International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 04 Issue: 03 | Mar -2017 www.irjet.net p-ISSN: 2395-0072

Android Controlled Air Conditioner Remote

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Abstract – *Remote is an essential component of electronic devices such as Television, DVD player, Air Conditioner (AC), etc. and used to operate that device wirelessly in a particular range. If a remote is misplaced it is difficult to find it, as well as only one person can use it at a time. This leads us to the designing of a remote which will be in one self's mobile phone. We are developing the remote buttons on the android application, by which we will be able to ON/OFF AC or increase/decrease the temperature of AC. Here we will be using Bluetooth as a medium to interface between mobile phone and controller. The AC will be controlled using an android phone commands. The android application will be re-programmable and tooling can be changed to provide multiple applications.*

Key Words: **Android mobile phone, Bluetooth module HC-05, IR LED, IR receiver, AC remote, etc.**

1. INTRODUCTION

Nowadays remote controller is available for every electronic device. But time is invested in search of it. So we can develop the remote on our smart phone screen by using android applications which indeed will be very useful for communication. The purpose of our research is to provide an Air Conditioner remote control architecture but with powerful computational platforms so that designer can focus and enjoy air conditioner without wasting time in search of remote. We can operate Air Conditioner by our mobile not only at home but also from outside. Total control will be there in our hands. This simple architecture is also useful for Education of android application and Arduino IDE programming because students can build their own Android application with low cost and use them as platform for experiments in several course.

2. LITERATURE SURVEY

In earlier system, the devices were controlled by manual operation. A person was supposed to go near to the switch or the device to switch ON or OFF the device. Although many wireless protocols exist they fail to provide compactness and user friendly interfaces to the users. User can control appliances easily by his Smartphone via Bluetooth. It provides simple user interface. The personal universal controller (PUC) is a remote control device for improving the interfaces to complex appliances. The PUC engages in two-way communication with everyday appliances, first downloading a specification of the appliances functions, and then automatically creating an interface for controlling that appliance. With the help of LIRC [2] [7] you can decode any infrared remote control codes and any Android phone can be converted into a remote control, so totally removing the need of remote controls. The only limitation with this approach is that the android phone should have an infrared port with it. The infrared remote control has the performance of the high signal to noise ratio, strong anti-interference, reliable transmission of information, low power and cost, therefore it is widely used in home appliances more or less. In addition to utilizing in home appliances, it has been brought into the industrial control and so on. But the formats of infrared remote control protocol used are different between the different companies' production, the consequence from this is that an infrared remote control device must be fit for the home appliances.

3. METHODOLOGY

This section presents the sequence of completion of this project. Initially a block diagram was finalized on what components will be used for this idea. Later a software platform and flow of software was decided and worked on. These are described as follows.

3.1 Block diagram

Block diagram is a basic flow diagram to explain the project. Here we can see that the Arduino Uno board is connected to the Bluetooth module directly. Arduino board is powered by using 5 V power supply. IR LED and IR receiver is connected on the transmitting and receiving terminals of the Arduino board respectively.

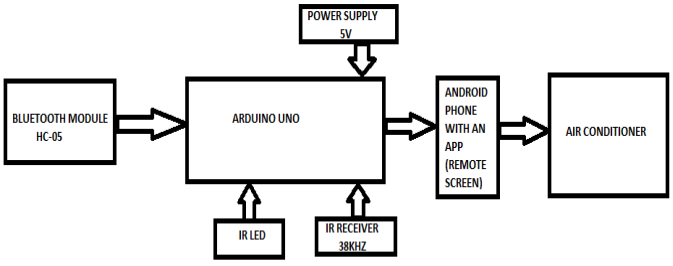

Fig -1: Block diagram

This whole connected hardware is connected to the android mobile phone wirelessly via Bluetooth module HC-05. On the software part we used MIT app inventor and Arduino IDE.

3.2 Hardware description

The reason why we chose Android platform for our application is that it is user friendly. Android is the mobile operating system which is owned by American company named Google [1].

