M.KUMARASAMY
COLLEGE OF ENGINEERING
NAAC Accredited Autonomous Institution
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ISO 9001:2015 & ISO 14001:2015 Certified Institution
Thalavapalayam, Karur – 639 113.

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A Minor Project Report

On

HOME SECURITY SYSTEM

Submitted in partial fulfilment of requirements for the award of the

Degree of

BACHELOR OF ENGINEERING

In

ELECTRONICS AND COMMUNICATION ENGINEERING

Under the guidance of

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KARUR – 639 113

DEC - 2020

BONAFIDE CERTIFICATE

Certified that this **18ECP105L -** Minor Project III report **"HOME SECURITY SYSTEM"** is the bonifide "**ROHITH.K (19BEC4167)RAJESH KUMAR.A (19BEC4161)RAVIPRASANTH.S (19BEC4164)SANJAY.G (19BEC4171)"** who carried out the project work under my supervision in the academic year 2020-2021

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To emerge as a leader among the top institutions in the field of technical education.

Mission

- Produce smart technocrats with empirical knowledge who can surmount the global challenges.
- Create a diverse, fully-engaged, learner-centric campus environment to provide quality education to the students.
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PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

- **PEO1**: Graduate will have successful career in the core areas of Electronics and Communication Engineering and also in allied discipline.
- **PEO2**: Graduates will provide Engineering solution by demonstrating technical competence and by applying knowledge in Electronics and Communication Engineering.
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- **PEO4**: Graduates will have curiosity for self-learning, updating recent development of technologies in the major area of study.

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- **PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
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- **PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
- **PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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- **PSO1**: Applying knowledge in various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of Engineering application.
- **PSO2**: Able to solve complex problems in Electronics and Communication Engineering with analytical and managerial skills either independently or in team using latest hardware and software tools to fulfil the industrialexpectations**.**

MAPPING OF PROJET WITH POs AND PSO

Keyword	**Matching with POs , PSOs**
Home Security,microcontroller, , Android applications, mobile network connectivity,signal from sensor	All **POs , PSOs**

ABSTRACT

Security is becoming a major issue everywhere. Home Security is becoming necessary nowadays as the possibilities of intrusion is increasing day by day. Safety from theft, leaking of raw gas and fire are the necessary requirements for home security system. However, the GSM (global system for mobile communication) based security systems provides enhanced security as whenever a signal from sensor occurs, a text message is sent to the desired number to take necessary actions. Here we are using an antitheft reporting system which will report the owner by ringing alarm and send a text message. Also for the safety system in case of fire or gas leakage, it will notify the owner by sending an SMS and also by ringing an alarm.The project presents a versatile security and alarm system which can be used by individuals, corporations and establishments which require a cheap but reliable security system. The idea behind this project is to provide its users with a simple, fast and reliable way to get help during emergency situations. The device can be placed at any remote location which can be easily accessed by the user. It uses a microcontroller for system control, GSM technology for communication and sends SMS containing the emergency message and the GPS location of the sender. The project consists of an 8-bit microcontroller ATmega16, GSM SIM900A module and two Android applications for user interface with the hardware. One of the application configures the device. On pressing the panic button, the emergency contact receives the emergency message along with the GPS location of the sender. The device has been made for less than 1300INR and it can be used anywhere irrespective of the place of deployment provided mobile network connectivity is available.

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Acronyms/List of Abbreviations

Acronym	Abbreviations
VCC	voltage common collector
GND	ground

1. INTRODUCTION:

All home security systems work on the same basic principle of securing entry points, like doors and windows, as well as interior space containing valuables like art, computers, guns, and coin collections. Regardless of the size of your home, or the number of doors and windows or interior rooms a homeowner decides to protect, the only real difference is in the number of security components deployed throughout the home and monitored by the control panel.The most basic definition of any security system is found in its name. It is literally a means or method by which something is secured through a system of interworking components and devices.In this instance, we're talking about home security systems, which are networks of integrated electronic devices working together with a central control panel to protect against burglars and other potential home intruders.A control panel, which is the primary controller of a home's security system .Door and window sensors ,Motion sensors, both interior and exterior,Wired or wireless security cameras,A high-decibel siren or alarm,A yard sign and window stickers.Home security systems work on the simple concept of securing entry points into a home with sensors that communicate with a control panel or command center installed in a convenient location somewhere in the home. The sensors are typically placed in doors that lead to and from a house as well as easily accessible windows, particularly any that open, especially those at ground level. Open spaces inside of homes can be secured with motion sensors.These security components, when armed, protect a given space by creating an invisible zone that cannot be breached without sounding an alarm. These are typically used to protect rooms containing valuables, as well as areas less frequented in larger homes.

