

AUTOMATIC SYSTEM FOR LPG REFILL BOOKING AND LEAKAGE DETECTION

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ABSTRACT

Automatic liquefied petroleum gas (LPG) booking, leakage detection. In this system to measure the gas present in the cylinder when weight of the cylinder reached below the fixed load, using the pervasive sensors and LPG leakage is detected through the sensor and this information is send to the user by short message service (SMS) and simultaneously alerts the customer using GSM module. In this system MQ-6 is gas sensor used to sense the LPG leakage gas and has high sensitivity to LPG and also response to natural gas. This work modifies the existing safety model installed in industries. It offers quick response time and accurate detection. The additional advantage of the system is that it continuously monitors the level of the LPG present in the cylinder using mechanical instrument is weight stand (load cell).

KEYWORDS:- *LPG automatic Booking ,LPG leakage detection , Real Time Information , GSM (Global System for mobile communications).*

I. INTRODUCTION

In India the supply of LPG through pipeline is not possible due to shortage of LPG production. As technology being improved many gas agencies or distributors have implemented IVRS these days although due to daily busy schedule, customer finds very difficult to book new cylinder, and also it is very dangerous when a LPG gas leakage occur in any domestic usage, chemical industry or in any other applications. This system provides automatic booking of LPG cylinder and to overcome the problem of LPG leakage. IVRS system was born from general complaint of consumers that landline phones of their distributors were busy or no one answered the call. With this system, a consumer can approach the gas agency by dialing a toll-free (or non-free) number and later will have to follow the interactive direction. Finally, the system will announce the customer number and confirm the customer number and also confirm the booking of cylinder by pressing 1. Here with most people who are illiterate find it difficulty in handling call or unable to use the higher end technologies. So our proposal is to completely automatic the process of refill booking without human intervention that accordingly will help consumer against foul play.

Our system is also intended to help consumers to upgrade their safety standards, act in accordance with statutory requirements on environmental commitment and most importantly the basic function being prevented by accidents and protect life and property from disasters.

The primary objective of our project is to measure the gas present in the cylinder when weight of the cylinder reached below the fixed load, using the pervasive sensors. The gas retailer gets the order for a new cylinder and the house owner (consumer) receive the message about the same and the details information about the booking proceedings. And the secondary objective is to provide any malfunction in gas system in order to prevent damage or explosion of LPG.

II. OBJECTIVES

1. Booking gas process is automatically.

2. We can Detect Gas leakage instantly.
3. LPG leakage is detected through the sensor and information is sent to the user by SMS.
4. To real time gas monitoring system.
5. To provide security for home, hotels, industries, etc.

III. AIM

As we know the problems occurs in day to day life at home related to the LPG gas, to solve such problems we design the automatic LPG gas booking and leakage detection system.

IV. RELATED WORK

1. Smart Gas Booking System & Leakage Detection [1]

From this paper we Refer-

We all are very busy in our daily life and it is difficult to know the level of LPG gas cylinder. If LPG is going to finish without informing us it can create difficult condition for cooking etc. Our system design can help us to avoid such kind of problem in our daily life. Our design is based on ARM controller, it can track LPG emptiness all the time if LPG is very close to finish or at empty level then it can alert us by sending SMS to LPG Agency for ordering the LPG cylinder. As per current government regulations, intense demand but shortage in production of LPG cylinder, once a new cylinder is booked we need to wait for some days to get it delivered. The other idea of our project is that it continuously monitors the level of the LPG present in the cylinder using load cell. If the gas level reaches below the threshold limit of gas around 2 kg so that the old empty cylinder is replace by new one in time and automatically books the cylinder using a GSM module.

LPG gas leakage detection projects main idea is to implement security system for detecting leakage of gas in the house. Now days there are many cases related to gas leakage which cause innocent people lives and property damage. This 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. The presence of dangerous LPG leakage in the gas vehicle (cars, van, auto), companies can be detected using the Ideal Gas Sensor. The system can be simply integrated into a unit that can sound an alarm. This system is very useful to avoid the hazardous.

2. GSM BASED GAS LEAKAGE DETECTION SYSTEM [2]

From this paper we Refer-

Gas leakage is a major problem with industrial sector, residential premises and gas powered vehicle like CNG (compressed natural gas) bus, car. One of the preventive methods to stop accident associated with the gas leakage is to install gas leakage detection kit at vulnerable place. The aim of this paper is to present such a design that can automatically detect and stop gas leakage in vulnerable premises. In particular gas sensor has been used which has high sensitivity for propane (C₃H₈) and butane (C₄H₁₀). Gas leakage systems consist of GSM (Global System for mobile communications) module, which warns by sending SMS. However, the former gas leakage system cannot react in time. These paper provide the design approach on both software and hardware.

3. LPG Gas Weight and Leakage Detection System Using GSM [3]

From this paper we Refer-

LPG gas weight and leakage detection system using GSM has applicable in home, restaurants, hotels as well as industries. This project is used to continuously monitor the weight of the LPG gas cylinder. Many times we observes that in our home whenever LPG gas cylinder is empty, then we give request for new cylinder at the office

of LPG gas provider. Many times it happens that because of shortage of LPG gas cylinder, there is delay in providing gas cylinder. Main reason behind this is delay in booking /informing to the gas provider. The use of the LPG gas is in the home or restaurant for the cooking purpose and it also useful in industries for the cutting or welding purpose. In these place if the LPG gas in the gas cutters are empty at that time request for new gas cylinder are sent to the storage departments and if there is shortage of gas cylinders in the storage department then there is delay in providing LPG gas cylinder. To avoid all such situations, we are implementing a project which is "LPG Gas Weight and Leakage Detection System Using GSM". When our 20% gas is remaining then a lower priority MSG is send to the owner of the gas cylinder and when the 5% gas is remaining then the higher priority MSG is send to the owner of the gas cylinder.

