



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 13, April 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

LPG Gas Level Detection and Gas Leakage Prevention with Automatic Booking System

Dhivya S¹, Mahalakshmi S², Maheswari S³, Kumar S⁴

U.G. Student, Department of Electronics and Communication Engineering, Builders Engineering College,
Nathakadaiyur, Tamil Nadu, India^{1,2,3}

Professor, Department of Electronics and Communication Engineering, Builders Engineering College, Nathakadaiyur,
Tamil Nadu, India⁴

ABSTRACT: In the modern society, Liquefied Petroleum Gas (LPG) has been widely used as a cooking fuel in homes, hotels and industries. However in many cases, LPG leakage poses a serious threat to the users and the society. There are several ways to avoid the damage because of the gas leakage but the best way is to place a gas leakage detector nearby the source. Apart from the safety issue, people also find it difficult to identify the amount of gas remaining in the cylinder which causes inconvenience in their work. Therefore this project proposes a flexible and reliable way of detecting the leakage of LPG, monitoring the amount of LPG available in the cylinder and provides the ability to book a cylinder by automatically sending the booking request via SMS to the distributor as required. This system is also capable of sending an alert SMS notification along with a buzzer to users and automatically turnoff the valve using solenoid valve to avoid accidents.

KEYWORDS: LPG, Gas sensor, Load cell, GSM Module, Buzzer, Amplifier, Relay.

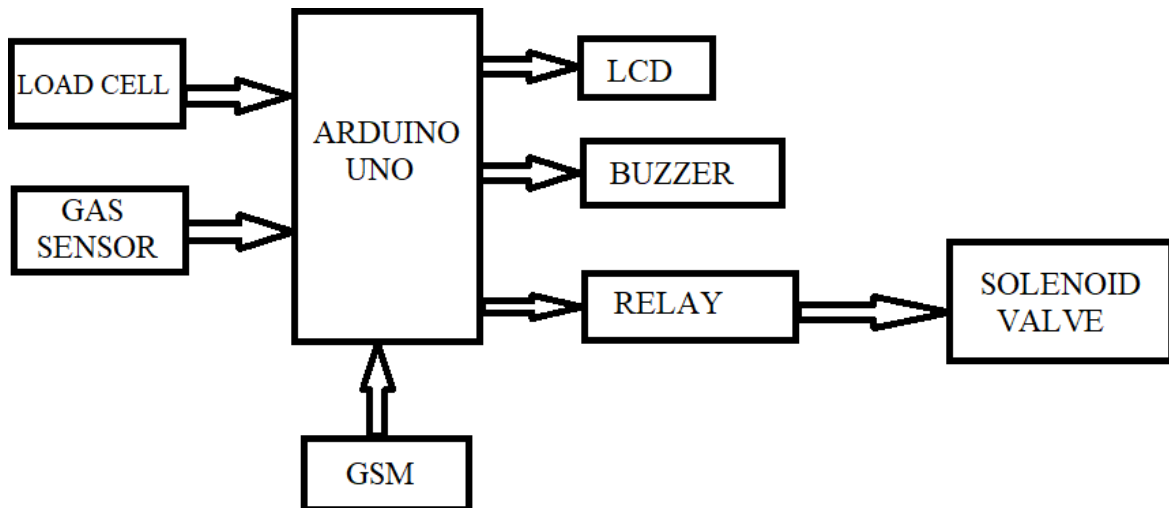
I. INTRODUCTION

The gas leakage detection system. This system is designed to detect LPG gases such as LPG and butane, which can be distinctly inflammable in nature. Most of the days, users find it difficult to figure out what amount of LPG is left in the cylinder and this causes tons of bothering to the user. Because of the busy life, people may forget to notice the empty condition of gas cylinders and this in turn will leads to delayed booking of cylinders. So, to avoid this the proposed system provides a means to continuously monitor the weight of the cylinder and when the level of LPG gas is critically low, then the system sends a message to the user and also the LQP agent to book the cylinder immediately. Apart from automatic booking of gas cylinder, the proposed system also checks for the leakage of gas, which in turn will help to prevent accidents that occurs due to leakage of gas. The several standards have been implemented for the gas leakage is detected by the gas sensor. This leakage detection gadget detects the fuel leakage and additionally stops the gasoline and a GSM alerts the required person. Then by detecting the gas leakage we can prevent the LPG gas burst accidents at home. The system detects the leakage of LPG gas using MQ-2 gas sensor and alerts the people at home by activating the alarm and also display the same message on LCD to take the necessary action. Thus using the proposed system booking of LPG cylinders is done automatically within time and thus problems occurring due to delayed booking of gas cylinders is avoided. Also the accidents due to gas leakage is also prevented by using a gas sensor that continuously sense the gas and in case of any leakage, the system automatically turnoff the valve using solenoid valve.

