Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

SMART HOME

[1]Satyam Antapurkar, [2]Lokesh Patil, [3]Shubham Chavan, [4]Rushikesh Pawra , [5]Harshal Shelar,

[1]*UG Scholar, Dept of Electrical Engineering. Sandip University Nashik . (UGC Recognize)* Nashik,
[2]*UG Scholar, Dept of Electrical Engineering. Sandip University Nashik . (UGC Recognize)* Nashik,
[3]*UG Scholar, Dept of Electrical Engineering. Sandip University Nashik . (UGC Recognize)* Nashik,
[4]*UG Scholar, Dept of Electrical Engineering. Sandip University Nashik . (UGC Recognize)* Nashik,
[5]*Assistant Prof. Dept of Electrical Engineering. Sandip University Nashik . (UGC Recognize)* Nashik,
[1]satyamantapurkar123@gmail.com
[2]lokesh2@gmail.com
[3]shubhamchavan267@gmail.com
[4]rushikesh.pawara22@gmail.com
[5]harshal.shelar@sandipuniversity.edu.ingmail.com

ABSTRACT :— The objective of the project is to have control on appliances through mobile, using convention method, online method and Google Assistant. The control via mobile is obtain when microcontroller gets associated with web through any HotSpot. Then, at that point by utilizing Blynk application we can handle machine. In the customary manner, the WIFI module is not in use rather touch button is only used for controlling appliances. Therefore we can use the appliances even when WIFI/hotspot devices are not available.

Keywords :—component, microcontroller, relay.

I. INTRODUCTION

Nowadays automation systems have become widespread in several areas by playing vital role in dominating many process related operation. Home automation systems advancing towards mechanization processes where less human endeavors are needed by the apparatus gear to control various frameworks in home. These days, we have controllers for our TV and other electronic frameworks, which made our life simple. But we do not have remote control for electrical appliances control. Time is a very valuable thing. Everybody wants to save time as much as they can. So to save time we also have included time based control of appliance.

1.1 OBJECTIVE

A. To control appliance using offline method a Template.
In this technique we need to control apparatuses utilizing capacitive touch catches which will convey advanced HIGH or LOW message to microcontroller.
B. To control appliance using online method.

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

In this technique we need to associate WiFi of Microcontroller to Hotspot which has a web association, so through this area of interest microcontroller will get associated with customer (Blynk) worker and through that to versatile application. Using this we con control and monitor the appliance are on or off. Also we can turn on and off appliance trough it.

C. To controll appliances through google asistant.

In this method we have to interconnect Google assistant with blynk. So to do this we need to use IFTTT (If This Then

That). The google assistant will send command to IFTTT and IFTTT will send this command to Blynk Server. Form Blynk server the signal of turning appliance on or off will be given to micro controller and it will do the rest of the task.

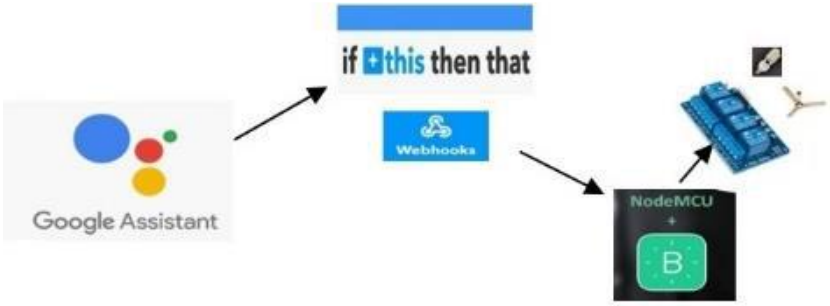


Fig No: 1. IFTTT Integration.

D. To measure Real Time Power.

Measuring Power uses Current Transformer and Potential Transformer. This measures Current and Voltage respectively and sends measured power to Micro controller.