V. PROPOSED SYSTEM ARCHITECTURE

Explanation-

The primary contributions of this paper are as follows:

- **Microcontroller:**
We are using LPC2138 as ARM controller, which is heart of our project.
- **Gas sensor:**
We are use MQ-6 sensor for detection leakage of gas.
- **Load cell:**
We are use load cell for weight sense of gas cylinder.
- **Buzzer:**
Buzzers are used as cheap, dependable device to generate an alarm tone in electronic circuits.
- **GSM:**
We can send the information through GSM system.
- **LCD DISPLAY:**
We are use LCD display for displaying leakage of gas and booking status.
- **EXHAUST FAN:**
We are use exhaust fan for cleaning the leakage gas area.

Block Diagram Discription:

To design a Automatic LPG gas booking and leakage detection system for use in Home and Industry. Such a monitoring system will be used to automatically LPG gas booking and Leakage detection. Here we can use the mechanical instrument like weight stand (load cell) for measuring the gas cylinder level. When the gas level reaches below to the threshold level which set value in the system. The load cell output is in few mV, so these outputs provide to the amplifier through the LPC 2138 controller and automatically booked the cylinder using a GSM module using SMS service and display the information on LCD. MQ-6 gas sensor is used in system, When the LPG leakage is detected by the sensor and information is sent to the user by short message service (SMS) and simultaneously alerts the customer using GSM module, display on LCD, buzzer will get ON and exhausts fan use to clean area.

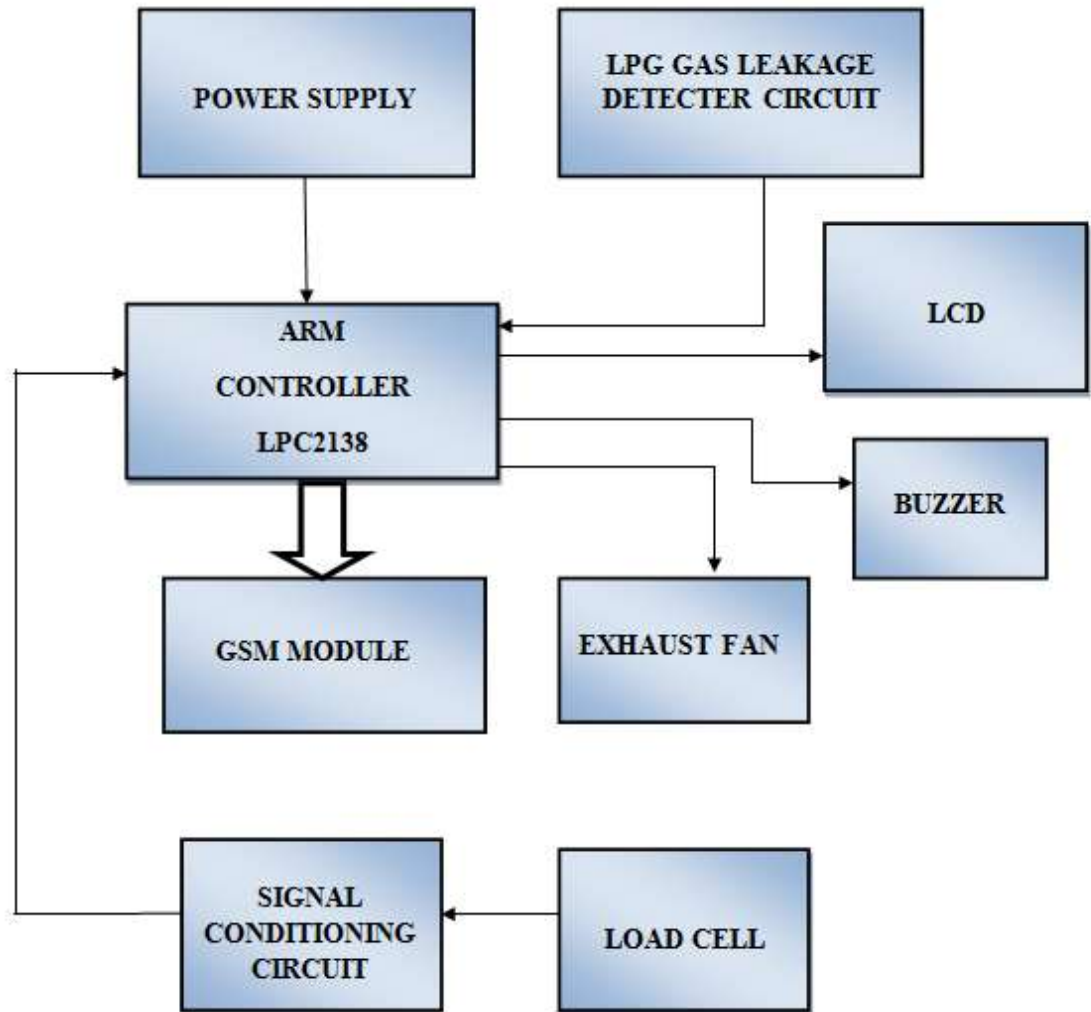


Fig.1 Block Diagram

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