



Android Bluetooth Device Control for Industrial Automation

G. Ravi Kishore^{1*}, S. Santhi Priya², Sandeep Chilumula² and Y Sudha³

¹Associate Professor, Department of Electronics and Communication Engineering, Vidya Jyothi Institute of Technology, (Affiliated to Jawaharlal Nehru Technological University Hyderabad) Telangana, India.

²Assistant Professor, Department of Electronics and Communication Engineering, Vidya Jyothi Institute of Technology, (Affiliated to Jawaharlal Nehru Technological University Hyderabad) Telangana, India.

³Assistant Professor, Department of Electrical and Electronics Engineering, Malla Reddy Engineering College, (Affiliated to Jawaharlal Nehru Technological University Hyderabad) Telangana, India.

Received: 21 Feb 2024

Revised: 03 Mar 2024

Accepted: 07 Jun 2024

*Address for Correspondence

G. Ravi Kishore

Associate Professor,

Department of Electronics and Communication Engineering,

Vidya Jyothi Institute of Technology,

(Affiliated to Jawaharlal Nehru Technological University Hyderabad)

Telangana, India.

Email: ravikishore@vjit.ac.in



This is an Open Access Journal / article distributed under the terms of the **Creative Commons Attribution License** (CC BY-NC-ND 3.0) which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. All rights reserved.

ABSTRACT

The paper presents the home appliances like a lightweight, Using an Android smart phone and a wireless microcontroller, you can control your TV and fans. Utilising cell technology, which benefits our society, makes it feasible. The goal of this project is to help the physically challenged and elderly people. Automated processes provide comfort for operator and increase productivity. The risk involved is also decreased with the advent of remote systems, it is now feasible to access and operate the strategy, system, or interface from a computer or mobile Android device with a user-friendly interface. A strategy must be developed using mobile electronics and control concepts. In the recent times, The efficiency and capabilities of mobile devices have greatly increased. This project helps to develop device control for industrial automation.

Keywords: Android, Bluetooth, device control, industrial automation





Ravi Kishore et al.,

INTRODUCTION

The objective of using Arduino for Wireless Device Control with Bluetooth is to enhance the working capabilities of the devices that are under control. The planning is an eco-friendly one[1]. This method saves space for recycling. Storage is a major problem and takes lot of space. The transportation cost is very high. Aluminium is used to make beverage cans. These aluminium modules are often recycled into similar products with better quality, efficiency and reliability. The need for Wireless technology is ever increasing and hardware is practically feasible.

Proposed System

The main goal of this project is to develop a system that supports industrial devices and the elderly. The objective of this project is to take into consideration all the domestic systems that are difficult to control by elderly people and the handicapped. The project will enable anyone with a Bluetooth-enabled device to Android mobile phone to get an application from the Google Play Store. With the help of this application, user can control all the appliances in the house via Bluetooth receivers [2]. The proposed system allows the clients to have access to all the appliances in the house including air conditioners, and lights, with a single click on a mobile phone to turn it either ON or OFF. Most important consideration in the application is that it must be simple to use friendly and simple to operate. By opening the application, the user can also check the status of the appliances to see whether they are ON or OFF. The application's GUI needs to be given top importance if we're going to create a user-friendly application and achieve all of our project's goals. The interface of the application will prove how simple it is to use the application as well as give flexibility to the user. The following list of objectives must be fulfilled to successfully help elderly and disabled individuals.

1. Develop Bluetooth appliance controller: The Bluetooth will interface with the microcontroller to perform the desired automation. The Bluetooth-enabled mobile phone will send signals to the microcontroller, which will process them.
2. Develop an application for a mobile phone: An application needs to be developed for the mobile phone, which needs to communicate with the Bluetooth receiver HC 06.
3. Integrate the device to the controller: The cost-effectiveness of a Smart Home must be the top consideration when designing it. The appliance controller has to be inexpensively integrated with the appliances in the house with an easy installation.
4. Test the set up and analyze the data: After the system is configured, with the help of a mobile device and a controller, tests are conducted while data is recorded and analyzed.

Hardware

The hardware components are shown below.

Software Components

The software consists of a toolbar which is used interfacing. The toolbar is shown in Fig 3. The working of the software is shown in the example given below.

Project Analysis

A BlueGiga WT11 Bluetooth component is used with an Arduino BT, an 8-bit microcontroller board. This module offers the functionality required for Bluetooth wireless serial connection.. This board has I/O ports, A/D converter, PWM and other extra resources help it be beneficial for the required work. For testing purpose, 25W, 240V lamps are used. The device alerts the user if there is a malfunction and says that the execution was unsuccessful.





CONCLUSION

The system was designed in such a way that any electrical home appliance can be operated through webpage. The controlling of electrical appliances is done through Wi-Fi. Hence, “Bluetooth Based device Automation” integrates features of all the hardware components used. Advanced micro controller is employed in it. Multiple electronic devices are controlled and standing of these devices may be monitored through Bluetooth. The Arduino microcontroller has been developed to control a number of home automation gadgets in response to commands from the user. The system's capacity to communicate through Bluetooth has been coded in. The technology is demonstrated to make it easier to control devices that are used in homes.

REFERENCES

1. K.Y.Lee, and J.W.Choi, “RemoteControlled Home Automation System via Bluetooth Home Network”, vol. 3, 2003, pp. 2824-2829.
2. D.J.Cook, M.Youngblood, and E.O.Heierman, “MavHome: An Agent Based Smarthome”, Arlington, VA: National Science Foundation.
3. H.Kanma, N.Wakabayashi, R.Kanazawa, and H.Ito., “HomeAppliance Control System over Bluetooth with a CellularPhone”, *IEEE Transactions on Consumer Electronics*, vol. 49, 2003, pp. 1049-1053.
4. N.S.Liang; L.C.Fu and C.L.Wu., “An Integrated-Flexible and Internet based Control Architecture for Home Automation System in the Internet Era”, vol. 2, 2002, pp.1101- 1106.
5. Bluetooth: <http://www.bluetooth.com/Pges/Fast-Facts.aspx>.

