

ESP8266 ESP-01 10A 250AC Relay module

Introduction:



ESP8266 ESP-01 10A 250AC Relay module is a smart relay module based on the ESP-01S WIFI module design. It can be used to ‘do it yourself’ (DIY) your own smart switch. This relay module is designed to be controlled with low voltages like 3.3V like ESP8266 ESP-01, ESP-01S, etc., or 5V like your Arduino. It can be remotely controlled by the mobile phone APP and provides APP and LUA source programs. It is easy to implement into projects and quite convenient to use.



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Features:

- Module working voltage: DC 5V
- Relay load capacity: 10A 250VAC 10A 125VAC 10A 30VDC 10A 28VDC
- Designed for ESP01 - ESP8266 module, supporting both ESP-01S and ESP-01
- Built-in Single Pole Double Throw Relay supporting 250AC, max 10A
- Relay outputs: NC, NO and COM are extended out to screw terminals

Applications:

- Smart switch.
- Remote wireless switch control.

Objectives:

This tutorial will show you a few simple steps about how to use ESP8266 ESP-01 10A 250AC Relay module by using ESP8266 ESP-01S. At the end of this tutorial, you will get a result of comparison when the relay module can turn on and off via wireless control using smart phone app Blynk.

Components needed:

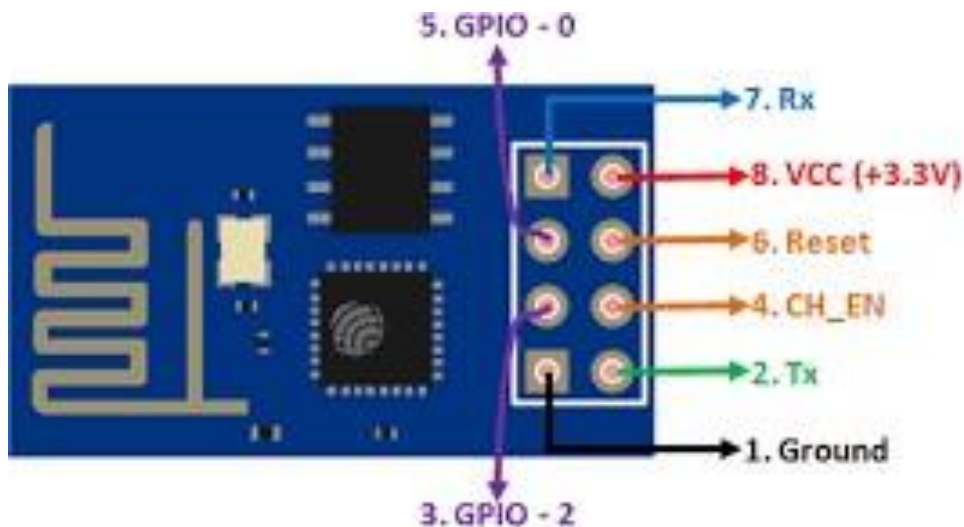
- Jumper wires.
- Breadboard.
- UART / TTL Serial Programmer (FT232RL FTDI).
- ESP8266 ESP-01S Wi-Fi Serial Transceiver Module.
- ESP8266 ESP-01 10A 250AC Relay module.
- Push button (Optional)

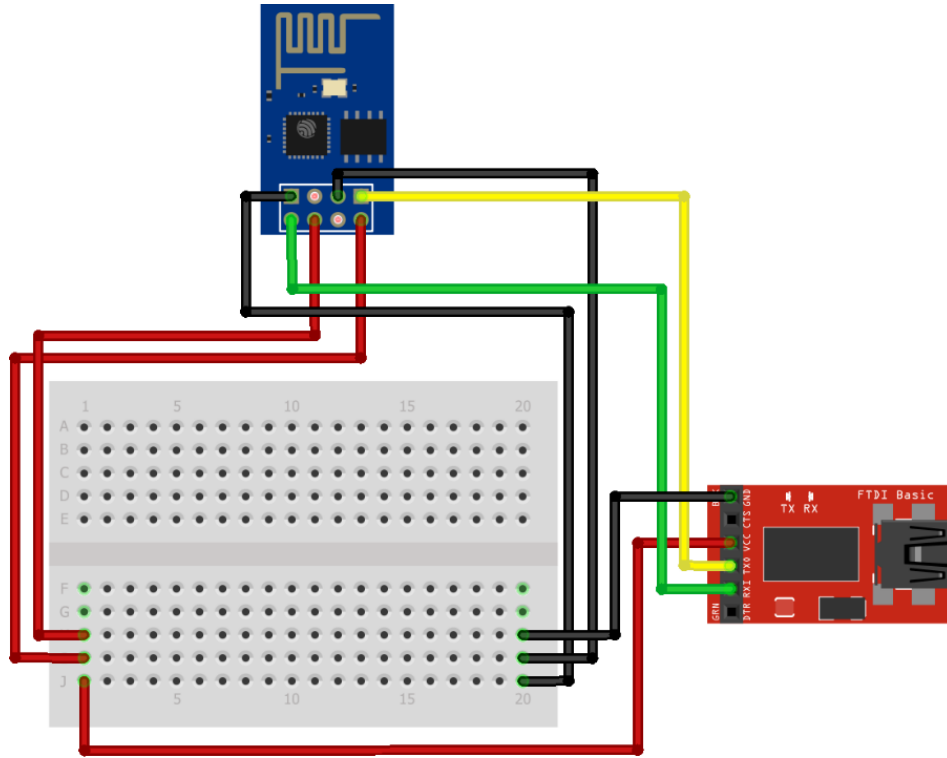
Procedures:

Step 1: Wiring connection to program ESP8266 Wi-Fi Serial Transceiver Module.

1. We need to connect ESP8266 ESP-01S Wi-Fi Serial Transceiver Module to ESP01/01S Relay Module so that we can control the relay via Wi-Fi. To program ESP8266 ESP-01S, UART / TTL Serial Programmer is required to be connected with ESP8266 ESP-01S and a PC with Arduino IDE software installed. The connection between ESP8266 ESP-01S and UART / TTL Serial Programmer, is shown as diagram listed below:

