

# HOME AUTOMATION BY GOOGLE ASSISTANT

**Prof. R.K. Moje, R.M. Dhormare, A.R. Patil, R.M. Kamble**

Electronics & Telecommunication, PDEA's College of Engineering, Manjari (BK), Pune-412307

**Abstract:** The thought behind Home Automation by Google Assistant is to control home devices with using our voice. There are many to do that in market but making our own is best. In this project requires voice command by the Google Assistant. Sinric Pro account which is cloud base free IOT web server used to create virtual switches. In this project of home Automation the person gives commands to Google Assistant the appliances like Bulb, Fan, etc. they can be control accordingly. When the person gives command to google Assistant and it decodes and it sends to ESP32. The Relay control by ESP32 to turn it ON or OFF as per Google Assistant request. The communication between the Application and ESP32 is establish by Wi-Fi(Internet).

## 1. INTRODUCTION

The Home Automation is technique using ESP32 that allows us to control an automate various variety of devices and system in our home. The ESP32 serves as the brain of home automation system with its powerful processing capability and built-in Wi-Fi and Bluetooth connectivity. ESP32 is connected by Sensors, Actuators and other smart devices you can easily monitor and control remotely or based on predefine condition.

The ESP32 in a Home Automation setup can use to control lighting, heating, ventilation, air conditioning, security system and more for example you can adjust room temperature, monitor energy consumption, turn ON or OFF lights all from centralize control system.

The customization and expansion of Home Automation system can be done by Flexibility of ESP32. As per your need you can develop your own software logic, set up automation rule, create schedules and integrate additional features.

The ESP32 is supported by various programming language and development environment, such as Arduino IDE, MicroPython, etc, making it accessible to wide range of developers.

## 2. LITRETURE REVIEW

[1] Sudeept Singh Yadav; Praveen Kumar; Sanil Kumar; Sanjeet Singh All Authors , Google Assistant Controlled Home Automation with Voice Recognition (09 March 2022)

The Aim of Google assistant Home automation is to control home appliances with voice commands wirelessly. Available there are numerous gadgets accessible to do that, yet making our own is marvelous. In this paper, the Google assistant needs voice dominion. A Adafruit account which is a web based free IoT platform which used to make virtual switches, that is connects to IFTTT site shrink as "If This Than That" which is utilized to make if else casual explanations. The voice commands for Google assistant application used to added through IFTTT site. In this home automation action, as the client provides orders to the Google associate, Home machines like Bulb, Fan and Motor and so forth, can be controlled appropriately. The orders given through the Google right hand are decoded and afterward shipped off the microcontroller, the microcontroller thusly control the transfers associated with it. The gadget associated with the particular transfer can be turned On or OFF according to the clients solicitation to the Google Assistant. The microcontroller exploit is microprocessor NodeMCU (ESP8266) and the function between the microcontroller and the google assistant application is set up through Wi-Fi internet.

[2] Harshavardhan Reddy; Neerav Negi; Zeenia Gupta; Sagar Sood; Ishika Kansal; Nikhil Aggarwal , All Authors. Advanced IOT Home Automation Using Google Assistant (18 July 2022)

Internet of Things (IoT) is an important technology that uses the internet and provides communication between various devices. It allows people and objects to connect from anywhere to anytime in any way. There are many IoT based applications. Out of which home automation is one of the most popular application which has improved the living standards of people. In this paper, we have proposed an intelligent smart automation model that can acquire and power the home appliances from anywhere in the world. This device focuses on controlling the devices using voice recognition and intelligence, while being interactive as well. Thus, our main intention in making this model is to build an acute home automation system which is more established and smarter enough to save energy and man efforts. In this model, mainly four sensors are used PIR sensor, Temperature sensor, MQ2 sensor and LDR sensor. All hardware devices used in this model are economical, accessible, and replaceable.

[3] Cherry Soni; Maitri Saklani; Gunjan Mokhariwale; Aishwarya Thorat; Kunal Shejul, All Authors(15 April 2022)

Internet of things aims to connect devices remotely. In this proposed work, it has been aimed to control the appliances remotely using our smartphones. This work offers the novelty to control the home appliances using our voices via multiple languages i.e., multilingual feature. The setup controls home appliances namely: a Bluetooth speaker, bulb, fan, and a charging socket. This design uses Raspberry Pi to connect with the appliances wherein the Blynk app is connected to the setup remotely. The IFTTT technology has been used as an intermediary between google assistant and the Blynk app. The google assistant permits the user to give commands in the language the user is comfortable in. This paper gives a solution for the most undermine problem that is the language barrier. The multilingual voice controlling will increase the robustness and efficiency of the system at the same time it will provide ease to the user.

