

Installation of Arduino IDE and Libraries for ESP32

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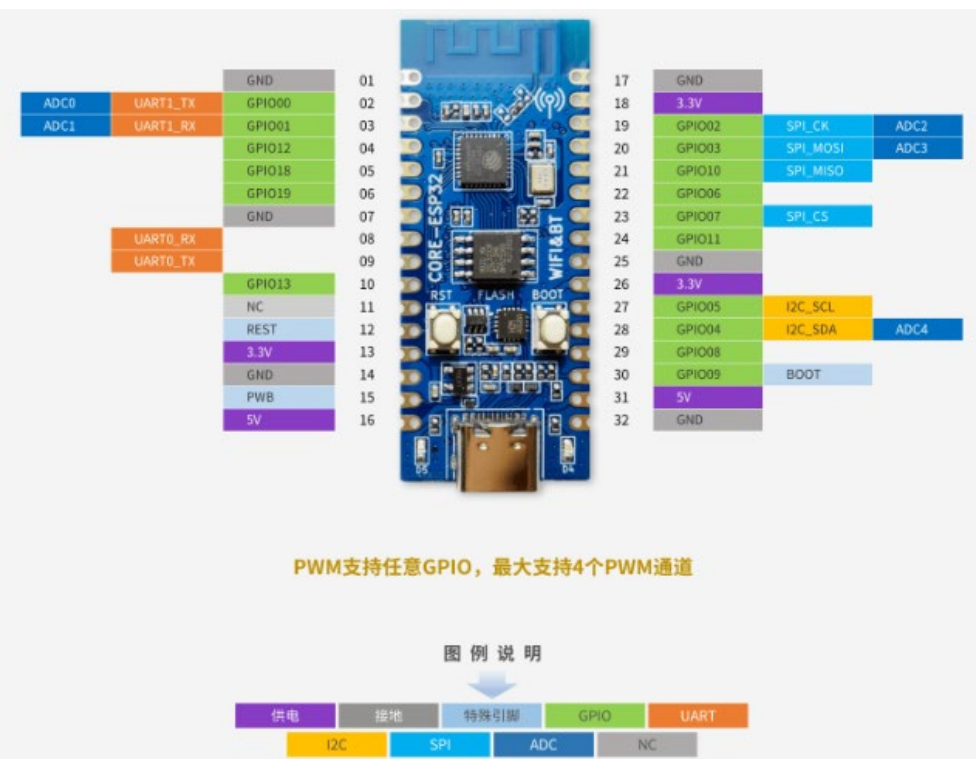
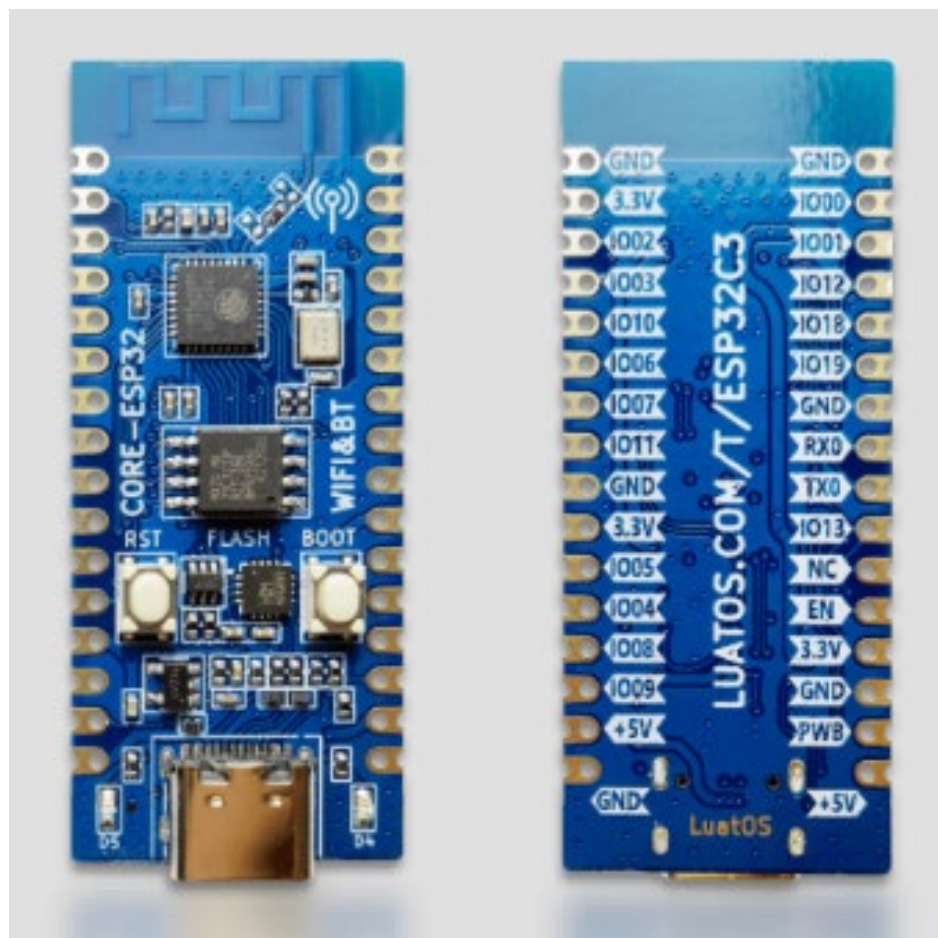
21 Feb 2024

Scope

- Install Arduino IDE and necessary libraries for compilation of the program on ESP32

ESP32 C3

- <https://www.designandmake.org/x/rbjPCw>



<https://wiki.luatos.com/chips/esp32c3/board.html>

Outline

- 1. Install Arduino IDE
 - Install the Arduino Integrated development environment (IDE) and the ESP32 core library for compiling and uploading program to an ESP32C3 device
- 2. Compile and Upload “Blink”
 - Compile and upload an example program (“Blink”) to ESP32C3 to verify step 1

Install Arduino IDE (1)

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



HARDWARE

SOFTWARE

CLOUD

DOCUMENTATION

COMMUNITY ▾

BLOG

ABOUT

Downloads



Arduino IDE 2.3.2

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.

For more details, please refer to the [Arduino IDE 2.0 documentation](#).

Nightly builds with the latest bugfixes are available through the section below.

SOURCE CODE

The Arduino IDE 2.0 is open source and its source code is hosted on [GitHub](#).

DOWNLOAD OPTIONS

Windows Win 10 and newer, 64 bits

Windows MSI installer

Windows ZIP file

Linux AppImage 64 bits (X86-64)

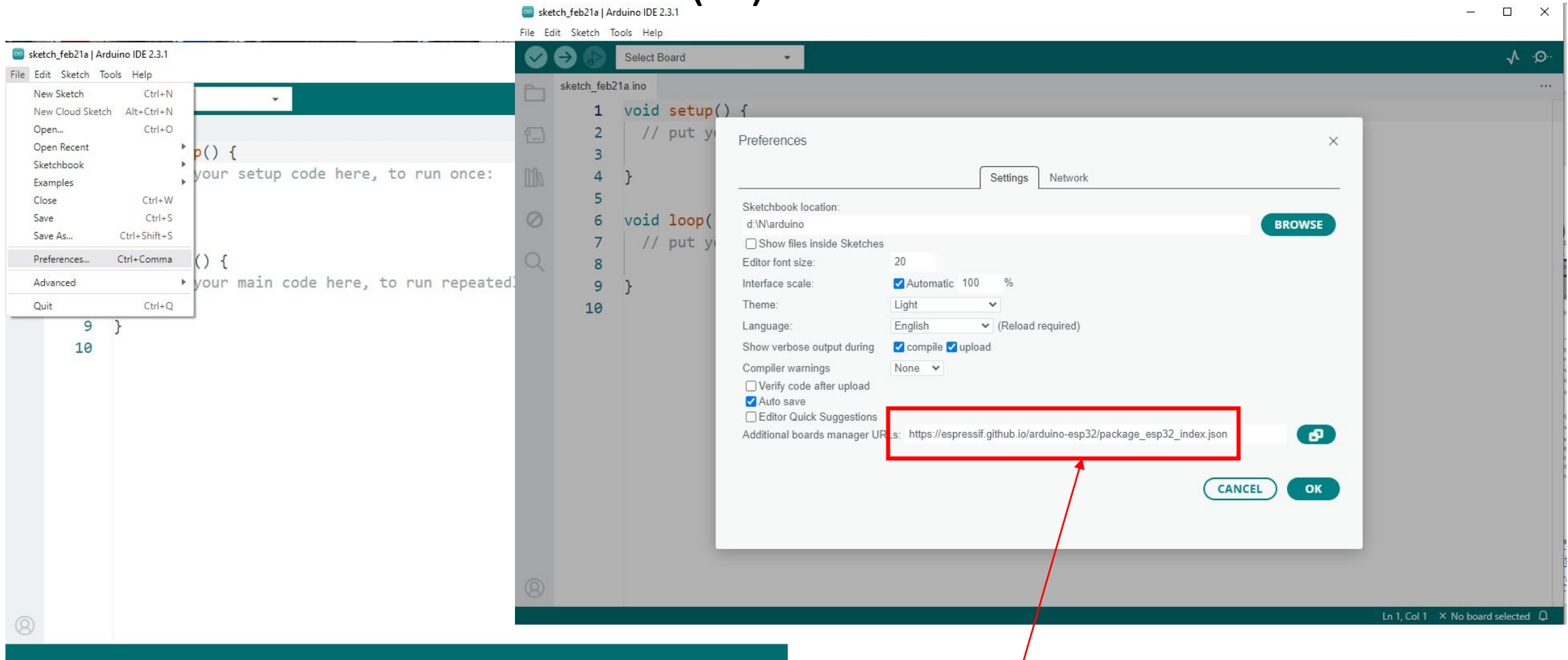
Linux ZIP file 64 bits (X86-64)

