HOME AUTOMATION USING ANDROID APPLICATION

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Abstract - *Today we are living in 21st century where automation is playing important role in human life. Home automation allows us to control household appliances like light, fan, AC etc. It also provides home security and emergency system to be activated. Home automation not only refers to reduce human efforts but also energy efficiency and time saving. The main objective of home automation is to provide ease in controlling the home appliances as well as provides safety. This paper put forwards the design of home automation and security system using Android ADK. The design is based on a standalone embedded system board Android ADK (Accessory Development Kit) at home. Home appliances are connected to the ADK and communication is established between the ADK and Android mobile device or tablet. The home appliances are connected to the input/output ports of the embedded system board and their status is passed to the ADK. We would develop an authentication to the system for authorized person to access home appliances. The device with low cost and scalable to less modification to the core is much important. It presents the design and implementation of automation system that can monitor and control home appliances via android phone/ tablet.*

Key Words: Control of all the home appliances, prevent from electrical shock, control via android app.

1. INTRODUCTION

As we are moving forward in the future, we are becoming more habitual of modern technology. This project bring us closer to it. Home Automation Using Android is user friendly. It controls all of the Home Appliance using an android application which gives you control of all the home appliance not only on the tip of your finger but also by voice command . Whenever a voice command like "Turn on the light" is given the command will get executed or we can use the dedicated soft keys on the application to control the appliances. The project was made in two different parts:

1.   Transmitter Module
2.   Receiver Module

The Transmitter module will consist of the Android app in the mobile. Whenever a command is given through app the command is converted into text by Google's Speech Recognition and is then sent to the Receiver module, the command is also displayed on the mobile screen so as to correct any command if misinterpreted. In the app voice command window as well as the soft keys can be used for controlling appliances like lights, fan, T.V, etc. The Receiver Module consist of LCD screen, Bluetooth and controller and trigger circuit. Whenever any command is received by the Bluetooth from the app it will first send it to the microcontroller. And if the command is valid, it will get executed. The LCD screen provided on the receiver shows the command given, so that in case a wrong command is given, it can be corrected by the user by giving correct command.

2. LITERATURE SURVEY

Home automation is the residential extension of building automation. It is automation of the home, housework or household activity. Home automation may include centralized control of lighting appliances, security locks of gates and doors and other systems, to provide improved convenience, comfort, energy efficiency and security.

The popularity of home automation has been increasing greatly in recent years due to much higher affordability and simplicity through smartphone and tablet connectivity. The concept of the "Internet of Things" has tied in closely with the popularization of home automation.

A home automation system integrates electrical devices in a house with each other. Devices may be connected through a home network to allow control by a personal computer, and may allow remote access from the internet. Through the integration of information technologies with the home environment, systems and appliances can communicate in an integrated manner which results in convenience, energy efficiency, and safety benefits.

3. COMPONENTS DESCRIPTION

Atmega16 Microcontroller
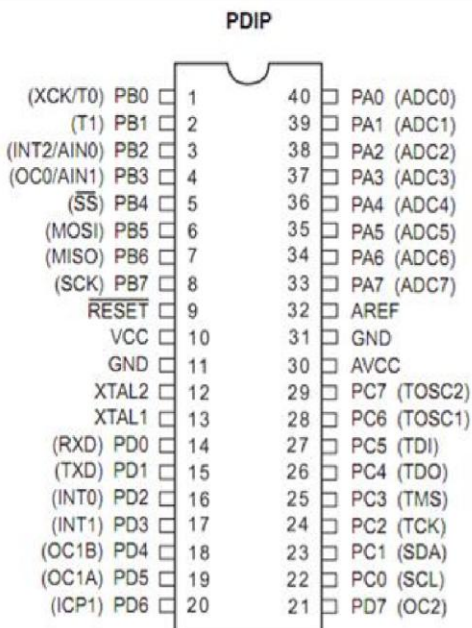
ATmega16 is an 8-bit high performance microcontroller of Atmel's family with low power consumption. Atmega16 is based on enhanced RISC (Reduced Instruction Set Computing) architecture with 131 powerful instructions. Most of the instructions execute in one machine cycle. Atmega16 can work on a maximum frequency of 16MHz.

Triac BT136

The TRIAC is a three terminal semiconductor device for controlling current.
It gains its name from the term Triode for Alternating Current. It is effectively a development of the SCR or thyristor, but unlike the thyristor which is only able to conduct in one direction, the TRIAC is a bidirectional device conducting is both directions.

Voltage Regulator 7805

Voltage Regulator can be designed by using op-amps, it is quicker and easier to use IC voltage regulators. Furthermore IC voltage regulators are versatile, relatively inexpensive and

are available with features such as programmable output, current/ voltage boosting and floating operation.

MOC5041 Optocoupler

For preventing the triac circuit from the 220v supply we are using the optocoupler. It creates an optical path in between the power supply and the triac circuit so as to give 5v supply to triac circuit. It also consist of Zero crossing circuit which triggers the triac circuit at every zero point so as to operate the triac in negative cycle also which results in fluency of the system.

Bluetooth Module HC05
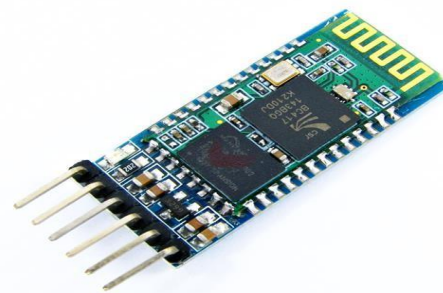
We are using a HC05 Bluetooth module at the receiver circuit so as to receive the command from the application and deliver it to the microcontroller where various command is already fed to it.

4. Circuit Diagram
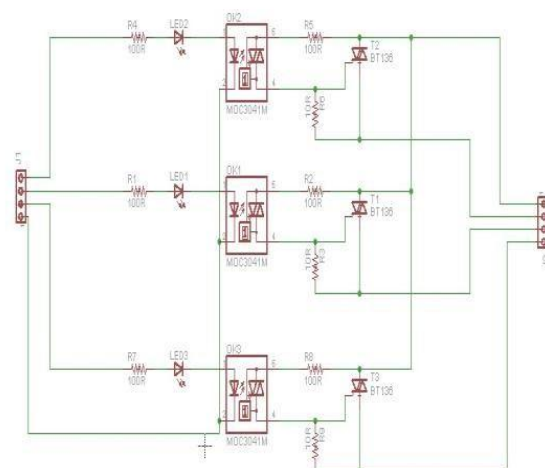
5. Working

When command is given through android app either by voice or soft keys the command is converted into text by Google's Speech Recognition and is then sent to the receiver the micro-controller Atmega16 interprets the command the performs the action as programmed. If a command given is valid then it is executed. For turning on or off an appliance the Triac needs to be triggered when Triac is triggered through opto-coupler by DC voltage it toggles and turns or off the A/C load. The opto-coupler prevent the high A/C voltage from back firing into controller circuit and thus protects the controller from getting damaged. Using a Triac eliminates the problem of sparking as it would happen if a relay was used.

6. CONCLUSIONS

In designing of this project we came to know that there is number of ways to operate our appliance in a safer manner. Android phone is not only capable of doing regular task but also with proper interfacing and application design it can operate our appliance.

REFERENCES

[1] Aniket Yeole,"RTOS Based Home Automation using Atmega" IJIRCCE Vol.3 , Issue 2,February2015.