



A STUDY OF SMART GAS LEVEL MONITORING, BOOKING AND GAS DETECTION OVER IOT

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ABSTRACT

Nowadays gas leakage and gas detection is a foremost problem in our daily lives. Also gas consumption is a major issue that needs to be disputed. The LPG gas is highly flammable and can impose damage to life and property. To evade such conditions, a large amount of effort has been dedicated to the extension of reliable techniques for perceiving gas leakage. A gas reservation/order is being done through the Help IOT and that the continuous weight dimension is using a load cell which is interfaced with a Microcontroller. The LPG gas is really inflammable and can burn even at some reserve from the source of leakage. Greatest fire accidents are caused for leak of gas. In this mission the trade with detection, monitoring and control system of LPG gas leakage. Consuming transmit DC motor the choice handle is repeatedly controlled. Leakage integrity letdowns because of anthropogenic and natural factors make terrible to prevent such emergency in other ways except providing constant monitoring of inflammable gas concentration and notification for people and different services.

Keywords:- Cloud storage, IOT , Gas sensor, GSM, DC motor, microcontroller, load cell.

I. INTRODUCTION

Liquefied petroleum gas (LPG) is currently the most used gas in our home for cooking purposes. LPG gas is a flammable gas, if leaked it can cause major damage to life and property. Therefore it should be used in safe handling manner and additional care has to be taken in order to prevent any leakage possible. The main features of LPG is that being heavier than air, it do not disperse easily and may lead to suffocation when inhaled. The dripped gases exploded may lead to explosion. The number of deaths due to the explosion of gas cylinders has been increasing in recent years. Now a days people are having very busy schedule and hence sometimes they forget or don't get enough time for booking the gas from the gas agency. So it would be much easier and helpful if there was a provision to book the gas automatically. A major amount of gas is being wasted due to the carelessness of consumer's .Sometimes they forget to turn off the burner which may also could lead to damages. The projected system unceasingly measure the weight of the cylinder and as soon

as it reaches the minimum edge it will automatically send an SMS alert to the user as well as authorized LPG agent so that they can act consequently. An added feature is that if the users accidentally forget to turn off the gas burner, the system will inform by activating an alarm. so the problem of wastage of the energy is solved information about gas leak, rebooking, weight of cylinder can be displayed on the LCD.

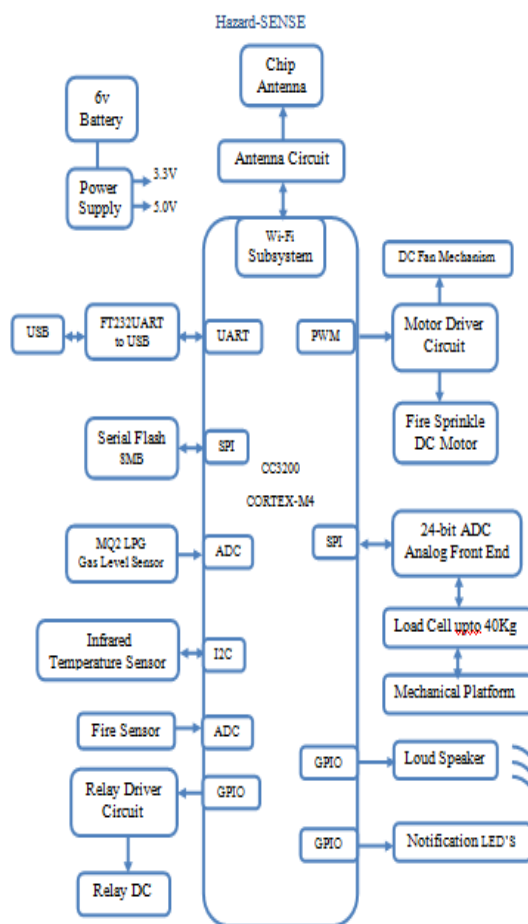


Fig:1 Block Diagram of gas Leakage

II. PROPOSED SYSTEM

The Proposed system contains of gas leakage exposure sensor which is interfaced with a microcontroller. If the leakage is detected microcontroller instantly start the stepper motor to turn off the gas controller. Entirely external coupling is made to turn off gas regulator. Communication will be also displayed on LCD display. Microcontroller will run an audio file when leakage is detected. Load cell is used to monitor the weight of cylinder. GSM segment is interfaced with a regulator which will automatically manuscript the cylinder once weight of cylinder spirits below the dawn. It also used to SMS gas leakage to specified mobile number.

