

# DRAGER MONITORING, DETECTION OF GAS HAZARDOUS AND AUTOMATIC BOOKING

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## Abstract:

Technologies are not same this year as past. The requirement of automaticity in the region of protection and communication has increased every year. The main aim of this project is to observe and report about the LPG cylinder for home safety and illegal usage. If LPG is going to finish without informing us it can create very difficult condition for cooking etc.. Our system will help us to avoid such kind of problems in our daily life. The main advantage of the system is that, it continuously monitors the level of LPG present in the cylinder using load cell and if the gas level reach below the threshold limit around 0.5 to 0.7kg it will manually registers the cylinder using IOT. This will lead to reduce booking irregularities. This implementation is based on pic18f45k22 using Kiel version software. Sensor used here is to detect the LPG leakage.

*Keywords*— **Cement, Marble powder, silica fume, compressive strength .**

## 1 INTRODUCTION

LPG explosive ordance was first identified as a significant component of petroleum in 1910. Walter Snelling (December 13, 1880), contributed to the development of explosive ordance used liquified petroleum gas. Analysis of sample of propane that can be traced back to Dr. Snelling has been shown to contain 0.062 mole% methane, 23.44 mole% ethane, 57.366 mole% propane, 7.127 mole% isobutane, 11.957 mole% butane and 0.044 mole% isopentane.

Liquified petroleum gas is the constallation of commercial hydrocarbons like propane and butane. Increased mixing of propane and butane gases in the air, they become unable to breath. It leads to death due to respiratory disorders of cooking gas exudation. To prevent them, knowing that there is a gas leak. knowing its mening and loss of lives caused by gas leaks must stop.

For booking concern the weight of the cylinder must be noted. A gross weight of the empty cylinder and LPG is 29.5kg. Weight of an empty cylinder is 15.3kg. so the net weight of LPG is 14.2kg. The minimum value is set by the user. When gas level reaches below the threshold level around 13 to 14 kg it will sends SMS alert to the user as well as the booring agencies. After the gas was used throughout, it is a tough job to do it again booking. By manual booking once booking is

over, it will take longtime to reach our home due to late booking. But in this proposed system automation is done in a way such that whenever the size of the shortfall is more than the amount specified in cylinder gases then automatically gets sent the booking signal to that respective office. This avoids the difficulties of booking and refilling of gas cylinder and knowing in advance, avoids the dangerous of gas leakage.

### 1.1. LITERATURE SURVEY:

1. J.V. Anchitalagammai "Control and monitoring system for Liquified Petroleum Gas Detection and prevention".
  - It deals with the detection monitoring and control system of LPG leakage.
  - Using relay dc motor,<sup>[7]</sup> stove knob is automatically controlled.
  - The leakage message is send to the user and fire station at the same time electric current is shut down by the relay.
2. Prof.M. Amsaveni, R.S. Anupreetha, C. Malarvizhi, M. Gunasekaran, "GSM based LPG leakage detection and controlling system" – IJES, March 2015.

- To automatically detect, alert, and control gas leakage.
  - When leakage is detected the electric power supply is shut down.
  - Here only the alert [2] message to the users.
3. S.Ranjitha, T.Swapna, " Security Alert System Using GSM For Gas Leakage ", International Journal of VLSI and Embedded System- IJVES.
    - The small amount of LPG as near gas sensor module.
    - The system detects the level of gas in the air, if it exceeds the safety level send a message to the consumer.
    - Leakage is manually [3] controlled.
  4. R.Padmapriya, E.Kamini. "Automatic LPG booking Leakage detection and real time LPG measurement monitoring system".
    - The gas leakage is detected by MQ-3 sensor.
    - MQ-3 [4] sensor which is high sensitive to alcohol and smoke only.
    - When the gas leakage occurs automatically the main power will be cut.
    - There is no automatic booking [4] of gas cylinder.
  5. V.Ramya, B.Palaniyappan, "Embedded system for hazardous gas detection and alerting".IJDPS -Vol.3 No.3 May 2012.
    - MQ-2 sensor
    - It sense only propane gas content in the air.
    - Output of this sensor be 10% precision of the original value.
    - Pic16F877 [5] is used.

**2.1 METHODOLOGY**

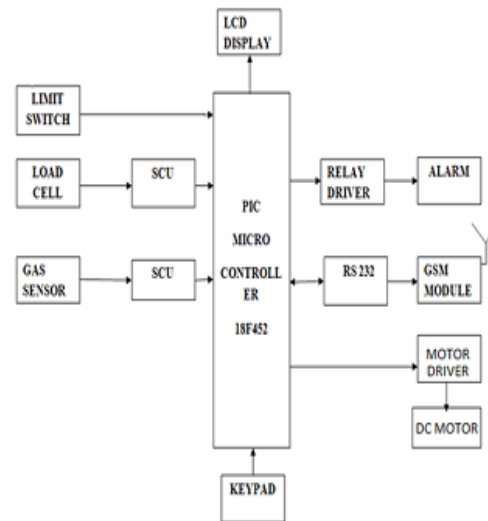
Detection of hazardous gas spontaneous bespeaking methodology is a part of home automation, which avoids the booking difficulties of a gas cylinder. Measurement of gas weight can be done by a resistive type load cell which converts the weight into electrical pulses and is also used to continuously measuring the weight at every stage. Here the GSM technology is used for communication between the user and the reservation agencies. Detection of speculative gases can b done by a sensing methodology, the sensor is

used here is to sense only the unsafe gases like (propane &butane).

