

SMART LPG SYSTEM

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Abstract - The primary objects of the this project is to provide a novel means for safely detecting any malfunction of a pressurized gas system in order to protect accumulation of combustible gases so that damage and explosion due to such an accumulation of gases is prevented. Another objective of the present invention is to provide a novel safety means for detecting the leakage of LPG gas into the area of an appliance when the appliance is suddenly shut down due to wind and any other reason. Yet another object of the present invention is to provide a novel gas detection and monitoring system for boats or the like which are normally dependent upon a stored supply of pressurized gas. Typical installation areas are gas yards (Bullets), gas banks with multi cylinders in manifold, utility areas like kitchens. This project is used to monitor the weight of LPG cylinder and send sms through GSM. In our home we observe whenever LPG gas cylinder is empty, we give request for new gas cylinder at the office of service provider. Main reason behind this is delay in informing to the service or we inform the service provider at the last moment when the cylinder is empty. In home and hotels the main use of LPG gas is for cooking. But in industry sometimes LPG gas and some other combustible gas is used for some other purposes. In these places if the LPG gas inside gas cylinder is finished at that time request for new gas cylinder is sent to the storage department but, if there is shortage in stock then delay in providing new gas cylinder. This may cause delay in process and intern delay in production. Main objective of this project is to get alert when there is leakage or when the cylinder is supported to end so that request to service provider can be send at early stage. Another objective is to provide auto switch off to gas supply under accidental conditions using stepper motor etc.

Key Words: microcontroller, GSM module, stepper motor, Gas sensor, load cell, LCD, Buzzer

1. INTRODUCTION

This system helps you to protect your safety standards in day to day life, compulsory requirements on environmental commitments, most important basic function being prevent accidents and protect day to day life. In the past, it has conventional practice to employ combustion equipment such as a furnace or heater or stove or LPG kit in cars, which utilizes a gas to produce heat

energy when properly ignited. In the use of combustible equipment in which a combustible gas such as natural , liquid propane gas is burned in heating boilers, domestic water heaters, ovens, the equipment and appliance is generally of an automatic recycling type. That is to say, the equipment is generally in operation for short periods of time after which is shut down for a short time period. The equipment has intermediate operation and the appliance is generally start and stop at the signal of an automatic controller, such as a thermostat, which may be actuated by temperature, pressure, etc.

Whenever LPG gas cylinder weight is less than or equal to 20% remaining, system sends a low priority, or low warning message to the owner of the house, owner of hotel, industry. So use of first low priority SMS is that user gets intimation about the weight of the gas cylinder. So he/she can immediately place the order / book a new LPG cylinder or gas refilling by online. In some cases user can ignore the first SMS because it has low priority but still there is a 20% gas remaining inside the gas cylinder. 20% means still there are some days for which user can use the gas and whenever the user receives the second SMS then he/she can immediately give booking for the gas .Now days LPG Gas cylinder booking in some cities is done by sending SMS or by online. We have to send SMS from a registered number to the gas booking agency. Then our request is taken means we don't have to dial a call and we don't have to visit the agency personally. This project is helps in implementing the method by sending SMS whenever the gas is empty. We can send SMS to the gas provider agency whenever gas weight is 5%, or empty.

2. RELATED WORK

2.1 Luay Friwan, Khaldon Lweesy, Aya Bani-Salma, Nour Mani , “A Wireless Home Safety Gas Leakage Detection System”, IEEE 2011.

A wireless safety device for gas leakage detection is proposed. The device is intended for use in household safety where appliances and heaters that use natural gas and liquid petroleum gas (LPG) may be a source of risk. The system also can be used for other applications in the industry or plants that depend on LPG and natural gas in their operations. This system design consists of two main modules: Detection and transmission module, and the Receiving module. The Detection and transmitting module detects the detection of change of gas concentration using a special sensing circuit built for this purpose. This module is checks if a change in concentration of gas has exceeded a certain pre-determined threshold. If the sensor is detects a change in gas concentration, it activates and audiovisual alarm and sends a signal to the receiver module. Receiver module acts as a mobile alarm device to allow the mobility within the house premises. This system was tested using LPG and the alarm was activated as a result of change in concentration.