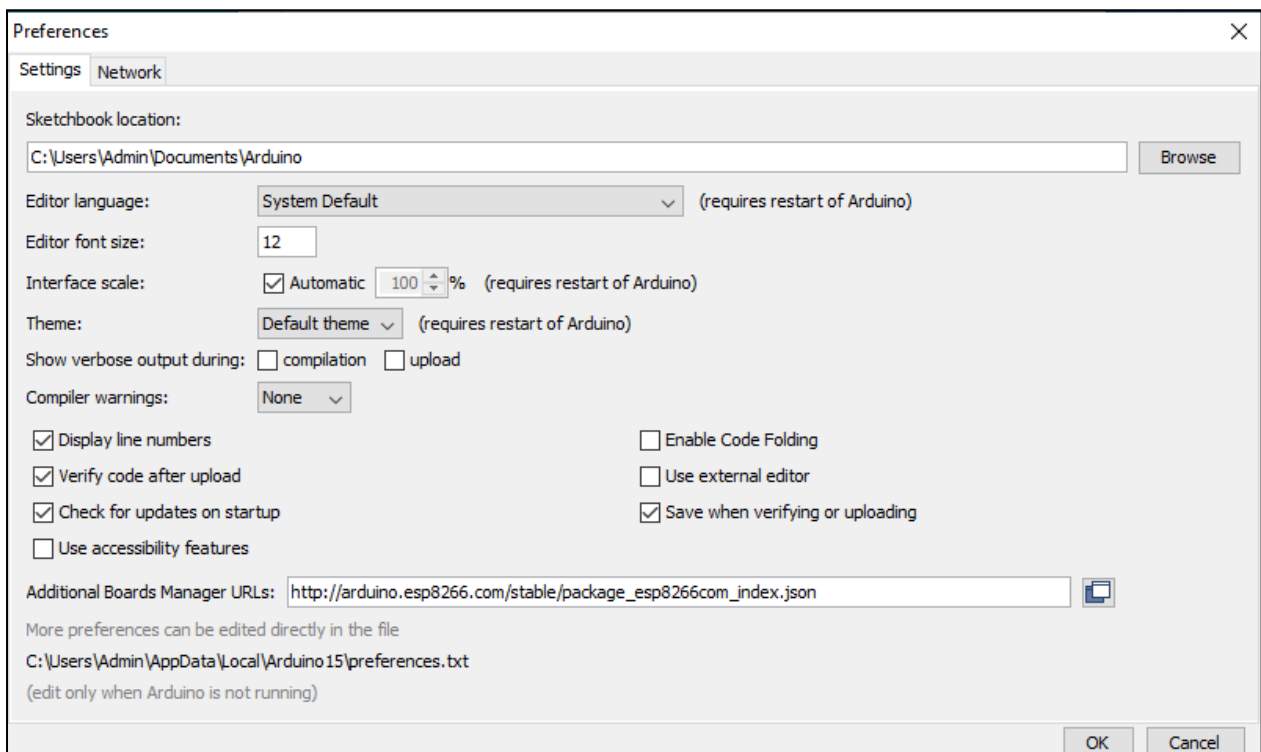
ESP-01S ESP8266	FT232RL FTDI
VCC	VCC
GND	GND
TX	RX
RX	TX
CH_PD / EN	VCC
GPIO_0	GND
GPIO_2	-





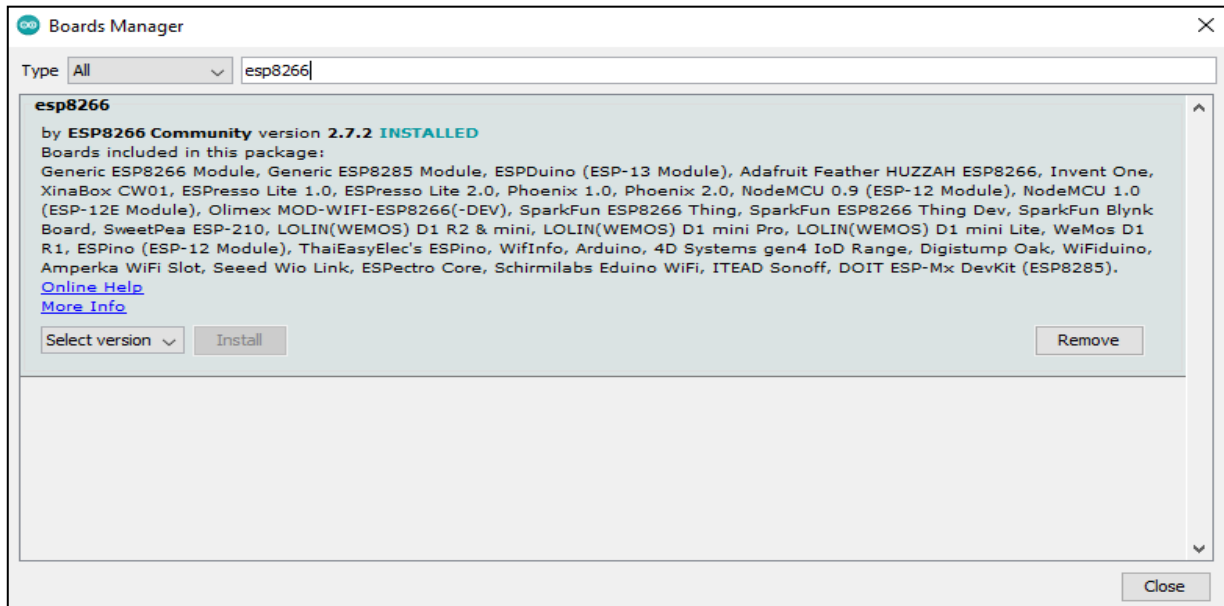
Step 2: Installing ESP8266 Board into Arduino IDE

1. Open Arduino IDE Preferences setting by clicking on **File > Preferences**.



2. Add http://arduino.esp8266.com/stable/package_esp8266com_index.json into Additional Boards Manager URLs: and click on **OK**.

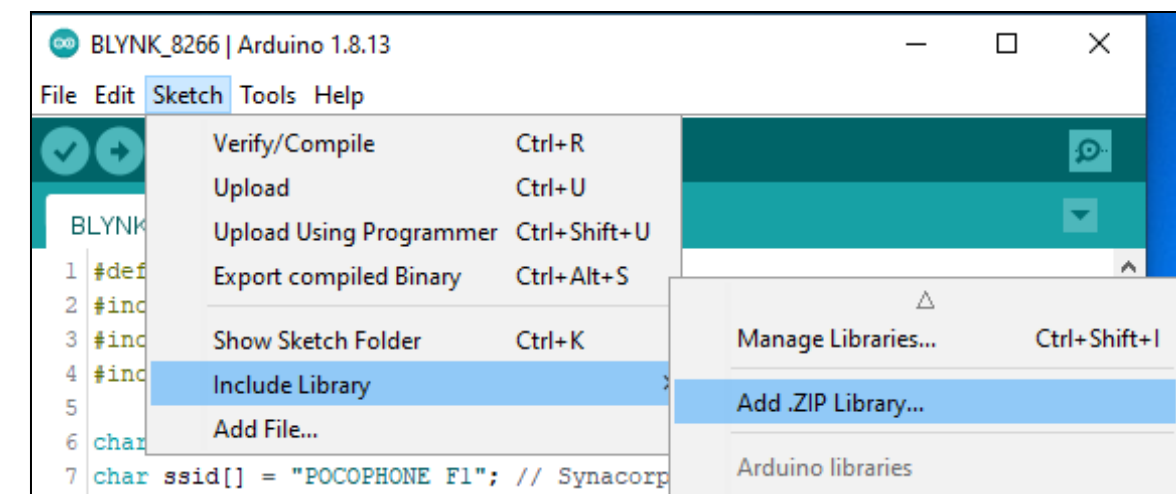
3. Open Board manager by clicking on **Tools > Board: > Boards Manager...** Search for **ESP8266** and click on **ADD / INSTALL**. Wait until installation complete (Require Internet Connection).



