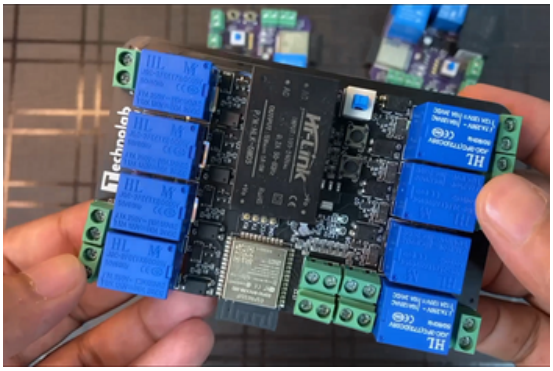
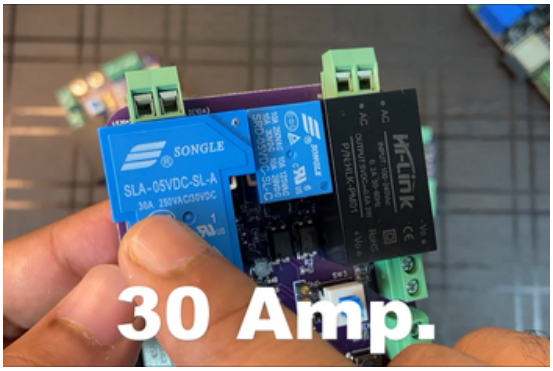
AUTODESK Instructables

30Amp Home-Automation PCB for Heavy Load Appliance

By technolabelectronics in CircuitsArduino

Introduction: 30Amp Home-Automation PCB for Heavy Load Appliance





In this article I am going to introduce my newly designed 30amp home-automation PCB.

I have also designed lot other home-automation PCBs, like 2 node , 4 node and 8 node home-automation PCBs.

These PCBs are fully tested and works very well These PCBs are best for home-automation system,

But these PCBs could handle only Up-to 10 amp load, So we can only use this PCBs for small load appliances like light bulb, televisions which consume less power,

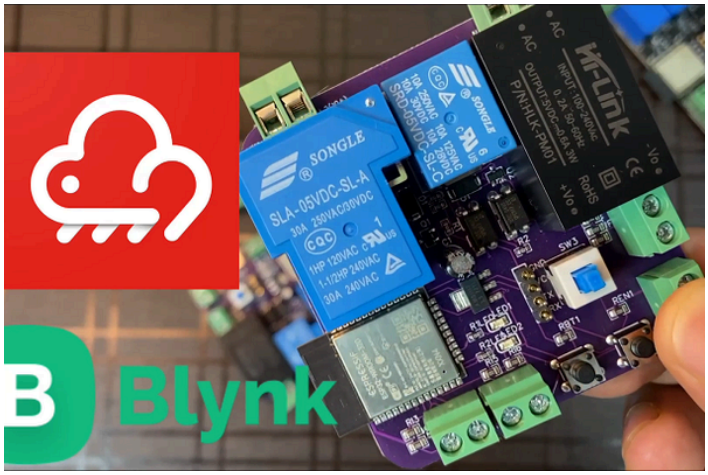
But if we want to automate heavy load appliances like air conditioners, washing machines, geyser then in that case , we couldn't connect to these PCBs.

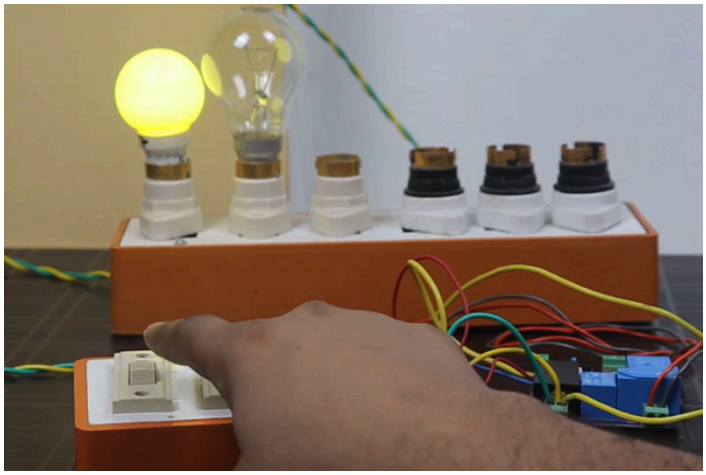
These PCBs will not handle such heavy load and eventually the relay will burn out.