Surveillance Cameras:

Available in both wired and wireless configurations, surveillance cameras can be used in several different ways as part of an overall security system.

Control Panel:

The control panel is the computer that arms and disarms the security systems, communicates with each i.nstalled component, sounds the alarm when a security zone is breached, and communicates with an alarm monitoring company.

They typically feature a touchpad for easy programming and interaction, is where pass codes are entered to arm and disarm the system, can work on voice commands, and can be programmed to work with wireless remote controls called key fobs.

Door and Window Sensors:

Door and window sensors are comprised of two parts installed adjacent to each other. One part of the device is installed on the door or window and the other on the door frame or window sill. When a door or window is closed, the two parts of the sensor are joined together, creating a security circuit.

When the security system is armed at the control panel, these sensors communicate with it by reporting that the point of entry is secure. Should a monitored door or window suddenly be opened, the security circuit is broken and the control panel interprets this as a breach of a secured zone. A high-decibel alarm is sounded and in most instances the alarm monitoring company is automatically notified.

1.1 Background

In recent years, home security has shifted away from simple control panels and deadbolt locks as locksmiths have started offering things like keyless entries for homeowners. Home security has turned into cool, coveted high-tech gadgets that compose items on many homeowners' wish lists. While the Jetson era hasn't arrived just yet, the technology behind modern smart homes, such as home security camera online viewing features, would likely be enough to blow the minds of our ancestors. There are so many new things that have been invented when it comes to providing security. Not just cameras, but also things like these Verifi biometric smart safes, but there are many other things that have also changed and have been upgraded from the past.

But, today's security systems aren't simply the product of technological developments of the past few years; the groundwork for smart security systems was laid generations ago. To understand how home security evolved into what it is today, you have to take a look back at the past.

The first home security systems an increase in crime followed. As a result, Americans became sensitive to security needs and were eager to find ways to protect themselves and their property. Additionally, many insurance companies began offering premium discounts to alarm subscribers. These events produced a consumer demand for alarm systems.

During this time, homeowners may have subscribed to a service called door shakers- a group of night watchmen who would shake subscribers' doors each night to ensure they were locked. More advanced users may have installed an alarm system that used electromagnetic contacts fastened to doors and windows, which were connected to a battery and bell. These systems were monitored by a central station that sent a guard to the residence when the alarm was triggered.

Fast forward to today, homeowners have traded in door shakers for automated, sophisticated systems. Now, to ensure that doors are locked and the alarm is set, users simply log in remotely via a web-enabled device and check the status of their homes. They can lock doors, arm the system, or adjust the thermostat with the touch of a button.

1.2 **Problem Statement**

A home security system is one line of defense a home can provide against intruders. Such systems can also help protect a home from fire by bringing a home's smoke detectors under its control. Please model a system that exhibits the following behavior. A system can be off, armed while residents are home, and armed while residents are away. The difference between the latter two states is that while residents are away all monitors are active, including window and door monitors and internal motion detectors. While residents are home, the monitors remain active while the motion detectors are deactivated to allow residents free movement within the home.

If a monitor or motion detector detects an intruder, an alarm rings for ninety seconds. This gives residents time to deactivate the system if they were responsible for sounding the alarm. If the alarm is not deactivated then the security system notifies a remote monitoring station of the alarm, and the remote monitoring station informs the local police of the intruder. The alarm will continue to ring until a legal personal identification code (PIN) is entered and the system is commanded to turn off.

A user can enter commands to the system using a keypad. All commands must be prefixed with a user's PIN. If a user arms the security system, they are given a ninety second grace period to leave the house before the armed state goes into effect.