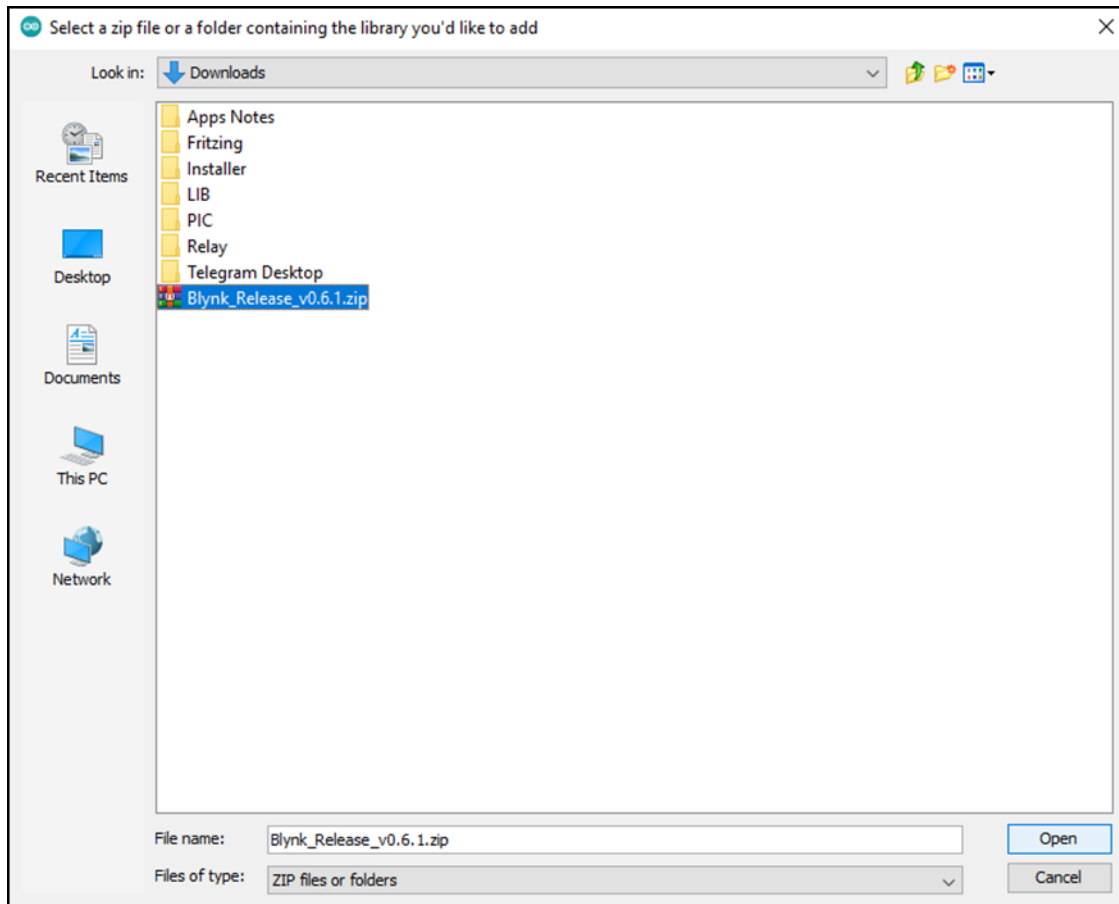
Step 3: Installing Blynk Library into Arduino IDE

1. Restart Arduino IDE after Board installation complete. Download the [Blynk](https://github.com/blynkkk/blynk-library/releases/download/v0.6.1/Blynk_Release_v0.6.1.zip) library (https://github.com/blynkkk/blynk-library/releases/download/v0.6.1/Blynk_Release_v0.6.1.zip).

2. Click on **Sketch > Include Library > Add .ZIP Library...**

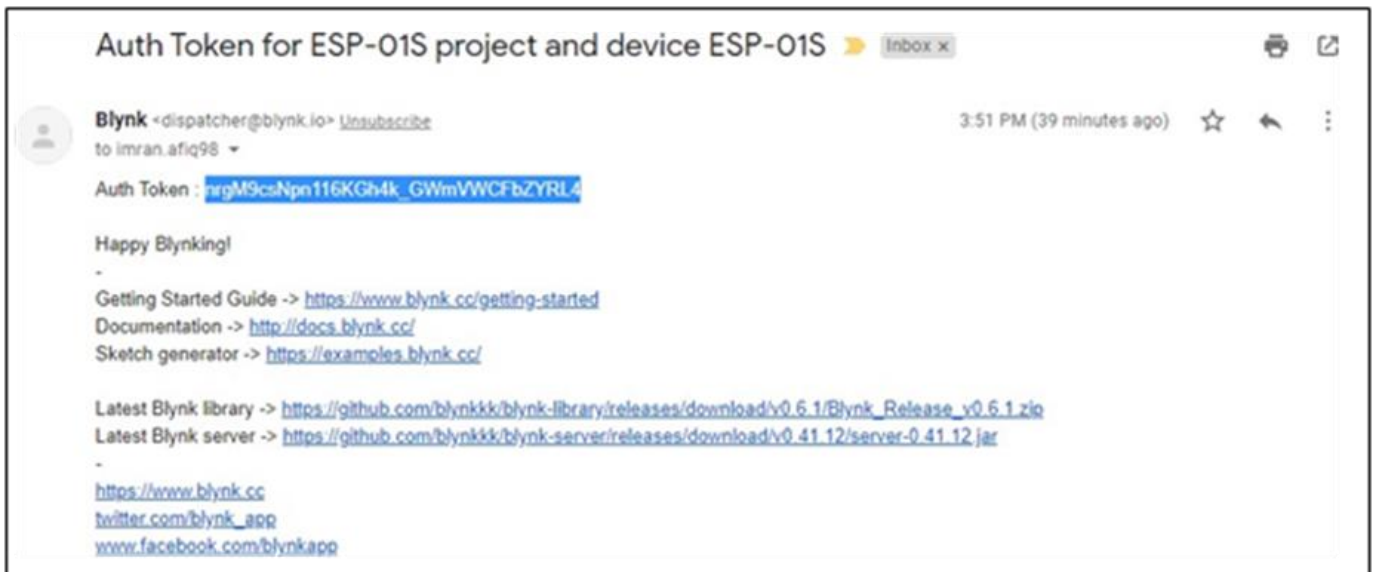
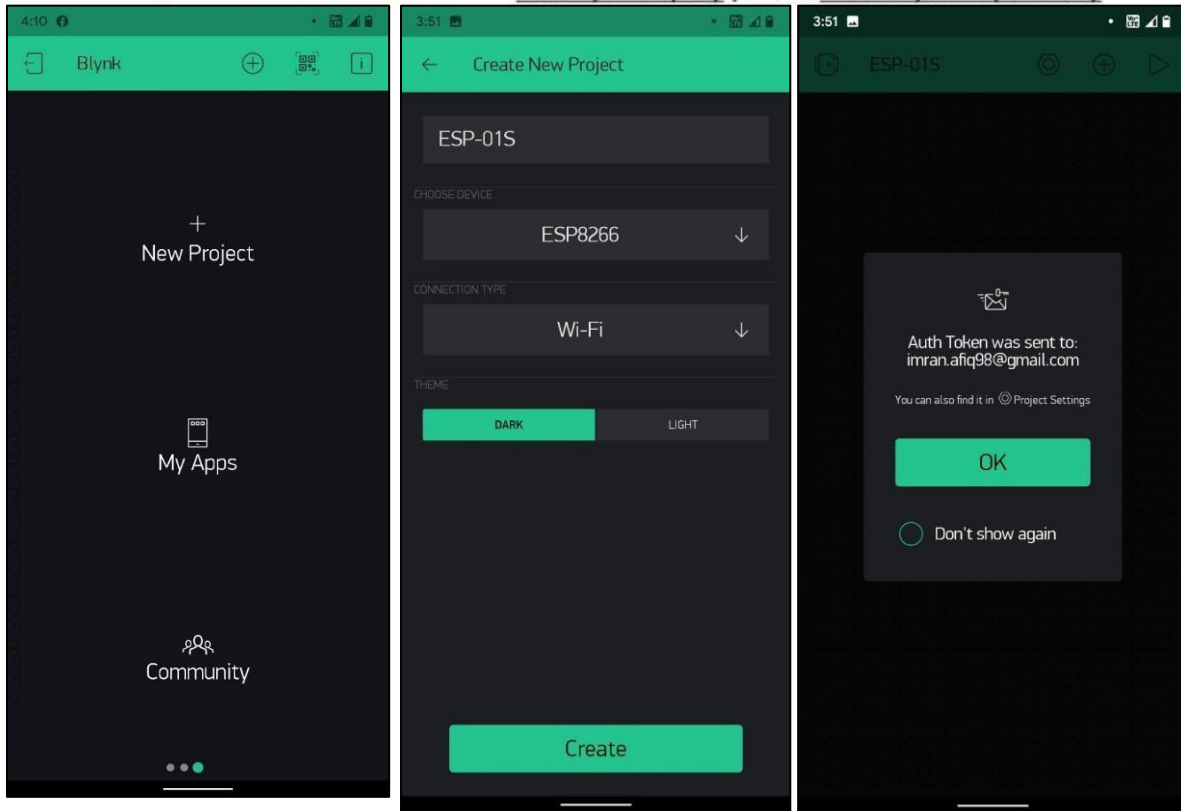