So to solve this problem, I have design brand new home-automation PCB which can easily handle Up-to 30amp load.

And most of the heavy load appliances that we used in our homes consumes current under 30 amp, So this PCBs is perfect for those appliances.

Step 1: IOT Plateform.



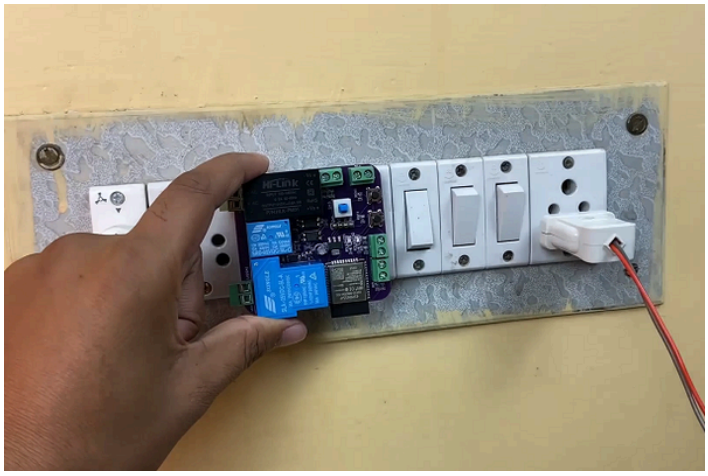


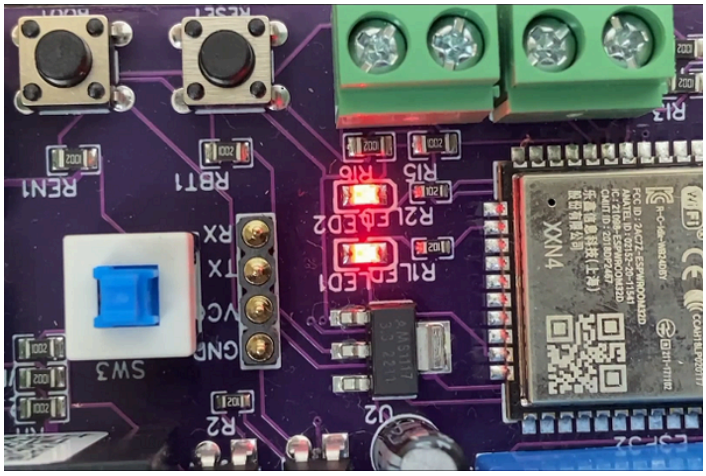
This PCB is compatible with all the popular IOT platform like BLYNK, ESP-RAINMAKER.

In this way we can easily integrate this PCB with Alexa and google assistant.

And apart from this , we can also give manual input to this PCB and also we can connect via Bluetooth to control the appliances from smartphone application in local area network.

Step 2: Compact Size,





And the size of this PCB is very small. and can easily fits inside the electrical switch board.

And there is two onboards LEDs , which we can use in many ways, like for testing code, WIFI indicator.

Step 3: PCB Design.

This is the Schematic of PCBs. If you want Your own custom designed PCBs, Then you can download this schematic.

After making the Schematic, Convert it into PCB, Arrange and place all the components in desirable places, Once the layout is ready route the wiring and complete the design of PCB.

After The completion of PCB design, You need to download three files which will required during PCB order. These files are BOM, Gerber and CPL that is pick and place file.

Step 4: NextPCB: Your One-Stop Solution for PCB Manufacturing and Assembly.

NextPCB: Your One-Stop Solution for PCB Manufacturing and AssemblyThis project is successfully completed because of the help and support from NextPCB -Reliable Multilayer PCB Manufacturer. NextPCB is one of the most experienced PCB manufacturers in Global, has specialized in the PCB and assembly industry for over 15 years.

Sign up/login to get exclusive $30 coupon:

Enjoy free PCB assembly for 5 boards:

HQDFM free online PCB Gerber viewer:

Unmatched Reliability and Quality

NextPCB prides itself on offering high-reliability PCB solutions. With over 15 years of in-house fabrication expertise, they guarantee 100% quality on their products, promising to remake them free of charge if any issues arise. Their commitment to quality is reflected in their impressive 99.6% on-time delivery rate, ensuring that your projects adhere to the stipulated timelines without any hitches.