II. RELATED WORK

Gas escape could result in severe accidents which ends in material losses and human injuries. Gas escape happens chiefly because of poor maintenance of apparatus and inadequate awareness of the individuals. Thus LPG escape detection is useful to stop accidents and to avoid wasting human lives. This paper presents a LPG escape detection and alert system. This technique triggers buzzer and displays the severity of the escape to alert individuals once LPG escape is detected. This technique is incredibly straightforward nevertheless reliable.

III. METHODOLOGY



A. Arduino UNO :

The Arduino Uno is a microcontroller board based on Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the ARDUINO IDE, via a type B USB cable. It can be powered by the USB cable or by an external 12-volt battery, though it accepts voltages between 7 and 20 volts. The Uno differed from all preceding boards by featuring the ATmega328P microcontroller and an ATmega16U2 programmed as a USB-to-serial converter.

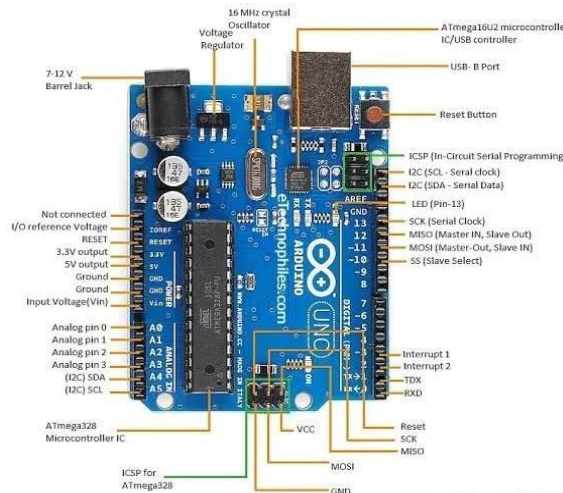


Fig 1.1 Arduino Uno

B. Gas sensor :

The methods to sensing gases depend on the change of physical or chemical properties of a given material or property on the presence of the target gas, compared to an ideal environment. Some of the sensing methods use the reaction between the sensing element with the target gas to determine this gas concentration; other methods are based on the comparison of physical properties such as speed velocity and wave propagation between an ideal mean and the one with the gas being sensed.



Fig 1.2 GAS SENSOR

C. Load Cell :

A load cell is a type of transducer, specifically a force transducer. It converts a force such as tension, compression, pressure, or torque into an electrical signal that can be measured and standardized. As the force applied to the load cell increases, the electrical signal proportionally changes. The most common types of load cell used are hydraulic, pneumatic, and strain gauge.



Fig 1.3 Load Cell

D. Buzzer :

The fig 1.4, shows a buzzer or beeper which is an audio signaling device, which maybe mechanical, electromechanical. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.



Fig 1.4 Buzzer

E. LCD : A liquid-crystal display (LCD) in Fig 1.5, is a flat-panel display or other electronically modulated optical device that uses the lightmodulating of liquid crystals combined with polarizers. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome.



Fig 1.5 LCD DISPLAY

V. EXPERIMENTAL RESULTS

Figure shows the results of the LPG weight measurement and gas leakage detection and message for user and gas booking agent. a) There is weight of the cylinder when gas level is normal, b) There is weight of the cylinder when gas

level is low, c) LPG gas leakage detected, d) Alert messages for user, e) Gas booking request message to gas booking agent.

