

EXP.No.7: INTERFACING AC LOAD WITH ESP8266 TO CONTROL IT USING BLYNK

OBJECTIVES:

1. To interface an AC load with the ESP8266 NodeMCU board.
2. To control the AC load using the Blynk IoT app.

MATERIALS REQUIRED:

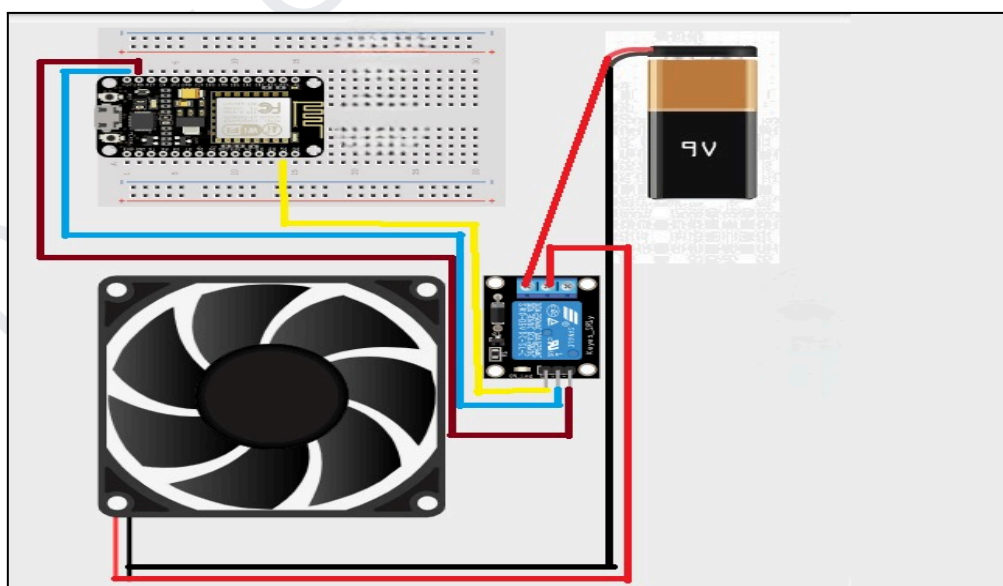
- ☐ ESP8266 NodeMCU board
- ☐ Relay module (for AC load control)
- ☐ AC load (e.g., lamp or fan)
- ☐ Breadboard
- ☐ Jumper wires
- ☐ USB cable
- ☐ Computer with Arduino IDE installed
- ☐ Blynk app installed on a smartphone or tablet

THEORY:

An AC load can be controlled through an ESP8266 NodeMCU board by using a relay module. A relay is an electrically operated switch that can open or close a circuit to control the AC load.

By sending a control signal from the ESP8266 to the relay, we can switch the AC load on or off. The ESP8266 board connects to Wi-Fi, allowing remote control through the Blynk app, which communicates with the board via the internet.

CIRCUIT DIAGRAM:



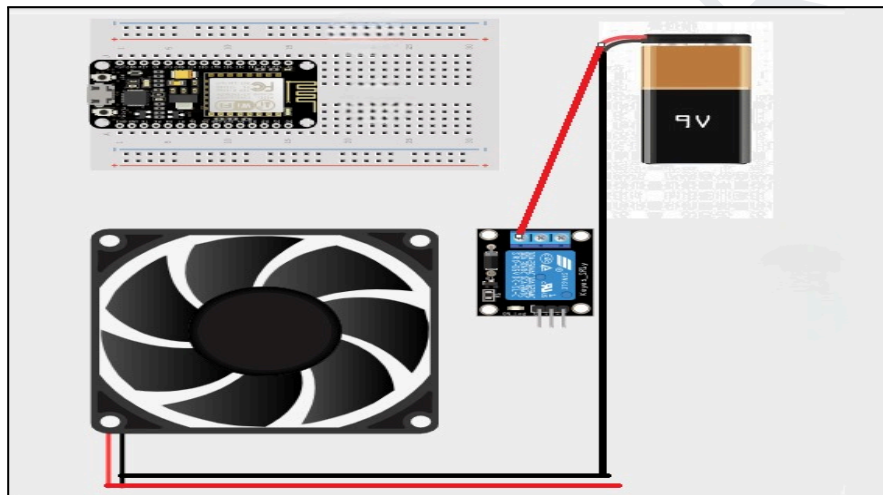
Relay Module Pin Configuration:

- ☐ V_{CC} : 3.3V (or 5V depending on the relay module)
- ☐ GND: GND
- ☐ IN: GPIO D1 on ESP8266
- ☐ NO (Normally Open): Connected to one terminal of the AC load
- ☐ COM (Common): Connected to the AC power supply

