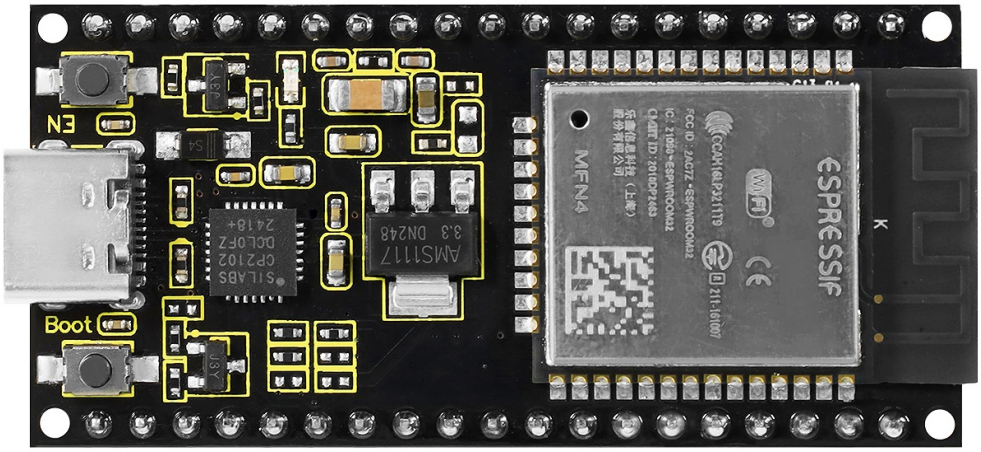
geeekus ESP32 Core Board



1.Description

This geeekus ESP32 core board is a Mini development board based on the ESP-WROOM-32 module.

The board has brought out most I/O ports to pin headers of 2.54mm pitch. These provide an easy way of connecting peripherals according to your own needs.

When it comes to developing and debugging with the development board, the both side standard pin headers can make your operation more simple and handy.

The ESP-WROOM-32 module is the industry's leading integrated WiFi + Bluetooth solution with less than 10 external components.

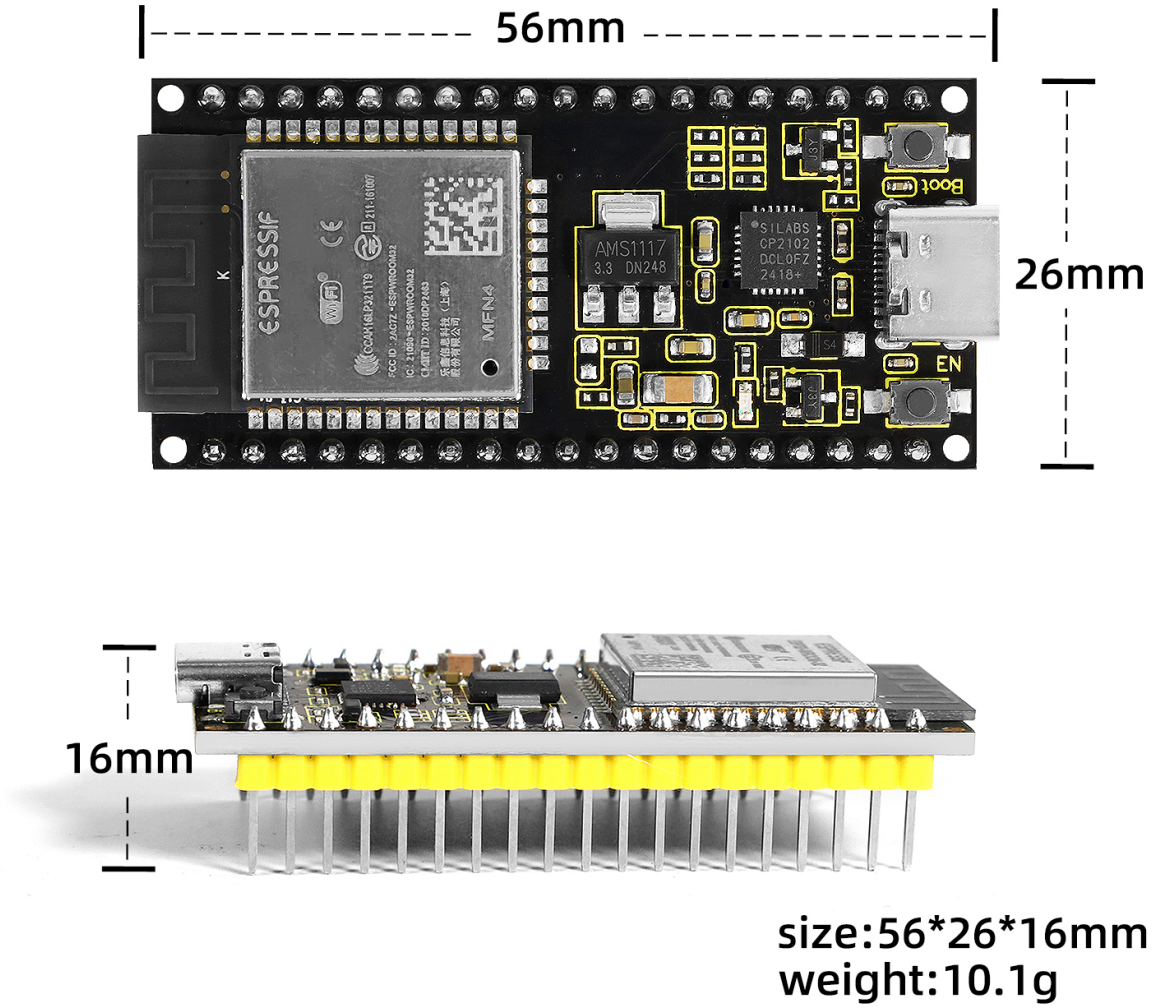
It integrates antenna switch, RF balun, power amplifiers, low noise amplifiers, filters and power management modules.

At the same time, it also integrates with TSMC's low-power 40nm technology, so that power performance and RF performance are safe and reliable, easy to expand to a variety of applications.

2.Technical Details

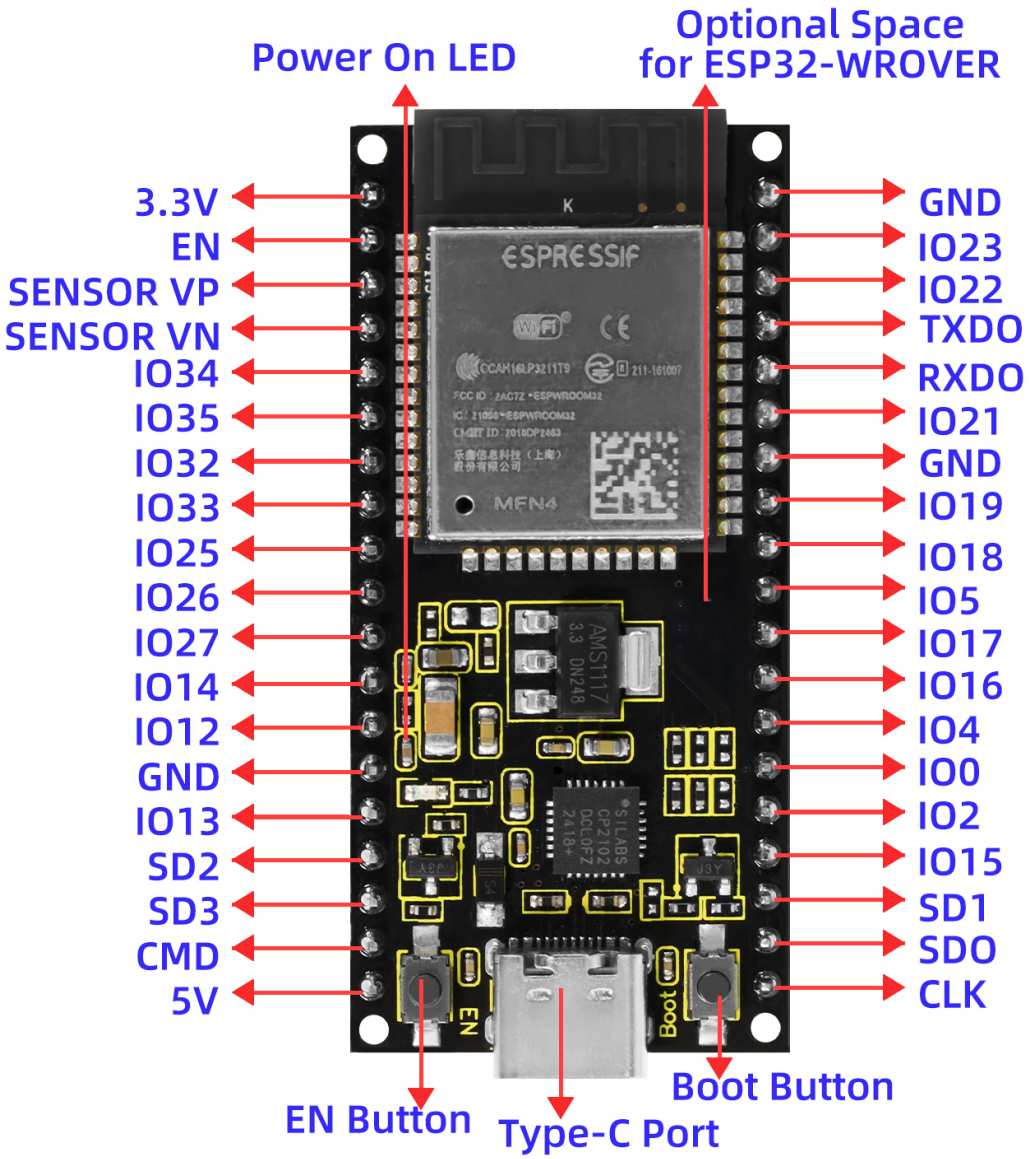
- Microcontroller: ESP-WROOM-32 module
- USB to Serial Port Chip: CP2102-GMR
- Operating Voltage: DC 3.3V
- Operating Current: 80mA (average)
- Current Supply: 500mA (Minimum)
- Operating Temperature Range: -10℃ ~ +60℃
- WiFi mode: Station/SoftAP/SoftAP+Station/P2P
- WiFi protocol: 802.11 b/g/n （802.11n, speed up to 150 Mbps）
- WiFi frequency range: 2.4 GHz ~ 2.5 GHz
- Bluetooth protocol: conform to Bluetooth v4.2 BR/EDR and BLE standards

- Weight: 10.1g
- Dimensions: 56mm*26mm*16mm



3.Element and Interfaces

Here is an explanation of what every element and interface of the board has:



Specialized Functions of Some Pins:

PINS	EXPLANATIONS
IO23	VSPI MOSI/SPI MOSI
IO22	Wire SCL
TXD0	IO1/Serial TX
RXD0	IO3/Serial RX
IO21	Wire SDA
IO19	VSPI MISO/SPI MISO
IO18	VSPI SCK/SPI SCK
IO5	VSPI SS/SPI SS

PINS	EXPLANATIONS
IO4	ADC10/TOUCH0
IO0	ADC11/TOUCH1
IO2	ADC12/TOUCH2
IO15	HSPI SS/ADC13/TOUCH3/TDO
SD1	IO8/FLASH D1
SD0	IO7/FLASH D0
CLK	IO6/FLASH SCK
CMD	IO11/FLASH CMD
SD3	IO10/FLASH D3
SD2	IO9/FLASH D2
IO13	HSPI MOSI/ADC14/TOUCH4/TCK
IO12	HSPI MISO/ADC15/TOUCH5/TDI
IO14	HSPI SCK/ADC16/TOUCH6/TMS
IO27	ADC17/TOUCH7
IO26	ADC19/DAC2
IO25	ADC18/DAC1
IO33	ADC5/TOUCH8
IO32	ADC4/TOUCH9
IO35	ADC7
IO34	ADC6
SENSOR VN	IO39/ADC3
SENSOR VP	IO36/ADC0
EN	RESET

