GAS LEAKAGE MONITORING AND ALERTING SYSTEM

DOMAIN : IOT

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ABSTRACT

Safety plays a major role in today's world and it is necessary that good safety systems are to be implemented in places of education and work. This work modifies the existing safety model installed in industries and this system also be used in homes and offices.The main objective of the work is designing micro controller based toxic gas detecting and alerting system. The hazardous gases like LPG and propane were sensed and displayed and notify each and every second in the LCD display. If these gases exceed the normal level then an alarm is generated immediately and also an alert message(Email) is sent to the authorized person through the INTERNET and used ARM development board. The advantage of this automated detection and alerting system over the manual method is that it offers quick response time and accurate detection of an emergency and in turn leading faster diffusion of the critical situations.

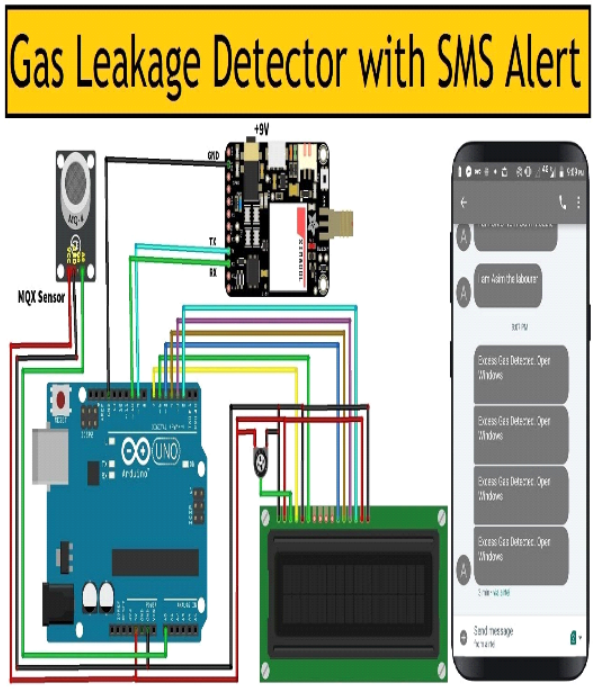
INTRODUCTION

The internet of Things is a developing topic of technical, social, and economic significance.Consumer products, hard-wearing goods,cars and trucks, industrial and utility Components, sensors, and additional everyday objects are being united with Internet connectivity and powerful data analytic competences that promise to transform the method we work and all other routines as well.The Internet of Things (IOT) is a significant topic in technology industry, policy, and engineering circles and has become front-page news in both the specially press and the popular media. This technology is embodied in a wide spectrum of networked products, systems and sensors, which take the advantages of development in computing power, electronics miniaturization, and network interconnection to offer new abilities not previously possible.

GSM MODULE

GSM Module Global System for Mobile/ GPRS (General Packet Radio Service) TTL modems SIM900A (general) quad-band GSM/ GPRS device, works on frequencies which is used to communicate over the mobile network. Its very compact in size and can be easily to use as plug in GSM Modem. The Modem is designed with 3V3 and 5V DC TTL interfacing circuitry and can operate in the range of 5.2V-12V. This allows the users to directly interface with 5V microcontrollers (Arduino, 8051 microprocessors, etc.).The significant mischance

identified with the utilization of LPG occurs because of the spillage of the gas which is hazardous. Gas holes can happen from the gas barrels which are utilized as a part of all the family unit of India.



The other probability of gas spillage is from the gas pipeline as the old pipelines regularly get consumed and subsequently may burst, offering path to the leakage of the gas. On the off chance that LPG releases, the odds of flame perils are at its crest as LPG is a combustible gas. LPG Gas spills have been expanded from 0.72% of all kitchen accidents to 10.74% of all the kitchen mishaps. A PC program to run online to distinguish the spillage areas has been begun and it works as the programmed administrator of the pipelines in remote regions. Basic Gas spill Detector is a straightforward gadget which is utilized.

GAS SENSOR

The Figure below of the MQ-2 gas sensor unit may commonly illustrate us more

LPG sensor It is an ideal sensor to detect the presence of a dangerous LPG leak in our home or in a service station, storage tank environment and even in vehicle which uses LPG gas as its fuel. This unit can be easily incorporated into an alarm circuit/unit, to sound an alarm or provide a visual indication of the LPG concentration. The sensor has excellent sensitivity combined with a quick response time. When the target combustible gas exist, the sensor's conductivity is higher along with the gas concentration rising. LPG gas sensors change of conductivity to its corresponding output signal of gasconcentration. MQ-2 gas sensor shown in figure is used to sense the poisonous gas and has high sensitivity to LPG, and also response to Natural gas. It is a portable gas detector which has long life with low cost.. Model No. MQ-2 Sensor Type Semiconductor Standard Bakelite (Black Bakelite) Detection Gas PROPANE, HYDROGEN,LPG Concentration 300-1000ppm (Hydrogen, Propane, LPG). When the target combustible gases exist, the sensor's conductivity is higher along the gas concentration increasing Raspberry pi 3 has been used as a single-board computer with wireless LAN and Bluetooth .It is a powerfull processor which can run full range of ARM GNU/Linux distributions as well as windows 10 IOT edition. The raspberry pi 3 is installed in our project model which supports linux operating system and python language coding commands which helps us to control and monitor the detected gas level through a sensor and it is interfaced with a free web page is linked via cloud interface raspberry pi 3 model which in turn is runned with set of python coding commands which detects and tells us about the real time value of gas level in the plant via MQ-2 sensor units.

