

Remote Control Switch Board

Vedant V. Salunkhe *, Varad S. Havaldar**, Pranav P. Bhosle***, Pratik P. Patil****, Swapnil S. Nikam*****

*(Computer Hardware and Maintenance, Rajarambapu Institute of Technology, Islampur
Email: vedantsalunkhe54@gmail.com)

** (Computer Hardware and Maintenance, Rajarambapu Institute of Technology, Islampur
Email: varadhavaldar0206@gmail.com)

*** (Computer Hardware and Maintenance, Rajarambapu Institute of Technology, Islampur
Email: bhosalepranav769@gmail.com)

**** (Computer Hardware and Maintenance, Rajarambapu Institute of Technology, Islampur
Email: patilpratik89660@gmail.com)

***** (Computer Hardware and Maintenance, Rajarambapu Institute of Technology, Islampur
Email: swapnilnikam086@gmail.com)

Abstract:

The Remote-Controlled Switch Board is an IoT-based system that enables remote management of electrical appliances using an IR remote and an Arduino Nano.

It controls up to eight devices through an 8-channel relay module, providing a convenient, energy-efficient solution for residential, commercial, and industrial use.

This system helps maintain energy by eliminating the need for manual switches and disabling the device when not in use, providing an evolutionary and economically effective solution for remote management.

Keywords — Home automation, Arduino nano, 8-channel relay module, IR sensors.

I. INTRODUCTION

In modern times, the integration of the Internet of Objects (IoT) has revolutionized the path of everyday life Conversation with electronic devices. Our project aims to switch payments and improve remote control Convenience and efficiency in managing remote electrical equipment. This system allows users to Check the 4 electrical devices on/off from the 4 electrical devices via IR remote control. Arduino Nano as a basic processing device.

This project includes an 8-channel relay module that makes switching between several devices

easier An IR sensor that receives orders from the remote control. Arduino nano, c Language, handle these commands and activate the appropriate relay to control connection Technical devices.

This approach eliminates the need for physical interaction with traditional switches. Creating a system is especially useful in scenarios where manual access is inconvenient.

The primary goal of this project is to offer a cost-effective, user-friendly, and efficient solution for remote control of electrical devices. This innovation not only adds convenience but also contributes to energy conservation by ensuring devices are turned off when not in use. Compact design and The

scalability of the system makes it adapted for various residential, commercial and industrial Applications.

II. PROBLEM DEFINATION

In today's fast-paced world, managing household or industrial appliances manually can be time consuming, inefficient, and inconvenient. Traditional switchboards require physical interaction, which may not be accessible to elderly or disabled individuals. In addition, often done by hand This leads to energy loss because users can forget to deactivate devices when they are not used.

This project aims to develop a remote control switch based on IoT, which allows users to manage Up to 4 devices using IR and Mobile Applications (via IoT). The system incorporates a Arduino nano microcontroller programmed in the C language through the Arduino Ide, an IR sensor For the local remote control, an 8 -channel relay module for switching devices.

By combining IoT and IR technology, the solution provides Improved accessibility, energy efficiency and convenience for users to control remote devices via the Internet or a remote control device.

III. METHODOLOGY

In today's rapidly evolving world, the need for convenience and efficient energy management is the need for convenience. It's becoming more and more important. Traditional switches require physical interaction for electrical operation For example, devices that can be annoying in a particular scenario, such as when it is difficult to create a switch;

Users are physically contested where the device is in another room. Furthermore, abandonment of unnecessary-operating devices contributes to energy loss and increased.

Electricity cost. Current solutions for remote control of devices are often linked to complex and expensive ones A system that may not be available to all users. This project solves the following problems:

I. Unsolved access to distribution shields: the difficulty in manual operating switches from -s Physical restrictions or distance.

II. Energy Base: Lack of effective mechanisms to disable devices when not in use.

III. Accessibility and simplicity: The need for economically efficient and practical systems The far function of the device. To overcome these problems, we propose a simple yet effective IoT-based Remote-Controlled Switch Board that enables users to operate electrical appliances conveniently and efficiently using an IR remote. This system offers an affordable, scalable, and easily implementable solution for both residential and commercial environments.

IV. ARCHITECTURE

A. System Architecture

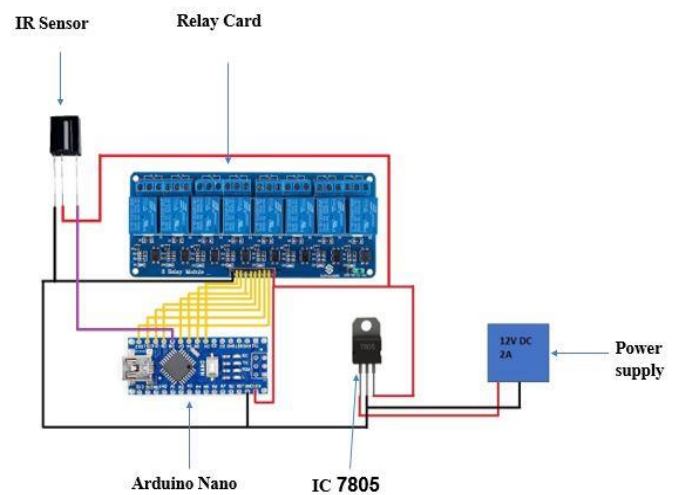


Fig. 1 System Architecture

Fig. 1 shows the system architecture of the Remote Control Switch Board. This figure helps us to understand how the connections are made and how the components are connected.

