GSM BASED SMS ALERT FIRE ALARM USING ARDUINO

Abstract:

This paper describes the design of a home fire alarm with Arduino-based system by means of GSM Module. An LM35 temperature sensor is used to detect the heat from the fire. An alert message will be sent to the user via short message service (SMS) via GSM module.

INTRODUCTION and OBJECTIVE:

In this project, we are going to build a Fire Alarm System using Arduino, LM35 Temperature Sensor and GSM Module. The objectives of this fire detector using arduino is to sense the surroundings for occurrence of fire with help of LM35 temperature sensor, and send 3 SMS alerts to two mobile numbers stored inside the arduino program if fire is detected (using GSM Module). We are going to build a very interesting project – a Fire Alarm System which will send SMS to a set of Mobile Numbers when fire occurs in a particular location. We have seen many typical Fire Alarm projects which will alert with a siren or that activate an automatic shutdown mechanism. These fire alarm projects make use of modern communication technologies to deal with emergencies.

Block Diagram and Circuit Diagram
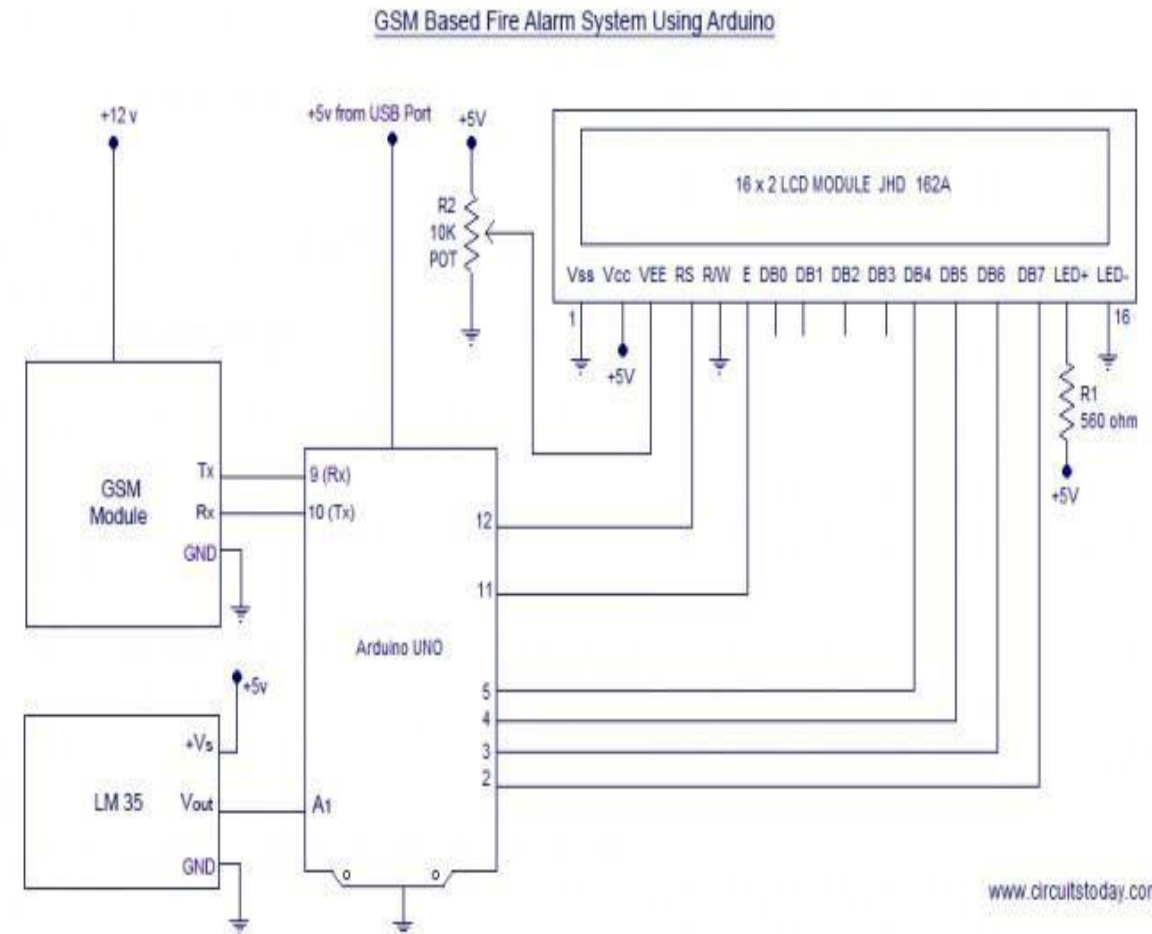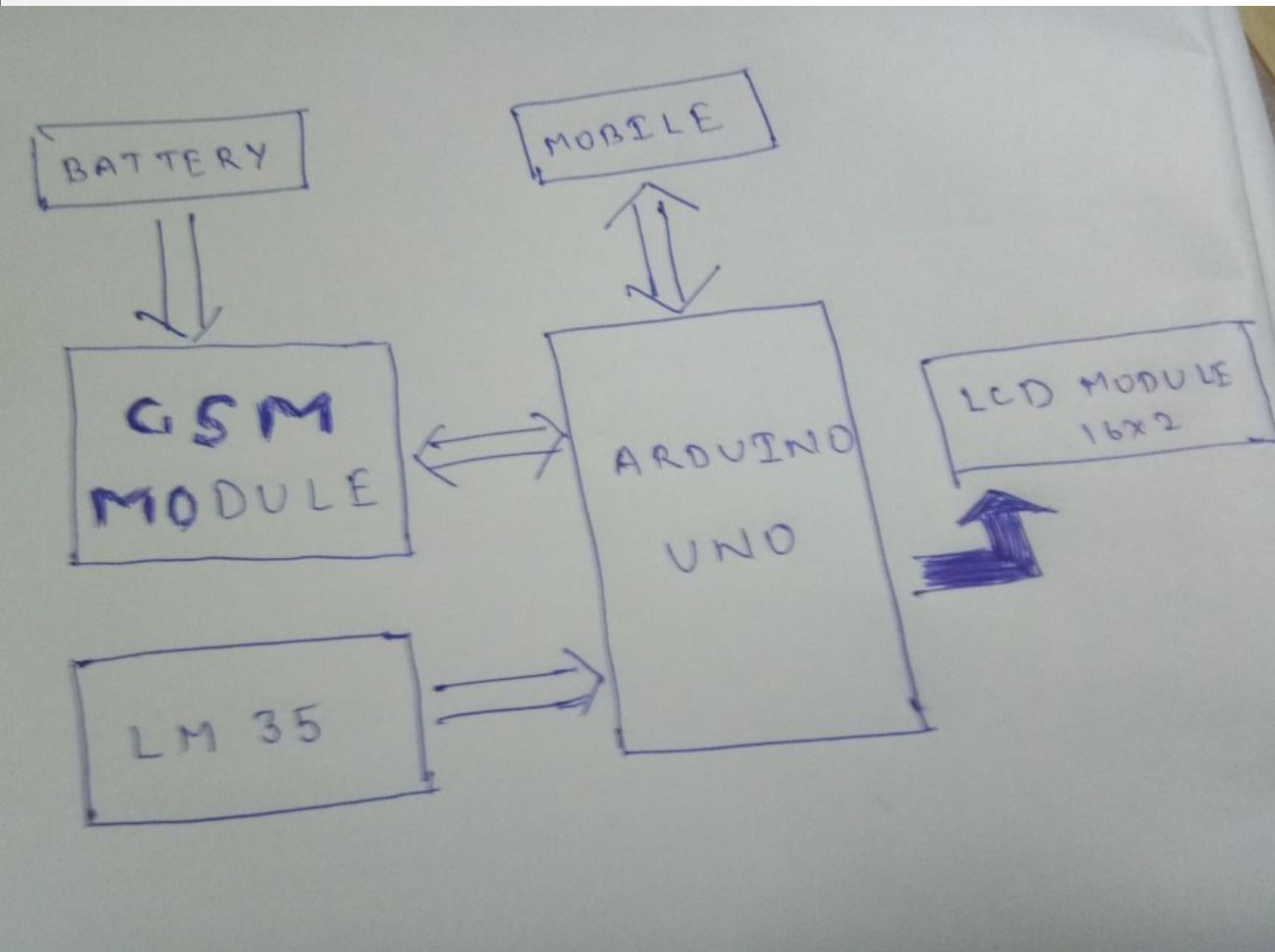
Purpose of making the project:

We know that if the burner is remained on for short span of time in the kitchen, it may caught fire. If no one is there in the kitchen it may cause some dangerous thing. According to that purpose only we have made a fire alarm system. We have made small system which will be placed near kitchen arena. We used LM 35 temperature sensor for sensing the heat. This system will work on the principle of simple fire alarm. Our project is based on new technologies. We have used GSM module for sending notification to registered mobile number. When fire is caught near kitchen, GSM module will send 3 notifications to 2 mobile numbers and due to this concerned one will notified. So they can take action as soon as possible. For our purpose we have connected LCD module. the same will be displayed on it too.

