

IOT BASED AUTOMATION WITH CONTROLLING ELECTRIC DEVICES AND MONITORING THE DEVICES USING SMART TECHNOLOGY

Submitted in partial fulfillment of the requirements for the award of Bachelor of
Engineering Degree in
Electrical and Electronics Engineering

By

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DEPARTMENT ELECTRICAL AND ELECTRONICS ENGINEERING
SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited with Grade "A" by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

APRIL 2021



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **A. HARSHA VARDHAN (37140007)** and **IJAZ AHMED (37140951)** who carried out the project entitled "IOT BASED AUTOMATION WITH CONTROLLING ELECTRIC DEVICES AND MONITORING THE DEVICES USING SMART TECHNOLOGY " under our supervision from December 2020 to April 2021.

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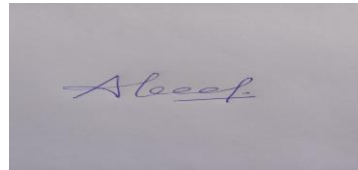
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DECLARATION

We **A.HARSHA VARDHAN (37140007)** and **IJAZ AHMED (37140951)** hereby declare that the Project Report entitled “IOT BASED AUTOMATION WITH CONTROLLING ELECTRIC DEVICES AND MONITORING THE DEVICES USING SMART TECHNOLOGY” done by us under the guidance of **DR. S. NIRMAL RAJ** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Electrical and Electronics Engineering.

1.

A rectangular box containing a handwritten signature in blue ink, which appears to be 'A. Harsha Vardhan'.

2.

A rectangular box containing a handwritten signature in blue ink, which appears to be 'Ijaz Ahmed'.

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SIGNATURE OF THE CANDIDATES

ACKNOWLEDGEMENT

We are pleased to acknowledge our sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. We are grateful to them.

We convey our thanks to **Dr. N. M. NANDHITA**, Dean, School of Electrical and Electronics Engineering and **Dr. V. SIVACHIDAMBARANATHAN**, Head of the Department, Dept. of Electrical and Electronics Engineering for providing us necessary support and details at the right time during the progressive reviews.

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ABSTRACT

This Project introduces you to the amazing world of IoT and its fascinating applications. Through this, you will build an IoT based electronic device that forms the basis of smart buildings. It includes parameters like temperature, lights, fire, fans, chargers etc. are monitored and controlled so as to make it highly efficient. In order to help maintain comfortable living conditions within a home, home monitoring and automation are utilized. The standards of humans comfort in homes can be categorized in to several types. Among these categories, the most significant ones are the thermal comfort, which is related to temperature and humidity, followed by the visual comfort, related to colours and light, and hygienic comfort, associated with air quality. A system can be set to monitor these parameters to help maintain them within an acceptable range. Additionally, making the house smart is to allow for intelligent automatic executing of several commands after analysing the collected data. Automation can be accomplished by using the internet of things (IoT). This gives the inhabitant accesses to certain data in the house and the ability to control some parameters remotely. This paper presents the complete design of an IoT bases sensing and monitoring system for smart home automation.

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LIST OF ABBREVIATIONS

BC	- Bayonet
CPU	- Central process Unit
ES	- Edison screw
HVAC	- Heating, Ventilation and Air Conditioning
IoT	- Internet of Things
PCB	- Computer Circuit Board
SMPS	- Switch Mode Power Supply
SoC	- System on a Chip
SSIO	- Service Set Identifier
Wi-Fi	- Wireless Fidelity
WSAN	- Wireless Sensor and Actuator Network

CHAPTER 1

INTRODUCTION

Home automation is building automation for a home, known as a smart house. A home automation system can management lighting, climate, recreation systems, and appliances. It's aiming to additionally embody home security like access management and alarm systems. When connected with the net, home devices square measure an important constituent of the net of Things ("IoT").

A home automation system generally connects controlled devices to a selected hub or "gate way". The interface for the management of the system uses wall-mounted terminals, pill or desktop computers, a mobile application, or a web interface, which can even be accessible off-site through the net.

Each of those components is equally vital in building a really good home expertise for your customers. Having the correct hardware permits the power to develop your IoT example iteratively and reply to technology pivots with ease. A protocol selected with the correct testing and careful thought helps your avoiding performance bottlenecks that otherwise would limit the technology and device integration capabilities with sensors and IoT gateways. Another vital thought is that the computer code that resides in your hardware managing your knowledge, managing knowledge transfer, computer code OTA updates and playing alternative crucial operations to create things speak.

We have talked concerning them before, but, let's clearly separate them into elements that might finally assist you build a practical model of what major elements are concerned in building a wise home. The foremost elements will be broken into: IoT sensors concerned in home automation are in thousands, and there are many home automation gateways still. Most of the computer code is either written in C, Python, Node. Js, or the other programing language. The biggest

players in IoT cloud will be divided into a platform as a service (PaaS) and infrastructure as a service (IaaS).

1.1 EXISTING SYSTEM

Existing technique, typically we tend to observe individuals operative and dominant home appliances manually and generally we tend to could forget to change off the appliances.

This method is somewhat tough to previous individuals or incapacitated wherever they're going to operate the house appliances using a mobile. We can also realize some things like there square measure cases wherever the house appliances square measure operated by mobile phones, Bluetooth, Wi-Fi, etc., however those won't provide excellent results of the outcomes that means we tend to can't even grasp whether or not the house appliance is switched on or off.

These square measure variety of the drawbacks among the prevailing technique of home appliances dominant. These lead USA to choose the project of "IoT primarily based Home Appliances management mistreatment Blynk Cloud".

1.2 CIRCUIT DIAGRAM

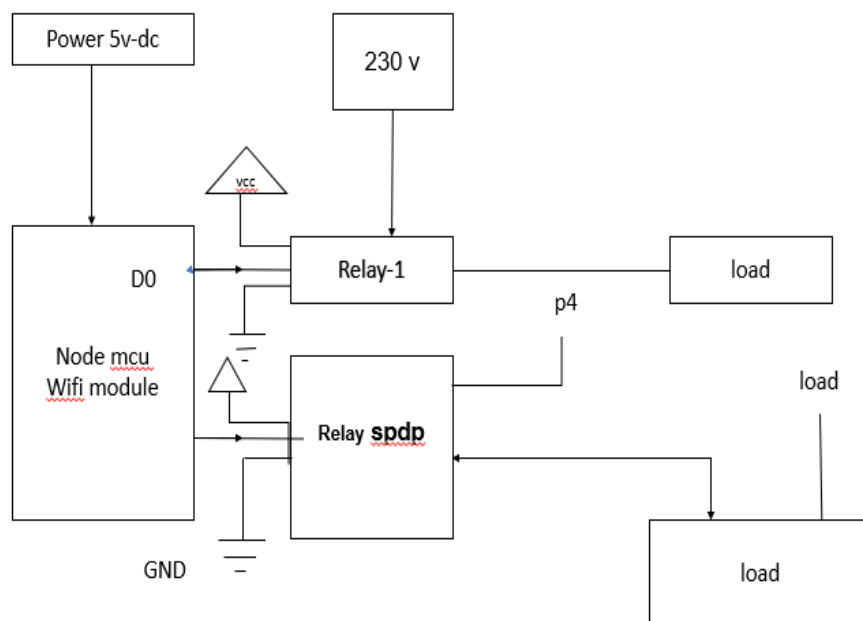


Figure 1.1 Circuit Diagram

The essential parts and materials for home automation victimisation IOT project is listed as a Wi-Fi module, Opto-coupler, TRIAC, resistors, capacitors, diode, regulator, hundreds (home appliances). There are a unit numerous eCommerce websites that area unit providing facility to buy all the desired parts on-line like a project kit consisting of individual parts essential to style a specific project.

