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Smart LPG Cylender Service Provider

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Abstract

A cost-effective, automatic Liquefied Petroleum Gas (LPG) booking, leakage detection and real time gas monitoring system is proposed in this paper. In this system, the LPG leakage is detected through the sensor and information is sent to the user by Short Message Service (SMS) and simultaneously alerts the customer using a GSM module, while activating the alarm and exhaust fan. The additional advantage of the system is that it continuously monitors the level of the LPG present in the cylinder using weight sensor and automatically books the cylinder using a GSM module

Keywords: *Buzzer, GSM Modem, LPG, Microcontroller, Smart City, Relay Circuit, Weight Sensor*

INTRODUCTION

From the past years, the use of liquefied petroleum gas (LPG) is increasing more and more because of the large demand for energy. Rather than using oil and coal, LPG gas burns cleanly and not so harmful to environmental entities. LPG gas is mostly used in motor vehicles, different industrial sectors, and in home appliances. The safety issues regarding gas cylinder due to increased use of LPG for heating, cooking and other home appliances. It is so difficult to control, once the LPG gas has been leaked out. There are different accidental cases caused by gas leakage like leakage and explosion, leakage and fire, and poisoning. These leakage problems arise due to some reasons like manufacturing

defect in gas pipe or in regulator. It may cause serious harm to human's life. The current system has drawback of booking of gas cylinder which is totally manual work for human beings till today. It also consumes precious time of humans as well as increases the workload. Sometimes if the person forgot to book the cylinder then it will delay to get cylinder.

The proposed system is intended to overcome issues. Objectives are: 1. To measure the quantity of LPG cylinder.: The objective of the proposed system is to continuously measure the weight of the cylinder and show it continuously on LCD display. 2.

To send message to owner and service center to get new LPG cylinder. System is continuously measure the weight of the cylinder and as soon as it reaches the minimum threshold it will automatically sends an SMS alert to the user as well as Authorized LPG agent so that they can act accordingly. The threshold level of weight of the cylinder is used for automatic cylinder booking.

OVERVIEW OF MODEL

A. Block Diagram –

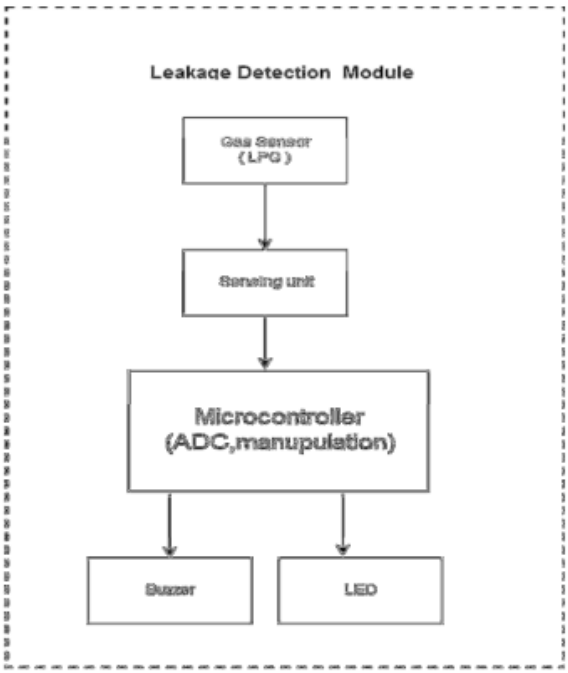

Fig. 1 Block Diagram of System

The system is a self-operated, smart, intelligent system which assembled with gas sensor, sensing unit, LED, buzzer and microcontroller. The Microcontroller gets the signals from the gas sensor and sensing unit then this analog signal is converted into digital value. If the value is greater than the reference value then microcontroller takes proper action according to program.

If the sensing unit sensor indicates value which is less than reference value, message is send to the main gas service center. Either stock is available or not, gas cylinder service provider can inform consumer by messaging at what time and day they will delivered gas cylinder to consumer. The gas sensor is used to sense the gas. If there is gas leakage gas sensor detect it and raise the alarm inside the home and the system will send message on LED screne and then they can take proper action for that.

The smart LPG cylinder service provider system consists of Arduino Uno, GSM module, Pressure sensor, LCD display. The Rx and Tx of GSM is connected to the pin no 9 and 10 of Arduino. Vcc connected to the 5v supply and ground is connected to the gnd. The supply of 12v is applied externally. Pressure sensor BMP180 have 4 terminals (VIN, Gnd, SCL, SDA) VIN connected to the 3.3v pin of the Arduino. Gnd terminal connected to the Gnd pin of the Arduino.