Code:

```
#include <SoftwareSerial.h>
#include<LiquidCrystal.h>
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
SoftwareSerial mySerial(0, 1);

int sensor=A1;
float temp_read,Temp_alert_val,Temp_shut_val;
int sms_count=0,Fire_Set;


void setup()
{
 pinMode(sensor,INPUT);
 mySerial.begin(9600);
 Serial.begin(9600);
 lcd.begin(16,2);
 delay(500);
}

void loop()
{
CheckFire();
CheckShutDown();
}
```

```
void CheckFire()
{
lcd.setCursor(0,0);
lcd.print("Fire Scan - ON");
Temp_alert_val=CheckTemp();
if(Temp_alert_val>45)
{
 SetAlert(); // Function to send SMS Alerts
}
}

float CheckTemp()
{
temp_read=analogRead(sensor); // reads the sensor output (Vout of
LM35)
temp_read=temp_read*5;   //converts the sensor reading to
temperature
temp_read=temp_read/10; // adds the decimal point
return temp_read; // returns temperature value in degree celsius
}

void SetAlert()
{
while(sms_count<3) //Number of SMS Alerts to be sent
{
SendTextMessage(); // Function to send AT Commands to GSM module
}
```

```
Fire_Set=1;
lcd.setCursor(0,1);
lcd.print("Fire Alert! SMS Sent!");
}

void CheckShutDown()
{
if(Fire_Set==1)
{

Temp_shut_val=CheckTemp();
if(Temp_shut_val<28)
{
lcd.setCursor(0,1);
lcd.print("Fire Shut! SAFE NOW");
sms_count=0;
Fire_Set=0;
}}}

void SendTextMessage()
{
mySerial.println("AT+CMGF=1");    //To send SMS in Text Mode
 delay(2000);
```

```
mySerial.println("AT+CMGS=\"+918758097766\"\r"); // change
to the phone number you using
 delay(2000);
 mySerial.println("Fire in NEW ROOM!");//the content of the
message
 delay(200);
 mySerial.println((char)26);//the stopping character
delay(5000);
mySerial.println("AT+CMGS=\"+918758097766\"\r"); //
change to the phone number you using
 delay(2000);
 mySerial.println("Fire in NEW ROOM!");//the content of the
message
 delay(200);
 mySerial.println((char)26);//the message stopping character
 delay(5000);
 sms_count++;
}
```

Small description for how this system works:

First we make all the connections and upload the code to arduino board. We give 12V supply to GSM module. When temperature of the surrounding become very high (greater than we set it in our code) then we receive SMS alerts.

Here we insert one big sized SIM card in the GSM module. We start the lighter and place beside the LM 35 temperature sensor. This will sense the temperature. If the temperature is higher, we can see the "Fire in the room" displayed on the LCD screen. At the same time SMS alerts are sent to 2 mobiles which are entered in the code. This will do 3 times. When fire is safe at that particular place, the same will display "fire is safe" on the LCD module.

Discussion on the project we made:

Our project was based on the recent news that a house in vellore was burnt down due to a small fire in the kitchen.our project was aimed towards the people who cannot afford high-end fire alarms due to their pricing

The project was made small and affordable and was also made it easy to install and maintain

We tested our fire alarm with serious of tests and we concluded that if the temperatue reaches 70 degree C The alarm would send an alert SMS to the registerd mobile numbers.the accuracy of the alarm was 9/10 times.

References:

http://www.circuitstoday.com/gsm-based-fire-alarm-system-using-arduinohttp://www.circuitstoday.com/gsm-based-fire-alarm-system-using-arduino

https://www.instructables.com/id/Fire-Alarm-System-GSM-based-using-Arduino/