macOS Intel, 10.14: "Catalina" or newer, 64 bits

macOS Apple Silicon, 11: "Big Sur" or newer, 64 bits

[Release Notes](#)

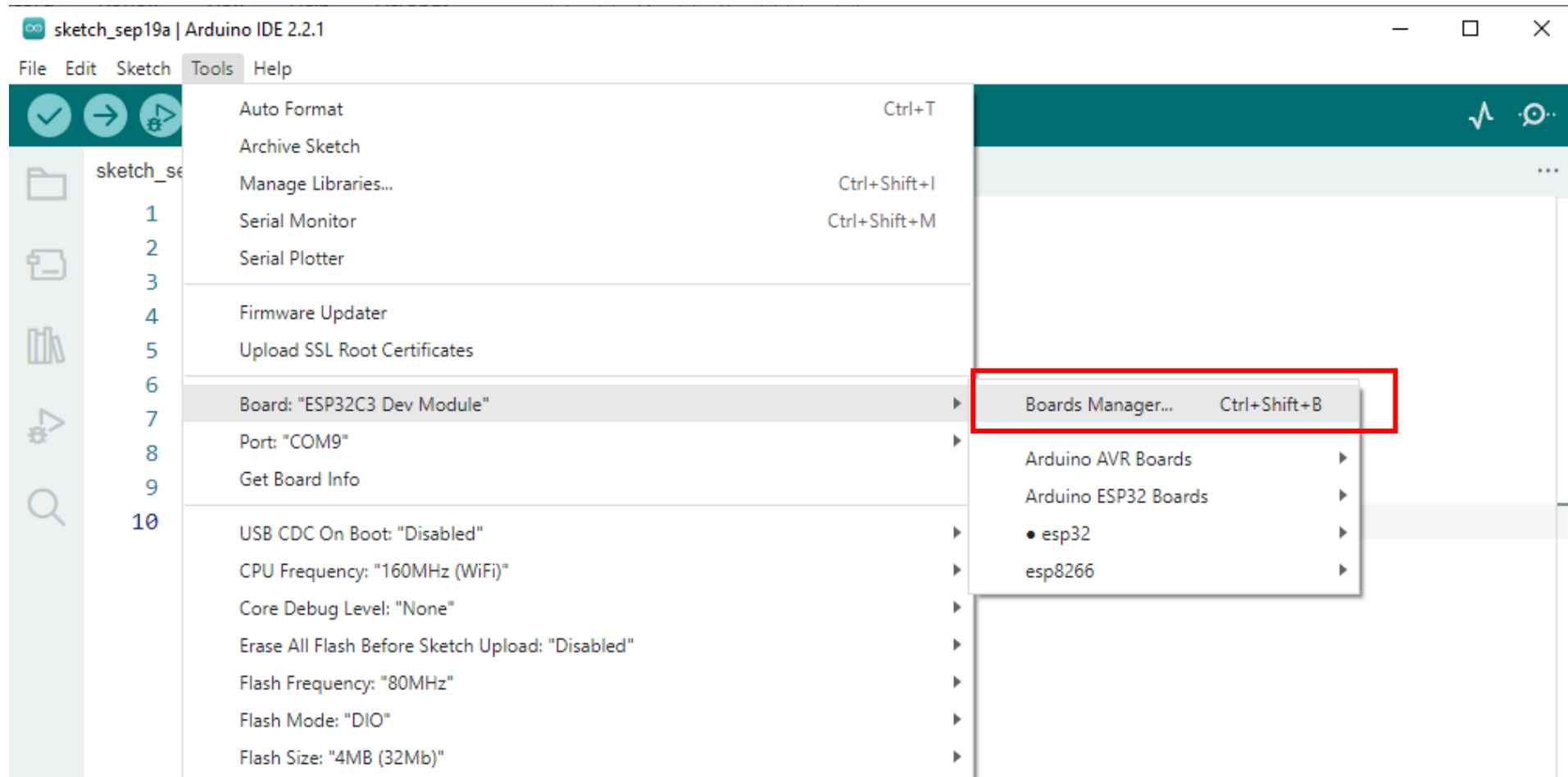
Install Arduino IDE (2)



Type: https://espressif.github.io/arduino-esp32/package_esp32_index.json
Refer to <https://docs.espressif.com/projects/arduino-esp32/en/latest/installing.html>

Install Arduino IDE (3)

- Tools > Boards > Board Managers



Install Arduino IDE (4)

sketch_sep19a | Arduino IDE 2.2.1

File Edit Sketch Tools Help

ESP32C3 Dev Module

BOARDS MANAGER

esp32

Type: All

Arduino ESP32 Boards by Arduino
2.0.12 installed
Boards included in this package: Arduino Nano ESP32
[More info](#)
2.0.13 **UPDATE**

esp32 by Espressif Systems
2.0.11 installed
Boards included in this package: OLIMEX ESP32-PoE-ISO, M5Stack-ATOMS3, Bee Motion Mini, SparkFun ESP32 MicroMod, Widora AIR, LOLIN S3 Mini, Adafruit QT Py ESP32, BPI-Leaf-S3, Deneyap Kart 1A v2...
[More info](#)
2.0.11 **REMOVE**

sketch_sep19a.ino

```
1 void setup() {  
2   // put your setup code here, to run on  
3  
4 }  
5  
6 void loop() {  
7   // put your main code here, to run rep  
8  
9 }  
10
```

Install this one

Install Arduino IDE (5)

The screenshot shows the Arduino IDE interface with the Board Manager menu open. The menu is divided into two panes. The left pane lists various boards, and the right pane lists specific board models. The 'AirM2M_CORE_ESP32C3' board is selected in the right pane, indicated by a red box and a red arrow pointing to it from the text 'AirM2M_CORE_ESP32C3' on the right side of the image.

sketch_feb24a | Arduino IDE 2.3.1

File Edit Sketch Tools Help

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: "AirM2M_CORE_ESP32C3" ▶ Boards Manager... Ctrl+Shift+B