4.Detailed Using Method as follows

Step1 Install the Arduino IDE

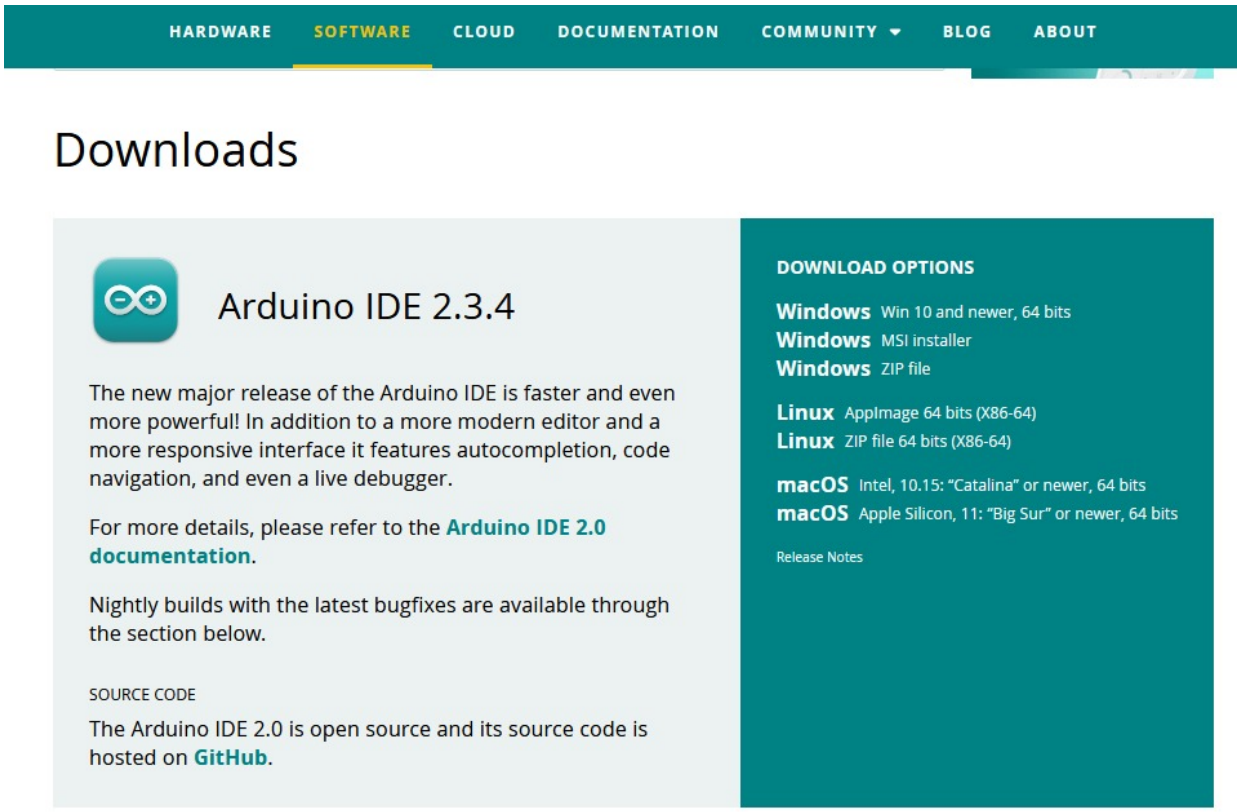
When programming the control board, first you should install the Arduino software and driver.

You can download the different versions for different systems from the link below:

https://www.arduino.cc/en/Main/OldSoftwareReleases#1.5.x

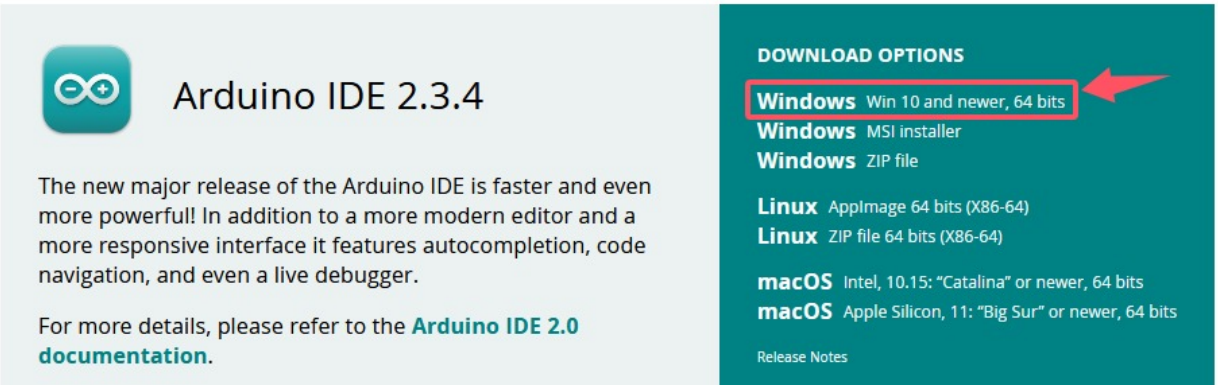
This control board is compatible with the Arduino 1.8.7 or latest version.

So next we will download the Arduino 2.3.4 software to test the geeekus ESP32 core board.
https://www.arduino.cc/en/software

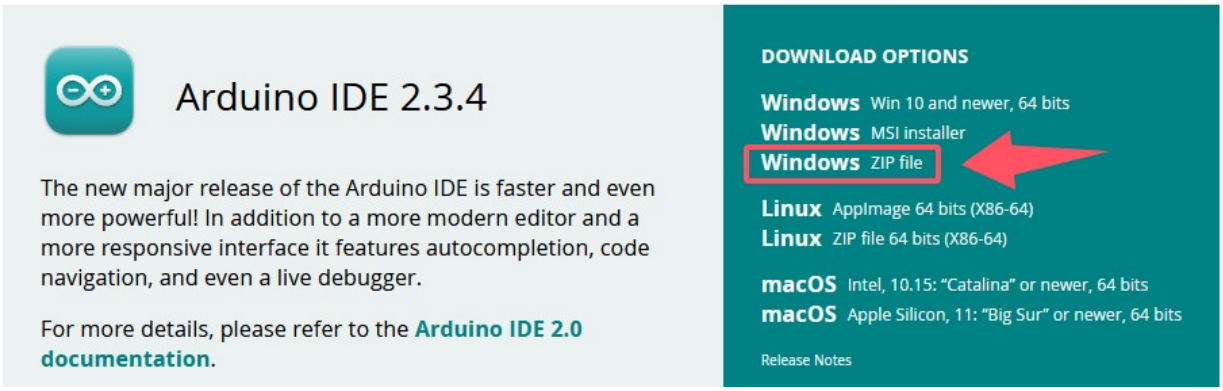


In this Windows system page, there are two options. One is Windows version, the other is Windows Installer.

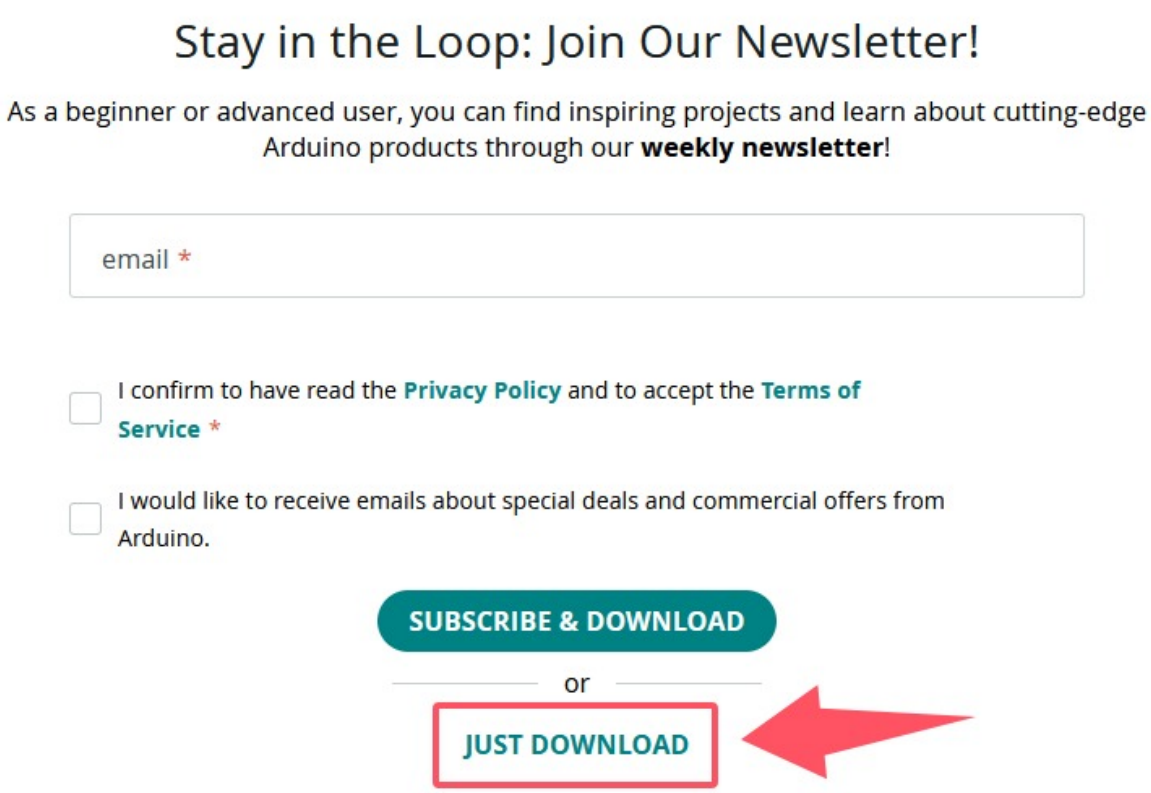
For Windows Installer, you can download the installation file, this way you need to install the arduino IDE.



For simple Windows version, you can download the software directly, do not need to install, just directly use the software after unzip the package.

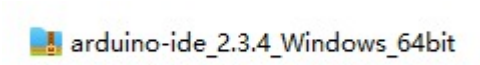


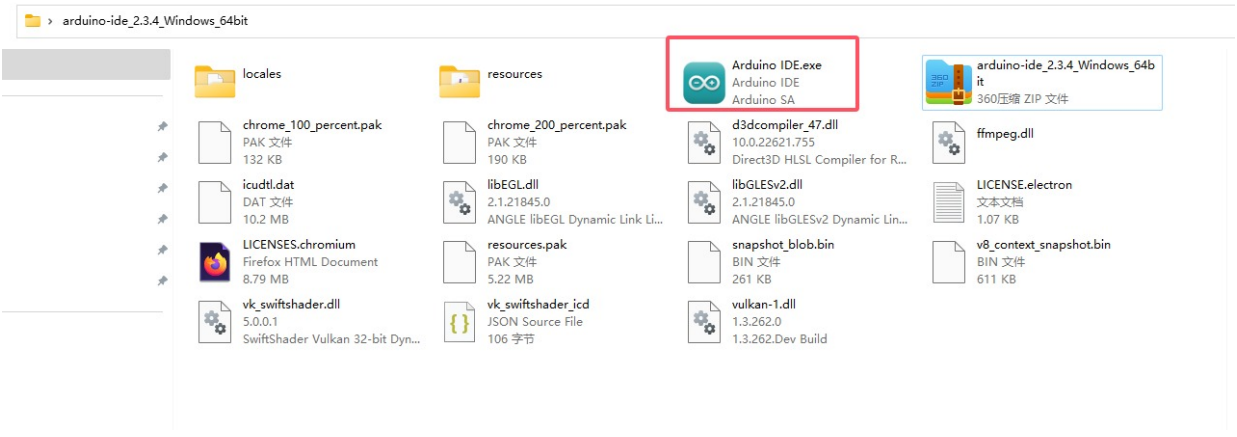
Next, we click the **Windows**, pop up the interface as below.