As we tend to see in circuit diagram a 5v dc provide is connected to node mcu as shown in figure, node mcu D0 is connected to a relay module because the relay module is connected with 230v ac provide the relay module is connected with diode and also the alternative finish of the relay is ground as we tend to see within the circuit diagram a load is connected with relay module because the load is working with relay module.

1.3 CIRCUIT DIAGRAM FOR HOME AUTOMATION

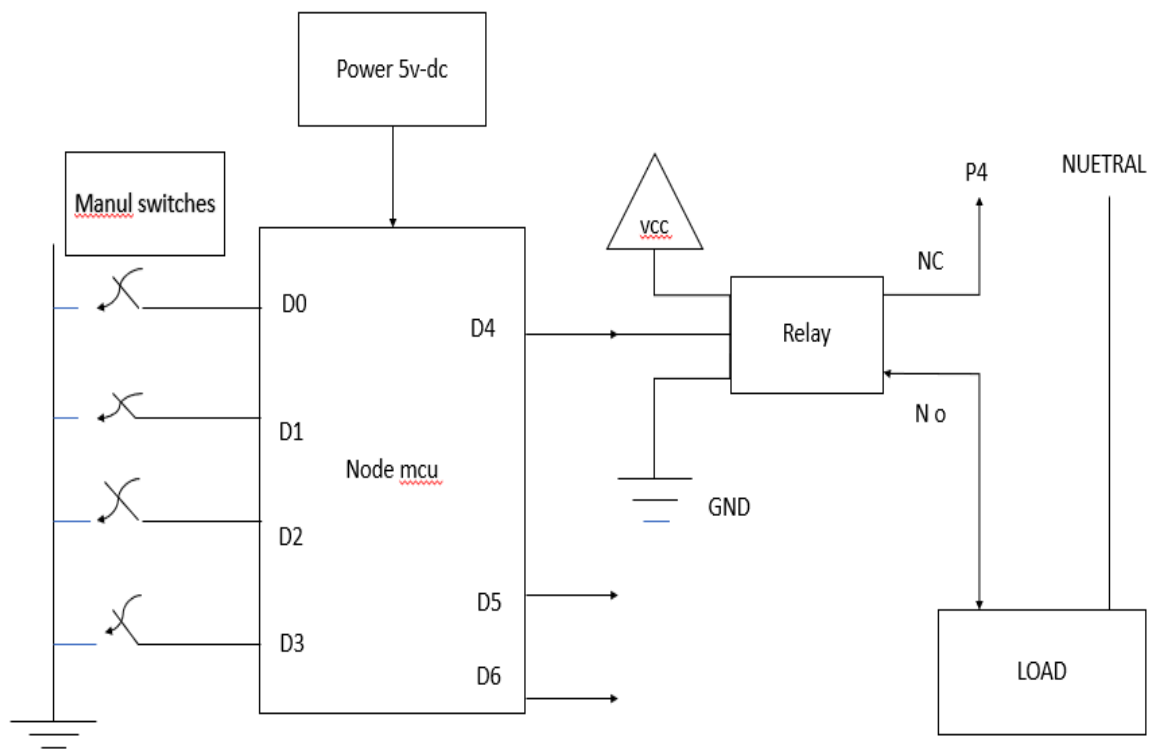


Figure 1.2 Required circuit diagram for Home Automation

In the circuit diagram manual switches are connected to nodemcu wherever the poles are D0,D1,D2,D3 and D4 is connected with relay module wherever are the nodemcu is connected to a provide voltage of 230 v dc provide ,in

the circuit diagram one finish is connected with a diode wherever because the another finish is grounded at the output aspect of the relay module is connected to load different finish id connected to p4.

The home automation exploitation IOT project consists of assorted blocks like power provide, Optocoupler, WLAN module, TRIAC, transformer, SMPS (Switch Mode Power Supply) and cargo. Designing Blocks of Home Automation System There varied modules and blocks used for coming up with home automation exploitation IOT project like WLAN module, transformer, Optocoupler, TRIAC then on. Wi-Fi (Wireless Fidelity) could be a wireless networking technology used for exchanging the knowledge between 2 or a lot of devices while not exploitation cables or wires. There are varied Wi-Fi technologies like Wi-Fi 802.11a, 802.11b, 802.11g and 802.11n. Here, during this project Wi-Fi module is employed to receive commands from the net and activate masses through TRIAC & Optocoupler by corporal punishment a program written inside the Wi-Fi module. Hence, no microcontroller is employed during this project to drive masses.

The home automation exploitation IOT project circuit are often connected exploitation varied electrical and electronic elements, modules, blocks & connecting wires as shown within the on top of figure. The automation system is formed of 2 main parts: the dominant system that's the Central process Unit (CPU) and a user operated device acting within the kind of trigger or remote. The processor sometimes is put in at one place reception and anyone communicates in it via hand-held pads, bit screens (installed or handheld) or remotes. they're the 2 basic elements that every house automation system has with the exception of these each automation system has varied options, operations, intelligence, flexibility and operations supported the worth and class with the system

Advantages

- ❖ In this system feedback is available
- ❖ In this system we no need of extra battery sources
- ❖ Can be operate from long distance also

Disadvantages

- ❖ The system should need wi-fi connection anytime
- ❖ It can be reset easily
- ❖ It cannot connect to three phase devices

CHAPTER 2

LITERATURE SURVEY

2.1 LITERATURE SURVEY

Ming Wang et al. (2013) in his paper mentioned concerning his work on system that uses a sensible central controller to line up a 433MH wireless detector and mechanism network (WSAN). A series of management modules, like switch modules, frequency management modules, are developed within the WSAN to regulate directly all types if home appliances.

Bharat Bohora et al. (2016) designed a system supported Blynk framework that controlled and monitored appliances via smartphone by victimization Wi-Fi as communication protocol and raspberry pi as personal server. All the appliances and sensors square measure connected to the web via NodeMCU.

Somnath Singh et al. (2016) in his paper mentioned concerning planning a wed-based management of home appliances that allowed user to modify appliances on/off by clicking on a webpage specially designed to act with those devices, by being anyplace within the world with a laptop r a sensible phone connected with net.n; this application is a smaller amount effective since the employment of headphones and sensible phones is increasing apace.

Kumar Mandula et al. (2017) discusses concerning the method of home automation victimization Bluetooth and local area network. Once property between Arduino and sensible phone is established victimization Bluetooth, short vary wireless communication is feasible in an inside surroundings. Local area network module is employed for connecting Arduino board from any a part of the planet.

M L Sharma et al. (2017) developed a system during which a home automation system was interfaced with Android mobile devices. The mobile device and system communicated with one another via Wi-Fi.

P. Siva Ngendra Reddy et al. (2018) used robot mobile to send commands to the Arduino board through Wi-Fi module and Arduino processed them to regulate all the house appliances. This method controlled the voltage levels of home appliances like fan, light etc. They got the standing of their home appliances in their robot mobile.

Miss Aboli Mane et al. (2018) used Blynk app in her project of home management system and security. Totally different sensors were connected with NodeMCU. With the assistance of Wi-Fi, NodeMCU was connected with Blynk app. On detection of any unwanted incident by totally different sensors, messages were sent to Blynk app.

Ramaiah Reddy et al. (2020) Associate in Nursingd Tan Karand in their have bestowed an application of Bluetooth Technology for Home Automation. The Bluetooth technology that organized in late is employed for implementing the wireless home automation system. Numerous appliances like air conditioners, home private space Network in Home surroundings. The communication between many shopper modules and also the enhances communication between the host sever and also the shopper modules. The wireless system aims at reducing the value of Home Automation. However the system doesn't use the trending mobile technology.