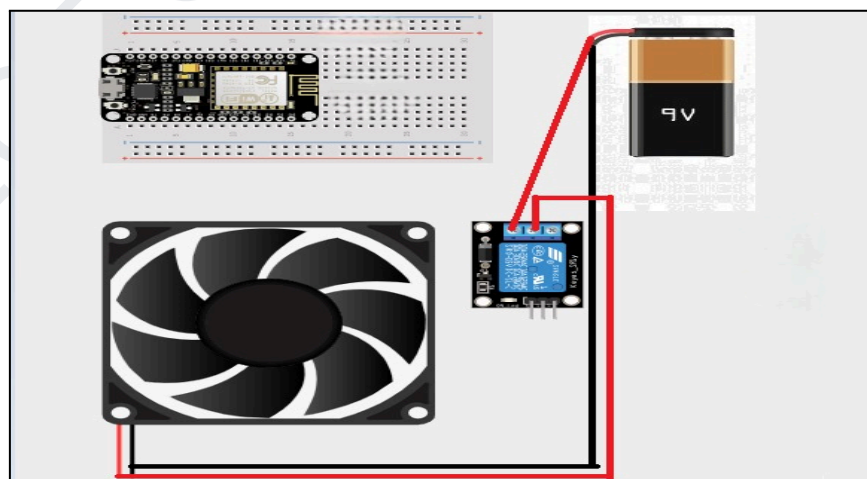
PROCEDURE:

1. Hardware Setup:

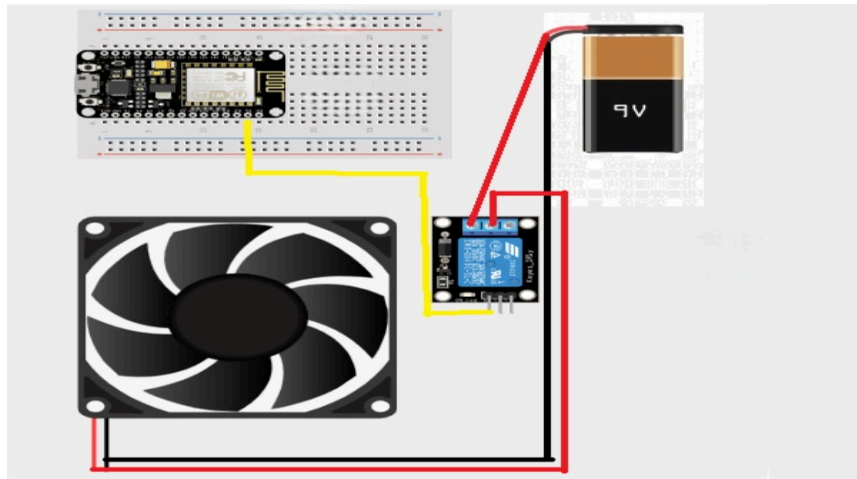
- ☐ Connect the positive terminal of battery to NO pin of relay. Connect the negative terminal of battery to negative terminal of fan.



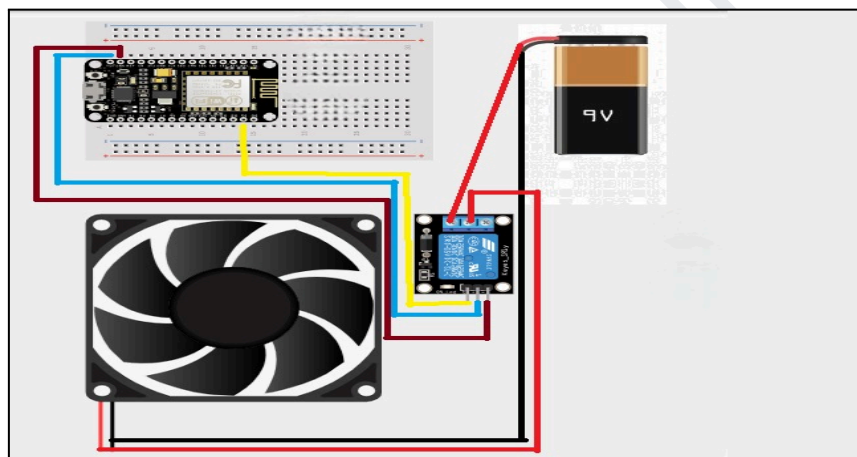
- ☐ Connect the positive terminal of fan to com of relay.



- ☐ Connect the IN of relay to data pin (D1 pin).



- ☐ Connect the V_{CC} pin of relay to V_{in} of 8266 and connect ground to ground of esp8266.



2. Software Setup:

- ☐ Open the Arduino IDE on your computer.
- ☐ Install the necessary libraries: Blynk library and any required dependencies.
- ☐ Install the Blynk library by navigating to Sketch -> Include Library -> Manage Libraries and searching for "Blynk".

3. Blynk App Setup:

- ☐ Open the Blynk app on your smartphone/tablet.
- ☐ Create a new project and note the Auth Token.
- ☐ Add a Button widget and set it to Virtual Pin V1.