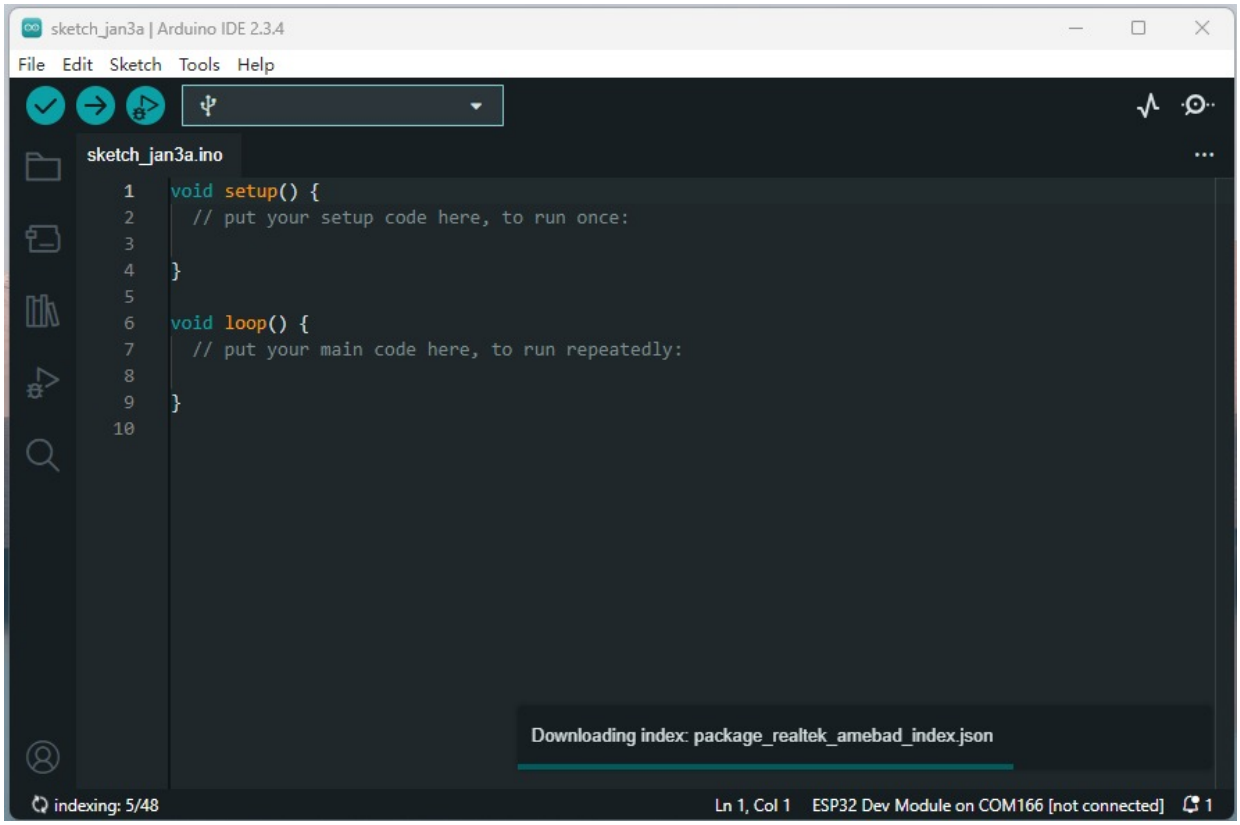
Click **JUST DOWNLOAD**.

Downloaded well the **arduino-2.3.4-windows-64bit.zip** package to your computer, you need to create a new folder, and then unzip the package into the new folder.





Click the icon(Arduino IDE.exe) of Arduino software to open. This is your Arduino.

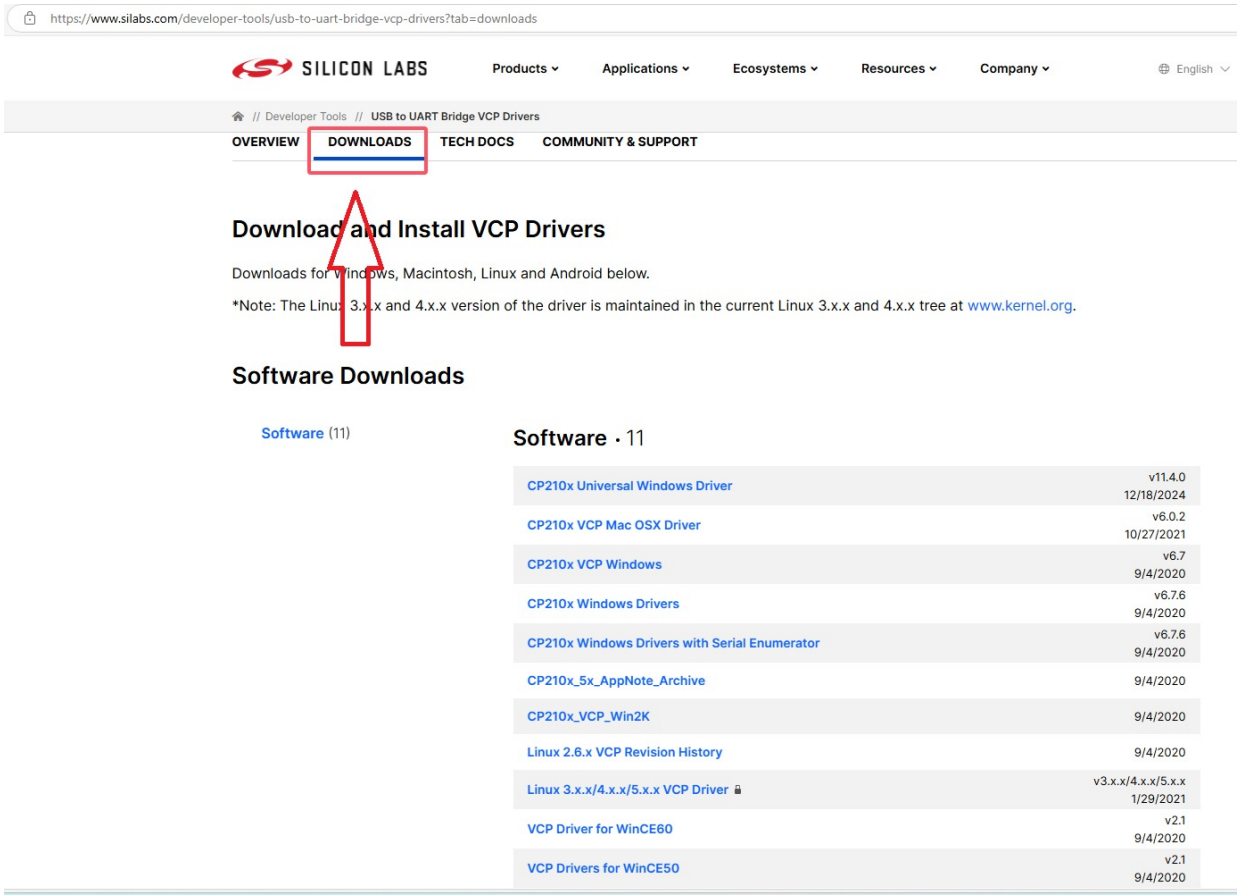


Step2 Installing the Driver

The USB to serial port chip of this control board is Silabs-CP2102. So you need to install the driver for the chip.

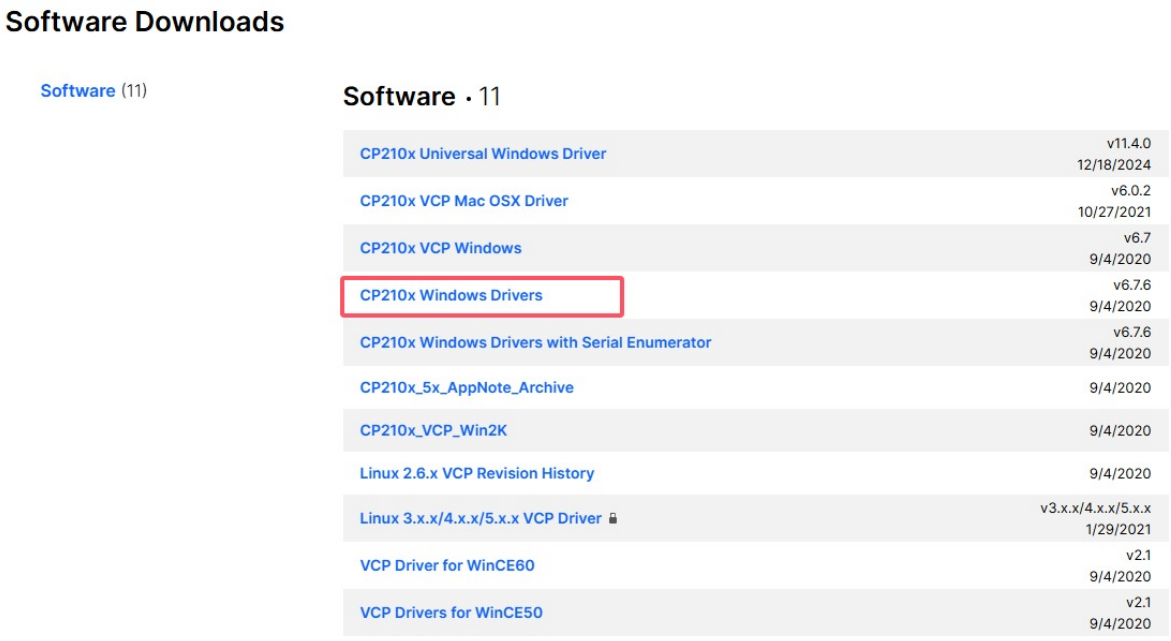
We provide driver downloads link: https://fs.keyestudio.com/CP2102-WINDOWS

Silabs provide driver downloads link: https://www.silabs.com/developer-tools/usb-to-uart-bridge-vcp-drivers

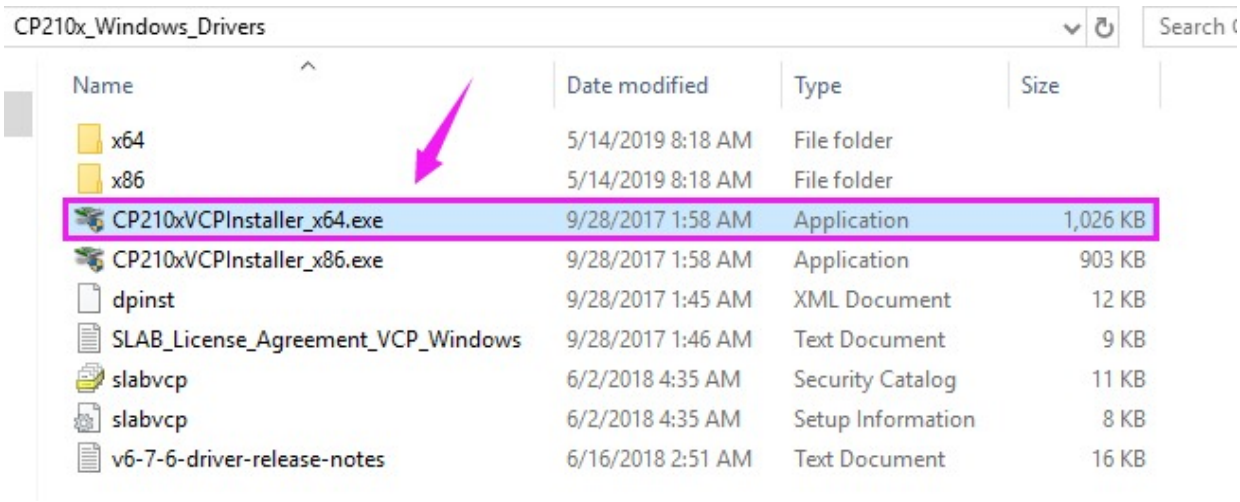


It includes different drivers for different computer's systems. Download and install the driver according to your computer's system.

