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# Android & Arduino Based Smart Home Automation

**JELLA SANDEEP**
PG Scholar, Dept of ECE
Kasireddy Narayanreddy College Of Engineering & Research, Hayathnagar, Hyderabad, TS, India

**K. RAMBABU**
Assistant Professor & HOD, Dept of ECE
Kasireddy Narayanreddy College Of Engineering & Research, Hayathnagar, Hyderabad, TS, India

**K. RAM KRISHNA**
Assistant Professor &Guide Dept of ECE
Kasireddy Narayanreddy College Of Engineering & Research
Hayathnagar, Hyderabad, TS, India

*Abstract:* **The project aims at designing smart home automation system controlled through Android phone over Bluetooth technology. The electrical loads can be controlled remotely using android application in android phone.**

*Keywords:* **Android App; Home Automation; Wireless Communication; Electrical And Electronic Devices;**

## I. INTRODUCTION

Nowadays, people have smartphones with them all the time. So it makes sense to use these to control home appliances. Presented here is a home automation system using a simple Android app, which you can use to control electrical appliances with clicks or voice commands. Commands are sent via Bluetooth to Arduino Uno. So you need not get up to switch on or switch off the appliances.

The home automation circuit is built around Arduino Uno board, Bluetooth module HC-05 and a four channel relay board. The number of channels depends on the number of appliances you wish to control. Arduino Uno is powered with a regulated power source. The relay module and Bluetooth module are also provided with regulated power supply.

## II. LITERATURE REVIEW

Arduino is an open source electronics prototyping platform based on flexible, easy-to-use hardware and software. It is intended for artists, designers, hobbyists and anyone interested in creating interactive objects or environments.

Electronic and Electrical environment with respect to this context is any environment which consists of appliances such as fans, television sets, air conditioners, motors, heater, lighting systems, etc. A remotely accessible environment is an environment in which each appliance can be remotely accessed and controlled using software as an interface, which includes an Android application and a Web application. Such remotely accessible systems are already available in the market, but have a number of drawbacks as well. This paper aims to perform a survey of all the existing such systems and compare the available features.

## III. PROPOSED SYSTEM

This project is to design and build android phone based remote control system for switching of electrical appliances based on arduino UNO. Arduino Uno is based on ATmega328 microcontroller (MCU). It consists of 14 digital input/output pins, six analogue inputs, a USB connection for programming the onboard MCU, a power jack, an ICSP header and a reset button. It is operated with a 16MHz crystal oscillator and contains everything needed to support the MCU. It is very easy to use as you simply need to connect it to a computer using a USB cable, or power it with an AC-to-DC adaptor or battery to get started. The MCU onboard is programmed in Arduino programming language using Arduino IDE.

Bluetooth technology is secured and low cost. It makes use of an Arduino Bluetooth board. An interactive user interface is used in the android phone app. The I/O ports of the Bluetooth board and relays are used for interfacing with the devices which are to be controlled.

***Software:***

1. Arduino IDE
2. Embedded CPP Code
3. Proteus Simulator

***Hardware Components:***

1. ATMEGA328 Microcontroller (Arduino UNO)
2. Bluetooth Module HC-05
3. 16x2 LCD Display
4. ULN2003
5. Relays
6. Regulated Power Supply

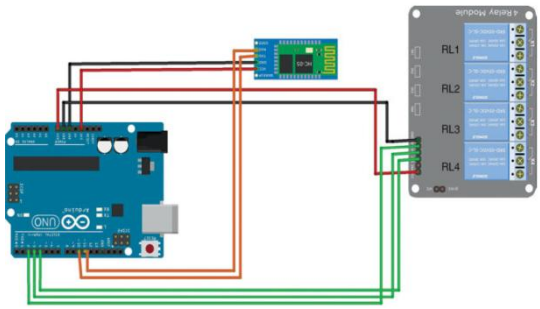
***Working Description :***

We are here using four electrical loads which are controlled remotely by android phone using bluetooth communication.The android phone sends