2.2 Rajitha .S, Swapna .T “A Security Alert System Using GSM for Gas Leakage” vol-3, 2012

The primary objective of this project is to monitor for LPG gas leakage to avoid fire accidents providing house safety feature where security is an important issue. The system detects the leakage of the LPG using gas sensor and alerts the consumer about the gas leakage by sending message. This system uses the GSM to alert the person about the gas leakage via message. When the system detects the LPG leakage concentration in the air exceeds the certain level then it immediately alert the consumer by sending message to specified mobile phone and alert the people at home by activating the alarm which includes the LED, Buzzer and simultaneously display message on LCD display to take the necessary action and switch on the exhaust fan to decrease the LPG gas concentration in the air.

2.3 Shivalingesh B.M, Pooja R, Mahesh S.R “LPG Detection measurement and Booking system” Nov 2012.

From this project we get the idea of measuring the Gas and automatic booking. This project is used to measure

the gas detection and also automatic booking.

3. Flowchart

There are two flow chart of this project:

1. LPG LEAKAGE SENSING AND CONTROLLING
- PART2. LPG WEIGHT SENSING PART

1. LPG LEAKAGE SENSING AND CONTROLLING PART

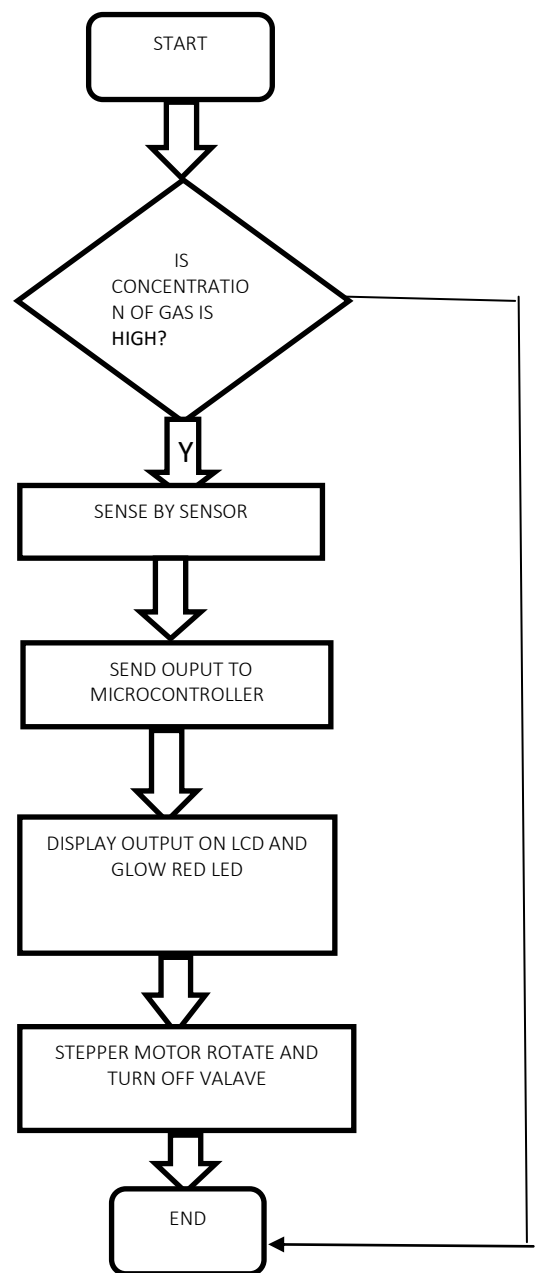


Fig-1: Flowchart for LPG leakage sensing and control

2. LPG WEIGHT SENSING PART:

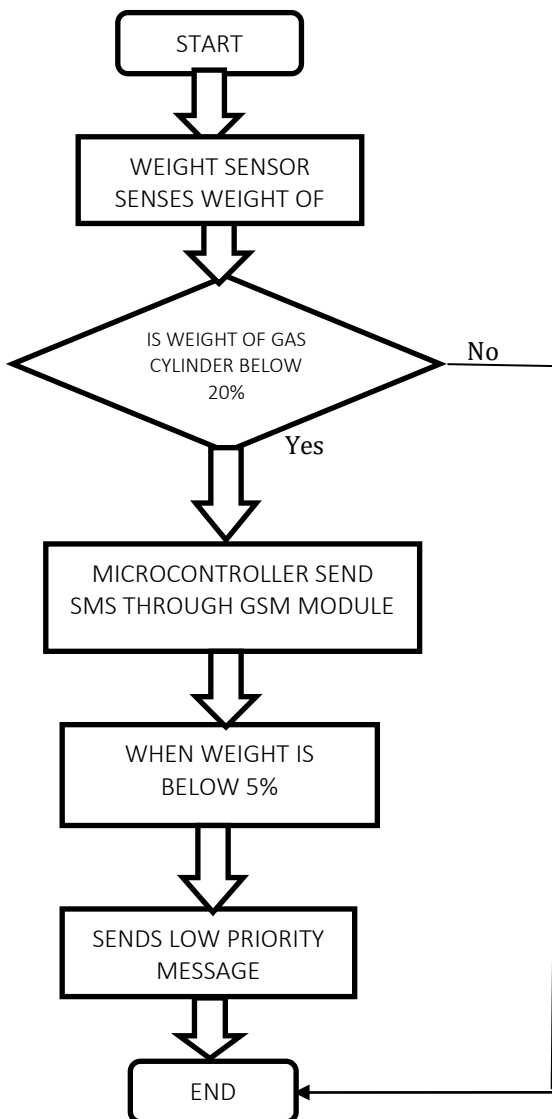