II. BLOCK DIAGRAM

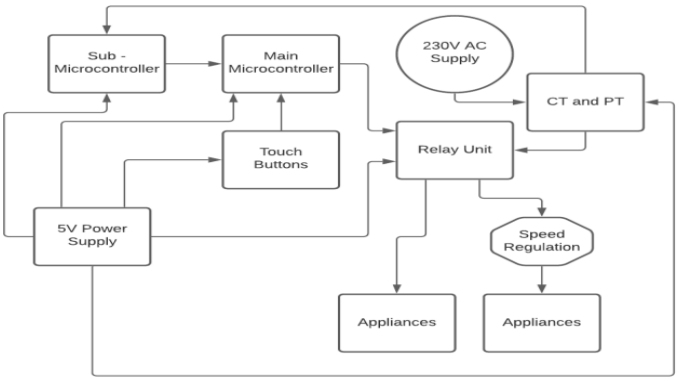


Fig No:- 2. Block Diagram

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

A. Main Microcontroller (ESP32 DevKit V1).

Main microcontroller does almost all necessary work. It has WiFi builtin every Touch button is connected to main microcontroller, every relay module is connected to main microcontroller. Power measurement data is transfered from sub-microcontroller to main microcontroller using Serial communication.

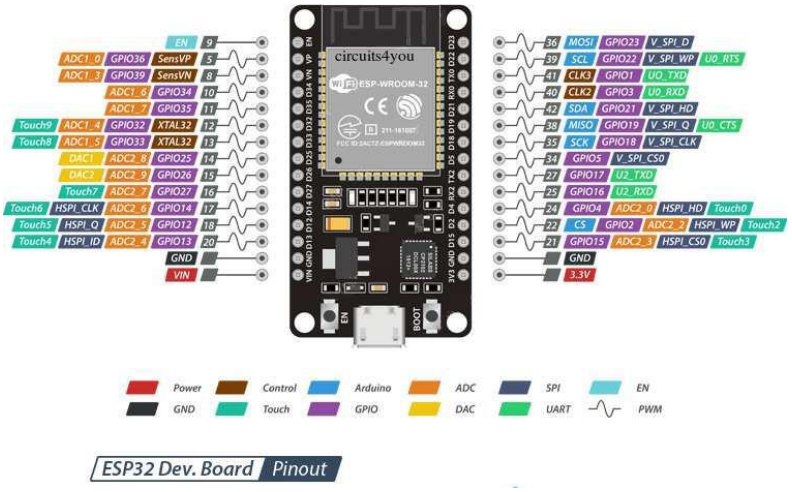


Fig No:- 3 ESP 32 DevKit V1 Pinout

B. Sub-Microcontroller (ATMEGA 328P).

Function of sub-microcontroller is to measure power from its built-in 10 bit ADC pins and then the measured voltage and current from CT and PT is calibrated on 102 = 1024 scale. Then this data is being processed by "emon" library and we get directly the measured voltage, current, active power and reactive power. This data is send to main microcontroller through serial communication.



Fig No:- 4 ATMEGA 328P Pinout

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

C. Touch Button.

This button sends the digital signal whenever they are in influence of human touch. So main microcontroller process the signal and turns respective appliance on or off.



Fig No:- 5 Capacitive Touch Sensor.

D. Relay Unit.

Relay units are basically used for switching 230 V AC sppliances. Relay used are having 5V DC actuating voltage. When 5 volt DC is given from supply to relay then the contacts of relay changes from NC (Normally Colsed) to NO (Normally Open). So appliacnes are connected at NO contacts and AC supply is given to common terminal of relay.

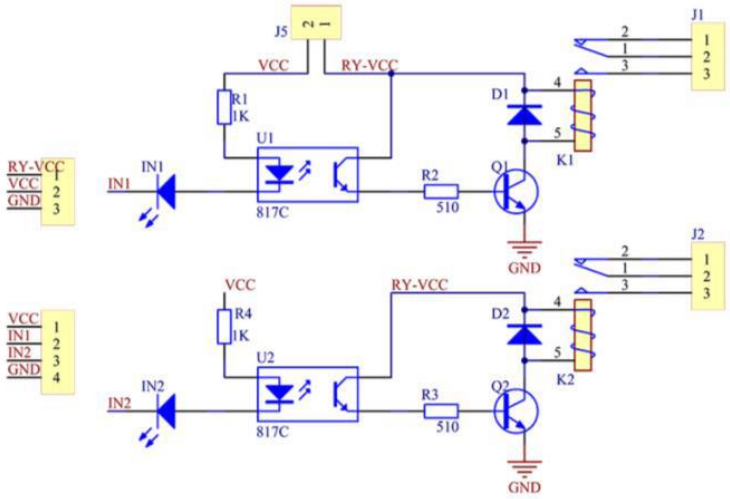


Fig No:- 6 Internal Circuit Diagram of Relay Circuit.

