

HOME AUTOMATION SYSTEM



Session 2005-2009

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Statement of submission

A report submitted to the
Department of Electrical Engineering
in partial fulfillment of the requirements for the
degree

Bachelor of Science
In
Electrical Engineering

By

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August 25, 2009

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Table of contents

Abstract	v
Acknowledgement	vi
Chapter 1: Introduction	
1.1 Introduction.....	1
1.2 Aim of the project	1
1.3 Concept	1
Chapter 2: Home Automation	
2.1 Introduction to home automation.....	5
2.2 Understanding Automation	5
2.3 Its Convenience.....	5
2.4 Safety	5
2.5 Money Savings.....	5
2.6 Security Systems	6
2.7 Lighting.....	6
2.8 Home Theater.....	6
2.9 Your Phone	6
2.10 Networking	7
2.11 Software	7
2.12 Electronics.....	7
Chapter 3: Home Automation Designs	
3.1 Methods of Home Automation Control	9
3.2 Radio Frequency	9
3.3 Infrared (IR)	9
3.4 Power line	9
3.5 Hardwired	10

Chapter 4: Project Design

4.1	Background.....	12
4.2	Project Design.....	18
4.3	Room Controller Module.....	19
4.3.1	User Interface Board.....	14
4.3.2	Control Board.....	15
4.3.2.a	Controller.....	16
4.3.2.b	Data Bus.....	16
4.3.2.c	System Communication.....	16
4.3.2.d	EEPROM.....	16
4.3.3	State Latch Board.....	17
4.3.4	Power Board.....	17
4.4	Master Controller Module.....	17
4.4.1	Room Controller Module communication interface.....	18
4.4.2	Broadcast communication mode.....	19
4.4.3	GSM Module communication interface.....	19
4.5	GSM Module.....	20

Chapter 5: Technologies Used

5.1	Microcontroller.....	23
5.2	How to choose a Microcontroller?.....	23
5.3	Description.....	24
5.4	Why we select 8051 microcontroller?.....	24
5.5	Communication Media.....	25
5.6	Infrared.....	25
5.7	Bluetooth versus Infrared.....	25
5.8	GSM.....	26
5.8.1	Key entities in GSM system.....	26

5.8.2	Working of GSM and architecture	27
5.8.3	Features.....	27
5.8.4	SMS	27
5.9	GSM Transceiver	28
5.9.1	Serial Communication	28
5.9.2	Two types of serial communication protocols.....	29
5.9.2.a	Synchronous Transmission	30
5.9.2.b	Asynchronous transmission	30
5.9.3	MAX232.....	31
5.9.4	Signaling Rate.....	32
5.10	Software Design	33
5.11	SMS AT commands	33
5.12	Data transfer between Master Controller and Nokia 6080	34
Conclusion		36
Future work.....		36
References.....		37
Appendix.....		38
	Code for Room Controller.....	38
	Code for Master Controller	68
	Code for Mobile Module.....	77

Abstract

Home Automation System is a method of controlling your house and communicating with it. Updating the statuses of Lights, Fans, motors and other house hold appliances through Remote Control and Mobile phone. This provides user access to his house even from remote location, giving him peace of mind that his house is in his control all the time.

Acknowledgement

First of all, we would like to thank Al-Mighty **Allah** for giving us strength to complete our final year project. Then to thank our project advisor Mr. Farhan Iqbal would be to express our indebtedness to him. The project wouldn't have been in the present form without his unflagging guidance and support. He took out his precious time and helped us right from the beginning of the project. We would also like to thank Mr. Muhammad Rizwan for his suggestions which helped us immensely in the design of the project. Various meetings were held which helped us troubleshoot the problems. We also want to take this opportunity to give our special thanks to the University of Management and technology (UMT) for letting us be a part of it for the last four years and the facilities and support it provided for the completion of our final year project and to thank the Dean of School of Science and Technology, Mr. Farooq Aslam for his support to the final year students. We will also like to thank Mr. Amir Manzoor, Ex-lab Engineer UMT. His help was of vital importance to us because of his wide experience in the field, and also for letting us use his trainer board. Mr. Javed Iqbal (from NUST) for his help in the field of microcontroller communication and for letting us go through his lecture slides. Mr. Saeed Ur Rehman Turk for initial guidance on how to use the microcontroller. We will also like to thank our project Manager Mr. Bazigh Mehmood for his efforts and help and also our lab incharge Mr. Naeem-ud-deen Zia. We will also like to thank our parents and families for encouraging us and giving us full support and showing their trust in us. Last but not the least we would like to thank all our friends and classmates who encouraged and helped us time to time in various aspects of the project especially Ammar Ahmad Khan for his help in the field of GSM communication.

(Signed)

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Date:

August 25, 2009

Chapter 1

Introduction

1.1 Introduction

Anything that is able to be controlled in our home is called home automation system. Home automation systems in existence today require a big and expensive change of infrastructure. If we have a remote or any other automatic control over the function within our home we have home automation. The home of the future can be the home you live in today.