3. New windows will pop-up Navigate & Select downloaded Blynk library earlier.

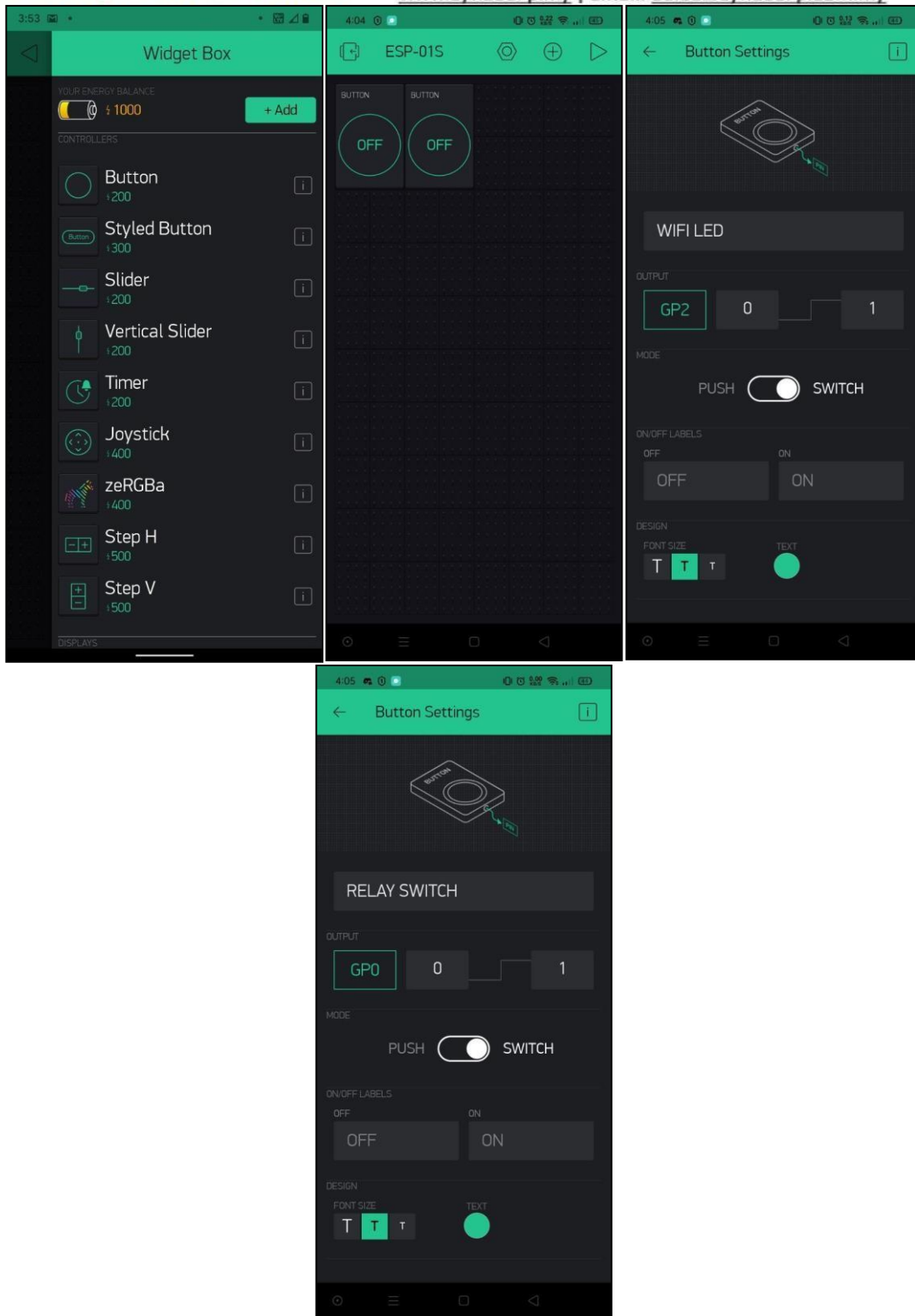


Step 4: Getting Blynk App ready

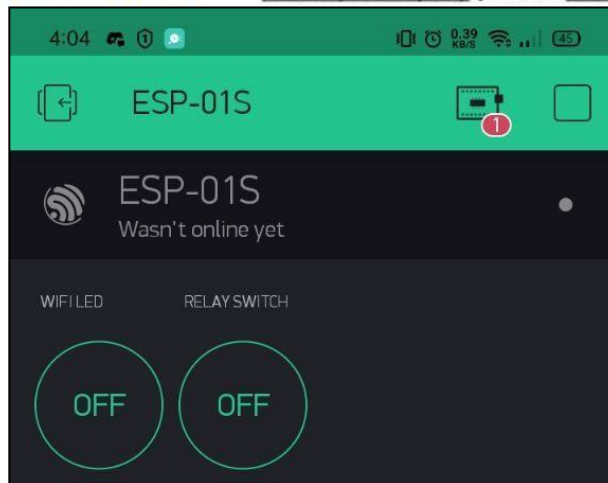
1. Download **Blynk** app from [Google Play Store](#) or [Apple App store](#).
2. Once downloaded launch the app & create or sign-in if already have an account.
3. Tap on **New Project**, enter project name (Example: ESP-01S), select **ESP8266** as **device** and **Wi-Fi** as **connection** type. Tap on create and the app will send **Auth Token** to registered **e-mail**.