III. Design and Component Description

1)Microcontroller:

The effective and flat working controller is desired to continuously intelligence in both leakage and close to the gas. Then also fast response is involve when leakage is found .Along with this the monitoring system essential provide extra leakage information which can be used in additional processing. The exposure system includes Arduino Duemilanove[3] microcontroller board which is Arduino companionable with microcontroller chip ATmega328p. The Duemilanove is a microcontroller breakout board featuring ATmega328 based on the popular Arduino Footmark with14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz stoneware resonator, a USB connection, a power jack, an ICSP header and reset switch.

These ATmega328 afford UART TTL (5V) sequential communication, which is existing on digital pins 0 (RX) and 1 (TX). The FTDI FT232RL on the boarding networks this serial announcement over USB and the FTDI drivers provide a simulated com port to software on the computer. This device activates between 1.8-5.5 volts.



Fig:2 microcontroller

2)Gas Sensor:

The Gas sensor MQ-6 is very sensitive to LPG, isobutene and propane. These sensor is castoff in gas leakage spotting equipments in national and industrial applications. The suitable for LPG detection and important thing is, it evades the noise signal of alcohol, cooking gases and smoke. Overall clean air it has lower conductivity. If combustible gas is detected, the sensor conductivity increases with increase in gas concentration. Higher sensitivity to LPG, low cost and long life are the main features to select this gas sensor. Voltage variation obtained is from 0.5 volts in clean air to 0.9 volts when leakage detected. Hence 0.7 volts is considered as threshold level indication of gas leakage. If output voltage of 0.7 volts is detected, gas leakage system will be operated.



Fig:3 Gas Sensor

3)Load Cell:

Where it must be aware in advance of amount of gas in the cylinder, before rebooking the cylinder to the provider. For this purpose the weight sensor is used, thus it monitors the level of gas present in the cylinder for standardization purpose the weight sensor is used along with load cell. The load cell is a transducer that is used to generate an electrical signal whose extent is directly proportional to the force being unrushed. Strain gauge load cells are the most shared in industry. These load cells are particularly firm, have very good character values, and incline to have long life cycles in submission.

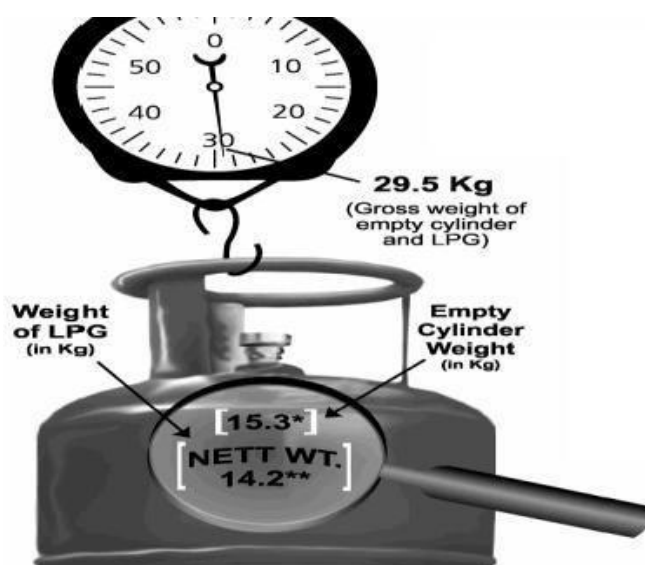


Fig:4 Load Cell

4)MQ2 Sensor:

Gas detector is a artificial that detects the presence of gases in an zone, regularly as part of a safety system. Gas Sensor (MQ2) element is useful for gas leakage recognition. It is suitable for perceiving H₂, LPG, CH₄, CO, Alcohol, Smoke or Propane. Due to its high sensitivity and fast reply time, dimensions can be busy as soon as imaginable. The compassion of the sensor can be familiar by using the potentiometer.



Fig:5 MQ2 Sensor

5) Infrared Sensor

Infrared sensor is an electronic device that produces in order to intelligence some parts of the surroundings. An IR sensor can be measure the temperature of an object as well as detects the motion. These kinds of sensors measures only infrared radiation, relatively than emitting it that is called as reflexive IR sensor. Typically in the infrared spectrum, all the objects radiate around form of thermal radiations. These types of radiations are invisible to our eyes that can be detected by an infrared sensor. When IR light cascades on the photodiode, the resistances and these output voltages, variation in proportion to the scale of the IR light established.