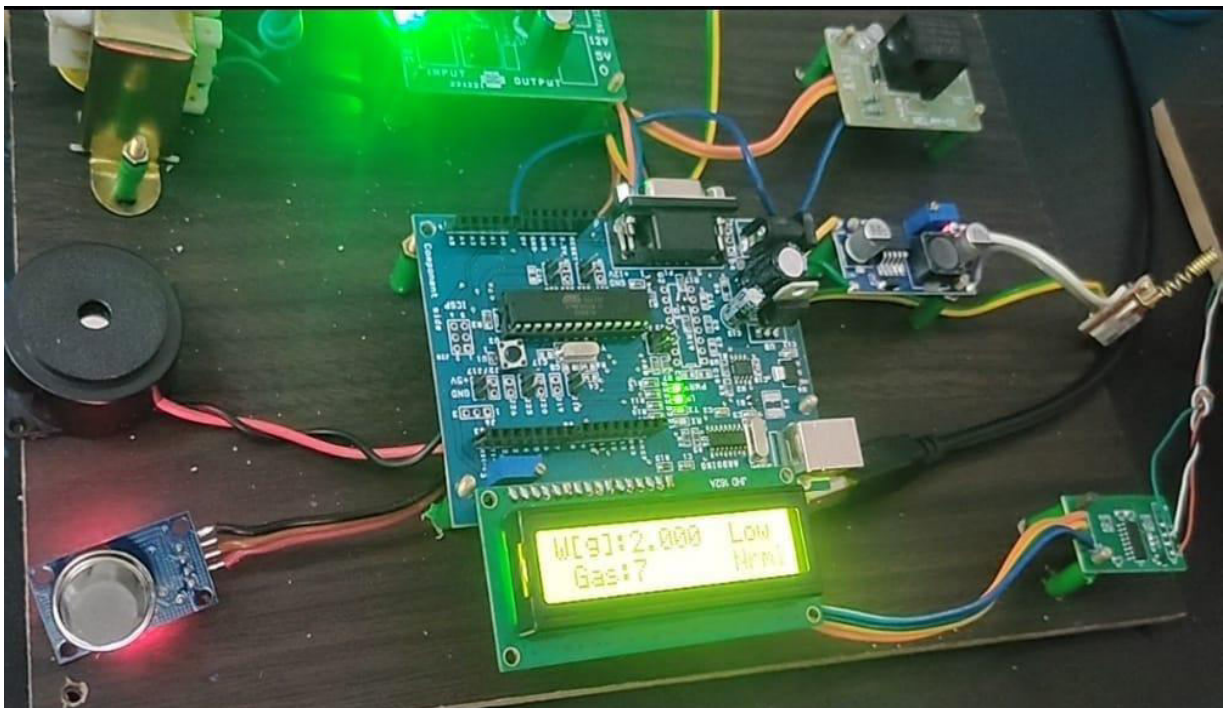
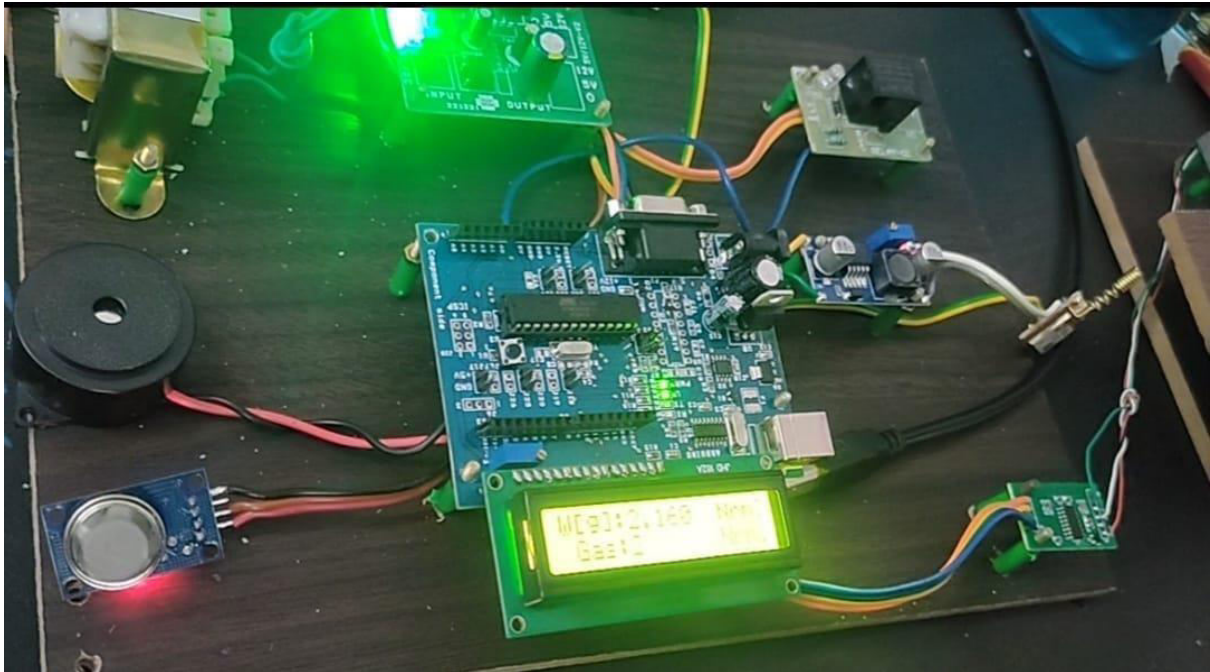


