Security and Controlling System at Home by Using GSM Technology

M. Anil Kumar

Abstract: Home security framework is required for comfort and wellbeing. Security is one of the fundamental worry of the present day. In this present universe of innovative progression legitimate measure ought to be taken to keep up the security and the solace of homes, banks and workplaces. By utilizing legitimate security frameworks billions of rupees spent on offices like fire detachment, police, and so forth can be controlled. With the help of internet electrical devices can be monitored for use which were reported in literature using firmwares. These in turn could be done using Smart Switch. For linking purpose internet is necessary and accessed through computers but all these require programming using internet protocol. The server associated with switch should have the information of the network being used by the user. The mode of operation should be involuntary and data should be entered by the user after selecting the type of safety required. Furthermore, after the necessary things have been sent, the user will have to again start the switch for availing the internet and operate the switch suitably by sending "1/0". The core of all these is the availability of internet with the user. But in developing countries like India where there is no internet facility or very poor internet speed it becomes very important that an alternate system is also in place i.e, it should also be done with the help of local network without the use of internet. One more drawback with using internet is the server location and date security. It should not be hacked through internet. To avoid these drawbacks we are going to implement these systems by using GSM technology and it works via Short Messaging Service (SMS) based on alert system.

Keywords: Home security, office security, smart switch, unauthorized person detection, GSM, RFID

I. INTRODUCTION

In this day and age of mechanical progression and robotization, home mechanizing framework has made its check and is additionally getting to be one of the quickly creating areas of utilization based innovation. The past thought of a happy living have changed far reaching since the appearance of the advanced and remote advances. Brilliant homes, or in straightforward terms, homes that are completely robotized, pre-programmed to do some predefined errands, react to specific circumstances and furthermore change as indicated by the requirements of the client takes up the new meaning of agreeable homes. The brilliant homes are relied upon to for example, temperature control, lightning and stimulation control, security and crisis reaction and numerous such others. They are relied upon to be controlled and robotized from close or from a separation. A general trend is emerging of having a house with modern technological aspects. Such perception includes having high-end electronic equipment which not only fulfills basic requirements but also adds to the overall ambient environment inside the house. By integrating the home electronic equipment with security features it can be made safer homes. Users can control the appliances and check its use away from home, i.e., no need to be in home to operate the devices and security feature is still there. All GSM is a standout amongst the most broadly utilized cell advances on the planet. With the expansion in the quantity of GSM endorsers, innovative work is vigorously bolstered to the GSM execution. In the literature it is also demonstrated the use of mobile to operate the appliances using controlling mechanisms. There were also problems associated with those techniques. The concurrent operations of multiple devices need better understanding of the mobile environment. The role of microcontrollers is to provide a link between the electronic devices and sensors with the GSM module. It can be integrated with the appliances for remotely accessing them. GSM is versatile in the sense that it can be operated with simple mobile phone and any person can operate it without waiting for internet connection. Due to the security associated with this technology the bidirectional communication, i.e., between the user and the home equipment remains safe. Accordingly, this examination work is based on using SMS for functioning the home electronic devices

II. LITRATURE SURVEY

Agarwal et. al. [1] utilizes secret key ensured entryway framework strategy in home mechanization framework. The entryway bolt is secret phrase secured with a LED mechanism wherein the type of color is used to distinguish the light echoed by the finger. The sensor based on Laser is used to find the hindrance in windows and entry points. Fire alert framework utilizes sensor that senses the temperature and is based on LM35 through which the changes are monitored. The use of various sensors, monitor for display, controllers along with the module of GMS are utilized in this context. In the literature [2-8] there are reports in which the security systems for vehicles were built. In that idea if cheat attempts to burglarize a vehicle it consequently deactivates the vehicle. This currently makes it outlandish for anyone so begin the vehicle, not to mention moving with it. The present day idea of homes encompasses various necessities of the house owners.