CHAPTER 3

SOFTWARE

3.1 BLYNK CLOUD

Introduction

Blynk was designed for the web of Things. It will management hardware remotely, it will show device knowledge, it will store knowledge, visualize it and do several different cool things.

Blynk could be a platform with iOS and golem apps to manage Arduino, Raspberry Pi and therefore the likes over the web. It is a digital dashboard wherever you'll build a graphic interface for your project by merely dragging and dropping widgets. It's extremely easy to line everything up and you may begin tinkering in but five minutes.

Blynk isn't tied to some specific board or defend. Instead, it's supporting hardware of your selection. Whether or not your Arduino or Raspberry Pi is connected to the web over Wi-Fi, LAN or this new ESP8266 chip, Blynk can get you on-line and prepared for the web Of Your Things. Figure summary of Blynk app.

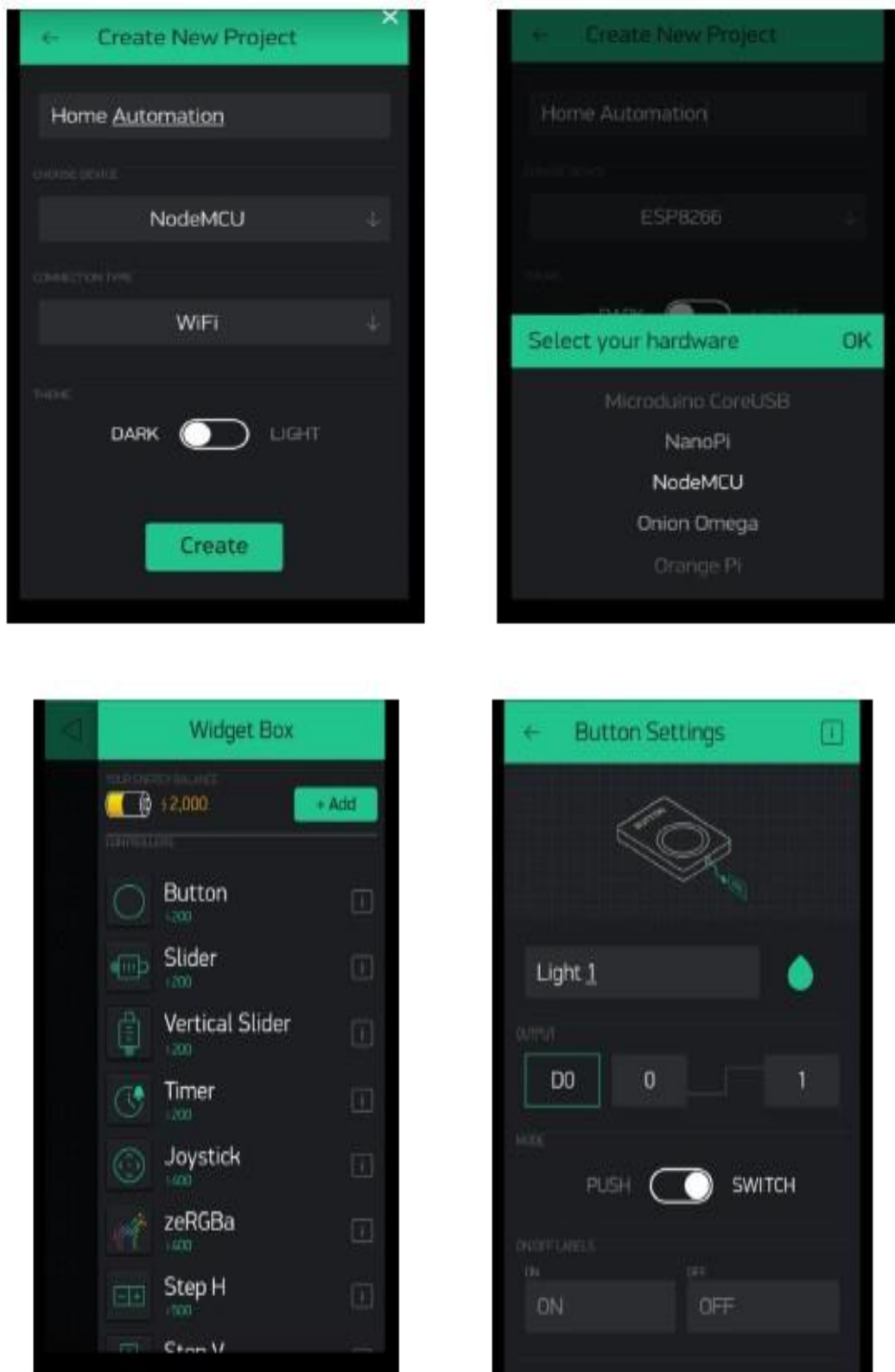
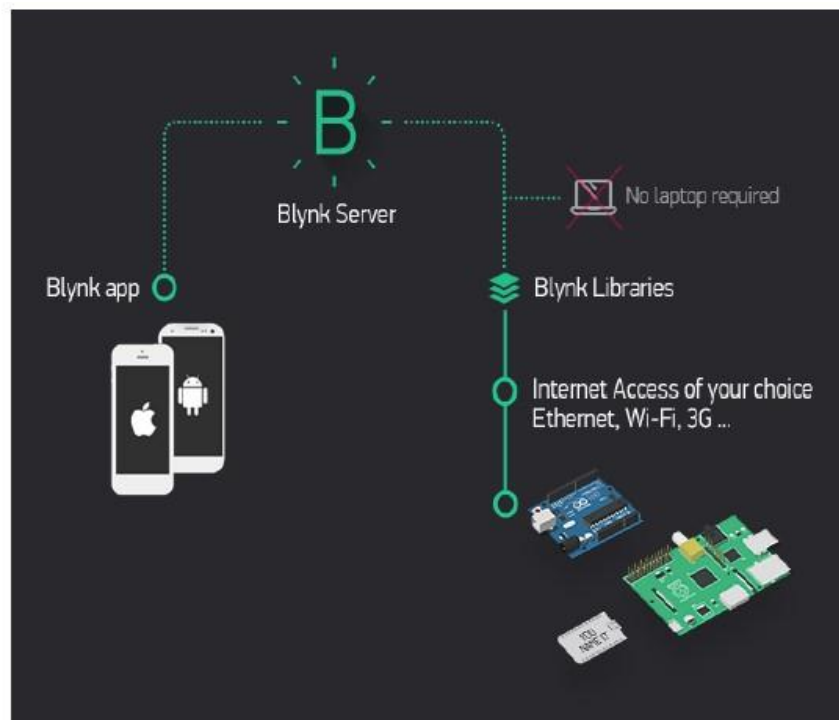


Figure 3.1 Overview of Blynk app

- There unit 3 major parts among the platform:
- **Blynk App** - permits to you switch out superb interfaces for your comes victimization varied widgets we offer.
- **Blynk Server** - answerable of all the communications between the Smartphone and hardware. You may be able to use our Blynk Cloud or run your personal Blynk server regionally. Its opensource, could simply handle thousands of devices and will even be launched on a Raspberry Pi.
- **Blynk Libraries** - for all the favored hardware platforms - modify communication with the server and technique all the incoming and out returning commands.
- Blynk was designed for information superhighway of Things. it will management hardware remotely, it will show device knowledge, it will store knowledge, visualize it and do several fully completely different cool things.



