Eight Zone Home Security Systems

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Abstract

Todays the need of home security alarm systems is on higher demand. As the numbers of crimes are increasing every day, there has to be something that will keep us safe. We are all aware of the high-end security systems are presented in the market but they are not easily available to alone. We therefore inferred to provide a solution by constructing a cost eligible electronic system that has the capability of sensing the motion of the unasked person and setting off the alarm. The basic idea behind this project is that Security is the main concern for everyone. Everyone wants to live securely in his/her house. Everyone wants themselves to keep innocuous or secure from various incidents for example theft in their home or accidents caused due to LPG gas leakage or due to fire in their home. Now days many times we heard news about house robbery or theft in some houses, bungalows, flats. These robberies or thefts take place when no one is in home or in other case we find that robbery is happen even if people are in their homes. Other bad news we heard is about accidents are happened or blast cause, because of LPG gas cylinder Smart Home can be also called as leakage. The second method sends SMS which uses GSM Module (sim 900c) and lpc2148 Arm processor, sensors, limit switch and buzzers.

Keywords- GSM (Global System for Mobile communications), LPC2148 PROCESSOR, SMS (Short Message Service), DC Motor, PIR sensor, GAS sensor, TEMPERATURE sensor, Buzzer

I. INTRODUCTION

We are going to design an interesting and chip home security system. This project helps you to protect your house from thieves and accidents. In this project, we are going to use an ARM LPC2148, P.I.R sensor module, LCD, GSM Module, Gas sensor, Temperature sensor and some other components. This project can have powered with 5V power supply. This is a basic motion-sensing alarm that detects when someone enters the area. When an intruder is detected, it activates a siren. Our body generates heat energy in the form of infrared which is invisible to human eyes. But it can be detected by electronic sensor. In this project, we are using P.I.R. Motion Sensor Module as an infrared sensor that generates electric charge when exposed in heat and sends a signal to ARM Processor. According to level of the infrared in front of sensor, LPC2148 displays the status on L.C.D and start buzzing speaker and also sending message to user through the GSM module. Also in our day to day life sometimes accidents caused due to LPG gas leakage or accidents due to fire in their house. To overcome this problem of unwanted accident we use the LPG Gas sensor and Temperature sensor in the project.

II. PROPOSED SYSTEM

In this model of eight zone home security system. We are using number of several sensors to test and measure No. of different parameters. That various sensors are as PIR Sensor, Temperature sensor, Gas sensors, etc and Limit switch. The system of home security is controlled by using ARM7 processor (lpc2148). Processor gets information from sensors and within few micro seconds it makes decision and immediately sends SMS to authenticate Number (owner). If, for example any faults are occurs in system (theft, gas leakage, fire) Sensors will sense, after that microcontroller will send a SMS to the home user or owner by using GSM module. By accepting message from GSM Module, the user having the information of “What is actual going on inside the home in their absenteeism”.

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Block Diagram consists of a power supply which is used to give power to the ARM Processor and via ARM Processor to the I/O devices like PIR Sensor, limit Switch, keypad, etc. using this system the messages and rating of the given parameters that can display on the LCD screen.

### III. HARDWARE DESIGN

#### A. Microcontroller Unit

The ARM is heart of the whole system in this or generally all controller operated modules, and the complete system should be analyzing in select the proper controller. The follows items are should be consider when selecting a controller. We are going to use ARM7 LPC2148 microprocessor.

- It has on chip static RAM of 8KB to 40KB and on chip flash memory of 32KB to 512KB.
- It is Advanced RISC Machine.
- It is Von Neuman Architecture
- It is a 32bit word. The word is form by dividing it in four 8bit bytes.
- One or two 10bit ADC is offer a total of 6/14 analog input with conversion time as low as 2.44 micro sec. per channel.
- Single 10bit DAC offers variables analog output.
- 60MHz maximum CPU clock presented from programmable on-chip PLL with settling time of 100microsec.
- Up to 21 external interrupt pins available.

#### B. Sensors

1. **PIR Sensor**

   P.I. R motion sensor module as an infrared sensor that generates electric charge when exposed in heat and sends signals to ARM processor.

2. **Gas Sensor**

   Gas sensor (MQ-2) having high sensitivity to LPG, hydrogen and methane, and also propane.

3. **Temperature Sensor**

   The LM35 is operate over a - temperature range of 55° to +150°C, while the LM35C sensor is rated for a -40° to +110°C range (-10° with improved accuracy). It can be used with single power supplies, or with plus and minus supplies. It has low linear output, output impedance and precise inherent calibration make interfacing to control circuitry especially easy.
C. **Dc Motor**  
It is used for purposes of door open and close. The geared DC motor has a gear assembly attached to the motor. DC motor’s speed is counted in terms of rotations of the shaft per minute (RPM).

D. **GSM Module**  
GSM Modem is accepting any GSM network operator SIM card and act as a cell phone with its own unique phone number. The GSM modem has GSM module number SIM900D and it’s from Silcom. The new SIM900-ultra compact and it is reliable wireless module. The SIM900 is a GSM/GPRS module in SMT type having complete quad-band. Its dimensions 33*33*3mm also it can fit almost all the space requirement in ours any application means for even as slim and compact required design. Has also features of SIM Application toolkit, Supply voltage is of range 3.1-4.8V, it also having feature of Low power consumption is 1.5mA (sleep mode).

**IV. SOFTWARE DESIGN**

- For programming and testing: KEIL software
- For PCB Layout: ARESS software
- For circuit diagram design: EXPRESS PCB software
- For simulation: Proteus software

**V. SIMULATION**

A. **Power Supply**

B. **Simulation of Temperature Parameter**
VI. Flowchart

A. Advantages of the Proposed System
- Remote indication: With the use of GSM technology owner of the house or industry get Remote indication through SMS. So even if the user is away from home or industry, he/she will be intimated about the hazardous or undesirable conditions/situations inside the house.
- This system is fully automated. So once this system is installed inside home or industry, then it does not require any human interaction to operate. With the use of this system we can try to save the life of person inside the home/industry. Agnone the accidents are happen due to fire and LPG Gas leakage can cause life threat.
- Also, the property inside house and various materials inside the house and industry are saved from to theft and from fire detection.
- This system is cost effective. Also, it is fast and efficient.
- The circuitry is not that much complicated and thus can be easily troubleshoot.
- All over the world, there could be an area where the mobile network is not established, so no connectivity of mobile phones in that area. Therefore, SMS cannot be delivered.
- Older people still are not familiar with the use of mobile and find it difficult to see the SMS on mobile.
VII. CONCLUSION

Security is a matter of great concern for all of us in this world at our home/workplace or anywhere. Multi security system will provide efficient security from fire hazards, gas leakage, and from intruder. Thus, it has become an important part of industry. This security system will reduce the damages caused by these threats and also provide maximum protection for human life. They are commonly used in large industries where inflammable materials are used. Apart from this, it can be used in banks or other workplace to keep protected from intruder, fire threat etc. Moreover, this can be used in our home for the protection. Since we are using buzzers, it would be helpful to warn the local people about the danger and the receiver, so that actual owner gets information regarding the threat by obtaining the SMS through GSM module. It is more economical and beneficial.

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