Port: "COM4" ▶ Arduino AVR Boards ▶

Get Board Info ▶ esp32 ▶

esp8266 ▶

USB CDC On Boot: "Disabled" ▶

CPU Frequency: "160MHz (WiFi)" ▶

Core Debug Level: "None" ▶

Erase All Flash Before Sketch Upload: "Disabled" ▶

Flash Frequency: "80MHz" ▶

Partition Scheme: "Default 4MB with spiiffs (1.2MB APP/1.5MB SPIFFS)" ▶

Upload Speed: "921600" ▶

Programmer ▶

Burn Bootloader ▶

WiFiduinoV2

WiFiduino32S3

IMBRIOS LOGSENS_V1P1

ProtoCentral HealthyPi 4

ET-Board

Denky

uPesy ESP32 Wrover DevKit

uPesy ESP32 Wroom DevKit

KB32-FT

Deneyap Kart

Deneyap Kart 1A

Deneyap Kart 1A v2

Deneyap Mini

Deneyap Mini v2

Deneyap Kart G

Trueverit ESP32 Universal IoT Driver

Trueverit ESP32 Universal IoT Driver MK II

ATMegaZero ESP32-S2

Franzininho WiFi

Franzininho WiFi MSC

TAMC Termod S3

DPU ESP32

Sonoff DUALR3

Lion:Bit Dev Board

Watchy

✓ AirM2M_CORE_ESP32C3

XIAO_ESP32C3

XIAO_ESP32S3

Connaxio's Espoir

CNRS AW2ETH

Department of Alchemy MiniMain ESP32-S2

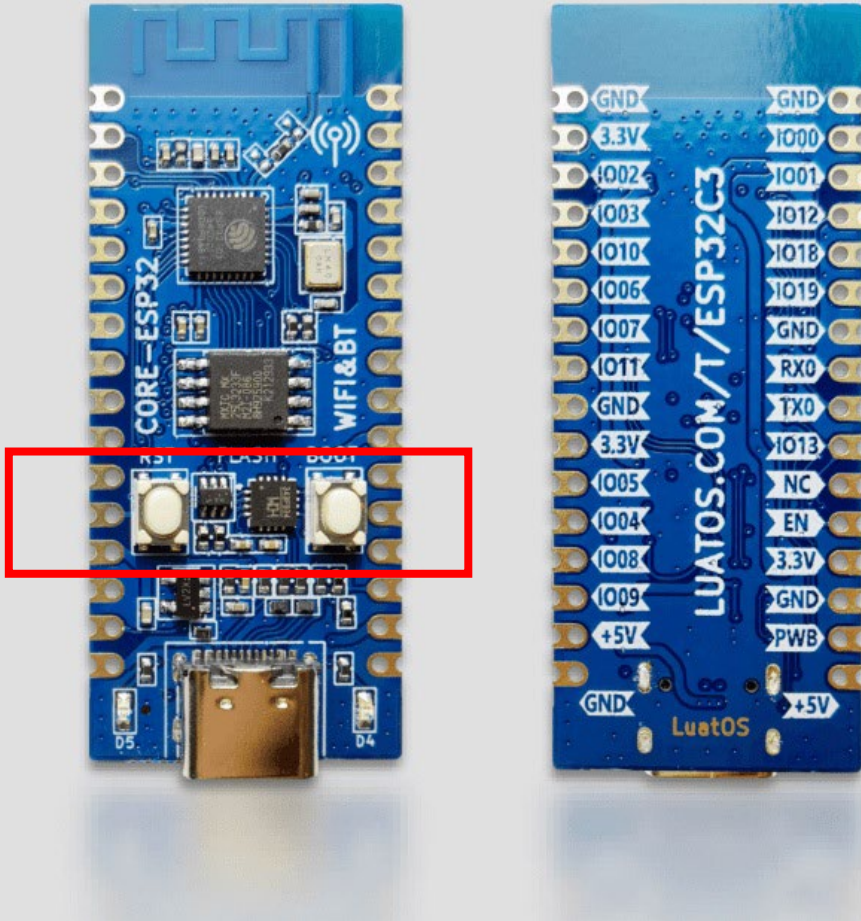
Bee Data Logger

Bee Motion S2

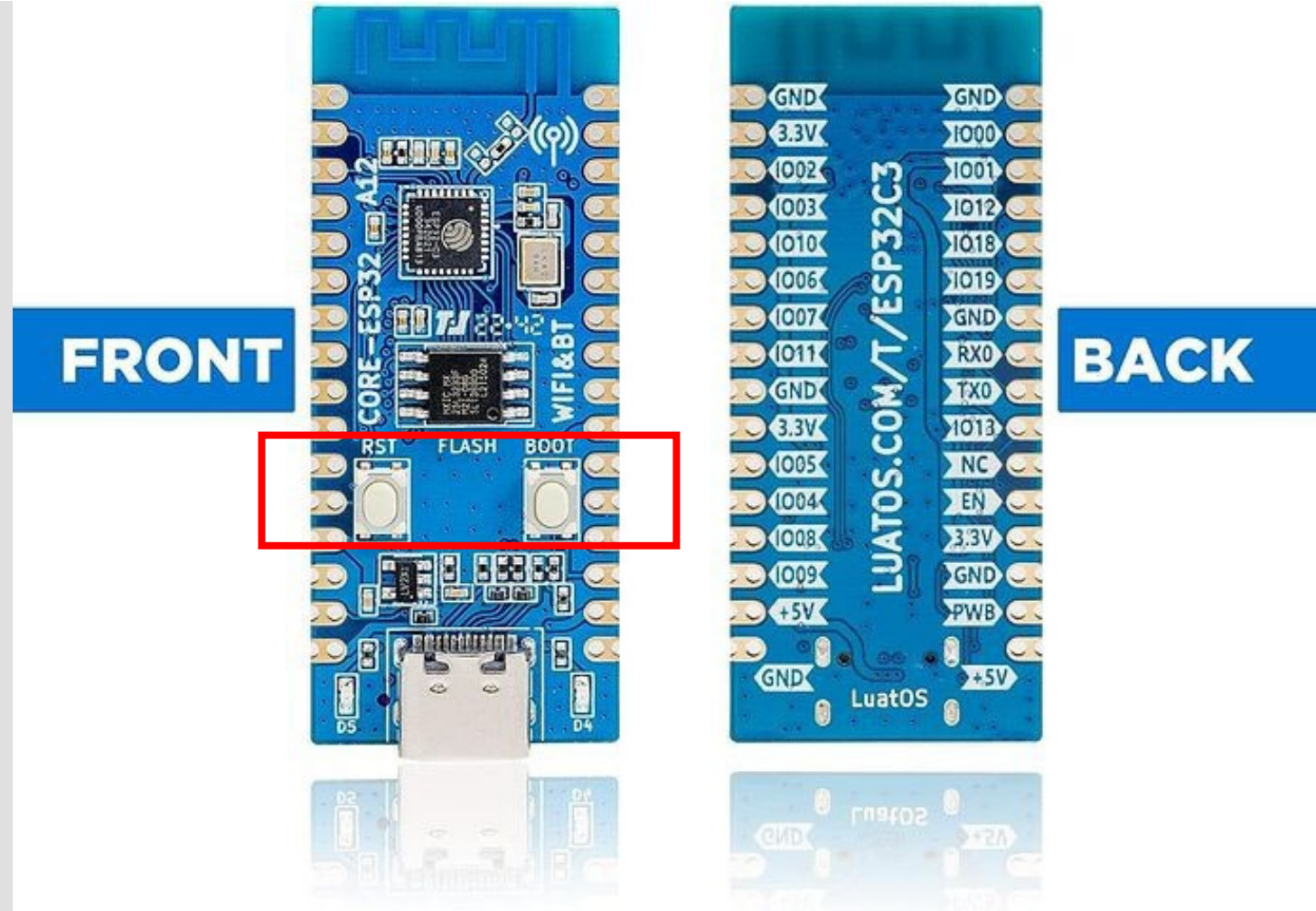
AirM2M_CORE_ESP32C3

indexing: 17/49

Confirm Type of ESP32 C3 board



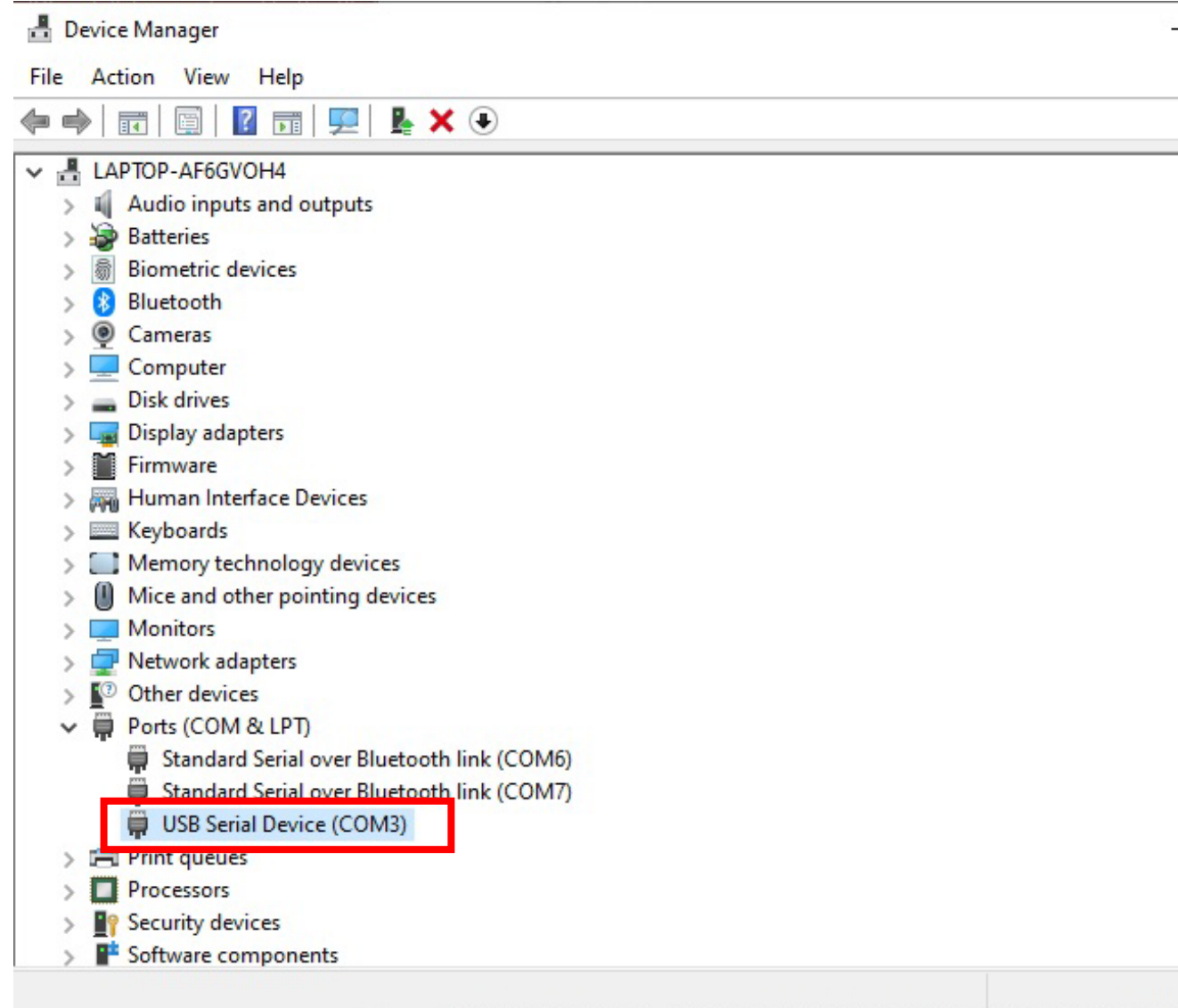
With CH343 chip



Without CH343 chip

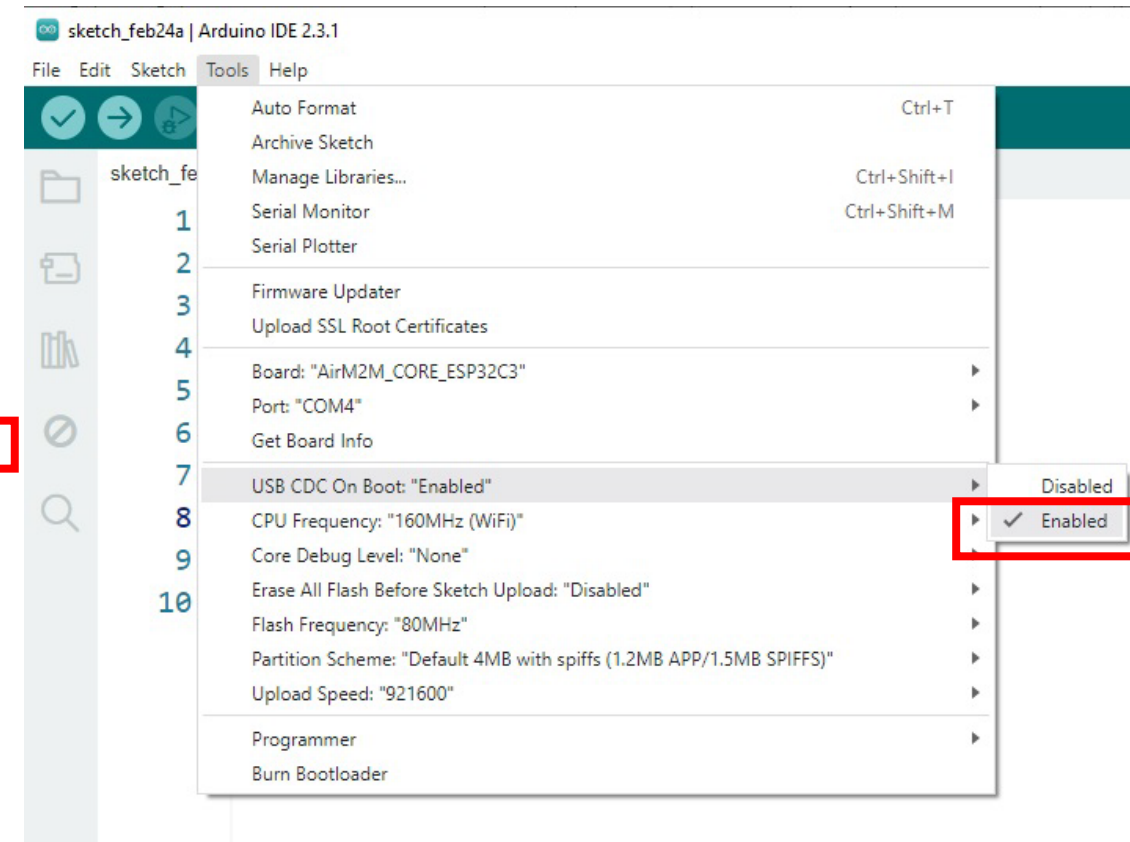
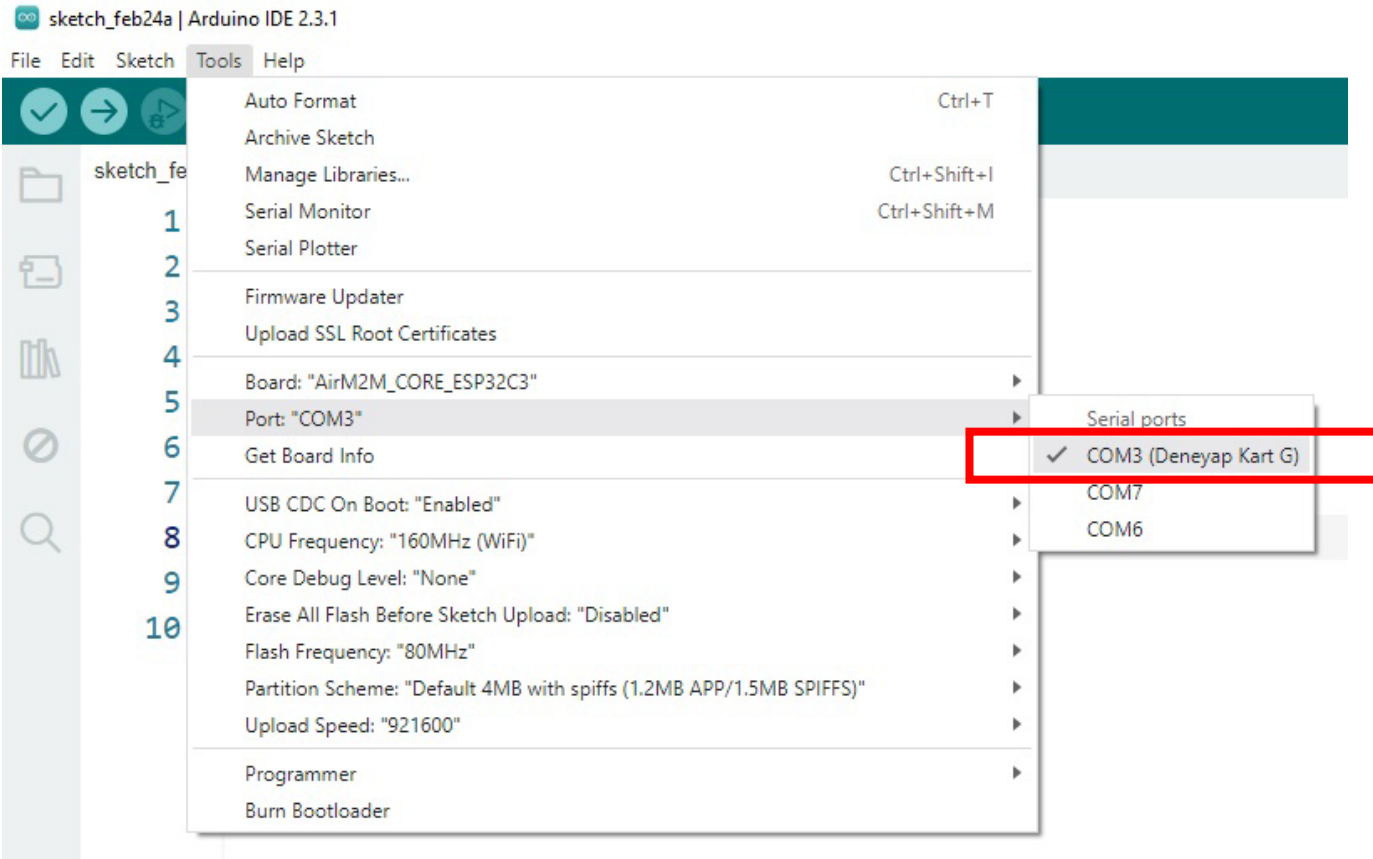
For Board Without CH343 (1)