For example, we download the driver for Windows 10. Get the compression package of CP210x_Windows_Drivers

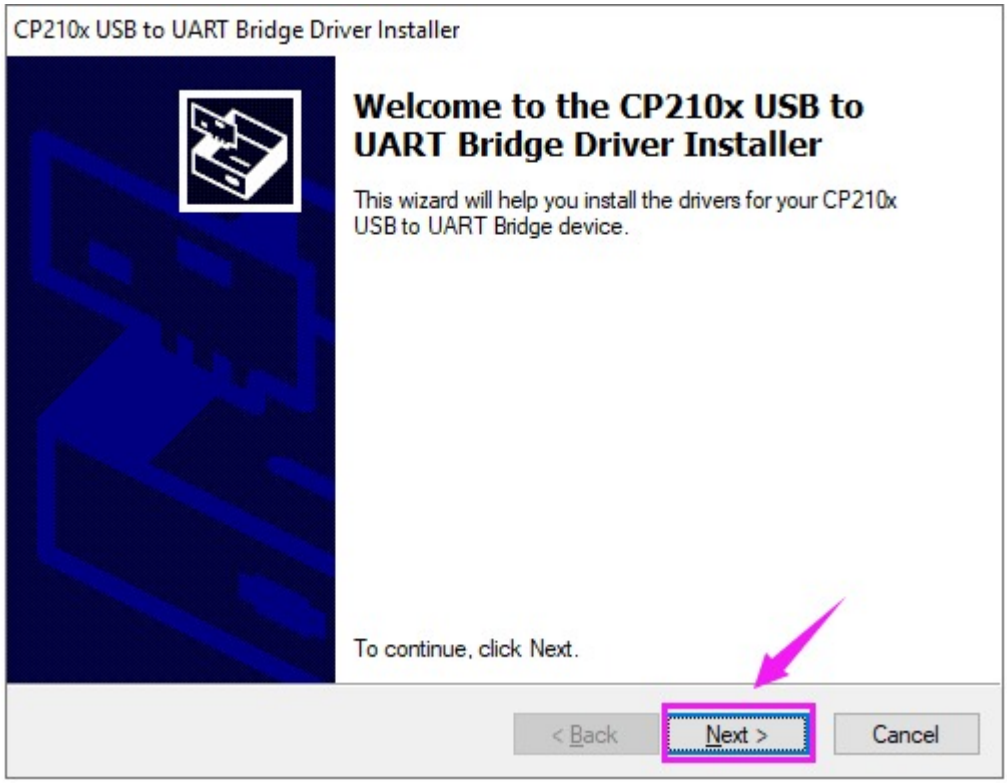


Then extract the compression package, you should see the application to install.

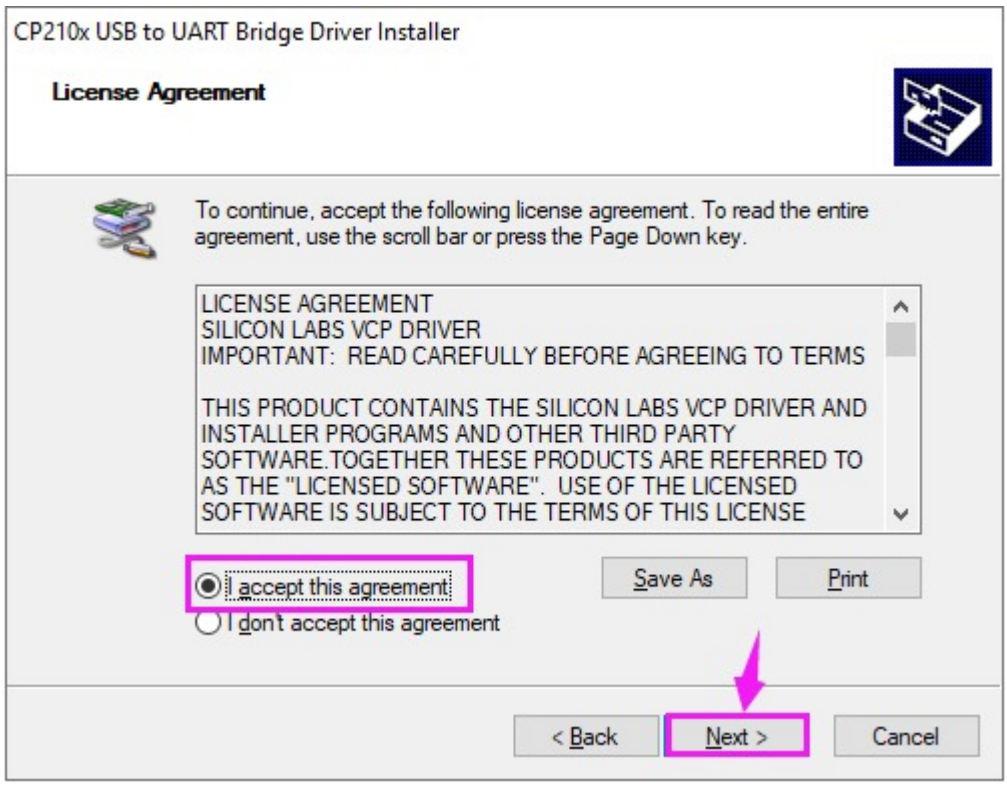


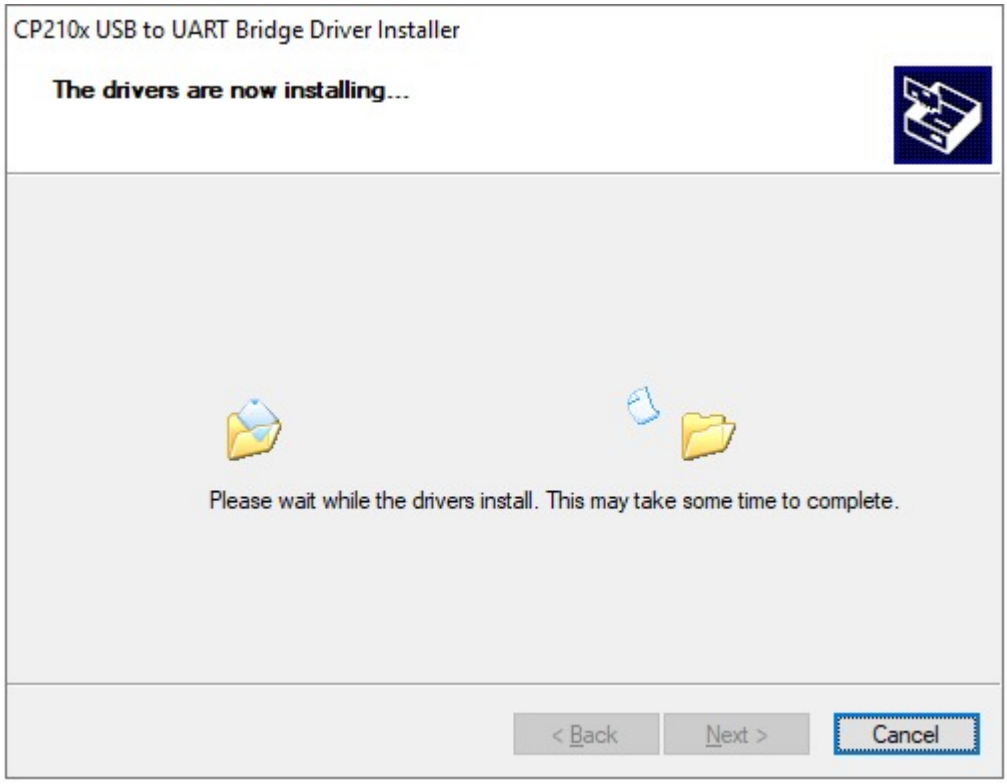
The driver software installation is very simple. Just select the driver application as you like.

Click to **.exe** package to install the driver. Click “Next”.

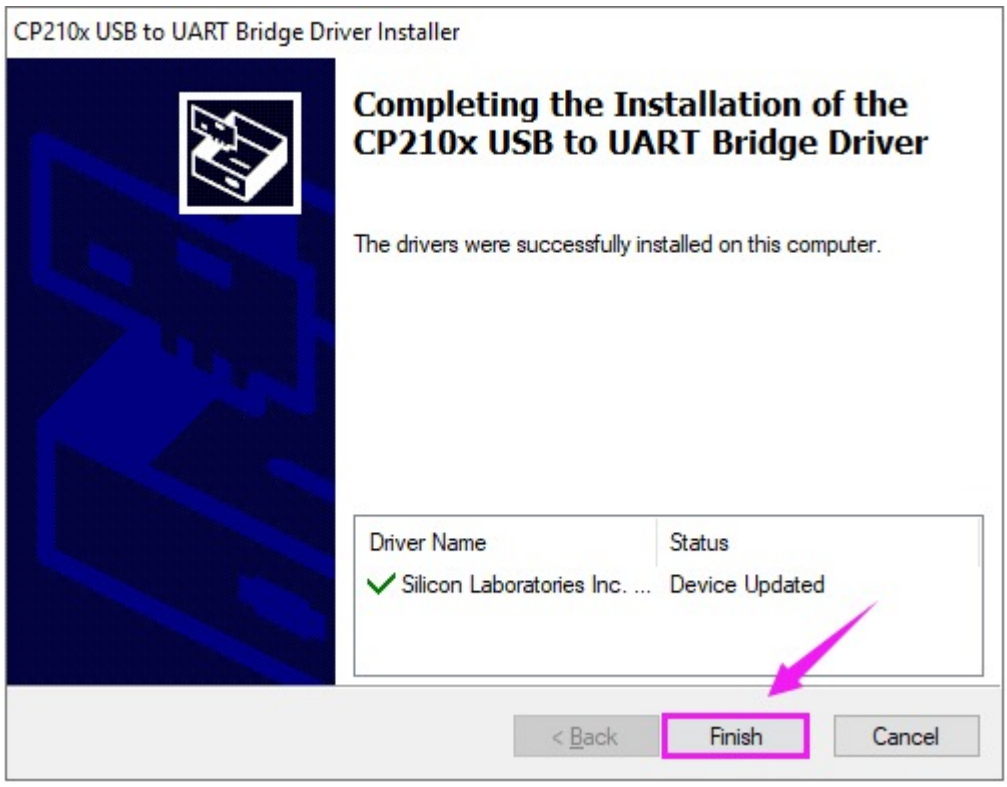


Click to select “I accept this agreement” and click “Next”.