Characteristics of Blynk are

Similar API & UI for all supported hardware & devices association to the cloud may be done mistreatment LAN, Wi-Fi, Bluetooth, BLE and USB (Serial) Set of easy-to-use Widgets Direct pin manipulation with no code writing simple to integrate and add new practicality mistreatment virtual pins.

History knowledge observation via History Graph convenience Device-to-Device communication mistreatment Bridge convenience causing emails, tweets, push notifications, etc.

CHAPTER 4

IMPLEMENTATION

4.1 BLOCK DIAGRAM

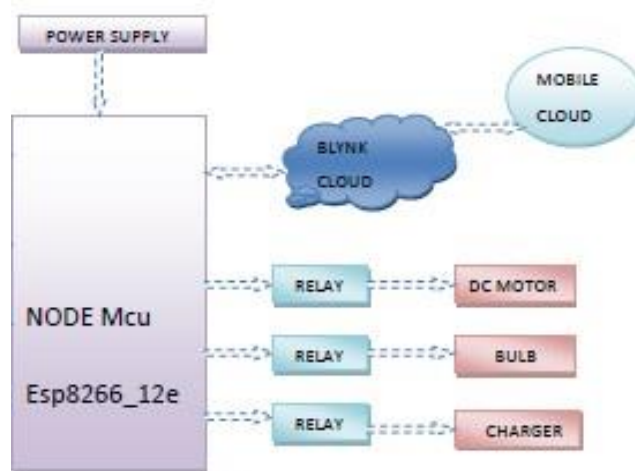


Figure 4.1 Block Diagram

As we see in figure 4.1 nodemcu is connected with 5v dc supply in same way blink cloud is also connected by providing wi-fi to the nodemcu, by using wires we connect three relay modules whereas the relay modules are connected with three different applications.

The information (whether it is on or off) given by the person with mobile is transmitted to blink cloud in the same way the information is passed to nodemcu through blink cloud the nodemcu will analyzed the information the analyzed information will be send to relay modules the relay modules will operating the application so the applications will be responded.

IoT could also be a world, where real, virtual and digital settings mix to create a wise environment that makes life straightforward. It is a replacement era of

computing technology throughout that machines move and communicate with different machines, objects and setting. This new technology has unlimited potential to boost our lives by using a “command-and-control” strategy. it is a revolution of the online throughout that objects create themselves recognizable. Objects will communicate info among them and will take necessary selections whenever needed. Communication has been extended via web to all or any or any things around USA. Once objects will communicate with each other, via the online, we'd wish to need complete advantage of remote access.

The last word goal of IoT applications is to automatise systems rather than victimization manual systems, to boost the quality of living. In today's world web serves to be a popular means that of communication. From the highest user's purpose of read, web based mostly Home Automation System is very convenient, straightforward versatile and low cost. Several devices currently have Wi-Fi and will attach with sensible phones or home computers. However these devices cannot communicate with each other as an alternative would like further devices to undertake to thus. Thus, these devices need to be unified, such they'll be monitored and controlled victimization one single program or device, e.g. dominant lights, fans, air conditioners, oven, white goods, TV etc. by victimization AN application on the Smartphone. This provides the user additional management of their home and will change several manual actions.

4.2 AUTOMATION

Automation is, unsurprisingly, one in every of the two main characteristics of home automation. Automation refers to the facility to program and schedule events for the devices on the network. The programming might embody time-related commands, such has having your lights activate or off at specific times on a daily basis. It can also embody non-scheduled events, like turning on all the lights in your home once your security system alarm is triggered.

Once you begin to know the chances of home automation scheduling, you'll come up with any number of useful and artistic solutions to form your life blinds into a “smart” outlet and program it to shut at noon every day does one have someone come by at an equivalent time every day to steer the dog? Program your

home automation system to unlock the front entrance for them and lock it up again when they're done.

4.3 HOME AUTOMATION COMPONENTS

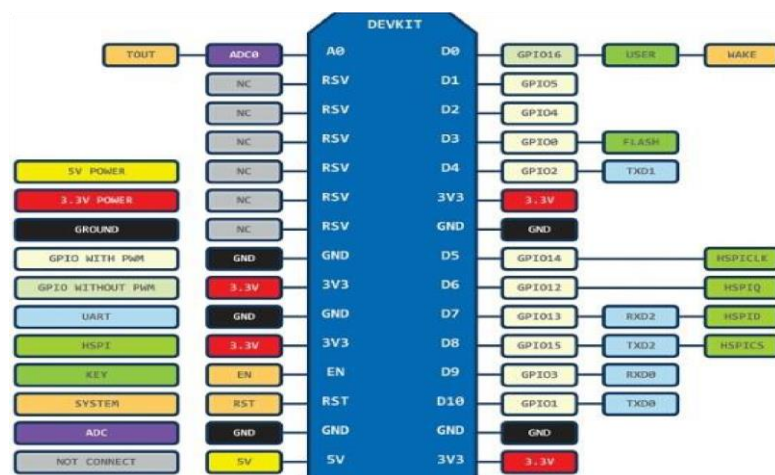
- What kinds of things square measure usually a region of a home automation system? Ideally, something which can be connected to a network square measure usually machine-controlled and controlled remotely. Inside the planet (outside of analysis labs and so the homes of the wealthy and famous), home automation most commonly connects easy binary devices. This includes “on and off” devices like lights, power shops and electronic locks, however additionally devices like security sensors that have solely 2 states, open and closed.
- Wherever home automation becomes really “smart” is inside the internet-enabled devices that attach to the current network and management it, the classic management unit is that the pc, that several of the earlier home automation systems were designed. Today’s home automation systems square measure additional possible to distribute programming and observance management between a zealous device inside the house, rather like the board of a security system, associate degreed a easy app interface which can be accessed via an internet-enabled laptop sensible phone or pill.
- Manufactures have made a decent variety of “smart” devices, several of that square measure full of Innovative options however few of that provide the sort of integration required to be a region of a whole home automation system. A lot of the problems square measure that each manufacturer options a distinct plan of however these devices ought to be connected controlled. thus whereas you'll need a “smart” TV, washer, white goods, thermostat, home appliance or any of the alternative internet-ready social unit devices on the market, the highest result's typically a separate management theme for each device.

- Within the close to future, home automation might standardize to permit U.S. to really benefit of all of these further potentialities. For the time being, the house security suppliers that target home automation have centered on the foremost essential and helpful elements of a connected home. At a basic level, this implies the doors and windows and environmental devices (thermostat, smoke detectors, temperature, humidity, fireplace and carbonic acid gas sensors) that keep you safe and comfortable for additional period security, convenience and management, home automation system from security suppliers ought to additionally embody choices for video cameras. With the best systems, you will even be able to embody lights and individual electrical shops into your home automation package

4.4 NODE-MCU (ESP8266-12E)



Figure 4.2 MCU (ESP8266-12E)



The Node MCU is associated with microcode and open-source supply development kit that helps you to exemplify your IOT product among some Lua script lines. It includes microcode that runs on the ESP8266 Wi-Fi SOC from Espressif Systems, and hardware that relies on the ESP-12 module. ESP8266EX offers a whole and self-contained Wi-Fi networking answer.

4.5 POWER SUPPLY

Almost all basic social unit electronic circuits want an unregulated AC to be reborn to constant DC, so as to control the device. All devices can have a definite power offer limit and therefore the electronic circuits within these devices should be ready to offer a relentless DC voltage inside this limit. That is, all the active and passive electronic devices can have a definite DC operative purpose (Q-point or Quiescent point), and now should be achieved by the supply of DC power. The DC power offer is much reborn to every and each stage in an electronic system. therefore a standard demand for all this phases are going to be the DC power offer. All low grid are often run with a battery. But, for while operative devices, batteries might influence be expensive and complex. The most effective methodology used is within the variety of an unregulated power offer – a mix of an electrical device, rectifier and a filter.