Home automation system has taken the home into a new dimension. Today, we can control virtually anything (fan, light and temperature) in our home with a remote or mobile phone. Now the technology is so advanced but there is nothing to worry about because home automation system is easy and affordable.

There are different methods of control and just how to get these benefits into your home today. More and more homes are being outfitted with increasingly complex automation systems. Most of the people may think that this is too hard to do or that it's too technologically advanced for you. There's nothing to worry about because home automation has become easy and affordable.

1.2 Aim of the project

The objective of this project is to develop a device that allows for a user to remotely control and monitor multiple home appliances using remote control, cellular phone or through main control board. This system provides user a great flexibility to control the devices at any time and with the constraints of the technologies being applied.

The proposed approach for designing this system is to implement a microcontroller-based control module that receives its instructions and commands from remote control or a cellular phone over the GSM network. The microcontroller then will carry out the issued commands and after performing the desired task it updates the status on the display screen.

1.3 Concept

Every Home Automation system is a stand-alone device. It is connected to the mains and controls the power outlet of the electrical device that is plugged into it.

There will be a receiver and transmitter in each of the boxes, so they can exchange information with the master. People can control power supply of electrical devices in order to create an interactive home environment to facilitate the control without changing any home appliance. People can enjoy the high technology and simplicity modern life style.

Each device will be with standard setup and while adding it into network; it can be given an address and tasks to do. All the settings will be easily reset to default value, so

people can move the devices between different electrical devices and networks. Home Automation system will be put into different rooms at home, depending on the needed functionality. Various different sensors could be attached.

Chapter 2

Home Automation

2.1 Introduction to home automation

Realistically speaking, there are key reasons why you need to make the decision to install these systems into your home. You may have your own benefits and desires when it comes to home automation, too. For each person, the experience is their own.

2.2 Understanding Automation

Home automation can allow you, and your computer, to make the things that you need and do in your home easier to accomplish. Perhaps you want to control your security system. Or, perhaps you want to voice automate the lights in your home so that you can get into bed and then turn the lights out. Or, perhaps you want to be able to control your sound system from anyplace in your home.

2.3 Its Convenience

The reason that many of the home automation products have been developed is that of convenience. People love being lazy, and in short, that's just fine when it comes to automation options. Convenience with home automation goes farther than this, though. You'll gain the ability to do more, faster and easier. For example, you can set temperature for your home, run a bath, dim the lights, warm your bed before you make it up the stairs and so much more. A popular choice is that of the bathroom and shower models which will actually get your bathroom heater and shower running five minutes before your alarm clock goes off to wake you up. Yes, no more cold showers and cold bathroom floors. It is an ultimate luxury that will change the way people in societies live. Inducing a feeling of being able to talk to your home.

2.4 Safety

Safety is important inside the home. If there is something that's gone wrong and there's water in the basement, an alert can be sent to you. Or, if the temperature of the home falls to a certain level, that too can be alerted to you. Home automation really puts you in charge of your home's safety. Without much cost and much trouble, you can set up your home to be safe from the moment you get up to the moment you fall asleep and beyond. Set up alerts to contact the police if there's a glass break. Set off warnings that will alert you, the police, the neighbors and even the other appliances in the home of a fire.

2.5 Money Savings

Believe it or not, home automation can save you money as well. There are several ways that it can, actually. For example, by fine tuning the way that your appliances work, you can get the most benefit from them, but you also get the benefit of using them only when you need to. Why should your home be heated to a perfect 72 degrees F when you aren't home to enjoy it? That's wasted energy. You can use home automation to help with this by programming it to turn on the heat or air conditioning a half hour before you get home.

2.6 Security Systems

Security today is one of the most important reasons to consider home automation. Your options are limited otherwise, you could purchase a system that will make a lot of noise if someone was to break in or violate it. Or, you could spend a small fortune on having a home monitoring service that will alert you directly when someone violates the home. With home automation, you get the best of both worlds. You can easily invest in a security system that will monitor your home just like others do, even better most of the time that will also be programmed to alert you when something violates it.

2.7 Lighting

Lighting is also one of the most inexpensive of products to choose from. Lighting home automation tools will allow you to control the amount of light, when the lights come on, go off and allow you to set up a vast number of wonderful lighted displays that you design. Lighting automation allows for several benefits that are unique. For one, there are benefits in saving energy. You can program lights to dim gradually over several hours, or you can plan on the lights going on or off at a set time. Lights can be shut off from any location within the home one by one or you can have a master switch which allows you to turn off all lights in the home (or those that you adjust) at one time.

Going to bed at night, all the lights can be turned off. Leaving the home, all lights can be turned off. Better yet, think you hear something downstairs in the middle of the night, turn all the lights in the house on at once. Timers are an ideal benefit to outdoor lighting or indoor lighting. Program your lighting to turn on and off as you see fit. You should plan for a timer that will dim over the course of the night. Or, if you are going on vacation, select a timer that will come on at various times of the day and night so that it looks like someone is at home even when you are miles away.