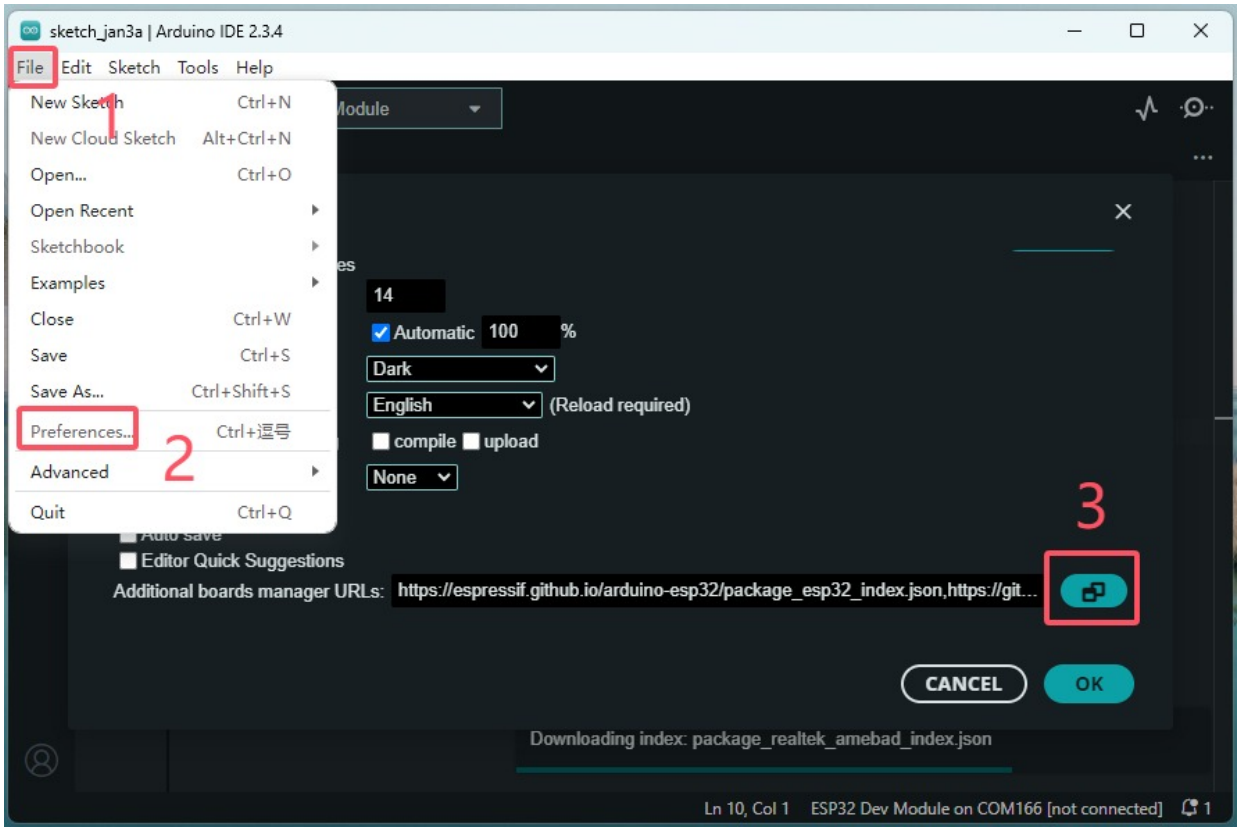


Wait for the installation complete. Finally click “Finish” to close the window.

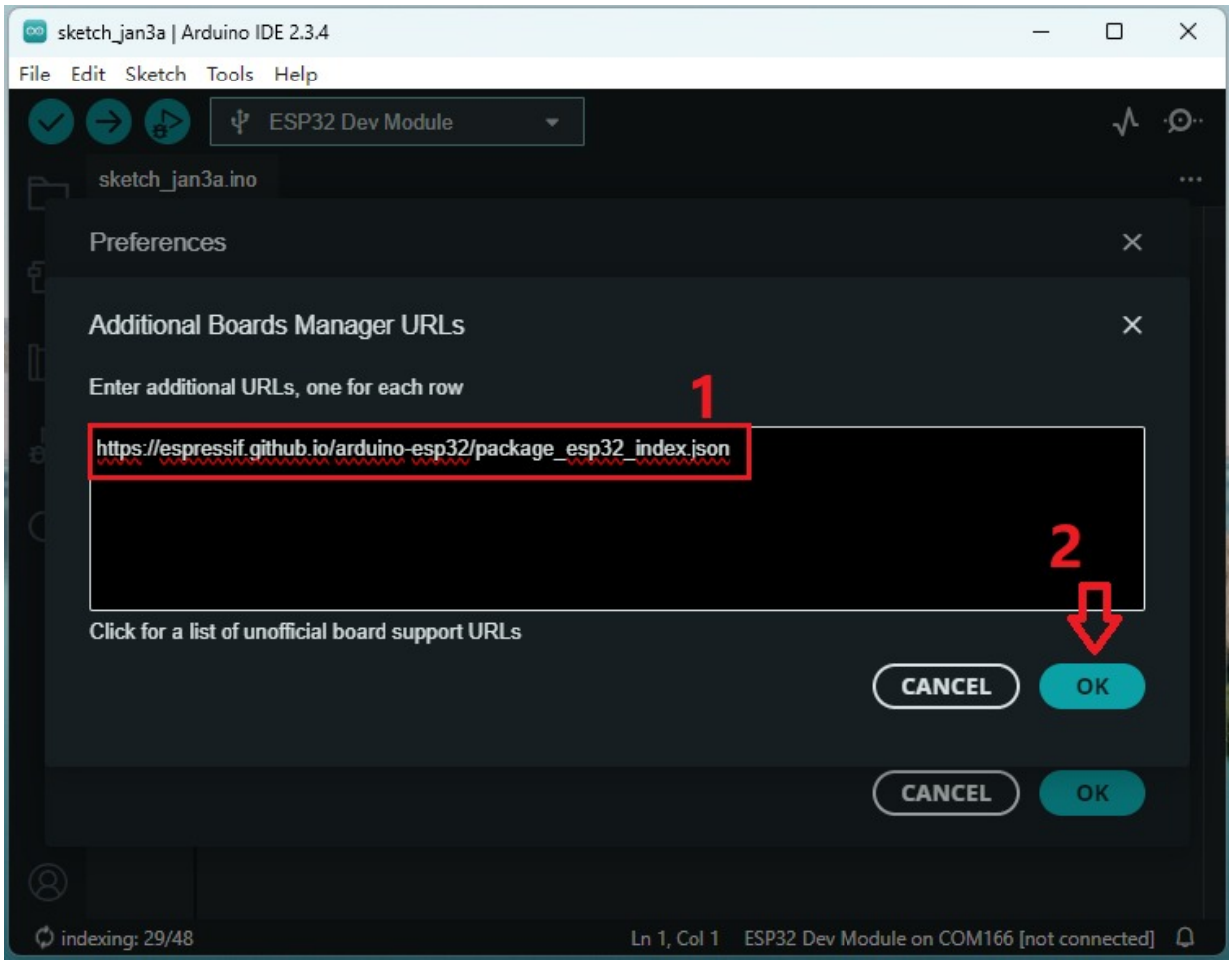


Step3 Building ESP32 Environment

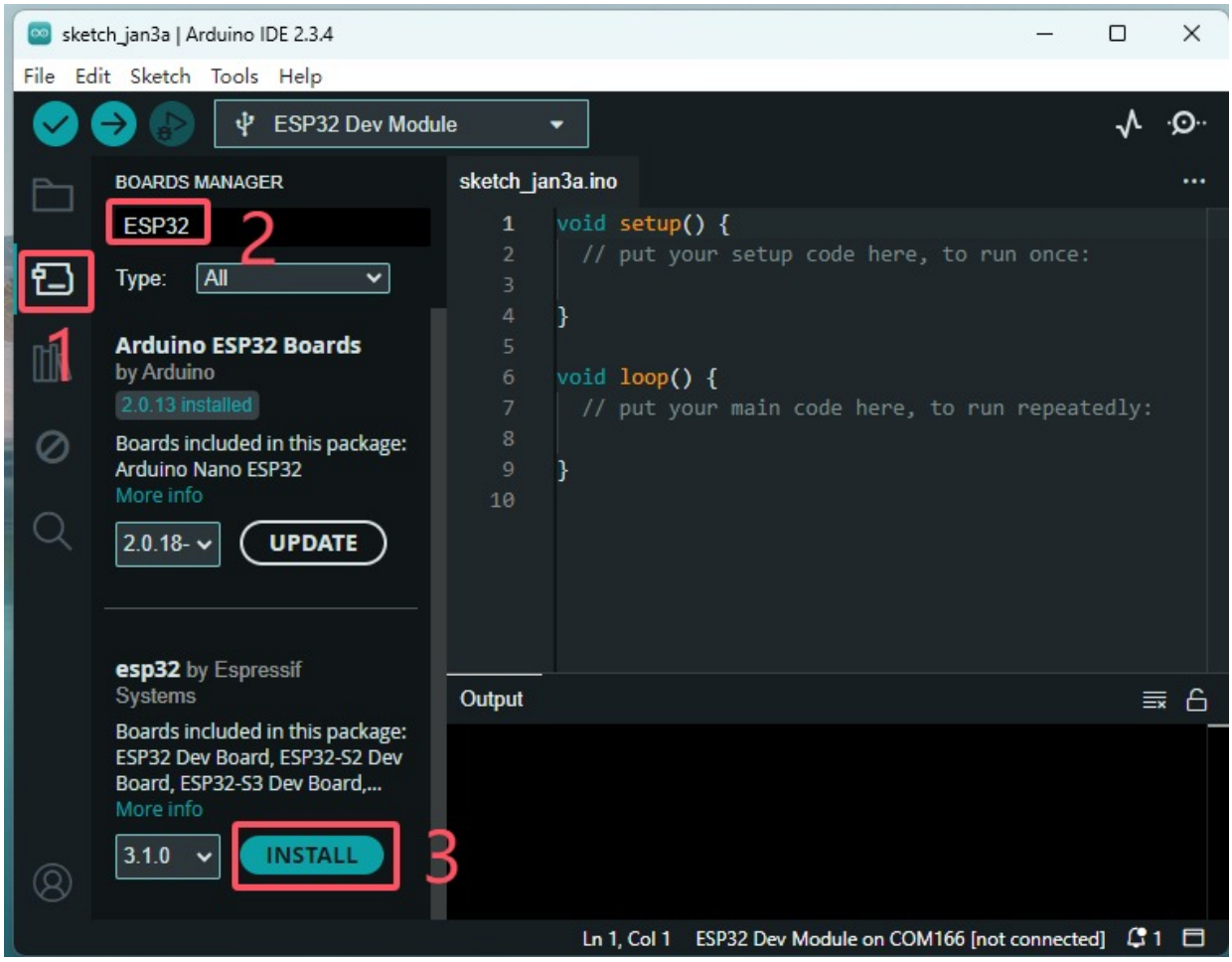
Click on the following menu:



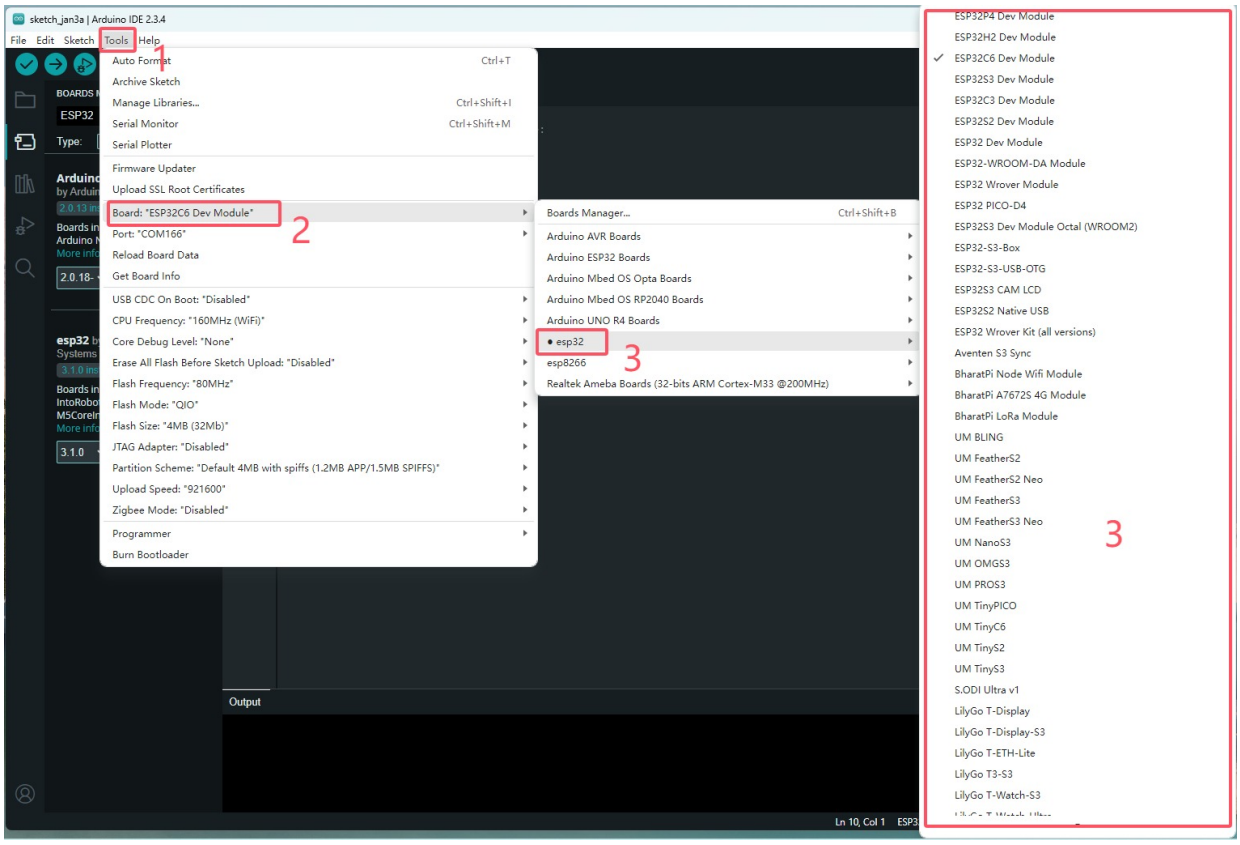
Add the following link to the IDE:
https://espressif.github.io/arduino-esp32/package_esp32_index.json



Add ESP32 board type:

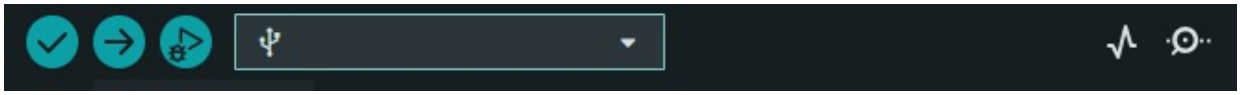

sketch_jan3a | Arduino IDE 2.3.4
File Edit Sketch Tools Help
ESP32 Dev Module
BOARDS MANAGER
ESP32
2
Type: All
Arduino ESP32 Boards
by Arduino
2.0.13 installed
Boards included in this package:
Arduino Nano ESP32
More info
2.0.18-
UPDATE
esp32 by Espressif Systems
Boards included in this package:
ESP32 Dev Board, ESP32-S2 Dev Board, ESP32-S3 Dev Board,...
More info
3.1.0
INSTALL
3
sketch_jan3a.ino
1 void setup() {
2 // put your setup code here, to run once:
3
4 }
5
6 void loop() {
7 // put your main code here, to run repeatedly:
8
9 }
10
Output
Ln 1, Col 1 ESP32 Dev Module on COM166 [not connected] 1

succeed!


Tools
1
Auto Format Ctrl+T
Archive Sketch
Manage Libraries... Ctrl+Shift+I
Serial Monitor Ctrl+Shift+M
Serial Plotter
Firmware Updater
Upload SSL Root Certificates
Board: "ESP32C6 Dev Module"
2
Port: "COM166"
Reload Board Data
Get Board Info
USB CDC On Boot: "Disabled"
CPU Frequency: "160MHz (WiFi)"
Core Debug Level: "None"
Erase All Flash Before Sketch Upload: "Disabled"
Flash Frequency: "80MHz"
Flash Mode: "QIO"
Flash Size: "4MB (32Mb)"
JTAG Adapter: "Disabled"
Partition Scheme: "Default 4MB with spiffs (1.2MB APP/1.5MB SPIFFS)"
Upload Speed: "921600"
Zigbee Mode: "Disabled"
Programmer
Burn Bootloader
Boards Manager... Ctrl+Shift+B
Arduino AVR Boards
Arduino ESP32 Boards
Arduino Mbed OS Opta Boards
Arduino Mbed OS RP2040 Boards
Arduino UNO R4 Boards
• esp32
3
esp8266
Realtek Ameba Boards (32-bits ARM Cortex-M33 @200MHz)
ESP32P4 Dev Module
ESP32H2 Dev Module
ESP32C6 Dev Module
ESP32S3 Dev Module
ESP32C3 Dev Module
ESP32S2 Dev Module
ESP32 Dev Module
ESP32-WROOM-DA Module
ESP32 Wrover Module
ESP32 PICO-D4
ESP32S3 Dev Module Octal (WROOM2)
ESP32-S3-Box
ESP32-S3-USB-OTG
ESP32S3 CAM LCD
ESP32S2 Native USB
ESP32 Wrover Kit (all versions)
Aventen S3 Sync
BharatPi Node Wifi Module
BharatPi A7672S 4G Module
BharatPi LoRa Module
UM BLING
UM FeatherS2
UM FeatherS2 Neo
UM FeatherS3
UM FeatherS3 Neo
UM NanoS3
UM OMGS3
UM PROS3
UM TinyPICO
UM TinyC6
UM TinyS2
UM TinyS3
S.ODI Ultra v1
LilyGo T-Display
LilyGo T-Display-S3
LilyGo T-ETH-Lite
LilyGo T3-S3
LilyGo T-Watch-S3
3
Output

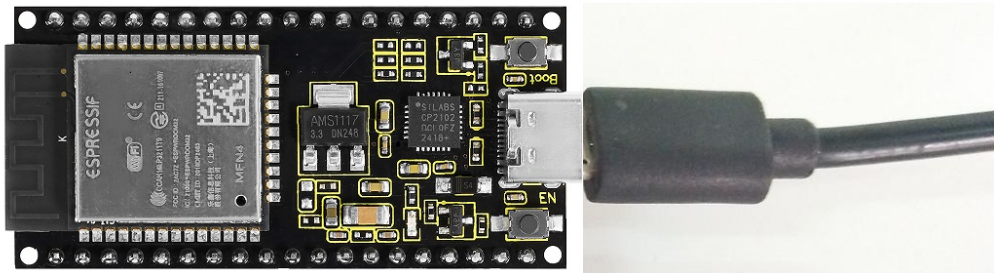
Step4 Arduino IDE Toolbar and Setting

The functions of each button on the Toolbar are listed below:



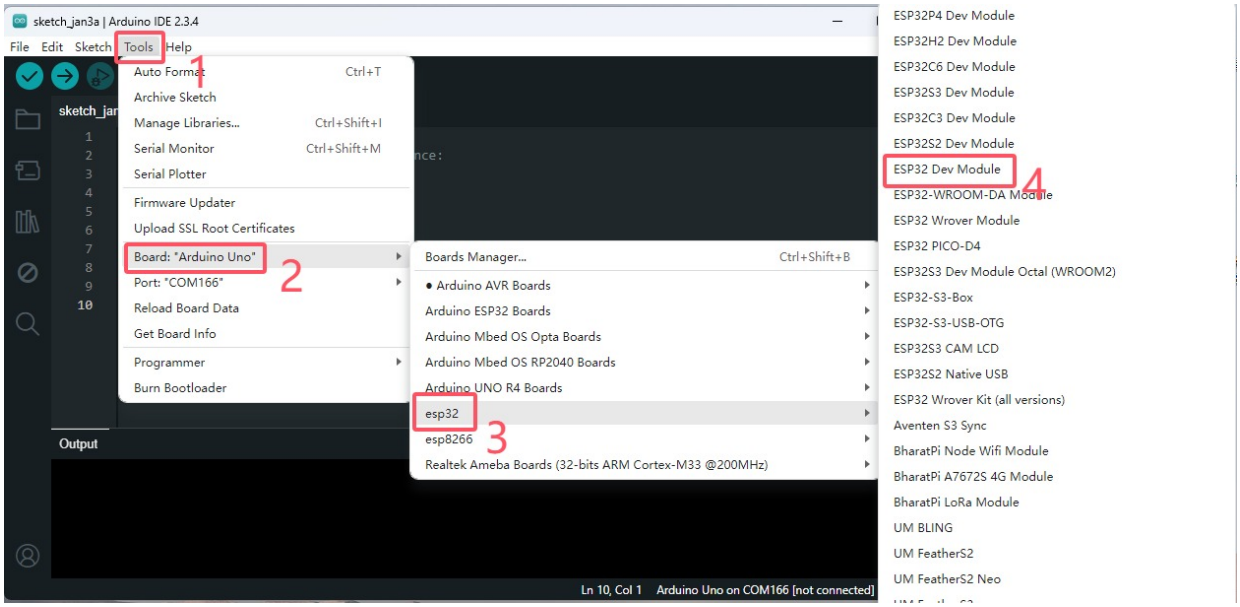
Verify	Check the code for errors
Upload	Upload the current Sketch to the Arduino
Debugging	Create a new blank Sketch
Serial Plotter	Show a list of Sketches
Serial Monitor	Display the serial data being sent from the development board

Attach your ESP32 core board to your computer with the USB cable.

