

Home Security System using GSM and GPS

Mohammad kaif¹, Aditi Yadav², Nidhi kumari³, Prachi pandey⁴, Ravindra Singh⁵

¹Student, Department of ECE, UCER Allahabad, Uttar Pradesh, India

²Student, Department of ECE, UCER Allahabad, Uttar Pradesh, India

³Student, Department of ECE, UCER Allahabad, Uttar Pradesh, India

⁴Student, Department of ECE, UCER Allahabad, Uttar Pradesh, India

⁵Professor, Department of ECE, UCER Allahabad, Uttar Pradesh, India

Abstract-Interest among customers in the brilliant as of late, there has been a developing home idea. Home Security System addresses and reports the situation with the associated gadgets in an instinctive, easy to understand interface permitting the client to cooperate and control different gadgets with the bit of a couple of catches. There are different advances utilized for Home Security like Bluetooth, WiMAX and Wireless LAN (Wi-Fi), GPS, ZigBee, and GSM. Among these GSM is the most generally utilized innovation on the planet. In this paper, we are proposing the use of various types of sensors such as Gas Leakage sensor and Fire Sensor to detect the change in surrounding of the home and notify

the user and fire station officer by sending an SMS via GSM module SIM900A and location to fire station via GPS NEO 6M. So that the user get early notification and officer get the location of place and can reach with immediate effect and control the situation so that there is not any large casualties. This system can control the situation at some extend by itself as we have use 2 solenoid valve and exhaust fan. If there is fire outbreak then the first solenoid valve will open and release the water on fire spot. If there is gas leakage then the second solenoid valve operate and it will block the main gas supply and the exhaust fan will remove the leaked gas. So our system is capable of handling the situation till there is any response from user.

Keywords: Global positioning system(GPS), Global system for mobile communications(GSM), Security, Sensors, Arduino, solenoid.

1.INTRODUCTION

The execution of Home Security Systems is a lot of fundamental in this day and age as there is a developing interest for security and insurance from different sort of dangers and weaknesses. Because of the usability and minimal expense our framework gives a decent measure of safety for the client just as it is not difficult to work and introduce.

This task is tied in with delivering an alarm cautioning framework dependent on Global System for Mobile (GSM) organization. It will be utilized to recognize the presence of gaseous petrols just as fire. At whatever point gas spillage or fire happens, the sensors utilized in the circuit will distinguish it and the GSM modem will convey a SMS alarm to the client and furthermore to the closest fire station alongside area to closest fire station utilizing GPS. With the system that provides a real-time notification, it increases the response time of the owner. This will provide the immediate aid to the situation occur. This system can be installed in kitchens, Liquefied Petroleum Gas (LPG) storage rooms, near the Natural Gas Vehicle (NGV) tank in mobile cars or any

places thinks required. **1.1Microcontroller Arduino UNO**

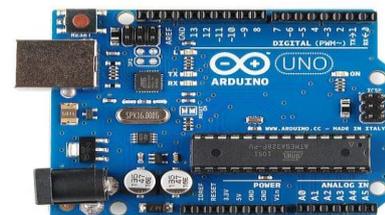


Fig 1: Microcontroller Arduino

The Arduino Uno is a microcontroller board based on the Atmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to- DC adapter or battery to get started. UNO Microcontroller is programmed using an Arduino Integrated Environment or rather Arduino Software [IDE]. This IDE

helps in writing an instruction code for the Arduino. Arduino can interact with buttons, LEDs, motors, speakers, GPS units, cameras, the internet, and even your smart-phone or your TV!

1.2 SIM900A GSM



Fig 2: GSM Module

This is a very low cost and simple Arduino GSM module. This module supports communication in range of 910MHz band. In India, most of the mobile network providers operate in the 900MHz band. If you are from a different country then you have to check the mobile network band in your country. A majority of the mobile networks in USA operate at 820MHz band (the band may either be 820MHz or 1800MHz). Canada operates primarily on 1900 MHz band. This is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 850/900/1800/1900MHz and which can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMSs.