4. Once Auth Token received Tap on **Plus (+)** icon to add features that called **Widget Box**. Tap on **Button** configure as pictures shown below. Create two buttons. Make sure the WIFI LED **OUTPUT** is configured as **GP2 1 – 0** and select **MODE** as **SWITCH**. For the RELAY button set the **OUTPUT** as **GP0 1 – 0** and select **MODE** as **SWITCH** as well.



5. Once finished go Back and Tap on Play button (on Top Right Corner of app) to start.



6. Blynk will show error message on **Board** icon (Top Right Corner). The error message was “ESP-01S Wasn’t online yet”. Ignore this for while because the program still not uploaded into board.

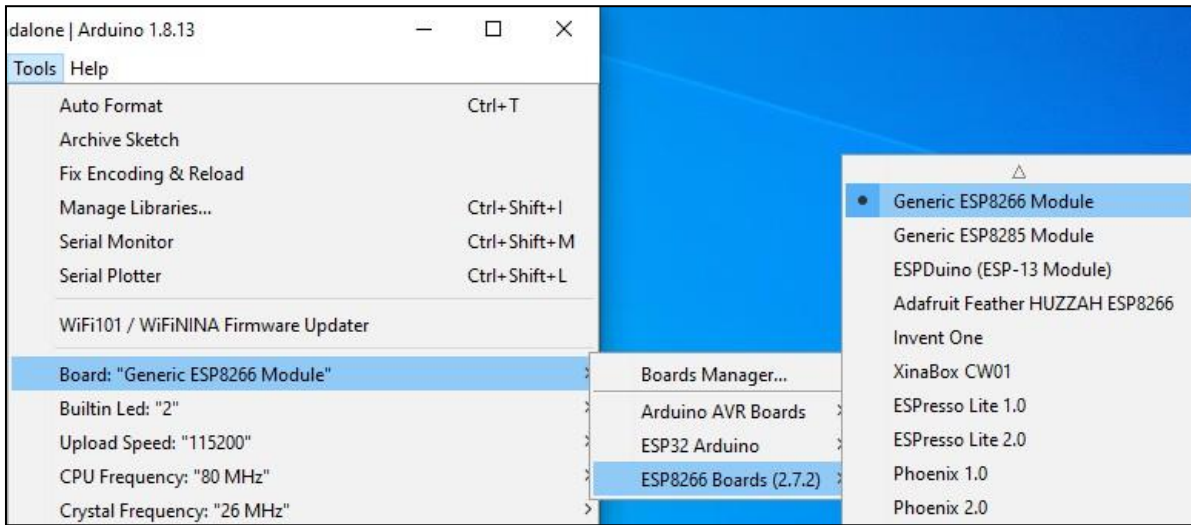
Step 5: Uploading Program into ESP8266

1. On Arduino IDE click on **File > Examples > Blynk > Board_WiFi > ESP8266_Standalone**.

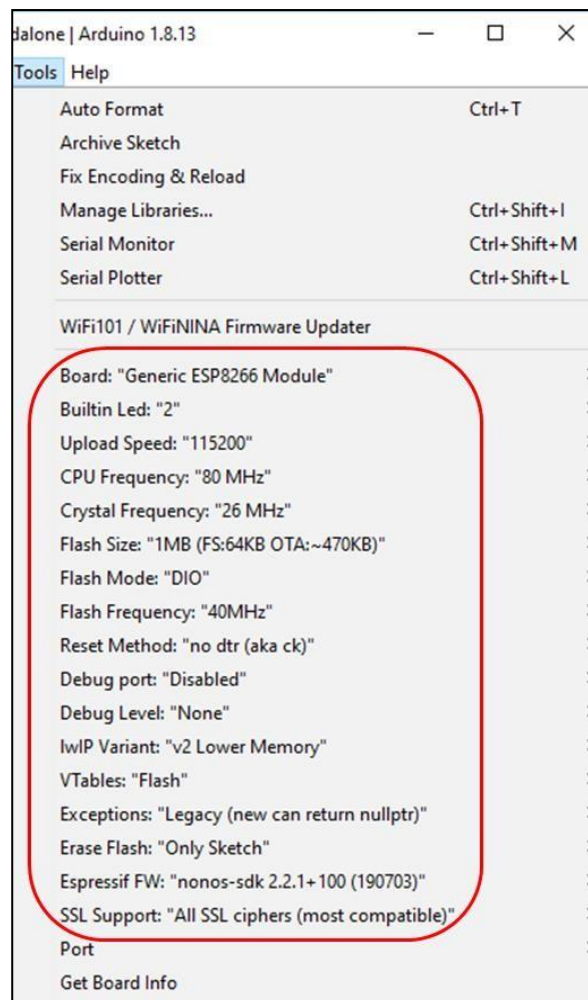
2. Fill in Wi-Fi ID (Name), Wi-Fi Password & Blynk Auth Token keys (Received via e-mail on previous step). (**Side note; make sure the Wi-Fi use for the coding is 2.4G and not 5G because it support 2.4G bandwidth only**).

<pre>#define BLYNK_PRINT Serial #include <ESP8266WiFi.h> #include <BlynkSimpleEsp8266.h> // You should get Auth Token in the Blynk App. // Go to the Project Settings (nut icon). char auth[] = "YourAuthToken"; // Your WiFi credentials. // Set password to "" for open networks. char ssid[] = "YourNetworkName"; char pass[] = "YourPassword"; void setup() { // Debug console Serial.begin(9600); Blynk.begin(auth, ssid, pass); } void loop() { Blynk.run(); }</pre>	<pre>#define BLYNK_PRINT Serial #include <ESP8266WiFi.h> #include <BlynkSimpleEsp8266.h> // You should get Auth Token in the Blynk App. // Go to the Project Settings (nut icon). char auth[] = "nrgM9csNpn116KGh4k_GWmVWCfbZYRL4"; // Your WiFi credentials. // Set password to "" for open networks. char ssid[] = "POCOPHONE F1"; char pass[] = "imranafiq98"; void setup() { // Debug console Serial.begin(9600); Blynk.begin(auth, ssid, pass); } void loop() { Blynk.run(); }</pre>
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3. Make sure programmer already connected with PC. Select the right board for **ESP-01S** by navigate to **Tools > Board: > ESP8266 Boards (2.7.2) > Generic ESP8266 Module**.