B. Block Diagram

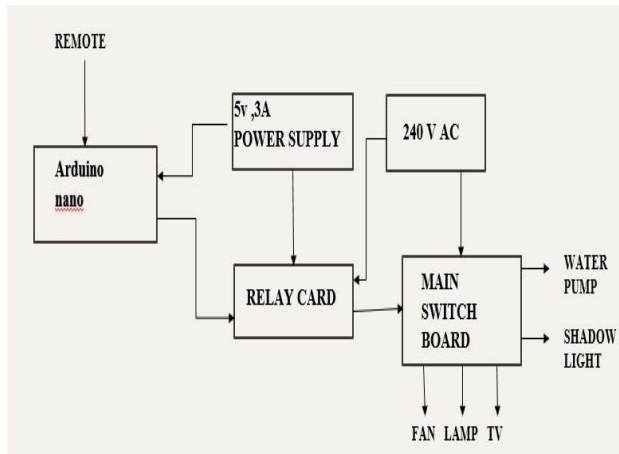


Fig. 2 Block Diagram

The given figure represents a home automation system using an Arduino Nano and a relay module. Here are some key points about the diagram:

Arduino Nano: The microcontroller receives input from a remote control and processes commands to control different appliances.

Power Supply: 5V and 3A power supplies are used to supply Arduino and Relay modules, and 240V AC supplies home appliances.

Relay Card: acts as a switch that controls high voltage devices based on Arduino signals.

Main Switch Board: Distributes power to a variety of appliances, including fans, lamps, TVs, water pumps, shadow lights, and more.

Remote Control: The system operates wirelessly through the remote.

V. RESULT

The figure shows the result of the project where the Arduino nano, 8-channel relay module, IR sensors are connected to the breadboard. When the buttons from remote are pressed then the light turns on/off.

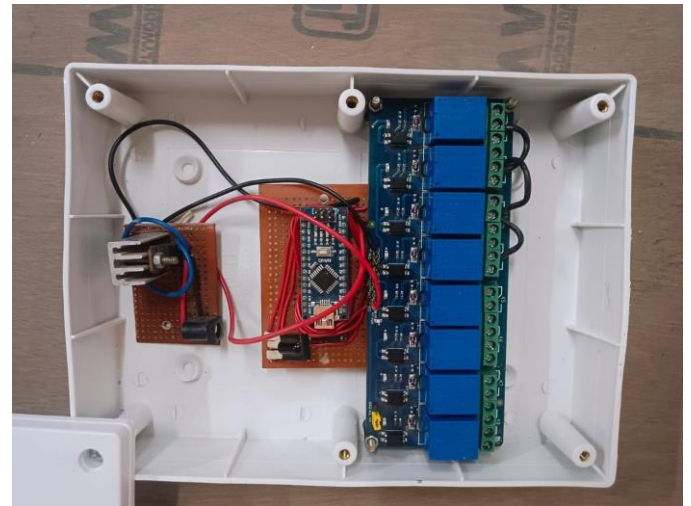


Fig. 2 Result

The below figure shows the use of our project in real life.



Fig. 3 Implementation

VI. CONCLUSIONS

This project successfully developed a distributed scarf on a remote control using an IR sensor, an 8-channel relay, and an Arduino Nano.

This allows remote control of up to four devices, providing a simple and affordable solution for home automation. This system demonstrates the power of a system built for practical and economically effective applications.

ACKNOWLEDGMENT

Our guide Mrs. S. S. Patil. encouraged us to complete this project work. Her continuous invaluable guidance throughout the project this study helped us to complete the work up to this stage and hope will continue in further work.

REFERENCES

- [1] DOE, J., & SMITH, J. (2022). Design and implementation of a remote control switch board using arduino nano. international journal of electronics
- [2] KHAN, M. T., & VERMA, P. S. (2022). Design of a smart lighting control system using arduino nano. journal of electrical engineering and automation.
- [3] BHATIA, L., KUMAR, M. R., & TIWARI, A. (2020). Energy-Efficient IoT-Based Remote Control System for Home Appliances. Journal of Ambient Intelligence and Smart Environments.
- [4] PATEL, S. K., & MEHTA, R. L. (2021). IoT-Based Smart Home Automation Using Arduino Nano. International Journal of IoT and Smart Home.