GAS LEAKAGE DETECTING SYSTEM

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ABSTRACT

Nowadays the home safety detection system plays an important role for the security of people. Since all the people from the home go to work on a daily basis, it makes it impossible to check on the appliances available at home, especially LPG gas cylinders, wired circuits, Etc. Since the last three years there has been a tremendous hike in the demands of liquefied petroleum gas (LPG) and natural gas. To meet this access amount of demand for energy and replace oil or coal due to their environmental disadvantage, LPG and natural gas are preferred. These gasses are mostly used on a large scale in industry, heating, home appliances and motor fuel. So as to track this leakage gas, the system includes an MQ6 gas sensor. This sensor senses the amount of leak gas present in the surrounding atmosphere. Through this, explosions or getting affected by the leakage of gas could be avoided.

INTRODUCTION

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 sensitive 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. If the LPG sensor senses any gas leakage from storage the output of this sensor goes low. This low signal is monitored by the microcontroller and sends the signal to the GSM module to send messages as "Gas Leakage" to a mobile number written in code.

PROPOSED WORK

Figure 1 represents the block diagram of the gas leakage detection and alerting system.Arduino UNO(Atmega-328) is the main unit of the system which performs the following tasks.

A signal conditioning of the Arduino Uno is done by the output signal of the sensor,provided input to Arduino.

The detection results displayed on LCD.

Indicates the people of Danger in workplace,factory,home.Buzzer activity with beep(siren) sound is made.

Also send alert SMS to the in charge of the plant whose number is saved in the SIM card using GSM modem.The SMS received depends upon the leak of gas in the detection area of the sensor
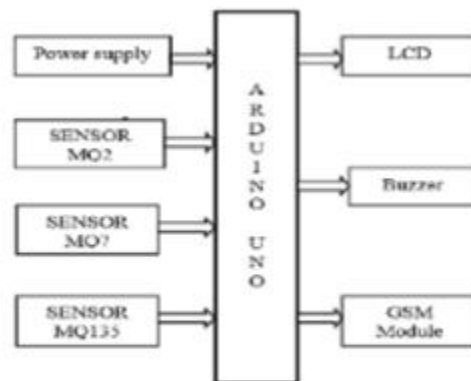

Figure 1 Block Diagram of gas leakage detecting and alerting system

HARDWARE DESCRIPTION

Arduino UNO:

Microcontroller Arduino UNO is employed is shown in fig 2.Th central unit of the system is arduino board,where all the components are interfaced externally on the board and programmed as per their functionality to work in synchronization.it's and electronic prototyping platform/board supported Atmega-328 which is of 8-but,16Mhz.during this serial communication is enabled and has 14 digit input/output pins(out of which 6 are PWM) and 6 analog input pins.It operates at 5v.every pin contains a specific function to control.

The storage is non-volatile storage and EEPROM.The key comparison of a non-volatile storage with EEPROM is that the incontrovertible fact that non-volatile storage contents are erasable.In contrast to a EEPROM ,the entire device is erased.where one can erase and judge on bases of Byte.thanks to the actual fact that the programming of the non-volatile storage performed while