Retrieval Number: I8752078919/19©BEIESP
DOI:10.35940/ijitee.I8752.078919

2470

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

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They are the safety features associated with each devices and overall safety of the house from external intrusion. The general security provided in the locality is not sufficient in this technological world and therefore apart from conventional manual security, a technology based system is also necessary in present times. In this framework, this work has been carried out. There are also security features which take the help of camera to monitor the surroundings of home and also inside it. This needs the availability of internet based system to relay the information captured by the camera. There is also other way to have such security based on GSM where the intruder is detected by the sensor and the message is relayed through basic phone to the owner. It removes the need for having computer at home to convey the information and is therefore more convenient to operate and maintain. Also as an extension, if fire sensors are used then it can also be relayed to the owner about any hazard. The SMS based system utilizes less power supply to operate it and therefore in remote locations also it can be used. Remotely Home Security based on GSM System by consolidating the upsides using Wireless Sensor Networks and also GSM innovation is displayed. It can identify interruption and so on and inform client remotely about the rate with separation playing no obstruction. In the work by Anandan [9], says that they have endeavored to expand the standard by consolidating new structure strategies and built up a minimal effort home and modern robotized security frameworks. The purpose is to defeat the imperfections by numerous other gadget as it is best in safety reason. It is less expensive and can be kept up effectively than some other very security gadget. There are two ways through which it works namely Internal and external modes. At the point when the inner mode is chosen, the interior territory is secured. The sensor will start functioning and it will give input to the microcontroller such that an alert is issued and also, it will be shown in the LCD connected. At the point when the outer mode is chosen by the client when not in home, the remote security region is selected. All the sensor will be dynamic and the security region address which was pre-customized, alongside the issue would be sent as SMS to predefined police headquarters and all the concerned related to the safety of the system. It would also be informed to the user about the associated unwanted happenings which were detected by the particular sensor. As reported in Teymourzadeh et al. [10] appeared in Fig. 1, waveform is produced in the computerized oscilloscope when the order is transmitted through PIC16F887 to the GSM module. This direction will execute the cancellation of the main message from memory of SIM card.. The program spans to a rest state hanging tight for the new approaching instant messages and after that contrasts the instant message and the put away directions. On the off chance that both the got instant message and the put away directions coordinate, it will execute the expected order, which is killing on or the yield terminal. A recreation resulted to perform the reaction while speaking with the GSM modem. The AT direction was directed from controller to GSM modem as the program begins up, at that point the reaction is gotten from the GSM modem after brief timeframe that does not surpass 500 microseconds which is quick enough to identify the approaching message from the modem. The presentation was utilized to indicate when the controller is transferring the signal.
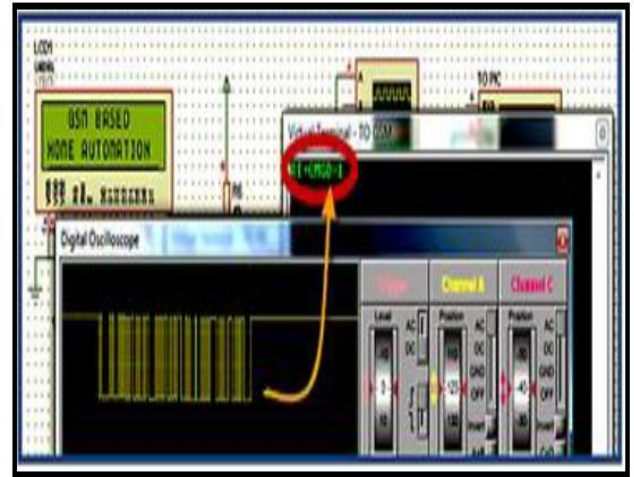