As mentioned above, the security system is linked to a home's smoke detectors. If smoke is detected, the security system rings a fire alarm (distinct from the intruder alarm) and notifies its remote monitoring station. The remote monitoring station will then notify the local fire department. As with an intruder alert, the fire alarm will continue to ring until a legal PIN is entered and the system is commanded to turn off.

1.3 Objectives

Minimizing break-ins

The main purpose for having a wireless home security system is to minimize break-ins. Just the simple fact that you have a security system could keep a potential burglar away from your house. Decals in your windows or a sign in your yard advertising your security could keep a burglar from attempting a break-in. Criminals don't want to get caught and know there is a high chance of being stopped because of a security system. Therefore, your wireless home security system has already done something without even having to be triggered.

Protecting possessions

Replacing your possessions is hard and some things, especially sentimental items, cannot be replaced. Having a wireless home security system means that you can worry less about a criminal breaking in and taking your items. If a criminal does actually get into your house, he or she will only have seconds before the police are alerted. This means you may not suffer a loss as large as one you may have incurred if you didn't have the system in place.

Avoiding danger

Nothing is more scary than having to fight off or confront a burglar in your home. You may not be equipped to handle this type of situation, so leave criminals to the police, even when you have a wireless home security system. If you come home to an alarm going off, you know there is a chance someone entered your house. You can avoid danger by staying out of your house until the police arrive to investigate.A home security system isn't just a deterrent for criminals. This product can also keep you safe from a fire or other disaster. Connecting the unit to a fire alarm can alert you within seconds if there is a fire. The product can even alert the police and fire department.

2. LITERATURE REVIEW

Now a day's people are going through many problems related to security of systems, so security is the most important thing nowadays. In this paper, we try to mention all study related to the security system, basically the system which related to the door lock and main entrance of buildings, which is helpful to prevent an issue like robbery. In past years, the research is gone on different door lock security systems like systems which provide indications of the buzzer. Due to the modern technology, some door lock security systems are based on Arduino, raspberry, the microcontroller also with subcomponent like GPS, GSM, RFID, face scanning, biometric scanning etc. each component is defined with their positive and negative points. In most of systems, SMS technique is used for communication to the system will become cost-effective, more reliable and it will take less time to deliver the message. As security having a big issue nowadays, the security monitoring systems today need to make use of the latest technology. In some papers, the authors have presented door lock security monitoring system based on embedded and Zigbee and sometimes the lock is protected by automatic password hence it could not easily hack by hackers. Also, the raised security systems are available based on Android platform, wireless techniques, and embedded systems. A lot of modification takes places in various Door lock security from the last few years, in next coming years, many changes will take place.

3. PROJECT METHODOLOGY

4.1 Existing Method

The security system mostly works on a common principle of securing entry points like the doors and windows. Some also secure interior space containing valuables like art, computers, guns, and coin collections. Whatever may be the size of your home or whatever may be the number of doors and windows or interior rooms every owner deploys a secured security system. The real difference here is only the number of security components deployed throughout the home and monitored by the control panel.

Security system:

As the name itself suggests, security system literally means a way or a means or a method through which something can be secured via interworking of components and devices. Let us consider an example of home security systems, which are networks of integrated electronic devices working together with a central control panel to protect against burglars and other potential home intruders .The control panel that is the primary controller of a home's security system..Door and window sensors.Motion sensors, both interior, and exterior.

4.2 Proposed Method

A single Application will allow us to use Home Automation and Home Security. Previously separate applications were used for Home Automation and Home Security System so we are solving this issue by using android app which will have all these functionalities within a single application. This android based system will allow us to control the lights and fan on/off, smoke detector will warn us for burning mishaps by deactivating the main power line, we can see our room temperature on our smart mobile screen, we can open or close our sliding home main gate, we can activate the security sensors of our home through one app by enabling it from smart mobile phone on need

For Home Automation:

- Home Appliances such as Lights and Fans on/off.
- Automation of Sliding Home Main Gate as open and close.
- Temperature Sensor.
- Smoke Detection.

