

GSM BASED SECURITY SYSTEM

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ABSTRACT

Home security system has been a major issue where crime is increasing and everybody want to take proper measures to prevent intrusion. In addition there was a need to automate home so that user can take advantage in such a way that person getting off the office doesn't get melted with hot climate. A traditional home security system gives the signals in terms of alarm. However, the GSM (Global System for Mobile communications) based security systems provides enhanced security as whenever a signal from sensor occurs, a text message is sent to a desired number to take necessary actions. This paper suggests method for home security system. The method involves sending of message using GSM module (SIM300) and ATMEGA8L microcontroller, sensors, buzzers, relays.

Keywords: AT(ATTENTION) commands, IR sensors, GSM (Global System for Mobile communications), Microcontroller, SMS (Short Message Service)

I. INTRODUCTION

What is a security system? Security is the degree of protection against damages, danger, loss and crime. Security as a form of protections structures and processes that provide or improve security as a condition. A security system provides a form of protection that ensures the safety and security of the assets and the threat but is not limited to the elimination of either the asset or the threat.

We have made a big contribution in the promotion and reliability of home security system. Among the contribution, the part of providing automatic text message notification regarding any undesirable movements is user friendly, live streaming of camera of user's desired secured zone is more trustable than that of previous versions of home security system. This is a security system which is buried to ensure the safety and security asset and the threat by using an ATMEGA8L microcontroller to automatically send predefined text notification to a desired number to meet technological advancement to automate life and to prevent intrusion to provide maximum protection. This paper mainly focuses on the security of a home when the user is away from the place.

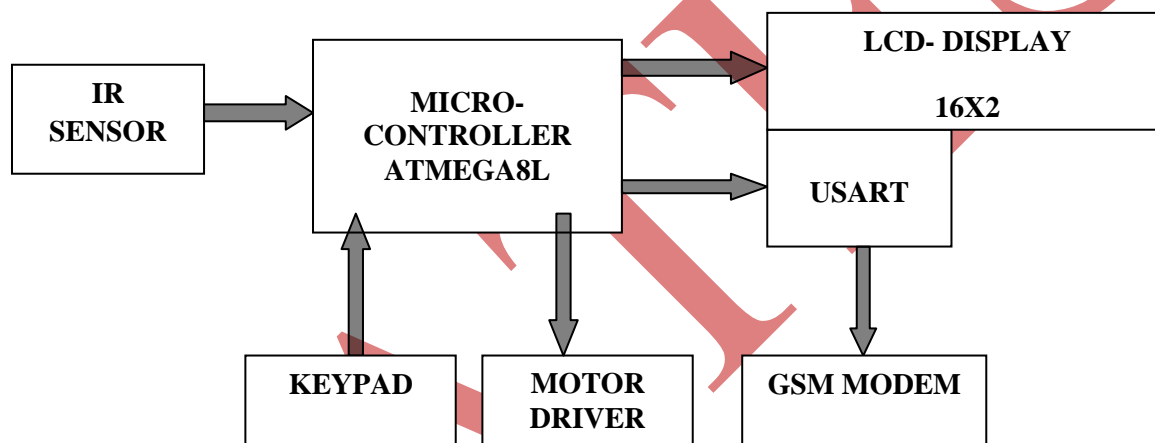
The aim of this paper is to develop and launch an up-to-date, reliable and user friendly security system to automate home security system using microcontroller circuitry synchronized with GSM module with an objective to provide maximum possible security based on an automatic emergency care response using sensors, camers, trapping system. The concept of trapping system is new, unique and more reliable than any of previous automatic security systems ever designed for homes.

II. OPERATION AND HARDWARE DESIGN

Hardware of the system contains sensors, Atmega81 microcontroller, sim300 (GSM module), Buzzer, in system programmer and relays to control the appliances. The system design is shown in Figure 1. IR sensor and Keypad are used as input devices. Motor driver, GSM modem, LCD- display are used as output devices. Input is given to Microcontroller, processing device which provides output to output devices in form of instructions that are to be performed by them.

