

CONTROL ACCESS & SECURITY BY USING ANDROID APPLICATION

¹Mrs.Nisha Balani, ² Mr. Anil S Band

¹Faculty, ² Students

^{1,2} Department Computer Science JIT Nagpur, India

Abstract – The concept Door locking and unlocking system uses GPRS to open and close the door. In addition to this the security will be provided using GSM in case of any unauthorized access. The main aim of this project is to provide security at homes, offices etc. The system automatically locks the door as soon as it receives predefined message from the user. The user will have to first register. His information will be stored in database. Whenever the message will be received for the registered number, the controller will accordingly give instruction to DC motor. DC motor will then perform action on door either locking or unlocking. In case of unauthorized access, the IR sensor will sense the action and send the alert message to the registered user using GSM.

Keywords – Global System for Mobile Communication (GSM), General Packet Radio Service (GPRS), Microcontroller, DC Motor, IR Sensor.

I. INTRODUCTION

The system automatically locks and unlocks the door as soon as it receives a predefined message from the user. The system provide security at homes, offices etc. There are many systems which has been developed till now which were working on the technologies such as entering passwords, wireless networks etc. but the disadvantages shown by them were not so secure also it required physical presence. Here we are developing a system which is more secure and cost efficient.

II. PROPOSED SYSTEM

The project intends to interface the microcontroller with the GSM modem and start/stop the vehicle engine by sending the predefined messages from the mobile to the controlling unit. The project uses the GSM technology and Embedded Systems to design this application. The main objective of this project is to design a system that continuously checks the messages if any, received from the user mobile and change the status of the engine as per the message received from the mobile. The main concept behind the project is receiving the sent SMS and processing it further as required to perform several operations. The type of the operation to be performed depends on the nature of the SMS sent. The principle in which the project is based is fairly simple. First, the sent SMS is stored and polled from the receiver mobile station and then the required control signal is Generated and sent to the intermediate hardware that we have designed according to the command received in form of the sent message. The messages are sent from the mobile set that contain commands in written form which are then processed accordingly to perform the required task.

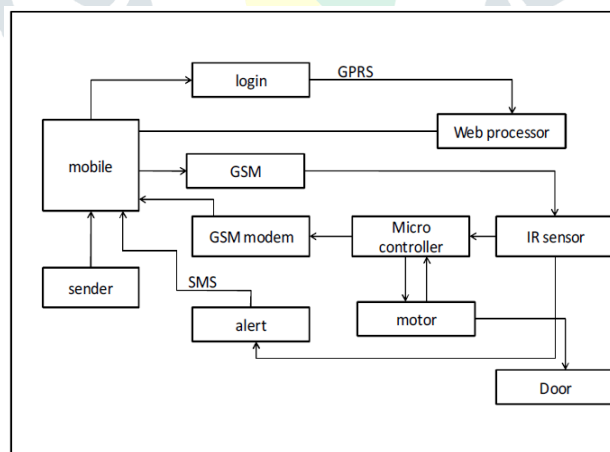


Fig.1. Architecture diagram of door locking and unlocking using GSM/GPRS technology.

III. TERMINOLOGY

A. Global system for mobile communication (GSM)

GSM was developed with a moderate level of service security the GSM system is designed to authenticate the user with the previously shared key and the challenge response. Communications between the sender of system and the base station can be encrypted. The security model is therefore used to provide confidentiality and authentication it has limited authorization and it is non-repudiation.

B. General packet radio service (GPRS)

General packet radio service is used as a packet oriented mobile data service. It is used in 2G and 3g cellular mobile communication system for GSM mobiles which is charged as per minute connection. GPRS

providesthedatarateof56114Kbit/second.GPRSsystemeables the SMS messaging and broadcasting of messages. It supports the multimedia messaging service. is better suites the internet application for smart devices through WAP. It supports the services like point-to-point, point-to- multipoint, multicast, and point-to-multicast.

A. ARM-7 microcontroller

Arm7 is a versatile processor that is designed for the mobile devices and other low power electronics. this processor is capable of up to 130 MIPS on the typical 0.13 μm process. The specialty of 128 bit wide interface/accelerator enables with the high speed. It is a low power consumption device. It supports the power saving mode and includes the idle and power down option.

B. IR sensors

Infrared radiation is the part of electromagnetic spectrum having wavelengths longer than visible light wavelengths, but usually smaller than microwaves, i.e., the region roughly lies from 0.75μm to 1000 μm is the infrared region. Infrared waves are not visible to human eyes.