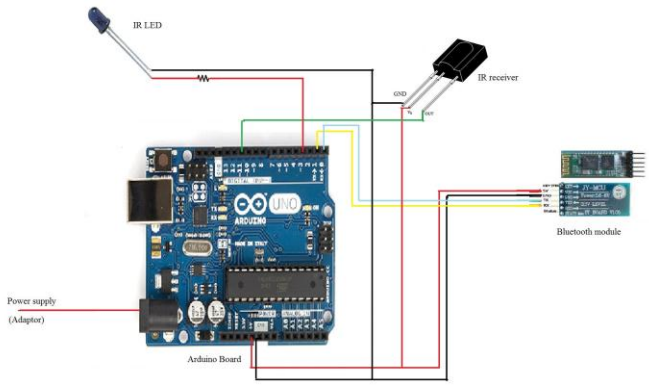

Fig -2: Circuit diagram

Firstly we required the IR remote control of AC (Hitachi AC here). Using the IR receiver we received the codes on the Arduino IDE which we installed on our hardware (i.e. laptop) [2]. After receiving the codes from the remote, we used the same codes as the output to be delivered on pressing the particular button on mobile application. When the button was pressed on the application it transfers the control via Bluetooth device to the Arduino board. Arduino board gives the command to IR LED to send that code to the AC, and thus the AC is controlled with Android phone.

3.3 Software description

A computer hardware and software require each other for complete execution. In this project two software used are;

1-MIT app inventor

MIT App Inventor is an open-source web application which was originally provided by Google and is now maintained by the Massachusetts Institute of Technology (MIT) hence MIT app inventor. It transforms the coding of complex languages into a simple drag and drop based coding [3].

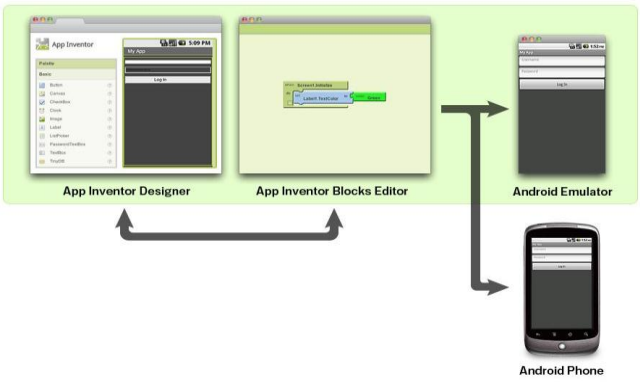

Fig -3: Basic idea of MIT app developer

2- Arduino IDE

The Arduino IDE (Integrated Development Environment) software was downloaded and installed on the hardware (laptop) [4]. Arduino IDE provides a perfect platform to write and burn the program onto the Arduino board. It consists of libraries and source codes with it.

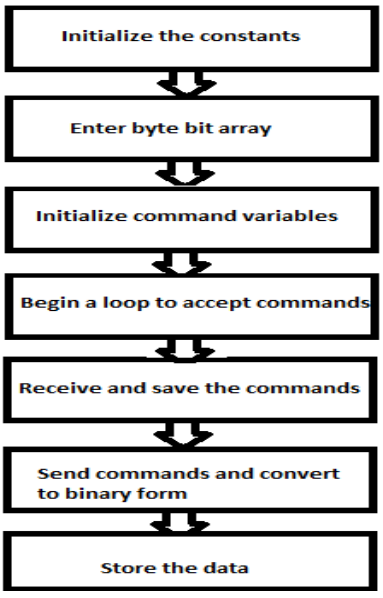

Fig -4: Flowchart for receiving IR codes on Arduino IDE

4. ADVANTAGES AND DISADVANTAGES

This application of the IR LED using Bluetooth and Android phone, has various advantages as well as disadvantages;

ADVANTAGES

• The main advantage of this application is that it is user friendly.
• It is comparatively easy to develop the application. • It is not much costlier
• Easier to locate this remote

DISADVANTAGES

• The main drawback of this project is the range of IR LED, because it needs to be kept near the AC set.
• The reason that it consists of hardware as well as software, its maintenance level increases.

5. CONCLUSIONS

Here we would like to conclude that the Bluetooth a good way for wireless communication. Even though having a few drawbacks but it works fairly for applications having a specified range. The Android Application is proved to be a better substitute comparatively to the actual remote of any appliance. The development of apps is easy and free of cost. With tremendous smart phone in markets, it is bound to have many more applications in near future. It provides for more development of applications based on android operating system. This opens door for wide range of possible similar applications like Remote starter for car, Automation of household tasks, etc.

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