ESP8266EX is among the foremost integrated Wi-Fi contribute the industry; it integrates the antenna switches, RF balun, power electronic equipment, low noise receive electronic equipment, filters, power management modules, it needs marginal external electronic equipment, and so the whole resolution, together with front-end module, is supposed to occupy marginal PCB space. • The ESP8266 has seen an honest adoption as a cost-effective resolution for IOT and Wi-Fi-capable devices. The ESP8266 was developed by Shanghai-based Espressif systems, as a Serial (UART) to Wi-Fi SoC (System on a Chip) based around a Tensilica Xtensa LX3DPU. This little IC includes an RF front, RAM, and (usually) an onboard TCP/IP stack that allows it ready to attach with a close-by Access purpose, to act as an Access purpose itself, or both.

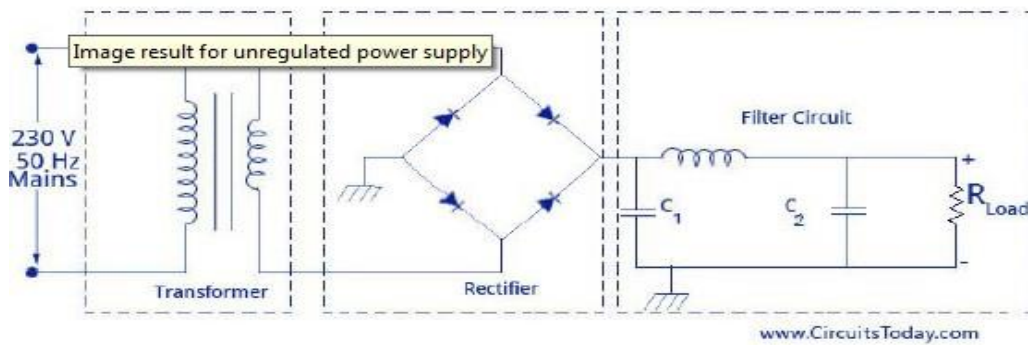


Figure 4.4 Unregulated power supply

In India, a 1 Ø offer is out there at 230 volts. The output of the device might even be a singsong serpentine AC voltage, that's regenerate to singsong DC with the assistance of a rectifier. This output is given to a filter circuit that reduces the AC ripples, and passes the DC parts. But here ar positive disadvantages in victimization AN unregulated power.

When the load varies, the output doesn't appear constant. The output voltage amendments by an excellent worth owing to the large amendment in current drawn from the availability. typically|this will be} usually chiefly owing to the high internal resistance of the power offer ($>30\ \Omega$).The maximum variations in AC offer mains is supply or take six Gregorian calendar month 1944 of its rated worth. but this worth may go higher in some countries (180-280 volts). once the worth is higher it's DC voltage output will dissent for the foremost half. . These variations in dc output voltage may cause inaccurate or erratic operation or defective of the various electronic circuits. For instance, in oscillators the frequency will shift, in transmitters output will get distorted, and in amplifiers the operative purpose will shift inflicting bias instability.

Quickly once launch, a variety of flight boards for the ESP8266 started turning into accessible. The foremost common ones unit of activity the ESP-NN series, that typically integrate the SOC at the side of Flash RAM, a crystal, AND even AN aboard antenna. The foremost salient distinction between whole altogether whole completely different ESP-NNmodels unit of activity the pins that unit of activity broken out from the ESP8266.

As a result of the ESP8266 was developed as a Serial to Wi-Fi adapter, its writing enforced an interpreter for AT commands. so initial usage of the IC was restricted to employing either a USB to Serial adapter, or a separate microcontroller (e.g., ATmega328) to issue AT commands over the ESP8266's Serial UART interface. For this reason, the ESP-01 board quickly became common amongst the ESP8266 community owing to its 2x4, 0.1in-pitch association that is throughout a footprint to be merely wired to a USB to Serial adapter.

4.6 RELAYS

A relay is electrical operations with mechanical relays use an electromagnet to automatically operate as switch, however the same principles are used, like solid-state relays. Relays are used wherever it's a necessity to manage a circuit by a separate low-power signal, or where many circuits need to be controlled by one signal. the first relays were used in long distance telegraph circuits as amplifiers: they perpetuate the signal returning in from one circuit and retransmitted it on another circuit. Relays extensively in telephone exchanges early computers to perform logical operations. a variety of relay which could handle the high power needed to directly management an electrical motor or whole completely different a full bunch is assumed as a contactor. Solid-state relays management power circuits with no moving components, instead using a semiconductor to perform modification.

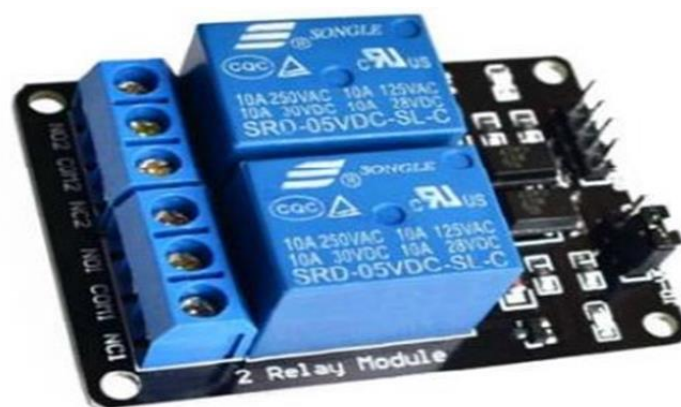


Figure 4.5 Relays

A simple magnetic attraction relay consists of a coil of wire wrapped around a soft iron core (a solenoid), an associated iron yoke that provides a low

reluctance path for magnetic flux, a movable iron coil, and one or a lot of sets of contacts (there area unit 2 contacts inside the relay pictured). The coil is hinged to the yoke and automatically connected to a minimum of one or a lot of sets of moving contacts.

The coil is control in place by a spring so as that once the relay is de-energized there is associate air gap inside the magnetic circuit. Throughout this condition, one of the two sets of contacts inside the relay pictured is closed, and thus the opposite set is open. Different relays could have a lot of or fewer sets of contacts looking forward to their perform. The relay inside the image conjointly options a wire connecting the coil to the yoke. This ensures continuity of the circuit between the moving contacts on the coil, and thus the circuit track on the pc printed circuit (PCB) via the yoke, that is soldered to the PCB.

When associate electrical current is mean the coil it generates a magnetic flux that activates the coil and thus the ensuing movement of the movable contact either makes or breaks (depending upon construction) a relevance a tough and quick contact. If the set of contacts was closed once the relay was de-energized, then the movement opens the contacts and breaks the affiliation, and therefore the different means around if the contacts were open. Once the current to the coil is transitioned, the coil is came back by a force, some 0.5 as robust as a result of the magnetism, to its relaxed position. Typically this force is provided by a spring, however gravity is to boot used unremarkably in industrial motor starters. Most relays area unit factory-made to figure quickly. Throughout a low-tension application this reduces noise; throughout a high voltage or current application it reduces arcing. When the coil is energized with DC, a diode is commonly placed across the coil to dissipate the energy from the collapsing magnetic flux at deactivation, which could otherwise generate a voltage spike dangerous to semiconductor circuit elements. Such diodes weren't wide used before the appliance of transistors as relay drivers, however shortly became omnipresent as early element transistors were simply destroyed by this surge. Some automotive relays embody a diode within the relay case.

