

# A Microcontroller Based LPG Cylinder Booking and Leakage Detection using GSM

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## ABSTRACT

Gas leakage is a major problem with industrial sector and also home applications etc. To avoid the gas leakage is to install a gas leakage detection system at the society. The main aim of this project is used to design that can automatically gas booking system, gas leakage detection system, alert system and control gas leakage. LPG cylinders have become an integral part of every home. Our kitchens are occupied with LPG cylinders which is used to make delicious food. But it can be very dangerous to make problems in our life. The aim of this project is to design a safety-oriented system which will alert the user about any problem in the kitchen through mobile by using GSM and give the buzzer sound by using alert system. This system will detect the gas leakage of LPG and send an alert information to the user, at the same time it will switch off the gas supply of LPG by switching regulator-switch using BO (Battery Operating) motor. It is also used to monitoring the high voltage passing through the home appliances and also industrial sector it will used to reduce the voltage level in the power supply. It also measures safety from any gas leakage accident like explosion. In additional advantage, this system has a load cell used to continuously monitoring the cylinder weight and send information to the user. The project is very helpful to check the entire LPG cylinder booking procedure automated Without human intervention and also Automated cylinder booking we also designed feature related to the safety to the user. And also the LPG Cylinders are produced some heat energy. The heat energy is generating the power by using generator through exhaust fan.

**KEYWORDS:** Arduino Uno At-mega, Gas Sensor, GSM Module, BO motor

## INTRODUCTION

Liquefied petroleum gas is used for industrial applications and domestic purposes. It has a smoke less gassing system. The main constituents of LPG are propane and butane. Gas leakage is a major problem in a residential houses and create fundamental issue on the society. Fire accidents mainly occur due to technical fault on the cylinder. A better systems on need to reduce the accident due to gas leakage. LPG gas is more higher sensitivity compared to gas is present in the air. The weight of the cylinder is continuously measured by load cell and the information is convey to the user by using GSM. The gas leakage is detected by the electro chemical cell and give the buzzer sound and convey the information to the user. The main objective of the project is used to reduce the voltage level in the main power supply. It is used to identify the any short circuit present in the industrial domain and also home appliances.

## PROPOSED APPROACH

In proposed system, which is used to measure the LPG gas cylinder weight. When it goes lower level it will intimate to the user through mobile phone automatically. And it will also sense the gas leakage present in the home in addition to its if the gas leakage present in home it will automatically drop the voltage level in the main supply.

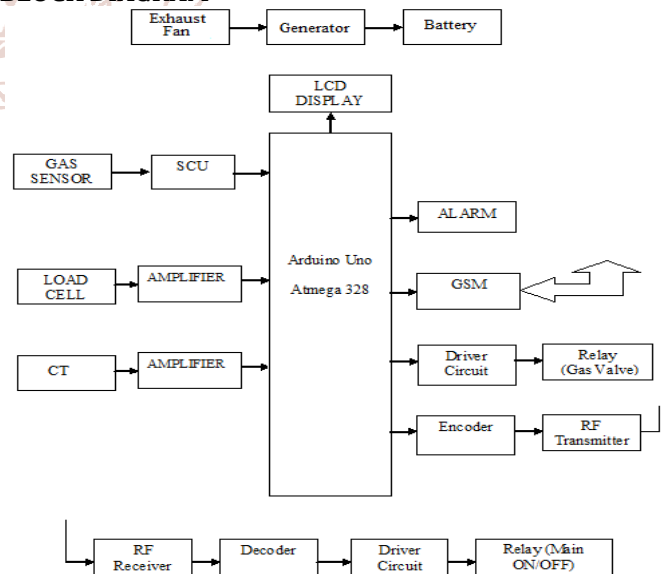
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## BLOCK DIAGRAM



## GAS SENSOR

A gas sensor is a device which is used to detect the presence of gases in the atmosphere. In this we have use the electrochemical sensor. The construction of the gas sensor is Gas sensor layer, Heater coil, Electrode Line, Tubular ceramic, Electrode.