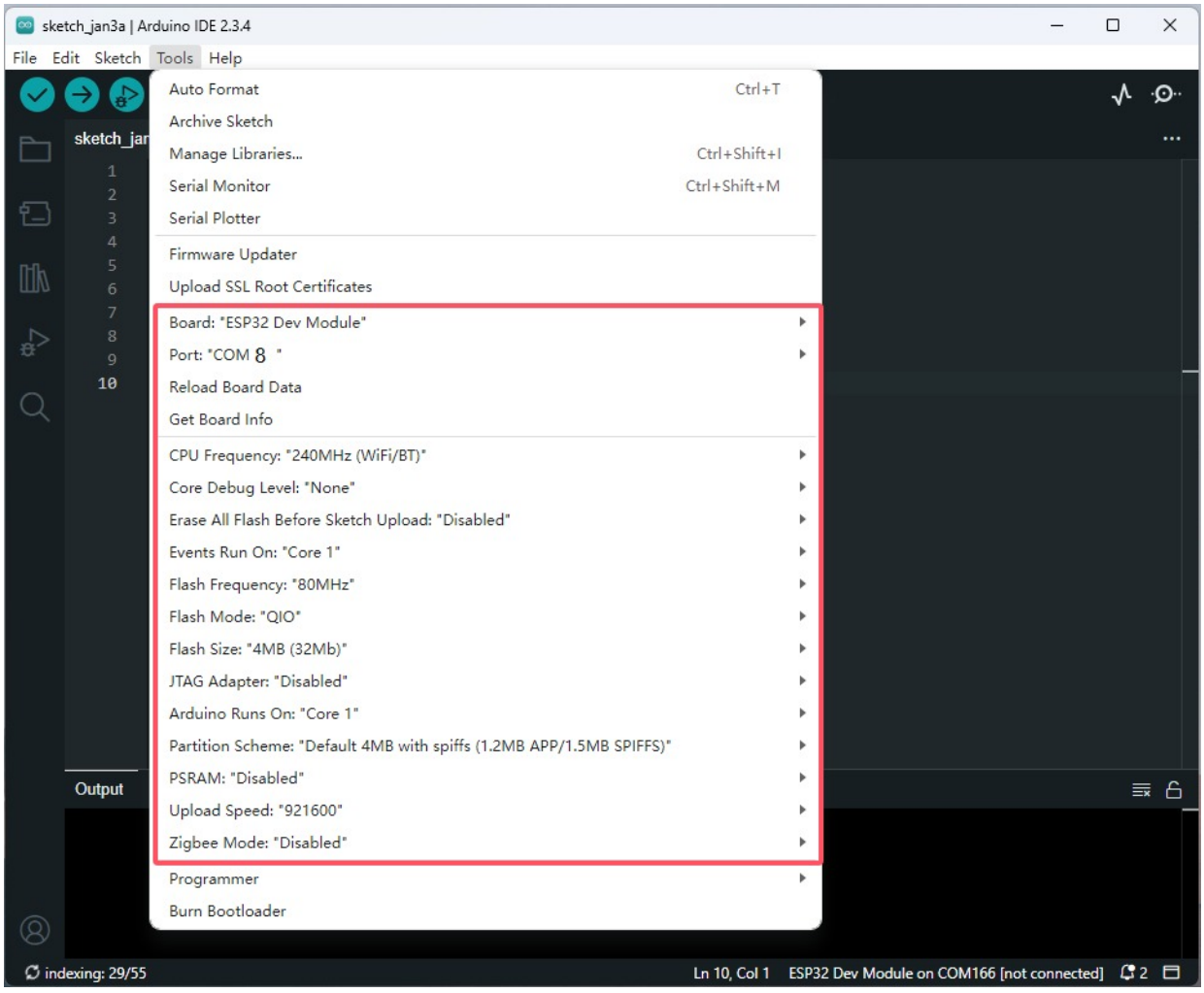


Check that the “Board Type”and “Serial Port” are set correctly.

Click to open the “**Tools”**, for “**Board”**, scroll to select the ESP32 Dev Module.

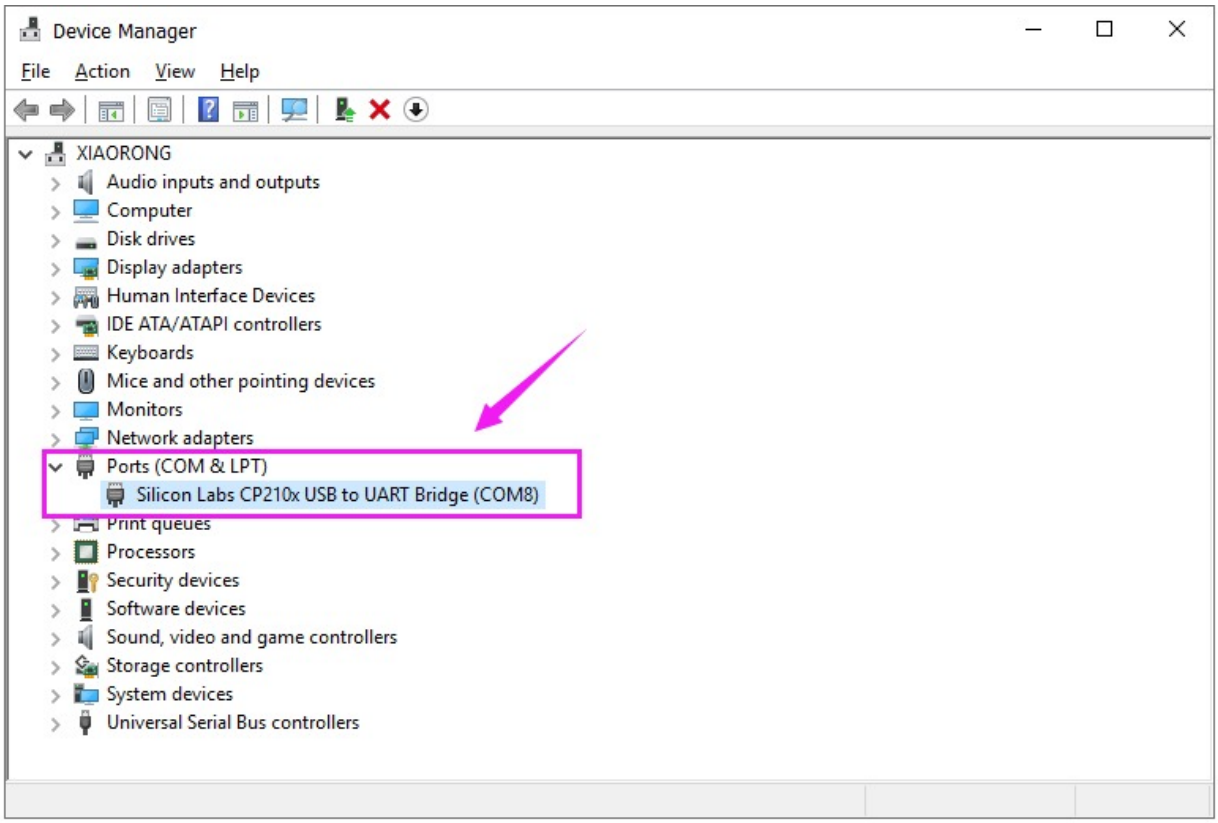


Select well the correct board and then should set the detailed information as shown below.

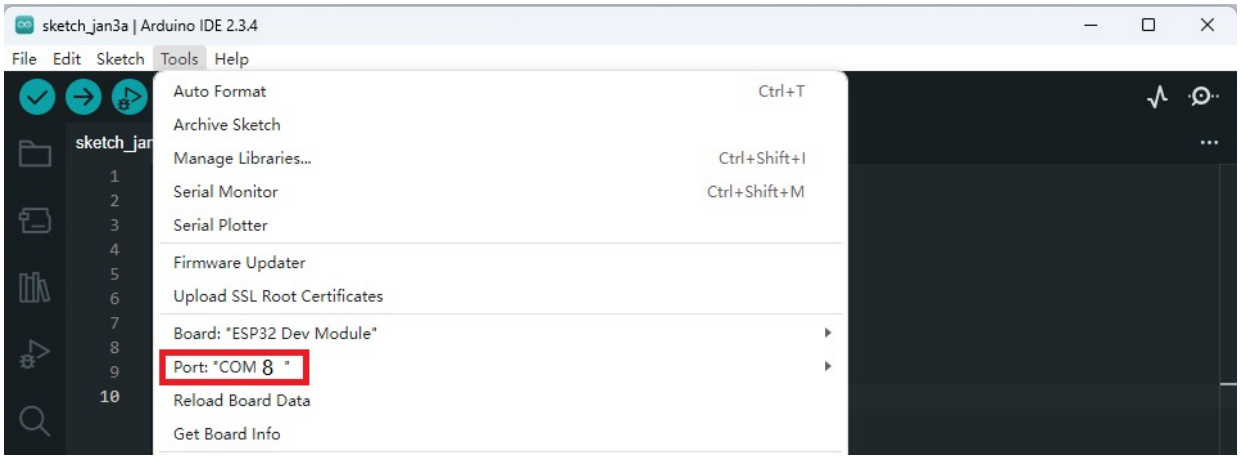


Pay close attention to select the proper **COM** port. (Arduino driver installed well, you are supposed to see the corresponding port.)

Check out the COM port in the Device Manager of your computer's control panel.

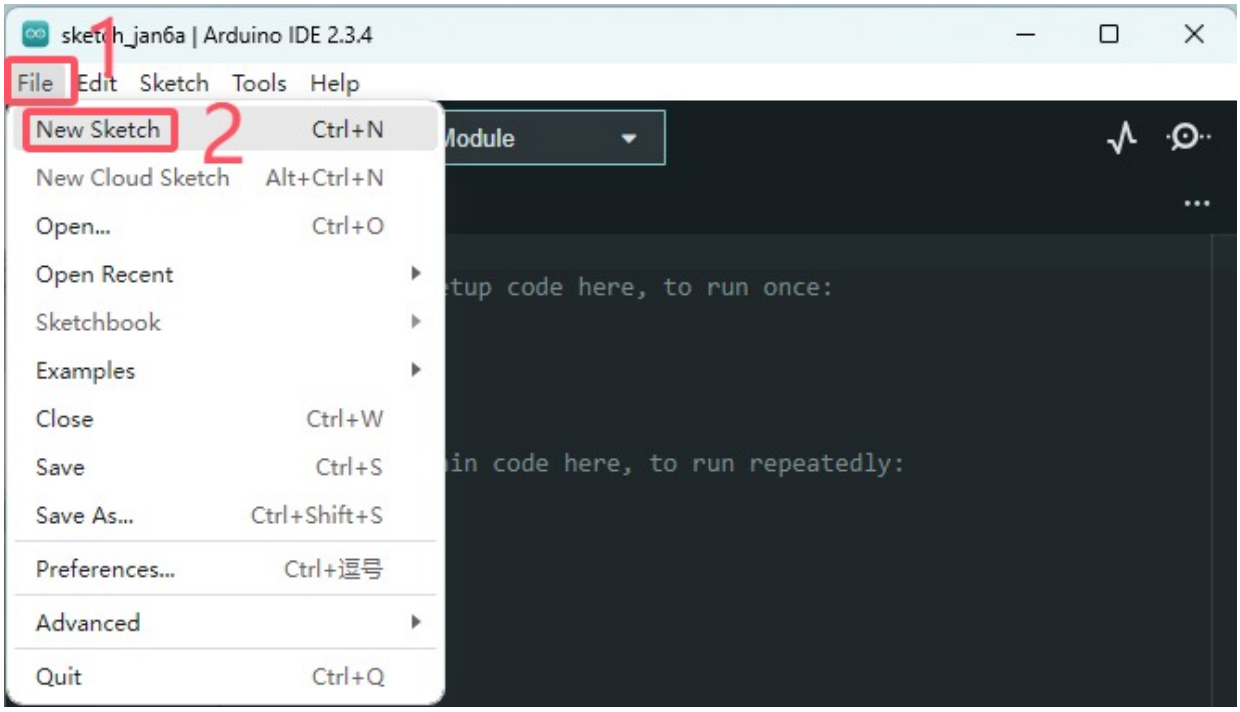


Here we can know the COM port is COM 8. Then select the Port COM 8 in the Arduino Tools.



