SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT213- IoT SYSTEM ARCHITECTURE

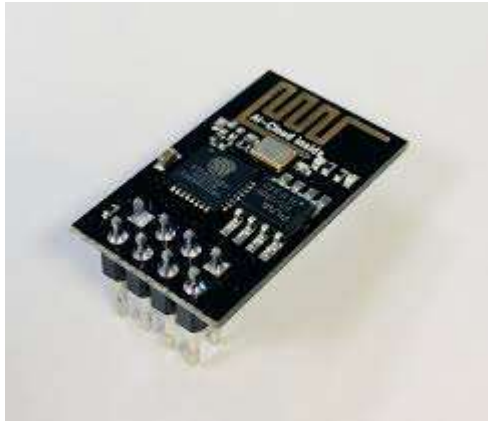
II ECE / IV SEMESTER

UNIT 2 – MICROCONTROLLER AND INTERFACING TECHNIQUES FOR IoT DEVICES

Interfacing ESP8266 wifi Module with Arduino

What is ESP8266?

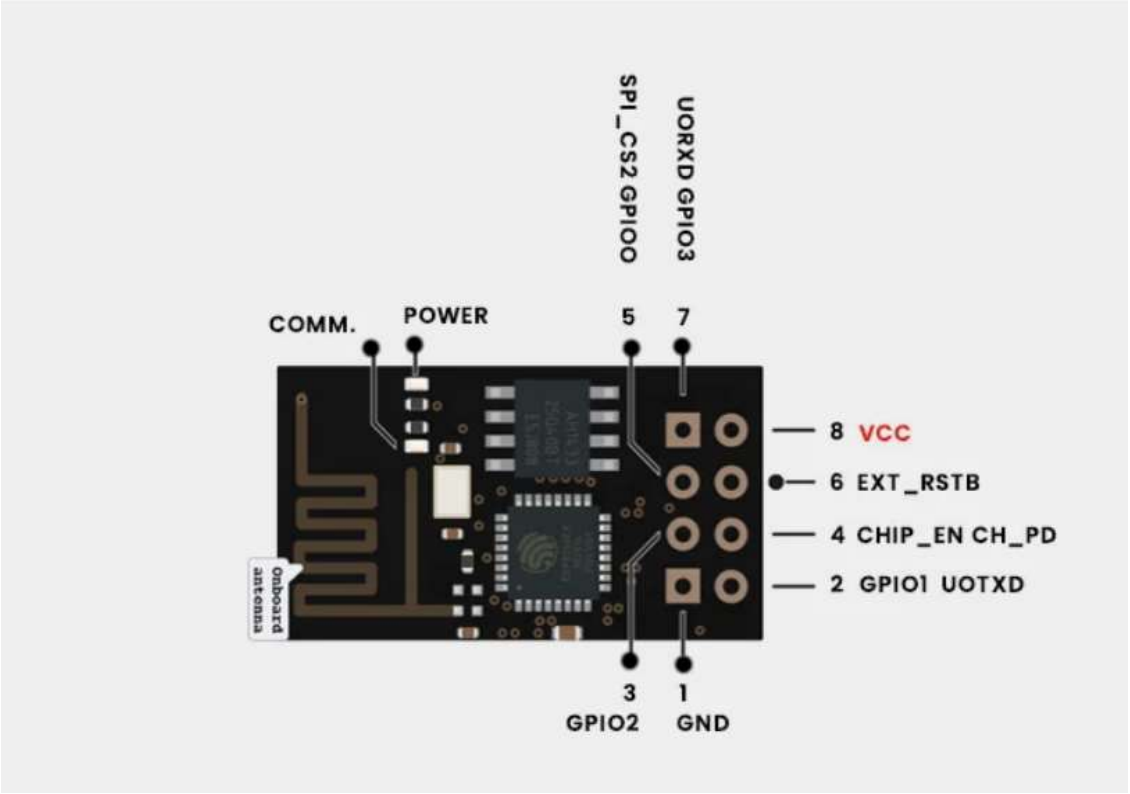
ESP8266 is a Low-cost wifi module that can provide internet connectivity to your small-scale embedded system/projects. This module comes with a single-chip CPU, GPIO pins, analog pins, I2C and SPI pins. The processor used in this module is the L106 32 bit RISC microprocessor, which runs on 80 MHz at Tensilica xtensa Dimond's standards.



