



SMART WIRELESS SWITCHBOARD USING MOBILE APP

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Abstract : In everyday life, conventional switchboards with physical buttons are commonly used to control appliances such as televisions, fans, and refrigerators in homes and offices. However, operating these switches, even when within reach, can sometimes be inconvenient, especially when engaged in other tasks. To address this challenge, we propose an advanced switchboard system that enables users to control household and office appliances through a mobile application. This innovative solution enhances user convenience by allowing remote operation of connected devices, offering a seamless and efficient alternative to traditional manual switches.

Index Terms – Switchboard, Mobile Application.

INTRODUCTION

In today's rapidly evolving technological landscape, the adoption of advanced technologies and innovations is reshaping how we interact with the world, simplifying daily activities, and enhancing convenience. One of the most prominent areas of innovation lies in the seamless connectivity enabled by mobile devices and wireless components, which allows individuals to remain connected and manage their environments with ease.

This paper presents the design and development of a Smart Wireless Switchboard, controllable via a mobile application. The proposed system replaces traditional switchboards with a smart, wireless alternative, offering users the ability to control electrical appliances in homes, offices, and other settings through Bluetooth-enabled mobile devices. This smart switchboard, coined as "Smartswitch", not only modernizes existing electrical systems but also provides a sleek, luxurious upgrade, aligning with the growing demand for automation and smart home solutions. By integrating wireless technology, the Smart Wireless Switchboard enhances both functionality and aesthetics, contributing to a more connected and efficient living and working environment.

NEED OF THE STUDY.

In the rapidly evolving modern world where global connectivity and technological advancements are driving widespread change, traditional button-based switchboards are becoming increasingly outdated. The demand for more flexible and efficient control systems has given rise to the need for smart switchboards that allow users to operate appliances remotely with ease. These systems must be adaptable, user-friendly, and capable of meeting the growing expectations of convenience in both residential and commercial settings.

RESEARCH METHODOLOGY

In this system, the switchboard is connected to AC power, with all components initially in the OFF state, indicated by the absence of illuminated LED's. The LED's correspond to each component and will remain off until activated. In the default state, the Bluetooth module's light will blink, signaling readiness for connection. Users can pair their mobile devices to the switchboard via the app, connecting to the HC-05 Bluetooth module. Upon successful connection, an audible alert will confirm that the board is now linked to the mobile device. Through the app's interface, users can control the connected components by pressing the designated switches, allowing seamless operation of the system.

BLOCK DIAGRAM

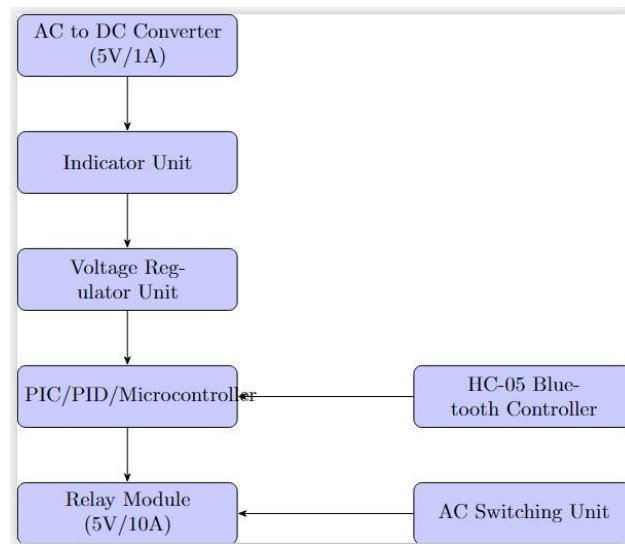


Figure 1: Block Diagram of the Proposed System

COMPONENTS

- 1) Arduino Nano Microcontroller
- 2) Relay Module
- 3) Bluetooth Module (HC-05)
- 4) 12V/ 1 Amp Module
- 5) Plastic or wooden Board
- 6) Baton Holders
- 7) Light Emitting Diodes
- 8) Capacitors
- 9) Connecting wires

CONCLUSION

In this project, we developed a modern switchboard system that offers enhanced convenience by enabling remote control of appliances via a mobile application. The system integrates key components such as an AC to DC converter, indicator unit, voltage regulator, microcontroller, relay module, and Bluetooth module (HC-05), allowing seamless wireless communication between the switchboard and the user's smartphone. This solution addresses the limitations of traditional button-based switchboards, offering a more flexible and user-friendly alternative that aligns with the growing demand for smart home automation. The successful implementation of the proposed system demonstrates its potential to improve everyday convenience and efficiency in both residential and commercial environments. Future improvements could focus on integrating additional connectivity options, such as Wi-Fi, and enhancing security protocols for safer usage.

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