- Connect ESP32C3 board to PC through a USB Type C cable
- Run Device Manager to determine port number



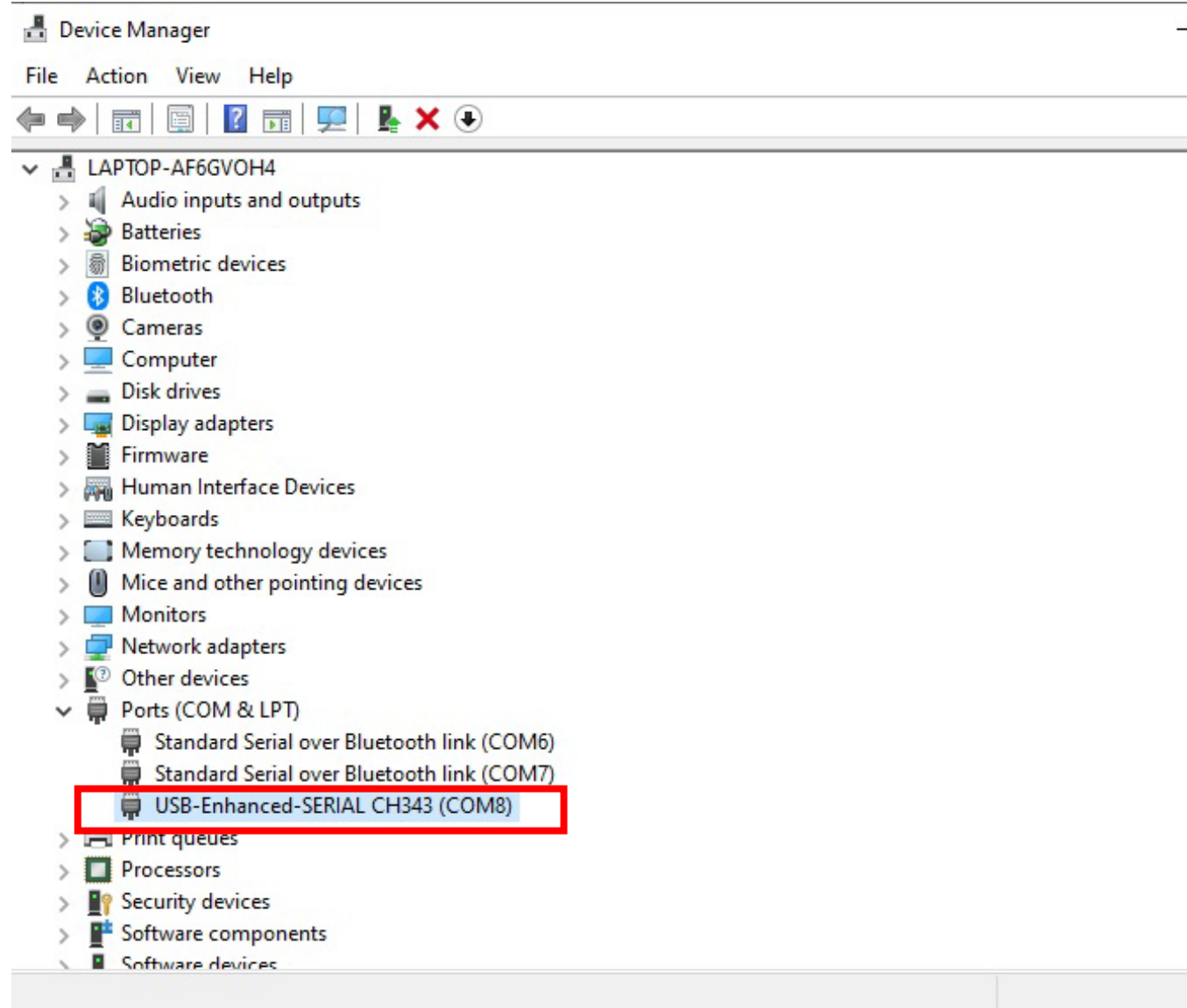
For Board Without CH343 (2)

- Set Port on Arduino, and enable CDC



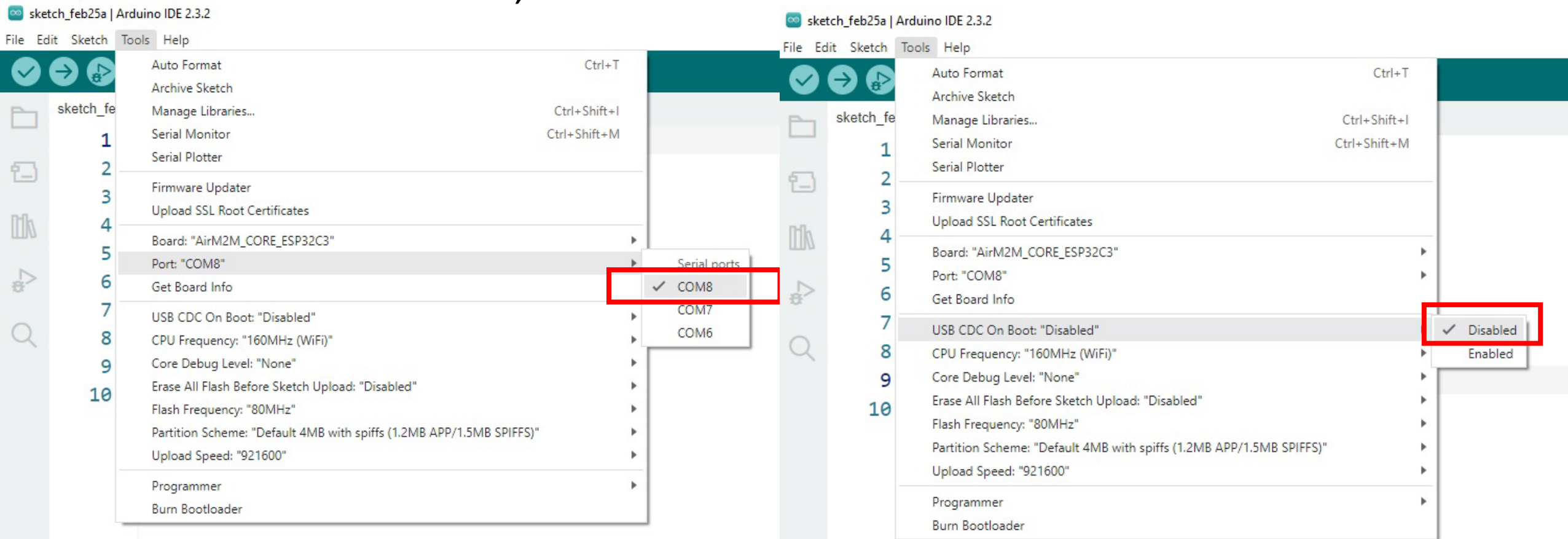
For Board With CH343 Chip (1)