Fig.2. IR sensor

IV.WORKING

The system is based on sending and receiving the SMS from the control unit and the mobile user. The sender who is operating the system can lock or unlock the door using the SMS system which is based on the GPRS and GSM service. The user will login into the system and get the login ID and the password which will make him the authenticated user. This username and password will be used for the door operations. Also all the information regarding the users will also is present in the microprocessor.

As soon as the user will send the SMS for locking controller will check the present status and inform the user. The controller will pass the signals to the motor that is present on our door to close the door. Also the reverse process will take place on the unlocking time.

By mean time if there is any theft on our door the IR sensor will detect the intensity breakout that is not based on signal, as our IR sensor are getting the signals from controller. It will pass the message of warning or theft on door. The controller will send the alert to the GSM module and then message will be passed to the user of the system. This way we can receive the alerts of the door actions. The operating door which is forcefully opened will again be reset to the original position of the user (in case of open or close). The Circuit results are displayed in following manner. The LED displays the exact action of door.



Fig.3. Thefts warning when door has been forcefully open

The GPRS system will also be able to track the operation of the door by giving the door status. We are also using GSM service to receive the message of the door operation if there is any theft on the door. IF any unauthorized person tries to attack on door or forcefully opens the door, then the user receive message regarding the theft.

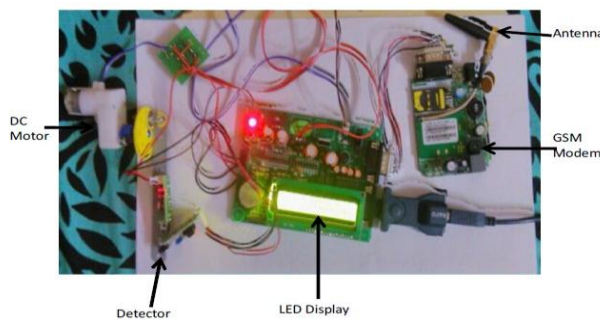


Fig.4. Circuit of Door operation through GSM/GPRS technology

The circuit consists of the UART microcontroller which is controlling door operation .The microcontroller is mounted with the LED display which is showing the status of the Door. There is a GSM module that is used to give the details of the door operation to the user when user is operating. The IR sensor will be adjusted in such a way that there will be a quick alert if the door is opened forcefully .The intensity of light will detect the theft on door. The theft message will be sensed by the controller and sent to the GSM module, from the GSM module the user will receive the message. There is a DC motor who is controlling the opening and closing operation, when the user sends the message it acts accordingly.

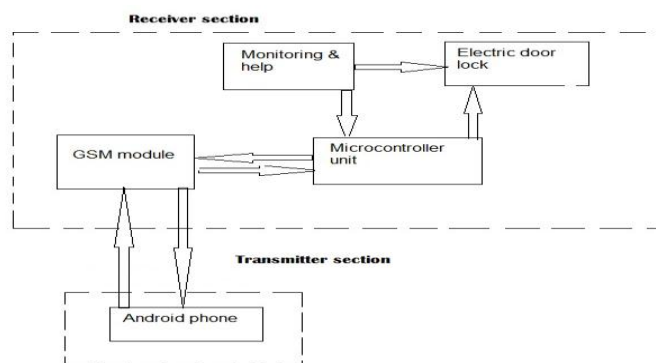


Fig .Android gsm Module

V. LITERATURE SURVEY

Design and construction of door locking security system using GSM[1]: - doorlocking, security, GSM, microcontroller and stepper motor— This project presents a prototype security door that can be remotely controlled by a GSM phone set acting as the transmitter and another GSM phone set with a dual tone multi-frequency (DTMF) connected to the door motor through a DTMF decoder interfaced with microcontroller unit and a stepper motor .The design is composed of four main functional modules, namely; the GSM module, the decoding module, controlling module and the switching module. The GSM module act as both transmitting and receiving unit employs the use of a mobile phone set serving as the communication device between the user at one end and the object of access (i.e. the door) at the other receiving end. The decoding module and the controlling module are made possible using modern integrated circuit chips ensuring proper conversion of signal to binary codes, enabling the microcontroller to communicate properly with the switching device responsible for opening and closing the door. The codes for this project was written in assembly language with Visual basic software and compiled with M-IDE studio for MC-51compiler which work perfectly with Window XP environment, the program run without error before it was burn onto the microcontroller using a device called the programmer by placing the microcontroller on it socket equal to the pin number.