E. CT and PT:

Basically this is a power measuring unit. Power is the product of voltage, current and power factor. So we need to measure the voltage, current and phase displacement between voltage and current. Here we are only measuring the AC voltage and AC current.

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

a) CT current measurement (ZMCT103C):-

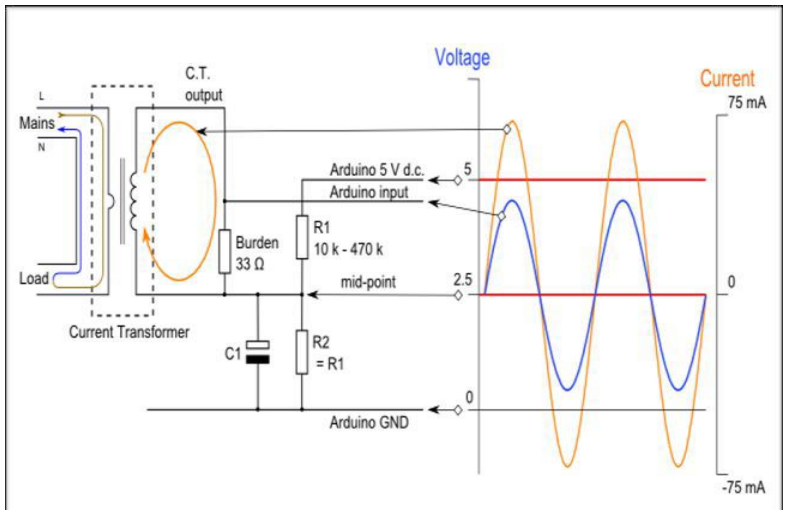


Fig No:- 7 CT Connection

Microcontroller ADC cannot read the AC quantity. So to convert this to DC we have used a level shifting Circuit at the output of CT. The burden resistance of CT is 33ohm. The voltage available at the yield of this will be relative to the current moving from essential so For 10 Amp essential current auxiliary current will be 10mA. Voltage across 33ohm resistor will be:
V33=10mA*33ohm=0.33V.(AC)
Since this is AC voltage we shift its level by utilizing resistor R1 and R2. This R1 and R2 is associated with the end goal that 2.5V gets included the yield of CT trouble voltage.
Voltage across Arduino pin:
Vap= 0.33+2.5= 2.83V.
So this Emon library subtracts the 2.5 V from above so we get AC current's value.
Some extra calculations are also done by the emon library to avoid error in measuring the current.

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

b) PT Voltage Measurment (ZMPT101B):-

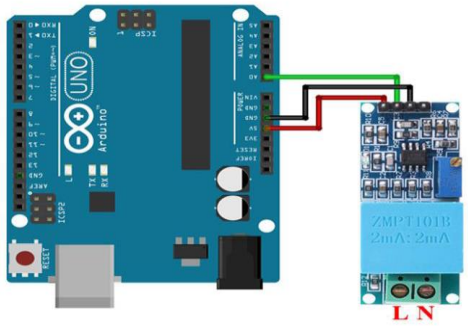


Fig No:- 8 PT Connection.

The connection of the potential transformer is shown in above fiure. Since the module is used for measuring voltage so we directly get analog value which is taken by the emon library.
The connection of the potential transformer is shown in above fiure. Since the module is used for measuring voltage so we directly get analog value which is taken by the emon library.

