

GSM Based Security Automation System for Building Entry Management

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Abstract- “Security experts agree, security means prevention.” And prevention means detecting the security risk outside before it becomes a security threat to people and assets inside. Residential buildings and big housing complexes often become the scene for a number of unwanted events and small / big crimes, for many reasons. One way to protect your assets and personnel within the building from such threats, is to have effective and easy to use automated entry management system to screen visitors and restrict unauthorized entries. The paper is based on GSM technology which is used for visitor entry management that can be developed to replace traditional manual visitor registration.

Keywords - GSM, Microcontroller, Security, SMS

I. INTRODUCTION

In today's fast paced technology driven world, security and automation has a huge demand be it at home or your work space. Home Security systems have been designed using the latest technologies and integrating it with automated systems. With these technologies the owner can have access to the entry as well as the exit of any visitor which makes the home even more secure. The proposed system uses mobile technology for building entry management. This system aims at providing security for screening the visitors entering from various building entry points like - entry points for staircase, lift lobby from basement parking levels and ground level main entrance. Mobile Communication being the easiest and lost cost method is used to provide security with just a message.

II. LITERATURE SURVEY

Literature Survey was based on previously published research papers some of which are explained below. Also some existing systems currently which are being used were taken into account during the survey.

Abhishek Parab, Amol Joglekar[1] implemented a home security system using GSM module and microcontroller. This system alerts the owner of there is any intrusion. If any intruder opens the door, the magnet gets detached from the relay hence connection is lost which results in sending a message to the owner. The above system only serves the purpose of alerting the owner that an intruder has entered his/her home but the purpose of security is not fulfilled completely.

Ankush Vishwanath, Basappa Yelappa Haibatti, Pavan Krishna Kotekar, Rakesh Kumar T S, Sandesh A, Shreyas M Belavadi and Sudarshan Patil

Kulkarni[2] presented a RFID and GSM Based three Level Security System. In this system, each person has a RFID tag as an identity. As the tag is brought near the RFID reader, the card gets validated and a 4 digit code is sent to the employee's mobile via GSM. By entering the correct code the person gets the access. The given system needs a unique tag for each person which could be not convenient for everyone.

Adnan Ibrahim, Afhal Paravath, Ashwin P.K., Shijin Mohammed Iqbal and Shaez Usman Abdulla[3] implemented a project on GSM based Digital Door Lock Security System which is a password based system. A five digit password has to entered to get the access.

It has 5 switches for entering the password, the number in the password is the times you need to press the switch, which makes the process time consuming and inconvenient for the user.

III. RESEARCH METHODOLOGY

1. Proposed System

Taking into consideration any residential complex which may have multiple entry points e.g. parking, underground lobby, main lobby etc. The system provides security to these various entry points in a building without a requirement of security personnel. The residents of this residential complex need to have their phone numbers feed into this system for authentication.

User simply has to send a message from the registered mobile number to the GSM module. The system checks if the user is an authorized user or not. After the authentication, according to the message that has been received the system opens that particular door. The electromagnetic Lock installed on the door gets

deenergize for a particular time and then gets locked again. The message to be send is also a predefined one and unique for each entry point. If the message does not match the predefined one, LCD displays 'Invalid Message'. Also no access is granted if the user is an unauthorized user. An emergency button is installed on the other side of the door by which the person inside can press this button to exit the door. This system offers security by not granting access to unregistered users or visitors.

The above system is implemented using Arduino UNO and GSM Module SIM900. Hardware implementation of the circuit was done by interfacing the Arduino with GSM Module, LCD and Relay circuit. Software implementation included basic C language.