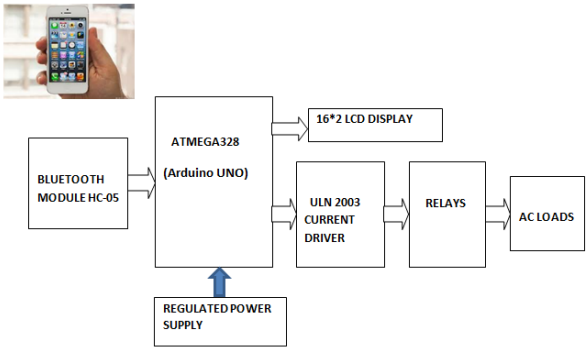
  

data to bluetooth module which is forwarded to Atmega328 Microcontroller which belongs to AVR family. The data is then processed and compared by controller and proper actions for switching of the electrical loads is performed. The electrical loads are connected to relays which basically work as electromagnetic switches.

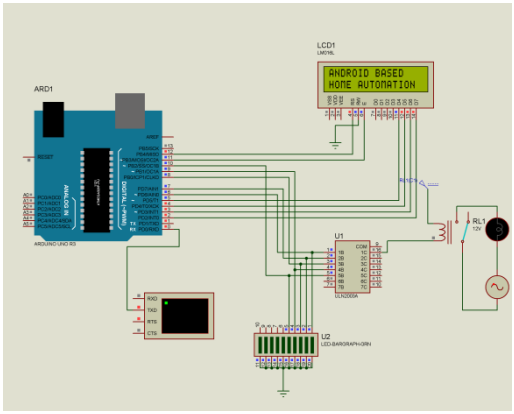
***Components Intefacing With Arduino***




**BLOCK DIAGRAM**




## IV. PROTEUS SCHEMATIC DIAGRAM




## V. SOFTWARE SCREENSHOT

***Screenshot of Arduino IDE***

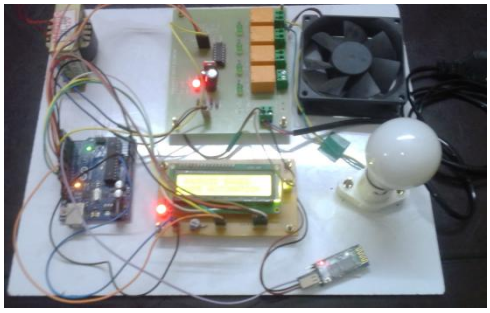

We are using embedded cpp code and arduino IDE to compile the source code

**Android APP Screen Shot**


## VI. APPLICATIONS

It can be useful for homes,offices,commercial places, Educational Institutions etc.

## RESULTS



## VII. CONCLUSION

In the designing of the project ease of user interface is considered. The controlling of electrical appliances is easy as the different buttons are available on the android app for different actions. The Android device used here makes bluetooth communication with the system. The Controlled Wireless communication can also be achieved using Wi-Fi network or internet. The future implications of the project can be GSM ,Zigbee, DTMF etc. The application has very robust design. Finally we can conclude that this paper presents the features to be possessed by an ideal system for home automation with remote access.

## VIII. FUTURE SCOPE

We can interface many sensors including motion sensors, light sensors and temperature sensors and provide automated toggling of devices based on conditions. More energy can be conserved by ensuring occupation of the house before turning on

devices and checking brightness and turning off lights if not necessary. The system can be integrated closely with home security solutions to allow greater control and safety for home owners. The next step would be to extend this system to automate a large scale environment, such as offices and industries.

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## AUTHOR's PROFILE

**JELLA SANDEEP,** Pursuing M.TECH(ES) from Kasireddy Narayanreddy College Of Engineering & Research, Hayathnagar, Hyderabad, TS, India.

**K. RAMBABU**, working as an Assistant Professor & HOD , Kasireddy Narayanreddy College Of Engineering & Research, Hayathnagar, Hyderabad, TS, India.

**K. RAM KRISHNA,** working as an Assistant Professor, Kasireddy Narayanreddy College Of Engineering & Research, Hayathnagar, Hyderabad, TS, India.

  