F. Speed regulation.

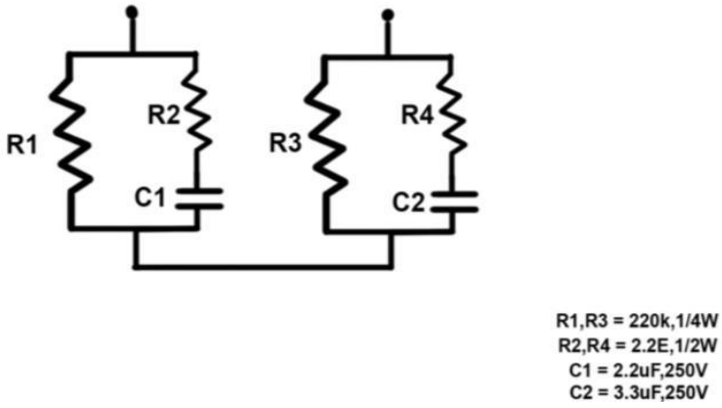


Fig No:- 9 Regulator

Above unit is the 4 speed regulation for fan. This is also switched using the relays at 230v AC. The value of the each components is found by studying the fan regulator.

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

III. CIRCUIT DIAGRAM

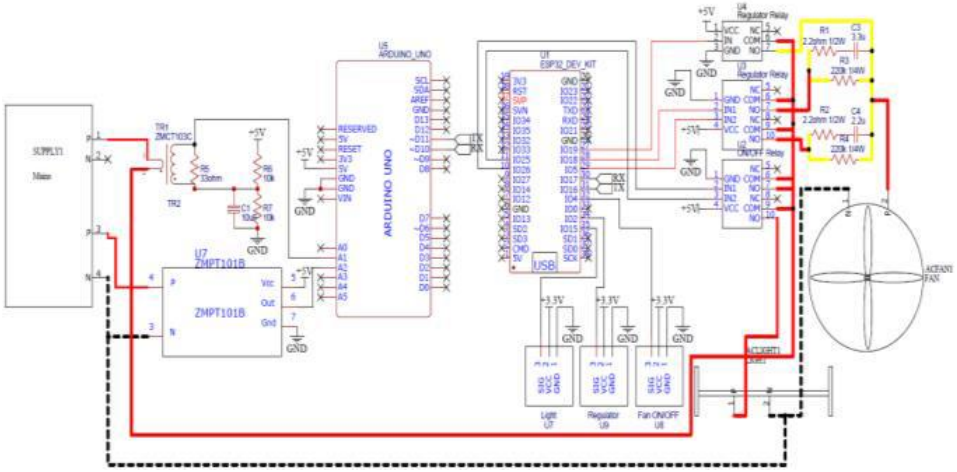


Fig No:- 10 Circuit Diagram

Above shown is circuit diagram and the major components used are:-

• Microcontroller:

1. Arduino Uno.
2. Operating voltage:-5v.

• Wi-Fi module:-

1. ESP32 DevKit V1
2. Operating voltage:-3.3v.

• Press button:-

1. Capacitive touch button.
2. Operating voltage:-5v.

• Relay Module:-

1. Voltage 5V.
2. 2 channel and 1 channel.

• Current Transformer:

1. ZMCT103C.
2. 10A/10mA.

• Potential Transformer module.

1. ZMPT101B.
2. Max Voltage :- 250V AC.

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

IV. BLYNK APP WIDGETS USED

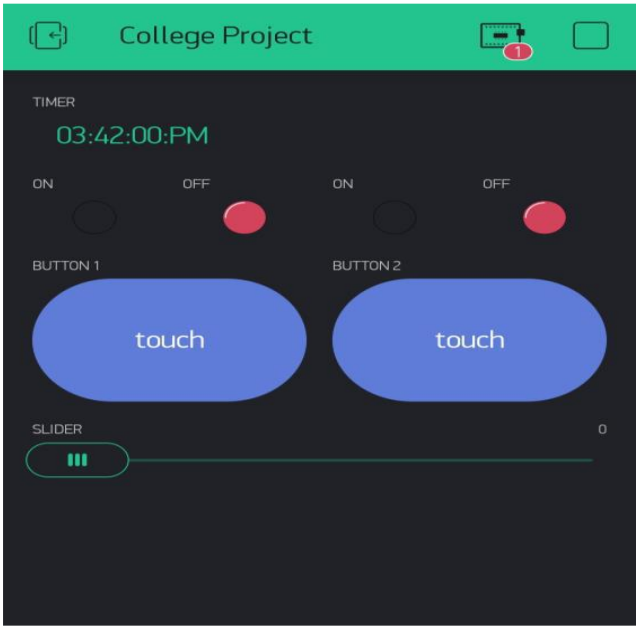


Fig No:- 11 Blynk app GUI.