Android based home door locks application via Bluetooth for disabled people[2]: - Bluetooth and android controller--This paper discusses about an ongoing project that serves the needs of people with physical disabilities at home. It uses the Bluetooth technology to establish communication between user's Smartphone and controller board. The prototype support manual controlling and microcontroller controlling to lock and unlock home door. By connecting the circuit with a relay board and connection to the Arduino controller board it can be controlled by a Bluetooth available to provide remote access from tablet or smartphone. This paper addresses the development and the functionality of the Android-based application (Android app) to assist disabled people gain control of their living area.

Password based security lock system: -motor microcontroller, LCD, keypad[3]:--The necessity of a low cost electronic home security system designed in co-ordination with other security measures is always there in our society to reduce the risk of home intrusion. Keeping this problem in mind, we are working on a project on automatic password based door lock system. We want to utilize the electronic technology to build an integrated and fully customized home security system at a reasonable cost. We hope this project will be useful in keeping thieves, dacoits and other sort of dangers at bay.

Microcontroller Based Home Security System with GSM Technology[4]:--Home, Security, System, Control, Microcontroller, Bluetooth, GSM--In this paper, design and implement of a microcontroller based home security system with GSM technology have been presented and analyzed. Two microcontrollers with other peripheral devices which include Light Emitting Diode (LED), Liquid Crystal Display (LCD), Buzzer and Global System for Mobile Communication (GSM) Module are responsible for reliable operation of the proposed security system. In addition, a mobile phone is interfaced with microcontroller through a Bluetooth device in order to control the system. Moreover, a manual keypad is another way to lock or unlock the system. A Compiler Code Vision AVR is used to design a program that controls the system along with maintaining all security functions. The designed program is applied in Proteus Software for simulation. At last, the results of practical circuit show the proper functions and also verify the reliable security within reasonable cost.

Security and Usability Improvement on a Digital Door Lock System based on Internet of Things[5]:--Internet of Things, Door lock system, Digital door lock--Recently, digital door locks have been widely used as part of the IoT (Internet of Things). However, the media has reported digital door locks being opened by invalid users to invade homes and offices. In this study, a digital door lock system that can work with the IoT environment is proposed. It is designed and implemented to enhance security and convenience. The proposed system provides strengthened security functions that can transfer recorded images to a user's mobile device when an invalid user attempts an illegal operation; it can also deliver alarm information to the mobile device when the door lock is physically damaged. The proposed system enables a user to check the access information and remotely operate the door lock to enhance convenience.

VI. METHODOLOGY

The system is based on sending signal from the android app of android phone and receiving the SMS from signal on GSM module through microcontroller to electronic door lock.

The sender who is operating the system can lock or unlock the door using the android application which is based on the GSM service which sends signal to the GSM module which contains SIM.

Also all the information regarding the users will also be present in the microcontroller. As soon as the user will send signal from android phone for locking and unlocking, controller will check the present status. The controller will pass the signals to the electronic door lock unit through relay for locking and unlocking.

If any forceful activity occurred with the door lock the IR sensor will detect the intensity breakout. The controller will activate the camera and will also send alert through the GSM module to registered user.

This way we can receive the alerts of the door actions. The operating door which is forcefully opened will again be reset to the original position of the user (in case of open or close). The Circuit results are displayed in following manner. The LED displays the exact action of door. We are using GSM service to receive the message of the door operation if there is any theft on the door. If any unauthorized person tries to attack on door or forcefully opens the door, then the user receive message regarding the theft and also camera will capture the scene.

There are three (3) different types of measurements have been done; (i) indoor and, (ii) outdoor with non-obstacle area and (iii) indoor with obstacle area. As shown in Table 1, it is found that, for indoor (obstacle and non-obstacle area), the maximum distance that the receiver can detect the RF signal from the Smartphone is around 15 meters in house while for outdoor area, the maximum distance is 20 meters. In this case, it can be said that for non-obstacle area, the system can communicate between input and output at a distance of at least . However, the effectiveness of the system is reduced up to 20% for an obstacle area.

VII. CONCLUSION AND FUTURE WORKS

The goal of this study is to propose a system that can help disabled people to open a magnetic door wirelessly using Android smartphone. The range and security aspects were considered through the use of Bluetooth technology that is embedded in the mobile device. The system was able to actuate a pin to *Lock* or *Unlock* the door from a short distance away by just pressing a button on a smartphone. The status of the door also has been created to make the system more complete.

In future, the LockIt Door Apps should offer assistance in controlling more doors, windows and basic home electronic appliances. Battery backup system should also be considered to ensure the completeness of the system.

VIII. ACKNOWLEDGMENT

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