) based sensors.. CO_2-based detection sensors are slow to detect change of events; whereas large-scale deployment of Camera or sonar-based surveillance

networks incurs substantial deployment costs and maintenance overhead. They also bring up privacy issues as they detect more than what is required. We argue for selective deployment of high precision gas sensors only in areas where opportunistic context sources are inadequate. Each soft sensor provides a cue about gas leakage and supervised learning algorithms fuse such cues to infer situations and subsequently to occupancy figures. We report system accuracy of as high as through a pilot study, which demonstrates that this scheme can support context aware applications in

smart buildings with minimal or no additional sensors. We can extend the framework to implement more sensors and handling privacy concerns and investigating unsupervised techniques in detail remain focus of our work in the future. The Android Application can be Developed for Handling and Managing the Sensors data.The Application called Blynk is used for controlling the Sensors data.The Blynk application can have Various library files and data.By Downloading the Required File we can install with arduino software we can made control for the sensors.

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