A. Timer Widget.
The timer widget is used to switch load on or off depending on specific time. User need to set on time and off time from 24 hrs clock.
B. LED Widget.
LED widget is used to indicate the ststus of appliance wether the appliance is on or off. For every appliance 2 LED widget is needed the greeh and the red. Red indicates appliance is off where as green indicates appliance is on.
C. Button Widget.
This widget has 2 mode of operation PUSH and SWITCH:-
a) Push mode:-

In this mode mode the micro controller receives HIGH pulse for the time button is pressed.
b) Switch mode:-

In this mode thebutton acts as switch i.e. for odd number of press the appliance will be turned on and for odd number of presses the appliance will get turned off.
D. Slider Widget.
Sider widget can give values from 0 to any desired value that has been set in its setting. But there we have used 4 speed fan regulator so we have set values from 0 to 4.

Innovative Journal for Opportunities and Development in Science & Technology,
Volume 1,Issue 10, June 2021
Paper Id: – IJ2021V1I10 - 12A-D,
ISSN 2582-6026

V. POWER CONSUMPTION RESULTS

A. When load turned off:-

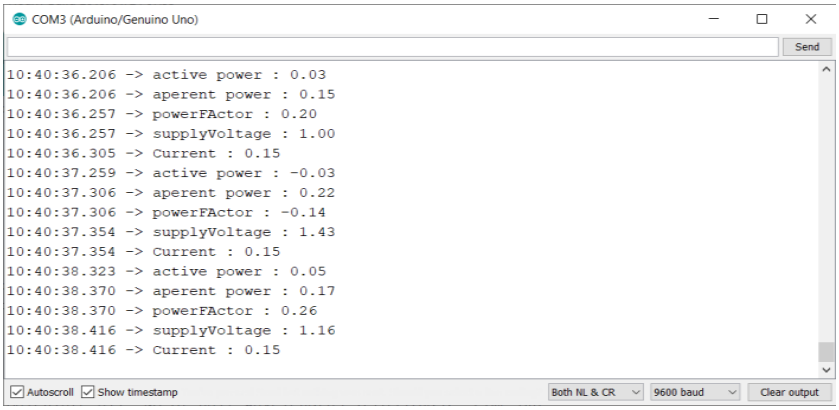


Fig No:- 12 Power consumption results when load turned off.

Without any load connected some power gets measured this is error in measurement.

B. When load turne on:-

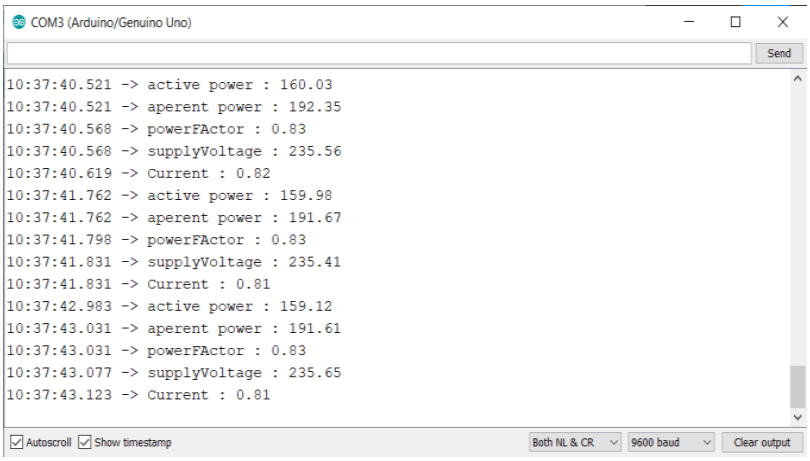


Fig No:- 13 Power consumption results when load turned on.

Here we connected 160 watt load and active power came out to be accurate.

REFERENCES

[1] G. Eason, B. Noble, and I. N. Sneddon, “On certain integrals of Lipschitz-Hankel type involving products of Bessel functions,” Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955.

ISSN 2582-6026

[2] Shahruk Osman, Tapan Kumar Chakraborty, Ariful Islam, Nazibur Rahman 'Design and Implementation of Remote Controlled Fan Regulator' Vol. 3, Issue 9, September 2014.