Features of ESP8266

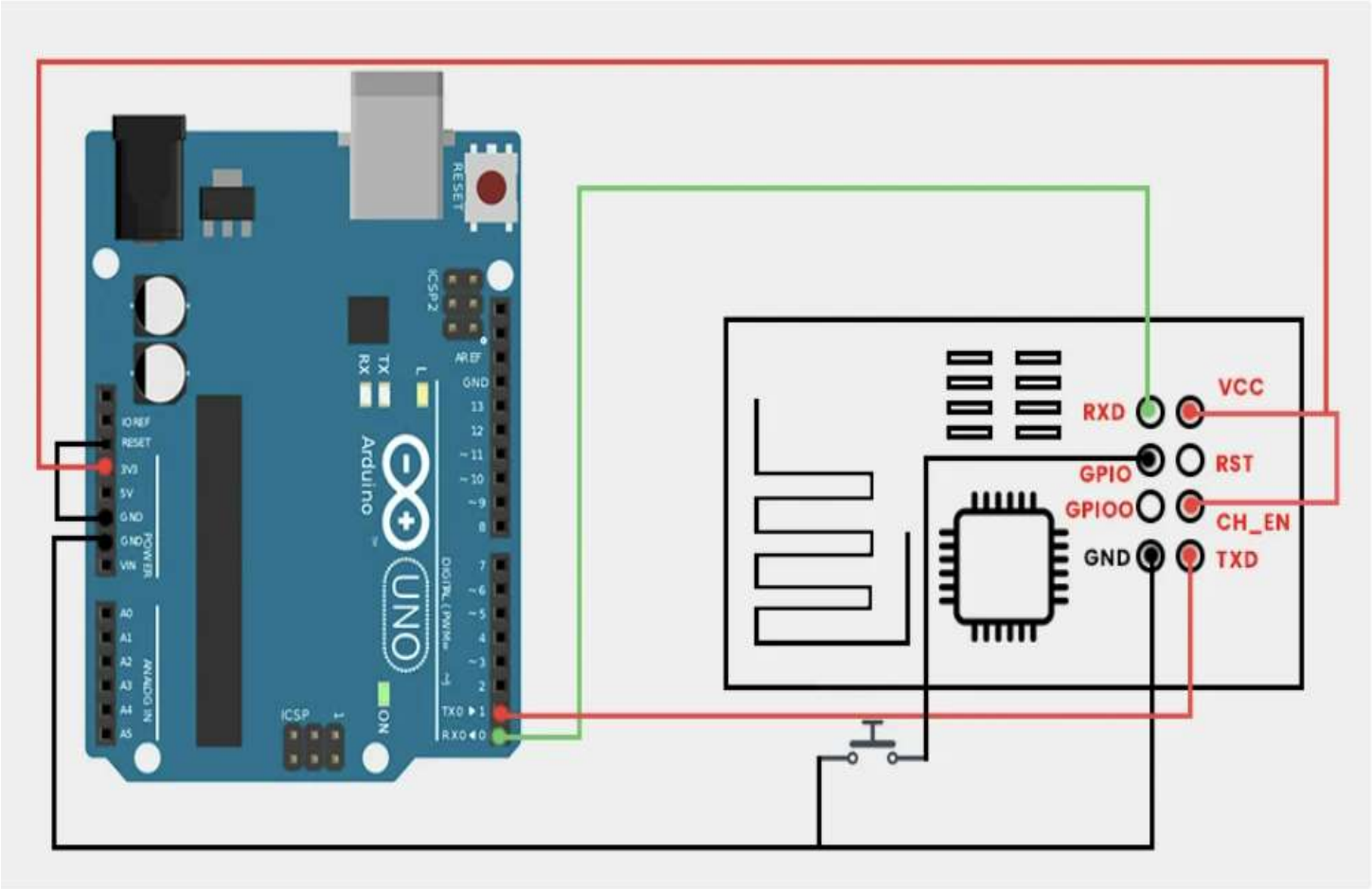
- On-chip Wi-Fi modules
- It has 2 GPIO pins
- Has inbuild 10 bit ADC (Analog to digital converter)
- 32 KB instruction RAM
- 16 KB system data RAM
- 32-bit microcontroller
- UART On dedicated Pins can be transferred UART to GPIO 0
- L106 32-bit RISC microprocessor core of Tensilica Xtensa Diamond standards 106 Micro run at a frequency of 80 MHz

Pin Description of ESP8266



Pin	Description
VCC	This is the power pin for 3.3v
GND	Ground pin for giving 0 volt
Rx	Receiver pin used to receive serial data from another device
Tx	Transmitter pin used to transfer serial data to other devices
CH_En	Chip enable pin, usually connected to 3.3 volt due to active-high property
GPIO 0	General-purpose GPIO pin basically has two used 1) used as a normal GPIO pin 2) used to enable the programming mode of ESP8266
GPIO 2	Used as a GPIO pin