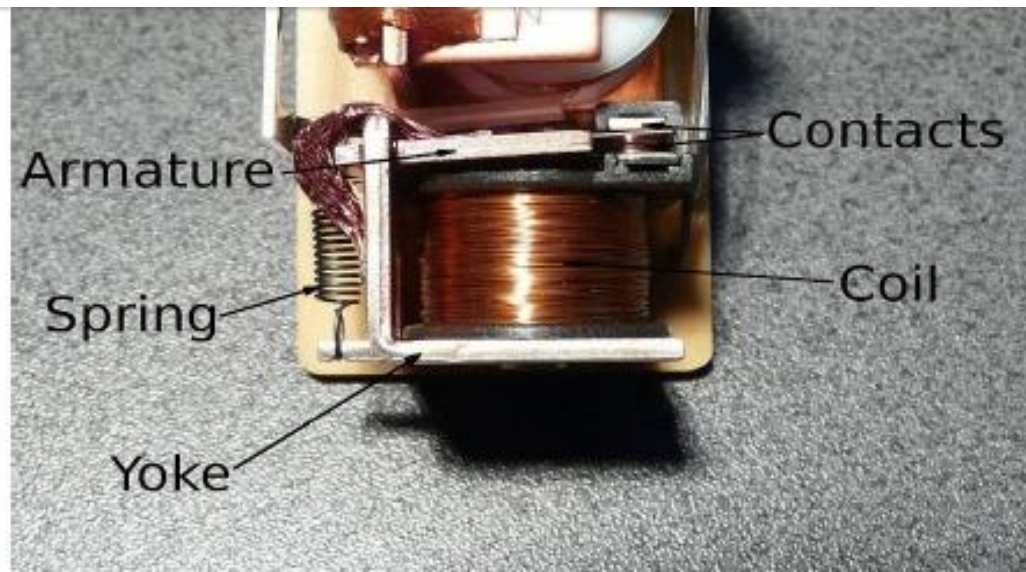


Figure 4.6 Simple Electromechanical Relay

Relays are utilized in electronics to modify a smaller current which successively will control larger current. They prevent the user to possess direct contact to the most device being controlled which may be holding high voltage. These devices are like a foreign control which is employed to form an enormous equipment work. The larger relays or contactors are being utilized in industries to supply energy on machineries like pumps and motors. The function of relay are often easily understood by explaining how head lights activate. The switches to show this on are often found on the dashboards of cars. Once moved, they're going to send a little current on the coil turning on the contactor. The relay then will control a high power load which during this case is that the head lights. Besides this instance, relays produce other more applications which we affect everyday but haven't been ready to notice.

Circuit Diagram

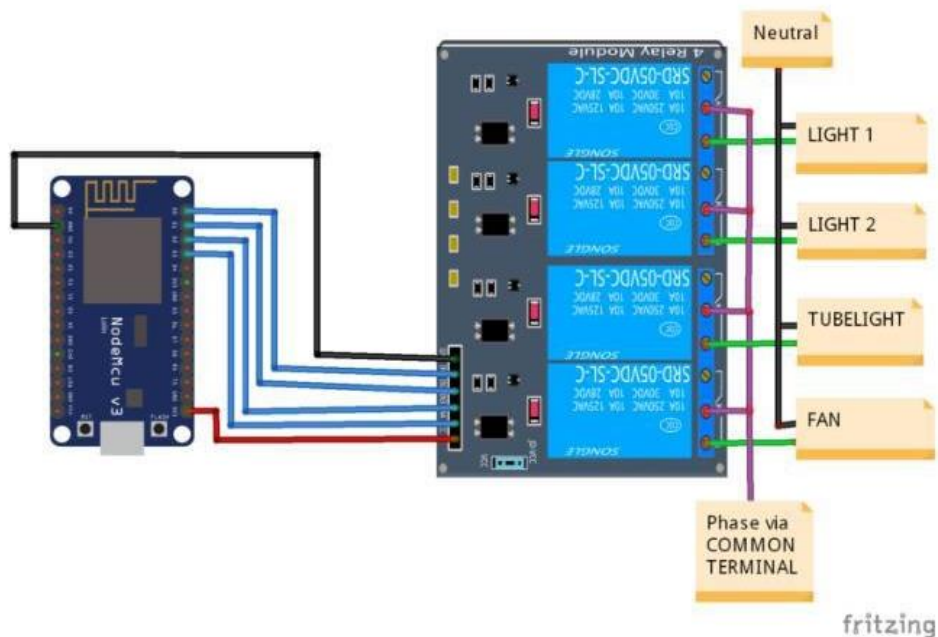


Figure 4.7 Circuit Diagram showing Relay Working

Relays are a unit being applied reception, industries and even on the road. Instrumentality for domestic use have components that require energy thus on operate. Associate example of it's icebox. This appliance has motors and fans. Relays are a unit accountable in dominant these components so as that icebox work and turn out cold temperature. Another application of relays is dominant traffic lights. they're going to be operated remotely with the use of a change element. Automatic garage door is another occasion wherever relays are a unit being utilised. The door's movement and direction are unit those being controlled. Relays do not solely energize instrumentality however conjointly create devices to stop functioning. These capabilities have brought automation and convenience in our lives. They let physical science run swimmingly and safely. Now, we do not got to deal directly with physical science that contain high voltage which can cause danger if they suddenly malfunction.

- Usually {this can be} often a low Level 5V 4-channel relay interface board, and each channel desires a 15-20mA driver current. It are a unit typically used to management numerous appliances and instrumentality with

massive current. It's equipped with high-current relays that employment beneath AC250V 10A or DC30V 10A. It is a typical interface which is able to be controlled directly by microcontroller. This module is optically isolated from high voltage facet for safety demand and conjointly stop mishap once interface to microcontroller.

4.7 BULB HOLDER OR LAMP HOLDER

Light bulb sockets, lightweight sockets lamp sockets or lamp holders offer electrical connections to the lamps and support it inside the fixture. The employment of sockets permits lamps to be safely and handily replaced (re-lamping). There are many different standards for these lamp holders, created by de facto and by varied standards bodies. A general writing could also be a letter or abbreviation followed by selection. Some miniature lamps have wire leads appropriate for direct affiliation to wires; some reflector lamps have screw terminals for wire connections.

- The most common form of sockets for mains electricity are discoverer screws, utilised in continental Europe and North America, whereas bayonet mounts dominate inside the Commonwealth countries and inside the automotive trade. Fluorescent lamps need a special, usually four-pin style. A broad form of different socket styles exists, applied for specialised lamp constructions.
- A lamp holder is that the device for holding a light-weight bulb or lamp. Most lightweight fittings or luminaires have a lamp holder. For wall and ceiling lights with a tough and quick lamp holder, it's necessary that the lamp holder is compatible with the type of bulb you'd prefer to use. For pendant lights it's necessary that the lamp holder is each compatible with the type of bulb you'd prefer to use and your most popular lamp shade.
- Most light sources (filament, CFL, LED etc) will have versions in bayonet and screw. But: because standard screw or E27 is that the commonest, this fitting will offer you the best range of sunshine bulb options. As a matter of convenience, it's going to add up to, say, have all hall and

landing ceiling pendants with an equivalent fitting to avoid bulb compatibility issues.

