LPG GAS MONITORING AND AUTOMATIC CYLINDER BOOKING SYSTEM BASED ON ARDUINO

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ABSTRACT

LPG (Liquefied Petroleum Gas or Liquid) is one of the most important commodities in our household items. This LPG contains flammable hydrocarbon gases including propane, butane and mixture of these gases. There are approximately 30crore LPG users in which mostly 40% of the population. In our country it is not possible to supply LPG through pipes to each and every home as the production of LPG is very low. Hence the supply is done with the help of cylinders. Whenever we observe the LPG gas cylinder is empty, we give request for a new cylinder by using IVRS (Interactive Voice Response System), SMS (Short Message Service) or Mobile applications. There is a delay in providing the gas cylinder. The main reason behind this is a delay in informing to the gas provider at the last moment when the gas is empty. Most of the illiterate people can't even complete the booking and also most of the times these land line phones are either busy due to congested calls or phones not working due to some technical issues. Another problem is that most of the times people book the refill with a prediction that the cylinder is going to be empty and hand over the old cylinder to the delivery men without knowing the exact quantity.

Keywords: *Arduino Mega, Temperature sensor, GSM Modem, Gas Sensor, Load Cell.*

1. INTRODUCTION

When the system identifies that LPG concentration in the air reaches the specified level then it alert the consumer by sending SMS to registered mobile phone and alert the people at home by activating the alarm which includes Buzzer simultaneously and also display the same message on LCD to take the necessary action and switch on the exhaust fan or opening windows to

decrease the gas concentration in the air. The system measure the weight of cylinder by using weight sensor and display corresponding weight in LPG display. The proposed system uses the

GSM Modem to alert the person about the gas leakage via SMS and status of automatic cylinder booking.

2. LITERATURE SURVEY

In the proposed system we have designed "LPG gas monitoring and automatic cylinder booking with alert system".These report focus on detection of economic fuels like petroleum, liquid petroleum gas, alcohol..etc., and alert the surrounding people about the leakage through SMS. It also sense surrounding temperature, so that no fire accidents occurs.

The one more important feature is automatic cylinder booking by noticing the current expenditure of LPG gas in our daily life. These projects alert the user by sending message to mobile through SMS in three conditions.They are

- When LPG gas weight reaches to maximum threshold value.
- When the LPG gas exceed its peak value.
- When the temperature exceed more than room temperature.

3. DESIGN AND IMPLEMENTATION

Gas sensor:

A gas sensor is a device which detects the presence of gas in the area. This sensor interacts with a gas to measure its

concentration. Each gas has a unique breakdown voltage. The gas sensor detects the presence of various gases such as hydrogen, carbon monoxide, methane and LPG ranging from 100ppm to 3000ppm. The detecting concentration of the device is 200-10000ppm.


Piezoelectric buzzer:

Buzzer is an audio signaling device. The project used an electronic type of buzzer which is a piezoelectric element that driven by an micro- controller signals. Piezo buzzer is based on the inverse principle of piezo electricity discover in 1880 by Jacques and Pierre Curie. It is the phenomenon of generating electricity when mechanical pressure is applied to the certain materials and the vice versa . such materials called Piezoelectric materials.

Load cell amplifier:

Load cell uses a four wire wheat stone bridge configuration to connect to the HX711. These are commonly colored RED, BLACK, WHITE, GREEN and YELLOW. Each color corresponds to the conventional color coding of load cells.
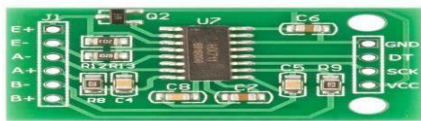
Arduino uno:

In this proposed system Arduino Uno is used as a controller. Arduino is an well equipped Open- Source

Prototype Platform based on easy-to-use hardware and software. Arduino boards are able toread inputs - light sensor, or a Twitter message -

and turn it into an output - activating a motor,publishing anything online.

GSM Module :

GSM (Global System for Mobile) is an abbreviatedform of Global System for Mobile Communication.