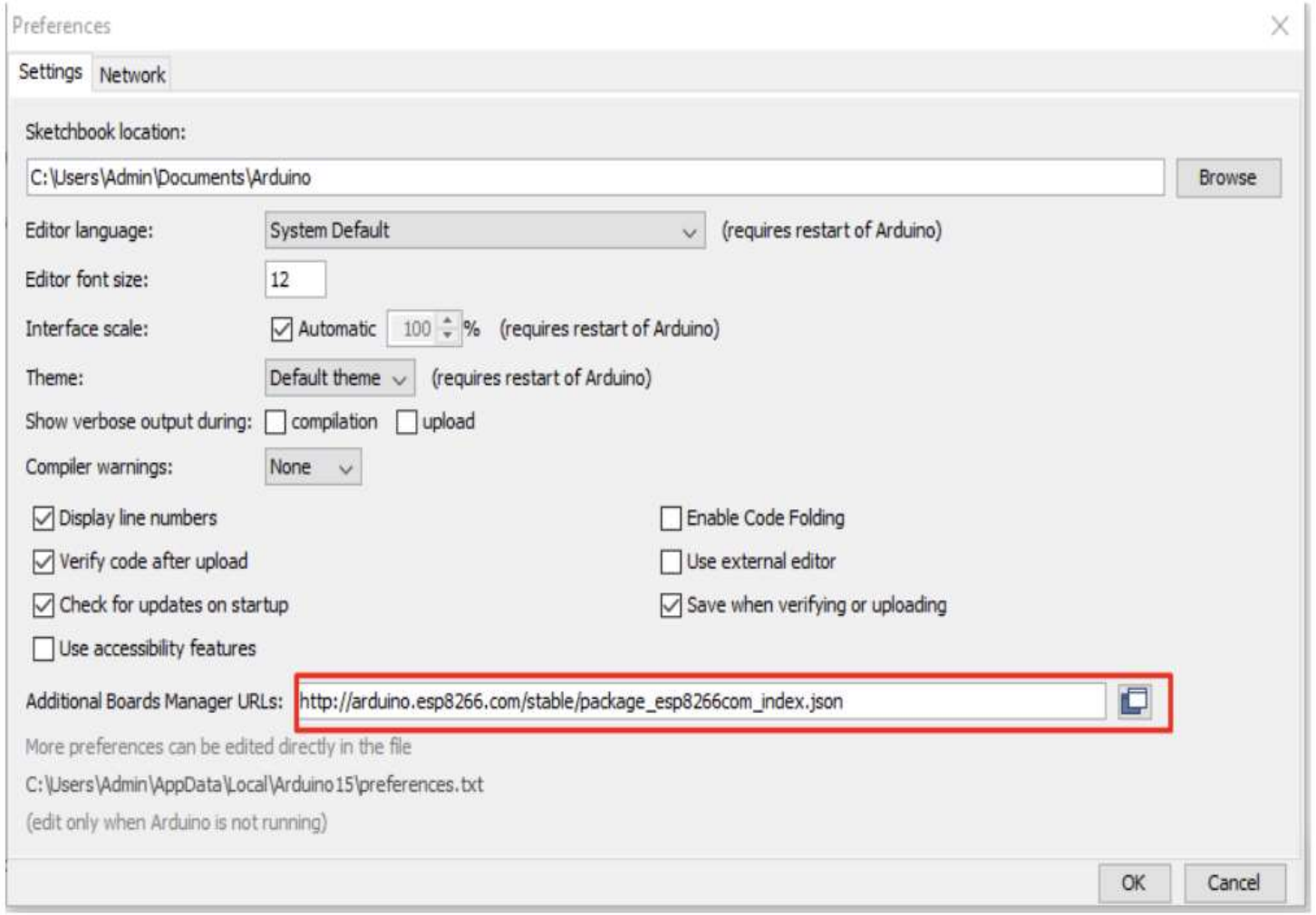
Connection of ESP2866 wifi Module with Arduino