Fig-2: Flowchart for LPG weight sensing

4 Block Diagram

The block diagram of lpg is shown in this fig.3 It consist of following blocks.

DESCRIPTION:

This system is used for day to day life.

LCD Display: we use 16X2 display.

Buzzer: Buzzer is used to indicate the user about the threshold level.

Weight sensor: The function of **Weight sensor** is to give output voltage as per the force/weight applied to it.

LPG gas sensor: It is used to detect LPG gas leakage. It gives analog output voltage which is proportional to the LPG gas sensed.

Microcontroller: We use pic18Fxxxx series microcontroller.

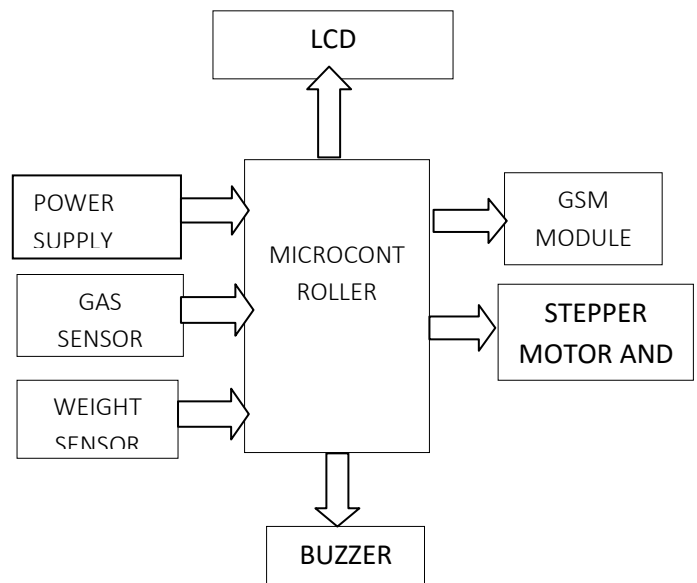


Fig.3: block diagram of SMART LPG SYSTEM

5. CONCLUSIONS

In this project we can detect the gas leakage, control it. And also send the SMS to the consumer when required.

The system detect the level of Gas in the air if it exceeds the safety level then send a SMS to the Consumer using GSM modem and activate the audio-visual alarm which include LED, Buzzer to alert the user at home in abnormal condition and to take the necessary action and display the message on LCD display. The real-time control of home is affordable at low cost and achievable by the use of pervasive sensors and actuators .the automatic working makes the total system much simpler and easily controllable. The wireless modules will be helpful in monitoring any of the devices remotely even over long distances.

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