B. Circuit Description –

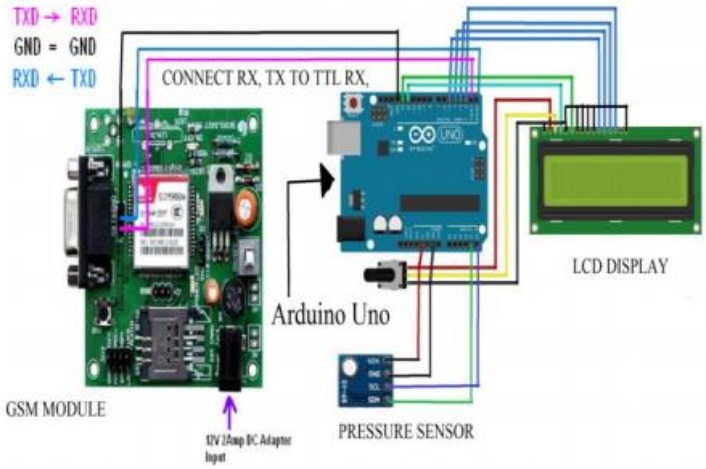

Fig. 2 Circuit Diagram of System

SCL of BMP180 is connected to the analog pin A4 of Arduino and SDA of BMP180 is connected to the A5 of Arduino. LCD (Liquid Crystal Display) have 16 pins. Led- is connected to Gnd and led+ is connected to the 5v these pins are used to turn ON the LCD display. Four data pins (DB0, DB1, DB2, DB3) are connected to the digital pins 2,3,4,5 of the Arduino.

The EN (Sends data to data pins when a high to low pulse is given) and RS (Selects command register when low; and data register when high) pins of LCD connected to the logic pins 6 and 7 of Arduino. R/W (Low to write to the register; High to read from the register) pin is always to logic zero because all data we are writing on a LCD. Pin VEE is used for adjusting the brightness of Display.

The pressure sensor BMP180 is used to detect the quantity of LPG gas inside the cylinder the cylinder will placed on it and continuously measures the quantity of LPG, whenever the quantity decreases to its reference level sensor detect it and send the SMS on owners mobile and to the service center and also ring the buzzer. The SCL (serial CLK) is given to the Arduino on pin A4 it act as a trigger for further action. SDA (serial data) is sends to the A5 pin of Arduino, that data is the quantity of LPG. So with the help of serial clock and serial data BMP180 is interfaced with Arduino. This sensor also measures the temperature of the kitchen and show it on the LCD display.

FLOWCHART

A Flow Chart:-

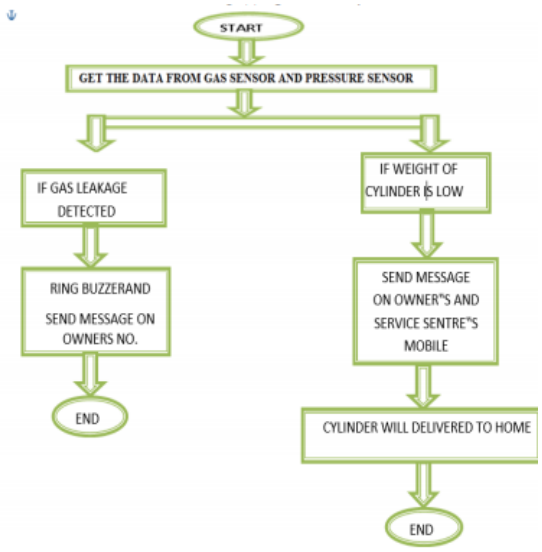

Fig. 3 Flowchart of System

CONCLUSION

As problems faced by LPG gas consumers are sorted out by this system, which meets the solution of few requirements of them, as this system is made completely automate the process of refill booking without human intervention. Pressure sensor senses the

pressure and whenever pressure is low then it will sends the message.

So in this way Smart LPG Cylinder Service Provider worked for detection of gas leakage and automatic refilling of LPG gas cylinder This propose system easy to use and fully automated so no human attention is required. This avoids problematic situation or the trouble caused due to unavailability of gas cylinder. It gives early intimation of gas quantity. This system can minimize hazard. By using this proposed methodology we can enhance the security system and also make awareness of the emergency situations and avoid the danger.

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