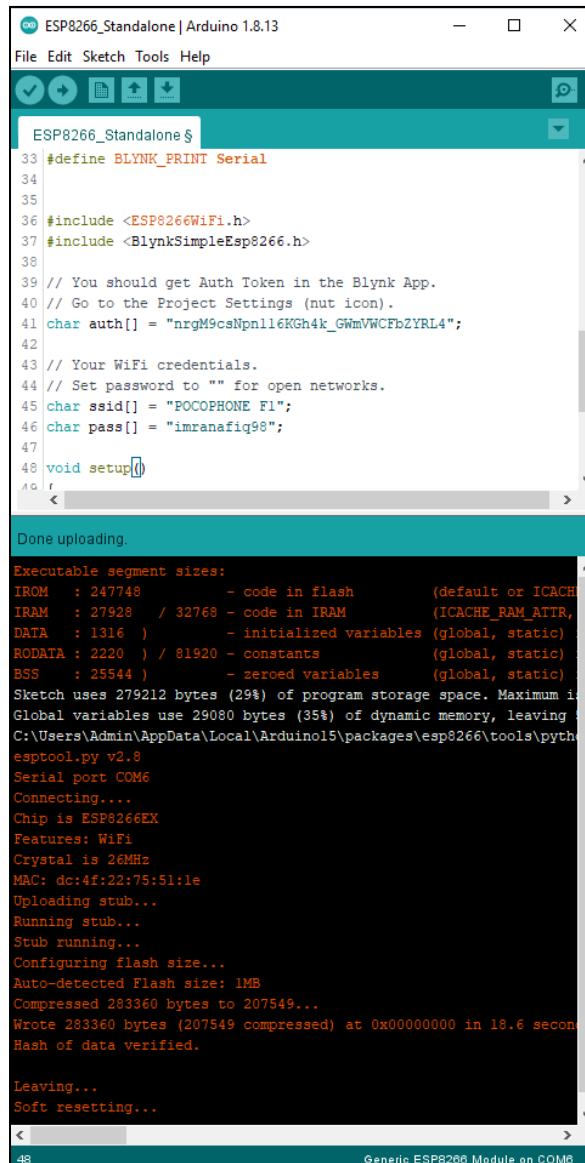
4. After selecting board make sure all the configurations are same as picture below. Select the right **COM PORT** that your **FT232RL FTDI** registered to.



Make sure these important configurations are same

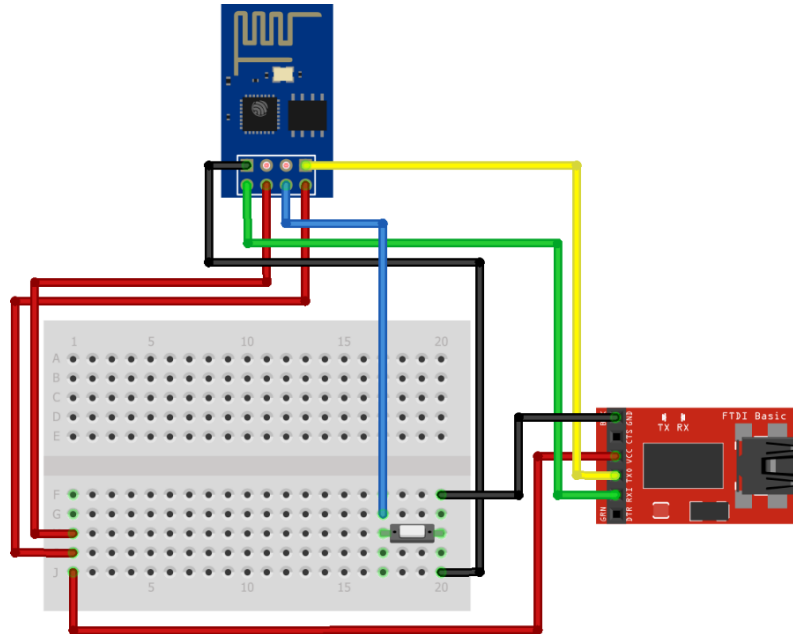
Board: “Generic ES_p8266 Module”
Upload Speed: “115200”
Flash Size: “1MB (FS:64KB OTA:
~470KB)”
Flash Mode: “DIO”
Reset Method: “no dtr (aka ck)”

5. After finish selecting **PORT**, click on **UPLOAD** to start uploading the code into board. Wait until Done Uploading message appear.