Fig 1.6 : There is weight of the cylinder when gas level is normal



Fig 1.7 : There is weight of the cylinder when gas level is low



Fig 1.8 : LPG gas leakage detected

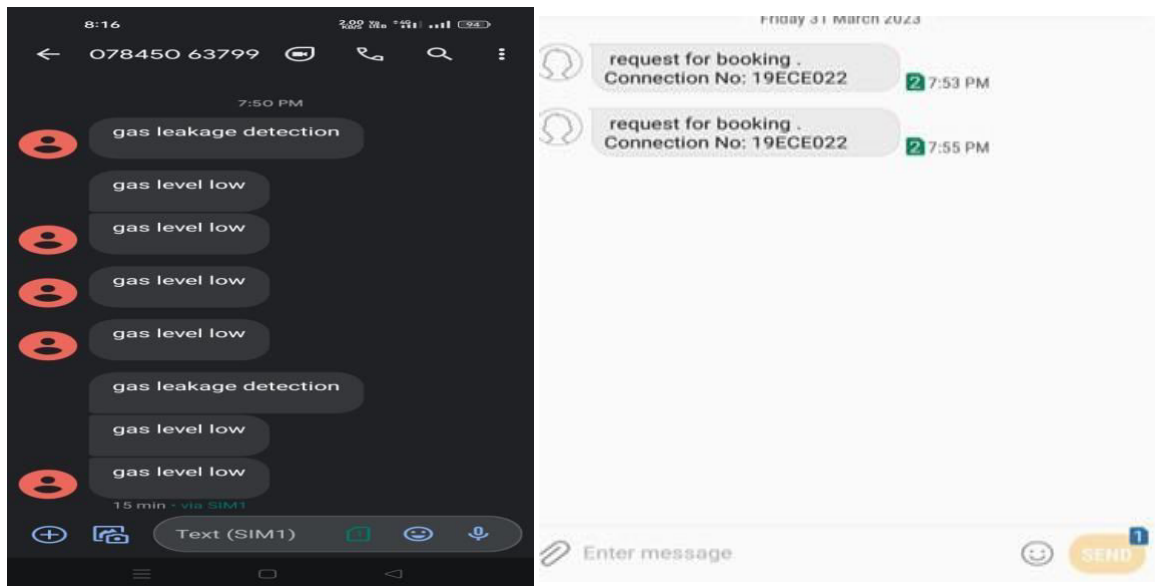


Fig 1.9 Alert messages for user,

Fig 1.10 Gas booking request message to gas booking agent.

VI. CONCLUSION

To overcome the various problems faced by LPG gas consumers, Automatic Gas Booking and Leakage detection System is developed which completely automates the process of refill the gas cylinder without any human intervention. It also helps the customers to upgrade their safety norms to prevent major accidents associated with gas leakage and protect life and property from such accidents. The primary objective of our project is to measure the gas present in the cylinder. The gas retailer gets the order for a new cylinder and the house owner (consumer) receives the message regarding the status of gas boeing. The secondary objective of the proposed system is to prevent damage due to gas accidents by detecting the gas leakage.

REFERENCES

1. Ashwini, Likitha B, Thanushree V, Sathya S, Harshitha K N “Automatic gas booking and gas leakage detection system using IOT”, IRJET Vol.07, Issue:06, June 2020.
2. Zaw Lin Oo, Theint Win Lai and Aung Moe “IoT Based LPG Gas Detection & Prevention With Alert System”. Balkan Journal of Electrical & Computer Engineering, volume 9, No 4, October 2021.
3. Ms. A. Preethi Vinnarasi M.E, Elumalai R M, Jerry Jenish, Karthik Raj.T ” LPG Gas Monitoring System Using Arduino”, April 2021 | IJIRT | Volume 7 Issue 11 | ISSN: 2349-6002
4. Alam M John, Bhavesh Purbhia, Ankith Sharma, Mrs. A.S Udupurkar: ”Automatic Gas Booking System presents a LPG/CNG Gas Leakage Detection System with GSM Module”.
5. G. Rathansabhpathy, B. Durga Devi, N. Gopi Krishnan, S. Gowsalya, M. Jagadeesh: ”Automatic Gas Booking and Leakage Detection System using Embedded System.



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details