Fig. 1 Command on display

From Fig. 2. [10], the PIC16F887 fills in as a transmitter at first and after that, it gets the reaction from modem. The span between the content sent and reaction got is under 500 microsec. Henceforth, the postpone time is overlooked in light of the fact that the information sent are constrained to specific directions that don't surpass 4 or 5 characters. Be that as it may, if the measure of information exchanged is extremely enormous, the reaction postpones time is exceptionally basic and must be examined and dissected in detail. For the GSM correspondence that is for most part represented by the SMS convention and does not surpass 2 or 3 seconds as had been tried for all intents and purposes.
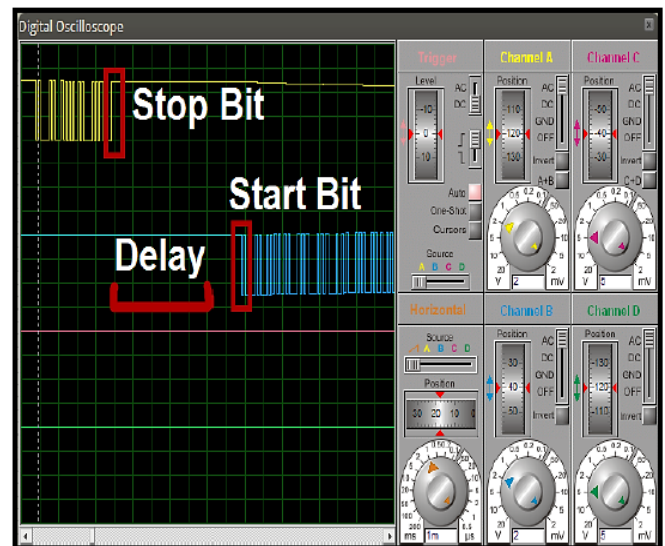

Fig. 2. Waveform of text message

III. IMPLEMENTATION AND RESULTS

In this work the controlling of home appliances like bulb fan etc. and also providing security features using RFID and GSM remote controlling by sending messages. In the block diagram shown below the microcontroller used is LPC2148. The inputs to this are the power supply, RFID module and GSM module.

The output is obtained through relays, motors and fan. LCD is connected to display the output to the user. GSM module transmits the output to the remote location. Relay is used to switch on and off the bulbs.
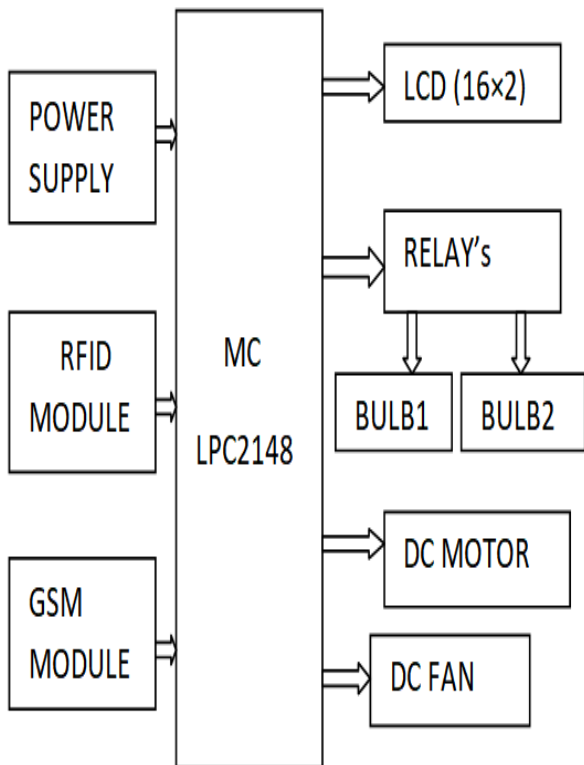

Fig. 3. Block diagram showing various modules used in this work.
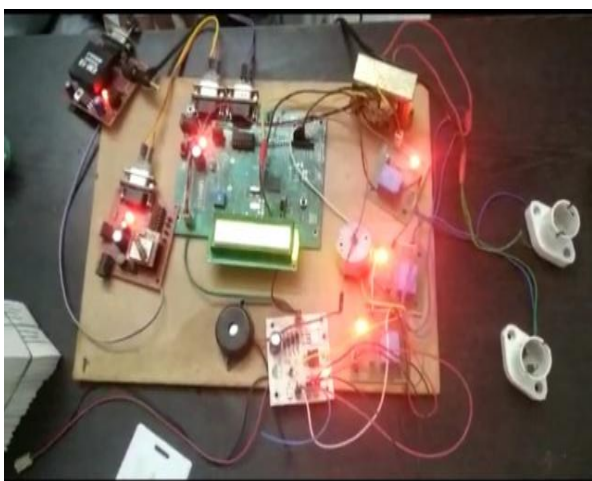
The following diagrams show the results of the project.