**Gas sensor:** It is used to sensing the gas, the sensing element is made up of Tin dioxide (sno<sub>2</sub>).

**Heater coil:** It is made up of Nickel chromium which has high melting point so that it can stay heated up without getting melted.



- Features**
1. High Sensitivity to LPG
  2. Low Sensitivity to alcohol, Smoke.
  3. Fast Response Time: <10s.

**LCD DISPLAY**

A Liquid crystal display is the flat panel display or other electronically modulated optical device. It does not emit the light directly. It consume less power when compare to LED and gas display. LCD is made up of millions of pixels.

In here we can use the 16\*2 display. It is mainly used to display the cylinder weight and current status of the cylinder

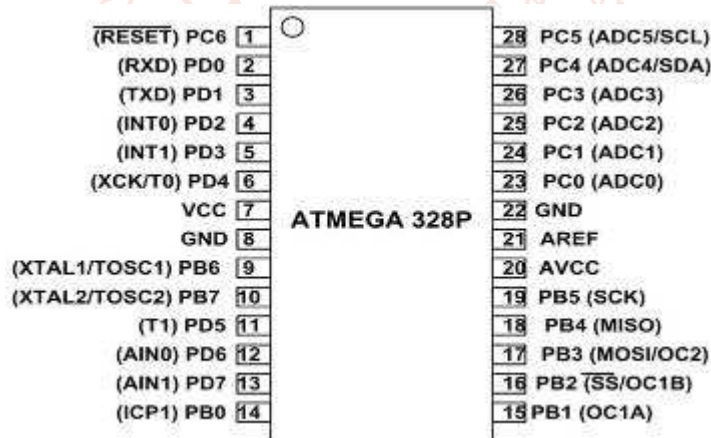


**BUZZER**

It is mainly used to indicate the gas leakage has occurred.

**ATMEGA328**

Arduino Uno is the 8-bit microcontroller. The microcontroller board is based on the ATmega328. It has 14 digital input pins and output pins and also have 6 analog pins and it has 16MHZ quartz crystal. AT mega memory has 1KB (EEPROM) Electrical Erasable Programmable Read Only Memory. The output voltage is 5V and input voltage is 7-12V. The clock speed is16 MHZ. We can use the IDE (Integrated circuit Environment) software. It is mainly used to allow to write the software and also uploaded on the board. A program written with the IDE for the board is called as sketch.



**GSM MODULE**

GSM (Global System for Mobile communication) it is a digital mobile network. It is mainly used in mobile phones. GSM phone can sent and receive the data packet while making call.GSM mainly used to transfer the message to mobile phone. It operated at frequency either 900MHZ, 1800MHZ. The system transmits the digital information through atmosphere and convert in to analog waveform.

**DRIVER CIRCUIT**

It is circuit or components used to control any another circuit or components, such as high power transistor, liquid crystal display. It also control the current flow of the system.

**RELAY**

Relay is also called as switch. Relay that open and close circuit electromechanically or electronically. Relay are widely used to switch starting coil.

**LOAD CELL**

Load cell is the type of transducer. It convert force such as tension, compression, pressure or torque into an electrical

signal. The load cell is mainly used measure the cylinder weight and also monitoring every day.

**RESULT AND DISCUSSION**

In this system is used to detect the gas leakage and automatic gas booking system. Electro chemical sensor is used to sense the gas leakage and give alert to the user by using mobile and also buzzer system. The information is displayed on the LCD display in the mobile devices. And also the system is used to reduce the voltage level in the main power supply and it will identify any high voltage is possible to the home appliances and industrial side. This system is very simple and reliable.

**CONCLUSION**

As we discussed about the microcontroller based LPG cylinder booking and leakage detection using GSM this will be verified. This project is very useful to prevent from fire accident and save the human life.

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