

# Home Automation using Cloud Computing

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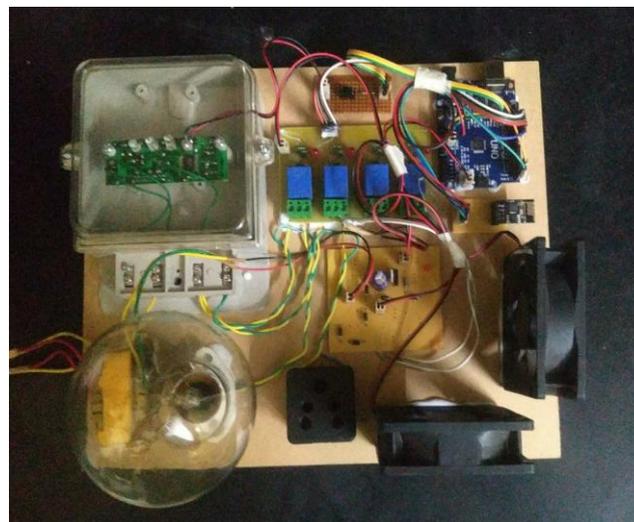
**Abstract:** Home automation system achieved great popularity in the last decades and it increases the comfort and quality of life. Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real-world objects (things) through the Internet. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer, and automated. The modern home automation system gives security and blissful life at residence. That is why the popularity of using home automation technology is increasing day by day. A smartphone application is used to control and monitor home appliances using different types of communication techniques like Zigbee, Wi-Fi, Bluetooth and etc. This system can be controlled using various ways like the internet, smartphone, voice control and etc., They cost very less and are available in cool designs. By using this IOT Technology, a person can reduce the stress and can lead their life with modern technology at home

**Keywords:** Arduino UNO, Node MCU, IOT, Energy Meter, Blynk App.

## 1. INTRODUCTION

Energy crisis is one of the major problems that the world faces today. The energy crisis can be reduced to a certain extent by properly monitoring our energy consumption and avoiding energy wastage. The energy meters are connected to the Arduino UNO through an optocoupler. The optocoupler sensor gives an interrupt each time the meter LED ashes to the programmed Arduino and Arduino process this data to the ESP8266 WI-FI module then WI-FI module sent this data to the Blynk app. This system monitors the kWh readings into the Blynk app. This design eliminates the human involvement in electricity maintenance. In this system, an Arduino is interfaced with an energy metering circuit, current sensing circuit, WI-FI communication and a contactor to make or break power line. In this project we are connecting loads through relay and CT. Whenever over load was detected by the system then the Arduino will send the blink notification to the user mobile then user disconnect the load by using Blynk application. Here relay works as switch to on/off the power supply which is connected to the load. The main controlling device of the project is Arduino which is programmed by Embedded C language.

FIG 1: Project Module



## 2. METHODOLOGY

### 2.1 HARDWARE COMPONENTS

Hardware components used in the module:

- Arduino UNO is a microcontroller board which has ATmega328 of 16MHz resonator
- ESP8266 is a wi-fi SoC (system on a chip) which is based on ESP-12 module.
- XTM18SA (LCD Display) Energy Meter of 120V/230V with power consumption of <2W.
- Relay is an electromagnetic switch
- Optocoupler (EC817) is used which provides an optical isolation between input source and output source by using light.
- Relay Driver is a circuit which can drive, or operate, a relay so that it can function appropriately in a circuit.

- Fans and Bulb (AC)

## 2.2 SOFTWARE USED

Software used in this project is:

- Arduino IDE for Arduino code
- Blynk app used to operate the devices

## 3. WORKING AND BLOCK DIAGRAM OF MODULE

Firstly, we have to connect the main plug to power supply. Now, we have to turn on the hotspot and enter its password (which was initially generated) in the phone and connect the Arduino to the phone. The power supply initially pass through the Transformer(230V/12V) which gives us a 12V output, this voltage is passed to the Regulated Power Supply Board which converts this 12V AC supply to 12V pulsating DC, then using a smoothing capacitor, we convert this 12V pulsating DC to pure DC.

This DC supply is now distributed among elements like 5V to Arduino, 5V to Wi-Fi module, 12V to Fans and to the Relays. Now these relays are connected to Energy Meter through Arduino and Optocoupler (which gets pulses from Energy Meter). By this the working of the module is initiated and we can operate it from the mobile phone using Blynk App where we get all the elements in our circuit board, displaying like a button. We can re-modify the buttons in the app if new elements are added to the circuit board.

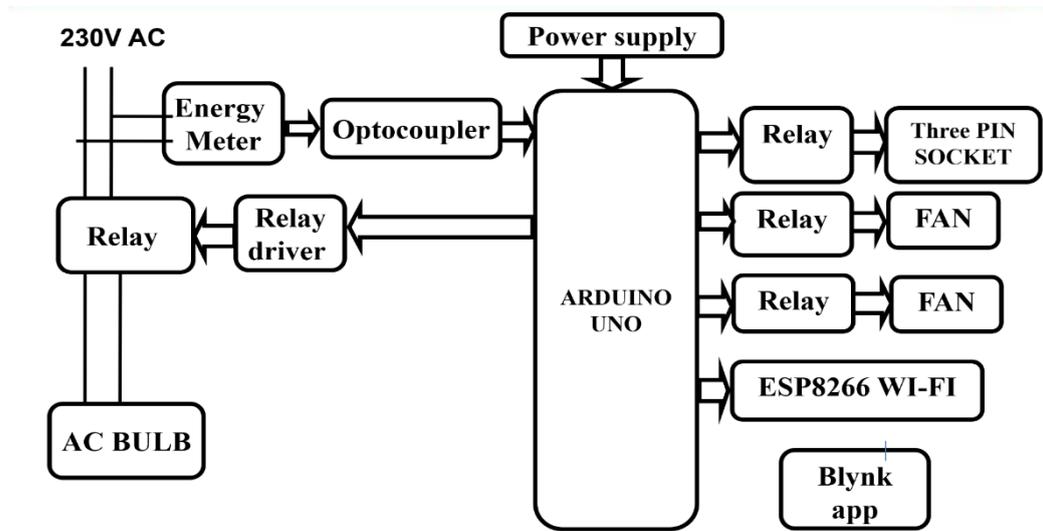


FIG 2: Block Diagram of the Module

## 4. RESULT

This Project can be made more efficient by adding Automatic Speed controlling Regulator or we can add intensity sensors which can detect human presence and adjust its intensity.



FIG 3: Module when load is connected

## 5. CONCLUSION

This application is mainly made for Physically challenged people who face issues moving here and there and also for senior citizens. The Smart phone present with them is connected to the program using the app and through the Wi-Fi module it communicates to all appliances

## 6. REFERENCES

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