4. Programming:

- ☐ Connect the ESP8266 to your computer using a USB cable.
- ☐ In the Arduino IDE, write the following code:

```
#define BLYNK_TEMPLATE_ID "___"
```

```
#define BLYNK_TEMPLATE_NAME "___"
#define BLYNK_AUTH_TOKEN "___"

#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

char ssid[] = "WIFI_NAME ";
char pass[] = "Password";

const int relayPin = D4;

BLYNK_WRITE(V5) {
  int pinValue = param.asInt();
  digitalWrite(relayPin, pinValue);
}

void setup()
{
  Serial.begin(115200);
  pinMode(relayPin, OUTPUT);
  digitalWrite(relayPin, LOW);

  WiFi.begin(ssid, pass);
  while (WiFi.status() != WL_CONNECTED)
  {
    delay(1000);
    Serial.print(".");
  }
  Serial.println("Connected to WiFi");

  Blynk.begin(BLYNK_AUTH_TOKEN, ssid, pass);
}

void loop()
{
  Blynk.run();
}
```

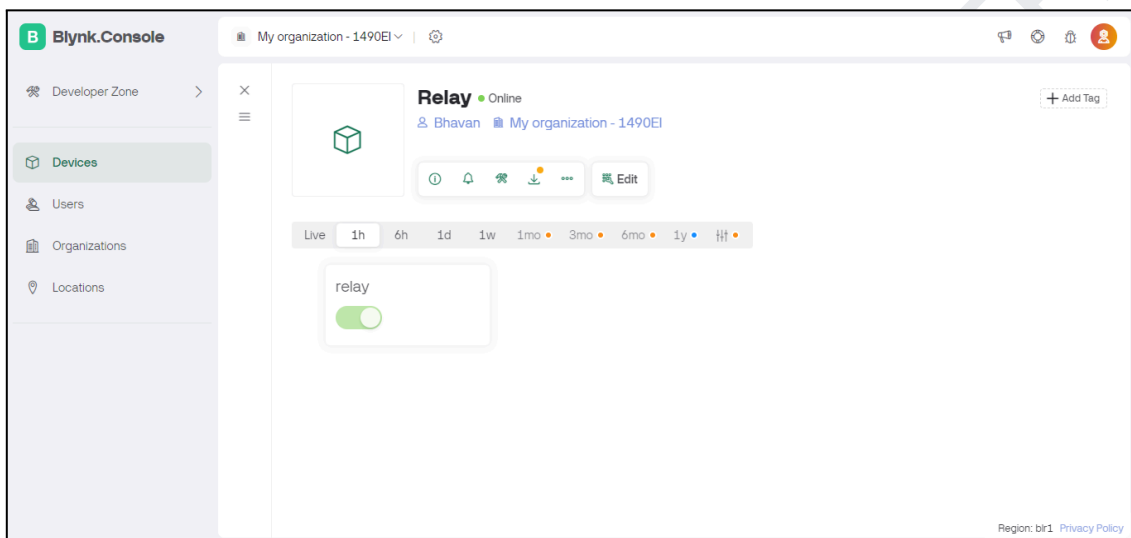
- ☐ Replace ``WIFI_NAME``, ``Password``, and `BLYNK_AUTH_TOKEN` with your actual Wi-Fi credentials and Blynk Auth Token.
- ☐ Upload the code to the ESP8266.

5. Running the Experiment:

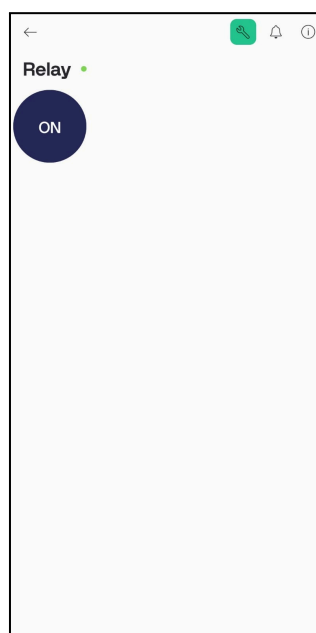
- ☐ Open the Serial Monitor in the Arduino IDE to observe the connection status.
- ☐ Open the Blynk app and use the Button widget to control the AC load.

Observations:

Observation in Blynk website:



Observation in Blynk IoT mobile app:



Result:

The AC load was successfully controlled using the Blynk app.

Conclusion:

This experiment demonstrates how to interface an AC load with the ESP8266 board using a relay module and how to control it remotely via the Blynk IoT platform. The successful implementation confirms the practicality of using ESP8266 and Blynk for IoT applications involving AC load control.

Appendix:**A. Symbols, Units, and Abbreviations:**

- ☐ V: Voltage
- ☐ VCC: Voltage Common Collector
- ☐ GND: Ground
- ☐ GPIO: General Purpose Input/Output

B. Tools Required:

- ☐ ESP8266 NodeMCU board
- ☐ Relay module
- ☐ AC load
- ☐ Breadboard
- ☐ Jumper wires
- ☐ USB cable
- ☐ Computer with Arduino IDE installed
- ☐ Blynk app installed on a smartphone or tablet

C. Additional Resources:

- ☐ ESP8266 Documentation
- ☐ Arduino IDE Installation Guide
- ☐ Blynk Documentation
- ☐ Relay Module Guide

D. Reference link with QR code

<https://www.youtube.com/watch?v=MawS1XU06C8>



This format provides a clear and comprehensive guide for conducting the experiment, ensuring students can follow along and achieve the desired outcomes.