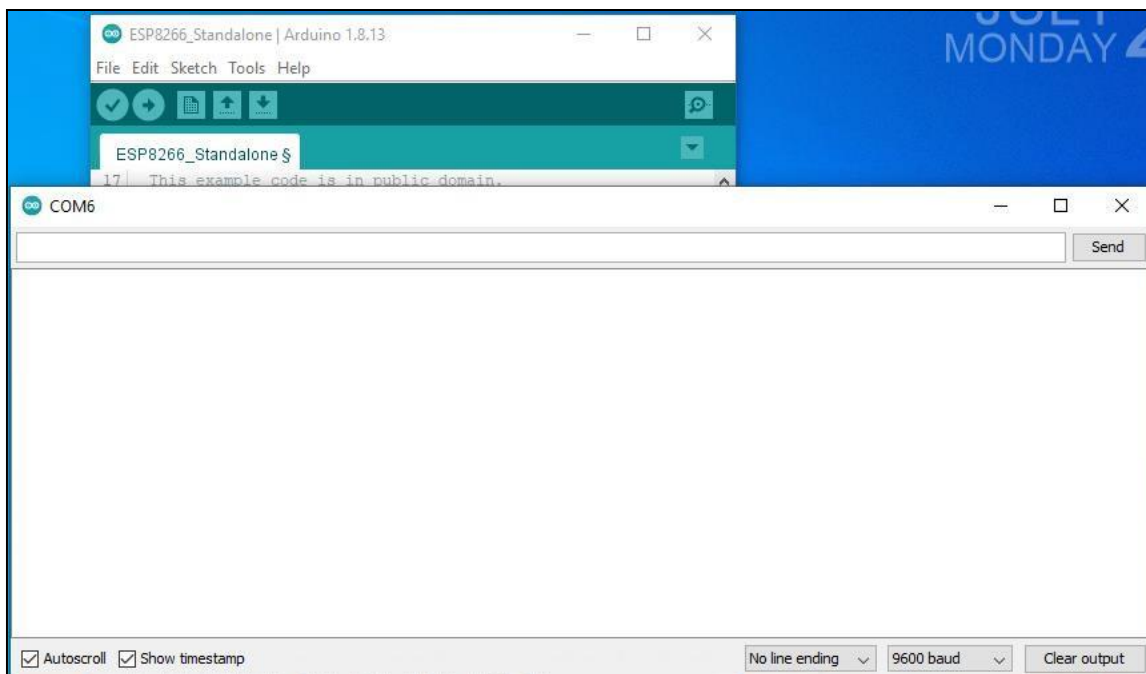
```
ESP8266_Standalone | Arduino 1.8.13
File Edit Sketch Tools Help
ESP8266_Standalone $
33 #define BLYNK_PRINT Serial
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36 #include <ESP8266WiFi.h>
37 #include <BlynkSimpleEsp8266.h>
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39 // You should get Auth Token in the Blynk App.
40 // Go to the Project Settings (nut icon).
41 char auth[] = "nrgM9csNpn116Kgh4k_GWmVWCfbZYRL4";
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43 // Your WiFi credentials.
44 // Set password to "" for open networks.
45 char ssid[] = "POCOPHONE F1";
46 char pass[] = "imranafiq98";
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Step 6: Wiring Connection – Testing

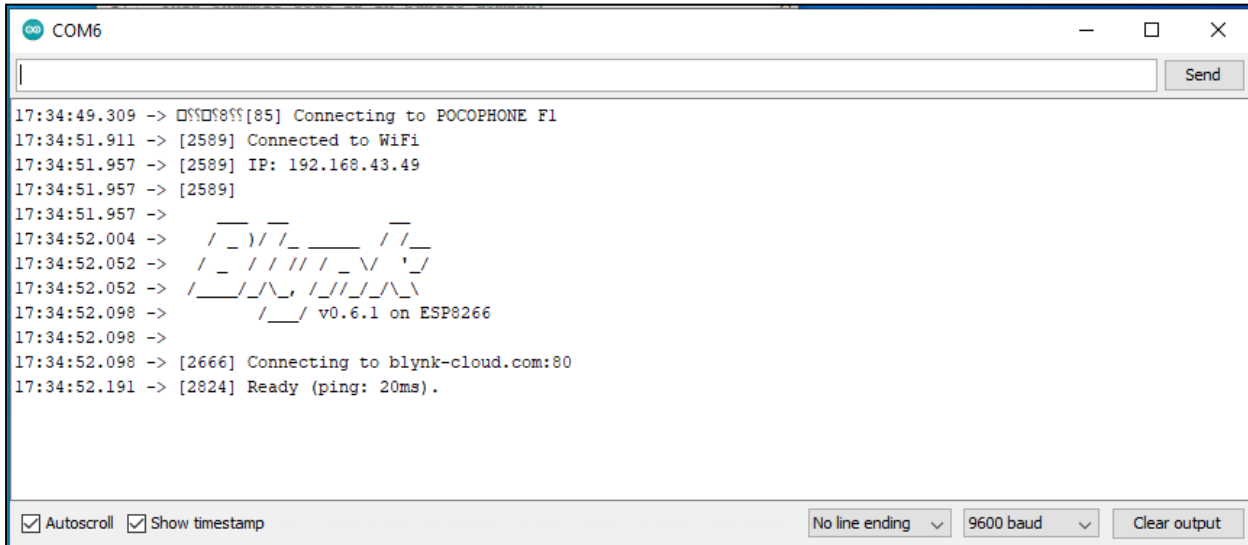


*Disconnect **GPIO-0** from **GND** and Connect **Reset** to **GND** via **Push Button Switch**.*

1. Connect the ESP-01S based on picture above.
2. Open Serial Monitor tab (CTRL+SHIFT+M) on Arduino IDE.



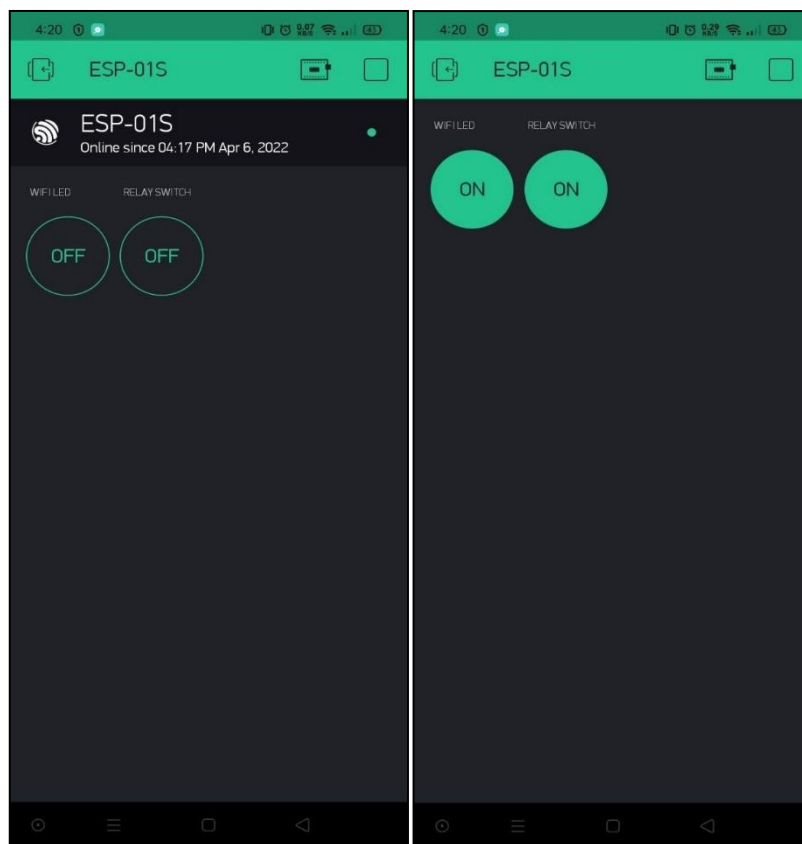
3. Click the Push button **once** to reset the ESP-01S. This step is to force ESP-01S reset and run / load the program recently uploaded to the board. Once board reset serial monitor will display ESP-01S attempt to connect Wi-Fi.



