

Lpg Gas Leakage Detection and Prevention System using Nodemcu



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Abstract: For lives security and satisfaction of social obligations, and keeping in center the dangerous examples of impacts and wounds because of spillage of gas in enterprises, vehicles and houses, a gas spillage framework has been structured whereby utilization of installed frameworks and association of Internet of things (IoT) in it, a framework is gotten that empowers us not exclusively to advise the concerned individual yet additionally hold onto any spillage of gas. In the paper, a framework has been proposed which diminish the odds of accidents and guarantee security by the virtue of existing electronics and technology.

Keywords: Arduino Uno, NodeMCU, 16*2 LCD Display, MQ-6 Gas Sensor, Buzzer, DC motor(9V).

I. INTRODUCTION

Liquefied Petroleum Gas [LPG] is one of the most well-known cooking fuels used all over India. Other than being modest and effectively accessible, LPG is used as perfect fuel for cooking purpose. With the growth in the quantity of individuals utilizing this LPG fuel, it is the importance to give some security gauges which are required to be represented to lead the mishap of free life. The major accidents occurred during the utilization of LPG. There will be gas leaks while using LPG gas in India. And, we can see the leakage from the worn gas tubes or old gas pipes, so that they may burst which will lead to heavy leakage of gas. As we know that LPG is a flammable gas, it has the odor less behavior. Ethanethiol is also mixed up with unbelievable odor less LPG gas, so during leakage it can be seen efficiently [3]. These LPG Gas leakages have been raised from 0.72% of all the kitchen accidents to 10.74% of all the kind of kitchen accidents. The LPG section weights nearly 4kg to 7kg at where the burner is located near the section is most secured than that of the elastic pipes used has the risks of getting leakage which may create a way to the spillage of gas. A computer designed specific software used to detect the spillage part where the leakage has been occurred. This software will run in offline and used for mailing to the specified user. An LPG gas detector is used to detect the leakage of gas as fast it can, and it will be used as trigger for

the whole system. Then we will send an email to the specified user and it will glow the hazard indicating lights and used for blowing the horn and a message will be shown on the LCD display. The equipment used will get the best output with more advantages and it can be upgraded in future for any further applications like turning off the main power supply and also used for sending SMS to the user. This is present at the hotels and high-tech homes where they don't want any hazard happening in their surroundings.

II. THEORETICAL ANALYSIS

While the LPG is a major fundamental necessity of every family, its leakage may cause a disaster. In order to detect the leakage of LPG and to intimate the surrounding people, we came up with an idea LPG leakage detection and prevention kit. So, we build a NodeMCU based LPG detector. On the off chance that gas spillage happens, this framework identifies it and makes an alarm by humming the bell connected with the circuit[2]. This work is so helpful but it was so hard to build and any person who is having some knowledge on IOT can build this. In this, we have used an LPG detector sensor module to detect the leakage of gas. If any LPG gas leakage happened, it will give a analog input to the A0 stick and the NodeMCU will read the analog input. Whenever the NodeMCU gets trigger input from the gas sensor, then we will have D3 as output from the NodeMCU and it will act as a trigger pin for the Arduino to show "LPG gas leakage detected" on the 16*2 LCD display. In order to help the people and to provide the security, we may implement this. So, in this we are using the NodeMCU and Arduino UNO boards which can be controlled using the Arduino IDE software and integrated drivers [5]. First we are using the MQ6 gas sensor which will be used to detect any LPG gas leakages or fascination in gases, and if any leakage occurs then we will use NodeMCU to trigger the Arduino UNO to show the leakage message on the display and the gas sensors values are kept utmost of 530ppm. When the sensor value is Crosses the utmost value, then it will pass the analog readings to the NodeMCU. Then the NodeMCU will trigger the output pins of D0, D1, D2 and D3 for various indications. The system will blow the horn from D1 stick and it will glow the LED at D0 stick and gives trigger to the DC motor fan to remove the gas from the room or surroundings and it will show a message on LCD display using Arduino UNO. The Arduino UNO will take the trigger value from NodeMCU from pin D3 and then it will show the LPG leakage Detected on 16*2display. If the gas leakage was not crossing the utmost value, then the Arduino will not show anything on the display, and it will be turned off. The major apparatus required for this project are