1.3 GPS Modem



Fig 3: GPS Modem

Main function of GPS Global Positioning System modem is to provide longitude and latitude of the ambulance. The GPS modem receives data from satellite. And then it gives this bunch of data to Microcontroller through serial communication. As ambulance moves along the way from patient's home to hospital, the co-ordinates of ambulance location will change and these variations are given to Microcontroller. In our project we are using GPS Modem of BLOX NEO 6M Series.

2. SENSORS

Sensors are one of the main entities in this project. They are responsible for detecting the required changes in the environment and report to the micro controller for further actions.

1.1 Gas Sensor



Fig 4: Gas Sensor

This sensor is basic for identifying LPG gas. It is suitable for detecting LPG fixations noticeable all around or the encompassing environment in a predetermined reach. It can distinguish gas in a reach from 200 to 10000ppm. It's anything but an extremely high affectability rate and speedy reaction time. The yield of the sensor is in the simple obstruction design. Drive circuit is an excessive lot of basic; we should simply give capacity to the radiator loop of 5V, add a heap obstruction, and interface the yield to an ADC converter.

2.2 Flame Sensor

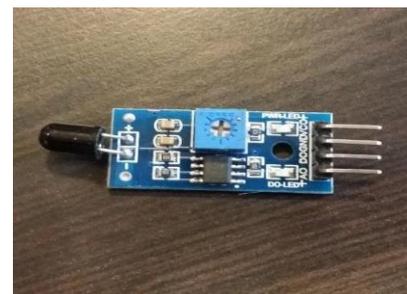


Fig 5: Flame Sensor

A fire alert framework has various gadgets cooperating to identify and caution individuals through visual and sound machines when smoke, fire, carbon monoxide or different crises are available. Fire detector are designed to respond at an early stage to one or more of the four major characteristics of combustion, heat, smoke, flame or gas. These cautions might be enacted naturally from smoke sensors, and heat identifiers or may likewise be actuated by means of manual fire alert initiation gadgets, for example, manual call focuses or pull stations. A fire

detector is usually implemented as a smoke sensor due to its early fire detection capability, fast response time and relatively low cost.

4. OVERVIEW

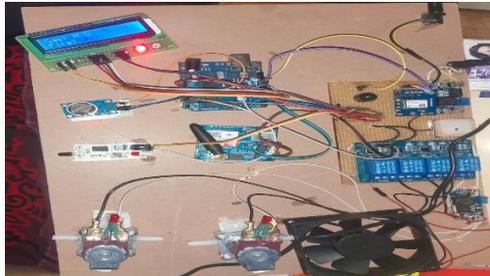


Fig 6: Structure of the entire system

The following figure 7 shows the entire overview or the structure of the project.

WORKING

Our project basically perform three type of working and we have describes it in three different cases which are as follows.

Case 1:

When only the flame value crosses the threshold it represents fire accident. Now, the LED will be ON and the buzzer rings to alert the people. The solenoid valve will be ON to let out water. An SMS is sent to the user and also an SMS along with location to fire station

Case 2:

When only the gas value crosses the threshold, it represents gas leakage. Now, the LED will be ON and the buzzer rings to alert the people. The exhaust fan will be ON to let out the gas and 2nd solenoid valve will close to stop the flow of gas from main supply . An SMS is sent to the user and also an SMS along with location to fire station

Case3:

When both flame and gas value cross the threshold, it represents fire accident due to gas leakage. Now, the LED will be ON and the buzzer rings to alert the people. The solenoid valve will be ON to let out water. An SMS is sent to the user.

