Smart Lock

Ramchandra Narkhede, Paras Shah, Aakanksha Chawale, Sanskruti Dabhade, Mrunal Aware

Computer Engineering Department, MIT Polytechnic, Pune, Maharashtra, India

ABSTRACT

The concept Door locking and unlocking system uses GSM to open and close the door. The main aim of our system is to provide more security to houses, offices etc. The system lock and unlock a door when it get predefined message from user application. Whenever the message will be received for the registered number, the controller will accordingly give instruction to solenoid lock. Solenoid lock will then perform action on door either locking or unlocking. The piezo sensor will sense the knock and send the message to the registered user using GSM.

Keywords : Global System for Mobile Communication (GSM), Solenoid lock, controller (Arduino).

I. INTRODUCTION

In this system when the user sends a predefined message then it unlock the door. The system provide security at homes, offices etc. there various system are developed till now using technologies such as entering passwords, wireless networks etc. but the disadvantages shown by them were not so secure also it required physical presence. But our system is much more secure and cost efficient.

II. PROPOSED SYSTEM

The solenoid lock locks/unlocks the door as soon as the microcontroller receives the predefined message send by the GSM module. In our project we have used GSM module and Embedded System to design this application entering passwords, wireless networks etc. In this system we have used GSM module to receive message from user. Knock detecting sensor to recognize knock, Arduino controller to control solenoid lock and to store Source code. Solenoid Lock is used to lock and unlock

door. The solenoid lock locks and unlocks the door as per the predefined message is sent.
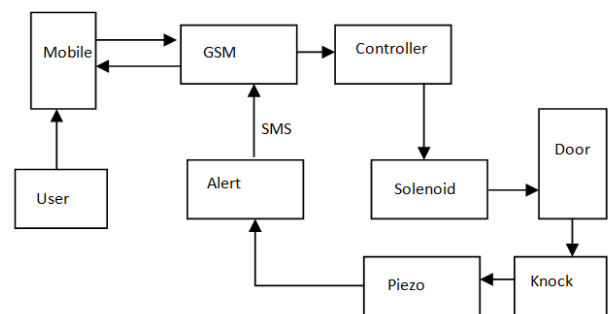

Fig 1. Architecture diagram of Smart Lock System

III. TERMINOLOGY

A. Global system for mobile communication (GSM).

GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication

system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.GSM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose.

B. Solenoid Lock

A solenoid door lock is a remote door locking mechanism that latches or opens by means of an electromagnetic solenoid. In the case of a latching solenoid, indefinitely until the button or controller is activated again. These types of door locks are used extensively in remote security access and automotive doors.

C. Piezo Buzzer

A **Piezo** electric element is a crystal or ceramic that deforms slightly when a voltage is applied to it. So if you supply an AC voltage at a few kilohertz, it deforms back and forth at the same speed as the AC signal, and produces an audible sound.

IV. WORKING

In this system when user send SMS to GSM module then system verify that message with predefined message and if it is same then door gets unlocked. For sending that message from user we have developed a simple android application i.e. "Door Lock", as shown in Fig.3 In this application we have registered user Mobile Number and GSM module Number. When user click on OPEN button then message automatically generated and sent it to GSM module

In this system we have used GSM module to receive message from user. Knock detecting sensor to recognize knock, Arduino controller to control solenoid lock and to store Source code. Solenoid Lock is used to lock and unlock door, As shown in Fig 1. When user send message to GSM module the system recognize that message with predefined message, and if it is verified and it is same as predefined message then controller supply voltage to solenoid lock and door get unlocked and if someone knock on your door then GSM send message to user i.e. "door is knocked".
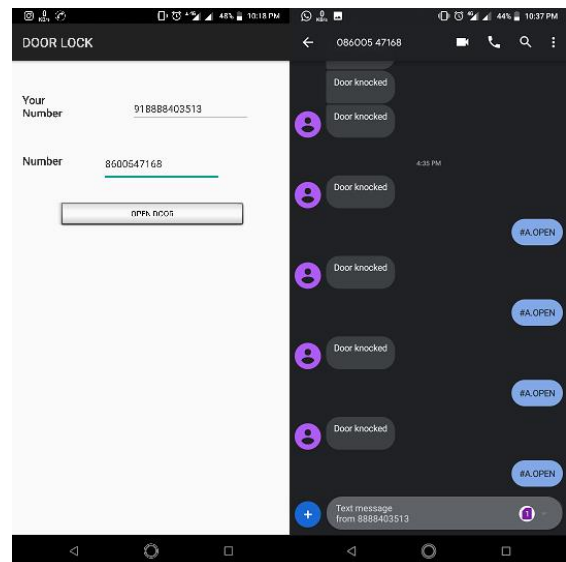

Fig 2. Screen Shoot of DOOR LOCK application.
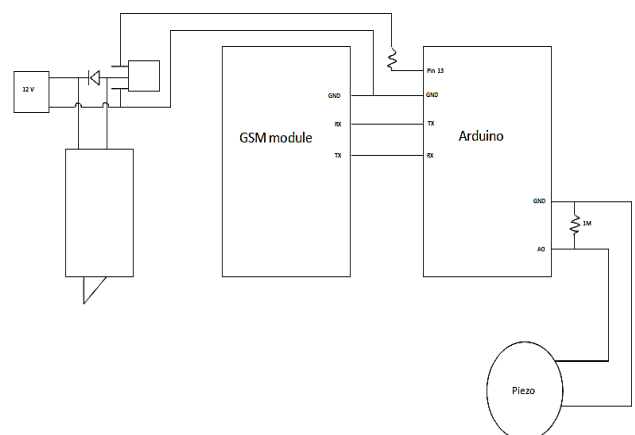
V. BLOCK DIAGRAM

Fig 3. Block diagram of Smart Lock System

VI. APPLICATION AND ADVANTAGES

- Cost Effective
- Can be used in various rooms like seminar hall, conference room, and study rooms in college where the capacity of room is limited and should not be exceeded.
- Smart locks are very convenient to use. You don't always need to carry a key around with you in order to get access to your home.

VII.FUTURE DEVELOPMENT

- We can monitor and control more parameters and devices.
- Voice announcement system can be added to indicate device conditions.
- We can implement other related modules like fire sensor, wind sensor.

VIII.   CONCLUSION

Mostly one key is used for one door so when many users use door problem may occurs. And also security problems may occur if the key can be duplicated. We thought about this problem and try to find a solution and a way to improve the security. So knock detecting door lock is the idea we come up which is more secure and cost efficient.

1. Very much reliable
2. Easy to implement

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