1. Arduino UNO
2. LPG Gas sensor Module (MQ-6)

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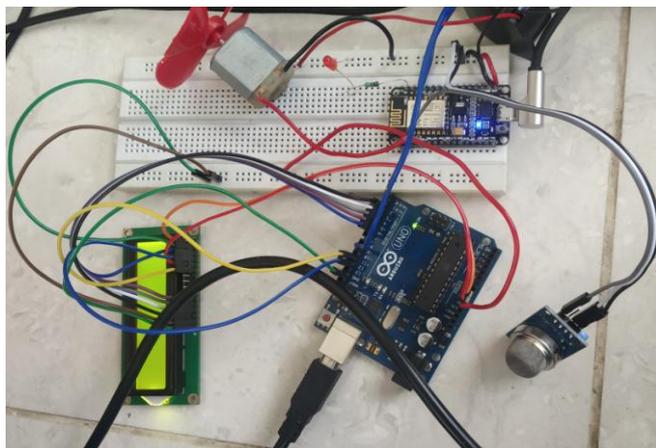


Fig-3: Output when no Gas leakage

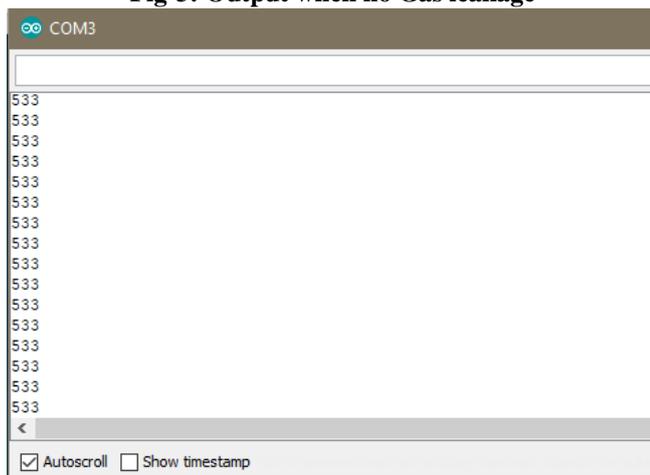


Fig-4: MQ-6 Sensor readings when GAS leakage was detected



Fig-5: Output when GAS leakage was detected

VII. CONCLUSION

The consequence of this undertaking is dictated by utilizing a lighter to gather spilled gas around the gas sensor in the wake of detecting system in the event that sensor worth is more noteworthy than the limit esteem, at that point small scale controller will play out its customized assignments:

1. Quickly the controller handle to stop further spillage.
2. Inside 2-4sec the transfer will remove the fundamental power supply.

3. Ringer starts signaling and a message is shown on LCD to caution the clients and close by individuals.
4. Wi-Fi module will send SMS/email utilizing the cloud to the clients.

The primary bit of leeway of this straightforward gas spill indicator is its effortlessness and its capacity to caution its partners about the spillage of the LPG gas. The favorable position of this framework incorporates its sound – visual cautioning frameworks. This finder is executed effectively and is anything but difficult to utilize and furthermore a low value item. Another favorable position of this gadget is that even though on the off chance that nobody is there in the house and, at that point gas holes happens. By using this we can reduce the accidents which are occurring due to the leakage of hazard gases and thereafter it will be utilized to turn off the main power supply using relay. Utilizing MQ-6 gas spillage will be ensured.

VIII. FUTURE SCOPE

Given the given highlights this framework can be made increasingly useful by including not many progressively essential little data sources like

1. Temperature: To screen the temperature of the chamber just as nature and program the framework to act as needs be. (Note: Piccolo include on-chip temperature sensors and LEDs)
2. Although this framework is profited by IOT for messaging and informing this can be made colossal by enhancing it with Android and GSM for messaging and informing [5].
3. Sensors: Continuous and profitable inclusion and the expansion of applicable and up and coming new innovation-based sensors would influence to a great extent to the believability of the framework.

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