Fig. 4. Kit showing the components when switched on.

CONTROLLING SECTION:
To control the home appliances like bulb, fan etc., by sending SMS alert by using GSM technology. Firstly, when switched ON the system the LCD displays the "waiting for the command".

Fig. 5. It shows waiting for the command

Then by using mobile send a message to the system, then LCD displays like this "SMS sending".
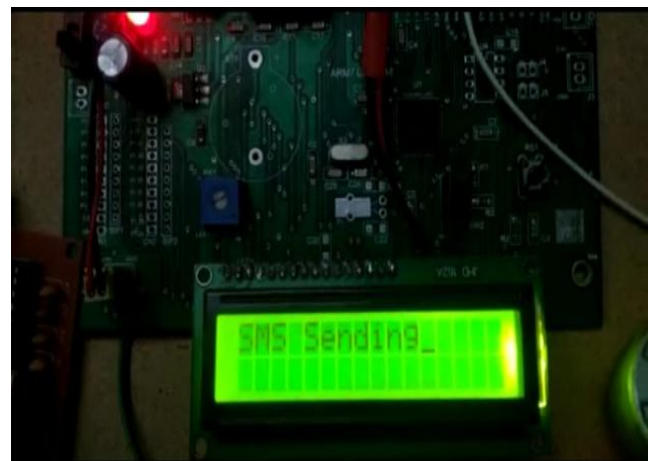

Fig. 6. It shows the SMS being sent

To ON the light, the input given is **@L1ON***
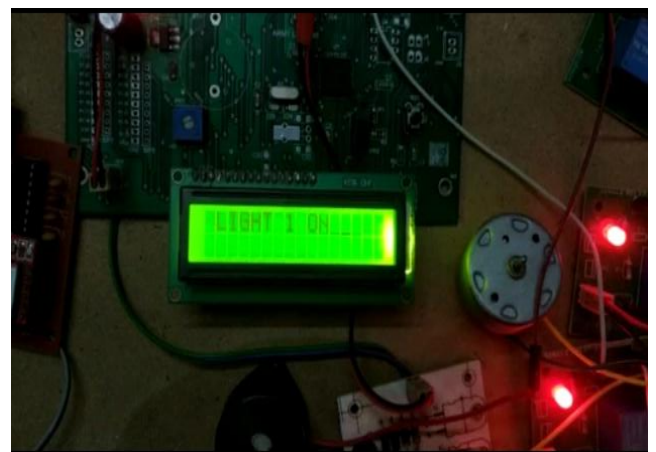Then LCD displays like this **LIGHT 1 ON**

Fig. 7. LCD showing command to switch ON.

Then light will be ON. To OFF the light the following input should be given. **@L1OFF*** The LCD will display **LIGHT 1 OFF.**
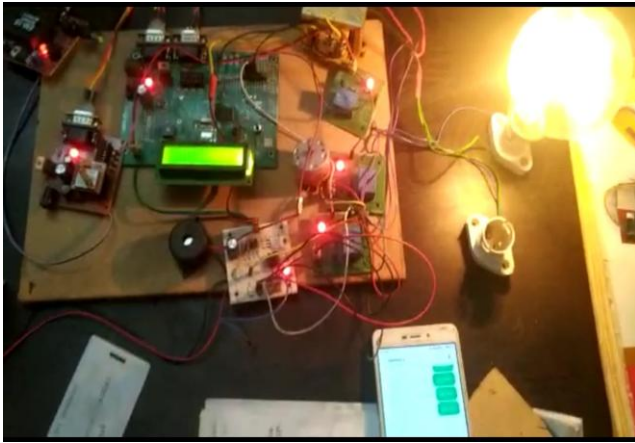
Fig. 8. It shows the bulb gets on through the command

Similarly, to ON the Motor the following input should be given **@M1ON*** Then it display like this **MOTOR 1 ON**