For Security:

- Sensor-based IR(infrared) Security system

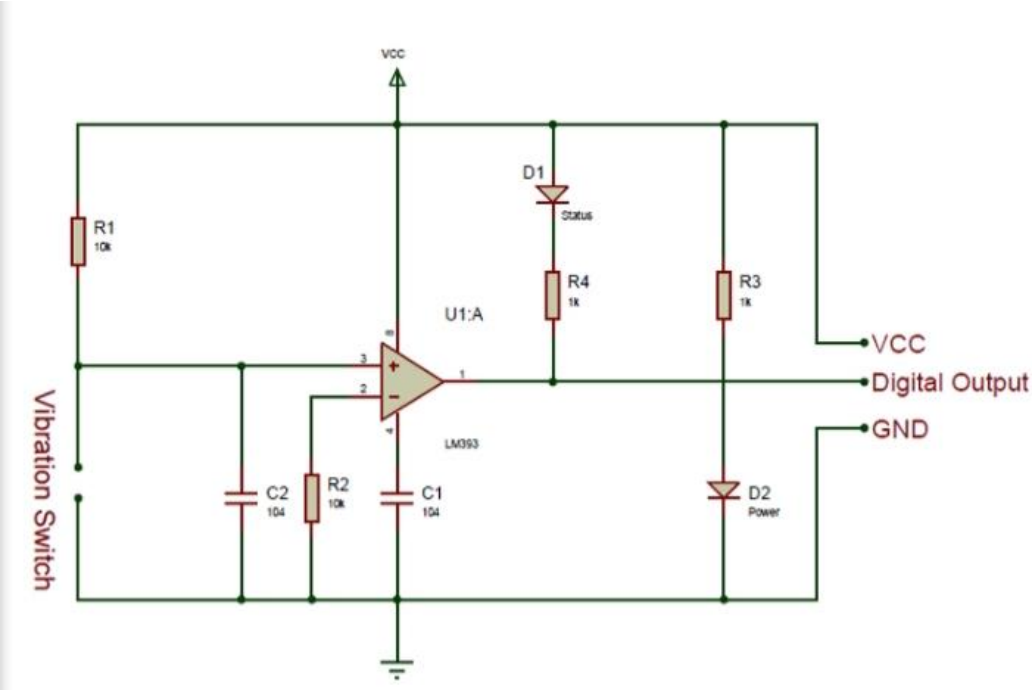


Fig:1.1

5. RESULTS AND DICUSSION

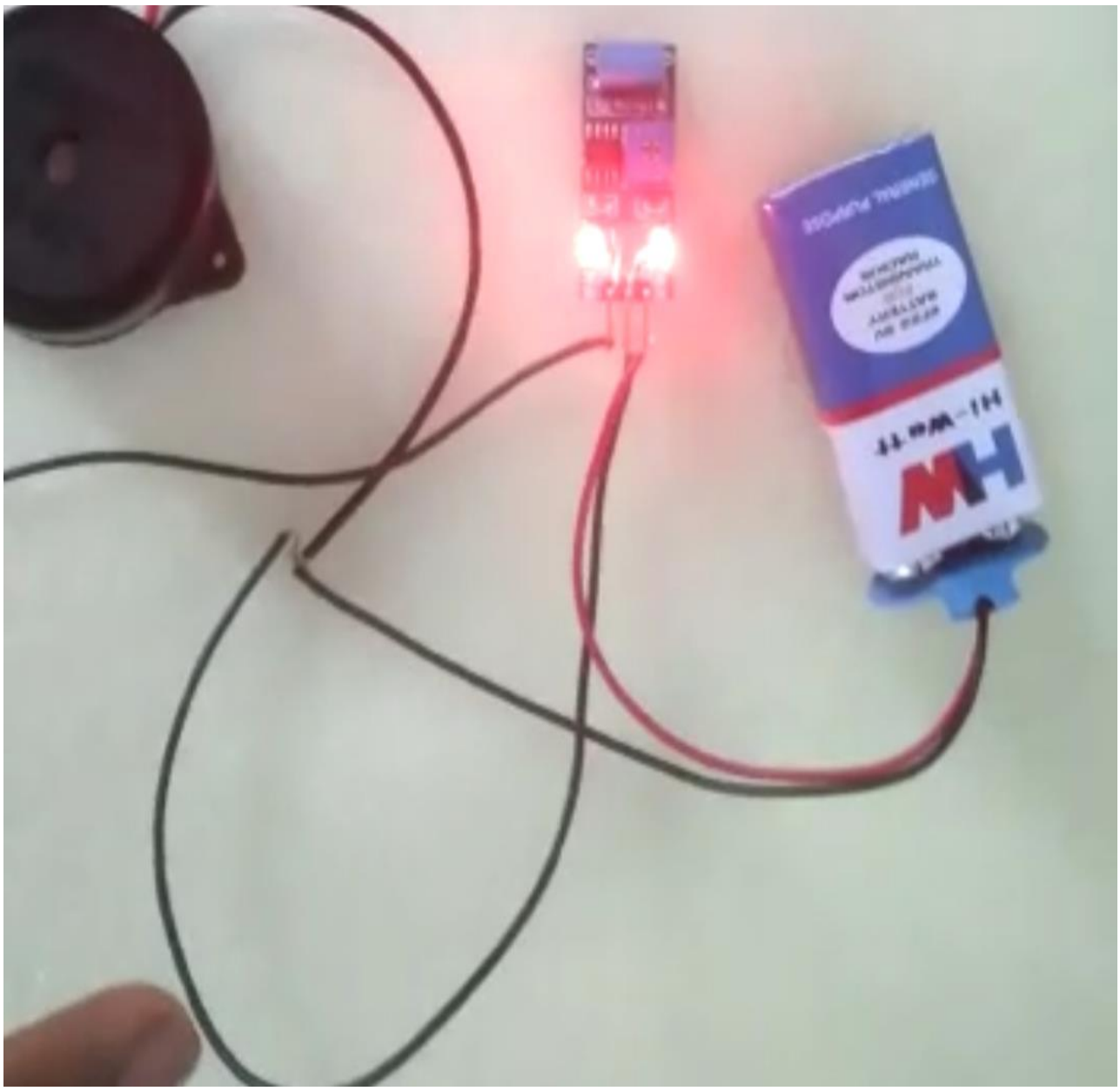
Industry

Some forecasts project the home security market as a whole will be worth $47 billion by 2020,[10] with the DIY home security market worth $1.5 billion. While the market for home security is expanding, especially with cable TV and Internet service providers introducing their own security and home automation products, it is a fragmented market, with "a massive array of large and small rivals." The US market leader is ADT with more than 6 million households subscribed.

The FBI reported that 1.7 million homes were burglarized in 2014.The same report shows that an estimated loss of $3.9 billion was suffered by the victims in the same year. Overall, when the average value was applied to the estimated number of burglaries, the average dollar loss per burglary offense was $2,251. Roughly, there are 2.5 million burglaries a year with 66% being home break-ins. Police typically only solve 13% of break-in crimes due to lack of information and witnesses.

Statistics

It is reported that 53% of break-ins occur during the day and 47% occur at night. Break-ins are 6% more likely to occur between 6am and 6pm while most are out of the house. With only 17% of homes being equipped with home security systems, many burglars are attracted to homes lacking a system. 95% of break-ins require some type of forceful entry (breaking a window, lock picking, kicking in doors). Some common tools used for break-ins are pliers, screwdrivers, and hammers. This makes it hard to see break-ins coming since they are common household tools.



6. **CONCLUSION**

Expectation and Improvement

The result of our design has met our expectation, in which every sensor is working and will sound specific alarm when the system goes into alert status. The keypad and LCD also offer great interface and users can be familiar with our system in less than few seconds.

If we have chance to design this project again, we will add a phone dialer chip like the Zarlink MT8880C we mentioned before. By doing so, we can make sure if no one is at home or if no one is around the area, someone else can be notified to take immediate action. In addition, we feel like our PORTB is a little bit wasted. We only have 4 output patterns but we are using all 8 pins. Next time we will use 74LS series chip together with only 2 output pins from MCP, so together we can save 6 I/O pins.

Intellectual Property

Besides the reference circuit from ISD1420 chip specification, reference keypad decode scheme from lab 3, and temperature sensor circuit from lab 5, we have designed and coded everything on our own. There is no code from public domain, and we did not reuse any code from the previous lab (we do reference, but not copy). Because we are using two pre-built sensor circuits (motion and smoke sensor), we feel like we should not pattern our whole design. However, if we take out these two parts and only have these “inputs,” we definitely have opportunity to pattern our design.

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