```

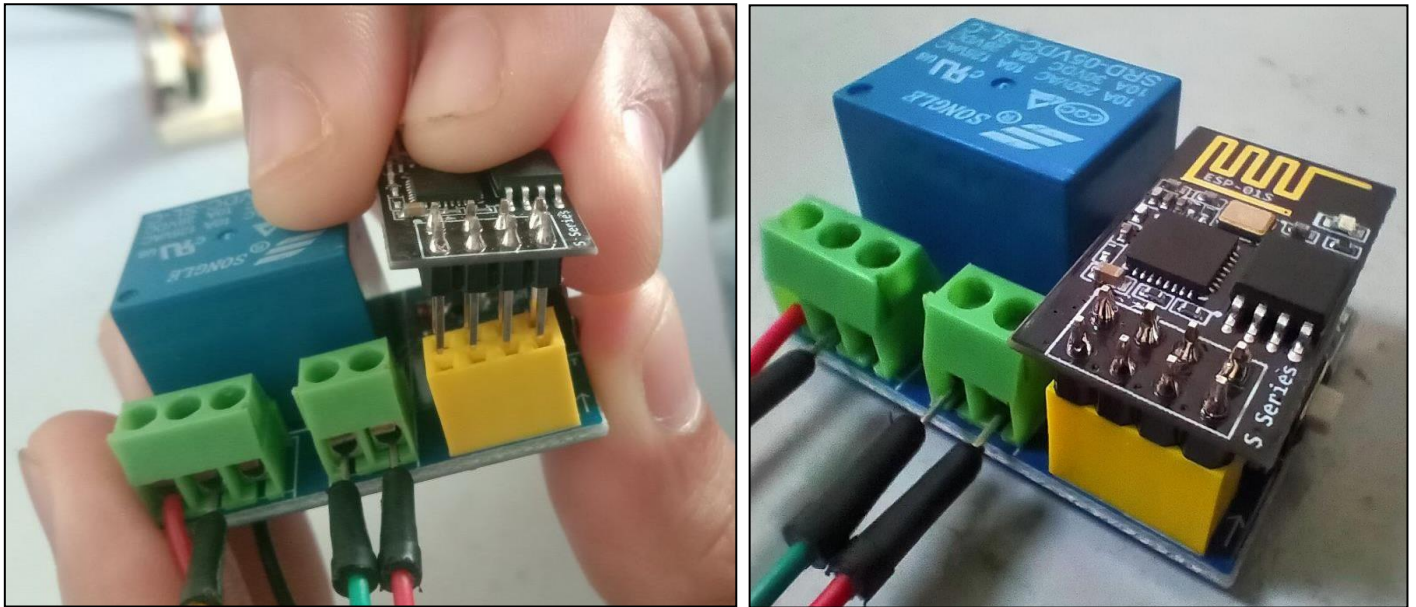
17:34:49.309 -> [85] Connecting to POCOPHONE F1
17:34:51.911 -> [2589] Connected to WiFi
17:34:51.957 -> [2589] IP: 192.168.43.49
17:34:51.957 -> [2589]
17:34:51.957 ->
17:34:52.004 -> / _ ) / / _ _ _ _ / / _
17:34:52.052 -> / _ / / / / / _ \ / _ \
17:34:52.052 -> / _ _ / \ _ / / / / \ _ \
17:34:52.098 -> / _ / v0.6.1 on ESP8266
17:34:52.098 ->
17:34:52.098 -> [2666] Connecting to blynk-cloud.com:80
17:34:52.191 -> [2824] Ready (ping: 20ms).
  
```

4. Once **Blynk** app Tap on **Wi-Fi LED** button that created in Step **D-4** to turn **ON/OFF** LED onboard indicator. Blynk app will show the board is online when connected to Wi-Fi (make sure Wi-Fi got active 2.4G internet connection).



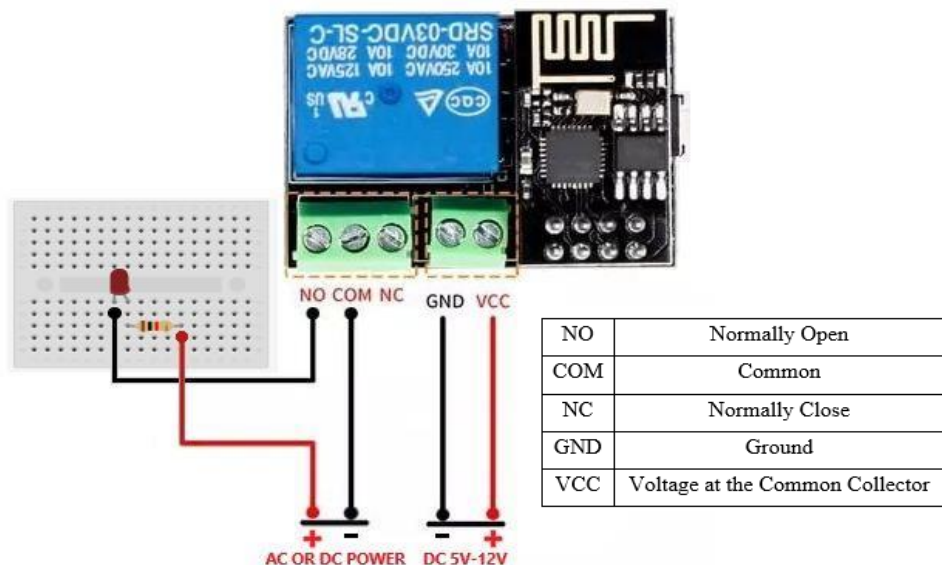
Step 7: Connecting ESP-01S ESP8266 to ESP8266 ESP-01 10A 250AC Relay module.

1. Unplug all the wires from ESP8266 ESP-01S.
2. Connect ESP8266 ESP-01S to the relay module by inserting the eight pins of ESP8266 ESP-01S into the relay module eight pins socket like the pictures below.



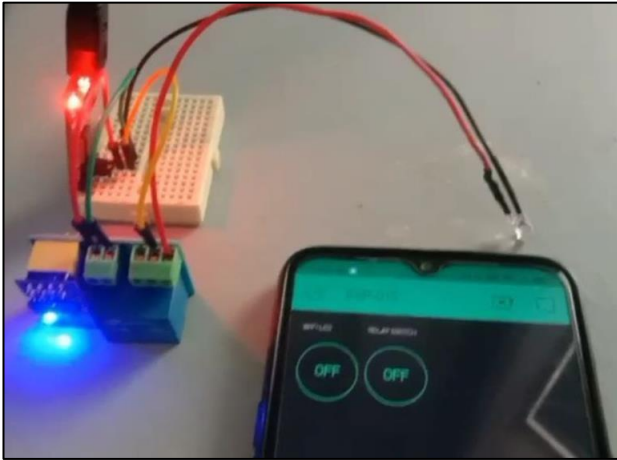
Step 8: Wiring connection & testing ESP8266 ESP-01 10A 250AC Relay module to an LED circuit.

1. Create a simple LED circuit and use the relay module as a switch for the LED as shown in the pictures below.

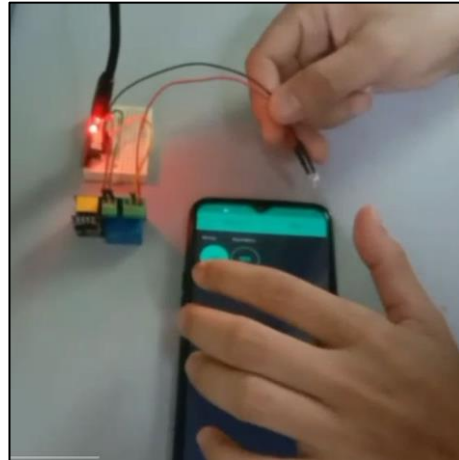


2. Powered on the circuit and relay module.

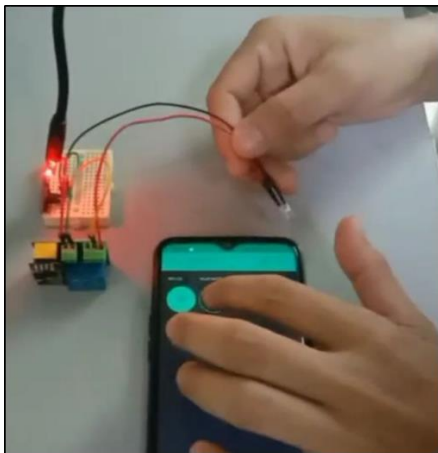
3. Open your Blynk app on your phone and turn ON and OFF your WIFI LED and RELAY SWITCH buttons to see the results as below.



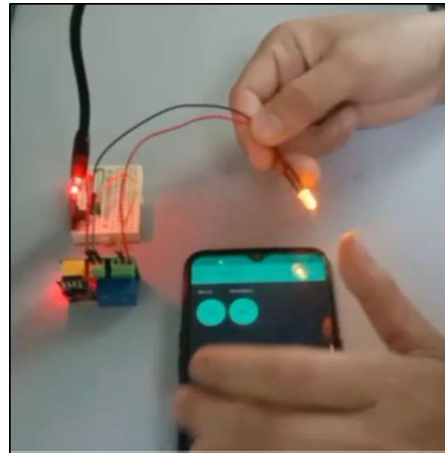
WIFI LED: OFF RELAY SWITCH:OFF



WIFI LED: ON RELAY SWITCH:OFF



WIFI LED: ON RELAY SWITCH:OFF



WIFI LED: ON RELAY SWITCH:ON



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Conclusion:

ESP 8266 ESP-01S need to be connect to relay module so a user can access it via Wi-Fi to turn it ON and OFF wirelessly. Before that, ESP 8266 ESP-01S need to be code with a simple Blynk coding to connect it with the Blynk app. After that, to program the ESP 8266 ESP-01S, USB to UART FTDI Converter is required to connect ESP 8266 ESP-01S to a PC. Then, upload the Blynk code provided via Arduino IDE to ESP8266 ESP-01S. Afterward, remove the connection between the ESP 8266 ESP-01S & UART / TTL Serial Programmer. Lastly, connect the ESP 8266 ESP-01S to the ESP8266 ESP-01 10A 250AC Relay module and powered it on so that you can test it when you open the UI in the Blynk app that already been set up.