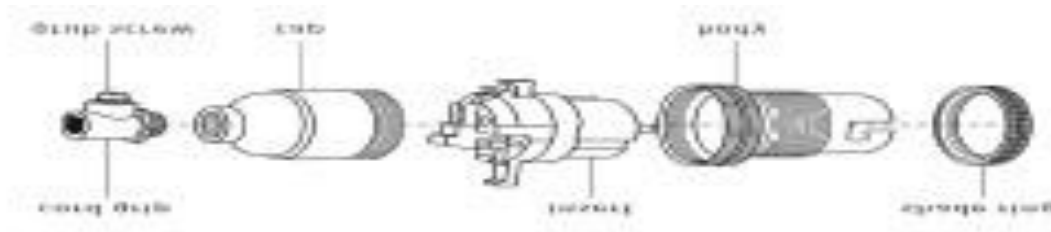


Figure 4.8 The components of a standard bayonet (B22 or BC) switched lamp holder with a cord grid

4.8 CONNECTING WIRES

Connecting wires permits Associate in Nursing electrical current to travel from one purpose on a circuit to a different, as a result of electricity desires a medium through that to manoeuvre. Within the case of computers, wires square measure embedded into circuit boards, carrying pulses of electricity that square measure taken as binary signals of zeros and ones. Most wires in computers and electronic elements square measure fabricated from copper or Al. Copper is reasonable and electrically conductive.

- In a basic circuit, the wire comes from one terminal of an influence supply, like battery. It then connects to a switch that determines whether or not the circuit is open or closed. The wire then connects to the device that's attractiveness, permitting it to draw electricity and perform is task



Figure 4.9 Connecting Wires

4.9 WORKING

- Step 1: so as to ascertain association between the consumer and therefore the server the Wi-Fi choice within the Smartphone is enabled
- Step 2: it's connected to the Wi-Fi module of the system.
- Step 3: every electronic/electrical appliance within the system is connected to the digital pins on the node MCU board.
- Step 4: A Relay is employed for connecting every device to the Arduino, that helps in changing high Voltage provide to low voltage.
- Step 5: A C-program is loaded on to the silicon chip chip on the node MCU Board that specifies what action is to be performed on receiving specific inputs.
- Step 6: Associate in Nursing automaton Application has been developed that allows the tip user to watch and management the appliances from any remote location.
- Step 7: Through blynk app we'll provide the command to the node MCU.
- Step 8: victorious dominant and observance of appliances.

4.10 RESULTS

Table 4.1 Results of Operation

S.NO	Command	Operation
1.	#Bulb is ON	When the Bulb is ON
2.	#Bulb is OFF	When the Bulb is OFF
3.	#Charger is turned ON	When the Charger is Turned ON
4.	#Charger is turned OFF	When the Charger is Turned OFF



Figure 4.10 Bulb ON

In the blink app lamp switch is on as we seen in figure 4.1 the input signal is send to kit by blink server the blink server as the node mcu is connected with wifi network node mcu will receive the output signal from blink app as the received output signal is converted to signal to analogue signals ,as the analogue signal is transmitted to relay module ,as the 4 channel relay module is connected is four applications in the same way it is connected with lamp in the same way the four applications will work by commend given by person through blink app.

As we see in the figure 4.11 feedback is received in blink app that represent the bulb is in on position we ,as the input (on) position is received to the node mcu it passes the information and see the notification whether the build in is on or off will be receiving the notification.

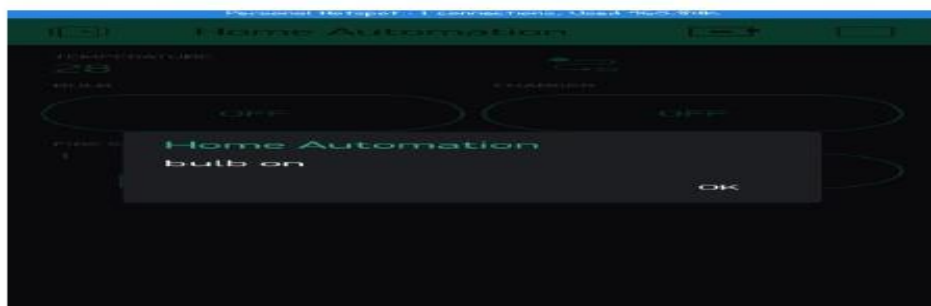


Figure 4.11 Notification in the Mobile

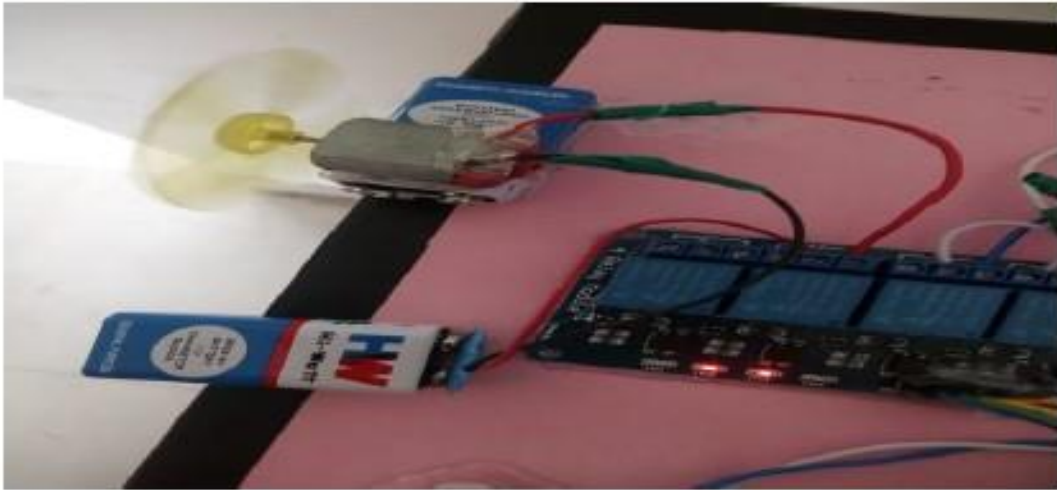


Figure 4.12 Fan is ON

In the same way fan is also connected to a relay module in the blink cloud it receive the on commend it send a notification to mobile that fan is on, whether the fan will receive the commands from connected relay module as we see the relay module is connected to node mcu as we know node mcu will receive the notification from blink app.