Fig:6 Infrared Sensor

6) GSM:

GSM modem is extremely flexible plug and play modem based on tri-band sim300. Sim300 can fit almost all the space requirements in much real-time application. This global system for mobile communication technology making it very easy to send and receive the messages support the AT commands. These commands can be implemented by interfacing to the receiver and transmitter pins of microcontroller. MQ6 gas sensor detects the leakage of gas, weight sensor provides the level in cylinder, and microcontroller will take the protective and necessary action.

IV. Operation of System

1) Leakage Detection system:

Leakage detection system the MQ6 gas sensor is used which is sensible to LPG, isobutene and propane gases. This sensor sends a signal to the microcontroller when gas is being leaked. An attentive message is sent through the GSM[8][9] to the user and a timer alarm is activated in the room. This alarm produces huge sound which drops down the attention of user and neighbours in current leak/fire coincidences. These alert message will be displayed on LCD Instantaneously.

2) Refilling of Cylinder:

LPG cylinder refilling unit comprises mainly the load sensor, which is attached with to the ATmega328p microcontroller. When the load of the cylinder reaches the below the predetermined value the GSM modem interfaced to the microcontroller sends booking request to the distributor. The distributor will verify the validity of customer in the

database and consequently an acknowledgement message is sent through GSM modem to the user repeatedly.

V. INTERNET OF THINGS(IOT):-

The capacity of various things to be related to each other through the Internet or network of physical devices (vehicles, building) related to fixed device (software, sensor) complete internet. IOT permits the object to sensor collect remotely across network of structure. Thus IOT contains various domains, protocols, application. The interconnection of these rooted devices is expected to help in automation in nearly all fields, whereas also enabling advanced requests like a smart grid and growing to the areas such as smart cities. At the same time, IOT is powerfully tied to the big data time due to the massive data that the “Things” can produce. For the interconnection of these strategies, changed wired or wireless standards exist. IOT provide numerous built-up and enterprises solution through latest technology. The roughly covers M2M communication, smart grids, smart building, smart cities and many more submission. Consuming IOT in smart cities/smart buildings can positively deliver dependable and efficient solutions as it will allow the user to interact with the objects.

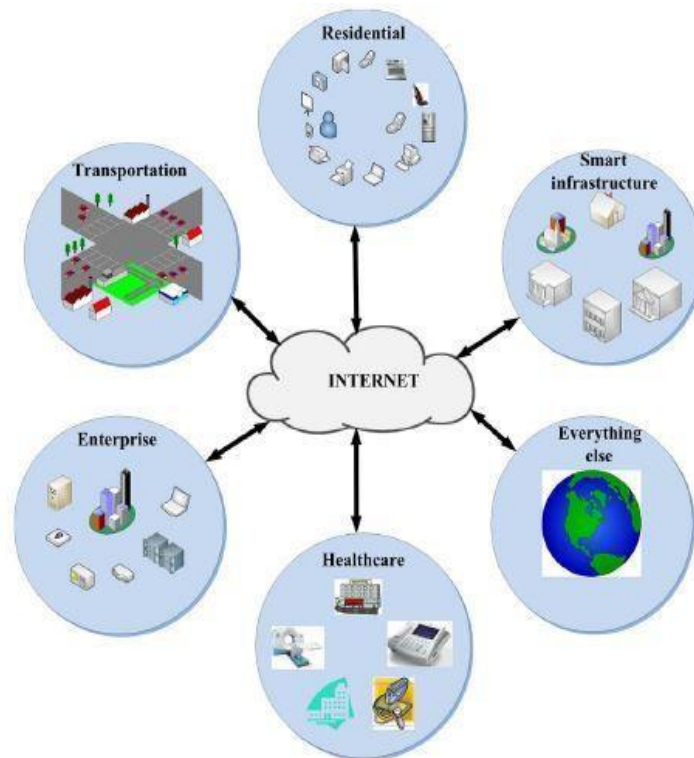


Fig:7 Basic IOT diagram

VI. CONCLUSION

In our modern scenario the usage of LPG has increased in a greater manner. As a result of this, the damages caused by the leakage of gas is increasing day by day. Thus to eliminate this problem we are introducing a highly advanced system known as Internet Of Things (IoT). It is used in a wide range of applications in present day society and introducing a vast scope to the future. Our proposed system is more effective and ecofriendly due to the reason of

detecting the leakage of gas and controlling the gas valve. So it is mainly designed for the safety of people and property. Consuming IOT, it also allows us to book the gas from the gas agency, when the weight of the gas cylinder decreases below a threshold value. This monitoring and exposure system is planned mostly to meet the security standards and to avoid fire accidents because of leakage.

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