**2.2 BLOCK DIAGRAM:**

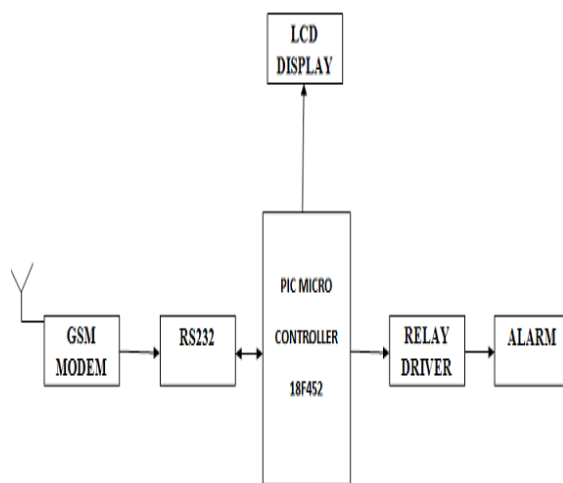
The block diagram representation will give the detailed process explannation. The transmitter and receiver sections are shown below.

**TRANSMITTER:**



**Fig 1.1:** transmitter section.

**RECEIVER:**



**Fig 1.2:** Receiver section

### 3. PROCESS:

This paper is implemented to monitor the level of the LPG usage. In this we measure the weight of the gas cylinder. This can be done easily by using the load cell which is made to give an exact weight measure of the cylinder.

The signal from the load cell is feasible to measure. So its value can be amplified using the amplifier. Amplified value is an analog data, micro controller converts it into a digital data using ADC which is inbuilt. The measured weight can be displayed in the LCD.

The minimum value can be fixed by the programmer, if the micro controller senses the load value minimum than the fixed value the gas booking is done automatically by the GSM module interface with the controller.

Gas sensor<sup>[6]</sup> is to sense the gas leakage. The sensor signal is applied to the signal conditioning unit. This unit consists of an amplifier section and comparator section. The output of the signal was which is in the digital form. Once the gas leakage is detected by the sensor then the signal is sent to the PIC micro controller<sup>[8]</sup>. Then the controller sends the signal to the dc motor to turn off the gas supply.

### 4. Result analysis

The regulator supply is connected to the dc motor to switch off the supply. When the gas sensor detects the speculative gas leakage, LCD will show "leakage is detected" it sends the signal to the dc motor by the controller thereby the supply is off. And also this message is sent to the user.



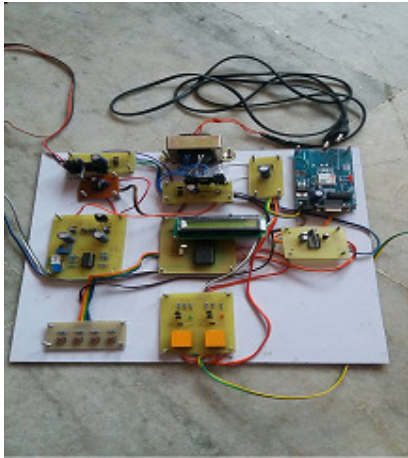
Fig -1.3: Dc motor is connected to the regulator.

The truss tool is connected to the load cell. Weight of the cylinder can be sensed by the load cell which converts the amount of weight into an electrical signal.



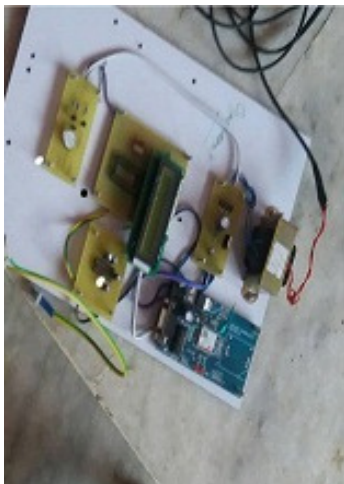
Fig.1.4: load cell is connected to the cylinder stand

Transmitter device consist of power supply, transformer, bridge rectifier, regulator, controller, LCD display, and GSM module. If the gas weight is low, LCD will show the message as "gas weight is low". And it will mechanically reserve the cylinder.



**Fig 1.5:** Transmitter Device.

The receiver section is nothing but a booking office which contains the GSM module to receive the signal from the transmitter to precede the booking process. Once the booking was over the LCD screen displays as "booking successfully" and the buzzer will sound to intimate the booking is over. (For prototype)



**Fig 1.6:** Receiver device.

## 5. FUTURE ENHANCEMENT:

The monitoring system can be future enhanced by using Bluetooth in place of GSM to send the alert messages to user, which supports the another real-time applications. This paper goal at reducing the major difficulties of booking process, it can also be done through IOT technology. Whenever the LPG level is undergoes the threshold level, it will send to the user both an alert message and also as a confirmation message. For customer convenience they can book it or not. In this type of communication technology lots of signal traffic can be eliminated. Because, in that we will

use IOT instead of GSM. The controlling mechanism also will be done using MSP430.

## 6. CONCLUSION:

A cost-effective gas leakage detection system was enhanced, designed and implemented successfully in this approach. Additional to gas leakage detection, this design gives a fully automated home security approach towards the leakage control and gas booking. Real time weight measurement of the gas and its display on LCD makes it an efficient home security system and also can be used in industries and other places to track down the leakage gas. The expenditure concerned in cultivating the system is significantly much less than the cost of gas detectors commercially available in the market.

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- [7] Direct current motor basics-DC machine [m.ecmweb.com](http://m.ecmweb.com).
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**BIOGRAPHIES:**



A. Ebziba. she completed her UG (Electronics And Communication) in Easa College Of Engineering And Technology. She is doing her PG in Sri Eshwar College Of Engineering in ME.vlsi design. Her field of interest is Embedded and VLSI design technology.



Mrs.S.Sathya priya. She is working as an Assistant professor for Electronics And Communication Engineering department in Easa College Of Engineering And Technology, Coimbatore. She has very much interest in Researches & communication systems.