



GAS LEAKAGE DETECTION AND AUTOMATIC GAS BOOKING ALERT SYSTEM USING IOT

**D.SATYANARAYANA¹, K. DEEPIKA², P.V.V.GANESH³, S.YAMINI SRIYA⁴,
C.H.YESU BABU⁵, N. MANI BHAVANA⁶**

¹²³⁴⁵⁶UG Students, Dept. of ECE, PRAGATI ENGINEERING COLLEGE

ABSTRACT

While LPG is an essential need of every household, its leakage could lead to a disaster. To alert on LPG leakage and prevent any mis-happening there are various products to detect the leakage. Here we have developed an Arduino based LPG gas detector alarm. If gas leakage occurs, this system detects it and makes an alert by buzzing the buzzer attached with the circuit. This system is easy to build and anyone who have some knowledge of electronics and programming can build it. We have used a LPG gas sensor module to detect LPG Gas. When LPG gas leakage occurs, it gives a HIGH pulse on its DO pin and Arduino continuously reads its DO pin. When Arduino gets a HIGH pulse from LPG Gas module it shows "LPG Gas Leakage Alert" message on 16x2 LCD and activates buzzer which beeps again and again until the gas detector module doesn't sense the gas in environment. When LPG gas detector module gives LOW pulse to Arduino, then LCD shows "No LPG Gas Leakage" message.

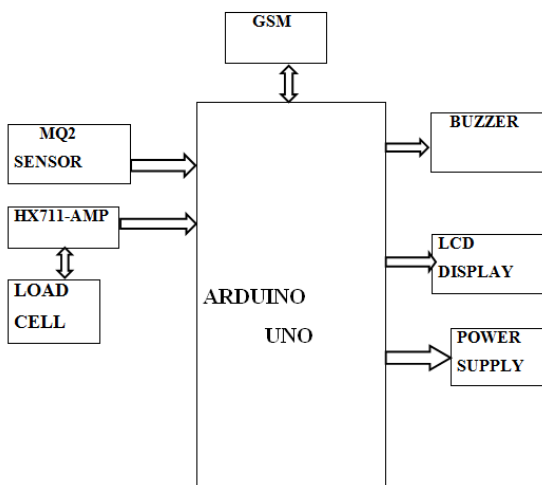
To overcome the various problems faced by LPG gas consumers, Automatic Gas Booking and Leakage detection System is developed which completely automates the process of refill the gas cylinder without any human intervention. The primary objective of our project is to measure the gas present in the cylinder. The gas retailer gets the order for a new cylinder and the house owner (consumer) receives the message regarding the status of gas book.

INTRODUCTION

The main objective of this research is automatic protection from the LPG (Liquefied Petroleum Gas) leakage or reduction of the hazards that can be caused due to unawareness of the user about the gas leakage and also providing an automatic gas

booking facility by applying advance communication technology. If there is any gas leakage from storage tank, service station or from the automobile then a buzzer will turn ON and an alert message will be sent to a pre-set mobile number by using GSM (Global System for Mobile

communication) technology. Sound from the alarm as well as message in the mobile number will give valuable suggestion to the users so that they can prevent themselves from dangerous effect of LPG gas leakage. Proposed model notifies alert to people before any leakage from the gas cylinder and also automatically books for refilling of gas from the gas booking centre before the cylinder gets empty.



ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB

cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means "One" in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

The Arduino Uno can be powered via the USB connection or with an external power supply. The powersource is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V,

the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts The power pins are as follows:•

- VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.•

- 5V. The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.

- 3.3V. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

- GND. Ground pins.

Memory:

The Atmega328 has 32 KB of flash memory for storing code (of which 0,5 KB is used for the bootloader); It has also 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).

HARDWARE COMPONENTS

Transformer is a static device used to convert the voltage from one level to

another level without change its frequency.

There are two types of transformers:

1. Step-up transformer
2. Step-down transformer

Step-up transformer converts low voltage level into high voltage level without change its frequency.

Step-down transformer converts high voltage level into low voltage level without change its frequency.

In this project we using step-down transformer which converts 230V AC to 12V AC.

The purpose of a rectifier is to convert an AC waveform into a DC waveform (OR) Rectifier converts AC current or voltages into DC current or voltage. There are two different rectification circuits, known as 'half-wave' and 'full-wave' rectifiers. Both use components called diodes to convert AC into DC.

When the AC input is positive, diodes A and B are forward-biased, while diodes C and D are reverse-biased. When the AC input is negative, the opposite is true - diodes C and D are forward-biased, while diodes A and B are reverse-biased. While the full-wave rectifier is an improvement on the half-wave rectifier, its output still isn't suitable as a power supply for most circuits since the

output voltage still varies between 0V and Vs-1.4V. So, if you put 12V AC in, you will 10.6V DC out.

A voltage regulator is an electrical regulator designed to automatically maintain a constant voltage level. It may use an electromechanical mechanism, or passive or active electronic components. Depending on the design, it may be used to regulate one or more AC or DC voltages. There are two types of regulator are they.

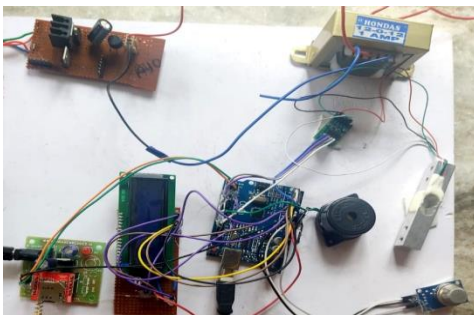
- Positive Voltage Series (78xx) and
- Negative Voltage Series (79xx)

78xx: '78' indicate the positive series and 'xx' indicates the voltage rating. Suppose 7805 produces the maximum 5V. '05' indicates the regulator output is 5V.

79xx: '78' indicate the negative series and 'xx' indicates the voltage rating. Suppose 7905 produces the maximum -5V. '05' indicates the regulator output is -5V.

These regulators consists the three pins there are Pin1: It is used for input pin.

RESULT



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. 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 booking. The secondary objective of the proposed system is to prevent damage due to gas accidents by detecting the gas leakage.

REFERENCES

1. Shrivastava, A., Prabhaker, R., Kumar, R., & Verma, R. GSM based gas leakage detection system. International Journal of Emerging Trends in Electrical and Electronics (IJETEE-ISSN: 2320-9569), 2013; 3(2):42-45.
2. Hema, L. K., Murugan, D., & Chitra, M. WSN based Smart system for detection of LPG and Combustible gases. In National Conf. on Architecture, Software systems and Green computing-2013. Ramya, & Palaniappan.



4. Distributed and Parallel Systems (IJDPS), 2012; 3(3):287-300. Priya, P. D., & Rao, C. T. Hazardous Gas Pipeline Leakage Detection Based on Wireless Technology. International Journal of Professional Engineering Studies, India, 2014; Jero, S. E., & Ganesh, A. B. 2011, March. PIC18LF4620 based customizable wireless sensor node. hazardous gas pipeline leakage. In 2011 International Conference on Emerging Trends in Electrical and Computer Technology (pp. 563-566). IEEE.
- 5.