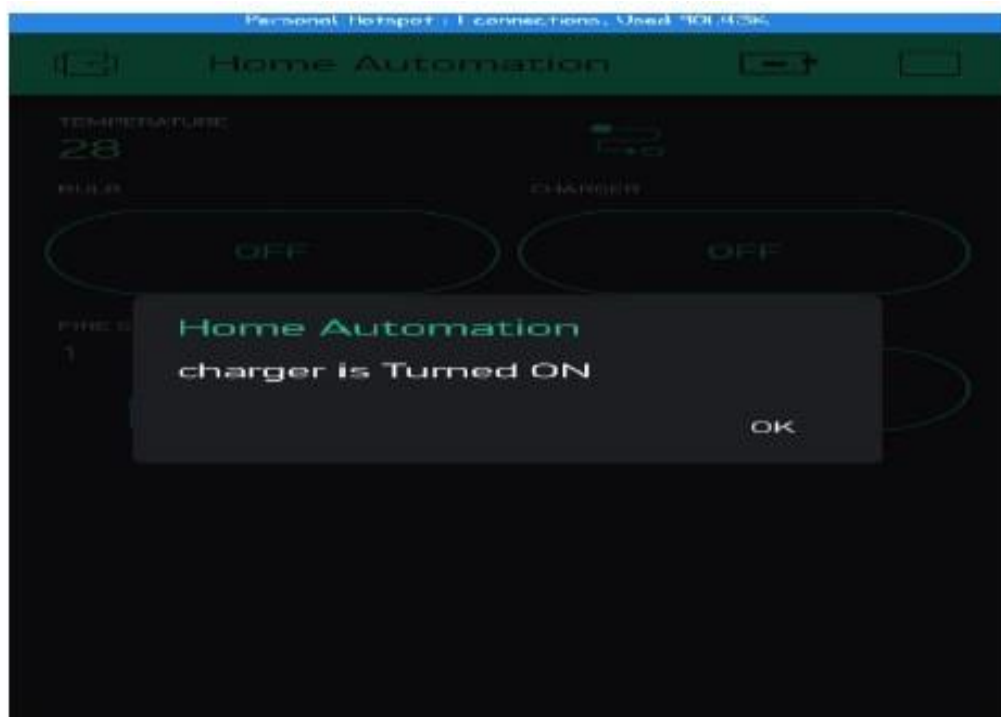


Figure 4.13 Charger ON Notification in Mobile

So as to ascertain association between the consumer and therefore the server the Wi-Fi choice within the Smartphone is enabled it's connected to the Wi-Fi module of the system. Every electronic/electrical appliance within the system is connected to the digital pins on the node MCU board. A Relay is employed for connecting every device the Arduino, that helps in changing high Voltage provide to low voltage. A C-program is loaded on to the silicon chip chip on the node MCU Board that specifies what action is to be performed on receiving specific inputs. Associate in Nursing automaton Application has been developed that allows the tip user to watch and management the appliances from any remote location. Through blynk app we'll provide the command to the node MCU. Victorious dominant and observance of app.

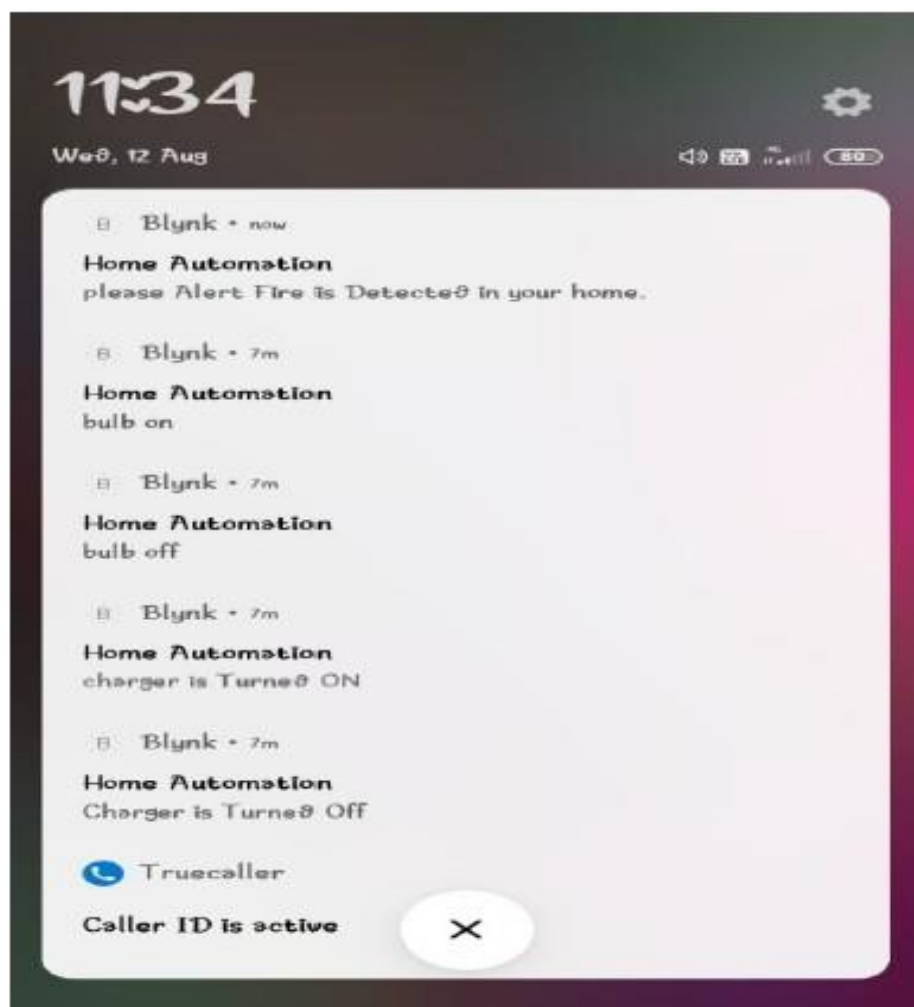


Figure 4.14 Real Time Notification

As we see in the figure 4.14 the mobile is received real time notification of build, fan, charger and tube light weather the system is in on or off position, the system can work from any place in the world it will be operated with the mobile blink cloud and it has feedback property so it will send the real time notification to mobile.

Advantages

- ❖ It reduce the human effort then it definitely save our time
- ❖ The efficiency is high in this system
- ❖ It Save lot of energy
- ❖ Easy to operate the different applications in home

Disadvantages

- ❖ Connecting to three phase devices the kit gets damage
- ❖ For installing this smart technology it efforts lot of money

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 CONCLUSION

From the tip user's purpose of read, web could be a suggests that of Communication that is definitely obtainable and cheap. Robot Phones and robot applications area unit already a district of human life. Thus, a mixture of those technologies can create life a lot of easy and straightforward to measure. The potential of the system are often improved to a larger extent by combining technologies like cloud computing, big data, artificial intelligence etc. despite the fact that these technologies don't seem to be unaccustomed the trade, combination of those technologies with the net of Things (IoT) can do miracles in human life. It's the automation of the house or home activity.

5.2 FUTURE SCOPE

Automation for residences become common place, the market will eventually be crowded with several players, multiple product offerings and competitive pricing with low margins. The products themselves will reach a 'plug and play' sort of usability.

REFERENCES

- [1] Atzori, L., Iera, A., and Morabito G.; "The net of things: A survey."; personal computer networks, 2017, Vol. 54(15), pp. 2787-2805.
- [2] Bohora, B., Maharjan, S., and Shrestha, B. R; "IoT based mostly wise Home exploitation Blynk Framework". Zerone Scholar, 2016, Vol. 1(1), pp. 26-30.
- [3] Mandula, K., Parupalli, R., Murty, C. A., Magesh, E., and Lunagariya, R.; "Mobile based mostly home automation exploitation net of Things (IoT)." International IEEE Conference on management, Instrumentation, Communication and procedure Technologies (ICCICCT), Dec 2017, pp. 340-343.
- [4] Mane, M. A., Pol, M. P., Patil, M. A., and Patil, M.; "IOT based totally Advanced Home Automation victimization Node MCU controller and Blynk App."; thirteenth Intl. Conf. on 2018.
- [5] Sharma, M. L., Kumar, S., & Mehta, N.;. "Smart Home System victimization IoT";International analysis Journal of Engineering and Technology, Nov. 2018, Vol. 4, issue 11.
- [6] Singh, S., Saha, D., Khaware, P., Das, S., Raj, D., Das, S., & Nandi, C. S.;"Home Automation And web of Things". International Advanced analysis Journal in Science, Engineering and Technology, 2016, Vol. 3(6).
- [7] Wang, M., Zhang, G., Zhang, C., Zhang, J. and Li, C.; "An IoT-based appliance system for wise homes." Fourth IEEE International Conference on Intelligent management and knowledge technique (ICICIP), June 2013
- [8] Reddy, P. S. N., Reddy, K. T. K., Reddy, P. A. K., Ramaiah, G. K., &Kishor, S. N. "An IoT based totally home automation victimization automaton application."; International IEEE Conference on [Signal technique, Communication, Power and Embedded System (SCOPES), October, 2020,.