



Android Based Home Appliances Control Using Bluetooth Module

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Abstract: Google android operating system is one of the leading and most popularly preferred system in smart phone. Smart phone affordability increases day by day due to their size and portability. Android GUI installed in Smart Phone. The operator has to touch on the screen of the phone to control the home appliances. This project is an android application which possesses the capability to control any sort of electrical appliances providing remote access from smart phone using Bluetooth. Bluetooth technology is wireless radio transmissions in a short distance providing a necessary technology to create convenience, intelligence and controllability. This generates Personal Area Network in home environment, where all these appliances can be interconnected and monitored using a single controller. Home automation involves a degree of computerized or automatic control to certain electrical and electronic systems in a building. Busy families, individuals with physical limitation represent very attractive market for such networking. This system will also assist and provide support in order to fulfill the needs of elderly and disabled in home.

Key Words: Microcontroller, Bluetooth module, relay, regulated power supply.

I. INTRODUCTION

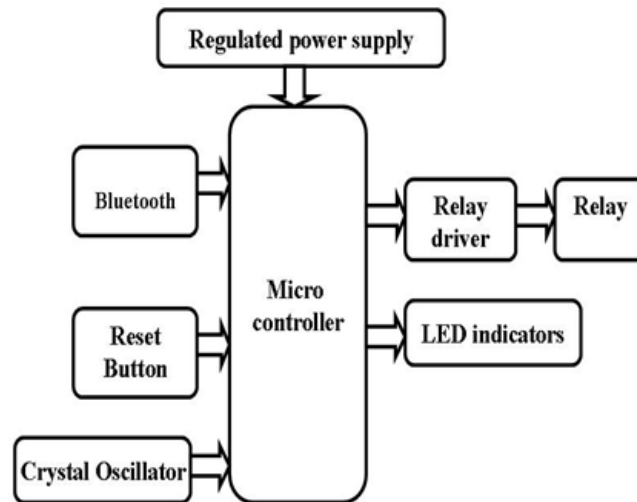
The project aims in designing a system which operates electrical appliances in home through Android mobile phone. Android is a software stack for mobile devices that includes an operating system and key applications. Android gives vast spectrum of connectivity options including Wi-Fi, Bluetooth, and wireless data over a cellular connection [for example GPRS, EDGE(Enhanced Data rates for GSM Evolution) and 3G]. Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. Bluetooth is an open standard specification for a radio frequency (RF)-based, short communication. It is designed to be an inexpensive, wireless networking system for all classes of portable devices, such as laptops, PDAs (personal digital assistants), and mobile phones. It also will enable wireless connections for desktop computers, making connections between monitors, printers, keyboards, and the CPU cable-free. There are two systems in this project. The first one consists of Bluetooth module which gets input from android smart phone. The program on the microcontroller serially communicates with Bluetooth device to generate respective output based on the input data to operate a set of relays through a relay driver IC. In the receiver section, bluetooth and 4-Relayboard are interfaced with Microcontroller. The controller acts accordingly on the Relays to switch connected electrical appliances. In achieving this, controller is loaded with a program written using Embedded 'C' language.

II. BACKGROUND STUDY

There are lots of home appliances system having different features.

- [1] Aritra Sasmal, Abhradeep Palit, Abhishek Majumder, Deepjyoti Bhowmik, Sougata Chanda, Aritra Bandyopadhyay depicted home automation system considering notification system to notify user accordingly used toast notification and putting status message on status display.
- [2] Ms. Jaya Sree depicted the way to use various software required for manufacturing and working of system. For example Express PCB is for designing circuit, keil compiler for compilation part, proteus7 for simulation part.
- [3] R.A.Ramle, M.H.Leong, R.S.S.Singh, M.M.Ismail, M.A.Othman, H.A.Sulaiman, M.H.Misran, M.A.Meor well explained three different types of physical control method namely pressing on the modified low voltage activating switch, clicking on window GUI on PC/Laptop, android GUI installed in smart phone.
- [4] Syed Hussain Naqvi Raza introduced the concept of homatic world in which homatic is represented as a wireless home automation and makes life easier. They used single core processor which operates on gingerbread operating system.
- [5] Subhamay Sarker, Mithun Chakraborty, Anindita Banerjee have shown the master slave relationship in project where all slaves links with the master. Pinconet topology used having specification limited to server.