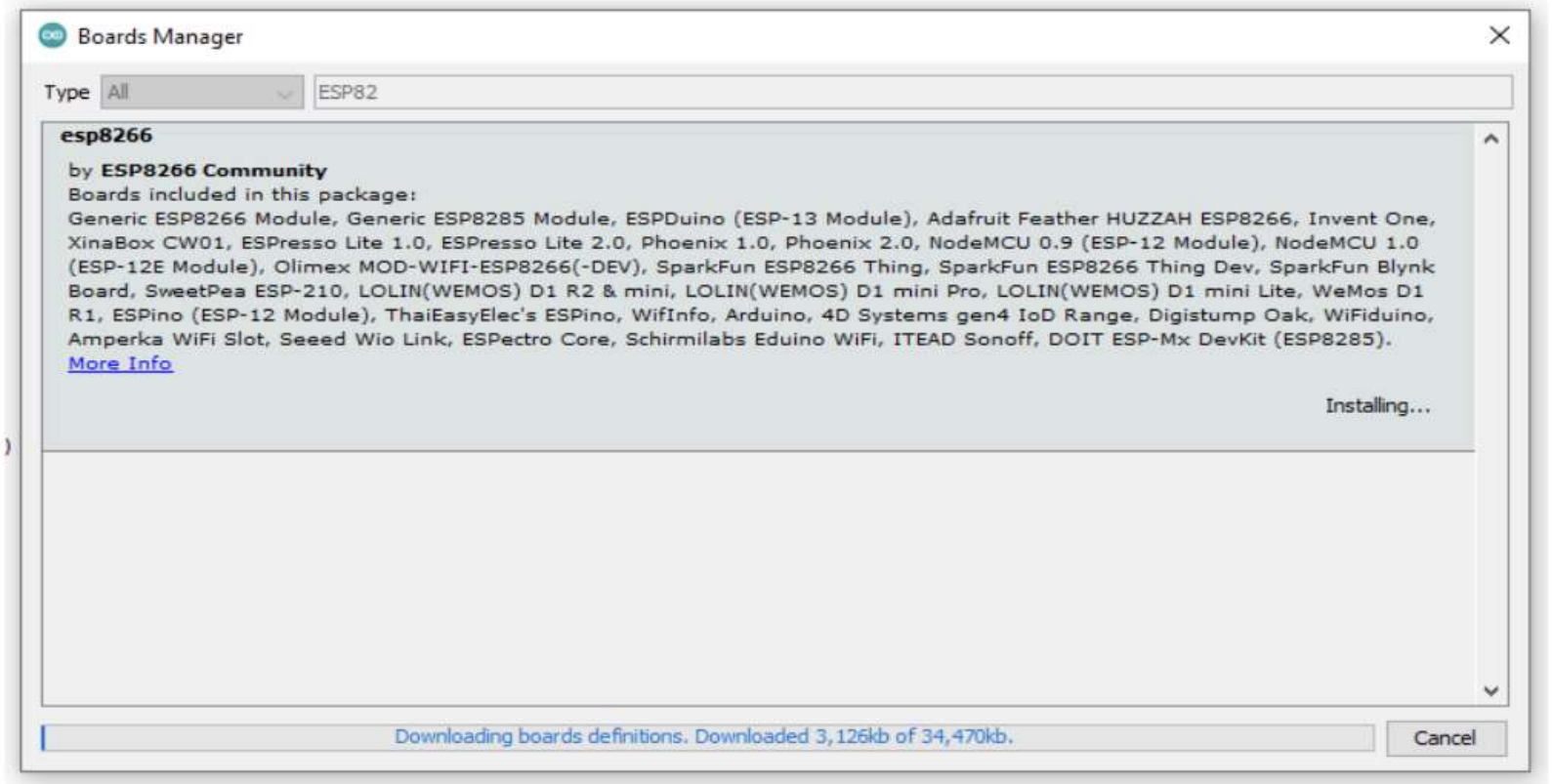
Software, Boards Installation:

You have to follow few simple steps to install ESP8266 in the Arduino IDE:

- First, you need to download the **Arduino IDE**.
- After that, we need to install the ESP8266 Board in Arduino IDE.
- Copy the following link to add ESP8266 or ESP8266 integrated board in Arduino IDE.
- http://arduino.esp8266.com/stable/package_esp8266com_index.json
- Go to Arduino IDE, then follow the path File/preferences and open the preference tab.
- And paste the above link in the additional board manager URL box as shown in the image.


Preferences
Settings
Network
Sketchbook location:
C:\Users\Admin\Documents\Arduino
Browse
Editor language:
System Default
(requires restart of Arduino)
Editor font size:
12
Interface scale:
Automatic
100
%
(requires restart of Arduino)
Theme:
Default theme
(requires restart of Arduino)
Show verbose output during:
compilation
upload
Compiler warnings:
None
Display line numbers
Enable Code Folding
Verify code after upload
Use external editor
Check for updates on startup
Save when verifying or uploading
Use accessibility features
Additional Boards Manager URLs:
http://arduino.esp8266.com/stable/package_esp8266com_index.json
More preferences can be edited directly in the file
C:\Users\Admin\AppData\Local\Arduino15\preferences.txt
(edit only when Arduino is not running)
OK
Cancel

- After this, go to **Tool/ Board Tools/board/board manager** and type **ESP8266**. You will find a board of ESP8266 click on the install option.



- This is how your ESP8266 board get installed.

Arduino code for ESP8266 module:

```
// LED Blink example for ESP8266 (ESP-01) module

#define LED        2               // LED is connected to GPIO2

void setup() {

  pinMode(LED, OUTPUT);            // Configure LED pin as output

}

void loop() {

  digitalWrite(LED, HIGH);          // Turn the LED on
  delay(500);                       // wait 1/2 second
  digitalWrite(LED, LOW);           // turn the LED off
  delay(500);                       // wait 1/2 second

}
```