### 3. COMPONENT REQUIRED

1. ESP32



Fig. 3. ESP32 Wi-Fi, Bluetooth Module

The ESP32 is a well-known microcontroller chip for Internet of Things (IoT) applications that is low-cost and low-power. It is produced by Express if Systems and is the ESP8266 chip's replacement. The ESP32 is suited for a number of IoT projects since it has a wide range of features and capabilities.

The ESP32's salient attributes are as follows:

**Dual-core processor:** Compared to single-core microcontrollers, the ESP32's dual-core Extensa LX6 processor offers higher performance and parallel processing.

**Wi-Fi and Bluetooth connectivity:** The ESP32 is compatible with Bluetooth v4.2 and Bluetooth Low Energy (BLE), as well as Wi-Fi 802.11 b/g/n. This makes it possible for it to access the internet and engage in wireless communication with other devices.

**GPIO pins:** There are a lot of general-purpose input/output (GPIO) pins on the ESP32.



2. 4 CHANNEL RELAY MODULE

Fig. 2. 4 Channel Relay Module

A 4-channel relay module is a piece of technology that enables low-voltage impulses to control a number of electrical circuits simultaneously. It normally consists of four independent relays, each of which has the ability to turn on or off a different circuit. In order to give a practical method of managing greater voltage or current devices, the module is designed to interact with microcontrollers, Arduino boards, or other control systems.

In a typical 4-channel relay module, you could find the following significant features and parts:

Relays: There will be four relays in the module, each with its own set of contacts. Relays are electromechanical switches that have a higher operating voltage and current capacity than a microprocessor.

Control Pins: Your microcontroller or other control device can be connected to the module's control pins.

3. Connecting Wire
4. Switches
5. Bulbs

## 4. SOFTWARE REQUIRED

### Arduino IDE

Install the Arduino IDE or another appropriate development environment before beginning to programmed the ESP32. Use the IDE's supported programming language (such as C++ or MicroPython) to create the ESP32 firmware. Use ESP32-specific libraries and home automation communication protocols like MQTT (Message Queuing Telemetry Transport)

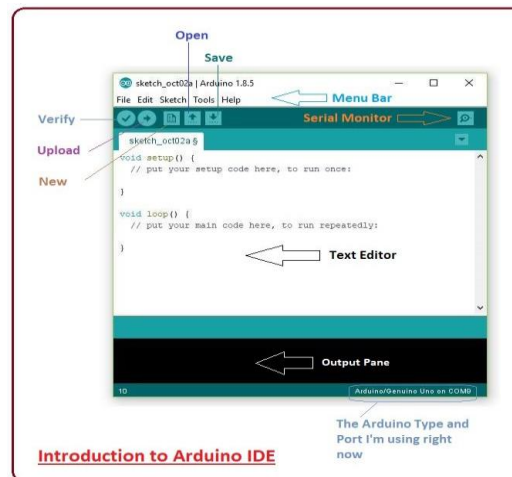


Fig. 3. Arduino IDE Interface

### Sinric Pro

Developers can build smart home applications on the Sinric Pro platform and combine them with well-known voice assistants like Amazon Alexa and Google Assistant. Users may voice-control their connected devices thanks to the cloud-based architecture and APIs it offers for managing and controlling smart devices.

Device control, state synchronisation, device detection, and event management are some of the functions offered by Sinric Pro. To create unique voice commands and automation scenarios for smart home applications, developers can use Sinric Pro.

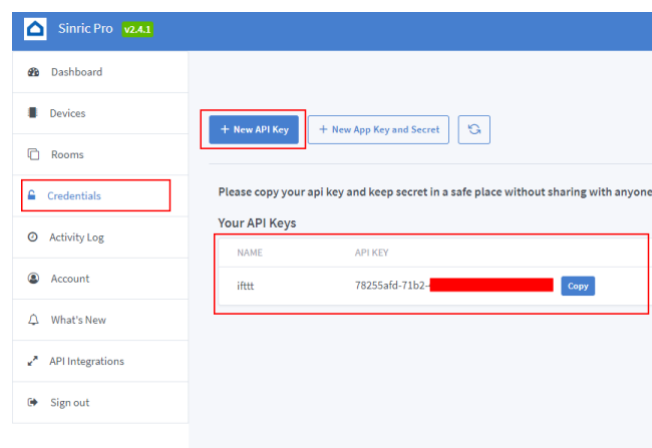


Fig. 4. Sinric Pro Interface

## 5. WORKING

The ESP32 microcontroller board can be used for home automation by using it to control a variety of appliances and devices in your house. A well-known low-power, Wi-Fi and Bluetooth-enabled microcontroller board called ESP32 provides a lot of flexibility for developing Internet of Things applications. Here is a general explanation of how ESP32-based home automation can function.