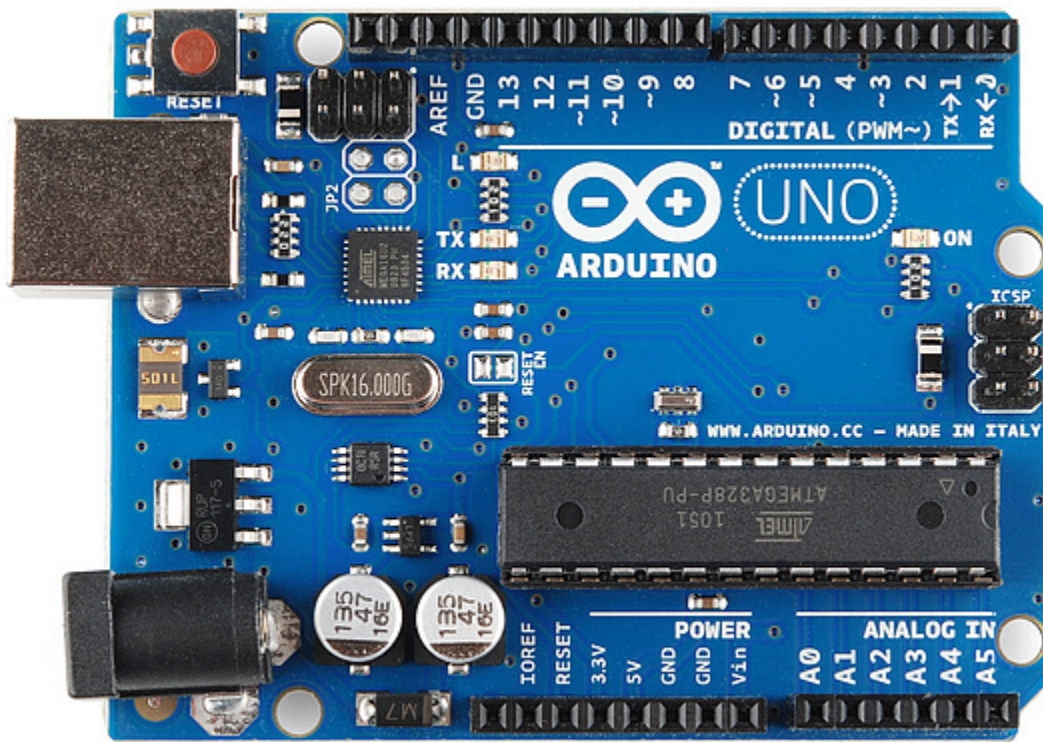it's on the system board socket.BIOS ROM of the PCB is the new upgrade which is immensely used.

fig:2(Arduino uno board)

MQ2 Sensor:

MQ-2 gas sensor module is shown in fig.3.It is a sensor detector used to detects the flammable smoke concentration of the combustible gas in their air,output is read in the analog voltage and digital value output.Supply input voltage is 5v.it is very sensitive to H2,LPG,CH4,CO,SMOKE,PROPANE.it has three pins for transmitter,receiver,ground and sensitivity can be adjust by the potentiometer .Detects LPG from 200 ppm to 1000 ppm.
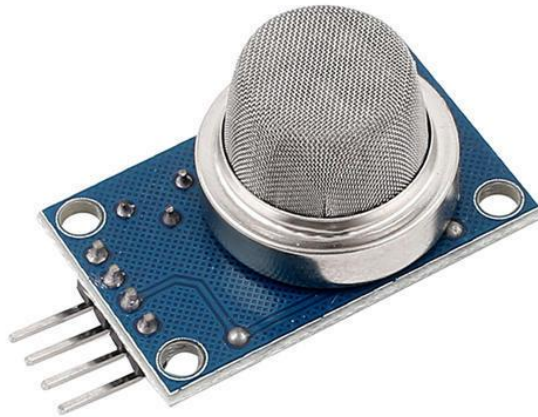
fig 3:(MQ2 sensor)

GSM Module:

SIM 900 GSM module is employed to send SMS alerting on gas detection.GSM is meant as a device used for exchanging the information.SIM card is recovered from the GSM to control the wireless node 5 volts of the DC supply is required by the GSM for functioning .The modem needs only three connection(transmitter,receiver,ground) to interface with Arduino controller Atmega-328 the excess power supply is used.Arduino microcontroller is connected with the receiver pin to the device.The arduino provide information to the GSM device.The GSM send an output to through the SIM inserted into its SIM slot to number written into the code to alert about the leakage of the LPG gas or the other gas sensed by the sensor.AT commands are accustomed communicate with GSM module and it's shown in figure 4.

fig 4:(GSM module)

BUZZER:

Buzzer is used to alarm the beep sound to indicate and warn the danger to the people working around.The buzzer is the output of the System.The sound of the buzzer is beep-beep,which indicates the danger.Refer figure 5 below.

Fig 5:(piezo buzzer)

LCD:

LCD is employed for displaying the message indicating that"gas detected at zone" into the display,which is initially coded in program to display the danger.The message been displayed on the LCD,data and command both are register of LCD and it's shown in fig5.THe register selects is employed to modify the registers .data register RS=1,whereas for the command register RS+0 is employed.