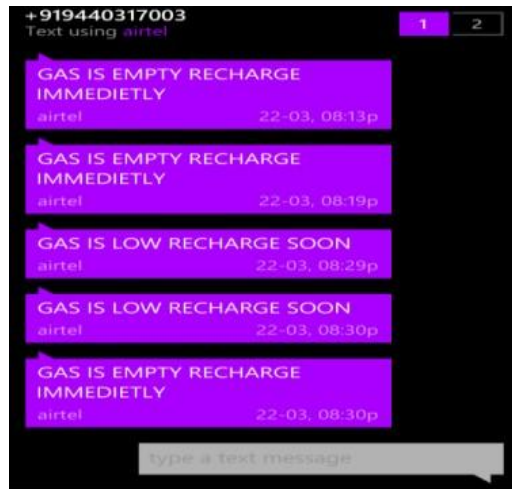It is used to establish a communication between a computer and a GSM system. Global Packet RadioService (GPRS) is an extension of GSM that

enables higher date transmission rate. It isbasically a GSM modem (like SIM900).

Fig 7: GSM SIM900 Module

RESULTS:-

The above figure represents SMS messages in user mobile phone which is send by GSM module for different kinds of input reaction in our project. The message "GAS IS LOW RECHARGE SOON" is

sent to the user when the LPG gas reaches to minimum threshold level. So the user comes to know to when to book the cylinder to avoid delay in delivering cylinder. The message "GAS IS EMPTY RECHARGE IMMEDIETLY" is sent when the weight of the gas is fully empty.

Actually the room temperature is 25°C, but we increased temperature of LM35 upto 53°c. Initially before gas leakage the output of gas sensor is 0 ppm, but when it sense gas the output is 267 ppm. We have placed 10kg load cell, so the maximum capacity is 10kg load. 338 is in the units of grams of weight.

4. FINAL OUTPUT:

5. CONCLUSION :

➢ As we shorted out the problem faced by LPG gas consumers so we come up with some solutions to meet the few requirements of them, as we made our system is completely automate the process of refill booking without human inervention.

➢ The primary objective of our project is to measure the gas present in the cylinder when weight of the cylinder is below the fixed load, this can be done using the weight sensors.

6. FUTURE SCOPE:

This monitoring system can be further enhanced by using Bluetooth in place of GSM to send the alert messages to user, which supports the another real-time application. For industrial purposes mobile robot can be developed for detecting multiple gas concentrations. Addition of load cell can also be used as pressure sensor which detects the amount of gas in the cylinder and also detects high pressure gas in cylinder pipe, displaying the alert messages via SMS and LCD displays

7. REFERENCES:

[1]. K. Galatsis, W. Woldarsla, Y.X. Li and K. Kalantar-zadeh, "A Vehicle air quality monitor using gas sensors for improved safety", report in Recent Researches in Applications of Electrical and Computer Engineering.

[2]. K. Galatsis, W. Wlodarsla, K. Kalantar- Zadeh and A. Trinchi, "Investigation of gas sensors for vehicle cabin air quality monitoring", National Conference on Synergetic Trends in engineering and Technology (STET-2014), International Journal of Engineering and Technical Research ISSN: 2321- 0869

[3]. "Smart Gas Cylinder Using Embedded System", Issn (Online) 2321 – 2004 Issn (Print) 2321 – 5526, International Journal Of Innovative Research In Electrical, Electronics, Instrumentation And ControlEngineering Vol. 2, Issue 2, February2014.

[4]. Fraiwan, L.; Lweesy, K.; Bani-Salma, A.; Mani, N, "A wireless home safety gas leakage detection system", Proc. of 1st Middle East Conference on Biomedical Engineering, pp. 11-14, 2011.

[5]. Johansson, A.; Birk, W.; Medvedev, A., "Model- based gas leakage detection and isolation in a pressurized system via Laguerre spectrum analysis", Proc. of IEEE International Conference on Control Applications, pp. 212-216, 1998.