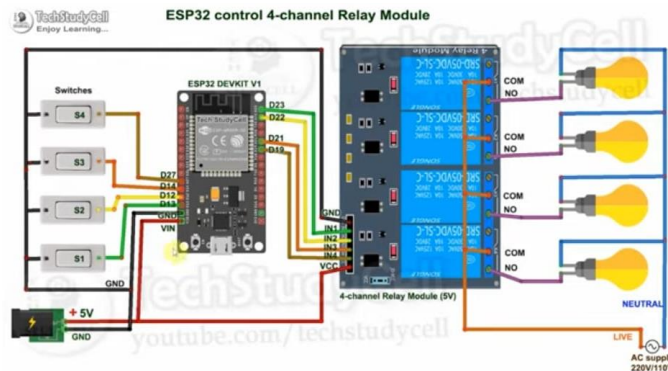


Fig. 5. Circuit Diagram

### Hardware Setup :

Choose the lights, fans, thermostats, and other items you want to automate. To enable communication, connect the ESP32 board to your home network through Wi-Fi. You might require extra parts to control particular devices, such as relays or solid-state relays (SSRs), to turn them on and off.

### Establish Communication :

To accept commands and transmit device status updates, ESP32 can connect to a central server or cloud platform. As a simple publish/subscribe messaging protocol, MQTT is frequently utilized. As a MQTT client, ESP32 may receive messages from a broker. Set up the ESP32 to process incoming messages, connect to the MQTT broker, and subscribe to particular topics.

## 6. BLOCK DIAGRAM

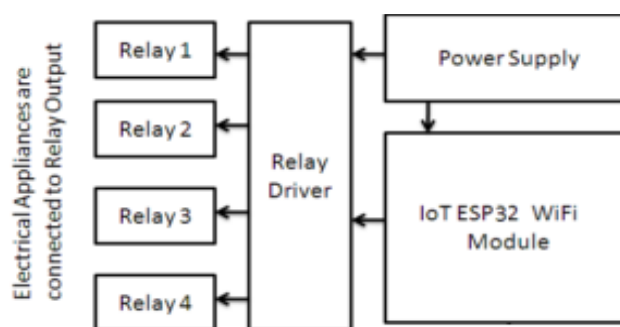


Fig. 5. Block Diagram

## 7. ACKNOWLEDGMENTS

We acknowledge the efforts of experts who have contributed towards the development of an ESP32 Controlled Home Automation by Google Assistant. This paper would have been an incomplete effort if it was not for the following people: We would like to thank the Department of Electrical & Electronics Engineering for providing us with the opportunity to perform and apply our knowledge.

Lastly, we would like to thank our families and friends who provided us with resources and their encouragement which lead to the successful completion of this paper.

**8. REFERENCES**

- [1] Harshavardhan Reddy; Neerav Negi; Zeenia Gupta; Sagar Sood; Ishika Kansal; Nikhil Aggarwal , All Authors. Advanced IOT Home Automation Using Google Assistant (18 July 2022)
- [2] Cherry Soni; Maitri Saklani; Gunjan Mokhariwale; Aishwarya Thorat; Kunal Shejul, All Authors(15 April 2022)
- [3] Sudeept Singh Yadav; Praveen Kumar; Sanil Kumar; Sanjeet Singh All Authors , Google Assistant Controlled Home Automation with Voice Recognition (09 March 2022)
- [4] Manish Prakash Gupta, “Google Assistant Controlled Home Automation”, Issue: 05 May2018.
- [5] Purushottam, and Chandan Kumar Dubey, “Automation-by-Voice-Commands”, Volume 8, Issue V, 2018.
- [6] Aayush Agarwal, Anshul Sharma, Asim Saket Samad and S Babeetha (2018) “UJALA- Home Automation System Using Google Assistant” Volume: 04 Issue: 02 | 2018.
- [7] Saurabh Singh, Harjeet Matharu and Dr. Sangeeta Mishra, “Internet of Things (IoT) Based Home Automation System”, November, 2017.
- [8] R. K. Kodali and S. Soratkal, "MQTT based home automation system using ESP8266", Proc. IEEE Region 10 Humanitarian Technology, Dec. 2016
- [9] N. P Jawarkar, V. Ahmed, S.A. Ladhake, and R.D Thakare – ‘Microcontroller based Remote monitoring using mobile phone through spoken commands’,- Journal of networks, Publisher: World Journal control science and engineering, Year:2008.
- [10] Basanta, H., Huang, Y.P., Lee, T.T., “Using voice and gesture to control living space for the elderly people”, 2017 International Conference on System Science and Engineering (ICSSE). (2017).
- [11] Arul, S.B., 2014. Wireless home automation system using zigbee. International Journal of Scientific & Engineering Research,