Operation of the whole system gets initiated when IR sensor senses the presence of any human being within its range. When presence of human being is sensed it sends signal to microcontroller, which reads the status of the IR sensor and switches on the keypad and LCD display. LCD display shows what has to be provided by person as input to controller in order to open the door. User then enters the required information to controller via keypad, in this case password is required to be entered. This entered password is displayed at the LCD display. If the entered password is correct then signal is sent to GSM modem via USART which further inform the owner of the house on the registered number about presence of someone near his gate by sending a predefined message and signal is also sent to microcontroller which further provide instructions to the motor driver to open door.

In case wrong password is entered three time by some intruder then also signal is sent to GSM via USART to send message of Security alert to registered user and in this case microcontroller provide instruction to motor driver to not to open the door. This helps in informing the owner of the house about the presence of some known person or some intruder around the house. USART here is used as a serial protocol for communication between microcontroller and GSM modem.



A. MICROCONTROLLER UNIT

The control module is built with the microcontroller IC. The central controller is Atmega81 which is 8-bit Microcontroller with 8K in-System Programmable Flash. It is having advanced RISC architecture. It consists of Two 8-bit Timer/Counters with separate prescalers and Compare Modes, one 16-bit Timer/Counter with separate pre scalar, compare Mode, and capture Mode, Real time counter with separate oscillator, three PWM channels, 8-channel i.e six-channels 10-bit accuracy and two-channels 8-bit accuracy and 23 Programmable I/O Lines. Some special features of this microcontroller are Power-ON resets and Programmable Brown-Out Detection, Internal calibrated RC oscillator, External and Internal Interrupt sources and Five Sleep modes (Idle, ADC Noise Reduction, Power-save, Power-down, and Standby).

B. GSM MOBILE UNIT

A SIM300 based quad band GSM module which supports GPS technology for satellite navigation is used. It provides GPRS multi-slot class10 / class8 capabilities and supports GPRS coding schemes CS-1, CS-2, CS-3, and CS-4. This module takes care of all your GSM-GPRS based communication requirements as well as provides live GPS data.

AT Command is a set of commands or instructions which can be used to communicate (talk) with a GSM modem/mobile phone. AT commands are used to automatically receive the call on system from the preconfigured number and system also sends the message to preconfigured number about the intrusion indication through AT commands [9]. The AT commands of GSM-GPRS modules are given below-

The AT commands for GSM-GPRS support is as follows:

- +CMTI: SMS has been received
- +CREG: Network registration indication
- +CMGS: To send the message
- +CMSS: To Send Message from Storage
- +CMGW: command writes an SMS to the first location available.
- +CPMS: command allows the message storage area to be selected (for reading, writing, etc.).
- +CMGR: Read Message
- +CCLK: Clock Management
- +CUSD: Unstructured Supplementary Service Data

III. SOFTWARE DESIGN

The proposed system uses AVR microcontroller, programming is done in 'C' language on CODE VISION AVR V2.05 and to download the program into AVR chip, KHAZAMA burner is used. PCB designing is done on PCB WIZARD 3.50 Pro Unlimited.

IV. RESULTS AND DISCUSSIONS

The developed GSM based security system gives good response to the sensor and sends SMS when it detects the intrusion at the door. The time taken by the system to deliver the SMS is dependent on the coverage area or range of the specified mobile network. If the mobile is in the range of the system then the SMS is delivered in 25-30 seconds.

Advantages of the proposed system:

1. As the system is SMS based, there is no need to have extra circuitry to transmit SMS. Mobile networks are used for transmission.
2. It is very cost effective, as day by day the cost of SMS is reducing.

Drawbacks of the proposed system:

1. All over the world, there could be a area where the mobile network is not established, so no connectivity of mobile phones in that area. Therefore, SMS cannot be delivered.
2. Older people still are not familiar with the use of mobile and find it difficult to see the SMS on mobile.

V. CONCLUSIONS

The GSM based home security system has been designed and tested with the mobile network. The user can get alerts anywhere through the GSM technology thus making the system location independent. A flexible way to control and

explore the services of the mobile, AT commands is used in the system. The communication of home is only through the SMS which has been tested with the mobile networks and is working on any mobile network. The system has tested on the model of smart home and further it will be tested in actual home. The complexity of the algorithm of the system can be increased by introducing number of sensors to make the energy efficient home. This paper provides a new concept and implementation of an effective GSM based security system. and also provides advantage of the technological advancement in daily life.

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