Fig 6:(LED 16x2 display)

SOFTWARE IMPLEMENTATION:

Figure 6 shows the chart flow of implementation of the software proposed system.This system monitors the gas,smoke by sensor 1,sensor 2,sensor 3.If any gas is detected the signal of sensor goes low and activate the Arduino UNO.Which send signals to the LCD("GAS DETECTED AT ZONE"),where sensor 1 is for zone,sensor 2 to zone 2 and sensor 3 for zone 3 respectively,Buzzer and GSM to alert the people about danger and if no gas is detected then LCD displays "NO GAS DETECTED "in its 16x2 display.
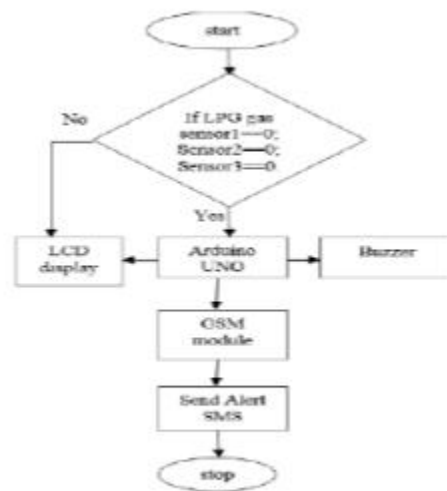

Figure 6 Flow Chart of Proposed System

RESULTS AND DISCUSSION:

Figure 7 shows the schematic diagram of our project .The technique has been tested by leak of gas almost about sensors,MQ2 gas sensor sends the signal to the Arduino UNO after detecting the gas leakage.Arduino to other externally connected device such as LCD ,buzzer and GSM send vigorous signals.SMS is sent by GSM module to the provided mobile number as a result ,In practice,results for are noticed by the people surrounding by the area are displayed in the LCD and buzzer sound indicate the danger to the people by making beep sound.
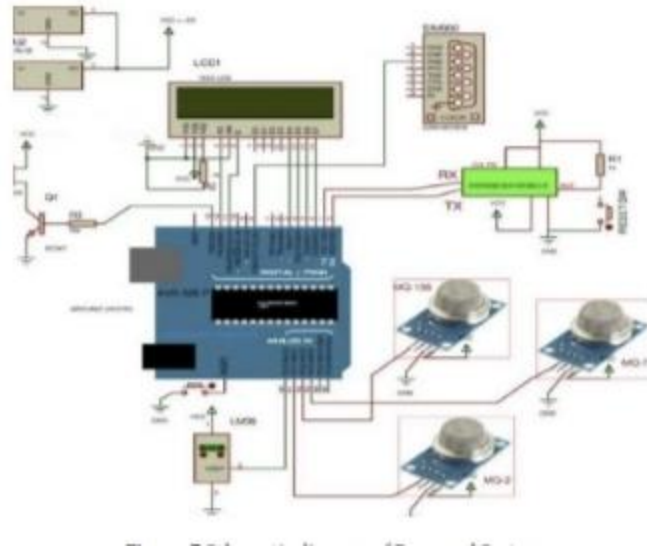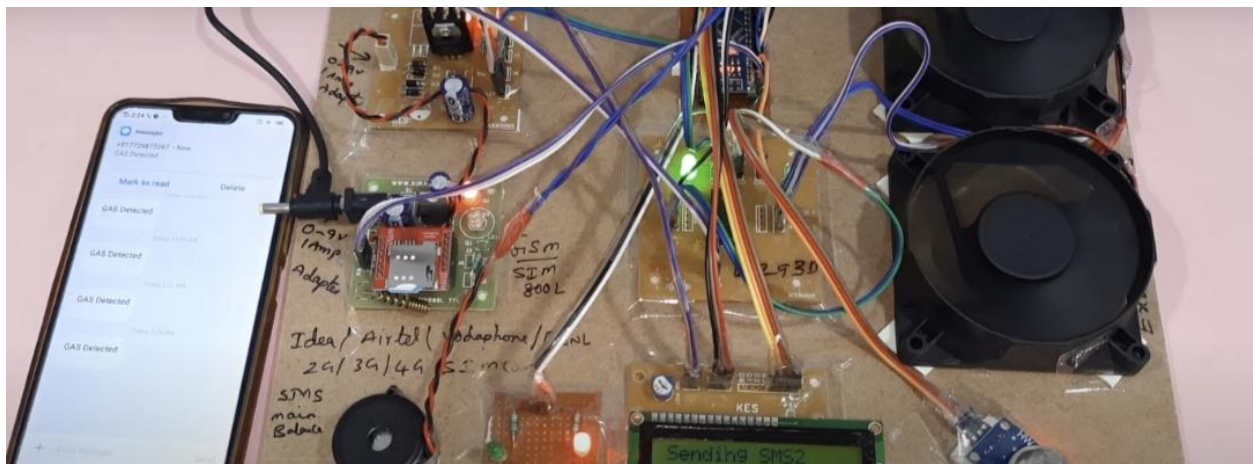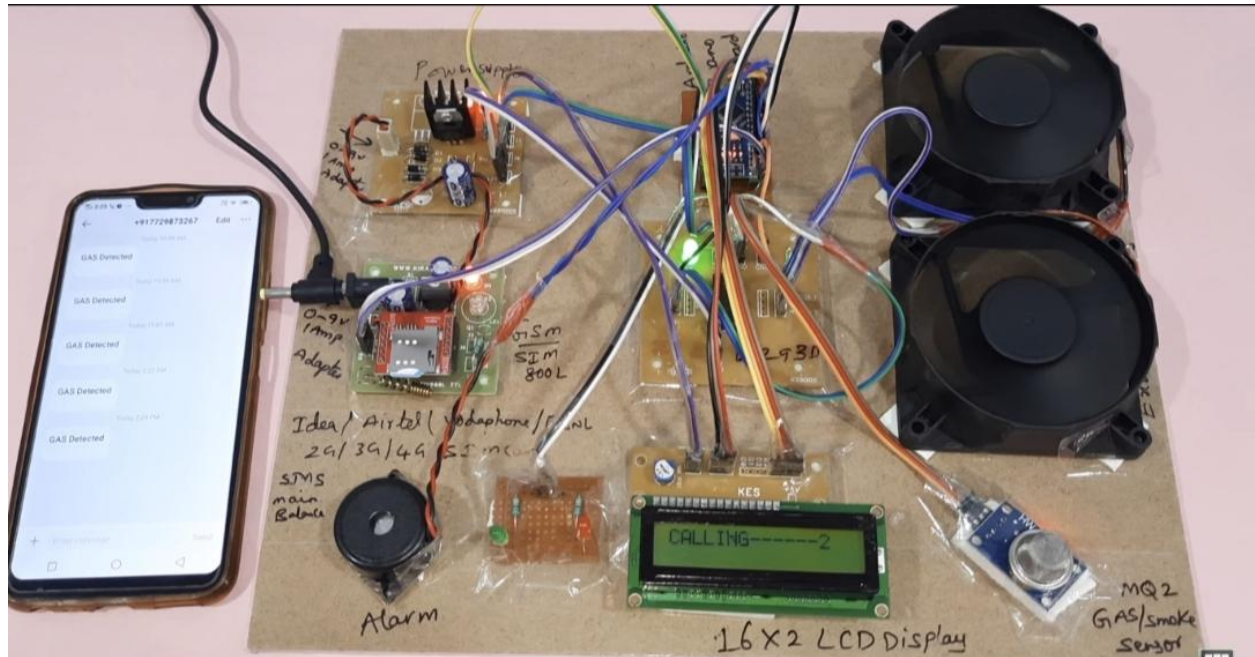
Fig 7:(working of proposed system)

CONCLUSIONS:

After this project performance,can conclude that detection of the LPG gas leakage is incredible in the project system.Applicable usefully in the industrial and domestic purpose.In danger situations we are able to save the life by using this system.An alert is indicated by the GSM module.A sensor node senses gas like CO_2,oxygen,propane.The simple procedures and Arduino UNO microcontroller area used to build the sensor.