2.8 Home Theater

If you have a home theater system, then you have the ability to automate it. There are many different types of theaters that can be automated to make them easier to use as well as more effective to use. Those that struggle to get their system up and running can easily benefit from automation. Your home automation system can completely start up for you with the touch of a button. The products will load, the system will load and within a matter of seconds you'll have your system up and running.

2.9 Your Phone

Although the phone may seem like a pretty standard piece of equipment that doesn't need much automation, there are still things that can be done to enhance it to make it even better. For example, automating your phone service could mean only allowing specific phone numbers to get through, or even cause your phone to ring at all. You can program the phone service to do a number of things, even better than this. Along with phone

systems, you can also control several aspects in regards to intercoms. Intercoms work very uniquely when it comes to the home. For example, with a wireless (or hardwired option if you prefer) you can communicate with anyone that's in your home, no matter where they are located. If you install video options, you can even see who it is that it at the door, making it even easier for you to make decisions about your home. When a visitor arrives, your phone system can alert you. Even before the doorbell has been rung, you'll be alerted to someone being at the door or approaching it. Consider an automatic dialer. Or, monitor the calls coming into your home. Door phones are a great choice to talk to the delivery person without having to open the door. You can even purchase remote monitoring units to allow you to monitor your phone usage, calls and even those that are using your phone when you are not there. [2a]

2.10 Networking

Connect to anything with home automation. Networking used to be something for only businesses, but walk into any average American home and the need for networking has grown, substantially. Whether it's connecting your computer systems to the internet or connecting them to each other, the need has grown considerably and probably will continue. Connect your television needs to your laptop to watch your favorite shows. Or, watch one movie in several rooms all at once. As you can see, there's plenty that can be put together to allow for communication to flow from one to the next. In fact, connectivity is one of the best features that can be done within the home. Home automation is a must today with all of this connectivity need that the average person needs.

2.11 Software

Computer software has to be able to control the communication, send tasks for Home Automation embedded devices and be provided with the GUI where end users can set up actions.

2.12 Electronics

This area covers in detail the hardware solutions chosen and how that affected the final prototype. The hardware could be described as three different work areas: dimmer/switching circuit and wireless modules.

Chapter 3

Home Automation Designs

3.1 Methods of Home Automation Control

As we have seen, there are actually quite a few ways to automate our home. But there are different methods to control it. This is where home automation gets a bit technical, but even still there are several easy ways to understand and it couldn't be easier to install into your home. But, when you get out there and start looking at products to help automate your home's systems, you'll want to take into consider several of these methods. Some may work better for you than others. These methods also help to define the cost of the product too. Remember, you can automate much of your home inexpensively. But, there is a different level of automation available in the various types of tools available. Learning more about each of these will help you to make the right decision for the product that's out there for you. Take a few minutes to compare the different methods of controlling your home automation. Select the one that seems to fit your lifestyle, your needs and your budget the best.

3.2 Radio Frequency

Radio frequency is just what it sounds like. It uses radio frequencies that travel through the air to get to the device and do what you ask it to do. Radio frequency, which is sometimes called RF, is a common type of home automation tool because it can get through walls. That means you can be in the garage and can get the lights in the house on. There are different ranges that you'll need to take into consideration. Depending on the application that you plan to use it for will make the most difference in this regard. Besides being a bit more costly than that of infrared, radio frequency isn't as good with long distance remote controlling that you may need. These two disadvantages may push you towards other types of control for home automation. But, it is still worth looking into, the most popular types of applications for radio frequency include garage doors, which can open from a bit down the drive or street and computer networking, such as within the home.

3.3 Infrared (IR)

Infrared technology is commonly used with home automation. The remote control options are one of the most affordable choices, and therefore are often used for the smallest budgets. You'll find that they start at very cheaply and move up, depending on what they are designed for. Infrared does have the disadvantage of requiring a "line of sight" style of remote control. You'll have to point the remote at the application, appliance or device for it to make any changes happen. You'll find that Infrared is used in many television remote controls as well as other consumer style electronics and appliances. Most of the remote controls you pick up today will have this type of technology in them.

3.4 Power line

Power line is a good choice for several reasons. First it is just as affordable as Infrared technology, which means that you'll find it offered in many types of applications that you

are considering using home automation for. It also works as a whole house types of control measure. The largest disadvantage of Power line is that it often needs noise filters used with it. You may also need phase couplers to work with it as well. Power line is more readily available for indoor home automation but in the most common types of automation, too. You'll find it used in appliances, in lighting applications as well as many types of home security.

3.5 Hardwired

There are benefits to using hardwired home automation. Although many people don't want to even think about this option because it is one of the most costly of options, the benefits are probably well worth it. In hardwired applications, you'll have to do the actually wiring of devices, something that a professional may have to help you with. The benefits of hardwiring, though, include the ability to rely on it. It is quite the dependable option especially when you compare it to other types of automation that can be somewhat dependant on frequency or location. Hardwired control is generally used in high end applications as well as in various video elements and in some cases networking throughout the home.