2. Block Diagram

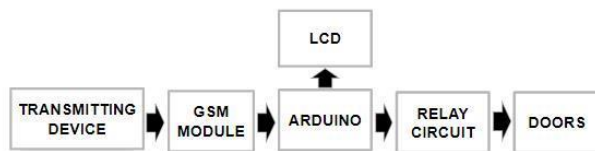


Figure 1 Block Diagram of the Proposed System

3. Flow Chart

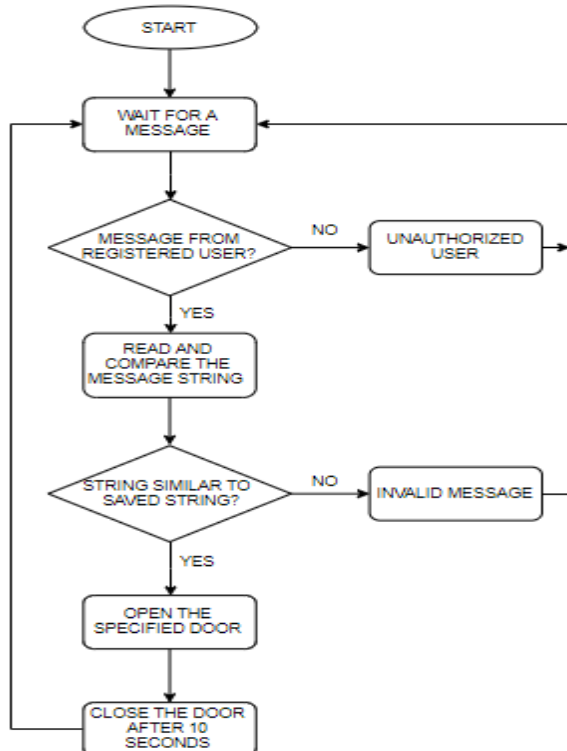


Figure 2 Flow Chart of the Proposed System.

3. Algorithm

- Step 1: Initialize the Arduino, GSM module and the LCD.
- Step 2: Send a message 'Door1' from a registered mobile number to the GSM module.
- Step 3: If the mobile number is a valid number, then go to Step 4 else wait for message.
- Step 4: If the message matches the predefined message then the door opens.
- Step 5: After a particular delay the door gets closed again.
- Step 6: Else 'Invalid Message' gets displayed on the LCD screen.

IV. RESULTS AND CONCLUSIONS

The system presented in this paper provides a security system for the various entry points in a building. The user sends a message from a registered phone number to get the access. Electromagnetic Doors installed at every entry point open for a small time period and then gets locked again. This paper presents a simple and low cost GSM based Automation System for Building Entry Management. The System provides Authentication of user, user friendly access grant procedure using the most widely used technology i.e. GSM.

We suggest the following few modifications for future development of the system:

- Interfacing with CCTV cameras.
- Interfacing with Face recognition Module.
- Interfacing with Fingerprint Sensor.
- Addition Battery Backup.

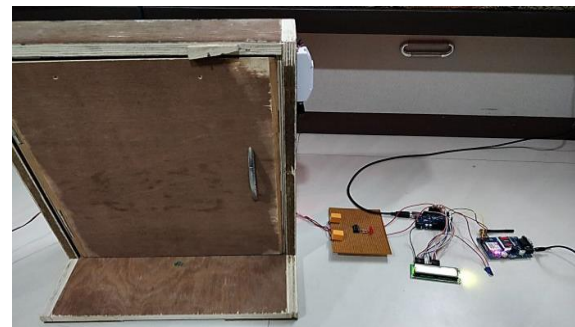


Figure 3 Door model with Electromagnetic lock installed.

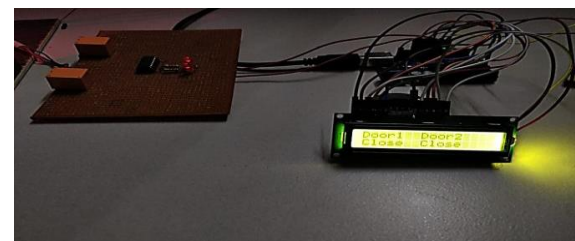


Figure 4 LCD shows the initial status of the doors.

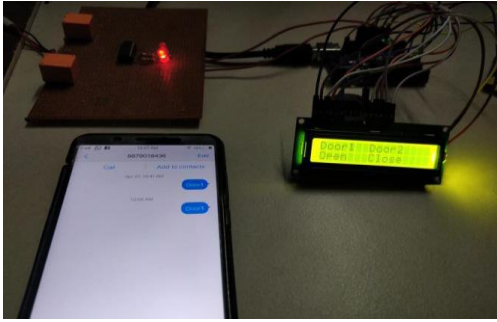


Figure 5 LCD shows the status of the doors when message is sent.

Acknowledgment

It is our proud privilege to have Prof. Makarand Kulkarni, Electronics Department, KJSCE as our mentor for this project, 'GSM Based Security Automation System for Building Entry Management'. He was also a guide to us for written this paper and we are very thankful to him for his help and support.

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