Fig. 9. It shows the MOTOR ON through command

To OFF the Motor, the following input should be given **@M1OFF*** In the LCD display it appears like this **MOTOR 1 OFF**
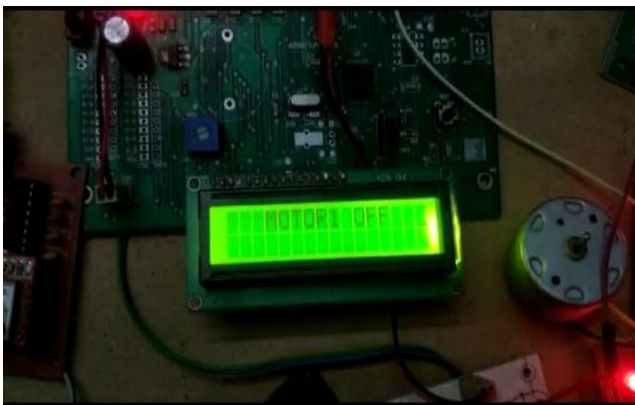

Fig. 10. It shows the motor OFF through command

SECURITY SECTION:

Security is provided to the home by using RFID (Radio Frequency Identification) Technology. It is used to open and close the doors.

When RFID card is scanned on the system then it checks it's valid card or not. If the card is valid then it displays like this **IT'S A VALID CARD DOOR OPENING** which is shown in the figure below.
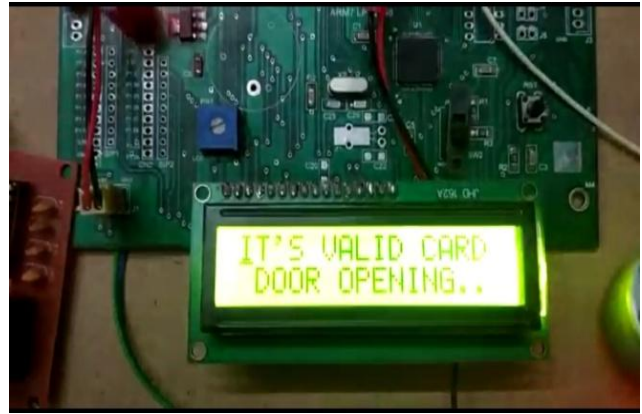

Fig. 11. It shows valid card and opening of door

If any other person is trying to open that door by using another RFID card, the door will not be opened. And the system will displays like this **INVALID CARD NOT AUTHORIZED**
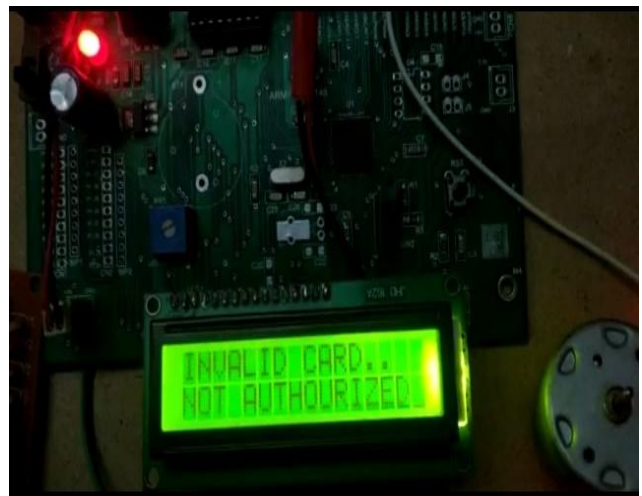

Fig. 12. It shows unauthorized access and will alert the user through SMS and door will not open.

IV. CONCLUSION

As of late, the home mechanization showcase is promising field that is becoming exceptionally quick and there is tremendous scope of improvements that can be done for the idea of a better home. The framework of home security depending on GSM has been structured and used with the flexible systems. The user can go outside and by the GSM innovation accordingly making the framework area autonomous. An adaptable method to control the systems has been presented in this paper. The correspondence with home is just through the SMS which was tried with the versatile systems and is taking a shot at any portable system.

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