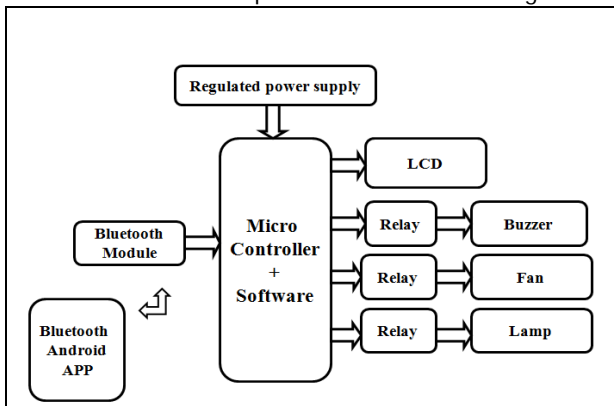


Fig 1: Schematic diagram

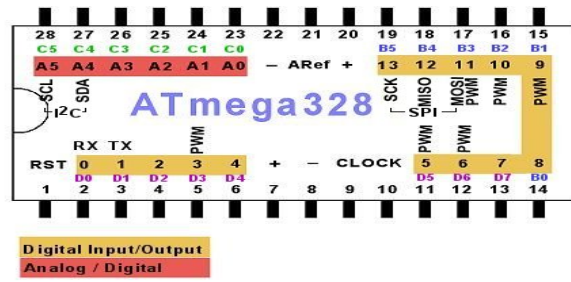


Fig 2

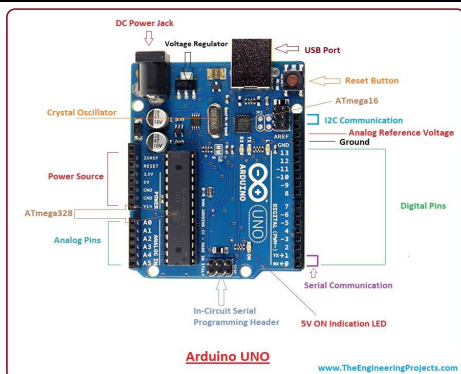


Fig 2: PIN DIAGRAM OF ATMEGA328



Fig 3: Toolbar for interfacing





Ravi Kishore et al.,

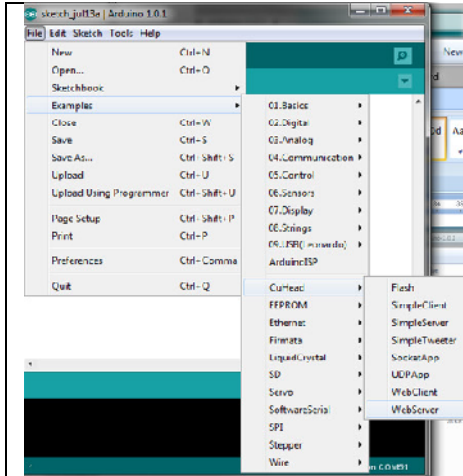


Fig 4: Compile Choose the target board "Arduino Uno":

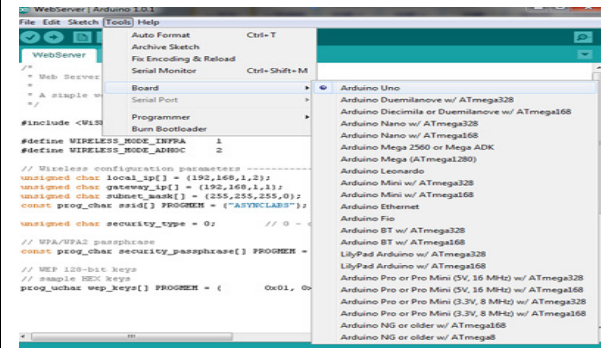


Fig 5: Target Board Choose Sketch-> Verify/Compile

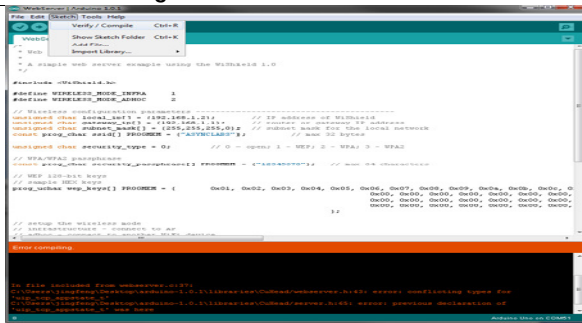


Fig 6: Verify/Compile

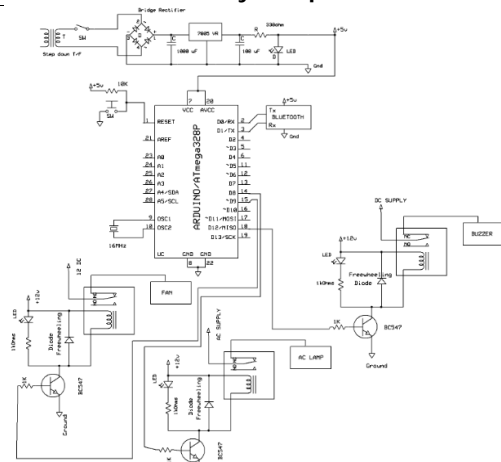


Fig 7: Experimental setup