METHODS AND MATERIAL

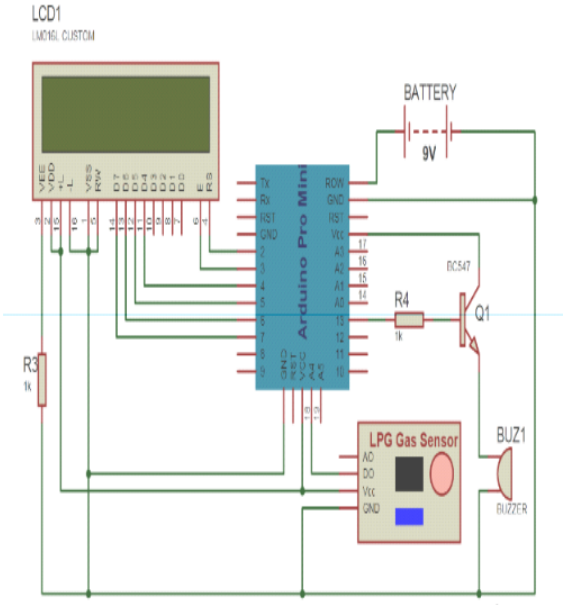
System Input, Output, Function, Success, Failure Input: Sensor data signal which is not regular or Change in Signal Output: End User get informed with alert buzzer and Display to LCD Functions:

1. Access ():- In this module we are going to access the feature provided by the module which Will include Sensor data access.
2. Control ():-In this module we are controlling the Alert System by using System which is connected to hardware or sensor data.
3. Broadcast ():-In this module we are going to broadcast the alert Display to LCD.

4. Success Conditions: If such data which is received through sensors are not stable or are more than threshold it will predict that there is leakage situation
5. Failure Conditions: Desired output is not generated due to following failures.
    1. Software Failure
    2. Hardware Failure
    3. Network Connection failure

GAS LEAKAGE DETECTOR USING GSM & ARDUINO WITH SMS ALERT

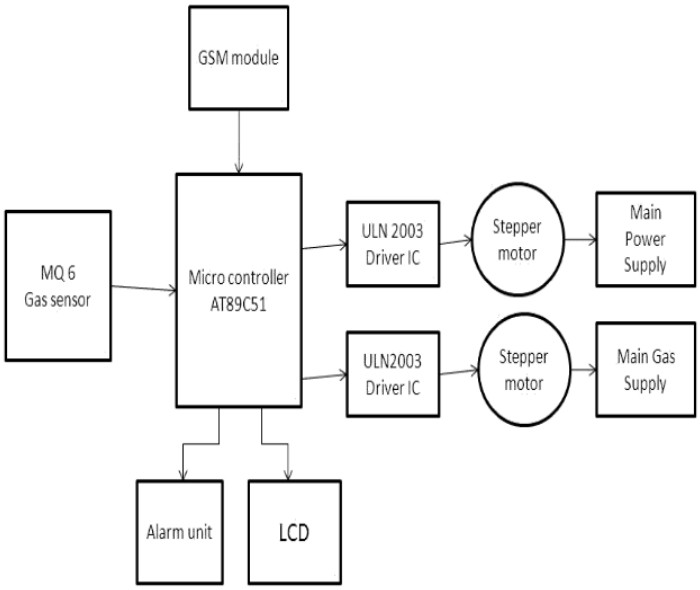
In this project, we are going to learn how to design a Gas Leakage Detector using GSM & Arduino with SMS Alert. We will interface Sim800 GSM Module as well as MQ135 Gas Sensor with Arduino. The gas level value will be displayed on the 16x2 LCD Display. Whenever the excess gas is detected SMS will be sent to a particular phone number.



Smoke and gas leakage detectors are very useful in detecting smoke or fire in buildings, and so are the important safety parameters in order to prevent disasters. Bursting cylinders and accidental fires have caused lots of harm to the economies in the past. This circuit triggers the alert system when smoke or gas leakage is detected. The circuit mainly uses the MQ135 Smoke/Gas sensor and Arduino to detect and smoke and gas leak. This MQ135 gas sensor is sensible to LPG, Alcohol, and Methane etc.It detects the presence of a dangerous LPG leak in your car or in a service station, storage tank environment. The sensor has excellent sensitivity combined with the quick response time. The sensor can also sense iso-butane, propane, LNG, and cigarette smoke.

BLOCK DIAGRAM

BLOCK DIAGRAM



CONCLUSION

In this system we have describe a newapproach for gas leakage detection system at a lowconcentration. The leakage is detected with the help ofMQ-5 gas sensor. Sensor sends a signal tomicrocontroller. In the next step microcontroller sends anactive signal to other externally connected devices. Thefficiency an d memory of t hen Microcontroller canbeincreased ifATME28P microcontroller is used inplace of PIC multiple SMS can be sent by changingprogramming GSM module. To change the SIM card wehave to make changes in program. In future we will addautomatic door opening application, and as well asautomatic closing of cylinder valve when ever gasleakage is detected