FLOWCHART

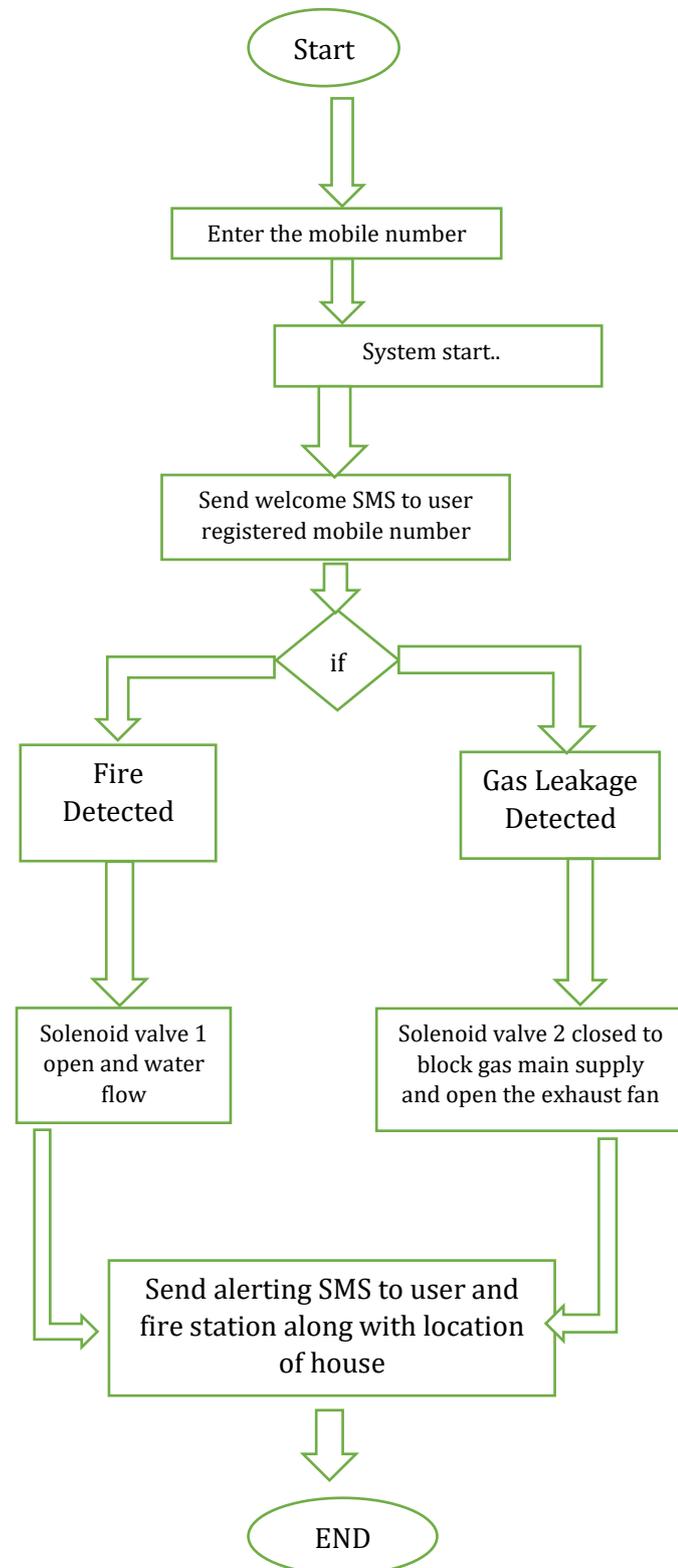


Fig 7: Flowchart For the System

CONCLUSION

A fire and gas hazard control has been designed, implemented and found working. This system has solved the problem caused by gas leakage in our surrounding which lead to fire outbreak that has caused the death of its victims. This system has been designed to carry out the detection and notify the presence of a Liquefied Petroleum Gas (LPG) in our surroundings. It also detect and notify the presence of fire in the environment then fight the fire outbreak itself using fire extinguisher and the water sprinkling system. The construction was made such that maintenance and repairs are done easily in case the system breaks down or if a fault occurs.

REFERENCES

- [1] Hand Book of RI electronics, 17th revised edition by GUPTA & KUMAR
- [2] Digital Logic & Computer design 32nd edition by M. Morris Mano
- [3] <http://www.atmel.com>
- [4] <http://www.electroniccircuit.com>
- [5] <http://www.circuitstoday.com/gsm-based-fire-alarm-system-using-arduino>
- [6] <https://www.projectsof8051.com/sms-based-lpggas-leakage-detection-system-using-gsm>
- [7] <http://www.systemsensor.com>
- [8] <https://components101.com/microcontrollers/arduino-uno>
- [9] <https://en.wikipedia.org/wiki/ATmega328>
- [10] <https://www.slideshare.net/SoumyadeepKal/gsm-based-sms-fire-alert-system>