- Connect ESP32C3 board to PC through a USB Type C cable
- Run Device Manager to determine port number



For Board With CH343 Chip (1)

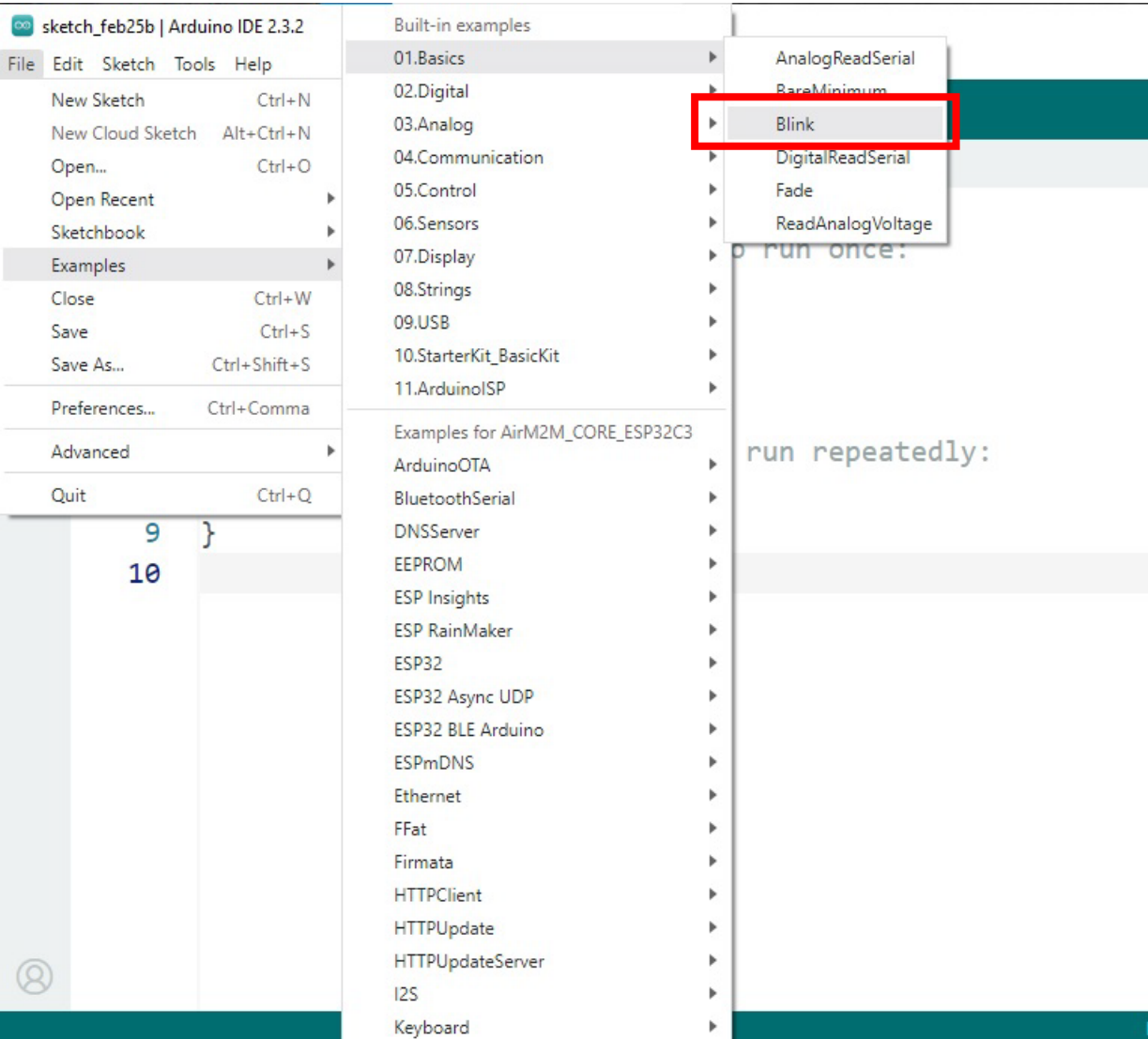
- Set Port on Arduino, and disable CDC



CH343 Driver

- CH343 – a chip on ESP32-C3 development board
- For communication between host (Windows/MacOS) and ESP32-C3 chip
- No need to install driver on Windows
- Need to install driver on some Mac
 - Refer to https://github.com/WCHSoftGroup/ch34xser_macos

Compile and Upload “Blink” (1)



sketch_feb25b | Arduino IDE 2.3.2

File Edit Sketch Tools Help

New Sketch Ctrl+N
New Cloud Sketch Alt+Ctrl+N
Open... Ctrl+O
Open Recent
Sketchbook
Examples
Close Ctrl+W
Save Ctrl+S
Save As... Ctrl+Shift+S
Preferences... Ctrl+Comma
Advanced
Quit Ctrl+Q

Built-in examples

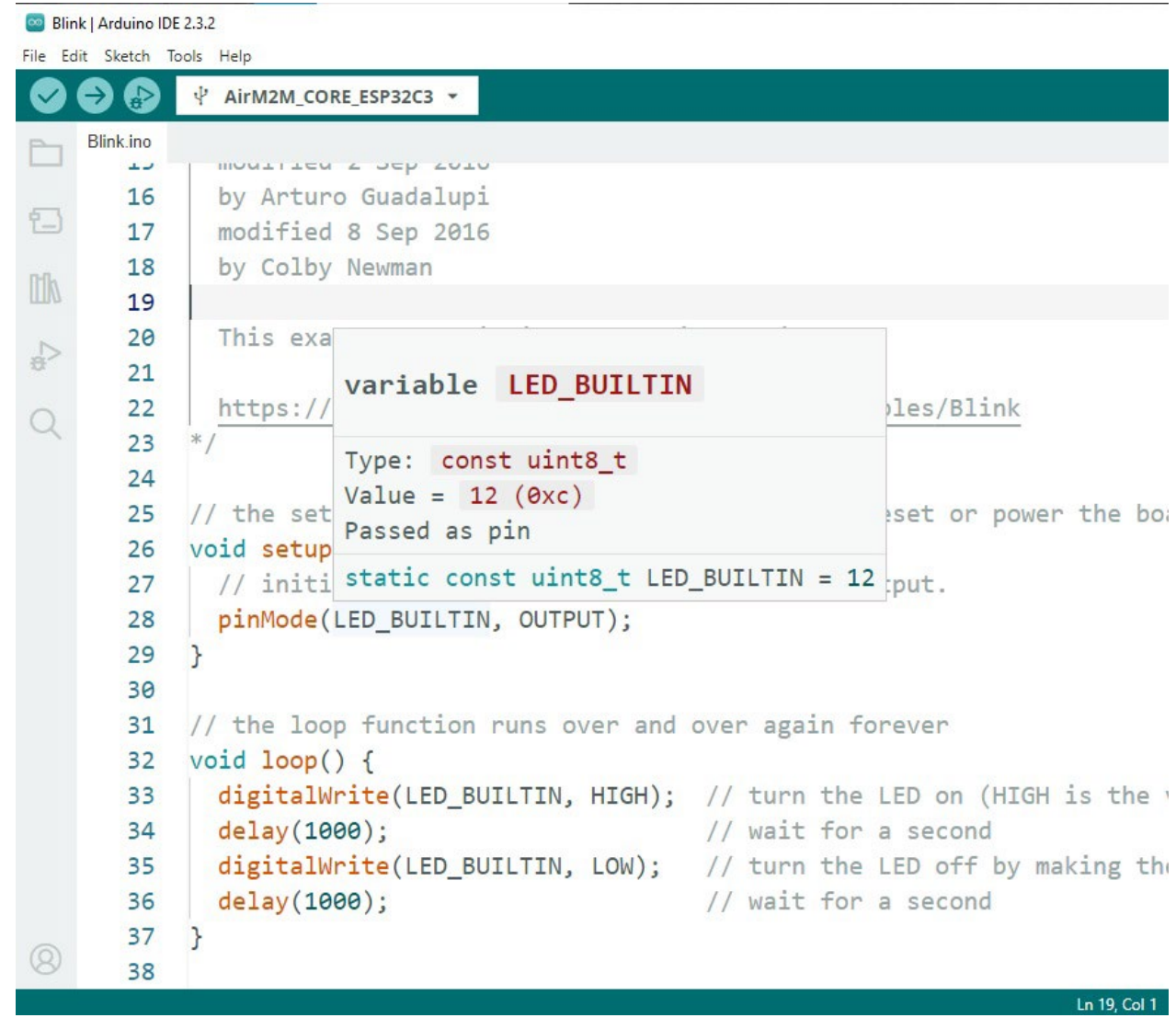
- 01.Basics
- 02.Digital
- 03.Analog
- 04.Communication
- 05.Control
- 06.Sensors
- 07.Display
- 08.Strings
- 09.USB
- 10.StarterKit_BasicKit
- 11.ArduinoISP