III. BLOCK DIAGRAM



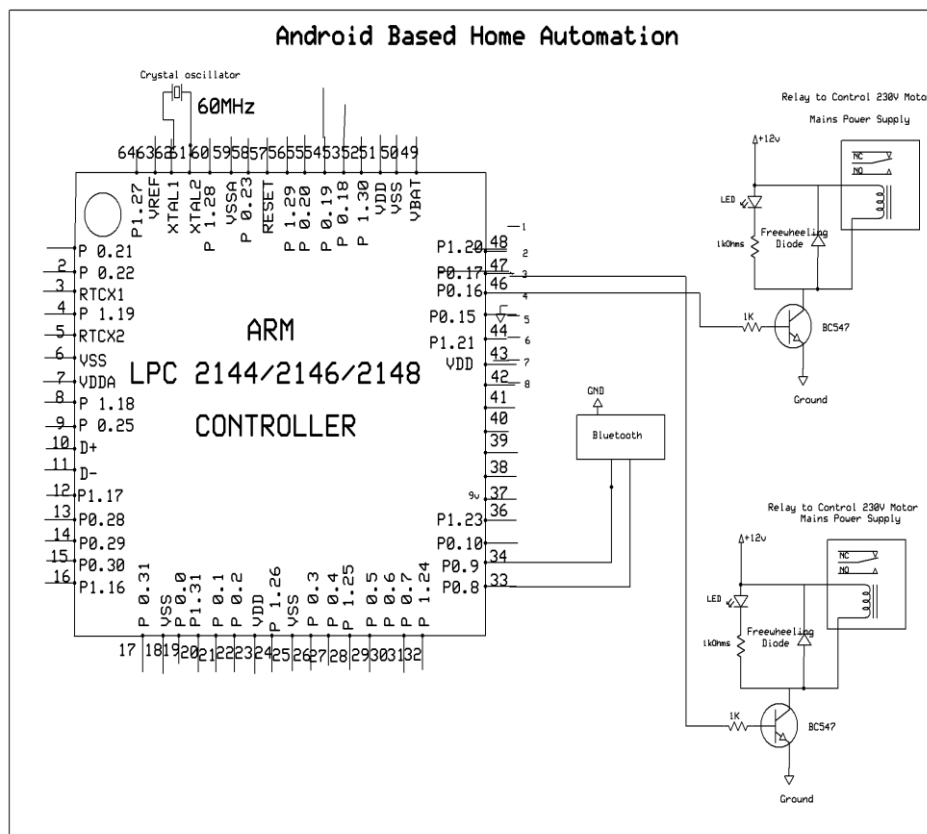
IV. MAJOR BLOCKS

ARM7-Microcontroller: The microcontroller we are using is a ARM7. The executable android application is installed on the device which communicates with the microcontroller which in turn communicates with the client modules or the house appliances through a relay board designed for parallel interfacing.

Bluetooth module:. Bluetooth device is used to exchange data wirelessly in a short distance using short-wavelength radio transmissions.

Relay: The relay device is used with the household electronic or electrical appliances which acts as ON & OFF switch.

Regulated power supply: Regulated power supply is used to provide desired dc power to the microcontroller .It consist of transformer, rectifier filter and regulator.

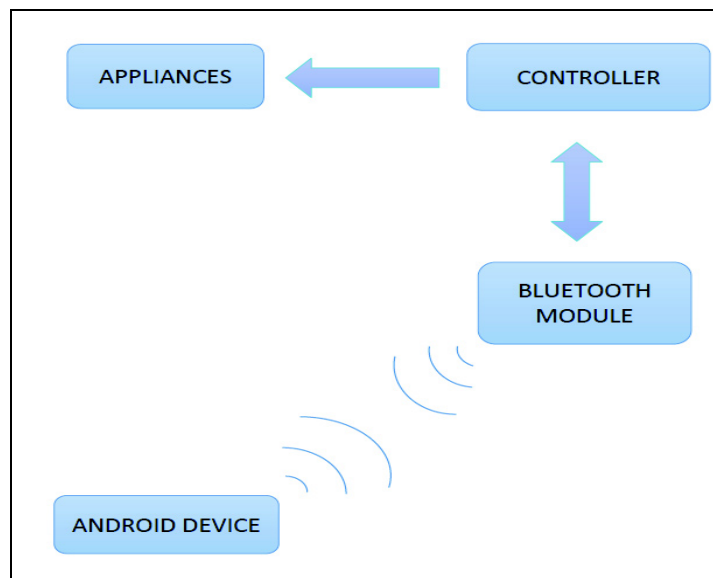


V. CONSTRUCTION

Construction of circuit is as shown. It consist of ARM LPC 2144/2146/2148 controller which is 64 pin IC. Crystal oscillator is connected to XTAL1 and XTAL2 which in turns providing continue oscillations. Relay circuit is connected to port 0. Port 0 is a 32-bit I/O port with individual direction controls for each bit. Total of 31 pins of the Port 0 can be used as a general purpose bidirectional digital I/Os while P0.31 is output only pin. The operation of port 0 pins depends upon the pin function selected via the pin connect block. Pins P0.24, P0.26 and P0.27 are not available. Relay output is connected to respective home appliances to switch it on or off. Relay consists of coil of wire surrounding a soft iron

core. The armature is hinged to the yoke and mechanically link to moving contact .It is held in place by a spring so that when relay is de-energized, gap created in magnetic circuit. Hence one of the contact in relay pictured is closed and other set is open. Thus making on electric appliance connected at the output.

VI. MECHANISM



VII. CONCLUSION

The objective of this paper is to realize the low cost system which designed to improve the standard living in home. The system has been successfully designed and prototyped to monitor and control the lighting status using an Android. With improvements in technology and the fact that Android is free and open source, making the overall system cost affordable for mass adoption.

VIII. FUTURE SCOPE

This project can be further developed by integrating it with the internet to monitor your home while sitting in a remote area. By doing this, one can keep an eye on his or her home through an internet connected to the user's mobile phone or PC or laptop. This will not only improve the security of your home in this modern day.

IX. APPLICATION

- 1.No need to carry separate remote or any other controlling unit.
- 2.This project is feasible because the cost of the project is very less as compared to the expensive Wi-Fi based on home control systems presently available in the market which require an additional cost of internet services.

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