Step5 Upload the Code

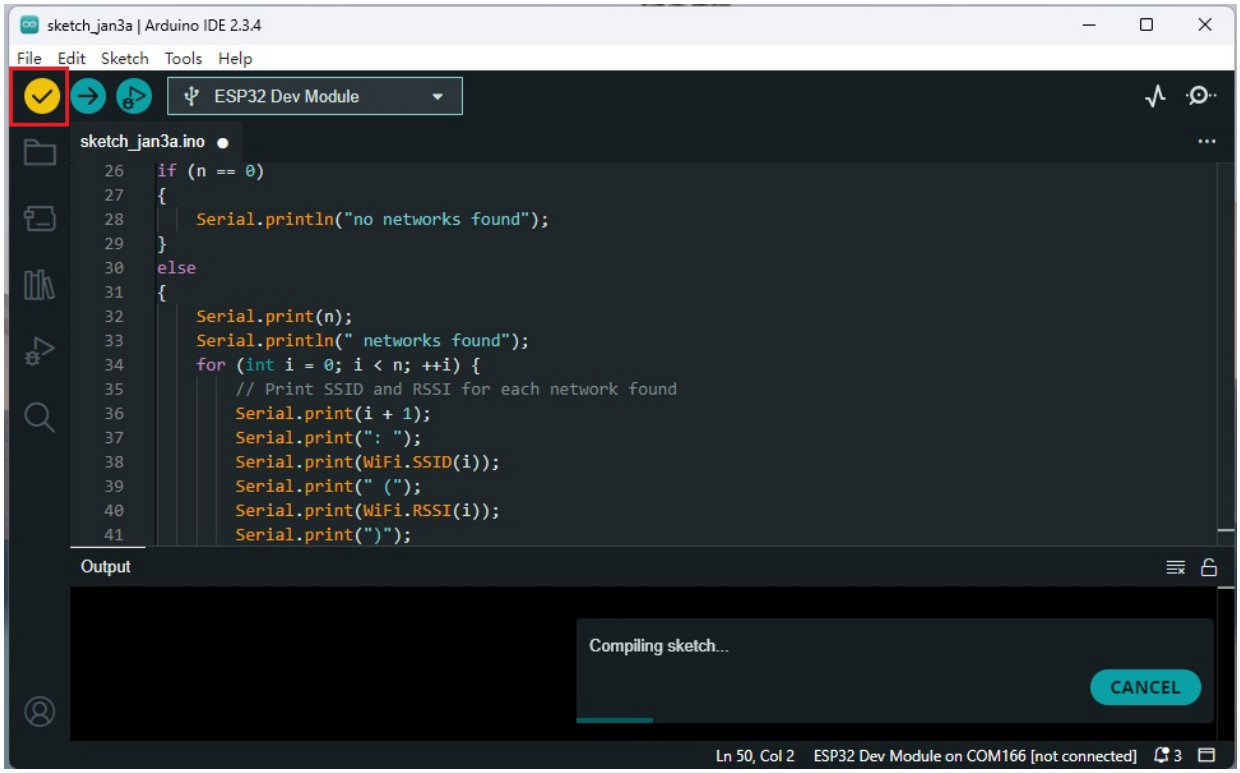
Create a new sketch:



Paste and copy the source code below to Arduino IDE.

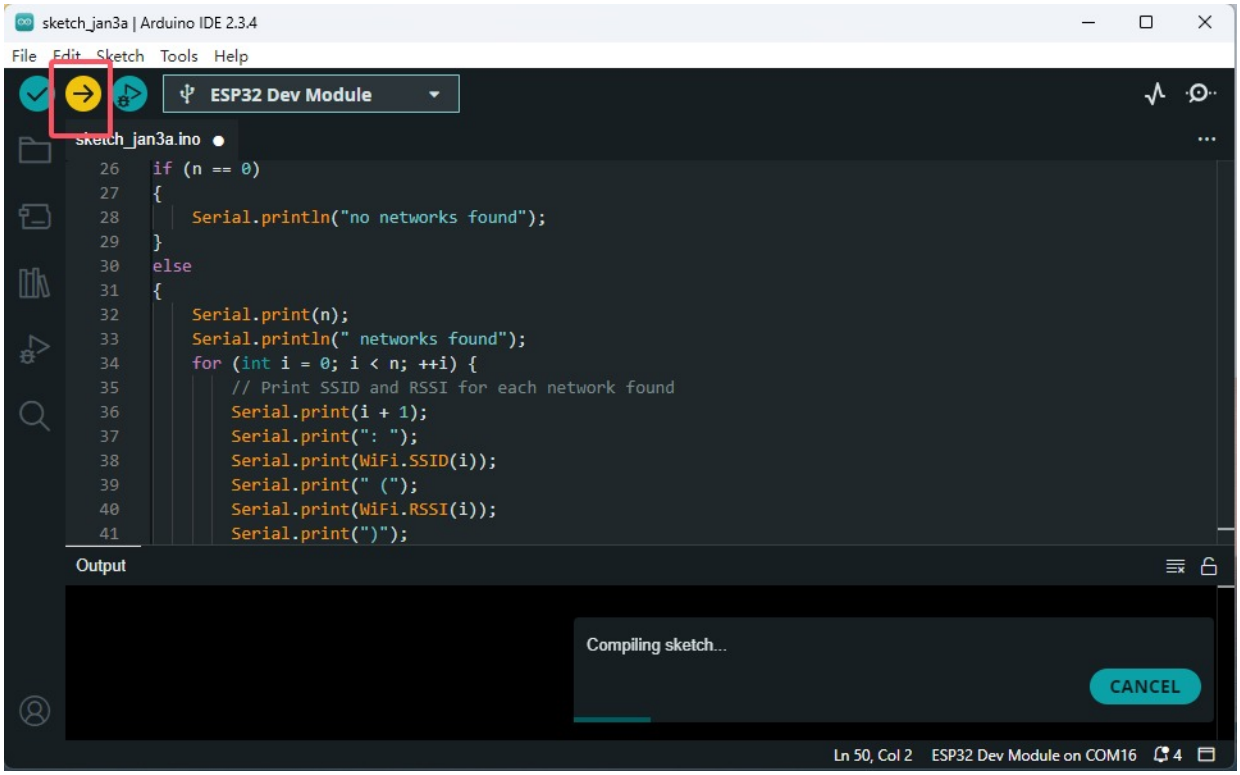
```
/*
This sketch demonstrates how to scan WiFi networks.
The API is almost the same as with the WiFi Shield library,
the most obvious difference being the different file you need to include:
*/

#include "WiFi.h"

void setup()
{
Serial.begin(115200);
// Set WiFi to station mode and disconnect from an AP if it was previously connected
WiFi.mode(WIFI_STA);
WiFi.disconnect();
delay(100);
Serial.println("Setup done");
}

void loop()
{
Serial.println("scan start");
// WiFi.scanNetworks will return the number of networks found
int n = WiFi.scanNetworks();
Serial.println("scan done");

if (n == 0)
{
    Serial.println("no networks found");
}
else
{
    Serial.print(n);
    Serial.println(" networks found");
    for (int i = 0; i < n; ++i) {
        // Print SSID and RSSI for each network found
        Serial.print(i + 1);
        Serial.print(": ");
        Serial.print(WiFi.SSID(i));
        Serial.print(" (");
        Serial.print(WiFi.RSSI(i));
        Serial.print(")");
        Serial.println((WiFi.encryptionType(i) == WIFI_AUTH_OPEN)?" ":"*");
        delay(10);
    }
}

Serial.println("");
// Wait a bit before scanning again
delay(5000);
}
```

Click verify button to check the errors. If compiling successfully, the message “Done compiling.” will appear in the status bar.

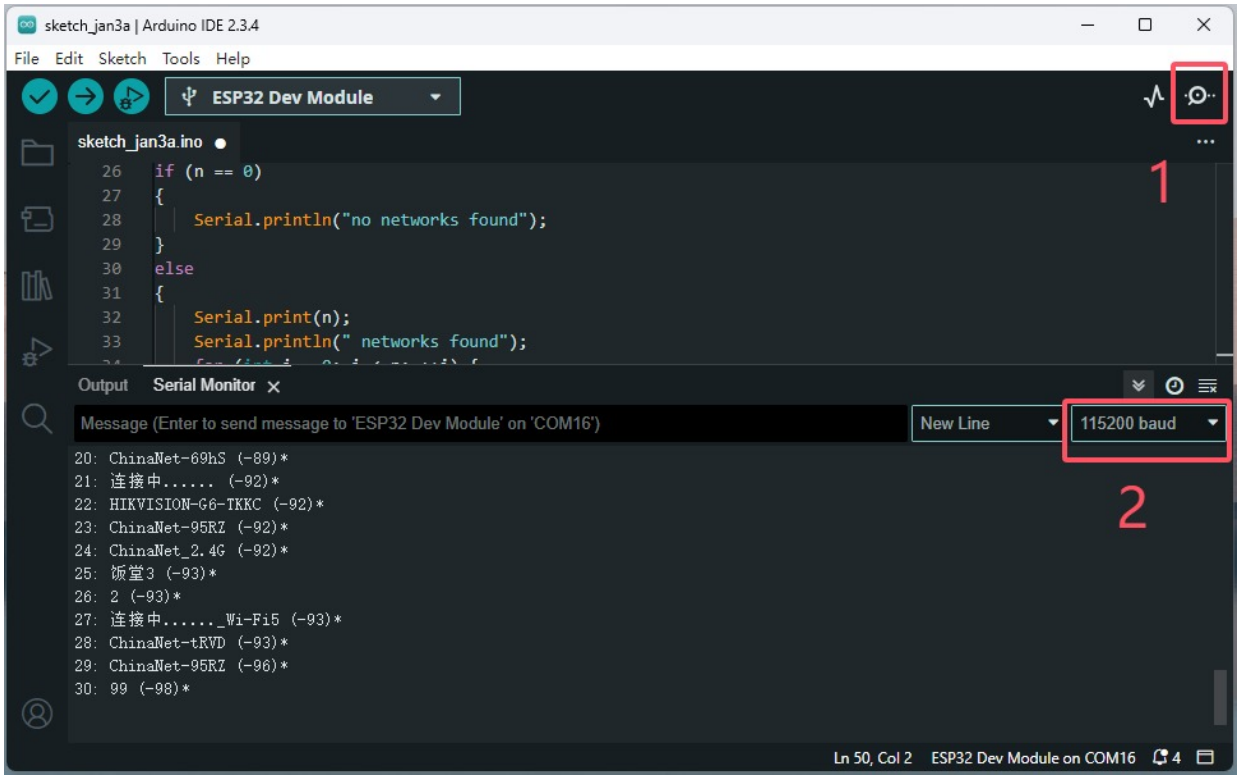


After that, click the “Upload” button to upload the code. If the upload is successful, the message “Done uploading.” will appear in the status bar.

Special Note: if fail to upload, when upload the source code, hold the BOOT button on the ESP32 board until upload well the code.



Done uploading the code to your board, open the serial monitor and set the baud rate to 115200. You should be able to see the WIFI information on the pop-up window.


sketch_jan3a | Arduino IDE 2.3.4
File Edit Sketch Tools Help
ESP32 Dev Module
sketch_jan3a.ino
if (n == 0)
{
Serial.println("no networks found");
}
else
{
Serial.print(n);
Serial.println(" networks found");
1
Output Serial Monitor
Message (Enter to send message to 'ESP32 Dev Module' on 'COM16')
New Line
115200 baud
2
20: ChinaNet-69hS (-89)*
21: 连接中..... (-92)*
22: HIKVISION-G6-TKKC (-92)*
23: ChinaNet-95RZ (-92)*
24: ChinaNet_2.4G (-92)*
25: 饭堂3 (-93)*
26: 2 (-93)*
27: 连接中....._Wi-Fi5 (-93)*
28: ChinaNet-tRVD (-93)*
29: ChinaNet-95RZ (-96)*
30: 99 (-98)*
Ln 50, Col 2 ESP32 Dev Module on COM16 4

End.