Examples for AirM2M_CORE_ESP32C3

- ArduinoOTA
- BluetoothSerial
- DNSServer
- EEPROM
- ESP Insights
- ESP RainMaker
- ESP32
- ESP32 Async UDP
- ESP32 BLE Arduino
- ESPmDNS
- Ethernet
- FFat
- Firmata
- HTTPClient
- HTTPUpdate
- HTTPUpdateServer
- I2S
- Keyboard

AnalogReadSerial
BareMinimum
Blink
DigitalReadSerial
Fade
ReadAnalogVoltage

run once:
run repeatedly:



Blink | Arduino IDE 2.3.2

File Edit Sketch Tools Help

AirM2M_CORE_ESP32C3

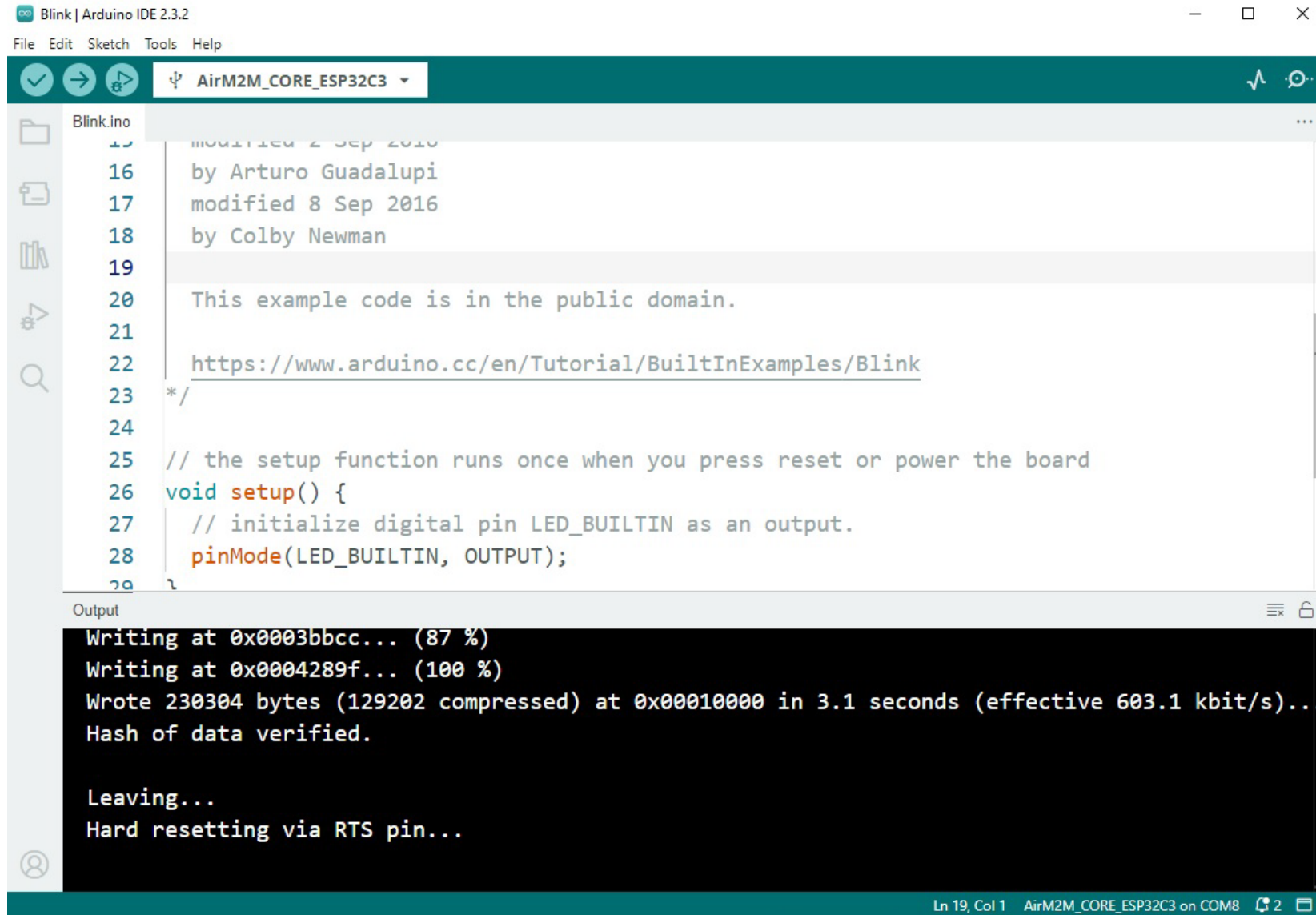
Blink.ino

```
15 // modified 2 Sep 2016
16 // by Arturo Guadalupi
17 // modified 8 Sep 2016
18 // by Colby Newman
19
20 // This example
21 // demonstrates how to use the
22 // built-in LED on the ESP32.
23 // For more information, see:
24 // https://www.espressif.com/en_US/
25 // products/ESP32-Pin-List#pin-
26 // 12
27 // The LED is controlled by the
28 // pinMode() and digitalWrite()
29 // functions.
30
31 // the setup function runs once
32 // when you first upload the
33 // program.
34 // Initialize the LED pin as:
35 // an output:
36
37 void setup() {
38   // initialize the LED pin as:
39   // an output:
40   pinMode(LED_BUILTIN, OUTPUT);
41 }
42
43 // the loop function runs over and
44 // over again forever
45
46 void loop() {
47   digitalWrite(LED_BUILTIN, HIGH);
48   // turn the LED on (HIGH is the
49   // positive voltage)
50   delay(1000);
51   // wait for a second
52   digitalWrite(LED_BUILTIN, LOW);
53   // turn the LED off by making the
54   // pin LOW (no voltage)
55   delay(1000);
56   // wait for a second
57 }
58
```

variable LED_BUILTIN
Type: const uint8_t
Value = 12 (0xc)
Passed as pin

Ln 19, Col 1

Compile and Upload “Blink” (2)



The screenshot displays the Arduino IDE 2.3.2 interface. The top menu bar includes File, Edit, Sketch, Tools, and Help. The toolbar shows icons for checking, running, and uploading. The board is set to AirM2M_CORE_ESP32C3. The main editor window shows the Blink.ino file with the following code:

```
15  // modified 2 Sep 2016
16  // by Arturo Guadalupi
17  // modified 8 Sep 2016
18  // by Colby Newman
19
20  // This example code is in the public domain.
21
22  // https://www.arduino.cc/en/Tutorial/BuiltInExamples/Blink
23  */
24
25  // the setup function runs once when you press reset or power the board
26  void setup() {
27    // initialize digital pin LED_BUILTIN as an output.
28    pinMode(LED_BUILTIN, OUTPUT);
29  }
```

The Output window at the bottom shows the following messages:

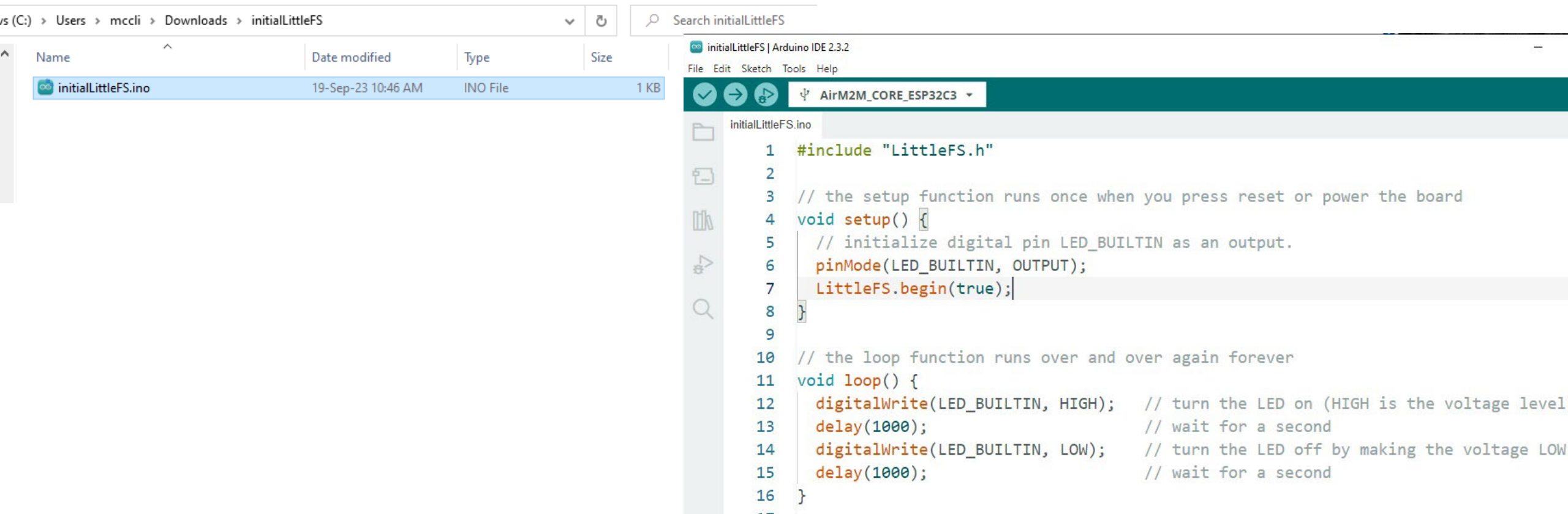
```
Writing at 0x0003bbcc... (87 %)
Writing at 0x0004289f... (100 %)
Wrote 230304 bytes (129202 compressed) at 0x00010000 in 3.1 seconds (effective 603.1 kbit/s)...
Hash of data verified.

Leaving...
Hard resetting via RTS pin...
```

The status bar at the bottom indicates the current position: Ln 19, Col 1, AirM2M_CORE_ESP32C3 on COM8, with 2 errors.

Compile and Upload “LittleFS Initialization” (1)

- Download the zip file from <https://www.designandmake.org/x/EFFvD>
- Unzip and click on the ino file

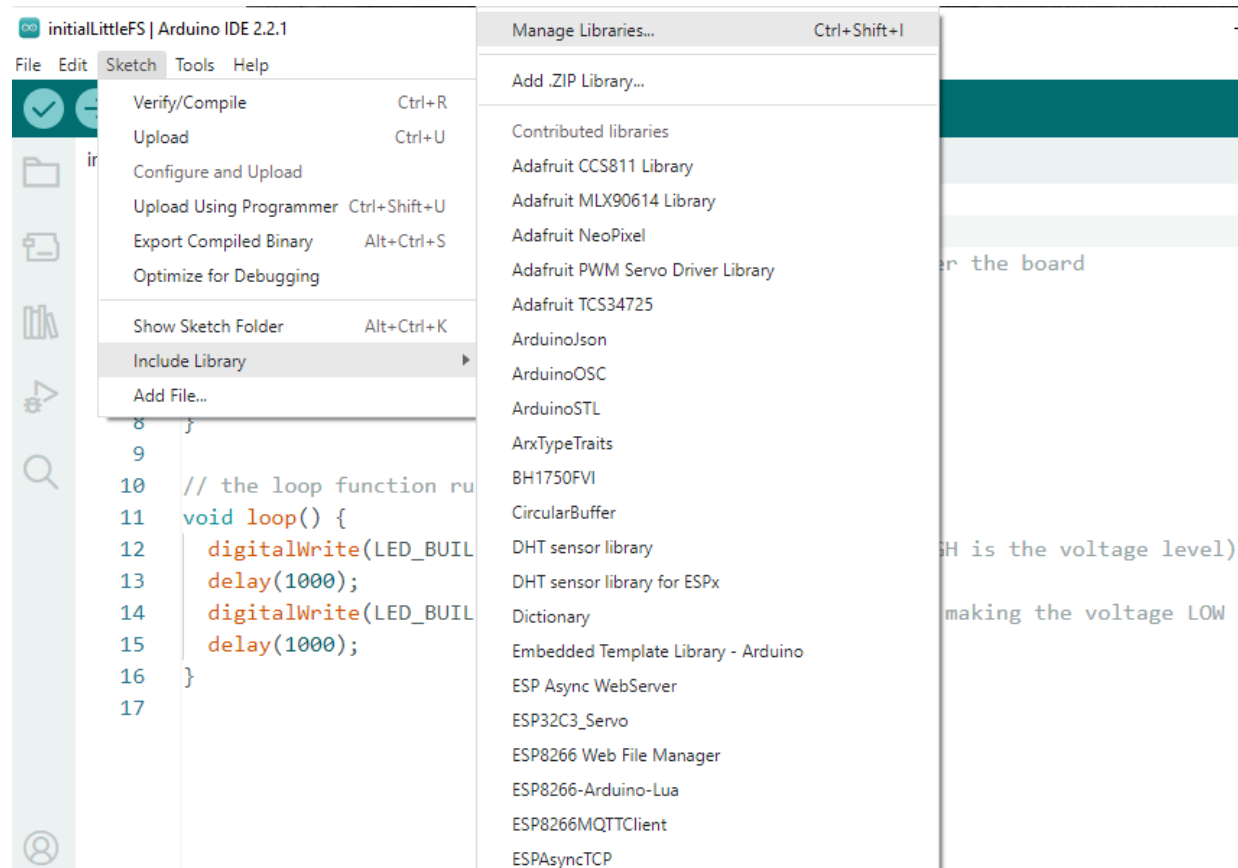


The image shows a Windows file explorer window on the left and the Arduino IDE on the right. The file explorer displays a folder named 'initialLittleFS' containing a file 'initialLittleFS.ino' with a size of 1 KB, last modified on 19-Sep-23 at 10:46 AM. The Arduino IDE window shows the code for 'initialLittleFS.ino' with the following content:

```
1 #include "LittleFS.h"
2
3 // the setup function runs once when you press reset or power the board
4 void setup() {
5     // initialize digital pin LED_BUILTIN as an output.
6     pinMode(LED_BUILTIN, OUTPUT);
7     LittleFS.begin(true);
8 }
9
10 // the loop function runs over and over again forever
11 void loop() {
12     digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
13     delay(1000); // wait for a second
14     digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the voltage LOW
15     delay(1000); // wait for a second
16 }
```

Compile and Upload “LittleFS Initialization” (2)

- Sketch > Include Library > Manage Libraries



Compile and Upload "LittleFS Initialization"

(3)

Enter "littlefs_esp32"

The image displays two screenshots of the Arduino IDE interface, illustrating the process of installing the LittleFS library for ESP32.

Left Screenshot: The Library Manager is open, and the search results for "littlefs_esp32" are shown. The library "LittleFS_esp32" by lorol is selected, and the "INSTALL" button is highlighted. The code editor shows the following code:

```
1 #include "LittleFS.h"
2
3 // the setup function runs once when you press reset or power the board
4 void setup() {
5   // initialize digital pin LED_BUILTIN as an output:
6   pinMode(LED_BUILTIN, OUTPUT);
7   LittleFS.begin(true);
8 }
9
10 // the loop function runs over and over again forever
11 void loop() {
12   digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the positive voltage)
13   delay(1000); // wait for a second
14   digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the pin LOW
15   delay(1000); // wait for a second
16 }
17
```

Right Screenshot: The Library Manager is open, and the library "LittleFS_esp32" by lorol is shown as "1.0.6 installed". The "REMOVE" button is highlighted. The code editor shows the same code as the left screenshot.

Output Window: The output window shows the following messages:

```
Downloading LittleFS_esp32@1.0.6
LittleFS_esp32@1.0.6
Installing LittleFS_esp32@1.0.6
Installed LittleFS_esp32@1.0.6
```

Compile and Upload “LittleFS Initialization” (4)

- Compile and upload to check for correctness
- Note:
 - This program is for initializing the LittleFS on ESP32C3, which is a file system (FS) for storing data