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*Abstract*—This manual shows how to program an ESP8266 board using Arduinos and Raspberry Pi. The procedure is the same for any Linux machine.

## 1 COMPONENTS

The necessary components for this manual are listed in Table I.

Component	Quantity
ESP8266	1
Raspberry Pi 4	1
Arduino Uno	1
Female-Female Jumper Wires	9
Resistor(1000Ω)	1
LED	1
Breadboard	1
Solid State Relay	1

TABLE I

## 2 SOFTWARE SETUP

Download the 32-bit arm version from the below link

<https://www.arduino.cc/en/main/software>

### 2.1 Installing Arduino

Open a terminal and execute the following commands

```
cp ~/Downloads/arduino-x.x.x-tar.xz ~/
tar xf arduino-x.x.x-tar.xz
cd arduino-x.x.x
sudo ./install.sh
```

### 2.2 Installation ESP8266 instructions using Arduino IDE Boards Manager

Start Arduino and open Preferences window. Enter the below link into Additional Board Manager URLs field

[http://arduino.esp8266.com/stable/package\\_esp8266com\\_index.json](http://arduino.esp8266.com/stable/package_esp8266com_index.json)

```
#Open Boards Manager from Tools
#Install ESP8266 platform
#Select Generic ESP8266 Module board from tools
```

## 3 HARDWARE SETUP

### 3.1 Fan Controlling through ESP8266

Connect the Arduino to a USB port of the Raspberry Pi. The hardware connections between the Arduino and ESP8266 are available in Table II. See Fig.1 as well as Fig.2 and Fig.3 for Pin configurations

- 1) Make the connections according to TABLE II
- 2) Connect arduino RESET pin to GND
- 3) Connect One of the AC terminal to fan and another terminal to Power socket
- 4) Connect another fan terminal to power socket
- 5) Enter your wifi SSID and password in below code
- 6) Execute the below code for FAN Control

ESP8266	Arduino
GND	GND
Tx	Tx
GPIO 0	Relay DC +ve
Relay DC -ve	GND
CH EN	VCC
Rx	Rx
VCC	3.3V

TABLE II: ESP8266-Arduino connections

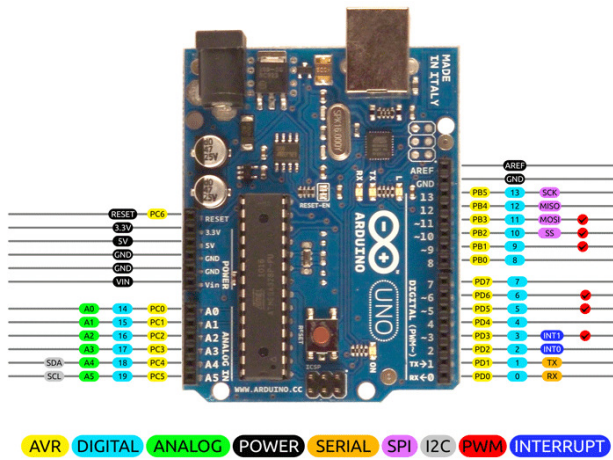


Fig. 1: Arduino Pin Configuration

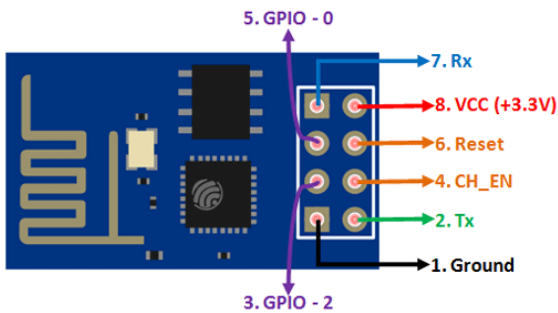


Fig. 2: ESP8266 Pin Configuration

<https://github.com/d-DP/ESP8266/blob/master/codes/wififan/blink1/blink1.ino>

- 7) Open the serial monitor to get IP address and enter that IP address in browser



Fig. 3: ESP8266 Pin Configuration