Comprehensive Services

PCB Manufacturing

NextPCB specializes in manufacturing a wide variety of PCBs, including:

- Ceramic PCB
- Metal Core PCB
- Aluminum PCB
- LED PCB
- Flexible PCB
- Rigid-flex PCB
- Thick Copper PCB
- High TG PCB
- High-frequency PCB
- HDI PCB

Their manufacturing process utilizes high-end materials and equipment sourced globally, including Taiwanese electroplating lines and German flying probe testers, ensuring the production of durable and efficient PCBs.

Free PCB Assembly Services

In a bid to support engineers and enthusiasts in their endeavors, NextPCB offers free PCB assembly services, allowing individuals and businesses to experience reliable PCB assembly from

NextPCB without any cost. This initiative stands as a testament to NextPCB's commitment to fostering innovation and supporting the PCB community.

Step 5: Code.

To upload the code into ESP32 chip I will use ESP32 development board , Connect the PCB to ESP32 board as per this Circuit diagram.

Step 6: Update ESP32 Boards Library.

This is the code for our today's home automation project, before you upload the code first you need to update the ESP32 boards library in your Arduino IDE.

Open Arduino preference and paste the copied link.

Now go-to tools and then click on board manager,

Search for ESP32, here you have to install this latest ESP32 boards in your Arduino IDE, Close this window after Installation.

Step 7: Code Explanation.

Now in the code, I have define the names of devices….light 1, light 2 like that…..you can give any name you want.

I have define the pins for relays and switches, If you are using my PCB then no need to change anything. Just upload the code as it is…..

Now Go-to tools and select the right board, that is ESP32 dev module.

Now click on partition scheme and select rainmaker.

and in the last select the right communication port then click on upload button to upload the code.

Step 8: ESP-RainMaker.

After clicking the upload button, on the PCB Press and hold the boot button and press the reset button once to make the module go inside the boot mode.

Once the code is successfully uploaded, Open Serial monitor.

Now press the reset button on the PCB for five seconds.

A QR code is printed on the Serial monitor. I have to scan this QR code

But this QR code is not clearly visible.

To view this QR code clearly, Copy this link and open in your browser.

Step 9: WiFi-Credentails.

Now with this QR code , we can easily enter the WI-FI Credentials to the esp32 chip using the ESP Rain-maker app.

And this ESP Rain- maker app is available for android as well as iOS.

Now open this app and Click on add Device, Scan the QR code. It will take few seconds to connect with the ESP32 chip.

Now select your WI-FI network and enter the password of your WI-FI. Here it will take few seconds to configure the WI-FI Credentials in ESP32

Here as you can see all the device is successful added,

Now we can easily control the relays from this app.

Step 10: Alexa & Google Assistant Configuration.

Let's connect Amazon Alexa and google assistant to this rainmaker app.

For this Go-to settings then tap on voice services, then click on Amazon Alexa....

then tap on link with Amazon Alexa on the bottom of the app....It will take few seconds to connect.....

Now open Amazon Alexa app.....and go-to all Devices.....

Here you can see both the Devices are connected to Amazon Alexa.

Now we can easily control the Devices from this Amazon Alexa app as well...

Lets connect google assistant to ESP Rain maker app, for this again go-to settings and open voice services.

This time click on google assistant....

here it shows the steps how to connect the google home to ESP Rain maker app which is very easy.

Again we can easily control the Device from this google home app as well.

And apart from this manual tapping we can also give voice command.

We have successfully connected the Alexa and google assistant to the ESP Rain maker.

Step 11: Connection of Appliances & Switches.

Now connect all the switches and appliances as per this connection diagram, here I am using light bulb to demonstrate this project.

After completing all the above setups and configuration, now you able to control your heavy load appliances from smart-speakers, from smart-phone as well from the manual switches.

Step 12: Conclusion.

As you see can I am able to control the Devices from the manual switch buttons, from giving voice command to Alexa and google assistant.

And apart from this we can also control it through the ESP Rain maker app.

This is the most simple and best home automation project.

You can now control your heavy load appliances from your smartphones as well from smart speakers through voice command.

You can install this PCB in your home or office to make your appliances smart.

If you purchase this PCB you will get a QR code along with this PCB, just scan this QR code with the ESP Rain maker app and easily Integrate the Alexa smart speaker and google assistant to it. And make your device smart.

Step 13: Video Tutorial.